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Application Notes for Power over Ethernet Support of the Extreme Networks Summit X150e-24p Switch for Avaya IP Telephones and Avaya G11 PSTN Gateway – Issue 1.0

Abstract

These Application Notes describe the procedures for configuring the Extreme Networks Summit X150e-24p Switch to provide inline Power over Ethernet (PoE) to Avaya 1600/4600/5600/9600 Series IP Telephones registered to Avaya Communication Manager, Avaya IP Office, and Avaya G11 PSTN Gateway. During compliance testing, Avaya IP Telephones successfully obtained power and transferred data over standard Ethernet CAT-5 cables from the Extreme Networks Summit X150e-24p Switch. Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

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1 of 12
X150e-PoE

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, such as PoE-enabled Ethernet switches, to detect, classify, and supply power to Powered Devices, such as PoE-enabled IP telephones. In the compliance-tested configuration described in these Application Notes, the Extreme Networks Summit X150e-24p Switch is configured to supply inline PoE to Avaya Powered Devices.

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

- Avaya G11 PSTN Gateway
- Avaya 1600 Series IP Telephones
- Avaya 4600 Series IP Telephones
- Avaya 5600 Series IP Telephones
- Avaya 9600 Series IP Telephones
- Avaya Quick Edition IP Telephones

Figure 1 illustrates the configuration used in these Application Notes. All Avaya 1600, 4600 Series and 9600 Series IP Telephones are registered with Avaya Communication Manager and Avaya 4601SW IP Telephones, Avaya 4602SW IP Telephones, and Avaya 5600 Series IP Telephones are registered with Avaya IP Office. Avaya 4610SW, 4621SW Quick Edition IP Telephones and Avaya G11 PSTN Gateway are tested conform to the IEEE 802.3af standard as show in **Table 2**.   **Figure 1** is for illustration purpose only and not all Avaya IP Telephones were simultaneously powered on during testing.
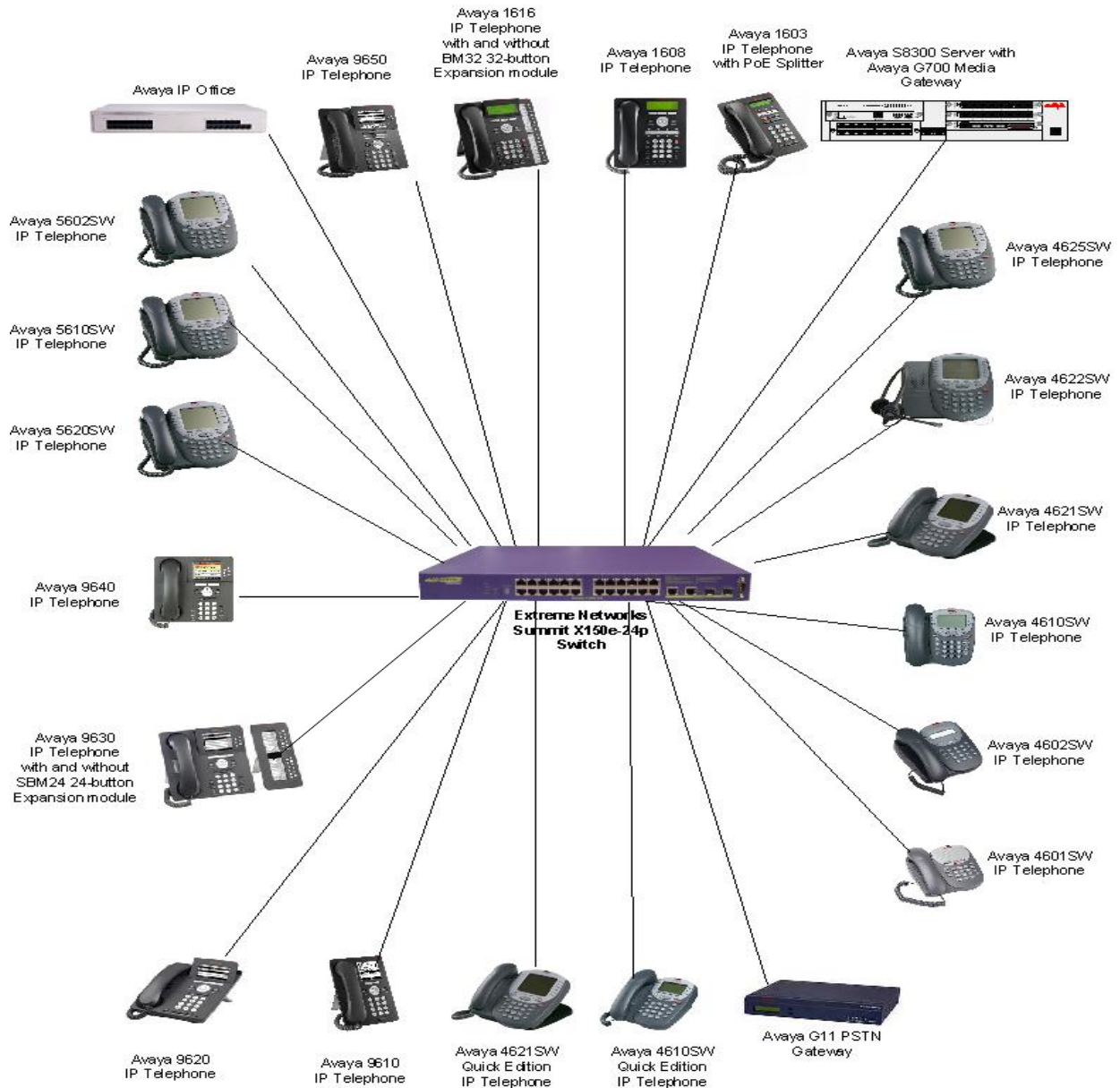
Figure 1: PoE Sample Network Configuration

2. Equipment and Software Validated

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

Equipment	Software/Firmware
Avaya IP Office IP406V2	4.0.7
Avaya S8300 Server with an Avaya G700 Media Gateway	Avaya Communication Manger 4.0
Avaya G11 PSTN Gateway	3.2.1
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 with and without SBM24 24-Button Expansion Module	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9640 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 4601SW IP Telephone	2.3 (H.323)
Avaya 4602SW IP Telephone	2.3 (H.323)
Avaya 4610SW IP Telephone	2.8 (H.323)
Avaya 4621SW IP Telephone	2.8 (H.323)
Avaya 4622SW IP Telephone	2.8 (H.323)
Avaya 4625SW IP Telephone	2.8 (H.323)
Avaya 5602SW Telephone	2.3 (H.323)
Avaya 5610SW Telephone	2.3 (H.323)
Avaya 5620SW Telephone	2.3 (H.323)
Avaya Quick Edition 4610SW IP Telephone	3.2.1 (SIP)
Avaya Quick Edition 4621SW IP Telephone	3.2.1 (SIP)
Avaya 1603 IP Telephone with PoE Splitter	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 with and without BM32 32-Button Expansion Module	Avaya one-X Value Edition 1.23 (H.323)
Extreme Networks Summit X150e-24p Switch	ExtremeXOS 12.0.2.18

3. Configure Avaya Communication Manager, Avaya IP Office, and Avaya IP Telephones

There is no specific configuration for Avaya Communication Manager, Avaya IP Office, and the Avaya IP Telephones to support the Extreme Networks Summit X150e-24p Switch. Consult the references in **Section 9** for additional information on configuring Avaya Communication Manager, Avaya IP Office, and the Avaya IP Telephones.

The Avaya 5600 Series IP Telephones configured in the sample network in **Figure 1** were administered as VoIP extensions in Avaya IP Office. For complete references on administering these stations, please refer to **Section 9 [8]** and **[9].** All other Avaya 1600, 4600 and 9600 Series IP Telephones configuration for Avaya Communication Manager, please consult references in **Section 9**.

Avaya Quick Edition IP Telephones and Avaya G11 PSTN Gateway are only tested to validate that the Extreme Networks Summit X150e-24p Switch is conforming to the IEEE 802.3af standard.

4. Configure the Extreme Networks Summit X150e-24p Switch

This section shows the necessary steps in configuring the Summit X150e-24p Switch as shown in **Figure 1**. Inline power is enabled by default on the Summit X150e-24p Switch.

Step	Description
1.	To perform the initial configuration on the Extreme Networks Summit X150e-24p Switch, setup a serial connection from the PC or laptop to the console port on the front of the switch. Setup a terminal session with the following parameters: - Baud rate - 9600 - Data bits - 8 - Parity - none - Stop bit - 1 - Flow control – XON / XOFF Connect to the Summit X150e-24p Switch and log in using appropriate credentials. `login: `***`admin`*** `password:`

Step	Description
2.	Validate the XOS version on the switch by entering the "show version" command at the prompt as shown below. The IP address assignment is optional. ``` X150e-24p # show version Switch : 800237-00-00 0724G-01604 Rev 0.0 BootROM: 1.0.3.1 IMG: 12.0.2.18 Image : ExtremeXOS version 12.0.2.18 v1202b18 by release-manager on Tue Oct 2 17:32:09 PDT 2007 BootROM : 1.0.3.1 X150e-24p # ```
3.	Validate PoE system information status by entering the "show inline-power status" command at the command prompt, which identified that 22 ports are being powered. ``` X150e-24p # show inline-power status Inline-Power Slot Statistics Firmware status : Operational Firmware revision : 501b1 Total ports powered : 22 Total ports awaiting power : 2 Total ports faulted : 0 Total ports disabled : 0 X150e-24p # ```

5. Interoperability Compliance Testing

The interoperability testing focused on verifying PoE interoperability between the Extreme Networks Summit X150e-24p Switch, Avaya IP Telephones and the Avaya one-X G11 PSTN Gateway.

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

- Successful boot operation.
- For Avaya 1600, 4600 and 9600 Series IP Telephones, successful registration with Avaya Communication Manager. For the Avaya 5600 Series IP Telephones, successful registration with Avaya IP Office.
- Booting the Avaya Quick Edition IP Telephones and Avaya G11 PSTN Gateway validated that the Extreme Networks Summit X150e-24p Switch conforms to the IEEE 802.3af standard..
- 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 Avaya Communication Manager or Avaya IP Office.

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 Summit X150e-24p Switch and verify that they successfully boot.
- Calls were made with background data to verify that power and data can be simultaneously carried on the PoE connections.

5.2. Test Results

All test cases completed successfully. The Extreme Summit X150e-24p Switch successfully provided inline power to the different Avaya IP telephones and Avaya G11 PSTN Gateway.

Table 1 and 2 below lists the IEEE 802.3af class and measured power of the Avaya IP Telephones and Avaya G11 PSTN Gateway when connected to the Extreme Summit X150e-24p Switch. The Measured Power listed as measured by the Extreme PoE 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	Volts	Measured Power (W) (Idle)	Current (mA)
Avaya 4601SW IP Telephone	2	50.2	3.1	63
Avaya 4602SW IP Telephone	2	50.2	3.2	64
Avaya 4610SW IP Telephone	2	50.2	3.3	64
Avaya 4621SW IP Telephone	2	50.2	5.0	101
Avaya 4622SW IP Telephone	2	50.2	4.9	98
Avaya 4625SW IP Telephone	3	50.2	7.6	152
Avaya 5602SW IP Telephone	1	50.2	3.2	64
Avaya 5610SW IP Telephone	2	50.2	3.3	65
Avaya 5620SW IP Telephone	2	50.2	3.8	75
Avaya 9610 IP Telephone	2	50.2	3.5	70
Avaya 9620 IP Telephone	2	50.2	4.5	90
Avaya 9630 IP Telephone	2	50.2	4.8	96
Avaya 9630 IP Telephone with SMB24 24-Button Expansion Module	2	50.2	5.3	106
Avaya 9640 IP Telephone	2	50.2	4.1	82
Avaya 9650 IP Telephone	2	50.2	4.7	95
Avaya 1603 IP Telephone with PoE Splitter	2	50.2	4.6	91
Avaya 1608 IP Telephone	2	50.2	4.4	87
Avaya 1616 IP Telephone	3	50.2	6.1	120
Avaya 1616 IP Telephone with BM32 Button Module	3	50.2	6.5	130
Avaya Quick Edition 4610SW IP Telephone	2	50.2	3.2	64
Avaya Quick Edition 4621SW IP Telephone	2	50.2	4.9	97
Avaya G11 PSTN Gateway	0	50.2	4.2	84

Table 1: Summit X150e-24p Switch Power Measurement

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8 of 12
X150e-PoE

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

Table 2: IEEE 802.3af Classes

6. Verification Steps

Inline PoE is supported on the Extreme Summit X150e-24p Switch. By default, PoE support is enabled on the system and on all ports.

- Use the "show inline-power config ports <portlist>" command to verify if in-line power is enabled for this device.

```
X150e-24p # show inline-power config port 19


Port   Config   Operator Limit   Priority   Label
19     Enabled     15400 mW       0
```

- Use the "show inline-power info ports <portlist>" command to display in-line power information is within specification as shown in **Table 2**.

```
X150e-24p # show inline-power info port 19


Port  State            Class     Volts   Curr    Power      Fault
                                          (mA)    (Watts)
19    delivering       class2    50.2    76      3.800      None
```

- Use the "show inline-power info detail ports <portlist>" command to display detail inline power information is within specification as shown in **Table 2**.

```
X150e-24p # show in info detail ports 19

Port 19

Configured Admin State: enabled
Inline Power State    : delivering
MIB Detect Status     : delivering
Label                 :
Operator Limit        : 15400 milliwatts
PD Class              : class2
Max Allowed Power     : 7.0 W
Measured Power        : 3.800 W
Line Voltage          : 50.2 Volts
Current               : 76 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/services or contact the Extreme Networks Worldwide TAC
at:

- Toll free: 800-998-2408
- Phone: 408-579-2826
- E-mail: support@extremenetworks.com

8. Conclusion

These Application Notes describe the steps for configuring the Extreme Networks Summit
X150e-24p Switch to provide inline Power over Ethernet to Avaya 1600 Series IP Telephones,
Avaya 4600 Series IP Telephones, Avaya 9600 Series IP Telephones, Avaya 5600 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 3.1, February 2007
[2] *Avaya Communication Manager Advanced Administration Quick Reference*, Doc # 03-300364, Issue 3, February 2007
[3] *Administration for Network Connectivity for Avaya Communication Manager,* Doc # 555-233-504, Issue 12, February 2007
[4] *Avaya one-X Deskphone Edition for 9600 Series IP Telephones Administrator Guide, Doc # 16-300698*
[5] *Avaya one-X Deskphone Value Edition 1600 Series IP Telephones Installation and Maintenance Guide Release 1, Doc # 16-601438*
[6] *4600 Series IP Telephone Release 2.8 LAN Administrator Guide, Doc # 555-233-507*
[7] *Avaya IP Telephony Implementation Guide*, May 1, 2006
[8] *Avaya IP Office 4.0 Product Description,* Doc # 15-601041, Issue 15e
[9] *Avaya IP Office Installation Manual,* Doc # 15-601042, Issue 14a

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

[10]   *ExtremeXOS Concepts Guide, Software Version 12.0,* Part number 100262-00 Rev. 02, July 2007
[11]   *ExtremeXOS Command Reference Guide, Software Version 12.0,* Part number 100261-00 Rev. 02, July 2007
[12]   *Summit X150 Series Switches Installation Note,* Part number: 120404-00 Rev. 01