Developer Guide

Amazon CloudSearch

API Version 2013-01-01

Amazon CloudSearch: Developer Guide

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What Is Amazon CloudSearch?

Important

Amazon CloudSearch is no longer available to new customers. Existing customers of Amazon CloudSearch can continue to use the service as usual. Learn more.

Amazon CloudSearch is a fully managed service in the cloud that makes it easy to set up, manage, and scale a search solution for your website or application.

With Amazon CloudSearch you can search large collections of data such as web pages, document files, forum posts, or product information. You can quickly add search capabilities without having to become a search expert or worry about hardware provisioning, setup, and maintenance. As your volume of data and traffic fluctuates, Amazon CloudSearch scales to meet your needs.

Note

This document describes the Amazon CloudSearch 2013-01-01 API. If you have 2011-02-01 search domains and need to reference the old documentation, you can download a PDF of the 2011-02-01 Developer Guide.

You can use Amazon CloudSearch to index and search both structured data and plain text. Amazon CloudSearch features:

- Full text search with language-specific text processing
- Boolean search
- Prefix searches
- Range searches
- Term boosting
- Faceting
- Highlighting
- Autocomplete suggestions

You can get search results in JSON or XML, sort and filter results based on field values, and sort results alphabetically, numerically, or according to custom expressions.

To build a search solution with Amazon CloudSearch, you take the following steps:

- **Create and configure a search domain.** A search domain includes your searchable data and the search instances that handle your search requests. If you have multiple collections of data that you want to make searchable, you can create multiple search domains.
- **Upload the data you want to search to your domain.** Amazon CloudSearch indexes your data and deploys the search index to one or more search instances.
- **Search your domain.** You send a search request to your domain's search endpoint as an HTTP/HTTPS GET request.

Topics

Are You New to Amazon CloudSearch?

For a high-level overview of Amazon CloudSearch, service highlights, and pricing information, see the Amazon CloudSearch detail page. If you are ready to start using Amazon CloudSearch, you should begin with Getting Started with Amazon CloudSearch.

You can interact with Amazon CloudSearch through the AWS Management Console, AWS SDKs, or AWS CLI. While you can also submit API requests directly to Amazon CloudSearch, the SDKs and AWS CLI automatically sign your requests as needed and provide centralized tools for interacting with Amazon CloudSearch domains in conjunction with other AWS services. For information about the AWS SDKs, see Tools for Amazon Web Services. For information about installing and using the AWS CLI, see the AWS Command Line Interface User Guide.

For more information about configuring and managing your search domains, getting your data into Amazon CloudSearch, submitting search requests, and processing the responses, see:

- Preparing Your Data—how to format your data so you can upload it to an Amazon CloudSearch domain for indexing
- configure indexing options—how to configure indexing options for an Amazon CloudSearch domain
- Searching Your Data with Amazon CloudSearch—how to use the Amazon CloudSearch query language
- Controlling Search Results—how to sort, filter, and paginate search results

How Search Works

The collection of data that you want to search (sometimes referred to as your *corpus*) can consist of unstructured full-text documents, semi-structured documents such as those formatted in mark-up languages like XML, or structured data that conforms to a strict data model. Each item that you want to be able to search (such as a forum post or web page) is represented as a document. Every document has a unique ID and one or more fields that contain the data that you want to search and include in results.

To make your data searchable, you represent it as a batch of documents in either JSON or XML and upload the batch to your search domain. Amazon CloudSearch then generates a search index from your document data according to your domain's configuration options. You submit queries against this index to find the documents that meet specific search criteria.

As your data changes, you submit updates to add, change, or delete documents from your index. Updates are applied continuously in the order they are received.

For information about how to format your data, see Preparing Your Data.

Indexing in Amazon CloudSearch

To build a search index from your data, Amazon CloudSearch needs the following information:

- Which document fields do you want to search?
- Which document field values do you want to retrieve with the search results?
- Which document fields represent categories that you want to use to refine and filter search results?
- How should the text within a particular field be processed?

You define this metadata in your domain configuration by configuring indexing options. You use indexing options to specify the fields included in the search index and control how you can use those fields.

You must configure a corresponding index field for each document field that occurs in your data—there's a one-to-one mapping between document fields and the fields in your Amazon CloudSearch index. In addition to the index field name, you specify the following:

- The index field type
- Whether the field is searchable (`text` and `text-array` fields are always searchable)
- Whether the field can be used as a category (facet)
- Whether the field value can be returned with the search results
- Whether the field can be used to sort the results
- Whether highlights can be returned for the field
- A default value to use if no value is specified in the document data.

For information about how to configure index fields for Amazon CloudSearch, see configure indexing options.

Facets in Amazon CloudSearch

A facet is an index field that represents a category that you want to use to refine and filter search results. When you submit search requests to Amazon CloudSearch, you can request facet information to find out how many hits share the same value in a facet. You can display this information along with the search results and use it to enable users to interactively refine their searches. (This is often referred to as faceted navigation or faceted search.)

A facet can be any date, literal, or numeric field that has faceting enabled in your domain configuration. For each facet, Amazon CloudSearch calculates the number of hits that share the same value. You can define buckets to calculate facet counts for particular subsets of the facet values. Only buckets that have matches are included in the facet results.

For information about configuring facets, see configure indexing options. For information about using facet information to support faceted navigation, see Getting and Using Facet Information in Amazon CloudSearch.

Text Processing in Amazon CloudSearch

During indexing, Amazon CloudSearch processes the contents of `text` and `text-array` fields according to the language-specific analysis scheme configured for the field. An analysis scheme controls how the text is normalized, tokenized, and stemmed, and specifies any stopwords or synonyms to take into account during indexing. Amazon CloudSearch provides default analysis schemes for each supported language. For information about configuring custom analysis schemes, see Configuring Analysis Schemes. For information about how Amazon CloudSearch normalizes and tokenizes text and applies configured text options when indexing text fields and processing search requests, see Text Processing in Amazon CloudSearch.

Sorting Results in Amazon CloudSearch

You can customize how search results are ranked by defining expressions that calculate custom values for every document that matches your search criteria. For example, you might define an expression that takes into account the value in a document's `popularity` field as well as the default relevance score calculated by Amazon CloudSearch Expressions are simply numeric expressions that use standard numeric operators and functions. Expressions can reference `int` and `double` fields, other expressions, a document's relevance score (_score), as well as the epoch time (_time). When you submit search requests, you specify the expression(s) you want to use to sort the search results. You can also reference expressions within your search criteria.

A document's relevance `_score` indicates how relevant a particular search hit is to the search request. To calculate the relevance score, Amazon CloudSearch takes into account how many times the search terms appear in a document relative to the other documents in the index.

For information about how to configure expressions for your domain, see Configuring Expressions.

Search Requests in Amazon CloudSearch

You submit search requests to your domain's search endpoint as HTTP/HTTPS GET requests. You can specify a variety of options to constrain your search, request facet information, control ranking, and specify what you want to be returned in the results. You can get search results in either JSON or XML. By default, Amazon CloudSearch returns results in JSON.

When you submit a search request, Amazon CloudSearch performs text processing on the search string. The search string is processed to:

- Convert all characters to lowercase

- Split the string into separate terms on whitespace and punctuation boundaries
- Remove terms that are on the stopword list for the field being searched.
- Map stems and synonyms according to the stemming and synonym options configured for the field being searched.

After this preprocessing is complete, Amazon CloudSearch looks up the search terms in the index and identifies all of the documents that match the request. To generate a response, Amazon CloudSearch processes this list of search hits to filter and sort the matching documents and compute facets. Amazon CloudSearch then returns the response in JSON or XML.

By default, Amazon CloudSearch returns search results ranked according to the hits' relevance _scores. Alternatively, your request can specify the index field or expression that you want to use to sort the hits. For example, you might want to sort hits by an index field that contains the price or an expression that calculates popularity.

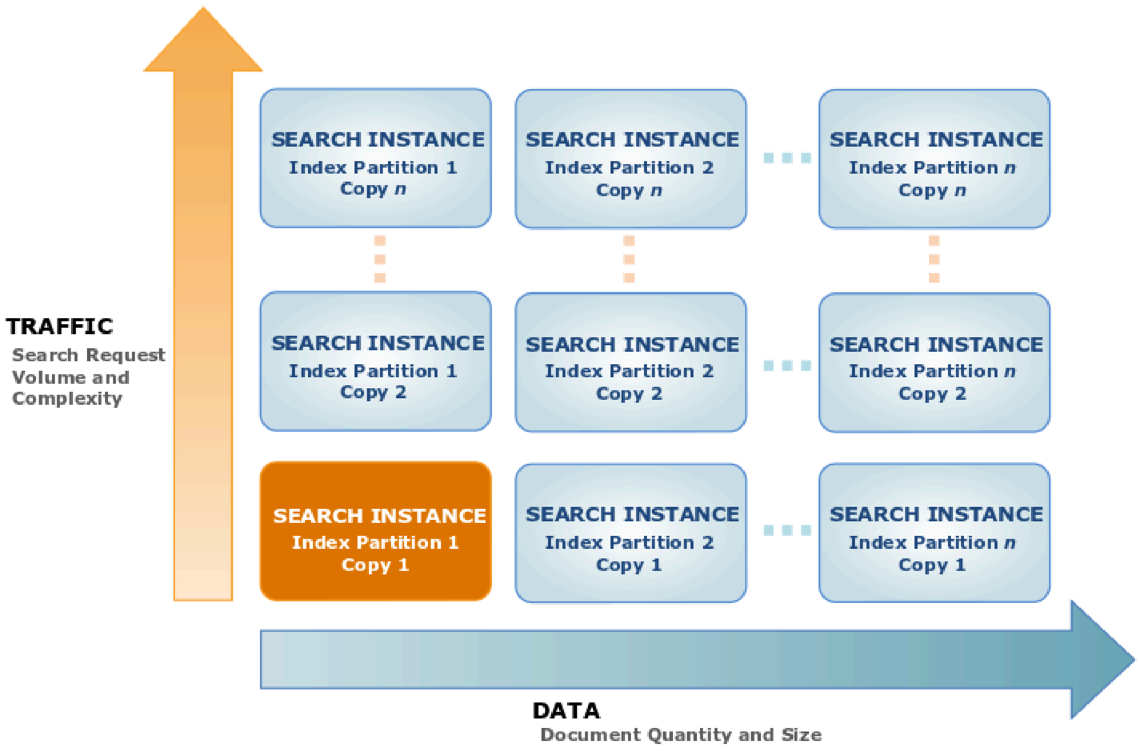
For more information about searching, ranking, and paginating results, see Searching Your Data with Amazon CloudSearch.

Automatic Scaling in Amazon CloudSearch

A search domain has one or more search instances, each with a finite amount of RAM and CPU resources for indexing data and processing requests. How many search instances a domain needs depends on the documents in your collection and the volume and complexity of your search requests.

Amazon CloudSearch can determine the size and number of search instances required to deliver low latency, high throughput search performance. When you upload your data and configure your index, Amazon CloudSearch builds an index and picks the appropriate initial search instance type. As you use your search domain, Amazon CloudSearch can scale to accommodate the amount of data uploaded to the domain and the volume and complexity of search requests.

When you create a search domain, a single instance is deployed for the domain. As the following illustration shows, you always have at least one instance for your domain. Amazon CloudSearch automatically scales the domain by adding instances as the volume of data or traffic increases.



Scaling for Data

When the amount of data you add to your domain exceeds the capacity of the initial search instance type, Amazon CloudSearch scales your search domain to a larger search instance type. After a domain exceeds the capacity of the largest search instance type, Amazon CloudSearch partitions the search index across multiple search instances. (The number of search instances required to hold the index partitions is sometimes referred to as the domain's *width*.)

When the volume of data in your domain shrinks, Amazon CloudSearch scales down your domain to fewer search instances or a smaller search instance type to minimize costs.

Note

If your domain has scaled up to accommodate your index size and you delete a large number of documents, the domain scales down the next time the full index is rebuilt. Although the index is automatically rebuilt periodically, to scale down as quickly as possible you can explicitly run indexing when you are done deleting documents.

Scaling for Traffic

As your search request volume or complexity increases, it takes more processing power to handle the load. A high volume of document uploads also increases the load on a domain's search instances. When a search instance nears its maximum load, Amazon CloudSearch deploys a duplicate search instance to provide additional processing power. (The number of duplicate search instances is sometimes referred to as the domain's *depth*.)

When traffic drops, Amazon CloudSearch removes search instances to minimize costs. For example, a new domain might scale up to handle the initial influx of documents, and scale back down after you have finished uploading your data and are only submitting updates.

If your domain experiences a sudden surge in traffic, Amazon CloudSearch deploys additional search instances. It takes a few minutes to set up the new instances, however, so you might see an increase in 5xx errors until the new instances can start processing requests. For more information about handling 5xx errors, see Handling Errors.

Keep in mind that the type and complexity of your search requests affect overall search performance and in some cases increase the number of search instances required to operate your domain. Submitting a high volume of small or single-document batches can affect your search domain's performance. For more information, see Tuning Search Request Performance in Amazon CloudSearch.

Accessing Amazon CloudSearch

You can access Amazon CloudSearch through the Amazon CloudSearch console, the AWS SDKs, or the AWS CLI.

- The Amazon CloudSearch console enables you to easily create, configure, and monitor your search domains, upload documents, and run test searches. Using the console is the easiest way to get started with Amazon CloudSearch and provides a central command center for the ongoing management of your search domains.

- The AWS SDKs support all of the Amazon CloudSearch API operations, making it easy to manage and interact with your search domains using your preferred technology. The SDKs automatically sign requests as needed using your AWS credentials.
- The AWS CLI wraps all of the Amazon CloudSearch API operations to provide a simple way to create and configure search domains, upload the data you want to search, and submit search requests. The AWS CLI automatically signs requests as needed using your AWS credentials.

Regions and Endpoints for Amazon CloudSearch

Amazon CloudSearch provides regional endpoints for accessing the configuration service and domain-specific endpoints for accessing the search and document services.

You use the configuration service to create and manage your search domains. The region-specific configuration service endpoints are of the form: `cloudsearch.`*`region`*`.amazonaws.com`. For example, `cloudsearch.us-east-1.amazonaws.com`. For a current list of supported regions, see Regions and Endpoints in the AWS General Reference.

To access the Amazon CloudSearch search and document services, you use separate domain-specific endpoints:

- `http://doc-`*`domainname`*`-`*`domainid`*`.us-east-1.cloudsearch.amazonaws.com`—a domain's document service endpoint is used to upload documents
- `http://search-`*`domainname`*`-`*`domainid`*`.us-east-1.cloudsearch.amazonaws.com`—a domain's search endpoint is used to submit search requests

Signing Amazon CloudSearch Requests

If you're using a language for which AWS provides an SDK, we recommend that you use the SDK to submit Amazon CloudSearch requests. All of the AWS SDKs greatly simplify the process of signing requests and save you a significant amount of time when compared to using the Amazon CloudSearch APIs directly. The SDKs integrate easily with your development environment and provide easy access to related commands. You can also use the Amazon CloudSearch console and AWS CLI to submit signed requests with no additional effort.

If you choose to call the Amazon CloudSearch APIs directly, you must sign your own requests. Configuration service requests must always be signed. Upload, search, and suggest requests must be signed, unless you configure anonymous access for those services. To sign a request, you calculate a digital signature using a cryptographic hash function, which returns a hash value based on the input. The input includes the text of your request and your secret access key. The hash function returns a hash value that you include in the request as your signature. The signature is part of the Authorization header of your request. After receiving your request, Amazon CloudSearch recalculates the signature using the same hash function and input that you used to sign the request. If the resulting signature matches the signature in the request, Amazon CloudSearch processes the request. Otherwise, the request is rejected.

Amazon CloudSearch supports authentication using AWS Signature Version 4. For more information, see Signature Version 4 Signing Process.

Frequently asked questions

What is the cutoff point for “current customers”?

We created an allowlist of account IDs that are already using Amazon CloudSearch. However, we will allowlist any new account of customers previously using Amazon CloudSearch. If you are having difficulties, please submit a support ticket.

What do we mean by “access” to the service?

Current customers can do anything they could previously. The only change is that non-current customers cannot access Amazon CloudSearch.

Can existing Amazon CloudSearch customers create new repositories if they were alreadyAmazon CloudSearch?

Yes. If you are having difficulties, please submit a support ticket

Getting Started with Amazon CloudSearch

To start searching your data with Amazon CloudSearch, you simply take the following steps:

- Create and configure a search domain
- Upload and index the data you want to search
- Send search requests to your domain

This tutorial shows you how to get up and running using the AWS Management Console for Amazon CloudSearch. To make it even easier to get started, we've generated a sample data set of 5,000 popular movie titles that you can download and examine, upload to your own search domain, and submit search queries against to see how Amazon CloudSearch works.

Using the AWS Management Console and the sample movie data, you'll have your own search domain up and running in about half an hour.

To begin, Get Signed Up.

Topics

Before You Begin with Amazon CloudSearch

To use Amazon CloudSearch, you need an Amazon Web Services (AWS) account. Your AWS account enables you to access Amazon CloudSearch and other AWS services, such as Amazon Simple Storage Service (Amazon S3) and Amazon Elastic Compute Cloud (Amazon EC2). As with other AWS services, you pay only for the Amazon CloudSearch resources you use. There are no sign up fees and charges are not incurred until you create a search domain.

If you already have an AWS account, you are automatically signed up for Amazon CloudSearch.

To create an AWS account

1. Go to https://aws.amazon.com and click **Sign Up Now**.
2. Follow the instructions to sign up. You will need to enter payment information before you can begin using Amazon CloudSearch.

Step 1: Create an Amazon CloudSearch Domain

An Amazon CloudSearch domain encapsulates a collection of data you want to search, the search instances that process your search requests, and a configuration that controls how your data is indexed and searched. You create a separate search domain for each collection of data you want to make searchable. For each domain, you configure indexing options that describe the fields you want to include in your index and how you want to use them, analysis schemes that specify language-specific text processing options for individual fields, expressions that you can use to customize how search results are ranked, and access policies that control access to the domain's document and search endpoints.

You interact with a search domain to:

- Configure index and search options
- Submit data for indexing
- Perform searches

Each domain has a unique endpoint through which you submit search requests to the domain. For example, the endpoint for a domain called *movies* created in the US East (N. Virginia) region might be:

Example

```
search-movies-mtshfsu2rje7ywr66uit3dei4m.us-east-1.cloudsearch.amazonaws.com
```

When creating a search domain, you specify a unique name for the domain. Domain names must start with a letter or number and be at least 3 and no more than 28 characters long. The allowed characters are: a-z, 0-9, and hyphen (-). By default, new domains are created in the US East (N. Virginia) region. To create a domain in another region, you must explicitly specify the region when creating the domain.

To configure the new domain, you must specify:

- Indexing options for the data you want to search.
- Access policies for the domain's document service and search service endpoints.

This tutorial shows you how to create and interact with a domain using the Amazon CloudSearch console. To learn more, see Creating a Search Domain.

Important

The domain you're about to create will be live and you will incur the standard Amazon CloudSearch usage fees for the domain until you delete it. For more information about Amazon CloudSearch usage rates, go to the Amazon CloudSearch detail page.

To create your movies domain

1. Go to the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. Choose **Create domain**.
3. Enter a name for your new domain. Domain names must start with a letter or number and be at least 3 and no more than 28 characters. Domain names can contain the following characters: a-z (lower case), 0-9, and - (hyphen). Upper case letters and underscores are not allowed.
4. Leave the other settings as their defaults and choose **Next**.
5. Select **Sample data** and choose **IMDb movies (demo)** from the dropdown. You can also automatically configure a search domain by analyzing a sample of your data.
6. Choose **Next**.
7. Review the index fields being configured. Eleven fields are configured automatically for the imdb-movie data: actors, directors, genres, image_url, plot, rank, rating, release_date, running_time_secs, title, and year.

   Note

   By default, all options are enabled for each field. While this is convenient for development and testing, fine-tuning the options configured for each field according to how you use those fields can reduce the size of your index. If your domain uses more than a single small search instance, tuning can help minimize the cost of running your domain.

When you finish reviewing the indexing options, choose **Next**.

8. For simplicity in this tutorial, use an open access domain. Choose **Allow open access to the domain** and choose **Next**.
9. Review the domain configuration and click **Create** to create your domain.

Amazon CloudSearch initializes resources for the domain, which can take about ten minutes. During this initialization process, the status of the domain is **Processing**. Once the status changes to **Active**, you can upload your data and start searching.

Step 2: Upload Data to Amazon CloudSearch for Indexing

You upload the data you want to search to your domain so that Amazon CloudSearch can build and deploy a searchable index. To be indexed by Amazon CloudSearch, the data must be formatted in either JSON or XML. The Amazon CloudSearch console can automatically convert the following file types to the required format:

- Document batches formatted in JSON or XML (.json, .xml)
- Comma Separated Value (.csv)
- Text Documents (.txt)

When you upload a CSV file, Amazon CloudSearch parses each row separately. The first row defines the document fields, and each subsequent row becomes a separate document. For all other file types Amazon CloudSearch creates a single document and the contents of the file are mapped to a single text field. If metadata is available for the file, the metadata is mapped to corresponding document fields—the fields generated from the document metadata vary depending on the file type.

The sample IMDb movies data is already formatted in JSON.

This tutorial shows how to submit data through the Amazon CloudSearch console, but you can also convert and upload documents with the command line tools, and upload documents using the `documents/batch` resource. (To upload more than 5 MB of data, you must use the command line tools or API.)

To upload the sample data to your movies domain

1. Go to the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation pane, choose **Domains**. Choose the name of your *movies* domain to view the domain dashboard.
3. Choose **Actions**, **Upload documents**.
4. Select **Sample data** and choose **IMDb movies (demo)** from the dropown.
5. Choose **Next**.
6. Review the upload summary and choose **Upload documents** to send the data to your domain for indexing.

   Note

   To see how the data is formatted, choose **Download the generated document batch**. For more information about preparing your own data, see Preparing Your Data.

You now have a fully functional Amazon CloudSearch domain that you can start searching. Updates are applied continuously in the order they are received, so you can start searching your domain right away.

Step 3: Search Your Amazon CloudSearch Domain

You can use the search tester in the Amazon CloudSearch console to submit sample search requests and view the results. You can also submit sample search requests through a Web browser or using cURL. In your application, you can use any HTTP library to send search traffic to your Amazon CloudSearch domain.

Searching with the Search Tester

The search tester in the Amazon CloudSearch console enables you to submit sample search requests using any of the supported query parsers: simple, structured, lucene, or dismax. By default, requests are processed with the simple query parser. You can specify options for the selected parser, filter and sort the results, and browse the configured facets. The search hits are automatically highlighted in the search results. For information about how this is done, see Highlighting Search Hits in Amazon CloudSearch. You can also select a suggester to get suggestions as you enter terms in the **Search** field. (You must configure a suggester before you can get suggestions. For more information see Getting Autocomplete Suggestions in Amazon CloudSearch.)

By default, results are sorted according to an automatically-generated relevance score, *_score*. For information about customizing how results are ranked, see Sorting Results in Amazon CloudSearch.

To search your domain

1. Go to the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation panel, choose your **movies** domain to open its configuration.
3. Choose **Run a test search**.
4. To perform a simple text search, enter a search query and choose **Run**. By default, all `text` and `text-array` fields are searched.

To search particular fields, expand **Options** and enter a comma-separated list of the fields you want to search for in the **Search fields** field. You can append a weight to each field with a caret (^) to control the relative importance of each field in the search results. For example, specifying `title^5, description` weights hits in the `title` field five times more than hits in the `description` field when calculating relevance scores for each matching document.

To use the structured query syntax, select **Structured** from the **Query parser** menu. Once you've selected the structured query parser, enter your structured query in the **Search** field and choose **Run**. For example, to find all of the movies with *star* in the title that were released in the year 2000 or earlier, you could enter: `(and title:'star' year:{,2000])`. For more information, see Constructing Compound Queries. To submit Lucene or DisMax queries, select the appropriate query parser.

You can specify additional options for the selected query parser to configure the default operator and control which operators can be used in a query. For more information, see Search Request Parameters.

You can copy and paste the request URL to submit the request and view the response from a Web browser. Requests can be sent via HTTP or HTTPS.

Submitting Search Requests from a Web Browser

You can submit search requests directly to your search endpoint from any Web browser. You can use any of the query parsers (simple, structured, lucene, or dismax) and specify a variety of options to constrain your search, request facet information, customize ranking, and control what information is returned in the results.

For example, to search your movies domain and get the titles of all of the available *Star Wars* movies, append the following search string to your search endpoint. (2013-01-01 is the API version and must be specified.)

Example

```
/2013-01-01/search?q=star+wars&return=title
```

Note

Your domain's search endpoint is shown on the domain dashboard. You can also perform a search from the AWS Management Console, view the raw request and response, and copy the request URL from the Search Request field. A domain's search and document service endpoints remain the same for the life of the domain.

By default, Amazon CloudSearch returns the response in JSON. You can also get the search results formatted in XML by specifying the `format` parameter, `format=xml`. (Note that errors can be returned in either JSON or XML, depending on where the error originated.)

Searching Numeric Fields

You can use the structured query syntax, `q.parser=structured`, to find documents that have particular numeric attributes. You can search for an exact value or a range of values within any numeric field (`double`, `double-array`, `int`, `int-array`). To search for a range, you specify the upper and lower bounds, separated by a comma, and enclose the range in brackets or braces. Use square brackets ([,]) when you want to include the bounds, and curly braces ({,}) to exclude the bounds. For example:

- `year:2000` matches documents whose year field contains the value 2000.
- `year:[2000,}` matches documents whose year field contains a value greater than or equal to 2000

- `year:{,2000]` matches documents whose year field contains a value less than or equal to 2000
- `year:[2000,2011]` matches documents whose year field contains a value between 2000 and 2011, inclusive.
- `year:{2000,2011}` matches documents whose year field contains a value between 2000 and 2011, exclusive.

You can also search date fields for a specific date or date range, but you must enclose each date string in single quotes: `release_date:['2000-01-01T00:00:00Z','2011-01-01T00:00:00Z']`.

For example, the following structured query searches for "star" in the title field, finds all of the matching movies that were released before 2000, and returns the title, year, and relevance score for each one:

Example

```
q=(and title:'star' year:{,2000])&q.parser=structured&return=title,year,_score
```

The response shows the status of the request, the number of matching documents, and the requested fields for each hit.

```
{
    "status": {
        "rid": "hLPckLsoEQoELQo=",
        "time-ms": 2
    },
    "hits": {
        "found": 15,
        "start": 0,
        "hit": [
            {
                "id": "tt0076759",
                "fields": {
                    "title": "Star Wars",
                    "year": "1977",
                    "_score": "5.7601414"
                }
            },
            .
            .
            .
            {
                "id": "tt0088170",
                "fields": {
                    "title": "Star Trek III: The Search for Spock",
                    "year": "1984",
                    "_score": "4.2371693"
                }
            }
        ]
    }
}
```

For more information about constructing search queries, see Searching Your Data with Amazon CloudSearch.

Sorting the Search Results

By default, Amazon CloudSearch sorts the search results according to an automatically generated relevance `_score`. You can change how results are ranked by using the *sort* parameter in your search request to specify the field or expression you want to use for ranking. (An expression is a custom numeric expression that can be evaluated for each document in the set of matching documents. For information about defining your own expressions, see Configuring Expressions.)

If you specify a text field with the `sort` parameter, the results are sorted alphabetically according to that field. For example, to sort results from your movies domain alphabetically by title, add `&sort=title asc` to your query string:

Example

```
2013-01-01/search?q=(and genres:'Sci-Fi' year:
{,2000])&q.parser=structured&return=title,year&sort=title asc
```

Note that you must explicitly specify the sort direction, `asc` (ascending) or `desc` (descending). When you sort alphabetically, Amazon CloudSearch sorts by Unicode codepoint. This means numbers come before letters and uppercase letters come before lowercase letters. Numbers are sorted as strings; for example, 10 will come before 2.

Similarly, you can specify an integer field with the `sort` parameter to sort the results numerically.

If you specify a comma separated list of fields or expressions, the first field or expression is used as the primary sort criteria, the second is used as the secondary sort criteria, and so on.

For more information about ranking results, see Sorting Results in Amazon CloudSearch

Getting Facet Information

A facet is an index field that represents a category that you want to use to refine and filter search results. When you submit search requests to Amazon CloudSearch, you can request facet information to find out how many hits share the same value in a facet. You can display this information along with the search results and use it to enable users to interactively refine their searches. (This is often referred to as faceted navigation or faceted search.)

A facet can be any date, literal, or numeric field that has faceting enabled in your domain configuration. For each facet, Amazon CloudSearch calculates the number of hits that share the same value. You can define buckets to calculate facet counts for particular subsets of the facet values. Only buckets that have matches are included in the facet results.

To get facet counts with your search results

- Use the `facet.FIELD` option to specify a field for which you want to compute facets. For the sample IMDb movies data faceting is enabled for the following fields: `genres`, `rank`, `rating`, `release_date`, `running_time_secs`, and `year`. Facet options are specified as a JSON object. If the JSON object is empty, `facet.FIELD={}`, facet counts are computed for all field values, the facets are sorted by facet count, and the top 10 facets are returned in the results:

  ```
  q=star&return=title&facet.genres={}
  ```

The facets appear below the hits in the results.

```
facets": {

    "genres": {
        "buckets": [
            {"value": "Comedy","count": 41},
            .
            .
            .
            {"value": "Sport", "count": 7}
        ]
```

```
    }
}
```

You can specify options to calculate facets for selected field values, specify the maximum number of facet values to include in the results, and control how the facets are sorted.

To define buckets to compute facet counts for selected field values, you specify the `buckets` option. For example, the following request sorts the facet counts for the year field by decade:

```
q=star&facet.year={buckets:["[1970,1979]","[1980,1989]","[1990,1999]"]}
```

This constrains the facet counts to the three specified ranges:

```
"facets": {
        "year": {
            "buckets": [
                {"value": "[1970,1979]", "count": 3},
                {"value": "[1980,1989]","count": 7},
                {"value": "[1990,1999]","count": 12}
            ]
        }
}
```

For more information about specifying facet options, see Getting and Using Facet Information in Amazon CloudSearch.

Getting Search Highlights

A search highlight is an excerpt of a text or text-array field that shows where the search term occurs within the field.

To get highlight information with your search results

- Use the `highlight.FIELD` option to specify the text or text-array field you want to get highlights for. The field must be highlight enabled in your domain's indexing options. For the sample IMDb movies data highlighting is enabled for the following fields: `actors`, `directors`, `plot`, and `title`. Highlight options are specified as a JSON object. If the JSON object is empty, `highlight.FIELD={}`, Amazon CloudSearch highlights all occurrences of the search term(s) by enclosing them in HTML emphasis tags, `<em>term</em>`, and the excerpts are returned as HTML.

```
q=title:'star'&q.parser=structured&return=_no_fields&highlight.title={}
```

The highlight information is included with each search hit.

```
hits": {
    "found": 29,
    "start": 0,
    "hit": [
        {
            "id": "tt0796366",
            "highlights": {
                "title": "<em>Star</em> Trek"
            }
        },
        .
        .
        .
        {
            "id": "tt2488496",
            "highlights": {
                "title": "<em>Star</em> Wars: Episode VII"
            }
        }
    ]
}
```

For more information about specifying highlight options, see Highlighting Search Hits in Amazon CloudSearch.

Step 4: Delete Your Amazon CloudSearch Movies Domain

When you are finished experimenting with your movies domain, **you must delete it to avoid incurring additional usage fees.**

Important

Deleting a domain deletes the index associated with the domain and takes the domain's document and search endpoints offline permanently.

To delete your imdb-movies domain

1. Go to the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home and navigate to the list of domains.
2. Select the checkbox for the *movies* domain, then choose **Delete** and confirm deletion.

Note

It can take around 15 minutes to delete the domain and its resources.

Wondering where to go next? Are You New to Amazon CloudSearch? has a guide to the rest of the Amazon CloudSearch developer documentation. For more information about the Amazon CloudSearch query language, see Searching Your Data with Amazon CloudSearch. If you're ready to set up a domain with your own data, see Preparing Your Data and upload documents.

Migrating to the Amazon CloudSearch 2013-01-01 API

The Amazon CloudSearch 2013-01-01 API offers several new features, including support for multiple languages, highlighting search terms in the results, and getting suggestions. To use these features, you create and configure a new 2013-01-01 search domain, modify your data pipeline to populate the new domain using the 2013-01-01 data format, and update your query pipeline to submit requests in the 2013-01-01 request format. This migration guide summarizes the API changes and highlights the ones that are most likely to affect your application.

Creating 2013-01-01 Amazon CloudSearch Domains

If you created Amazon CloudSearch domains prior to the launch of the 2013-01-01 API, you can choose which API version to use when you create a new domain. To create a 2013-01-01 domain through the console, select the 2013-01-01 version in the Create Domain Wizard. To create a 2013-01-01 domain from the command line, download and install the AWS CLI and run the `aws cloudsearch create-domain` command.

Note

To create and interact with 2013-01-01 domains, you must use the AWS CLI tools. To create and interact with 2011-02-01 domains, you must use the v1 tools.

Configuring 2013-01-01 Amazon CloudSearch Domains

You can configure 2013-01-01 domains through the console, command line tools, or AWS SDKs. 2013-01-01 domains support several new configuration options:

- **Analysis Schemes**—you configure analysis schemes to specify language-specific text processing options for `text` and `text-array` fields. Amazon CloudSearch now supports 33 languages, as well as an option for multi-language fields. For more information, see Configuring Analysis Schemes. For the complete list of supported languages, see Supported Languages.
- **Availability Options**—you can enable the Multi-AZ option to expand a domain into a second availability zone to ensure availability in the event of a service disruption. For more information, see Configuring Availability Options.

- **Scaling Options**—you can set the desired instance type and desired replication count to increase upload or search capacity, speed up search requests, and improve fault tolerance. For more information, see Configuring Scaling Options in Amazon CloudSearch.
- **Suggesters**—you can configure suggesters to implement autocomplete functionality. For more information, see Configuring Suggesters for Amazon CloudSearch.

Access to the Amazon CloudSearch configuration service is managed through IAM and now enables you to control access to specific configuration actions. Note that the Amazon CloudSearch ARN has also changed. Access to your domain's document and search endpoints is managed through the Amazon CloudSearch configuration service. For more information, see configure access policies.

2013-01-01 domains also support an expanded set of indexing options:

- **Analysis Scheme**—you configure language-specific text-processing on a per field basis by specifying an analysis scheme for each `text` and `text-array` field. For more information, see Configuring Analysis Schemes.
- **Field Types**—Amazon CloudSearch now supports 11 field types:
  - date—contains a timestamp. Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: yyyy-mm-ddT00:00:00Z. In UTC, for example, 5:00 PM August 23, 1970 is: 1970-08-23T17:00:00Z.
  - date-array—a date field that can contain multiple values.
  - double—contains a double-precision 64-bit floating point value.
  - double-array—a double field that can contain multiple values.
  - int—contains a 64-bit signed integer value.
  - int-array—an integer field that can contain multiple values.
  - latlon—contains a location stored as a latitude and longitude value pair.
  - literal—contains an identifier or other data that you want to be able to match exactly.
  - literal-array—a literal field that can contain multiple values.
  - text—contains arbitrary alphanumeric data.
  - text-array—a text field that can contain multiple values.
- **Highlight**—when you enable the highlight option for a field, you can retrieve excerpts that show where the search terms occur within that field. For more information, see Highlighting Search Hits in Amazon CloudSearch.

- **Source**—you can specify a source for a field to copy data from one field to another, enabling you to use the same source data in different ways by configuring different options for the fields.

When configuring your 2013-01-01 domain, there are several things to keep in mind:

- By default, when you add a field, all options valid for that field type are enabled. While this is useful for development and testing, disabling options you don't need can reduce the size of your index and improve performance.
- You must use the separate array type fields for multi-valued fields.
- Only single-value fields can be sort enabled.
- Only `text` and `text-array` fields can be highlight enabled.
- All fields *except* `text` and `text-array` fields can be facet enabled.
- Literal fields are now case-sensitive.
- You no longer have to store floating point values as integers—use a `double` field.
- You can store locations using the new `latlon` field type. For more information, see location-based searching and sorting.
- An `int` field is a 64-bit signed integer.
- Instead of configuring a default search field, you can specify which fields to search with the `q.options` parameter in your search requests. The `q.options` parameter also enables you to specify weights for each of the fields.
- When sorting and configuring expressions, you reference the default relevance score with the name `_score`. Due to changes in the relevance algorithm, the calculated scores will be different than they were under the 2011-02-01 API. For more information, see Configuring Expressions.
- Expressions now support the `logn`, `atan2`, and `haversin` functions as well as the `_score` (text relevance score) and `_time` (epoch time) variables. If you store locations in `latlon` fields, you can reference the latitude and longitude values as `FIELD.latitude` and `FIELD.longitude`. You can also reference both `int` and `double` fields in expressions. The following functions are no longer supported: `cs.text_relevance`, `erf`, `lgamma`, `rand`, and `time`. For more information, see Configuring Expressions.

For more information about configuring indexing options for a 2013-01-01 domain, see configure indexing options. For more information about configuring availability options, scaling options, text processing options, suggesters, and expressions see Creating and Managing Search Domains.

New Amazon CloudSearch Configuration Service Actions and Options

The following actions have been added to the 2013-01-01 Configuration Service API:

- DefineAnalysisScheme
- DefineExpression
- DefineSuggester
- DeleteAnalysisScheme
- DeleteExpression
- DeleteSuggester
- DexcribeAnalysisSchemes
- DescribeAvailabilityOptions
- DescribeExpressions
- DescribeScalingParameters
- DescribeSuggesters
- ListDomainNames
- UpdateAvailabilityOptions
- UpdateScalingParameters

The `deployed` option has been added to the describe actions for index fields, access policies, and suggesters. Set the `deployed` option to true to show the active configuration and exclude pending changes.

Obsolete Amazon CloudSearch Configuration Service Actions and Options

The following actions are not supported in the 2013-01-01 Configuration Service API:

- DefineRankExpression
- DescribeRankExpression
- DeleteRankExpression
- DescribeDefaultSearchField

- DescribeStemmingOptions
- DescribeStopwordOptions
- DescribeSynonymOptions
- UpdateDefaultSearchField
- UpdateStemmingOptions
- UpdateStopwordOptions
- UpdateSynonymOptions

Uploading Data to 2013-01-01 Amazon CloudSearch Domains

With the 2013-01-01 API, you no longer have to specify document versions—updates are applied in the order they are received. You also no longer specify the `lang` attribute for each document—you control language-specific text processing by configuring an analysis scheme for each `text` and `text-array` field.

To upload your data to a 2013-01-01 domain, you need to:

- Omit the `version` and `lang` attributes from your document batches.
- Make sure all of the document fields correspond to index fields configured for your domain. Unrecognized fields are no longer ignored, they will generate an error.
- Post the document batches to your 2013-01-01 domain's doc endpoint. Note that you must specify the 2013-01-01 API version. For example, the following request posts the batch contained in `data1.json` to the `doc-movies-123456789012.us-east-1.cloudsearch.amazonaws.com` endpoint.

```
curl -X POST --upload-file data1.json doc-movies-123456789012.us-east-1.
cloudsearch.amazonaws.com/2013-01-01/documents/batch --header "Content-Type:
application/json"
```

The 2013-01-01 API supports prescaling your domain to increase upload capacity. If you have a large amount of data to upload, configure your domain's scaling options and select a larger desired instance type. Moving to a larger instance type enables you to upload batches in parallel and reduces the time it takes for the data to be indexed. For more information, see Configuring Scaling Options in Amazon CloudSearch.

For more information about formatting your data, see Preparing Your Data.

Searching 2013-01-01 Amazon CloudSearch Domains

Much of the effort required to migrate an existing Amazon CloudSearch search domain to the 2013-01-01 API is updating your query pipeline to submit 2013-01-01 compatible search requests.

- Use the 2013-01-01 API version in all requests.
- Use the q parameter to specify search criteria for all requests. The bq parameter is no longer supported. To use the structured (Boolean) search syntax, specify `q.parser=structured` in the request.
- Parameters cannot be repeated in a search request.
- The wildcard character (*) is only supported when using the simple query parser. Use the `prefix` operator to perform prefix matching with the structured query parser. For example, `q=(prefix 'oce')&q.parser=structured`.
- Use the field name `_id` to reference the document ID field in a search request. The `docid` field name is no longer supported.
- Use the `range` operator search a field for a value within the specified range. The `filter` operator is no longer supported.
- Use the new range syntax to search for ranges of values, including dates and locations stored in `latlon` fields. The double dot (..) notation is no longer supported. Separate the upper and lower bounds with a comma (,), and enclose the range in brackets or braces. A square bracket ([,]) indicates that the bound is included, a curly brace ({,}) excludes the bound. For example, `year:2008..2011` is now expressed as `year:[2008,2011]`. An open ended range such as `year:..2011` is now expressed as `year:{,2011]`.
- Use the `term` operator to search a field for a particular value. The `field` operator is no longer supported.
- Use the `q.options` parameter to specify field weights. The `cs.text_relevance` function is no longer supported. For example, `q.options={fields:['title^2','plot^0.5']}`.
- Use the `fq` parameter to filter results without affecting how the matching documents are scored and sorted.
- Use a dot (.) as a separator rather than a hyphen (-) in the prefix parameters: `expr.NAME`, `facet.FIELD`, `highlight.FIELD`.
- Use the `facet.FIELD` parameter to specify all facet options. The `facet-FIELD-top-N`, `facet-FIELD-sort`, and `facet-FIELD-constraints` parameters are no longer supported.

- Use the `sort` parameter to specify the fields or expressions you want to use for sorting. You must explicitly specify the sort direction in the sort parameter. For example, `sort=rank asc, date desc`. The `rank` parameter is no longer supported.
- Use `expr.NAME` to define an expression in a search request. The `rank-RANKNAME` parameter is no longer supported.
- Use `format=xml` to get results as XML. The `result-type` parameter is no longer supported.

The 2013-01-01 search API also supports several new features:

- Term boosting—use the `boost` option in a structured query to increase the importance of one part of the query relative to the other parts. For more information, see Constructing Compound Queries.
- Sloppy phrase search—use the `near` operator in a structured query to search a `text` or `text-array` field for multiple terms and find documents that contain the terms within the specified distance of one another. You can also perform a sloppy phrase search with the simple query parser by appending the ~ operator and a value to the phrase. For more information, see Searching for Phrases.
- Fuzzy search—use the ~ operator to perform fuzzy searches with the simple query parser. Append the ~ operator and a value to a term to indicate how much terms can differ and still be considered a match. For more information, see Searching for Individual Terms.
- Highlighting—use the `highlight.FIELD` parameter to highlight matches in a particular field. For more information, see Highlighting Search Hits in Amazon CloudSearch.
- Autocomplete—configure a suggester and submit requests to the `suggester` resource to get a list of query completions and the documents in which they were found. For more information, see Getting Autocomplete Suggestions in Amazon CloudSearch.
- Partial search results—use the `partial=true` parameter to retrieve partial results when one or more index partitions are unavailable. By default Amazon CloudSearch only returns results if every partition can be queried.
- Deep paging—use the `cursor` parameter to paginate results when you have a large result set. For more information, see Paginate the results.
- Match all documents—use the `matchall` structured query operator to retrieve all of the documents in the index.
- New query parsers—use the `q.parser` parameter to select the Lucene or DisMax parsers instead of the simple or structured parser, `q.parser=lucene` or `q.parser=dismax`.

You'll also notice some changes in behavior when searching:

- Strings are no longer tokenized on case boundaries and periods that aren't followed by a space are considered part of the term. For more information, see Text Processing in Amazon CloudSearch.
- Literal fields are now case-sensitive.
- Search responses no longer include the rank, match expression, or CPU time. The only status information returned is the resource ID (rid) and processing time (time-ms).
- When you get facet information for an `int` field, `min` and `max` values are no longer returned.

For more information about searching your data, see Searching Your Data with Amazon CloudSearch and the Search API.

New Parameters and Options in the Amazon CloudSearch 2013-01-01 Search API

The following parameters have been added to the 2013-01-01 Search API:

- `cursor.FIELD`
- `expr.NAME`
- `facet.FIELD`
- `format`
- `fq`
- `highlight.FIELD`
- `partial`
- `pretty`
- `q.options`
- `q.parser`
- `return`
- `sort`

The ~ operator has been added to the simple query language to support fuzzy searches and sloppy phrase searches.

The following operators have been added to the structured query language:

- `boost`
- `matchall`
- `near`
- `phrase`
- `prefix`
- `range`
- `term`

Obsolete Amazon CloudSearch Search Parameters and Options

The following parameters are no longer supported in the 2013-01-01 search API:

- bq
- facet-FIELD-top-N
- facet-FIELD-sort
- facet-FIELD-constraints
- rank
- rank-RANKNAME
- return-fields
- result-type
- t-FIELD

The following operators and shortcuts are no longer supported in structured queries:

- field
- filter
- -
- |
- +
- *

Updated Limits in Amazon CloudSearch 2013-01-01

This table summarizes the changes and additions to the Amazon CloudSearch limits. For the complete list of Amazon CloudSearch limits, see Limits.

Change	Summary
Reserved names	*score* is the only reserved name.
No limit on return data	Data returned from a text field is no longer truncated at 2 KB. However, keep in mind that the maximum document size is 1 MB.
No limit on stemming, stopword, or synonym dictionaries.	Stemming, stopword, and synonym dictionaries are configured in an analysis scheme and there is no limit on the size of an analysis scheme definition.
Maximum number of field values	An array type field can contain up to 1000 values.
Field size	The maximum size of `literal` fields is 4096 Unicode code points.
Int field range	An `int` field can contain values in the range -9,223,372,036,854,775,808 - 9,223,372,036,854,775,807 (inclusive).
Maximum number of highlights	The maximum number of occurrences of the search term(s) that can be highlighted is 5.
Maximum number of suggesters	The maximum number of suggesters you can configure for a domain is 10.
Maximum number of hits you can retrieve at once	The maximum number of hits you can retrieve at once is 10,000. The `size` parameter can contain values in the range 0 - 10000.

Creating and Managing Amazon CloudSearch Domains

A search domain encapsulates the data you want to search, indexing options that control how you can search the data and what information you can retrieve from your search domain, and the search instances that index your data and process search requests. You can create, monitor, and delete domains using the Amazon CloudSearch console, AWS CLI, or AWS SDKs. All domain management actions are implemented by the Amazon CloudSearch configuration service. For more information, see the Configuration API Reference for Amazon CloudSearch.

Topics

Creating an Amazon CloudSearch Domain

To search your data with Amazon CloudSearch, the first thing you need to do is create a search domain. If you have multiple collections of data that you want to make searchable, you can create multiple search domains. Before you can send search requests to a new domain, you must also configure access policies, configure index fields, and upload the data you want to search.

When you create a search domain, you must give it a unique name. Domain names must start with a letter or number and be at least 3 and no more than 28 characters long. The allowed characters are: a-z, 0-9, and hyphen (-). Upper case letters, underscores (_), and other special characters are not allowed in domain names.

By default, all new domains are created using the 2013-01-01 API version. If you have previously created search domains with the 2011-02-01 API version, you can opt to use the old API for your new domain. However, we recommend using the 2013-01-01 API for all new use cases. All domains will need to migrate to the 2013-01-01 API when the 2011-02-01 API is retired.

You can choose the AWS region where you want to create your search domain. Typically, you should choose the region closest to your operations. For example, if you reside in Europe, create your search domain in the Europe (Ireland) region (eu-west-1). For a current list of supported regions and endpoints, see Regions and Endpoints. For more information about choosing a region, see Regions and Endpoints for Amazon CloudSearch.

Note

Amazon CloudSearch domains in different regions are entirely independent. For example, if you create a search domain called *my-domain* in us-east-1, and another domain called *my-domain* in eu-west-1, they are completely independent and do not share any data.

Each search domain has unique endpoints through which you upload data for indexing and submit search requests. A domain's document and search endpoints remain the same for the life of the domain. For example, the endpoints for a domain called imdb-movies might be:

```
doc-imdb-movies-nypdffbzrfkoudsurkxvgwbpi4.us-east-1.cloudsearch.amazonaws.com
search-imdb-movies-nypdffbzrfkoudsurkxvgwbpi4.us-east-1.cloudsearch.amazonaws.com
```

Important

By default, access to a new domain's document and search endpoints is blocked for all IP addresses. You must configure access policies for the domain to be able to submit search requests to the domain's search endpoint and upload data from the command line or through the domain's document endpoint. You can upload documents and search the domain through the Amazon CloudSearch console without configuring access policies.

You can create a search domain from the Amazon CloudSearch console, using the `aws cloudsearch create-domain` command, or using one of the AWS SDKs.

Topics

Creating a Domain Using the Amazon CloudSearch Console

The Amazon CloudSearch console enables you to easily create new search domains and provides a variety of options for configuring indexing options.

To create a domain

1. Sign in to the AWS Management Console and open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. Choose **Create domain**.
3. Enter a name for your new domain. Domain names must start with a letter or number and be at least 3 and no more than 28 characters long. Domain names can contain the following characters: a-z (lower case), 0-9, and - (hyphen). Upper case letters, underscores (_), and other special characters are not allowed in domain names.

   Optionally, you can set the **Desired instance type** and **Desired replication count** to prescale your domain. For more information, see Configuring Scaling Options in Amazon CloudSearch.
4. Choose **Next**.
5. In the configuring options, select **Manual configuration** and choose **Next**.
6. Configure the index fields for the domain. For instructions, see configure indexing options.
7. Choose **Next**.
8. Configure the domain access policy. For instructions, see configure access policies.

   Note

   Until you configure access policies, you will only be able to upload documents and submit search queries through the console. By default, the document and search endpoints are configured to block all IP addresses.
9. Choose **Next**.
10. Review the domain configuration and choose **Create**.

The domain's document and search service endpoints are displayed on the domain dashboard when the domain becomes active. At that point, you can upload documents for indexing and start searching your data.

Creating a Domain Using the AWS CLI

You use the `aws cloudsearch create-domain` command to create search domains. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To create a domain

- Run the `aws cloudsearch create-domain` command and specify the name of the domain you want to create with the `--domain-name` option. For example, to create a domain called *movies*:

  Example

  ```
  aws cloudsearch create-domain --domain-name movies
  {
    "DomainStatus": {
        "DomainId": "965407640801/movies",
        "Created": true,
        "Deleted": false,
        "SearchInstanceCount": 0,
        "DomainName": "movies",
        "SearchService": {},
        "RequiresIndexDocuments": false,
        "Processing": false,
        "DocService": {},
        "ARN": "arn:aws:cloudsearch:us-east-1:965407640801:domain/movies",
        "SearchPartitionCount": 0
    }
  }
  ```

The `aws cloudsearch create-domain` command returns immediately. It takes about ten minutes to create endpoints for a new domain. You can use the `aws cloudsearch describe-domains` command to view a summary of the domain's status and configuration. For more information, see Getting Information About an Amazon CloudSearch Domain.

Important

Once a domain's endpoints are active, they remain the same for the life of the domain. You should cache the endpoints—there's no need to query for the endpoint before submitting a document or search service request and doing so is likely to result in your requests being throttled.

Creating an Amazon CloudSearch Domain Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `CreateDomain`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Configuring Access for Amazon CloudSearch

You use AWS Identity and Access Management (IAM) access policies to control access to the Amazon CloudSearch configuration service and each search domain's document, search, and suggest services. An IAM access policy is a JSON document that explicitly lists permissions that define what actions people or processes are allowed to perform. For an introduction to IAM access policies, see Overview of AWS IAM Policies.

You control access to the Amazon CloudSearch configuration service APIs and the domain services APIs independently. For example, you might choose to restrict who can modify the configuration of your production domain, but allow team members to create and manage their own domains for development and testing. Similarly, you might configure your development and test domains to accept anonymous requests to the upload, search, and suggest services, but lock down your production domain so that it accepts only authenticated requests from your application.

When AWS receives a request, it authenticates that the request is from a known AWS user, and then checks relevant policies to determine whether the user is authorized to perform the requested actions using the requested resources. If a user has not been explicitly granted permission to perform an action, the request is denied. During policy evaluation, if AWS encounters an explicit deny, the deny effect takes precedence over any explicit allow effects that are in force.

Important

To enable authentication, Amazon CloudSearch requests must be signed with an access key. The only exception is if you allow anonymous access to a domain's upload, search, or suggest services. For more information, see Signing Requests.

Topics

Writing Access Policies for Amazon CloudSearch

Amazon CloudSearch supports both *user-based policies* and *resource-based policies*:

- **User-based policies** are attached to a particular IAM role, group, or user. A user-based policy specifies which of your account's search domains a person or process can access and what actions they can perform. To attach a user-based policy to a user, group, or role, you use the IAM console, AWS CLI, or AWS SDKs. **You must define user-based policies to control access to the Amazon CloudSearch configuration service actions.** (The *user* in this context isn't necessarily a person, it's just an identity with associated permissions. For example, you might create a user to represent an application that needs to have credentials to submit search requests to your domain.)
- **Resource-based policies** for Amazon CloudSearch are attached to a particular search domain. A resource-based policy specifies who has access to the search domain and which domain services they can use. Resource-based policies control access only to a particular domain's document, search, and suggest services; they cannot be used to configure access to the Amazon CloudSearch configuration service actions. To attach a resource-based policy to a domain, you use the Amazon CloudSearch console, AWS CLI or AWS SDKs.

In general, we recommend managing access to Amazon CloudSearch APIs by configuring user-based policies. This enables you to manage all of your permissions in one place and any changes you need to make take effect almost immediately. However, to allow public access to a domain's search service or restrict access based on IP addresses, you must configure a resource-based policy for the domain. (We recommend replacing your old IP based access policies with user-based policies at your earliest convenience.) You can also use resource-based policies to easily allow other accounts to access a domain. Keep in mind that processing changes to a domain's resource-based policies takes significantly longer than applying changes to user-based policies.

The IAM console can help you write both user-based and resource-based policies for Amazon CloudSearch. For more information, see Managing IAM Policies.

Contents of an Access Policy for Amazon CloudSearch

You specify the following information in your access policies for Amazon CloudSearch:

- `Version` specifies the policy language version that the statement is compatible with. The version is always set to `2012-10-17` .
- `Resource` is the ARN (Amazon Resource Name) for the domain to which a user-based policy applies. `Resource` is not specified in resource-based policies configured through the Amazon CloudSearch configuration service, because the policy is attached directly to the resource. For more information about Amazon CloudSearch ARNs, see Amazon CloudSearch ARNs.
- `Effect` specifies whether the statement authorizes or blocks access to the specified action(s). It must be `Allow` or `Deny`
- `Sid` is an optional string that you can use to provide a descriptive name for the policy statement.
- `Action` specifies which Amazon CloudSearch actions the statement applies to. For the supported actions, see Amazon CloudSearch Actions. You can use a wildcard (*) as the action to configure access for all actions when you need to grant administrative access to select users. (In this case, you might also want to enable multi-factor authorization for additional security. For more information, see Configuring MFA-Protected API Access.) Wildcards are also supported within action names. For example, `"Action":["cloudsearch:Describe*]` matches all of the configuration service `Describe` actions, such as `DescribeDomains` and `DescribeServiceAccessPolicies`.
- `Condition` specifies conditions for when the policy is in effect. When configuring anonymous, IP-based access, you would specify the IP addresses that the access rule applies to, for example `"IpAddress": {"aws:SourceIp": ["192.0.2.0/32"]}`.
- `Principal` specifies who is allowed access to the domain in a resource-based policy. `Principal` is not specified in user-based policies configured through IAM. The `Principal` value for a resource-based policy can specify other AWS accounts or users in your own account. For example, to grant access to the account 555555555555, you would specify `"Principal":{"AWS":["arn:aws:iam::555555555555:root"]}`. Specifying a wildcard (*) enables anonymous access to the domain. Anonymous access is not recommended. If you enable anonymous access, you should at least specify a condition to restrict which IP addresses can submit requests to the domain. For more information, see Granting Access to a Domain from Selected IP Addresses.

For examples of access policies for Amazon CloudSearch, see Amazon CloudSearch Policy Examples.

Amazon CloudSearch ARNs

A policy's Amazon Resource Name (ARN) uniquely specifies the domain that the policy applies to. The ARN is a standard format that AWS uses to identify resources. The 12-digit number in the ARN is your AWS account ID. Amazon CloudSearch ARNs are of the form `arn:aws:cloudsearch:`**`REGION`**`:`**`ACCOUNT-ID`**`:domain/`**`DOMAIN-NAME`**.

The following list describes the variable elements in the ARN:

- `REGION` is the AWS region where the Amazon CloudSearch domain for which you are configuring permissions resides. You can use a wildcard (*) for the `REGION` for all regions.
- `ACCOUNT-ID` is your AWS account ID with no hyphens; for example, 111122223333.
- `DOMAIN-NAME` identifies a specific search domain. You can use a wildcard (*) for the `DOMAIN-NAME` for all of your account's domains in the specified region. If you have multiple domains whose names start with the same prefix, you can use a wildcard to match all of those domains. For example, `dev-*` matches `dev-test`, `dev-movies`, `dev-sandbox`, and so on. Note that if you name new domains with the same prefix, the policy also applies to those new domains.

For example, the following ARN identifies the `movies` domain in the `us-east-1` region owned by account 111122223333:

```
arn:aws:cloudsearch:us-east-1:111122223333:domain/movies
```

The following example shows how the ARN is used to specify the resource in a user-based policy.

A domain's ARN is displayed on the domain dashboard in the Amazon CloudSearch console and is also available by calling `DescribeDomains`.

Important

When specifying an ARN for a domain created with the 2011-02-01 API, you must use the former Amazon CloudSearch service name, `cs`. For example, `arn:aws:cs:us-east-1:111122223333:domain/movies`. If you need to define policies that configure access for both 2011 and 2013 domains, make sure to specify the correct ARN format for each domain. For more information, see Configuration Service Access Policies Not Working.

Amazon CloudSearch Actions

The actions you specify control which Amazon CloudSearch APIs the statement applies to. All Amazon CloudSearch actions are prefixed with `cloudsearch:`, such as `cloudsearch:search`. The following list shows the supported actions:

- `cloudsearch:document` allows access to the document service API. Permission to use the `document` action is required to upload documents to a search domain for indexing.
- `cloudsearch:search` allows access to the search API. Permission to use the `search` action is required to submit search requests to a domain.
- `cloudsearch:suggest` allows access to the suggest API. Permission to use the `suggest` action is required to get suggestions from a domain.
- `cloudsearch:`**`CONFIGURATION-ACTION`** allows access to the specified configuration service action. Permission to use the `DescribeDomains` and `ListDomainNames` configuration actions is required to access the Amazon CloudSearch console. Configuration actions can be specified only in user-based policies. For the complete list of actions, see Actions.

Amazon CloudSearch Policy Examples

This section presents a few examples of Amazon CloudSearch access policies.

Topics

Granting Read-only Access to the Amazon CloudSearch Configuration Service

You can grant read-only access to the configuration service by allowing only the following actions. This might be useful if you want to allow users to view the configuration of a production domain without being able to make changes.

- `cloudsearch:DescribeAnalysisSchemes`
- `cloudsearch:DescribeAvailabilityOptions`
- `cloudsearch:DescribeDomains`
- `cloudsearch:DescribeExpressions`
- `cloudsearch:DescribeIndexFields`
- `cloudsearch:DescribeScalingParameters`
- `cloudsearch:DescribeServiceAccessPolicies`
- `cloudsearch:DescribeSuggesters`
- `cloudsearch:ListDomainNames`

The following user-based policy grants read-only access to the configuration service for a `movies` domain owned by the account 555555555555. The policy uses wildcards for the actions, since it grants access to all actions that begin with *Describe* or *List*. Note that this will also grant access to any describe or list actions that might be added to the API in the future.

Granting Access to All Amazon CloudSearch Configuration Service Actions

You can grant access to all Amazon CloudSearch configuration service actions by including an `Allow` statement that grants access to all configuration service actions, but not the domain services actions. This enables you to grant administrative access without authorizing a user to upload or retrieve data from a domain. One way to do this is to use a wildcard to grant access to all Amazon CloudSearch actions, and then include a deny statement that blocks access to the domain services actions. The following user-based policy grants access to the configuration service for all domains owned by the 111122223333 account in the `us-west-2` region.

Granting Unrestricted Access to All Amazon CloudSearch Services

You can grant unrestricted access to all Amazon CloudSearch services, including all configuration service actions and all domain services with a user-based policy. To do this, you specify wildcards for the actions, region, and domain name. The following policy enables the user to access all Amazon CloudSearch actions for any domain in any region that's owned by the 111122223333 account.

Granting Permission to Upload Documents to an Amazon CloudSearch Domain

You can grant a user permission to upload documents to a search domain by specifying the `cloudsearch:document` action. For example, the following user-based policy enables the user to upload documents to the `movies` domain in `us-east-1` owned by the 111122223333 account.

Granting Amazon CloudSearch Access to Another AWS Account

You have two options to configure cross-account access for a CloudSearch domain:

Option	Description
Configure an IAM role for cross-acc ount access.	Increased security, but requires complex request signing. For more information, see Cross-Account API Access Using IAM Roles in the IAM documentation.
Attach a resource-based policy to the CloudSearch domain and attach a user-based managed policy to an IAM role.	Easier to implement. For more information, see Creating a Role to Delegate Permissions to an IAM User and Walkthrough: Delegating Access Across AWS Accounts For Accounts You Own Using IAM Roles in the IAM documentation.

This topic provides an example of the second option, adding a resource-based policy to the CloudSearch domain. Assume that account #1 is owned by account id 111111111111 and account #2 is owned by account id 999999999999. Account #1 wants to grant access to account #2 to use the search service for the `movies` domain, which requires two steps:

1. Account #1 attaches a resource-based policy to the domain using the Amazon CloudSearch console that grants access to account #2.
2. Account #2 attaches a user-based managed policy to an IAM role owned by that account using the IAM console.

   JSON

```
{
  "Version":"2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": ["cloudsearch:search"],
      "Resource": "arn:aws:cloudsearch:us-east-1:111111111111:domain/movies"
    }
  ]
}
```

Important

To configure resource-based policies for Amazon CloudSearch, you must have permission to use the `cloudsearch:UpdateServiceAccessPolicies` action.

Granting Access to an Amazon CloudSearch Domain from Selected IP Addresses

Resource-based access policies set through the Amazon CloudSearch configuration service support anonymous access, which enables you to submit unsigned requests to a search domain's services. To allow anonymous access from selected IP addresses, use a wildcard for the `Principal` value and specify the allowed IP addresses as a `Condition` element in the policy.

Important

Allowing anonymous access from selected IP addresses is inherently less secure than requiring user credentials to access your search domains. We recommend against allowing anonymous access even if it is permitted only from select IP addresses. If you currently allow anonymous access, you should upgrade your applications to submit signed requests and control access by configuring user-based or resource-based policies.

If you are creating a resource-based policy that grants access to requests coming from an Amazon EC2 instance, you need to specify the instance's public IP address.

IP addresses are specified in the standard Classless Inter-Domain Routing (CIDR) format. For example 10.24.34.0/24 specifies the range 10.24.34.0 - 10.24.34.255, while 10.24.34.0/32 specifies the single IP address 10.24.34.0. For more information about CIDR notation, see RFC 4632.

For example, the following policy grants access to the search action for the `movies` domain owned by AWS account 111122223333 from the IP address 192.0.2.0/32.

Granting Public Access to an Amazon CloudSearch Domain's Search Service

If you need to allow public access to your domain's search endpoint, you can configure a resource-based policy with no conditions. This enables unsigned requests to be sent from any IP address.

Important

Allowing public access to a search domain means you have no control over the volume of requests submitted to the domain. Malicious users could flood the domain with requests, impacting legitimate users as well as your operating costs.

For example, the following policy grants public access to the search action for the `movies` domain owned by AWS account 111122223333.

Configuring Access for Amazon CloudSearch Using the AWS Management Console

To configure user-based policies

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. Configure Amazon CloudSearch permissions by attaching a policy to a user, group, or role. For more information, see Managing Policies (AWS Management Console). For more information about user-based policies for Amazon CloudSearch see Writing Access Policies for Amazon CloudSearch.

To configure resource-based policies

1. Sign in to the AWS Management Console and open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. Choose the name of the domain you want to configure.
3. On the **Domain configuration** tab, choose **Edit** next to **Access policy**.
4. When you're done making changes to the domain access policy, choose **Submit**.

Your domain remains in a `Processing` state while Amazon CloudSearch updates the access policy.

Configuring Access for Amazon CloudSearch with the AWS CLI

You can configure both user-based policies and resource-based policies for Amazon CloudSearch with the AWS CLI. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To configure user-based policies

- Configure Amazon CloudSearch permissions by attaching a policy to a user, group, or role with the `aws put-user-policy`, `aws put-group-policy`, or `aws put-role-policy` command. For more information, see Managing Policies (AWS Management Console). For more information about user-based policies for Amazon CloudSearch see Writing Access Policies for Amazon CloudSearch.

To configure resource-based policies

- Run the `aws cloudsearch update-service-access-policies` command and specify an access policy with the `--access-policies` option. The access policy must be enclosed in quotes and all quotes within the access policy must be escaped with a backslash. For more information about resource-based policies for Amazon CloudSearch see Writing Access Policies for Amazon CloudSearch.

  The following example configures the `movies` domain to accept search requests from the IP address `192.0.2.0`.

  ```
  aws cloudsearch update-service-access-policies --domain-name movies
  --access-policies "{\"Version\":\"2012-10-17\",       \"Statement\":[{
    \"Sid\":\"search_only\",
    \"Effect\":\"Allow\",
    \"Principal\": \"*\",
    \"Action\":\"cloudsearch:search\",
    \"Condition\":{\"IpAddress\":{\"aws:SourceIp\":\"192.0.2.0/32\"}}}
  ]}"
  {
    "AccessPolicies": {
      "Status": {
        "PendingDeletion": false,
        "State": "Processing",
        "CreationDate": "2014-04-30T22:07:30Z",
        "UpdateVersion": 9,
  ```

```
      "UpdateDate": "2014-04-30T22:07:30Z"
    },
    "Options":
      "{\"Version\":\"2012-10-17\",       \"Statement\":[{\"Sid\":\"\",
        \"Effect\":\"Allow\",\"Principal\":\"*\",
        \"Action\":\"cloudsearch:search\",
        \"Condition\":{\"IpAddress\":{\"aws:SourceIp\":
        \"192.0.2.0/32\"}}}]}"
    }
}
```

Updating resource-based access policies takes some time to complete. You can check the state of the policy with the `aws cloudsearch describe-service-access-policies` command. Once the policy has been applied, the state of the policy changes to `Active`.

You can retrieve your domain's policies using the `aws cloudsearch describe-service-access-policies` command.

Configuring Access to a Domain's Endpoints Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `UpdateServiceAccessPolicies`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Configuring Scaling Options in Amazon CloudSearch

A search domain has one or more search instances, each with a finite amount of RAM and CPU resources for indexing data and processing requests. You can configure scaling options to control the instance type that is used, the number of instances your search index is distributed across (partition count), and the number of replicas of each index partition (replication count). All instances for a domain are always of the same type.

You can configure the desired instance type, partition count, or replication count for an Amazon CloudSearch domain to:

- **Increase upload capacity** By default, all search domains start out on a `search.small` instance. You can increase your domain's document upload capacity by changing the desired instance type. If you have a large amount of data to upload—for example, when you are initially populating your search domain—you can choose a larger instance type to increase the number of updates that can be submitted in parallel and reduce how long it takes to index your data. If you are already using the largest instance type, you can increase the desired partition count to further increase upload capacity. For more information, see Bulk Uploads. Note that increasing the desired replication count does *not* generally increase a domain's upload capacity.

- **Speed up search requests.** Choosing a larger desired instance type can also speed up search requests. If you've tuned your requests and still aren't meeting your performance targets, try choosing a larger instance type. If you are already using the largest instance type, you can increase the desired partition count to further boost query performance. For more information, see Tuning Search Request Performance in Amazon CloudSearch.
- **Increase search capacity.** By default, Amazon CloudSearch uses one instance per index partition. When Amazon CloudSearch scales the domain automatically, it adds replicas based on the resources needed to process the query traffic. To increase a domain's search capacity, you set the desired replication count. However, deploying additional instances takes some time. If you know in advance that you will need additional capacity—for example, before a big launch or announcement—add replicas ahead of time to ensure that your search domain is ready to handle the load.
- **Improve fault tolerance.** Increasing the desired replication count also improves the domain's fault-tolerance—if there's a problem with one of the replicas, the others will continue to handle requests while it is being recovered. However, note that the replicas reside in the same Availability Zone. If you need to ensure availability of your domain in the event of an Availability Zone service disruption, you should enable the MultiAZ option. For more information, see Configuring Availability Options.

When you set the desired instance type, desired number of replicas, or desired partition count, Amazon CloudSearch scales your domain as necessary, but will never scale the domain to an instance type that's smaller than the desired type, use fewer replicas than the desired number of replicas, or reduce the partition count below the desired partition count.

Note

The automatic scaling progression is based on the instance type's available disk space. The `search.small` and `search.medium` instance types have the same amount of disk space, so both scale to `search.large`.

You can change your scaling options at any time. If your need for additional capacity is temporary, you can prescale your domain by setting the scaling options and then revert the changes after your volume of uploads or queries returns to your domain's steady state. When you make changes, you need to re-index your domain, which can take some time for the changes to take effect. How long it takes to re-index depends on the amount of data in your index. You can monitor the domain status to determine when indexing is complete—the status changes from PROCESSING to ACTIVE.

Topics

Choosing Scaling Options in Amazon CloudSearch

When you set scaling options for a domain, you make a trade-off between cost and performance—changing the desired instance type, replication count, and partition count can significantly impact the cost of running your domain.

To determine which instance type to select to handle your upload traffic, monitor your upload performance as you increase the upload rate. If you start seeing a large number of 504 or 507 errors before you reach your desired upload rate, select a larger instance type. If you are already on the largest instance type, you can increase the number of partitions to further increase upload capacity.

For datasets of less than 1 GB of data or fewer than one million 1 KB documents, a small search instance should be sufficient. To upload data sets between 1 GB and 8 GB, we recommend setting the desired instance type to `search.large` before you begin uploading. For datasets between 8 GB and 16 GB, start with a `search.xlarge`. For datasets between 16 GB and 32 GB, start with a `search.2xlarge`. If you have more than 32 GB to upload, select the `search.2xlarge` instance type and increase the desired partition count to accommodate your data set. Each partition can contain up to 32 GB of data. Submit a Service Increase Limit Request if you need more upload capacity or have more than 500 GB to index.

To determine how many replicas you need to handle a given query volume, do some testing using a sample of your expected queries at the rate you need to support. Keep in mind that query performance depends heavily on the type of queries being processed. In general, searches that return a large volume of hits and complex structured queries are more resource intensive than simple text queries that match a small percentage of the documents in your search domain. If you expect a high volume of complex queries, choose a larger desired instance type and increase the desired replication count.

Configuring Scaling Options through the Amazon CloudSearch Console

To configure a search domain's scaling options

Note that changing the desired instance type and replication count can significantly increase the cost of running your domain.

1. On the Amazon CloudSearch console, choose the name of the domain you want to configure.
2. On the **Domain configuration** tab, choose **Edit** next to **Scaling options**.
3. Select an instance type from the **Desired instance type** menu.
4. Select the number of replicas you want to use from the **Desired replication count** menu.
5. If you selected the `search.2xlarge` instance type, configure the **Desired partition count**. Increase the partition count if you have more data to upload than will fit on a single `search.2xlarge` partition. For more information, see Bulk Uploads.
6. Choose **Submit**.
7. After you finish making changes to your domain configuration, choose **Actions**, **Run indexing** to update and deploy your index to the new instances.

Configuring Scaling Options through the AWS CLI

You use the `aws cloudsearch update-scaling-parameters` command to configure scaling options for a search domain. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To configure a search domain's scaling options

- Run the `aws cloudsearch update-scaling-parameters` command. You can specify the desired instance type and desired replication count. If you choose the largest instance type (`search.2xlarge`), you can also set the desired partition count. For example, the following command sets the desired instance type to `search.xlarge` and the desired replication count to two. You must specify both the `--domain-name` and `--scaling-parameters` options.

```
aws cloudsearch update-scaling-parameters --domain-name movies --scaling-parameters
 DesiredInstanceType=search.xlarge,DesiredReplicationCount=2
{
    "ScalingParameters": {
        "Status": {
            "PendingDeletion": false,
            "State": "RequiresIndexDocuments",
            "CreationDate": "2014-06-25T21:41:21Z",
            "UpdateVersion": 10,
            "UpdateDate": "2014-06-25T21:41:21Z"
        },
        "Options": {
            "DesiredInstanceType": "search.xlarge",
            "DesiredReplicationCount": 2
        }
    }
}
```

Important

When you specify `--scaling-parameters`, Amazon CloudSearch treats unspecified options as "reset to default" rather than "leave as-is."
For example, if you specify `--scaling-parameters DesiredInstanceType=search.xlarge` in a command and then `--scaling-parameters DesiredReplicationCount=2` in a subsequent command, Amazon CloudSearch resets `DesiredInstanceType` to its default value during the second command.
If you want the change from the first command to persist, you must specify it again in all subsequent commands: `--scaling-parameters DesiredInstanceType=search.xlarge,DesiredReplicationCount=2`.

For the changes to take effect, you must initiate an index build. You can rebuild the index by calling `aws cloudsearch index-documents`.

Configuring Scaling Options through the AWS SDK

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `UpdateScalingParameters`.

For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Configuring Availability Options in Amazon CloudSearch

You can expand an Amazon CloudSearch domain to an additional Availability Zone in the same region to increase fault tolerance in the event of a service disruption. Availability Zones are physically separate locations with independent infrastructure engineered to be insulated from failures in other Availability Zones. For more information, see Regions and Availability Zones in the Amazon EC2 User Guide.

When you turn on the Multi-AZ option, Amazon CloudSearch provisions and maintains extra instances for your search domain in a second Availability Zone to ensure high availability. The maximum number of Availability Zones a domain can be deployed in is two.

Turning on Multi-AZ does not affect a search domain's service endpoints or increase the volume of data or traffic your search domain can handle. Updates are automatically applied to the instances in both Availability Zones. Search traffic is distributed across all of the instances and the instances in either zone are capable of handling the full load in the event of a failure.

If there's an Availability Zone service disruption or the instances in one zone become degraded, Amazon CloudSearch routes all traffic to the other Availability Zone. Redundant instances are restored in a separate Availability Zone without any administrative intervention or disruption in service.

You expand an existing search domain to a second Availability Zone by turning on the Multi-AZ option. Similarly, you can turn off the Multi-AZ option to downgrade the domain to a single Availability Zone. Turning the Multi-AZ option on or off takes about half an hour.

You can configure a domain's availability options through the Amazon CloudSearch console, using the `aws cloudsearch update-availability-options` command, or the AWS SDKs.

Important

If your domain is running on a single search instance, enabling the Multi-AZ option adds a second search instance in a different availability zone, which doubles the cost of running your domain. Similarly, if your index is split across multiple partitions, a new instance is deployed in the second Availability Zone for each partition. Additional replicas are added to ensure that either Availability Zone has enough capacity to handle all of your traffic —when Multi-AZ is enabled, your domain will have at least one replica of each index partition. If you set the desired number of replicas and enable the Multi-AZ option, Amazon CloudSearch ensures that you have at least that many replicas available in total across the two availability zones. You can monitor the number of instances being used for your domain from the domain dashboard.

Topics

Configuring Availability Options through the Amazon CloudSearch Console

If your domain currently uses a single search instance, enabling Multi-AZ adds a second search instance, which can significantly increase the cost of running your domain.

To configure a search domain's availability options

1. Within the Amazon CloudSearch console, choose the name of your domain.
2. In the **Domain configuration**, choose **Edit** next to **Availability options**.
3. Enable **Toggle Multi-AZ options**.
4. Choose **Submit**.

Configuring Amazon CloudSearch Availability Options Using the AWS CLI

You use the `aws cloudsearch update-availability-options` command to configure availability options for a search domain. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To configure a search domain's availability options

- Run the `aws cloudsearch update-availability-options` command and specify the `--multi-az` option to turn on MultiAZ for the domain, or `--no-multi-az` to turn MultiAZ off. For example, the following request enables MultiAZ for the `movies` domain:

```
aws cloudsearch update-availability-options --domain-name movies --multi-az

{
    "AvailabilityOptions": {
        "Status": {
            "PendingDeletion": false,
            "State": "Processing",
            "CreationDate": "2014-04-30T20:42:57Z",
            "UpdateVersion": 13,
            "UpdateDate": "2014-05-01T00:17:45Z"
        },
        "Options": true
    }
}
```

Configuring Availability Options through the AWS SDK

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `UpdateAvailabilityOptions`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Configuring Domain Endpoint Options in Amazon CloudSearch

Amazon CloudSearch domains let you require that all traffic to the domain arrive over HTTPS. This security feature helps you block clients that send unencrypted requests to the domain.

Topics

Configuring Domain Endpoint Options Using the Amazon CloudSearch Console

To configure a search domain's endpoint options

1. Within the Amazon CloudSearch console, choose the name of your domain to open its settings.
2. Under **Domain configuration**, choose **Edit** next to **HTTPS options**.
3. Enable **Toggle HTTPS options**.
4. Choose **Submit**.

Configuring Domain Endpoint Options Using the AWS CLI

Use the `aws cloudsearch update-domain-endpoint-options` command. For more information, see the AWS CLI Command Reference.

Configuring Domain Endpoint Options Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including the section called "DescribeDomainEndpointOptions" and the section called "UpdateDomainEndpointOptions". For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Monitoring Amazon CloudSearch Domains

The AWS Management Console enables you to easily monitor the status and configuration of your search domains and view your Amazon CloudSearch usage. You can also get configuration information about particular domains with the AWS CLI and AWS SDKs.

Topics

Getting Information About an Amazon CloudSearch Domain

You can retrieve the following information about each of your search domains:

- **Domain name**—The name of the domain.
- **ARN**—The domain's Amazon Resource Name (ARN).
- **Document endpoint**—The endpoint through which you can submit document updates.
- **Search endpoint**—The endpoint through which you can submit search requests.
- **Searchable documents**—The number of documents that have been indexed.
- **Access policies**—The access policies configured for the domain's document and search endpoints.
- **Analysis schemes**—The text analysis schemes that can be applied to the domain's index fields.
- **Index fields**—The name and type of each configured index field.
- **Expressions**—The expressions that can be used for sorting search results.
- **Suggesters**—The suggesters that can be used to retrieve suggestions for incomplete queries.

When a domain is first created, the domain status will indicate that the domain is currently being activated and no other information is available. Once your domain's document and search endpoints are available, the domain status shows the endpoint addresses that you can use to add data and submit search requests. If you haven't submitted any data for indexing, the number of searchable documents is zero.

You can view all of the information about your domain through the Amazon CloudSearch console. When you use the `aws cloudsearch describe-domains` command or the AWS SDKs, the domain's ARN is shown within the domain's access policies.

To get the number of searchable documents, use the console or submit a `matchall` request to your domain's search endpoint.

```
q=matchall&q.parser=structured&size=0
```

Topics

Getting Domain Information Using the Amazon CloudSearch Console

You can use the Amazon CloudSearch console to view information about all of your domains. The dashboard of the console shows a summary of each domain that you have created, including the domain name, status, and number of searchable documents. To update the table with the latest information, click the **Refresh** button at the top of the page.

A domain can be in one of five states:

- **Loading**—The domain has just been created and is still being initialized. You must wait until the domain status changes to PROCESSING, NEEDS INDEXING, or ACTIVE before you can start uploading documents.
- **Active**—The domain is running and all configured fields have been indexed.
- **Needs Indexing**—You have made changes to the domain configuration that require rebuilding the index. If you search the domain, these changes won't be reflected in the results. When you are done making changes, choose **Actions**, **Run indexing** to rebuild your index.
- **Processing**—Configuration changes are being applied to your domain. If you search the domain, the most recent configuration changes might not be reflected in the results.
- **Being Deleted**—You chose to delete the domain and its contents, and the domain and all of its resources are in the process of being removed. When deletion is complete, the domain will be removed from the list of domains.

From the Amazon CloudSearch dashboard, you can do the following:

- View the status of your search domains
- Access the dashboard for a particular domain
- Access the Amazon CloudSearch documentation and other resources

To view detailed information about a particular domain

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. Choose **Domains** from the left navigation pane.

The domain dashboard shows the status summary for the selected domain. From the domain dashboard, you can do the following:

- View the status of the domain
- Upload documents to the domain
- Search the domain
- Access the domain configuration pages
- Delete the domain

Getting Amazon CloudSearch Domain Information Using the AWS CLI

You use the `aws cloudsearch describe-domains` command to get the status of your search domains. To get specific information such as the access policies, availability options, and scaling options configured for a domain, you use the separate `describe` commands for each option. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To get domain status information

- Run the `aws cloudsearch describe-domains` command to get information about all of your domains. To get information about specific domains, use the `--domain-names` option to specify the domains that you are interested in. For example, the following request gets the status of the `movies` domain:

```
aws cloudsearch describe-domains --domain-names movies

{
    "DomainStatusList": [
        {
            "SearchInstanceType": "search.small",
            "DomainId": "965407640801/movies",
            "Created": true,
            "Deleted": false,
            "SearchInstanceCount": 1,
            "DomainName": "movies",
            "SearchService": {
                "Endpoint": "search-movies-m4fcjhuxgj6i76smhyiz7pfxsu.us-
east-1.cloudsearch.amazonaws.com"
            },
            "RequiresIndexDocuments": false,
            "Processing": true,
            "DocService": {
                "Endpoint": "doc-movies-m4fcjhuxgj6i76smhyiz7pfxsu.us-
east-1.cloudsearch.amazonaws.com"
            },
            "ARN": "arn:aws:cloudsearch:us-east-1:965407640801:domain/movies",
            "SearchPartitionCount": 1
        }
    ]
}
```

The `describe-domains` command does not return the number of searchable documents in the domain. To get the number of searchable documents, use the console or submit a `matchall` request to your domain's search endpoint:

```
q=matchall&q.parser=structured&size=0
```

To get the analysis schemes configured for a domain

- Run the `aws cloudsearch describe-analysis-schemes` command. For example, the following request gets the analysis schemes configured for the `movies` domain:

```
aws cloudsearch describe-analysis-schemes --domain-name movies

{
    "AnalysisSchemes": [
        {
            "Status": {
                "PendingDeletion": false,
                "State": "Active",
                "CreationDate": "2014-03-28T19:27:30Z",
                "UpdateVersion": 31,
                "UpdateDate": "2014-03-28T19:27:30Z"
            },
            "Options": {
                "AnalysisSchemeLanguage": "en",
                "AnalysisSchemeName": "samplescheme",
                "AnalysisOptions": {
                    "AlgorithmicStemming": "none",
                    "Synonyms": "{\"aliases\":{\"youth\":[\"young adult\"]},
\"groups\":[[\"tool box\",\"toolbox\"],[\"band saw\",\"bandsaw\"],[\"drill press\",
\"drillpress\"]]}",
                    "StemmingDictionary": "{}",
                    "Stopwords": "[]"
                }
            }
        }
    ]
}
```

To get the availability options configured for a domain

- Run the `aws cloudsearch describe-availability-options` command. For example, the following request gets the availability options configured for the `movies` domain. If Multi-AZ is enabled for the domain, the `Options` value is set to `true`:

```
aws cloudsearch describe-availability-options --domain-name movies

{
    "AvailabilityOptions": {
        "Status": {
            "PendingDeletion": false,
            "State": "Processing",
            "CreationDate": "2014-04-30T20:42:57Z",
            "UpdateVersion": 13,
            "UpdateDate": "2014-05-01T00:17:45Z"
        },
        "Options": true
    }
}
```

To get the expressions configured for a domain

- Run the `aws cloudsearch describe-expressions` command. For example, the following request gets the expressions configured for the `movies` domain:

```
aws cloudsearch describe-expressions --domain-name movies

{
    "Expression": {
        "Status": {
            "PendingDeletion": false,
            "State": "Processing",
            "CreationDate": "2014-05-01T01:15:18Z",
            "UpdateVersion": 52,
            "UpdateDate": "2014-05-01T01:15:18Z"
        },
        "Options": {
            "ExpressionName": "popularhits",
            "ExpressionValue": "((0.3*popularity)/10.0)+(0.7* _score)"
        }
    }
}
```

Getting Domain Information Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `DescribeDomains`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

The `DescribeDomains` action does not return the number of searchable documents in the domain. To get the number of searchable documents, use the console or submit a `matchall` request to your domain's search endpoint:

```
q=matchall&q.parser=structured&size=0
```

Monitoring an Amazon CloudSearch Domain with Amazon CloudWatch

Amazon CloudSearch automatically sends metrics to Amazon CloudWatch so that you can gather and analyze performance statistics. You can monitor these metrics by using the Amazon CloudSearch console, or by using the CloudWatch console, AWS CLI, or AWS SDKs. Each of your domain's search instances sends metrics to CloudWatch at one-minute intervals. The metrics are archived for two weeks; after that period, the data is discarded.

There is no charge for the Amazon CloudSearch metrics that are reported through CloudWatch. If you set alarms on the metrics, you will be billed at standard CloudWatch rates. You can use the metrics in all regions supported by Amazon CloudSearch.

Topics

- Generating SDK for Java Metrics for Amazon CloudSearch
- Viewing CloudWatch Metrics for an Amazon CloudSearch Domain

Not all statistics, such as *Average* or *Sum*, are applicable for every metric. However, all of these values are available through the Amazon CloudSearch console, or by using the CloudWatch console, AWS CLI, or AWS SDKs for all metrics. In the following table, each metric has a list of Valid Statistics that is applicable to that metric.

Amazon CloudSearch Metrics

The `AWS/CloudSearch` namespace includes the following metrics.

Metric	Description
`SuccessfulRequests`	The number of search requests successfully processed by a search instance. Units: Count Valid statistics: Maximum, Sum
`SearchableDocuments`	The number of searchable documents in the domain's search index. Units: Count Valid statistics: Maximum
`IndexUtilization`	The percentage of the search instance's index capacity that has been used. The Maximum value indicates the percentage of the domain's index capacity that has been used. Units: Percent Valid statistics: Average, Maximum
`Partitions`	The number of partitions the index is distributed across. Units: Count Valid statistics: Minimum, Maximum

Dimensions for Amazon CloudSearch Metrics

Amazon CloudSearch sends the ClientId and DomainName dimensions to CloudWatch.

Dimension	Description
`ClientId`	The AWS account ID.
`DomainName`	The name of the search domain.

Generating SDK for Java Metrics for Amazon CloudSearch

The AWS SDK for Java can generate performance metrics for your Amazon CloudSearch client and send them to CloudWatch for visualization. For the Java VM arguments that enable this feature, see Enabling Metrics for the AWS SDK for Java in the *AWS SDK for Java Developer Guide*.

You can use the following code to test metrics generation. The code creates a new CloudWatch client and performs 2,500 searches. Because the SDK only sends metrics once per minute, long-running clients work best. The code uses the default credential provider chain.

```
import com.amazonaws.client.builder.AwsClientBuilder;
import com.amazonaws.services.cloudsearchdomain.AmazonCloudSearchDomain;
import com.amazonaws.services.cloudsearchdomain.AmazonCloudSearchDomainClientBuilder;
import com.amazonaws.services.cloudsearchdomain.model.SearchRequest;

public class Metrics {

  public static void main(String[] args) {

    String search_endpoint = "https://search-domain-id.us-
west-1.cloudsearch.amazonaws.com";
    String region = "us-west-1";

    AwsClientBuilder.EndpointConfiguration endpointConfig = new AwsClientBuilder
        .EndpointConfiguration(search_endpoint, region);

    AmazonCloudSearchDomainClientBuilder builder = AmazonCloudSearchDomainClientBuilder
        .standard()
        .withEndpointConfiguration(endpointConfig);
    AmazonCloudSearchDomain client = builder.build();

    String query;
    SearchRequest request = new SearchRequest();
    com.amazonaws.services.cloudsearchdomain.model.SearchResult test =
 client.search(request);

    for (int i = 0; i < 2500; i++) {
      query = "test";
      request.setQuery(query);
      test = client.search(request);
      System.out.println(test.toString());
    }
  }
}
```

To verify that the SDK is sending metrics to CloudWatch, check the **Metrics** page of the CloudWatch console and look for **AWSSDK/Java** under the **Custom Namespaces** section. The metrics might take several minutes to display.

Viewing CloudWatch Metrics for an Amazon CloudSearch Domain

The Amazon CloudSearch console graphs the metrics reported to CloudWatch. You can also access the metrics through the CloudWatch console, AWS CLI, and AWS SDKs. For more information, see Viewing, Graphing, and Publishing Metrics in the *Amazon CloudWatch Developer Guide*.

To view metrics for a search domain using the Amazon CloudSearch console

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch.
2. Choose **Domains** from the left navigation pane.
3. Click the name of the domain, and then go to the **Monitoring** tab.

Logging Amazon CloudSearch Configuration API Calls with AWS CloudTrail

Amazon CloudSearch integrates with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in Amazon CloudSearch. CloudTrail captures all configuration API calls for Amazon CloudSearch as events.

Note

CloudTrail only captures calls to the configuration API, such as `CreateDomain` and `UpdateServiceAccessPolicies`, not the document service API nor the search API.

The calls captured include calls from the Amazon CloudSearch console, CLI, or SDKs. If you create a trail, you can enable continuous delivery of CloudTrail events to an Amazon S3 bucket, including events for Amazon CloudSearch. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in **Event history**. Using the information collected by CloudTrail, you can determine the request that was made to Amazon CloudSearch, the IP address from which the request was made, who made the request, when it was made, and additional details.

To learn more about CloudTrail, see the AWS CloudTrail User Guide.

Amazon CloudSearch Information in CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When activity occurs in Amazon CloudSearch, that activity is recorded in a CloudTrail event along with other AWS service events in **Event history**. You can view, search, and download recent events in your AWS account. For more information, see Viewing Events with CloudTrail Event History.

For an ongoing record of events in your AWS account, including events for Amazon CloudSearch, create a trail. A *trail* enables CloudTrail to deliver log files to an Amazon S3 bucket. By default, when you create a trail in the console, the trail applies to all AWS Regions. The trail logs events from all Regions in the AWS partition and delivers the log files to the Amazon S3 bucket that you specify. Additionally, you can configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see the following:

- Overview for Creating a Trail
- CloudTrail Supported Services and Integrations
- Configuring Amazon SNS Notifications for CloudTrail
- Receiving CloudTrail Log Files from Multiple Regions and Receiving CloudTrail Log Files from Multiple Accounts

All Amazon CloudSearch configuration API actions are logged by CloudTrail and are documented in the the section called “Configuration API Reference”.

Every event or log entry contains information about who generated the request. The identity information helps you determine the following:

- Whether the request was made with root or AWS Identity and Access Management (IAM) user credentials.
- Whether the request was made with temporary security credentials for a role or federated user.
- Whether the request was made by another AWS service.

For more information, see the CloudTrail userIdentity Element.

Understanding Amazon CloudSearch Log File Entries

A trail is a configuration that enables delivery of events as log files to an Amazon S3 bucket that you specify. CloudTrail log files contain one or more log entries. An event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files aren't an ordered stack trace of the public API calls, so they don't appear in any specific order.

The following example shows a CloudTrail log entry that demonstrates the `CreateDomain` action.

```
{
  "eventVersion": "1.05",
  "userIdentity": {
    "type": "IAMUser",
    "principalId": "AIDACKCEVSQ6C2EXAMPLE",
    "arn": "arn:aws:iam::123456789012:user/test-user",
    "accountId": "123456789012",
    "accessKeyId": "AKIAIOSFODNN7EXAMPLE",
    "userName": "test-user",
    "sessionContext": {
      "attributes": {
        "mfaAuthenticated": "false",
        "creationDate": "2018-08-21T23:31:33Z"
      }
    },
    "invokedBy": "signin.amazonaws.com"
  },
  "eventTime": "2018-08-21T23:32:15Z",
  "eventSource": "cloudsearch.amazonaws.com",
  "eventName": "CreateDomain",
  "awsRegion": "us-west-1",
  "sourceIPAddress": "123.123.123.123",
  "userAgent": "signin.amazonaws.com",
  "requestParameters": {
    "domainName": "test-domain"
  },
  "responseElements": {
    "domainStatus": {
      "aRN": "arn:aws:cloudsearch:us-west-1:123456789012:domain/test-domain",
      "searchInstanceCount": 0,
      "docService": {},
      "requiresIndexDocuments": false,
      "deleted": false,
      "searchService": {},
      "domainId": "123456789012/test-domain",
      "processing": false,
      "created": true,
      "searchPartitionCount": 0,
      "domainName": "test-domain"
    }
  },
  "requestID": "12345678-1234-1234-1234-987654321098",
  "eventID": "87654321-4321-4321-4321-987654321098",
  "eventType": "AwsApiCall",
  "recipientAccountId": "123456789012"
}
```

Tracking your Amazon CloudSearch Usage and Charges

The AWS account activity page enables you to track your Amazon CloudSearch usage and charges.

To get your Amazon CloudSearch usage information

1. Go to aws.amazon.com and choose **My Account**, **Billing & Cost Management**.
2. Choose **Cost & Usage Reports**, then choose **AWS Usage Report**.
3. Choose **Amazon CloudSearch** from the services dropdown.
4. Specify the information that you want to include in the report, then choose the download button for the data format that you want to download. Reports can be downloaded in XML or CSV format.

Deleting an Amazon CloudSearch Domain

If you are no longer using a search domain, you must delete it to avoid incurring additional usage fees. You will still be charged for a domain even if it does not contain any documents—deleting all documents does not delete the domain. Deleting a domain deletes the index associated with the domain and takes the domain's document and search endpoints offline permanently. It can take some time to completely remove a domain and decommission all of its resources. Small domains are typically deleted in a short amount of time, while especially large domains may require an extended amount of time to be deleted. During this process, the domain status is `Being Deleted` and your account is not charged.

You can delete a domain from the Amazon CloudSearch console, using the `aws cloudsearch delete-domain` command, or using the AWS SDKs.

Topics

Deleting a Domain Using the Amazon CloudSearch Console

You can easily delete a domain from the domain dashboard in the Amazon CloudSearch console.

To delete a domain

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In left **Navigation** pane, choose **Domains**.
3. Select the checkbox next to the domain that you want to delete, then choose **Delete** and confirm deletion.

Deleting a Domain Using the AWS CLI

Run the `aws cloudsearch delete-domain` command and specify the name of the domain you want to delete. For example, to delete the *movies* domain, you specify `--domain-name movies`.

```
aws cloudsearch delete-domain --domain-name movies
```

For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

Deleting Amazon CloudSearch Domains Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `DeleteDomain`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Tagging Amazon CloudSearch Domains

Use Amazon CloudSearch tags to attach metadata to your search domains. AWS does not apply any semantic meaning to your tags; tags are interpreted strictly as character strings. All tags contain the following elements.

Tag Element	Description
Tag key	The tag key is the required name of the tag. Tag keys must be unique for the domain to which they are attached. For a list of basic restrictions on tag keys and values, see Tag Restrictions.
Tag value	The tag value is an optional string value of the tag. Tag values can be null and do not have to be unique in a tag set. For example, you can have a key-value pair in a tag set of project/Trinity and cost-center/Trinity. For a list of basic restrictions on tag keys and values, see Tag Restrictions.

Each Amazon CloudSearch domain has a tag set, which contains all the tags that are assigned to that domain. AWS does not automatically set any tags on Amazon CloudSearch domains. A tag set can contain as many as ten tags, or it can be empty. If you add a tag to an Amazon CloudSearch domain that has the same key as an existing tag for a resource, the new value overwrites the old value.

You can use a tag key to define a category, and the tag value can be a item in that category. For example, you could define a tag key of `project` and a tag value of `Salix` indicating that the domain is assigned to the Salix project. You could also use tags to designate domains for test or production environments by using keys such as `environment=test` and `environment=production`. We recommend that you use a consistent set of tag keys to make it easier to track metadata associated with your search domains.

You also can use tags to organize your AWS bill to reflect your own cost structure and to track costs by grouping expenses for similarly tagged resources. To do this, sign up to get your AWS account bill with tag key values included. Then, organize your billing information according to resources with the same tag key values to see the cost of combined resources. For example, you can tag several Amazon CloudSearch domains with key-value pairs, and then organize your billing information to see the total cost for each domain across several services. For more information, see Cost Allocation and Tagging in the *AWS Billing and Cost Management* documentation.

Note

Tags are cached for authorization purposes. Because of this, additions and updates to tags on Amazon CloudSearch domains might take several minutes before they are available.

Working with Tags (Console)

Use the following procedure to create a resource tag with the Amazon CloudSearch console.

To create a tag

1. Go to the Amazon CloudSearch console and choose the name of your domain to open its configuration panel.
2. Go to the **Tags** tab and choose **Manage**.
3. Enter a tag key and optional value, then choose **Submit**.

For more information about using the console to work with tags, see Working with the Tag Editor in the *AWS Management Console Getting Started Guide*.

Controlling How Data is Indexed in Amazon CloudSearch

You control how your data is indexed by configuring indexing options and analysis schemes for your domain. Indexing options control how your data is mapped to index fields and what information you can search and retrieve from the index. The data you upload must contain the same fields configured in your domain's indexing options, and the field values must be compatible with the configured field types. Analysis schemes control how `text` and `text-array` fields are processed during indexing by defining language-specific stemming, stopword, and synonym options.

Topics

Preparing Your Data for Amazon CloudSearch

You need to format your data in JSON or XML before you can upload it to your search domain for indexing. Each item that you want to be able to receive as a search result is represented as a document. Every document has a unique document ID and one or more fields that contain the data that you want to search and return in results. These document fields are used to populate the index fields you configure for your domain. For more information, see configure indexing options.

Creating Document Batches describes how to format your data. For a detailed description of the Amazon CloudSearch JSON and XML schemas, see the Document Service API.

Topics

Mapping Document Data to Index Fields in Amazon CloudSearch

To populate the fields in your index, Amazon CloudSearch reads the data from the corresponding document fields. Every field specified in your document data must be configured in your indexing options. Documents can contain a subset of the fields configured for the domain—every document does not have to contain all fields. In addition, you can populate additional fields in your index by copying the data from one field to another. This enables you to use the same source data in different ways by configuring different options for the fields.

An array field such as `text-array` can contain up to 1000 values. At search time, the document is returned as a hit if any of those values match the search query.

Creating Document Batches in Amazon CloudSearch

Important

Before uploading data to an Amazon CloudSearch domain, follow these guidelines:

- Group documents into *batches* before you upload them. Continuously uploading batches that consist of only one document has a huge, negative impact on the speed at which Amazon CloudSearch can process your updates. Instead, create batches that are as close to the limit as possible and upload them less frequently. For more information on maximum batch size and upload frequency, see *Limits*.
- A domain's document and search endpoints remain the same for the life of the domain. You should cache the endpoints rather than retrieving them before every upload or search request. Querying the Amazon CloudSearch configuration service by calling `aws cloudsearch describe-domains` or `DescribeDomains` before every request will likely result in your requests being throttled.

You create document batches to describe the data that you want to make searchable. When you send document batches to a domain, the data is indexed automatically according to the domain's indexing options. The Amazon CloudSearch console can automatically generate document batches from a variety of source documents.

A document batch is a collection of add and delete operations that represent the documents you want to add, update, or delete from your domain. Batches can be described in either JSON or XML. See *Limits* for maximum batch size and document size.

To get the best possible upload performance, group add and delete operations in batches that are close to the maximum batch size. Submitting a large volume of single-document batches to the document service can increase the time it takes for your changes to become visible in search results. If you have a large amount of data to upload, you can send batches in parallel. The number of simultaneous uploaders you can use depends on the search instance type. You can prescale for bulk uploads by setting the desired instance type option for your domain. For more information, see Configuring Scaling Options in Amazon CloudSearch.

For each document in a batch, you must specify:

- The operation you want to perform: *add* or *delete*.
- A unique ID for the document. A document ID can contain any letter or number and the following characters: _ - = # ; : / ? @ &. Document IDs must be at least 1 and no more than 128 characters long.
- A name-value pair for each document field. To specify the value for a `latlon` field, you specify the latitude and longitude as a comma-separated list; for example, `"location_field": "35.628611,-120.694152"`. When specifying documents in JSON, the value for a field cannot be `null`. (You can, however, omit the field entirely.)

For example, the following JSON batch adds one document and deletes one document:

```
[
 {"type": "add",
  "id":   "tt0484562",
  "fields": {
    "title": "The Seeker: The Dark Is Rising",
    "directors": ["Cunningham, David L."],
    "genres": ["Adventure","Drama","Fantasy","Thriller"],
    "actors": ["McShane, Ian","Eccleston, Christopher","Conroy, Frances",
               "Crewson, Wendy","Ludwig, Alexander","Cosmo, James",
               "Warner, Amelia","Hickey, John Benjamin","Piddock, Jim",
               "Lockhart, Emma"]
  }
 },
 {"type": "delete",
  "id":   "tt0484575"
 }
]
```

The same batch formatted in XML looks like this:

```
<batch>
 <add  id="tt0484562">
  <field name="title">The Seeker: The Dark Is Rising</field>
  <field name="directors">Cunningham, David L.</field>
  <field name="genres">Adventure</field>
  <field name="genres">Drama</field>
  <field name="genres">Fantasy</field>
  <field name="genres">Thriller</field>
  <field name="actors">McShane, Ian</field>
  <field name="actors">Eccleston, Christopher</field>
  <field name="actors">Conroy, Frances</field>
  <field name="actors">Ludwig, Alexander</field>
  <field name="actors">Crewson, Wendy</field>
  <field name="actors">Warner, Amelia</field>
  <field name="actors">Cosmo, James</field>
  <field name="actors">Hickey, John Benjamin</field>
  <field name="actors">Piddock, Jim</field>
  <field name="actors">Lockhart, Emma</field>
 </add>
 <delete id="tt0484575" />
</batch>
```

Amazon CloudSearch accepts a batch only if all documents in it are valid. You can verify the validity of your JSON or XML data using tools such as `xmllint` and `jsonlint`.

Both JSON and XML batches can only contain UTF-8 characters that are valid in XML. Valid characters are the control characters tab (0009), carriage return (000D), and line feed (000A), and the legal characters of Unicode and ISO/IEC 10646. FFFE, FFFF, and the surrogate blocks D800–DBFF and DC00–DFFF are invalid and will cause errors. (For more information, see Extensible Markup Language (XML) 1.0 (Fifth Edition).) You can use the following regular expression to match invalid characters so you can remove them: `/[^\u0009\u000a\u000d\u0020-\uD7FF\uE000-\uFFFD]/` .

When formatting your data in JSON, quotes (") and backslashes (\) within field values must be escaped with a backslash. For example:

```
"title":"Where the Wild Things Are"
"isbn":"0-06-025492-0"
"image":"images\\covers\\Where_The_Wild_Things_Are_(book)_cover.jpg"
```

```
"comment":"Sendak's \"Where the Wild Things Are\" is a children's classic."
```

When formatting your data in XML, ampersands (&) and less-than symbols (<) within field values need to be represented with the corresponding entity references (`&amp;` and `&lt;`).

For example:

```
<field name="title">Little Cow &amp; the Turtle</field>
<field name="isbn">0-84466-4774</field>
<field name="image">images\covers\Little_Cow_&amp;_the_Turtle.jpg</field>
<field name="comment">&lt;insert comment></field>
```

If you have large blocks of user-generated content, you might want to wrap the entire field in a CDATA section, rather than replacing every occurrence with the entity reference. For example:

```
<field name="comment"><![CDATA[Monsters & mayhem--what's not to like! ]]>
```

Adding and Updating Documents in Amazon CloudSearch

An add operation specifies either a new document that you want to add to the index or an existing document that you want to update.

When you add or update a document, you specify the document's ID and all of the fields the document contains. You don't have to specify every configured field for every document—documents can contain a subset of the configured fields. However, every field in the document must correspond to a field configured for the domain.

To add a document to a search domain

1. Specify an add operation that contains the ID of the document you want to add and each of the fields that you want to be able to search or return in results. If the document already exists, the add operation will replace it. (You cannot update selected fields, the document is overwritten with the new version.) For example, the following operation adds document tt0484562:

   ```
   { "type": "add",
     "id":   "tt0484562",
     "fields": {
       "title": "The Seeker: The Dark Is Rising",
       "directors": ["Cunningham, David L."],
   ```

```
    "genres": ["Adventure","Drama","Fantasy","Thriller"],
    "actors": ["McShane, Ian","Eccleston, Christopher","Conroy, Frances",
               "Crewson, Wendy","Ludwig, Alexander","Cosmo, James",
               "Warner, Amelia","Hickey, John Benjamin","Piddock, Jim",
               "Lockhart, Emma"]
  }
}
```

2. Include the add operation in a document batch and upload the batch to your domain. You can upload data through the Amazon CloudSearch console or by posting a request directly to the domain's document service endpoint. For more information, see upload documents.

Deleting Documents in Amazon CloudSearch

A delete operation specifies a document that you want to remove from a domain's index. Once a document is deleted, it will no longer be searchable or returned in results.

When posting updates to delete documents, you have to specify each document that you want to delete.

If your domain has scaled up to accommodate your index size and you delete a large number of documents, the domain scales down the next time the full index is rebuilt. Although the index is automatically rebuilt periodically, to scale down as quickly as possible you can explicitly run indexing when you are done deleting documents.

Note

To delete documents, you upload document batches that contain delete operations. You are billed for the total number of document batches uploaded to your search domain, including batches that contain delete operations. For more information about Amazon CloudSearch pricing, see aws.amazon.com/cloudsearch/pricing/.

To delete a document from a search domain

1. Specify a delete operation that contains the ID of the document you want to remove. For example, the following operation would remove document `tt0484575`:

```
{
  "type": "delete",
  "id": "tt0484575"
}
```

2. Include the delete operation in a document batch and upload the batch to your domain. You can upload batches through the Amazon CloudSearch console or by posting a request directly to the domain's document service endpoint. For more information, see upload documents.
3. The delete operation removes documents from your index—they won't appear in search results—but to delete them entirely from Amazon CloudSearch, you must also rebuild your index.

Processing Your Source Data for Amazon CloudSearch

To upload data for indexing, you need to format your data in either JSON or XML. The Amazon CloudSearch console provide a way to automatically generate properly formatted JSON or XML from several common file types: CSV, text, and HTML. You can also process batches formatted for the Amazon CloudSearch 2011-02-01 API to convert them to the 2013-01-01 format.

For most file types, each source file is represented as a separate document in the generated JSON or XML. If metadata is available for the file, the metadata is mapped to corresponding document fields—the fields generated from the document metadata vary depending on the file type. The contents of the source file are parsed into a single text field. If the file contains more than 1 MB of data, the data mapped to the text field is truncated so that the document does not exceed 1 MB.

CSV files are handled differently. When processing a CSV file, Amazon CloudSearch uses the contents of the first row to define the document fields, and creates a separate document for each following row. If there is a column header called *docid*, the values in that column are used as the document IDs. If necessary, the docid values are normalized to conform to the allowed character set. A document ID can contain any letter or number and the following characters: _ - = # ; : / ? @ &. If there is no docid column, a unique ID is generated for each document based on the filename and row number.

If you upload multiple types of files, CSV files are parsed row-by-row, and non-CSV files are treated as individual documents.

Note

Currently, only CSV files are parsed to automatically extract custom field data and generate multiple documents.

You can also process data stored in DynamoDB. Amazon CloudSearch represents each item read from the table as a separate document.

Processing Source Data Using the Amazon CloudSearch Console

When you upload source documents or DynamoDB items through the Amazon CloudSearch console, they are automatically converted to the Amazon CloudSearch JSON format. You can use the console to upload up to 5 MB of data at a time. If you choose, you can download the generated JSON file. For more information about uploading data through the console, see upload documents and Uploading DynamoDB Data.

Configuring Index Fields for an Amazon CloudSearch Domain

Each document that you add to your search domain has a collection of fields that contain the data that can be searched or returned. Every document must have a unique document ID and at least one field.

In your domain configuration, you define an index field for each of the fields that occur in your documents. You cannot upload documents that contain unrecognized fields. However, every document does not have to contain all fields—documents can contain a subset of the fields configured for the domain.

Topics

Amazon CloudSearch supports the following index field types:

- `date`—contains a timestamp. Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: `yyyy-mm-ddTHH:mm:ss.SSSZ`. In UTC, for example, 5:00 PM August 23, 1970 is: `1970-08-23T17:00:00Z`. Note that you can also specify fractional seconds when specifying times in UTC. For example, `1967-01-31T23:20:50.650Z`.
- `date-array`—a date field that can contain multiple values.
- `double`—contains a double-precision 64-bit floating point value.
- `double-array`—a double field that can contain multiple values.

- `int`—contains a 64-bit signed integer value.
- `int-array`—an integer field that can contain multiple values.
- `latlon`—contains a location stored as a latitude and longitude value pair (`lat, lon`).
- `literal`—contains an identifier or other data that you want to be able to match exactly. Literal fields are case-sensitive.
- `literal-array`—a literal field that can contain multiple values.
- `text`—contains arbitrary alphanumeric data.
- `text-array`—a text field that can contain multiple values.

Regular index field names must begin with a letter and be at least 3 and no more than 64 characters long. The allowed characters are: a-z (lower-case letters), 0-9, and _ (underscore). The name *score* is reserved and cannot be specified as a field name. All field and expression names must be unique.

Dynamic field names must either begin or end with a wildcard (*). The string before or after the wildcard can contain the same set of characters as a regular index field. For more information about dynamic fields, see the section called "Using Dynamic Fields".

The options you can configure for a field vary according to the field type:

- `HighlightEnabled`—You can get highlighting information for the search hits in any `HighlightEnabled` text field. Valid for: `text`, `text-array`.
- `FacetEnabled`—You can get facet information for any `FacetEnabled` field. Text fields cannot be used for faceting. Valid for: `int`, `int-array`, `date`, `date-array`, `double`, `double-array`, `latlon`, `literal`, `literal-array`.
- `ReturnEnabled`—You can retrieve the value of any `ReturnEnabled` field with your search results. Note that this increases the size of your index, which can increase the cost of running your domain. When possible, it's best to retrieve large amounts of data from an external source, rather than embedding it in your index. Since it can take some time to apply document updates across the domain, critical data such as pricing information should be retrieved from an external source using the returned document IDs. Valid for: `int`, `int-array`, `date`, `date-array`, `double`, `double-array`, `latlon`, `literal`, `literal-array`, `text`, `text-array`.
- `SearchEnabled`—You can search the contents of any `SearchEnabled` field. Text fields are always searchable. Valid for: `int`, `int-array`, `date`, `date-array`, `double`, `double-array`, `latlon`, `literal`, `literal-array`, `text`, `text-array`.

- `SortEnabled`—You can sort the search results alphabetically or numerically using any `SortEnabled` field. Array-type fields cannot be `SortEnabled`. Only sort enabled numeric fields can be used in expressions. Valid for: `int`, `date`, `latlon`, `double`, `literal`, `text`.

You can also specify a default value and a source for any field. Specifying a default value can be important if you are using a numeric field in an expression and that field is not present in every document. Specifying a source copies data from one field to another, enabling you to use the same source data in different ways by configuring different options for the fields. You can use a wildcard (*) when specifying the source name to copy data from all fields that match the specified pattern.

When you add fields or modify existing fields, you must explicitly issue a request to re-index your data when you are done making configuration changes. For more information, see rebuild the index.

Important

If you change the type of a field and have documents in your index that contain data that is incompatible with the new field type, all fields being processed are put in the `FailedToValidate` state when you run indexing and the indexing operation fails. Rolling back the incompatible configuration change will enable you to successfully rebuild your index. If the change is necessary, you must update or remove the incompatible documents from your index to use the new configuration.

Configuring Individual Index Fields with the AWS CLI

You use the `aws cloudsearch define-index-field` command to configure individual index fields for a search domain. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To add an index field to your domain

- Run the `aws cloudsearch define-index-field` command and specify the name of the new field with the `--name` option, and the field type with the `--type` option. The following example adds an `int` field called `year` to the movies domain.

Example

```
aws cloudsearch define-index-field --domain-name movies --name year --type int
{
    "IndexField": {
        "Status": {
            "PendingDeletion": false,
            "State": "RequiresIndexDocuments",
            "CreationDate": "2014-06-25T23:03:06Z",
            "UpdateVersion": 15,
            "UpdateDate": "2014-06-25T23:03:06Z"
        },
        "Options": {
            "IndexFieldType": "int",
            "IndexFieldName": "year"
        }
    }
}
```

Note

When you add fields or modify existing fields, you must explicitly issue a request to re-index your data when you are done making configuration changes. For more information, see rebuild the index.

Configuring Index Fields Using the Amazon CloudSearch Console

You can easily configure individual index fields for your domain through the **Indexing Options** panel in the Amazon CloudSearch console. Configuring index fields in the console requires the `DefineIndexFields` action, which the AWS CLI doesn't support.

Configuring Individual Fields Using the Amazon CloudSearch Console

To configure a new index field

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation pane, choose **Domains**.

3. Click the name of the domain that you want to configure, then go to the **Indexing options** tab.
4. Choose **New index field** to add a field specification to the list.
5. Specify a unique name for the field and select the field type. Field names must begin with a letter and be at least 3 and no more than 64 characters long. The allowed characters are: a-z (lower-case letters), 0-9, and _ (underscore). The name *score* is reserved and cannot be used as a field name.
6. Select the query details that you want to enable for the field. For more information, see configure indexing options.
7. Select the analysis scheme to use for each text field. The analysis scheme specifies the language-specific text processing options that are used during indexing. By default, text fields use the `_en_default_` analysis scheme. For more information, see Configuring Analysis Schemes.
8. Specify a default value for the field (optional). This value is used when no value is specified for the field in the document data.
9. Optionally, add additional fields in **Source field**.
10. Choose **Submit**.

Note

When you add fields or modify existing fields, you must explicitly issue a request to re-index your data when you are done making configuration changes. For more information, see rebuild the index.

Configuring Amazon CloudSearch Index Fields Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `DefineIndexField`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Using Dynamic Fields in Amazon CloudSearch

Dynamic fields provide a way to index documents without knowing in advance exactly what fields they contain. For example, consider the case where you want to search a set of products. You might not know the names of all of the possible product attributes across all product categories, but you can structure your data so that all text-based attributes are stored in fields that end in `_t`, and all integer values are stored in fields that end in `_i`. With dynamic fields, you can map the attribute fields to the appropriate field type without having to configure a field for every possible attribute. This reduces the amount of configuration that you need to do up front, and eliminates the need to modify your domain configuration every time a product with a new attribute is added. You can also use dynamic fields to essentially ignore new fields by mapping them to a field that is not searchable or returnable.

Topics

Configuring Dynamic Fields in Amazon CloudSearch

You designate a field as a dynamic field by specifying a wildcard (*) as the first, last, or only character in the field name. Dynamic field names must either begin or end with a wildcard (*). Multiple wildcards and wildcards embedded within a string are not supported.

A dynamic field's name defines a pattern. The wildcard matches zero or more arbitrary characters. Any unrecognized fields that match that pattern are configured with the dynamic field's indexing options. Regular index fields take precedence over dynamic fields. If a document field name matches both a regular index field and a dynamic field pattern, it is mapped to the regular index field.

Note

The options you can configure for dynamic fields are the same as for static fields. Similarly, document field names that match a dynamic field must meet all the same criteria as static field names.

For example, if you establish the naming convention that `_i` is appended to the name of any new `int` field, you can define a dynamic field with the pattern `*_i` that sets the field type to `int` and configures a set of predefined indexing options for new `int` fields. When you add a field such as `review_rating_i`, it's configured according to the `*_i` options and indexed automatically.

If a document field matches more than one dynamic field pattern, the longest matching pattern is used. If the patterns are the same length, the dynamic field that occurs first when the field names are sorted alphabetically is used.

You can define * as a dynamic field to match any fields that don't map to an explicitly defined field or a longer dynamic field pattern. This is useful if you want to simply ignore unrecognized fields. For more information, see Using a Dynamic Field to Ignore Unrecognized Fields in Amazon CloudSearch.

Dynamic fields count toward the total number of fields defined for a domain. A domain can have a maximum of 200 field definitions, which includes dynamic fields. However, the pattern defined by a single dynamic field typically matches multiple document fields, so the total number of fields in your index can exceed 200. For more information, see *Limits*. When using dynamic fields, keep in mind that significantly increasing the number of fields in your index can impact query performance.

Adding new fields to your domain configuration can affect how fields that were generated dynamically are validated during indexing. If the validation fails, indexing will fail. For example, if you define a dynamic field called `*_new` and upload documents that contain a field called `rating_new`, the `rating_new` field will be added to your index. If you then explicitly configure a field called `rating_new`, that new field configuration will be used to validate the contents of your document's `rating_new` field when you run indexing. If `*_new` is configured as a `text` field and you configure `rating_new` as an `int` field, validation will fail if the existing `rating_new` fields contain non-integer data.

For more information about configuring index fields, see configure indexing options.

Using a Dynamic Field to Ignore Unrecognized Fields in Amazon CloudSearch

Amazon CloudSearch requires that you configure an index field for every field that occurs in the documents you are indexing. In some cases, however, you want to index a particular set of fields and simply ignore everything else. You can use dynamic fields to ignore all unrecognized fields by defining a literal field called * and disabling all indexing options for the field. Any unrecognized fields will inherit those options and will be added to your domain; however, the field contents won't be searchable or returnable, so they'll have minimal impact on the size of your index. (They do, however, count toward the total number of fields configured for the domain.) Similarly, you can selectively ignore fields that match a particular pattern, such as *_n.

To ignore unrecognized fields

1. Configure the fields that you want to index, search, or return in the results.
2. Add a dynamic field that matches any other fields that are found in the documents and disables all indexing options for them:
   - Specify `*` as the name of the field, with no prefix or suffix string. (You can also specify a more specific pattern to selectively disable fields.)
   - Set the field type to `literal` and disable the `search`, `facet`, and `return` options. Note that the maximum size of a literal field is 4096 Unicode code points.

Because longer dynamic field patterns are matched first, you can still use dynamic fields to configure options for fields that you want to use. Any fields that don't map to a regular index field or a longer dynamic field will match the * pattern.

Note

When you create a dynamic field with the name `*`, it means that your index can potentially contain any valid field name. This also means that you can reference any valid field name in your search requests, whether or not it actually exists in your index.

Searching Dynamic Fields in Amazon CloudSearch

You can reference dynamically generated fields by name in your search requests and expressions, just like any other field. For example, to search the dynamically generated field `color_t` for the color `red`, you use the structured query parser:

```
q=color_t:’red’&q.parser=structured
```

If you've defined a catch-all dynamic field (*) to map any fields that don't match regular fields or more specific dynamic field patterns, you can specify *any* valid field name in your search requests, whether or not the field actually exists in your index.

Wildcards are not supported within field names, so you cannot reference the dynamic field itself. For example, specifying q=`*_t:’red’` would return an error.

The options a dynamically generated field inherits from the dynamic field configuration control how you can use the field in your search requests, for example, whether you can search it, get facets or highlights, use it for sorting, or return in it results. Note that dynamically generated fields must be searched explicitly—dynamic fields are NOT included in the fields that are searched by default when you use the simple query parser or do not specify a field when searching with the structured query parser.

You can specify dynamic fields as sources for other fields if the target field is an array. A field's source attribute supports wildcards, which enables you to specify a pattern that matches a group of dynamic fields. For example, to search all fields generated from the `*_t` dynamic field, you could create a field called `all_t_fields` and set its source attribute to `*_t`. This copies the contents of all fields whose names end in `_t` into `all_t_fields`. Note, however, that searching this field will search *all* fields that match the pattern, not only dynamically generated fields.

For more information about constructing and submitting search requests, see Searching Your Data with Amazon CloudSearch.

Configuring Text Analysis Schemes for Amazon CloudSearch

Amazon CloudSearch enables you to configure a language-specific analysis scheme for each `text` and `text-array` field. An analysis scheme controls how the contents of the field are processed during indexing. Although the defaults for each language work well in many cases, fine-tuning the analysis options enables you to optimize the search results based on your knowledge of the data you are searching. For a list of supported languages, see Supported Languages.

An analysis scheme specifies the language of the text to be processed and the following analysis options:

- **Algorithmic stemming**—specifies the level of algorithmic stemming to perform. The available stemming levels vary depending on the language.
- **Japanese Tokenization Dictionary**—specifies overrides of the algorithmic tokenization when processing Japanese. The dictionary specifies how particular sets of characters should be grouped into words.
- **Stemming dictionary**—specifies overrides for the results of the algorithmic stemming. The dictionary maps specific related words to a common root word or stem.
- **Stopwords**—specifies words that should be ignored during indexing and searching.
- **Synonyms**—specifies words that have the same meaning as words that occur in your data and should produce the same search results.

During text processing, field values and search terms are converted to lowercase (case-folded), so stopwords, stems, and synonyms are not case-sensitive. For more information about how Amazon CloudSearch processes text during indexing and when handling search requests, see Text Processing in Amazon CloudSearch.

You must specify a language for each analysis scheme and configure an analysis scheme for each `text` and `text-array` field. When you configure fields through the Amazon CloudSearch console, the analysis scheme defaults to the `_en_default_` analysis scheme. If you do not specify analysis options for an analysis scheme, Amazon CloudSearch uses the default options for the specified language. For information about the defaults for each language, see Language Specific Settings.

The easiest way to define analysis schemes is through the **Analysis Schemes** page in the Amazon CloudSearch console. You must apply an analysis scheme to a field for it to take effect. You can apply an analysis scheme to a field from the **Indexing Options** page. You can also define analysis schemes and configure an analysis scheme for each field through the command line tools and AWS SDKs.

When you apply a new analysis scheme to an index field or modify an analysis scheme that's in use, you must explicitly rebuild the index for the changes to be reflected in search results.

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Stemming in Amazon CloudSearch

Stemming is the process of mapping related words to a common stem. A stem is typically the root or base word from which variants are derived. For example, *run* is the stem of *running* and *ran*. Stemming is performed during indexing as well as at query time. Stemming reduces the number of terms that are included in the index, and facilitates matches when the search term is a variant of a term that occurs in the content being searched. For example, if you map the term *running* to the stem *run* and then search for *running*, the request matches documents that contain *run* as well as *running*.

Amazon CloudSearch supports both algorithmic stemming and explicit stemming dictionaries. You configure algorithmic stemming by specifying the level of stemming that you want to use. The available levels of algorithmic stemming vary depending on the language:

- none—disable algorithmic stemming
- minimal—perform basic stemming by removing plural suffixes
- light—target the most common noun/adjective inflections and derived suffixes
- full—aggressively stem inflections and suffixes

In addition to controlling the degree of algorithmic stemming that's performed, you can specify a stemming dictionary that maps specific related words to a common stem. You specify the dictionary as a JSON object that contains a collection of string:value pairs that map a term to its stem, for example, `{"term1": "stem1", "term2": "stem2", "term3": "stem3"}`. The stemming dictionary is applied in addition to any algorithmic stemming. This enables you to override the results of the algorithmic stemming to correct specific cases of overstemming or understemming. The maximum size of a stemming dictionary is 500 KB. Stemming dictionary entries must be lowercase.

You use the `StemmingDictionary` key to define a custom stemming dictionary in an analysis scheme. Because you pass the dictionary to Amazon CloudSearch as a string, you must escape all double quotes within the string. For example, the following analysis scheme defines stems for *running* and *jumping*:

```
{
    "AnalysisSchemeName": "myscheme",
    "AnalysisSchemeLanguage": "en",
    "AnalysisOptions": {
        "AlgorithmicStemming": "light",
        "StemmingDictionary": "{\"running\": \"run\",\"jumping\": \"jump\"}"
    }
}
```

If you do not specify the level of algorithmic stemming or a stemming dictionary in your analysis scheme, Amazon CloudSearch uses the default algorithmic stemming level for the specified language. While stemming can help users find relevant documents that might otherwise be excluded from the search results, overstemming can result in too many matches with questionable relevance. The default level of algorithmic stemming configured for each language works well for most use cases. In general, it's best to start with the default and then make adjustments to optimize the relevance of the search results for your use case. For information about the defaults for each language, see Language Specific Settings.

Stopwords in Amazon CloudSearch

Stopwords are words that should typically be ignored both during indexing and at search time because they are either insignificant or so common that including them would result in a massive number of matches.

During indexing, Amazon CloudSearch uses the stopword dictionary when it processes `text` and `text-array` fields. In most cases, stopwords are not included in the index. The stopword dictionary is also used to filter search requests.

A stopwords dictionary is a JSON array of terms, for example, `["a", "an", "the", "of"]`. The stopwords dictionary must explicitly list each word that you want to ignore. Wildcards and regular expressions are not supported.

You use the `Stopwords` key to define a custom stopwords dictionary in an analysis scheme. Because you pass the dictionary to Amazon CloudSearch as a string, you must escape all double quotes within the string. For example, the following analysis scheme configures the stopwords *a*, *an*, and *the*:

```
{
    "AnalysisSchemeName": "myscheme",
    "AnalysisSchemeLanguage": "en",
    "AnalysisOptions": {
        "Stopwords": "[\"a\",\"an\",\"the\"]"
    }
}
```

If you do not specify a stopwords dictionary in your analysis scheme, Amazon CloudSearch uses the default stopword dictionary for the specified language. The default stopwords configured for each language work well for most use cases. In general, it's best to start with the default and then make adjustments to optimize the relevance of the search results for your use case. For information about the defaults for each language, see Language Specific Settings.

Synonyms in Amazon CloudSearch

You can configure synonyms for terms that appear in the data that you are searching. That way, if a user searches for the synonym rather than the indexed term, the results will include documents that contain the indexed term. For example, you might define custom synonyms to do the following:

- Map common misspellings to the correct spelling
- Define equivalent terms, such as `film` and `movie`
- Map a general term to a more specific one, such as `fish` and `barracuda`
- Map multiple words to a single word or vice versa, such as `tool box` and `toolbox`

When you define a synonym, the synonym is added to the index everywhere the base token occurs. For example, if you define `fish` as a synonym of `barracuda`, the term `fish` is added to every document that contains the term `barracuda`. Adding a large number of synonyms can increase the size of the index as well as query latency—synonyms increase the number of matches and the more matches, the longer it takes to process the results.

The synonym dictionary is used during indexing to configure mappings for terms that occur in text fields. No synonym processing is done on search requests. By default, Amazon CloudSearch does not define any synonyms.

You can specify synonyms in two ways:

- As a *conflation group* where each term in the group is considered a synonym of every other term in the group.
- As an *alias* for a specific term. An alias is considered a synonym of the specified term, but the term is not considered a synonym of the alias.

A synonym dictionary is specified as a JSON object that defines the synonym groups and aliases. The `groups` value is an array of arrays, where each sub-array is a conflation group. The `aliases` value is an object that contains a collection of string:value pairs where the string specifies a term and the array of values specifies each of the synonyms for that term. The following example includes both conflation groups and aliases:

```
{
    "groups": [["1st", "first", "one"], ["2nd", "second", "two"]],
    "aliases": { "youth": ["child", "kid", "boy", "girl"],
                 "adult": ["men", "women"] }
}
```

Both groups and aliases support multiword synonyms. In the following example, multiword synonyms are used in a conflation group as well as an alias:

```
{
    "groups": [["tool box", "toolbox"], ["band saw", "bandsaw"]],
    "aliases": { "workbench": ["work bench"]}
}
```

You use the `Synonyms` key to define a custom synonym dictionary in an analysis scheme. Because you pass the dictionary to Amazon CloudSearch as a string, you must escape all double quotes within the string. For example, the following analysis scheme configures aliases for the term *youth*:

```
{
    "AnalysisSchemeName": "myscheme",
    "AnalysisSchemeLanguage": "en",
    "AnalysisOptions": {
        "Synonyms": "{\"aliases\": {\"youth\": [\"child\",\"kid\"]}}"
    }
}
```

Configuring Analysis Schemes Using the Amazon CloudSearch Console

You can define analysis schemes from the **Analysis Schemes** pane in the Amazon CloudSearch console.

To define an analysis scheme

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. From the left nagivation pane, choose **Domains**.
3. Choose the name of your domain to open its configuration.
4. Go to the **Advanced search options** tab.
5. In the **Analysis schemes** pane, choose **Add analysis scheme**.
6. Specify a name for the analysis scheme and select a language.

7. Choose **Next**.
8. In the next three steps, configure the scheme's text stopword, stemming, and synonym options. You can configure individual stopwords, stems, and synonyms, or edit the displayed dictionaries directly. The dictionaries are formatted in JSON. Stopwords are specified as an array of strings. Stems are specified as an object that contains one or more key:value pairs. Synonym aliases are also specified as a JSON object with one or move key:value pairs, where the alias values are specified as an array of strings. A synonym group is specified as a JSON array. (The synonym dictionary is an array of arrays.)

   If you selected Japanese as the language, you also have the option of specifying a custom tokenization dictionary that overrides the default tokenization of specific phrases. For more information, see Customizing Japanese Tokenization.
9. On the summary page, review the analysis scheme configuration and choose **Save**.

Important

To use an analysis scheme, you must apply it to one or more `text` or `text-array` fields and rebuild the index. You can configure a field's analysis scheme from the **Indexing options** tab. To rebuild your index, choose **Actions**, **Run indexing**.

Configuring Analysis Schemes Using the AWS CLI

You use the `aws cloudsearch define-analysis-scheme` command to define language-specific text processing options, including stemming options, stopwords, and synonyms. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

You specify an analysis scheme as part of the configuration of each `text` or `text-array` field. For more information, see configure indexing options.

To define an analysis scheme

- Run the `aws cloudsearch define-analysis-scheme` command and specify the `--analysis-scheme` option and a JSON object that contains your analysis options. The analysis scheme must be valid JSON. The analysis option key and value pairs must be enclosed in quotes, and all quotes within the option values must be escaped with a backslash. For the format of the analysis options, see define-analysis-scheme in the AWS CLI Command Reference. See Configuring Analysis Schemes for more information about specifying stemming, stopword, and synonym options.

If you specify Japanese (`ja`) as the language, you also have the option of specifying a custom tokenization dictionary that overrides the default tokenization of specific phrases. For more information, see Customizing Japanese Tokenization.

Tip

The easiest way to configure an analysis scheme with the AWS CLI is to store the analysis scheme in a text file and specify that file as the `--analysis-scheme` value. This enables you to format the scheme so that it's easier to read. For example, the following scheme defines an English analysis scheme called `myscheme` that uses light algorithmic stemming and configures two stopwords:

```
{
    "AnalysisSchemeName": "myscheme",
    "AnalysisSchemeLanguage": "en",
    "AnalysisOptions": {
        "AlgorithmicStemming": "light",
        "Stopwords": "[\"a\", \"the\"]"
    }
}
```

If you save this scheme in a text file called `myscheme.txt`, you can pass the file in as the value of the `--analysis-scheme` parameter:

```
aws cloudsearch define-analysis-scheme --region us-east-1 --domain-name
 movies --analysis-scheme file://myscheme.txt
```

Important

To use an analysis scheme, you must apply it to one or more `text` or `text-array` fields and rebuild the index. You can configure a field's analysis scheme with the `aws cloudsearch define-index-field` command. To rebuild the index, call `aws cloudsearch index-documents`.

Configuring Analysis Schemes Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `DefineAnalysisScheme`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Important

To use an analysis scheme, you must apply it to one or more `text` or `text-array` fields and rebuild the index. You can configure a field's analysis scheme with the define index field method. To rebuild your index, you use the index documents method.

Indexing Bigrams for Chinese, Japanese, and Korean in Amazon CloudSearch

Chinese, Japanese, and Korean do not have explicit word boundaries. Simply indexing individual characters (unigrams) can result in matches that aren't very relevant to a search query. One solution is to index *bigrams*. A bigram is every sequence of two adjacent characters in a string. For example, the following example shows bigrams for the string

我的氣墊船裝滿了鱔魚

:

```
我的   的氣   氣墊   墊船   船裝   裝滿   滿了   了鱔   鱔魚
```

While indexing bigrams can improve search result quality, keep in mind that it can significantly increase the size of your index.

To index bigrams for Chinese, Japanese, and Korean

1. Create a text analysis scheme and set the language to multiple languages (`mul`).
2. Configure the index field that contains the CJK data to use your multi-language analysis scheme.

When you assign an analysis scheme that sets a field's language to `mul`, Amazon CloudSearch automatically generates bigrams for all Chinese, Japanese, and Korean text within the field.

For more information about creating and using analysis schemes, see Configuring Analysis Schemes.

If you are indexing Japanese content, you might also be interested in using a custom tokenization dictionary with the standard Japanese language processor. For more information, see Customizing Japanese Tokenization.

Customizing Japanese Tokenization in Amazon CloudSearch

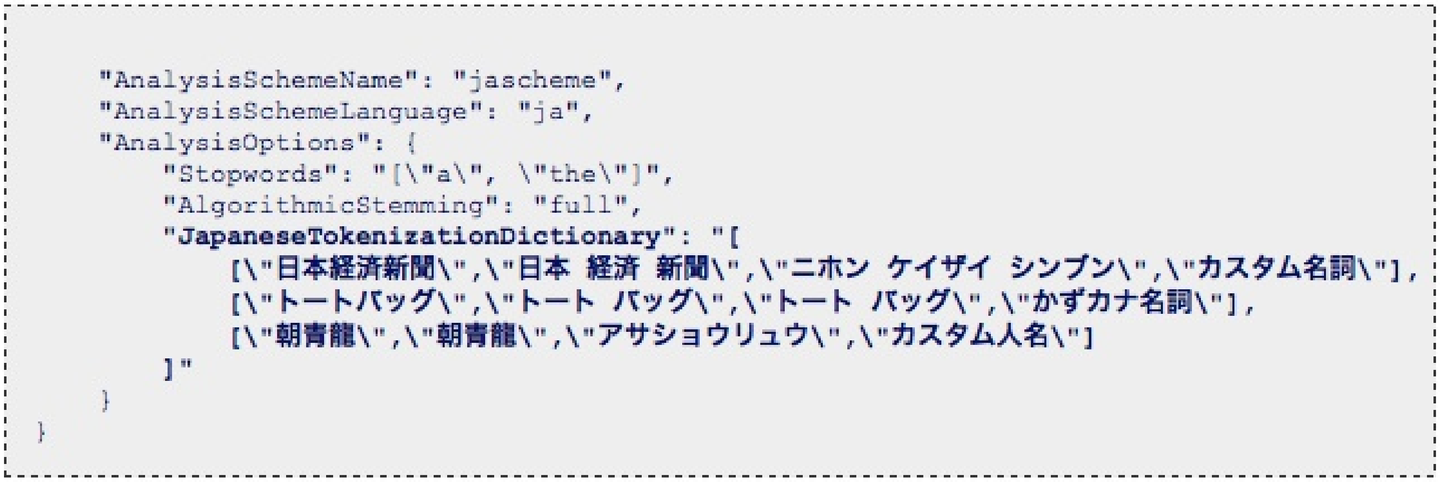
If you need more control over how Amazon CloudSearch tokenizes Japanese, you can add a custom Japanese tokenization dictionary to your analysis scheme. Configuring a custom tokenization dictionary enables you to override how specific entries are tokenized by the standard Japanese language processor. This can improve search result accuracy in some cases, particularly when you need to index and retrieve domain-specific phrases.

A tokenization dictionary is a collection of entries where each entry specifies a set of characters, how the characters should be tokenized, how each token should be pronounced (readings), and a part-of-speech tag. You specify the dictionary as an array, and each dictionary entry is an array of strings. The entries are of the following form:

```
["<text>","<token 1> ... <token n>","<reading 1> ... <reading n>","<part-of-speech
 tag>"]
```

You must specify a reading for each token and the part-of-speech tag for the entry. See Japanese Part-of-Speech Tags for the part of speech tags that are treated as stopwords.

You use the `JapaneseTokenizationDictionary` key to define a custom tokenization dictionary in an analysis scheme. Because you pass the tokenization dictionary to Amazon CloudSearch as a string, you must escape all double quotes within the string. For example, the dictionary in the following analysis scheme specifies segmentation overrides for Kanji and Katakana compounds, and a custom reading for a proper name:



```
    "AnalysisSchemeName": "jascheme",
    "AnalysisSchemeLanguage": "ja",
    "AnalysisOptions": {
        "Stopwords": "[\"a\", \"the\"]",
        "AlgorithmicStemming": "full",
        "JapaneseTokenizationDictionary": "[
            [\"日本経済新聞\",\"日本 経済 新聞\",\"ニホン ケイザイ シンブン\",\"カスタム名詞\"],
            [\"トートバッグ\",\"トート バッグ\",\"トート バッグ\",\"かずカナ名詞\"],
            [\"朝青龍\",\"朝青龍\",\"アサショウリュウ\",\"カスタム人名\"]
        ]"
    }
}
```

When configuring an analysis scheme with the AWS CLI, you can store the analysis scheme in a text file and specify that file as the `--analysis-scheme` value. This enables you to format the scheme so that it's easier to read. For example, if you store the `jascheme` analysis scheme in a file called `jascheme.txt`, you can pass that file in when you call `aws cloudsearch define-analysis-scheme`:

```
aws cloudsearch define-analysis-scheme --region us-east-1 --domain-name
mydomain --analysis-scheme file://jascheme.txt
```

For more information about creating and using analysis schemes, see Configuring Analysis Schemes.

Japanese Part-of-Speech Tags in Amazon CloudSearch

When you use a custom tokenization dictionary for Japanese, you specify a part-of-speech tag for each entry. If the part-of-speech tag matches one of the tags configured as a stop tag, the entry is treated as a stopword.

The following table shows the part of speech tags configured as stop tags in Amazon CloudSearch.

Stop Tags

Tag	Part-of-Speech	Description	
助動詞	Auxiliary-verb	A verb that adds functional or grammatical meaning	

Tag	Part-of-Speech	Description
		to the clause in which it appears.
接続詞	Conjunction	Conjunctions that can occur independently.
フィラー	Filler	Aizuchi that occurs during a conversation or sounds inserted as filler.
非言語音	Non-verbal	Non-verbal sound.
その他-間投	Other-interjection	Words that are hard to classify as noun-suffixes or sentence-final particles.
助詞-副詞化	Particle-adnominalizer	The "ni" and "to" that appear following nouns and adverbs.
助詞-連体化	Particle-adnominalizer	The "no" that attaches to nouns and modifies non-inflectional words.
助詞-副助詞	Particle-adverbial	An adverb used to show position, direction of movement, and so on.

Tag	Part-of-Speech	Description
助詞-副助詞／並立助詞／終助詞	Particle-adverbial/conjunctive/final	The particle "ka" when unknown whether it is adverbial, conjunctive, or sentence final.
助詞-格助詞-連語	Particle-case-compound	Compounds of particles and verbs that mainly behave like case particles.
助詞-格助詞-一般	Particle-case-misc	Case particles.
助詞-格助詞-引用	Particle-case-quote	The "to" that appears after nouns, a person’s speech, quotation marks, expressions of decisions from a meeting, reasons, judgements, conjectures, and so on.
助詞-格助詞	Particle-case	Case particles where the subclassification is undefined.
助詞-接続助詞	Particle-conjunctive	Conjunctive particles.
助詞-並立助詞	Particle-coordinate	Coordinate particles.
助詞-係助詞	Particle-dependency	Dependency particles.

Tag	Part-of-Speech	Description
助詞-終助詞	Particle-final	Final particles.
助詞-間投助詞	Particle-interjective	Particles with interjective grammatical roles.
助詞-特殊	Particle-special	A particle that does not fit into any of the other classifications. This includes particles that are used in Tanka, Haiku, and other poetry.
助詞	Particle	Unclassified particles.
記号-括弧閉	Symbol-close_bracket	Close bracket:].
記号-読点	Symbol-comma	Comma: ,.
記号-一般	Symbol-misc	A general symbol not in one of the other categories.
記号-括弧開	Symbol-open_bracket	Open bracket: [.
記号-句点	Symbol-period	Periods and full stops.
記号-空白	Symbol-space	Full-width whitespace.
記号	Symbol	Unclassified symbols.

Text Processing in Amazon CloudSearch

During indexing, Amazon CloudSearch processes `text` and `text-array` fields according to the analysis scheme configured for the field to determine what terms to add to the index. Before the analysis options are applied, the text is *tokenized* and *normalized*.

During tokenization, the stream of text in a field is split into separate tokens on detectable boundaries using the word break rules defined in the Unicode Text Segmentation algorithm. For more information, see Unicode Text Segmentation.

According to the word break rules, strings separated by whitespace such as spaces and tabs are treated as separate tokens. In many cases, punctuation is dropped and treated as whitespace. For example, strings are split at hyphens (-) and the at symbol (@). However, periods that are not followed by whitespace are considered part of the token.

Note that strings are not split on case boundaries—*CamelCase* strings are not tokenized.

During normalization, upper case characters are converted to lower case. Accents are typically handled according to the stemming options configured in the field's analysis scheme. (The default analysis scheme for English removes accents.)

Once tokenization and normalization are complete, the stemming options, stopwords, and synonyms specified in the analysis scheme are applied.

When you submit a search request, the text you're searching for undergoes the same text processing so that it can be matched against the terms that appear in the index. However, no text analysis is performed on the search term when you perform a prefix search. This means that a search for a prefix that ends in `s` typically won't match the singular version of the term when stemming is enabled. This can happen for any term that ends in `s`, not just plurals. For example, if you search the `actor` field in the sample movie data for `Anders`, there are three matching movies. If you search for `Ander*`, you get those movies as well as several others. However, if you search for `Anders*` there are no matches. This is because the term is stored in the index as `ander`, `anders` does not appear in the index.

If stemming is preventing your wildcard searches from returning all of the relevant matches, you can suppress stemming for the text field by setting the `AlgorithmicStemming` option to none, or you can map the data to a `literal` field instead of a `text` field.

Topics

- Language Specific Text Processing Settings in Amazon CloudSearch

Supported Languages in Amazon CloudSearch

Arabic (ar)	Armenian (hy)	Basque (eu)
Bulgarian (bg)	Catalan (ca)	Chinese - Simplified (zh-Hans)
Chinese - Traditional (zh-Hant)	Czech (cs)	Danish (da)
Dutch (nl)	English (en)	Finnish (fi)
French (fr)	Galician (gl)	German (de)
Greek (el)	Hindi (hi)	Hebrew (he)
Hungarian (hu)	Indonesian (id)	Irish (ga)
Italian (it)	Japanese (ja)	Korean (ko)
Latvian (lv)	Multiple (mul)	Norwegian (no)
Persian (fa)	Portuguese (pt)	Romanian (ro)
Russian (ru)	Spanish (es)	Swedish (sv)
Thai (th)	Turkish (tr)	

Language Specific Text Processing Settings in Amazon CloudSearch

Arabic (ar)

Algorithmic stemming options: `light`

Default analysis scheme: `_ar_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

من ومن منها منه في وفي فيها فيه و ف ثم او أو ب بها به ا أ اى اي أي أى لا ولا الا ألا إلا لكن ما وما كما فما عن مع اذا إذا ان أن إن انها أنها إنها انه أنه إنه بان بأن فان فأن وان وأن وإن التى التي الذى الذي الذين الى الي إلى إلي على عليها عليه اما أما إما ايضا أيضا كل وكل لم ولم لن ولن هى هي هو وهى وهي وهو فهى فهي فهو انت أنت لك لها له هذه هذا تلك ذلك هناك كانت كان يكون تكون وكانت وكان غير بعض قد نحو بين بينما منذ ضمن حيث الان الآن خلال بعد قبل حتى عند عندما لدى جميع

Armenian (hy)

Algorithmic stemming options: `full`

Default analysis scheme: `_hy_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

այդ այլ այն այս դու դուք եմ են ենք ես եք է էի էին էինք էիր էիք էր ըստ թ ի ին իսկ իր կամ համար հետ հետո մենք մեջ մի ն նա նաև նրա նրանք որ որը որոնք որպես ու ում պիտի վրա և

Basque (eu)

Algorithmic stemming options: `full`

Default analysis scheme: `_eu_default_`

- Algorithmic stemming options: `full`
- Default stopword dictionary:

al anitz arabera asko baina bat batean batek bati batzuei batzuek batzuetan batzuk bera beraiek berau berauek bere berori beroriek beste bezala da dago dira ditu du dute edo egin ere eta eurak ez gainera gu gutxi guzti haiei haiek haietan hainbeste hala han handik hango hara hari hark hartan hau hauei hauek hauetan hemen hemendik hemengo hi hona honek honela honetan honi hor hori horiei horiek horietan horko horra horrek horrela horretan horri hortik hura izan ni noiz nola non nondik nongo nor nora ze zein zen zenbait zenbat zer zergatik ziren zituen zu zuek zuen zuten

Bulgarian (bg)

Algorithmic stemming options: `light`

Default analysis scheme: `_bg_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  а аз ако ала бе без беше би бил била били било близо бъдат бъде бяха в вас ваш ваша вероятно вече взема ви вие винаги все всеки всички всичко всяка във въпреки върху г ги главно го д да дали до докато докога дори досега доста е едва един ето за зад заедно заради засега затова защо защото и из или им има имат иска й каза как каква какво както какъв като кога когато което които кой който колко която къде където към ли м ме между мен ми мнозина мога могат може моля момента му н на над назад най направи напред например нас не него нея ни ние никой нито но някои някой няма обаче около освен особено от отгоре отново още пак по повече повечето под поне поради после почти прави пред преди през при пък първо с са само се сега си скоро след сме според сред срещу сте съм със също т тази така такива такъв там твой те тези ти тн то това тогава този той толкова точно трябва тук тъй тя тях у харесва ч че често чрез ще щом я

Catalan (ca)

Algorithmic stemming options: `full`

Elision filter enabled

Default analysis scheme: `_ca_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  a abans ací ah així això al als aleshores algun alguna algunes alguns alhora allà allí allò altra altre altres amb ambdós ambdues apa aquell aquella aquelles aquells aquest aquesta aquestes aquests aquí baix cada cadascú cadascuna cadascunes cadascuns com contra d'un d'una d'unes d'uns dalt de del dels des després dins dintre donat doncs durant e eh el els em en encara ens entre érem eren éreu es és esta està estàvem estaven estàveu esteu et etc ets fins fora gairebé ha han has havia he hem heu hi ho i igual iguals ja l'hi la les li li'n llavors m'he ma mal malgrat mateix mateixa mateixes mateixos me mentre més meu meus meva meves molt molta moltes molts mon mons n'he n'hi ne ni no nogensmenys només nosaltres nostra nostre nostres o oh oi on pas pel pels per però perquè poc poca pocs poques potser propi qual quals quan quant que què quelcom qui quin quina quines quins s'ha s'han sa semblant semblants ses seu seus seva seva seves si sobre sobretot sóc solament sols son són sons sota sou t'ha t'han t'he ta tal també tampoc tan tant tanta tantes teu teus teva teves ton tons tot tota totes tots un una unes uns us va vaig vam van vas veu vosaltres vostra vostre vostres

Chinese - Simplified (zh-Hans)

Algorithmic stemming not supported

Stemming dictionary not supported

Default analysis scheme: `_zh-Hans_default_`

Chinese - Traditional (zh-Hant)

Algorithmic stemming not supported

Stemming dictionary not supported

Default analysis scheme: `_zh-Hant_default_`

Czech (cz)

Algorithmic stemming options: `light`

Default analysis scheme: `_cs_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  a s k o i u v z dnes cz tímto budeš budem byli jseš můj svým ta tomto tohle tuto tyto jej zda proč máte tato kam tohoto kdo kteří mi nám tom tomuto mít nic proto kterou byla toho protože asi ho naši napište re což tím takže svých její svými jste aj tu tedy teto bylo kde ke pravé ji nad nejsou či pod téma mezi přes ty pak vám ani když však neg jsem tento článku články aby jsme před pta jejich byl ještě až bez také pouze první vaše která nás nový tipy pokud může strana jeho své jiné zprávy nové není vás jen podle zde už být více bude již než který by které co nebo ten tak má při od po jsou jak další ale si se ve to jako za zpět ze do pro je na atd atp jakmile přičemž já on ona ono oni ony my vy jí ji mě mne jemu tomu těm těmu němu němuž jehož jíž jelikož jež jakož načež

Danish (da)

Algorithmic stemming options: `full`

Default analysis scheme: `_da_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  og i jeg det at en den til er som på de med han af for ikke der var mig sig men et har om vi min havde ham hun nu over da fra du ud sin dem os op man hans hvor eller hvad skal selv her alle vil blev kunne ind når være dog noget ville jo deres efter ned skulle denne end dette mit også under have dig anden hende mine alt meget sit sine vor mod disse hvis din nogle hos blive mange ad bliver hendes været thi jer sådan

Dutch (nl)

Algorithmic stemming options: `full`

Default analysis scheme: `_nl_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  de en van ik te dat die in een hij het niet zijn is was op aan met als voor had er maar om hem dan zou of wat mijn men dit zo door over ze zich bij ook tot je mij uit der daar haar naar heb hoe heeft hebben deze u want nog zal me zij nu ge geen omdat iets worden toch al waren veel meer doen toen moet ben zonder kan hun dus alles onder ja eens hier wie werd altijd doch wordt wezen kunnen ons zelf tegen na reeds wil kon niets uw iemand geweest andere
- Default stemming dictionary:

  fiets fiets bromfiets bromfiets ei eier kind kinder

English (en)

Algorithmic stemming options: `minimal|light|full`

Default analysis scheme: `_en_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  a an and are as at be but by for if in into is it no not of on or such that the their then there these they this to was will with

Finnish (fi)

Algorithmic stemming options: `light`|`full`

Default analysis scheme: `_fi_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  olla olen olet on olemme olette ovat ole oli olisi olisit olisin olisimme olisitte olisivat olit olin olimme olitte olivat ollut olleet en et ei emme ette eivät minä minun minut minua minussa minusta minuun minulla minulta minulle sinä sinun sinut sinua sinussa sinusta sinuun sinulla sinulta sinulle hän hänen hänet häntä hänessä hänestä häneen hänellä häneltä hänelle me meidän meidät meitä meissä meistä meihin meillä meiltä meille te teidän teidät teitä teissä teistä teihin teillä teiltä teille he heidän heidät heitä heissä heistä heihin heillä heiltä heille tämä tämän tätä tässä tästä tähän tallä tältä tälle tänä täksi tuo tuon tuotä tuossa tuosta tuohon tuolla tuolta tuolle tuona tuoksi se sen sitä siinä siitä siihen sillä siltä sille sinä siksi nämä näiden näitä näissä näistä näihin näillä näiltä näille näinä näiksi nuo noiden noita noissa noista noihin noilla noilta noille noina noiksi ne niiden niitä niissä niistä niihin niillä niiltä niille niinä niiksi kuka kenen kenet ketä kenessä kenestä keneen kenellä keneltä kenelle kenenä keneksi ketkä keiden ketkä keitä keissä keistä keihin keillä keiltä keille keinä keiksi mikä minkä minkä mitä missä mistä mihin millä miltä mille minä miksi mitkä joka jonka jota jossa josta johon jolla jolta jolle jona joksi jotka joiden joita joissa joista joihin joilla joilta joille joina joiksi että ja jos koska kuin mutta niin sekä sillä tai vaan vai vaikka kanssa mukaan noin poikki yli kun niin nyt itse

French (fr)

Algorithmic stemming options: `minimal`|`light`|`full`

Elision filter enabled

Default analysis scheme: `_fr_default_`

- Algorithmic stemming: `minimal`
- Default stopword dictionary:

  au aux avec ce ces dans de des du elle en et eux il je la le leur lui ma mais me même mes moi mon ne nos notre nous on ou par pas pour qu que qui sa se ses son sur ta te tes toi ton tu un une vos votre vous c d j l à m n s t y été étée étées étés étant suis es est sommes êtes sont serai seras sera serons serez seront serais serait serions seriez seraient étais était étions étiez étaient fus fut fûmes fûtes furent sois soit soyons soyez soient fusse fusses fût fussions fussiez fussent ayant eu eue eues eus ai as avons avez ont aurai auras aura aurons aurez auront aurais aurait aurions auriez auraient avais avait avions aviez avaient eut eûmes eûtes eurent aie aies ait ayons ayez aient eusse eusses eût eussions eussiez eussent ceci celà cet cette ici ils les leurs quel quels quelle quelles sans soi

Galician (gl)

Algorithmic stemming options: `minimal|full`

Default analysis scheme: `_gl_default_`

- Algorithmic stemming: `minimal`
- Default stopword dictionary:

  # galican stopwords a aínda alí aquel aquela aquelas aqueles aquilo aquí ao aos as así á ben cando che co coa comigo con connosco contigo convosco coas cos cun cuns cunha cunhas da dalgunha dalgunhas dalgún dalgúns das de del dela delas deles desde deste do dos dun duns dunha dunhas e el ela elas eles en era eran esa esas ese eses esta estar estaba está están este estes estiven estou eu é facer foi foron fun había hai iso isto la las lle lles lo los mais me meu meus min miña miñas moi na nas neste nin no non nos nosa nosas noso nosos nós nun nunha nuns nunhas o os ou ó ós para pero pode pois pola polas polo polos por que se senón ser seu seus sexa sido sobre súa súas tamén tan te ten teñen teño ter teu teus ti tido tiña tiven túa túas un unha unhas uns vos vosa vosas voso vosos vós

German (de)

Algorithmic stemming options: `minimal|light|full`

Default analysis scheme: `_de_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  aber alle allem allen aller alles als also am an ander andere anderem anderen anderer anderes anderm andern anderr anders auch auf aus bei bin bis bist da damit dann der den des dem die das daß derselbe derselben denselben desselben demselben dieselbe dieselben dasselbe dazu dein deine deinem deinen deiner deines denn derer dessen dich dir du dies diese diesem diesen dieser dieses doch dort durch ein eine einem einen einer eines einig einige einigem einigen einiger einiges einmal er ihn ihm es etwas euer eure eurem euren eurer eures für gegen gewesen hab habe haben hat hatte hatten hier hin hinter ich mich mir ihr ihre ihrem ihren ihrer ihres euch im in indem ins ist jede jedem jeden jeder jedes jene jenem jenen jener jenes jetzt kann kein keine keinem keinen keiner keines können könnte machen man manche manchem manchen mancher manches mein meine meinem meinen meiner meines mit muss musste nach nicht nichts noch nun nur ob oder ohne sehr sein seine seinem seinen seiner seines selbst sich sie ihnen sind so solche solchem solchen solcher solches soll sollte sondern sonst über um und uns unse unsem unsen unser unses unter viel vom von vor während war waren warst was weg weil weiter welche welchem welchen welcher welches wenn werde werden wie wieder will wir wird wirst wo wollen wollte würde würden zu zum zur zwar zwischen

Greek (el)

Algorithmic stemming options: `full`

Default analysis scheme: `_el_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  ο η το οι τα του τησ των τον την και κι κ ειμαι εισαι ειναι ειμαστε ειστε στο στον στη στην μα αλλα απο για προσ με σε ωσ παρα αντι κατα μετα θα να δε δεν μη μην επι ενω εαν αν τοτε που πωσ ποιοσ ποια ποιο ποιοι ποιεσ ποιων ποιουσ αυτοσ αυτη αυτο αυτοι αυτων αυτουσ αυτεσ αυτα εκεινοσ εκεινη εκεινο εκεινοι εκεινεσ εκεινα εκεινων εκεινουσ οπωσ ομωσ ισωσ οσο οτι

Hebrew (h3)

Algorithmic stemming options: `full`

Default analysis scheme: `_he_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary

Hindi (hi)

Algorithmic stemming options: `full`

Default analysis scheme: `_hi_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary

Hungarian (hu)

Algorithmic stemming options: `light|full`

Default analysis scheme: `_hu_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  a ahogy ahol aki akik akkor alatt által általában amely amelyek amelyekben amelyeket amelyet amelynek ami amit amolyan amíg amikor át abban ahhoz annak arra arról az azok azon azt azzal azért aztán azután azonban bár be belül benne cikk cikkek cikkeket csak de e eddig egész egy egyes egyetlen egyéb egyik egyre ekkor el elég ellen elő először előtt első én éppen ebben ehhez emilyen ennek erre ez ezt ezek ezen ezzel ezért és fel felé hanem hiszen hogy hogyan igen így illetve ill. ill ilyen ilyenkor ison ismét itt jó jól jobban kell kellett keresztül keressünk ki kívül között közül legalább lehet lehetett legyen lenne lenni lesz lett maga magát majd majd már más másik meg még mellett mert mely melyek mi mit míg miért milyen mikor minden mindent mindenki mindig mint mintha mivel most nagy nagyobb nagyon ne néha nekem neki nem néhány nélkül nincs olyan ott össze ő ők őket pedig persze rá s saját sem semmi sok sokat sokkal számára szemben szerint szinte talán tehát teljes tovább továbbá több úgy ugyanis új újabb újra után utána utolsó vagy vagyis valaki valami valamint való vagyok van vannak volt voltam voltak voltunk vissza vele viszont volna

Indonesian (id)

Algorithmic stemming options: `light|full`

Default analysis scheme: `id_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  ada adanya adalah adapun agak agaknya agar akan akankah akhirnya aku akulah amat amatlah anda andalah antar diantaranya antara antaranya diantara apa apaan mengapa apabila apakah apalagi apatah atau ataukah ataupun bagai bagaikan sebagai sebagainya bagaimana bagaimanapun sebagaimana bagaimanakah bagi bahkan bahwa bahwasanya sebaliknya banyak sebanyak beberapa seberapa begini beginian beginikah beginilah sebegini begitu begitukah begitulah begitupun sebegitu belum belumlah sebelum sebelumnya sebenarnya berapa berapakah berapalah berapapun betulkah sebetulnya biasa biasanya bila bilakah bisa bisakah sebisanya boleh bolehkah bolehlah buat bukan bukankah bukanlah bukannya cuma percuma dahulu dalam dan dapat dari daripada dekat demi demikian demikianlah sedemikian dengan depan di dia dialah dini diri dirinya terdiri dong dulu enggak enggaknya entah entahlah terhadap terhadapnya hal hampir hanya hanyalah harus haruslah harusnya seharusnya hendak hendaklah hendaknya hingga sehingga ia ialah ibarat ingin inginkah inginkan ini inikah inilah itu itukah itulah jangan jangankan janganlah jika jikalau juga justru kala kalau kalaulah kalaupun kalian kami kamilah kamu kamulah kan kapan kapankah kapanpun dikarenakan karena karenanya ke kecil kemudian kenapa kepada kepadanya ketika seketika khususnya kini kinilah kiranya sekiranya kita kitalah kok lagi lagian selagi lah lain lainnya melainkan selaku lalu melalui terlalu lama lamanya selama selama selamanya lebih terlebih bermacam macam semacam maka makanya makin malah malahan mampu mampukah mana manakala manalagi masih masihkah semasih masing mau maupun semaunya memang mereka merekalah meski meskipun semula mungkin mungkinkah nah namun nanti nantinya nyaris oleh olehnya seorang seseorang pada padanya padahal paling sepanjang pantas sepantasnya sepantasnyalah para pasti pastilah per pernah pula pun merupakan rupanya serupa saat saatnya sesaat saja sajalah saling bersama sama sesama sambil sampai sana sangat sangatlah saya sayalah se sebab sebabnya sebuah tersebut tersebutlah sedang sedangkan sedikit sedikitnya segala segalanya segera sesegera sejak sejenak sekali sekalian sekalipun sesekali sekaligus sekarang sekarang sekitar sekitarnya sela selain selalu seluruh seluruhnya semakin sementara sempat semua semuanya sendiri sendirinya seolah seperti sepertinya sering seringnya serta siapa siapakah siapapun disini disinilah sini sinilah sesuatu sesuatunya suatu sesudah sesudahnya sudah sudahkah sudahlah supaya tadi tadinya tak tanpa setelah telah tentang tentu tentulah tentunya tertentu seterusnya tapi tetapi setiap tiap setidaknya tidak tidakkah tidaklah toh waduh wah wahai sewaktu walau walaupun wong yaitu yakni yang

Irish (ga)

Algorithmic stemming options: `full`

Elision filter enabled

Default analysis scheme: `_ga_default_`

- Algorithmic stemming options: `full`
- Default stopword dictionary:

  a ach ag agus an aon ar arna as b' ba beirt bhúr caoga ceathair ceathrar chomh chtó chuig chun cois céad cúig cúigear d' daichead dar de deich deichniúr den dhá do don dtí dá dár dó faoi faoin faoina faoinár fara fiche gach gan go gur haon hocht i iad idir in ina ins inár is le leis lena lenár m' mar mo mé na nach naoi naonúr ná ní níor nó nócha ocht ochtar os roimh sa seacht seachtar seachtó seasca seisear siad sibh sinn sna sé sí tar thar thú triúr trí trína trínár tríocha tú um ár é éis í ó ón óna ónár

Italian (it)

Algorithmic stemming options: `light|full`

Elision filter enabled

Default analysis scheme: `_it_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  ad al allo ai agli all agl alla alle con col coi da dal dallo dai dagli dall dagl dalla dalle di del dello dei degli dell degl della delle in nel nello nei negli nell negl nella nelle su sul sullo sui sugli sull sugl sulla sulle per tra contro io tu lui lei noi voi loro mio mia miei mie tuo tua tuoi tue suo sua suoi sue nostro nostra nostri nostre vostro vostra vostri vostre mi ti ci vi lo la li le gli ne il un uno una ma ed se perché anche come dov dove che chi cui non più quale quanto quanti quanta quante quello quelli quella quelle questo questi questa queste si tutto tutti a c e i l o ho hai ha abbiamo avete hanno abbia abbiate abbiano avrò avrai avrà avremo avrete avranno avrei avresti avrebbe avremmo avreste avrebbero avevo avevi aveva avevamo avevate avevano ebbi avesti ebbe avemmo aveste ebbero avessi avesse avessimo avessero avendo avuto avuta avuti avute sono sei è siamo siete sia siate siano sarò sarai sarà saremo sarete saranno sarei saresti sarebbe saremmo sareste sarebbero ero eri era eravamo eravate erano fui fosti fu fummo foste furono fossi fosse fossimo fossero essendo faccio fai facciamo fanno faccia facciate facciano farò farai farà faremo farete faranno farei faresti farebbe faremmo fareste farebbero facevo facevi faceva facevamo facevate facevano feci facesti fece facemmo faceste fecero facessi facesse facessimo facessero facendo sto stai sta stiamo stanno stia stiate stiano starò starai starà staremo starete staranno starei staresti starebbe staremmo stareste starebbero stavo stavi stava stavamo stavate stavano stetti stesti stette stemmo steste stettero stessi stesse stessimo stessero stando

Japanese (ja)

Algorithmic stemming options: `full`

Algorithmic decompounding enabled

Optional tokenization dictionary

Default analysis scheme: `_ja_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  の に は を た が で て と し れ さ ある いる も する から な こと として い や れる など なっ ない
  この ため その あっ よう また もの という あり まで られ なる へ か だ これ によって により おり
  より による ず なり られる において ば なかっ なく しかし について せ だっ その後 できる それ
  う ので なお のみ でき き つ における および いう さらに でも ら たり その他 に関する たち ます
  ん なら に対して 特に せる 及び これら とき では にて ほか ながら うち そして とともに ただし
  かつて それぞれ または お ほど ものの に対する ほとんど と共に といった です とも ところ ここ

Korean (ko)

Algorithmic stemming not supported

Algorithmic decompounding enabled

Default analysis scheme: `_ko_default_`

- Default stopword dictionary

Latvian (lv)

Algorithmic stemming: `light`

Default analysis scheme: `_lv_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  aiz ap ar apakš ārpus augšpus bez caur dēļ gar iekš iz kopš labad lejpus līdz no otrpus pa par pār pēc pie pirms pret priekš starp šaipus uz viņpus virs virspus zem apakšpus un bet jo ja ka lai tomēr tikko turpretī arī kaut gan tādēļ tā ne tikvien vien kā ir te vai kamēr ar diezin droši diemžēl nebūt ik it taču nu pat tiklab iekšpus nedz tik nevis turpretim jeb iekam iekām iekāms kolīdz līdzko tiklīdz jebšu tālab tāpēc nekā itin jā jau jel nē nezin tad tikai vis tak iekams vien būt biju biji bija bijām bijāt esmu esi esam esat būšu būsi būs būsim būsiet tikt tiku tiki tika tikām tikāt tieku tiec tiek tiekam tiekat tikšu tiks tiksim tiksiet tapt tapi tapāt topat tapšu tapsi taps tapsim tapsiet kļūt kļuvu kļuvi kļuva kļuvām kļuvāt kļūstu kļūsti kļūst kļūstam kļūstat kļūšu kļūsi kļūs kļūsim kļūsiet varēt varēju varējām varēšu varēsim var varēji varējāt varēsi varēsiet varat varēja varēs

Multiple (mul)

Algorithmic stemming: not supported

Default analysis scheme: `_mul_default_`

- Default stopword dictionary

Norwegian (no)

Algorithmic stemming options: `minimal|light|full`

Default analysis scheme: `_no_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  og i jeg det at en et den til er som på de med han av ikke ikkje der så var meg seg men ett har om vi min mitt ha hadde hun nå over da ved fra du ut sin dem oss opp man kan hans hvor eller hva skal selv sjøl her alle vil bli ble blei blitt kunne inn når være kom noen noe ville dere som deres kun ja etter ned skulle denne for deg si sine sitt mot å meget hvorfor dette disse uten hvordan ingen din ditt blir samme hvilken hvilke sånn inni mellom vår hver hvem vors hvis både bare enn fordi før mange også slik vært være båe begge siden dykk dykkar dei deira deires deim di då eg ein eit eitt elles honom hjå ho hoe henne hennar hennes hoss hossen ikkje ingi inkje korleis korso kva kvar kvarhelst kven kvi kvifor me medan mi mine mykje no nokon noka nokor noko nokre si sia sidan so somt somme um upp vere vore verte vort varte vart

Persian (fa)

Algorithmic stemming not supported

Default analysis scheme: `_fa_default_`

- Default stopword dictionary:

  انان نداشته سراسر خياه ايشان وي تاكنون بيشتري دوم پس ناشي وگو يا داشتند سپس هنگام هرگز پنج نشان امسال ديگر گروهي شدند چطور ده و دو نخستين ولي چرا چه وسط ه كدام قابل يك رفت هفت همچنين در هزار بله بلي شايد اما شناسي گرفته دهد داشته دانست داشتن خواهيم ميليارد وقتيكه امد خواهد جز اورده شده بلكه خدمات شدن برخي نبود بسياري جلوگيري حق كردند نوعي بعري نكرده نظير نبايد بوده بودن داد اورد هست جايي شود دنبال داده بايد سابق هيچ همان انجا كمتر كجاست گردد كسي تر مردم تان دادن بودند سري جدا ندارند مگر يكديگر دارد دهند بنابراين هنگامي سمت جا انچه خود دادند زياد دارند اثر بدون بهترين بيشتر البته به براساس بيرون كرد بعضي گرفت توي اي ميليون او جريان تول بر مانند برابر باشيم مدتي گويند اكنون تا تنها جديد چند بي نشده كردن كردم گويد كرده كنيم نمي نزد روي قصد فقط بالاي ديگران اين ديروز توسط سوم ايم دانند سوي استفاده شما كنار داريم ساخته طور امده رفته نخست بيست نزديك طي كنيد از انها تمامي داشت يكي طريق اش چيست روب نمايد گفت چندين چيزي تواند ام ايا با ان ايد ترين اينكه ديگري راه هايي بروز همچنان پاعين كس حدود مختلف مقابل چيز گيرد ندارد ضد همچون سازي شان مورد باره مرسي خويش برخوردار چون خارج شش هنوز تحت ضمن هستيم گفته فكر بسيار پيش براي روزهاي انكه نخواهد بالا كل وقتي كي چنين كه گيري نيست است كجا كند نيز يابد بندي حتي توانند عقب خواست كنند بين تمام همه ما باشند مثل شد اري باشد اره طبق بعد اگر صورت غير جاي بيش ريزي اند زيرا چگونه بار لطفا مي درباره من ديده همين گذاري برداري علت گذاشته هم فوق نه ها شوند اباد همواره هر اول خواهند چهار نام امروز مان هاي قبل كنم سعي تازه را هستند زير جلوي عنوان بود

Portuguese (pt)

Algorithmic stemming options: `minimal|light|full`

Default analysis scheme: `_pt_default_`

- Algorithmic stemming: `minimal`
- Default stopword dictionary:

  de a o que e do da em um para com não uma os no se na por mais as dos como mas ao ele das à seu sua ou quando muito nos já eu também só pelo pela até isso ela entre depois sem mesmo aos seus quem nas me esse eles você essa num nem suas meu às minha numa pelos elas qual nós lhe deles essas esses pelas este dele tu te vocês vos lhes meus minhas teu tua teus tuas nosso nossa nossos nossas dela delas esta estes estas aquele aquela aqueles aquelas isto aquilo estou está estamos estão estive esteve estivemos estiveram estava estávamos estavam estivera estivéramos esteja estejamos estejam estivesse estivéssemos estivessem estiver estivermos estiverem hei há havemos hão houve houvemos houveram houvera houvéramos haja hajamos hajam houvesse houvéssemos houvessem houver houvermos houverem houverei houverá houveremos houverão houveria houveríamos houveriam sou somos são era éramos eram fui foi fomos foram fora fôramos seja sejamos sejam fosse fôssemos fossem for formos forem serei será seremos serão seria seríamos seriam tenho tem temos tém tinha tínhamos tinham tive teve tivemos tiveram tivera tivéramos tenha tenhamos tenham tivesse tivéssemos tivessem tiver tivermos tiverem terei terá teremos terão teria teríamos teriam

Romanian (ro)

Algorithmic stemming options: `full`

Default analysis scheme: `_ro_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary:

  acea aceasta această aceea acei aceia acel acela acele acelea acest acesta aceste acestea acești aceștia acolo acum ai aia aibă aici al ăla ale alea ălea altceva altcineva am ar are aș așadar asemenea asta ăsta astăzi astea ăstea ăștia asupra ați au avea avem aveți azi bine bucur bună ca că căci când care cărei căror cărui cât câte câți către câtva ce cel ceva chiar cînd cine cineva cît cîte cîți cîtva contra cu cum cumva curând curînd da dă dacă dar datorită de deci deja deoarece departe deși din dinaintea dintr dintre drept după ea ei el ele eram este ești eu face fără fi fie fiecare fii fim fiţi iar ieri îi îl îmi împotriva în înainte înaintea încât încît încotro între întrucât întrucît îţi la lângă le li lîngă lor lui mă mâine mea mei mele mereu meu mi mine mult multă mulţi ne nicăieri nici nimeni nişte noastră noastre noi noştri nostru nu ori oricând oricare oricât orice oricînd oricine oricît oricum oriunde până pe pentru peste pînă poate pot prea prima primul prin printr sa să săi sale sau său se şi sînt sîntem sînteţi spre sub sunt suntem sunteţi ta tăi tale tău te ţi ţie tine toată toate tot toţi totuşi tu un una unde undeva unei unele uneori unor vă vi voastră voastre voi voştri vostru vouă vreo vreun

Russian (ru)

Algorithmic stemming options: `light|full`

Default analysis scheme: `_ru_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

и в во не что он на я с со как а то все она так его но да ты к у же вы за бы по только ее мне было вот от меня еще нет о из ему теперь когда даже ну вдруг ли если уже или ни быть был него до вас нибудь опять уж вам сказал ведь там потом себя ничего ей может они тут где есть надо ней для мы тебя их чем была сам чтоб без будто человек чего раз тоже себе под жизнь будет ж тогда кто этот говорил того потому этого какой совсем ним здесь этом один почти мой тем чтобы нее кажется сейчас были куда зачем сказать всех никогда сегодня можно при наконец два об другой хоть после над больше тот через эти нас про всего них какая много разве сказала три эту моя впрочем хорошо свою этой перед иногда лучше чуть том нельзя такой им более всегда конечно всю между

Spanish (es)

Algorithmic stemming options: `light|full`

Default analysis scheme: `_es_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

de la que el en y a los del se las por un para con no una su al lo como más pero sus le ya o este sí porque esta entre cuando muy sin sobre también me hasta hay donde quien desde todo nos durante todos uno les ni contra otros ese eso ante ellos e esto mí antes algunos qué unos yo otro otras otra él tanto esa estos mucho quienes nada muchos cual poco ella estar estas algunas algo nosotros mi mis tú te ti tu tus ellas nosotras vosotros vosotras os mío mía míos mías tuyo tuya tuyos tuyas suyo suya suyos suyas nuestro nuestra nuestros nuestras vuestro vuestra vuestros vuestras esos esas estoy estás está estamos estáis están esté estés estemos estéis estén estaré estarás estará estaremos estaréis estarán estaría estarías estaríamos estaríais estarían estaba estabas estábamos estabais estaban estuve estuviste estuvo estuvimos estuvisteis estuvieron estuviera estuvieras estuviéramos estuvierais estuvieran estuviese estuvieses estuviésemos estuvieseis estuviesen estando estado estada estados estadas estad he has ha hemos habéis han haya hayas hayamos hayáis hayan habré habrás habrá habremos habréis habrán habría habrías habríamos habríais habrían había habías habíamos habíais habían hube hubiste hubo hubimos hubisteis hubieron hubiera hubieras hubiéramos hubierais hubieran hubiese hubieses hubiésemos hubieseis hubiesen habiendo habido habida habidos habidas soy eres es somos sois son sea seas seamos seáis sean seré serás será seremos seréis serán sería serías seríamos seríais serían era eras éramos erais eran fui fuiste fue fuimos fuisteis fueron fuera fueras fuéramos fuerais fueran fuese fueses fuésemos fueseis fuesen siendo sido tengo tienes tiene tenemos tenéis tienen tenga tengas tengamos tengáis tengan tendré tendrás tendrá tendremos tendréis tendrán tendría tendrías tendríamos tendríais tendrían tenía tenías teníamos teníais tenían tuve tuviste tuvo tuvimos tuvisteis tuvieron tuviera tuvieras tuviéramos tuvierais tuvieran tuviese tuvieses tuviésemos tuvieseis tuviesen teniendo tenido tenida tenidos tenidas tened

Swedish (sv)

Algorithmic stemming options: `light`|`full`

Default analysis scheme: `_sv_default_`

- Algorithmic stemming: `light`
- Default stopword dictionary:

  och det att i en jag hon som han på den med var sig för så till är men ett om hade de av icke mig du henne då sin nu har inte hans honom skulle hennes där min man ej vid kunde något från ut när efter upp vi dem vara vad över än dig kan sina här ha mot alla under någon eller allt mycket sedan ju denna själv detta åt utan varit hur ingen mitt ni bli blev oss din dessa några deras blir mina samma vilken er sådan vår blivit dess inom mellan sådant varför varje vilka ditt vem vilket sitta sådana vart dina vars vårt våra ert era vilkas

Thai (th)

Algorithmic stemming not supported

Stemming dictionary not supported

Default analysis scheme: `_th_default_`

- Default stopword dictionary:

  ไว้ ไม่ ไป ได้ ให้ ใน โดย แห่ง แล้ว และ แรก แบบ แต่ เอง เห็น เลย เริ่ม เรา เมื่อ เพื่อ เพราะ เป็นการ เป็น เปิดเผย เปิด เนื่องจาก เดียวกัน เดียว เช่น เฉพาะ เคย เข้า เขา อีก อาจ อะไร ออก อย่าง อยู่ อยาก หาก หลาย หลังจาก หลัง หรือ หนึ่ง ส่วน ส่ง สุด สำหรับ ว่า วัน ลง ร่วม ราย รับ ระหว่าง รวม ยัง มี มาก มา พร้อม พบ ผ่าน ผล บาง น่า นี้ นำ นั้น นัก นอกจาก ทุก ที่สุด ที่ ทำให้ ทำ ทาง ทั้งนี้ ทั้ง ถ้า ถูก ถึง ต้อง ต่างๆ ต่าง ต่อ ตาม ตั้งแต่ ตั้ง ด้าน ด้วย ดัง ซึ่ง ช่วง จึง จาก จัด จะ คือ ความ ครั้ง คง ขึ้น ของ ขอ ขณะ ก่อน ก็ การ กับ กัน กว่า กล่าว

Turkish (tr)

Algorithmic stemming: `full`

Default analysis scheme: `_tr_default_`

- Algorithmic stemming: `full`
- Default stopword dictionary

Uploading and Indexing Data in Amazon CloudSearch

To make your data searchable, you need to format it in JSON or XML as described in Preparing Your Data and upload it to your search domain for indexing. In most cases, Amazon CloudSearch automatically indexes your data and the changes are visible in search results in just a few minutes. However, certain changes to your domain configuration put the domain in the `NEEDS INDEXING` state. For those changes to take effect, you must explicitly run indexing to rebuild your index. Currently, you also need to periodically run indexing so your suggesters reflect the most recent data in your index. The following sections describe how to upload data to your domain and run indexing when it's needed.

Important

Rebuilding your index after data uploads is unnecessary and can cause your domain to incur additional charges. You only need to rebuild your index after certain configuration changes or after you have deleted documents and want them permanently removed from the service.

Topics

Uploading Data to an Amazon CloudSearch Domain

Important

Before uploading data to an Amazon CloudSearch domain, follow these guidelines:

- Group documents into *batches* before you upload them. Continuously uploading batches that consist of only one document has a huge, negative impact on the speed at which Amazon CloudSearch can process your updates. Instead, create batches that are as close to the limit as possible and upload them less frequently. For more information on maximum batch size and upload frequency, see *Limits*.
- A domain's document and search endpoints remain the same for the life of the domain. You should cache the endpoints rather than retrieving them before every upload or

search request. Querying the Amazon CloudSearch configuration service by calling `aws cloudsearch describe-domains` or `DescribeDomains` before every request will likely result in your requests being throttled.

You create document batches to describe the data that you want to upload to an Amazon CloudSearch domain. A document batch is a collection of add and delete operations that represent the documents you want to add, update, or delete from your domain. Batches can be described in either JSON or XML. When you upload document batches to a domain, the data is indexed automatically according to the domain's indexing options.

As your data changes, you upload batches to add, change, or delete documents from your index. Amazon CloudSearch applies updates continuously. You only have to explicitly reindex your data when you make configuration changes that put your domain in the `NEEDS INDEXING` state or need to update suggesters.

To upload data to your domain, it must be formatted as a valid JSON or XML batch. The fields specified in each document must correspond to index fields configured for the domain. However, a document does not have to contain every configured index field. For information about creating document batches, see Preparing Your Data. For information about configuring index fields for a domain, see configure indexing options.

You are billed for the total number of document batches uploaded to your search domain, including batches that contain delete operations. For more information about Amazon CloudSearch pricing, see aws.amazon.com/cloudsearch/pricing/.

You can submit a document batch to a domain using the Amazon CloudSearch console, AWS CLI, or by posting it directly to the domain's document service endpoint.

For more information about the document service API, see the Document Service API.

Topics

Submitting Document Upload Requests to an Amazon CloudSearch Domain

Important

Before uploading data to an Amazon CloudSearch domain, follow these guidelines:

- Group documents into *batches* before you upload them. Continuously uploading batches that consist of only one document has a huge, negative impact on the speed at which Amazon CloudSearch can process your updates. Instead, create batches that are as close to the limit as possible and upload them less frequently. For more information on maximum batch size and upload frequency, see *Limits*.
- A domain's document and search endpoints remain the same for the life of the domain. You should cache the endpoints rather than retrieving them before every upload or search request. Querying the Amazon CloudSearch configuration service by calling `aws cloudsearch describe-domains` or `DescribeDomains` before every request will likely result in your requests being throttled.

We recommend using one of the AWS SDKs or the AWS CLI to submit document upload requests. The SDKs and AWS CLI handle request signing for you and provide an easy way to perform all Amazon CloudSearch actions. You can also use the Amazon CloudSearch console to upload individual batches and import data from DynamoDB or S3.

For example, the following request uploads a batch using the AWS CLI.

```
aws cloudsearchdomain --endpoint-url http://doc-movies-y6gelr4lv3jeu4rvoelunxsl2e.us-
east-1.cloudsearch.amazonaws.com upload-documents --content-type
 application/json --documents movie-data-2013.json
```

For development and testing purposes, you can allow anonymous access to your domain's document service and submit unsigned HTTP POST requests directly to your domain's document service. In a production environment, restrict access to your domain to specific IAM roles, groups, or users and submit signed requests. For information about controlling access for Amazon CloudSearch, see configure access policies. For more information about request signing, see Signing AWS API Requests.

For example, the following POST request uploads a batch of documents formatted in JSON to the domain endpoint doc-movies-123456789012.us-east-1.cloudsearch.amazonaws.com.

```
curl -X POST --upload-file data1.json doc-movies-123456789012.us-
east-1.cloudsearch.amazonaws.com/2013-01-01/documents/batch --header "Content-Type:
 application/json"
```

Bulk Uploads in Amazon CloudSearch

Document batches are limited to one batch every 10 seconds and 5 MB per batch. To learn more, see Limits. However, you can upload batches in parallel to reduce the amount of time it takes to upload all of your data.

To perform a bulk upload:

- Set your desired instance type to a larger instance type than the default `search.small`. The number of upload threads you can use depends on the type of search instance your domain is using and the nature of your data and indexing options. Larger instance types have a higher upload capacity. Attempting to upload batches in parallel to a `search.small` instance usually results in a high rate of 504 or 507 errors. For more information about setting the desired instance type, see Configuring Scaling Options in Amazon CloudSearch.
- Start uploading data once your configuration changes are active. If you encounter a high rate of 5xx errors, you either need to reduce your upload rate or switch to a larger instance type. If you are already using the largest instance type, you can increase the desired partition count to further increase upload capacity.

  Important

  If you submit a large volume of updates while your domain is in the PROCESSING state, it can increase the amount of time it takes for the updates to be applied to your search index. To avoid this update lag, wait until your domain is in the ACTIVE state before starting your bulk upload.

- When you are finished with your bulk upload, you can change the desired instance type back to a smaller instance type. If your index fits on a smaller type, Amazon CloudSearch will automatically scale your domain back down. Amazon CloudSearch will not scale to an instance type that's smaller than the desired instance type configured for your domain.

For datasets of less than 1 GB of data or fewer than one million 1 KB documents, a small search instance should be sufficient. To upload data sets between 1 GB and 8 GB, we recommend setting the desired instance type to `search.large` before you begin uploading. For datasets between 8 GB and 16 GB, start with a `search.xlarge`. For datasets between 16 GB and 32 GB, start with a `search.2xlarge`. If you have more than 32 GB to upload, select the `search.2xlarge` instance type and increase the desired partition count to accommodate your data set. Each partition can contain up to 32 GB of data. Submit a Service Increase Limit Request if you need more upload capacity or have more than 500 GB to index.

Uploading Data Using the Amazon CloudSearch Console

In the Amazon CloudSearch console, you can upload data from your local file system or Amazon S3 to your domain from the domain dashboard. The console can automatically convert the following types of files to document batches during the upload process:

- Document batches formatted in JSON or XML (.json, .xml)
- Comma Separated Value (.csv)
- Text Documents (.txt)

You can also convert and upload items from an DynamoDB table. For more information, see Uploading DynamoDB Data.

Note

To upload data from Amazon S3 or DynamoDB, you must have permission to access both the service and the resources you want to upload. For more information, see Using Bucket Policies and User Policies and Using IAM to Control Access to DynamoDB Resources.

CSV files are parsed row-by-row and a separate document is generated for each row. All other types of files are treated as a single document. For more information about automatically generating document batches, see Preparing Your Data.

To send data to a domain for indexing

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation pane, choose **Domains**.

3. Choose the name of your domain to open the domain configuration.
4. Choose **Actions**, **Upload documents**.
5. Select the location of the data you want to upload to your domain:

    - Local machine
    - Amazon S3
    - Amazon DynamoDB
    - Sample data

    If you upload data that isn't formatted as document batches, it will automatically be converted during the upload process.

    > **Note**
    >
    > If a batch is invalid, Amazon CloudSearch converts the content to a valid batch that contains a single content field and generic metadata fields. Since these are not normally the fields configured for the domain, you will get errors stating that the fields don't exist.

6. Upload your data.

    a. If you are uploading local files, select **Choose file** to locate the file(s) to upload.

    b. If you are uploading objects from Amazon S3, provide the URI of the bucket to upload from.

    c. If you are uploading items from DynamoDB, select the table to upload from. To limit the read capacity units that can be consumed while reading from the table, enter the maximum percentage of read capacity units. To start reading from a particular item, specify a start hash key.

    d. If you're uploading predefined sample data, choose the data set to use.

7. Choose **Continue.**
8. Review the documents to be uploaded and choose **Upload documents**.
9. In the **Upload Summary**, if a document batch has been automatically generated from your data, you can choose **Download the generated document batch** to get it. Choose **Close** to return to the domain dashboard.

Uploading Data Using the AWS CLI

You use the `aws cloudsearch upload-documents` command to send document batches to your search domain. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To send document batches to a domain for indexing

- Run the `aws cloudsearchdomain upload-documents` command to upload your batches to your domain:

```
aws cloudsearchdomain upload-documents --endpoint-url http://doc-movies-
y6gelr4lv3jeu4rvoelunxsl2e.us-east-1.cloudsearch.amazonaws.com --content-type
 application/json --documents document-batch.json
{
    "status": "success",
    "adds": 5000,
    "deletes": 0
}
```

Posting Documents to an Amazon CloudSearch Domain's Document Service Endpoint via HTTP

You use the `documents/batch` resource to post document batches to your domain to add, update, or remove documents. For example:

```
curl -X POST --upload-file movie-data-2013.json doc-movies-123456789012.us-
east-1.cloudsearch.amazonaws.com/2013-01-01/documents/batch --header "Content-
Type:application/json"
```

Indexing Document Data with Amazon CloudSearch

When you send document updates to your domain, Amazon CloudSearch automatically updates the domain's search index with the new data. You don't have to do anything for the updates to be indexed. However, if you change the configuration of your domain's index fields or text options, you must explicitly rebuild your search index for those changes to be visible in search results. Because rebuilding the index can take a significant amount of time if you have a lot of data, you should finish making all of your configuration changes before re-indexing your documents.

Important

If you change the type of a field and have documents in your index that contain data that is incompatible with the new field type, all fields being processed are put in the `FailedToValidate` state when you run indexing and the indexing operation fails. Rolling back the incompatible configuration change will enable you to successfully rebuild your index. If the change is necessary, you must update or remove the incompatible documents from your index to use the new configuration.

When you make changes that require re-indexing, the domain status changes to `Needs Indexing`. While the index is being rebuilt, the domain's status is `Processing`. You can continue to submit search requests while indexing is in process, but the configuration changes won't be visible in search results until indexing completes and the domain's status changes to `Active`. You can also continue to upload document batches to your domain. However, if you submit a large volume of updates while your domain is in the `Processing` state, it can increase the amount of time it takes for the updates to be applied to your search index. If this becomes an issue, slow your update rate until the domain returns to the `Active` state.

Note

Depending on the volume of data, building a full index can take a considerable amount of compute power. Amazon CloudSearch automatically manages the resources needed to build the index in a timely fashion. Most data updates and simple domain configuration changes are built and deployed in minutes. Indexing large volumes of data and applying configuration changes that require rebuilding the full index will take longer to complete.

You can initiate indexing from the Amazon CloudSearch console, using the `aws cloudsearch index-documents` command, or through the AWS SDKs.

Topics

Indexing Documents Using the Amazon CloudSearch Console

When you make changes that require your domain's index to be rebuilt, the status shown on the domain dashboard changes to NEEDS INDEXING. The console also displays a message at the top of the configuration pages prompting you to run indexing when you are done making changes.

To run indexing

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. From the left navigation pane, choose **Domains**.
3. Choose the name of the domain that needs indexing.
4. On the domain dashboard, choose **Actions**, **Run indexing**.

Indexing Documents Using the Amazon CloudSearch AWS CLI

You use the `aws cloudsearch index-documents` command to rebuild your domain's search index. For information about installing and setting up the AWS CLI, see the AWS Command Line Interface User Guide.

To explicitly index your domain

- Run the `aws cloudsearch index-documents` command. The following example rebuilds the index for a domain called *movies*.

  Example

  ```
  aws cloudsearch index-documents --domain-name movies
  ```

Indexing Documents with the AWS SDK

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `IndexDocuments`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Searching Your Data with Amazon CloudSearch

You specify the terms or values you want to search for with the `q` parameter. How you specify the search criteria depends on which query parser you use. Amazon CloudSearch supports four query parsers:

- `simple`—search all `text` and `text-array` fields for the specified string. The simple query parser enables you to search for phrases, individual terms, and prefixes. You can designate terms as required or optional, or exclude matches that contain particular terms. To search particular fields, you can specify the fields you want to search with the `q.options` parameter. The `simple` query parser is used by default if the `q.parser` parameter is not specified.
- `structured`—search specific fields, construct compound queries using Boolean operators, and use advanced features such as term boosting and proximity searching.
- `lucene`—specify search criteria using the Apache Lucene query parser syntax. If you currently use the Lucene syntax, using the `lucene` query parser enables you to migrate your search services to an Amazon CloudSearch domain without having to completely rewrite your search queries in the Amazon CloudSearch structured search syntax.
- `dismax`—specify search criteria using the simplified subset of the Apache Lucene query parser syntax defined by the DisMax query parser. If you are currently using the DisMax syntax, using the `dismax` query parser enables you to migrate your search services to an Amazon CloudSearch domain without having to completely rewrite your search queries in the Amazon CloudSearch structured search syntax.

You can use additional search parameters to control how search results are returned and include additional information such as facets, highlights, and suggestions with your search results.

For information about all of the Amazon CloudSearch search parameters, see the Search API.

Topics

- Searching and Ranking Results by Geographic Location in Amazon CloudSearch
- Searching DynamoDB Data with Amazon CloudSearch
- Filtering Matching Documents in Amazon CloudSearch
- Tuning Search Request Performance in Amazon CloudSearch

Submitting Search Requests to an Amazon CloudSearch Domain

We recommend using one of the AWS SDKs or the AWS CLI to submit search requests. The SDKs and AWS CLI handle request signing for you and provide an easy way to perform all Amazon CloudSearch actions. You can also use the Search Tester in the Amazon CloudSearch console to search your data, browse the results, and view the generated request URLs and JSON and XML responses. For more information, see Searching with the Search Tester.

Important

- Search endpoints don't change: A domain's document and search endpoints remain the same for the life of the domain. You should cache the endpoints rather than retrieving them before every upload or search request. Querying the Amazon CloudSearch configuration service by calling `aws cloudsearch describe-domains` or `DescribeDomains` before every request is likely to result in your requests being throttled.
- IP addresses **do** change: Your domain's IP address *can* change over time, so it's important to cache the endpoint as shown in the console and returned by the `aws cloudsearch describe-domains` command rather than the IP address. You should also re-resolve the endpoint DNS to an IP address regularly. For more information, see Setting the JVM TTL for DNS Name Lookups.

For example, the following request submits a simple text search for `wolverine` using the AWS CLI and returns just the IDs of the matching documents.

```
aws cloudsearchdomain --endpoint-url http://search-movies-
y6gelr4lv3jeu4rvoelunxsl2e.us-east-1.cloudsearch.amazonaws.com search --search-query
 wolverine  --return _no_fields
```

```
{
    "status": {
        "rid": "/rnE+e4oCAqfEEs=",
        "time-ms": 6
    },
    "hits": {
        "found": 3,
        "hit": [
            {
                "id": "tt1430132"
            },
            {
                "id": "tt0458525"
            },
            {
                "id": "tt1877832"
            }
        ],
        "start": 0
    }
}
```

By default, Amazon CloudSearch returns the response in JSON. You can get the results formatted in XML by specifying the `format` parameter. Setting the response format only affects responses to successful requests. The format of an error response depends on the origin of the error. Errors returned by the search service are always returned in JSON. 5xx errors due to server timeouts and other request routing problems are returned in XML.

Note

The AWS SDKs return fields as arrays. Single-value fields are returned as arrays with one element, such as:

```
"fields": {
  "plot": ["Katniss Everdeen reluctantly becomes the symbol of a mass rebellion
 against the autocratic Capitol."]
}
```

For development and testing purposes, you can allow anonymous access to your domain's search service and submit unsigned HTTP GET or POST requests directly to your domain's search endpoint. In a production environment, restrict access to your domain to specific IAM roles, groups, or users and submit signed requests using the AWS SDKs or AWS CLI. For information about controlling access for Amazon CloudSearch, see configure access policies. For more information about request signing, see Signing AWS API Requests.

You can use any method you want to send HTTP requests directly to your domain's search endpoint —you can enter the request URL directly in a Web browser, use cURL to submit the request, or generate an HTTP call using your favorite HTTP library. To specify your search criteria, you specify a query string that specifies the constraints for your search and what you want to get back in the response. The query string must be URL-encoded. The maximum size of a search request submitted via GET is 8190 bytes, including the HTTP method, URI, and protocol version. You can submit larger requests using HTTP POST; however, keep in mind that large, complex requests take longer to process and are more likely to time out. For more information, see Tuning Search Request Performance in Amazon CloudSearch.

For example, the following request submits a structured query to the `search-movies-rr2f34ofg56xneuemujamut52i.us-east-1.cloudsearch.amazonaws.com` domain and gets the contents of the `title` field.

```
http://search-movies-rr2f34ofg56xneuemujamut52i.us-east-1.cloudsearch.
amazonaws.com/2013-01-01/search?q=(and+(term+field%3Dtitle+'star')
(term+field%3Dyear+1977))&q.parser=structured&return=title
```

Important

Special characters in the query string must be URL-encoded. For example, you must encode the = operator in a structured query as %3D: `(term+field%3Dtitle+'star')`. If you don't encode the special characters when you submit the search request, you'll get an `InvalidQueryString` error.

Searching with the Search Tester

The search tester in the Amazon CloudSearch console enables you to submit sample search requests using any of the supported query parsers: simple, structured, lucene, or dismax. By default, requests are processed with the simple query parser. You can specify options for the selected parser, filter and sort the results, and browse the configured facets. The search hits are automatically highlighted in the search results. For information about how this is done, see Highlighting Search Hits in Amazon CloudSearch. You can also select a suggester to get suggestions as you enter terms in the **Search** field. (You must configure a suggester before you can get suggestions. For more information see Getting Autocomplete Suggestions in Amazon CloudSearch.)

By default, results are sorted according to an automatically-generated relevance score, *_score*. For information about customizing how results are ranked, see Sorting Results in Amazon CloudSearch.

To search your domain

1. Go to the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation panel, choose the name of your domain to open its configuration.
3. Choose **Run a test search**.
4. To perform a simple text search, enter a search query and choose **Run**. By default, all `text` and `text-array` fields are searched.

To search particular fields, expand **Options** and enter a comma-separated list of the fields you want to search in the **Search fields** field. You can append a weight to each field with a caret (^) to control the relative importance of each field in the search results. For example, specifying `title^5, description` weights hits in the `title` field five times more than hits in the `description` field when calculating relevance scores for each matching document.

To use the structured query syntax, select **Structured** from the **Query parser** menu. Once you've selected the structured query parser, enter your structured query in the **Search** field and choose **Run**. For example, to find all of the movies with *star* in the title that were released in the year 2000 or earlier, you could enter: `(and title:'star' year:{,2000])`. For more information, see Constructing Compound Queries. To submit Lucene or DisMax queries, select the appropriate query parser.

You can specify additional options for the selected query parser to configure the default operator and control which operators can be used in a query. For more information, see Search Request Parameters.

You can copy and paste the request URL to submit the request and view the response from a Web browser. Requests can be sent via HTTP or HTTPS.

Constructing Compound Queries in Amazon CloudSearch

You can use the structured query parser to combine match expressions using Boolean `and`, `or`, and `not` operators. To select the structured query parser, you include `q.parser=structured` in your query. The structured query operators are specified as *prefix* operators. The syntax is:

- `(and boost=N EXPRESSION1 EXPRESSION2 ... EXPRESSIONn)`
- `(or boost=N EXPRESSION1 EXPRESSION2 ... EXPRESSIONn)`
- `(not boost=N EXPRESSION)`

For example, the following query matches all movies in the sample data set that contain *star* in the title, and either Harrison Ford or William Shatner appear in the `actors` field, but Zachary Quinto does not.

```
(and title:'star' (or actors:'Harrison Ford' actors:'William Shatner')(not
 actors:'Zachary Quinto'))
```

When using the structured query operators, you specify the name of the operator, options for the operator, and then the match expression being operated on, `(OPERATOR OPTIONS EXPRESSION)`. The match expression can be a simple text string, or a subclause of your compound query. Any options must be specified before the terms. For example, `(and (not field=genres 'Sci-Fi')(or (term field=title boost=2 'star')(term field=plot 'star')))`.

Parentheses control the order of evaluation of the expressions. When an expression is enclosed in parentheses, that expression is evaluated first, and then the resulting value is used in the evaluation of the remainder of the compound query.

Important

You must URL-encode special characters in the query string. For example, you must encode the = operator in a structured query as `%3D`: `(term+field%3Dtitle+'star')`. Amazon CloudSearch returns an `InvalidQueryString` error if special characters are not URL-encoded. For a complete reference of URL-encodings, see the W3C HTML URL Encoding Reference.

For example, the following query searches the `title` field for the phrase `star wars` and excludes matches that have a value less than 2000 in the `year` field.

```
(and (phrase field='title' 'star wars') (not (range field=year {,2000})))
```

To submit this search request, you need to encode the query string and specify the `structured` query parser with the `q.parser` parameter.

```
http://search-movies-rr2f34ofg56xneuemujamut52i.us-east-1.cloudsearch.
amazonaws.com/2013-01-01/search?q=(and+(phrase+field='title'+'star wars')+(not+(range
+field%3Dyear+{,2000})))&q.parser=structured
```

The structured query syntax enables you to combine searches against multiple fields. If you don't specify a field to search, all `text` and `text-array` fields are searched. For example, the following query searches all `text` and `text-array` fields for the term *star*, and excludes documents that contain *Zachary Quinto* in the `actors` field.

```
(and 'star' (not actors:'Zachary Quinto'))
```

You can specify a `boost` value to increase the importance of one expression in a compound query in relation to the others. The boost value increases the scores of the matching documents. For example, the following query boosts matches for the term *star* if they occur in the `title` field rather than the `description` field.

```
(and (range field=year [2013,}) (or (term field=title boost=2 'star') (term field=plot
 'star'))
```

Boost values must be greater than zero.

In addition to `and`, `or`, and `not`, the Amazon CloudSearch structured search syntax supports several specialized operators:

- `matchall`—Matches every document in the domain. Syntax: `matchall`.
- `near`—Supports sloppy phrase queries. The `distance` value specifies the maximum number of words that can separate the words in the phrase; for example, `(near field='plot' distance=4 'naval mutiny demonstration')`. Use the `near` operator to enable matching when the specified terms are in close proximity, but not adjacent. For more information about

sloppy phrase searches, see Searching for Phrases. Syntax: `(near field=FIELD distance=N boost=N 'STRING')`.

- `phrase`—Searches for a phrase in `text` or `text-array` fields; for example, `(phrase field="title" 'teenage mutant ninja')`. Supports boosting documents that match the expression. For more information about phrase searches, see Searching for Phrases. Syntax: `(phrase field=FIELD boost=N 'STRING')`.
- `prefix`—Searches a text, text-array, literal, or literal-array field for the specified prefix followed by zero or more characters; for example, `(prefix field='title' 'wait')`. Supports boosting documents that match the expression. For more information about prefix searches, see Searching for Prefixes.Syntax: `(prefix field=FIELD boost=N 'STRING')`.
- `range`—Searches for a range of values in a numeric field; for example: `(range field=year [2000,2013])`. For more information about range searches, see Searching for a Range of Values. Syntax: `(range field=FIELD boost=N RANGE)`.
- `term`—Searches for an individual term or value in any field; for example: `(and (term field=title 'star')(term field=year 1977))`. Syntax: `(term field=FIELD boost=N 'STRING'|VALUE)`.

For more information about searching particular types of data, see the following sections. For more information about the structured search syntax, see Structured Search Syntax.

Searching for Text in Amazon CloudSearch

You can search both text and literal fields for a text string:

- `Text` and `text-array` fields are always searchable. You can search for individual terms as well as phrases. Searches within `text` and `text-array` fields are not case-sensitive.
- `Literal` and `literal-array` fields can only be searched if they are search enabled in the domain's indexing options. You can search for an exact match of your search string. Searches in literal fields are case-sensitive.

If you use the simple query parser or do not specify a field when searching with the structured query parser, by default all `text` and `text-array` fields are searched. Literal fields are *not* searched by default. You can specify which fields you want to search with the `q.options` parameter.

You can search the unique document ID field like any text field. To reference the document ID field in a search request, you use the field name `_id`. Document IDs are always returned in the search results.

Topics

Searching for Individual Terms in Amazon CloudSearch

When you search `text` and `text-array` fields for individual terms, Amazon CloudSearch finds all documents that contain the search terms anywhere within the specified field, in any order. For example, in the sample movie data, the `title` field is configured as a `text` field. If you search the `title` field for *star*, you will find all of the movies that contain *star* anywhere in the `title` field, such as *star*, *star wars*, and *a star is born*. This differs from searching `literal` fields, where the field value must be identical to the search string to be considered a match.

The `simple` query parser provides an easy way to search `text` and `text-array` fields for one or more terms. The `simple` query parser is used by default unless you use the `q.parser` parameter to specify a different query parser.

For example, to search for *katniss*, specify `katniss` in the query string. By default, Amazon CloudSearch includes all return enabled fields in the search results. You can specify the `return` parameter to specify which fields you want to return.

```
https://search-domainname-domainid.us-east-1.cloudsearch.amazonaws.com/
2013-01-01/search?q=katniss&return=title
```

By default, the response is returned in JSON:

```
{
    "status": {
        "rid": "rd+5+r0oMAo6swY=",
        "time-ms": 9
    },
    "hits": {
        "found": 3,
        "start": 0,
        "hit": [
            {
                "id": "tt1951265",
                "fields": {
                    "title": "The Hunger Games: Mockingjay - Part 1"
                }
            },
            {
                "id": "tt1951264",
                "fields": {
                    "title": "The Hunger Games: Catching Fire"
                }
            },
            {
                "id": "tt1392170",
                "fields": {
                    "title": "The Hunger Games"
                }
            }
        ]
    }
}
```

To specify multiple terms, separate the terms with a space. For example: `star wars`. When you specify multiple search terms, by default documents must contain all of the terms to be considered a match. The terms can occur anywhere within the text field, in any order.

By default, all `text` and `text-array` fields are searched when you use the simple query parser. You can specify which fields you want to search by specifying the `q.options` parameter. For example, this query constrains the search to the `title` and `description` fields and boosts the importance of matches in the `title` field over matches in the `description` field.

```
q=star wars&q.options={fields: ['title^5','description']}
```

When you use the simple query parser, you can use the following prefixes to designate individual terms as required, optional, or to be excluded from the search results:

- **+**—matching documents must contain the term. This is the default—separating terms with a space is equivalent to preceding them with the + prefix.

- **-**—exclude documents that contain the term from the search results. The `-` operator only applies to individual terms. For example, to exclude documents that contain the term *star* in the default search field, specify: `-star`. Searching for `search?q=-star wars` retrieves all documents that do not contain the term *star*, but do contain the term *wars*.
- **|**—include documents that contain the term in the search results, even if they don't contain the other terms. The **|** operator only applies to individual terms. For example, to include documents that contain either of two terms, specify: `term1 |term2`. Searching for `search?q=star wars |trek` includes documents that contain both *star* and *wars*, or the term *trek*.

These prefixes only apply to individual terms in a simple query. To construct compound queries, you need to use the structured query parser, rather than the simple query parser. For example, to search for the terms *star* and *wars* using the structured query parser you would specify:

```
(and 'star' 'wars')
```

Note that this query matches documents that contain each of the terms in any of the fields being searched. The terms do not have to be in the same field to be considered a match. If, however, you specify `(and 'star wars' 'luke')`, *star* and *wars* must occur within the same field, and *luke* can occur in any of the fields.

If you don't specify any fields when you use the `structured` query parser, all `text` and `text-array` fields are searched by default, just like with the `simple` parser. Similarly, you can use the `q.options` parameter to control which fields are searched and to boost the importance of selected fields. For more information, see Constructing Compound Queries.

You can also perform *fuzzy* searches with the simple query parser. To perform a fuzzy search, append the ~ operator and a value that indicates how much terms can differ from the user query string and still be considered a match. For example, the specifying `planit~1` searches for the term *planit* and allows matches to differ by up to one character, which means the results will include hits for *planet*.

Searching for Phrases in Amazon CloudSearch

When you search for a phrase, Amazon CloudSearch finds all documents that contain the complete phrase in the order specified. You can also perform *sloppy* phrase searches where the terms appear within the specified distance of one another.

To match a complete phrase rather than the individual terms in the phrase when you search with the simple query parser, enclose the phrase in double quotes. For example, the following query searches for the phrase *with love*.

```
q="with love"
```

To perform a sloppy phrase search with the simple query parser, append the ~ operator and a distance value. The distance value specifies the maximum number of words that can separate the words in the phrase. For example, the following query searches for the terms *with love* within three words of one another.

```
q="with love"~3
```

In a compound query, you use the `phrase` operator to specify the phrase you want to match; for example:

```
(phrase field=title 'star wars')
```

To perform a sloppy phrase search in a compound query, you use the `near` operator. The `near` operator enables you to specify the phrase you are looking for and how far apart the terms can be within a field and still be considered a match. For example, the following query matches documents that have the terms *star* and *wars* no more than three words apart in the `title` field.

```
(near field=title distance=3 'star wars')
```

For more information, see Constructing Compound Queries.

Searching for Literal Strings in Amazon CloudSearch

When you search a literal field for a string, Amazon CloudSearch returns only those documents that contain an exact match for the complete search string in the specified field, including case. For example, if the `title` field is configured as a literal field and you search for *Star*, the value of the `title` field must be *Star* to be considered a match—*star*, *star wars* and *a star is born* will not be included in the search results. This differs from text fields, where searches are not case-sensitive and the specified search terms can appear anywhere within the field in any order.

To search a literal field, prefix the search string with the name of the literal field you want to search, followed by a colon. The search string must be enclosed in single quotes. For example, the following query searches for the literal string *Sci-Fi*.

```
genres:'Sci-Fi'
```

This example searches the genre field of each document and matches all documents whose genre field contains the value *Sci-Fi*. To be a match, the field value must be an exact match for the search string, including case. For example, documents that contain the value *Sci-Fi* in the genre field will not be included in the search results if you search for *sci-fi* or *young adult sci-fi*.

In a compound query, you use the `term` operator syntax to search literal fields. For example, `(term field=genres 'Sci-Fi')`. For more information, see Constructing Compound Queries.

You can use literal fields in conjunction with faceting to enable users to drill down into the results according to the faceted attributes. For more information about faceting, see Getting and Using Facet Information in Amazon CloudSearch.

Searching for Prefixes in Amazon CloudSearch

You can search `text`, `text-array`, `literal`, and `literal-array` fields for a *prefix* rather than for a complete term. This matches results that contain the prefix followed by zero or more characters. You must specify at least one character as the prefix. (To match all documents, use the `matchall` operator in a structured query.) In general, you should use a prefix that contains at least two characters to avoid matching an excessive number of documents.

When you search a `text` or `text-array` field, terms that match the prefix can occur anywhere within the contents of the field. When you search literal fields, the entire search string, up to and including the prefix characters, must match exactly.

- Simple query parser—use the `*` (asterisk) wildcard operator to search for a prefix, for example `pre*`.
- Structured query parser—use the `prefix` operator to search for a prefix, for example `prefix 'pre'`

For example, the following query searches for the prefix *oce* in the title field and returns the title of each hit:

```
q=oce*&q.options={fields:['title']}&return=title
```

If you perform this search against the sample movie data, it returns as *Ocean's Eleven* and *Ocean's Twelve*:

```
{

    "status": {
        "rid": "hIbIxb8oRAo6swY=",
        "time-ms": 2
    },
    "hits": {
        "found": 2,
        "start": 0,
        "hit": [
            {
                "id": "tt0240772",
                "fields": {
                    "title": "Ocean's Eleven"
                }
            },
            {
                "id": "tt0349903",
                "fields": {
                    "title": "Ocean's Twelve"
                }
            }
        ]
    }

}
```

In a compound query, you use the `prefix` operator to search for prefixes. For example, to search the `title` field for the prefix *oce*, you specify:

```
q.parser=structured&q=(prefix field%3Dtitle 'oce')
```

Note the URL encoding. For more information, see Constructing Compound Queries.

Note

When performing wildcard searches on text fields, keep in mind that Amazon CloudSearch tokenizes the text fields during indexing and performs stemming according to the analysis scheme configured for the field. Normally, Amazon CloudSearch performs the same text processing on the search query. However, when you search for a prefix with the wildcard operator (*) or `prefix` operator, no stemming is performed on the prefix. This means that a search for a prefix that ends in s won't match the singular version of the term. This can happen for any term that ends in s, not just plurals. For example, if you search the actor field in the sample movie data for Anders, there are three matching movies. If you search for Ander*, you get those movies as well as several others. However, if you search for Anders* there are no matches. This is because the term is stored in the index as ander, anders does not appear in the index. For more information about how Amazon CloudSearch processes text and how it can affect searches, see Text Processing in Amazon CloudSearch.

Searching for Numbers in Amazon CloudSearch

You can use structured queries to search any search enabled numeric field for a particular value or range of values. Amazon CloudSearch supports four numeric field types: double, double-array, int, and int-array. For more information, see configure indexing options.

The basic syntax for searching a field for a single value is **FIELD**:**VALUE**. For example, year:2010 searches the sample movie data for movies released in 2010.

You must use the structured query parser to use the field syntax. Note that numeric values are *not* enclosed in quotes—quotes designate a value as a string. To search for a range of values, use a comma (,) to separate the upper and lower bounds, and enclose the range using brackets or braces. For more information, see Searching for a Range of Values.

In a compound query, you use the term operator syntax to search for a single value: (term field=year 2010).

Searching for Dates and Times in Amazon CloudSearch

You can use structured queries to search any search enabled date field for a particular date and time or a date-time range. Amazon CloudSearch supports two date field types, date and date-array. For more information, see configure indexing options.

Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: yyyy-mm-ddTHH:mm:ss.SSSZ. In UTC, for example, 5:00 PM August 23, 1970 is: 1970-08-23T17:00:00Z. Note that you can also specify fractional seconds when specifying times in UTC. For example, 1967-01-31T23:20:50.650Z.

To search for a date (or time) in a `date` field, you must enclose the date string in single quotes. For example, both of the following queries search the movie data for all movies released at midnight on December 25, 2001:

```
q.parser=structured&q=release_date:'2001-12-25T00:00:00Z'
q.parser=structured&q=(term field%3Drelease_date '2001-12-25T00:00:00Z')
```

To search an entire day, see the section called "Searching for a Date Range".

Searching for a Range of Values in Amazon CloudSearch

You can use structured queries to search a field for a range of values. To specify a range of values, use a comma (,) to separate the upper and lower bounds and enclose the range using brackets or braces. A square brace, [or], indicates that the bound is included in the range, a curly brace, { or }, excludes the bound.

For example, to search the sample data set for movies released from 2008 to 2010 (inclusive), specify the range as `[2008,2010]`.

To specify an open-ended range, omit the bound. For example, `year:[2002,}` matches all movies released from 2002 onward, and `year:{,1970]` matches all movies released through 1970. When you omit a bound, you must use a curly brace.

In a compound query, you use the `range` operator syntax to search for a range of values; for example: `(range field=year [1967,})`.

Searching for a Date Range

To search for a range of dates (or times) in a `date` field, you use the same bracketed range syntax that you use for numeric values, but you must enclose the date string in single quotes. For example, the following request searches the movie data for all movies with a release date of January 1, 2013 or later:

```
q.parser=structured&q=release_date:['2013-01-01T00:00:00Z',}
```

Use the following syntax to search for a fixed range:

```
q.parser=structured&q=release_date:['2013-01-01T00:00:00Z','2013-01-02T23:59:59Z']
```

Searching for a Location Range

You can perform a bounding box search by searching for a range of locations. To search for a range of locations in a `latlon` field, you use the same bracketed range syntax that you use for numeric values, but you must enclose the latitude/longitude pair in single quotes.

For example, if you include a `location` field in each document, you could specify your bounding box filter as `location:['nn.n,nn.n','nn.n,nn.n']`. In the following example, the matches for *restaurant* are filtered so that only matches within the downtown area of Paso Robles, CA are included in the results.

```
q='restaurant'&fq=location:
['35.628611,-120.694152','35.621966,-120.686706']&q.parser=structured
```

For more information, see location-based searching and sorting.

Searching for a Text Range

You can also search a text or literal field for a range of values using the bracketed range syntax. Like dates, the text strings must be enclosed in single quotes. For example, the following request searches the movie data for a range of document IDs. To reference a document's ID, you use the special field name `_id`.

```
_id:['tt1000000','tt1005000']
```

Searching and Ranking Results by Geographic Location in Amazon CloudSearch

If you store locations in your document data using a `latlon` field, you can use the `haversin` function in an Amazon CloudSearch expression to compute the distance between two locations. Storing locations with your document data also enables you to easily search within particular areas.

Topics

- Searching Within an Area in Amazon CloudSearch
- Sorting Results by Distance in Amazon CloudSearch

Searching Within an Area in Amazon CloudSearch

To associate a location with a search document, you can store the location's latitude and longitude in a `latlon` field using decimal degree notation. The values are specified as a comma-separated list, `lat,lon`—for example `35.628611,-120.694152`. Associating a location with a document enables you to easily constrain search hits to a particular area with the `fq` parameter.

To use a bounding box to constrain results to a particular area

1. Determine the latitude and longitude of the upper-left and lower-right corners of the area you are interested in.
2. Use the `fq` parameter to filter the matching documents using those bounding box coordinates. For example, if you include a `location` field in each document, you could specify your bounding box filter as `fq=location:['nn.n,nn.n','nn.n,nn.n']` . In the following example, the matches for *restaurant* are filtered so that only matches within the downtown area of Paso Robles, CA are included in the results.

```
q='restaurant'&fq=location:
['35.628611,-120.694152','35.621966,-120.686706']&q.parser=structured
```

Sorting Results by Distance in Amazon CloudSearch

You can define an expression as part of your search request to sort results by distance. Amazon CloudSearch expressions support the `haversin` function, which computes the great-circle distance between two points on a sphere using the latitude and longitude of each point. (For more information, see Haversine formula.) The resulting distance is returned in kilometers.

To calculate the distance between each matching document and the user, you pass the user's location into the `haversin` function and reference the document locations stored in a `latlon` field. You specify the user latitude and longitude in decimal degree notation and access the latitude and longitude stored in a `latlon` as `FIELD.latitude` and `FIELD.longitude`. For example, `expr.distance=haversin(`**`userlat`**`,`**`userlon`**`, location.latitude,location.longitude)`.

To use the expression to sort the search results, you specify the `sort` parameter.

For example, the following query searches for restaurants and sorts the results by distance from the user.

```
q=restaurant&expr.distance=haversin(35.621966,-120.686706,location.latitude,location.longitude)
 asc
```

Note that you must explicitly specify the sort direction, `asc` or `desc`.

You can include the distance calculated for each document in the search results by specifying the name of the expression with the `return` parameter. For example, `return=distance`.

You can also use the distance value in more complex expressions to take other characteristics into account, such as a document's relevance `_score`. In the following example, a second rank expression uses both the document's calculated `distance` and its relevance `_score`.

```
expr.distance=haversin(38.958687,-77.343149,latitude,longitude)&expr.myrank=_score/
log10(distance)&sort=myrank+desc
```

Tip

For these sample queries to work, you must configure your index with a `latlon` field and have `location` data in your documents:

```
{
  "fields": {
    "location": "40.05830,-74.40570"
  }
}
```

If the field doesn't exist, you might receive the following error message when performing a search:

```
Syntax error in query: field (location) does not exist.
```

For more information about using expressions to sort search results, see Controlling Search Results.

Searching DynamoDB Data with Amazon CloudSearch

You can specify a DynamoDB table as a source when configuring indexing options or uploading data to a search domain through the console. This enables you to quickly set up a search domain to experiment with searching data stored in DynamoDB database tables.

To keep your search domain in sync with changes to the table, you can send updates to both your table and your search domain, or you can periodically load the entire table into a new search domain.

Topics

Configuring an Amazon CloudSearch Domain to Search DynamoDB Data

The easiest way to configure a search domain to search DynamoDB data is to use the Amazon CloudSearch console. The console's configuration wizard analyzes your table data and suggests indexing options based on the attributes in the table. You can modify the suggested configuration to control which table attributes are indexed.

Note

To upload data from DynamoDB, you must have permission to access both the service and the resources you want to upload. For more information, see Using IAM to Control Access to DynamoDB Resources.

When you automatically configure a search domain from a DynamoDB table, a maximum of 200 unique attributes can be mapped to index fields. (You cannot configure more than 200 fields for a search domain, so you can only upload data from DynamoDB tables with 200 or fewer attributes.) When Amazon CloudSearch detects an attribute that has a small number of distinct values, the field is facet enabled in the suggested configuration.

Important

When you use a DynamoDB table to configure a domain, the data is not automatically uploaded to the domain for indexing. You must upload the data for indexing as a separate step after you configure the domain.

Configuring a Domain to Search DynamoDB using the Amazon CloudSearch Console

You can use the Amazon CloudSearch console to analyze data from a DynamoDB table to configure a search domain. A maximum of 5 MB is read from the table regardless of the table size. By default, Amazon CloudSearch reads from the beginning of the table. You can specify a start key to begin reading from a particular item.

To configure a search domain using a DynamoDB table

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. From the left navigation pane, choose **Domains**.
3. Choose the name of the domain to open its details panel.
4. Go to the **Indexing options** tab and choose **Configuration wizard**.
5. Select **Amazon DynamoDB**.
6. Select the DynamoDB table that you want to analyze.
   - To limit the read capacity units that can be consumed while reading from the table, enter the maximum percentage of read capacity units you want to use.
   - To start reading from a particular item, specify a **Start hash key**. If the table uses a hash and range type primary key, specify both the hash attribute and the range attribute for the item.
7. Choose **Next**.
8. Review the suggested configuration. You can edit these fields and add additional fields.
9. When you finish, choose **Confirm**.
10. If you haven't uploaded data to your domain yet, clear the **Run indexing now** checkbox to exit without indexing. If you're done making configuration changes and are ready to index your data with the new configuration, make sure **Run indexing now** is selected. When you're ready to apply the changes, choose **Finish**.

Uploading Data to Amazon CloudSearch from DynamoDB

You can upload DynamoDB data to a search domain through the Amazon CloudSearch console or with the Amazon CloudSearch command line tools. When you upload data from a DynamoDB table, Amazon CloudSearch converts it to document batches so it can be indexed. You select define index fields for each of the attributes in your domain configuration. For more information, see Configuring an Amazon CloudSearch Domain to Search DynamoDB Data.

You can upload data from more than one DynamoDB table to the same Amazon CloudSearch domain. However, keep in mind that you can upload a maximum of 200 attributes from all tables combined. If an item with the same key appears in more than one uploaded table, the last-applied item overwrites all previous versions.

When converting table data to document batches, Amazon CloudSearch generates a document for each item it reads from the table, and represents each item attribute as a document field. The unique ID for each document is either read from the `docid` item attribute (if it exists) or assigned an alphanumeric value based on the primary key.

When Amazon CloudSearch generates documents for table items:

- Sets of strings and sets of numbers are represented as multi-value fields. If a DynamoDB set contains more than 100 values, only the first 100 values are added to the multi-value field.
- DynamoDB binary attributes are ignored.
- Attribute names are modified to conform to the Amazon CloudSearch naming conventions for field names:
  - All uppercase letters are converted to lowercase.
  - If the DynamoDB attribute name does not begin with a letter, the field name is prefixed with `f_`.
  - Any characters other than a-z, 0-9, and _ (underscore) are replaced by an underscore. If this transformation results in a duplicate field name, a number is appended to make the field name unique. For example, the attribute names `håt`, `h-t`, `hát` would be mapped to `h_t`, `h_t1`, and `h_t2` respectively.
  - If the DynamoDB attribute name exceeds 64 characters, the first 56 characters of the attribute name are concatenated with the 8-character MD5 hash of the full attribute name to form the field name.
  - If the attribute name is `body`, it is mapped to the field name `f_body`.
  - If the attribute name is `_score` it is mapped to the field name `f_ _score`.

- Number attributes are mapped to Amazon CloudSearch int fields and the values are transformed to 32-bit unsigned integers:
  - If a number attribute contains a decimal value, only the integral part of the value is stored. Everything to the right of the decimal point is dropped.
  - If the value is larger than can be stored as an unsigned integer, the value is truncated.
  - Negative integers are treated as unsigned positive integers.

Uploading DynamoDB Data to a Domain through the Amazon CloudSearch Console

You can use the Amazon CloudSearch console to upload up to 5 MB of data from a DynamoDB table to a search domain.

To upload DynamoDB data using the console

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. From the left navigation pane, choose **Domains**.
3. Choose the name of the domain to open its configuration.
4. Choose **Actions**, **Upload documents**.
5. Select **Amazon DynamoDB**.
6. From the dropdown, select the DynamoDB table that contains your data.
   - To limit the read capacity units that can be consumed while reading from the table, enter the maximum percentage of read capacity units.
   - To start reading from a particular item, specify a **Start hash key**. If the table uses a hash and range type primary key, specify both the hash attribute and the range attribute for the item.
7. When you finish specifying the table options, choose **Next**.
8. Review the items that will be uploaded. You can also save the generated document batch by choosing **Download the generated document batch**. Then choose **Upload documents**.

Synchronizing a Search Domain with a DynamoDB Table

To keep your search domain in sync with updates to your DynamoDB table, you can either programmatically track and apply updates to your domain, or periodically create a new domain and upload the entire table again. If you have a large amount of data, it's best to track and apply updates programmatically.

Programmatically Synchronizing Updates

To synchronize changes and additions to your DynamoDB table, you can create a separate update table to track the changes to the table you are searching and periodically upload the contents of the update table to the corresponding search domain.

To remove documents from the search domain, you must generate and upload document batches that contain a delete operation for each deleted document. One option is to use a separate DynamoDB table to track deleted items, periodically process the table to generate a batch of delete operations, and upload the batch to your search domain.

To make sure that you don't lose any changes that are made during the initial data upload, you must begin collecting tracking changes before the initial data upload. While you might update some Amazon CloudSearch documents with identical data, you ensure that no changes are lost and your search domain contains an up-to-date version of every document.

How often you synchronize updates depends on the volume of changes and your update latency tolerance. One approach is to accumulate changes over a fixed time period and at the end of the time period upload the changes and delete the period's tracking tables.

For example, to synchronize changes and additions once a day, at the beginning of each day you could create a table called updates_YYYY_MM_DD to collect the daily updates. At the end of the day, you upload the updates_YYYY_MM_DD table to your search domain. After the upload is complete, you can delete the update table and create a new one for the next day.

Switching to a New Search Domain

If you don't want to track and apply individual updates to your table, you can periodically load the entire table into a new search domain and then switch your query traffic over to the new domain.

To switch to a new search domain

1. Create a new search domain and copy the configuration from your existing domain.
2. Upload the entire DynamoDB table to the new domain. For more information, see Uploading Data to Amazon CloudSearch from DynamoDB.

3. After the new domain is active, update the DNS entry that directs query traffic to the old search domain to point to the new domain. For example, if you use Amazon Route 53, you can simply update the recordset with your new search service endpoint.
4. Delete the old domain.

Filtering Matching Documents in Amazon CloudSearch

You use the `fq` parameter to filter the documents that match the search criteria specified with the q parameter without affecting the relevance scores of the documents included in the search results. Specifying a filter just controls which matching documents are included in the results, it has no effect on how they are scored and sorted.

The `fq` parameter supports the structured query syntax described in Search API.

For example, you could add an `available` field to your documents to indicate whether or not an item is in stock, and filter on that field to limit the results to in-stock items:

```
search?q=star+wars&fq=available:'true'&return=title
```

Tuning Search Request Performance in Amazon CloudSearch

Search requests can become very resource intensive to process, which can have an impact on the performance and cost of running your search domain. In general, searches that return a large volume of hits and complex structured queries are more resource intensive than simple text queries that match a small percentage of the documents in your search domain.

If you experience slow response times, frequently encounter internal server errors (typically 507 or 509 errors), or see the number of instance hours your search domain consumes increase without a substantial increase in the volume of data you're searching, you can fine-tune your search requests to help reduce the processing overhead. This section reviews what to look for and steps you can take to tune your search requests.

Analyzing Query Latency

Before you can tune your requests, you must analyze your current search performance. Log your search requests and response times so that you can see which requests take the longest to process.

Slow searches can disproportionally affect overall performance by tying up your search domain's resources. Optimizing the slowest search requests speeds up *all* of your searches.

Topics

Reducing the Number of Hits

Query latency is directly proportional to the number of matching documents. Searches that match the most documents are generally the slowest.

Eliminating two types of searches that commonly result in a huge number of matching documents can significantly improve overall performance:

- Queries that match every document in your corpus (`matchall`). While this can be a convenient way to list all the documents in your domain, it's a resource intensive query. If you have a lot of documents, not only can it cause other requests to time out, it's likely to time out itself.
- Prefix (wildcard) searches with only one or two characters specified. If you're using this type of search to provide instant results as the user types, wait until the user has entered at least two characters before you start submitting requests and displaying the possible matches.

To reduce the number of documents that match your requests, you can also do the following:

- Eliminate irrelevant words from your corpus so they aren't using for matching. The easiest way to do this is to add them to the stopwords list dictionary for the analysis scheme(s) you're using. Alternatively, you can preprocess your data to strip out irrelevant words. Eliminating irrelevant words also has the benefit of reducing the size of your index, which can help reduce costs.
- Explicitly filter the results based on the value of a particular field using the `fq` parameter.

If you still have requests that match a lot of documents, you can reduce latency by minimizing the amount of processing to be done on the result set:

- Minimize the facet information that you request. Generating the facet counts adds to the time it takes to process the request and increases the likelihood that other requests will time out. If you do request facet information, keep in mind that the more facets you specify, the longer it takes to process the request.

- Avoid using your own expressions for sorting. The additional processing required to sort the results increases the likelihood that requests will time out. If you must customize how the results are sorted, it is generally faster to use a field than to use an expression.

Keep in mind that returning a large amount of data in the search results can increase the transport time and affect query latency. Minimize the number of return fields you use to improve performance and reduce the size of your index.

Simplifying Structured Queries

The more clauses there are in the query criteria, the longer it takes to process the query.

If you have complex structured queries that don't perform well, you need to find a way to reduce the number of clauses. In some cases, you might simply be able to set a limit or reformulate the query. In others, you might need to modify your domain configuration to accommodate simpler queries.

Querying Your Search Domain for More Information in Amazon CloudSearch

When you submit a search request, Amazon CloudSearch returns a collection of the documents that match your search criteria. You can also retrieve:

- The contents of selected fields
- Facet information that enables you to categorize the results
- Statistics for the values contained in numeric fields
- Highlights that show the search hits in the field data
- Autocomplete suggestions

Topics

Retrieving Data from Index Fields in Amazon CloudSearch

By default, the search results include all return enabled fields. To return a subset of the return enabled fields or return expression values for the matching documents, you can specify the `return` parameter. To return only the document IDs for the matching documents, specify `return=_no_fields`. To retrieve the relevance score calculated for each document, specify `return=_score`. You specify multiple return fields as a comma separated list. For example, `return=title,_score` returns just the title and relevance score of each matching document.

Only fields configured to be return enabled can be included in the search results. Making fields return enabled increases the size of your index, which can increase the cost of running your domain. You should only store document data in the search index by making fields return enabled when it's difficult or costly to retrieve the data using other means. Because it can take some time to apply document updates across the domain, you should retrieve critical data such as pricing information by using the returned document IDs instead of returned from the index.

For example, to include the *title* and relevance *_score* in the search results, specify the following:

```
search?q=star -wars&return=title,_score&size=3
```

The specified fields are included with each hit in the search results:

```
{
  "status" : {
    "rid" : "y9Dzhs8oEwqMHnk=",
    "time-ms" : 2
  },
  "hits" : {
    "found" : 76,
    "start" : 0,
    "hit" : [ {
      "id" : "tt1411664",
      "fields" : {
        "title" : "Bucky Larson: Born to Be a Star",
        "_score" : "9.231539"
      }
    }, {
      "id" : "tt1911658",
      "fields" : {
        "title" : "The Penguins of Madagascar",
        "_score" : "7.1051397"
      }
    }, {
      "id" : "tt0120601",
      "fields" : {
        "title" : "Being John Malkovich",
        "_score" : "6.206055"
      }
    } ]
  }
}
```

Getting Statistics for Numeric Fields in Amazon CloudSearch

Amazon CloudSearch can return the following statistics for facet-enabled numeric fields:

- `count`–The number of documents that contain a value in the specified field.
- `max`–The maximum value found in the specified field.
- `mean`–The average of the values found in the specified field.
- `min`–The minimum value found in the specified field.
- `missing`–The number of documents that do not contain a value in the specified field.
- `stddev`–A measure to quantify the amount of deviation, or variation, in the field values. A low standard deviation indicates that the values across all documents are close to the mean. A high standard deviation indicates that the values are spread out over a large range. The standard deviation is calculated by taking the square root of the variance, which is the average of the squared differences from the mean.
- `sum`–The sum of the field values across all documents.
- `sumOfSquares`–The sum of all field values squared.

To get statistics for a field you use the `stats.FIELD` parameter. `FIELD` is the name of a facet-enabled numeric field. You specify an empty JSON object, `stats.FIELD={}`, to get all of the available statistics for the specified field. (The `stats.FIELD` parameter does not support any options; you must pass an empty JSON object.) You can request statistics for multiple fields in the same request.

You can get statistics only for facet-enabled numeric fields: `date`, `date-array`, `double`, `double-array`, `int`, or `int-array`. Note that only the `count`, `max`, `min`, and `missing` statistics are returned for `date` and `date-array` fields. For more information about enabling a field to return facets, see configure indexing options.

For example, to search for *star* and get statistics for the *year* field, specify the following:

```
search?q=star&stats.year={}
```

Getting and Using Facet Information in Amazon CloudSearch

Topics

A *facet* is an index field that represents a category that you want to use to refine and filter search results. When you submit search requests to Amazon CloudSearch, you can request facet information to find out how many documents share the same value in a particular field. You can display this information along with the search results, and use it to enable users to interactively refine their searches. (This is often referred to as faceted navigation or faceted search.)

You can get facet information for any facet-enabled field by specifying the `facet.FIELD` parameter in your search request. By default, Amazon CloudSearch returns facet counts for the top 10 values. For more information about enabling a field to return facets, see configure indexing options. For a description of the `facet.FIELD` parameter, see Search Request Parameters in the Search API reference.

You can specify facet options to control the sorting of the facet values for each field, limit the number of facet values returned, or choose what facet values to count and return.

Getting Facet Information in Amazon CloudSearch

To get facet information for a field, you use the `facet.FIELD` parameter. `FIELD` is the name of a facet-enabled field. You specify facet options as a JSON object. If the JSON object is empty (`facet.FIELD={}`), facet counts are computed for all field values, the facets are sorted by facet count, and the top 10 facets are returned in the results. You can request facet information for multiple fields in the same request.

You can retrieve facet information in two ways:

- `sort`—Returns facet information sorted either by facet counts or facet values.
- `buckets`—Returns facet information for particular facet values or ranges.

Sorting Facet Information

You specify the `sort` option to control how the facet information is sorted. There are two sort options: `count` and `bucket`:

- Use `count` to sort the facets by facet counts. For example, `facet.year={sort:'count'}` counts the number of matches that have the same year value and sorts the facet information by that number.
- Use `bucket` to sort the facets by the facet values. For example, `facet.year={sort:'bucket'}`.

When you use the `sort` option, you can specify the `size` option to control the maximum number of facet values returned in the results. The `size` option is valid only when you use the `sort` option.

In the following example, facet information is calculated for the `genres` field, the genres are sorted by facet value, and the first 5 genres are returned in the results:

```
facet.genres={sort:'bucket', size:5}
```

Bucketing Facet Information

You can explicitly specify the facet values or ranges that you want to count by using the `buckets` option. Buckets are specified as an array of values or ranges, for example, `facet.color={buckets:["red","green","blue"]}`.

To specify a range of values, use a comma (,) to separate the upper and lower bounds and enclose the range using brackets or braces. A square bracket, [or], indicates that the bound is included in the range, a curly brace, { or }, excludes the bound. You can omit the upper or lower bound to specify an open-ended range. When omitting a bound, you must use a curly brace. For example, `facet.year={buckets:["[1970,1979]","[1980,1989]", "[1990,1999]","[2000,2009]","[2010,}"]}`. For a timestamp, you can use `q=-poet&facet.release_date={buckets:["[\'1980-01-01T00:00:00Z\', \'1986-01-01T00:00:01Z\']"]}`.

The `sort` and `size` options are not valid if you specify buckets.

Amazon CloudSearch supports two methods for calculating bucket counts, `filter` and `interval`. By default, the `filter` method is used, which simply submits an additional filter query for each bucket to get the bucket counts. While this works well in many cases, if you have a high update rate or are retrieving a large number of facets, performance can suffer because those queries can't take advantage of the internal caching mechanism.

If you're experiencing slow query performance for bucketed facets, try setting the buckets method to `interval`, which post-processes the result set rather than submitting multiple queries:

```
facet.year={buckets:["[1970,1979]","[1980,1989]","[1990,1999]"],method:"interval"}
```

We recommend doing your own performance testing to determine which method is best for your application. In general, the `filter` method is faster if you have a fairly low update rate and aren't retrieving a large number of buckets. However, if you have a high update rate or a lot of buckets, using the `interval` method to post-process the result set can result in significantly faster query performance.

Using Facet Information in Amazon CloudSearch

You can display facet information to enable users to more easily browse search results and identify the information they are interested in. For example, if a user is trying to find one of the Star Trek movies, but can't remember the full title, he might start by searching for *star*. If you want to display top facets for *genre*, you would include `facet.FIELD` in the query, along with the number of facet values that you want to retrieve for each facet:

```
search?q=star&facet.genres={sort:'count',size:5}&format=xml&return=_no_fields
```

The preceding example gives you the following information in the search response:

```
<results>
    <status rid="v7r9hs8oFQqMHnk=" time-ms="3"/>
    <hits found="85" start="0">
        <hit id="tt1411664"/>
        <hit id="tt1911658"/>
        <hit id="tt0086190"/>
        <hit id="tt0120601"/>
        <hit id="tt2141761"/>
        <hit id="tt1674771"/>
        <hit id="tt0056687"/>
        <hit id="tt0397892"/>
        <hit id="tt0258153"/>
        <hit id="tt0796366"/>
    </hits>
    <facets>
        <facet name="genres">
            <bucket value="Comedy" count="41"/><bucket value="Drama" count="35"/>
            <bucket value="Adventure" count="29"/>
            <bucket value="Sci-Fi" count="24"/>
            <bucket value="Action" count="20"/>
        </facet>
    </facets>
</results>
```

Multi-Select Facets in Amazon CloudSearch

If you want to display the available facets and enable users to select multiple values to refine the results, you can submit one request to get the documents that match the facet constraints and additional requests to get the facet counts.

For example, in the sample movie data, the `genres`, `rating`, and `year` fields are facet enabled. If the user searches for the term *poet*, you can submit the following request to get the matching movies and the facet counts for the `genres`, `rating`, and `year` fields:

```
q=poet&facet.genres={}&facet.rating={}&facet.year={}&return=_no_fields
```

Because no `facet.FIELD` options are specified, Amazon CloudSearch counts all of the facet values and returns the top 10 values for each facet:

```
{
  "status" : {
    "rid" : "it3T8tIoDgrUSvA=",
    "time-ms" : 5
  },
  "hits" : {
    "found" : 14,
    "start" : 0,
    "hit" : [
       {"id" : "tt0097165"},
       {"id" : "tt0059113"},
       { "id" : "tt0108174"},
       {"id" : "tt1067765"},
       { "id" : "tt1311071"},
       {"id" : "tt0810784"},
       {"id" : "tt0819714"},
       {"id" : "tt0203009"},
       {"id" : "tt0114702"},
       {"id" : "tt0107840"} ]
  },
  "facets" : {
    "genres" : {
      "buckets" : [
         {"value" : "Drama","count" : 12},
         {"value" : "Romance","count" : 9},
         {"value" : "Biography", "count" : 4},
         {"value" : "Comedy","count" : 2},
         {"value" : "Thriller","count" : 2},
         {"value" : "War","count" : 2},
         {"value" : "Crime","count" : 1},
         {"value" : "History","count" : 1},
         {"value" : "Musical","count" : 1} ]
    },
    "rating" : {
      "buckets" : [
         {"value" : "6.3","count" : 3},
         {"value" : "6.2","count" : 2},
         {"value" : "7.1","count" : 2},
         {"value" : "7.9","count" : 2},
         {"value" : "5.3","count" : 1},
         {"value" : "6.1""count" : 1},
         {"value" : "6.4","count" : 1},
         {"value" : "6.9","count" : 1},
         {"value" : "7.6","count" : 1} ]
    },
    "year" : {
      "buckets" : [
         {"value" : "2013","count" : 3},
         {"value" : "1993","count" : 2},
         {"value" : "1965","count" : 1},
         {"value" : "1989","count" : 1},
         {"value" : "1995","count" : 1},
         {"value" : "2001","count" : 1},
         {"value" : "2004","count" : 1},
         {"value" : "2006","count" : 1},
         {"value" : "2008","count" : 1},
         {"value" : "2009","count" : 1} ]
    }
  }
}
```

When the user refines the search by selecting facet values, you use those facet selections to filter the results. For example, if the user selects *2013*, *2012*, and *1993*, the following request gets the matching movies released during those years:

```
q=poet&fq=(or year:2013 year:2012 year:1993)&facet.genres={}&facet.rating={}
&facet.year={}&return=_no_fields
```

This gets the documents that match the user's selection and the facet counts with the filter applied:

```
{
  "status" : {
    "rid" : "zMP38tIoDwrUSvA=",
    "time-ms" : 6
  },
  "hits" : {
    "found" : 6,
    "start" : 0,
    "hit" : [
       {"id" : "tt0108174"},
       {"id" : "tt1067765"},
       {"id" : "tt1311071"},
       {"id" : "tt0107840"},
       {"id" : "tt1462411"},
       {"id" : "tt0455323"} ]
  },
  "facets" : {
    "genres" : {
      "buckets" : [
         {"value" : "Drama","count" : 4},
         {"value" : "Romance","count" : 3},
         {"value" : "Comedy","count" : 2},
         {"value" : "Thriller","count" : 2},
         {"value" : "Biography","count" : 1},
         {"value" : "Crime","count" : 1} ]
    },
    "rating" : {
      "buckets" : [
         {"value" : "6.3","count" : 2},
         {"value" : "5.3","count" : 1},
         {"value" : "6.2","count" : 1},
         {"value" : "6.4","count" : 1},
         {"value" : "7.1","count" : 1} ]
    },
    "year" : {
      "buckets" : [
         {"value" : "2013","count" : 3},
         {"value" : "1993","count" : 2},
         {"value" : "2012","count" : 1} ]
    }
  }
}
```

This is what you want to show for the genres and ratings. However, to enable the user to change the year filter, you need to get the facet counts for the years that *aren't* selected. To do this, you submit a second request to retrieve the facet counts for the year field without the filter:

```
q=poet&facet.year={}&size=0
```

There's no need to retrieve the matching documents, so the `size` parameter is set to zero to minimize the request latency. The request returns just the facet information for the `year` field:

```
{
  "status" : {
    "rid" : "x/7r0NIoRwqlHfo=",
    "time-ms" : 4
  },
  "hits" : {
    "found" : 14,
    "start" : 0,
    "hit" : [ ]
  },
  "facets" : {
    "year" : {
      "buckets" : [
         {"value" : "2013","count" : 3},
         {"value" : "1993","count" : 2},
         {"value" : "1965","count" : 1},
         {"value" : "1989","count" : 1},
         {"value" : "1995","count" : 1},
         {"value" : "2001","count" : 1},
         {"value" : "2004","count" : 1},
         {"value" : "2006","count" : 1},
         {"value" : "2008","count" : 1},
         {"value" : "2009","count" : 1} ]
    }
  }
}
```

To minimize the response time, you can send this request in parallel with the request to get the filtered results. However, keep in mind that these additional requests can impact your overall query performance, and it might be necessary to scale your domain up to handle the additional traffic. (For more information about scaling, see Configuring Scaling Options in Amazon CloudSearch.)

If the user further refines the search by selecting a genre or rating, you add that to the filter criteria to get the matching documents. For example, the following request gets the movies released in 2013, 2012, or 1993 that have a rating of 6.3:

```
q=poet&fq=(and rating:6.3 (or year:2013 year:2012
 year:1993))&facet.genres={}&return=_no_fields
```

Getting the facet information for genres in this request returns the facet counts with the rating and year filters applied:

```
{
  "status" : {
    "rid" : "l66b89IoEArUSvA=",
    "time-ms" : 6
  },
  "hits" : {
    "found" : 2,
    "start" : 0,
    "hit" : [
       {"id" : "tt1462411"},
       {"id" : "tt0455323"} ]
  },
  "facets" : {
    "genres" : {
      "buckets" : [
         {"value" : "Drama","count" : 2} ]
    }
  }
}
```

To enable the user to select a different rating, you submit an additional request to get the rating facet counts with only the year filter applied:

```
q=poet&fq=(or year:2013 year:2012 year:1993)&facet.rating={}&size=0
```

This request gets the following response:

```
{
  "status" : {
    "rid" : "jqWj89IoEQrUSvA=",
    "time-ms" : 5
  },
  "hits" : {
    "found" : 6,
    "start" : 0,
    "hit" : [ ]
  },
  "facets" : {
    "rating" : {
      "buckets" : [
         {"value" : "6.3","count" : 2},
         {"value" : "5.3","count" : 1},
         {"value" : "6.2","count" : 1},
         {"value" : "6.4","count" : 1},
         {"value" : "7.1","count" : 1} ]
    }
  }
}
```

Similarly, you need another request to get the year facet counts with only the rating filter applied:

```
q=poet&fq=rating:6.3&facet.year={}&size=0
```

This request gets the following response:

```
{
  "status" : {
    "rid" : "4L6F8NIoDQrUSvA=",
    "time-ms" : 4
  },
  "hits" : {
    "found" : 3,
    "start" : 0,
    "hit" : [ ]
  },
  "facets" : {
    "year" : {
      "buckets" : [
         {"value" : "1995","count" : 1},
         {"value" : "2012","count" : 1},
         {"value" : "2013","count" : 1} ]
    }
  }
}
```

Highlighting Search Hits in Amazon CloudSearch

Amazon CloudSearch can return excerpts with the search results to show where the search terms occur within a particular field of a matching document. For example, in the following excerpt the search terms *luke skywalker* are highlighted within the `plot` field:

```
highlights": {
    "plot": "After the rebels have been brutally overpowered by the Empire on
    their newly established base, *Luke* *Skywalker* takes advanced Jedi
    training with Master Yoda, while his friends are pursued by Darth Vader
    as part of his plan to capture *Luke*."
}
```

If you search for a phrase, the matching documents must contain that phrase. However, when you retrieve highlights, the terms in the phrase are highlighted individually. If you search for the phrase `"Luke Skywalker"` and retrieve highlights for the `plot` field as shown in the previous example, the term `Luke` is highlighted even when it isn't followed by `Skywalker`. Highlights are returned for the first 10 KB of data in a field. If the field contains more than 10 KB of data and the search terms appear past the 10 KB limit, they are not highlighted.

You can get highlights for any highlight enabled field by specifying the `highlight.FIELD` parameter in your search request. For example, to get highlights for the `plot` field shown, you could specify the following:

```
search?q=star wars&highlight.plot={}
```

For more information about enabling a field to return highlights, see configure indexing options.

You can control how many occurrences of the search term(s) within an excerpt are highlighted, how they should be highlighted, and whether the excerpt is returned as plain text or HTML. When Amazon CloudSearch returns excerpts as HTML, non-alphanumeric characters are escaped with HTML entity encoding. This is done to minimize the risks associated with embedding untrusted HTML content, since the field might have originally been populated with user-generated content.

You specify highlight options as a JSON object. If the JSON object is empty, `highlight.FIELD={}`, Amazon CloudSearch highlights all occurrences of the search term(s) by enclosing them in HTML emphasis tags, <em>*term*</em>, and the excerpts are returned as HTML.

- To specify whether the excerpt should be returned as `text` or `html`, use the `format` option; for example, `highlight.plot={format:'text'}`.
- To specify the maximum number of occurrences of the search term(s) you want to highlight, use the `max_phrases` option; for example, `highlight.plot={max_phrases:3}`. The default is 1, the maximum is 5.
- To specify the string to prepend to each highlighted term, use the `pre_tag` option; for example, `highlight.plot={pre_tag:'<strong>', post_tag:'</strong>'}`.
- To specify the string to append to each highlighted term, use the `post_tag` option; for example, `highlight.plot={pre_tag:'<strong>', post_tag:'</strong>'}`.

Getting Autocomplete Suggestions in Amazon CloudSearch

This section describes how to configure suggesters so you can retrieve suggestions. Suggestions are possible matches for an incomplete search query—they enable you to display likely matches before users finish typing their queries. In Amazon CloudSearch, suggestions are based on the contents of a particular text field. When you request suggestions, Amazon CloudSearch finds all of the documents whose values in the suggester field start with the specified query string—the beginning of the field must match the query string to be considered a match. The return data includes the field value and document ID for each match. You can configure suggesters to find matches for the exact query string, or to perform approximate string matching (fuzzy matching) to correct for typographical errors and misspellings.

For more information about the suggest API, see Suggest in the Search API.

Topics

Configuring Suggesters for Amazon CloudSearch

When you configure a suggester, you must specify the name of the text field you want to search for possible matches and a unique name for the suggester. Fields used for suggestions must be return enabled. Only the first 512 bytes of data in the field are used to generate suggestions.

Suggester names must begin with a letter and be at least three and no more than 64 characters long. The allowed characters are: a-z (lower-case letters), 0-9, and _ (underscore). The suggester name is specified in the query string when you retrieve suggestions, so it's best to use short names. The name *score* is reserved and cannot be used as a suggester name.

Suggesters also support two options:

- `FuzzyMatching`—You can set the level of fuzziness allowed when suggesting matches for a string to none, low, or high. With none, the specified string is treated as an exact prefix. With low, suggestions must differ from the specified string by no more than one character. With high, suggestions can differ by up to two characters. The default is none.
- `SortExpression`—You can configure this expression to compute a score for each suggestion to control how they are sorted. The scores are rounded to the nearest integer, with a floor of 0 and a ceiling of 2^31-1. A document's relevance score is not computed for suggestions, so sort expressions cannot reference the `_score` value. To sort suggestions using a numeric field or existing expression, simply specify the name of the field or expression. If no expression is configured for the suggester, the suggestions are sorted in alphabetical order. Note that an expression defined within a suggester cannot be referenced in search requests or other expressions. If want to use an expression for other purposes, add it to your domain configuration and reference it by name from the suggester. For more information about expressions, see Configuring Expressions.

If you want to get suggestions from multiple text fields, you define a suggester for each field and submit separate suggestion requests to get matches from each suggester. You can configure up to ten suggesters. Suggesters can consume significant amounts of memory and disk space, particularly if you use text-heavy source fields and set fuzzy matching to high.

Tip

Instead of configuring suggesters to use *all* possibilities from *all* documents, consider indexing the most popular 1,000 or 10,000 search queries and configuring suggesters to use those. You can store the queries in a separate Amazon CloudSearch index or in a field used only for suggestions.

The easiest way to define suggesters is through the **Suggesters** page in the Amazon CloudSearch console. You can also define suggesters using the AWS SDKs or AWS CLI.

Important

After you add a suggester to your search domain, you must run indexing before you can use it to retrieve suggestions. As you add and delete documents, you must periodically rebuild your index to update the suggestions. Suggestions won't reflect added or deleted documents until you call `IndexDocuments`.

Configuring Suggesters through the Amazon CloudSearch Console

You can easily add, update, and delete suggesters through the Amazon CloudSearch console.

To add a suggester

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation pane, choose **Domains**.
3. Choose the name of the domain to open its configuration.
4. Go to the **Advanced search options** tab.
5. In the **Suggesters** pane, choose **Add suggester**.s
6. Enter a name for the new suggester.
7. For **Source field**, specify the text field to use for suggestions.
8. To include suggestions that correct for minor misspellings or typos, set **Fuzzy matching** to **Low** or **High**. When set to low, the suggestions include terms that differ from the user query string by a single character. When set to high, the suggestions include terms that differ by up to two characters.
9. To control how the suggestions are sorted, enter a numeric expression in the **Sort expression** field. The expression can simply be the name of the numeric field you want to use to sort the

suggestions, the name of an existing expression, or any valid expression. For more information about expressions, see Configuring Expressions.

10. Click **Save changes**.
11. When you're done configuring suggesters for your search domain, you must re-index your domain before you can use the suggesters. To run indexing, go to the domain dashboard and choose **Actions**, **Run indexing**.

Configuring Suggesters with the AWS CLI

You can add or update suggesters with the `aws cloudsearch define-suggester` command. To remove a suggester, you use `aws cloudsearch delete-suggester`.

To add or update a suggester

- Run the `aws cloudsearch define-suggester` command. You specify the configuration of the suggester in JSON with the `--suggester` option. The suggester configuration must be enclosed in quotes and all quotes within the configuration must be escaped with a backslash. For the format of the suggester configuration, see define-suggester in the AWS CLI Command Reference. For example, the following command configures a suggester called `mysuggester` to return suggestions based on the `title` field.

```
aws cloudsearch define-suggester --domain-name movies --suggester "{\"SuggesterName
\": \"mysuggester\", \"DocumentSuggesterOptions\": {\"SourceField\":\"title\"}}"
{
  "Suggester": {
    "Status": {
      "PendingDeletion": false,
      "State": "RequiresIndexDocuments",
      "CreationDate": "2014-06-26T17:26:43Z",
      "UpdateVersion": 27,
      "UpdateDate": "2014-06-26T17:26:43Z"
    },
    "Options": {
      "DocumentSuggesterOptions": {
        "SourceField": "title"
      },
      "SuggesterName": "mysuggester"
    }
  }
}
```

You can use the `--fuzzy-matching` option to include suggestions that correct for minor misspellings or typos. Valid values for fuzzy matching are none, `low`, and `high`. (The default is none.) When set to `low`, the suggestions will include terms that differ from the user query string by a single character. When set to `high`, the suggestions will include terms that differ by up to two characters. For example, the following command configures `mysuggester` to include suggestions that differ from the user query string by just one character:

```
aws cloudsearch  --name mysuggester --source title
  --fuzzy-matching low
```

You can use the `--sort-expression` option to control how the returned suggestions are sorted. You can use any valid expression for sorting. (Often, this will just be the name of a numeric field or a predefined expression.) For example, to sort the suggestions returned by `mysuggester` according to the value in the `year` field, specify:

```
aws cloudsearch define-suggester --name mysuggester --source title
  --fuzzy-matching low --sort-expression year
```

To delete a suggester

- Run the `aws cloudsearch delete-suggester` command and specify the `--name` option. For example, to delete `mysuggester`:

```
aws cloudsearch delete-suggester --name mysuggester --delete
```

Configuring Suggesters Using the AWS SDKs

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `DefineSuggester`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Retrieving Suggestions in Amazon CloudSearch

You retrieve suggestions by sending requests to the `suggest` resource on a domain's search endpoint via HTTP GET. For example:

```
http://search-movies-rr2f34ofg56xneuemujamut52i.us-east-1.cloudsearch.
amazonaws.com/2013-01-01/suggest?q=oce&suggester=mysuggester
```

You must specify the API version in the request and the query string must be URL-encoded. The maximum size of a suggestion request is 8190 bytes, including the HTTP method, URI, and protocol version.

The `suggest` resource supports four parameters:

- q—The string that you want to get suggestions for.
- `suggester`—The name of the suggester you want to use.
- `size`—The number of suggestions to retrieve. By default, the top ten suggestions are returned. (The suggestions are sorted according the sort expression defined in the suggester. If no sort expression is defined in the suggester, the suggestions are sorted in alphabetical order.)
- `format`—The content type of the response, `json` or `xml`. By default, suggestions are returned in JSON.

The q and `suggester` parameters must be specified. No suggestions are returned if you request suggestions for an empty string. The `size` and `format` parameters are optional.

The following example gets suggestions for the string `oce` based on the contents of the `title` field.

```
http://search-imdb2-m2brrr7ex7z6sqhgwsjdmcuvd4.us-
east-1.cloudsearch.amazonaws.com/2013-01-01/suggest?q=oce&suggester=title
{
  "status": {
    "rid": "646f5s0oDAr8pVk=",
    "time-ms": 2
  },
  "suggest": {
    "query": "oce",
    "found": 3,
    "suggestions": [{
        "suggestion": "Ocean's Eleven",
        "score": 0,
        "id": "tt0054135"
      },
      {
        "suggestion": "Ocean's Thirteen",
        "score": 0,
        "id": "tt0496806"
      },
      {
        "suggestion": "Ocean's Twelve",
        "score": 0,
        "id": "tt0349903"
      }
    ]
  }
}
```

Controlling How Search Results are Returned in Amazon CloudSearch

You can specify parameters in your search request to control how the search results are sorted, return results in XML rather than JSON, and paginate through the result set. You can define expressions that calculate a custom value that can be used to specify search constraints or sort results.

Topics

Sorting Results in Amazon CloudSearch

By default, search results are sorted according to their relevance to the search request. A document's relevance score (`_score`) is based on how often the search terms appear in the document compared to how common the term is across all documents in the domain. Relevance scores are positive values that can vary widely depending on your data and queries. The scores for each clause in your query are additive, so queries with more clauses will naturally have higher scores than queries with just one or two. If you know what your typical queries will look like, you can do some test queries to get an idea of the range of scores you're likely to see.

To change how search results are sorted, you can:

- Use a `text` or `literal` field to sort results alphabetically. Note that Amazon CloudSearch sorts by Unicode codepoint, so numbers come before letters and uppercase letters come before lowercase letters. Numbers are sorted as strings, not by value; for example, 10 will come before 2.
- Use an `int` or `double` field to sort results numerically.
- Use a `date` field to sort results by date.
- Use a custom expression to sort results.

To use a field to sort the search results, you must configure the field to be `SortEnabled`. Only single-value fields can be `SortEnabled`—you cannot use the array-type fields for sorting. For more information about configuring fields, see configure indexing options.

To use an expression for sorting, you construct a numeric expression using `int` fields, other expressions, a document's relevance score, and numeric operators and functions. You can define expressions in your domain configuration, or within a search request. For more information about configuring expressions, see Configuring Expressions.

Tip

To sort results randomly, you can use a simple `_rand` expression:

```
/2013-01-01/search?expr.r=_rand&q=test&return=r%2Cplot%2Ctitle&sort=r+desc
```

This expression is stable, which lets you page back and forth without losing the initial, randomized sort. If you want to use a different randomized sort, you can add `a-z` and `0-9` characters after the `_rand` value, such as:

```
/2013-01-01/search?expr.r=_rand1a2b3c&q=test&return=r%2Cplot%2Ctitle&sort=r+desc
```

You use the `sort` parameter to specify the field or expression you want to use to sort the results. You must explicitly specify the sort direction along with the name of the field or expression. For example, `sort=year asc` or `sort=year desc`.

When you use a field for sorting, documents without a value in that field are listed last. If you specify a comma separated list of fields or expressions, the first field or expression is used as the primary sort criteria, the second is used as the secondary sort criteria, and so on.

If you do not specify the `sort` parameter, the search results are ranked using the documents' default relevance scores with the highest-scoring documents listed first. This is equivalent to specifying `sort=_score desc`.

You can use the `q.options` parameter to specify field weights to apply when calculating a document's relevance `_score`. For more information, see Using Relative Field Weighting to Customize Text Relevance.

Using Relative Field Weighting to Customize Relevance Ranking in Amazon CloudSearch

You can assign weights to selected fields so you can boost the relevance `_score` of documents with matches in key fields such as a `title` field, and minimize the impact of matches in less important fields. By default all fields have a weight of 1.

Field weights are set with the `q.options fields` option. You specify fields as an array of strings. To set the weight for a field, you append a caret (^) and a positive numeric value to the field name. You cannot set a field weight to zero or use mathematical functions or expressions to define a field weight.

For example, if you want matches within the `title` field to score higher than matches within the `plot` field, you could set the weight of the `title` field to 2 and the weight of the `plot` field to 0.5:

```
q.options={fields:['title^2','plot^0.5']}
```

In addition to controlling field weights, the `fields` option defines the set of fields that are searched by default if you use the simple query parser or don't specify a field in part of a compound expression when using the structured query parser. For more information, see Search Request Parameters in the Search API Reference.

To reference the weighted relevance score in the definition of an expression, you use `_score`. You can use the weighted `_score` value in conjunction with numeric fields, other expressions, and the standard numeric operators and functions. For more information, see Configuring Expressions.

Configuring Expressions in Amazon CloudSearch

You can define numeric expressions and use them to sort search results. Expressions can also be returned in search results. You can add expressions to the domain configuration or define expressions within search requests.

Topics

- Comparing Expressions in Amazon CloudSearch

Writing Expressions for Amazon CloudSearch

Amazon CloudSearch expressions can contain:

- Single value, sort enabled numeric fields (`int`, `double`, `date`). (You must specify a specific field, wildcards are not supported.)
- Other expressions
- The `_score` variable, which references a document's relevance score
- The `_time` variable, which references the current epoch time
- The `_rand` variable, which returns a randomly generated value
- Integer, floating point, hex, and octal literals
- Arithmetic operators: `+ - * / %`
- Bitwise operators: `| & ^ ~ << >> >>>`
- Boolean operators (including the ternary operator): `&& || ! ?:`
- Comparison operators: `< <= == >= >`
- Mathematical functions: `abs ceil exp floor ln log10 logn max min pow sqrt`
- Trigonometric functions: `acos acosh asin asinh atan atan2 atanh cos cosh sin sinh tanh tan`
- The `haversin` distance function

JavaScript order of precedence rules apply for operators. You can override operator precedence by using parentheses.

Shortcut evaluation is used when evaluating logical expressions—if the value of the expression can be determined after evaluating the first argument, the second argument is not evaluated. For example, in the expression `a || b`, `b` is only evaluated if `a` is not true.

Expressions always return an integer value from 0 to the maximum 64-bit signed integer value (2^63 - 1). Intermediate results are calculated as double-precision floating point values and the return value is rounded to the nearest integer. If the expression is invalid or evaluates to a negative value, it returns 0. If the expression evaluates to a value greater than the maximum, it returns the maximum value.

Expression names must begin with a letter and be at least 3 and no more than 64 characters long. The following characters are allowed: a-z (lower-case letters), 0-9, and _ (underscore). The name *score* is reserved and cannot be used as an expression name.

For example, if you define an `int` field named *popularity* for your domain, you could use that field in conjunction with the default relevance `_score` to construct a custom expression.

```
(0.3*popularity)+(0.7*_score)
```

Note that this simple example assumes that the popularity ranking and the relevance _score values are in about the same range. To tune your expressions for ranking results, you need to do some testing to determine how to weight the components of your expressions to get the results you want.

Using Date Fields in Amazon CloudSearch Expressions

The value from a `date` field is stored as an epoch time with millisecond resolution. This means you can use the mathematical and comparison operators to construct expressions using dates stored in your documents and the current epoch time (`_time`). For example, using the following expression to sort search results from the movies domain pushes movies with recent release dates toward the top of the list.

```
_score/(_time - release_date)
```

Defining Amazon CloudSearch Expressions in Search Requests

You can define and use expressions directly within a search request so that you can iterate quickly while you fine-tune expressions that you use to sort results. By defining an expression within a search request, you can also incorporate contextual information into the expression, such as the user's geographic location. You can override an expression defined in the domain configuration by defining an expression with the same name within a search request.

When you define an expression within a search request, it is not stored as part of your domain configuration. If you want to use the expression in other requests, you must define the expression in each request or add the expression to your domain configuration. Defining an expression in every request rather than adding it to the domain configuration increases the request overhead, which can result in slower response times and potentially increase the cost of running your domain. For information about adding expressions to the domain configuration, see Configuring Expressions.

You can define and use multiple expressions in a search request. The definition of an expression can reference other expressions defined within the request, as well as expressions configured as part of the domain configuration.

There are no restrictions on how you can use expressions that you define in a search request. You can use the expression to sort the search results, define other expressions, or return computed information in the search results.

To define an expression in a search request

1. Use the `expr.NAME` parameter, where NAME is the name of the expression you are defining. For example:

   ```
   expr.rank1=log10(clicks)*_score
   ```

2. To use the expression to sort the results, specify the name of the expression with the `sort` parameter:

   ```
   search?q=terminator&expr.rank1=log10(clicks)*_score&sort=rank1 desc
   ```

3. To include the computed value in the search results, add the expression to the list of `return` fields:

   ```
   search?q=terminator&expr.rank1=log10(clicks)*_score&sort=rank1 desc&return=rank1
   ```

For example, the following request creates two expressions that are used to sort the results and returns one of them in the search results:

```
search?q=terminator&expr.rank1=sin( _score)&expression.rank2=cos( _score)&sort=rank1
 desc,rank2 desc&return=title,_score,rank2
```

Configuring Reusable Expressions for a Search Domain in Amazon CloudSearch

When you define an expression in a domain's configuration, you can reference the expression in any search request. Adding an expression to the domain configuration reduces the overhead of specifying it in every request, and helps maximize response times and minimize costs.

When you add an expression to your domain configuration, it takes some time for the change to be processed and the new expression to become active. To quickly test changes to an expression, you can define and use the expression directly in a search request, as described in query time expressions. After you have finished testing and tuning an expression, you should add it to your domain configuration.

Topics

Configuring Expressions Using the Amazon CloudSearch Console

To configure an expression

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. From the left navigation pane, choose **Domains**.
3. Choose the name of the domain to open its configuration.
4. Go to the **Advanced search options** tab.
5. In the **Expressions** pane, choose **Add expression**.
6. Enter a name for the new expression.
7. For **Value**, enter the numerical expression that you want to evaluate at search time. You can select **Insert** to add special values and mathematical and trigonometric functions.
8. Choose **Save**.

Configuring Amazon CloudSearch Expressions Using the AWS CLI

You use the `aws cloudsearch define-expression` command to define computed expressions for a domain.

To configure an expression

- Run the `aws cloudsearch define-expression` command to define a new expression. You specify a name for the expression with the `--name` option, and the numeric expression that you want to evaluate with the `--expression` option. For example, the following request creates an expression called `popularhits` that takes into account a document's `popularity` and relevance `_score`.

```
aws cloudsearch define-expression --domain-name movies --name popularhits --
expression '((0.3*popularity)/10.0)+(0.7* _score)'

{
    "Expression": {
        "Status": {
            "PendingDeletion": false,
            "State": "Processing",
            "CreationDate": "2014-05-01T01:15:18Z",
            "UpdateVersion": 52,
            "UpdateDate": "2014-05-01T01:15:18Z"
        },
        "Options": {
            "ExpressionName": "popularhits",
            "ExpressionValue": "((0.3*popularity)/10.0)+(0.7* _score)"
        }
    }
}
```

Configuring Expressions Using the Amazon CloudSearch Configuration API

The AWS SDKs (except the Android and iOS SDKs) support all of the Amazon CloudSearch actions defined in the Amazon CloudSearch Configuration API, including `DefineExpression`. For more information about installing and using the AWS SDKs, see AWS Software Development Kits.

Comparing Expressions in Amazon CloudSearch

You can use the Amazon CloudSearch console to compare expressions and see how changes to the expression and field weights affect how Amazon CloudSearch sorts search results.

To compare expressions

1. Open the Amazon CloudSearch console at https://console.aws.amazon.com/cloudsearch/home.
2. In the left navigation pane, choose **Domains**.
3. Choose the name of the domain to open its configuration.

4. Choose **Actions**, **Compare expressions**.
5. In the **Search** box, enter the terms you want to search for. Amazon CloudSearch ranks the search results using the specified expressions and weights. It refreshes the results whenever you make changes to the expressions or weights.
6. In each expression editor, specify the rank expressions to compare. You can add new expressions or select an existing expression from the **Saved expressions** menu. Amazon CloudSearch evaluates new expressions when you submit a search request.
7. Specify the field weights to use for each expression. You can also edit the field weights directly in the expression. Field weights must be in the range 0.0 to 10.0, inclusive. By default, the weight for all fields is set to 1.0. You can set individual field weights to control how much matches in particular text or literal fields affect a document's relevance _score. You can also change the default weight.

    > **Note**
    >
    > Adjusting field weights only affects result ranking if the expression references the `_score` value. You can modify the expression to change how the weight relevance `_score` contributes to a document's overall ranking. For more information, see Using Relative Field Weighting to Customize Text Relevance.

8. Choose **Run**.
9. The search results for the two expressions are shown side-by-side. (If the expression is empty, the results are sorted according to the default relevance `_score`.) Four icons highlight the differences:

    Green up arrow

        The document is ranked higher in the search results using the second expression.

    Red down arrow

        The document is ranked lower in the search results using the second expression.

➕

Yellow plus

The document is included in the search results using the second expression, but was omitted from the search results using the first expression.

⛔

Red minus

The document was omitted from the search results using the second expression, but was included in the search results using the first expression.

> **Note**
>
> You can save expressions to your domain configuration directly from the **Compare expressions** pane. To save either expression, choose **Save expression**.

Getting Results as XML in Amazon CloudSearch

By default, Amazon CloudSearch search responses are formatted in JSON. To get results as XML, specify the query parameter `format=xml` in your search request:

```
search?q=star wars&return=_no_fields&format=xml
```

Search responses formatted in XML contain exactly the same information as a JSON response:

```
<results>
    <status rid="3abhhs8oEAqMHnk=" time-ms="2"/>
    <hits found="9" start="0">
        <hit id="tt0076759"/>
        <hit id="tt0086190"/>
        <hit id="tt0121766"/>
        <hit id="tt2488496"/>
        <hit id="tt1408101"/>
        <hit id="tt0489049"/>
        <hit id="tt0120915"/>
        <hit id="tt0080684"/>
        <hit id="tt0121765"/>
    </hits>
</results>
```

For detailed information about the JSON and XML response formats for search requests, see Search Response.

Paginating Results in Amazon CloudSearch

By default, Amazon CloudSearch returns the top ten hits according to the specified sort order. To control the number of hits returned in a result set, you use the `size` parameter.

To get the next set of hits beginning from a particular offset, you can use the `start` parameter. Note that the result set is zero-based—the first result is at index 0. You can get the first 10,000 hits using the `size` and `start` parameters. To page through more than 10,000 hits, use the `cursor` parameter. For more information, see Deep Paging Beyond 10,000 Hits .

For example, `search?q=wolverine` returns the first 10 hits that contain *wolverine*, starting at index 0. The following example sets the `start` parameter to 10 to get the next set of ten hits.

```
search?q=wolverine&start=10
```

If you want to retrieve 25 hits at a time, set the `size` parameter to 25. To get the first set of hits, you don't have to set the `start` parameter.

```
search?q=wolverine&size=25
```

For subsequent requests, use the `start` parameter to retrieve the set of hits you want. For example, to get the third batch of 25 hits, specify the following:

```
search?q=wolverine&size=25&start=50
```

Deep Paging Beyond 10,000 Hits in Amazon CloudSearch

Using `size` and `start` to page through results works well if you only need to access the first few pages of results. However, if you need to page through thousands of hits, using a cursor is more efficient. To page through more than 10,000 hits, you must use a `cursor`. (You can only access the first 10,000 hits using the `start` and `size` parameters.)

To page through results using a cursor, you specify `cursor=initial` in your initial search request and include the `size` parameter to specify how many hits you want to get. Amazon CloudSearch returns a cursor value in the response that you use to get the next set of hits. Cursors return sequential sets of hits; however, you can use them to simulate random access of a deep page if you need to. Keep in mind that cursors are intended to be used to page through a result set within a reasonable amount of time of the initial request. Using a stale cursor can return stale results if updates have been posted to the index in the interim.

Important

When you use a cursor to page through a result set that is sorted by document score (`_score`), you can get inconsistent results if the index is updated between requests. This can also occur if your domain's replication count is greater than one, because updates are applied in an eventually consistent manner across the instances in the domain. If this is an issue, avoid sorting the results by score. You can either use the `sort` option to sort by a particular field, or use `fq` instead of q to specify your search criteria. (Document scores are not calculated for filter queries.)

For example, the following request sets the `cursor` value to `initial` and the `size` parameter to `100` to get the first set of hits.

```
search?q=-star&cursor=initial&size=100
```

The cursor for the next set of hits is included in the response.

```
{
    "status": {
        "rid": "z67+3L0oHgo6swY=",
        "time-ms": 7
    },
    "hits": {
        "found": 1649,
        "start": 0,
        "cursor": "Vb-HSS4YQW9JSVFKeFpvQ2wwZERBek16SXpOems9Aw",
        "hit": [
            {
                "id": "tt0397892"
            },
            .
            .
            .
            {
                "id": "tt0332379"
            }
        ]
    }
}
```

In the next request, the `cursor` parameter specifies the returned cursor value.

```
search?q=-star&cursor=Vb-HSS4YQW9JSVFKeFpvQ2wwZERBek16SXpOems9Aw&size=100
```

Integrating Amazon CloudSearch with API Gateway

This chapter provides information about integrating Amazon CloudSearch with Amazon API Gateway. API Gateway lets you create and host REST APIs that make calls to other services. Some use cases for using API Gateway with Amazon CloudSearch include the following:

- Further securing the Amazon CloudSearch search endpoint using API keys or Amazon Cognito user pools
- Using CloudWatch to monitor and log search calls to the Amazon CloudSearch domain
- Restricting users to a more limited subset of the Amazon CloudSearch API
- Enforcing a rate limit on the number of requests

To learn more about the benefits of API Gateway, see the API Gateway Developer Guide.

Topics

Prerequisites

Before you integrate Amazon CloudSearch with API Gateway, you must have the following resources.

Prerequisite	Description
Amazon CloudSearch Domain	For testing purposes, the domain should have some searchable data. The IMDb movies data is an excellent option. The domain must have the following access policy: This policy configures the Amazon CloudSearch domain so that only API Gateway (and probably the account owner) can access it. To learn more, see the section

Prerequisite	Description
	called “Creating a Search Domain” and Configuring Access for Amazon CloudSearch.

Prerequisite	Description
IAM Role	This role delegates permissions to API Gateway and allows it to make requests to Amazon CloudSearch. The role is referred to as *my-api-gateway-role* within this chapter and must have the following permissions:

JSON

```
{
  "Version":"2012-10-17",
  "Statement": [{
    "Effect": "Allow",
    "Action": [
      "logs:CreateLogGroup",
      "logs:CreateLogStream",
      "logs:DescribeLogGroups",
      "logs:DescribeLogStreams",
      "logs:PutLogEvents",
      "logs:GetLogEvents",
      "logs:FilterLogEvents"
    ],
    "Resource": "*"
  }]
}
```

The role must also have the following trust relationship:

JSON

```
{
  "Version":"2012-10-17",
  "Statement": [{
    "Sid": "",
    "Effect": "Allow",
    "Principal": {
      "Service": "apigateway.amazonaws.com"
    },
    "Action": "sts:AssumeRole"
```

Prerequisite	Description

	```
	  }]
	}
	```
	
	To learn more, see Creating Roles in the *IAM User Guide*.

Creating and Configuring an API (Console)

The steps involved in creating an API vary depending on whether the request uses parameters, requires a request body, needs specific headers, and many other factors. The following procedure creates an API that has one function: performing searches on an Amazon CloudSearch domain. For more complete information about configuring APIs, see Creating an API in Amazon API Gateway.

To create an API (console)

1. Sign in to the AWS Management Console, and open the API Gateway console at https://console.aws.amazon.com/apigateway.
2. Choose **Create API** (or choose **Get Started** if this is your first time using API Gateway).
3. Choose **Build** under **REST API** (not private).
4. Provide a name and optional description, then choose **Create API**.
5. Choose **Actions**, **Create Method**. From the dropdown menu, choose **GET** and confirm.
6. For **Integration type**, choose **AWS Service**.
7. For **AWS Region**, choose the Region in which your Amazon CloudSearch domain resides.
8. For **AWS Service**, choose **CloudSearch**.
9. For **AWS Subdomain**, specify the subdomain for your Amazon CloudSearch domain's search endpoint.

   For example, if your domain's search endpoint is `search-my-test-asdf5asdfasdfasdfasd5asdfg.us-west-1.cloudsearch.amazonaws.com`, specify `search-my-test-asdf5ambgebbgmmodhhq5asdfg`.
10. For **HTTP Method**, choose **GET**.
11. For **Action Type**, choose **Use path override** and enter `/2013-01-01/search`.

12. For **Execution role**, specify the ARN for *`my-api-gateway-role`*, such as `arn:aws:iam::`*`123456789012`*`:role/`*`my-api-gateway-role`*.
13. For **Content Handling**, choose **Passthrough**, use the default timeout, and then choose **Save**.
14. Choose **Method Request**.
15. For **Request Validator**, choose **Validate query string parameters and headers**, and then confirm.
16. Expand **URL Query String Parameters**. Choose **Add query string**, name the string q, and confirm. Mark the query string as required.
17. Choose **Method Execution** to return to the method summary.
18. Choose **Integration Request**.
19. Expand **URL Query String Parameters**. Choose **Add query string**, name the string q, provide a mapping of `method.request.querystring.q`, and then confirm.

Testing the API (Console)

At this point, you've created an API that has one method. Before deploying the API, you should test it.

To test the API (console)

1. Navigate to the **Method Execution** page.
2. Choose **Test**.
3. Under **Query Strings**, enter a query string that will match some data in the Amazon CloudSearch domain. If you are using the IMDb movie data, try `q=thor`.
4. Choose **Test**.
5. Verify that the response body contains search results, such as the following:

```
{
  "status": {
    "rid": "rcWTo8IsviEK+own",
    "time-ms": 1
  },
  "hits": {
    "found": 7,
    "start": 0,
    "hit": [
      {
        "id": "tt0800369",
        "fields": {
          "rating": "7.0",
          "genres": [
            "Action",
            "Adventure",
            "Fantasy"
          ],
          "title": "Thor",
          "release_date": "2011-04-21T00:00:00Z",
          "plot": "The powerful but arrogant god Thor is cast out of Asgard to
 live amongst humans in Midgard (Earth), where he soon becomes one of their finest
 defenders.",
          "rank": "135",
          "running_time_secs": "6900",
          "directors": [
            "Kenneth Branagh",
            "Joss Whedon"
          ],
          "image_url": "http://ia.media-imdb.com/images/M/
MV5BMTYxMjA5NDMzNV5BMl5BanBnXkFtZTcwOTk2Mjk3NA@@._V1_SX400_.jpg",
          "year": "2011",
          "actors": [
            "Chris Hemsworth",
            "Anthony Hopkins",
            "Natalie Portman"
          ]
        }
      },
      ...
    ]
  }
}
```

At this point, you have a functional API. You can add methods to enable more robust search requests, deploy the API and configure rate limiting, create and require the use of API keys, add Amazon Cognito user pool authentication, and much more. For more information, see the API Gateway Developer Guide.

Handling Errors in Amazon CloudSearch

This section provides information about how to handle errors when interacting with Amazon CloudSearch programmatically. For information about specific error codes returned by the Amazon CloudSearch services, see:

- Search Service Errors
- documents/batch Status Codes
- Configuration Service Common Errors. For the specific errors that can be returned from a particular action, see the documentation for that action.

Topics

Error Types in Amazon CloudSearch

The HTTP status codes returned by the Amazon CloudSearch APIs indicate whether the request completed successfully, or if a client or server error occurred while processing the request:

- 2xx status codes indicate that the client request was processed successfully.
- 4xx status codes indicate that there was a problem with the client request. Common client request errors include providing invalid credentials and omitting required parameters. When you get a 4xx error, you need to correct the problem and resubmit a properly formed client request.
- 5xx status codes indicate that a server error occurred while processing the client request. Server errors are typically transient and are often the result of server timeouts, throttling, or capacity limitations. We recommend catching and retrying all 5xx errors.

An HTTP status code is returned for every request. In addition, the body of the response provides additional warning and error information.

Messages in a `search` response indicate the severity level, the warning or error code, and a description of the problem with the search request. For a list of the warnings and errors that can be returned by the search service, see Search Response Properties (JSON) or Search Response Elements (XML).

Errors and warnings in a `documents/batch` response provide information about parsing and validation issues encountered while processing the document data. For more information, see documents/batch Response (JSON) or documents/batch Response (XML).

Errors returned in a configuration service response provide information about what caused the request to return a 4xx or 5xx status code. For information about the common errors that all actions use, see Common Errors. Action-specific errors are listed in the action topics in the Configuration API Reference for Amazon CloudSearch.

Retrying Requests in Amazon CloudSearch

For your application to run smoothly, you need to build in logic to catch and respond to errors. One typical approach is to implement your request within a try block or if-then statement.

We recommend catching and retrying all server errors (5xx). Because errors can be generated from anywhere within the request pipeline, you should implement a fallback for unexpected 5xx errors in addition to any special handling for specific status codes.

507 and 509 errors typically indicate that your search service is overloaded. This can be due to the volume or complexity of search requests that you are submitting. Amazon CloudSearch normally scales automatically to handle the load. Because it takes some time to deploy additional search instances, we recommend using an exponential backoff retry policy to temporarily reduce the request rate and minimize request failures. For more information, see Error Retries and Exponential Backoff.

Certain usage patterns, such as submitting complex search queries to a single small search instance, can sometimes result in timeouts without triggering automatic scaling. If you repeatedly experience a high error rate, you can explicitly request additional capacity through the Amazon CloudSearch Service Limit Request form.

Client errors (4xx) typically indicate that you need to revise the request to correct the problem—simply retrying the same request will most likely result in the same error. 409 errors returned by the configuration service can indicate that the request was rejected because a resource limit has been reached. For more information, see Limits.

Amazon CloudSearch API Reference

You use three APIs to interact with Amazon CloudSearch:

- Configuration API—Set up and manage your search domain.
- Document Service API—Submit the data you want to search.
- Search API—Search your domain.

Configuration API Reference for Amazon CloudSearch

You use the Amazon CloudSearch Configuration API to create, configure, and manage search domains. For more information configuring search domains, see Creating and Managing Search Domains.

The other APIs you use to interact with Amazon CloudSearch are:

- Document Service API—Submit the data you want to search.
- Search API—Search your domain.

Topics

Submitting Configuration Requests in Amazon CloudSearch

Important

The easiest way to submit configuration requests is to use the Amazon CloudSearch console, Amazon CloudSearch command line tools, or the AWS SDK for Java, JavaScript, .NET, PHP, Ruby, or Python (Boto). The command line tools and SDKs handle the signing process for you and ensure that Amazon CloudSearch configuration requests are properly formed. For more information about the AWS SDKs, see AWS Software Development Kits.

You submit Amazon CloudSearch configuration requests to the Amazon CloudSearch endpoint for your region using the AWS Query protocol. For the current list of supported regions and endpoints, see Regions and Endpoints.

AWS Query requests are HTTP or HTTPS requests submitted via HTTP GET or POST with a Query parameter named Action. You must specify the API version in all configuration requests and that version must match the API version specified when the domain was created.

You must include authorization parameters and a digital signature in every request. Amazon CloudSearch supports AWS Signature Version 4. For detailed signing instructions, see Signature V4 Signing Process in the AWS General Reference.

Note

Amazon CloudSearch throttles excessive requests to the configuration service. Throttling occurs *by action*, so excessive `DescribeDomains` requests don't cause Amazon CloudSearch to throttle `DescribeIndexFields` requests. The request limit changes based on the needs of the service, but allows many calls to each action per hour.

Structure of a Configuration Request

This reference shows Amazon CloudSearch configuration requests as URLs, which can be used directly in a browser. (Although the GET requests are shown as URLs, the parameter values are shown unencoded to make them easier to read. Keep in mind that you must URL encode parameter values when submitting requests.) The URL contains three parts:

- Endpoint—the Web service entry point to act on, `cloudsearch.us-east-1.amazonaws.com`.
- Action—the Amazon CloudSearch configuration action you want to perform. For a complete list of actions, see Actions.
- Parameters—any request parameters required for the specified action. Each query request must also include some common parameters to handle authentication. For more information, see Request Authentication.

You must specify the `Version` parameter in every Amazon CloudSearch configuration request. The current Amazon CloudSearch API version is 2013-01-01.

For example, the following GET request creates a new search domain called *movies*:

```
https://cloudsearch.us-east-1.amazonaws.com
?Action=CreateDomain
&DomainName=movies
&Version=2013-01-01
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE/20120712/us-east-1/cloudsearch/aws4
_request
&X-Amz-Date=2012-07-12T21:41:29.094Z
&X-Amz-SignedHeaders=host
&X-Amz-Signature=c7600a00fea082dac002b247f9d6812f25195fbaf7f0a6fc4ce08a39666c6a10
3c8dcb
```

Request Authentication

Requests submitted to the Configuration API are authenticated using your AWS access keys. You must include authorization parameters and a digital signature in every request. Amazon CloudSearch supports AWS Signature Version 4. For detailed signing instructions, see Signature V4 Signing Process in the AWS General Reference.

Note

If you are just getting started signing your own AWS requests, take a look at how the SDKs implement signing. The source for most of the AWS SDKs is available at https://github.com/aws.

For example, to construct a `CreateDomain` request, you need the following information:

```
Region name: us-east-1
Service name: cloudsearch
API version: 2013-01-01
Date: 2014-03-12T21:41:29.094Z
Access key: AKIAIOSFODNN7EXAMPLE
Secret key: wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY
Action: CreateDomain
```

```
Action Parameters: DomainName=movies
```

The canonical query string for a `CreateDomain` request looks like this:

```
Action=CreateDomain
&DomainName=movies
&Version=2013-01-01
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE/20120712/us-east-1/cloudsearch/aws4
_request
&X-Amz-Date=2012-07-12T21:41:29.094Z
&X-Amz-SignedHeaders=host
```

The final signed request looks like this:

```
https://cloudsearch.us-east-1.amazonaws.com
?Action=CreateDomain
&DomainName=movies
&Version=2013-01-01
&X-Amz-Algorithm=AWS4-HMAC-SHA256
&X-Amz-Credential=AKIAIOSFODNN7EXAMPLE/20120712/us-east-1/cloudsearch/aws4
_request
&X-Amz-Date=2014-03-12T21:41:29.094Z
&X-Amz-SignedHeaders=host
&X-Amz-Signature=c7600a00fea082dac002b247f9d6812f25195fbaf7f0a6fc4ce08a39666c6a10
```

Actions

The following actions are supported:

- BuildSuggesters
- CreateDomain
- DefineAnalysisScheme
- DefineExpression
- DefineIndexField
- DefineSuggester
- DeleteAnalysisScheme
- DeleteDomain

- DeleteExpression
- DeleteIndexField
- DeleteSuggester
- DescribeAnalysisSchemes
- DescribeAvailabilityOptions
- DescribeDomains
- DescribeExpressions
- DescribeIndexFields
- DescribeScalingParameters
- DescribeServiceAccessPolicies
- DescribeSuggesters
- IndexDocuments
- ListDomainNames
- UpdateAvailabilityOptions
- UpdateScalingParameters
- UpdateServiceAccessPolicies

BuildSuggesters

Description

Indexes the search suggestions. For more information, see Configuring Suggesters in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `BuildSuggestersResult`.

FieldNames

A list of field names.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

CreateDomain

Description

Creates a new search domain. For more information, see Creating a Search Domain in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A name for the domain you are creating. Allowed characters are a-z (lower-case letters), 0-9, and hyphen (-). Domain names must start with a letter or number and be at least 3 and no more than 28 characters long.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `CreateDomainResult`.

DomainStatus

The current status of the search domain.

Type: DomainStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

DefineAnalysisScheme

Description

Configures an analysis scheme that can be applied to a `text` or `text-array` field to define language-specific text processing options. For more information, see Configuring Analysis Schemes in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

AnalysisScheme

Configuration information for an analysis scheme. Each analysis scheme has a unique name and specifies the language of the text to be processed. The following options can be configured for an analysis scheme: `Synonyms`, `Stopwords`, `StemmingDictionary`, `JapaneseTokenizationDictionary` and `AlgorithmicStemming`.

Type: AnalysisScheme

Required: Yes

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DefineAnalysisSchemeResult`.

AnalysisScheme

The status and configuration of an `AnalysisScheme`.

Type: AnalysisSchemeStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DefineExpression

Description

Configures an `Expression` for the search domain. Used to create new expressions and modify existing ones. If the expression exists, the new configuration replaces the old one. For more information, see Configuring Expressions in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Expression

A named expression that can be evaluated at search time. Can be used to sort the search results, define other expressions, or return computed information in the search results.

Type: Expression

Required: Yes

Response Elements

The following element is returned in a structure named `DefineExpressionResult`.

Expression

The value of an `Expression` and its current status.

Type: ExpressionStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DefineIndexField

Description

Configures an `IndexField` for the search domain. Used to create new fields and modify existing ones. You must specify the name of the domain you are configuring and an index field configuration. The index field configuration specifies a unique name, the index field type, and the options you want to configure for the field. The options you can specify depend on the `IndexFieldType`. If the field exists, the new configuration replaces the old one. For more information, see Configuring Index Fields in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

IndexField

The index field and field options you want to configure.

Type: IndexField

Required: Yes

Response Elements

The following element is returned in a structure named `DefineIndexFieldResult`.

IndexField

The value of an `IndexField` and its current status.

Type: IndexFieldStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DefineSuggester

Description

Configures a suggester for a domain. A suggester enables you to display possible matches before users finish typing their queries. When you configure a suggester, you must specify the name of the text field you want to search for possible matches and a unique name for the suggester. For more information, see Getting Search Suggestions in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Suggester

Configuration information for a search suggester. Each suggester has a unique name and specifies the text field you want to use for suggestions. The following options can be configured for a suggester: `FuzzyMatching`, `SortExpression`.

Type: Suggester

Required: Yes

Response Elements

The following element is returned in a structure named `DefineSuggesterResult`.

Suggester

The value of a `Suggester` and its current status.

Type: SuggesterStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DeleteAnalysisScheme

Description

Deletes an analysis scheme. For more information, see Configuring Analysis Schemes in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

AnalysisSchemeName

The name of the analysis scheme you want to delete.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DeleteAnalysisSchemeResult`.

AnalysisScheme

The status of the analysis scheme being deleted.

Type: AnalysisSchemeStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DeleteDomain

Description

Permanently deletes a search domain and all of its data. Once a domain has been deleted, it cannot be recovered. For more information, see Deleting a Search Domain in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

The name of the domain you want to permanently delete.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DeleteDomainResult`.

DomainStatus

The current status of the search domain.

Type: DomainStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

DeleteExpression

Description

Removes an `Expression` from the search domain. For more information, see Configuring Expressions in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

ExpressionName

The name of the `Expression` to delete.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

Response Elements

The following element is returned in a structure named `DeleteExpressionResult`.

Expression

The status of the expression being deleted.

Type: ExpressionStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DeleteIndexField

Description

Removes an `IndexField` from the search domain. For more information, see Configuring Index Fields in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

IndexFieldName

The name of the index field your want to remove from the domain's indexing options.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

Response Elements

The following element is returned in a structure named `DeleteIndexFieldResult`.

IndexField

The status of the index field being deleted.

Type: IndexFieldStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DeleteSuggester

Description

Deletes a suggester. For more information, see Getting Search Suggestions in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

SuggesterName

Specifies the name of the suggester you want to delete.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

Response Elements

The following element is returned in a structure named `DeleteSuggesterResult`.

Suggester

The status of the suggester being deleted.

Type: SuggesterStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeAnalysisSchemes

Description

Gets the analysis schemes configured for a domain. An analysis scheme defines language-specific text processing options for a `text` field. Can be limited to specific analysis schemes by name. By default, shows all analysis schemes and includes any pending changes to the configuration. Set the `Deployed` option to `true` to show the active configuration and exclude pending changes. For more information, see Configuring Analysis Schemes in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

AnalysisSchemeNames.member.N

The analysis schemes you want to describe.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

Deployed

Whether to display the deployed configuration (`true`) or include any pending changes (`false`). Defaults to `false`.

Type: Boolean

Required: No

DomainName

The name of the domain you want to describe.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DescribeAnalysisSchemesResult`.

AnalysisSchemes

The analysis scheme descriptions.

Type: AnalysisSchemeStatus list

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeAvailabilityOptions

Description

Gets the availability options configured for a domain. By default, shows the configuration with any pending changes. Set the `Deployed` option to `true` to show the active configuration and exclude pending changes. For more information, see Configuring Availability Options in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

Deployed

Whether to display the deployed configuration (`true`) or include any pending changes (`false`). Defaults to `false`.

Type: Boolean

Required: No

DomainName

The name of the domain you want to describe.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DescribeAvailabilityOptionsResult`.

AvailabilityOptions

The availability options configured for the domain. Indicates whether Multi-AZ is enabled for the domain.

Type: AvailabilityOptionsStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

DisabledOperation

The request was rejected because it attempted an operation which is not enabled.

HTTP Status Code: 409

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeDomains

Description

Gets information about the search domains owned by this account. Can be limited to specific domains. Shows all domains by default. To get the number of searchable documents in a domain, use the console or submit a `matchall` request to your domain's search endpoint: `q=matchall&q.parser=structured&size=0`. For more information, see Getting Information about a Search Domain in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainNames.member.N

The names of the domains you want to include in the response.

Type: String list

Length constraints: Minimum length of 3. Maximum length of 28.

Required: No

Response Elements

The following element is returned in a structure named `DescribeDomainsResult`.

DomainStatusList

A list that contains the status of each requested domain.

Type: DomainStatus list

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

DescribeExpressions

Description

Gets the expressions configured for the search domain. Can be limited to specific expressions by name. By default, shows all expressions and includes any pending changes to the configuration. Set the `Deployed` option to `true` to show the active configuration and exclude pending changes. For more information, see Configuring Expressions in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

Deployed

Whether to display the deployed configuration (`true`) or include any pending changes (`false`). Defaults to `false`.

Type: Boolean

Required: No

DomainName

The name of the domain you want to describe.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

ExpressionNames.member.N

Limits the `DescribeExpressions` response to the specified expressions. If not specified, all expressions are shown.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

Response Elements

The following element is returned in a structure named `DescribeExpressionsResult`.

Expressions

The expressions configured for the domain.

Type: ExpressionStatus list

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeIndexFields

Description

Gets information about the index fields configured for the search domain. Can be limited to specific fields by name. By default, shows all fields and includes any pending changes to the configuration. Set the `Deployed` option to `true` to show the active configuration and exclude pending changes. For more information, see Getting Domain Information in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

Deployed

Whether to display the deployed configuration (`true`) or include any pending changes (`false`). Defaults to `false`.

Type: Boolean

Required: No

DomainName

The name of the domain you want to describe.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

FieldNames.member.N

A list of the index fields you want to describe. If not specified, information is returned for all configured index fields.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

Response Elements

The following element is returned in a structure named `DescribeIndexFieldsResult`.

IndexFields

The index fields configured for the domain.

Type: IndexFieldStatus list

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeScalingParameters

Description

Gets the scaling parameters configured for a domain. A domain's scaling parameters specify the desired search instance type and replication count. For more information, see Configuring Scaling Options in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DescribeScalingParametersResult`.

ScalingParameters

The status and configuration of a search domain's scaling parameters.

Type: ScalingParametersStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeDomainEndpointOptions

Description

Returns the domain's endpoint options, specifically whether all requests to the domain must arrive over HTTPS. For more information, see Configuring Domain Endpoint Options in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain.

Type: String

Required: Yes

deployed

Whether to retrieve the latest configuration (which might be in a `Processing` state) or the current, active configuration (`?deployed=true`).

Type: Boolean

Required: No

Response Elements

DomainEndpointOptions

The status and configuration of a search domain's endpoint options.

Type: DomainEndpointOptionsStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeServiceAccessPolicies

Description

Gets information about the access policies that control access to the domain's document and search endpoints. By default, shows the configuration with any pending changes. Set the `Deployed` option to `true` to show the active configuration and exclude pending changes. For more information, see Configuring Access for a Search Domain in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

Deployed

Whether to display the deployed configuration (`true`) or include any pending changes (`false`). Defaults to `false`.

Type: Boolean

Required: No

DomainName

The name of the domain you want to describe.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `DescribeServiceAccessPoliciesResult`.

AccessPolicies

The access rules configured for the domain specified in the request.

Type: AccessPoliciesStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

DescribeSuggesters

Description

Gets the suggesters configured for a domain. A suggester enables you to display possible matches before users finish typing their queries. Can be limited to specific suggesters by name. By default, shows all suggesters and includes any pending changes to the configuration. Set the `Deployed` option to `true` to show the active configuration and exclude pending changes. For more information, see Getting Search Suggestions in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

Deployed

Whether to display the deployed configuration (`true`) or include any pending changes (`false`). Defaults to `false`.

Type: Boolean

Required: No

DomainName

The name of the domain you want to describe.

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

SuggesterNames.member.N

The suggesters you want to describe.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

Response Elements

The following element is returned in a structure named `DescribeSuggestersResult`.

Suggesters

The suggesters configured for the domain specified in the request.

Type: SuggesterStatus list

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

IndexDocuments

Description

Tells the search domain to start indexing its documents using the latest indexing options. This operation must be invoked to activate options whose OptionStatus is `RequiresIndexDocuments`.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `IndexDocumentsResult`.

FieldNames

The names of the fields that are currently being indexed.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

ListDomainNames

Description

Lists all search domains owned by an account.

Response Elements

The following element is returned in a structure named `ListDomainNamesResult`.

DomainNames

The names of the search domains owned by an account.

Type: String to String map

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

UpdateAvailabilityOptions

Description

Configures the availability options for a domain. Enabling the Multi-AZ option expands an Amazon CloudSearch domain to an additional Availability Zone in the same Region to increase fault tolerance in the event of a service disruption. Changes to the Multi-AZ option can take about half an hour to become active. For more information, see Configuring Availability Options in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

MultiAZ

You expand an existing search domain to a second Availability Zone by setting the Multi-AZ option to true. Similarly, you can turn off the Multi-AZ option to downgrade the domain to a single Availability Zone by setting the Multi-AZ option to `false`.

Type: Boolean

Required: Yes

Response Elements

The following element is returned in a structure named `UpdateAvailabilityOptionsResult`.

AvailabilityOptions

The newly-configured availability options. Indicates whether Multi-AZ is enabled for the domain.

Type: AvailabilityOptionsStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

DisabledOperation

The request was rejected because it attempted an operation which is not enabled.

HTTP Status Code: 409

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

UpdateScalingParameters

Description

Configures scaling parameters for a domain. A domain's scaling parameters specify the desired search instance type and replication count. Amazon CloudSearch will still automatically scale your domain based on the volume of data and traffic, but not below the desired instance type and replication count. If the Multi-AZ option is enabled, these values control the resources used per Availability Zone. For more information, see Configuring Scaling Options in the *Amazon CloudSearch Developer Guide*.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

ScalingParameters

The desired instance type and desired number of replicas of each index partition.

Type: ScalingParameters

Required: Yes

Response Elements

The following element is returned in a structure named `UpdateScalingParametersResult`.

ScalingParameters

The status and configuration of a search domain's scaling parameters.

Type: ScalingParametersStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

UpdateDomainEndpointOptions

Description

Updates the domain's endpoint options, specifically whether all requests to the domain must arrive over HTTPS. For more information, see Configuring Domain Endpoint Options in the *Amazon CloudSearch Developer Guide*.

Request Parameters

DomainName

A string that represents the name of a domain.

Type: String

Required: Yes

DomainEndpointOptions

Container for the endpoint options.

Type: DomainEndpointOptions

Required: Yes

Response Elements

DomainEndpointOptionsStatus

The status and configuration of a domain's endpoint options.

Type: DomainEndpointOptionsStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

ValidationException

The request contains invalid input or is missing required input.

HTTP status code 400.

DisabledOperation

The request was rejected because it attempted an operation which is not enabled.

HTTP Status Code: 409

UpdateServiceAccessPolicies

Description

Configures the access rules that control access to the domain's document and search endpoints. For more information, see Configuring Access for an Amazon CloudSearch Domain.

Request Parameters

For information about the common parameters that all actions use, see Common Parameters.

AccessPolicies

The access rules you want to configure. These rules replace any existing rules.

Type: String

Required: Yes

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Response Elements

The following element is returned in a structure named `UpdateServiceAccessPoliciesResult`.

AccessPolicies

The access rules configured for the domain.

Type: AccessPoliciesStatus

Errors

For information about the errors that are common to all actions, see Common Errors.

Base

An error occurred while processing the request.

HTTP Status Code: 400

Internal

An internal error occurred while processing the request. If this problem persists, report an issue from the Service Health Dashboard.

HTTP Status Code: 500

InvalidType

The request was rejected because it specified an invalid type definition.

HTTP Status Code: 409

LimitExceeded

The request was rejected because a resource limit has already been met.

HTTP Status Code: 409

ResourceNotFound

The request was rejected because it attempted to reference a resource that does not exist.

HTTP Status Code: 409

Data Types

The Amazon CloudSearch Configuration Service API contains several data types that various actions use. This section describes each data type in detail.

Note

The order of each element in the response is not guaranteed. Applications should not assume a particular order.

The following data types are supported:

- AccessPoliciesStatus
- AnalysisOptions
- AnalysisScheme
- AnalysisSchemeStatus
- AvailabilityOptionsStatus
- BuildSuggestersResult
- CreateDomainResult
- DateArrayOptions
- DateOptions
- DefineAnalysisSchemeResult
- DefineExpressionResult
- DefineIndexFieldResult
- DefineSuggesterResult
- DeleteAnalysisSchemeResult
- DeleteDomainResult
- DeleteExpressionResult
- DeleteIndexFieldResult
- DeleteSuggesterResult
- DescribeAnalysisSchemesResult
- DescribeAvailabilityOptionsResult
- DescribeDomainsResult
- DescribeExpressionsResult
- DescribeIndexFieldsResult
- DescribeScalingParametersResult
- DescribeServiceAccessPoliciesResult
- DescribeSuggestersResult
- DocumentSuggesterOptions
- DomainStatus
- DoubleArrayOptions

- DoubleOptions
- Expression
- ExpressionStatus
- IndexDocumentsResult
- IndexField
- IndexFieldStatus
- IntArrayOptions
- IntOptions
- LatLonOptions
- Limits
- ListDomainNamesResult
- LiteralArrayOptions
- LiteralOptions
- BuildSuggestersResult
- OptionStatus
- ScalingParameters
- ScalingParametersStatus
- ServiceEndpoint
- Suggester
- SuggesterStatus
- TextArrayOptions
- TextOptions
- UpdateAvailabilityOptionsResult
- UpdateScalingParametersResult
- UpdateServiceAccessPoliciesResult

AccessPoliciesStatus

Description

The configured access rules for the domain's document and search endpoints, and the current status of those rules.

Contents

Options

Access rules for a domain's document or search service endpoints. For more information, see Configuring Access for a Search Domain in the *Amazon CloudSearch Developer Guide*. The maximum size of a policy document is 100 KB.

Type: String

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

AnalysisOptions

Description

Synonyms, stopwords, and stemming options for an analysis scheme. Includes tokenization dictionary for Japanese.

Contents

AlgorithmicStemming

The level of algorithmic stemming to perform: none, `minimal`, `light`, or `full`. The available levels vary depending on the language. For more information, see Language Specific Text Processing Settings in the *Amazon CloudSearch Developer Guide*

Type: String

Valid Values: none | `minimal` | `light` | `full`

Required: No

JapaneseTokenizationDictionary

A JSON array that contains a collection of terms, tokens, readings and part of speech for Japanese Tokenizaiton. The Japanese tokenization dictionary enables you to override the default tokenization for selected terms. This is only valid for Japanese language fields.

Type: String

Required: No

StemmingDictionary

A JSON object that contains a collection of string:value pairs that each map a term to its stem. For example, `{"term1": "stem1", "term2": "stem2", "term3": "stem3"}`. The stemming dictionary is applied in addition to any algorithmic stemming. This enables you to override the results of the algorithmic stemming to correct specific cases of overstemming or understemming. The maximum size of a stemming dictionary is 500 KB.

Type: String

Required: No

Stopwords

A JSON array of terms to ignore during indexing and searching. For example, `["a", "an", "the", "of"]`. The stopwords dictionary must explicitly list each word you want to ignore. Wildcards and regular expressions are not supported.

Type: String

Required: No

Synonyms

A JSON object that defines synonym groups and aliases. A synonym group is an array of arrays, where each sub-array is a group of terms where each term in the group is considered a synonym of every other term in the group. The aliases value is an object that contains a collection of string:value pairs where the string specifies a term and the array of values specifies each of the aliases for that term. An alias is considered a synonym of the specified term, but the term is not considered a synonym of the alias. For more information about specifying synonyms, see Synonyms in the *Amazon CloudSearch Developer Guide*.

Type: String

Required: No

AnalysisScheme

Description

Configuration information for an analysis scheme. Each analysis scheme has a unique name and specifies the language of the text to be processed. The following options can be configured for an analysis scheme: `Synonyms`, `Stopwords`, `StemmingDictionary`, `JapaneseTokenizationDictionary` and `AlgorithmicStemming`.

Contents

AnalysisOptions

Synonyms, stopwords, and stemming options for an analysis scheme. Includes tokenization dictionary for Japanese.

Type: AnalysisOptions

Required: No

AnalysisSchemeLanguage

An IETF RFC 4646 language code or `mul` for multiple languages.

Type: String

Valid Values: `ar | bg | ca | cs | da | de | el | en | es | eu | fa | fi | fr | ga | gl | he | hi | hu | hy | id | it | ja | ko | lv | mul | nl | no | pt | ro | ru | sv | th | tr | zh-Hans | zh-Hant`

Required: Yes

AnalysisSchemeName

Names must begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore).

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

AnalysisSchemeStatus

Description

The status and configuration of an `AnalysisScheme`.

Contents

Options

Configuration information for an analysis scheme. Each analysis scheme has a unique name and specifies the language of the text to be processed. The following options can be configured for an analysis scheme: `Synonyms`, `Stopwords`, `StemmingDictionary`, `JapaneseTokenizationDictionary` and `AlgorithmicStemming`.

Type: AnalysisScheme

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

AvailabilityOptionsStatus

Description

The status and configuration of the domain's availability options.

Contents

Options

The availability options configured for the domain.

Type: Boolean

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

BuildSuggestersResult

Description

The result of a `BuildSuggester` request. Contains a list of the fields used for suggestions.

Contents

FieldNames

A list of field names.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

CreateDomainResult

Description

The result of a `CreateDomainRequest`. Contains the status of a newly created domain.

Contents

DomainStatus

The current status of the search domain.

Type: DomainStatus

Required: No

DateArrayOptions

Description

Options for a field that contains an array of dates. Present if `IndexFieldType` specifies the field is of type `date-array`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SourceFields

A list of source fields to map to the field.

Type: String

Required: No

DateOptions

Description

Options for a date field. Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: yyyy-mm-ddT00:00:00Z. Present if `IndexFieldType` specifies the field is of type `date`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SortEnabled

Whether the field can be used to sort the search results.

Type: Boolean

Required: No

SourceField

A string that represents the name of an index field. CloudSearch supports regular index fields as well as dynamic fields. A dynamic field's name defines a pattern that begins or ends with a wildcard. Any document fields that don't map to a regular index field but do match a dynamic field's pattern are configured with the dynamic field's indexing options.

Regular field names begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore). Dynamic field names must begin or end with a wildcard (*). The wildcard can also be the only character in a dynamic field name. Multiple wildcards, and wildcards embedded within a string are not supported.

The name `score` is reserved and cannot be used as a field name. To reference a document's ID, you can use the name `_id`.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

DefineAnalysisSchemeResult

Description

The result of a `DefineAnalysisScheme` request. Contains the status of the newly-configured analysis scheme.

Contents

AnalysisScheme

The status and configuration of an `AnalysisScheme`.

Type: AnalysisSchemeStatus

Required: Yes

DefineExpressionResult

Description

The result of a `DefineExpression` request. Contains the status of the newly-configured expression.

Contents

Expression

The value of an `Expression` and its current status.

Type: ExpressionStatus

Required: Yes

DefineIndexFieldResult

Description

The result of a `DefineIndexField` request. Contains the status of the newly-configured index field.

Contents

IndexField

The value of an `IndexField` and its current status.

Type: IndexFieldStatus

Required: Yes

DefineSuggesterResult

Description

The result of a `DefineSuggester` request. Contains the status of the newly-configured suggester.

Contents

Suggester

The value of a `Suggester` and its current status.

Type: SuggesterStatus

Required: Yes

DeleteAnalysisSchemeResult

Description

The result of a `DeleteAnalysisScheme` request. Contains the status of the deleted analysis scheme.

Contents

AnalysisScheme

The status of the analysis scheme being deleted.

Type: AnalysisSchemeStatus

Required: Yes

DeleteDomainResult

Description

The result of a `DeleteDomain` request. Contains the status of a newly deleted domain, or no status if the domain has already been completely deleted.

Contents

DomainStatus

The current status of the search domain.

Type: DomainStatus

Required: No

DeleteExpressionResult

Description

The result of a `DeleteExpression` request. Specifies the expression being deleted.

Contents

Expression

The status of the expression being deleted.

Type: ExpressionStatus

Required: Yes

DeleteIndexFieldResult

Description

The result of a `DeleteIndexField` request.

Contents

IndexField

The status of the index field being deleted.

Type: IndexFieldStatus

Required: Yes

DeleteSuggesterResult

Description

The result of a `DeleteSuggester` request. Contains the status of the deleted suggester.

Contents

Suggester

The status of the suggester being deleted.

Type: SuggesterStatus

Required: Yes

DescribeAnalysisSchemesResult

Description

The result of a `DescribeAnalysisSchemes` request. Contains the analysis schemes configured for the domain specified in the request.

Contents

AnalysisSchemes

The analysis scheme descriptions.

Type: AnalysisSchemeStatus list

Required: Yes

DescribeAvailabilityOptionsResult

Description

The result of a `DescribeAvailabilityOptions` request. Indicates whether or not the Multi-AZ option is enabled for the domain specified in the request.

Contents

AvailabilityOptions

The availability options configured for the domain. Indicates whether Multi-AZ is enabled for the domain.

Type: AvailabilityOptionsStatus

Required: No

DescribeDomainsResult

Description

The result of a `DescribeDomains` request. Contains the status of the domains specified in the request or all domains owned by the account.

Contents

DomainStatusList

A list that contains the status of each requested domain.

Type: DomainStatus list

Required: Yes

DescribeExpressionsResult

Description

The result of a `DescribeExpressions` request. Contains the expressions configured for the domain specified in the request.

Contents

Expressions

The expressions configured for the domain.

Type: ExpressionStatus list

Required: Yes

DescribeIndexFieldsResult

Description

The result of a `DescribeIndexFields` request. Contains the index fields configured for the domain specified in the request.

Contents

IndexFields

The index fields configured for the domain.

Type: IndexFieldStatus list

Required: Yes

DescribeScalingParametersResult

Description

The result of a `DescribeScalingParameters` request. Contains the scaling parameters configured for the domain specified in the request.

Contents

ScalingParameters

The status and configuration of a search domain's scaling parameters.

Type: ScalingParametersStatus

Required: Yes

DescribeServiceAccessPoliciesResult

Description

The result of a `DescribeServiceAccessPolicies` request.

Contents

AccessPolicies

The access rules configured for the domain specified in the request.

Type: AccessPoliciesStatus

Required: Yes

DescribeSuggestersResult

Description

The result of a `DescribeSuggesters` request.

Contents

Suggesters

The suggesters configured for the domain specified in the request.

Type: SuggesterStatus list

Required: Yes

DocumentSuggesterOptions

Description

Options for a search suggester.

Contents

FuzzyMatching

The level of fuzziness allowed when suggesting matches for a string: `none`, `low`, or `high`. With none, the specified string is treated as an exact prefix. With low, suggestions must differ from the specified string by no more than one character. With high, suggestions can differ by up to two characters. The default is none.

Type: String

Valid Values: `none | low | high`

Required: No

SortExpression

An expression that computes a score for each suggestion to control how they are sorted. The scores are rounded to the nearest integer, with a floor of 0 and a ceiling of 2^31-1. A document's relevance score is not computed for suggestions, so sort expressions cannot reference the `_score` value. To sort suggestions using a numeric field or existing expression, simply specify the name of the field or expression. If no expression is configured for the suggester, the suggestions are sorted with the closest matches listed first.

Type: String

Required: No

SourceField

The name of the index field you want to use for suggestions.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

DomainEndpointOptions

Description

Whether to require that all requests to the domain arrive over HTTPS. We recommend `Policy-Min-TLS-1-2-2019-07` for `TLSSecurityPolicy`. For compatibility with older clients, the default is `Policy-Min-TLS-1-0-2019-07`.

Contents

EnforceHTTPS

Enables or disables the requirement that all requests to the domain arrive over HTTPS.

Type: Boolean

Valid Values: `true | false`

Required: No

TLSSecurityPolicy

The minimum required TLS version.

Type: String

Valid Values: `Policy-Min-TLS-1-2-2019-07 | Policy-Min-TLS-1-0-2019-07`

Required: No

DomainEndpointOptionsStatus

Description

The configuration and status of the domain's endpoint options.

Contents

Options

The current configuration.

Type: DomainEndpointOptions

Status

The status of the configuration option.

Type: OptionStatus

DomainStatus

Description

The current status of the search domain.

Contents

ARN

The Amazon Resource Name (ARN) of the search domain. See Identifiers for IAM Entities in *Using AWS Identity and Access Management* for more information.

Type: String

Required: No

Created

True if the search domain is created. It can take several minutes to initialize a domain when CreateDomain is called. Newly created search domains are returned from DescribeDomains with a false value for Created until domain creation is complete.

Type: Boolean

Required: No

Deleted

True if the search domain has been deleted. The system must clean up resources dedicated to the search domain when DeleteDomain is called. Newly deleted search domains are returned from DescribeDomains with a true value for IsDeleted for several minutes until resource cleanup is complete.

Type: Boolean

Required: No

DocService

The service endpoint for updating documents in a search domain.

Type: ServiceEndpoint

Required: No

DomainId

An internally generated unique identifier for a domain.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

DomainName

A string that represents the name of a domain. Domain names are unique across the domains owned by an account within an AWS region. Domain names start with a letter or number and can contain the following characters: a-z (lowercase), 0-9, and - (hyphen).

Type: String

Length constraints: Minimum length of 3. Maximum length of 28.

Required: Yes

Limits

Type: Limits

Required: No

Processing

True if processing is being done to activate the current domain configuration.

Type: Boolean

Required: No

RequiresIndexDocuments

True if IndexDocuments needs to be called to activate the current domain configuration.

Type: Boolean

Required: Yes

SearchInstanceCount

The number of search instances that are available to process search requests.

Type: Integer

Required: No

SearchInstanceType

The instance type that is being used to process search requests.

Type: String

Required: No

SearchPartitionCount

The number of partitions across which the search index is spread.

Type: Integer

Required: No

SearchService

The service endpoint for requesting search results from a search domain.

Type: ServiceEndpoint

Required: No

DoubleArrayOptions

Description

Options for a field that contains an array of double-precision 64-bit floating point values. Present if `IndexFieldType` specifies the field is of type `double-array`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: Double

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SourceFields

A list of source fields to map to the field.

Type: String

Required: No

DoubleOptions

Description

Options for a double-precision 64-bit floating point field. Present if `IndexFieldType` specifies the field is of type `double`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document. This can be important if you are using the field in an expression and that field is not present in every document.

Type: Double

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SortEnabled

Whether the field can be used to sort the search results.

Type: Boolean

Required: No

SourceField

The name of the source field to map to the field.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

Expression

Description

A named expression that can be evaluated at search time. Can be used to sort the search results, define other expressions, or return computed information in the search results.

Contents

ExpressionName

Names must begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore).

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

ExpressionValue

The expression to evaluate for sorting while processing a search request. The `Expression` syntax is based on JavaScript expressions. For more information, see Configuring Expressions in the *Amazon CloudSearch Developer Guide*.

Type: String

Length constraints: Minimum length of 1. Maximum length of 10240.

Required: Yes

ExpressionStatus

Description

The value of an `Expression` and its current status.

Contents

Options

The expression that is evaluated for sorting while processing a search request.

Type: Expression

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

IndexDocumentsResult

Description

The result of an `IndexDocuments` request. Contains the status of the indexing operation, including the fields being indexed.

Contents

FieldNames

The names of the fields that are currently being indexed.

Type: String list

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

IndexField

Description

Configuration information for a field in the index, including its name, type, and options. The supported options depend on the `IndexFieldType` .

Contents

DateArrayOptions

Options for a field that contains an array of dates. Present if `IndexFieldType` specifies the field is of type `date-array`. All options are enabled by default.

Type: DateArrayOptions

Required: No

DateOptions

Options for a date field. Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: yyyy-mm-ddT00:00:00Z. Present if `IndexFieldType` specifies the field is of type `date`. All options are enabled by default.

Type: DateOptions

Required: No

DoubleArrayOptions

Options for a field that contains an array of double-precision 64-bit floating point values. Present if `IndexFieldType` specifies the field is of type `double-array`. All options are enabled by default.

Type: DoubleArrayOptions

Required: No

DoubleOptions

Options for a double-precision 64-bit floating point field. Present if `IndexFieldType` specifies the field is of type `double`. All options are enabled by default.

Type: DoubleOptions

Required: No

IndexFieldName

A string that represents the name of an index field. CloudSearch supports regular index fields as well as dynamic fields. A dynamic field's name defines a pattern that begins or ends with a wildcard. Any document fields that don't map to a regular index field but do match a dynamic field's pattern are configured with the dynamic field's indexing options.

Regular field names begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore). Dynamic field names must begin or end with a wildcard (*). The wildcard can also be the only character in a dynamic field name. Multiple wildcards, and wildcards embedded within a string are not supported.

The name `score` is reserved and cannot be used as a field name. To reference a document's ID, you can use the name `_id`.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

IndexFieldType

The type of field. The valid options for a field depend on the field type. For more information about the supported field types, see Configuring Index Fields in the *Amazon CloudSearch Developer Guide*.

Type: String

Valid Values: `int | double | literal | text | date | latlon | int-array | double-array | literal-array | text-array | date-array`

Required: Yes

IntArrayOptions

Options for a field that contains an array of 64-bit signed integers. Present if `IndexFieldType` specifies the field is of type `int-array`. All options are enabled by default.

Type: IntArrayOptions

Required: No

IntOptions

Options for a 64-bit signed integer field. Present if `IndexFieldType` specifies the field is of type `int`. All options are enabled by default.

Type: IntOptions

Required: No

LatLonOptions

Options for a latlon field. A latlon field contains a location stored as a latitude and longitude value pair. Present if `IndexFieldType` specifies the field is of type `latlon`. All options are enabled by default.

Type: LatLonOptions

Required: No

LiteralArrayOptions

Options for a field that contains an array of literal strings. Present if `IndexFieldType` specifies the field is of type `literal-array`. All options are enabled by default.

Type: LiteralArrayOptions

Required: No

LiteralOptions

Options for literal field. Present if `IndexFieldType` specifies the field is of type `literal`. All options are enabled by default.

Type: LiteralOptions

Required: No

TextArrayOptions

Options for a field that contains an array of text strings. Present if `IndexFieldType` specifies the field is of type `text-array`. A `text-array` field is always searchable. All options are enabled by default.

Type: TextArrayOptions

Required: No

TextOptions

Options for text field. Present if `IndexFieldType` specifies the field is of type `text`. A `text` field is always searchable. All options are enabled by default.

Type: TextOptions

Required: No

IndexFieldStatus

Description

The value of an `IndexField` and its current status.

Contents

Options

Configuration information for a field in the index, including its name, type, and options. The supported options depend on the `IndexFieldType`.

Type: IndexField

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

IntArrayOptions

Description

Options for a field that contains an array of 64-bit signed integers. Present if `IndexFieldType` specifies the field is of type `int-array`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: Long

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SourceFields

A list of source fields to map to the field.

Type: String

Required: No

IntOptions

Description

Options for a 64-bit signed integer field. Present if `IndexFieldType` specifies the field is of type `int`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document. This can be important if you are using the field in an expression and that field is not present in every document.

Type: Long

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SortEnabled

Whether the field can be used to sort the search results.

Type: Boolean

Required: No

SourceField

The name of the source field to map to the field.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

LatLonOptions

Description

Options for a latlon field. A latlon field contains a location stored as a latitude and longitude value pair. Present if `IndexFieldType` specifies the field is of type `latlon`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SortEnabled

Whether the field can be used to sort the search results.

Type: Boolean

Required: No

SourceField

A string that represents the name of an index field. CloudSearch supports regular index fields as well as dynamic fields. A dynamic field's name defines a pattern that begins or ends with a wildcard. Any document fields that don't map to a regular index field but do match a dynamic field's pattern are configured with the dynamic field's indexing options.

Regular field names begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore). Dynamic field names must begin or end with a wildcard (*). The wildcard can also be the only character in a dynamic field name. Multiple wildcards, and wildcards embedded within a string are not supported.

The name `score` is reserved and cannot be used as a field name. To reference a document's ID, you can use the name `_id`.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

Limits

Description

No action documentation available.

Contents

MaximumPartitionCount

Type: Integer

Required: Yes

MaximumReplicationCount

Type: Integer

Required: Yes

ListDomainNamesResult

Description

The result of a `ListDomainNames` request. Contains a list of the domains owned by an account.

Contents

DomainNames

The names of the search domains owned by an account.

Type: String to String map

Required: No

LiteralArrayOptions

Description

Options for a field that contains an array of literal strings. Present if `IndexFieldType` specifies the field is of type `literal-array`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SourceFields

A list of source fields to map to the field.

Type: String

Required: No

LiteralOptions

Description

Options for literal field. Present if `IndexFieldType` specifies the field is of type `literal`. All options are enabled by default.

Contents

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

FacetEnabled

Whether facet information can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SearchEnabled

Whether the contents of the field are searchable.

Type: Boolean

Required: No

SortEnabled

Whether the field can be used to sort the search results.

Type: Boolean

Required: No

SourceField

A string that represents the name of an index field. CloudSearch supports regular index fields as well as dynamic fields. A dynamic field's name defines a pattern that begins or ends with a wildcard. Any document fields that don't map to a regular index field but do match a dynamic field's pattern are configured with the dynamic field's indexing options.

Regular field names begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore). Dynamic field names must begin or end with a wildcard (*). The wildcard can also be the only character in a dynamic field name. Multiple wildcards, and wildcards embedded within a string are not supported.

The name `score` is reserved and cannot be used as a field name. To reference a document's ID, you can use the name `_id`.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

OptionStatus

Description

The status of domain configuration option.

Contents

CreationDate

A timestamp for when this option was created.

Type: DateTime

Required: Yes

PendingDeletion

Indicates that the option will be deleted once processing is complete.

Type: Boolean

Required: No

State

The state of processing a change to an option. Possible values:

- `RequiresIndexDocuments`: the option's latest value will not be deployed until IndexDocuments has been called and indexing is complete.
- `Processing`: the option's latest value is in the process of being activated.
- `Active`: the option's latest value is completely deployed.
- `FailedToValidate`: the option value is not compatible with the domain's data and cannot be used to index the data. You must either modify the option value or update or remove the incompatible documents.

Type: String

Valid Values: `RequiresIndexDocuments | Processing | Active | FailedToValidate`

Required: Yes

UpdateDate

A timestamp for when this option was last updated.

Type: DateTime

Required: Yes

UpdateVersion

A unique integer that indicates when this option was last updated.

Type: Integer

Required: No

ScalingParameters

Description

The desired instance type and desired number of replicas of each index partition.

Contents

DesiredInstanceType

The instance type that you want to preconfigure for your domain. For example, `search.medium`.

Type: String

Valid Values: `search.small | search.medium | search.large | search.xlarge | search.2xlarge`

> **Note**
>
> For older domains, valid values might also include `search.m1.small`, `search.m1.large`, `search.m2.xlarge`, `search.m2.2xlarge`, `search.m3.medium`, `search.m3.large`, `search.m3.xlarge`, and `search.m3.2xlarge`.

Required: No

DesiredPartitionCount

The number of partitions you want to preconfigure for your domain. Only valid when you select `search.2xlarge` as the instance type.

Type: Integer

Required: No

DesiredReplicationCount

The number of replicas you want to preconfigure for each index partition.

Type: Integer

Required: No

ScalingParametersStatus

Description

The status and configuration of a search domain's scaling parameters.

Contents

Options

The desired instance type and desired number of replicas of each index partition.

Type: ScalingParameters

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

ServiceEndpoint

Description

The endpoint to which service requests can be submitted.

Contents

Endpoint

The endpoint to which service requests can be submitted. For example, `search-imdb-movies-oopcnjfn6ugofer3zx5iadxxca.eu-west-1.cloudsearch.amazonaws.com` or `doc-imdb-movies-oopcnjfn6ugofer3zx5iadxxca.eu-west-1.cloudsearch.amazonaws.com`.

Type: String

Required: No

Suggester

Description

Configuration information for a search suggester. Each suggester has a unique name and specifies the text field you want to use for suggestions. The following options can be configured for a suggester: `FuzzyMatching`, `SortExpression`.

Contents

DocumentSuggesterOptions

Options for a search suggester.

Type: DocumentSuggesterOptions

Required: Yes

SuggesterName

Names must begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore).

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: Yes

SuggesterStatus

Description

The value of a `Suggester` and its current status.

Contents

Options

Configuration information for a search suggester. Each suggester has a unique name and specifies the text field you want to use for suggestions. The following options can be configured for a suggester: `FuzzyMatching`, `SortExpression`.

Type: Suggester

Required: Yes

Status

The status of domain configuration option.

Type: OptionStatus

Required: Yes

TextArrayOptions

Description

Options for a field that contains an array of text strings. Present if `IndexFieldType` specifies the field is of type `text-array`. A `text-array` field is always searchable. All options are enabled by default.

Contents

AnalysisScheme

The name of an analysis scheme for a `text-array` field.

Type: String

Required: No

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

HighlightEnabled

Whether highlights can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SourceFields

A list of source fields to map to the field.

Type: String

Required: No

TextOptions

Description

Options for text field. Present if `IndexFieldType` specifies the field is of type `text`. A `text` field is always searchable. All options are enabled by default.

Contents

AnalysisScheme

The name of an analysis scheme for a `text` field.

Type: String

Required: No

DefaultValue

A value to use for the field if the field isn't specified for a document.

Type: String

Length constraints: Minimum length of 0. Maximum length of 1024.

Required: No

HighlightEnabled

Whether highlights can be returned for the field.

Type: Boolean

Required: No

ReturnEnabled

Whether the contents of the field can be returned in the search results.

Type: Boolean

Required: No

SortEnabled

Whether the field can be used to sort the search results.

Type: Boolean

Required: No

SourceField

A string that represents the name of an index field. CloudSearch supports regular index fields as well as dynamic fields. A dynamic field's name defines a pattern that begins or ends with a wildcard. Any document fields that don't map to a regular index field but do match a dynamic field's pattern are configured with the dynamic field's indexing options.

Regular field names begin with a letter and can contain the following characters: a-z (lowercase), 0-9, and _ (underscore). Dynamic field names must begin or end with a wildcard (*). The wildcard can also be the only character in a dynamic field name. Multiple wildcards, and wildcards embedded within a string are not supported.

The name `score` is reserved and cannot be used as a field name. To reference a document's ID, you can use the name `_id`.

Type: String

Length constraints: Minimum length of 1. Maximum length of 64.

Required: No

UpdateAvailabilityOptionsResult

Description

The result of a `UpdateAvailabilityOptions` request. Contains the status of the domain's availability options.

Contents

AvailabilityOptions

The newly-configured availability options. Indicates whether Multi-AZ is enabled for the domain.

Type: AvailabilityOptionsStatus

Required: No

UpdateScalingParametersResult

Description

The result of a `UpdateScalingParameters` request. Contains the status of the newly-configured scaling parameters.

Contents

ScalingParameters

The status and configuration of a search domain's scaling parameters.

Type: ScalingParametersStatus

Required: Yes

UpdateServiceAccessPoliciesResult

Description

The result of an `UpdateServiceAccessPolicies` request. Contains the new access policies.

Contents

AccessPolicies

The access rules configured for the domain.

Type: AccessPoliciesStatus

Required: Yes

Common Parameters

This section lists the request parameters that all actions use. Any action-specific parameters are listed in the topic for the action.

Action

The action to be performed.

Default: None

Type: string

Required: Yes

AuthParams

The parameters that are required to authenticate a Conditional request. Contains:

- AWSAccessKeyID
- SignatureVersion
- Timestamp
- Signature

Default: None

Required: Conditional

AWSAccessKeyId

The access key ID that corresponds to the secret access key that you used to sign the request.

Default: None

Type: string

Required: Yes

Expires

The date and time when the request signature expires, expressed in the format YYYY-MM-DDThh:mm:ssZ, as specified in the ISO 8601 standard.

Condition: Requests must include either *Timestamp* or *Expires*, but not both.

Default: None

Type: string

Required: Conditional

SecurityToken

The temporary security token that was obtained through a call to AWS Security Token Service. For a list of services that support AWS Security Token Service, go to Using Temporary Security Credentials to Access AWS in **Using Temporary Security Credentials**.

Default: None

Type: string

Required: No

Signature

The digital signature that you created for the request. For information about generating a signature, go to the service's developer documentation.

Default: None

Type: string

Required: Yes

SignatureMethod

The hash algorithm that you used to create the request signature.

Default: None

Type: string

Valid Values: `HmacSHA256` | `HmacSHA1`

Required: Yes

SignatureVersion

The signature version you use to sign the request. Set this to the value that is recommended for your service.

Default: None

Type: string

Required: Yes

Timestamp

The date and time when the request was signed, expressed in the format YYYY-MM-DDThh:mm:ssZ, as specified in the ISO 8601 standard.

Condition: Requests must include either *Timestamp* or *Expires*, but not both.

Default: None

Type: string

Required: Conditional

Version

The API version that the request is written for, expressed in the format YYYY-MM-DD.

Default: None

Type: string

Required: Yes

Common Errors

This section lists the common errors that all actions return. Any action-specific errors are listed in the topic for the action.

IncompleteSignature

The request signature does not conform to AWS standards.

HTTP Status Code: 400

InternalFailure

The request processing has failed because of an unknown error, exception or failure.

HTTP Status Code: 500

InvalidAction

The action or operation requested is invalid. Verify that the action is typed correctly.

HTTP Status Code: 400

InvalidClientTokenId

The X.509 certificate or AWS access key ID provided does not exist in our records.

HTTP Status Code: 403

InvalidParameterCombination

Parameters that must not be used together were used together.

HTTP Status Code: 400

InvalidParameterValue

An invalid or out-of-range value was supplied for the input parameter.

HTTP Status Code: 400

InvalidQueryParameter

The AWS query string is malformed or does not adhere to AWS standards.

HTTP Status Code: 400

MalformedQueryString

The query string contains a syntax error.

HTTP Status Code: 404

MissingAction

The request is missing an action or a required parameter.

HTTP Status Code: 400

MissingAuthenticationToken

The request must contain either a valid (registered) AWS access key ID or X.509 certificate.

HTTP Status Code: 403

MissingParameter

A required parameter for the specified action is not supplied.

HTTP Status Code: 400

OptInRequired

The AWS access key ID needs a subscription for the service.

HTTP Status Code: 403

RequestExpired

The request reached the service more than 15 minutes after the date stamp on the request or more than 15 minutes after the request expiration date (such as for pre-signed URLs), or the date stamp on the request is more than 15 minutes in the future.

HTTP Status Code: 400

ServiceUnavailable

The request has failed due to a temporary failure of the server.

HTTP Status Code: 503

Throttling

The request was denied due to request throttling.

HTTP Status Code: 400

ValidationError

The input fails to satisfy the constraints specified by an AWS service.

HTTP Status Code: 400

Document Service API Reference for Amazon CloudSearch

You use the document service API to add, replace, or delete documents in your Amazon CloudSearch domain. For more information managing the documents in your search domain, see upload documents.

The other APIs you use to interact with Amazon CloudSearch are:

- Configuration API Reference for Amazon CloudSearch—Set up and manage your search domain.
- Search API—Search your domain.

documents/batch

This section describes the HTTP request and response messages for the `documents/batch` resource.

You create document batches to describe the data that you want to upload to an Amazon CloudSearch domain. A document batch is a collection of add and delete operations that represent the documents you want to add, update, or delete from your domain. Batches can be described in either JSON or XML. A batch provides all of the information Amazon CloudSearch needs for indexing. Each item that you want to be able to return as a search result (such as a product) is represented as a document—a batch is simply a collection of add and delete requests for individual documents. Every document has a unique ID and one or more fields that contain the data that you want to search and return in results.

To update a document, you specify an add request with the document ID of the document you want to update. For more information, see Adding and Updating Documents in Amazon CloudSearch. Similarly, to delete a document, you submit a delete request with the document ID of the document you want to delete. For information about deleting documents, see Deleting Documents in Amazon CloudSearch.

For more information about submitting data for indexing, see upload documents.

documents/batch JSON API

JSON documents/batch Requests

The body of a `documents/batch` request uses JSON or XML to specify the document operations you want to perform. A JSON representation of a batch is a collection of objects that define individual add and delete operations. The `type` property identifies whether an object represents an add or delete operation. For example, the following JSON batch adds one document and deletes one document:

```
[
{ "type": "add",
  "id":   "tt0484562",
  "fields": {
    "title": "The Seeker: The Dark Is Rising",
    "directors": ["Cunningham, David L."],
    "genres": ["Adventure","Drama","Fantasy","Thriller"],
    "actors": ["McShane, Ian","Eccleston, Christopher","Conroy, Frances",
              "Crewson, Wendy","Ludwig, Alexander","Cosmo, James",
              "Warner, Amelia","Hickey, John Benjamin","Piddock, Jim",
              "Lockhart, Emma"]
  }
},
{ "type": "delete",
  "id":   "tt0484575"
}]
```

Note

When specifying document batches in JSON, the value for a field cannot be `null`.

The JSON schema representation of a batch is shown below:

```
{
    "type": "array",
    "minItems": 1,
    "items": {
        "type": "object",
        "properties": {
            "type": {
                "type": "string",
                "enum": ["add", "delete"],
                "required": true
            },
            "id": {
                "type": "string",
                "pattern": "[a-z0-9][a-z0-9_]{0,127}",
                "minLength": 1,
                "maxLength": 128,
                "required": true
            },
            "fields": {
                "type": "object",
                "patternProperties": {
                    "[a-zA-Z0-9][a-zA-Z0-9_]{0,63}": {
                        "type": "string",
                        }
                    }
                }
            }
        }
}
```

documents/batch Request Properties (JSON)

Property	Description	Required
type	The operation type, `add` or `delete`.	Yes
id	An alphanumeric string. Allowed characters are: A-Z (upper-case letters), -a-z (lower-case letters), 0-9, _ (underscore), - (hyphen), / (forward slash), # (hash sign), : (colon). The max length is 128 characters.	Yes
fields	A collection of one or more *field_name* properties that define the fields the document contains. Condition: Required for add operations. Must contain at least one *field_name* property.	Conditional
field_name	Specifies a field within the document being added. Field names must begin with a letter and can contain the following characters: a-z (lower case), 0-9, and _ (underscore). Field names must be at least 3 and no more than 64 characters. The name *score* is reserved and cannot be used as a field name. To specify multiple values for a field, you specify an array of values instead of a single value. For example: `"genre": ["Adventure","Drama","Fantasy","Thriller"]`	Conditional

Property	Description	Required
	Condition: At least one field must be specified in the fields object.	

documents/batch Response (JSON)

The response body lists the number of adds and deletes that were performed and any errors or warnings that were generated.

The JSON schema representation of a document service API response is shown below:

```
{
    "type": "object",
    "properties": {
        "status": {
            "type": "text",
            "enum": ["success", "error"],
            "required": true
        },
        "adds": {
            "type": "integer",
            "minimum": 0,
            "required": true
        },
        "deletes": {
            "type": "integer",
            "minimum": 0,
            "required": true
        },
        "errors": {
            "type": "array",
            "required": false,
            "items": {
                "type": "object",
                "properties": {
                    "message": {
                        "type": "string",
                        "required": true
                    }
                }
            }
        },
        "warnings": {
            "type": "array",
            "required": false,
            "items": {
                "type": "object",
                "properties": {
                    "message": {
                        "type": "string",
                        "required": true
                    }
                }
            }
        }
    }
}
```

documents/batch Response Properties (JSON)

Property	Description
status	The result status, which is either `success` or `error`.
adds	The number of add document operations that were performed. Always zero when the status is `error`.
deletes	The number of delete document operations that were performed. Always zero when the status is `error`. For information on permanent ly deleting documents, see the section called “Deleting Documents”.
errors	Provides information about a parsing or validation error. Specified only if the status is `error`.
warning	Provides information about a warning generated during parsing or validation.

documents/batch XML API

XML documents/batch Requests

The body of a `documents/batch` request specifies the document operations you want to perform in XML. For example:

```
<batch>
 <add  id="tt0484562">
  <field name="title">The Seeker: The Dark Is Rising</field>
  <field name="director">Cunningham, David L.</field>
  <field name="genre">Adventure</field>
  <field name="genre">Drama</field>
  <field name="genre">Fantasy</field>
  <field name="genre">Thriller</field>
  <field name="actor">McShane, Ian</field>
  <field name="actor">Eccleston, Christopher</field>
  <field name="actor">Conroy, Frances</field>
  <field name="actor">Ludwig, Alexander</field>
  <field name="actor">Crewson, Wendy</field>
  <field name="actor">Warner, Amelia</field>
  <field name="actor">Cosmo, James</field>
  <field name="actor">Hickey, John Benjamin</field>
  <field name="actor">Piddock, Jim</field>
  <field name="actor">Lockhart, Emma</field>
 </add>
 <delete id="tt0301199" />
</batch>
```

documents/batch Request Elements (XML)

Element	Description	Required
batch	The collection of add or delete operations that you want to submit to your search domain. A batch must contain at least one add or delete element.	Yes
add	Specifies a document that you want to add to your search domain. The id attributes is	No

Element	Description	Required
	required and an add element must contain at least one field. Attributes: • `id`—An alphanumeric string. Any characters other than A-Z (upper or lower case) and 0-9 are illegal. The max length is 128 characters.	

Element	Description	Required

field	Specifies a field in the document being added. The name attribute and a field value are required. Field names must begin with a letter and can contain the following characters: a-z (lower case), 0-9, and _ (underscore). The name *score* is reserved and cannot be used as a field name. The field value can be text or CDATA.
	
	To specify multiple values for a field, you include multiple field elements with the same name. For example:
	
	`<field name="genre">Adventure</field>`
	`<field name="genre">Drama</field>`
	`<field name="genre">Fantasy</field>`
	`<field name="genre">Thriller</field>`
	
	Constraints:
	
	• `name`—An alphanumeric string that begins with a letter. Can contain a-z (lower case), 0-9, _ (underscore), - (hyphen), and . (period).
	
	Condition: At least one field must be specified in an add element.
		Conditional

Element	Description	Required
delete	Specifies a document that you want to remove from your search domain. The id attribute is required. A delete element must be empty. For information on permanently deleting documents, see the section called "Deleting Documents". Constraints: • `id`—An alphanumeric string. Any characters other than A-Z (upper or lower case) and 0-9 are illegal.	No

documents/batch Response (XML)

The response body lists the number of adds and deletes that were performed and any errors or warnings that were generated.

The RelaxNG schema of a document service API response is:

```
 start = response

response = element response {
    attribute status { "success" | "error" },
    attribute adds { xsd:integer },
    attribute deletes { xsd:integer },
    element errors {
        element error {
            text
        }+
    }? &
    element warnings {
        element warning {
            text
        }+
    }?
}
```

documents/batch Response Elements (XML)

Element	Description
result	Contains elements that list the errors and warnings generated when parsing and validating the request. Attributes: • `status`—The result status, which is either `success` or `error`. • `adds`—The number of added documents. If the status is `error`, this is always zero. • `deletes`—The number of deleted documents. If the status is `error`, this is always zero. Constraints: If the status is `error`, the results element contains a list of errors. If the status is `success`, the results element can contain a list of warnings, but no errors.
errors	Contains a collection of error elements that identify the errors that occurred when parsing and validating the request.
error	Provides information about a parsing or validation error. The value provides a description of the error.
warnings	Contains a collection of warning elements that identify the warnings that were generated when parsing and validating the request.
warning	Provides information about a parsing or validation warning. The value provides a description of the error.

documents/batch Status Codes

A document service request can return three types of status codes:

- 5xx status codes indicate that there was an internal server error. We recommend catching and retrying all 5xx error codes as they typically represent transient error conditions.
- 4xx status codes indicate that the request was malformed.
- 2xx status codes indicate that the request was processed successfully.

Error	Description	HTTP Status Code
No Content-Type	The Content-Type header is missing.	400
No Content-Length	The Content-Length header is missing.	411
Incorrect Path	URL path does not match "/YYYY-MM-DD/documents/batch".	404
Invalid HTTP Method	The HTTP method is not POST. Requests must be posted to documents /batch.	405
Invalid Accept Type	Accept header specifies a content type other than "application/xml" or "application/json". Responses can be sent only as XML or JSON.	406
Request Too Large	The length of the request body is larger than the maximum allowed value.	413
Invalid Content Type	The content type is something other than "application/json" or "application/xml".	415
Invalid Character Set	The character set is something other than "ASCII", "ISO-8859-1", or "UTF-8".	415

Common Request Headers

Name	Description	Required
Content-Type	A standard MIME type describing the format of the object data. For more information, see W3C RFC 2616 Section 14. Default: application/json Constraints: application/json or application/xml only	Required
Content-Length	The length in bytes of the body of the request.	Yes
Accept	A standard MIME type describing the format of the response data. For more information, see W3C RFC 2616 Section 14. Default: the content-type of the request Constraints: application/json or application/xml only	No

Common Response Headers

Name	Description
Content-Type	A standard MIME type describing the format of the object data. For more information, see W3C RFC 2616 Section 14. Default: the value of the Accept header in the request, or the Content-Type of the request if the Accept header is missing or doesn't specify either application/xml or application/json. Constraints: application/xml or application/json only
Content-Length	The length in bytes of the body in the response.

Search API Reference for Amazon CloudSearch

Topics

You use the Search API to submit search or suggestion requests to your Amazon CloudSearch domain. For more information about searching, see Searching Your Data with Amazon CloudSearch. For more information about suggestions, see Getting Autocomplete Suggestions in Amazon CloudSearch.

The other APIs you use to interact with Amazon CloudSearch are:

- Configuration API—Set up and manage your search domain.
- Document Service API—Submit the data you want to search.

Search

This section describes the HTTP request and response messages for the search resource.

Search Syntax

```
GET /2013-01-01/search
```

Search Request Headers

HOST

The search request endpoint for the domain you're querying. You can use DescribeDomains to retrieve your domain's search request endpoint.

Required: Yes

Search Request Parameters

cursor

Retrieves a cursor value you can use to page through large result sets. Use the `size` parameter to control the number of hits you want to include in each response. You can specify either the `cursor` or `start` parameter in a request, they are mutually exclusive. For more information, see Paginate the results.

To get the first cursor, specify `cursor=initial` in your initial request. In subsequent requests, specify the cursor value returned in the hits section of the response.

For example, the following request sets the cursor value to `initial` and the `size` parameter to 100 to get the first set of hits. The cursor for the next set of hits is included in the response.

```
search?q=john&cursor=initial&size=100&return=_no_fields
{
   "status": {
      "rid": "+/Xu5s0oHwojC6o=",
      "time-ms": 15
   },
   "hits": {
      "found": 503,
      "start": 0,
      "cursor": "VegKzpYYQW9JSVFFRU1UeWwwZERBd09EUTNPRGM9ZA",
      "hit": [
         {"id": "tt0120601"},
         {"id": "tt1801552"},
         ...
      ]
   }
}
```

To get the next set of hits, you specify the cursor value and the number of hits to retrieve.

```
search?q=john&cursor=VegKzpYYQW9JSVFFRU1UeWwwZERBd09EUTNPRGM9ZA&size=100
```

Type: String

Required: No

expr.NAME

Defines an expression that can be used to sort results. You can also specify an expression as a return field. For more information about defining and using expressions, see Configuring Expressions.

You can define and use multiple expressions in a search request. For example, the following request creates two expressions that are used to sort the results and includes them in the search results:

```
search?q=(and (term field=genres 'Sci-Fi')(term field=genres
 'Comedy'))&q.parser=structured
&expr.expression1=_score*rating
&expr.expression2=(1/rank)*year
&sort=expression1 desc,expression2 desc
&return=title,rating,rank,year,_score,expression1,expression2
```

Type: String

Required: No

facet.FIELD

Specifies a field that you want to get facet information for—`FIELD` is the name of the field. The specified field must be facet enabled in the domain configuration. Facet options are specified as a JSON object. If the JSON object is empty, `facet.FIELD={}`, facet counts are computed for all field values, the facets are sorted by facet count, and the top 10 facets are returned in the results.

You can specify three options in the JSON object:

- `sort` specifies how you want to sort the facets in the results: `bucket` or `count`. Specify `bucket` to sort alphabetically or numerically by facet value (in ascending order). Specify `count` to sort by the facet counts computed for each facet value (in descending order). To retrieve facet counts for particular values or ranges of values, use the `buckets` option instead of `sort`.
- `buckets` specifies an array of the facet values or ranges you want to count. Buckets are returned in the order they are specified in the request. To specify a range of values, use a comma (,) to separate the upper and lower bounds and enclose the range using brackets or braces. A square bracket, [or], indicates that the bound is included in the range, a curly

brace, { or }, excludes the bound. You can omit the upper or lower bound to specify an open-ended range. When omitting a bound, you must use a curly brace. The `sort` and `size` options are not valid if you specify `buckets`.

- `size` specifies the maximum number of facets to include in the results. By default, Amazon CloudSearch returns counts for the top 10. The `size` parameter is only valid when you specify the `sort` option; it cannot be used in conjunction with `buckets`.

For example, the following request gets facet counts for the `year` field, sorts the facet counts by value and returns counts for the top three:

```
facet.year={sort:"bucket", size:3}
```

To specify which values or range of values you want to calculate facet counts for, use the `buckets` option. For example, the following request calculates and returns the facet counts by decade:

```
facet.year={buckets:["[1970,1979]","[1980,1989]",
             "[1990,1999]","[2000,2009]",
             "[2010,}"]}
```

You can also specify individual values as buckets:

```
facet.genres={buckets:["Action","Adventure","Sci-Fi"]}
```

Note that the facet values are case-sensitive—with the sample IMDb movie data, if you specify `["action","adventure","sci-fi"]` instead of `["Action","Adventure","Sci-Fi"]`, all facet counts are zero.

Type: String

Required: No

format

Specifies the content type of the response.

Type: String

Valid Values: json|xml

Default: json

Required: No

fq

Specifies a structured query that filters the results of a search without affecting how the results are scored and sorted. You use `fq` in conjunction with the q parameter to filter the documents that match the constraints specified in the q parameter. Specifying a filter just controls which matching documents are included in the results, it has no effect on how they are scored and sorted. The `fq` parameter supports the full structured query syntax. For more information about using filters, see Filtering Matching Documents. For more information about structured queries, see Structured Search Syntax.

Type: String

Required: No

highlight.FIELD

Retrieves highlights for matches in the specified `text` or `text-array` field. Highlight options are specified as a JSON object. If the JSON object is empty, the returned field text is treated as HTML and the first match is highlighted with emphasis tags: `<em>search-term</em>`.

You can specify four options in the JSON object:

- `format`—specifies the format of the data in the text field: `text` or `html`. When data is returned as HTML, all non-alphanumeric characters are encoded. The default is `html`.
- `max_phrases`—specifies the maximum number of occurrences of the search term(s) you want to highlight. By default, the first occurrence is highlighted.
- `pre_tag`—specifies the string to prepend to an occurrence of a search term. The default for HTML highlights is `<em>`. The default for text highlights is `*`.
- `post_tag`—specifies the string to append to an occurrence of a search term. The default for HTML highlights is `</em>`. The default for text highlights is `*`.

Examples: `highlight.plot={}`, `highlight.plot={format:'text',max_phrases:2,pre_tag:'<b>',post_tag:'</b>'}`

Type: String

Required: No

partial

Controls whether partial results are returned if one or more index partitions are unavailable. When your search index is partitioned across multiple search instances, by default Amazon CloudSearch only returns results if every partition can be queried. This means that the failure of a single search instance can result in 5xx (internal server) errors. When you specify `partial=true`. Amazon CloudSearch returns whatever results are available and includes the percentage of documents searched in the search results (`percent-searched`). This enables you to more gracefully degrade your users' search experience. For example, rather than displaying no results, you could display the partial results and a message indicating that the results might be incomplete due to a temporary system outage.

Type: Boolean

Default: False

Required: No

pretty

Formats JSON output so it's easier to read.

Type: Boolean

Default: False

Required: No

q

The search criteria for the request. How you specify the search criteria depends on the query parser used for the request and the parser options specified in the `q.options` parameter. By default, the `simple` query parser is used to process requests. To use the `structured`, `lucene`, or `dismax` query parser, you must also specify the `q.parser` parameter. For more information about specifying search criteria, see Searching Your Data with Amazon CloudSearch.

Type: String

Required: Yes

q.options

Configure options for the query parser specified in the `q.parser` parameter. The options are specified as a JSON object, for example: `q.options={defaultOperator: 'or', fields: ['title^5','description']}`.

The options you can configure vary according to which parser you use:

- `defaultOperator`—The default operator used to combine individual terms in the search string. For example: `defaultOperator: 'or'`. For the `dismax` parser, you specify a percentage that represents the percentage of terms in the search string (rounded down) that must match, rather than a default operator. A value of `0%` is the equivalent to OR, and a value of `100%` is equivalent to AND. The percentage must be specified as a value in the range 0-100 followed by the percent (%) symbol. For example, `defaultOperator: 50%`. Valid values: `and`, `or`, a percentage in the range 0%-100% (`dismax`). Default: `and` (`simple`, `structured`, `lucene`) or `100` (`dismax`). Valid for: `simple`, `structured`, `lucene`, and `dismax`.
- `fields`—An array of the fields to search when no fields are specified in a search. If no fields are specified in a search and this option is not specified, all statically configured `text` and `text-array` fields are searched. You can specify a weight for each field to control the relative importance of each field when Amazon CloudSearch calculates relevance scores. To specify a field weight, append a caret (^) symbol and the weight to the field name. For example, to boost the importance of the `title` field over the `description` field you could specify: `fields: ['title^5','description']`. Valid values: The name of any configured field and an optional numeric value greater than zero. Default: All statically configured `text` and `text-array` fields. Dynamic fields and `literal` fields are not searched by default. Valid for: `simple`, `structured`, `lucene`, and `dismax`.
- `operators`—An array of the operators or special characters you want to disable for the simple query parser. If you disable the `and`, `or`, or `not` operators, the corresponding operators (`+`, `|`, `-`) have no special meaning and are dropped from the search string. Similarly, disabling `prefix` disables the wildcard operator (`*`) and disabling `phrase` disables the ability to search for phrases by enclosing phrases in double quotes. Disabling precedence disables the ability to control order of precedence using parentheses. Disabling `near` disables the ability to use the ~ operator to perform a sloppy phrase search. Disabling the `fuzzy` operator disables the ability to use the ~ operator to perform a fuzzy search. `escape` disables the ability to use a backslash (\) to escape special characters within the search string. Disabling whitespace is an advanced option that prevents the parser from tokenizing on whitespace, which can be useful for Vietnamese. (It prevents Vietnamese words from being

split incorrectly.) For example, you could disable all operators other than the phrase operator to support just simple term and phrase queries: `operators:['and', 'not', 'or', 'prefix']`. Valid values: `and`, `escape`, `fuzzy`, `near`, `not`, `or`, `phrase`, `precedence`, `prefix`, `whitespace`. Default: All operators and special characters are enabled. Valid for: `simple`.

- `phraseFields`—An array of the `text` or `text-array` fields you want to use for phrase searches. When the terms in the search string appear in close proximity within a field, the field scores higher. You can specify a weight for each field to boost that score. The `phraseSlop` option controls how much the matches can deviate from the search string and still be boosted. To specify a field weight, append a caret (^) symbol and the weight to the field name. For example, to boost phrase matches in the `title` field over the `abstract` field, you could specify: `phraseFields:['title^3', 'abstract']` Valid values: The name of any `text` or `text-array` field and an optional numeric value greater than zero. Default: No fields. If you don't specify any fields with `phraseFields`, proximity scoring is disabled even if `phraseSlop` is specified. Valid for: `dismax`.
- `phraseSlop`—An integer value that specifies how much matches can deviate from the search phrase and still be boosted according to the weights specified in the `phraseFields` option. For example, `phraseSlop: 2`. You must also specify `phraseFields` to enable proximity scoring. Valid values: positive integers. Default: 0. Valid for: `dismax`.
- `explicitPhraseSlop`—An integer value that specifies how much a match can deviate from the search phrase when the phrase is enclosed in double quotes in the search string. (Phrases that exceed this proximity distance are not considered a match.) `explicitPhraseSlop: 5`. Valid values: positive integers. Default: 0. Valid for: `dismax`.
- `tieBreaker`—When a term in the search string is found in a document's field, a score is calculated for that field based on how common the word is in that field compared to other documents. If the term occurs in multiple fields within a document, by default only the highest scoring field contributes to the document's overall score. You can specify a `tieBreaker` value to enable the matches in lower-scoring fields to contribute to the document's score. That way, if two documents have the same max field score for a particular term, the score for the document that has matches in more fields will be higher. The formula for calculating the score with a tieBreaker is:

```
(max field score) + (tieBreaker) * (sum of the scores for the rest of the matching
 fields)
```

For example, the following query searches for the term *dog* in the `title`, `description`, and `review` fields and sets `tieBreaker` to 0.1:

```
q=dog&q.parser=dismax&q.options={fields:['title', 'description', 'review'],
 tieBreaker: 0.1}
```

If *dog* occurs in all three fields of a document and the scores for each field are title=1, description=3, and review=1, the overall score for the term dog is:

```
3 +  0.1 * (1+1) = 3.2
```

Set `tieBreaker` to 0 to disregard all but the highest scoring field (pure max). Set to 1 to sum the scores from all fields (pure sum). Valid values: 0.0 to 1.0. Default: 0.0. Valid for: `dismax`.

Type: JSON object

Default: See individual option descriptions.

Required: No

q.parser

Specifies which query parser to use to process the request: `simple`, `structured`, `lucene`, and `dismax`. If `q.parser` is not specified, Amazon CloudSearch uses the `simple` query parser.

- `simple`—perform simple searches of `text` and `text-array` fields. By default, the `simple` query parser searches all statically configured `text` and `text-array` fields. You can specify which fields to search by with the `q.options` parameter. If you prefix a search term with a plus sign (+) documents must contain the term to be considered a match. (This is the default, unless you configure the default operator with the `q.options` parameter.) You can use the - (NOT), | (OR), and * (wildcard) operators to exclude particular terms, find results that match any of the specified terms, or search for a prefix. To search for a phrase rather than individual terms, enclose the phrase in double quotes. For more information, see Searching Your Data with Amazon CloudSearch.
- `structured`—perform advanced searches by combining multiple expressions to define the search criteria. You can also search within particular fields, search for values and ranges of values, and use advanced options such as term boosting, `matchall`, and `near`. For more information, see Constructing Compound Queries.

- `lucene`—search using the Apache Lucene query parser syntax. For more information, see Apache Lucene Query Parser Syntax.
- `dismax`—search using the simplified subset of the Apache Lucene query parser syntax defined by the DisMax query parser. For more information, see DisMax Query Parser Syntax.

Type: String

Default: `simple`

Required: No

return

The field and expression values to include in the response, specified as a comma-separated list. By default, a search response includes all return enabled fields (`return=_all_fields`). To return only the document IDs for the matching documents, specify `return=_no_fields`. To retrieve the relevance score calculated for each document, specify `return=_score`. You specify multiple return fields as a comma separated list. For example, `return=title,_score` returns just the title and relevance score of each matching document.

Type: String

Required: No

size

The maximum number of search hits to return.

Type: Positive integer

Default: 10

Required: No

sort

A comma-separated list of fields or custom expressions to use to sort the search results. You must specify the sort direction (`asc` or `desc`) for each field. For example, `sort=year desc,title asc`. You can specify a maximum of 10 fields and expressions. To use a field to sort results, it must be sort enabled in the domain configuration. Array type fields cannot be used for sorting. If no `sort` parameter is specified, results are sorted by their default relevance scores in descending order: `sort=_score desc`. You can also sort by document ID (`sort=_id`) and version (`sort=_version`).

Type: String

Required: No

start

The offset of the first search hit you want to return. You can specify either the `start` or `cursor` parameter in a request, they are mutually exclusive. For more information, see [Paginate the results](#).

Type: Positive integer

Default: 0 (the first hit)

Required: No

Structured Search Syntax

You use the Amazon CloudSearch structured search syntax to define search criteria when using the `structured` query parser, and to specify filter criteria with the `fq` parameter.

When using the structured query operators, you specify the name of the operator, options for the operator, and then the terms being operated on, `(OPERATOR OPTIONS STRING|EXPRESSION)`. Any options must be specified before the string or expression. For example, `(and (not field=genres 'Sci-Fi')(or (term field=title boost=2 'star')(term field=plot 'star')))`.

Important

You must URL-encode special characters in the query string. For example, you must encode the = operator in a structured query as `%3D`: `(term+field%3Dtitle+'star')`. Amazon CloudSearch returns an `InvalidQueryString` error if special characters are not URL-encoded. For a complete reference of URL-encodings, see the W3C [HTML URL Encoding Reference](#).

If you do not specify the field you want to search when using the structured query parser, all statically configured `text` and `text-array` fields are searched. Dynamic fields and `literal` fields are *not* searched by default. You can specify which fields you want to search by default with the `q.options` parameter.

Parentheses control the order of evaluation of the expressions in a compound query. When an expression is enclosed in parentheses, that expression is evaluated first, and then the resulting value is used in the evaluation of the remainder of the query. The expressions can contain any of the structured query operators.

You can also use the structured query parser to search for a simple text string—just enclose the string you want to search for in single quotes: `q='black swan'&q.parser="structured"`.

For more information about constructing compound queries with the structured query operators, see Constructing Compound Queries.

FIELD

Syntax: `FIELD: 'STRING'|value`

Searches the specified field for a string, numeric value, date, or range of numeric values or dates.

Strings must be enclosed in single quotes. Any single quotation marks or backslashes in the string must be escaped with a backslash. To specify a range of values, use a comma (,) to separate the upper and lower bounds and enclose the range using brackets or braces. A square bracket, [or], indicates that the bound is included in the range, a curly brace, { or }, excludes the bound. You can omit the upper or lower bound to specify an open-ended range. When omitting a bound, you must use a curly brace.

Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: `yyyy-mm-ddTHH:mm:ss.SSSZ`. In UTC, for example, 5:00 PM August 23, 1970 is: `1970-08-23T17:00:00Z`. Note that you can also specify fractional seconds when specifying times in UTC. For example, `1967-01-31T23:20:50.650Z`.

Examples:

```
title:'star'
year:2000
year:[1998,2000]
year:{,2011]
release_date:['2013-01-01T00:00:00Z',}
```

and

Syntax: `(and boost=N EXPRESSION EXPRESSION ... EXPRESSIONn)`

Includes a document only if it matches all of the specified expressions.(Boolean `AND` operator.) The expressions can contain any of the structured query operators, or a simple search string. Search strings must be enclosed in single quotes. Note that to match documents that contain the specified terms in any of the fields being searched, you specify each term as a separate expression: `(and 'star' 'wars')`. If you specify `(and 'star wars')`, *star* and *wars* must occur within the same field to be considered a match.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Example:

```
(and title:'star' actors:'Harrison Ford' year:{,2000])
```

matchall

Syntax: `matchall`

Matches every document in the domain. By default, returns the first 10. Use the `size` and `start` parameters to page through the results.

near

Syntax: `(near field=FIELD distance=N boost=N 'STRING')`

Searches a `text` or `text-array` field for the specified multi-term string and matches documents that contain the terms within the specified distance of one another. (This is sometimes called a *sloppy* phrase search.) If you omit the `field` option, Amazon CloudSearch searches all statically configured `text` and `text-array` fields by default. Dynamic fields and `literal` fields are not searched by default. You can specify which fields you want to search by default by specifying the `q.options` `fields` option.

The distance value must be a positive integer. For example, to find all documents where *teenage* occurs within 10 words of *vampire* in the `plot` field, you specify a distance value of 10: `(near field=plot distance=10 'teenage vampire')`.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Example:

```
(near field=plot distance=10 'teenage vampire')
```

not

Syntax: `(not boost=N EXPRESSION)`

Excludes a document if it matches the specified expression. (Boolean `NOT` operator.) The expression can contain any of the structured query operators, or a simple search string. Search strings must be enclosed in single quotes.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Example:

```
(not (or actors:'Harrison Ford' year:{,2010]))
```

or

Syntax: `(or boost=N EXPRESSION1 EXPRESSION2 ... EXPRESSIONn)`

Includes a document if it matches any of the specified expressions. (Boolean `OR` operator.) The expressions can contain any of the structured query operators, or a simple search string. Search strings must be enclosed in single quotes.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Example:

```
(or actors:'Alec Guinness' actors:'Harrison Ford' actors:'James Earl Jones')
```

phrase

Syntax: `(phrase field=FIELD boost=N 'STRING')`

Searches a `text` or `text-array` field for the specified phrase. If you omit the `field` option, Amazon CloudSearch searches all statically configured `text` and `text-array` fields by default.

Dynamic fields and `literal` fields are not searched by default. You can specify which fields you want to search by default by specifying the `q.options` `fields` option.

Use the `phrase` operator to combine a phrase search with other search criteria in a structured query. For example `q=(and (term field=title 'star') (range field=year {,2000]))` matches all documents that contain *star* in the title field and have a year value less than or equal to 2000.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Example:

```
(phrase field=plot 'teenage girl')
```

prefix

Syntax: `(prefix field=FIELD boost=N 'STRING')`

Searches a `text`, `text-array`, `literal`, or `literal-array` field for the specified prefix followed by zero or more characters. If you omit the `field` option, Amazon CloudSearch searches all statically configured `text` and `text-array` fields by default. Dynamic fields and `literal` fields are not searched by default. You can specify which fields you want to search by default by specifying the `q.options` `fields` option.

Use the `prefix` operator to combine a prefix search with other search criteria in a structured query. For example, `q=(and (prefix field=title 'sta') (range field=year {,2000]))` matches all documents that contain the prefix *sta* in the title field and have a year value of less than or equal to 2000.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Note

To implement search suggestions, you should configure and query a suggester, rather than performing prefix searches. For more information see Suggestion Requests.

Example:

```
(prefix field=title 'star')
```

range

Syntax: `(range field=FIELD boost=N RANGE)`

Searches a numeric field (double, double-array, int, int-array) or date field (date, date-array) for values in the specified range. Matches documents that have at least one value in the field within the specified range. The `field` option must be specified.

Use the `range` operator to combine a range search with other search criteria in a structured query. For example `q=(and (term field=title 'star') (range field=year {,2000]))` matches all documents that contain *star* in the title field and have a year value of less than or equal to 2000.

To specify a range of values, use a comma (,) to separate the upper and lower bounds and enclose the range using brackets or braces. A square bracket, [or], indicates that the bound is included in the range, a curly brace, { or }, excludes the bound. You can omit the upper or lower bound to specify an open-ended range. When omitting a bound, you must use a curly brace.

Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: `yyyy-mm-ddTHH:mm:ss.SSSZ`. In UTC, for example, 5:00 PM August 23, 1970 is: `1970-08-23T17:00:00Z`. Note that you can also specify fractional seconds when specifying times in UTC. For example, `1967-01-31T23:20:50.650Z`.

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Examples:

```
(range field=year [1990,2000])
(range field=year {,2000])
(range field=year [1990,})
```

term

Syntax: `(term field=FIELD boost=N 'STRING'|VALUE)`

Searches the specified field for a string, numeric value, or date. The `field` option must be specified when searching for a value. If you omit the `field` option, Amazon CloudSearch searches all statically configured `text` and `text-array` fields by default. Dynamic fields and `literal` fields are not searched by default. You can specify which fields you want to search by default by specifying the `q.options fields` option.

Use the `term` operator to combine a term search with other search criteria in a structured query. For example, `q=(and (term field=title 'star') (range field=year {,2000]))` matches all documents that contain *star* in the title field and have a year value of less than or equal to 2000.

Strings and dates must be enclosed in single quotes. Any single quotation marks or backslashes in a string must be escaped with a backslash.

Dates and times are specified in UTC (Coordinated Universal Time) according to IETF RFC3339: `yyyy-mm-ddTHH:mm:ss.SSSZ`. In UTC, for example, 5:00 PM August 23, 1970 is: `1970-08-23T17:00:00Z`. Note that you can also specify fractional seconds when specifying times in UTC. For example, `1967-01-31T23:20:50.650Z.`

The boost value is a positive numeric value that increases the importance of this part of the search query relative to the other parts.

Examples:

```
(term field=title 'star')
(term field=year 2000)
```

Simple Search Syntax

You use the Amazon CloudSearch simple search syntax to define search criteria when using the `simple` query parser. The simple query parser is used by default if you do not specify the `q.parser` parameter.

You use the simple query parser to search for individual terms or phrases. By default, all statically configured `text` and `text-array` fields are searched. Dynamic fields and `literal` fields are *not* searched by default. You can use the `q.options` parameter to specify which fields you want to search, change the default operator used to combine individual terms in the search string, or disable any of the simple parser operators (`and`, `escape`, `fuzzy`, `near`, `not`, `or`, `phrase`, `precedence`, `prefix`, `whitespace`).

For more information about using the simple query parser, see text.

+ (and)

    Syntax: `+TERM`

    Requires the specified term. To match, documents must contain the specified term.

    Example: +star

\ (escape)

    Syntax: `\CHAR`

    Escapes special characters that you want to search for. You must escape the following characters if you want them to be part of the query: `+ - & | ! ( ) { } [ ] ^ " ~ * ? : \ /`.

    Example: `M\*A\*S\*H`

~ (fuzzy)

    Syntax: `TERM~N`

    Performs a fuzzy search. Append the ~ operator and a value to a term to indicate how much terms can differ and still be considered a match.

    Example: `stor~1`

~ (near)

    Syntax: `"PHRASE"~N`

    Performs a sloppy phrase search. Append the ~ operator and a value to a phrase to indicate how far apart the terms can be and still be considered a match for the phrase.

    Example: `"star wars"~4`

- (not)

    Syntax: `-TERM`

    Prohibits the specified term. To match, documents must not contain the term.

    Example: star -wars

| (or)

    Syntax: `|TERM`

Makes the specified term optional.

Example: star |wars

"..." (phrase)

Syntax: `"PHRASE"`

Performs a search for the entire phrase. Can be combined with the ~ operator to perform a sloppy phrase search.

Example: "star wars"

(...) (precedence)

Syntax: `(...)`

Controls the order in which the query constraints are evaluated. The contents of the inner-most parentheses are evaluated first.

Example: `+(war|trek)+star`

* (prefix)

Syntax: `CHARS*`

Matches documents that contain terms that have the specified prefix.

Example: `sta*`

Search Response

When a request completes successfully, the response body contains the search results. By default, search results are returned in JSON. If the `format` parameter is set to `xml`, search results are returned in XML.

Unless you explicitly specify the `return` parameter, the document ID and all returnable fields are included for each matching document (hit). The response also shows the total number of hits found (`found`) and the index of the first document listed (`start`). By default, the response contains the first 10 hits. You specify the `size` parameter in your request to control how many hits are included in each response. To page through the hits, you can use the `start` or `cursor` parameter. For more information, see Paginate the results.

The following example shows a typical JSON response.

```
{
    "status": {
        "rid": "rtKz7rkoeAojlvk=",
        "time-ms": 10
    },
    "hits": {
        "found": 3,
        "start": 0,
        "hit": [
            {
                "id": "tt1142977",
                "fields": {
                    "rating": "6.9",
                    "genres": [
                        "Animation",
                        "Comedy",
                        "Family",
                        "Horror",
                        "Sci-Fi"
                    ],
                    "plot": "Young Victor conducts a science experiment to
                             bring his beloved dog Sparky back to life, only
                              to face unintended, sometimes monstrous,
                              consequences.",
                    "release_date": "2012-09-20T00:00:00Z",
                    "title": "Frankenweenie",
                    "rank": "1462",
                    "running_time_secs": "5220",
                    "directors": [
                        "Tim Burton"
                    ],
                    "image_url": "http://ia.media-imdb.com/images/M/MV5BMjIx
                                  ODY3MjEwNV5BMl5BanBnXkFtZTcwOTMzNjc4Nw@@._
                                  V1_SX400_.jpg",
                    "year": "2012",
                    "actors": [
                        "Winona Ryder",
                        "Catherine O'Hara",
                        "Martin Short"
                    ]
                }
            },
    .
    .
    .
         ]
     }
}
```

The following example shows the equivalent XML response.

```
<results>
    <status rid="itzL7rkoeQojlvk=" time-ms="34"/>
    <hits found="3" start="0">
        <hit id="tt1142977">
            <field name="rating">6.9</field>
            <field name="genres">Animation</field>
            <field name="genres">Comedy</field>
            <field name="genres">Family</field>
            <field name="genres">Horror</field>
            <field name="genres">Sci-Fi</field>
            <field name="plot">Young Victor conducts a science experiment to
                               bring his beloved dog Sparky back to life, only
                               to face unintended, sometimes monstrous,
                               consequences.
            </field>
            <field name="release_date">2012-09-20T00:00:00Z</field>
            <field name="title">Frankenweenie</field>
            <field name="rank">1462</field>
            <field name="running_time_secs">5220</field>
            <field name="directors">Tim Burton</field>
            <field name="image_url">http://ia.media-imdb.com/images/M/MV5BMjI
                                    xODY3MjEwNV5BMl5BanBnXkFtZTcwOTMzNjc4Nw@@.
                                    _V1_SX400_.jpg
            </field>
            <field name="year">2012</field>
            <field name="actors">Winona Ryder</field>
            <field name="actors">Catherine O'Hara</field>
            <field name="actors">Martin Short</field>
        </hit>
        .
        .
        .
    </hits>
</results>
```

Setting the response format only affects responses to successful requests. The format of an error response depends on the origin of the error. Errors returned by the search service are always returned in JSON. 5xx errors due to server timeouts and other request routing problems are returned in XML. When a request returns an error code, the body of the response contains information about the error that occurred. If an error occurs while the request body is parsed and validated, the error code is set to 400 and the response body includes a list of the errors and where they occurred.

Search Response Headers

Content-Type

A standard MIME type describing the format of the object data. For more information, see W3C RFC 2616 Section 14.

Valid values: application/json or application/xml

Default: application/json

Content-Length

The length in bytes of the body in the response.

Search Response Properties (JSON)

status

Contains the resource id (rid) and the time it took to process the request (time-ms).

rid

The encrypted Resource ID.

time-ms

How long it took to process the search request in milliseconds.

hits

Contains the number of matching documents (`found`), the index of the first document included in the response (`start`), and an array (`hit`) that lists the document IDs and data for each hit.

found

The total number of hits that match the search request after Amazon CloudSearch finished processing the request.

start

The index of the first hit returned in this response.

hit

An array that lists the document IDs and data for each hit.

id

The unique identifier for a document.

fields

A list of returned fields.

facets

Contains facet information and facet counts.

FACETFIELD

A field for which facets were calculated.

buckets

An array of the calculated facet values and counts.

value

The facet value being counted.

count

The number of hits that contain the facet value in `FACETFIELD`.

Search Response Elements (XML)

results

Contains the search results. Any errors that occurred while processing the request are returned as messages in the info element.

status

Contains the resource id (`rid`) and the time it took to process the request (`time-ms`).

hits

Contains hit statistics and a collection of hit elements. The found attribute is the total number of hits that match the search request after Amazon CloudSearch finished processing the results. The contained hit elements are ordered according to their relevance scores or the `sort` option specified in the search request.

hit

A document that matched the search request. The id attribute is the document's unique id. Contains a `d` (data) element for each returned field.

field

A field returned from a hit. Hit elements contain a `d` (data) element for each returned field.

facets

Contains a facet element for each facet requested in the search request.

facet

Contains a bucket element for each value of a field for which a facet count was calculated. The `facet.FIELD` size option can be used to specify how many constraints to return. By default, facet counts are returned for the top 10 constraints. The `facet.FIELD` buckets option can be used to explicitly specify which values to count.

bucket

A facet field value and the number of occurrences (count) of that value within the search hits.

Submitting Suggest Requests in Amazon CloudSearch

You submit suggest requests via HTTP GET to your domain's search endpoint at `2013-01-01/suggest`. For information about controlling access to the suggest service, see configure access policies.

You must specify the API version in all suggest requests and that version must match the API version specified when the domain was created.

For example, the following request gets suggestions from the `search-movies-rr2f34ofg56xneuemujamut52i.us-east-1.cloudsearch.amazonaws.com` domain for the query string `oce` using the suggester called `title`.

```
http://search-imdb-hd6ebyouhw2lczkueyuqksnuzu.us-
west-2.cloudsearch.amazonaws.com/2013-01-01/suggest -d"q=oce&suggester=suggest_title"
```

You can use any method you want to send GET requests to your domain's search endpoint—you can enter the request URL directly in a Web browser, use cURL to submit the request, or generate an HTTP call using your favorite HTTP library. You can also use the Search Tester in the Amazon CloudSearch console to get suggestions. For more information, see Searching with the Search Tester.

Important

A domain's document and search endpoints remain the same for the life of the domain. You should cache the endpoints rather than retrieving them before every upload or search request. Querying the Amazon CloudSearch configuration service by calling `aws cloudsearch describe-domains` or `DescribeDomains` before every request is likely to result in your requests being throttled.

By default, Amazon CloudSearch returns the response in JSON. You can get the results formatted in XML by specifying the `format` parameter, `format=xml`. Setting the response format only affects responses to successful requests. The format of an error response depends on the origin of the error. Errors returned by the search service are always returned in JSON. 5xx errors due to server timeouts and other request routing problems are returned in XML.

Suggest

Suggestion Requests

Suggest Syntax in Amazon CloudSearch

```
GET /2013-01-01/suggest
```

Suggest Request Headers in Amazon CloudSearch

HOST

The search request endpoint for the domain you're querying. You can use DescribeDomains to retrieve your domain's search request endpoint.

Required: Yes

Suggest Request Parameters in Amazon CloudSearch

q

The string to get suggestions for.

Type: String

Required: Yes

suggester

The name of the suggester to use to find suggested matches.

Type: String

Required: Yes

size

The maximum number of suggestions to return.

Type: Positive integer

Default: 10

Required: No

format

Specifies the content type of the response.

Type: String

Valid Values: json|xml

Default: json

Required: No

Suggest Response

When a request completes successfully, the response body contains the suggestions. By default, suggestions are returned in JSON. Set the `format` parameter to `xml` to get the results in XML.

Setting the response format only affects responses to successful requests. The format of an error response depends on the origin of the error. Errors returned by the search service are always returned in JSON. 5xx errors due to server timeouts and other request routing problems are returned in XML. When a request returns an error code, the body of the response contains information about the error that occurred. If an error occurs while the request body is parsed and validated, the error code is set to 400 and the response body includes a list of the errors and where they occurred.

The following example shows a JSON response to a request for suggestions:

```
{
   "status": {
      "rid": "qOSM5s0oCwr8pVk=",
      "time-ms": 2
   },
   "suggest": {
      "query": "oce",
      "found": 3,
      "suggestions": [
         {
          "suggestion": "Ocean's Eleven",
           "score": 0,
           "id": "tt0054135"
         },
         {
          "suggestion": "Ocean's Thirteen",
          "score": 0,
          "id": "tt0496806"
         },
         {
          "suggestion": "Ocean's Twelve",
          "score": 0,
          "id": "tt0349903"
         }
      ]
   }
}
```

The following example shows the equivalent XML response:

```
<results>
   <status rid="/pSz580oDQr8pVk=" time-ms="2"/>
   <suggest query="oce" found="3">
      <suggestions>
         <item suggestion="Ocean's Eleven" score="0" id="tt0054135"/>
         <item suggestion="Ocean's Thirteen" score="0" id="tt0496806"/>
         <item suggestion="Ocean's Twelve" score="0" id="tt0349903"/>
      </suggestions>
   </suggest>
</results>
```

Search Service Errors

A search or suggestion request can return three types of status codes:

- 5xx status codes indicate that there was an internal server error. You should catch and retry all 5xx error codes as they typically represent transient error conditions. For more information, see Handling Errors.
- 4xx status codes indicate that the request was malformed. Correct the error(s) before resubmitting your request.
- 2xx status codes indicate that the request was processed successfully.

The format of an error response depends on the origin of the error. Errors returned by the search service are always returned in JSON. 5xx errors due to server timeouts and other request routing problems are returned in XML.

Errors returned by the search service contain the following information:

error

    Contains an error message returned by the search service. The `code` and `msg` properties are included for each error.

code

The error code.

msg

A description of the error that was returned by the search service.

Troubleshooting Amazon CloudSearch

The following topics describe solutions to problems you might encounter when using Amazon CloudSearch.

Topics

Uploading Documents

If your document data is not formatted correctly or contains invalid values, you will get errors when you attempt to upload it or use it to configure fields for your domain. Here are some common problems and their solutions:

- **Invalid JSON**—if you are using JSON, the first thing to do is make sure there are no JSON syntax errors in your document batch. To do that, run it through a validation tool such as the JSON Validator. This will identify any fundamental issues with the data.

- **Invalid XML**—document batches must be well-formed XML. You are especially likely to encounter issues if your fields contain XML data—the data must be XML-encoded or enclosed in CDATA sections. To identify any problems, run your document batch through a validation tool such as the W3C Markup Validation Service.
- **Not Recognized as a Document Batch**—if Amazon CloudSearch doesn't recognize your data as a valid document batch when you upload data using the console, Amazon CloudSearch generates a valid batch that contains a single content field and generic metadata fields such as `content_encoding`, `content_type`, and `resourcename`. Since these are not normally the fields configured for the domain, you get errors stating that the fields don't exist. Similarly, if you attempt to configure a domain from an invalid batch, Amazon CloudSearch responds with the content and meta-data fields instead of the fields in the batch.

  First, make sure that the batch is valid XML or JSON. If it is, check for invalid document IDs and make sure you have specified the operation type for each document. For add operations, make sure that the type, ID, and at least one field are specified for each document. Delete operations only need to specify the type and ID. For more information about formatting your data, see Creating Document Batches.
- **Document IDs with bad values**—A document ID can contain any letter or number and the following characters: _ - = # ; : / ? @ &. Document IDs must be at least 1 and no more than 128 characters long.
- **Multi-valued fields without a value**—when specifying document data in JSON, you cannot specify an empty array as the value of a field. Multi-valued fields must contain at least one value.
- **Bad characters**—one problem that can be difficult to detect if you do not filter your data while generating your document batch is that can contain characters that are invalid in XML. Both JSON and XML batches can contain only UTF-8 characters that are valid in XML. You can use a validation tool such as the JSON Validator or W3C Markup Validation Service to identify invalid characters.

Deleting All Documents in an Amazon CloudSearch Domain

Amazon CloudSearch currently does not provide a mechanism for deleting all of the documents in a domain.

Amazon CloudSearch Domain Not Scaling Down After Deleting Documents

If your domain has scaled up to accommodate your index size and you delete a large number of documents, the domain scales down the next time the full index is rebuilt. Although the index is automatically rebuilt periodically, to scale down as quickly as possible you can explicitly run indexing when you are done deleting documents.

Document Update Latency

Sending a large volume of single-document batches can increase the amount of time it takes each document to become searchable. If you have a large amount of update traffic, you need to batch your updates. We recommend using a batch size close to the 5 MB limit. For more information, see Creating Document Batches.

You can load up to 10,000 document batches per day (every 24 hours), with each batch size up to 5 MB. Loading more data per day significantly increases the latency of document updates. To mitigate this risk, you can increase your update capacity by selecting a larger instance type. For more information, see Configuring Scaling Options in Amazon CloudSearch.

Large Number of 5xx Errors When Uploading Documents to an Amazon CloudSearch Domain

If you parallelize uploads and your domain is on a search.small instance, you might experience an unacceptably high rate of 504 or 507 errors. Setting the desired instance type to a larger instance type will increase your update capacity and reduce the error rate. For more information about handling 5xx errors, see Handling Errors. For information about prescaling your domain to increase upload capacity, see Configuring Scaling Options in Amazon CloudSearch.

Search Latency and Timeouts in Amazon CloudSearch

If you are experiencing slow response times, frequently encountering internal server errors (typically 507 or 509 errors), or seeing the number of instance hours your search domain is consuming increase without a substantial increase in the volume of data you're searching, fine-tuning your search requests to reduce the processing overhead can help. For more information, see Tuning Search Request Performance in Amazon CloudSearch. Increasing the desired replication count can also speed up search request processing. For more information, see Configuring Scaling Options in Amazon CloudSearch.

507 and 509 errors typically indicate that your search service is overloaded. This can be due to the volume or complexity of search requests that you are submitting. Amazon CloudSearch normally scales automatically to handle the load. Because it takes some time to deploy additional search instances, we recommend using an exponential backoff retry policy to temporarily reduce the request rate and minimize request failures. For more information, see Error Retries and Exponential Backoff.

Certain usage patterns, such as submitting complex search queries to a single small search instance, can sometimes result in timeouts without triggering automatic scaling. If you repeatedly experience a high error rate, you can explicitly request additional capacity through the Amazon CloudSearch Service Limit Request form.

Search Latency for Faceted Queries in Amazon CloudSearch

If you are bucketing facet information with the `buckets` option and experiencing slow query performance, try setting the buckets method to `interval`. For more information, see Bucketing Facet Information.

Sudden Increase in 5xx Errors When Searching an Amazon CloudSearch Domain

If your search domain experiences a sudden spike in traffic, Amazon CloudSearch responds by adding search instances to your domain to handle the increased load. However, it takes a few minutes to set up the new instances. You are likely to see a temporary increase in 5xx errors until the new instances are ready to start processing requests. For more information about handling 5xx errors, see Handling Errors. For information about pre-scaling your domain to handle an expected spike in search requests, see Configuring Scaling Options in Amazon CloudSearch.

Indexing Failures after Updating Indexing Options in Amazon CloudSearch

If you make changes to a domain's index configuration, in certain cases you might encounter Failed to Validate errors when you run indexing. This means that the index field options you set are not compatible with the documents that are already in your index. Specifically, you changed the type of an index field, and there are documents in your index that contain data that is incompatible with that type. For example, this might happen if you change a `literal` field to an `int` field, and some of your documents contain alphanumeric data in that field. When this happens, Amazon CloudSearch sets the status of ALL fields that were being processed to the `FailedToValidate` state. Rolling back the incompatible configuration change will enable you to successfully rebuild your index. If the change is necessary, you must update or remove the incompatible documents from your index to use the new configuration. If you can't identify the change that caused the error or need assistance identifying the incompatible documents, contact support.

Domain Not Found When Submitting Amazon CloudSearch Requests

You cannot access a 2013-01-01 domain with the 2011-02-01 command line tools or SDKs. Similarly, you cannot access a 2011-02-01 domain with the 2013-01-01 command line tools or SDKs. Make sure you are specifying the correct API version in your request and using the appropriate command line tools or SDK.

Number of Searchable Documents Not Returned with Domain Information

The `aws cloudsearch describe-domains` and `DescribeDomains` do not return the number of searchable documents in the domain. To get the number of searchable documents, use the console or submit a `matchall` request to your domain's search endpoint.

```
q=matchall&q.parser=structured&size=0
```

Configuration Service Access Policies Not Working in Amazon CloudSearch

If you have both 2011 and 2013 domains, have configured IAM policies for accessing the configuration service, and are getting *not authorized* errors, note that the Amazon CloudSearch ARN is different for the 2011-02-01 API and the 2013-01-01 API. To allow users to access both 2011 and 2013 domains, you must allow access to both ARNs in the IAM policy. For example:

```
{
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "cloudsearch:*",
       ],
      "Resource": "arn:aws:cloudsearch:*",
      "Resource": "arn:aws:cs:*"
    }
  ]
}
```

If your 2011 policy granted access to particular domains or actions, you must include those restrictions in your policy. Note that the only supported action for 2011 domains is `cloudsearch:*` and you might encounter other errors when attempting to configure resource-level permissions for domains created with the 2011-01-01 API.

Search and Document Service Access Policies Not Working in Amazon CloudSearch

If you have configured access policies for you domain's search and document service endpoints, but are getting the error *403 Request forbidden by administrative rules*, it is likely due to one of the following issues.

- Make sure the API version and resource name are specified in your requests. For example, to upload documents with the 2013-01-01 API, you must append `/2013-01-01/documents/batch` to your domain's document service endpoint:

  ```
  doc-movies-123456789012.us-east-1.cloudsearch.amazonaws.com/2013-01-01/documents/
  batch
  ```

  To submit search requests using the 2013-01-01 API, you must append `/2013-01-01/search` to your domain's search endpoint:

  ```
  search-movies-123456789012.us-east-1.cloudsearch.amazonaws.com/2013-01-01/search?
  q=star+wars&return=title
  ```

  To get suggestions using the 2013-01-01 API, you must append `/2013-01-01/suggest` to your domain's search endpoint:

```
search-movies-123456789012.us-east-1.cloudsearch.amazonaws.com/2013-01-01/suggest?
q=kat&suggester=mysuggester
```

- If you are connecting from an EC2 instance, make sure the access policy specifies your EC2 instance's public IP address.
- If the machine you are connecting from is behind a router, make sure the access policy specifies your public facing IP address.

For more information, see configure access policies.

Amazon CloudSearch Console Permissions Errors

To access to the console, you must have permissions for the `DescribeDomains` action. Access to particular domains and actions might be restricted by to the configured IAM access policies. In addition, uploading data from an Amazon S3 bucket or DynamoDB table requires access to those services and resources. For more information about Amazon CloudSearch access policies, see configure access policies.

Using Wildcards to Search Text Fields Doesn't Produce Expected Results

When you submit a search request, the text you're searching for undergoes the same text processing so that it can be matched against the terms that appear in the index. However, no text analysis is performed on the search term when you perform a prefix search. This means that a search for a prefix that ends in `s` typically won't match the singular version of the term when stemming is enabled. This can happen for any term that ends in `s`, not just plurals. For example, if you search the `actor` field in the sample movie data for `Anders`, there are three matching movies. If you search for `Ander*`, you get those movies as well as several others. However, if you search for `Anders*` there are no matches. This is because the term is stored in the index as `ander`, `anders` does not appear in the index.

If stemming is preventing your wildcard searches from returning all of the relevant matches, you can suppress stemming for the text field by setting the `AlgorithmicStemming` option to none, or you can map the data to a `literal` field instead of a `text` field.

For more information about how Amazon CloudSearch processes text, see Text Processing in Amazon CloudSearch.

Inconsistent Results When Using Cursors for Deep Paging

When you use a cursor to page through a result set that is sorted by document score (`_score`), you can get inconsistent results if the index is updated between requests. This can also occur if your domain's replication count is greater than one, because updates are applied in an eventually consistent manner across the instances in the domain. If this is an issue, avoid sorting the results by score. You can either use the `sort` option to sort by a particular field, or use `fq` instead of `q` to specify your search criteria. (Document scores are not calculated for filter queries.)

Certificate Errors When Using an SDK

Because AWS SDKs use the CA certificates from your computer, changes to the certificates on the AWS servers can cause connection failures when you attempt to use an SDK. Error messages vary, but typically contain the following text:

```
SSL3_GET_SERVER_CERTIFICATE:certificate verify failed
```

You can prevent these failures by keeping your computer's CA certificates and operating system up-to-date. If you encounter this issue in a corporate environment and do not manage your own computer, you might need to ask an administrator to assist with the update process.

The following list shows minimum operating system and Java versions:

- Microsoft Windows versions that have updates from January 2005 or later installed contain at least one of the required CAs in their trust list.
- Mac OS X 10.4 with Java for Mac OS X 10.4 Release 5 (February 2007), Mac OS X 10.5 (October 2007), and later versions contain at least one of the required CAs in their trust list.
- Red Hat Enterprise Linux 5 (March 2007), 6, and 7 and CentOS 5, 6, and 7 all contain at least one of the required CAs in their default trusted CA list.
- Java 1.4.2_12 (May 2006), 5 Update 2 (March 2005), and all later versions, including Java 6 (December 2006), 7, and 8, contain at least one of the required CAs in their default trusted CA list.

The three certificate authorities are:

- Amazon Root CA 1
- Starfield Services Root Certificate Authority - G2
- Starfield Class 2 Certification Authority

Root certificates from the first two authorities are available from Amazon Trust Services, but keeping your computer up-to-date is the more straightforward solution. To learn more about ACM-provided certificates, see AWS Certificate Manager FAQs.

Note

These certificates are not yet required, but are scheduled for deployment to the AWS servers in November 2017.

Understanding Amazon CloudSearch Limits

This table shows naming and size restrictions within Amazon CloudSearch. You can submit a request if you need to increase the maximum number of partitions for a search domain. For information about increasing other limits such as the maximum number of search domains, contact Amazon CloudSearch.

The current Amazon CloudSearch limits are summarized in the following table.

Item	Limit
Batch size	The maximum batch size is 5 MB.
Data loading volume	You can load one document batch every 10 seconds (approximately 10,000 batches every 24 hours), with each batch size up to 5 MB. Exceeding this limit significantly increases the latency of document updates and could result in throttling. To mitigate this risk, you can increase your update capacity by selecting a larger instance type. For more informati on, see Creating Document Batches. **Important** No matter which instance type you select, Amazon CloudSearch does not guarantee the ordering of documents received in the same second. For example, if you send three updates with a tenth of a second between them, the final update might not be the last one applied. Preserving update order is yet another reason to adhere to this limit.
Document size	The maximum document size is 1 MB.
Document fields	Documents can have no more than 200 fields.

Item	Limit
Expressions	• Up to 50 expressions can be configured for a domain. • The maximum size of an expression is 10240 bytes. • The maximum value that can be returned by an expression is max(int64_t).
Highlighting	• The maximum number of occurrences of the search term(s) that can be highlighted is 5. • Highlights are only returned for the first 10 KB of data in a text field.
Index fields	• Up to 200 index fields can be configured for a domain. A dynamic field counts as one index field, but typically matches multiple document fields. Dynamic fields can cause the total number of fields in your index to exceed 200. If you use dynamic fields, keep the number of index fields below 1,000 to avoid performance issues. • Up to 1000 values can be specified in a field. • Up to 20 sources can be specified for an array-type field. • The maximum size of a literal field is 4096 UTF-8 code points. • The maximum size of a default value for a field is 1 KB. • An int field can contain values from -9,223,37 2,036,854,775,808 to 9,223,372,036,854,775,807 (inclusive). • Individual terms within a text or text-array field are treated as stopwords if they exceed 256 characters.

Item	Limit
Naming conventions	• Domain Names: Allowed characters are a-z (lower-case letters), 0-9, and hyphen (-). Domain names must start with a letter or number and be at least 3 and no more than 28 characters long. • Field Names: Allowed characters are a-z (lower-case letters), 0-9, and _ (underscore). Field names must begin with a letter and be at least 1 and no more than 64 characters long. The name *score* is reserved and cannot be used as a field name. • Expression Names: Allowed characters are a-z (lower-case letters), 0-9, and _ (underscore). Expression names must begin with a letter and be at least 3 and no more than 64 characters long. The name *score* is reserved and cannot be used as an expression name. • Document IDs: A document ID (_id) can contain any letter or number and the following characters: _ - = # ; : / ? @ &. Document IDs must be at least 1 and no more than 128 characters long.
Policy document size	The maximum size of an Amazon CloudSearch policy document is 100 KB.
Region restriction	The ap-northeast-2 region supports only m4 instance types.
_score	A document's text relevance score is a positive floating point value.
Search domains	Each AWS account can create up to 100 search domains.

Item	Limit
Search partitions	A search index can be split across a maximum of 10 partitions. You can submit a request if you need to increase this limit. To avoid search query failures, Amazon CloudSearch domains can grow beyond this maximum partition limit, but new document additions are rejected. If you encounter this scenario, delete documents and trigger the IndexDocuments API. Alternately, request a limit increase. You can monitor the Amazon CloudWatch `IndexUtilization` and `Partitions` metrics to take action before exceeding the maximum partition limit.
Search replicas	Each search partition can have up to 5 replicas. **Note** Enabling Multi-AZ doubles the number of replicas.

Item	Limit
Search requests	• compound queries: Can contain a maximum of 1024 clauses. • GET requests: The maximum size of a search request submitted as an HTTP GET request is 8190 bytes. • facet parameter: The maximum number of facet values you can return is 10,000. • size parameter: Can contain values in the range 0 - 10000. The sum of the size and start parameters cannot exceed 10,000. If you need to page through more than 10,000 hits, use a cursor. • sort parameter: Can contain up to 10 int fields and expressions. • start parameter: Can contain values in the range 0 - 10000. The sum of the size and start parameters cannot exceed 10,000. If you need to page through more than 10,000 hits, use a cursor.
Suggesters	• You can define a maximum of 10 suggesters for a domain. • Only the first 512 bytes of a text field are used to generate suggestions. • The scores computed from a suggester's `SortExpression` are rounded to the nearest integer, with a floor of 0 and a ceiling of 2^31-1.
Synonym dictionary size	The maximum size of a Amazon CloudSearch synonym dictionary is 100 KB.

Amazon CloudSearch Resources

The following table lists resources that you might find useful as you work with Amazon CloudSearch.

Resource	Description
AWS SDKs	Most of the AWS SDKs support Amazon CloudSearch, including the Java, .NET, Node.js, PHP, Python, and Ruby SDKs.
Amazon CloudSearch Sample Data	Download the IMDb Sample Data to get a search domain up and running quickly with the command line tools or Configuration Service API and see how to format your own data for Amazon CloudSearch.
Amazon CloudSearch Discussion Forum	The forum where Amazon CloudSearch users can post questions and discuss various Amazon CloudSearch topics.
Amazon CloudSearch Pricing	Pricing information for Amazon CloudSearch.
Request to Increase Limits	The form to request an increase in the maximum number of search instances or partitions for a search domain.
Amazon CloudSearch 2011-02-01 Developer Guide	The 2011-02-01 Amazon CloudSearch Developer Guide is available in PDF only: Download PDF.

Document History for Amazon CloudSearch

This topic describes important changes to Amazon CloudSearch.

Relevant Dates to this History:

- **Current product version—**2013-01-01
- **Latest product release—**6 January 2021
- Latest documentation update—6 January 2021

Change	Description	Release Date
New instance types	Amazon CloudSearch now uses newer instance types for new domains. These instance types provide a more intuitive scaling progression and better performance at the same price.	6 January 2021
Enforce HTTPS	You can now require that all requests to your Amazon CloudSearch domain arrive over HTTPS. To learn more, see the section called "Configuring Domain Endpoint Options".	13 November 2019
Support for resource tagging	Amazon CloudSearch added support for resource tagging. For more information, see Tagging Amazon CloudSearch Domains in this service guide.	10 February 2016
AP (Seoul) support	Amazon CloudSearch added support for the AP (Seoul) `ap-northeast-2` region. For a list of regions supported by Amazon CloudSearch, see AWS Regions and Endpoints in the AWS General Reference.	28 January 2016
Integration with Amazon CloudWatch and support for index field statistics	You can now use Amazon CloudWatch to monitor your Amazon CloudSearch domains. CloudWatch is a monitoring service for AWS cloud resources and the applications you run on AWS. Amazon CloudSearch automatically sends metrics to CloudWatch so that you can gather	5 March 2015

Change	Description	Release Date
	and analyze performance statistics. You can monitor these metrics by using the Amazon CloudSearch console, or by using the CloudWatch console, AWS CLI, or AWS SDKs. There is no charge for the Amazon CloudSearch metrics that are reported through CloudWatch. For more information about using CloudWatch to monitor search domains, see Monitoring a Domain with Amazon CloudWatch. You also can now retrieve statistics against facet-enabled numeric fields. Amazon CloudSearch can return the following statistics against indexed numeric fields in the documents: count, min, max, mean, missing, stddev, sum, and sumOfSquares. To learn more about index field statistics, see Querying For More Information.	
Support for M3 instance types	You can now use M3 instances to power your Amazon CloudSearch domains. Amazon CloudSearch now supports the following instance types for newly created domains: `m1.small`, `m3.medium` , `m3.large`, `m3.xlarge` , and `m3.2xlarge` . For more information about newly available instance types and how to modify existing domains, see Configuring Scaling Options in Amazon CloudSearch.	10 February 2015
Support for Dynamic Fields	Dynamic fields provide a way to index documents without knowing in advance exactly what fields they contain. A dynamic field's name defines a pattern that contains a wildcard (*) as the first, last, or only character. Any unrecognized document field that matches the pattern is configured with the dynamic field's indexing options. For more information, see Using Dynamic Fields in Amazon CloudSearch.	11 December 2014

Change	Description	Release Date
Enhanced Japanese Language Processing and CloudTrail Support	You can now control how Amazon CloudSearch tokenizes Japanese by adding a custom Japanese tokenization dictionary to the analysis scheme that you use for fields that contain Japanese. Configuring a custom tokenization dictionary can improve search result accuracy by facilitating indexing and retrieval of domain-specific phrases. To learn more about using custom dictionaries, see Customizing Japanese Tokenization. You can also index bigrams for Chinese, Japanese, and Korean. For more information, see Indexing Bigrams for Chinese, Japanese, and Korean. You can also now use AWS CloudTrail to get a history of Amazon CloudSearch configuration API calls and related events for your account. CloudTrail is a web service that records your account's API calls and delivers the resulting log files to your Amazon S3 bucket. You can also use CloudTrail to track changes that were made to your AWS resources. For example, you can use the API call history to perform a security analysis or troubleshoot operational issues. CloudTrail also makes it easier for you to demonstrate compliance with internal policies or regulatory standards. For more information, see the Security at Scale: Logging in AWS whitepaper. For more information about using CloudTrail to log Amazon CloudSearch calls, see Logging Amazon CloudSearch Configuration API Calls with AWS CloudTrail.	15 October 2014
Documentation Update	This update clarifies that you must URL-encode search query strings and provides additional information about getting facet information for selected buckets. For more information about bucketing facets, see Getting Facet Information.	19 September 2014

Change	Description	Release Date
Enhanced IAM Integration	You can now use IAM to control access to each domain's document, search, and suggest services and use AWS Signature Version 4 to sign all Amazon CloudSearch requests. Requests are signed automatically when you use the latest AWS SDKs and the AWS CLI. For more information, see configure access policies. In conjunction with this release, there is an update of the Amazon CloudSearch command line tools. The updated CLTs now automatically sign document upload requests submitted through the `cs-import-documents` command. You can download the new CLT bundle from the Amazon CloudSearch developer tools page . **Important** This CLT update contains just two commands: cs-import-documents and cs-configure-from-batches. All configuration actions should be performed using the AWS CLI. The AWS CLI also supports uploading documents and submitting search and suggest requests. For more information, see the AWS Command Line Interface User Guide.	14 August 2014

Change	Description	Release Date
Enhanced Amazon CloudSearch Support in the AWS SDKs and AWS CLI	The AWS SDKs and AWS CLI now provide full support for all Amazon CloudSearch 2013-01-01 API operation s, including creating, configuring, and managing search domains, uploading documents, and submitting search requests. For information about installing and using the AWS CLI, see the AWS Command Line Interface User Guide. **Note** To generate document batches and automatically configure indexing options based on the contents of a batch, you still need to use the standalone Amazon CloudSearch command line tools.	26 June 2014
Hebrew Language Support and Desired Partition Count Scaling Opti on	Amazon CloudSearch now supports Hebrew in addition to the 33 other Supported Languages. This update also adds a new scaling option, desired partition count. You can use this option to preconfigure the number of index partition s for a domain that uses the m2.2xlarge search instance type. If you have a large amount of search data, preconfig uring a domain to use more partitions can enable you to load data faster. You can also configure a domain with additional partitions to drop the per-partition document count and speed up complex queries. Amazon CloudSear ch will still scale the domain up or down based on the volume of data or traffic, but the number of partitions will never drop below your desired partition count. For more information, see Configuring Scaling Options in Amazon CloudSearch.	24 March 2014

Change	Description	Release Date
Amazon CloudSearch 2013-01-01 API	Amazon CloudSearch has a new API version with many improvements and new features. The new API is not backward-compatible with the 2011-02-01 API. To use the new features, you must create a new search domain with the 2013-01-01 API. In conjunction with this release, there is also a new set of command line tools. Note that the new tools require a Java 7 compatible JRE, so you might need to update Java to use the tools.	24 March 2014

AWS Glossary

For the latest AWS terminology, see the AWS glossary in the *AWS Glossary Reference*.