UCS Director Multi-Node Deployment 5.4 - Dual-Stack IPv4/IPv6

The purpose of this document is to illustrate the steps to Add IPv6 addresses to an existing IPv4 UCS Director Multi-Node Deployment to support both IPv4 and IPv6 Virtual and Physical devices. Also included in this document are steps to add an IPv6 UCSM Physical Account and change its system tasks to use a service node to validate IPv6 is functioning through the service node as well.

Assumptions/Requirements

- You currently have a UCS Director 5.4 IPv4 Multi-Node deployment.
- This document was built in a lab and the IPv6 addresses used throughout this document are NOT actually registered to me. This environment is contained and does not route outside of this lab. You should use your won registered Global Unicast IPv6 space for your setup.
- Global Unicast IPv6 addresses are required if you are configuring your UCS Manager domains for IPv6 Management.

Useful Documents

<u>Internet Protocol Version 6 Address Space</u>

IPv6 Global Unicast Address Assignments

Table of Contents

Table of Contents	2
1. Add IPv6 Address/Gateway to Primary Node	
2. Add IPv6 Address/Gateway to Inventory Database Node	
3. Add IPv6 Address/Gateway to Monitoring Database Node	5
4. Add IPv6 Address/Gateway to Service Node	6
5. Test Connectivity to the UCS Director GUI	7
6. Optional - Configure UCSM Dual-Stack	8
7. Add IPv6 UCSM Physical Account to UCSD	.10
8. Assign System Policy to UCSM-POD5 System Task	. 11

1. Add IPv6 Address/Gateway to Primary Node

SSH to the Primary Node and log in using the root account.

- Open vi editor for eth0: 'vi /etc/sysconfig/network-scripts/ifcfg-eth0'
- Cursor down to the IPV6INIT=no and put your cursor to the letter n: enter 'cw' for change word
- Type 'yes' and then press enter/return to create a new line
- Type 'IPV6ADDR=' + 'yourIPv6address'+'/yourIPv6prefixlength', then press enter/return
- Type 'IPV6_DEFAULTGW='+'yourIPv6gateway', then press enter/return
- Press the 'esc' button, then enter ':wq!' to write and quit vi editor
- Verify the changes have been saved: 'cat /etc/sysconfig/network-scripts/ifcfg-eth0'
- Below is an example.

```
[root@CUCSD-P-5_4_0_0 ~]# cat /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE=eth0
BOOTPROTO=static
ONBOOT=yes
IPADDR=172.17.80.119
SATEWAY=172.17.80.1
NETMASK=255.255.255.0
TYPE=Ethernet
PEERDNS=yes
USERCTL=no
IPV6INIT=yes
IPV6ADDR=2d00:4888:a60e:0080:c0:fef::c119/64
IPV6_DEFAULTGW=2d00:4888:a60e:0080::22
[root@CUCSD-P-5_4_0_0 ~]#
```

Restart the Network Services: 'service network restart'

```
[root@CUCSD-P-5_4_0_0 ~]# service network restart
Shutting down interface eth0: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: Determining if ip address 172.17.80.119 is already in use for device eth0...
[ OK ]
[root@CUCSD-P-5_4_0_0 ~]#
```

Test Connectivity by pinging the IPv6 default gateway and it's own IPv6 address. 'ping6 -c 5 yourIPv6address'

```
[root@CUCSD-P-5_4_0_0 ~]# ping6 -c 5 2d00:4888:a60e:0080::22 PING 2d00:4888:a60e:0080::22(2d00:4888:a60e:80::22) 56 data bytes
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=1 ttl=64 time=0.480 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=2 ttl=64 time=0.291 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=3 ttl=64 time=0.323 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=4 ttl=64 time=0.300 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=5 ttl=64 time=0.360 ms
--- 2d00:4888:a60e:0080::22 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4001ms rtt min/avg/max/mdev = 0.291/0.350/0.480/0.072 ms
[root@CUCSD-P-5_4_0_0 ~]#
[root@CUCSD-P-5_4_0_0 ~]#
[root@CUCSD-P-5_4_0_0 ~]#
[root@CUCSD-P-5_4_0_0 ~]# ping6 -c 5 2d00:4888:a60e:0080:c0:fef::c119
PING 2d00:4888:a60e:0080:c0:fef::c119(2d00:4888:a60e:80:c0:fef:0:c119) 56 data bytes
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c119: icmp_seq=1 tt]=64 time=0.035 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c119:
                                                                       icmp_seq=2 ttl=64 time=0.076 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c119:
                                                                      icmp_seq=3 ttl=64 time=0.081 ms
64 býtes from 2d00:4888:a60e:80:c0:fef:0:c119: icmp_seq=4 ttl=64 time=0.077 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c119: icmp_seq=5 ttl=64 time=0.084 ms
--- 2d00:4888:a60e:0080:c0:fef::c119 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.035/0.070/0.084/0.020 ms
[root@CUCSD-P-5_4_0_0 ~]# ■
```

2. Add IPv6 Address/Gateway to Inventory Database Node

SSH to the Inventory Database Node and log in using the root account.

- Open vi editor for eth0: 'vi /etc/sysconfig/network-scripts/ifcfg-eth0'
- Cursor down to the 'IPV6INIT=no' and put your cursor to the letter n: enter 'cw' for change word
- Type 'yes' and then press enter/return to create a new line
- Type 'IPV6ADDR=' + 'yourIPv6address'+'/yourIPv6prefixlength', then press enter/return
- Type 'IPV6_DEFAULTGW='+'yourIPv6gateway', then press enter/return
- Press the 'esc' button, then enter ':wq!' to write and quit vi editor
- Verify the changes have been saved: 'cat /etc/sysconfig/network-scripts/ifcfg-eth0'
- Below is an example.

[root@CUCSD-I-5_4_0_0 \sim]#

```
[root@CUCSD-I-5_4_0_0 ~]# cat /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE=eth0
BOOTPROTO=static
ONBOOT=yes
IPADDR=172.17.80.120
GATEWAY=172.17.80.1
NETMASK=255.255.255.0
TYPE=Ethernet
PEERDNS=yes
USERCTL=no
IPV6INIT=yes
IPV6ADDR=2d00:4888:a60e:0080:c0:fef::c120/64
IPV6_DEFAULTGW=2d00:4888:a60e:0080::22
[root@CUCSD-I-5_4_0_0 ~]#
```

Restart the Network Services: 'service network restart'

```
[root@CUCSD-I-5_4_0_0 ~]# service network restart |
Shutting down interface eth0: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: Determining if ip address 172.17.80.120 is already in use for device eth0...
[ OK ]
[root@CUCSD-I-5_4_0_0 ~]#
```

3. Add IPv6 Address/Gateway to Monitoring Database Node

SSH to the Monitoring Database Node and log in using the root account.

- Open vi editor for eth0: 'vi /etc/sysconfig/network-scripts/ifcfg-eth0'
- Cursor down to the 'IPV6INIT=no' and put your cursor to the letter n: enter 'cw' for change word
- Type 'yes' and then press enter/return to create a new line
- Type 'IPV6ADDR=' + 'yourIPv6address'+'/yourIPv6prefixlength', then press enter/return
- Type 'IPV6_DEFAULTGW='+'yourIPv6gateway', then press enter/return
- Press the 'esc' button, then enter ':wq!' to write and quit vi editor
- Verify the changes have been saved: 'cat /etc/sysconfig/network-scripts/ifcfg-eth0'
- Below is an example.

```
[root@cucsb-m-5_4_0_0 ~]# cat /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE=eth0
BOOTPROTO=static
ONBOOT=yes
IPADDR=172.17.80.121
GATEWAY=172.17.80.1
NETMASK=255.255.255.0
TYPE=Ethernet
PEERDNS=yes
USERCTL=no
IPV6INIT=yes
IPV6ADDR=2d00:4888:a60e:0080:c0:fef::c121/64
IPV6_DEFAULTGW=2d00:4888:a60e:0080::22
[root@cucsb-M-5_4_0_0 ~]#
```

Restart the Network Services: 'service network restart'

```
[root@CUCSD-M-5_4_0_0 ~]# service network restart
Shutting down interface eth0: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: Determining if ip address 172.17.80.121 is already in use for device eth0...
[ OK ]
[root@CUCSD-M-5_4_0_0 ~]#
```

Test Connectivity by pinging the IPv6 default gateway and it's own IPv6 address. 'ping6 -c 5 yourIPv6address'

```
[root@CUCSD-M-5_4_0_0 ~]# ping6 -c 5 2d00:4888:a60e:0080::22
PING 2d00:4888:a60e:0080::22(2d00:4888:a60e:80::22) 56 data bytes
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=1 ttl=64 time=1.62 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=2 ttl=64 time=0.297 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=3 ttl=64 time=0.291 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=4 ttl=64 time=0.285 ms
64 bytes from 2d00:4888:a60e:80::22: icmp_seq=5 ttl=64 time=0.329 ms
--- 2d00:4888:a60e:0080::22 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4001ms
rtt min/avg/max/mdev = 0.285/0.564/1.622/0.529 ms
[root@CUCSD-M-5_4_0_0 ~]# ping6 -c 5 2d00:4888:a60e:80:c0:fef::c121
PING 2d00:4888:a60e:0080:c0:fef::c121(2d00:4888:a60e:80:c0:fef:0:c121) 56 data bytes
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c121: icmp_seq=1 ttl=64 time=0.040 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c121: icmp_seq=2 ttl=64 time=0.085 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c121: icmp_seq=3 ttl=64 time=0.084 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c121: icmp_seq=3 ttl=64 time=0.081 ms
64 bytes from 2d00:4888:a60e:80:c0:fef:0:c121: icmp_seq=5 ttl=64 time=0.087 ms
65 packets transmitted, 5 received, 0% packet loss, time 4000ms
from 100:4888:a60e:0080:c0:fef:c121 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
from 100:4888:a60e:0080:c0:fef:c121 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
from 100:4888:a60e:0080:c0:fef:c121 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
from 100:4888:a60e:0080:c0:fef:c121 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
from 100:4888:a60e:0080:c0:fef:c121 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
from 100:4888:a60e:0080:c0:fef:c121 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
```

4. Add IPv6 Address/Gateway to Service Node

SSH to the Service Node and log in using the root account.

- Open vi editor for eth0: 'vi /etc/sysconfig/network-scripts/ifcfg-eth0'
- Cursor down to the 'IPV6INIT=no' and put your cursor to the letter n: enter 'cw' for change word
- Type 'yes' and then press enter/return to create a new line
- Type 'IPV6ADDR=' + 'yourIPv6address'+'/yourIPv6prefixlength', then press enter/return
- Type 'IPV6_DEFAULTGW='+'yourIPv6gateway', then press enter/return
- Press the 'esc' button, then enter ':wq!' to write and quit vi editor
- Verify the changes have been saved: 'cat /etc/sysconfig/network-scripts/ifcfg-eth0'
- Below is an example.

```
[root@CUCSD-S-5_4_0_0 ~]# cat /etc/sysconfig/network-scripts/ifcfg-eth0

BOOTPROTO=static

ONBOOT=yes

IPADDR=172.17.80.122

GATEWAY=172.17.80.1

NETMASK=255.255.255.0

TYPE=Ethernet
PEERDNS=yes
USERCTL=no
IPV6INIT=yes
IPV6ADDR=2d00:4888:a60e:0080:c0:fef::c122/64

IPV6_DEFAULTGW=2d00:4888:a60e:0080::22
[root@CUCSD-S-5_4_0_0 ~]#
```

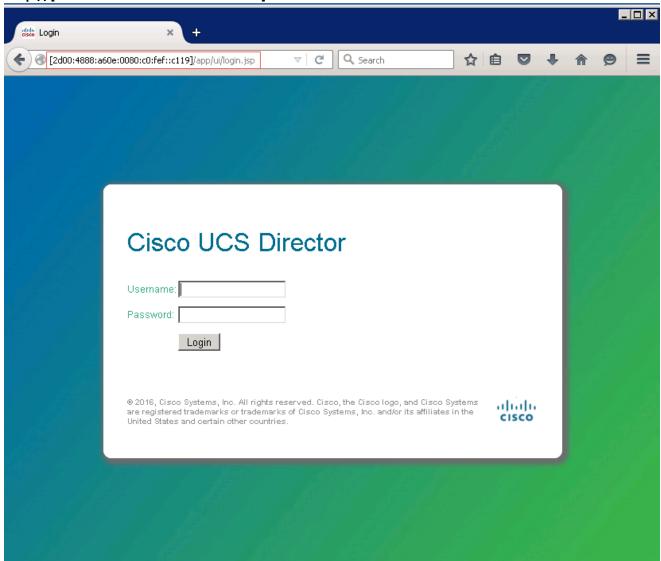
Restart the Network Services: 'service network restart'

```
[root@CUCSD-S-5_4_0_0 ~]# service network restart shutting down interface eth0: [ OK ]
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: Determining if ip address 172.17.80.122 is already in use for device eth0...
[ OK ]
[root@CUCSD-S-5_4_0_0 ~]#
```

Test Connectivity by pinging the IPv6 default gateway and it's own IPv6 address. 'ping6 –c 5 yourIPv6address'

5. Test Connectivity to the UCS Director GUI

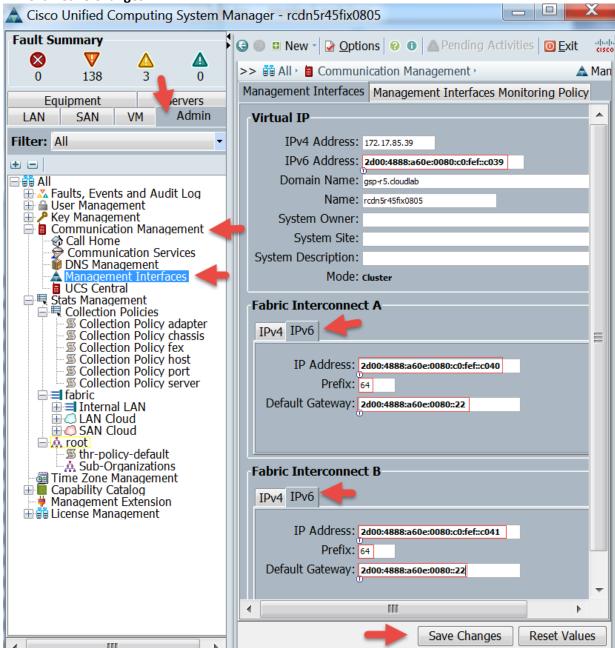
Open Firefox or Internet Explorer and paste your Primary Node IPv6 address between '[]' brackets. Example: 'http://[2d00:4888:a60e:0080:c0:fef::c119]'



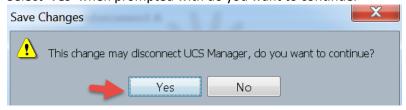
6. Optional - Configure UCSM Dual-Stack

Configure the UCSM VIP IPv6 Address, Fabric Interconnect A/B IPv6 Addresses, Prefix and IPv6 Gateway. Login the UCSM GUI and Navigate to Admin -> All -> Communication Management -> select 'Management Interfaces'.

- Under 'Virtual IP' Section: enter 'yourIPv6 address' for the 'IPv6 Address' field
- Under 'Fabric Interconnect A' section: select IPv6 tab, enter 'yourIPv6address', 'prefix' and 'yourIPv6gateway'
- Under 'Fabric Interconnect B' section: select IPv6 tab, enter 'yourIPv6address', 'prefix' and 'yourIPv6gateway'
- Click 'Save Changes'



Select 'Yes' when prompted with do you want to continue.



Select 'OK'.



Open Firefox or Internet Explorer and paste your UCSM IPv6 address between '[]' brackets. Example: 'http://[2d00:4888:a60e:0080:c0:fef::c039]'

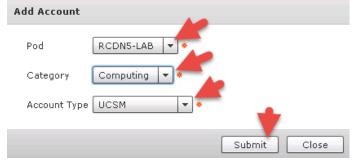


7. Add IPv6 UCSM Physical Account to UCSD

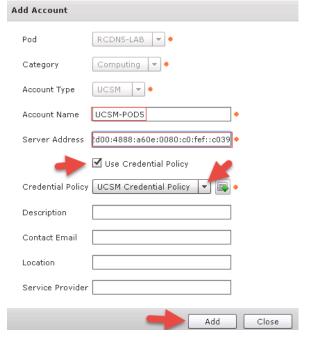
Open Firefox or Internet Explorer and paste your Primary Node IPv6 address between '[]' brackets. Example: 'http://[2d00:4888:a60e:0080:c0:fef::c119]'. Go to Administration -> Physical Accounts -> Physical Accounts -> click 'Add'.



Drop down and select 'yourPOD' for the Pod, 'Computing' for the Category, 'UCSM' for Account Type and click 'Submit'.



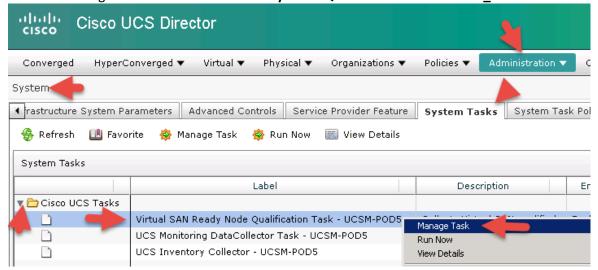
Enter an Account Name, enter 'yourUCSMIPv6Address' for Server Address, select 'Use Credential Policy' check box, drop down and select your UCSM Credential Policy and click 'Add'.



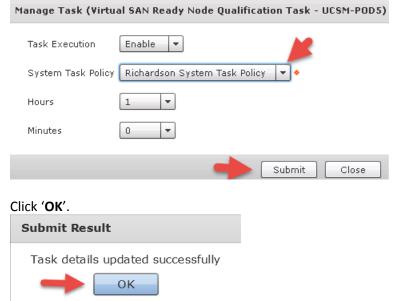


8. Assign System Policy to UCSM-POD5 System Task

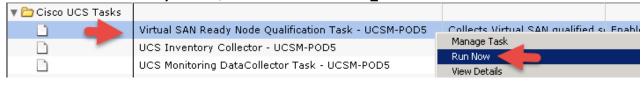
Assign Richardson System Policy to UCSM System Task. Go to Administration -> System -> Service Tasks -> expand 'Cisco UCS Tasks' -> right click on 'Virtual SAN Ready Node Qualification Task - UCSM_POD5' and select 'Manage Task'.

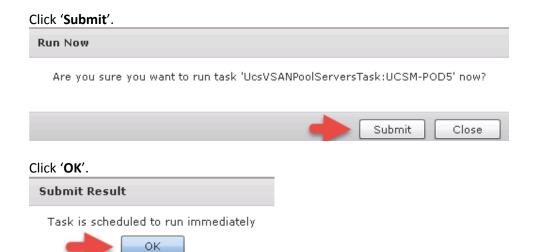


Drop down and select the 'Richardson System Task Policy' and click 'Submit'.

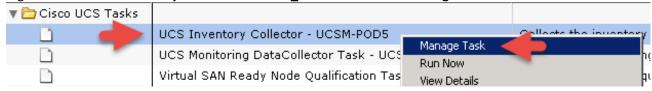


Run the 'Virtual SAN Ready Node Qualification Task – UCSM_POD5' task.

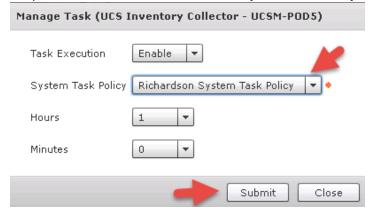




Right click on 'UCS Inventory Collector - UCSM_POD5' and select 'Manage Task'.



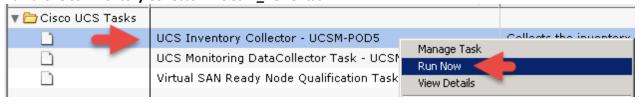
Drop down and select the 'Richardson System Task Policy' and click 'Submit'.



Click 'OK'.



Run the 'UCS Inventory Collector - UCSM_POD5' task.

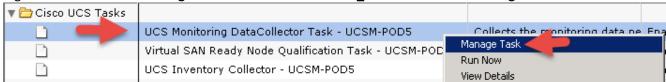




Click 'OK'.



Right click on 'UCS Monitoring DataCollector Task - UCSM_POD5' and select 'Manage Task'.



Submit

Close

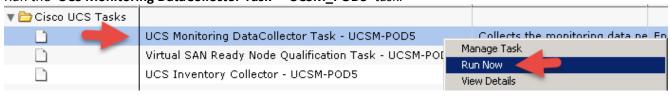
Drop down and select the 'Richardson System Task Policy' and click 'Submit'.

Manage Task (UCS Monitoring DataCollector Task - UCSM-POD5) Task Execution Enable System Task Policy Richardson System Task Policy Hours 0 Minutes 15 Submit Close

Click 'OK'.

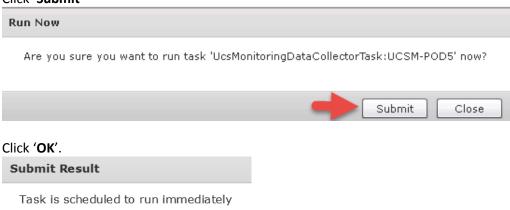


Run the 'UCS Monitoring DataCollector Task - UCSM_POD5' task.



Click 'Submit'

OK



Verify all UCSM System Task ran on the Service Node. Notice the Execution Node Name column has 'CUCSD-S1-5_4_0_0' which is the service node in my Richardson Service Node Pool.

