ThinkAgile MX Solution Builder Extension Guide for MXBR2408

The Solution Builder Extension (SBE) allows customers to apply updates from Lenovo to Azure Local, version 23H2 instances. In addition to Microsoft Azure Local solution updates, Lenovo releases regular updates for the hardware running Azure Local. These updates may include driver and firmware updates, hardware monitoring enhancements, and diagnostic tools.

Lenovo ThinkAgile MX SBE packages enable the automation of updates for system firmware, device drivers, and utility software for Lenovo ThinkAgile MX solutions via the Cluster Aware Update (CAU) plugin. Further SBE capabilities like automatic SBE package downloads and robust health checks are provided by a PowerShell module. All update packages follow Lenovo ThinkAgile MX Best Recipe releases and are contained in a single compressed ZIP archive. Each SBE package supports specific Machine Types (MT) and specific Azure Local release versions. Check the SBE package Release Notes, which are contained in the ZIP archive, for additional details.

For Lenovo ThinkAgile MX Premier Solutions, when an SBE Premier update package becomes available, it appears automatically as an update option in the Azure portal. Applying an SBE Premier package is a simple matter of clicking the appropriate button in the Azure Portal. This document does not pertain to SBE Premier update packages.

For many Lenovo ThinkAgile MX solutions, SBE Standard update packages can be downloaded from the Best Recipe page of the Lenovo Updates Repository site (https://thinkagile.lenovo.com/mx) and then imported into the cluster.

This document presents the steps that need to be taken to obtain and process the Standard SBE package for ThinkAgile MX solutions using Best Recipe MXBR2408. Note that not all ThinkAgile MX solutions support SBE package updates at this time. If an SBE update package is available for a ThinkAgile MX solution, it will be shown at the top of the current Best Recipe page for the solution, which can be found here:

https://support.lenovo.com/us/en/solutions/HT507406

Introduction

For background information regarding SBE, SBE packages, and guidance for taking advantage of its capabilities, see the following Microsoft article:

https://learn.microsoft.com/en-us/azure-stack/hci/update/solution-builder-extension

The process used to update a ThinkAgile MX solution running Azure Local using a Standard SBE Package consists of the following main activities:

- Configure XCC settings
- Discover SBE updates
- Import SBE update
- Download, check readiness, and install

Before starting to work with SBE packages, certain prerequisites are necessary to provide a secure method of communicating between the Azure Local nodes and the Azure Arc control plane.

Configure XCC settings

The following XCC settings are critical for establishing secure communication to the nodes:

- IPv6 must be Enabled in Ethernet Configuration
- Ethernet Over USB must be Enabled
- REST Over HTTPS must be Enabled
- Security Mode must be set to "Compatibility"
- IPMI over KCS Access must be Enabled
- TLS Version Support must be set to "TLS 1.2 and Higher"

To check/configure the above XCC settings, open the XCC browser interface on each node in the Azure Local instance and configure the required settings. Follow these steps:

1. Log in to the XCC browser interface, expand BMC Configuration in the left navigation pane, and then select Network.
2. In the Ethernet Configuration area, click to Enable IPV6 on the right side of the user interface, and then click Apply. The IPv4 settings on the left side of the user interface can be configured according to your needs.
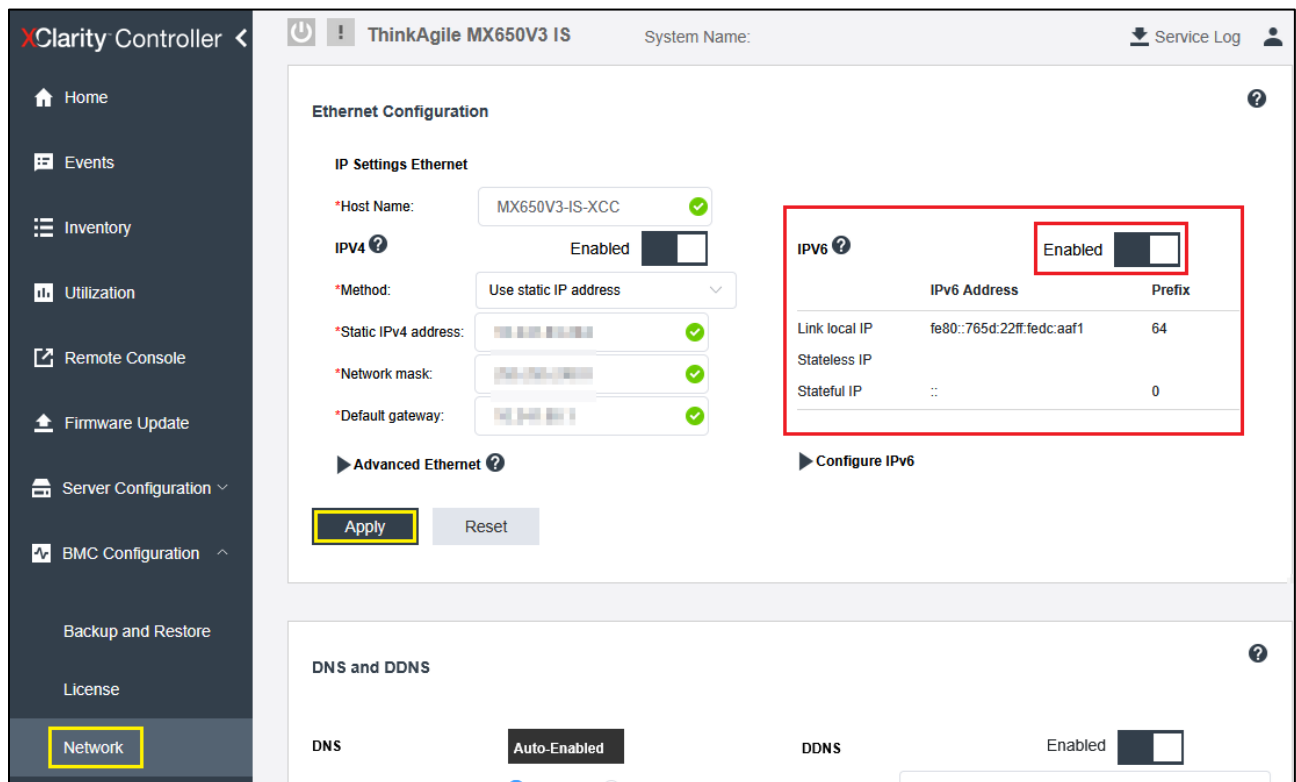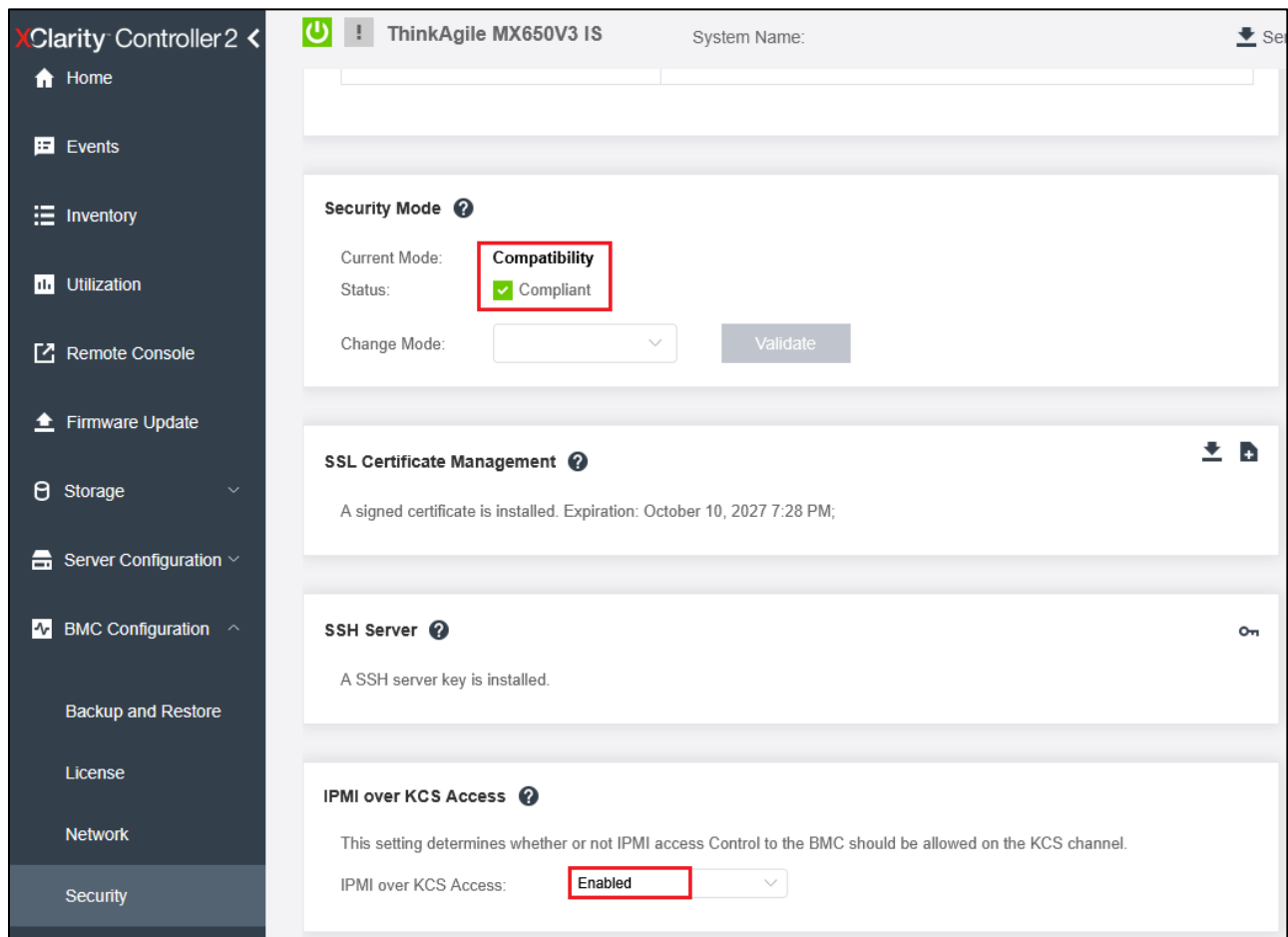

3. While still on the Network pane, scroll down to the Ethernet Over USB section and ensure that Ethernet over USB is set to Enabled. Ensure that the "Use IPv4 link-local address for Ethernet Over USB" option is selected in the drop-down list.
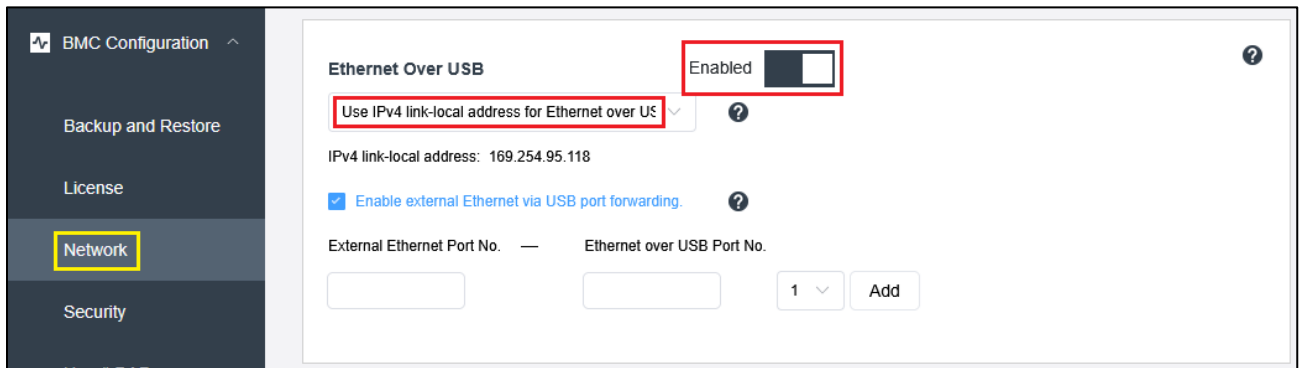
4. While still on the Network pane, scroll down to the Service Enablement and Port Assignment settings to ensure that REST Over HTTPS is Enabled. This is the default setting but should be verified.
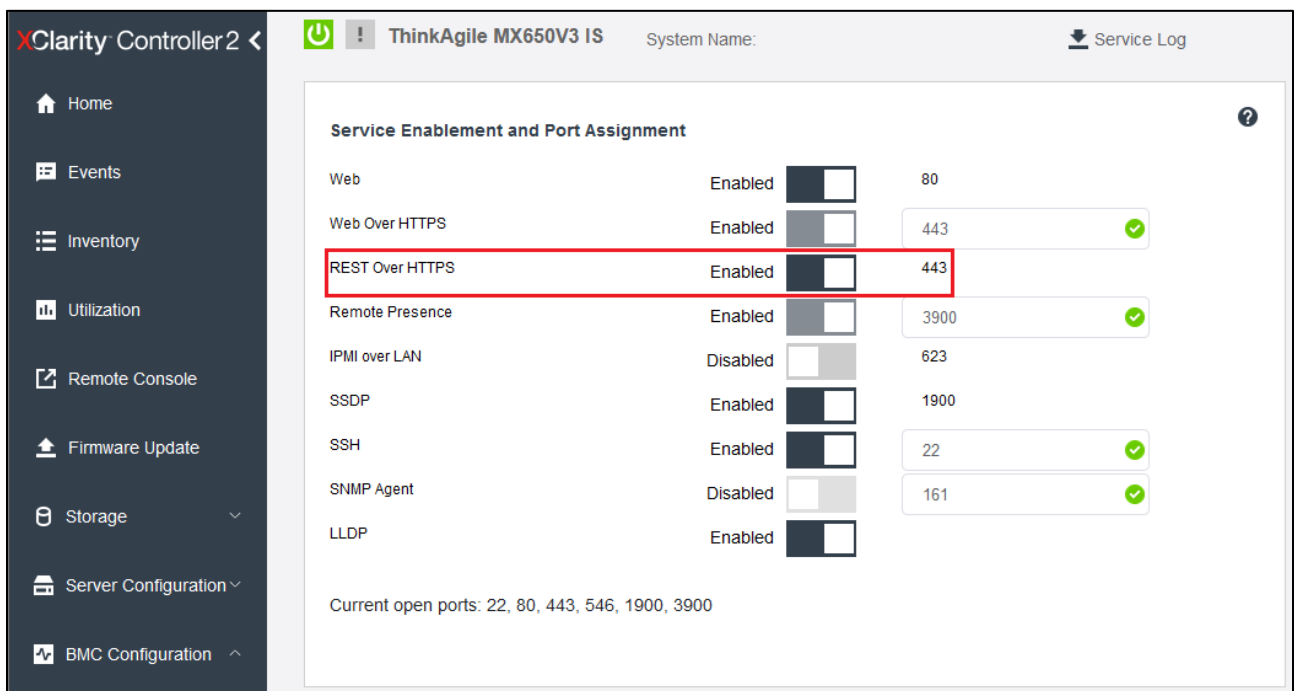
5. In the left navigation pane, select Security.
6. In the Security Mode area on the right, ensure that Compatibility is selected and Compliant is checked.
7. In the IPMI over KCS access section, ensure that IPMI over KCS access is Enabled.

8. While still on the Security pane, scroll down to the bottom of the list of settings to ensure that TLS Version Support is set to "TLS 1.2 and higher". This is the default setting but should be verified.
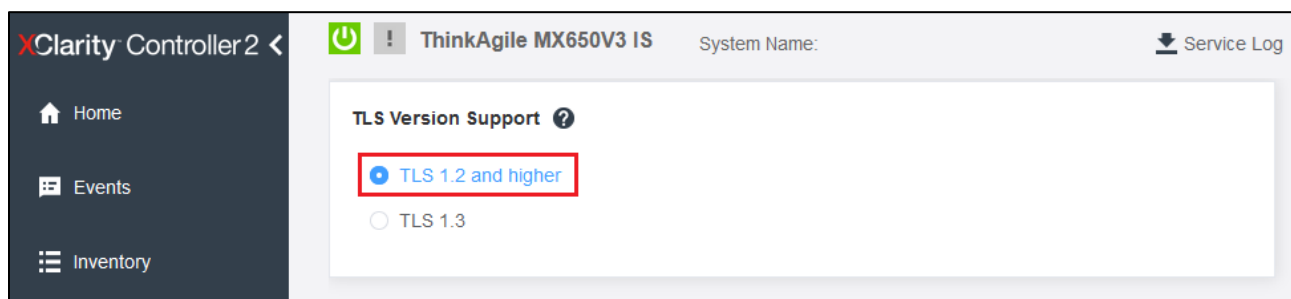
Proxy Configuration

If using a proxy, certain interfaces might need to be excluded, including the IBM NDIS interface. Proxy configuration instructions can be found in the following Microsoft article:

https://learn.microsoft.com/en-us/azure/azure-local/manage/configure-proxy-settings-23h2?view=azloc-24113

In addition to any proxy exclusions you might require, the IBM NDIS interface must always be excluded. The best way to accomplish this is to exclude the subnet used by this interface (169.254.0.0/16 in CIDR format). To do this, execute the following commands on each node:

```
$NoProxy = "169.254.0.0/16"
[Environment]::SetEnvironmentVariable("NO_PROXY",$NoProxy,"Machine")
```

The Azure Local nodes are now ready to communicate with the Azure Arc control plane.

Discover SBE updates

To check whether an SBE update package is available for a Lenovo ThinkAgile MX solution, use the following PowerShell command:

```
Get-SolutionUpdateEnvironment | ft SbeFamily, HardwareModel, CurrentSbeVersion
```

Here's an example output from our lab environment:

```
PS C:\Users\Lcmuser> $Update = Get-SolutionUpdateEnvironment
PS C:\Users\Lcmuser> $Update | ft SbeFamily, HardwareModel, CurrentSbeVersion

SbeFamily          Hardware Model          CurrentSbeVersion
---------          --------------          -----------------
                   ThinkAgile MX650 V3 IS  2.1.0.0
```

Import SBE package

For Lenovo ThinkAgile MX solutions that are not Premier Solutions, importing a Standard SBE package is the method used to update the solution using an SBE package. Essentially, the Standard SBE package must be manually downloaded from the Lenovo ThinkAgile MX updates repository site and copied to a CSV on the Azure Local instance. It can be found as part of the Best Recipe content for those solutions that support updating via the SBE process. The following example shows the MXBR2408 Best Recipe page on the site:

Once the SBE package has been downloaded, extract the zip archive, which contains the following 5 files:

- Lenovo_ThinkAgile_MX_Solution_Builder_Extension_Guide.pdf
- LenovoSBEReleaseNotes.txt
- SBE_Discovery_Lenovo.xml
- SBE_Lenovo_MX*<Model><Version>*.xml
- SBE_Lenovo_MX*<Model><Version>*.zip

The last 3 files in the list (file names starting with "SBE_") are the files that will need to be imported. Microsoft suggests running the following PowerShell command on one of the nodes in the Azure Local instance to create a "Sideload" directory in the proper location:

```
New-Item C:\ClusterStorage\Infrastructure_1\Shares\SU1_Infrastructure_1\Sideload -ItemType Directory
```

Once the directory has been created, copy the 3 extracted files whose names begin with "SBE_" from the downloaded SBE package to the directory.

```
PS C:\……\Sideload> dir

    Directory: C:\ClusterStorage\Infrastructure_1\Shares\SU1_Infrastructure_1\Sideload

Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----        12/11/2024   9:10 AM           4906 SBE_Discovery_Lenovo.xml
-a----        12/11/2024   9:10 AM        1026321 SBE_Lenovo_MX650V3-MX630V3_4.1.2411.1003.xml
-a----        12/11/2024   9:08 AM     3062180400 SBE_Lenovo_MX650V3-MX630V3_4.1.2411.1003.zip
```

Discover the update package using the following PowerShell command:

```
Add-SolutionUpdate -SourceFolder C:\ClusterStorage\Infrastructure_1\Shares\SU1_Infrastructure_1\Sideload
```

Verify that the Update service discovers the update package and that it is available to start preparation and installation using the following command:

```
Get-SolutionUpdate
```

Details about the update can be found in the output of the command, including the State of the update, which should show as "Ready".

```
PS C:\……\Sideload> Get-SolutionUpdate

ResourceId            : redmond/SBE4.1.2411.1003
InstalledDate         :
Description           : SBE Package for Lenovo ThinkAgile MX650V3/MX630V3
State                 : Ready
KbLink                : https://thinkagile.lenovo.com/MX/SBE/LenovoSBEReleaseNotes
MinVersionRequired    : 10.2311.0.9
MinSbeVersionRequired : 2.1.0.0
PackagePath           : C:\ClusterStorage\Infrastructure_1\Shares\SU1_Infrastructure_1\Updates\Packages\SBE4.1.2411.1003
PackageSizeInMb       : 2920
DisplayName           : SBE_Lenovo_MX650V3-MX630V3_4.1.2411.1003
Version               : 4.1.2411.1003
SbeVersion            : 4.1.2411.1003
Publisher             : Lenovo
ReleaseLink           : https://thinkagile.lenovo.com/MX/SBE/LenovoSBEReleaseNotes
AvailabilityType      : Local
PackageType           : SBE
Prerequisites         : {}
UpdateStateProperties :
AdditionalProperties  : {SBEFamily, SupportedModels, SBEPublisher, SBEReleaseLink}
ComponentVersions     :
RebootRequired        : Unknown
HealthState           : Unknown
HealthCheckResult     :
HealthCheckDate       : 1/1/0001 12:00:00 AM
BillOfMaterials       : {}
```

If you rerun the **Get-SolutionUpdateEnvironment** command shown above, you should now see the SBE Family name for the update:

```
PS C:\Users\Lcmuser> $Update = Get-SolutionUpdateEnvironment
PS C:\Users\Lcmuser> $Update | ft SbeFamily, HardwareModel, CurrentSbeVersion

SbeFamily        HardwareModel         CurrentSbeVersion
---------        -------------         -----------------
MX650V3-MX630V3  ThinkAgile MX650 V3 IS 2.1.0.0
```

Download, check readiness, and install

To stage the Standard SBE update package and payloads (for example, firmware and driver updates), run the following command:

```
Get-SolutionUpdate | ? Version -eq "10.2302.0.31" | Start-SolutionUpdate
```

Note: To only prepare the update without starting the installation, use the **-PrepareOnly** flag with the **Start-SolutionUpdate** command in the example above. If the **-PrepareOnly** flag is used, the command will need to be run again without this flag in order to perform the update.

The update process should begin immediately, showing the Instance ID of the update on the output line, just after the version of the update being applied, as shown in the following output. Make sure to capture the Instance ID (highlighted in the yellow box) for use in monitoring the update process.

```
PS C:\……\Sideload> Get-SolutionUpdate | ? Version -eq "4.1.2411.1003" | Start-SolutionUpdate
redmond/SBE4.1.2411.1003/f13a89b8-3247-4518-ba98-0a5e384afe74
```

Once the update has been started, the Get-SolutionUpdate can be run to check status of the update process. Initially, the State will show as "Preparing" as shown in the following output:

```
PS C:\......\Sideload> Get-SolutionUpdate

ResourceId            : redmond/SBE4.1.2411.1003
InstalledDate         :
Description           : SBE Package for Lenovo ThinkAgile MX650V3/MX630V3
State                 : Preparing
KbLink                : https://thinkagile.lenovo.com/MX/SBE/LenovoSBEReleaseNotes
MinVersionRequired    : 10.2311.0.9
MinSbeVersionRequired : 2.1.0.0
PackagePath           : C:\ClusterStorage\Infrastructure_1\Shares\SU1_Infrastructure_1\Updates\Packages\SBE4.1.2411.1003
PackageSizeInMb       : 2920
DisplayName           : SBE_Lenovo_MX650V3-MX630V3_4.1.2411.1003
Version               : 4.1.2411.1003
SbeVersion            : 4.1.2411.1003
Publisher             : Lenovo
ReleaseLink           : https://thinkagile.lenovo.com/MX/SBE/LenovoSBEReleaseNotes
AvailabilityType      : Local
PackageType           : SBE
Prerequisites         :
UpdateStateProperties :
AdditionalProperties  : {SBEFamily, SupportedModels, SBEPublisher, SBEReleaseLink}
ComponentVersions     :
RebootRequired        : Unknown
HealthState           : Unknown
HealthCheckResult     :
HealthCheckDate       : 1/1/0001 12:00:00 AM
BillOfMaterials       : {}
```

To remove much of the non-critical information from the output, use the modified PowerShell command shown below, which provides only summary status:

```
Get-SolutionUpdate | ft Version,State,UpdateStateProperties
```

Output includes only the specified details, as shown in the following output:

```
PS C:\......\Sideload> Get-SolutionUpdate | ft Version,State,UpdateStateProperties

Version              State UpdateStateProperties
-------              ----- ---------------------
4.1.2411.1003 HealthChecking
```

During the update process, repeat the command above to check status of the update process. The cluster servers may reboot and a PowerShell session may need to be reestablished to continue monitoring the process. Following are a few outputs from the command during the update:

```
PS C:\> Get-SolutionUpdate | ft Version,State,UpdateStateProperties

Version              State UpdateStateProperties
-------              ----- ---------------------
4.1.2411.1003 Installing
```

```
PS C:\> Get-SolutionUpdate | ft Version,State,UpdateStateProperties

Version              State UpdateStateProperties
-------              ----- ---------------------
4.1.2411.1003 Installing 65% complete.
```

Once the installation is complete, the State changes to "Installed".

```
PS C:\> Get-SolutionUpdate | ft Version,State,UpdateStateProperties

Version              State UpdateStateProperties
-------              ----- ---------------------
4.1.2411.1003 Installed
```

After the updates are installed, verify the solution version of the environment and the operating system version via PowerShell using the following command:

```
Get-SolutionUpdateEnvironment | ft State, CurrentVersion
```

Output from our lab:

```
PS C:\> Get-SolutionUpdateEnvironment | ft State,CurrentVersion

              State CurrentVersion
              ----- --------------
AppliedSuccessfully 10.2411.0.22
```

Check the operating system version to confirm it matches the recipe that was installed by running the following command:

```
cmd /c ver
```

Output from our lab:

```
PS C:\> cmd /c ver

Microsoft Windows [Version 10.0.25398.1251]
```

The Azure Local instance has been updated.

Important Note for Lenovo ThinkAgile MX Premier Solutions

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Before deploying a Lenovo ThinkAgile MX Premier Solution, ensure that IPV6 is Enabled in the Ethernet Configuration section of the XCC browser interface (navigate to BMC Configuration > Network). Other BMC Network settings should not be changed. Simply ensure that IPV6 is Enabled and Apply the setting if necessary.