NVIDIA CloudXR Introductory Offer Quick Start Guide on Azure

This guide walks through getting started using the **NVIDIA CloudXR Introductory Offer - WinServer 2019** offering available from the Azure Marketplace.

What's included

Using the **NVIDIA CloudXR Introductory Offer - WinServer 2019** eases installation and delivery of NVIDIA CloudXR to developers. Deploying the Marketplace offering provides the following software and Azure instance configurations:

- An Azure instance configured with an NVIDIA-supported GPU
- CloudXR Server installer and documentation
- Azure Firewall settings for the instance.
- NVIDIA vGPU v13.0 drivers

What's excluded

The post-deployment applications and configurations that are required but **not** included are:

- Steam & SteamVR
- A remote desktop solution besides RDP
- CloudXR clients
- OpenVR applications to stream.

Steam and SteamVR

CloudXR uses StreamVR's OpenVR SDK as an interface between head-mounted displays and VR software by installing a plugin to SteamVR. Steam and SteamVR are not distributed with the image and must be downloaded directly from Valve and installed manually after the instance launches.

CloudXR test/sample clients

Because devices and clients continue to evolve, visit the developer portal (https://www.nvidia.com/en-us/design-visualization/solutions/cloud-xr/) for the latest clients, information, and support.

Remote Desktop Solution besides RDP

Using Windows RDP is the only option for intial configuration steps after deployment, but using RDP during CloudXR Streaming sessions will display a green screen to the VR device. This is a known problem with Windows RDP unable to release the Microsoft Basic Display Driver used during the remote session. You must install an alternative remote desktop solution (some options include VNC, PCoIP from Teradici, or DCV from NICE) and use this whenever logging into the remote instance.

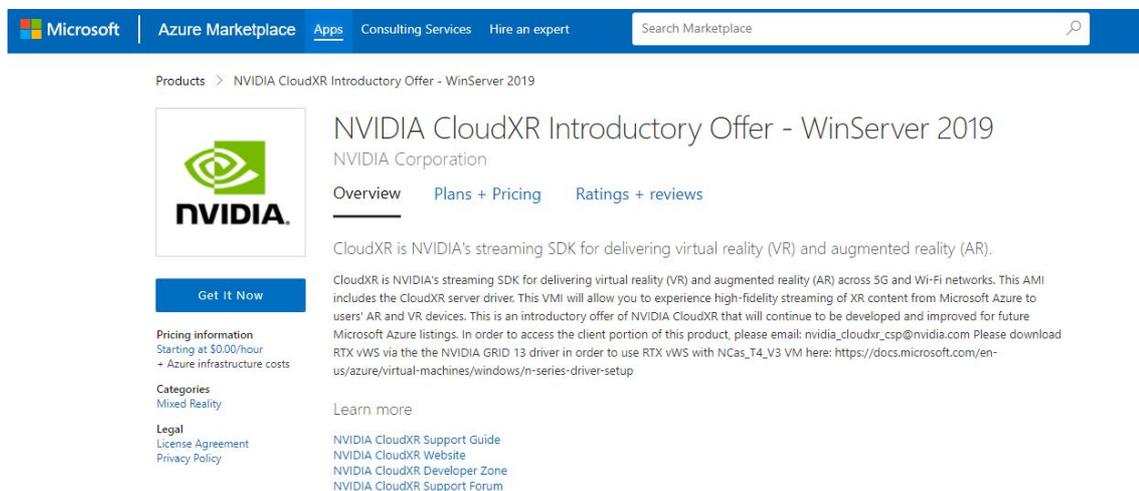## Azure Configuration Prerequisites

Before getting started, you must have a Azure Account that meets the following prerequisites:

- Deployment rights for Azure instances
- The rights to create firewalls and attach to networks used by the instance.
- Access to Microsoft RDP for post-deployment initialization steps
- You also should be comfortable operating within the Azure Console.

Marketplace Deployment Steps

The steps described below are for launching an instance within the Azure Marketplace. Advanced customizations such as VPC networking specifics and public/private subnetting placement are beyond the scope of this document.

1. Navigate to **Azure Marketplace** (https://azuremarketplace.microsoft.com/en-us/marketplace/apps/nvidia.nvidia-cloudxr-win2019?tab=Overview) and search for *CloudXR* to find the latest listing. Review the details and make a note of the instance size, pricing, usage, and other details. Select **Get It Now**. Then select **Create** on the next page.

2. Within the **Create a virutal machine** page review the options for your instance. The Marketplace image comes completed with default options for most installations. Review the sections and make any desired changes. Select the region closest to your client users (where GPUs are available). If you're not sure which region that is, use a 3rd party Azure region ping test to verify.

3. Ensure the **Image** remains selected with *CloudXR 3.0 - Gen1* and **Size** includes the *NCas_T4_v3* type. Enter a **Username** and **Password** to connect to the deployed instance. Select **Review+Create** or if you'd like to review more options step through each step within the wizard.

    - ***Note***: *The deployment template will create a new Public IP and network security group configured with proper firewall settings. It is advised post dpeloyment to update the NSG with*

IP ranges for only allowed networks.

4. On the final page, confirm your settings and charges for use and select **Create**.

> **Note: Azure instances are billed based on usage. It is advised to shut down your instance when no longer in use.**

Connecting to the GPU-Accelerated CloudXR Workstation

1. Locate the public IP address for your new instance and use RDP to initially connect.
2. Use the Username and Password you created within the the deployment wizard.

# Installing and using CloudXR on the Azure instance

At this point, you should be connected to the remote instance with RDP. The instance comes configured with (most) Windows firewall settings, CloudXR server installer, and SDK documentation. It does not come with an OpenVR SDK (Steam and SteamVR), Virtual Audio driver, and an alternative to RDP that you'll need to download and install manually.

1. Open the Windows File Explorer and navigate to `C:\CloudXR Docs`
2. Open the **README_azure** file to review.
3. The instance comes with a license for NVIDIA vGPU, but the driver must be installed manually. Open the shortcut within the `CloudXR Docs` folder to navigate to driver or browse to https://docs.microsoft.com/en-us/azure/virtual-machines/windows/n-series-driver-setup#nvidia-grid-drivers. Download and install.
4. Open a web-browser on the instance. Navigate to https://www.steamvr.com to first **install Steam** followed by **SteamVR**.
5. After SteamVR has been installed, open the folder **CloudXR 3.0** folder. Navigate to **Installer** and run **CloudXR-Setup.exe**
6. Ensure all CloudXR Server options remain selected and client options are NOT selected. Select **Install**. (Note: SteamVR must be already installed else the CloudXR installer will NOT complete successfully.)
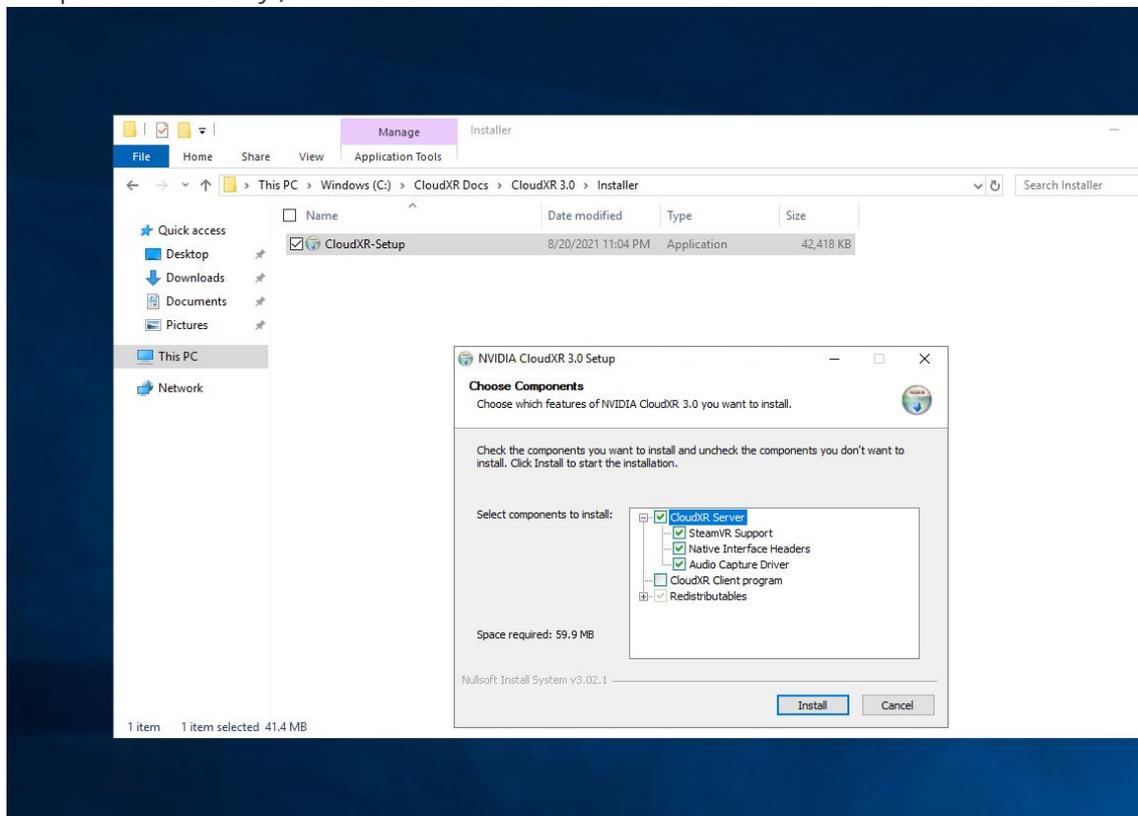
7. Once completed, select **Launch SteamVR** from the Windows Desktop. If not done already, you will be prompted to log into Steam.
8. SteamVR will launch and display a messaging asking you to connect a headset. This can be ignored. If you also see a notice regarding App Container permissions, select **Update Permissions**.
9. Validate CloudXR's plugin is installed by opening SteamVR's **settings** panel. Enable **Advanced Setting** and select **Manage Add-ons**. The addon **CloudXRRemoteHMD** should

be listed and **On** selected.
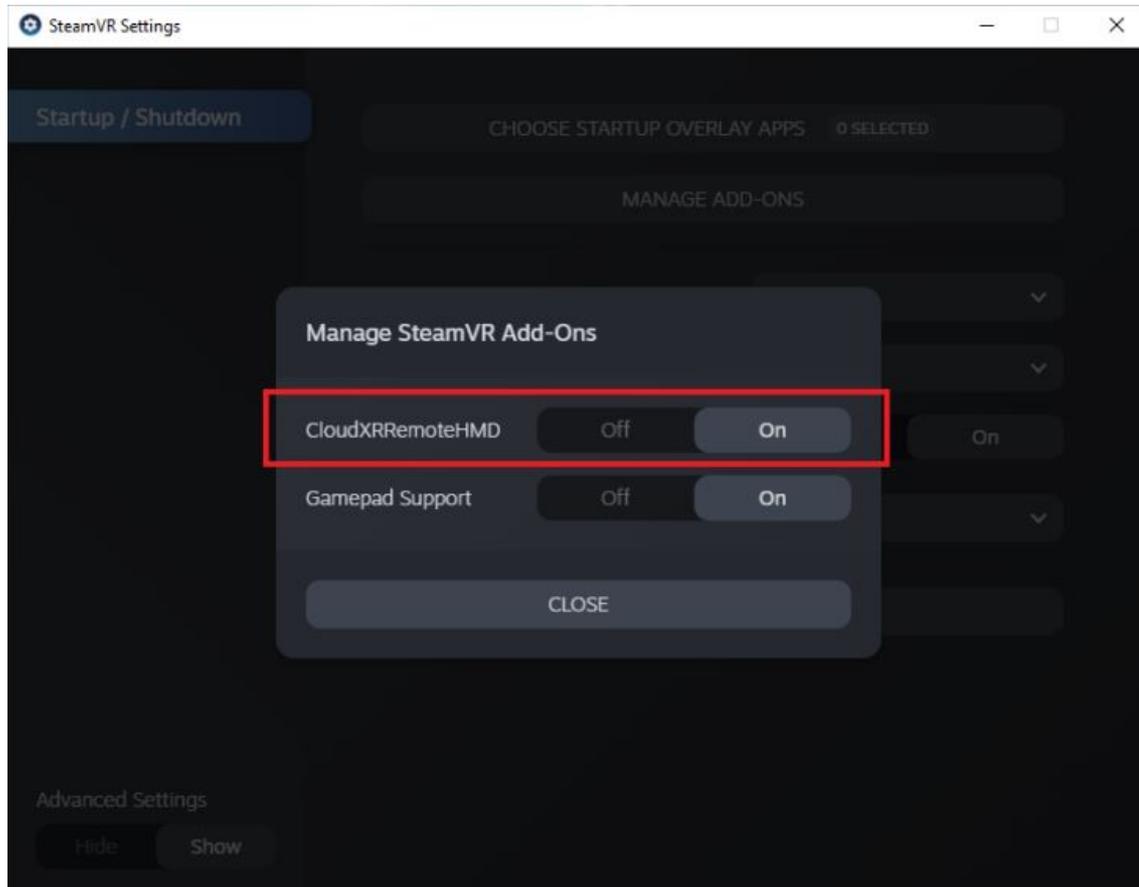

10. On the Desktop, double-click **vrserverallowadd.bat** to add a Windows Firewall rule to allow VRServer.exe to send and receive network traffic.
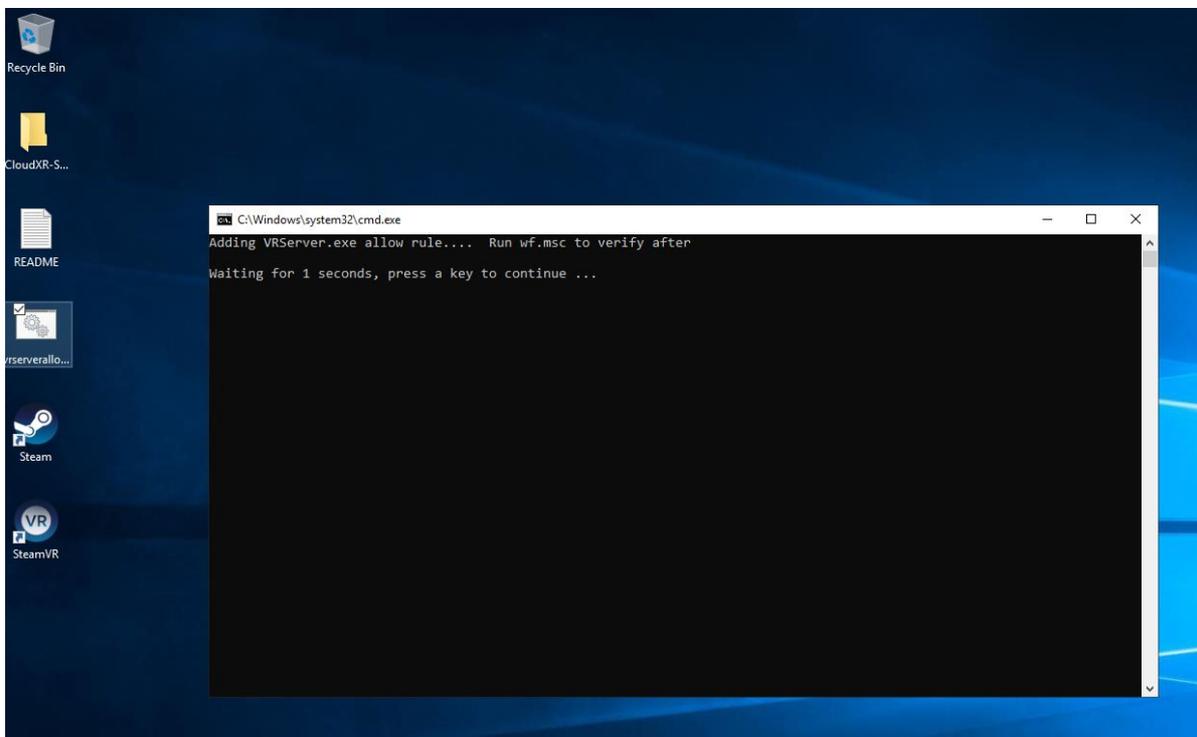
11. Verify the rule has been added by launching **Run > wf.msc** to open **Windows Defender Firewall with Advanced Security**. Look for a rule named **CloudXR VR Server Path**. (Also note the **CLOUDXR RTSP TCP** entries that were added by the CloudXR Server installer).
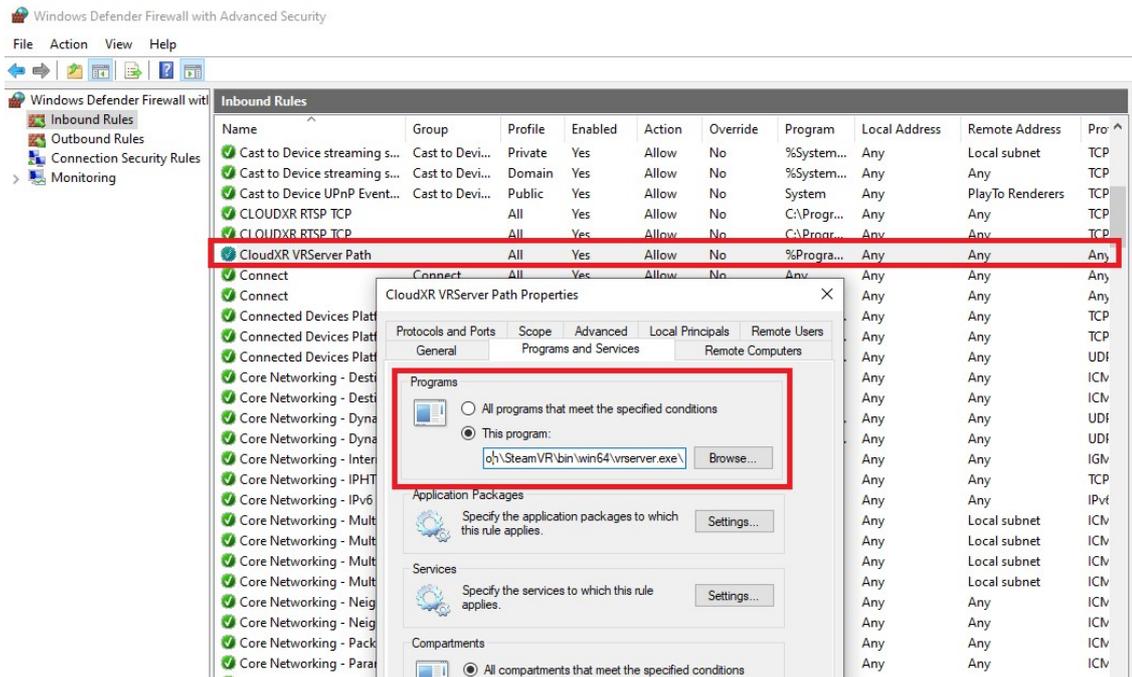
12. Install an alternative remote desktop connection tool. Popular options include VNC, PCoIP from Teradici, or DCV from NICE. Use this from now on when connecting to your instance. RDP will produce a green screen within the CloudXR Stream when connected to the workstation.

13. (Optional) Install a virtual audio device if sound is required. A popular option can be found at https://vb-audio.com/Cable/

14. Server installation and configuration is now complete.

    Note: Azure instances are billed based on usage. Consider shutting down your instance when no longer in use to prevent unnecessary charges.

Connecting to CloudXR Server from CloudXR Client

The latest CloudXR sample/test clients help developers learn how to develop their own client applications. These have been omitted from the image to ensure the latest versions are used when developing. These can be acquired from the NVIDIA Developer portal at https://developer.nvidia.com/nvidia-cloudxr-sdk. The instructions below may change at any time and do not discuss methods of loading and launching client applications on HMD devices. For these details, consult the CloudXR documentation. https://docs.nvidia.com/cloudxr-sdk/index.html

1. Ensure firewalls are configured to allow access for the specified ports for CloudXR. These include your local network firewall and remote Azure Network and Firewall ettings. Specific ports and their values are located with the CloudXR documentation.

2. Launch SteamVR. It may display warning about a disconnected headset which can be ignored.

3. Launch the CloudXR Client application on your client device and use the public IP address of your instance for its connection endpoint. Once connected, SteamVR will display icons indicating a device is connected. You will also see the SteamVR "void" within the headset. You can also open the VR view within SteamVR and validate images between the server and headset.

4. Launch any OpenVR application and use it as you normally would.

5. **Shut down / STOP the instance when your session is over else Azure charges will continue to accumulate.**