



Avaya Solution & Interoperability Test Lab

Application Notes for 3COM OfficeConnect Managed Switch 9 Power over Ethernet (PoE) Switch with Avaya IP Telephones and Avaya Wireless Access Points - Issue 1.0

Abstract

These Application Notes describe the configuration of the 3COM OfficeConnect Managed Switch 9 to provide inline Power over Ethernet (PoE) to Avaya IP Telephones and Avaya Wireless Access Points. Avaya IP Telephones and Wireless Access Points successfully obtained power and transferred data over standard Ethernet cables from a 3COM OfficeConnect Managed Switch 9 layer 2 switch. Testing was conducted 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. In the configuration described in these Application Notes, a 3COM OfficeConnect Managed Switch 9 is configured to supply inline PoE to Avaya IP Telephones and Avaya Wireless Access Points.

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

- 4601 IP Telephone
- 4602 IP Telephone and 4602SW IP Telephones
- 4610SW IP Telephone
- 4620 IP Telephone and 4620SW IP Telephone
- 4621SW IP Telephone
- 4622SW IP Telephone
- 4625SW IP Telephone
- 4630SW IP Telephone
- 5601 IP Telephone
- 5602SW IP Telephone
- 5610SW IP Telephone
- 5620SW IP Telephone
- Avaya Gen-2 4606, 4612, and 4624 IP Telephones
- Avaya Wireless AP-4/5/6 Access Point
- Avaya Wireless AP-8 802.11a/b/g Access Point

The Avaya 4612 and 4624 IP Telephones can be identified as Gen-2 by inspecting the model number. “2A” in the model number indicates Gen-2. The model number can be found by:

- Inspecting the label attached to the bottom of the Telephone.

OR

- Pressing **Mute, V, I, E, W, #** on the keypad and then pressing * until the model number appears. Press # to exit.

An example of a model number is 4612D02A-003 (Gen-2).

The powering tests included verification of the following operations after the product was connected to the switch:

- Successful boot operation.
- For Avaya IP Telephones, successful registration with Avaya Communication Manager or Avaya IP Office (for the Avaya 5600-Series IP Telephones), completion of a test call, and raising speakerphone volume to maximum level.

- For the Wireless LAN Access Points, successful PC File Transfer.
- Connecting a mix of up to four Avaya IP Telephones and Access Points to the switch, power cycling the switch and verifying successful boot operation and registration of the devices.

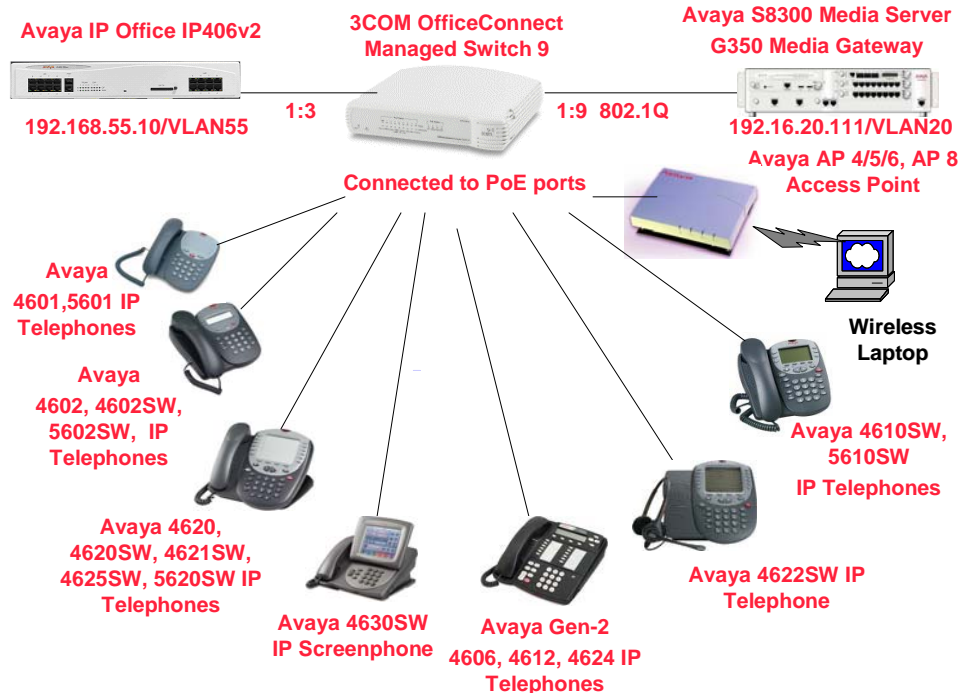


Figure 1: PoE Interoperability between 3COM OfficeConnect Managed Switch 9 and Avaya IP Telephones and Avaya Wireless Access Points

2. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration provided. The IP Telephones used the H.323 firmware versions.

| Equipment | Software/Firmware |
|--|-------------------|
| Avaya S8300 Media Server in a G350 Media Gateway | 3.0.1 (load 346) |
| Avaya IP Office IP406v2 | 3.1(29) |
| Avaya 4601 IP Telephone | 1.8.0 |
| Avaya 4602 IP Telephone | 1.8.2 |
| Avaya 4602SW IP Telephone | 1.8.2 |
| Avaya 4610SW IP Telephone | 2.1.3 |
| Avaya 4620 IP Telephone | 2.1.3 |
| Avaya 4620SW IP Telephone | 2.1.3 |
| Avaya 4621SW IP Telephone | 2.2 |
| Avaya 4622SW IP Telephone (Avaya Communication Manager only) | 2.2 |
| Avaya 4625SW IP Telephone (Avaya Communication Manager only) | 2.5 |

| Equipment | Software/Firmware |
|--|----------------------------------|
| Manager only) | |
| Avaya 4630SW IP Telephone (Avaya Communication Manager only) | 2.0.2 |
| Avaya 5601 IP Telephone (IP Office only) | 1.810 |
| Avaya 5602SW IP Telephone (IP Office only) | 1.806 |
| Avaya 5610SW IP Telephone (IP Office only) | 2.1.3 |
| Avaya 5620SW IP Telephone (IP Office only) | 2.1.3 |
| Avaya Gen-2 4606 IP Telephone | 1.8.2 |
| Avaya Gen-2 4612 IP Telephone | 1.8.2 |
| Avaya Gen-2 4624 IP Telephone | 1.8.2 |
| Avaya AP-4/5/6 | 3.0.4 |
| Avaya AP-8 Wireless Access Point | 3.1.0 |
| 3COM OfficeConnect Managed Switch 9 | Software: 1.01 Hardware: R01B |

3. Configure Inline Power over Ethernet on the OfficeConnect Managed Switch 9

This section describes the switch VLAN configuration. Separate Application Notes will describe a configuration of Rapid Spanning Tree Protocol and Quality of Service in a more complex layer 2 network.

Inline Power over Ethernet (PoE) is supported on the OfficeConnect Managed Switch 9 (OfficeConnect). PoE support is available on ports 1, 2, 5 and 6 and enabled by default. The switch supports a maximum of 15.4 Watts, which limits the number of powered endpoints, depending on type. For example, no more than two Avaya 4620SW IP telephones can be supported simultaneously. There was no PoE specific configuration done for this test.

Optionally and not shown here, the switch supports the capability to “guarantee” an administered amount of power to a port. This could be used to ensure that IP Telephone operation would not be disrupted by an accidental connection of a device that drew more than the expected amount of power. For this configuration, the total power draw was kept within the limits of the switch.

3.1. Getting Started with a New or Initialized System

1. Connect to the OfficeConnect with the appropriate serial cable. Run a terminal emulator, such as Hyperterminal with settings of 19.2 Kb/s and log in with an appropriate login and password.

Login: admin

Password:

Menu options: -----3Com OfficeConnect Managed Switch 9-----

bridge - Administer bridge-wide parameters
feature - Administer system features
gettingStarted - Basic device configuration
logout - Logout of the Command Line Interface
physicalInterface - Administer physical interfaces
protocol - Administer protocols
security - Administer security
system - Administer system-level functions
trafficManagement - Administer traffic management

Type ? for help.

2. Enter **gettingStarted**.
3. Enter the appropriate entries to set up an IP address to manage the system. For this configuration, 192.16.20.247 was the IP address on default VLAN 1.

IMPORTANT NOTES

Changes made will only be applied at the end of this dialogue.

You may quit at any point by entering <Esc>.

Hitting return without entering a new value when prompted will select the value displayed within the brackets '['].

IP ADDRESS DETAILS

Select an IP address assignment method [current method shown].

manual - manually enter IP address

auto - automatically allocate IP address using DHCP

none - IP address not required

Enter configuration method (auto,manual,none)[none]: **manual**

Enter IP address [192.16.20.247]: **192.16.20.247**

Enter Subnet Mask [255.255.255.0]: **255.255.255.0**

Enter Default Gateway [192.16.20.112]: **192.16.20.112**

Select management VLAN ID (1)[1]:

SYSTEM DETAILS

Enter system name : bill's switch
Enter system location : here in the lab
Enter system contact : myself

PASSWORD

It is recommended that you change all user passwords from default.
Do you want to change your passwords (yes,no)[yes]:no

ADVANCED CONFIGURATION

Advanced configuration allows you to configure SNMP Community Strings and SNMP Trap information.

Do you wish to set up the advanced configuration (yes,no)[no]: no

SUMMARY

The parameters you have just entered are ready to be applied.

IP address assignment method: Manual
IP address: 192.16.20.247
Subnet Mask: 255.255.255.0
Default Gateway: 192.16.20.112
Management VLAN ID: 1
System Name: bill's switch
System location: here in the lab
System contact: myself

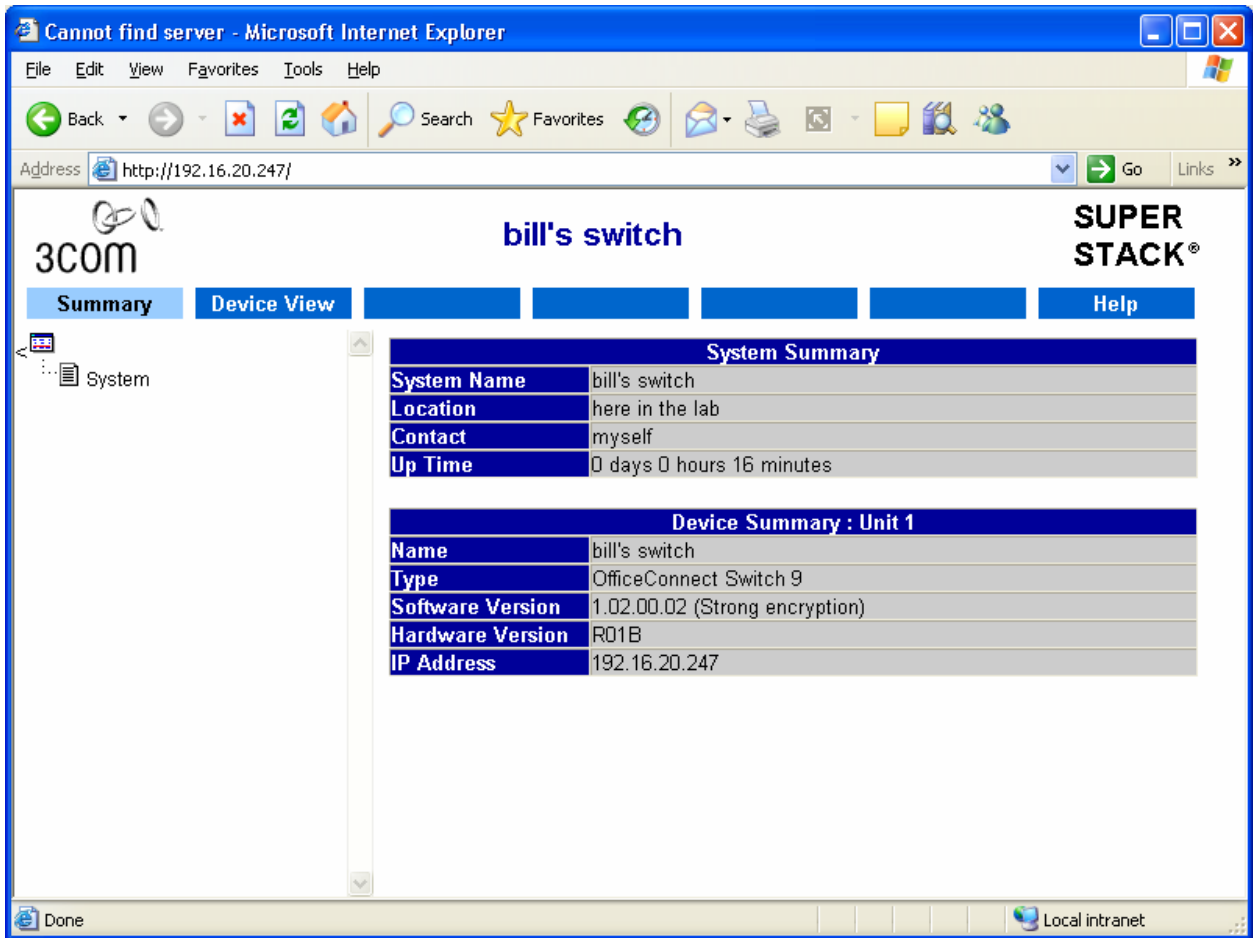
WARNING: A change of IP address details will cause loss of management communication with the device.
You will need to re-establish contact with the device after the new parameters have been applied.

Do you wish to apply these parameters (yes, no)[no]:yes

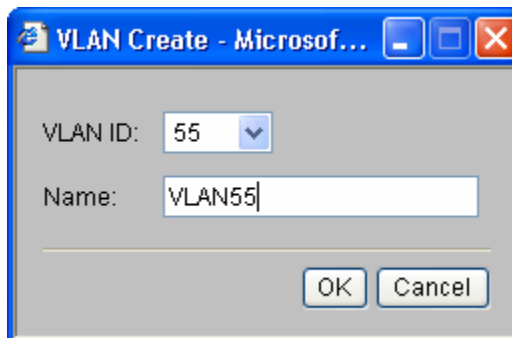
This operation may take up to 30 seconds.

Select menu option:

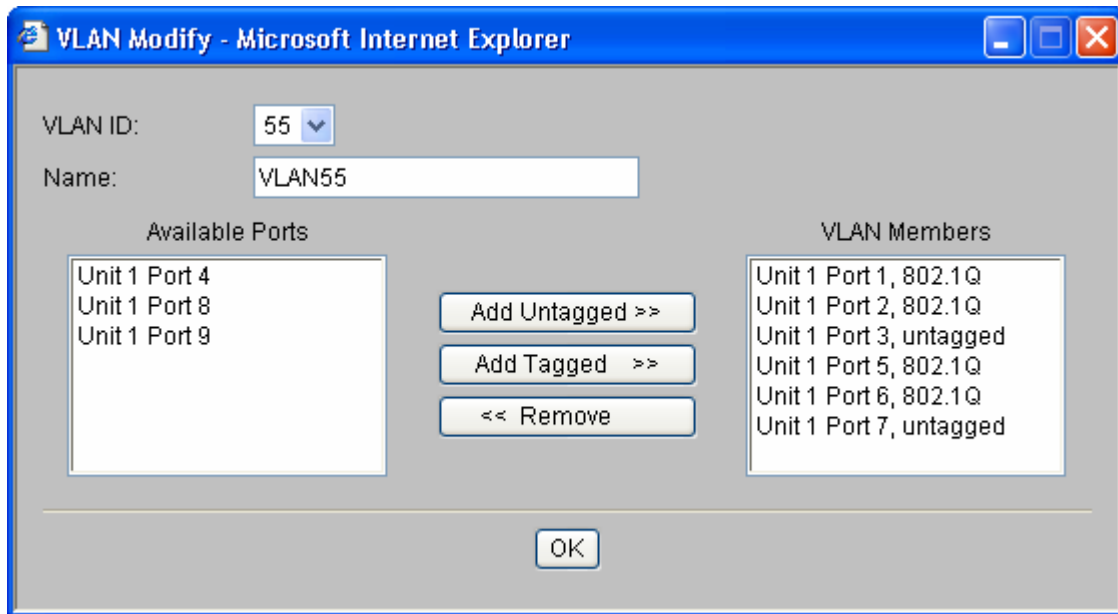
- Configure a PC to have an IP address on the same subnet as the OfficeConnect switch, cable it to one of the switch 10/100 ports on the default VLAN. Open a browser to the management address and log in with the admin login and password.



- Select **Device View**→**Bridge**→**VLAN**→**Create**. Enter the VLAN ID for the Voice VLAN and a Name. Select OK.



6. Select **Device View**→**Bridge**→**VLAN**→**Modify**. Enter the VLAN ID for the Voice VLAN. Select each IP Phone ports and then **Add Tagged**. For this configuration, ports 1,2,5 and 6 were chosen, since they are the powered ports. Select the IP Office port and select **Add Untagged**. Also, any supporting PC port (e.g., for an IP Office Manager/License Server PC) should be added as untagged. Select **OK**. If the Avaya G350 Media Gateway is used, rather than the IP Office, add its port to its VLAN with tagging set as appropriate.



7. By default, the default VLAN (VLAN 1) is assigned to the ports untagged so that it will be available to PCs that are connected to the IP telephones. Because it has been replaced on the IP Office port by the Voice VLAN as the port's untagged VLAN, the IP Office will not be directly exposed to the data traffic.

8. Select **Device View**→ **Physical Interface**→**Ethernet**->**Power**→**Configuration**. Ensure that the power on the IP Telephone ports is enabled (active). Otherwise, the power on other ports can be disabled.

The screenshot shows a web browser window titled "PoE Config - Microsoft Internet Explorer". The main content area is divided into two sections: "Select Ports" and "Select Action".

Select Ports

| Port | Power State | Limited To | Current |
|--------------------------|-------------|------------|---------|
| <input type="checkbox"/> | 1 Active | 15.4 | 4 |
| <input type="checkbox"/> | 2 Active | 15.4 | 7.2 |
| <input type="checkbox"/> | 5 Inactive | 15.4 | 0 |
| <input type="checkbox"/> | 6 Inactive | 15.4 | 0 |

Select Action

power on port(s)
 power on port(s)

Maximum power is: **16 W**
Current Power is: **11.23 W**
Total Power Remaining is: 4.77 W

9. Select **Device View**→**Traffic Management**→**COS**→**Default Priority**. Set the port priority of the IP Office port to 7 to provide the highest priority to traffic coming from the IP Office port. Select **OK**. This is the simplest approach necessary for this configuration where the IP Office is configured for voice traffic only, rather than as a router for data traffic as well. The low value of 0 will be applied to the default VLAN traffic (VLAN 1 in this configuration), such as traffic from a PC connected to an IP Telephone. The priority of IP Telephone traffic will be based on the 802.1P value of the tag sent by the IP Telephone

| Ports | Default Priority (0-7) |
|-------|------------------------|
| 1 | 0 |
| 2 | 0 |
| 3 | 7 |
| 4 | 0 |
| 5 | 0 |
| 6 | 0 |
| 7 | 0 |
| 8 | 0 |
| 9 | 0 |

4. Avaya Endpoint Configuration Notes

Details of the Avaya IP Telephone and Avaya Access Point configuration are not provided in these Application Notes. Configuration is not required for Power over Ethernet operation.

The endpoints were configured for VLAN tagging and Quality of Service settings consistent with the 3COM OfficeConnect Managed Switch for the purpose of this test.

5. Testing

The interoperability testing focused on verifying PoE interoperability between the 3COM OfficeConnect Managed Switch 9 and Avaya IP Telephones and Avaya Wireless Access Points.

5.1. General Test Approach

The general test approach was to connect the Avaya IP Telephones and Avaya Wireless Access Points to PoE-enabled ports on the 3COM OfficeConnect Switch. IP Telephones were allowed to power up and initialize. The IP Telephones were registered to each Telephony Server in turn and calls were made. The volume of the speakerphone, if any, was set to maximum to draw the most power and the power draw as measured by the OfficeConnect switch was recorded. Data was transferred via the wireless network in the case of the Access Point products.

Telephony quality in the presence of saturating data traffic was also tested by using a packet generator to saturate an inter-switch trunk and then placing voice calls and subjectively verifying that call setup time and voice quality was not effected.

5.2. Test Results

All tests passed. All products operated as expected, as long as the total power draw was within the OfficeConnect Switch specifications.

6. Verification and Troubleshooting

1. Check that the IP Telephone powers up when connected to the OfficeConnect switch and registers to the Avaya IP Office or Avaya Communication Manager. Place calls with the speakerphone enabled.
2. If the IP Telephone does not power up,
 - a. Try plugging it directly into the OfficeConnect switch, if possible, rather than through any building wiring.
 - b. Select **Physical Interface→Ethernet→Power→Configuration**. Ensure that the power on the IP Telephone ports is enabled (active).
 - c. Try swapping the IP Telephone with a working phone and cable.
3. If the IP Telephone appears to lose power while initializing or after attaining a stable state, it could be that too much power is being drawn from the switch. Select **Physical Interface→Ethernet→Power→Configuration**. If the total power draw is greater than

14 Watts, it could be that a transient condition (e.g., such as the use of speakerphones on one of the powered sets) can draw enough power to exceed the maximum. Try disabling or removing one of the powered devices and check the power stability. The figure below shows the power draw of a particular configuration.

PoE Config - Microsoft Internet Explorer

Select Ports

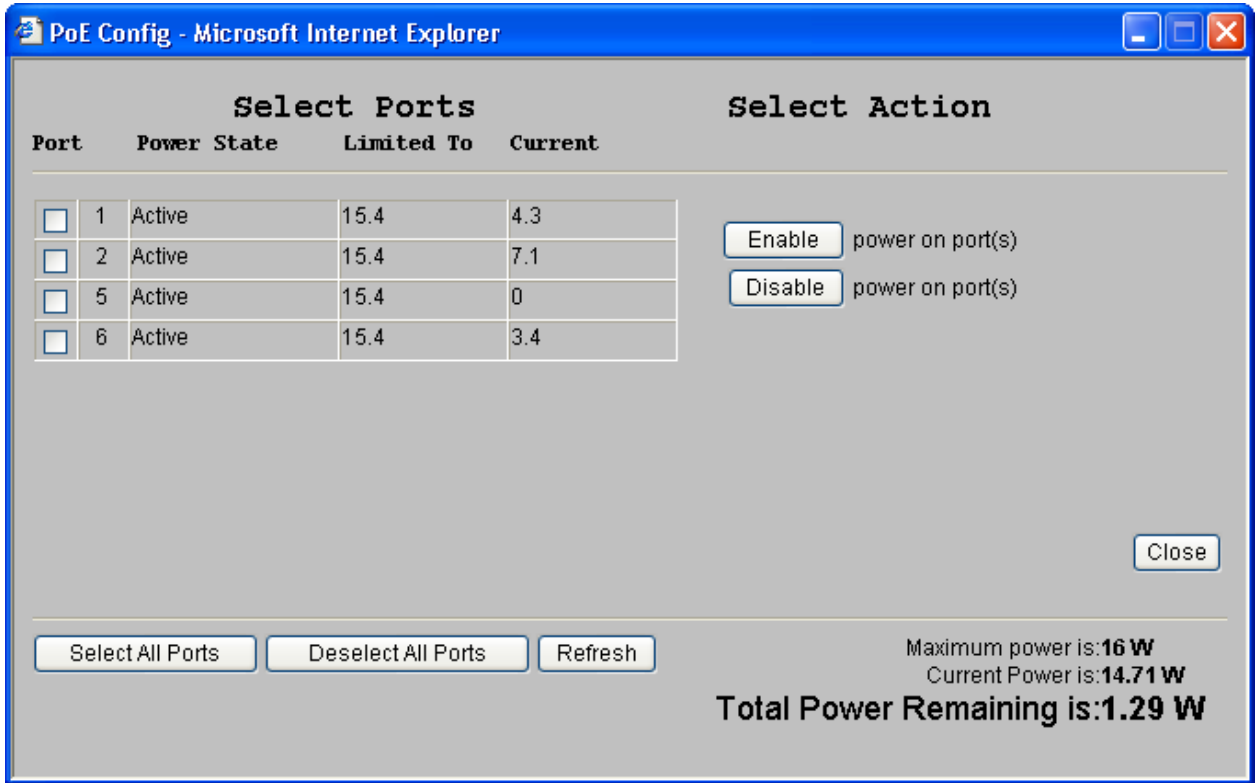
| Port | Power State | Limited To | Current |
|--------------------------|-------------|------------|---------|
| <input type="checkbox"/> | 1 Active | 15.4 | 3.9 |
| <input type="checkbox"/> | 2 Active | 15.4 | 6.4 |
| <input type="checkbox"/> | 5 Active | 15.4 | 0 |
| <input type="checkbox"/> | 6 Active | 15.4 | 3.4 |

Select Action

power on port(s)
 power on port(s)

Maximum power is: **16 W**
Current Power is: **13.71 W**
Total Power Remaining is: 2.29 W

Pressing the speakerphone button for power and pressing the GUI Refresh button shows the overall power draw.



If the volume button is set too high, the phone can reboot.

If this is the issue, reconfigure by separately powering at least one of the devices in another way.

7. Conclusion

These Application Notes describe the steps for configuring the 3COM OfficeConnect Managed Switch 9 to provide inline Power over Ethernet (PoE) to Avaya IP Telephones and Avaya Wireless Access Points. During testing, the Avaya PDs simultaneously obtained power and transferred data over standard Ethernet cables from the 3COM OfficeConnect Managed Switch 9.

8. Additional References

- “OfficeConnect Managed Switch 9 and Switch 9 FX Implementation Guide” can be found at <http://www.3COM.com>.

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