I recently had the opportunity to assist on a project where a partner was using N-Series Azure VMs. My part of this effort was developing a script to automate the setup of the VMs. To perform the VM setup and configuration, an ARM template was used. There are several other ways to set up an Azure VM (e.g. PowerShell, CLI, Azure Portal, etc.) The ARM template approach was used because in doing so provided consistency with several other ARM templates being used for other parts of the project.

Setting up Azure VMs using ARM templates is common. There are many articles, blog posts, and sample templates available to help get started. That isn’t itself especially interesting. The interesting part, at least for me, was the N-Series aspect. N-Series VMs require a separate step to fully configure – installing the NVIDIA driver. The NVIDIA driver needs to be installed to take advantage of the GPU capabilities of the N-Series VM. There are instructions (<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/n-series-driver-setup>) on how to install the driver, but those instructions assume you like to remote into the VM each time you create a VM, and then run an installation program. That’s tolerable if doing it only a few times. Any more than that, and it’s time for automation to save me.

I scoured the Internet as best I could for a reference on how to perform a silent install of the drivers. The best resource I could find was <https://lazyadmin.nl/it/deploy-nvidia-drivers/> and also <http://www.itninja.com/question/how-to-install-custom-nvidia-graphic-drivers-silently-in-k1000-managed-installations>. Now I need to take that and bake it into a custom script extension. By doing so, I can let ARM do its thing by provisioning the VM and related resources (NIC, Virtual Network, IP address, etc.), and invoke a PowerShell script to install the NVIDIA driver.

Before writing the PowerShell script to silently install the NVIDIA driver, I decided to try to install the driver manually. I wanted to observe the experience for myself. It is a good thing I did, as that was where I noticed an interesting “opportunity”. While running the NVIDIA driver installation, I received a Windows prompt to authorize the drivers.

[insert screenshot]

Apparently, the NVIDIA driver isn’t digitally signed. Thus, Windows prompts the user to confirm that installing the driver is REALLY what is desired. Yes, yes it is. That’s lovely, except it makes the automated install a bit more complicated. To get over this hurdle, I needed to first complete the manual installation of the driver. With the driver installed, I could export the Trusted Publisher certificate that is created by Windows as part of the driver installation.

[insert screenshot]

I can use that certificate as part of the automated install process. But . . . but. . .what. . . . how? Good question! By using the **certutil.exe** program it is possible to install the certificate into the Trusted Publisher store on a *new* VM. Lightbulbs?

The custom script I’m going to use will do execute a few different steps:

1. Download the NVIDIA driver file from Azure Blob storage. I put the driver file in blob storage to make sure that this specific one is the one I will use.
2. Unzip the NVIDIA driver file and extract the contents to a local directory
3. Use certutil.exe to install the certificate
4. Run the NVIDIA setup.exe with parameters to do so silently
5. Wait for the installation program to finish
6. Force a reboot of the VM

You can find the full ARM template, custom script, and deployment script at XXXXX.

**Alternative**

**Resources**:

Custom Script Extension for Windows (<https://docs.microsoft.com/en-us/azure/virtual-machines/windows/extensions-customscript?toc=%2fazure%2fvirtual-machines%2fwindows%2ftoc.json>)

There was previously a comment at <https://docs.microsoft.com/en-us/azure/virtual-machines/windows/n-series-driver-setup> about a silent install for the NVIDIA drivers, which linked to <https://github.com/Azure/azure-accessplatform-windows-gpu/blob/9269ac0665cc6e3ae3cbbece842a8fe2cba12570/CustomScripts/nVIDIAdTeradiciLeostreamAgents.ps1#L75-L92>. That comment appears to be gone.