



## Configuring HP Procurve 2610, 2900 & 8212 Switches for use in Livewire™ Networks

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### Introduction

Ethernet switches intended for use in constructing Axia Livewire IP-Audio networks must be properly pre-configured to provide required multicast filtering and quality of service (QoS) features. This document explains the required steps to configure specific models of Hewlett-Packard ProCurve switch.

For initial configuration of the device, use Telnet with a serial port connection.

For serial connection to the switch use the console cable. Typical default serial port settings are 9600baud / 8 bit / no parity / no flow control.

Please refer to your Hewlett-Packard switch manual for additional information about the command line interface.

### Basic IP Configuration

Use the standard “setup” command or other commands to set up IP address, network mask, switch name and other basic parameters.

```
ProCurve Switch 2610-24                               4-Jan-1990  23:00:32
===== TELNET - MANAGER MODE =====
                          Switch Setup

System Name : ProCurve Switch 2610-24
System Contact :
Manager Password :                               Confirm Password :
Logon Default : CLI                               Time Zone [0] : 0
Community Name : public                           Spanning Tree Enabled [No] : No

Default Gateway :
Time Sync Method [None] : TIMEP
TimeP Mode [Disabled] : Disabled

IP Config [DHCP/Bootp] : Manual
IP Address : 10.0.11.1
Subnet Mask : 255.255.0.0

Actions->  Cancel      Edit      Save      Help

Enter System Name - up to 25 characters.
Use arrow keys to change field selection, <Space> to toggle field choices,
and <Enter> to go to Actions.
```



**Note: The core switch must have the lowest IP address to become the root of the IGMP multicast distribution tree.**

### **Enable IGMP (multicast filtering)**

Make sure you configure all VLANs used for multicast.

```
conf t
vlan 1
ip igmp
end
```

### **Enable IP and multicast routing (the core switch only)**

Unicast routing:

```
conf t
ip routing
end
```

### **PIM-DM (Protocol Independent Multicasting - Dense Mode) routing**

This mode is *not recommended*, since PIM-DM uses a lot of CPU performance resources. If you must use it, do so only with smaller installations of 400 audio streams or less. The advantage of PIM-DM over PIM-SM is a simpler configuration.

```
conf t
vlan 1
ip pim-dense
end
```

In the example above, PIM-DM (Protocol Independent Multicasting Dense Mode) is used. This is the simplest multicast routing configuration. Although in case of routing multicast traffic across multiple VLANs and on multiple switches, PIM Sparse Mode should be used.

### **PIM-SM (Protocol Independent Multicasting - Sparse Mode) routing**

Multicast routing using PIM-SM is the recommended configuration. In opposite to the Dense Mode, Sparse Mode uses network resources more conservatively and does not have packet duplication issues.

PIM-SM requires unicast router (RIP or OSPF).

```
conf t
router rip
exit
conf t
```

PIM router configuration:

```
conf t
router pim
 bsr-candidate
 bsr-candidate source-ip-vlan 1
 bsr-candidate priority 100
 rp-candidate
 rp-candidate source-ip-vlan 1
 rp-candidate group-prefix 224.0.0.0 240.0.0.0
 rp-candidate hold-time 150
exit
```

Enable PIM-SM on all VLANs forwarding multicast (in this example only VLAN 1):

```
conf t
vlan 1
 ip pim-sparse
 ip-addr any
 exit
exit
```

### Quality of service

Typically, we configure network devices to use network layer 2 protocol 802.1p tag embedded in network packets, to determine forwarding priority. By default Livewire devices mark clock and live audio traffic with priority 6. Standard audio packets are not tagged. HP switches use the priority information and will apply priority to the live audio packets assuring forwarding with no delay. Standard audio packets will be handled with lower priority (default level of 3).

To assure both audio traffic types have higher priority than other services, we enable IGMP high priority forwarding.

```
conf t
vlan 1
 ip igmp high-priority-forward
end
```

To preserve 802.1p quality of service information of links between switches, tagging must be enabled for Axia VLAN on ports connecting the devices:

Example 1: Procurve 2900 - ports 23 and 24 are used as uplink ports:

```
conf t
vlan 1 tagged 23-24
end
```

Example 2: Procurve 8212 - ports A1 through A12 are used for connecting island switches:

```
conf t
vlan 1 tagged A1-A12
end
```

### Quality of service (alternative configuration)

Another option of applying correct QoS is using IP Precedence and DiffServ which uses network layer 3 ToS field of Internet Protocol frame header.

Livewire uses the following QoS configuration:

Stream Type	QoS value	DSCP codepoint
Standard audio streams	5	101110
Livestreams and clock	6	110000

We map standard streams to priority level 5 and Livestreams to priority level 6:

```
conf t
  qos dscp-map 101110 priority 5
  qos dscp-map 110000 priority 6
end
```

Enable type-of-service traffic classifying:

```
conf t
  qos type-of-service diff-services
end
```

### Save the configuration to the Flash Memory

After the entire configuration is done, you need to save it to permanent Flash memory in the switch.

```
HP ProCurve Switch 2626# write memory
```



## **Confirming Switch Configuration**

To view the configuration of your switch, enter the following command:

```
Show run
```

The results of correct configuration are displayed below for each model.

### **Procurve 2610 configuration**

```
; J9085A Configuration Editor; Created on release #R.11.04
```

```
hostname "ProCurve Switch 2610-24"  
snmp-server community "public" Unrestricted  
vlan 1  
  name "DEFAULT_VLAN"  
  untagged 1-25,27-28  
  ip address 10.0.11.1 255.255.0.0  
  tagged 26  
  ip igmp high-priority-forward  
  exit
```

### **Procurve 2900 configuration**

```
; J9049A Configuration Editor; Created on release #T.12.09
```

```
hostname "ProCurve Switch 2900-24G"  
qos dscp-map 101110 priority 5  
qos dscp-map 110000 priority 6  
module 3 type J90XXA  
snmp-server community "public" Unrestricted  
vlan 1  
  name "DEFAULT_VLAN"  
  untagged 1-22,A1-A4  
  ip address 10.0.2.1 255.255.0.0  
  tagged 23-24  
  ip igmp high-priority-forward  
  exit
```



## Procurve 8212 configuration

### *With PIM-Dense Mode*

```
; J9091A Configuration Editor; Created on release #K.12.31
```

```
hostname "ProCurve Switch 8212z1"  
qos dscp-map 101110 priority 5  
qos dscp-map 110000 priority 6  
module 1 type J8702A  
ip routing  
snmp-server community "public" Unrestricted  
vlan 1  
    name "DEFAULT_VLAN"  
    untagged A13-A24  
    ip address 10.0.0.1 255.255.0.0  
    tagged A1-A12  
    ip igmp high-priority-forward  
    exit  
ip multicast-routing  
router pim  
    exit  
vlan 1  
    ip pim-dense  
        ip-addr any  
    exit  
exit
```

### *With PIM-Sparse Mode*

```
; J9091A Configuration Editor; Created on release #K.13.09
```

```
hostname "ProCurve Switch 8212z1"  
qos dscp-map 101110 priority 5  
qos dscp-map 110000 priority 6  
module 1 type J8702A  
ip routing  
snmp-server community "public" Unrestricted  
vlan 1  
    name "DEFAULT_VLAN"  
    untagged A13-A24  
    ip address 10.0.0.1 255.255.0.0  
    tagged A1-A12  
    ip igmp high-priority-forward  
    exit  
no ip ssh  
ip multicast-routing  
router rip  
    exit  
router pim  
    bsr-candidate  
    bsr-candidate source-ip-vlan 1  
    bsr-candidate priority 100  
    rp-candidate  
    rp-candidate source-ip-vlan 1
```



```
rp-candidate group-prefix 224.0.0.0 240.0.0.0
rp-candidate hold-time 150
exit
vlan 1
ip pim-sparse
ip-addr any
exit
exit
```

***For more assistance:***

If you have more questions about switch setup, contact Axia Support at [support@AxiaAudio.com](mailto:support@AxiaAudio.com).