Overview of Cisco 5520 Wireless Controller

The Cisco 5520 Wireless Controller provides centralized control, management, and troubleshooting for high-scale deployments in service provider and large campus deployments. It offers flexibility to support multiple deployment modes in the same controller: for example, centralized mode for campus, Cisco FlexConnect mode for lean branches managed over the WAN, and mesh (bridge) mode for deployments where full Ethernet cabling is unavailable. As a component of the Cisco Unified Wireless Network, this controller provides real-time communications between Cisco Aironet access points, the Cisco Prime Infrastructure, and the Cisco Mobility Services Engine, and is interoperable with other Cisco controllers.

Cisco 5520 Wireless Controller Rear Panel View

1. Two Type A 3.0 USB ports
2. CIMC port 10/100/1000 Base-T
4. Ethernet Service Port (SP)—Management 10/100/1000 Base-T
5 Redundancy Port (RP)

6 VGA Connector—Rear panel has a standard VGA port using a female D-Sub-15 Connector

7 ID Switch and LED

---

Rear Panel LEDs, Definitions of States

Table 1 lists the Cisco 5520 Wireless Controller Rear Panel LEDs, Definitions of States.

<table>
<thead>
<tr>
<th>LED Name</th>
<th>Function</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pwr OK</td>
<td>—</td>
<td>Amber On—Power is good</td>
</tr>
<tr>
<td>10 G</td>
<td>—</td>
<td>Amber On—10 G mode</td>
</tr>
<tr>
<td>Port-n Link Status</td>
<td>—</td>
<td>Amber Off—1 G mode</td>
</tr>
<tr>
<td>Port-n Link Activity</td>
<td>—</td>
<td>Green On—Link is up</td>
</tr>
</tbody>
</table>
Overview of the Cisco 8540 Wireless Controller

The Cisco 8540 Wireless Controller provides centralized control, management, and troubleshooting for high-scale deployments in service provider and large campus deployments. It offers flexibility to support multiple deployment modes in the same controller: for example, centralized mode for campus, Cisco FlexConnect mode for lean branches managed over the WAN, and mesh (bridge) mode for deployments where full Ethernet cabling is unavailable. As a component of the Cisco Unified Wireless Network, this controller provides real-time communications between Cisco Aironet access points, the Cisco Prime Infrastructure, and the Cisco Mobility Services Engine, and is inter-operable with other Cisco controllers.

Cisco 8540 Wireless Controller Rear Panel View

<table>
<thead>
<tr>
<th>LED Name</th>
<th>Function</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port-n Link Activity</td>
<td>-</td>
<td>Green blinking—Link activity</td>
</tr>
<tr>
<td>Service Port and Redundancy Port LED (present on the port)</td>
<td>Interface Port Speed (the left LED on the port)</td>
<td>Off—Link Speed = 10 Mbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amber On—Link Speed = 100 Mbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green On—Link Speed = 1 Gbps</td>
</tr>
<tr>
<td>Interface Port Status (the right LED on the port)</td>
<td>Off—No link</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green On—Link</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blinking—Traffic present</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Cisco 5520 Wireless Controller Rear Panel LEDs, Definitions of States

1 Two Type A 3.0 USB ports
2 CIMC port 10/100/1000 Base-T
Overview of CIMC

The Cisco Integrated Management Controller (CIMC) is the management service for the C-Series servers. CIMC runs within the server.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 G</td>
</tr>
<tr>
<td>2</td>
<td>Pwr OK</td>
</tr>
<tr>
<td>3</td>
<td>Port-n Link Status</td>
</tr>
<tr>
<td>4</td>
<td>Port-n Link Activity</td>
</tr>
<tr>
<td>5</td>
<td>Two 1/10 G SFP/SFP+ Ports</td>
</tr>
</tbody>
</table>
CIMC is a separate management module that is built into the motherboard. CIMC has its own ARM-based processor which runs the CIMC software. It is shipped with a running version of the firmware. Users can update CIMC firmware through the Firmware Update Management page. You need not worry about installing the initial CIMC firmware.

Logging in to CIMC

Before starting

Check if Adobe Flash Player 10 or higher is installed on your local machine.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Type or select the web link for CIMC in your web browser.</td>
</tr>
<tr>
<td>Step 2</td>
<td>A security dialog box is displayed, do the following:</td>
</tr>
<tr>
<td></td>
<td>a. Optional: Check the check box to accept all content from Cisco.</td>
</tr>
<tr>
<td></td>
<td>b. Click Yes to accept the certificate and continue.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Enter your Username and password in the log in window.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click Log In.</td>
</tr>
</tbody>
</table>

Setting up CIMC

Setting up CIMC for 5520 and 8540 Wireless Controller

To setup the CIMC interface follow the given steps:

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Connect the CIMC cable to the 10/100/1000 port in base T.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Use the command imm dhcp enable on WLC CLI to enable DHCP to set the IP.</td>
</tr>
<tr>
<td>Step 3</td>
<td>If DHCP is not available, use the command imm address &lt;ip address&gt; &lt;net mask&gt; &lt;gateway ip&gt;.</td>
</tr>
</tbody>
</table>

View the IP and details, using the command imm summary.

```
imm ?
address IMM Static IP Configuration
dhcp Enable | Disable | Fallback DHCP
restart Saves settings and Restarts IMM Module
summary Displays IMM Parameters
username Configures Login Username for IMM
```
Setting up CIMC

Note

Default password will be either ‘password’ or ‘Cisco1234’. You can change this via the username command.

CIMC Configurations that are required for reliable WLC operation

Note

Once the user logs in to CIMC the following should not be changed. This will cause issues for WLC operation.

- Do not change the NIC mode to shared. It should be in dedicated mode
- Do not change the FlexFlash Mode
- Do not change the SSD/Virtual disk settings
- BIOS parameters should not be changed

Expectations when logged in via CIMC

- FlexFlash is configured for RAID but only one flash is populated this causes CIMC to show the FlexFlash as degraded. We can safely dis-regard the FlexFlash degradation warning in our case.
- Expect to see only one CPU populated
- Do not configure Software Raid on SSD

IMM Chassis Command reference

>show imm chassis
bios Fetch Chassis BIOS information
current Fetch Chassis Current information
fan Fetch Chassis FAN information
mac Fetch Chassis MAC information
memory Fetch Chassis Memory information
power-supply Fetch Chassis Power Supply information
sol-info Fetch Serial Over Lan information
temperature Fetch Chassis Temperature information

Some Example Outputs

>show imm chassis bios
BIOS Information
Vendor: Cisco Systems, Inc.
Version: C240M4.2.0.4a.0.042220151400
Release Date: 04/22/2015

>show imm chassis fan
FAN1_SPEED | 13h | ok | 29.1 | 16000 RPM
FAN2_SPEED | 14h | ok | 29.2 | 16000 RPM
FAN3_SPEED | 15h | ok | 29.3 | 17100 RPM
FAN4_SPEED | 16h | ok | 29.4 | 17100 RPM
FAN5_SPEED | 17h | ok | 29.5 | 17100 RPM
FAN6_SPEED | 18h | ok | 29.6 | 17100 RPM

> show imm chassis mac
MAC Address: a4:6c:2a:39:0f:be
Verify that the chasis mac and show inventory mac are conservative and not the same.

> show inventory
Burned-in MAC Address................................. A4:6C:2A:39:0F:BF
Power Supply 1........................................ Present, OK
Power Supply 2........................................ Present, OK
Maximum number of APs supported...................... 6000
PID: AIR-CT8540-K9, VID: V01, SN: FCH1913V18E

> show imm chassis temperature
FP_TEMP_SENSOR | 46h | ok | 12.1 | 23 degrees C
DDR4_P1_A1_TEMP | 64h | ok | 8.0 | 26 degrees C
DDR4_P1_B1_TEMP | 6Ah | ok | 8.3 | 26 degrees C
DDR4_P1_C1_TEMP | 71h | ok | 8.6 | 25 degrees C
DDR4_P1_D1_TEMP | 77h | ok | 8.9 | 25 degrees C
P1_TEMP_SENS | A1h | ok | 3.1 | 31 degrees C
PSU1_TEMP | C4h | ok | 10.1 | 24 degrees C
PSU2_TEMP | C5h | ok | 10.2 | 25 degrees C
PCH_TEMP_SENS | C6h | ok | 7.0 | 27 degrees C
RISER2_INLET_TMP | E8h | ok | 7.1 | 26 degrees C
RISER1_INLET_TMP | E9h | ok | 7.2 | 26 degrees C
RISER1_OUTLET_TMP | EAh | ok | 7.3 | 28 degrees C
RISER2_OUTLET_TMP | E Bh | ok | 7.4 | 26 degrees C

> show imm chassis current
PSU1_IOUT | 28h | ok | 10.1 | 6 Amps
PSU2_IOUT | 2Eh | ok | 10.2 | 7 Amps

> show imm chassis power-supply
PSU1_POUT | 29h | ok | 10.1 | 72 Watts
PSU2_POUT | 2Fh | ok | 10.2 | 88 Watts
POWER_USAGE | C1h | ok | 7.0 | 176 Watts
PSU1_PIN | C2h | ok | 10.1 | 80 Watts
PSU2_PIN | C3h | ok | 10.2 | 96 Watts

> show imm chassis sol-info

Note
Serial over LAN Configuration: When SOL is enabled, external console does not work

Set in progress: set-complete
Enabled: false
Force Encryption: false
Force Authentication: false
Privilege Level: USER
Character Accumulate Level (ms): 50
Character Send Threshold: 201
Configure/View CIMC IP from console during bootup

Press F8 in the BIOS screen at the time of Bootup to view CIMC IP address configuration and to reset password.

**Step 1**  Choose either DHCP or Static config.

**Step 2**  Enter the VLAN tag if needed.

**Step 3**  Enter the CIMC password.
Step 4  Press F5 to display the configured IP after making changes to IP or enabling DHCP.

CIMC Configuration Utility
Cisco Systems, Inc Version 1.1

*******************************************************
IPV4 (Basic)
DHCP enabled: (x)
CIMC IP:172.25.183.20
Subnetmask: 255.255.255.0
Gateway:172.25.183.1

VLAN (Advanced)
VLAN enabled: []
VLAN id:1
Priority:0

Default User (Basic)
Default password:
Reenter password:

*******************************************************

Step 5  Press F10 to save the configuration.

---

Accessing CIMC

To access CIMC follow the given steps:

---

Step 1  The POST and the option ROM config is displayed during the boot up process.

Step 2  These are the Option ROM config screens, which are displayed:
- LSI
- HBA/CNA if installed
- Additional NICs
- LOM

---

Step 3  Point a Web browser to the configured CIMC IP address.
- Default username: admin
• Default password: password

Step 4  Choose Admin > Network Settings and check Settings.
Step 5 Choose Network and in IPv4 properties, check the Use DHCP box, and reboot the chassis to revert to DHCP, from the Admin tab in the GUI.
Step 6 Monitor your DHCP server to see when the IP is assigned to your MAC. Point to the new IP server.
After logging into the CIMC, you can check the network setting:

Troubleshooting

On Boot up vKVM /Monitor does not display any output
Console output not visible / Console port not working
APs not joining with and displays certificate Error / Certificates not found
APs not joining with and cannot find AP images
Serial Console not present at customer can we use SOL
Continuous prints are seen on cli related to Temp Breach
Controller is starting on connecting the power
Service port is not working when CIMC port is connected
My management port not coming up
Not able to install/update 5520 controller software
Troubleshooting

Not able to detect the 1G SFP
Port and Link LEDs

On Boot up vKVM / Monitor does not display any output

Solution
Display Port / VGA Terminal is not supported.
- Connect the RJ45 console at the rear or use console of break out connector.

Console output not visible / Console port not working

Solution
- Check if the correct console port is connected and not VGA/Video port
- Check if baudrate is 9600
• Check if Serial-over-LAN is disabled in CIMC

![Cisco Integrated Management Controller GUI](image1)

• Get the status of this from the Telnet/SSH to controller using

```bash
show imm chassis sol-info
```

**Note**
When Serial-Over-LAN is enabled all external consoles will be disabled.

**APs not joining with and displays certificate Error / Certificates not found**

**Solution**
• Check if the certificates are installed and not certificate errors were seen during bootup

```bash
show certificate all
```

The above command shows the certificates present/installed and status
• Check if the FlexFlash is present in the SDcard panel in UCS
• Check if the Flexflash is connected to HOST

![Cisco Integrated Management Controller GUI](image2)

If we remove the SDcard while WLC is powered on, it will get disconnected and cannot be accessed in subsequent boots as well.
APs not joining with and cannot find AP images

Solution
• Check if the AP image bundle is present on the controller.

```bash
show ap bundle all
```

Note
The above command is seen if the AP images are present. If not found transfer download AES image to re-install the AP bundle.

Serial Console not present at customer can we use SOL

Solution
Yes. But note that external consoles will be disabled.
• Check this box to enabled in CIMC

Log on to CIMC via SSH
• Once logged in execute the command
  connect host
• Type Ctrl+X to Exit the serial console.

Continuous prints are seen on cli related to Temp Breach

Solution

Applicable for only 8.1.122.0 and below. Not applicable for 8.1.131.0 onwards and for 8.2

DP WARN - Ambient Temp 46 Breached remote High limit 45
DP WARN - Core temp 96 Breached remote High limit 95
The above prints related to Temp Breach are seen
• Verify the Fan settings and see that the fans are at least 16000 RPM by running
  show imm chassis fan
• Check if the vents in the front and back of controller are not obstructed
• Check if the appliance is not in a thermal hot pocket

Controller is starting on connecting the power

Solution
After a power outage my controller switches on by default
Troubleshooting

- Set the default power restore policy to power on.

**Note**
This is done so that you need not press the button to physically start the appliance even after all the LEDs are up. This can be changed in CIMC if required.

---

**Service port is not working when CIMC port is connected**

**Solution**

- Check if the NIC is in dedicated mode

You can also figure this by comparing chassis mac and Burned in MAC

(Cisco Controller) > show imm chassis mac
MAC Address: a4:6c:2a:39:0f:be
(Cisco Controller) > show inventory
Burned-in MAC Address............................ A4:6C:2A:39:0F:BF
Check if the show imm chassis mac and show inventory mac are conservative and not the same. Otherwise it will cause discrepancy.

**Note**
If this happens check if the NIC is set to be in shared more in CIMC
My management port not coming up

Solution
- Verify if the correct port is connected

Note
Note that the port numbering starts from right to left.

Not able to install/update 5520 controller software

Solution
Check if you have downloaded the 5520 software. 5508 software is not compatible with 5520

Not able to detect the 1G SFP

Solution
If there is nothing installed in port 1, the board will be configured for 10 G mode by default. Therefore, to switch to 1 G mode, install an SFP module in port 1 and the reboot the system.

Conversely, if an SFP module is installed and the user wants to switch to 4 x 10 G mode, then an SFP+ module must be installed in port 1 and the WLC has to be rebooted.

Thus, Online Insertion and Removal (OIR) of SFP and SFP+ between 10 G and 1 G is not possible.

OIR of 10 G to 10 G and 1 G and 1 G is possible.

Note for 1 G SFP to be detected make sure it is MSA compliant.
It is recommended to have all ports as either 10 G or 1 G. In case they are different, port 1 SFP determines the mode of operation and functionality on the other SFPs may not work.

**Port and Link LEDs**

**Solution**

<table>
<thead>
<tr>
<th>LED</th>
<th>Functional Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pwr OK</td>
<td>LED: (Amber) On indicates power is good</td>
</tr>
<tr>
<td>10Gbe</td>
<td>LED: (Amber) On indicates 10GbE mode. LED: Off indicates 1GbE mode</td>
</tr>
<tr>
<td>Port-n Link Status</td>
<td>LED: (Green) on indicates link up status</td>
</tr>
<tr>
<td>Port-n Link Activity</td>
<td>LED: (Green) blinking indicates link activity</td>
</tr>
</tbody>
</table>

Where n = port number

**Logging out of CIMC**

**Step 1**

In the upper right of CIMC, click **Log Out**.
Logging out returns you to the CIMC log in page.

**Step 2**
(Optional) Log back in or close your web browser.

---

### Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see *What’s New in Cisco Product Documentation* at:


Subscribe to *What’s New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.

---

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

© 2015 Cisco Systems, Inc. All rights reserved.