Dell EMC Ready Architectures for VDI

Designs for Citrix XenDesktop and XenApp for Dell EMC XC Family

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Deployment Guide

Abstract

This deployment guide provides instructions for deploying Citrix core components for virtual desktop infrastructure (VDI) and XenApp for Hosted Shared Desktops on Dell EMC XC Family devices in a VMware vSphere environment.

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CHAPTER 1

Overview

This chapter presents the following topics:

Document purpose

This guide describes how to deploy the Citrix XenDesktop core components for a virtual desktop infrastructure (VDI) and Citrix XenApp for hosted shared desktops on Dell EMC XC Family devices.

XenDesktop components:

- **Delivery Controller**—The server-side component that is responsible for managing user access, brokering and optimizing connections, and providing the Machine Creation Services that create desktop and server images.

- **StoreFront**—An enterprise application store that provides an interface for users to remotely access XenDesktop and Citrix XenApp virtual desktops and applications.

- **Virtual Delivery Agent**—Software that enables connections to applications and desktops.

This guide does not replace the Citrix XenDesktop documentation. The XenDesktop documentation and Citrix VDI Handbook and Best Practices provide more information about deploying XenDesktop.

Microsoft Windows 10 optimizations are not within the scope of this guide because they depend on business IT policies. For more information, refer to the Citrix VDI Handbook and Best Practices and your local IT policies.

Audience

This guide is intended for decision makers, managers, architects, developers, and technical administrators of IT environments who need an understanding of how to deploy Citrix XenDesktop and XenApp VDI components on XC Family devices.

We value your feedback

Dell EMC and the authors of this document welcome your feedback on the solution and the solution documentation. Contact Dell EMC Solutions team with your comments.

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CHAPTER 2

Hardware and Software Requirements

This chapter presents the following topics:

XC Family devices prerequisites

Ensure that your environment meets the hardware and software requirements for installing XenDesktop core components on XC Family devices.

This guide assumes that the following prerequisites have been met:

- Dell EMC XC Family devices have been deployed according to Dell EMC recommendations and the following components are in place and configured:
  - Dell EMC XC Family devices
  - VMware vCenter Server (vCenter Server Appliance or Microsoft Windows based installations)
  - DHCP
  - NTP
  - Active Directory/DNS
  - Physical switches
  - External license server

  For more information, see the Dell EMC documentation in the References section of this guide.

- XenDesktop is installed according to the XenDesktop Documentation.

Table 1 Software requirements

Software	Version
Microsoft Windows	10
Microsoft Windows Server 2016	Standard or Datacenter edition
VMware vCenter	6.5
VMware ESXi	6.5.0
Dell EMC XC Family devices	Dell EMC XC Family device built on Dell EMC PowerEdge 14th generation server platform
Citrix XenDesktop	7.15 LTSR
Citrix Virtual Delivery Agent	7.15

XenDesktop component requirements

The XenDesktop core components require three virtual machines, as detailed in the following table.

Table 2 Virtual machine minimum requirements for XenDesktop core components

Component	Virtual machine software	CPUs	Memory	Hard drive
Citrix Delivery Controller	Microsoft Windows Server 2016	1	4 GB	40 GB

Table 2 Virtual machine minimum requirements for XenDesktop core components (continued)

Component	Virtual machine software	CPUs	Memory	Hard drive
Citrix StoreFront	Microsoft Windows Server 2016	1	4 GB	40 GB
Citrix Virtual Delivery Agent	Microsoft Windows 10 Create the master image used to deploy a pool from XenDesktop on this virtual machine.	Specifications depend on the size of your workload.		

The following table lists the minimum hardware requirements for all XenDesktop components.

Table 3 Minimum hardware requirements

Component	Minimum requirements
All core components on one server for evaluation only, not a production deployment	5 GB RAM
All core components on one server for test deployment or a small production environment	12 GB RAM
Citrix Delivery Controller	5 GB RAM, 800 MB hard disk
Citrix Studio	1 GB RAM, 100 MB hard disk
Citrix Director	2 GB RAM, 200 MB hard disk
Citrix StoreFront	2 GB RAM
License server	2 GB RAM

CHAPTER 3

Installation and Configuration

This chapter presents the following topics:

Installing Delivery Controller

Install Delivery Controller to manage user access, optimize connections, and create desktop and server images.

Before you begin

Ensure that the Delivery Controller requirements are met.

Procedure

1. On the virtual machine where the software is to be installed, download the XenDesktop software and extract the installers.

2. Right-click **XenApp_and_XenDesktop_7.*x*.iso** and select **Mount**.

3. Double-click the **AutoSelect** installer application.

4. Select **XenDesktop** and click **Start**.

5. Under **Get Started**, select **Delivery Controller**.

6. Accept the terms of the license agreement and click **Next**.

7. Under **Core Components**, select the required options and click **Next**.

   Note

   - Do not select **StoreFront**, which is installed later on a different standalone machine.

   - We recommend using an external license server, which is installed later. This guide does not provide instructions for installing the Delivery Controller license server feature.

8. Under **Features**, select the required options and click **Next**.

   - If a standalone SQL Server instance does not exist, select **Install Microsoft SQL Server 2014 SP2 Express**.

   - If you need the shadowing feature of Director Server, select **Install Windows Remote Assistance**.

9. Under **Firewall**, select **Automatically** and click **Next**.

   This option enables XenDesktop to create the firewall rules for the ports that the XenDesktop components use.

10. Under **Summary**, review the settings for accuracy and click **Install**.

    XenDesktop starts the installation process, which can take several minutes.

11. Under **Smart Tools**, select the options required for your deployment and click **Next**.

12. When the installation has completed, click **Finish**.

13. When Citrix Studio opens, ensure that the currently logged-in user has the required privileges to run Studio.

    You cannot run Studio with a local user account.

Results

The **Welcome to Citrix Studio** screen appears.

Installing StoreFront

Install StoreFront on a dedicated virtual machine.

Before you begin

Ensure that the StoreFront requirements have been met.

Although you can install StoreFront and Delivery Controller on the same virtual machine, we recommend that you install these components on separate dedicated virtual machines.

Procedure

1. On the virtual machine where the software is to be installed, download the XenDesktop software and extract the installers.

2. Right-click **XenApp_and_XenDesktop_7.x.iso** and select **Mount**.

3. Double-click the **AutoSelect** installer application.

4. Select **XenDesktop** and click **Start**.

5. Under **Extend Deployment**, select **Citrix StoreFront**.

6. Accept the terms of the license agreement and click **Next**.

7. Under **Core Components**, accept the default settings and click **Next**.

8. Under **Firewall**, select **Automatically** and click **Next**.

   This option enables XenDesktop to create the firewall rules for the ports that the XenDesktop components use.

9. Under **Summary**, review the settings for accuracy and click **Install**.

   XenDesktop starts the installation process, which can take several minutes.

10. Under **Smart Tools**, select the options required for your deployment and click **Next**.

11. When the installation has completed, click **Finish**.

Results

The Citrix StoreFront **Welcome** screen appears.

Creating a store

After you have installed StoreFront, create a store to provision VDI virtual machines for users.

Procedure

1. In StoreFront, select **Create a new deployment**.

2. Under **Base URL**, type the base URL for StoreFront to use.

3. Review the **Getting Started** screen and click **Next**.

4. Under **Store Name**, type a name for the store, select the required options, and click **Next**.

5. Under **Delivery Controllers**:

   a. Type a display name for the Delivery Controller.

   b. Select the **Transport type** (HTTP or HTTPS).

       c. Click **Add**.

       d. Type the server name of the Delivery Controller that you installed earlier and click **OK**.

6. Click **Next**.

7. Under **Remote Access**, select **Enable Remote Access** if required by your deployment and click **Next**.

8. Under **Authentication Methods**, select the methods required by your deployment and click **Next**.

9. Under **XenApp Services URL**, accept the default selections and click **Create**.

10. Under **Summary**, review the store details and click **Finish**.

   Citrix StoreFront displays the new store.

Configuring trusted domains

In StoreFront, configure a trusted domain for users.

Procedure

1. Under **My Store**, select **Manage Authentication**.

2. Under **Methods**, select **User name and password**.

3. Under **Settings**, select **Configure Trusted Domains**.

4. Select **Trusted domains only** and click **Add**.

5. In the **Add Domain** dialog box, type a domain name and click **OK**.

Creating a site

After you have installed StoreFront, created a store, and configured a trusted domain, use Citrix Studio to create a site.

Procedure

1. Log in to the Delivery Controller and open Citrix Studio.

2. Select **Deliver applications and desktops to your users**.

3. Under **Databases**, provide the following information, and then click **Next**.

   - Select **Create and set up databases from Studio**.

   - In the **Location** field, type the fully qualified domain name (FQDN) of an external SQL Server instance on which to create the databases.

4. Under **Licensing**, accept the default settings:

   - **Use the free 30-day trial**

   - **License server: Localhost**

   You will set up the external license server in a subsequent procedure.

   Note

   If you are not using an external license server and you installed the license feature during the Delivery Controller installation, then you can add the license file in this step. Installation of a local license server is beyond the scope of this guide.

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5. Under **Connection**, provide the following information, and then click **Next**.

   - **Connection type**: Select **VMware vSphere**.
   - **Connection address**: Type the connection address URL in the following format: `https://`*`hostname or IP address of the vCenter`*`/sdk`
   - **User name**: Type a username with administrator access to the vCenter Server instance.
   - **Password**: Type the password for the user.
   - **Connection name**: Type a connection name.

6. If a certificate authentication warning appears, refer to your IT policies.

   Dell EMC recommends using a CA. For more information, see Obtain and import a certificate on the Citrix website.

7. Under **Storage Management**, click **Browse**, select a cluster, click **OK**, select the required storage option, and then click **Next**.

8. Under **Storage Selection**, select all the types of virtual machine data to store on the shared storage and click **Next**.

9. Under **Network**, provide the following information, and then click **Next**.

   - Select the networks for the virtual machines to use.
   - Type a name for the network resources.

10. Under **Additional Features**, select the features to install and click **Next**.

11. Under **Summary**, review the information for accuracy, and then click **Finish**.

    The **Site Setup** page shows **Configuration Successful**.

12. Click **Test site configuration**.

    The results of the testing are displayed. If any outstanding issues exist, refer to the Citrix documentation.

Adding the StoreFront server to the Delivery Controller

Use Citrix Studio to add a StoreFront server to present desktops to end users.

Procedure

1. From Delivery Controller, select **Configuration** > **StoreFront** > **Add StoreFront Server.**

2. In the **Add StoreFront Server** dialog box, type the following information and click **OK**.

   - **StoreFront server name**
   - **Description**
   - **URL of the StoreFront server**

Results

The StoreFront server is added to the Delivery Controller.

Adding an External Citrix License Server

Add an external license server.

Procedure

1. From Delivery Controller, select **Configuration** > **Licensing** > **Change License Server.**

2. In the **Change License Server** dialog box, type the license server address and click **Connect**.

3. If a warning that the certificate is not trusted appears, refer to your IT policies.

Results

The external license server is connected.

Installing the Virtual Delivery Agent

Install the Virtual Delivery Agent on the virtual machine to be used as the master image on the user virtual machines.

Before you begin

- Ensure that the Virtual Delivery Agent requirements are met.

- Ensure that the virtual machine to be used as a master image is joined to a domain and is activated for Windows before you create a master image.

- Ensure that required Windows optimizations are completed.

Procedure

1. On the virtual machine where the software is to be installed, download the XenDesktop software and extract the installers.

2. Right-click **XenApp_and_XenDesktop_7.x.iso** and select **Mount**.

3. Double-click the **AutoSelect** installer application.

4. Select **XenDesktop** and click **Start**.

5. Under **Prepare Machines and Images**, select **Virtual Delivery Agent for Windows Desktop OS**.

6. If the User Account Control warning appears, click **Yes**.

7. Under **Environment**, select **Create a Master Image**.

8. Under **HDX 3D Pro**, select one of the following modes and click **Next**.

   - If you are using shared graphics through a GPU card, select **Yes, install VDA in HDX 3D Pro mode**.

   - If you are not using shared graphics, select **No, install VDA in standard mode**.

9. Under **Core Components**, select the required components and click **Next**.

10. Under **Additional Components**, select the required components and click **Next**.

    If you use Machine Creation Services (MCS) to provision desktops, select **Citrix Machine Identity Service**.

11. Under **Delivery Controller**, connect the master image to a Delivery Controller:

      a. Type the FQDN hostname of the Delivery Controller.

      b. Click **Test connection**.

      c. If the test is successful, click **Add**.

         If the test is unsuccessful, refer to the Citrix documentation for troubleshooting procedures.

      d. Click **Next**.

12. Under **Features**, select the required features and click **Next**.

13. Under **Firewall**, select **Automatically** and click **Next**.

    This option enables XenDesktop to create the firewall rules for the ports that the XenDesktop components use.

14. Under **Summary**, review the settings for accuracy and click **Install**.

    XenDesktop starts the installation process, which can take several minutes.

15. Under **Smart Tools**, select the options required for your deployment and click **Next**.

16. Under **Finish**, ensure that **Restart machine** is selected and click **Finish**.

Deploying a non-persistent MCS catalog

Deploy a non-persistent MCS catalog on XenDesktop 7.*x*.

Before you begin

Ensure that XenDesktop and its core components (Delivery Controller, StoreFront, and Virtual Delivery Agent) are installed.

Procedure

1. Log in to the Delivery Controller and open Citrix Studio.

2. Select **Machine Catalog** > **Create Machine Catalog**.

3. Read the information under **Introduction**, and then click **Next**.

4. Under **Operating System**, select **Desktop OS** and click **Next**.

    The selected operating system is used to create the virtual machine pool.

5. Under **Machine Management**, make the following selections, and then click **Next**.

    - Select **Machines that are power managed**. This option enables you to create a pool of virtual machines.

    - For **Deploy machines using**, select **Citrix Machine Creation Services (MCS)**.

6. For **Desktop Experience**, select the options for your deployment and click **Next**.

7. For **Master Image**, select the virtual machine or snapshot to use as the template for virtual machines deployed by the pool and click **Next**.

    If no snapshots exist, XenDesktop automatically creates one.

8. Under **Virtual Machines**, provide the following information and click **Next**.

    - Select the number of virtual machines required for the pool.

- Select the amount of memory for each machine.
- Select the amount of memory allocated to cache.
- Select the disk cache size.

9. Under **Computer Accounts**, provide the following information and click **Next**.

   - Select **Create New Active Directory accounts**.
   - Type the location in Active Directory where the virtual machines will be placed.
   - In the **Account naming scheme** field, type a name for the virtual machines followed by ### (hashtags). The number of hashtags represents the number of trailing digits required by your naming scheme.

10. Under **Summary**, review the information for accuracy, type a **Machine Catalog name**, and click **Finish**.

Results

Citrix MCS provisions the pool to the hosts.

Creating delivery groups

Procedure

1. In Citrix Studio, select **Delivery Group** > **Create Delivery Group**.
2. Read the information under **Introduction**, and then click **Next**.
3. Under **Machines**, verify the machine catalog, select the number of virtual machines for the delivery group, and click **Next**.
4. Under **Users**, select the users that will have access to the delivery group and click **Next**.

   Depending on the requirements, you might want to restrict access to certain users for security purposes.

   - To select all users, select **Allow any authenticated users to use this Delivery Group.**
   - To restrict access to the delivery group, select **Restrict use of this Delivery Group to the following users**, click **Add**, and select the Active Directory users or groups that should have access.
5. (Optional) Under **Applications**, click **Add** to add applications to the virtual machines.
6. Click **Next**.
7. Under **Desktops**, click **Add** to assign users or groups to the virtual machines in the delivery group.
8. In the **Add Desktop** dialog box, provide the following information and click **OK**.

   - Type a display name for the delivery group.
   - Select the option to allow all users to use the virtual desktop or restrict use to selected users. Click **Add** to select users for restricted access.
9. Under **Desktops**, review the added information for accuracy and click **Next**.
10. Under **Summary**, review the settings for accuracy, type a name for the delivery group, and click **Finish**.

The delivery group is created.

11. Right-click the delivery group and select **Edit Delivery Group**.

12. Select **Power Management** and change the virtual machine power settings according to your business policies.

Note

The power settings can also be managed by PowerShell. The Citrix documentation provides more details.

Deploying XenApp hosted shared desktops

Deploy XenApp hosted shared desktops MCS Catalog on XenDesktop 7.x

Before you begin

Ensure that XenDesktop and its core components (Delivery Controller, StoreFront, and Virtual Delivery Agent) are installed. Instructions are provided in the sections, Installing Delivery Controller on page 12, Installing StoreFront on page 13, and Installing the Virtual Delivery Agent on page 16.

Procedure

1. Log in to the Delivery Controller and open Citrix Studio.

2. Select **Machine Catalog** > **Create Machine Catalog**.

3. Read the information under **Introduction**, and then click **Next**.

4. Under **Operating System**, select **Server OS** and click **Next**.

   The selected operating system is used to create the virtual machine pool.

5. Under **Machine Management**, make the following selections, and then click **Next**.

   • Select **Machines that are power managed**. This option enables you to create a pool of virtual machines.

   • For **Deploy machines using**, select **Citrix Machine Creation Services (MCS)**.

   • For **Resources** use the drop-down menu to select which resource that you will be using to during the pool creation process.

6. For **Master Image**, select the virtual machine or previously created snapshot that will be used as the template for the virtual machines being deployed by the pool and click **Next**. If no snapshots have been created before Citrix will automatically create a new snapshot and then click **Next**.

7. Under **Virtual Machines**, provide the following information and click **Next**.

   • Select the number of virtual machines required for the pool.

   • Select the amount of memory for each machine.

   • Select the amount of memory allocated to cache.

   • Select the disk cache size.

8. Verify your settings and click **Next**.

9. Under **Computer Accounts**, provide the following information and click **Next**.

- Select **Create New Active Directory accounts**.

- Type the location in Active Directory where the virtual machines will be placed.

- In the **Account naming scheme** field, type a name for the virtual machines followed by ### (hashtags). The number of hashtags represents the number of trailing digits required by your naming scheme.

10. Under **Summary**, review the information for accuracy, type a **Machine Catalog name**, and click **Finish**.

Results

Citrix MCS provisions the XenApp hosted shared desktops to the hosts.

Installing and configuring NVIDIA GPU

Before you begin

Ensure that the Memory Mapped I/O (MMIO) setting in the system BIOS is set to 12 TB:

1. Press F2 on startup to enter the system BIOS settings.

2. Select **Integrated Devices**.

3. Ensure that the Memory Mapped I/O base option is set to 12 TB.

4. Save and exit.

The Dell EMC R740xd Installation and Service Manual provides more information about the MMIO default setting and when to change it to 12 TB.

Instructions for the following steps are located in the NVIDIA Virtual GPU Software Quick Start Guide.

Procedure

1. Follow the instructions for Installing the License Server Software to configure the license server and attach the license files.

2. If you are using NVIDIA vGPU, ensure that error correcting code (ECC) memory is disabled on all GPUs.

   NVIDIA vGPU does not support ECC memory and fails to start if ECC is enabled.

   a. Ensure that NVIDIA Virtual GPU Manager is installed on your hypervisor and that the host is in maintenance mode.

   b. Follow the steps under Disabling ECC Memory.

3. Follow the steps for Configuring a vSphere VM with Virtual GPU to configure the virtual machine (VM) hardware and attach an NVIDIA vGPU profile to a VM.

4. Follow the steps for Installing the NVIDIA vGPU Software Display Driver to install the NVIDIA windows drive package on the guest VM/Master image.

CHAPTER 4

References

This chapter presents the following topics:

Dell EMC documentation

The following Dell EMC documentation provides additional and relevant information. Access to these documents depends on your login credentials. If you do not have access to a document, contact your Dell EMC representative.

- Dell EMC Virtual Desktop Infrastructure
- Dell EMC XC Series Family Technical Resource Center

This document is part of the documentation set for this architecture, which includes the following:

- Dell EMC Ready Architectures for VDI: Designs for Citrix XenDesktop and XenApp on XC Family Design Guide
- Dell EMC Ready Architectures for VDI: Designs for Citrix XenDesktop and XenApp on XC Family Deployment Guide
- Dell EMC Ready Architectures for VDI: Designs for Citrix XenDesktop and XenApp on XC Family Validation Guide

VMware documentation

The following resources provide additional and relevant information.

- VMware vSphere documentation
- VMware Compatibility Guide

Citrix resources

The following Citrix resources provide additional and relevant information:

- XenDesktop and XenApp 7.15 LTSR System Requirements
- Citrix VDI Handbook and Best Practices
- Citrix deployment guides
- Citrix StoreFront Proof of Concept Implementation Guide
- XenApp and XenDesktop: Install