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CAE

**UCS CIMC/KVM IP Address
Changes in 1.4.1**



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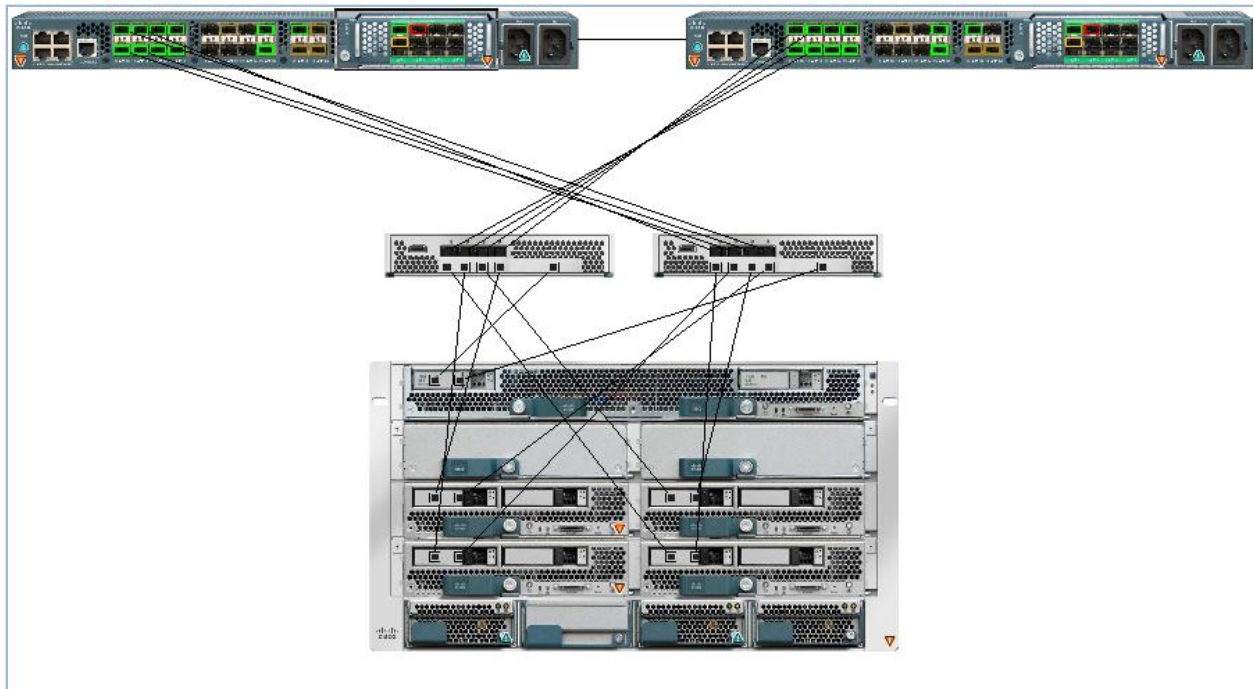
1 Introduction

The purpose of this document is to familiarize the reader with the new changes made to setting the CIMC/KVM IP addresses.

2 Test Requirements

- Software
 - UCS 1.4.1 beta image
- Hardware Requirements
 - UCS Test system with two 6100s
 - A set of IP addresses on the same subnet as the UCS management subnet
 - Several Blades in the UCS system that can be used to go through the different configurations.

2.1 UCS topology



2.1.1 CIMC/KVM IP address Prerequisites

The current problem

The CIMC (Cisco Integrated Management Controller) is a chip on every UCS blade that provides KVM, and management access to the blade. In previous releases the CIMC gets an IP address from a pool that is defined by the UCS administrator.

Each physical blade takes an IP address from the pool and uses that IP address until the blade is removed or the IP address is removed from the pool.

There are several restrictions with the current mode of operations.

- First there is no correlation to the KVM IP address to a Service Profile that a blade gets associated to. So for a user that needs access to the KVM of the blade they need to know the CIMC IP address of the physical blade associated. If the blade fails and a new blade is associated then the KVM IP address will change.
- Second there is no way to determine which KVM IP address a blade will get. They pull from the pool in a fashion that is not easy to determine which IP will get assigned to which blade.

Changes in Current Code

There are several changes in the 1.4.1 code that alter the way in which a CIMC IP address can be set.

- You can specifically set a CIMC IP address to a physical server
- You can specifically set a CIMC IP address to a Service Profile (logical server)
- You can specifically set a CIMC IP address from a pool of free addresses to a Service Profile (logical server)

The next few sections will have step by step detail on how to configure the above new options.

NOTE: If a bare metal blade already has a CIMC IP address set (either from a pool or static) and its assigned to an Service Profile (SP) with a CIMC IP address (pool or static), **the blade will respond to both IP addresses.**

In other words setting a static CIMC IP addresses in an SP does not override the bare metal IP set on the blade. They both work. This allows for blades to get set a static IP at installation and always maintain that CIMC address but also for the blades to make use of CIMC IP set in a SP.

We will demonstrate this in the steps below.

2.1.2 Configure Specific IP address for Physical Blade

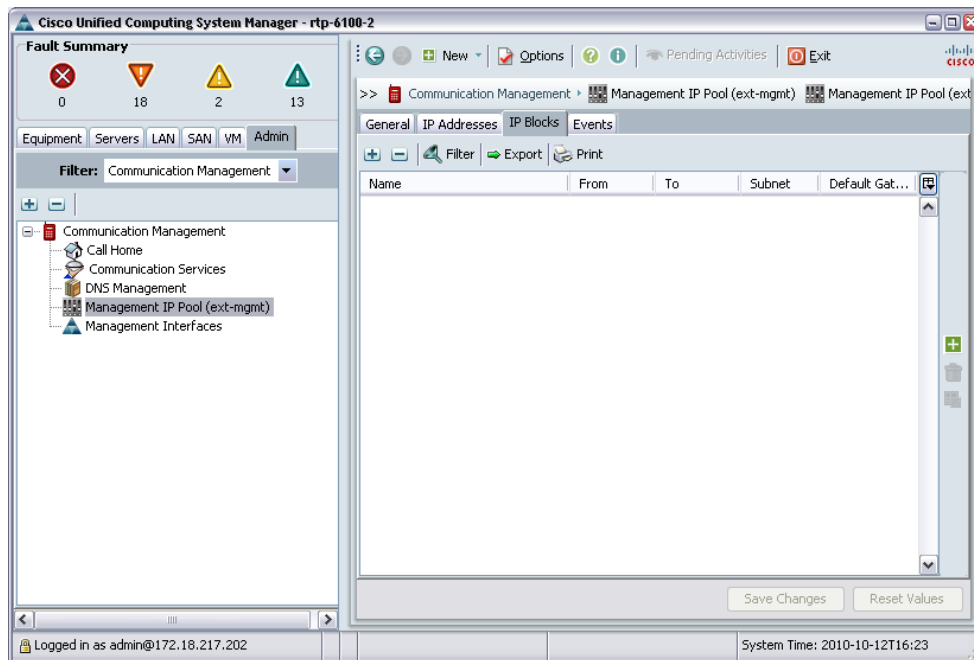
Requirements:

You need a free set of IP addresses on the same subnet as the UCS management interface. In this example the following CIMC IP addresses will be used.

172.18.217.133
172.18.217.134
172.18.217.183
172.18.217.185
172.18.217.187

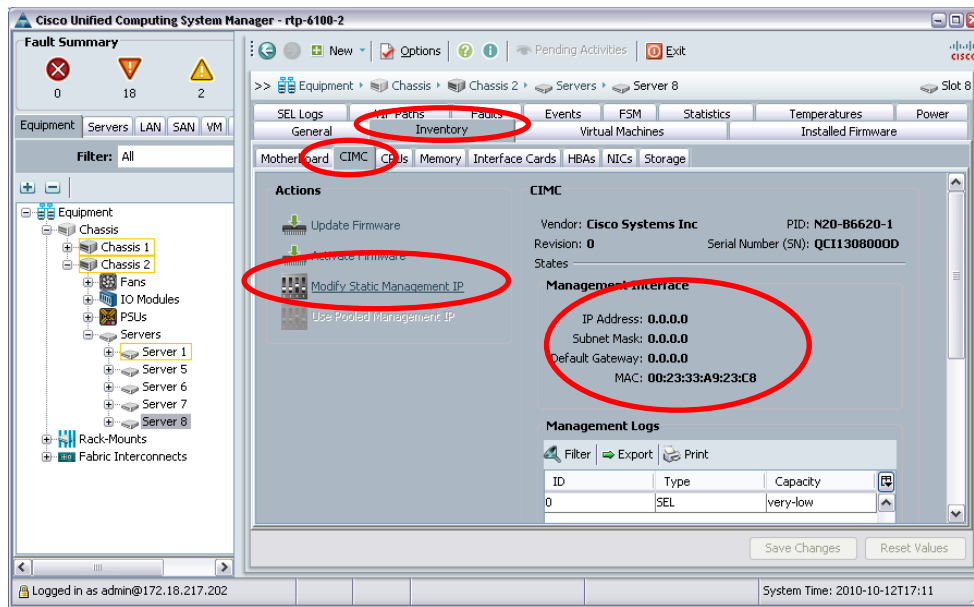
My UCS management interface is 172.18.217.202 netmask 255.255.255.0 default gateway 172.18.217.1

We make the assumption that no Management IP address pool exists within UCSM. As you can see below in the screenshot no Management IP Pool is set.

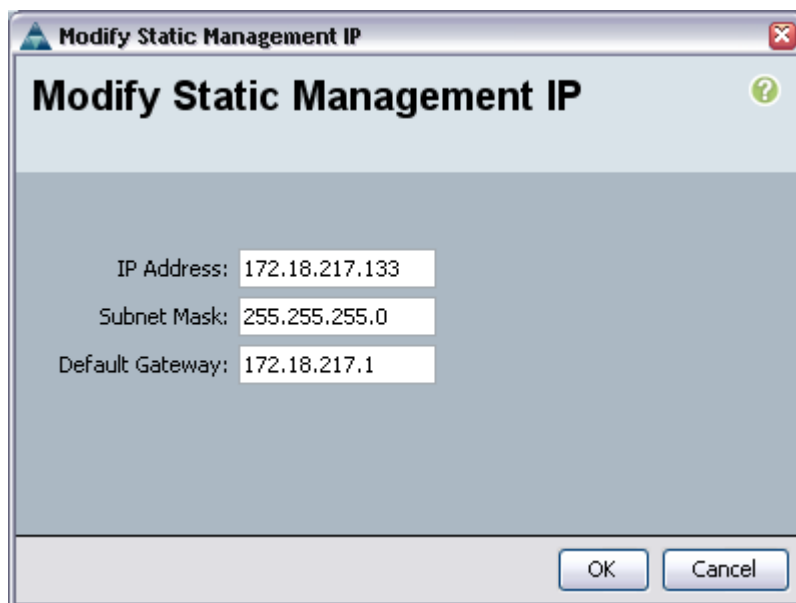


Configuration steps:

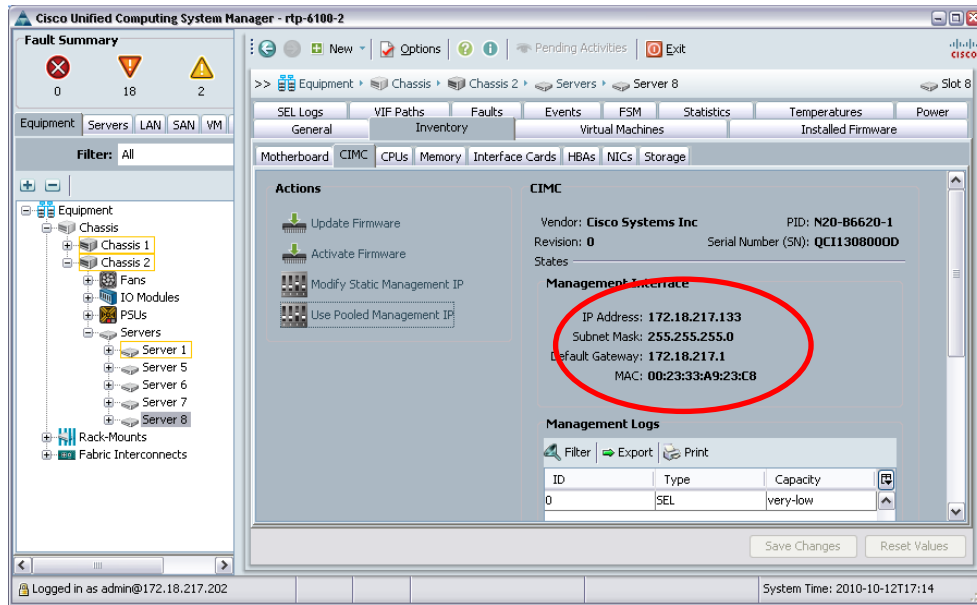
Click on the "Equipment" tab and then select a server. Here I selected Server 8 and then clicked on "Inventory" and "CIMC" tabs. You can see that the CIMC currently does not have an IP address. This is expected when no Management IP address pool exists.



Click on the “Modify Static Management IP” and fill in the info.



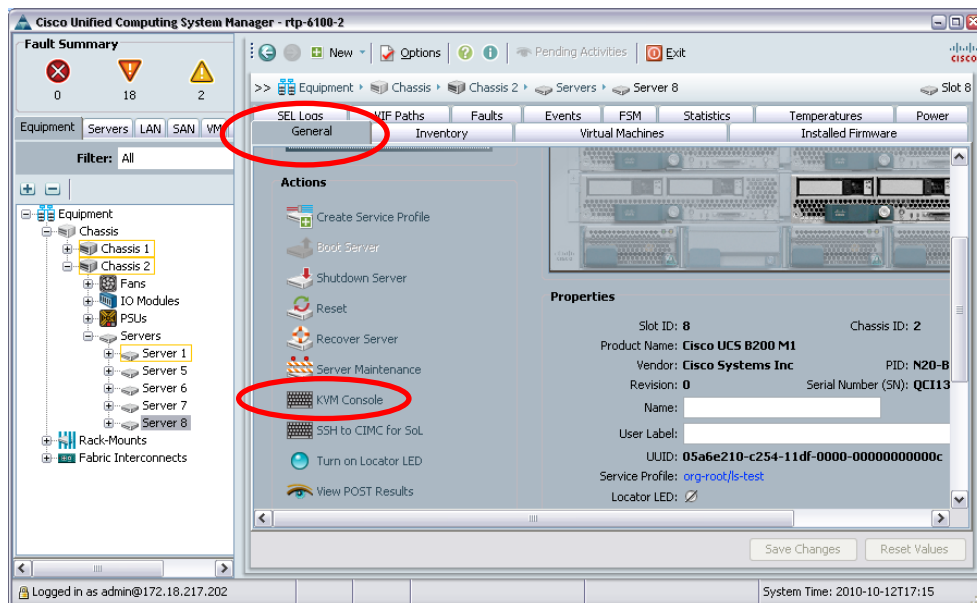
After adding the IP address for the CIMC the CIMC should now display 172.18.217.133 as the IP address the CIMC is using.

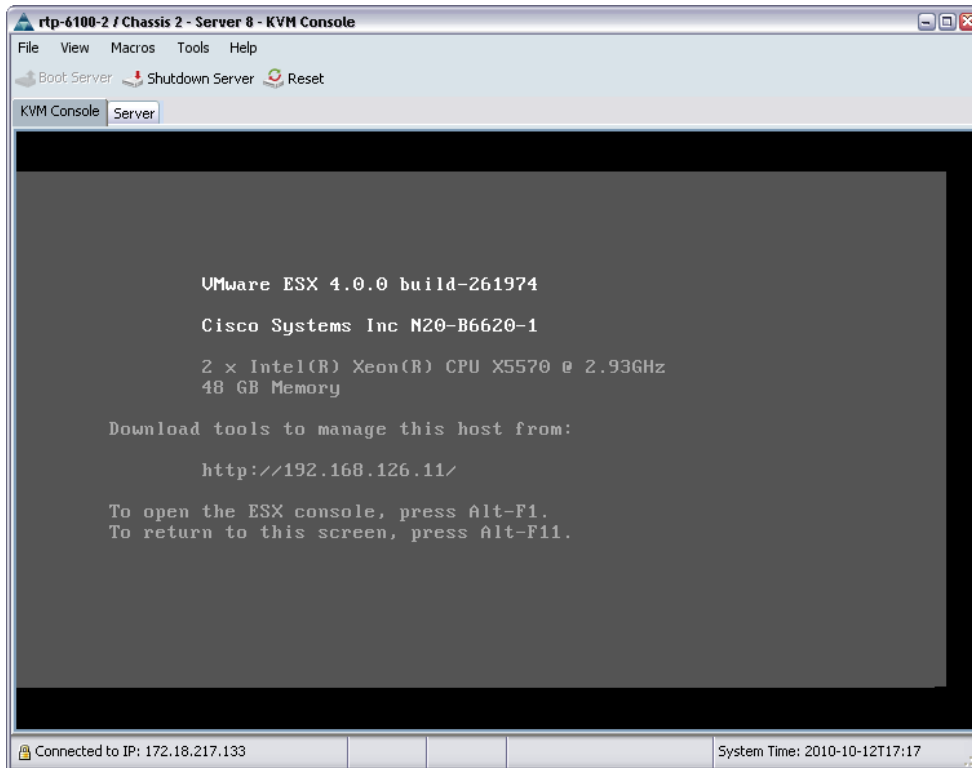


You can test this by starting a KVM session to the server. Click on the “General” tab and then select KVM Console. The console should start.

Verification steps:

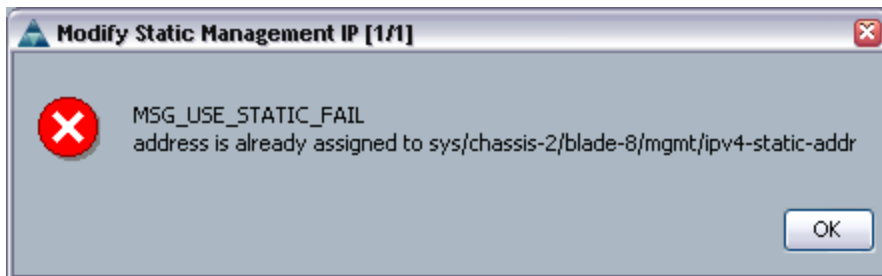
Make sure the KVM now works. You can start the KVM by clicking on the “General” tab and then selecting “KVM Console” in the action pane below.





Try to assign the same IP address to a different blade:

What happens if we try to use the same IP address on another blade. Choose blade 7 and try to set it's IP address to 172.18.217.133.



The system keeps track of what IP addresses have been assigned and will not let you assign an IP that has already been used.

You can also run a scanning tool against the IP addresses. Here we are running nmap against the 172.18.217.133 IP address. You can see that the IP responds to SSH and KVM port.

```
[root@rtp9-cae-duck ~]# nmap -sT -v 172.18.217.133
```

```
Starting nmap 3.70 ( http://www.insecure.org/nmap/ ) at 2010-10-12 14:05 EST
Initiating Connect() Scan against ucs-2-kvm-1.cisco.com (172.18.217.133) [1660 ports] at 14:05
Discovered open port 22/tcp on 172.18.217.133
Discovered open port 2068/tcp on 172.18.217.133
```


The Connect() Scan took 30.85s to scan 1660 total ports.
Host ucs-2-kvm-1.cisco.com (172.18.217.133) appears to be up ... good.
Interesting ports on ucs-2-kvm-1.cisco.com (172.18.217.133):
(The 1658 ports scanned but not shown below are in state: filtered)
PORT STATE SERVICE
22/tcp open ssh
2068/tcp open advocentkvm
MAC Address: 00:0D:EC:B1:A0:00 (Cisco Systems)

Nmap run completed -- 1 IP address (1 host up) scanned in 31.136 seconds

Conclusion:

This process sets a CIMC IP address for a bare metal blade in the UCS system. This IP address will stay with this blade until it is removed or assigned to another blade.

2.1.3 Statically set a CIMC IP address in a Service Profile

Create a Service Profile:

Create a Service Profile as you normally would

When you get to the following screen you should have ability to hard code a CIMC IP address to the SP.

Select the Management IP address header. Select “static” and then fill in the IP address information. Complete the rest of the SP steps.

Create Service Profile (expert)

Unified Computing System Manager

Create Service Profile (expert)

1. ☒ Identify Service Profile
2. ☒ Storage
3. ☒ Networking
4. ☒ vNIC/vHBA Placement
5. ☒ Server Boot Order
6. ☒ Maintenance Policy
7. ☒ Server Assignment
8. ☒ Operational Policies

Operational Policies

Optionally specify information that affects how the system operates.

Management IP Address

You can specify if the server will have a static management IP address, or if it will be derived from the management IP Pool. Selecting these options, the management IP address will follow the service profile if it migrates between servers. If you specify none, the management IP address will be determined by the server's CIMC settings.

Management IP Address Policy: ☐ none ☒ static ☐ pooled

IP Address: 172.18.217.134

Subnet Mask: 255.255.255.0

Default Gateway: 172.18.217.1

Monitoring Configuration (Thresholds)

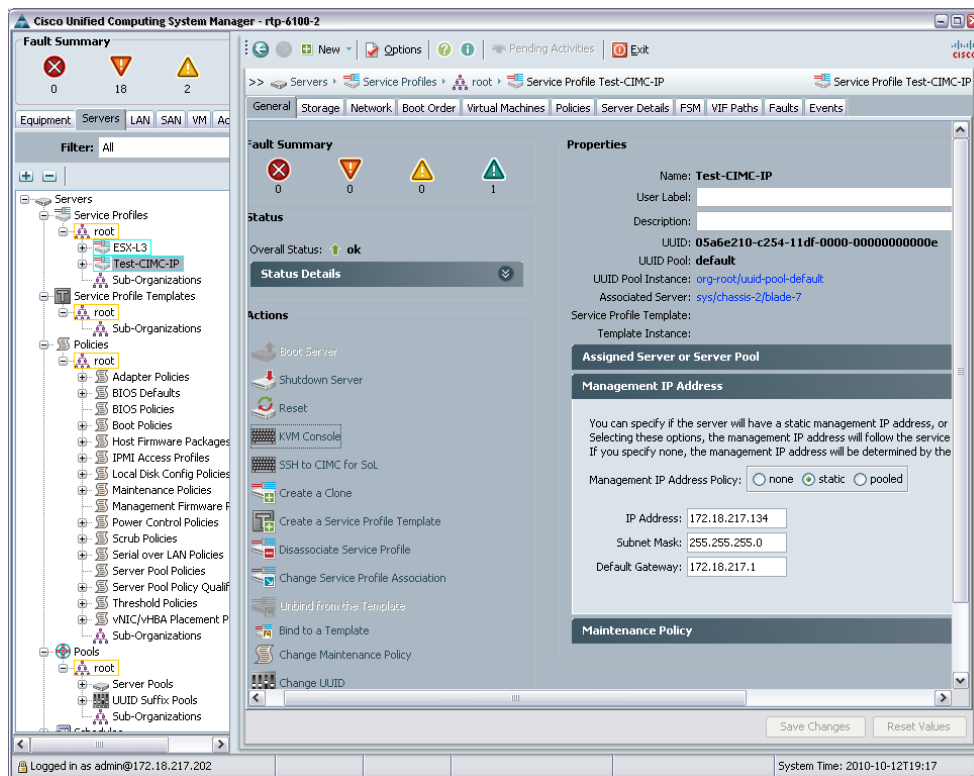
Power Control Policy Configuration

Scrub Policy

< Prev Next > Finish Cancel

Verify:

Associate the SP to one of the free servers. Once a server is associated you should be able to check the CIMC information of the server to verify that the right IP address was set. Note below how the IP is set in the Service Profile and that the blade is associated to blade 7.



You can launch the KVM from Server Profile section or scan it with nmap.

Here we scan it with NMAP after its associated.

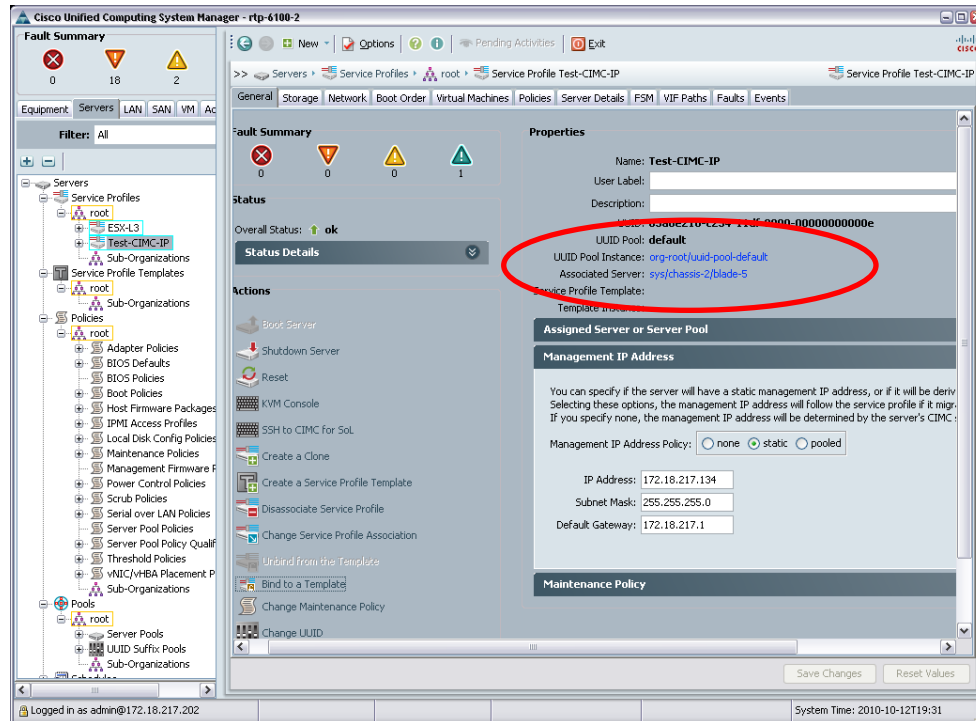
```
[root@rt9-cae-duck ~]# nmap -sT -v 172.18.217.134
```

```
Starting nmap 3.70 ( http://www.insecure.org/nmap/ ) at 2010-10-12 14:11 EST
Initiating Connect() Scan against ucs-2-kvm-2.cisco.com (172.18.217.134) [1660 ports] at 14:11
Discovered open port 22/tcp on 172.18.217.134
Discovered open port 2068/tcp on 172.18.217.134
The Connect() Scan took 31.65s to scan 1660 total ports.
Host ucs-2-kvm-2.cisco.com (172.18.217.134) appears to be up ... good.
Interesting ports on ucs-2-kvm-2.cisco.com (172.18.217.134):
(The 1658 ports scanned but not shown below are in state: filtered)
PORT      STATE SERVICE
22/tcp    open  ssh
2068/tcp  open  advocentkvm
MAC Address: 00:0D:EC:B1:A0:00 (Cisco Systems)
```

```
Nmap run completed -- 1 IP address (1 host up) scanned in 31.951 seconds
```

Change association to another blade:

Now we will change the association so that a new blade will take the place of blade 7. Select “Change Service Profile Association” and select another blade to take the SP.



After the new blade is associated verify that the static CIMC IP is still working.

Verification:

Verify with KVM and NMAP that the IP address is still active.

```
[root@rtp9-cae-duck ~]# nmap -sT -v 172.18.217.134
```

```
Starting nmap 3.70 ( http://www.insecure.org/nmap/ ) at 2010-10-12 14:30 EST
Initiating Connect() Scan against ucs-2-kvm-2.cisco.com (172.18.217.134) [1660 ports] at 14:30
Discovered open port 22/tcp on 172.18.217.134
Discovered open port 2068/tcp on 172.18.217.134
The Connect() Scan took 31.66s to scan 1660 total ports.
Host ucs-2-kvm-2.cisco.com (172.18.217.134) appears to be up ... good.
Interesting ports on ucs-2-kvm-2.cisco.com (172.18.217.134):
(The 1658 ports scanned but not shown below are in state: filtered)
PORT      STATE SERVICE
22/tcp    open  ssh
2068/tcp   open  advocentkvm
MAC Address: 00:0D:EC:B1:A0:00 (Cisco Systems)
```

Nmap run completed -- 1 IP address (1 host up) scanned in 31.951 seconds

Modify an Existing Service Profile:

It should be noted that you can modify an existing Service Profile to use a static CIMC IP address. So if an existing customer upgrades to 1.4 he can go back and change the existing Service Profiles.

2.1.4 Use a Pool of CIMC IP addresses for a Service Profile

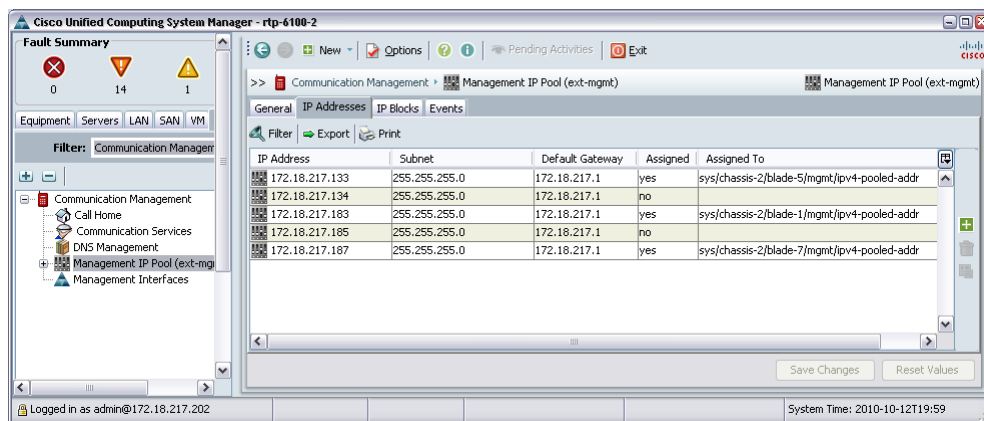
Configuration steps:

Note: There is no CIMC IP address pool specific for Service Profiles. The pool that is used is the same Management IP address pool that is specified under the Admin tab. This can cause a conflict because as soon as IP addresses are assigned to the pool UCSM starts giving out these IP addresses to the bare metal servers.

This means that if you have 7 servers and intend to create 7 Service Profiles and use Pooled CIMC IP addresses that you need 14 IP addresses in the Management IP address pool. And indeed yes each blade will end up answering on two IP addresses for the CIMC. In this case it would be better to use static settings in the SP.

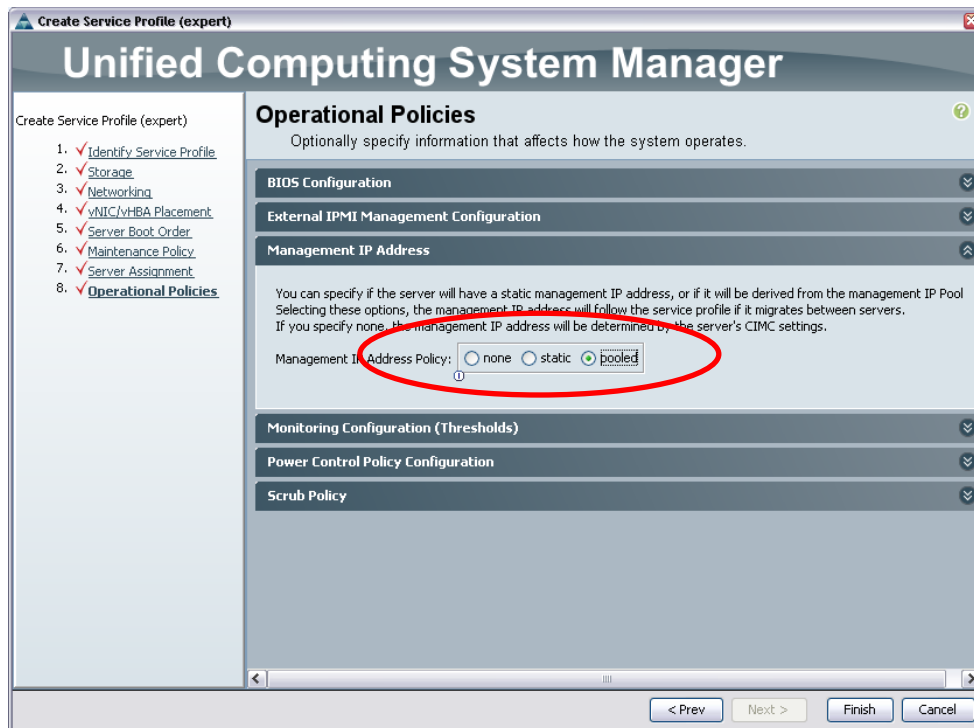
Configuration:

I have 3 blades in my system. I will make available 5 IP addresses in the Management IP address pool.



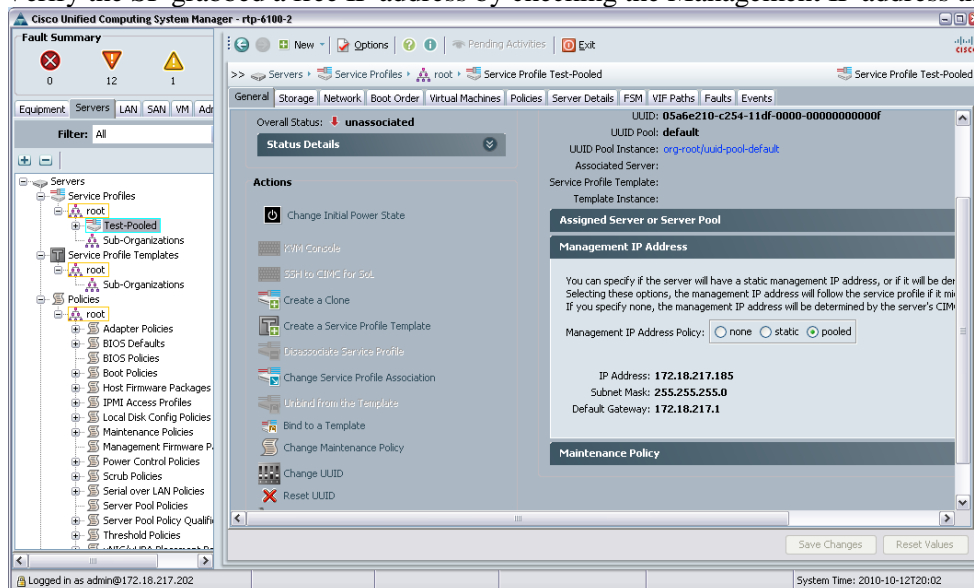
Here you can see I have 5 IP addresses in the Pool and that 3 have already been assigned to the blades in the system. The assignment happens automatically as soon as the IP addresses are allocated to the pool.

Create a new Service Profile. When you get to the Operational Policies screen set the Management IP Address to Pooled and complete the Service Profile.



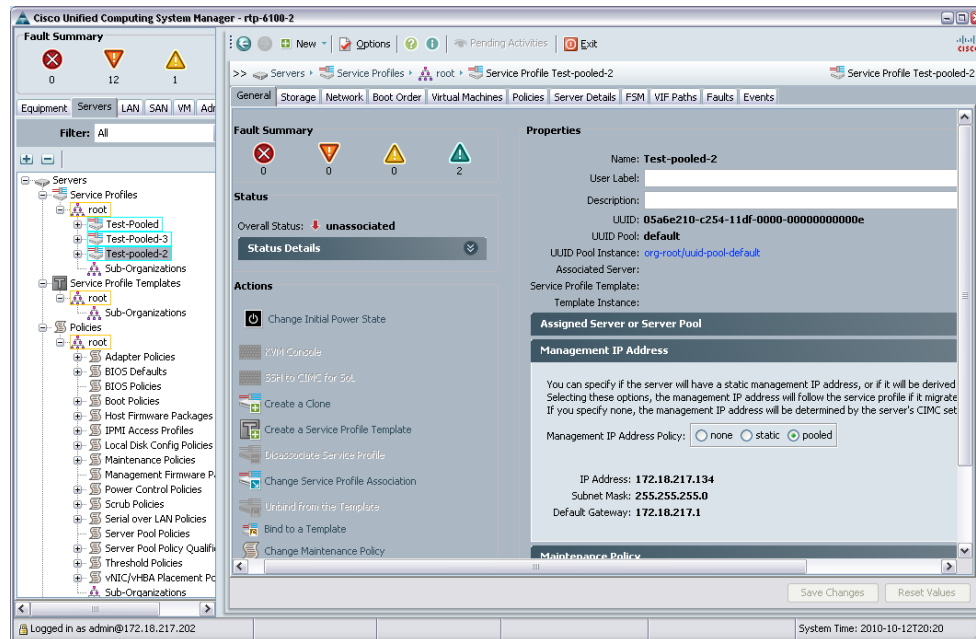
Verify steps:

Verify the SP grabbed a free IP address by checking the Management IP address that gets assigned.

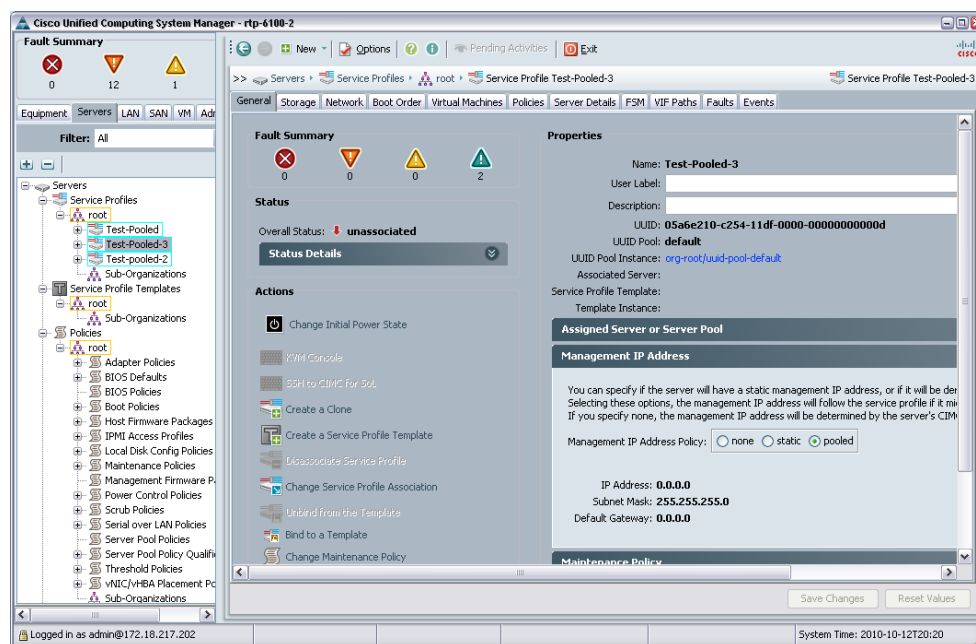


Here you can see that it grabbed .185 Create two more SPs with pooled Management IP addresses and see what happens.

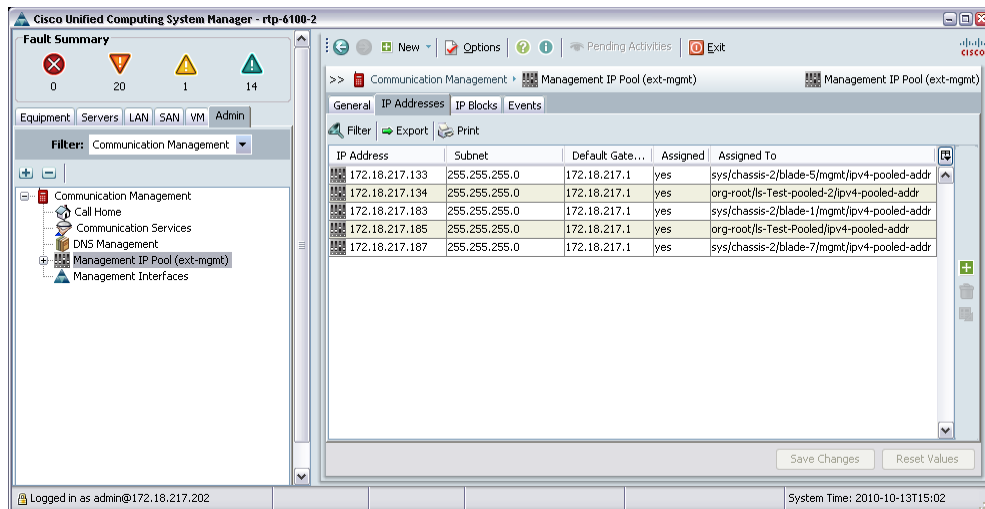
We created two more SPs. One took the last IP address .134 and the other is blank because no free IP addresses remained in the pool.



SP with no IP address



Look at the Management IP address pool in UCSM



You can see that all IP addresses in the pool are used. If a new blade is installed or a new SP is created with a pooled CIMC policy it will not get an IP address and access to the KVM will not work.

NOTE: While SP Test-Pooled-3 did not get a CIMC IP address the blade that is associated to the SP does. So KVM access will still work using the IP address that is assigned to the blade.

To access a KVM directly without launching UCSM or the KVM launcher you can use <http://UCSM-IP-ADDRESS/ucsm/kvm.jnlp>

This will bring up a login box where you can enter the username, password, and IP address of the KVM you want to access. This is nice shortcut to connect directly to the KVM of a bare metal server or a Service Profile.

