

# RADEON PRO

SOFTWARE

## AMD MxGPU and Citrix XenServer/XenDesktop

### Deployment Guide v1.0

This guide describes host and VM configuration procedures to enable AMD MxGPU hardware-based GPU virtualization using the PCIe SR-IOV protocol.

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## REVISION HISTORY

Version	Date	Author	Notes
1.0	05/24/2017	Anthony Hernandez	First released version

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# Overview

This *Deployment Guide* describes configuring Citrix® XenServer®, XenDesktop®, and XenApp® to use AMD Multiuser GPU (MxGPU) technology, which allows system administrators to deploy and manage graphics-accelerated virtual machines using the AMD FirePro™ S7100X, S7150, and S7150 x2 family of products in MxGPU mode. MxGPU technology uses the Single Root I/O Virtualization (SR-IOV) PCIe® virtualization standard to create up to 16 virtual MxGPUs per physical GPU. These MxGPUs can then be automatically or manually assigned to virtual machines on the Citrix host.

## Why MxGPU?

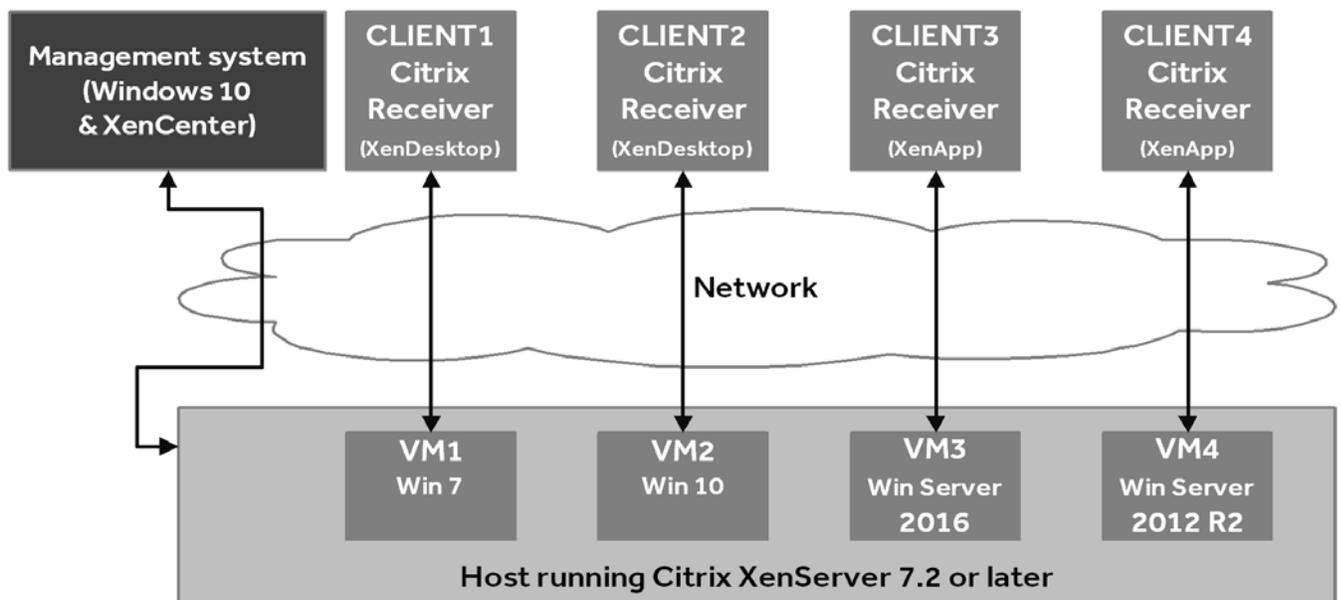
AMD MxGPU technology offers the following benefits:

- **Full Workstation Acceleration:** Hardware-based virtualization enables workstation-grade Radeon™ Pro 2D/3D graphics acceleration using the Single Root I/O Virtualization (SR-IOV) PCIe virtualization standard. This eliminates proprietary and complex software from the hypervisor, and allows each VM to use native Radeon Pro drivers with natural compatibility and access to all GPU graphics and compute functions on the server. Each physical GPU can support 1 to 16 users and requires no profiles. The consistent performance delivered by hardware-based MxGPU virtualization fully realizes all of the other benefits described here while also simplifying resource allocation and planning.
- **Real-Time Remote Access:** Replacing an individual workstation with an access portal allows each authorized user to access either a desktop (personalized or pooled) and/or applications at virtually any time from virtually any location on virtually any device via almost any broadband connection. Flexible permissions allow groups and individuals to access only the resources they need. Users transmit commands and receive fully-rendered pixels, with all compute and graphics processing taking place on the server and all data remaining in the datacenter. Updates made by one user are instantly visible to all users with appropriate access privileges.
- **Data Security:** Traditional workstations often use locally-stored working copies of data, which exposes that data to potential loss or theft. Centralizing data storage facilitates backup and other protective measures while eliminating these possibly catastrophic losses. User sessions that transmit only commands and fully-rendered pixels but no actual data further mitigate the risks of unauthorized access. This also allows fast, easy IT management and maintenance from a single location.
- **Scalability and Flexibility:** Adding and removing users is as easy as creating or removing accounts and allocating resources. Users needing access to different applications and/or GPU performance when shifting projects can receive the resources they need within minutes.
- **Effective Version Control:** All compute and graphics functions occur on the server. Users receive only fully-rendered pixels and transmit only commands. The data itself remains in the datacenter, with no need to transfer large files between locations nor reconcile changes. Hosting environments in the data center also ensures standardization among all users, further reducing the need to control versions.

- **Cost Effectiveness:** IT departments no longer need to procure, support, repair, and upgrade individual workstations with multiple hardware, OS, and application configurations, especially among ever-shifting project teams. Users simply log in to their virtual desktops at virtually any time from virtually any device and receive full workstation performance, GPU acceleration, and application/data access based on their credentials and assigned resources. Predictable, profile-less GPU assignment simplifies resource allocation and planning with linear scalability and no additional hardware licensing or other fees beyond the hardware purchase. Persistent desktops can be used for internal parties with consistent needs, while third parties or users with widely varying needs can access pooled desktops. There is also less need for personnel to be on site to work. Additional savings can be realized from a reduced need to transfer large file between locations and reconcile different versions of that data.

## System Topology

The following diagram displays the high-level system topology where a single host is running multiple MxGPU-enabled virtual machines that are being accessed by remote users on a variety of devices.



# Hardware and Software Requirements

The following requirements must be met in order to enable MxGPU virtualization:

- **Host/Server:** Please contact AMD for an up-to-date list of MxGPU-certified servers. Each server must have the following minimum configuration:
  - **Graphics Adapter:** AMD FirePro™ S7100X, S7150, or S7150 x2.
  - **CPU:** One or more Intel VT or AMD-V 64-bit x86-based CPU(s).
  - **System memory:** 32 GB (minimum; 1 TB maximum). The number of guest VMs and individual use cases will determine the optimum amount of RAM needed.
  - **Storage:** 500 GB (minimum). The number of guest VMs and individual use cases will determine the optimum type(s) and amount of storage needed.
  - **Network adapter:** Gigabit Ethernet (GbE) and up.
  - **BIOS:** Enable IOMMU (AMD CPUs) or VT-d (Intel CPUs), SR-IOV, ARI, memory mapping above 4 GB, MMIO High Size (if available), and UEFI boot. Please refer to your BIOS documentation for instructions on enabling these options.



*Note: Some platforms support additional virtualization options. For example, the AMD Kaveri APU includes an ARI (Alternative Reroute Interface). Please refer to your platform documentation for information and instructions.*

- **Software:** The host/server must have both Citrix XenServer 7.2 or later and Citrix XenDesktop 7.13 or later.
- **Client:** Any of the following client devices can be used to access virtual machines that have been configured on the host/server:
  - Zero client (up to 4 connectors) with standard mouse, keyboard, and monitor.
  - Thin client with standard mouse, keyboard, and monitor running Microsoft® Windows® Embedded OS.
  - Laptop/desktop with standard mouse, keyboard, and monitor running with Microsoft Windows 7 or later.
- **Administrator System:** The system used for administrative functions must be configured as follows:
  - **OS:** Windows 7 or later (64-bit).
  - **Browser:** Microsoft Internet Explorer® 11+, Microsoft Edge™, Google Chrome™, or Mozilla Firefox®.

- **Guest VM resources:** The following table lists some recommended resource allocations for guest VMs depending on user needs:

User Type/Performance	vCPU cores	System memory (GB)	# of enabled MxGPUs	Frame buffer size (MB) <sup>1</sup>
<i>Workstation (High-performance)</i>	4	8	2	3840
<i>Power (Professional)</i>	2	4	4	1920
<i>Knowledge (Enhanced)</i>	2	3	8	960
	2	3	10	768
<i>Task (Standard)</i>	1	2	16	480
<i>Note: All guest memory must be locked/reserved.</i>				
<i>1. Amount of memory available to each VF.</i>				

- **Guest VM configuration:** Each guest VM must be configured as follows:
  - **OS:** Windows 7 or 10 (64-bit).
  - **AMD Drivers:** Radeon Pro Software 17.5.2 or later.
  - **Citrix XenDesktop or XenApp VDA:** Version 7.13 or later.

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# XenServer MxGPU Setup

Configuring Citrix XenServer for MxGPU virtualization is a straightforward procedure. First, complete initial passthrough setup on the virtual machine. Next, enable platform SR-IOV by installing an MxGPU patch on the XenServer host. You may also need to install a PGP key. Finally, assign virtualized MxGPU resources to the virtual machine, and then log in to that virtual machine to verify and complete setup and personalization, such as screen resolution or multiple monitors.

## Prerequisites

The following prerequisites must be met before configuring MxGPU on a XenServer host:

- The host meets all of the applicable requirements listed in “[Hardware and Software Requirements](#)” on page 4, including BIOS configuration.
- Citrix XenServer has been installed on the host (server).
- Citrix XenCenter® has been installed on the management system.
- All required Citrix licenses have been installed.
- One or more virtual machine(s) meeting all of the applicable requirements in “[Hardware and Software Requirements](#)” on page 4 have been created on the host, and both an operating system and Citrix XenServer Tools have been installed on the virtual machine(s).



*Note: When creating the VM, you can select either **None** or any available GPU when prompted to assign a virtual GPU.*

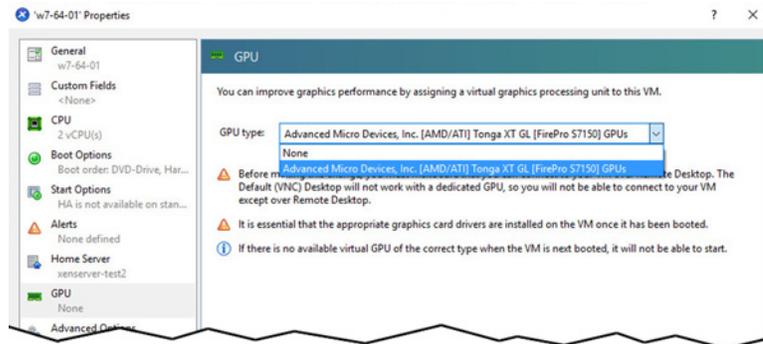
## Passthrough Setup

To begin setting up the GPU passthrough on a virtual machine:

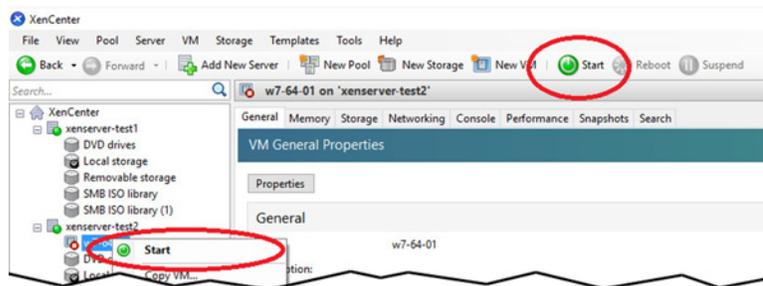
1. In XenCenter, verify that the selected virtual machine is shut down.
2. Select the virtual machine and then either:
  - Right-click the virtual machine and then select **Properties**.
  - Click the **Properties** button in the **General** tab.

The **<Virtual Machine> Properties** window appears, where **<Virtual Machine>** is the name of the selected virtual machine.

3. In the left pane of the **<Virtual Machine> Properties** window, select **GPU** in the left pane, and then use the **GPU type** pull-down menu to select the **Advanced Micro Devices** option.



4. Click **OK** to close the **<Virtual Machine> Properties** window.
5. In XenCenter, select the virtual machine and then either:
  - Right-click the virtual machine and then select **Start**.
  - Click the **Start** button in the toolbar at the top of the window.



The virtual machine will boot and display the operating system desktop.

# Enabling Platform SR-IOV

Unleashing the full power of AMD MxGPU virtualization requires enabling additional virtualization capabilities in the server BIOS beyond IOMMU or VT-d. This is done by installing an MxGPU patch (.iso) on the XenServer host. If you are using a pre-release patch version, you may also need to install a PGP key. Release candidate and production patch versions will include this key.

## Step 1: Key Installation

To install the PGP key, if needed:

1. Obtain the key file `RPM-GPG-KEY-AMD-MXGPU` and copy it to the `/opt/xensource/debug/` directory on the XenServer host.
2. Log in to the XenServer host as a root user, navigate to the `/opt/xensource/debug/` directory, and then execute the following command:  
`./import-update-key RPM-GPG-KEY-AMD-MXGPU`

The console displays output similar to the following:

```

gpg: checking the trustdb
gpg: 3 marginal(s) needed, 1 complete(s) needed, NOD trust model
gpg: depth: 0 valid: 3 signed: 0 trust: 0-, 0q, 0n, 0m, 0f, 5s
gpg: next trusted check due at 2018-11-08
pub 2048R/49AAJDE2 created: 2017-03-01 expires: 2017-08-28 usage: SCEA
      trust: unknown validity: unknown
[ unknown ] (1), Example Updates (update) <example@example.com>
[ unknown ] (1), Example Updates (update) <example@example.com>
pub 2048R/49AAJDE2 created: 2017-03-01 expires: 2017-08-28 usage: SCEA
      trust: unknown validity: unknown
[ unknown ] (1), Example Updates (update) <example@example.com>
Please decide how far you trust this user to correctly verify other users' keys
(by looking at passports, checking fingerprints from different sources, etc.)

 1 = I don't know or won't say
 2 = I do NOT trust
 3 = I trust marginally
 4 = I trust fully
 5 = I trust ultimately
 * = back to the main menu

pub 2048R/49AAJDE2 created: 2017-03-01 expires: 2017-08-28 usage: SCEA
      trust: ultimate validity: unknown
[ unknown ] (1), Example Updates (update) <example@example.com>
Please note that the shown key validity is not necessarily correct
unless you restart the program.

pub 2048R/49AAJDE2 created: 2017-03-01 expires: 2017-08-28 usage: SCEA
      trust: ultimate validity: unknown
[ unknown ] (1), Example Updates (update) <example@example.com>
[ root@xenserver-HPEBlade debug ]# ls
debug_ha_query_liveness perfTest RPM-GPG-KEY-amd-wear12 walstat
event_listen             shutdown                up                  walstat
crash                    subteststat            vmopxy
[ root@xenserver-HPEBlade debug ]# ./import-update-key with-wd
[ root@xenserver-HPEBlade debug ]# ./import-update-key RPM-GPG-KEY-amd-wear12
gpg: key 505C9429: public key "AMD Test XenRT key (password is 'AMD') <bob.ball@citrix.com>" imported
gpg: Total number processed: 1
gpg:      imported: 1 (RSA: 1)
gpg: (GnuPG) 2.0.22; Copyright (C) 2013 Free Software Foundation, Inc.
This is free software; you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

gpg: checking the trustdb
gpg: 3 marginal(s) needed, 1 complete(s) needed, NOD trust model
gpg: depth: 0 valid: 4 signed: 0 trust: 0-, 0q, 0n, 0m, 0f, 6s
gpg: next trusted check due at 2017-08-18
pub 2048R/505C9429 created: 2017-03-08 expires: never usage: SCEA
      trust: unknown validity: unknown
[ unknown ] (1), AMD Test XenRT key (password is 'AMD') <bob.ball@citrix.com>
[ unknown ] (1), AMD Test XenRT key (password is 'AMD') <bob.ball@citrix.com>
Please decide how far you trust this user to correctly verify other users' keys
(by looking at passports, checking fingerprints from different sources, etc.)

 1 = I don't know or won't say
 2 = I do NOT trust
 3 = I trust marginally
 4 = I trust fully
 5 = I trust ultimately
 * = back to the main menu

pub 2048R/505C9429 created: 2017-03-08 expires: never usage: SCEA
      trust: ultimate validity: unknown
[ unknown ] (1), AMD Test XenRT key (password is 'AMD') <bob.ball@citrix.com>
Please note that the shown key validity is not necessarily correct
unless you restart the program.

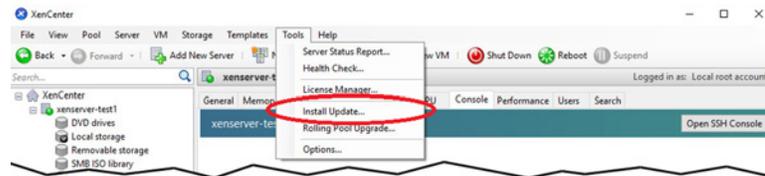
pub 2048R/505C9429 created: 2017-03-08 expires: never usage: SCEA
      trust: ultimate validity: unknown
[ unknown ] (1), AMD Test XenRT key (password is 'AMD') <bob.ball@citrix.com>
[ root@xenserver-HPEBlade debug ]#

```

## Step 2: MxGPU Patch Installation

To install the MxGPU patch:

1. Download the supplemental pack `mxgpu-<version>.amd.iso`, where `<version>` is the version number of the patch, such as `1.0`. Place this file in a known location that can be accessed by XenCenter.
2. On the management system, access the XenCenter interface.
3. Select **Tools>Install Updates**.

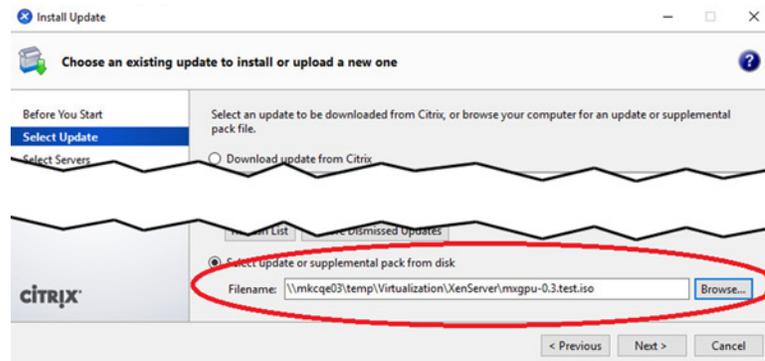


The **Install Update** window appears with the **Before You Start** page displayed.

4. Read the information on this window, verify that you have followed all of the procedures, and then click **Next**.

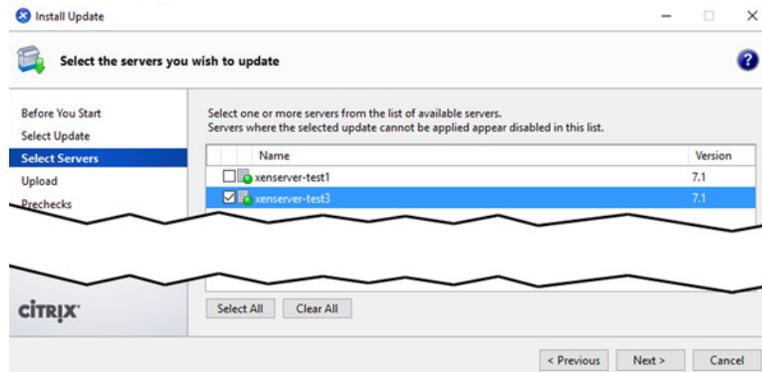
The **Select Update** page appears.

5. Click the **Browse** button, and then navigate to the directory where you placed the MxGPU patch.



6. Select the MxGPU patch, and then click **Next**.

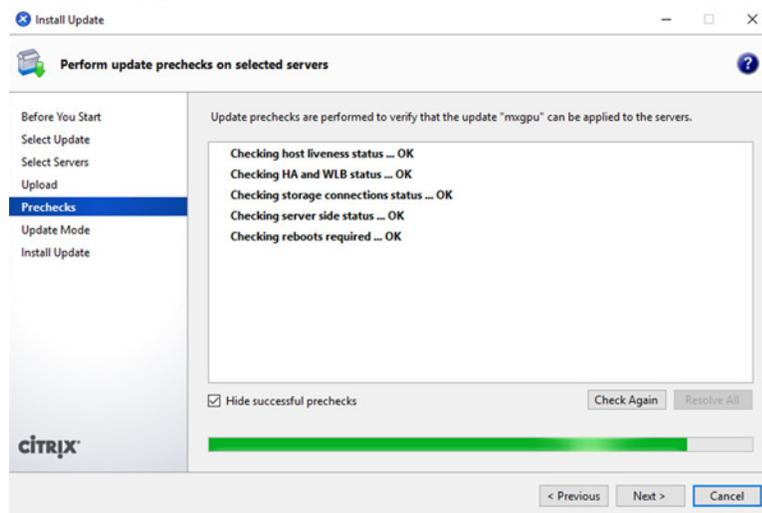
The **Select Servers** page appears.



7. Select the XenServer host or pool to which you would like to apply the supplemental pack, and then click **Next**.

The **Upload** page appears and displays the status of the upload. An error message will appear if there is not enough space.

The **Prechecks** page appears once the upload is complete.



8. XenCenter performs a series of prechecks to determine whether the MxGPU patch can be applied onto the selected servers and displays the results. If needed, follow the on-screen recommendations to resolve any update prechecks that have failed, and then click **Next** to continue.

The **Update Mode** page appears.

9. Check the **Allow XenCenter to carry out the post-update tasks...** option, and then click **Install update**.

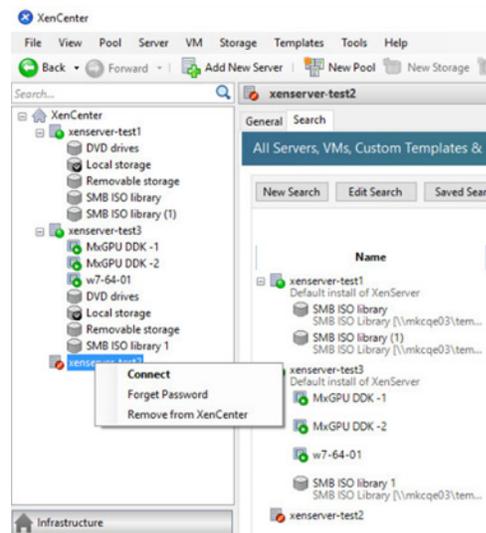
The **Install Update** window displays a progress bar and status messages as the installation proceeds.

10. Click **Finish** to close the **Install Update** window.

11. Log in to the XenServer host as a root user, and then execute the following command:  
`xe-toolstack-restart`

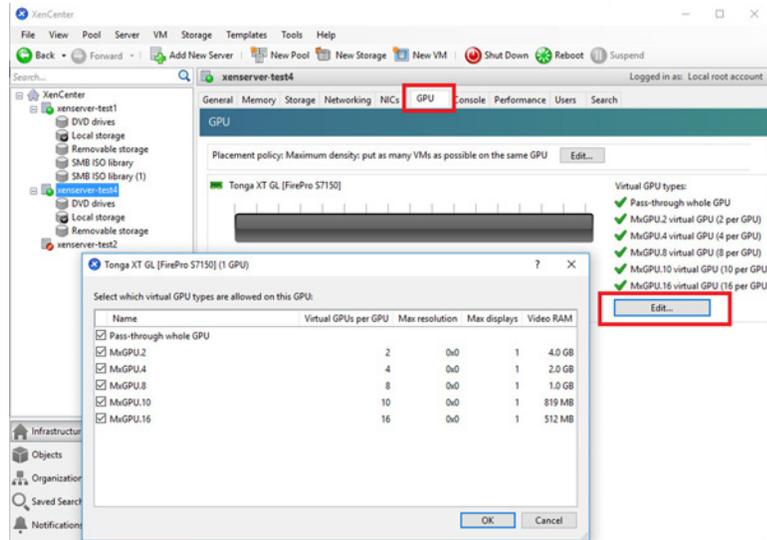
The host will disconnect from XenCenter.

12. In the XenCenter interface, right-click the disconnected host and then select **Connect**.



13. Select the reconnected host, open the **GPU** tab, and then click the **Edit** button.

The **<GPU>** window appears, where **<GPU>** is the AMD GPU type, such as **Tonga XT GL (FirePro S7150) (1GPU)**.



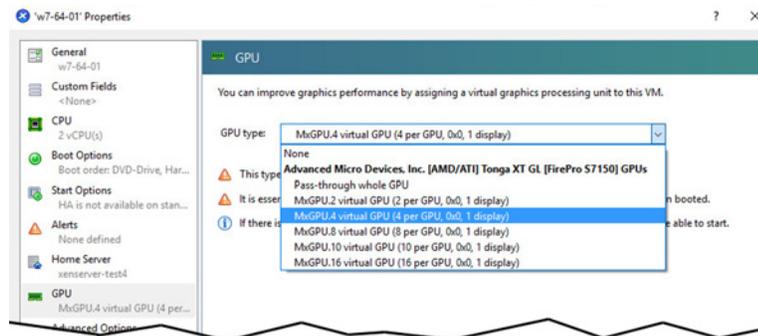
## Step 3: Finishing MxGPU Setup

To finish setting up MxGPU virtualization:

1. Verify that the virtual machine you are configuring is shut down, and then either:
  - Right-click the virtual machine and then select **Properties**.
  - Click the **Properties** button in the **General** tab.

The **<Virtual Machine> Properties** window appears, where **<Virtual Machine>** is the name of the selected virtual machine.

2. In the left pane of the **<Virtual Machine> Properties** window, select **GPU** in the left pane, and then use the **GPU type** pull-down menu to select the desired passthrough option.



When configuring the passthrough option, smaller “per GPU” numbers indicate fewer virtual GPUs per physical GPU, which provides higher performance, and vice-versa. The following table provides some general recommended passthrough options based on user type:

User Type/Performance	vCPU cores	System memory (GB)	# of enabled MxGPUs	Frame buffer size (MB) <sup>1</sup>
<i>Workstation (High-performance)</i>	4	8	2	3840
<i>Power (Professional)</i>	2	4	4	1920
<i>Knowledge (Enhanced)</i>	2	3	8	960
	2	3	10	768
<i>Task (Standard)</i>	1	2	16	480
<i>Note: All guest memory must be locked/reserved.</i>				
<i>1. Amount of memory available to each VF.</i>				

3. Select the desired GPU passthrough option, and then click **OK**.
4. Start the virtual machine.
5. Once the virtual machine has booted, access Device Manager and note the new graphics adapter. You may now complete setting up the virtualized environment, such as screen resolution or adding/configuring multiple monitors.

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## HDX 3D Pro Setup

This chapter provides step-by-step instructions for setting up Citrix HDX™ 3D Pro remote desktops for guest virtual machines. To setup the HDX 3D Pro remote desktop, create a Windows Server 2012 VM is needed to install the Delivery Controller, install the Virtual Delivery Agent (VDA) on the target virtual machines, and install Citrix Receiver™ on a client (remote) system.

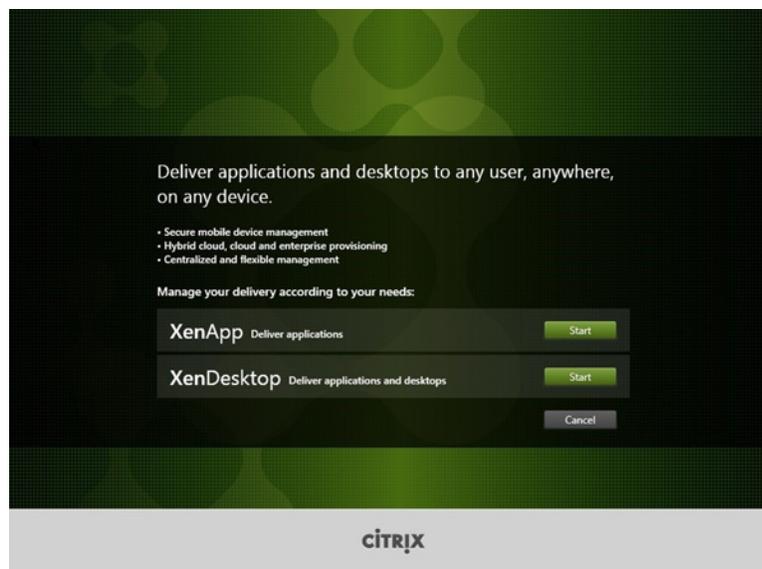
Please see <http://docs.citrix.com/en-us/xenapp-and-xendesktop/7-13/hdx/gpu-acceleration-server.html> for more information and HDX 3D Pro.

## Step 1: Installing XenDesktop

To install Citrix XenDesktop:

1. Create a guest virtual machine, and then install Windows Server 2012.
2. Configure the virtual machine as follows:
  - If necessary, join the server to a domain.
  - Add yourself as an administrator.
3. Reboot the virtual machine, and then log in to the machine or domain, as appropriate.
4. Either copy the Citrix Virtual Delivery Agent (VDA) standalone package (.iso) to the virtual machine, or map a network location that contains the package.
5. Mount the .iso and then execute `autoselect.exe`.

The following splash screen appears.

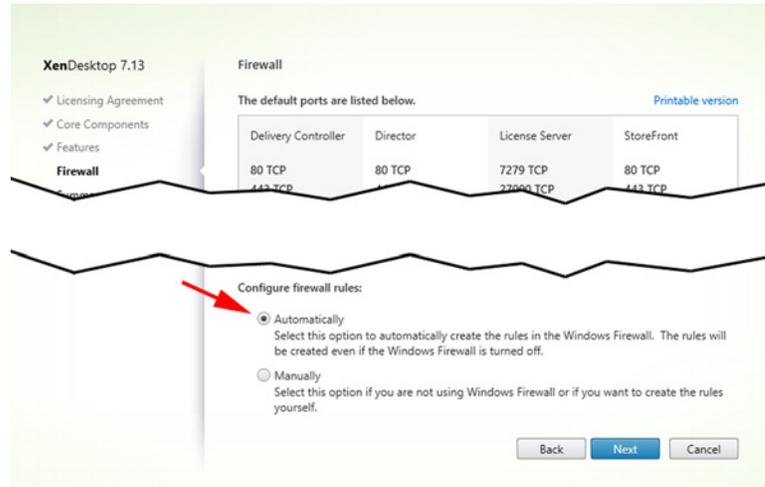


6. Click the **Start** button in the **XenDesktop** section.  
A screen with a series of options appears.
7. In the **Getting Started** section on the left side of the screen, click **Delivery Controller**.  
A pop-up window appears.
8. Select **Yes**.  
The **Software License Agreement** page appears.
9. Check the **I have read, understood, and accept...** radio button, and then click **Next**.

10. The **Core Components** page appears. Make sure that all components are selected, and then click **Next**.

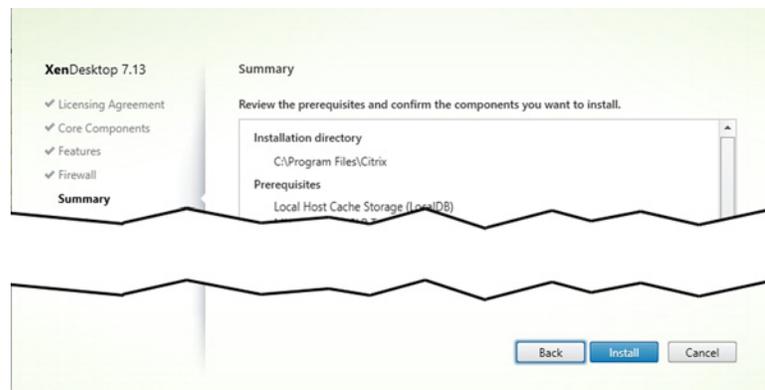
11. The **Features** page appears. Make sure that all features are selected, and then click **Next**.

The **Firewall** page appears.



12. Check the **Automatically** radio button, and then click **Next**.

A **Summary** page appears.

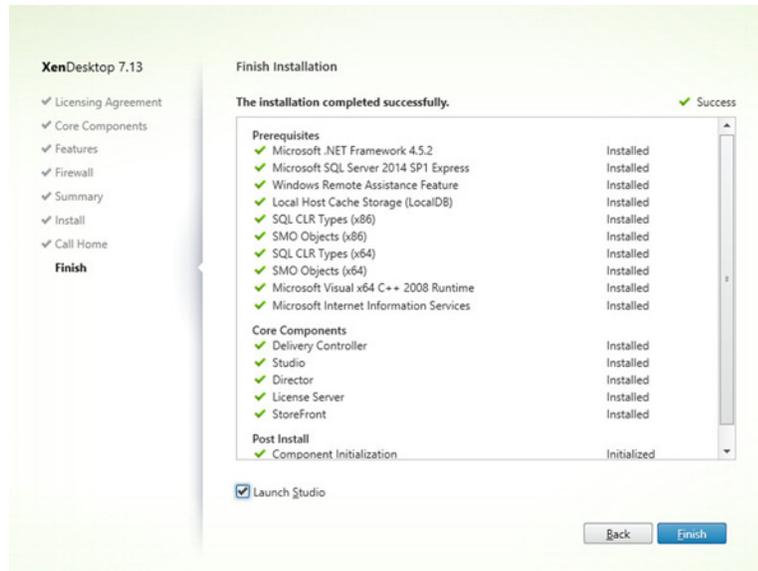


13. Click **Install** to continue.

The system installs the necessary files/components. The virtual machine may reboot several times during this process.

14. A **Call Home** page may appear. Make the appropriate selection for your needs, and then click **Next**.

The **Finish Installation** page appears.



15. Make sure that the **Launch Studio** checkbox is selected, and then click **Finish**.

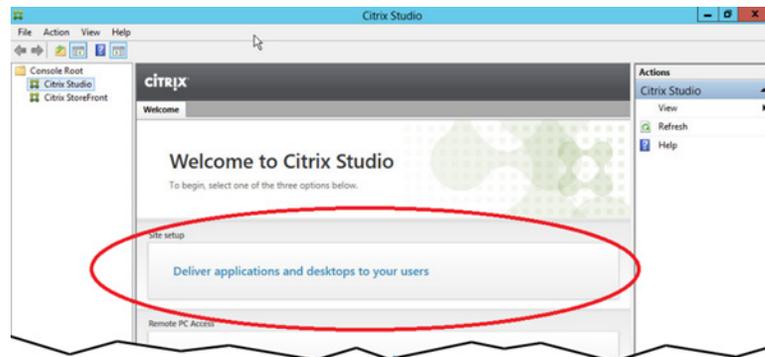


*Note: If you do not check the **Launch Studio** checkbox, then you will need to launch Citrix Studio after the installation complete.*

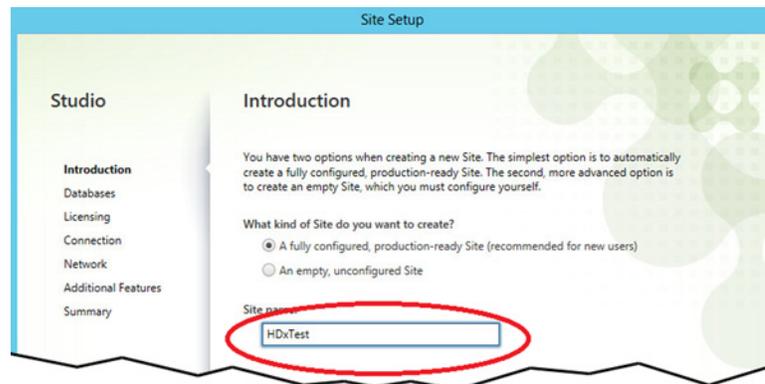
## Step 2: Configuring XenDesktop

To configure Citrix Studio to deliver desktops using XenDesktop:

1. After Citrix Studio launches, click **Deliver applications and desktops to your users**.



The **Introduction** page appears.



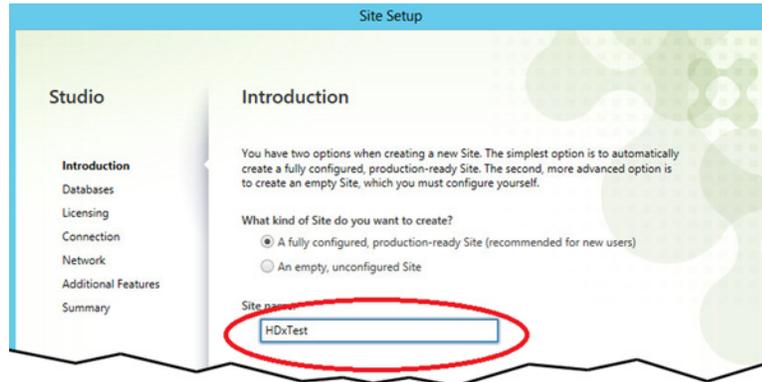
2. Check the **A fully configured...** radio button, add a name in the **Site name** field, and then click **Next**.



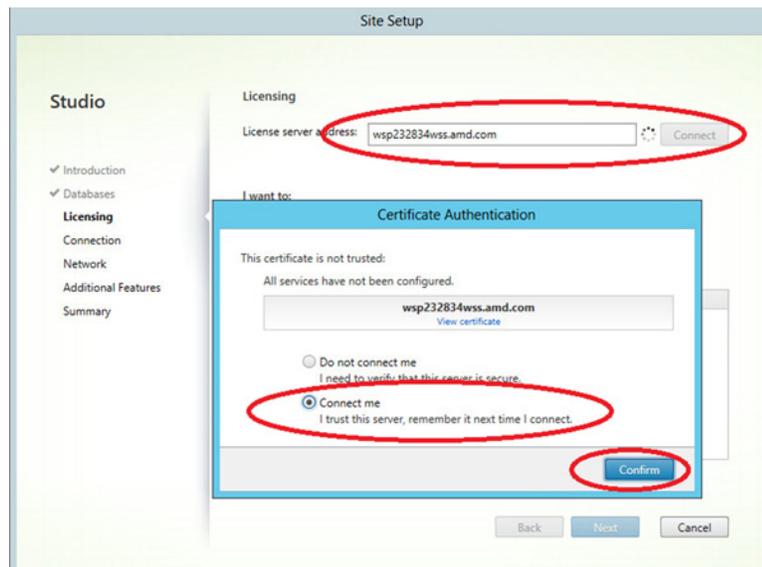
*Note: A site name is the name given to a product deployment. It comprises the Delivery Controllers and the other core components, VDAs, virtual resource connections (if used), plus the machine catalogs and Delivery Groups that you create and manage.*

3. The **Databases** page appears. Check the **Create and setup databases from Studio** radio button, and then click **Next**.

The **Site Setup** page appears.

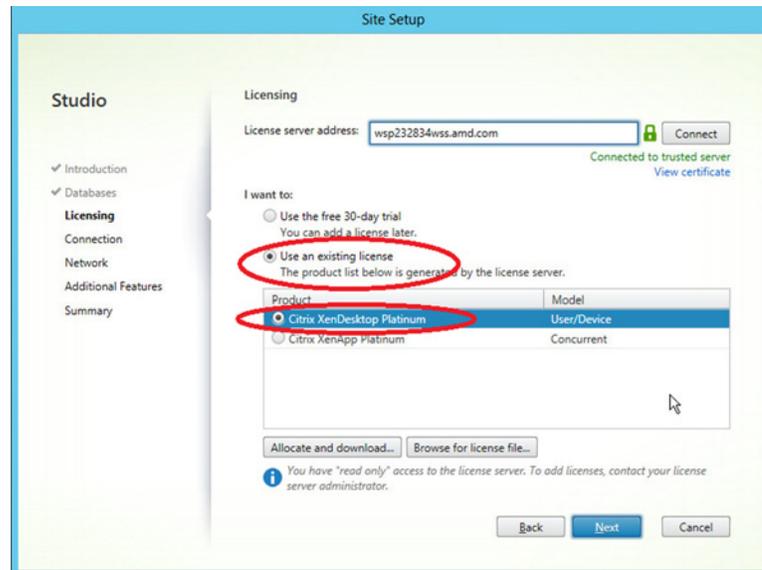


4. Enter the **License server address** and then click **Connect** to open a **Certificate Authentication** popup.



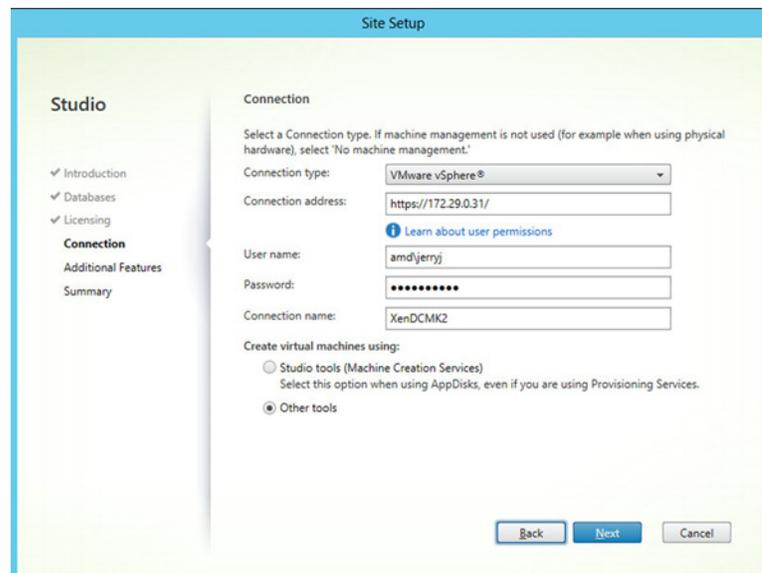
- In the popup, select **Connect me**, and then click **Confirm**.

The system connects to the specified licensing server, and then displays the **Licensing** page.



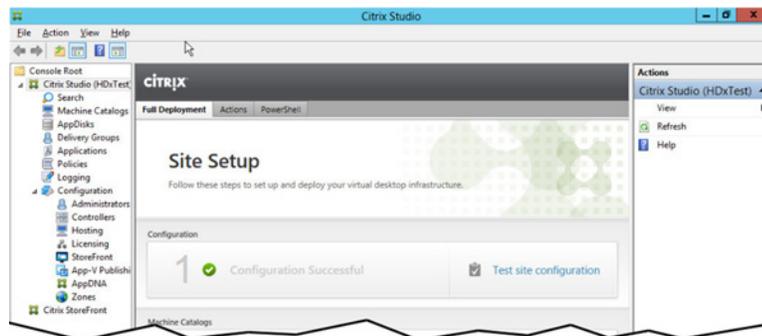
- Check the **Use an existing license** and **Citrix XenDesktop Platinum** radio buttons, and then click **Next**.

The **Connection** page appears.



7. Select the following:
  - **Connection type:** Citrix XenServer.
  - **Connection address:** IP address of the XenServer host.
  - **Username:** Your domain (if any) and username, such as `amd/johndoe`.
  - **Password:** Your password.
  - **Connection name:** Enter a name for this connection.
  - **Create virtual machines using:** Check the **Other tools** radio button.
8. Click **Next** to open a **Certificate Authentication** window.
9. Check the **Trust certificate** checkbox, and then click **OK**.
10. The **Additional Features** page appears. Leave all options blank, and then click **Next**.
11. The **Summary** page appears. Review the summary to ensure that all parameters are correctly configured, and then click **Finish**.

The system will configure Citrix Studio using the parameters you provided in Steps 1-10, above, and then return to the **Site Setup** window with the **Configuration** option checked.

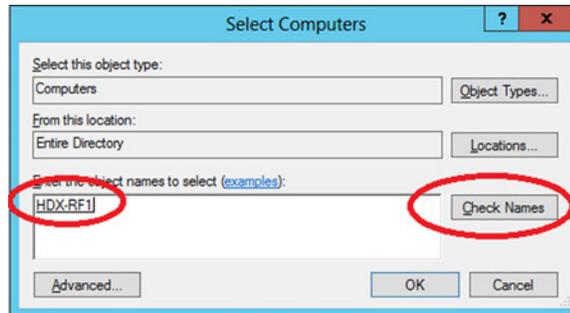


## Step 3: Configuring the Machine Catalog

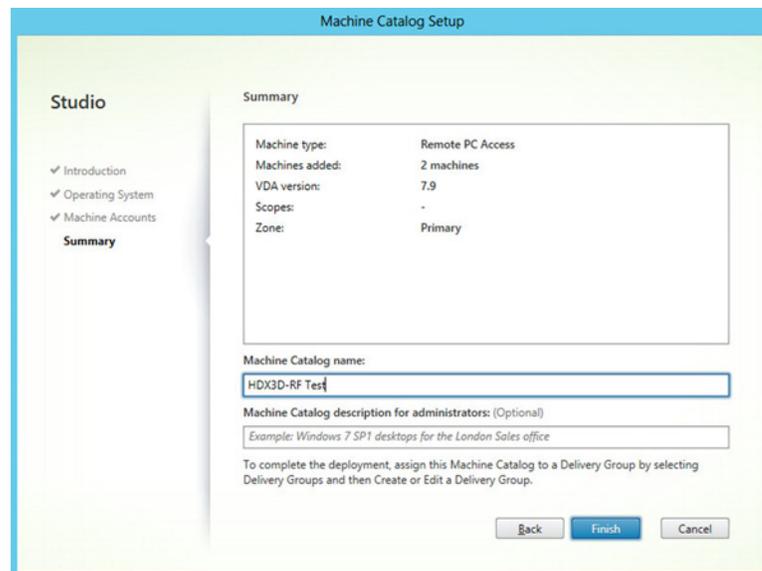
After configuring the basic options, the next step is to set up machines for desktops, applications, or remote access. To do this:

1. In the **Site Setup** window, click **Set up machines for desktop and applications or remote PC access**.
2. The **Introduction** page appears. Review the information on this page, and then click **Next**.

3. The **Operating System** page appears. Select **Remote PC Access**, and then **Next**.
4. The **Machine Catalog Setup** page appears. Click the **Add machine accounts...** button. The **Select Computers** popup appears.

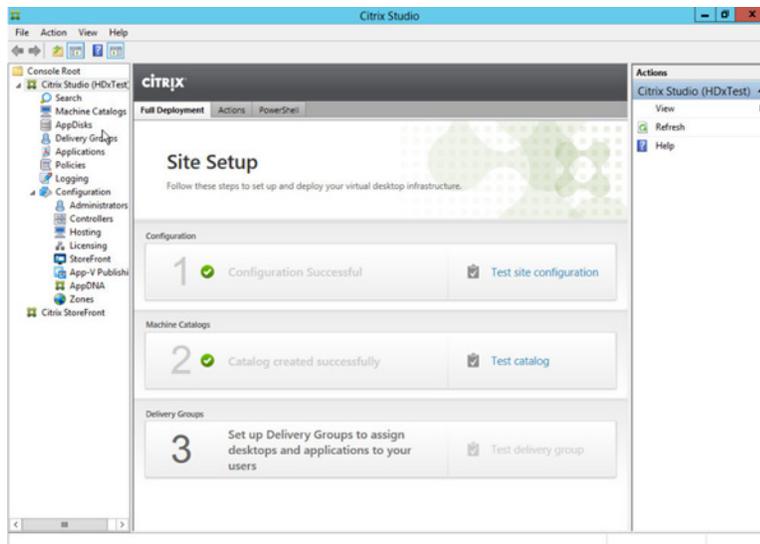


5. Enter the name of a guest virtual machine that will require HDX 3D Pro remote desktops, and then click the **Check Names** button. A line appears under the name if the system can find the specified computer.
6. Repeat Step 5 for each additional virtual machine that you want to add. Remember to click **Check Names** after each name you enter. When you have finished entering all virtual machines, click **OK** to continue.
7. In the **Machine Accounts** page, double-check the list of virtual machines, and then click **Next**. The **Summary** page appears.



8. Click **Finish**.

The **Creating Catalog** popup appears while the setup process completes. When complete, the system returns to the **Site Setup** window with both the **Configuration** and **Machine Catalogs** options checked.



## Step 4: Setting up Delivery Groups

After configuring the basic options and machine catalog, the next step is to set up delivery groups that will allow you to assign desktops and applications to users. To do this:

1. In the **Site Setup** window, click **Set up Delivery Groups to assign desktops and applications to your users**.
2. The **Introduction** page appears. Review the information on this page, and then click **Next**.
3. The **Machines** page appears. Select the catalog that you created in "[Step 3: Configuring the Machine Catalog](#)" on page 24, and then click **Next**.
4. The **Users** page appears. Proceed as follows:
  - If you want to allow any authenticated user to access this Delivery Group, then check the **Allow any authenticated users...** radio button, and then click **Next**. Skip to Step xx.
  - If you want to restrict access to this Delivery Group to only certain users, then check the **Restrict use of this Delivery Group...** radio button to open the **Select Users or Groups** popup, configure the authorized users, and then click **Next**. Be sure to click the **Check Names** button after each user/group you enter; a line appears under the name if it is valid. Proceed to Step 5.

The **Desktop Assignment Rules** page appears.

5. Click the **Add...** button to open the **Add Desktop Assignment Rule** popup.

The screenshot shows the "Add Desktop Assignment Rule" dialog box. It includes the following fields and controls:

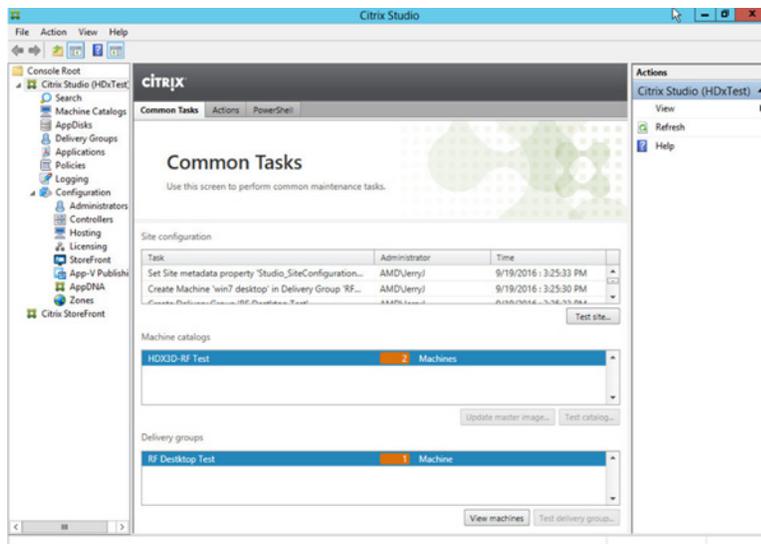
- Display name:** win7 desktop
- Description:** Example: Assigned desktops for Finance Dept. (Note: The name and description are shown in Receiver.)
- Assignment options:**
  - Allow everyone with access to this Delivery Group to have a desktop assigned
  - Restrict desktop assignment to:
    - GPU Virtualization Tech Group (AMD\GPU Virtualiazation Tech Group)
    - Buttons: Add..., Remove
- Maximum desktops per user:** 2 (with minus and plus buttons)
- Enable desktop assignment rule**  
Clear this check box to disable delivery of this desktop.
- Buttons:** OK, Cancel

6. Enter the following information:
  - **Display name:** Name of the desktop.,
  - **Description:** Brief description of the desktop (optional).
  - **Assignment:** Verify that the user(s) and/or group(s) that you entered in Step 4 are correct.
  - **Enable desktop assignment rule:** Make sure this checkbox is checked.
7. Click **OK** to proceed. The desktop display name and user/group list appears in the list. Click **Next**.

The **Summary** page appears.

- Enter the **Delivery Group name**, an optional description, and then click **Finish**.

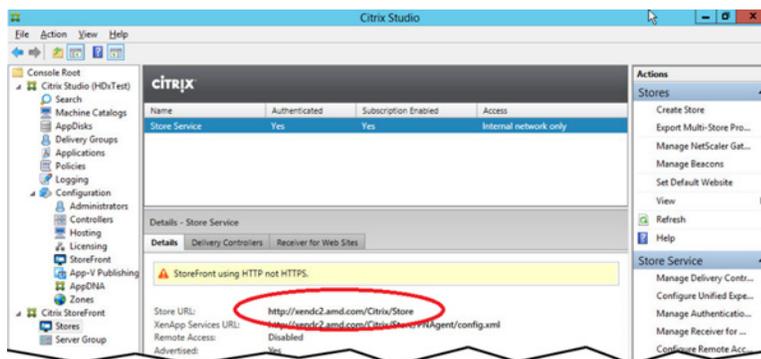
The system returns to the **Site Setup** window with all three sections (**Configuration**, **Machine Catalogs**, and **Delivery Groups**) populated.



## Step 5: Verifying the XenDesktop Address

To verify the XenDesktop address:

- In Citrix Studio, select **Citrix Storefront**, and then select **View or Change Stores**.
- Select the **Details** tab, and then note the **Store URL** entry.



- Open a web browser, and then navigate to the Store URL. You should be able to access a remote desktop using your username and password.

## Step 6: Installing the Virtual Delivery Agent

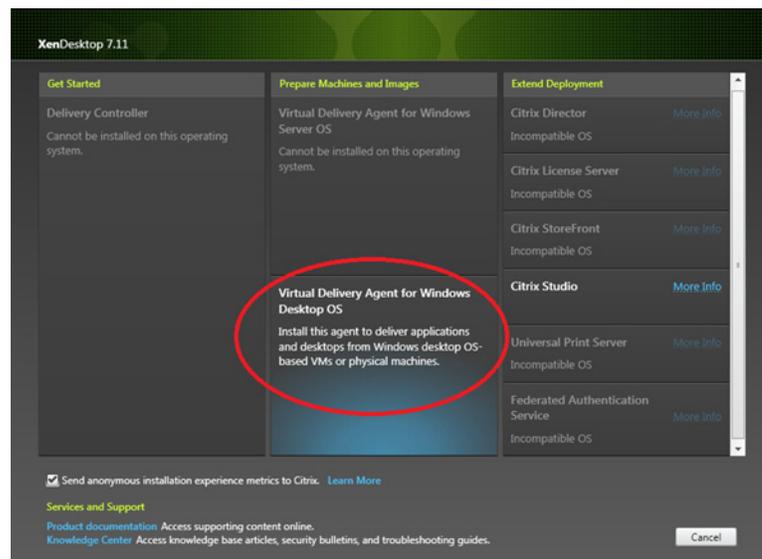
To install the Virtual Delivery Agent (VDA) on a guest virtual machine:

1. Log in to the virtual machine.
2. Either copy the Citrix Virtual Delivery Agent (VDA) standalone package (.iso) to the virtual machine, or map a network location that contains the package.
3. Mount the .iso and then execute `autoselect.exe`.

The following splash screen appears.

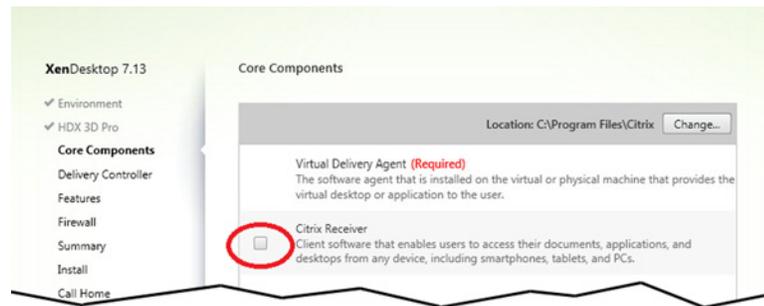
4. Click the **Start** button in the **XenDesktop** section.

The following screen appears.



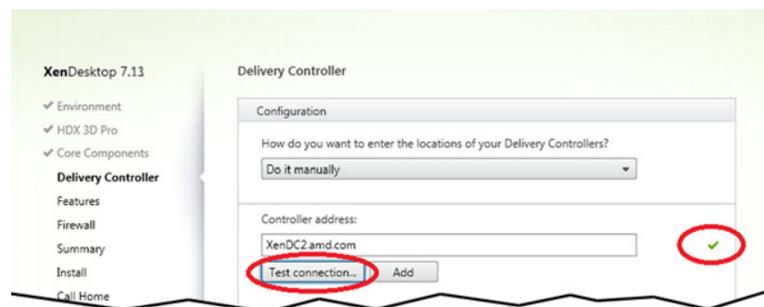
5. Select **Virtual Delivery Agent for Windows Desktop OS**.
6. The **Environment** page appears. Check the **Enable Remote PC Access** radio button, and then click **Next**.
7. The **HDX 3D Pro** page appears. Check the **Yes, install the VDA for HDX 3D Pro** radio button, and then click **Next**.

8. The **Core Components** page appears.



9. If needed, click the **Change...** button to change the VDA installation location away from the default `C:\Program Files\Citrix` folder. You may also clear the **Citrix Receiver** checkbox because you are working on a target machine. Click **Next** when you have finished making any changes.

The **Delivery Controller** page appears.

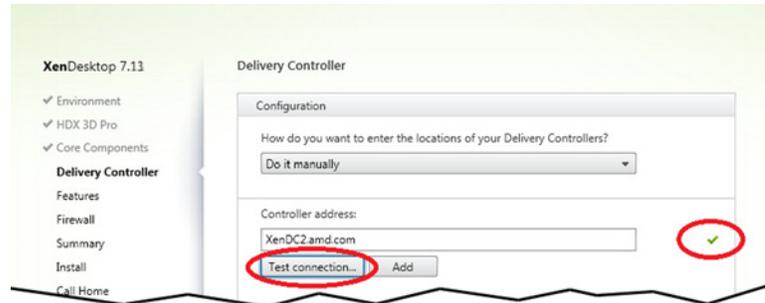


10. Use the **How do you want...** pull-down menu to select **Do it manually**, and then:

- a. Add the Windows Server 2012 virtual machine name (see [“Step 1: Installing XenDesktop” on page 18](#)) in the **Controller address** field.
  - b. Click the **Test Connection** button.
  - c. Verify that a green check mark appears after the connection name.
  - d. Click the **Add** button. If needed, you can edit or delete the connection.
  - e. Click **Next** when you have finished configuring and testing the connection.
6. The **Features** page appears. Keep the default selections, and then click **Next**.
7. The **Firewall** page appears. Check the **Automatically** radio button, and then click **Next**.
8. The **Summary** page appears. Verify all of the selected options, and then click **Install**.  
A popup displays installation progress.
9. Some warnings about new Citrix devices/software, USB, and network protocols may appear. In each warning, click **Install** to continue.

10. The **Call Home** page appears. Make the appropriate selection for your needs, and then click **Next**.

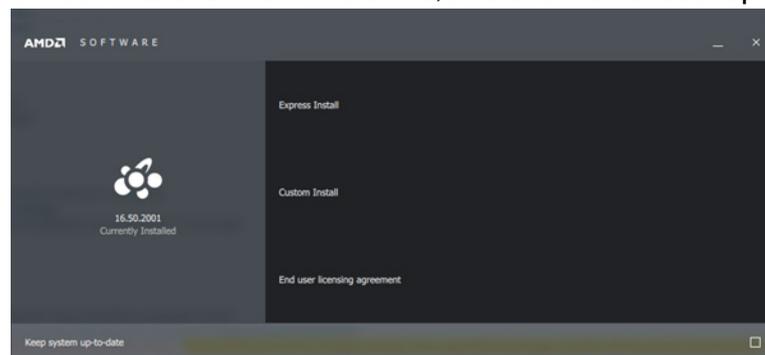
The **Finish installation** page appears.



11. Verify that the **Restart machine** checkbox is checked, and then click **Finish**.

The virtual machine will restart.

12. Once the virtual machine has restarted, log in using your username and password.
13. If needed, download the AMD graphics driver from <http://www.amd.com/en-us/solutions/professional/virtualization> to the virtual machine, and then run the setup.

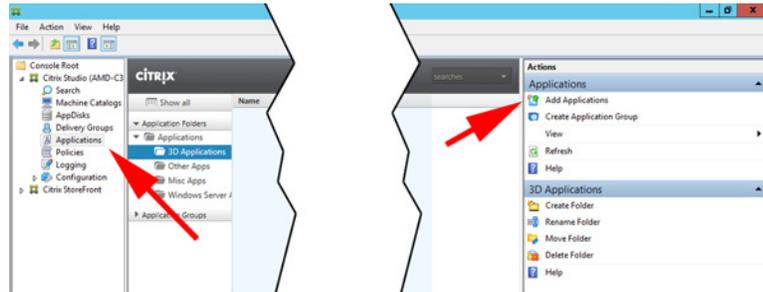


The **Device Manager** on the virtual machine will display **AMD MxGPU** as the **Display Adapter** once the driver setup process is completed.

## Step 7: Configuring XenApp

To configure Citrix Studio to deliver applications using XenApp:

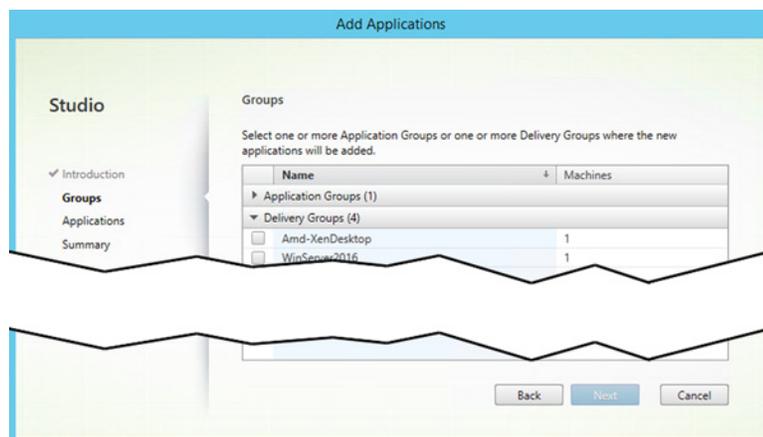
1. In Citrix Studio, select **Applications>Add Application**.



The **Add Applications** window appears with the **Introduction** page displayed.

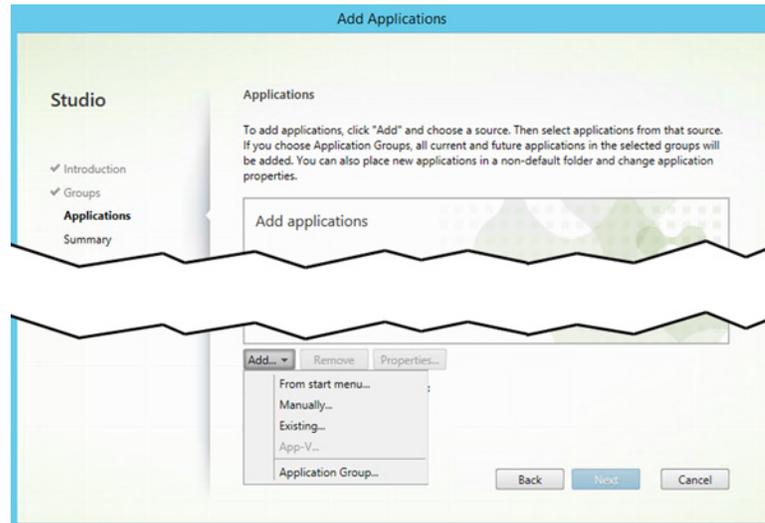
2. Accept the default options, and then click **Next** to proceed.

The **Groups** page appears.



3. Add a new delivery group and/or select one or more existing group(s), as appropriate, and then click **Next**.

The **Applications** page appears.



4. Select the applications to provision by choosing applications from the **Start** menu and/or by manually specifying the path to an application. Please refer to your Citrix documentation for additional instructions. Click **Next** when you have finished.

The **Summary** page appears.

5. Review the configuration, and then click **Finish**.

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## Remote Connection Setup

This chapter describes how to install Citrix Receiver on the client device, and then guides you through connecting to an MxGPU-enabled virtual machine. Installing Citrix Receiver is a one-time process; for subsequent connections, simply open a web browser to the Store URL, log in, and connect to an available virtual machine.

## Step 1: Install Citrix Receiver



*Note: This is a one-time procedure. Once Citrix Receiver is installed on the client device, you can simply connect remotely to the virtual machine as described in “Step 2: Connect to the Virtual Machine” on page 37.*

To install Citrix Receiver:

1. Log in to the client device.
2. Open a web browser and navigate to the Citrix StoreFront URL.



*Note: You can view the Citrix StoreFront URL by opening Citrix Studio, selecting **Citrix Storefront > View or Change Stores**, and then noting the **Store URL**.*

A **Receiver** page appears. Select **I agree**, and then click **Install**.

3. One or more warning popup(s) may appear. If this happens, click **Run** or **Yes**, as appropriate.

The **Welcome to Citrix Receiver** window appears.



4. Click **Start**.
5. The **License Agreement** window appears. Check the **I accept the license agreement** checkbox, and then click **Install**.  
A progress bar appears while Citrix Receiver installs on your system.
6. The **Installation Successful** window appears when the installation is complete. Click **Finish**.

- Return to the web browser, and then click **Continue**.



Citrix Receiver is now installed on the client system.

## Step 2: Connect to the Virtual Machine

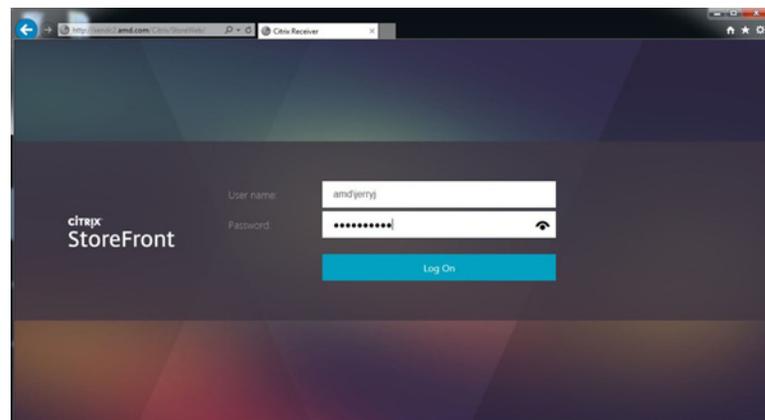
To remotely connect to the virtual machine from the client system:

- On the client system, open a web browser and navigate to the **Citrix StoreFront** page for your organization.



*Note: You can view the Citrix StoreFront URL by opening Citrix Studio, selecting **Citrix Storefront > View or Change Stores**, and then noting the **Store URL**.*

The **Citrix StoreFront** page appears.

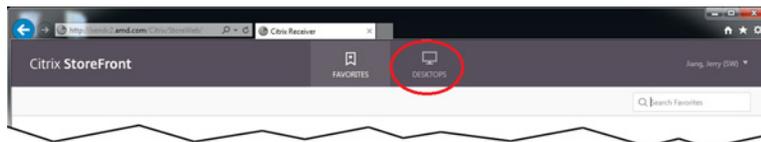


- Enter your username and password, and then click **Log On**.

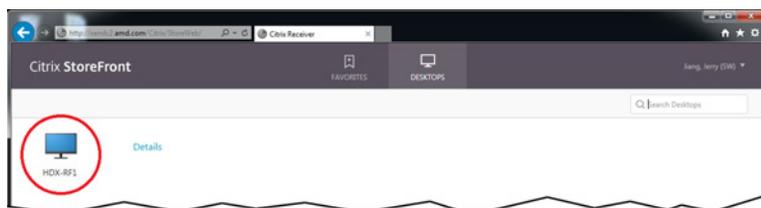
## XenDesktop

To access a full Windows Desktop delivered by XenDesktop:

1. The **StoreFront** page appears after you log in to the StoreFront. Click the **Desktop** button in the toolbar.



The guest virtual machine(s) registered with this Storeweb will appear.



2. Click the virtual machine that you want to connect to. If a warning appears, click **Allow**.

Citrix Receiver connects to the selected virtual machine and displays the virtual machine desktop in the window. Please refer to your Citrix documentation for information about Citrix Receiver.

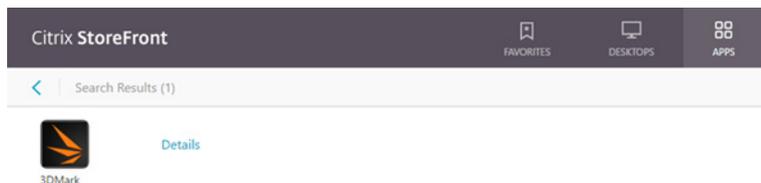
## XenApp

To access applications without a desktop delivered by Citrix XenApp:

1. The **StoreFront** page appears after you log in to the StoreFront. Click the **Apps** button in the toolbar.



The available applications registered with this Storeweb will appear.



2. Click the application that you want to launch. If a warning appears, click **Allow**.

Citrix Receiver launches the selected application. Please refer to your Citrix documentation for information about Citrix Receiver.

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# AMD MxGPU and Citrix XenServer/XenDesktop

Deployment Guide v1.0  
05/24/2017

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