

Cisco Integrated System for Microsoft Azure Stack

Procedure to Add Server Nodes



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Overview

With Microsoft Azure Stack Update 1807, Microsoft supports the addition of physical servers to an existing Azure Stack. Cisco® customers running Azure Stack Update 1807 and later can now order and add nodes to their existing Azure Stack. With the current version of the add-node capability, Microsoft allows you to expand an existing cluster to a maximum of 16 servers per scale unit. This document provides detailed instructions for adding new nodes to existing Azure Stack systems. The procedure documented below is unique to Cisco and represents a clear advantage for customers as professional or customer services are not required thus saving the customer's IT budget, and enable customers to add system resource when desired.

Prerequisites

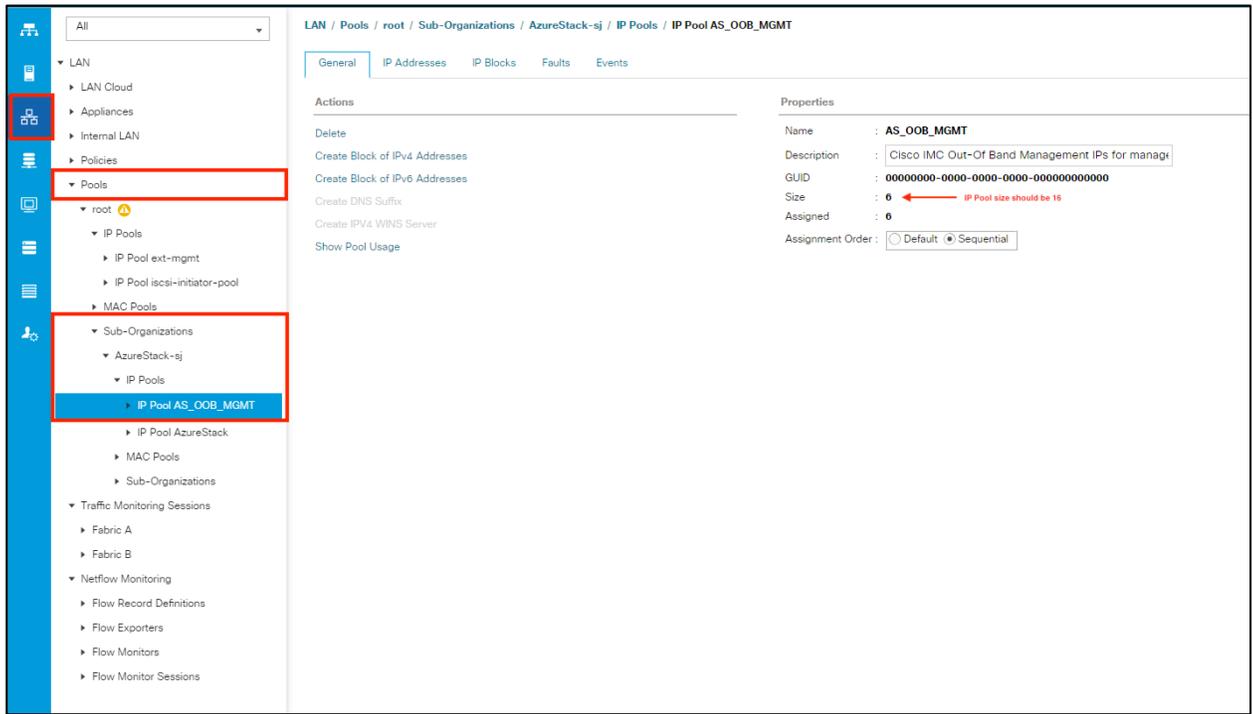
Before you begin the add-node process, verify that your system meets the prerequisites described here:

1. Azure Stack must be running Update 1807 or later with no errors or warnings on the Azure Stack administration portal.
2. Verify that you have the following components as a part of add-node package:
 - a. Server with the exact same components as the other servers in the existing Azure Stack
 - b. Two QSFP-H40G-CU3M cables
 - c. Cisco Unified Computing System™ (Cisco UCS®) port license for two ports (should be included in the add-node bill of materials)
3. Obtain two CAT 6 cables (not included in the Cisco bill of materials)
4. Verify that no errors or warnings are displayed on Cisco UCS Manager. You can access Cisco UCS Manager using any computer that has access to the Azure Stack out-of-band-management network. Access Cisco UCS Manager using a web browser of your choice and open https://<UCS_Manager_IP>. You can find the Cisco UCS Manager IP address and admin login credentials in your customer handover information.
5. Verify that the Cisco UCS service profile template has enough Cisco Integrated Management Controller (IMC) or baseboard management controller (BMC) IP addresses for the nodes that you want to add. Most new deployments after September 2018 should have IMC IP address pools large enough to support 16 servers, but for the older deployments you may need to manually expand the IMC IP address pool. Each Cisco server for Azure Stack needs two IMC IP addresses:
 - Out-of-band management IP address
 - In-band management IP address

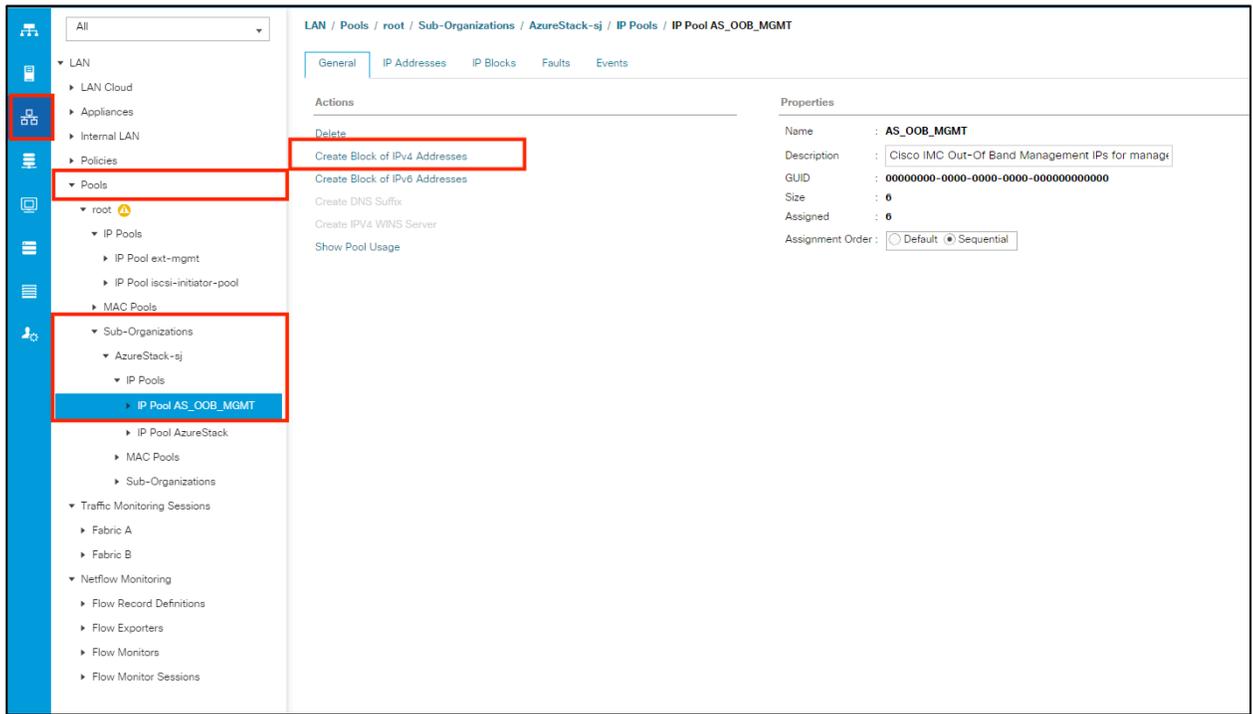
There should be one IP address pool for each type of IMC IP address. IMC IP address pools should already exist on all Cisco appliances for Azure Stack.

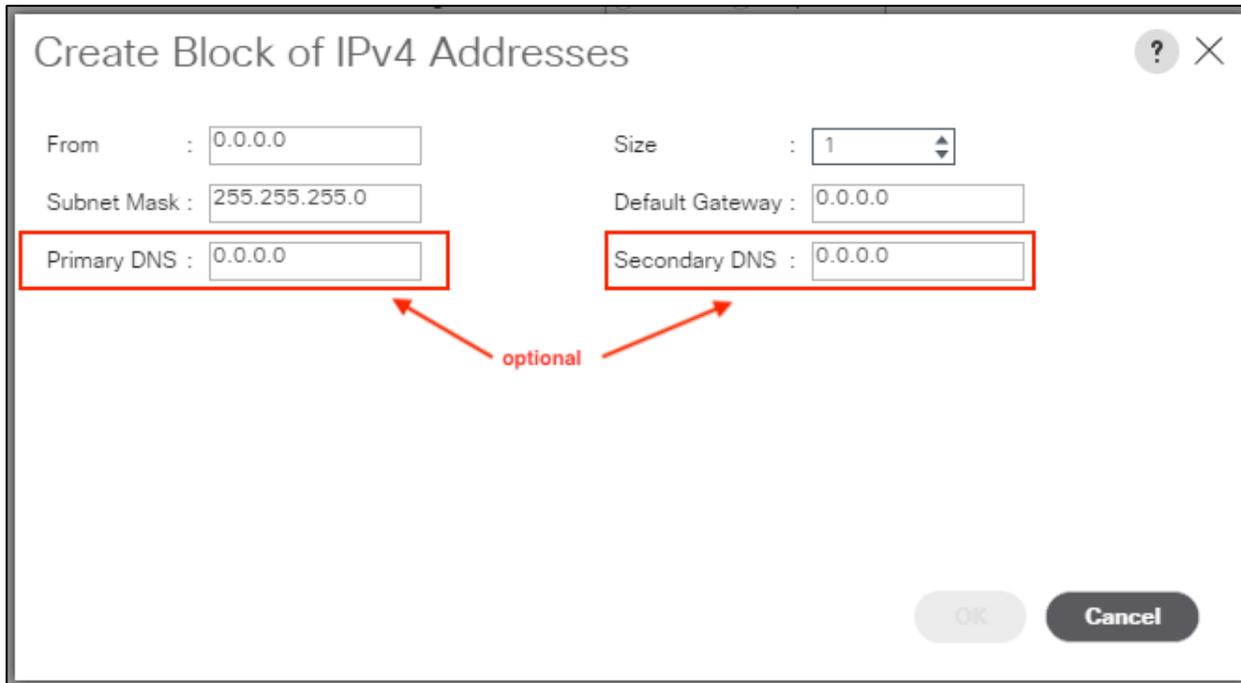
To extend the out-of-band management IP address pool, review the out-of-band management IP subnet information provided on the Cisco deployment worksheet addendum to find unused IP address blocks in that subnet. The recommended total pool size is 16 IP addresses.

From Cisco UCS Manager, navigate to LAN > Pools > Sub-Organizations > <AzureStack Org> -> IP Pools. Locate the out-of-band management IP address pool and verify that the pool size is 16.



If the pool size is not 16, then add more IP addresses using the Create Block of IPv4 Addresses option on the user interface. Add enough IP addresses to make the pool size 16. Leave the Domain Name System (DNS) values at the default setting of 0.0.0.0.





Create Block of IPv4 Addresses

From : 0.0.0.0 Size : 1

Subnet Mask : 255.255.255.0 Default Gateway : 0.0.0.0

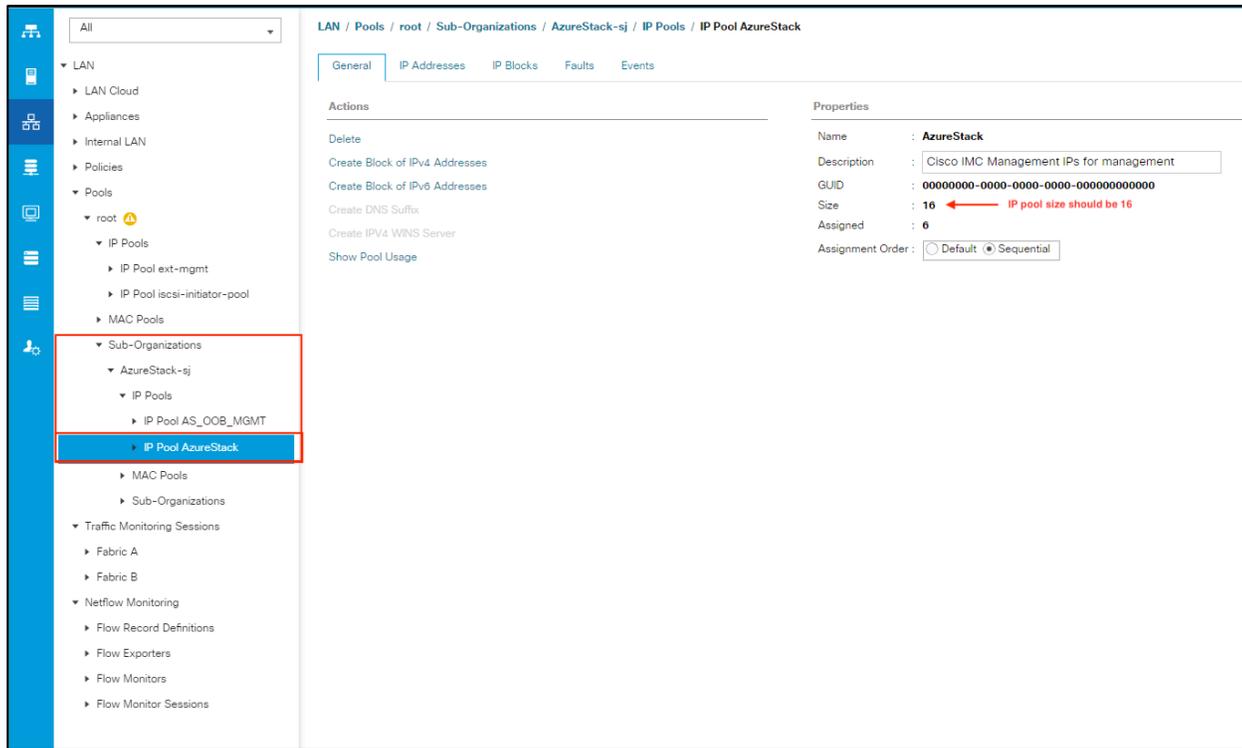
Primary DNS : 0.0.0.0 Secondary DNS : 0.0.0.0

optional

OK Cancel

Repeat the preceding process to expand the in-band management IP address pool.

To determine the number of in-band management IP addresses needed for the pool expansion, review the deployment worksheet completed prior to the deployment process. It includes the BMC IP addresses for each server in the IP use section. If the IP addresses for all 16 servers are not listed on the worksheet, pick the consecutive unused IP addresses after the last-used BMC IP address to expand the pool. For example, if you have a four-node system and currently have a fully consumed IP address pool of four IP addresses—192.168.26.3 to 192.168.26.6—then use IP addresses 192.168.26.7 to 192.168.26.18 to expand the in-band IP address pool.



LAN / Pools / root / Sub-Organizations / AzureStack-sj / IP Pools / IP Pool AzureStack

General | IP Addresses | IP Blocks | Faults | Events

Actions

- Delete
- Create Block of IPv4 Addresses
- Create Block of IPv6 Addresses
- Create DNS Suffix
- Create IPv4 WINS Server
- Show Pool Usage

Properties

Name : **AzureStack**

Description : Cisco IMC Management IPs for management

GUID : 00000000-0000-0000-0000-000000000000

Size : **16** ← IP pool size should be 16

Assigned : **6**

Assignment Order : Default Sequential

Add-node procedure

Follow the steps presented here to add nodes.

1. Install Cisco UCS port licenses.

Log in to Cisco UCS Manager and navigate to Admin > License Management > Fabric Interconnect A > General. Click Download License and select the UCS C_PORT license file provided with the new server.

The screenshot displays the Cisco License Management interface. On the left is a navigation sidebar with a gear icon highlighted. The main content area is titled "All / License Management" and includes tabs for "Fabric Interconnect A", "Fabric Interconnect B", and "Faults". Under "Fabric Interconnect A", there are sub-tabs for "General", "Installed Licenses", "Downloaded License Files", and "Download Tasks". A "Download License" button is highlighted in the top toolbar. Below this is a table of licenses:

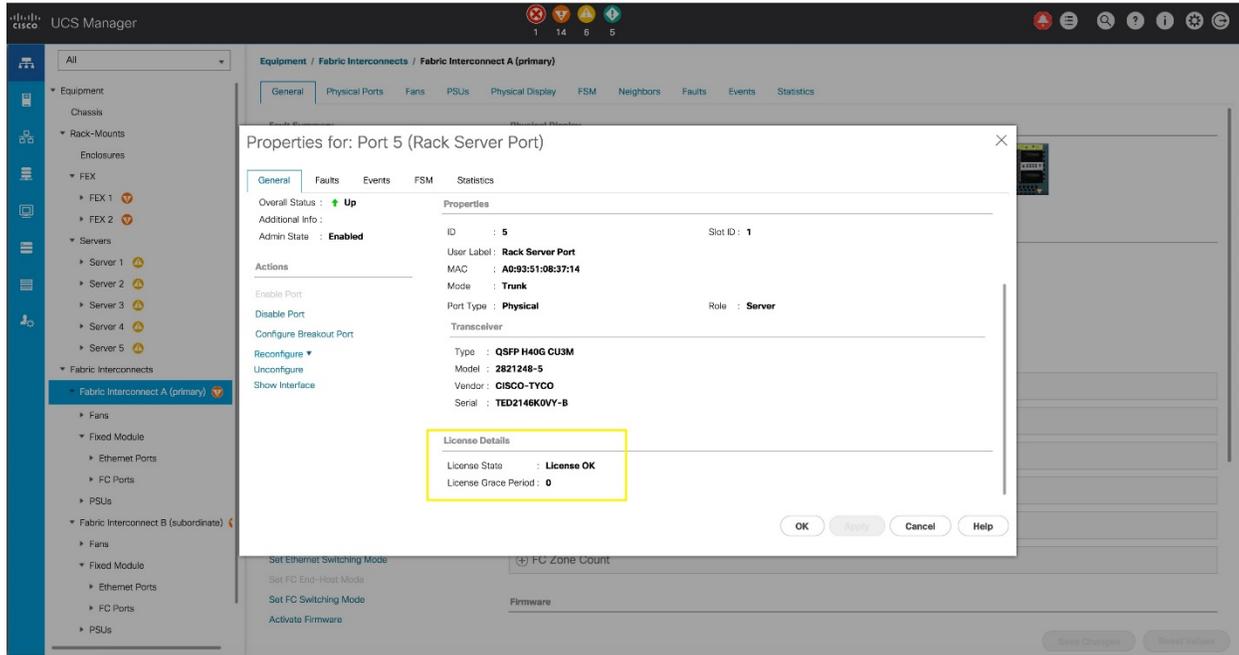
Feature Name	Grace Period	Vendor
40G_ETH_C_PORT_ACTIVATION_PKG	120	cisco
40G_ETH_PORT_ACTIVATION_PKG	120	cisco

Below the table is a "Details" section with tabs for "General", "Events", and "FSM". The "Properties" section lists the following details for the selected license:

- Name : 40G_ETH_C_PORT_ACTIVATION_PKG
- Scope : A
- Total Quantity : 14
- Used Quantity : 6
- Subordinate Used Quantity : 0
- Default Quantity : 0
- Operational State : License OK
- Grace Period Used : 0 Days
- Peer License Count Comparison : Matching

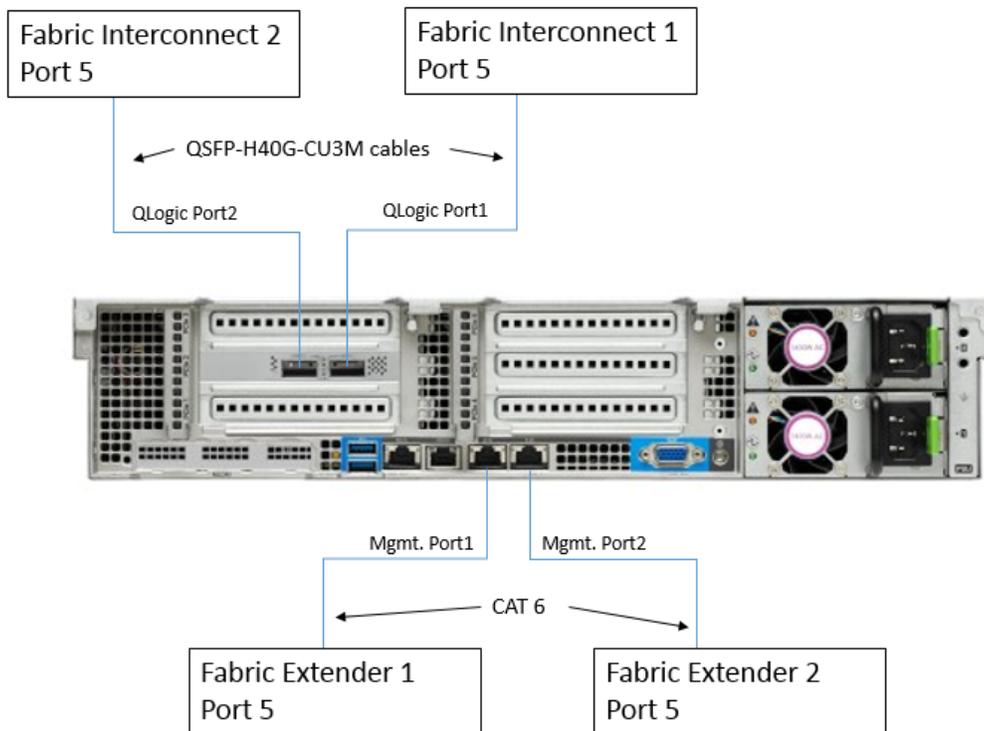
Repeat the preceding process to add a license on Fabric Interconnect B.

After installing a license on each fabric interconnect, check the license status for the newly added server port by checking the port properties.



2. Install the new server in the existing Azure Stack rack, but don't connect the power. Refer to the Cisco cabling guide for Azure Stack for additional information about server placement and cabling. Connect the QLogic and management ports to the fabric interconnect and fabric extender. The new server will consume the next consecutive ports on the fabric interconnects and fabric extenders. For example, if you are installing a fifth server on a four-node Azure Stack system, the cabling for the server will look like Figure 1.

Figure 1. Sample server cabling diagram



3. Connect the power and wait for the Cisco UCS server discovery process to finish. During the discovery phase, Cisco UCS Manager automatically performs the following actions:
 - Inventories the server and server components
 - Adds the server to the appropriate server pool
 - Creates a new service profile for the server
 - Associates the service profile with the server
 - During service profile association, upgrades server firmware to match other servers in the system

Server discovery can take anywhere from 40 minutes to 2 hours depending on the number of server components that require firmware upgrades. After discovery is complete, under Equipment choose Rack-Mounts > Servers > Server <newly added server number> > General. The status of the Association State should be Associated.

The screenshot displays the Cisco UCS Manager interface. On the left is a navigation tree with categories: Equipment, Rack-Mounts, FEX, Servers, Fabric Interconnects, and Policies. 'Server 5' is selected and highlighted in blue. The main content area shows the breadcrumb 'Equipment / Rack-Mounts / Servers / Server 5' and tabs for 'General', 'Inventory', 'Virtual Machines', 'Hybrid Display', and 'Installed Firmware'. The 'General' tab is active. It contains a 'Fault Summary' section with four icons and counts: a red 'X' (0), a yellow triangle (0), a yellow triangle with an exclamation mark (1), and a green triangle with an exclamation mark (1). Below this is a 'Status' section showing 'Overall Status : ↑ OK'. A 'Status Details' section lists various states: Configuration Error (not-applicable), Admin State (↑ In Service), Discovery State (↑ Complete), Avail State (↓ Unavailable), Assoc State (↑ Associated), Power State (↑ On), Slot Status (↑ Equipped), and Check Point (Discovered). The 'Assoc State' is highlighted with a red box.

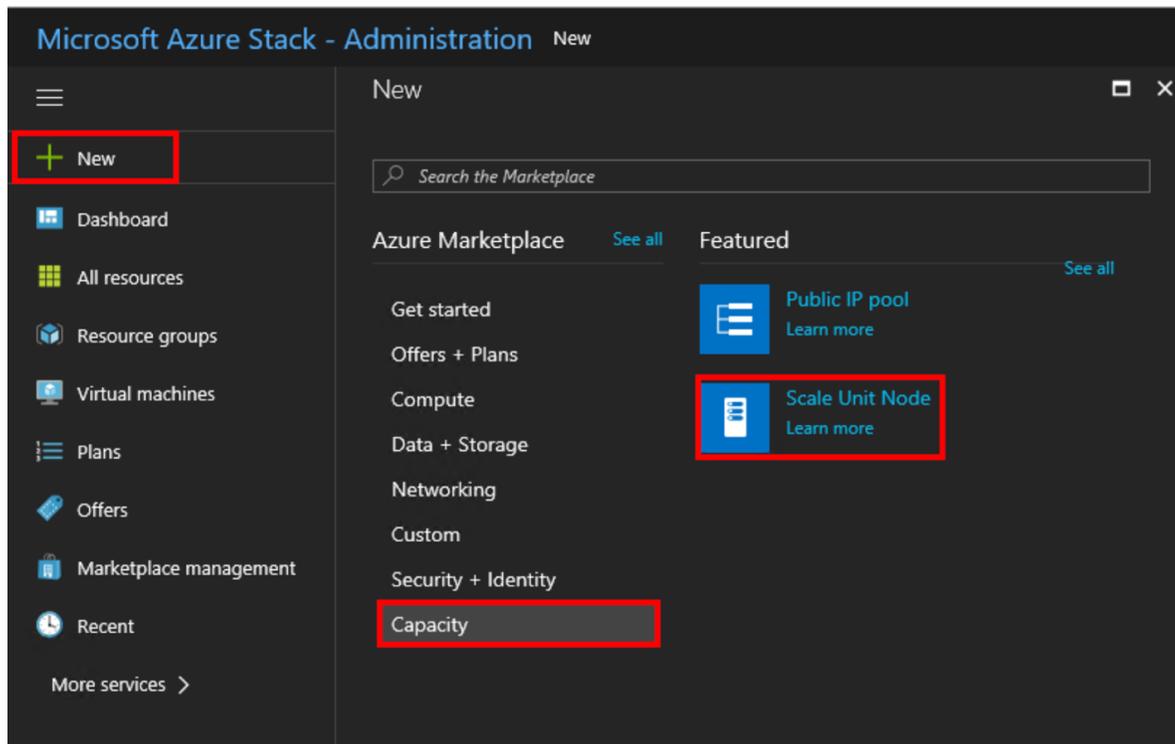
- From the Server tab, select the service profile associated with the newly installed server. Record the in-band management IP address.

The screenshot displays the Cisco IMC interface for configuring a service profile. The left sidebar shows a navigation tree with 'server-5' selected. The main content area is titled 'Servers / Service Profiles / root / Sub-Organizations / AzureStack-sj / Service Profile server-5'. The 'General' tab is active, showing various configuration options. A red box highlights the 'Management IP Address' section, which includes the following details:

- Outband IPv4: Inband
- Network: Inband-Mgmt
- Inband IPv4: Inband IPv6
- Management IP Address Policy: pooled
- Pool Name: AzureStack
- IP Pool Instance: org-root/org-AzureStack-sj/ip-pool-AzureStack
- IP Address: 192.168.26.6
- Subnet Mask: 255.255.255.192
- Default Gateway: 192.168.26.1
- Primary DNS: 171.70.168.183
- Secondary DNS: 171.36.131.10
- Reset Management IP Address

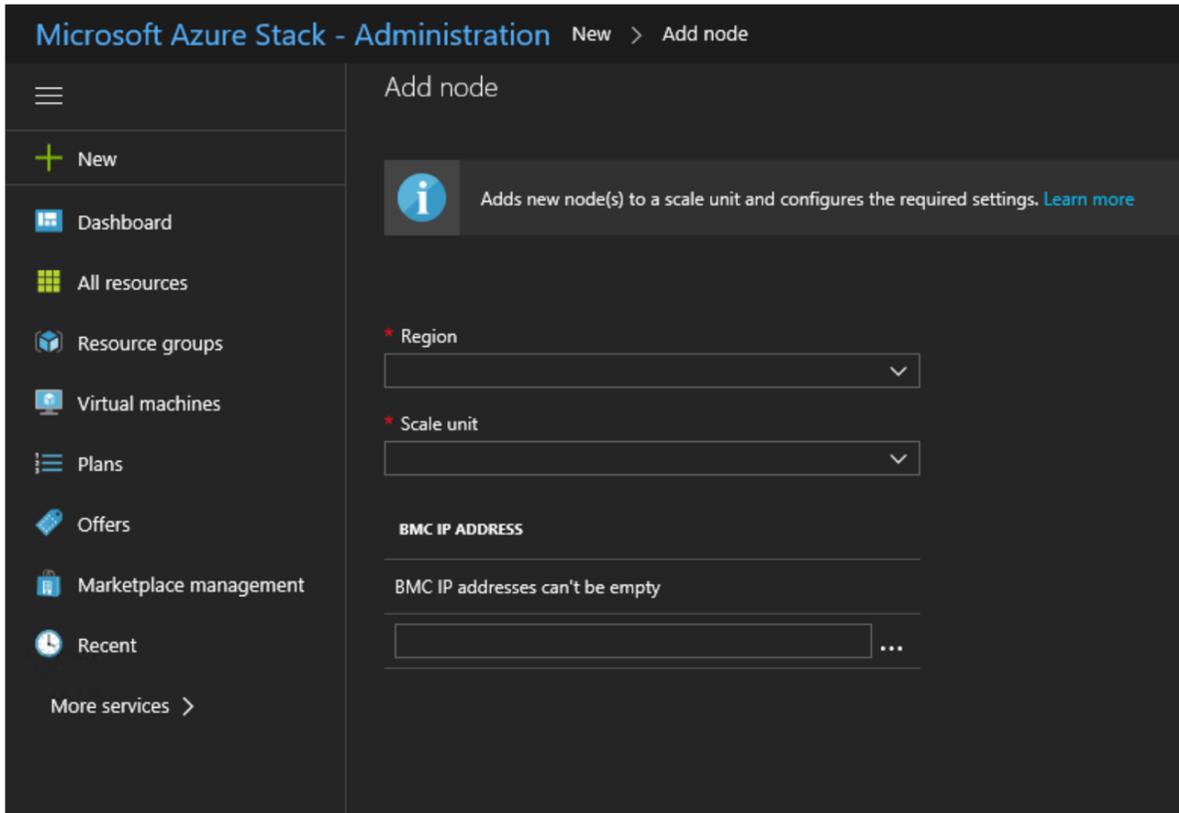
- Log in to the Azure Stack administration portal as an Azure Stack operator.

- Navigate to New > Capacity > Scale Unit Node.



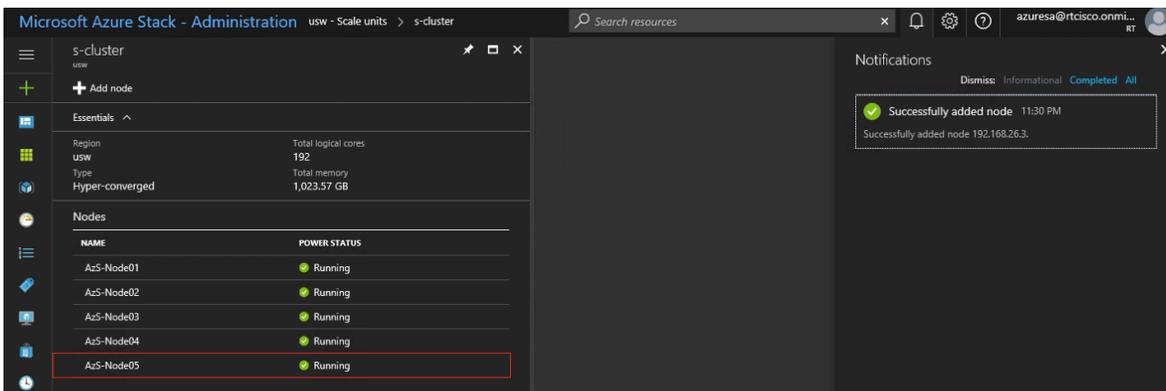
- On the Add Node pane, select the region and then select the scale unit to which you want to add the node. Specify the BMC IP address (the in-band management IP address you recorded in step 4) for the scale unit node you are adding.

Note: You can add only one node at a time



You can also add a node using Microsoft PowerShell. Refer to the Microsoft add-node documentation for additional details (<https://docs.microsoft.com/en-us/azure/azure-stack/azure-stack-add-scale-node>).

Note: During node addition, the scale unit will show a status of Expanding, and this scale unit expansion takes very long time. You can add a new node to the cluster when the last added node shows a status of Running; you do not need to wait for cluster expansion to finish.



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