



Avaya Solution & Interoperability Test Lab

Application Notes for the Juniper Networks EX 3200 Ethernet switch 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 Juniper Networks EX 3200 Ethernet switch to provide inline Power over Ethernet (PoE) to Avaya 1600/4600/9600 Series IP Telephones registered to the Avaya Communication Manager and Avaya G11 PSTN Gateway. During compliance testing, The Avaya endpoints successfully obtained power and transferred data over standard Ethernet cables from the Juniper Networks EX 3200 switch.

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 telephones and wireless Access Point. In the compliance-tested configuration described in these Application Notes, the Juniper Networks EX 3200 is configured to supply inline PoE to Avaya PDs. No Juniper Network specific configuration is required on Avaya Communication Manager, Avaya IP Office and Avaya G11 PSTN Gateway to support this solution.

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 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.

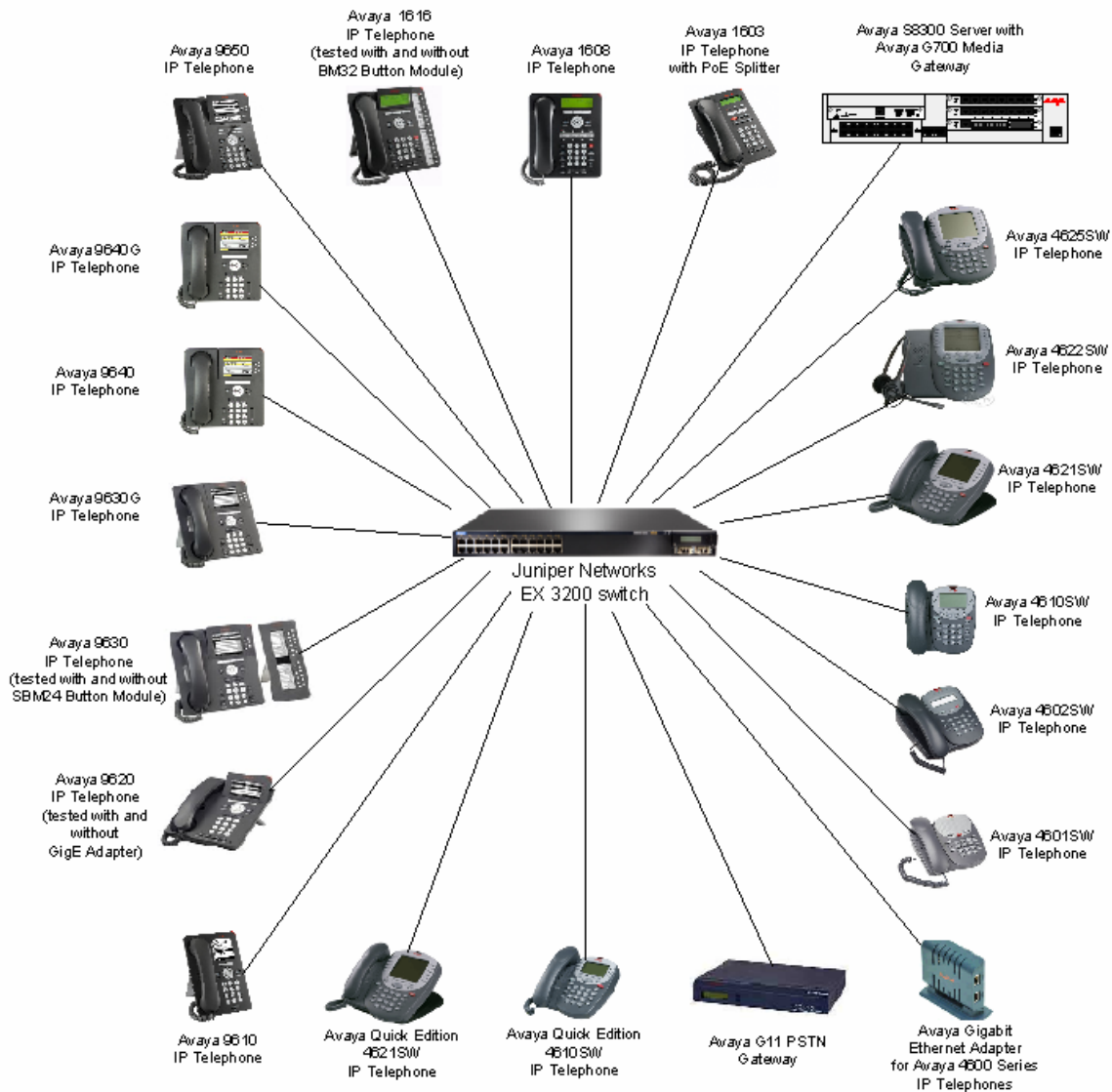


Figure 1: PoE sample network configuration

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
Juniper Networks EX 3200 switch	JUNOS 9.1R1.8

4. Configure the Juniper Networks EX 3200 switch

This section shows the necessary steps in configuring the EX 3200 as shown in the **Figure 1**.

In-line power is enabled by default on the EX 3200-24P switch. No configuration is needed.

5. Interoperability Compliance Testing

The interoperability testing focused on verifying PoE interoperability between the Juniper Networks EX 3200 Switch, 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.
- For Avaya IP telephones, completion of a test call, and raising speakerphone volume to maximum value.
- Connecting a mix of Avaya IP Telephones Point 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 EX 3200 and verify that they successfully boot.
- Verify completion of a test call.
- Power-cycle the EX 3200 switch and verify successful boot operation and registration of the devices

5.2. Test Results

All Power over Ethernet test cases completed successfully. The EX 3200 switch 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 EX 3200. The power listed as measured by the Juniper 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	Measured Power (W) (Idle)
Avaya 1603 IP Telephone with PoE Splitter	2	3.6
Avaya 1608 IP Telephone	2	4.3
Avaya 1616 IP Telephone	3	5.9
Avaya 4601SW IP Telephone	2	3.1
Avaya 4602SW IP Telephone	2	3.2
Avaya 4610SW IP Telephone	2	3.3
Avaya 4621SW IP Telephone	2	4.8
Avaya 4621SW IP Telephone with Gig Adapter	0	10.6
Avaya 4622SW IP Telephone	2	4.7
Avaya 4625SW IP Telephone	3	7.6
Avaya 9610 IP Telephone	2	4.0
Avaya 9620 IP Telephone	2	4.6
Avaya 9620 IP Telephone with GigE Adapter	3	8.2
Avaya 9630 IP Telephone	2	4.1
Avaya 9630G IP Telephone	3	3.9
Avaya 9630 IP Telephone with SMB 24 Button	2	5.2
Avaya 9640 IP Telephone	2	3.9
Avaya 9640G IP Telephone	2	3.7
Avaya 9650 IP Telephone	2	4.6
Avaya Quick Edition 4610SW IP Telephone	2	3.2
Avaya Quick Edition 4621SW IP Telephone	2	4.8
Avaya G11 PSTN gateway	0	4.0

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 Juniper Networks EX 3200 Switch. By default, PoE support is enabled on the system and on all ports.

- Use the “show poe controller” command to verify available power available on the switch.

```
interop> show poe controller
```

Controller index	Maximum power	Power consumption	Guard band	Management
0	410 W	4W	0W	Static

- Use the “show poe interface” command to display the poe status of all the ports.

```
interop> show poe interface
```

Interface	Admin status	Oper status	Max power	Priority	Power consumption	Class
ge-0/0/0	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/1	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/2	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/3	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/4	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/5	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/6	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/7	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/8	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/9	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/10	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/11	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/12	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/13	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/14	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/15	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/16	Enabled	OFF	15.4W	Low	0.0W	0
ge-0/0/17	Enabled	ON	15.4W	Low	4.2W	2
ge-0/0/18	Enabled	OFF	15.4W	Low	0.0W	0

- Use the “show poe interface <interface #>” command to display the PoE status of the individual port.

```
interop> show poe interface ge-0/0/19
```

PoE interface status:	
PoE interface	: ge-0/0/19
Administrative status	: Enabled
Operational status	: ON
Power limit on the interface	: 15.4W
Priority	: Low
Power consumed	: 3.2W
Class of power device	: 2

7. Support

For technical support on Juniper Networks products, consult the support pages at <http://www.juniper.net> or contact the Juniper Networks TAC at:

- Toll free: 800-638-8296

8. Conclusion

These Application Notes describe the steps for configuring the Juniper Networks EX 3200 to provide inline Power over Ethernet (PoE) to the Avaya PDs, Avaya 9600 Series IP Telephones, Avaya 4600 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 Juniper Networks products may be found at <http://www.juniper.net>

- [5] *Complete Software Guide for JUNOS for EX-series Software*, Release 9.1, Revision R1.

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