Citrix Virtual Apps and Desktops Service on the AWS Cloud

Quick Start Reference Deployment

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AWS Quick Start Team

Contents

This Quick Start was created by Citrix Systems in collaboration with Amazon Web Services (AWS).

Quick Starts are automated reference deployments that use AWS CloudFormation templates to deploy key technologies on AWS, following AWS best practices.

Quick Links

The links in this section are for your convenience. Before you launch the Quick Start, please review the architecture, security, and other considerations discussed in this guide.

- If you have an AWS account, and you're already familiar with AWS services and Citrix, you can launch the Quick Start to build the architecture shown in Figure 1 in a new or existing virtual private cloud (VPC). The deployment takes about 90 minutes. If you're new to AWS or to Citrix, please review the implementation details and follow the step-by-step instructions provided later in this guide.

Launch (for new VPC) **Launch (for existing VPC)**

- If you want to take a look under the covers, you can view the AWS CloudFormation templates that automate the deployment.

View template (for new VPC) **View template (for existing VPC)**

Overview

This Quick Start reference deployment guide provides step-by-step instructions for deploying a Citrix Virtual Apps and Desktops service resource location on the AWS Cloud. It is intended for users who want to accelerate a production implementation by automating the foundation setup, or for users who want to set up a trial deployment of Citrix Cloud.

Citrix Virtual Apps and Desktops Service Resource Location on AWS

This Quick Start will deploy the necessary components for Citrix Virtual Apps and Desktops service to use as a resource location on AWS.

Citrix Cloud uses the concept of a **resource location** to denote a collection of customer-managed resources that can be used by Citrix Cloud. On AWS, you typically have one resource location per Region. Resource locations typically contain Active Directory domains, Virtual Desktop Agents (VDAs), file servers, application servers, etc. Citrix Cloud Connectors are installed in a given resource location, and they facilitate communication between Citrix Cloud's control plane (web services) and the resources in the resource location. For more information, see the Citrix documentation.

This allows customers to launch applications and desktops on Amazon EC2 instances and remotely access them via the Citrix Virtual Apps and Desktops service. Using the Citrix Virtual Apps and Desktops service, you can deliver secure virtual apps and desktops to any device, and leave most of the product installation, setup, configuration, upgrades, and monitoring to Citrix. You maintain complete control over applications, policies, and users while delivering a high-quality user experience.

The user experience for this solution is provided by the Citrix Workspace platform, which provides a customizable user interface that you can apply your own branding to and that is consumable either via a web browser or via the Citrix Workspace app (available for most contemporary device and operating system platforms).

Costs and Licenses

You are responsible for the cost of the AWS services used while running this Quick Start reference deployment. There is no additional cost for using the Quick Start.

The AWS CloudFormation template for this Quick Start includes configuration parameters that you can customize. Some of these settings, such as instance type, will affect the cost of deployment. For cost estimates, see the pricing pages for each AWS service you will be using. Prices are subject to change.

> **Tip** After you deploy the Quick Start, we recommend that you enable the AWS Cost and Usage Report to track costs associated with the Quick Start. This report delivers billing metrics to an S3 bucket in your account. It provides cost estimates based on usage throughout each month, and finalizes the data at the end of the month. For more information about the report, see the AWS documentation.

This Quick Start leverages the Citrix Virtual Apps and Desktops service, which is delivered as an evergreen managed service from Citrix Cloud. For this Quick Start script to function, you will need either an active trial or a paid subscription to the Citrix Virtual Apps and Desktops service. This service is licensed on a per-user, per-month basis. For more information or to request a trial, contact your Citrix reseller or sales representative. To request an evaluation, see the Citrix Cloud services website.

> **Note** Amazon EC2 AMIs with Windows Server require no Client Access Licenses (CALs). They also include two Microsoft Remote Desktop Services licenses for administrative purposes. For Remote Desktop Session Host or Citrix Virtual Apps and Desktops use cases, we recommend obtaining additional Microsoft Remote Desktop Services licenses for additional users.

Architecture

Deploying this Quick Start for a new virtual private cloud (VPC) with **default parameters** builds the following Citrix environment in the AWS Cloud:

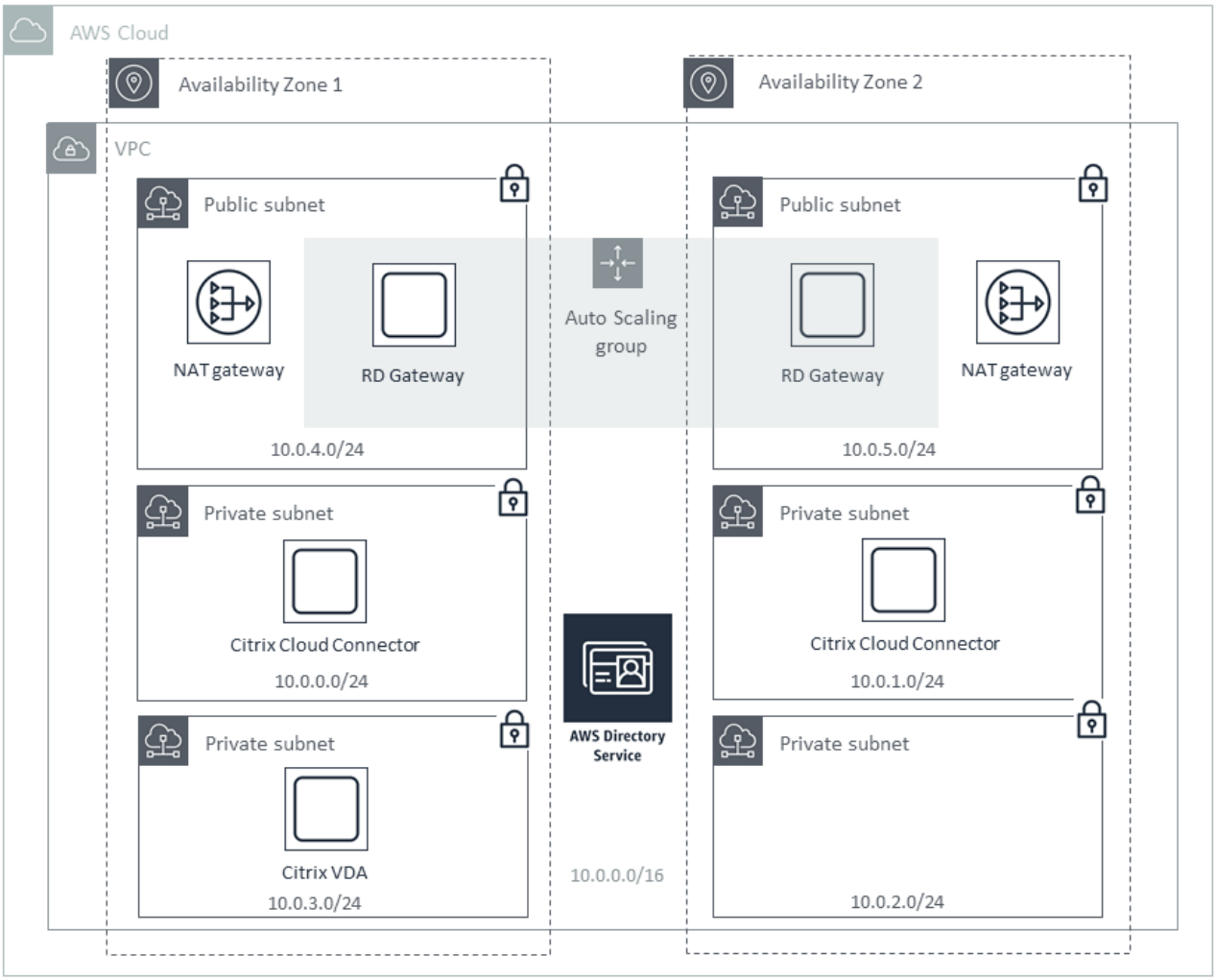


Figure 1: Quick Start architecture for Citrix Virtual Apps and Desktops service on AWS

This Quick Start sets up the following resources in AWS:

- A highly available system architecture that spans two Availability Zones. *
- A VPC configured with public and private subnets according to AWS best practices, to provide you with your own virtual network on AWS. *
- An internet gateway to allow access to the internet. *
- In the public subnets, managed NAT gateways to allow outbound internet access for resources in the private subnets. *
- In the public subnets, a Remote Desktop Gateway in an Auto Scaling group to allow inbound Remote Desktop access to EC2 instances in public and private subnets. *

- In the private subnets, AWS Directory Service for Microsoft Active Directory deployed in both Availability Zones for redundancy. *
- In the private subnets, two Citrix Cloud Connectors (domain-joined Windows servers) running on EC2 instances, deployed in both Availability Zones for redundancy.
- A Windows Server with the Citrix Virtual Delivery Agent (VDA) installed, running on an EC2 instance.

This Quick Start also performs the following in your Citrix Cloud tenant:

- Configures the two Citrix Cloud Connector instances to form a resource location on AWS.
- Creates an AWS hosting connection and resource.
- Creates a machine catalog, and adds the VDA instance to the machine catalog.
- Creates a Delivery Group, including a hosted shared desktop and two sample published applications.

* The template that deploys the Quick Start into an existing VPC skips the tasks marked by asterisks and prompts you for your existing VPC configuration.

Prerequisites

Technical Requirements

To deploy this Quick Start template, you need the following:

- An AWS account. You need an AWS account to deploy the services described in this guide..
- A Citrix Cloud tenant, with an active Virtual Apps and Desktops service trial or paid subscription. For information on requesting a trial, contact your Citrix reseller or sales representative, or visit the Citrix Cloud services website.

Specialized Knowledge

Before you deploy this Quick Start, we recommend that you become familiar with the following AWS services. (If you are new to AWS, see Getting Started with AWS.)

- Amazon EC2
- Amazon VPC
- AWS Directory Service for Microsoft Active Directory
- AWS CloudFormation

Deployment Options

This Quick Start provides two deployment options:

- Deploy a Citrix Virtual Apps and Desktops resource location into a new VPC (end-to-end deployment). This option builds a new AWS environment consisting of the VPC, subnets, NAT gateways, security groups, bastion hosts, and other infrastructure components, and then deploys a Citrix Virtual Apps and Desktops resource location into this new VPC.
- Deploy a Citrix Virtual Apps and Desktops resource location into an existing VPC. This option provisions a Citrix Virtual Apps and Desktops Resource Location in your existing AWS infrastructure.

> **Note** This deployment option requires an Active Directory inside of your existing VPC, as well as a route to the internet accessible from the subnet where you deploy the two Citrix Cloud Connectors and the Citrix VDAs.

The Quick Start provides separate templates for these options. It also lets you configure CIDR blocks, instance types, and Citrix settings, as discussed later in this guide.

Deployment Steps

Step 1. Prepare Your AWS Account

1. If you don't already have an AWS account, create one at https://aws.amazon.com by following the on-screen instructions.
2. Use the region selector in the navigation bar to choose the AWS Region where you want to deploy Citrix Virtual Apps and Desktops service on AWS.
3. Create a key pair in your preferred region.
4. If necessary, request a service limit increase for the Amazon EC2 t2.large instance type. You might need to do this if you already have an existing deployment that uses this instance type, and you think you might exceed the default limit with this deployment.

> **Note** Make sure that you have at least three Elastic IP addresses available.

Step 2. Create a Secure Client

After you sign up for your active trial or paid subscription of Citrix Virtual Apps and Desktop, you need to create a Secure Client in your Citrix Cloud tenant. When you create the Secure Client, you need to record the Customer ID, the Secure Client ID, and the Secure Client Secret. These three pieces of information will be used by the Quick Start template.

1. Log in to the Citrix Cloud management console.
2. Go to **API Access**.
3. Note the **Customer ID**.

   This value is shown in bold. Note that this is different than the OrgID, which is shown in the top right corner of the Citrix Cloud management console.

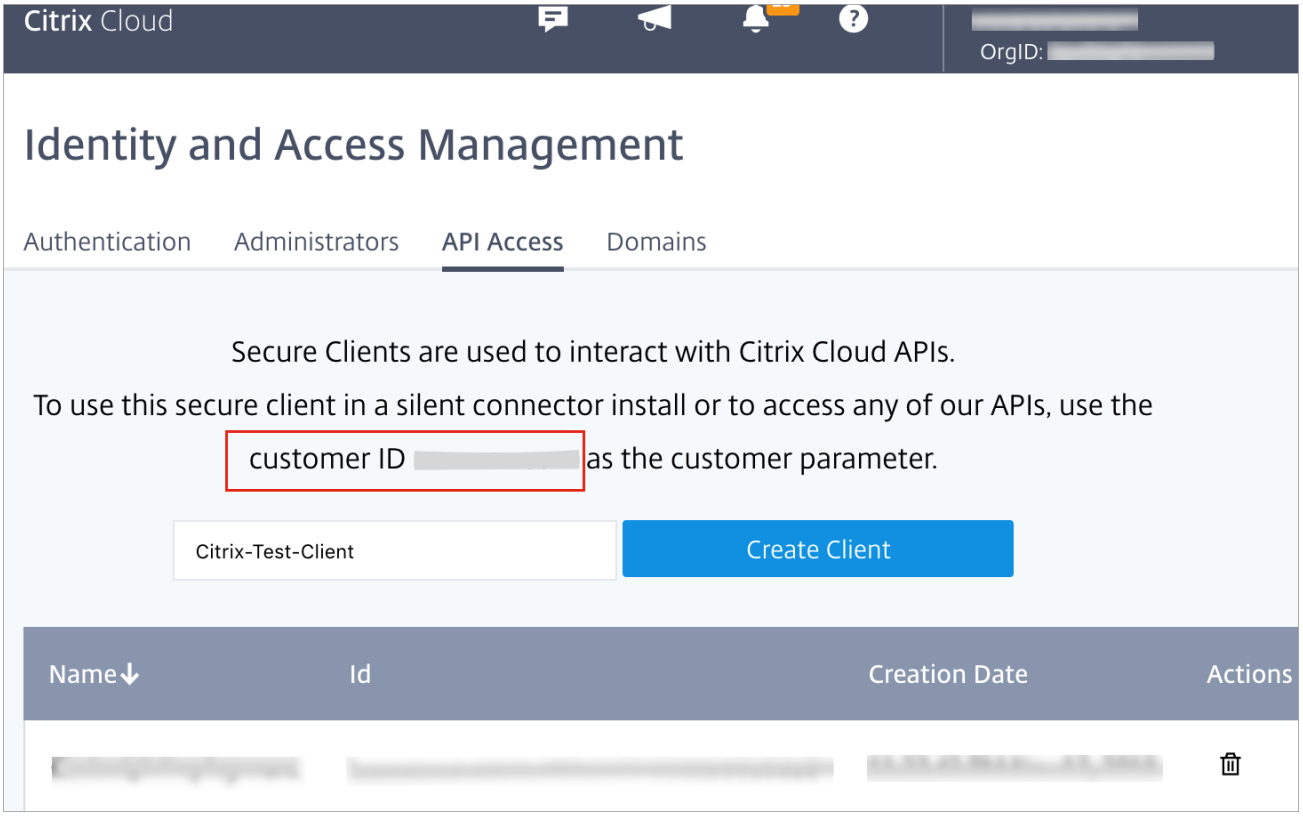


Figure 2: Identifying customer ID and creating a new secure client

4. Enter a name for the client.
5. Choose **Create Client**.
6. Download the following information from the pop-up window.:
   - **Secure Client ID** – This value looks something like c0xbc290-20c4-e96e-9f69-69b4526edf5d. The value is shown under **Id** at the time of creation, and you can retrieve it later by going to the Identify and Access Management page.
   - **Secure Client Secret** – This value looks something like jPcBJmYtBndMI1R-p420Gw==, and it is shown only at the time of creation.

Step 3. Launch the Quick Start

> **Note** You are responsible for the cost of the AWS services used while running this Quick Start reference deployment. There is no additional cost for using this Quick Start. For full details, see the pricing pages for each AWS service you will be using in this Quick Start. Prices are subject to change.

1. Choose one of the following options to launch the AWS CloudFormation template into your AWS account. For help choosing an option, see deployment options earlier in this guide.

Option 1	Option 2
Deploy **Citrix Virtual Apps and Desktops service** into a new VPC on AWS	Deploy **Citrix Virtual Apps and Desktops service** into an existing VPC on AWS
Launch	Launch

> **Important** If you're deploying Citrix Virtual Apps and Desktops service on AWS into an existing VPC, make sure that your VPC has two private subnets in different Availability Zones for the Citrix Cloud Connector instances. These subnets require NAT gateways or NAT instances in their route tables. This allows the instances to download packages and software as well as communicate with the Citrix Cloud control plane without exposing them to the internet.

When deploying the Citrix Virtual Apps and Desktops service into a new VPC on AWS, each deployment takes about 90 minutes to complete.

2. Check the region that's displayed in the upper-right corner of the navigation bar, and change it if necessary. This is where the network infrastructure where Citrix Virtual Apps and Desktops service will be built. The template is launched in the US East (Ohio) Region by default.
3. On the **Select Template** page, keep the default setting for the template URL, and then choose **Next**.
4. On the **Specify Details** page, change the stack name if needed. Review the parameters for the template. Provide values for the parameters that require input. For all other parameters, review the default settings and customize them as necessary. When you finish reviewing and customizing the parameters, choose **Next**.

In the following tables, parameters are listed by category and described separately for the two deployment options:

- Parameters for deploying the Citrix Virtual Apps and Desktops service resource location on AWS into a new VPC
- Parameters for deploying the Citrix Virtual Apps and Desktops service resource location on AWS into an existing VPC

- **Option 1: Parameters for deploying the Citrix Virtual Apps and Desktops service resource location on AWS into a new VPC**

View template

Citrix Cloud Configuration:

Parameter label (name)	Default	Description
Citrix Cloud Customer ID (CitrixCustomerId)	*Requires input*	Customer ID of your Citrix Cloud tenant.
Citrix Cloud Secure Client ID (CitrixAPIClientID)	*Requires input*	ID of your Citrix Cloud Secure Client used for integration with Citrix Cloud APIs.
Citrix Cloud Secure Client Secret (CitrixAPIClientSecret)	*Requires input*	Secret of your Citrix Cloud Secure Client.
Citrix Cloud Connector 1 name (CitrixCloudConnector1HostName)	CTX-CC1	Host name of the first Citrix Cloud Connector.
Citrix Cloud Connector 2 name (CitrixCloudConnector2HostName)	CTX-CC2	Host name of the second Citrix Cloud Connector.
Citrix VDA name (CitrixVDAHostName)	CTX-VDA1	Host name of the Citrix VDA.

Active Directory Configuration:

Parameter label (name)	Default	Description
Domain DNS name (DomainDNSName)	example.com	Fully qualified domain name (FQDN) of the forest root domain; e.g., example.com.
Domain NetBIOS name (DomainNetBIOSName)	example	NetBIOS name of the domain (up to 15 characters) for users of earlier versions of Windows; e.g., example.
Domain admin password (DomainAdminPassword)	*Requires input*	Password for the domain admin user. Must be at least 8 characters and contain letters, numbers, and symbols.

Amazon EC2 Configuration:

Parameter label (name)	Default	Description
Key pair name (KeyPairName)	*Requires input*	A public/private key pair, which allows you to connect securely to your instance after it launches. When you created an AWS account, this is the key pair you created in your preferred region.
RD Gateway instance type (RDGWInstanceType)	t2.large	Amazon EC2 instance type for the Remote Desktop Gateway instances.
Citrix Cloud Connector instance type (CitrixCloudConnectorInstance Type)	t2.large	Amazon EC2 instance type for the Citrix Cloud Connector instances.
Citrix Server VDA instance type (CitrixVDAInstanceType)	m5.large	Amazon EC2 instance type for the Citrix VDA instance.
Windows Server version for Citrix Cloud Connector (CitrixCloudConnectorsWindows ServerVersion**)**	WS2016FULL BASE	Windows Server version for the Citrix Cloud Connectors.
Windows Server version for Citrix VDA (CitrixVDAWindowsServer Version)	WS2016FULL BASE	Windows Server version for the Citrix VDA.

Network Configuration:

Parameter label (name)	Default	Description
Availability Zones **(AvailabilityZones)**	*Requires input*	List of Availability Zones to use for the subnets in the VPC. Only two Availability Zones are used for this deployment, and the logical order of your selections is preserved.
VPC CIDR (VPCCIDR)	10.0.0.0/16	CIDR block for the VPC.
Private Citrix infrastructure subnet 1 CIDR (PrivateInfraSubnet1CIDR)	10.0.0.0/24	CIDR block for private infrastructure subnet 1 located in Availability Zone 1.
Private Citrix infrastructure subnet 2 CIDR (PrivateInfraSubnet2CIDR)	10.0.1.0/24	CIDR block for infrastructure private subnet 2 located in Availability Zone 2.
Private Citrix VDA subnet 1 CIDR (PrivateVDASubnet1CIDR)	10.0.2.0/24	CIDR block for private VDA subnet 1 located in Availability Zone 1.

Parameter label (name)	Default	Description
Private Citrix VDA subnet 2 CIDR (PrivateVDASubnet2CIDR)	10.0.3.0/24	CIDR block for private VDA subnet 2 located in Availability Zone 2.
Public subnet 1 CIDR (PublicSubnet1CIDR)	10.0.4.0/24	CIDR Block for the public DMZ subnet 1 located in Availability Zone 1.
Public subnet 2 CIDR (PublicSubnet2CIDR)	10.0.5.0/24	CIDR Block for the public DMZ subnet 2 located in Availability Zone 2.
Allowed RD Gateway external access CIDR (RDGWCIDR)	*Requires input*	CIDR from which you may connect to the Remote Desktop Gateway host; e.g., 1.1.1.1/32.

AWS Quick Start Configuration:

Parameter label (name)	Default	Description
Quick Start S3 Bucket Name (QSS3BucketName)	aws-quickstart	The S3 bucket you have created for your copy of Quick Start assets, if you decide to customize or extend the Quick Start for your own use. The bucket name can include numbers, lowercase letters, uppercase letters, and hyphens, but should not start or end with a hyphen.
Quick Start S3 Key Prefix (QSS3KeyPrefix)	quickstart-citrix-virtualapps-service/	The S3 key name prefix used to simulate a folder for your copy of Quick Start assets, if you decide to customize or extend the Quick Start for your own use. This prefix can include numbers, lowercase letters, uppercase letters, hyphens, and forward slashes.

- **Option 2: Parameters for deploying the Citrix Virtual Apps and Desktops service resource location on AWS into an existing VPC**

  View template

Citrix Cloud Configuration:

Parameter label (name)	Default	Description
Citrix Cloud Customer ID (CitrixCustomerId)	*Requires input*	Customer ID of your Citrix Cloud tenant.
Citrix Cloud Secure Client ID (CitrixAPIClientID)	*Requires input*	ID of your Citrix Cloud Secure Client used for integration with Citrix Cloud APIs.
Citrix Cloud Secure Client Secret (CitrixAPIClientSecret)	*Requires input*	Secret of your Citrix Cloud Secure Client.

Parameter label (name)	Default	Description
Citrix Cloud Connector 1 name (CitrixCloudConnector1HostName)	CTX-CC1	Host name of the first Citrix Cloud Connector.
Citrix Cloud Connector 2 name (CitrixCloudConnector2HostName)	CTX-CC2	Host name of the second Citrix Cloud Connector.
Citrix VDA name (CitrixVDAHostName)	CTX-VDA1	Host name of the Citrix VDA.

Amazon EC2 Configuration:

Parameter label (name)	Default	Description
Key pair name (KeyPairName)	*Requires input*	A public/private key pair, which allows you to connect securely to your instance after it launches. When you created an AWS account, this is the key pair you created in your preferred region.
Citrix Cloud Connector instance type (CitrixCloudConnectorInstanceType)	t2.large	Amazon EC2 instance type for the Citrix Cloud Connector instances.
Citrix Server VDA instance type (CitrixVDAInstanceType)	m5.large	Amazon EC2 instance type for the Citrix VDA instance.
Windows Server version for Citrix Cloud Connector (CitrixCloudConnectorsWindowsServerVersion**)**	WS2016FULLBASE	Windows Server version for the Citrix Cloud Connectors.
Windows Server version for Citrix VDA (CitrixVDAWindowsServerVersion)	WS2016FULLBASE	Windows Server version for the Citrix VDA.

Microsoft Active Directory Configuration:

Parameter label (name)	Default	Description
Active Directory Server 1 IP address **(ADServer1PrivateIP)**	*Requires input*	IP address of the first Active Directory server located in Availability Zone 1.
Active Directory Server 2 IP address **(ADServer2PrivateIP)**	*Requires input*	IP address of the second Active Directory server located in Availability Zone 2.

Parameter label (name)	Default	Description
Domain DNS name (DomainDNSName)	example.com	Fully qualified domain name (FQDN) of the forest root domain; e.g., example.com.
Domain NetBIOS name (DomainNetBIOSName)	example	NetBIOS name of the domain (up to 15 characters) for users of earlier versions of Windows; e.g., example.
Domain admin password (DomainAdminPassword)	*Requires input*	Password for the domain admin user. Must be at least 8 characters and contain letters, numbers, and symbols.

Network Configuration:

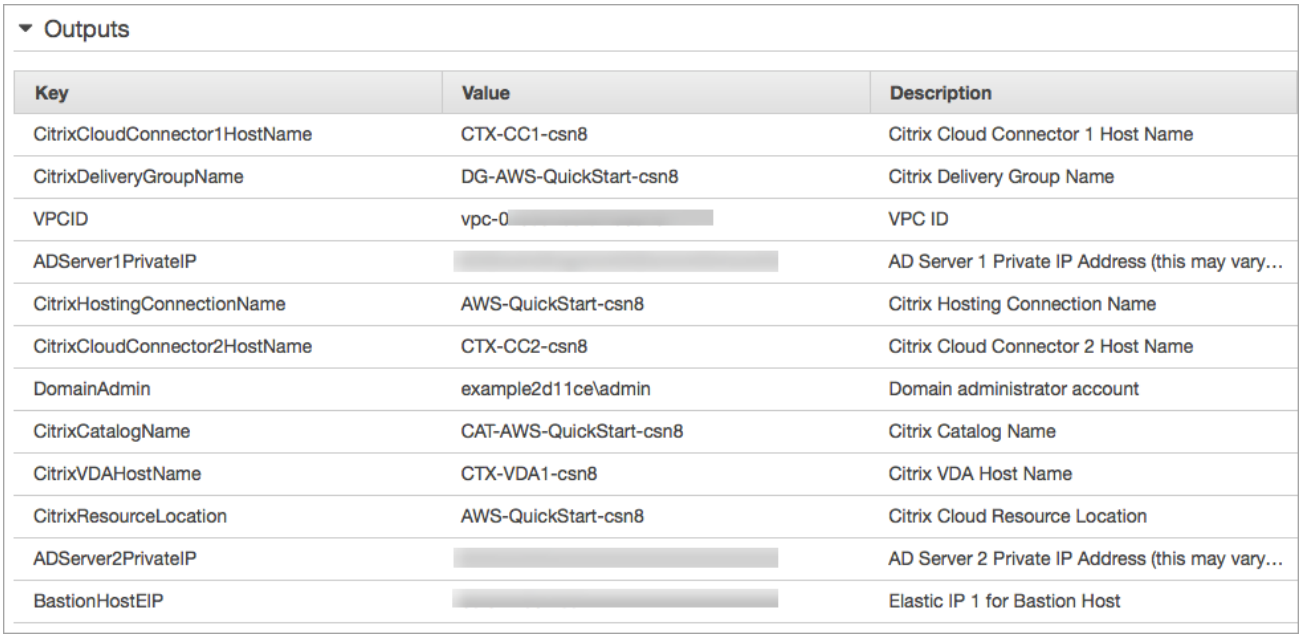
Parameter label (name)	Default	Description
VPC ID (VPCID)	*Requires input*	ID of the VPC; e.g., vpc-0343606e.
Private Citrix infrastructure subnet 1 ID (PrivateInfraSubnet1CIDR)	*Requires input*	ID of the private infrastructure subnet 1 in Availability Zone 1; e.g., subnet-a0246dcd.
Private Citrix infrastructure subnet 2 ID (PrivateInfraSubnet2CIDR)	*Requires input*	ID of the private infrastructure subnet 2 in Availability Zone 2; e.g., subnet-a0246dce.
Private Citrix VDA subnet 1 ID (PrivateVDASubnet1CIDR)	*Requires input*	ID of the private VDA subnet 1 in Availability Zone 1; e.g., subnet-a0246dcf.
Private Citrix VDA subnet 2 ID (PrivateVDASubnet2CIDR)	*Requires input*	ID of the private VDA subnet 2 in Availability Zone 2; e.g., subnet-a0246dcg.
Bastion security group ID (BastionSecurityGroupID)	*Requires input*	ID of the Bastion Security Group; e.g., sg-7f16e910.

AWS Quick Start Configuration:

Parameter label (name)	Default	Description
Quick Start S3 Bucket Name (QSS3BucketName)	aws-quickstart	The S3 bucket you have created for your copy of Quick Start assets, if you decide to customize or extend the Quick Start for your own use. The bucket name can include numbers, lowercase letters, uppercase letters, and hyphens, but should not start or end with a hyphen.
Quick Start S3 Key Prefix (QSS3KeyPrefix)	quickstart-citrix-virtualapps-service/	The S3 key name prefix used to simulate a folder for your copy of Quick Start assets, if you decide to customize or extend the Quick Start for your own use. This prefix can include numbers,

Parameter label (name)	Default	Description
		lowercase letters, uppercase letters, hyphens, and forward slashes.

5. On the **Options** page, you can specify tags (key-value pairs) for resources in your stack and set advanced options. When you're done, choose **Next**.
6. On the **Review** page, review and confirm the template settings. Under **Capabilities**, select the check box to acknowledge that the template will create IAM resources.
7. Choose **Create** to deploy the stack.
8. Monitor the status of the stack. When the status is **CREATE_COMPLETE**, the Citrix Cloud Virtual Apps and Desktops on AWS cluster is ready.
9. Use the URLs displayed in the **Outputs** tab for the stack to view the resources that were created.


Outputs

Key	Value	Description
CitrixCloudConnector1HostName	CTX-CC1-csn8	Citrix Cloud Connector 1 Host Name
CitrixDeliveryGroupName	DG-AWS-QuickStart-csn8	Citrix Delivery Group Name
VPCID	vpc-0	VPC ID
ADServer1PrivateIP		AD Server 1 Private IP Address (this may vary...
CitrixHostingConnectionName	AWS-QuickStart-csn8	Citrix Hosting Connection Name
CitrixCloudConnector2HostName	CTX-CC2-csn8	Citrix Cloud Connector 2 Host Name
DomainAdmin	example2d11ce\admin	Domain administrator account
CitrixCatalogName	CAT-AWS-QuickStart-csn8	Citrix Catalog Name
CitrixVDAHostName	CTX-VDA1-csn8	Citrix VDA Host Name
CitrixResourceLocation	AWS-QuickStart-csn8	Citrix Cloud Resource Location
ADServer2PrivateIP		AD Server 2 Private IP Address (this may vary...
BastionHostEIP		Elastic IP 1 for Bastion Host

Figure 3: CloudFormation stack outputs

Step 4. Explore and Test the Deployment

Each Quick Start deployment of the Citrix Virtual Apps and Desktops service on AWS generates and uses a four-character **Deployment ID**. This ID is used in either the name or description of many of the resources this Quick Start template creates. In the following figures, notice that the Deployment ID is **oew8**.

Explore EC2 Instances

When the Quick Start Cloud Formation template has successfully created the stack, there will be the following EC2 instances running in your AWS account:

- One Remote Desktop Gateway host (RD Gateway)
- Two Citrix Cloud Connectors
- One Citrix Virtual Delivery Agent (VDA)

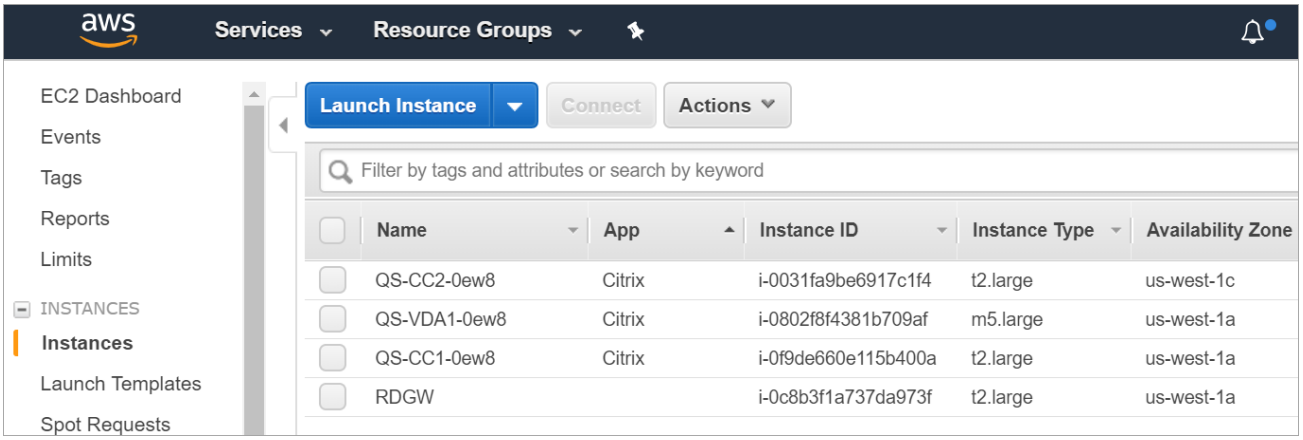


Figure 4: Quick Start Amazon EC2 instances

Connect to the Bastion Host (RD Gateway)

Since most of the EC2 instances created by this Quick Start do not have a public IP address, you use the RD Gateway to connect to these instances.

1. First, log in to the RD Gateway instance by opening a Remote Desktop Connection to the **BastionHostEIP** address shown on the Outputs tab.
2. Use the value of **DomainAdmin** as the user name, and use the value of **DomainAdminPassword** as the password. Note that the RD Gateway has a public IP address, but the other instances have private IP addresses.
3. Connect to the RD Gateway instance over the internet by using Remote Desktop, then use Remote Desktop on the RD Gateway to connect to the other EC2 instances.

   You can find the private IP addresses of the Citrix Cloud Connector and VDA instances by selecting the respective EC2 instance in the AWS Console.

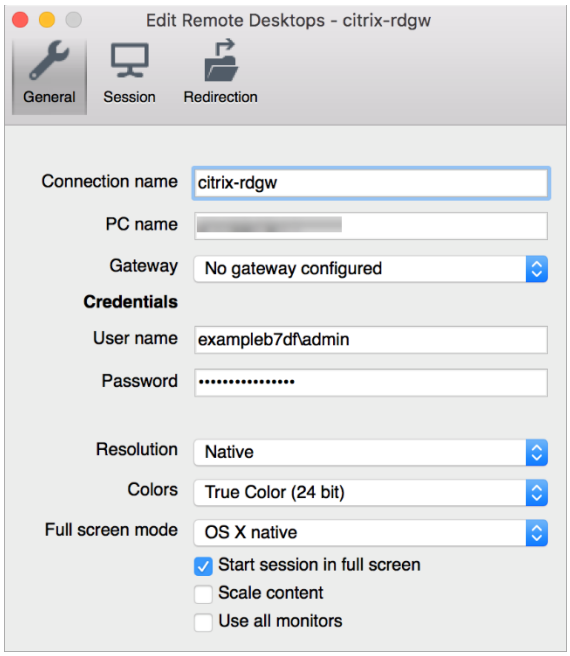


Figure 5: Accessing RD Gateway

Explore the Resources Created in Your Citrix Cloud Tenant

A successful Quick Start deployment creates a number of resources in your Citrix Cloud tenant. You can explore these resources by logging into the Citrix Cloud management console. Most of these resources are created to get you started, and you can customize them to meet your needs.

This Quick Start template creates a resource location for each deployment. The resource location follows a standard naming convention that is made unique by incorporating the Deployment ID into the name:

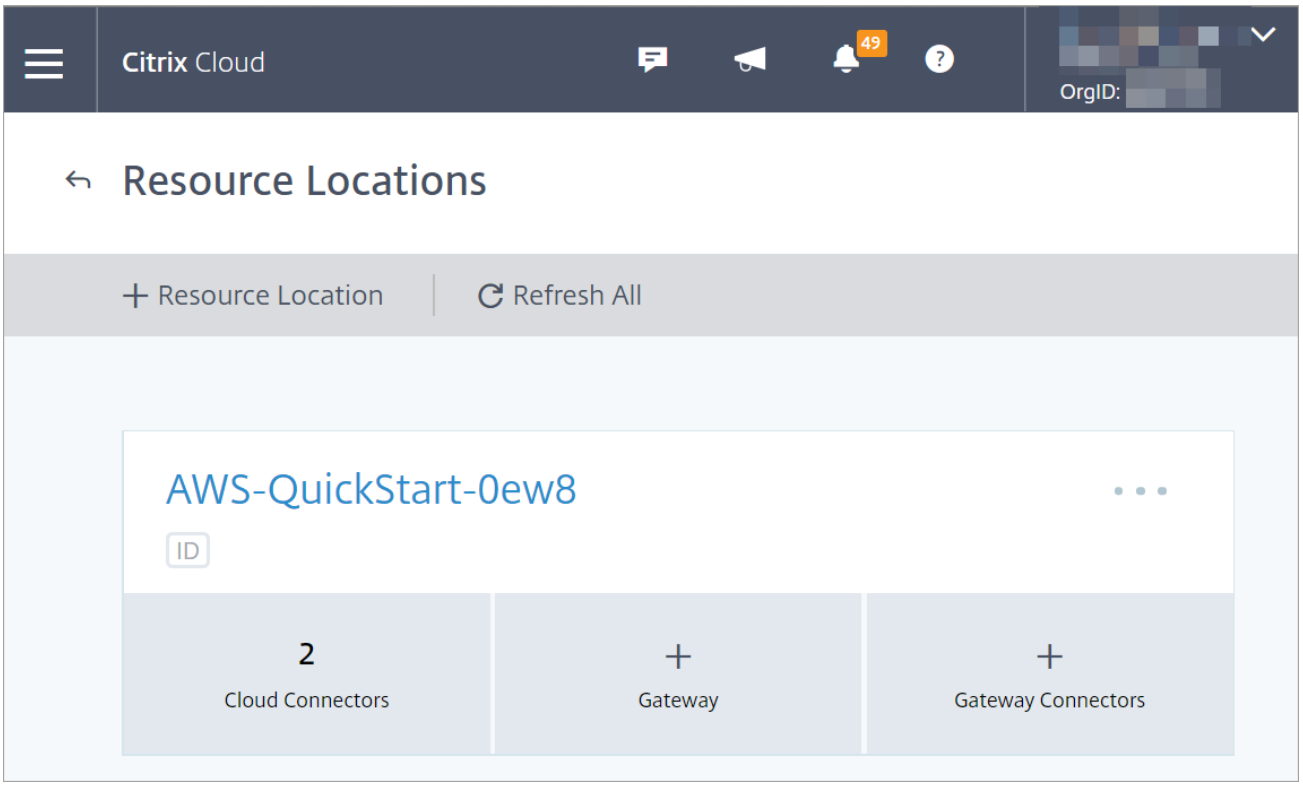


Figure 6: Quick Start Citrix resource location

Note that the resource location contains the two Citrix Cloud Connector instances created by the Quick Start template.

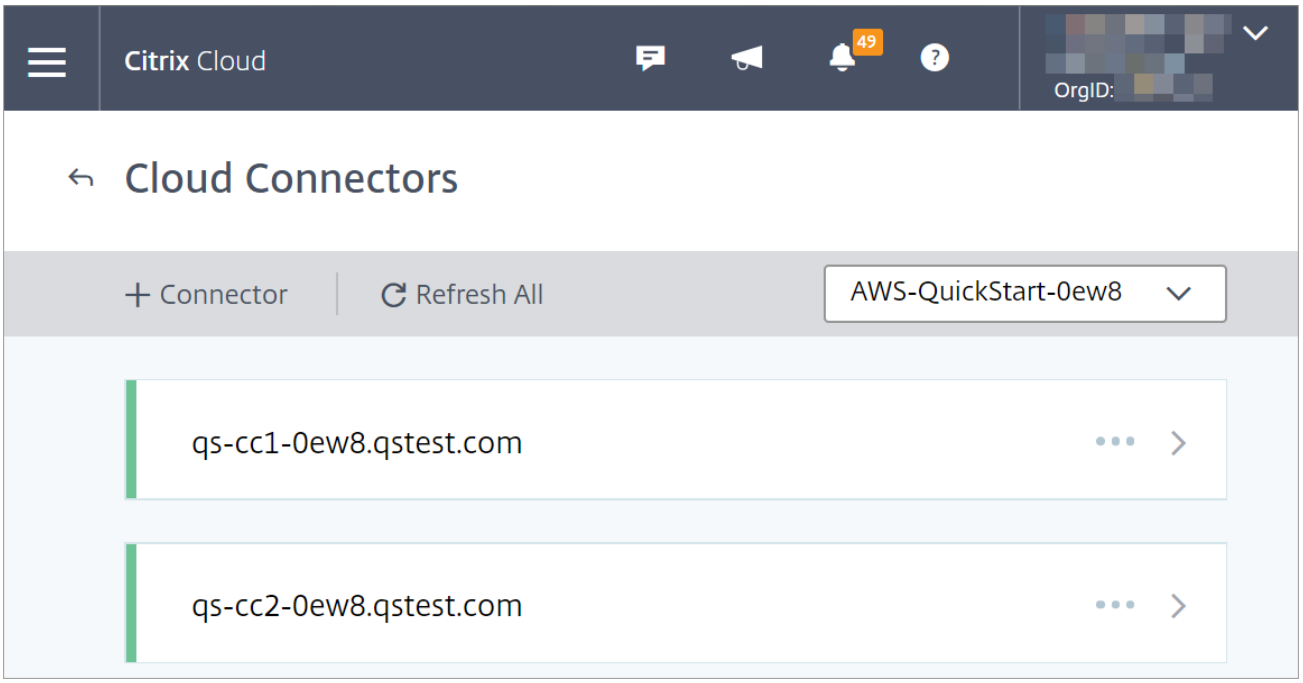


Figure 7: Quick Start Citrix Cloud Connectors

When a resource location is created, the Active Directory to which the Citrix Cloud Connectors are joined is automatically added to the list of available domains in the Citrix Cloud tenant. To see this list of domains in the Citrix Cloud management console, choose Identity and Access Management, and then choose Domains.

You can see that the qstest.com forest/domain (the name chosen for this Quick Start sample deployment) is now available in the Citrix Cloud tenant.

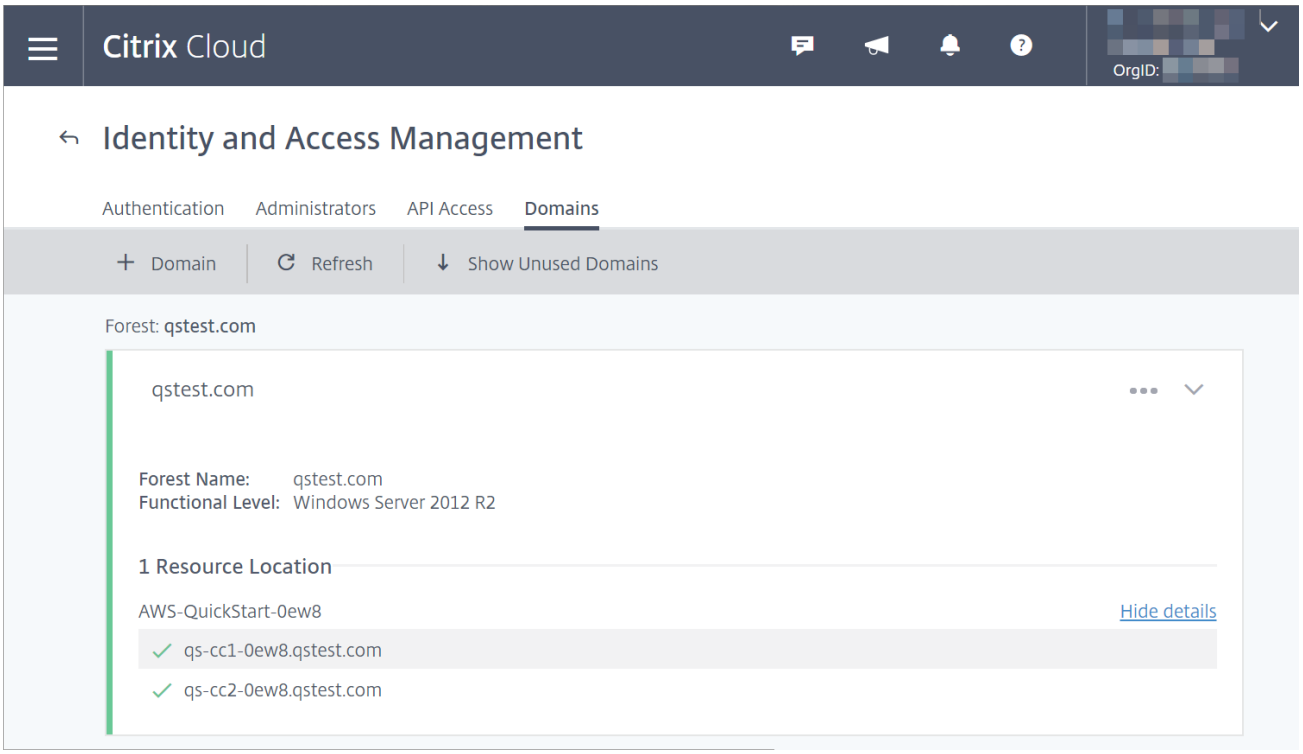


Figure 8: Citrix Cloud tenant domains

To provision and manage the VDA with the Citrix Virtual Apps and Desktops service, this Quick Start template creates a Hosting Connection and a Hosting Resource in your specific environment. More information on hosting connections and resources can be found in the Citrix documentation.

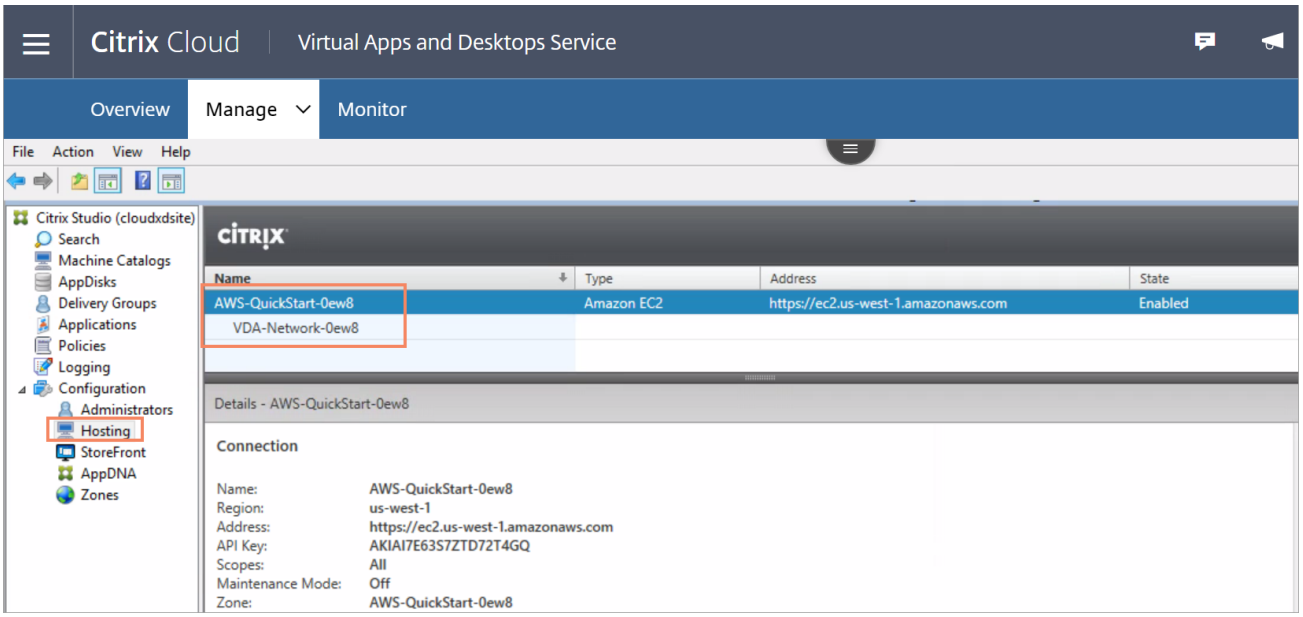


Figure 9: Citrix Cloud hosting connection

The Virtual Apps and Desktops are delivered from the VDA EC2 instance where they're installed and executed. This Quick Start template creates a single VDA based on Windows Server 2016.

Machine catalogs typically contain one or more identically configured VDAs that share the properties of the machine catalog. More information on machine catalogs can be found in the Citrix documentation.

This Quick Start template creates one manually provisioned, power-managed machine catalog based on Windows Server 2016.

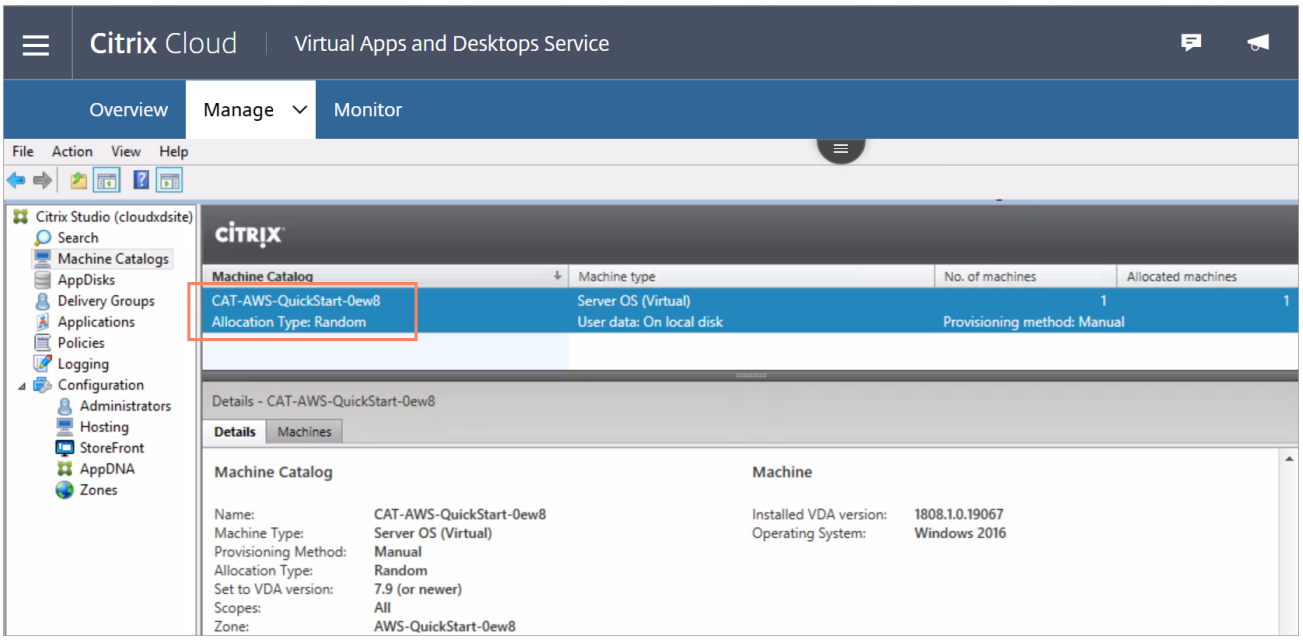


Figure 10: Citrix Cloud machine catalog

The Quick Start template adds the VDA instance it creates to the machine catalog it creates.

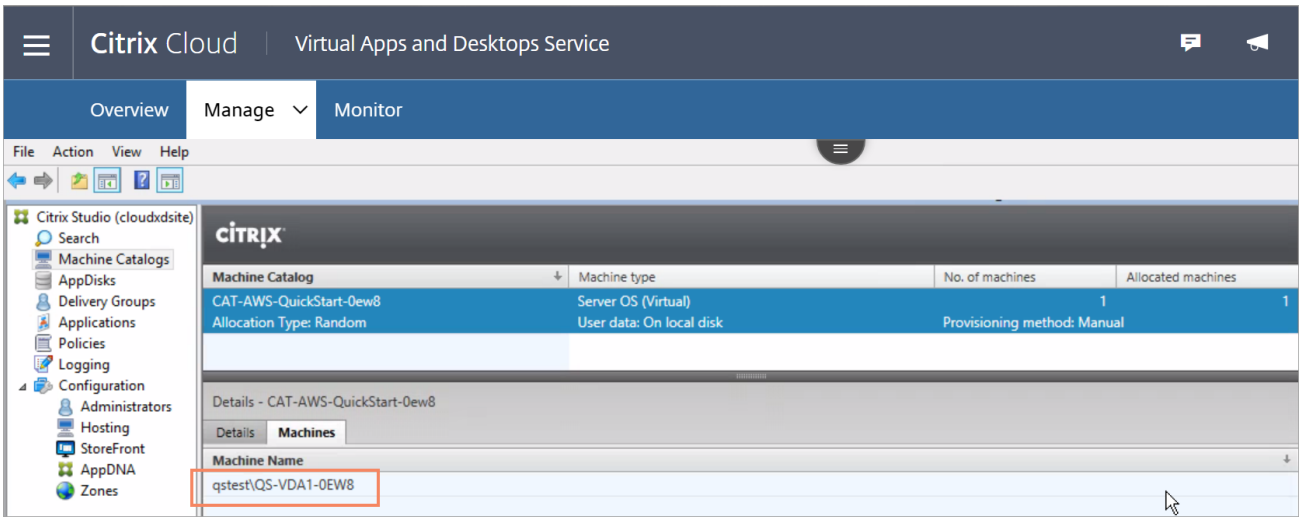


Figure 11: Citrix Cloud VDA

The Citrix Virtual Apps and Desktops are defined by Delivery Groups. Delivery Groups have a number of attributes associated with them, including Apps, Desktops, users, and machine catalogs. You can find more information on Delivery Groups in the Citrix documentation.

This Quick Start template creates one Delivery Group,, which is available to all authenticated users.

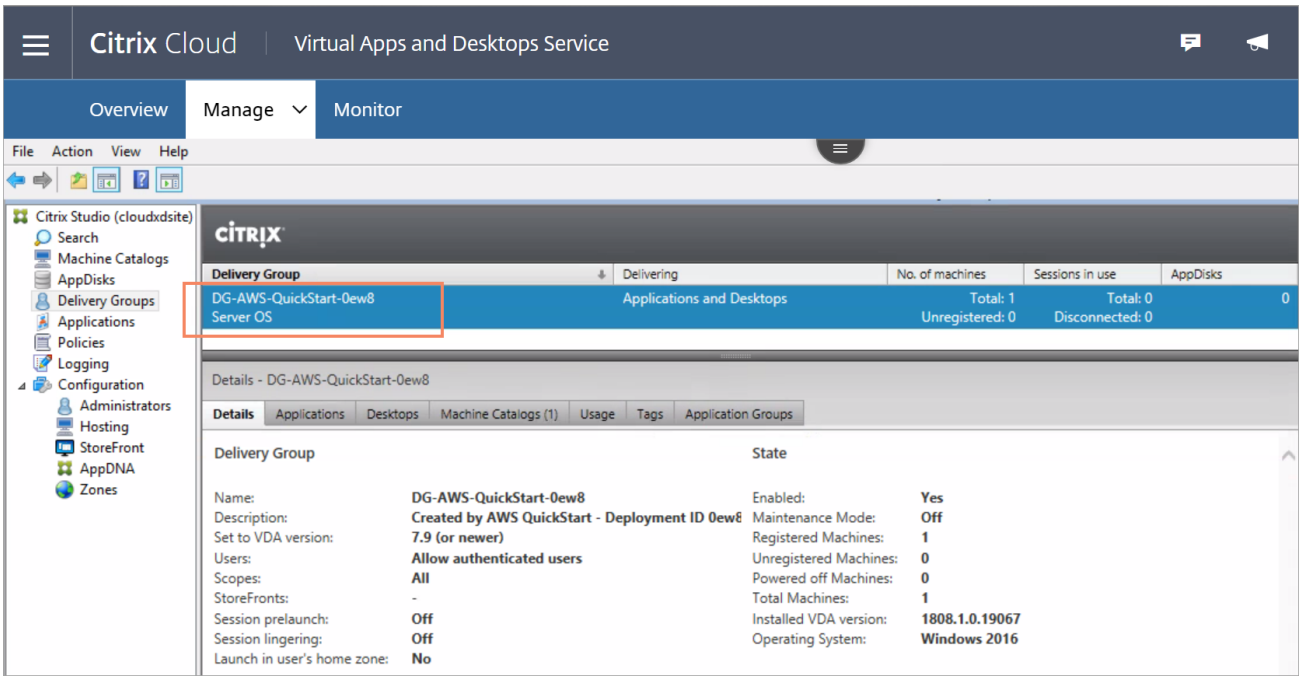


Figure 12: Citrix Cloud delivery group

This Quick Start template also defines two sample applications and a published desktop (delivered from the machine catalog).

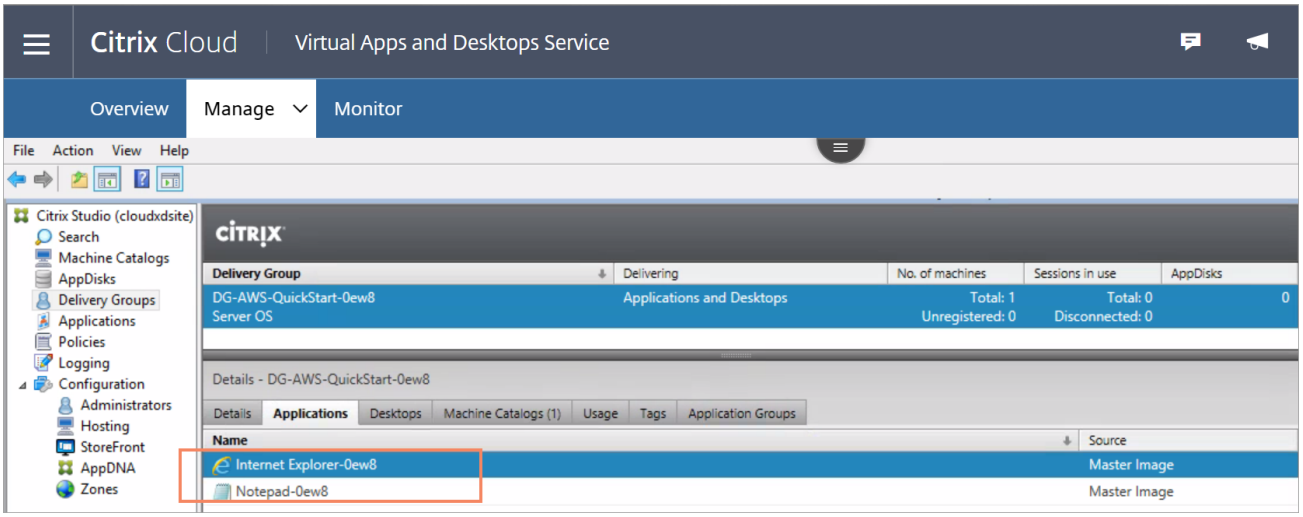


Figure 13: Citrix Cloud defined applications

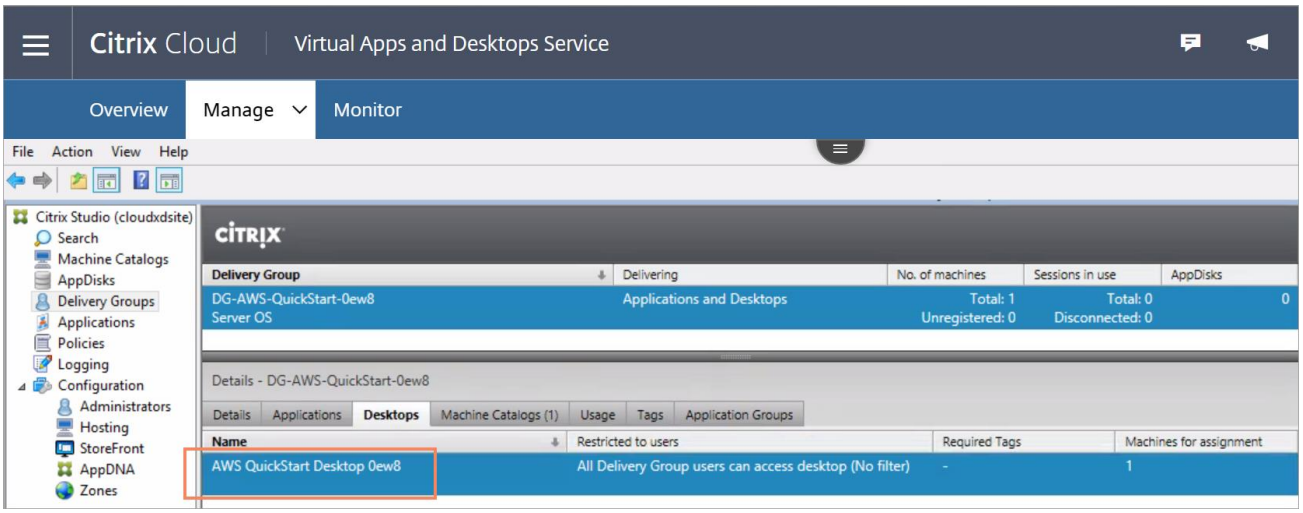


Figure 14: Citrix Cloud published desktop

Test Your Citrix Virtual Apps and Desktops Service Deployment

This Quick Start template is designed to create a fully functional deployment. After the deployment is complete, you should be able to navigate to the Citrix Workspace for your Citrix Cloud tenant, log in with appropriate credentials, and connect to the published applications or desktop.

To test your deployment, first identify the URL of your Citrix Workspace. In the Citrix Cloud management console, choose Workspace Configuration. The Workspace URL will look something like the following:

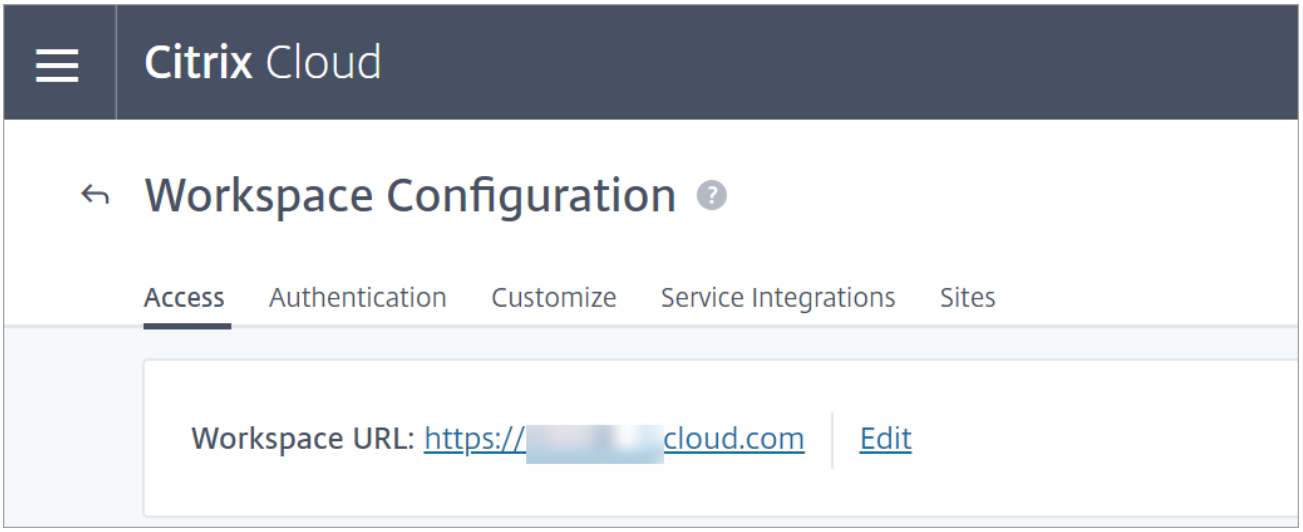


Figure 15: Citrix Cloud Workspace URL

This URL can be used by either the Citrix Workspace app or a web browser to access the Virtual Apps and Desktops service created by this Quick Start template. After you are connected, log in with a valid Active Directory user:

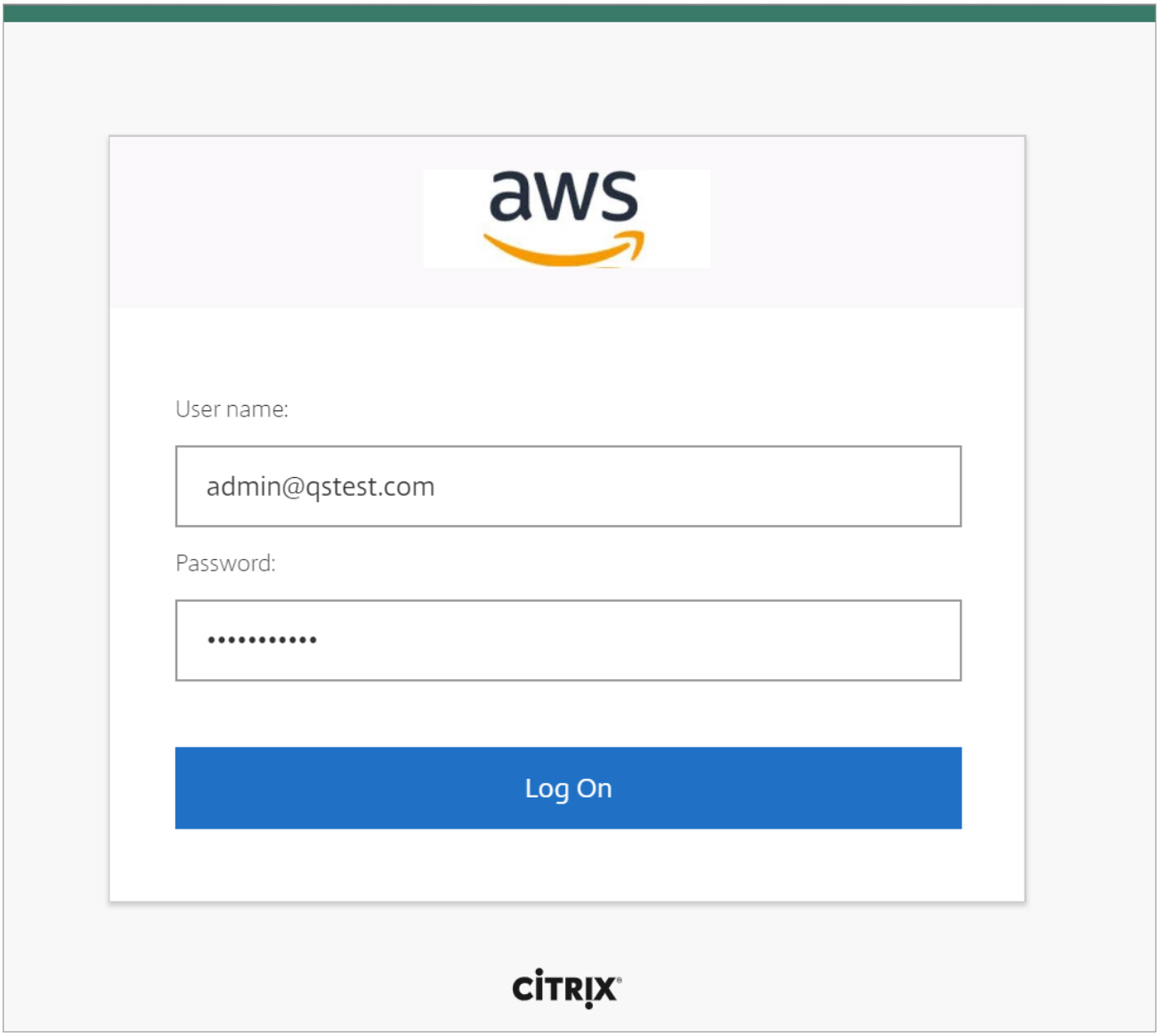


Figure 16: Citrix Cloud Workspace login

After you log in, you will see the two sample published apps and an AWS QuickStart Desktop.

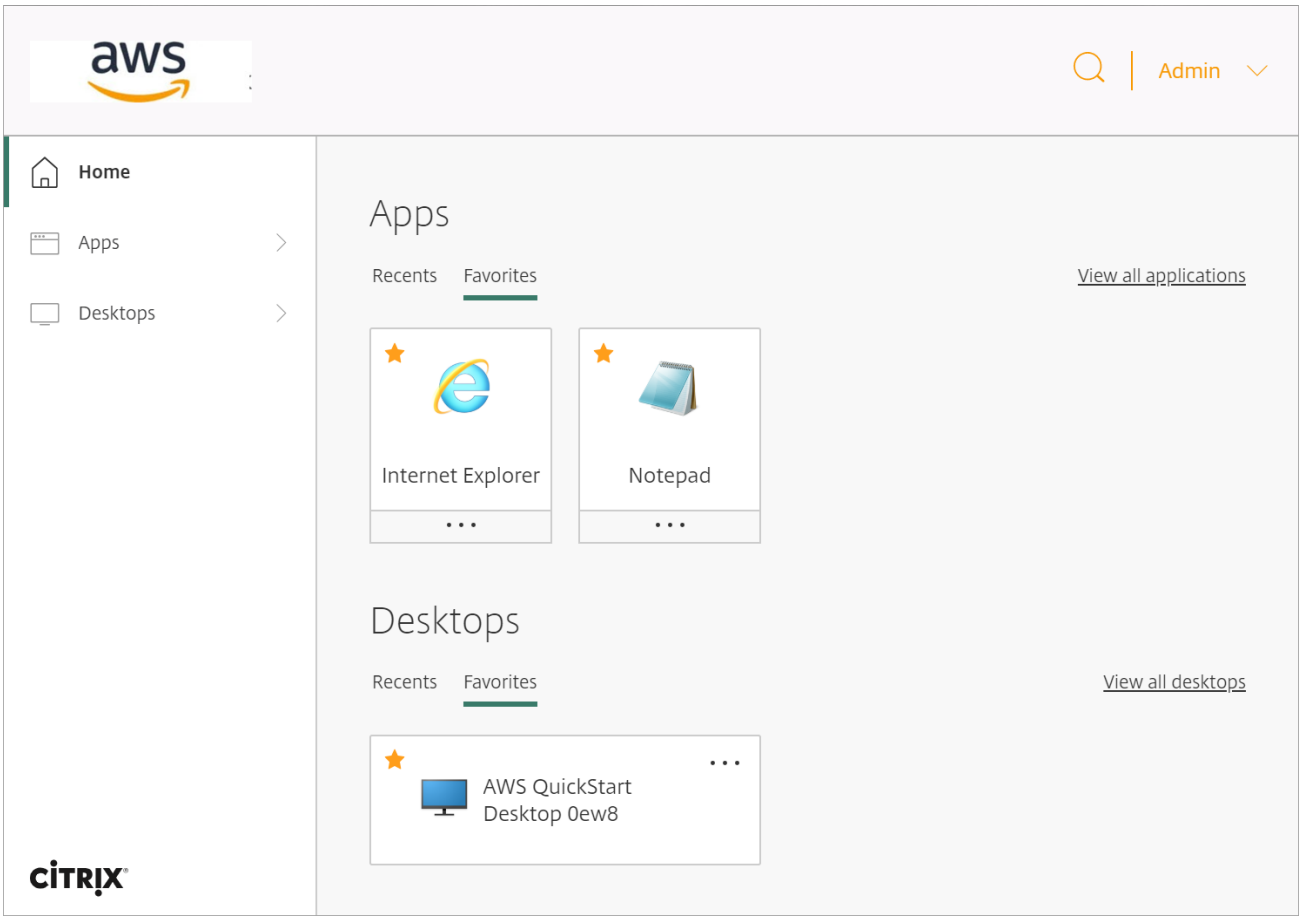


Figure 17: Citrix Workspace published apps and desktop

If you are testing the system on a client device that does **not** have the Citrix Workspace app installed on it, virtualized applications and desktops can be run in a browser tab. For the richest, highest-performance experience, install the Citrix Workspace app on the client device. This can be configured from the User, Account Settings dialog box when using Citrix Workspace web through a browser:

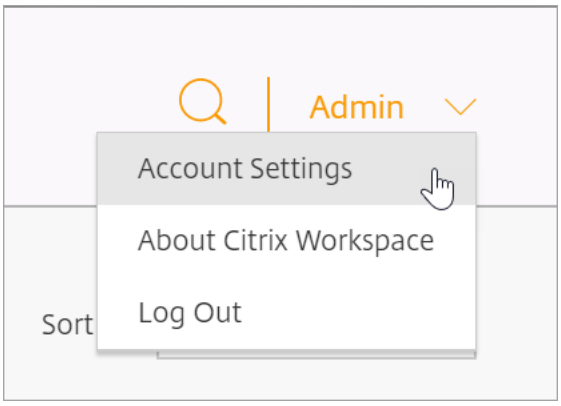


Figure 18: Citrix workspace Account Settings

You can also install and configure the Citrix Workspace app directly from here:

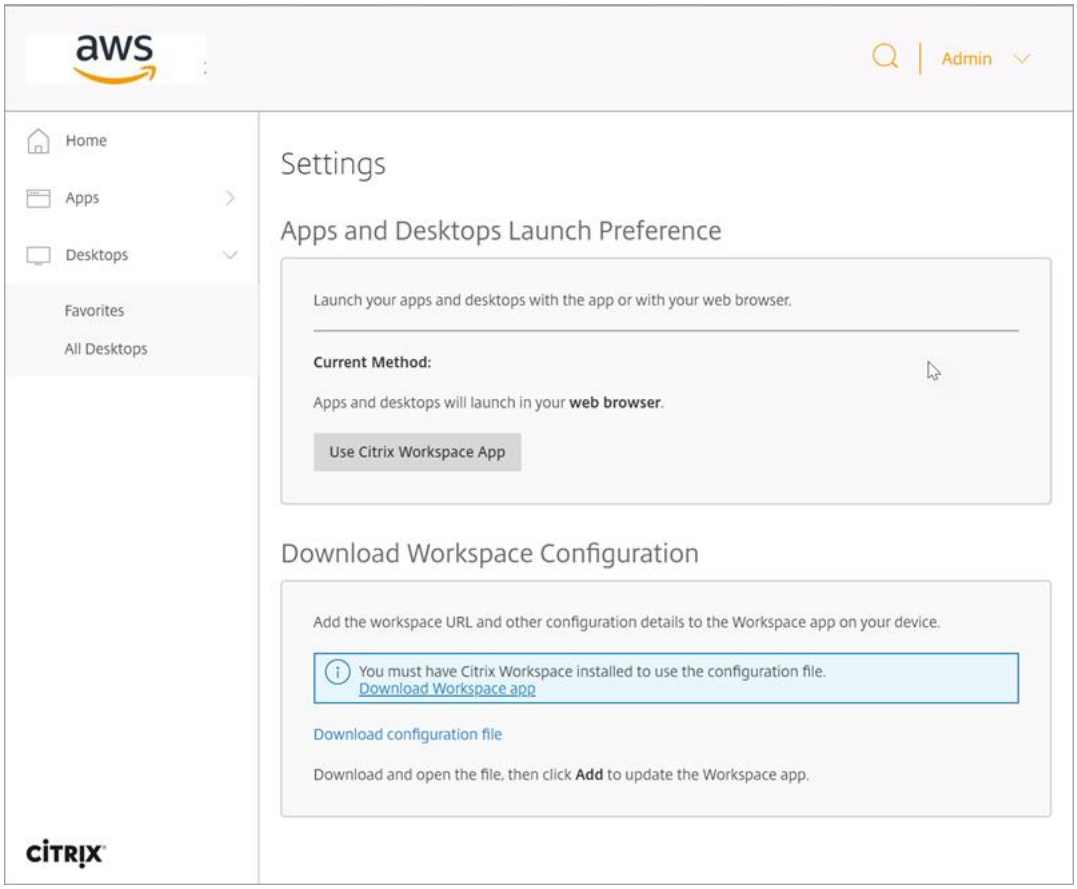


Figure 19: Citrix workspace configuration

A virtual desktop running on AWS looks like the following:

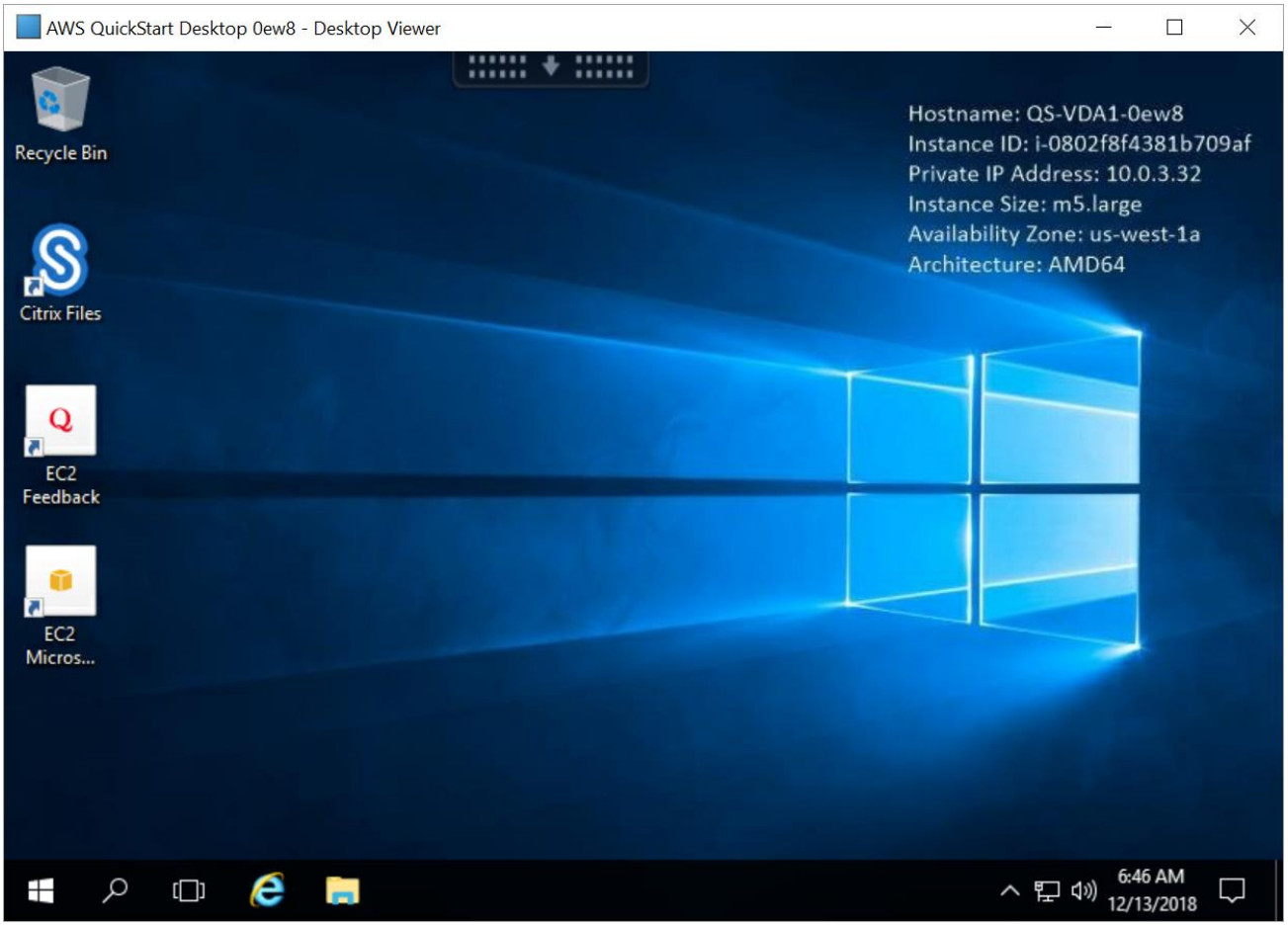


Figure 20: Citrix Workspace virtual desktop

If you log into the Citrix Workspace successfully but you do not see any virtual applications or desktops, check to ensure that the Virtual Apps and Desktops service integration is enabled by choosing **Workspace Configuration** and then choosing **Service Integrations**.

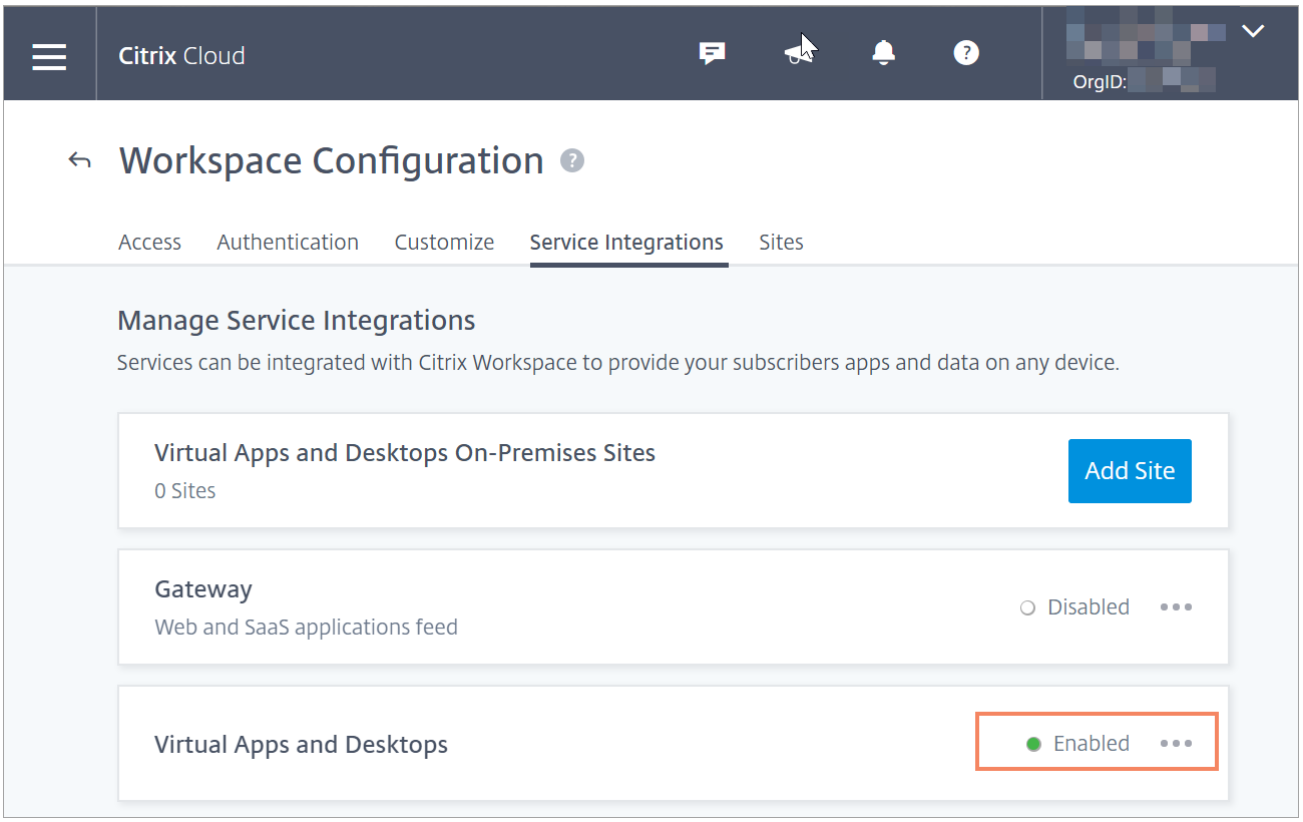


Figure 21: Citrix Workspace service integrations

Best Practices Using Citrix Virtual Apps and Desktops on AWS

Plan your Security Groups. For more information, the documentation for Amazon EC2 Security Groups for Windows Instances.

To configure mapped drives for VDA desktops, follow the steps outlined in the Directory Services blog post Using Group Policy Preferences to Map Drives Based on Group Membership.

Reference architectures and best practices are being migrated to Citrix's Tech Zone documentation website.

Customizing Your Citrix Virtual Apps and Desktops Service Deployment on AWS

You will likely want to customize the deployment to meet the needs of a specific use case. As you've seen here, this Quick Start template creates a fully functional system in about 90

minutes, but you need to customize the Delivery Group to match the organization's needs. You can also install additional applications on the VDA by remotely connecting to the instance as an administrator.

Common next steps and system customizations include:

- Modifying published applications or desktops (to remove defaults, add new apps, filter access to the resources by Active Directory user or group, etc.). This can be done on the Manage tab of the Virtual Apps and Desktops service in the Citrix Cloud management console. The Delivery Group properties are a great place to start.
- Configuring Citrix User Profile Management. The Citrix Virtual Apps and Desktops service includes a component called User Profile Management (UPM), which allows you to manage roaming user profiles in a high-performance, flexible manner. For more information on use cases and configuration of Citrix UPM.
- Provisioning and configuring the Citrix Workspace Environment Manager service. The Citrix Workspace Environment Manager service uses intelligent resource management and User Profile Management technologies to deliver competitive performance, desktop logon, and application response times for Virtual Apps and Desktops deployments. It is a software-only, driver-free solution, requiring only a lightweight agent to be installed on your VDA.
- Creating a master image VDA template instance, and deploying any number of additional instances based on the master image with Machine Creation Services. This is a more complex process, but it allows you to provision and version-manage instances at scale.
- Deploying advanced networking capabilities into the system. Citrix is also an provider of networking services, including a mix of sophisticated networking appliances and networking-related web services. You might be interested in one or more of the following:
  - Citrix ADC VPX (formerly known as NetScaler ADC), virtual appliance-based application delivery controller, performs application-specific traffic analysis to intelligently distribute, optimize, and secure Layer 4-Layer 7 (L4–L7) network traffic for web applications. It provides a broad range of services from sophisticated load balancing and SSL offload to advanced authentication, application firewalling, and more. Design and deployment guidance can be found in the Citrix documentation.
  - Citrix Gateway VPX (formerly known as Citrix NetScaler Unified Gateway) provides a comprehensive, secure remote access solution to a variety of different applications, effectively consolidating remote access infrastructure and providing secure single

sign-on to Citrix virtual apps and desktops, Remote Desktop Protocol (RDP), web, and SaaS applications. One common use case with the Citrix Workspace is leveraging Citrix Gateway VPX on AWS to flexibly proxy ICA/HDX traffic (Citrix remote display protocol used by virtual apps and desktops) directly into the AWS VPC. Find more information on configuring Citrix Gateway VPX for use with Citrix Workspace in the Citrix documentation.

- Citrix SD-WAN VPX (formerly known as Citrix NetScaler SD-WAN) allows you to set up sophisticated and flexible software-defined wide-area networks. It allows customers to leverage multiple network connections for performance and automated failover, provides application aware traffic steering and management, traffic optimization, as well as deep visibility into and control over traffic flows on the corporate WAN. It's also available on the AWS Marketplace. For deployment and integration guidance on Citrix SD-WAN on AWS, see the Citrix documentation.
- Citrix Web App Firewall protects web applications and sites from both known and unknown attacks, including application-layer and zero-day threats. It's available as a standalone appliance or integrated with the Citrix ADC platform.
- Citrix Secure Web Gateway (formerly known as Citrix NetScaler Secure Web Gateway) is an effective, easy-to-use, high-performing web security solution with user behavior analytics. It leverages a combination of web services and customer managed appliances to help protect users from known and unknown web threats. It helps enforce company security policies on all outgoing web traffic, effectively protecting the company from known and unknown attacks while providing visibility and control over outbound web traffic.
- Citrix Application Delivery Management is a centralized network management, analytics, and orchestration solution. From a single platform, administrators can view, automate, and manage network services for scale-out application architectures.
- Citrix Intelligent Traffic Management is based on recently acquired Cedexis technology. Our advanced traffic management improves user experience by harnessing big data and routing users to their requested content.

FAQ

Q. I encountered a CREATE_FAILED error when I launched the Quick Start.

A. If AWS CloudFormation fails to create the stack, we recommend that you relaunch the template with **Rollback on failure** set to **No**. (This setting is under **Advanced** in the AWS CloudFormation console, **Options** page.) With this setting, the stack's state will be retained and the instance will be left running, so you can troubleshoot the issue. (Look at the log files in `%ProgramFiles%\Amazon\EC2ConfigService` and `C:\cfn\log`.)

> **Important** When you set **Rollback on failure** to **No**, you will continue to incur AWS charges for this stack. Please make sure to delete the stack when you finish troubleshooting.

For additional information, see Troubleshooting AWS CloudFormation on the AWS website.

Q. I encountered a size limitation error when I deployed the AWS CloudFormation templates.

A. We recommend that you launch the Quick Start templates from the links in this guide or from another S3 bucket. If you deploy the templates from a local copy on your computer or from a non-S3 location, you might encounter template size limitations when you create the stack. For more information about AWS CloudFormation limits, see the AWS documentation.

Q. I encountered problems when logging in with the configured domain and password.

A. If you are unable to log in with the default domain and the password that was provided, follow the instructions in Connecting to Your Windows Instance. After you connect to the bastion instance, use Remote Desktop to connect to each of the instances within the private subnet.

GitHub Repository

You can visit our GitHub repository to download the templates and scripts for this Quick Start, to post your comments, and to share your customizations with others.

Additional Resources

AWS services

- AWS Directory Service for Microsoft Active Directory
  https://docs.aws.amazon.com/directoryservice/latest/admin-guide/directory_microsoft_ad.html
- Active Directory Administration Tools
  https://docs.aws.amazon.com/directoryservice/latest/admin-guide/ms_ad_install_ad_tools.html#install_ad_tools_win2016
- Amazon EC2
  https://aws.amazon.com/documentation/ec2/

- Amazon VPC
  https://aws.amazon.com/documentation/vpc/
- AWS CloudFormation
  https://aws.amazon.com/documentation/cloudformation/

Citrix documentation

- Citrix documentation
  https://docs.citrix.com/en-us/citrix-virtual-apps-desktops-service/
- Citrix Tech Zone
  https://docs.citrix.com/en-us/tech-zone
- Configure the Volume Worker instance to use the Machine Catalog VPC and not the default VPC
  https://support.citrix.com/article/CTX219734
- How to Define Identity Access Management Permissions Running XenDesktop on AWS
  https://support.citrix.com/article/CTX140429
- MCS doesn't show the instance type or size you'd like to use for your deployment within a machine catalog
  https://support.citrix.com/article/CTX139707
- MCS fails with dedicated instances - Citrix switched the instance type of the Volume Service Worker to T2 which doesn't exist in dedicated environments
  https://support.citrix.com/article/CTX222527

Quick Start reference deployments

- AWS Quick Start home page
  https://aws.amazon.com/quickstart/

Document Revisions

Date	Change	In sections
January 2019	Initial publication	—

Notices

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