Basic Control Network Setup (HP Procurve Cisco and Brocade)

Ericsson Compression Systems Manual Collection (Internal)

Contents

List of Figures

1 What this Document Describes

This document is intended to provide information regarding the set up of a basic control network using either HP Procurve, Cisco Catalyst or Brocade switches.

This document includes an example C2960.

It is assumed that the reader has access to the 'Cisco Switch Setup (Basics)' and 'Brocade Switch Setup (Basics)' documents.

2   Overview

Ericsson Television supply three different control network switches. For very simple systems the HP Procurve is often used.

Prior to the R2D FD1/2 (R2.1) system release the HP Procurve was considered 'plug-and-play', the switch could be taken directly from the box and built into the system – no switch configuration was required.

From R2D FD1/2 (R2.1) system release the HP Procurve MUST be configured in order for CSM/DSM to work (see section 3.3).

For larger, more complex systems, or for customers who prefer more control, the Cisco Catalyst or Brocade switches are used.

Note: The HP Procurve switch should not be used in systems with redundant control networks.

3 'Basic' Control Network Architectures

3.1 Single Switch

The following diagram illustrates the most basic type of control network. The diagram shows the interface with the customer network and the interface with the data network.
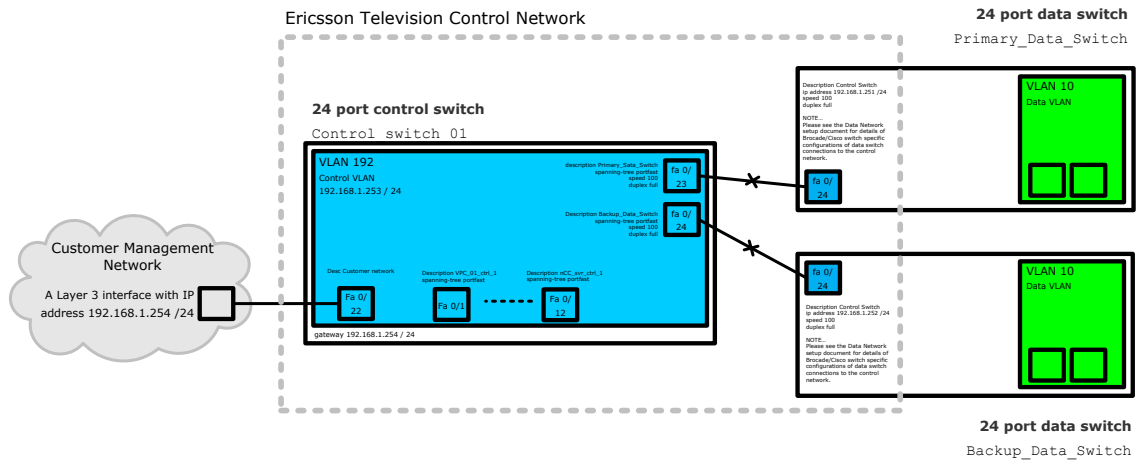

Figure 3-1 Basic, 'one switch' control network.

Note: On many switches, auto MDI-X is disabled on an interface when speed and duplex are manually configured. A twisted Ethernet cable <u>must be</u> used to connect switches/routers to other switches/routers. Figure 3-1 shows this by placing an 'x' on the connecting cable.

3.2 Multiple Switches

Ericsson Television strongly recommend the use of **star** topologies, where multiple control switches are used in a non-redundant control architecture. This is shown by the following figure.
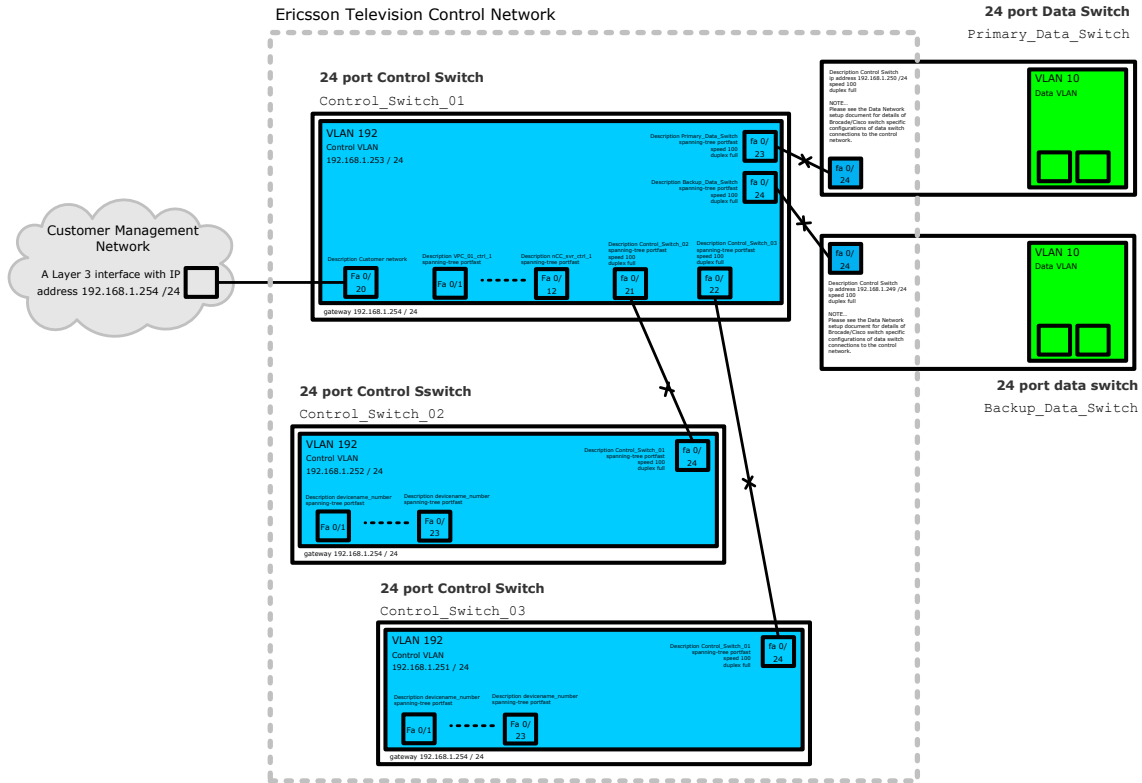

Figure 3-2 Basic, 'multiple switch' control network

Note: On many switches, auto MDI-X is disabled on an interface when speed and duplex are manually configured. Thus, a twisted Ethernet cable must be used to connect switches/routers to other switches/routers. The diagram shows this by placing an '**X**' on the connecting cable.

The above Figure 3-2 shows that there is one control switch (Control_Switch_01) into which all the other control switches are connected. This reduces the number of switches through which an Ethernet packet must pass to get from one end of the network to the other. This also simplifies trouble-shooting.

The nCC server should be connected to the 'central' switch (the switch which connects to all the other switches).

3.3 R2.1 Release onwards – CSM / DSM

R2.1 release (also internally known as R2D FD1&2) and onwards introduces the CSM / DSM protocol.

Control Status Messages (CSM) are sent by nCC on the control network. CSM is a multicast packet. A device joins this multicast and raises an alarm if a CSM is not received.

All capable devices on the network will send Device Status Messages (DSM) on the control network. DSM is a multicast packet, each device uses the same multicast destination IP address. nCC joins the DSM from devices and raises "No Contact" alarm if a DSM is not received for a given device.

The CSM/DSM mechanism provides faster 'no contact' detection than SNMP polling.

CSM/DSM messages are IP multicast addresses. The control network switches must be configured to properly to prevent flooding of multicast traffic across all switch interfaces.

IGMP snooping must configured on all control switches.

4 HP Procurve Configuration

R2.1 release (also internally known as R2D FD1&2) and onwards introduces the CSM/DSM protocol. Prior to this release HP Procurve switches were placed in system straight from the box with little or no configuration. With the implementation of CSM/DSM, an IP address must be configured and IGMP must be enabled.

Multicast support is not available in ProCurve 2350. A control switch replacement must be performed before CSM/DSM is enabled.

Multicast support is available in ProCurve 2510 but manual configuration must be performed to enable this functionality.

4.1 IP Addressing

To configure an IP address on the switch, connect a console (supplied within the box) to the front of the switch and a laptop / server.

The following settings apply for serial port connection, Table 4.1. Please be aware that any baud rate between 1200 and 115200 is applicable as the HP Procurve is capable of auto-sensing this rate.

Table 4.1   Default MX8400 serial connection parameters

Parameter	Setting
Baud rate	1200 to 115200
Data	8 bit
Parity	None
Stop Bit	1 bit
Flow Control	Xon/Xoff

On selecting OK, the main terminal window will appear, hit "Enter" several times until the following is displayed:

```
ProCurve Switch 2510-48#
```

At this prompt, enter the setup display by entering setup as shown:

```
ProCurve Switch 2510-48#setup
```

This will enter the primary setup display allows several configurable options as shown in Figure 4-1.
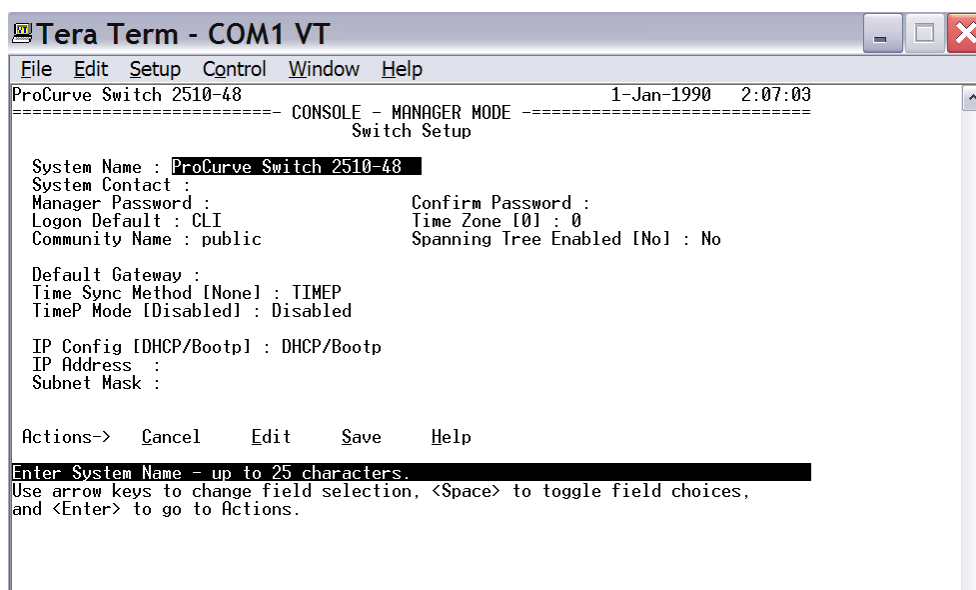
Figure 4-1 setup display

Using the [Tab] key, navigate to the parameters that need to be altered and enter required IP addresses for:

- Default gateway

- IP address

- Subnet mask

IP Config [DHCP/Bootp] must be set to manual. Navigate using the [Tab] key and use the Space bar to select the Manual option.

A system name and password can be added if required, however this is not recommended.

To complete the configuration, press Enter and select Save using the arrow keys, a completed example is shown in Figure 4-2.

Figure 4-2 Completed setup

Ensure that the HP Procurve IP address can be PINGed from the nCC server and a Telnet session can be established. Figure 4-3 shows successful connection via Telnet.
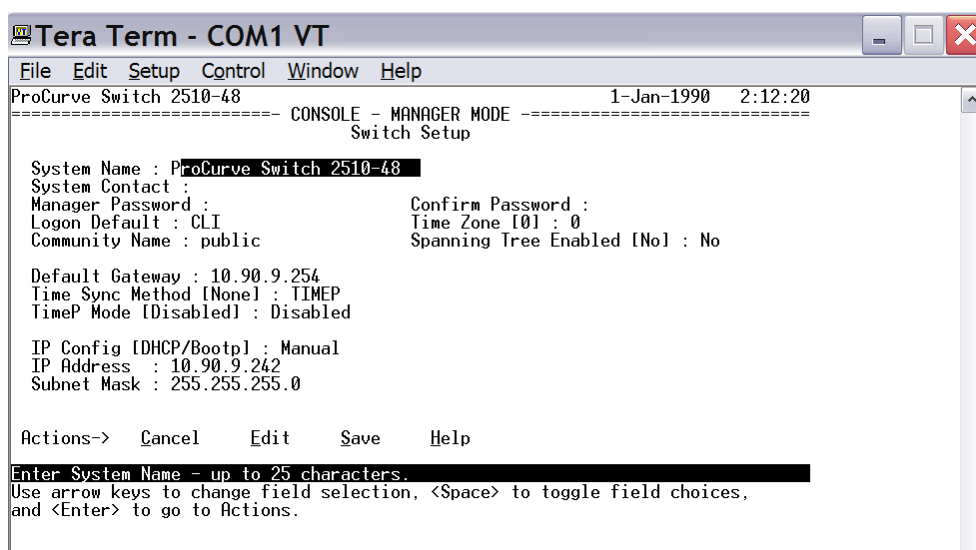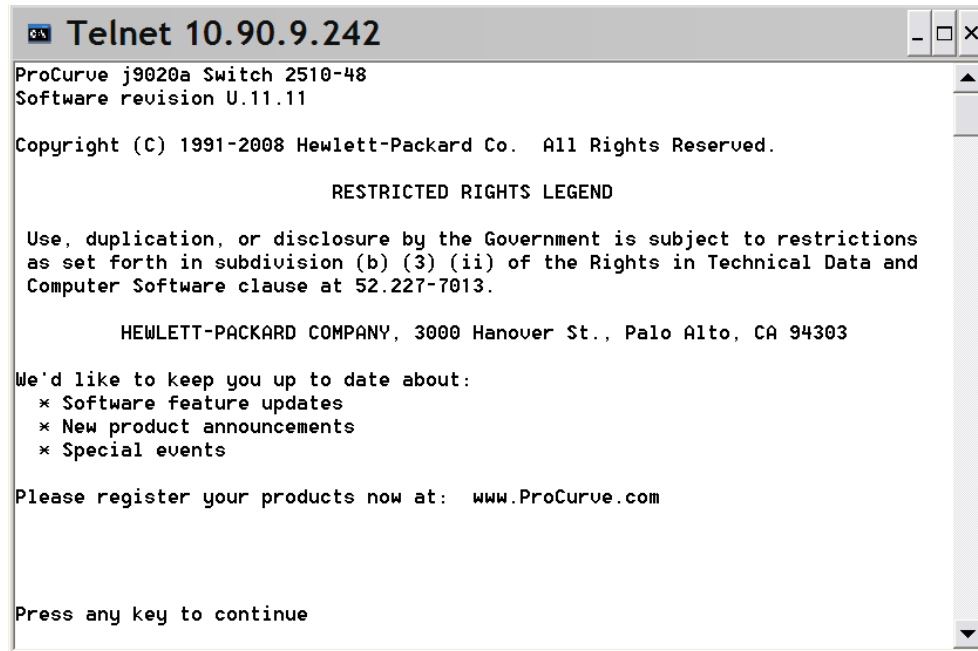


```
Telnet 10.90.9.242                                              _ □ ×
ProCurve j9020a Switch 2510-48
Software revision U.11.11

Copyright (C) 1991-2008 Hewlett-Packard Co.  All Rights Reserved.

                        RESTRICTED RIGHTS LEGEND

 Use, duplication, or disclosure by the Government is subject to restrictions
 as set forth in subdivision (b) (3) (ii) of the Rights in Technical Data and
 Computer Software clause at 52.227-7013.

        HEWLETT-PACKARD COMPANY, 3000 Hanover St., Palo Alto, CA 94303

We'd like to keep you up to date about:
  × Software feature updates
  × New product announcements
  × Special events

Please register your products now at:  www.ProCurve.com




Press any key to continue
```

Figure 4-3 Telnet

4.2   IGMP Snooping

On an HP Procurve, IGMP is disabled by default as shown below.

```
ProCurve Switch 2510-48#show ip igmp config
IGMP Service
VLAN ID         VLAN NAME      IGMP ENABLED        QUERIER ALLOWED
-------         ---------      ------------        ---------------
1               DEFAULT_VLAN NO                    YES
```

IGMP must be turned on to ensure that the multicasts entering the switch are not distributed to every interface. Multicasts are only to be forwarded to interfaces which have devices connected that explicitly join a given multicast.

To change the IGMP settings enter the configuration terminal (conf t) on the HP Procurve:

```
ProCurve Switch 2510-48#conf t
ProCurve Switch 2510-48 (config)#
```

IGMP must be enabled on a per-vlan basis. Thus the following command must be implemented and checked:

```
ProCurve Switch 2510-48 (config)# vlan 1 ip igmp
ProCurve Switch 2510-48 (config)# exit
ProCurve Switch 2510-48#show ip igmp config

IGMP Service
VLAN ID         VLAN NAME      IGMP ENABLED      QUERIER ALLOWED
-------         ---------      ------------      ---------------
1               DEFAULT_VLAN YES                 YES
```

The configuration must be saved such that the configuration is correctly applied following a reboot:

```
ProCurve Switch 2510-48#write memory
```

5 Example Cisco Configuration

The following example shows how a Cisco 2960 will look after a successful configuration following the instructions in this document.

```
version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
no service dhcp

hostname Control C2960 Rack 01

ip subnet-zero
ip igmp snooping querier

no ip domain-lookup
vtp mode transparent

spanning-tree mode rapid-pvst
spanning-tree extend system-id

interface FastEthernet0/1
 description VPC 01
 switchport access vlan 192
 switchport mode access
 spanning-tree portfast

interface FastEthernet0/2
 description VPC 02
 switchport access vlan 192
 switchport mode access
 spanning-tree portfast

*** lots more interfaces, each correctly setup, not shown for
clarity***

interface FastEthernet0/23
 description Main Data C3560 Rack 02
 switchport access vlan 192
 switchport mode access
 spanning-tree portfast
 duplex full
 speed 100

interface FastEthernet0/24
description Backup Data C3560 Rack 02
 switchport access vlan 192
 switchport mode access
 spanning-tree portfast
 duplex full
 speed 100
```

```
interface GigabitEthernet0/1
 switchport mode dynamic desirable

interface GigabitEthernet0/2
 switchport mode dynamic desirable

interface Vlan1
 shutdown

interface Vlan192
 description Control VLAN
 ip address 192.168.1.253 255.255.255.0

ip default-gateway 192.168.1.254
ip classless
no ip http server

snmp-server community private RW
snmp-server community public RO

line con 0
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
```

6 Example Brocade Configuration

The following example shows how a Brocade FWS will look after a successful configuration following the instructions in this chapter.

```
ver 04.3.03T7e1
!
module 1 fws1g-24-port-copper-base-module
!
global-stp
!
vlan 1 name DEFAULT-VLAN by port
!
vlan 192 name Control_VLAN by port
 untagged ethe 0/1/1 to 0/1/24
 router-interface ve 192
 spanning-tree 802-1w
!
boot sys fl sec
enable telnet password .....
enable super-user-password .....
hostname Control 648G Rack 01
ip route 0.0.0.0 0.0.0.0 192.168.1.254
!
ip multicast active
snmp-server community public ro
snmp-server community private rw
!
interface ethernet 0/1/1
 port-name VPC_01
 spanning-tree 802-1w admin-edge-port
!
interface ethernet 0/1/2
 port-name VPC_02
 spanning-tree 802-1w admin-edge-port
!
*** lots more interfaces, each correctly setup, not shown for
clarity ***
!
interface ethernet 0/1/23
 port-name Main Data Rack 02
 spanning-tree 802-1w admin-pt2pt-mac
!
interface ethernet 0/1/24
 port-name Backup_data_Rack_02
 spanning-tree 802-1w admin-pt2pt-mac
!
interface ve 192
 port-name Control_Interface_192
 ip address 192.168.1.253 255.255.255.0
!
end
```