Avaya Solution & Interoperability Test Lab

Application Notes for Extreme Networks G48Tc module Power over Ethernet Support for Avaya IP Telephones and Avaya One-X Gateway – Issue 1.0

Abstract

These Application Notes describe the procedures for configuring the Extreme Networks G48Tc module to provide inline Power over Ethernet (PoE) to Avaya 1600/4600/9600 Series IP Telephones registered to the Avaya Communication Manager or Avaya G11 PSTN Gateway. During compliance testing, Avaya IP Telephones successfully obtained power and transferred data over standard Ethernet cables from the Extreme Networks G48Tc module.

Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

Power over Ethernet (PoE) allows both power and data to be simultaneously carried over standard Ethernet cables. PoE-enabled Ethernet switches can supply power directly to Ethernet devices, thereby simplifying installation and removing the need for separate power supplies for those devices. The IEEE 802.3af standard defines the mechanisms for Power Sourcing Equipment (PSE), such as PoE-enabled Ethernet switches, to detect, classify, and supply power to Powered Devices (PDs), such as PoE-enabled IP telephone. In the compliance-tested configuration described in these Application Notes, the Extreme Networks G48Tc module is configured to supply inline PoE to Avaya PDs. No Extreme Networks specific configuration is required on Avaya Communication Manager, Avaya IP Office and Avaya G11 PSTN Gateway to support this solution.

The G48Tc is a single slot module offering 10/100/1000 Mbps Ethernet connectivity for the BlackDiamond (BD) 8800 series Ethernet switch. The S-POE field upgradeable add-on module is installed to provide PoE capability.

As illustrated in **Figure 1**, the Avaya PDs covered in these Application Notes include the following:

- Avaya 1603 IP Telephone
- Avaya 1608 IP Telephone
- Avaya 1616 IP Telephone
- Avaya 4601SW IP Telephone
- Avaya 4602SW IP Telephone
- Avaya 4610SW IP Telephone
- Avaya 4621SW IP Telephone
- Avaya 4622SW IP Telephone
- Avaya 4625SW IP Telephone
- Avaya 9610 IP Telephone
- Avaya 9620 IP Telephone
- Avaya 9630 IP Telephone
- Avaya 9630G IP Telephone
- Avaya 9640 IP Telephone
- Avaya 9640G IP Telephone
- Avaya 9650 IP Telephone
- Avaya 4610SW one-X Quick Edition IP Telephone
- Avaya 4621SW one-X Quick Edition IP Telephone
- Avaya G11 PSTN Gateway

2. Configuration

Figure 1 illustrates the configuration used in these Application Notes. All Avaya 16xx, 46xx series and 96xx series telephones are registered with Avaya Communication Manager. Both Avaya 4610SW and Avaya 4621SW One-X Quick Edition IP Telephones are registered to the Avaya One-X G11 PSTN Gateway. **Figure 1** is for illustration purpose only and not all Avaya IP Telephones were simultaneously powered on during testing.

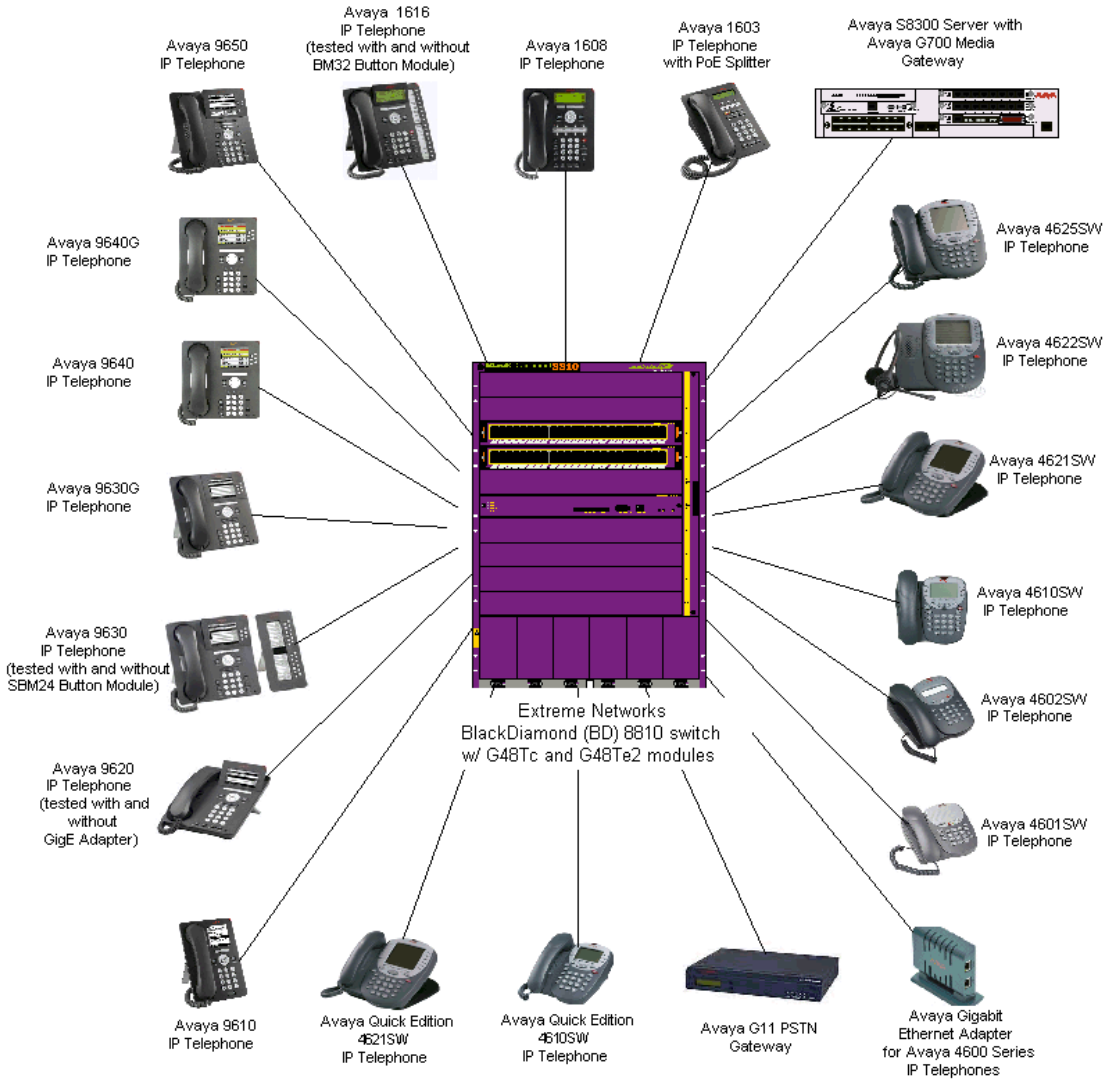

Figure 1: PoE sample network configuration

3. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration provided:

Equipment	Software/Firmware
Avaya S8300 Media Server with a G700 Media Gateway	5.0
Avaya 1603 IP Telephone	Avaya one-X Value Edition 1.23 (H.323)
Avaya 1608 IP Telephone	Avaya one-X Value Edition 1.23 (H.323)
Avaya 1616 IP Telephone	Avaya one-X Value Edition 1.23 (H.323)
Avaya 4601SW IP Telephone	2.3 (H.323)
Avaya 4602SW IP Telephone	2.8.3 (H.323)
Avaya 4610SW IP Telephone	2.8.3 (H.323)
Avaya 4621SW IP Telephone	2.8.3 (H.323)
Avaya 4622SW IP Telephone	2.8.3 (H.323)
Avaya 4625SW IP Telephone	2.8.3 (H.323)
Avaya 9610 IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9620 IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9630 IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9630G IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9640 IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9640G IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9650 IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 4610SW one-X Quick Edition IP Telephone	3.2.1 (SIP)
Avaya 4621SW one-X Quick Edition IP Telephone	3.2.1 (SIP)
Avaya G11 PSTN Gateway	3.2.1
Extreme Networks G48Tc module	ExtremeXOS 12.0.1.11

4. Configure the Extreme Networks G48Tc module

This section shows the necessary steps in configuring the G48Tc module installed in the BlackDiamond 8810 chassis as shown in the **Figure 1**.

1. Install the BD 8800 S-POE power module onto the G48Tc. Insert the G48Tc back into the BD 8810 chassis. In-line power is enabled by default; no additional configuration command is needed. Please reference [5] for additional installation information.

5. Interoperability Compliance Testing

The interoperability testing focused on verifying PoE interoperability between the Extreme Networks G48Tc module, Avaya IP Telephones and the Avaya G11 PSTN Gateway.

The power tests included verification of the following after the powered device was connected to the switch:

- Successful boot operation.
- For Avaya IP Telephones, successful registration with Avaya Communication Manager or Avaya G11 PSTN Gateway.
- Completion of a test call, and raising speakerphone volume to maximum value.
- Connecting a mix of Avaya IP Telephones to the switch, power cycling the switch and verifying successful boot operation and registration of the devices to the Avaya Communication Manager.

5.1. General Test Approach

The general test approach was to:

- Connect the Avaya IP Telephones and Avaya G11 PSTN Gateway to ports on the G48Tc module and verify that they successfully boot.
- Verify completion of a test call.
- Power-cycle the G48Tc module and verify successful boot operation and registration of the devices

5.2. Test Results

All Power over Ethernet test cases completed successfully. The G48Tc module successfully provided inline power to the different Avaya IP telephones and G11 PSTN Gateway.

Table 1 below lists the IEEE 802.3af class, allocated power, and measured power of the Avaya IP Telephones and Avaya G11 PSTN Gateway when connected to the G48Tc module. The power listed as measured by the Extreme Networks BD8810 switch is for an idle phone. Cable length and impedance affects power usage, so the measurements listed here may vary based on the cable used.

Avaya Powered Device	802.3af Class	Measured Power (W) (Idle)
Avaya 1603 IP Telephone with PoE Splitter	2	4.3
Avaya 1608 IP Telephone	2	4.3
Avaya 1616 IP Telephone	3	5.6
Avaya 4601SW IP Telephone	2	3.1
Avaya 4602SW IP Telephone	2	3.3
Avaya 4610SW IP Telephone	2	3.5
Avaya 4621SW IP Telephone	2	4.9
Avaya 4621SW IP Telephone with Gig Adapter	0	10.1
Avaya 4622SW IP Telephone	2	4.8
Avaya 4625SW IP Telephone	3	7.5
Avaya 9610 IP Telephone	2	4.3
Avaya 9620 IP Telephone	2	4.7
Avaya 9620 IP Telephone with GigE Adapter	3	7.8
Avaya 9630 IP Telephone	2	4.1
Avaya 9630 IP Telephone with SMB 24 Button	2	4.6
Avaya 9630G IP Telephone	3	3.9
Avaya 9640 IP Telephone	2	4.1
Avaya 9640G IP Telephone	2	3.8
Avaya 9650 IP Telephone	2	4.8
Avaya Quick Edition 4610SW IP Telephone	2	3.2
Avaya Quick Edition 4621SW IP Telephone	2	4.8
Avaya G11 PSTN gateway	0	4.1

Table 2 below summarizes the IEEE 802.3af classes.

Class	PSE Output Max. Power (W)
0	15.4
1	4.0
2	7.0
3	15.4
4	Treat as Class 0

6. Verification Steps

Inline Power over Ethernet (PoE) is supported on the Extreme Networks G48Tc module. By default, PoE support is enabled on the system and on all ports.

- Use the "show inline-power" command to verify available power available on the switch.

```
BD-8810.23 # show inline-power

                Inline Power System Information
Configured                  : Enabled
System Power Surplus        :  431 Watts available for budgeting
Redundant Power *SHORTFALL*:  134 Watts over budget to maintain N+1
Power Usage Threshold       : 70 percent (per slot)
Disconnect Precedence       : deny-port
                                        Budgeted       Measured
Slot  Inline-Power  Firmware Status     Power (Watts)  Power (Watts)   Legacy
2     Enabled       Operational         50 W           0 W             Disabled
3     Enabled       Operational         50 W           0 W             Disabled
4     Enabled       Operational         50 W           0 W             Disabled
8     Enabled       Operational         50 W           0 W             Disabled
```

- Use the "show inline-power stats slot <slot#>" command to display the PoE status of the slot.

```
BD-8810.18 # show inline-power stats slot 3

Inline-Power Slot Statistics
Slot:  3
Firmware status               : Operational
Firmware revision             : 501b1

Total ports powered           : 0
Total ports awaiting power    : 48
Total ports faulted           : 0
Total ports disabled          : 0
```

- Use the "show inline-power configuration port <port#>" command to verify available power available on the port.

```
BD-8810.14 # show inline-power configuration port 3:1

Port   Config   Operator Limit   Priority   Label
3:1    Enabled     15400 mW      Low
```

- Use the “show inline-power info detail port <port #>” command to display the PoE status of the individual port.

```
BD-8810.65 # show inline-power info detail ports 3:1

Port 3:1

Configured Admin State: enabled
Inline Power State    : delivering
MIB Detect Status     : delivering
Label                 :
Operator Limit        : 15400 milliwatts
PD Class              : class3
Max Allowed Power     : 15.400 W
Measured Power        : 7.500 W
Line Voltage          : 48.0 Volts
Current               : 157 mA
Fault Status          : None
Detailed Status       : valid resistor detected, 802.3a
Priority              : low
```

7. Support

For technical support on Extreme Networks products, consult the support pages at http://www.extremenetworks.com or contact the Extreme Networks TAC at:

• Toll free: 800-998-2408

8. Conclusion

These Application Notes describe the steps for configuring the Extreme Networks G48Tc module to provide inline Power over Ethernet (PoE) to the Avaya PDs, Avaya 9600 Series IP Telephones, Avaya 4600 Series IP Telephones, Avaya 1600 Series IP Telephones, and Avaya G11 PSTN Gateway.

9. Additional References

Product documentation for Avaya products may be found at http://support.avaya.com

[1] *Administrator Guide for Avaya Communication Manager*, Doc # 03-300509, Issue 4.0, Release 5.0, January 2008
[2] *Avaya Communication Manager Advanced Administration Quick Reference*, Doc # 03-300364, Issue 4, Release 5.0, January 2008
[3] *Administration for Network Connectivity for Avaya Communication Manager*, Doc # 555-233-504, Issue 13, January 2008
[4] *Avaya IP Telephony Implementation Guide*, May 1, 2006

Product documentation for Extreme Networks products may be found at http://www.extremenetworks.com

[5] *BlackDiamond 8800 Series Switches Hardware Installation Guide*, April 2008, Part number 100284-00, R 01.
[6] *ExtremeXOS Concepts Guide*, Version 12.1 May 2008, Part number 100272-00, R 02.
[7] *ExtremeXOS Command Reference Guide*, Version 12.1 May 2008, Part number 100273-00, R 02.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.