

Interconnecting Your Axia Network's Hewlett-Packard HP2626 Switch with an Office Network

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Introduction

Often, users wish to allow access to an Axia IP-Audio Network from an office network for configuration and maintenance purposes. This document describes a simple network integration solution based on the popular HP ProCurve 2626 Ethernet switch recommended for small Axia networks.

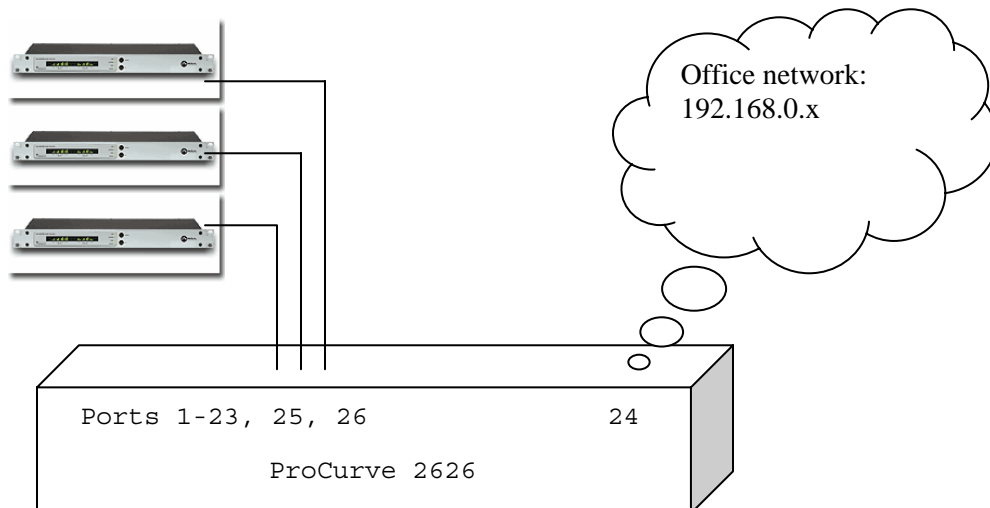
It is also possible to use the switch to provide access to both the Axia network and the office network. It is, however, recommended that Axia devices and office workstations be on different virtual LANs (VLANs).

Note that the configuration shown in this document will not allow office PC's access to Axia audio channels; this functionality requires that your entire office network support quality of service (QoS) features, and also to be configured to for multicast filtering.

Example network configuration

This example shows how to configure remote access from an office network to an Axia network.

Network	IP addresses	Network Mask
Office	192.168.0.0 – 192.168.0.255	255.255.255.0
Axia	192.168.2.0 – 192.168.2.255	255.255.255.0





In addition to IP routing, we will configure two virtual LANs on the switch. Virtual LANs provide additional security features, such as preventing broadcast and multicast audio streams from traversing the network boundary. This solution provides some level of protection against broadcast or multicast flooding.

The instructions below illustrate how to configure a single port (port 24) for office network access, but it is also possible to configure more ports this way to allow office workstations to plug directly into the HP2626 switch. Since the office and Axia devices are on different VLANs, they will not interfere with the Axia network.

Configuring HP2626 switch for routing between networks

For initial configuration of the device, you can use HyperTerminal with a serial port connection to the switch using the console cable. Typical default serial port settings are 9600baud / 8 bit / no parity / no flow control.

Please refer to your HP switch manual for additional information about the command line interface.

Axia devices are connected to switch ports 1 - 23 and 25 - 26, which are members of the default VLAN 1. Port 24 will be used to connect to the office network switch.

Configuration

To configure the VLAN 1 interface, enter the following instructions to configure the switch:

```
Telos Livewire Demo# config
Telos Livewire Demo(config)# vlan 1
Telos Livewire Demo(vlan-1)# ip address 192.168.2.10 255.255.255.0
Telos Livewire Demo(vlan-1)# end
```

Assigned switch address: 192.168.2.10 should be used as a gateway by devices connected to the Axia network.

Now, Configure VLAN 2 for the office network uplink:

```
Telos Livewire Demo# config
Telos Livewire Demo(config)# vlan 2
Telos Livewire Demo(vlan-2)# ip address 192.168.0.199
255.255.255.0
Telos Livewire Demo(vlan-2)# untagged 24
Telos Livewire Demo(vlan-2)# end
Telos Livewire Demo#
```

The switch uses address 192.168.0.199, assigned from the office network range. It should be used as a gateway to reach the Axia network from outside.



To add more ports to the office VLAN, repeat the “untagged” command and specify different port numbers. You can use those ports to connect PC workstations to the network.

Now, enable IP routing on the switch:

```
Telos Livewire Demo(config)# ip routing
```

Check network connectivity to one of the business network units (e.g. gateway at 192.168.0.254):

```
Telos Livewire Demo# ping 192.168.0.254
192.168.0.254 is alive, time = 1 ms
```

Optional: To allow the Internet access from Axia network, configure the default route:

```
Telos Livewire Demo# config
Telos Livewire Demo(config)# ip route 0.0.0.0 0.0.0.0
192.168.0.251
Telos Livewire Demo# end
```

Once the configuration is verified, make sure to save it:

```
Telos Livewire Demo# write memory
```

Configuring the business network gateway to allow Axia network access

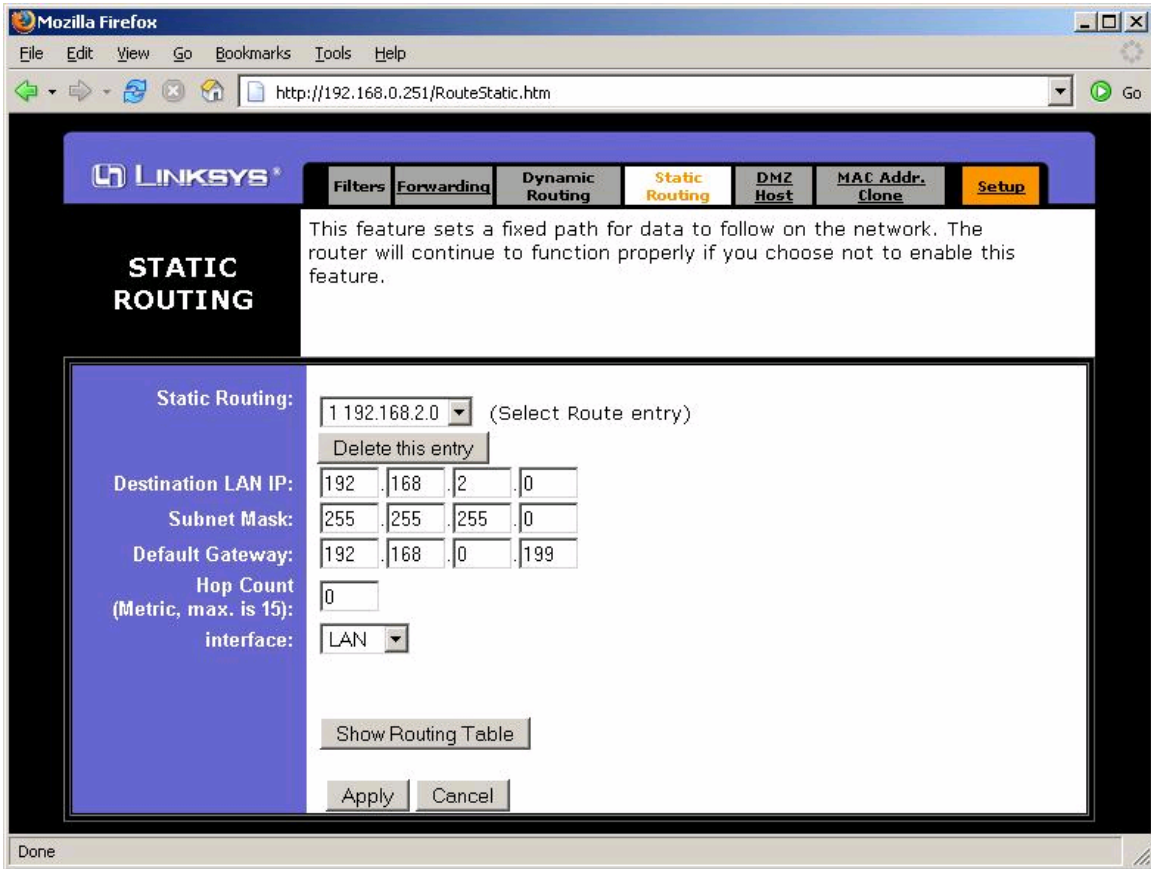
Workstations may be not directly connected to the switch we configured. Still, they can access the Axia network. Those systems use gateways to access devices from outside their local networks. There must be a route configured for each network, and this route must be added to the gateway or router. Those devices use either specific command-line commands or a web-based user interface to set these options. Please refer to your HP user’s manual for more information.

Configuring a route requires three parameters: destination network, the network mask and gateway. In our example, the destination network is 192.168.2.0 mask 255.255.255.0
The gateway is the address assigned to the switch from office network range: 192.168.0.199

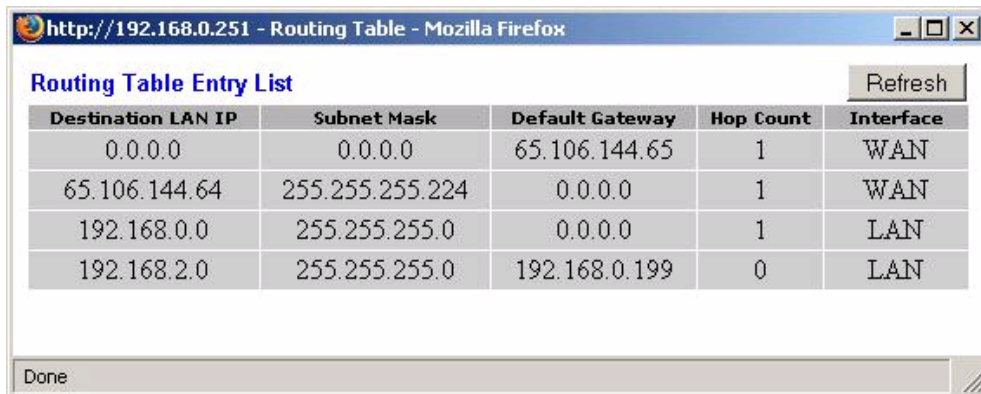
The route configuration command will be like below, or similar:

```
route add 192.168.2.0 mask 255.255.255.0 192.168.0.199
```

Popular LinkSys routers provide a web-based user interface. The screenshot below shows static route configuration for the 192.168.2.x network access.



Static route configuration: 192.168.2.x network.



Routing table.

To verify routing configuration, use ping and tracert tools. First, make sure that you have access to the first gateway, then to the second one, end eventually to a device in the other network. In case of a problem, make sure that gateway IP addresses are configured properly in both your PC and Axia devices.



Example

Here's an example output of the route trace through a 192.168.0.251 business gateway to the 192.168.0.199 Axia switch and to the destination device 192.168.2.163:

```
C:\>tracert 192.168.2.163

Tracing route to 192.168.2.163 over a maximum of 30 hops

  1  <10 ms  <10 ms  <10 ms  GW251.telos-systems.com
      [192.168.0.251]
  2   1 ms    1 ms    1 ms    192.168.0.199
  3   1 ms    1 ms    1 ms    192.168.2.163

Trace complete.
```

Alternative: Configuring individual clients residing in a business network to access an Axia network

Clients in business network know how to access other clients from the same network using the default local network route. To reach the Axia network, there must be a route defined. One option is to configure routes in the business network to access 192.168.2.x manually:

On Windows systems, type this command:

```
C:\>route add 192.168.2.0 mask 255.255.255.0 192.168.0.199
```

And then verify:

```
C:\>route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...00 60 08 3f fa 8e ..... 3Com 3C90x Ethernet Adapter (Microsoft's Packet Scheduler)
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
-----
0.0.0.0                    0.0.0.0          192.168.0.251    192.168.0.150    1
127.0.0.0                  255.0.0.0        127.0.0.1        127.0.0.1        1
192.168.0.0                255.255.255.0    192.168.0.150    192.168.0.150    1
192.168.0.150              255.255.255.255  127.0.0.1        127.0.0.1        1
192.168.0.255              255.255.255.255  192.168.0.150    192.168.0.150    1
192.168.2.0                255.255.255.0    192.168.0.199    192.168.0.150    1
224.0.0.0                  224.0.0.0        192.168.0.150    192.168.0.150    1
255.255.255.255            255.255.255.255  192.168.0.150    192.168.0.150    1
Default Gateway:          192.168.0.251
=====
Persistent Routes:
None
```

Configuration on Linux system:



```
route add -net 192.168.2.0 netmask 255.255.255.0 gw 192.168.0.199
```

And then check the routes:

```
c3p0:/home/maciej# route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.2.0 192.168.0.199 255.255.255.0 UG 0 0 0 eth0
localnet * 255.255.255.0 U 0 0 0 eth0
default GW254.telos-sys 0.0.0.0 UG 0 0 0 eth0
```

And finally, ping device on the Axia network:

```
c3p0:/home/maciej# ping 192.168.2.10
PING 192.168.2.10 (192.168.2.10): 56 data bytes
64 bytes from 192.168.2.10: icmp_seq=0 ttl=64 time=1.0 ms
```

For more assistance:

If you have more questions about switch setup, contact Axia Support at support@axiaaudio.com.