



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for the HP ProCurve 2910 Series Switch Supporting Power over Ethernet with Avaya Endpoints – Issue 1.0**

### **Abstract**

These Application Notes describe the procedures for configuring the HP ProCurve 2910 Series Switch to provide inline Power over Ethernet (PoE) to Avaya 1600/4600/5600/9600 Series IP Telephones.

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 HP ProCurve 2910 Series Switch was configured to supply inline PoE to Avaya PDs. The ProCurve 2910 Series Switch supports the IEEE 802.3af PoE standard as well as the upcoming draft IEEE 802.3at standard for Power over Ethernet Plus (PoE+) , which can provide up to 30 W per port .

## 1.1. Interoperability Compliance Testing

The interoperability testing focused on verifying PoE interoperability with the ProCurve 2910al Switch and Avaya IP Telephones.

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

- Successful boot operation.
- 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.

## 1.2. Support

For technical support on ProCurve products, consult the support pages at:

<http://www.procurve.com/customercare/support/manuals/index.htm>

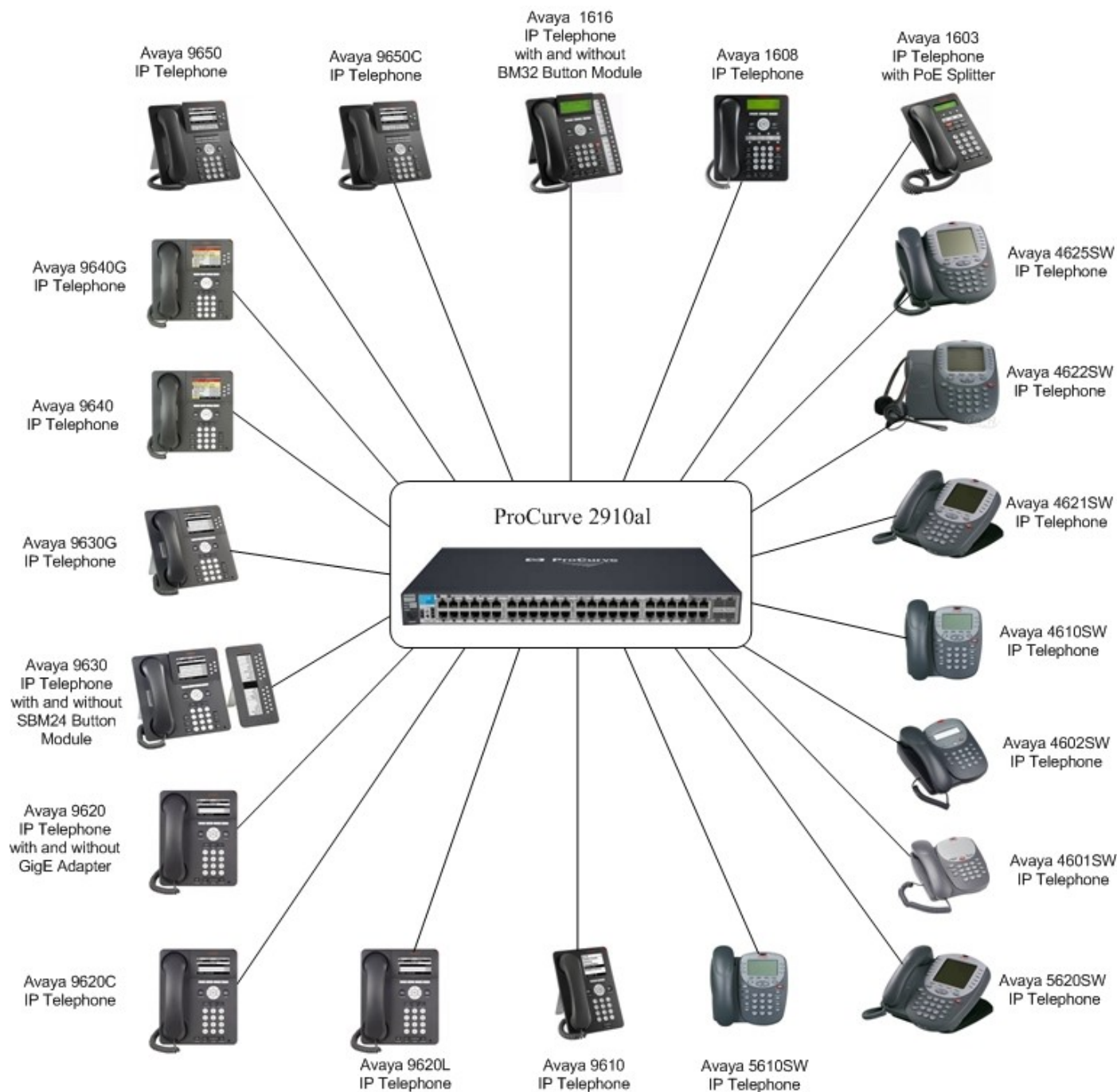
# 2. Reference Configuration

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

- Avaya 9600 Series IP Telephones
- Avaya 4600 Series IP Telephones
- Avaya 5600 Series IP Telephones
- Avaya 1600 Series IP Telephones

For compliance testing, the Avaya 1600/4600/9600 Series IP Telephones registered to Avaya Aura™ Communication Manager and the Avaya 5600 Series IP Telephones registered to Avaya IP Office.

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



**Figure 1: HP ProCurve 2910 Series Switch and Avaya IP Telephones**

### 3. Equipment and Software Validated

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

| Equipment   | Software/Firmware   |
|---|---|
| <b>Avaya PBX Products</b>   |   |
| Avaya S8300 Server running Avaya Aura™ Communication Manager                            | Avaya S8300 Server running Avaya Aura Communication Manager |
| Avaya G450 Media Gateway<br>MGP<br>MM712 DCP Media Module                               | 28.22.0<br>HW9  |
| Avaya IP Office (IP500)   | 4.2 (14)  |
| <b>Avaya Telephony Sets</b>   |   |
| Avaya 9650 one-X Deskphone Edition IP Telephone   | 3.0   |
| Avaya 9650C one-X Deskphone Edition IP Telephone  | 3.0   |
| Avaya 9640G one-X Deskphone Edition IP Telephone  | 3.0   |
| Avaya 9640 one-X Deskphone Edition IP Telephone   | 3.0   |
| Avaya 9630 one-X Deskphone Edition IP Telephone with and without SBM24 24-button module | 3.0   |
| Avaya 9620 one-X Deskphone Edition IP Telephone with and without GigE Adapter           | 3.0   |
| Avaya 9620C one-X Deskphone Edition IP Telephone  | 3.0   |
| Avaya 9620L one-X Deskphone Edition IP Telephone  | 3.0   |
| Avaya 9610 one-X Deskphone Edition IP Telephone   | 3.0   |
| Avaya one-X Value Edition 1608 IP Telephone   | 1.1   |
| Avaya one-X Value Edition 1616 IP Telephone with and without BM32 32-button module      | 1.1   |
| Avaya one-X Value Edition 1603 IP Telephone with PoE Splitter                           | 1.1   |
| Avaya 4625SW IP Telephone   | 2.9   |
| Avaya 4622SW IP Telephone   | 2.9   |
| Avaya 4621SW IP Telephone   | 2.9   |
| Avaya 4610SW IP Telephone   | 2.9   |
| Avaya 4602SW IP Telephone   | 2.3   |
| Avaya 4601SW IP Telephone   | 2.3   |
| Avaya 5620SW IP Telephone ( Registered to IPO)  | 8.016   |
| Avaya 5610SW IP Telephone ( Registered to IPO)  | 8.016   |
| <b>ProCurve Products</b>  |   |
| HP ProCurve 2910al Switch   | W.14.28   |

**Table 1: Equipment and Software Tested**

## 4. Configure Communication Manager and Avaya IP Office

- No ProCurve 2910al Switch specific configuration is required on Communication Manager or Avaya IP Office to support this solution.
- For additional configuration details, refer to **Section [9]**.

## 5. Configure the ProCurve 2910al Switch

For additional configuration details, consult the ProCurve 2910al Switch configuration manual in **Section [9]**.

Inline PoE is supported on the ProCurve 2910al Switch. By default, PoE support is enabled on the system and on all ports.

## 6. General Test Approach and Test Results

### 6.1. Test Approach

The general test approach was to:

- Connect the Avaya IP Telephones to ports on the ProCurve 2910al Switch and verify that the PDs successfully booted.
- Power cycle the ProCurve 2910al Switch and verify successful boot operation of the PDs and registration of the telephones.

### 6.2. Test Results

All Power over Ethernet test cases completed successfully. The ProCurve 2910al Switch successfully provided inline power to all of the Avaya IP Telephones listed in **Table 2**. **Table 2** lists the measured power of the Avaya IP Telephones when connected to the ProCurve 2910al Switch. The power listed as measured by the ProCurve 2910al Switch is for PDs under idle conditions.

**Note:** Cable length and impedance affect 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) |
|--------------------------|---------------|-------|---------------------------|
| 1603 with PoE Splitter   | 2             | 54.8  | 4.8                       |
| 1608                     | 2             | 54.8  | 3.9                       |
| 1616 (D02A Series (NEW)) | 2             | 54.9  | 2.7                       |
| 1616 (D01A Series (OLD)) | 3             | 54.8  | 5.4                       |
| 1616 with BM32           | 2             | 54.8  | 3.4                       |
| 4601SW                   | 2             | 55.2  | 3.3                       |
| 4602SW                   | 2             | 55.2  | 3.4                       |
| 4610SW                   | 2             | 54.9  | 2.8                       |
| 4621SW                   | 2             | 54.9  | 4.9                       |
| 4622SW                   | 2             | 55.1  | 5.0                       |
| 4625SW                   | 3             | 54.8  | 7.7                       |
| 5610SW                   | 2             | 54.9  | 3.2                       |
| 5620SW                   | 2             | 55.1  | 3.9                       |
| 9610                     | 2             | 55.1  | 4.2                       |
| 9620L                    | 1             | 55.1  | 2.2                       |
| 9620                     | 2             | 54.9  | 4.6                       |
| 9620C                    | 2             | 55.0  | 4.2                       |
| 9620 with GigE Adapter   | 3             | 54.9  | 7.6                       |
| 9630                     | 2             | 54.9  | 5.0                       |
| 9630G                    | 2             | 54.9  | 3.8                       |
| 9630 with SMB24          | 2             | 54.8  | 5.5                       |
| 9640                     | 2             | 55.1  | 4.1                       |
| 9640G                    | 2             | 55.1  | 3.8                       |
| 9650                     | 2             | 55.1  | 4.9                       |
| 9650C                    | 2             | 55.1  | 4.0                       |

**Table 2: IEEE 802.3af Class and Measured Power**

**Table 3** summarizes the maximum output 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     | Class 4 is reserved for future use by PoE+ to provide up to 30W at the PSE |

**Table 3: IEEE 802.3af Classes**

## 7. Verification Steps

The following steps may be used to verify the configuration of PoE related parameters:

- Verify that the PoE **Operational Status** in **ON** at the system level by entering the command **show power-over-ethernet**.

```
ProCurve 2910al-48G-PoE Switch# show power-over-ethernet
```

```
Status and Counters - System Power Status
```

```
Pre-standard Detect : On  
Operational Status : On  
Usage Threshold (%) : 80
```

```
Chassis power-over-ethernet:
```

```
Total Provided Power:    382 W  
Total Failover Power:     0 W  
Total Redundancy Power:   0 W  
Total Allocated Power:   13 W +/- 6W
```

- Verify that **Power Enable** is **Yes** at the port level by entering the command **show power-management brief**.

```
ProCurve 2910al-48G-PoE Switch# show power-over-ethernet brief
```

```
Status and Counters - Port Power Status
```

| PoE Port | Power Enable | LLDP Detect | Power Priority | Alloc By | PoE Val | Configured Type | Detection Status | Power Class |
|----------|--------------|-------------|----------------|----------|---------|-----------------|------------------|-------------|
| 1        | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 2        | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 3        | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 4        | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 5        | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 6        | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 7        | Yes          | disabled    | low            | usage    | 17 W    |                 | Delivering       | 2           |
| 8        | Yes          | disabled    | low            | usage    | 17 W    |                 | Delivering       | 2           |
| 9        | Yes          | disabled    | low            | usage    | 17 W    |                 | Delivering       | 2           |
| 10       | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 11       | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 12       | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |
| 13       | Yes          | disabled    | low            | usage    | 17 W    |                 | Searching        | 0           |

- Connect the Avaya PD to a PoE enabled port on the ProCurve 2910al Switch and verify that the PD powers on successfully. If the PD does not power on, enter the command **show power-over-ethernet <portlist>** where <portlist> is the name of the port on the ProCurve 2910al Switch to see if **Power Enable** is **Yes**.

```

Status and Counters - Port Power Status for port 9

Power Enable      : Yes
Priority           : low
AllocateBy        : usage
Detection Status  : Delivering
Over Current Cnt  : 0
Power Denied Cnt  : 0
Voltage           : 54.9 V
Power             : 5.2 W

LLDP Detect       : disabled
Configured Type   :
Value             : 17 W
Power Class       : 2

MPS Absent Cnt   : 0
Short Cnt         : 0

Current           : 96 mA

```

- Verify that Avaya 1600/4600/5600/9600 Series IP Telephones have successfully registered to either Communication Manager or Avaya IP Office
  - For the Avaya 1600/4600/9600 Series IP Telephones check Communication Manager
  - For the Avaya 5600 Series IP Telephones check Avaya IP Office.

## 8. Conclusion

These Application Notes describe the steps for configuring the HP ProCurve 2910al Switch to provide inline PoE to Avaya IP telephones. It was verified that PoE was delivered successfully to all Avaya PDs tested.



## 9. Additional References

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

- [1] *Administering Avaya Aura™ Communication Manager*, May 2009 , Issue 5.0, Document Number 03-300509..
- [2] *Avaya one-X Deskphone Edition for 9600 Series IP Telephones Administrator Guide Release 3.0*, Document Number 16-300698.
- [3] *Avaya one-X Deskphone Value 1600 Series IP Telephones Installation and Maintenance Guide Release 1*, Document # 16-601443.
- [4] *4600 Series IP Telephone LAN Administrator Guide*, Document Number: 555-233-507.

The HP product documentation can be found at:

<http://www.procurve.com/customer-care/support/manuals/index.htm>

- [5] *Management and Configuration Guide for the ProCurve Series 2900 Switches*

## 10. Change History

| Issue | Date      | Reason        |
|-------|-----------|---------------|
| 1.0   | 7/17/2009 | Initial issue |

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