Technology Partner Integration Guide

Amazon WorkSpaces Core

Amazon WorkSpaces Core: Technology Partner Integration Guide

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Introduction

Amazon WorkSpaces Core offers managed virtual desktop infrastructure (VDI) that's designed to work with third-party management solutions. Amazon WorkSpaces Core gives technology partners like you flexibility and choice, while maintaining the security, global reliability, and cost efficiency customers have enjoyed from WorkSpaces for years. For more information, see Amazon WorkSpaces Core. Amazon WorkSpaces Core is part of the Amazon WorkSpaces Family of services. For more information, see Amazon WorkSpaces Family.

This guide is for third-party VDI solution providers who want to build a solution using Amazon WorkSpaces Core. Amazon WorkSpaces Core is for builders. Builders use Amazon WorkSpaces Core API operations to easily provide WorkSpaces capabilities in their solutions with select, purpose-built infrastructure components.

If you're a customer interested in using a VDI or desktop as a service (DaaS) solution built on Amazon WorkSpaces Core, see Amazon WorkSpaces Core and choose **WorkSpaces Core Partners** to learn more.

Shared responsibility model

Security and compliance is a shared responsibility between AWS and its partners. This shared model can help relieve your operational burden. AWS operates, manages and controls the components from the host operating system and visualization layer to the physical security of the facilities in which the service operates. The customer assumes responsibility and management of the guest operating system (including updates and security patches), other associated application software, and the configuration of the security group firewall that's provided by AWS.

Customers should carefully consider the services that they choose. Their responsibilities vary depending on the services used, the integration of those services into their IT environment, and applicable laws and regulations. The nature of this shared responsibility also provides the flexibility and customer control that permits the deployment. For more information, see Shared Responsibility Model.

Topics

Shared responsibilities with Amazon WorkSpaces Core

The following responsibilities are shared between your company and Amazon WorkSpaces Core:

- Compliance validation.
- Amazon WorkSpaces image import.
- AWS Identity and Access Management (IAM) for WorkSpaces. This responsibility includes IAM configurations and policies. This responsibility doesn't include access to the desktop through the customer and/or partner directory, or gateway services.

Amazon WorkSpaces Core responsibilities

The following responsibilities belong to Amazon WorkSpaces Core:

- Infrastructure security.

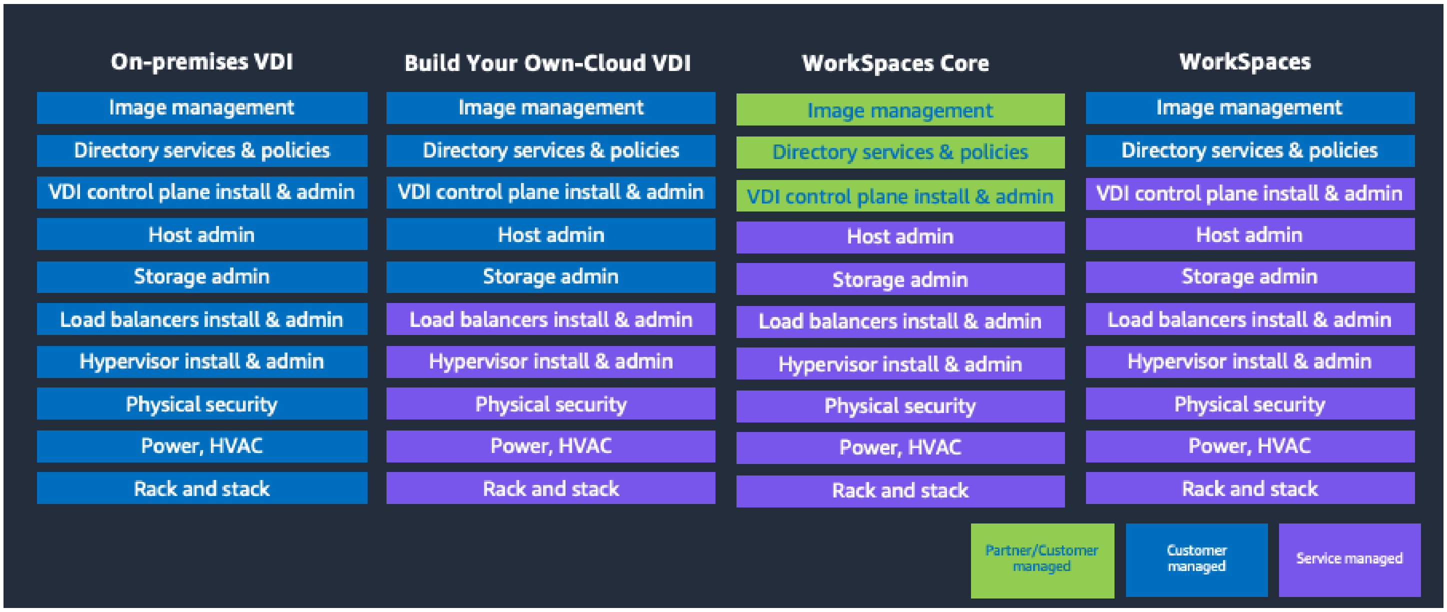
- Encryption at rest (which must be enabled). For more information, see Encrypted WorkSpaces in the *Amazon WorkSpaces Administration Guide*.
- Resilience in Amazon WorkSpaces Core (except for cross-Region redirection).
- WorkSpaces API operations, AWS Command Line Interface (AWS CLI), SDK, CDK, and console.
- WorkSpaces based monitoring.
- WorkSpaces dedicated hardware requirements.
- Windows operating system (OS) updates and security patches.

Customer and partner responsibilities

The following responsibilities belong to your company:

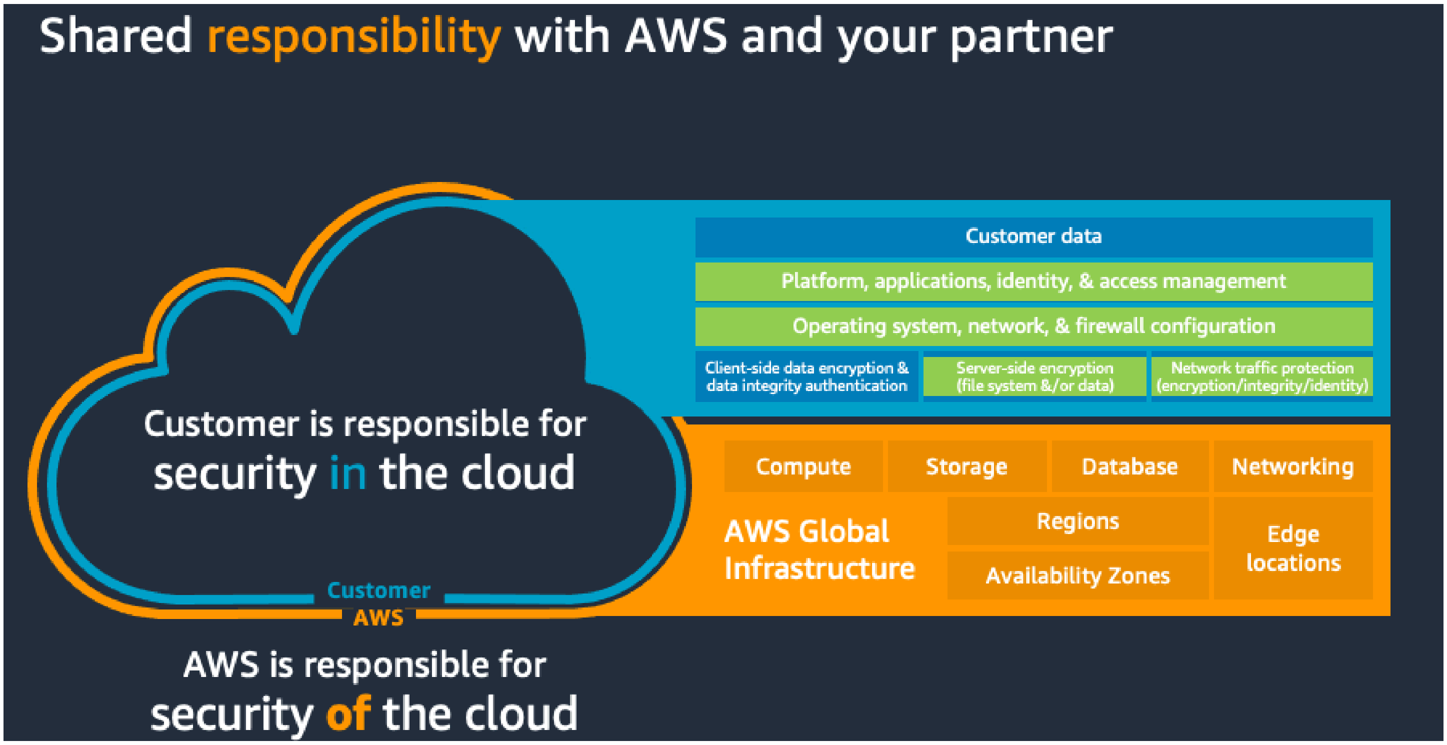
- Lifecycle of the Amazon WorkSpaces Core desktop, including calling our API, CLI, or console to provision the desktop, receiving any status, and calling our API, CLI, or console to terminate the desktop.
- Registration of Amazon WorkSpaces Core desktops within the customer or partner solution.
- Brokering Active Directory users to the Amazon WorkSpaces Core desktop.
- Gateway services for securely accessing the Amazon WorkSpaces Core desktop.
- Multi-Region resilience.
- AWS is responsible for patching and fixing flaws within the infrastructure, but customers are responsible for patching their guest OS and applications.
- Additional monitoring, security, and analytic solutions. These solutions are also the responsibility of the customer or partner operating the solution.

The following images show the shared responsibility model and shared responsibility with AWS and your partner.



On-premises VDI	Build Your Own-Cloud VDI	WorkSpaces Core	WorkSpaces
🟦 Image management	🟦 Image management	🟩 Image management	🟦 Image management
🟦 Directory services & policies	🟦 Directory services & policies	🟩 Directory services & policies	🟦 Directory services & policies
🟦 VDI control plane install & admin	🟦 VDI control plane install & admin	🟩 VDI control plane install & admin	🟪 VDI control plane install & admin
🟦 Host admin	🟦 Host admin	🟪 Host admin	🟪 Host admin
🟦 Storage admin	🟦 Storage admin	🟪 Storage admin	🟪 Storage admin
🟦 Load balancers install & admin	🟦 Load balancers install & admin	🟪 Load balancers install & admin	🟪 Load balancers install & admin
🟦 Hypervisor install & admin	🟪 Hypervisor install & admin	🟪 Hypervisor install & admin	🟪 Hypervisor install & admin
🟦 Physical security	🟪 Physical security	🟪 Physical security	🟪 Physical security
🟦 Power, HVAC	🟪 Power, HVAC	🟪 Power, HVAC	🟪 Power, HVAC
🟦 Rack and stack	🟪 Rack and stack	🟪 Rack and stack	🟪 Rack and stack

🟩 Partner/Customer managed 🟦 Customer managed 🟪 Service managed



Shared responsibility with AWS and your partner

Customer data

Platform, applications, identity, & access management

Operating system, network, & firewall configuration

Client-side data encryption & data integrity authentication	Server-side encryption (file system &/or data)	Network traffic protection (encryption/integrity/identity)

Customer is responsible for security in the cloud

AWS is responsible for security of the cloud

Prerequisites

To use an Amazon WorkSpaces Core-based virtual desktop infrastructure (VDI) solution, customers must meet the following requirements:

- The customer must have a technology partner that they're working with, or be willing to build their own control plane (broker and orchestration). They must also bring their own pixel streaming protocol.
- The customer must have Active Directory (AD connector or MAD within a customer account).
- If the customer is deploying Windows Client OS then the customer must meet the Bring Your Own License model (BYOL) criteria. For more information, see Bring Your Own Windows desktop licenses in the *Amazon WorkSpaces Administration Guide*.
- If the customer is deploying Windows Server OS then the customer will need to provide Remote desktop licensing.
  - Windows Server license included for Amazon WorkSpaces Core instances include two Microsoft Remote Desktop connections for administrative purposes only. If you need additional Microsoft Remote Desktop connections, you can buy Remote Desktop Services User CALs with Software Assurance (SA) from Microsoft and bring them to AWS through License Mobility benefits.
  - If you have Microsoft Software Assurance with License Mobility, you might be able to bring your own Microsoft RDS CALs and then use them with Amazon WorkSpaces Core. For more information about how to sign up for and complete a license verification process, and to view eligibility requirements, see License Mobility.
  - First, sign up and complete the Microsoft license verification form to confirm that you have eligible licenses with Software Assurance. For more information, see License Mobility through Software Assurance on the Microsoft website. In the License Mobility Verification form, provide the following information about the Authorized Mobility Partner:
    - Email Address: **`microsoft@amazon.com`**
    - Partner Name: **`Amazon Web Services`**
    - Partner Website: **`aws.amazon.com`**
- After the form is submitted, Microsoft provides confirmation to you and to Amazon Web Services (AWS) that you have completed the verification process.

For more information, see Microsoft licensing on AWS.

Infrastructure setup

Use the following steps to set up your customer’s AWS account. As the technology partner, you perform some steps, and your customer also performs some steps.

Topics

Enable AWS account for Bring Your Own Protocol

To enable the customer AWS account for BYOP, customers must contact their AWS account manager. For select technology partners with hosted managed solutions, BYOP might be enabled at the technology partner solution level. In that case, the customer account won't need to have BYOP enabled within their account.

Grant partner solution access to AWS account

Partner step and Customer step – Create a technology partner solution connection to the customer's AWS account.

For more information, see AWS security credentials in the IAM User Guide. This connection can be done with secret and access keys for self-managed solutions. The preferred method is to use an assume role capability. For more information, see How to Use External ID When Granting Access to Your AWS Resources at the AWS Security Blog.

If assume role access is being used, the technology partner creates an assume role from the technology partner solution's AWS account to the customer's AWS account. You can provide the customer with an AWS CloudFormation template to automate creation of the role with permissions or instructions on permissions as needed.

If assume role access is being used, instruct your customer to use tag-based authorization. This limits exposure to customer resources from the role granted to the partner solution. For more information, see Tag-based authorization guidelines.

Enable the account for BYOL and configure the BYOL CIDR block (Windows client OS ONLY)

Follow these steps to enable Bring Your Own Licenses (BYOL), configure the BYOL Classless Inter-Domain Routing (CIDR) block, and register the directory.

1. *(Customer step)* – Enable BYOL.
   1. For information on how to enable BYOL see Bring Your Own Windows desktop licenses in the *Amazon WorkSpaces Administration Guide*.
2. *(Partner step)* – List and configure the management CIDR ranges.
   1. This is the management CIDR block that is required for the WorkSpaces dedicated control plane. WorkSpaces desktops have two elastic network interfaces: one network interface for the management network and another for access to a customer's virtual private cloud (VPC).

      First use the DescribeAccountModifications API to see if the customer has configured the CIDR block already. If they haven't, use the ListAvailableManagementCidrRanges API to provide a list of CIDR block ranges for the customer to select. Then use the ModifyAccount API to configure BYOL and provide the CIDR block.

      > ⚠ **Important**
      >
      > This action can not be changed once configured.

Import the Windows Client OS image (BYOL-BYOP)

Use the following steps to import the image.

1. *(Customer step)* – The customer must have an image within Amazon Elastic Compute Cloud (Amazon EC2) as an Amazon Machine Image (AMI). For more information, see Importing a VM as an image using VM Import/Export in the *VM Import/Export User Guide*.

2. *(Partner step)* – List the AMIs and display them to the customer admin by using the DescribeImages API.

```
describe-images - (EC2)
"VirtualizationType" (filter)
"Description" (display)
"PlatformDetails" (display)
"EnaSupport" (display) - instance types limit
"Hypervisor" (display) - instance types limit
"State" (filter)
"ImageId" (display)
"VolumeType" (display)
"VolumeSize" (display) - make sure meets WS requirements
"Encrypted" (display and filter) not supported
"OwnerId" (display)
"ImageType": "machine" (filter)
"Name" (display)
```

3. *(Customer step)* – Select the Amazon EC2 AMI.

4. *(Partner step)* – Import the image. Make sure to use the BYOP import ingestion process with the ImportWorkspaceImage Amazon WorkSpaces Core API. When doing so, choose an ingestion process option that meets your needs. For more information about the ingestion process options available, see IngestionProcess in the *WorkSpaces API Reference*.

   Following is an example command using the AWS CLI:

```
aws workspaces import-workspace-image --ec2-image-id ami-example123 --ingestion-process BYOL_REGULAR_BYOP --image-name win10-ent-img01 --image-description “Windows 10 Enterprise”
```

5. *(Partner step)* – Display the status of the import by using the DescribeWorkspaceImages API.

Configure the directory

Complete the following steps to configure the directory.

1. *(Partner step)* – Present the directories that the customer admin would choose for WorkSpaces using the DescribeWorkspaceDirectories API. Amazon WorkSpaces requires that you pre-configure a directory within the AWS Directory Service.
2. *(Partner step)* – Register the directory to AWS for this WorkSpaces to access using the RegisterWorkspaceDirectory API. This step is used for adding the desktop to Active Directory. Note that BYOL requires a tenancy of DEDICATED, all others must use SHARED

Add a security group to a WorkSpaces directory

You must allow for access from the customer VPC into the Amazon WorkSpaces Core desktop. WorkSpaces desktops, including Amazon WorkSpaces Core desktops, have a security group attached to the customer VPC elastic network interface. By default, this security group blocks all traffic.

For Remote Desktop Protocol (RDP) access or access from any other protocol that will be accessing the desktop, you must add or modify a security group to the WorkSpaces directory. For more information, see Security groups for your WorkSpaces in the *Amazon WorkSpaces Administration Guide*.

You can also add this new default security group to existing WorkSpaces without rebuilding them. For more information, see To add a security group to an existing WorkSpace in the *Amazon WorkSpaces Administration Guide*. Use caution when modifying or deleting these security groups. Customers are responsible for the “security in the cloud." For more information, see Shared Responsibility Model.

Deploy Amazon WorkSpaces Core desktops

Complete the following steps to deploy the Amazon WorkSpaces Core desktops.

1. *(Partner and customer step)* – Create a bundle using the CreateWorkspaceBundle API. Initially only needed for BYOL deployments. BYOL customers import their image first. They will need to create a bundle to deploy desktops. Unlike shared tenancy deployments where WorkSpaces provides a bundle which includes an image.

   ```
   CreateWorkspaceBundle (Amazon WorkSpaces)
      "BundleDescription"
      "BundleName"
   ```

```
   "ComputeType"
   "ImageId"
   "RootStorage" - "Capacity"
   "Tags": [
   "UserStorage"
      "Capacity"
```

2. *(Partner and customer step)* – Create a WorkSpace using the CreateWorkspaces API.

> **Note**
>
> Amazon WorkSpaces Core (BYOP) supports user-decoupled and regular user-assigned WorkSpaces.

Following is an example command using the AWS CLI:

```
aws workspaces create-workspaces --workspaces DirectoryId=d-example123,UserName='"[UNDEFINED]"',WorkspaceName=desktop1,BundleId=wsb-example123
```

For `RunningMode`, the `AUTO_STOP` mode isn't available for Amazon WorkSpaces Core. Instead, a new running mode value of `MANUAL` is available for technology partner solutions to power manage the workspace and offer hourly usage of the instance. With the `MANUAL` mode, technology partner solutions use the `StartWorkSpaces` and `StopWorkSpaces` API operations to manage the workspaces. The customer is only charged for the hours when the WorkSpace is in the `AVAILABLE` state.

> **Note**
>
> To ensure that no workspaces are inadvertently charging the customer for unknown periods of time, manual workspaces in the `AVAILABLE` state will be stopped after a sufficiently long period of time (greater than or equal to 48 hours). Manual workspaces are subject to an automatic maintenance window schedule once a month, similar to the current `AUTO_STOP` workspaces detailed here. You can opt out of this maintenance schedule by using the `ModifyWorkspaceCreationProperties` API operation.

Custom images

After you deploy a WorkSpace, you can customize the image being used by customers moving forward. For example, if you use a shared tenancy bundle for BYOP and you'd like to install a partner solution agent, or install productivity or proprietary applications within an image. This is often referred to as *golden image creation*.

You can customize an image using the CreateWorkspaceImage API. You can then use use the CreateWorkspaceBundle or UpdateWorkspaceBundle API. Then deploy WorkSpaces as described within this document.

Tag-based authorization guidelines

Tag-based authorization can prevent you from modifying customer resources. This strategy utilizes IAM tag conditions. You assume a role in your customer's account, and the role will have IAM policies based on tag conditions. When you create a resource in your customer's account, the policy requires a specific tag to be added. And when you modify a resource in your customer's account, the policy ensures that it only allows modification on resources with the specified tags. You should not have permission to modify or delete tags on a resource. To create a complete IAM policy for the assume role, the customer can use the following examples.

Topics

- Tag conditions
- Additional examples

Tag conditions

TagKeys condition

To ensure that only a specific tag key can be used in a request, use the `aws:TagKeys` condition key.

RequestTag condition

To ensure that a specific tag key and value will be put on the resource, use a combination of the `aws:TagKeys` and `aws:RequestTag` condition keys. This applies to resource creation API actions, such as CreateWorkspaces.

The following tag keys policy example only allows API actions to use tag keys "PartnerManaged."

```
{
"Version":"2012-10-17",
"Statement":[
{
"Effect":"Allow",
"Action":[
ws:CreateWorkspaces
],
"Resource":"*",
"Condition":{
"StringEquals": {
"aws:RequestTag/PartnerManaged": "true"
},
"ForAllValues:StringEquals": {
"aws:TagKeys": "PartnerManaged"
}
}
}
]
}
```

ResourceTag condition

To control access to a customer’s resources based on the tag key and value use a combination of the `aws:TagKeys` and `aws:ResourceTag` condition keys. This applies to modifications related to API actions, such as ModifyWorkspaceProperties.

The following resource tag policy example ensures that modifications can only happen on resources with the tag “Key=PartnerManaged, Value=true”.

```
{
"Version":"2012-10-17",
"Statement":[
{
"Effect":"Allow",
"Action":[
ws:ModifyWorkspaceProperties
],
"Resource":"*",
"Condition":{
"StringEquals":{
"aws:ResourceTag/PartnerManaged":"true"
},
"ForAllValues:StringEquals": {
"aws:TagKeys": "PartnerManaged"
}
}
}
]
}
```

Additional examples

API name	Tag condition request	Assumed role policy for UserTag	Note

CreateWorkSpaces	TagKeys + RequestTag	{
		"Version":"2012-10-17",
		"Statement":[{
		"Effect":"Allow",
		"Action":[
		"workspaces:CreateWorkspaces"
		],
		"Resource":"*",
		"Condition":{
		"StringEquals":{
		"aws:RequestTag/PartnerManaged":"true"
		},
		"ForAllValues:StringEquals":{
		"aws:TagKeys":"PartnerManaged"
		}
		}
		}
		]
		}
			With this policy, you can only create a workspace if you provide a tag key "PartnerManaged" and value "true" in the request.

TerminateWorkSpaces	TagKeys + RequestTag	{	With this policy, you can only terminate

API name	Tag condition request	Assumed role policy for UserTag	Note

		`"Version":"2012-10-17",`
		`"Statement":[`
		`{`
		`"Effect":"Allow",`
		`"Action":[`
		`"workspaces:TerminateWorkspaces"`
		`],`
		`"Resource":"*",`
		`"Condition":{`
		`"StringEquals":`
		`{`
		`"aws:ResourceTag/PartnerManaged":"true"`
		`},`
		`"ForAllValues:StringEquals":{`
		`"aws:TagKeys":"PartnerManaged"`
		`}`
		`}`
		`}`
		`]`
		`}`
			a workspace if the workspace has a tag key "PartnerManaged" and value "true".

Lifecycle management of instances

To perform various actions for Amazon WorkSpaces Core, use the following API operations. To help you create your workflow, we have provided a recommendation for each API operation. We recommend partners solutions use as many of these APIs as possible so that admin customers don't need to access the WorkSpaces console.

- Deployment and setup
  - CreateTags
  - DescribeAccount
  - DescribeAccountModifications
  - ImportWorkspaceImage
  - ModifyAccount
  - ListAvailableManagementCidrRanges
  - RegisterWorkspaceDirectory
- Operations
  - CopyWorkspaceImage – Supports an `UpdateWorkspaceBundle` image process and copying from one AWS Region to another Region.
  - CreateWorkspaceImage – Supports custom images and workflows for day-two operations.
  - DescribeTags
  - DescribeWorkspaceBundles
  - DescribeWorkspaceDirectories
  - DescribeWorkspaceImagePermissions
  - DescribeWorkspaceImages
  - DescribeWorkspaces
  - DescribeWorkspaceSnapshots
  - MigrateWorkspace
  - ModifyWorkspaceCreationProperties
  - ModifyWorkspaceProperties – Supports modification of the following properties:
    - ComputeTypeName
    - RootVolumeSizeGib
    - RunningMode – BYOP must use `ALWAYS_ON` or `MANUAL`.

    - UserVolumeSizeGib
  - ModifyWorkspaceState
  - RebootWorkspaces
  - RebuildWorkspaces
  - RestoreWorkspace
  - StartWorkspaces
  - StopWorkspaces
  - UpdateWorkspaceBundle
  - UpdateWorkspaceImagePermission
- Termination
  - DeleteTags
  - DeleteWorkspaceBundle
  - DeleteWorkspaceImage
  - DeregisterWorkspaceDirectory
  - TerminateWorkspaces

Solution deployment guide example

As a partner who is building a solution using Amazon WorkSpaces Core, it's your responsibility to document how your customers can deploy your solution to their environments. We recommend that you create a deployment guide, with the following suggested table of contents. Some topics might not be relevant to your solution, so revise the topics as necessary.

It’s also a good practice to link to other AWS documentation where relevant. For example, refer your customers to the Amazon WorkSpaces Administration Guide for sections related to Bring Your Own License (BYOL) image import, directory setup, and virtual private cloud (VPC) setup. Specific details of your deployment guide and steps will vary, depending on the level of integration of your solution with the WorkSpaces API, and what steps customers must take manually using the AWS Management Console or AWS Command Line Interface.

As a partner, you're responsible for hosting and publishing the deployment guides on your website. Amazon WorkSpaces Core can link to these guides from the **WorkSpaces Core Partners** section at Amazon WorkSpaces Core, where customers can easily find them.

Following is a suggested table of contents for an Amazon WorkSpaces Core solution deployment guide:

- Chapter 1: Introduction
- Chapter 2: Getting started
  - Overview
  - Setting up security groups
  - Configuring the directory services security group
  - Configuring a VPC
- Chapter 3: Installing <your service> in Amazon EC2
  - Required AWS permissions
  - Launching a connection broker instance
  - Upgrading the <your service> connection broker
  - Lauching a <your service> gateway instance
  - Obtaining your <your service> license
- Chapter 4: Preparing WorkSpaces Core images
- Chapter 5: Integrating with your AWS infrastructure

  - Connecting to your Amazon diretory services
  - Connecting to your Amazon WorkSpaces account
  - Attaching the <your service> gateway to a connection broker
- Chapter 6: Launching new workspaces
  - Loading users
  - Deploying new workspaces
- Chapter 7: Connecting users to WorkSpaces
  - Amazon WorkSpaces pools
  - Protocol plans
  - Power control plans
  - Release plans
  - Building user policies
  - Assigning policies to users
  - Testing your connection broker configuration
  - Connecting to WorkSpaces

Document history for the Amazon WorkSpaces Core Technology Partner Integration Guide

The following table describes the documentation releases for Amazon WorkSpaces Core.

Change	Description	Date
Added new topic	Added "Tag-based authorization guidelines" topic	April 1, 2024
Initial release	Initial release of the Amazon WorkSpaces Core Technology Partner Integration Guide.	September 20, 2023