



**Avaya Solution & Interoperability Test Lab**

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## **Configuring the Nortel 5520-24T-PWR Switch Supporting Power over Ethernet with Avaya Communication Manager and Avaya IP Telephones – Issue 1.0**

### **Abstract**

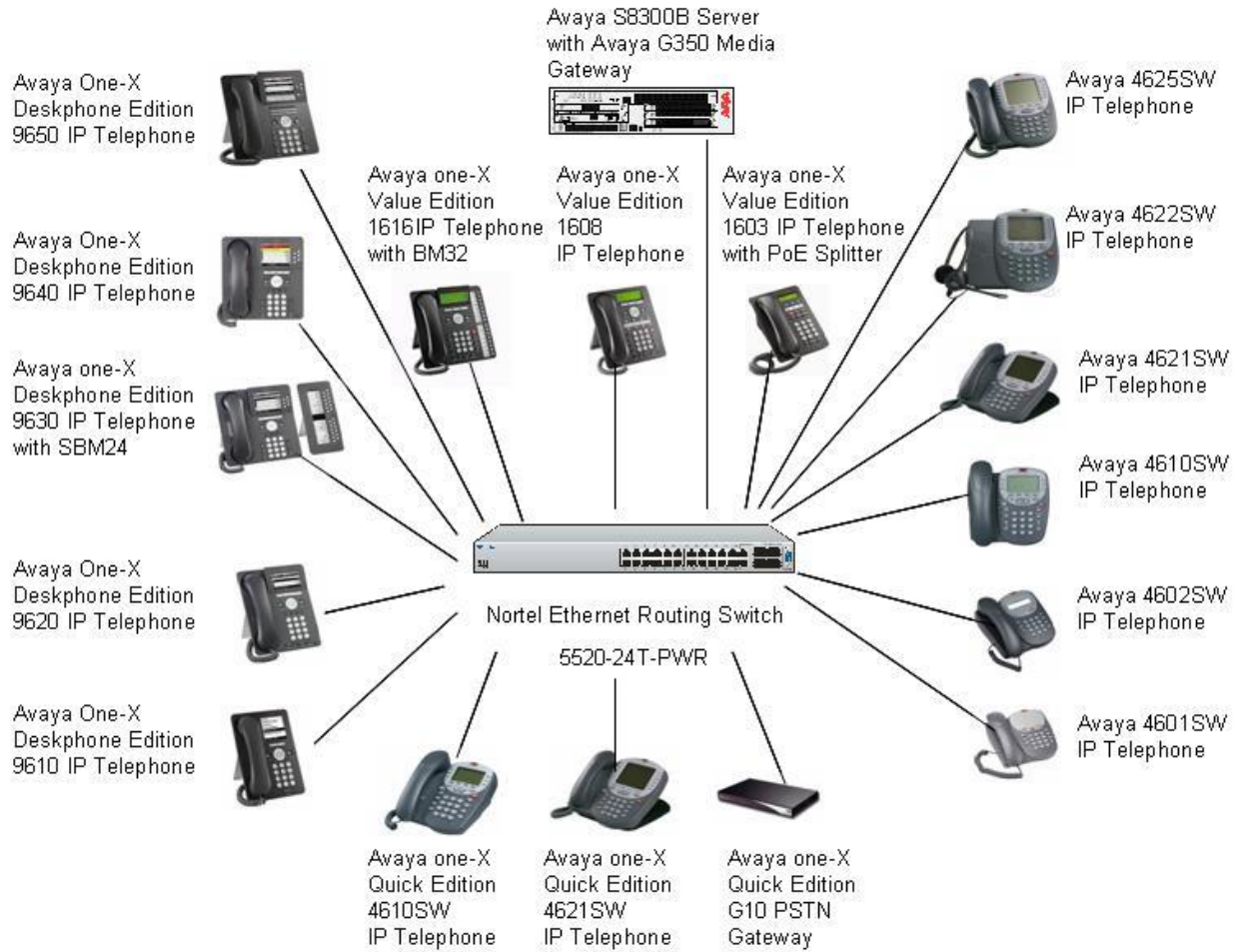
These Application Notes describe the configuration of the Nortel 5520-24T-PWR switch and Avaya 1600/4600/9600 Series IP Telephones registered to Avaya Communication Manager and Avaya one-X Quick Edition IP Telephones and G10 PSTN Gateway.

# 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. The Nortel 5520-24T-PWR switch provides 24 ports with PoE.

The Avaya product configurations addressed by these Application Notes are shown in **Figure 1**. The following Avaya powered devices were covered:

- Avaya one-X DeskPhone Edition IP Telephones : 9610, 9620, 9630 (with and without SBM24), 9640, 9650
- 46xx Series IP Telephones: 4601, 4602, 4610, 4621, 4622, 4625
- Avaya one-X Deskphone Value Edition IP Telephones: 1603 with PoE Splitter, 1608, 1616 (with and without BM32 Button Module)
- Avaya one-X Quick Edition: 4610, 4621, and G10 PSTN Gateway



**Figure 1: Network Configuration**

## 2. Equipment and Software Validated

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

Equipment	Version
Avaya G350 Media Gateway with Avaya S8300B Media Server	Avaya Communication Manger 4.0 (R014x.00.0.730.5)
Avaya one-X Deskphone Edition 9610 IP Telephone	1.5
Avaya one-X Deskphone Edition 9620 IP Telephone	1.5
Avaya one-X Deskphone Edition 9630 IP Telephone with SBM24	1.5
Avaya one-X Deskphone Edition 9640 IP Telephone Media Server	1.5
Avaya one-X Deskphone Edition 9650 IP Telephone	1.5
Avaya 4601SW IP Telephone	2.3
Avaya 4602SW IP Telephone	2.3
Avaya 4610SW IP Telephone	2.8
Avaya 4621SW IP Telephone	2.8
Avaya 4622SW IP Telephone	2.8
Avaya 4625SW IP Telephone	2.8
Avaya one-X Value Edition 1603 IP Telephone with PoE Splitter	1.23
Avaya one-X Value Edition 1608 IP Telephone	1.23
Avaya one-X Value Edition 1616 IP Telephone with BM32	1.23
Avaya one-X Quick Edition 4610 IP Telephone	7.0.7
Avaya one-X Quick Edition 4621 IP Telephone	7.0.7
Avaya one-X Quick Edition G10 PSTN Gateway	7.0.7
Nortel Ethernet Routing Switch 5520-24T-PWR	FW 5.0.0.3 SW v5.0.4.010

### 3. Configuration of the Avaya endpoints

There is no configuration requirement on the Avaya endpoints to use PoE. For details on configuring Avaya Communication Manager Servers, Gateways, or Endpoints, consult the Administrator's guide [1].

### 4. Configuration of the Nortel switch

The configuration covered here is specific to PoE and does not include configuration of other features available in the Nortel switch. Consult the Nortel configuration manual [2] for additional configuration details.

The default configuration on the Nortel switch is sufficient to enable the Avaya IP Telephones to receive Power over Ethernet, as long as PoE is enabled on the port.

A serial port on a PC was used to connect to the serial port of the Nortel switch. A standard terminal emulator was running on the PC. When connected to the switch, the main screen appears and displays the switch model and software versions. The user must press "Ctrl-Y" to enter the menu configuration screen shown below.

```
Ethernet Routing Switch 5520-24T-PWR Main Menu

      IP Configuration/Setup...
      SNMP Configuration...
      System Characteristics...
      Switch Configuration...
      Console/Comm Port Configuration...
      Display Hardware Units...
      Spanning Tree Configuration...
      TELNET/SNMP/Web Access Configuration...
      Software Download...
      Configuration File...
      Display System Log...
      Reset...
      Reset to Default Settings...
      Shutdown Command...
      Command Line Interface...
      Logout...
```

Use the arrow keys to move down to "Command Line Interface..." and press the "Enter" key to access the Command Line Interface (CLI).

PoE can be enabled/disabled on a per port basis. Type "enable" followed by the "Enter" key. Type "config t" followed by the "Enter" key. Type "interface fastethernet all" followed by the "Enter" key. The "poe poe-shutdown port x" command disables PoE on a port. The "no poe-shutdown port x" command enables PoE on a port. The screen below shows sample commands to disable/enable PoE on port 1.

```
5520-24T-PWR(config-if)#poe poe-shutdown port 1
5520-24T-PWR(config-if)#no poe-shutdown port 1
```

## 5. Observations

**Table 1** shows the detected class and power allocated from the Nortel 5520-24T-PWR switch. IP Telephones were connected directly to the switch. Cables of different lengths were used. Cable length and impedance affects power usage, so the measurements listed here may vary based on the cable used. The power measurements reported here are only for reference purposes.

Avaya Powered Device	802.3af Class	Measured Power (W) (Idle)
4601SW	2	2.9
4602SW	2	3.1
4610SW	2	3.7
4621SW	2	4.8
4622SW	2	4.8
4625SW	3	7.9
9610	2	4.2
9620	2	4.6
9630	2	4.8
9630 with SBM24	2	5.3
9640	2	3.9
9650	2	4.8
1603 with PoE Splitter	2*	4.0
1608	2	4.0
1616	3	5.6
1616 with BM32	3	6.0
Quick Edition 4610SW	2	3.2
Quick Edition 4621SW	2	4.9
Quick Edition G10 PSTN gateway	0	4.3

**Table 1: Power Measurements**

\* The Avaya one-X Value Edition 1603 IP Telephone with PoE Splitter is a Class 2 Powered Device. It was observed that the Nortel 5520-24T-PWR was not able to properly detect its class. The switch reported different classes for the device, but showed power measurements in the expected range, and was able to properly provide power to the device. The class for all other devices was properly detected. It should be noted that the Avaya one-X Value Edition 1603 IP Telephone with PoE Splitter has been tested with other PoE switches and its class was properly detected.

## 6. Verification Steps

The following commands can be used with the Nortel 5520-24T-PWR to display the device class detected and power provided.

At the CLI main entry point, type “enable” followed by the “Enter” key. The “show poe-power-measurement” command displays power measurements for the ports using PoE. The window below shows a sample output.

```
5520-24T-PWR#show poe-power-measurement
```

Port	Volt(V)	Current(mA)	Power(Watt)	
1	48.2	99	4.771	9630
2	0.0	0	0.000	
3	48.3	82	3.960	9640
4	0.0	0	0.000	
5	48.3	99	4.781	4621

The “show poe-port” command displays the power class for the ports using PoE. The window below shows a sample output.

```
5520-24T-PWR#show poe-port
```

Port	Admin Status	Current Status	Classification	Limit (Watts)	Priority
1	Enable	Delivering Power	2	16	Low
2	Enable	Detecting	0	16	Low
3	Enable	Delivering Power	2	16	Low
4	Enable	Detecting	0	16	Low
5	Enable	Delivering Power	2	16	Low

When the IP Telephones are properly powered, the IP Telephones should register and receive dial tone when they are off-hook. If the IP Telephones are not receiving power, check the cable used and check the port configuration to ensure PoE was enabled on the port.

## 7. Conclusion

These Application Notes described configuration of the Nortel 5520-24T-PWR switch to power Avaya IP Telephones, and the Avaya one-X Quick Edition G10 PSTN Gateway. The Nortel 5520-24T-PWR switch was able to power all devices tested.

## 8. Additional References

The Avaya product documentation is available at <http://support.avaya.com>.

The Nortel documentation is available from the Nortel website.

[1] Administrator Guide for Avaya Communication Manager, Issue 3.1, February 2007, Document Number: 03-300509.

[2] Nortel Ethernet Routing Switch 5500 Series, Overview – System Configuration, Version 02.03, July 10 2006.

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