



Avaya Solution & Interoperability Test Lab

Application Notes for the Foundry Networks FastIron Edge Switch Supporting Power over Ethernet with Avaya Communication Manager, Avaya G11 PSTN Gateway and Avaya IP Telephones – Issue 1.0

Abstract

These Application Notes describe the procedures for configuring the Foundry Networks FastIron Edge Switch to provide inline Power over Ethernet (PoE) to Avaya 1600/4600/9600 Series IP Telephones registered to Avaya Communication Manager and the Avaya G11 PSTN Gateway.

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.

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. In the compliance-tested configuration described in these Application Notes, the Foundry Networks FastIron Edge Switch is configured to supply inline PoE to Avaya PDs.

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

- Avaya 9600 Series IP Telephones (including the Avaya 9630 IP Telephone with the SBM24 Button Module)
- Avaya 4600 Series IP Telephones
- Avaya 1600 Series IP Telephones
- Avaya Quick Edition IP Telephones and Avaya G11 PSTN Gateway.

See **Table 1** for a detailed list of specific models tested.

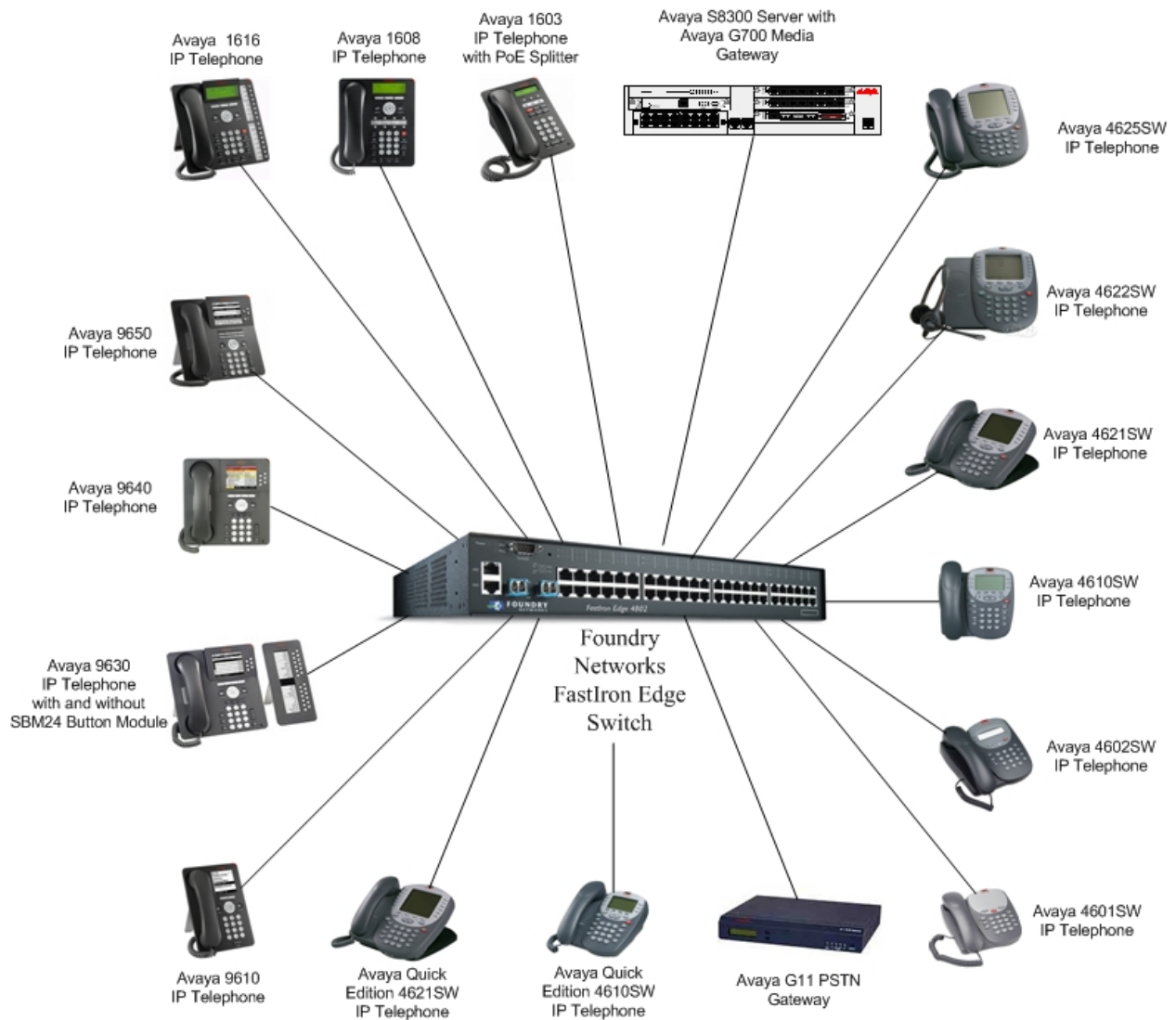


Figure 1: Foundry Networks FastIron Edge Switch with Avaya Communication Manager, Avaya IP Telephones and Avaya G11 PSTN Gateway

2. Equipment and Software Validated

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

Equipment	Software/Firmware
Avaya S8300 Server with Avaya G700 Media Gateway	Avaya Communication Manger 4.0 (R014x.00.0.730.5)
Avaya 9650 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 9630 IP Telephone with and without SBM24 Button Module	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9620 IP Telephone	Avaya one-X Deskphone Edition 1.5 (H.323)
Avaya 9610 IP Telephone	Avaya one-X Deskphone Edition 1.5 (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 1603 IP Telephone with PoE Splitter	Avaya one-X Value Edition 1.23 (H.323)
Avaya 4625SW IP Telephone	2.8 (H.323)
Avaya 4622SW IP Telephone	2.8 (H.323)
Avaya 4621SW IP Telephone	2.8 (H.323)
Avaya 4610SW IP Telephone	2.8 (H.323)
Avaya 4602SW IP Telephone	2.8 (H.323)
Avaya 4601SW IP Telephone	2.3 (H.323)
Avaya G11 PSTN Gateway	3.2.1
Avaya Quick Edition 4610SW IP Telephone	3.2.1 (SIP)
Avaya Quick Edition 4621SW IP Telephone	3.2.1 (SIP)
Foundry Networks FastIron Edge Switch	4.0

Table 1: Equipment and Software Tested

3. Configure Avaya Communication Manager and Avaya G11 PSTN Gateway

For the compliance-tested configuration, no additional configuration specific to the Foundry Edge Switch is required on Avaya Communication Manager or Avaya G11 PSTN Gateway. Consult the Avaya configuration manuals in [1] & [7] for additional configuration details.

4. Configure the Foundry Networks FastIron Edge Switch

The configuration covered here is specific to PoE and does not include the configuration of other features available in the Foundry Edge Switch. Consult the Foundry Edge Switch configuration manual [8] for additional configuration details.

Inline PoE is supported on the Foundry Edge Switch. By default, PoE is disabled on all ports and must be enabled.

To enable a Foundry Edge Switch port to provide inline power, configure the port using following CLI command. This command should be repeated for all ports to which PDs will be connected.

For this example port (interface) 1 was used.

```
FES4802 Router# config t  
FES4802 Router(config)# interface e 1  
FES4802 Router(config-if-e100-1)# inline power
```

5. Interoperability Compliance Testing

The interoperability testing focused on verifying PoE interoperability between the Foundry Edge Switch, Avaya IP telephones and the Avaya G11 PSTN Gateway.

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

- Successful boot operation.
- For Avaya IP telephones, successful registration with Avaya Communication Manager.
- For Avaya IP telephones, 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 of the PDs and registration of the telephones.

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 Foundry Edge Switch and verify that the PDs successfully booted.
- Verify completion of a test call.
- Power cycle the Foundry Edge Switch and verifying successful boot operation of the PDs and registration of the telephones.

5.2. Test Results

All Power over Ethernet test cases completed successfully. The Foundry FastIron Edge Switch successfully provided inline power to all of the Avaya IP telephones and to the Avaya G11 PSTN Gateway. **Table 2** lists the IEEE 802.3af class and measured power of the Avaya IP telephones and Avaya G11 PSTN Gateway when connected to the Foundry FastIron Edge Switch. The power listed as measured by the Foundry FastIron Edge Switch is for PDs under idle conditions.

Note: 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	Detection
Avaya 1603 IP Telephone with PoE Splitter	2	Good
Avaya 1608 IP Telephone	2	Good
Avaya 1616 IP Telephone	3	Good
Avaya 4601SW IP Telephone	2	Good
Avaya 4602SW IP Telephone	2	Good
Avaya 4610SW IP Telephone	2	Good
Avaya 4621SW IP Telephone	2	Good
Avaya 4622SW IP Telephone	2	Good
Avaya 4625SW IP Telephone	3	Good
Avaya 9610 IP Telephone	2	Good
Avaya 9620 IP Telephone	2	Good
Avaya 9630 IP Telephone	2	Good
Avaya 9630 IP Telephone with SBM24 Button Module	2	Good
Avaya 9640 IP Telephone	2	Good
Avaya 9650 IP Telephone	2	Good
Avaya Quick Edition 4610SW IP Telephone	2	Good
Avaya Quick Edition 4621SW IP Telephone	2	Good
Avaya G11 PSTN Gateway	0	Good

Table 2: IEEE 802.3af Class and Detection

Table 3 summarizes the power at the PSE for the IEEE 802.3af classes.

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

Table 3: IEEE 802.3af Classes

6. Verification Steps

Inline PoE is supported on the Foundry Edge Switch. By default, PoE support is disabled on the system and on all ports.

The following steps may be used to verify the configuration for Power over Ethernet:

- To verify the inline power and total power consumption on the Foundry FastIron Edge Switch, enter the command **show inline power**. Verify that **Power Enable** is **ON**, **Power** is **Good** and observe the **Class** that is obtained. A detailed explanation of each field is in Appendix A.

FES4802 Router# show inline power				
Power Supply : total capacity is 480000 of which 206200 is currently available power has been successfully allocated 20 times and rejected 0 times				
Port	Detection	Class	Power Enable	Power

01	802.3AF-PD	Class2	ON	Good
02	Unknown	Unknown	OFF	No
03	Unknown	Unknown	OFF	No

- To verify that Avaya 1600/4600/9600 Series IP Telephones have successfully registered with Avaya Communication Manager, enter **list registered-ip-stations** at the SAT on Avaya Communication Manager. For more information on how to provision Avaya IP telephones please refer to [1].

The screen below lists a subset of the Avaya IP telephones tested in this configuration.

```

Command: list registered-ip-stations

list registered-ip-stations

REGISTERED IP STATIONS

Station Ext/  Set      Product  Prod  Station      Net  Gatekeeper  TCP
 Orig Port   Type     ID        Rel   IP Address   Rgn  IP Address   Skt
50000         9620    IP_Phone 1.500 192.168.200.116 1    10.1.1.1    y
50001         9620    IP_Phone 2.800 192.168.200.115 1    10.1.1.1    y
50004         9630    IP_Phone 1.500 10.33.1.105   1    10.1.1.1    n
51003         4620    IP_Phone 1.500 10.33.1.104   1    10.1.1.1    n

Command successfully completed
Command:
ESC-x=Cancel Esc-e=Submit Esc-p=Prev Pg Esc-n=Next Pg Esc-h=Help Esc-r=Refresh

```

7. Troubleshooting

If the PD does not power up, check the inline power configuration on the Foundry FastIron Edge Switch. Enter **show inline power** (see Section 6).

1. If “Power Enable” is “ON” and “Power” is “Good”, check if there is a limit or priority setting on the port.
2. If “Power Enable” is “ON” and “Power” is “No”, there may be a priority setting or insufficient available power to power the PD.

The Foundry Networks switch provides up to 15.4W per port. For more information refer to [8].

8. Support

For technical support on Foundry Networks products, consult the support pages at <http://www.foundrynet.com/>

9. Conclusion

These Application Notes describe the steps for configuring the Foundry Networks FastIron Edge Switch to provide inline Power over Ethernet to Avaya IP telephones and the Avaya G11 PSTN Gateway. It was verified that PoE was delivered successfully to all Avaya PD's tested.

10. Additional References

The following Avaya product documentation can be found at <http://support.avaya.com>.

- [1] *Administrator Guide for Avaya Communication Manager*, Doc # 03-300509, February 2007
- [2] *Administration for Network Connectivity for Avaya Communication Manager*, Doc # 555-233-504, Issue 12, February 2007
- [3] *Avaya one-X Deskphone Edition for 9600 Series IP Telephones Administrator Guide*, Doc # 16-300698, May 2007
- [4] *Avaya one-X Deskphone Value Edition 1600 Series IP Telephones Installation and Maintenance Guide Release 1*, Doc # 16-601438, June 2007
- [5] *4600 Series IP Telephone Release 2.8 LAN Administrator Guide*, Doc # 555-233-507, February, 2007
- [6] *Avaya one-X Quick Edition Release 3.2.0 Telephone System Administration Guide*, Doc # 16-601412, August 2007
- [7] *Avaya one-X™ Quick Edition Safety and Quick Installation Instructions for: G11 Global Analog Gateway 16-601414 Issue 2*, May 2007

The following Foundry Networks product documentation can be found at:

<http://www.foundrynet.com/>.

- [8] *Foundry FastIron Configuration Guide- for the FastIron Edge Switch X Series*, December 2007

Appendix A: Description of Fields for “show power inline”

Label	Description
Detection	<p>The type of powered device connected to the port. This value can be one of the following:</p> <ul style="list-style-type: none"> • Unknown – Inline power has not been configured on this port. • 802.3AF-PD – The device connected to this port is 802.3af-compliant. • LEGACY – The powered device connected to this port is a legacy product (not 802.3af-compliant). • Open – Power over Ethernet is configured on this port; however, there is no device connected to this port. • NO-PD – Power over Ethernet is configured on this port, and the device connected to this port is a non-powered device, or there is no device connected to this port.
Class	<p>Determines the maximum amount of power a powered device receives. This value can be one of the following:</p> <ul style="list-style-type: none"> • Class0 – This is the default. Requires 15.4 watts maximum. • Class1 – Requires 4 watts maximum. • Class2 – Requires 7 watts maximum. • Class3 – Requires 15.4 watts maximum. • Class4 – Not supported at this time. • Unknown – The device attached to the port cannot advertise its class.
Power Enable	<p>Shows whether or not Power over Ethernet is enabled on the port. This value can be one of the following:</p> <ul style="list-style-type: none"> • ON – This port has been configured to provide inline power and power is enabled. • OFF – This port has been configured to provide inline power and power is not enabled.
Power	<p>Shows the status of the power provided to the powered device. This value can be one of the following:</p> <ul style="list-style-type: none"> • NO – The port is not providing inline power. • Good – The port is providing inline power and is functioning normally.

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