CISCO

CAE UCS 1.4.1
C-Series Rack
Integration with UCSM

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1 Introduction

This White Paper will guide the user through the configuration and verification C-Series Rack Integration into UCS

1.1 What Cisco Provides

- Software
  - UCS 1.4.1 Image
  - C-series BIOS/CIMC to rack integration conversion utility

1.2 What the Field Site Must Provide

- Hardware Requirements
  - o UCS system
 - o C-series: C200, C210. C250 versions required

1.3 Topology Used for this white paper

Below is the topology used for creation of this document.

In the UCS (1.4.X) release, the N2248T Fabric Extenders will connect via their uplink ports (4 ports on the far right of the chassis) to any 10G fixed port on the 6100. In UCS, these are configured as "Server Ports" in the GUI and CLI interfaces. This is identical to how the existing IOM ports connect.

The C-series Lan On MotherBoard (LOM) port connects to any of the 1 GigE ports on the 2248.

The CNA 10 GigE ports connect directly to any 10 GigE port on the 6100. These will also be configured in UCS as "Server Ports"

UCS-A

UCS-B

10 Gig

1 Gig 2248

10 Gig Adapter links

LOM

BMC

adapter
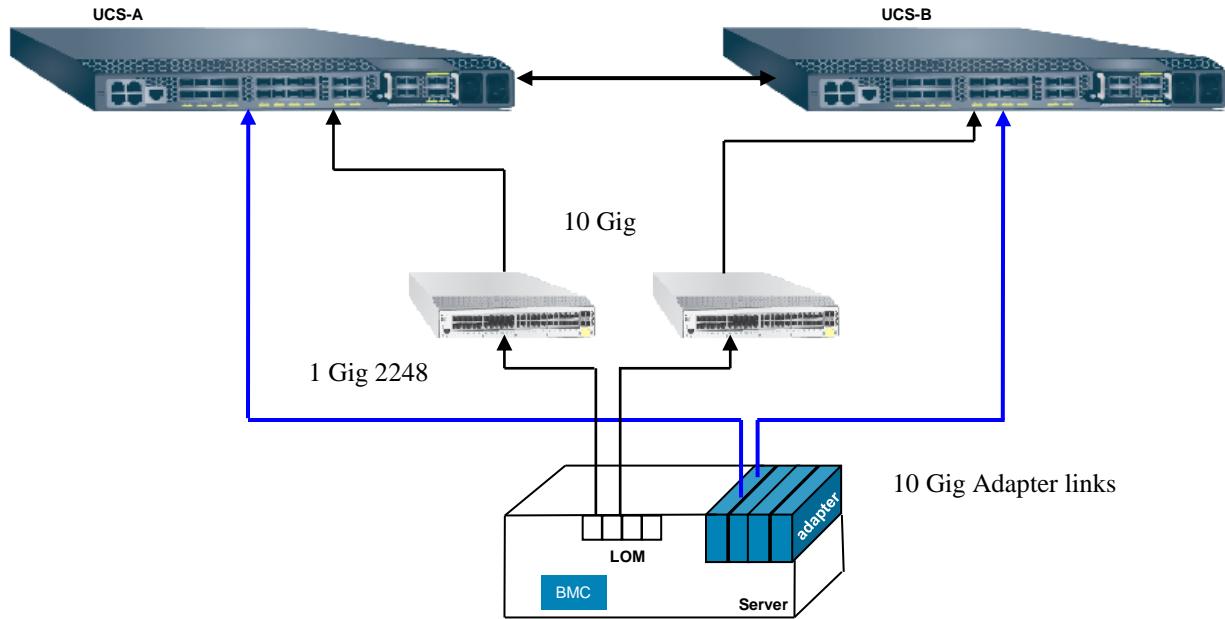
Server

1.4 Caveats for this feature

The number of "Server Ports" between the 2248 and the 6100 must equal or exceed the number of links set in the UCS "Chassis Discovery Policy". Again, this is identical to the existing UCS to IOM Chassis policy discovery policies. The IOM and N2248 FEX are treated identically in this step

Only C200, C210 and C250 are supported at this release. Only CNA's are supported at this release. Mixing of CNA and non-CNA adapters is the same rack server is not supported

The C-series must be upgraded to the latest Cisco.com release.

Once the C-series is upgraded, run the host-upgrade-utility on it to upgrade the CIMC/BIOS and LOM firmware prior to connecting to UCS.

For SAN boot, all local drives must be removed.

1.5 UCS and N2248TP configuration

Set the chassis discovery policy equal to or less than the number of server port links going to the N2248T.

In this setup, there will only be 1 server port going between the N2248T and the UCS 6100's.

Change the existing Chassis Discovery Policy to match the number of ports you will connect.

It's important to note that the Discovery Policy defines the minimum number of server ports to a FEX/IOM required to join the cluster. It does not limit the number of server links that will be used for data traffic.

e.g. Chassis Discovery Policy of 1, but with 4 server ports cabled and configured will work and provide 40G of data.

Chassis Discovery Policy of 4 but will 1 server port cabled and configured will fail discover as the FEX/IOM does not meet the minimum discovery policy
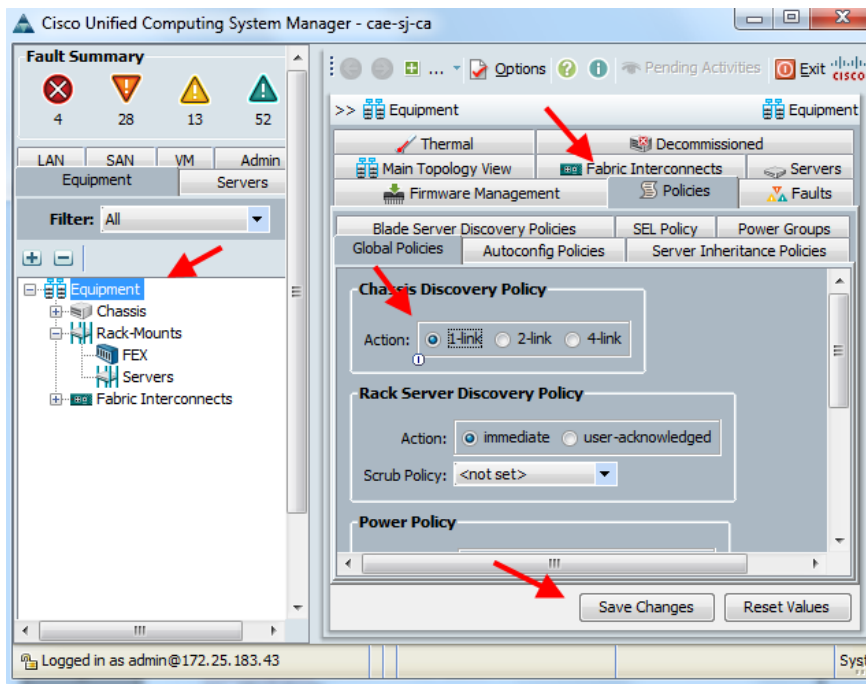

Configure the server ports to the 2248T
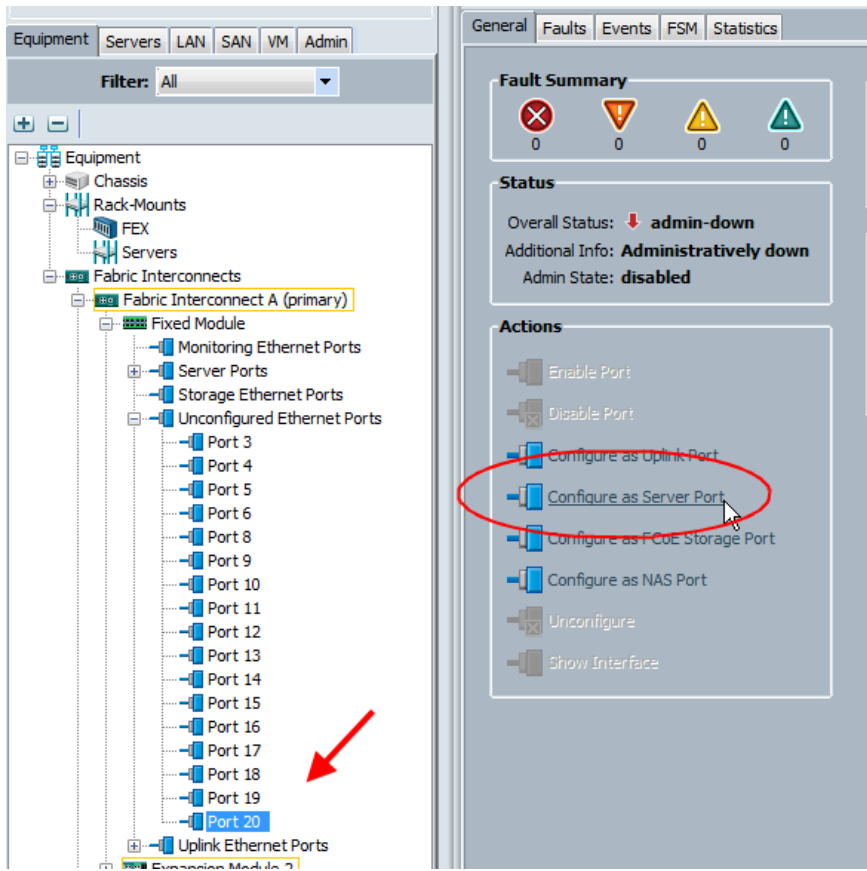
The port will go up, initializing. If the attached FEX does not have the latest firmware, it will begin the download from the 6100 and then activate/reboot.

During this time, you'll see "accessibility-problem" This process is quite lengthy if a firmware upgrade is required (~20 minutes)

The top level FEX will not show any FSM activity
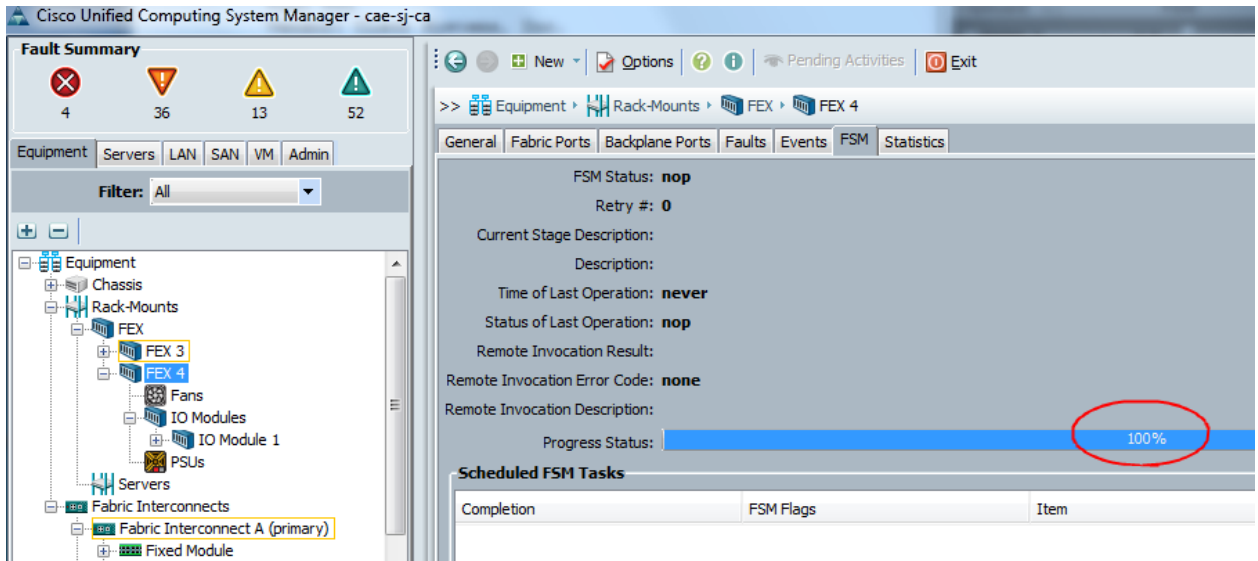
You need to drill down to the IOM under the FEX tab to observe the process
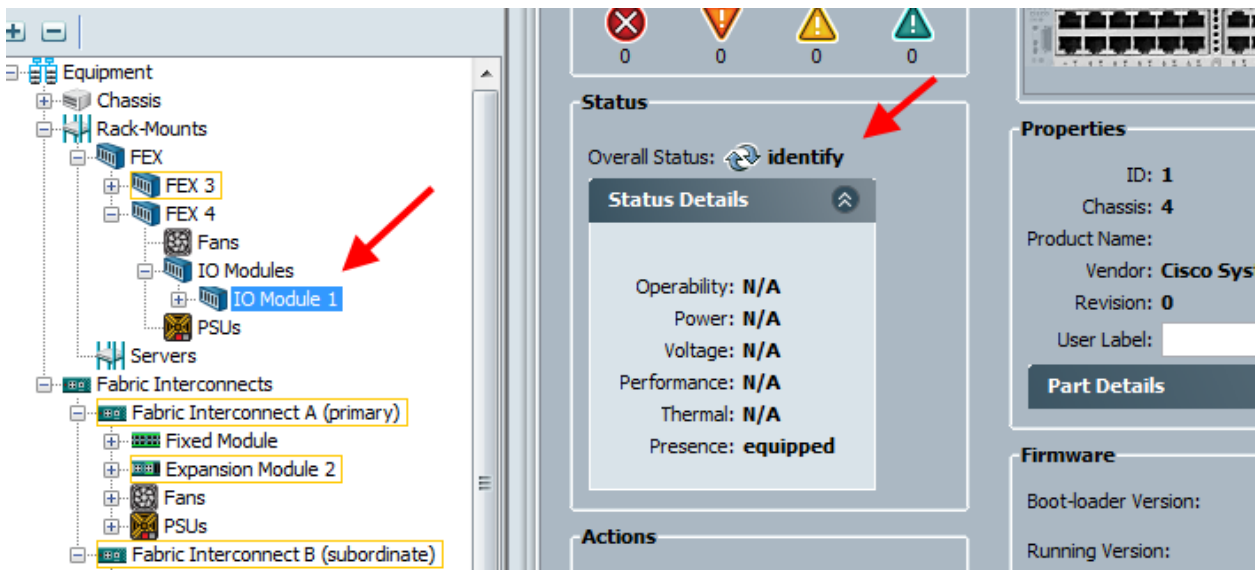
Repeat the port configuration for any remaining ports going to the FEX or to the Fabric-B FEX if you have one.

You cannot connect a single FEX to both fabrics. This is the same restriction that exists on the Chassis IOMs.

Once the FEX has complete discovery, the IOM will report operable
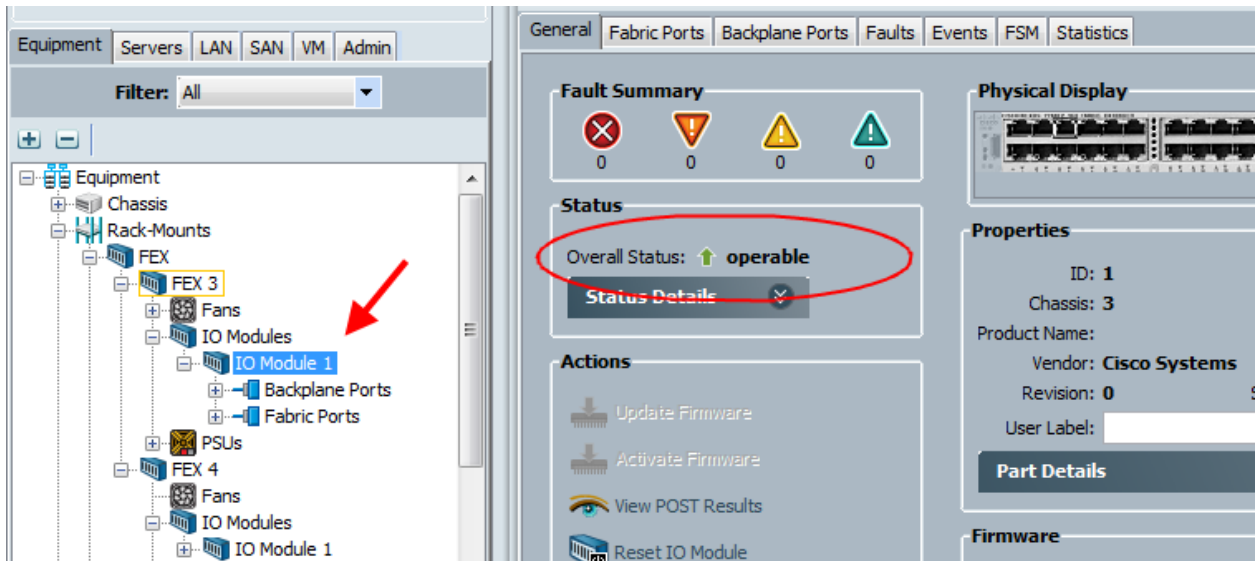
My FEX reports a power-problem as I only plugged in one power supply
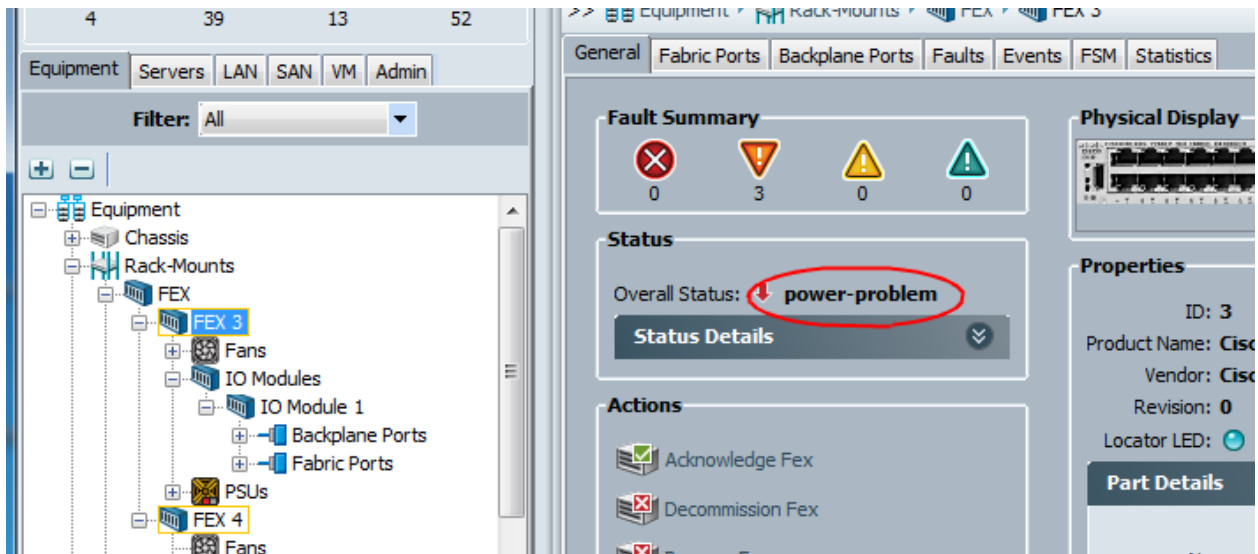
Backplane ports will be used to connect to the management ports on the rack series. These are the 1G Lan On Motherboard (LOM) port on the C-series.
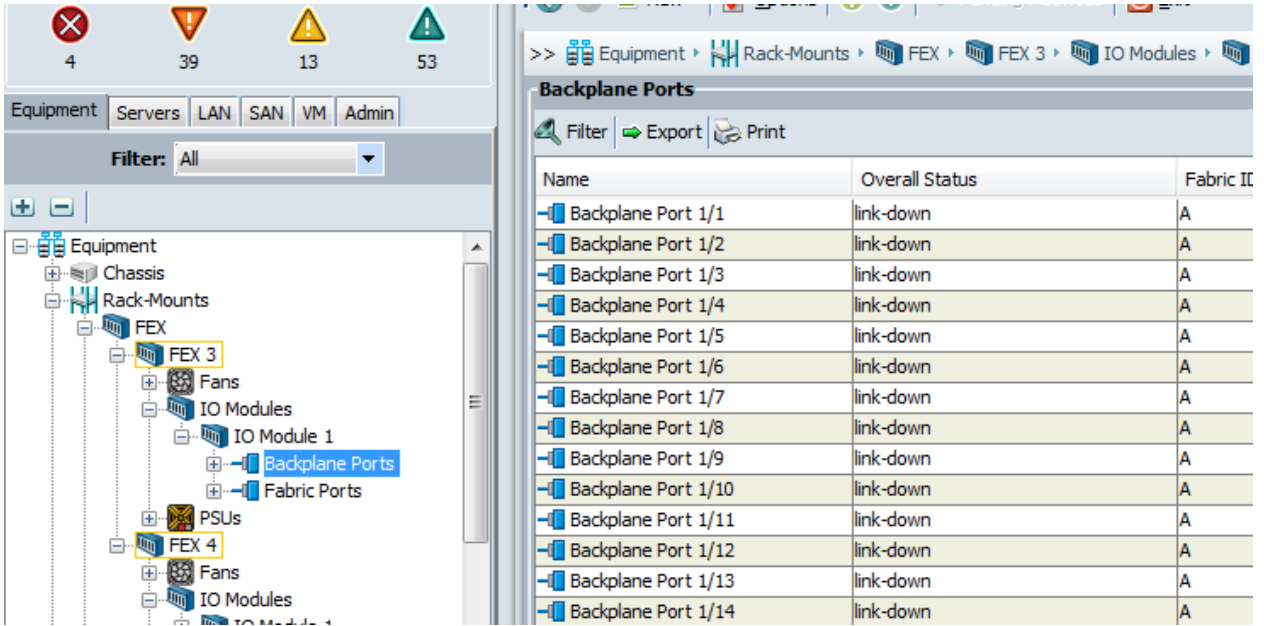
The IOM fabric ports are those connected to the 6100
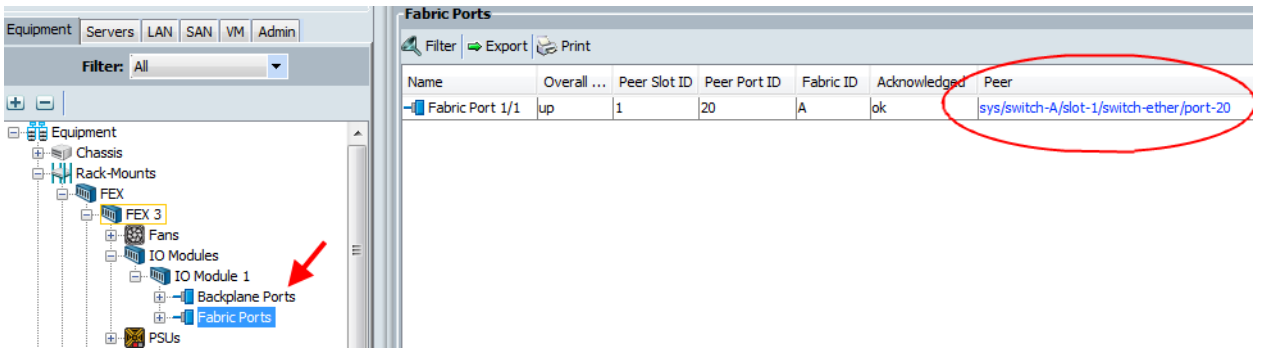
Each new N2248TP will display as a unique FEX in UCS. In the screen shot below, there are two N2248TP's attached to each Fabric Interconnect.
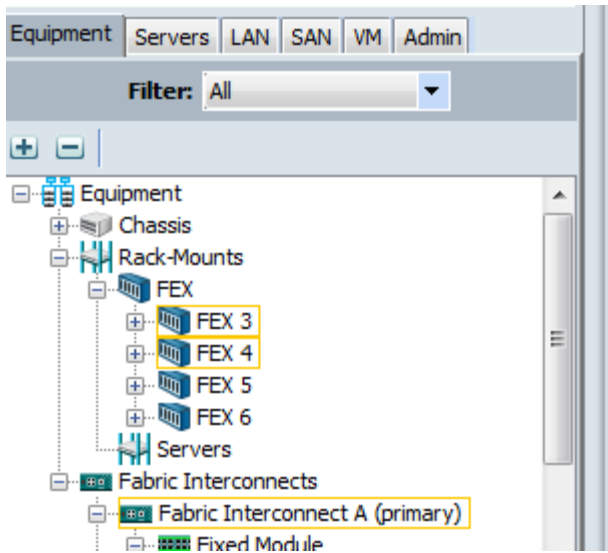
Use Scope commands to display FEX/IOM information

```
cae-sj-ca-A# scope fabric-extender 3
cae-sj-ca-A /fabric-extender # show detail

FEX:
    ID: 3
    Fabric ID: A
    User Label:
    Overall Status: Power Problem
    Oper qualifier: Fan Power,Psu Power,Fan Inoperable,Psu Inoperable
    Thermal Status: N/A
    Product Name: Cisco Nexus 2248TP
    PID: N2K-C2248TP-1GE
    VID: V01
    Vendor: Cisco Systems
    Serial (SN): SSI1352049T
    HW Revision: 0
    Controller Subject:
    Current Task 1:
    Current Task 2:

cae-sj-ca-A /fabric-extender # scope iom 1
cae-sj-ca-A /fabric-extender/iom # show detail

IOM:
    ID: 1
    Side: Left
    Fabric ID: A
    User Label:
    Overall Status: Operable
    Oper qualifier: N/A
    Operability: N/A
```

```
      Presence: Equipped
      Thermal Status: N/A
      Discovery: Online
      Config State: Ok
      Peer Comm Status: Unknown
      Product Name: Cisco Nexus 2248TP
      PID: N2K-C2248TP-1GE
      VID: V01
      Vendor: Cisco Systems
      Serial (SN): JAF1352AHAK
      HW Revision: 0
      Controller Subject: Iocard
      Current Task 1:
      Current Task 2:
```

From NX-OS on the UCS

```
cae-sj-ca-A(nxos)# show fex
  FEX        FEX         FEX                      FEX
Number    Description    State          Model             Serial
---------------------------------------------------------------------
  1        FEX0001               Online         N20-C6508    QCI1239000Q
  3        FEX0003               Online    N2K-C2248TP-1GE   JAF1352AHAK
  6        FEX0006               Online    N2K-C2248TP-1GE   JAF1353ADAN

cae-sj-ca-A# connect nxos
cae-sj-ca-A(nxos)# show interface fex-fabric
     Fabric      Fabric      Fex              FEX
Fex  Port      Port State   Uplink    Model             Serial
------------------------------------------------------------------
  1    Eth1/1      Active      1         N20-C6508    QCI1239000Q
  1    Eth1/2      Active      2         N20-C6508    QCI1239000Q
  6   Eth1/19      Active      1    N2K-C2248TP-1GE  JAF1353ADAN
  3   Eth1/20      Active      1    N2K-C2248TP-1GE  JAF1352AHAK
```

From NX-OS show the fabric and backplane port connectivity
(6100 - Eth1/20 is connected to the FEX)

```
cae-sj-ca-A(nxos)# show fex 3 detail
FEX: 3 Description: FEX0003    state: Online
  FEX version: 4.2(1)N1(1) [Switch version: 4.2(1)N1(1.4)]
  FEX Interim version: 4.2(1)N1(0.001)
  Switch Interim version: 4.2(1)N1(1.3.423)
  Extender Model: N2K-C2248TP-1GE,  Extender Serial: JAF1352AHAK
  Part No: 73-12748-04
  Card Id: 99, Mac Addr: 00:0d:ec:f4:f5:d8, Num Macs: 64
  Module Sw Gen: 21  [Switch Sw Gen: 21]
```

```
 post level: complete
pinning-mode: static    Max-links: 1
 Fabric port for control traffic: Eth1/20
 Fabric interface state:
   Eth1/20 - Interface Up. State: Active
 Fex Port          State  Fabric Port  Primary Fabric
        Eth3/1/1  Down     Eth1/20      Eth1/20
        Eth3/1/2  Down     Eth1/20      Eth1/20
        Eth3/1/3  Down     Eth1/20      Eth1/20
        Eth3/1/4  Down     Eth1/20      Eth1/20
        Eth3/1/5  Down     Eth1/20      Eth1/20
<output truncated>
```

To find the N2248 port to Fabric interconnect
(FEX 1/1 is connected to 6100 eth 1/20)

```
cae-sj-ca-A(nxos)# show fex 3 transceiver detail

Fex Uplink: 1
Fabric Port: Ethernet1/20
    sfp is present
    name is Molex Inc.
    part number is 74752-4501
    revision is E
    serial number is 730610056
    nominal bitrate is 12000 MBits/sec
    Link length supported for 50/125mm fiber is 0 m(s)
    Link length supported for 62.5/125mm fiber is 0 m(s)
    cisco id is --
    cisco extended id number is 4

    Invalid calibration


Fex Uplink: 2
Fabric Port: --
    sfp information is not available
```

Once the FEX has complete discovery, the IOM will report operational

1.6   Connect C-series rack server to UCS and N2248T

With this version, the control plane uses the LOM ports connected to the N2248T. The data
plane is connected through the CNA ports directly to the 6100.

Supported CNA's are:
1)   Cisco P81E VIC (Virtual Interface Card)
2)   Cisco M72KR-E (Emulex)

3) Cisco M72KR-Q (Qlogic)
4) Cisco 82599 (Intel Niantic)
5) Cisco M51KR-B (Broadcom BCM57711)

Mixing CNA types is not supported at this release, nor is using non-CNA's.

Prior to proceeding, the C-series BIOS/CIMC/LOM firmware must be upgraded to the latest CIMC/BIOS from CCO,

Then use the host-upgrade-utility to complete the upgrade process. This also includes a LOM firmware fix that must be applied.

The current version is: hostUpgrade_v1_2_5.iso Check for the latest release. After this upgrade, unplug the rack server to do a complete power cycle.
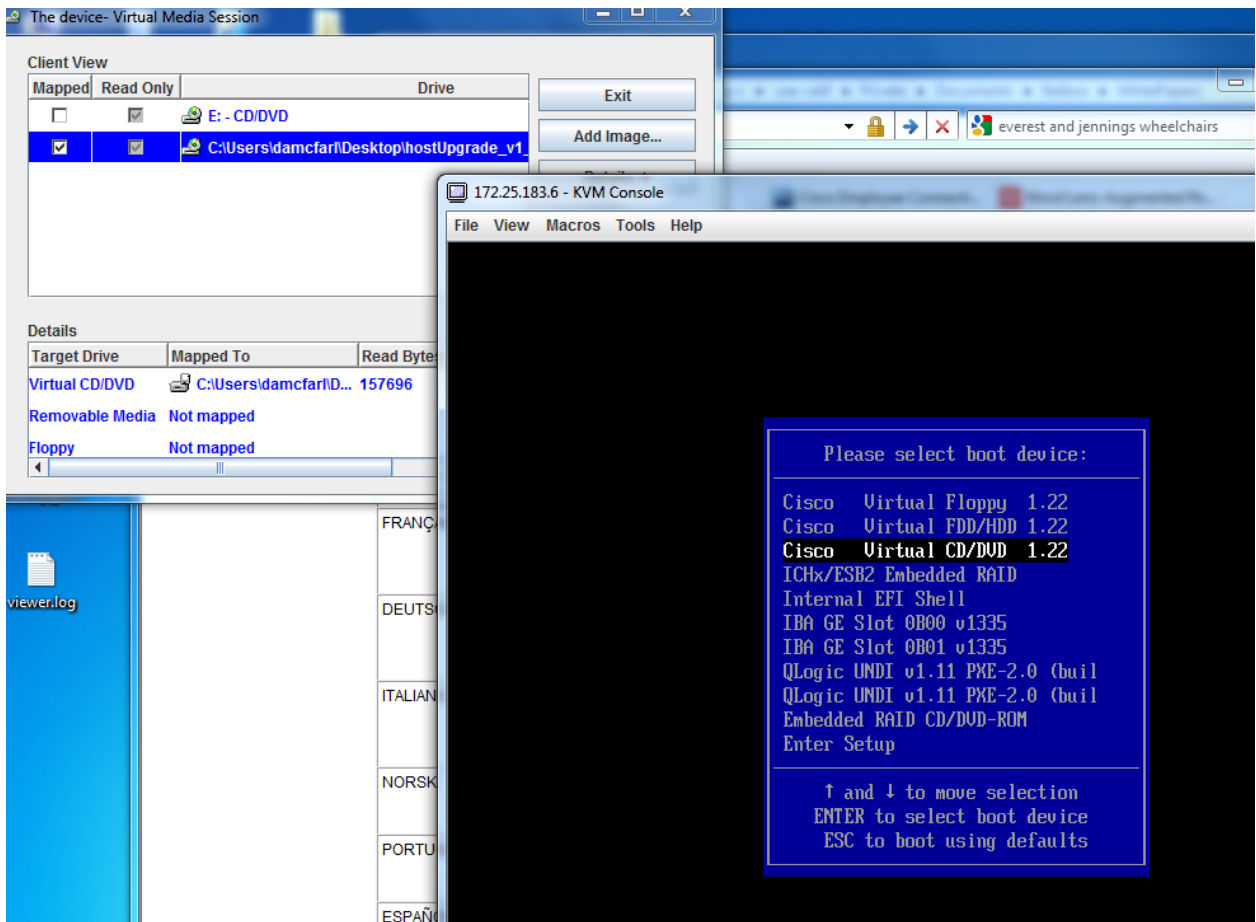
```
172.25.183.6 - KVM Console                                              _ □ X

File  View  Macros  Tools  Help


C-Series Host Based Upgrade v1.2, Build 5
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C200 Server
-----------
BIOS ............... C200.1.2.2b.0.102520100113
CIMC firmware ...... 1.2(1.8)



This tool supports updating of CIMC/BIOS/LOM images
Once the update starts it cannot be stopped. After updating the
system will be rebooted when exited.


Have you read Cisco EULA?
Press 'y' to continue , 'n' to read EULA, 'q' to exit(reboot)  _
```

```
172.25.183.6 - KVM Console                                              _ □ X

File  View  Macros  Tools  Help


C-Series Host Based Upgrade v1.2, Build 5
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C200 Server
-----------
BIOS ............... C200.1.2.2b.0.102520100113
CIMC firmware ...... 1.2(1.8)


1) Update CIMC Firmware   - 1.2(1.8)
2) Update BIOS            - C200.1.2.2b.0
3) Update LOM Firmware
4) All the above
5) Reboot with retaining current settings of CIMC
6) Reboot with configuring the CIMC to default
   factory settings (UCSM mode)

Enter Choice :
```
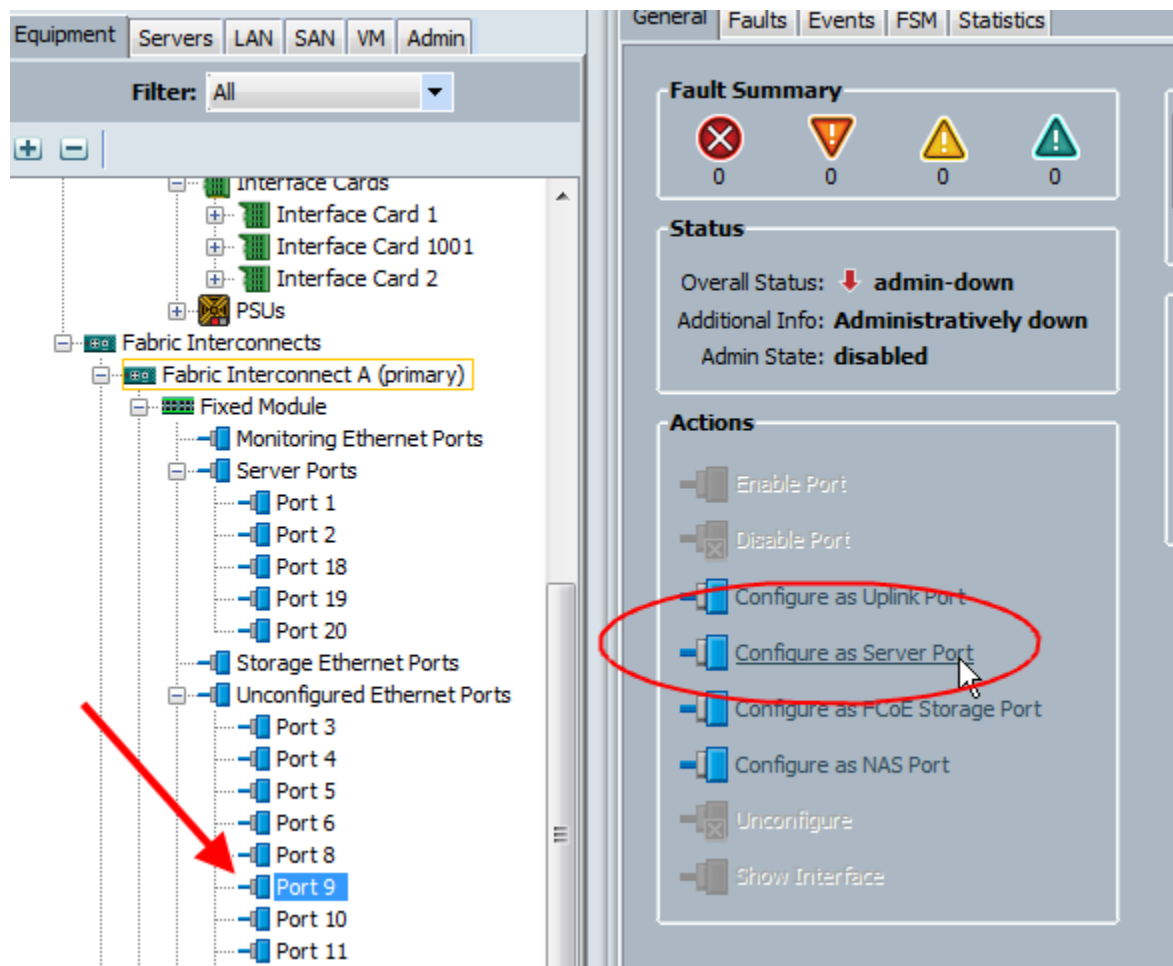
After the C-series BIOS/CIMC/LOM are upgraded, the CIMC management will need to be changed by accessing the F8 screen and by the LOM to Shared-mode and DHCP enabled. No other changes need to be made.

Attach the LOM ports to the N2248T. one per fabric

Attach the CNA ports to the 6100. One per fabric. In UCS configure those as server ports.

There is no further configuration necessary on the FEX. If the LOM ports were properly upgraded they will link-up on the FEX. The servers will go from inoperable -> discovery -> operable
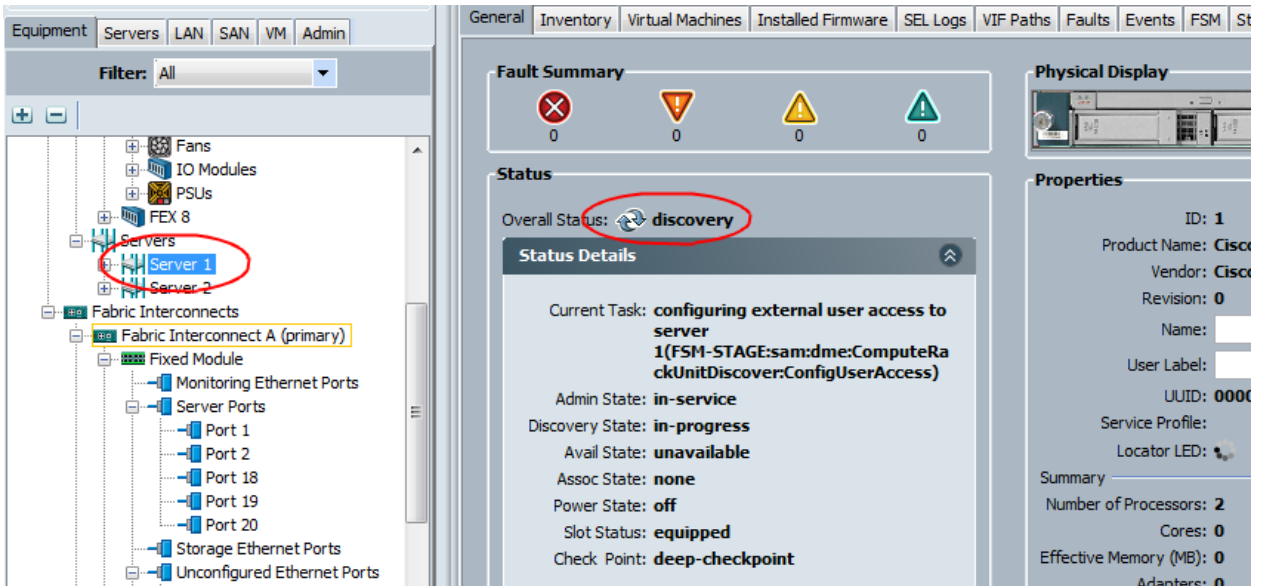
The discovery process is the same as the process for a blade server and may take a little time. You can monitor progess in the FSM tab, or by running the GUI.
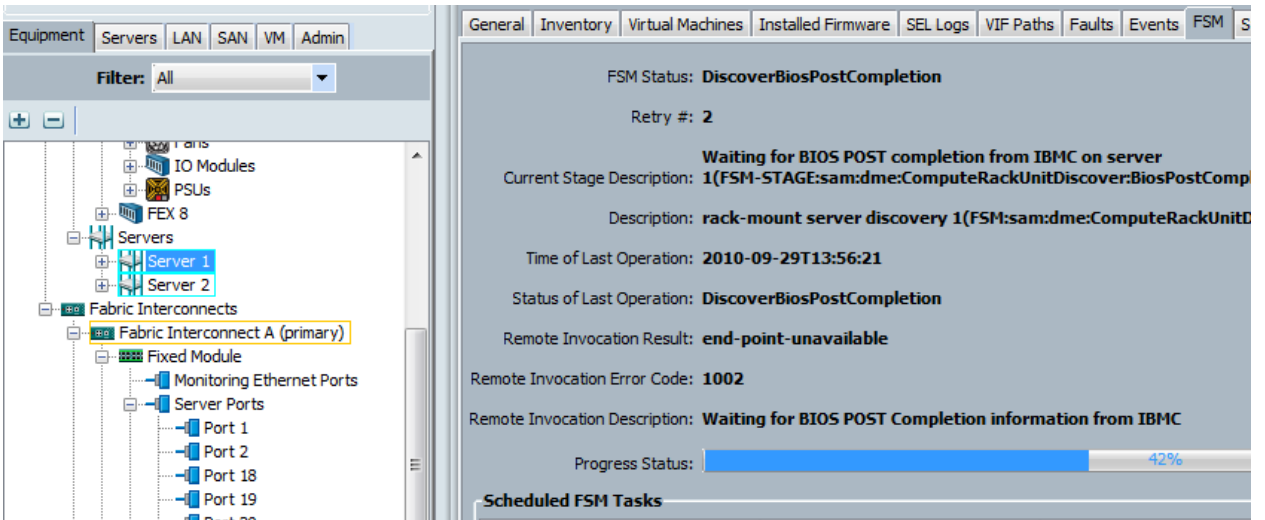
Check connectivity in UCS

The N2248 control plane connectivity to the LOM on the rack servers

1) Service Profile Association
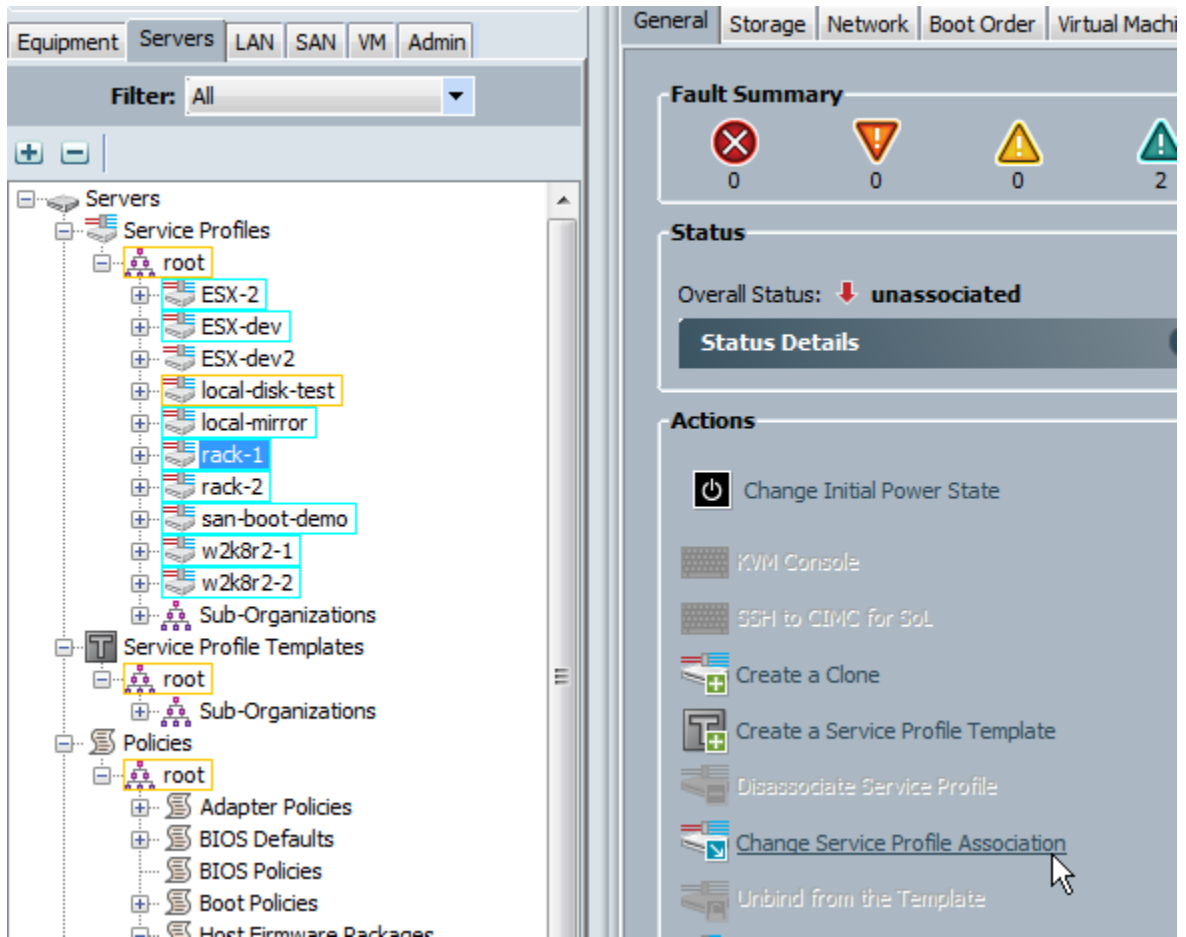
You must select "All Servers" to show the rack servers.

Selecting Rack 1
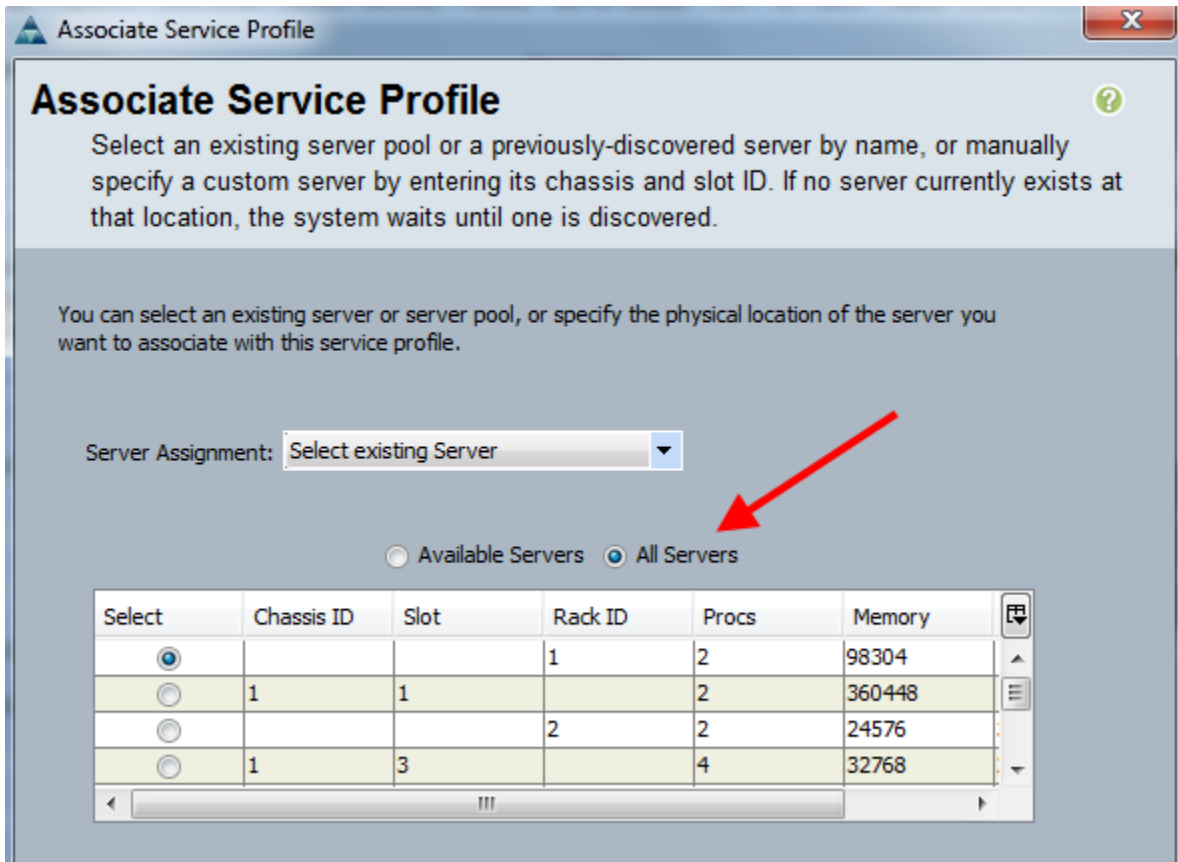
After association is complete
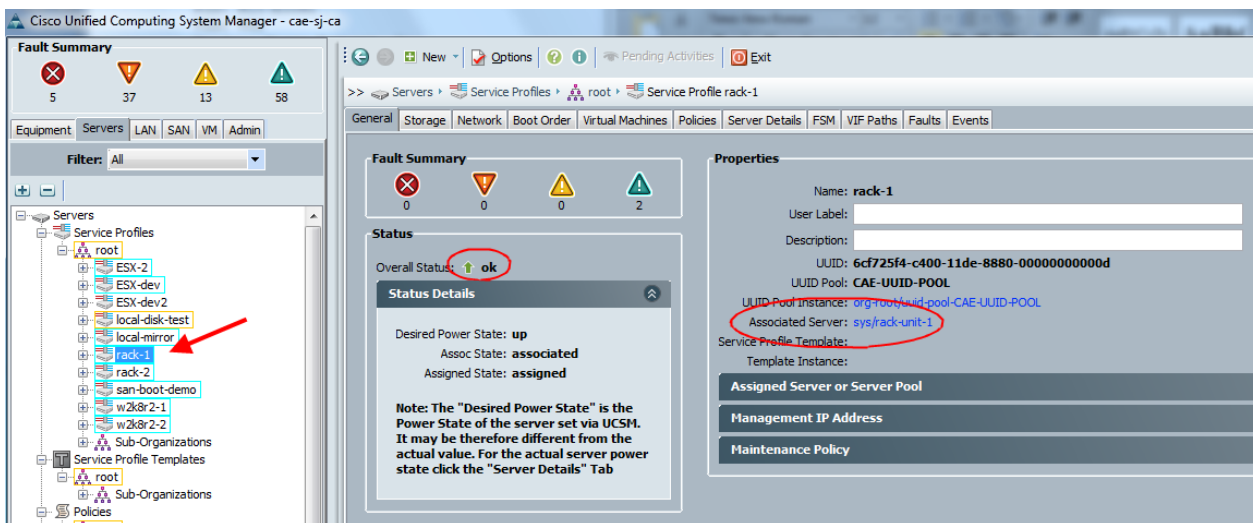
Simple Connectivity test

My vNIC0 MAC is 00:25:00:99:0F

I'll configure that on my OS

This MAC mapped to "Local Area Connection 2" on my Windows 2008r2 install

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
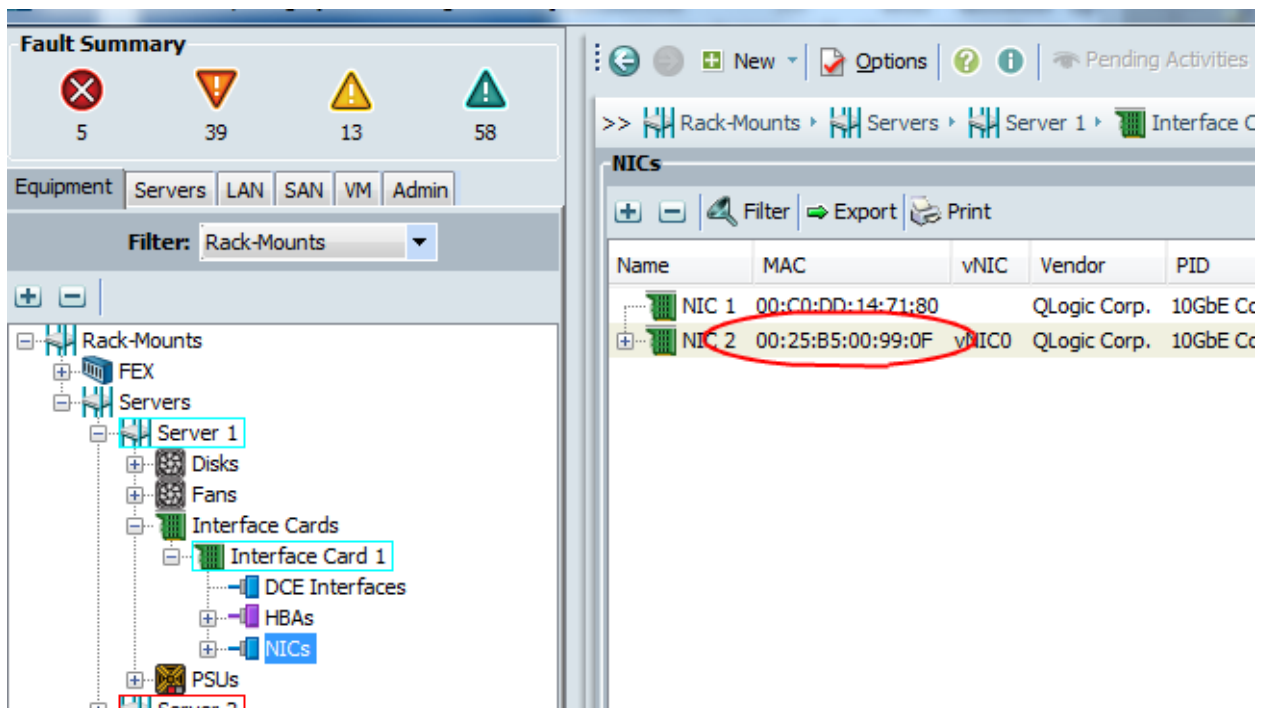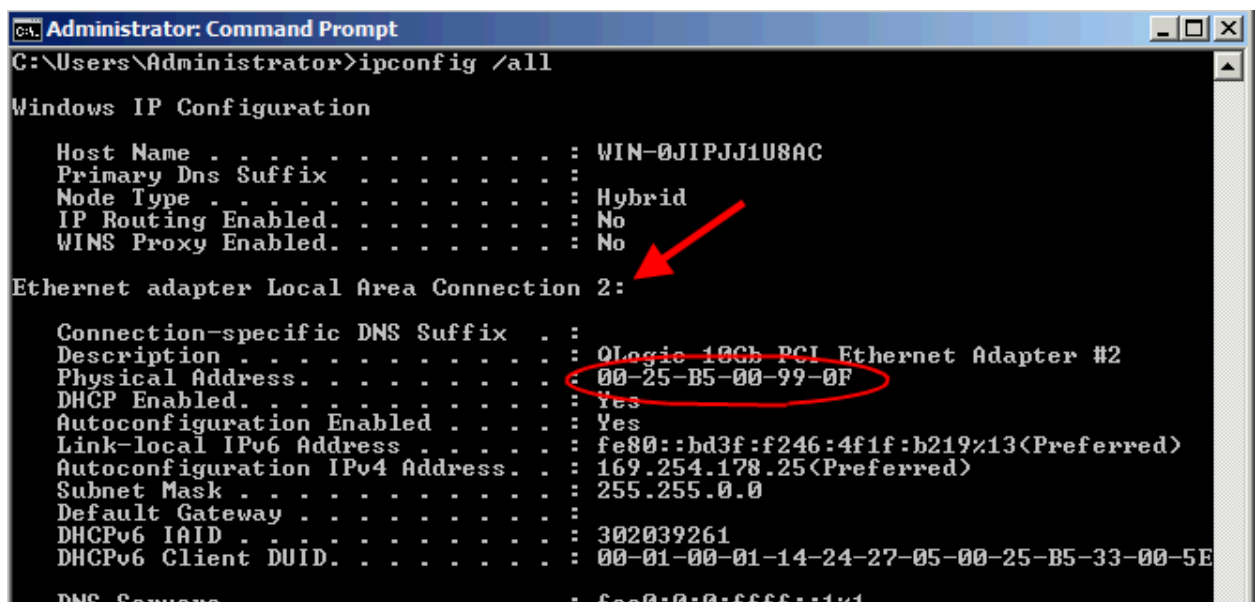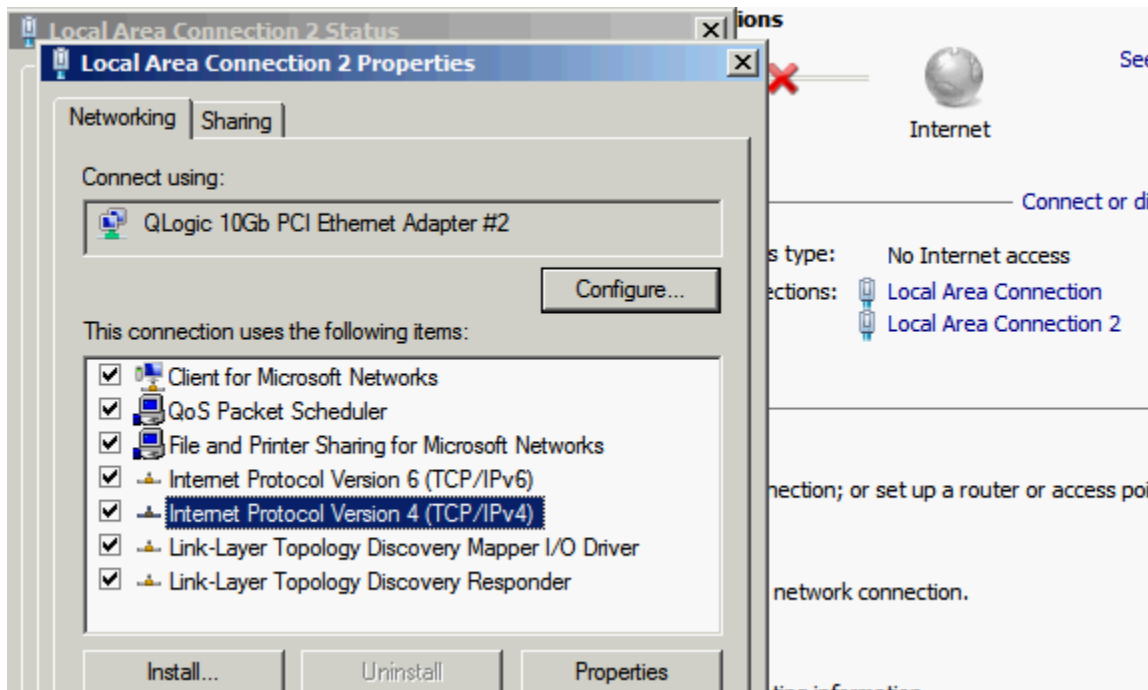
○ Obtain an IP address automatically

◉ Use the following IP address:

IP address:	172 . 25 . 184 . 14
Subnet mask:	255 . 255 . 255 . 224
Default gateway:	172 . 25 . 184 . 1

○ Obtain DNS server address automatically

◉ Use the following DNS server addresses:

Preferred DNS server:	171 . 70 . 168 . 183
Alternate DNS server:	. . .

☐ Validate settings upon exit

[Advanced...]

[OK] [Cancel]

Administrator: Command Prompt

```
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\Administrator>ping 172.25.184.1

Pinging 172.25.184.1 with 32 bytes of data:
Reply from 172.25.184.1: bytes=32 time<1ms TTL=255
Reply from 172.25.184.1: bytes=32 time<1ms TTL=255
Reply from 172.25.184.1: bytes=32 time<1ms TTL=255
Reply from 172.25.184.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.25.184.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator>_
```

```
cae-sj-ca-A(nxos)# show interface ethernet 1/9 counters

--------------------------------------------------------------------------------
Port                 InOctets        InUcastPkts       InMcastPkts       InBcastPkts
--------------------------------------------------------------------------------
Eth1/9               2788143              234             40356               453


--------------------------------------------------------------------------------
Port                OutOctets       OutUcastPkts       OutMcastPkts      OutBcastPkts
--------------------------------------------------------------------------------
Eth1/9               168303              237              1165                26
```