Before you begin

There are several hardware requirements for this procedure. You must have:

- One Patton 3224 unit
- A PC or a laptop with a serial port
- RJ45 to DB-9 adapter
- Two straight-through Ethernet cables

Introduction

The instructions in this application note explain how to set up a bridged multi-link Point-to-Point Protocol connection with two Patton IPLink Model 2884s or 2888s back to back.

When following the steps in this procedure, it is assumed that you know how to access your device through both the console and the webpage. If you do not know how to do this, please refer to the user manual you received with your unit. You can also find this manual on the Patton website.

A TFTP server is used for backing up of configuration files, although this is not needed. If you are in need of a TFTP server, you can download SolarWinds for Windows which is a free TFTP server: http://www.solar-winds.com/downloads/   It is strongly recommended, if you are doing this for the first time, to set up this pro- cedure as an isolated net- work so that it will not interfere with your network.

Follow these steps to set up the PPP connection:

- Restore to minimal configuration
- Removing the default IP addresses
- Setting an IP address
- Setting up the DSL link
- Setting up the modem
- Checking the link state
- Configuring PPP
- Checking the PPP state

Restore to minimal configuration

To begin, make sure that your units do not contain a configuration. To do this you will need to restore to the minimal configuration. It is strongly recommended that you back up the configuration of your unit.

Backup Your Current Configuration

If you have a TFTP server setup you can copy the startup-config to the TFTP server by using the command:

```
(none)#  copy startup-config tftp://<IP Address>/<filename>
```

The filename is what you want the configuration file to be named on your TFTP server.

Or, you can save the startup-config to Non -Volatile Random Access Memory (NV-RAM). NV-RAM is the location that the configuration file is stored in any router. To save the startup config to NVRAM, enter the command below (you can replace original-config with any name you like. It does not have to have the "-config" part) :

```
(none)# copy startup-config original-config
```

Now that you have backed up your configuration, you can restore the unit to the shipping-config or to the minimal-config. If you restore to the shipping-config, the configuration will be as it was when you first received the unit. If you restore to minimal-config, everything will be cleared, and there will only be default settings will be available.

Restore to Minimal Configuration

Enter the following command to restore to minimal-config from the CLI.

```
(none)# copy minimal-config startup-config
```

You will need to restart your unit for the changes to take affect:

```
(none)# reload
```

Removing the default IP addresses

A PPPcan be configured as a Bridge Control Protocol (BCP) interface. A BCP connection will bridge two networks together to appear as one.

If you want to configure a BCP, select a unit and change the IP address of that unit to **192.168.200.1**.

```
(none) login: admin
password:
(none)# configure
(none)[config]# interface ethernet eth0
(none)[eth-eth0]# no ip address 192.168.200.10
(none)[eth-eth0]# no ip address 192.168.1.10
```

The above commands remove the IP addresses that were previously assigned to the interface. It is possible to put more than one IP address on an interface.

You will also need to disable the DHCP client on eth0.

```
(none)[eth-eth0]# no ip address dhcp
```

Exit the eth0 interface:

```
(none)[eth-eth0]# exit
```

Setting an IP address

Because you are setting up a BCP, you will need a bridge group. Follow the commands below to set up the bridge group:

```
(none)[config]# interface bridge br0
(none)[bridge(br0)]# no shutdown
(none)[bridge(br0)]# attach eth0
```

There are two ways to specify the netmask of an IP address.

You can enter the IP address as shown below:

```
(none)[bridge(br0)]# ip address 192.168.200.1/24
```

This notation is often referred to as slash notation. It is simply calculated by counting up the Binary bits.

/32 = 255.255.255.255
/24 = 255.255.255.0
/16 = 255.255.0.0
/8 = 255.0.0.0

Alternatively, you can enter the IP address as shown below:

```
(none)[bridge(br0)]# ip address 192.168.200.1 netmask 255.255.255.0
```

Exit the interface:

```
(none)[bridge(br0)]# exit
(none)[config]#
```

Setting up the DSL link

Select the DSL interface you want:

```
(none)[config]# interface dsl 0
```

Define the number of timeslots desired. 36 timeslots will give you a link speed of 2.304 Mbps.

```
(none)[dsl-0]# set timeslot 36
```

You need to set the clocking of the link. If central is selected, the 3224 will provide clock to the modem. If remote is selected, then the 3224 will expect to receive clock form the modem.

```
(none)[dsl-0]# set type central
```

Set the annex type:

```
(none)[dsl-0]# set annex b
```

Enable the link.

```
(none)[dsl-0]# no shutdown
```

Setting up the modem

Now, you will have to setup the modem. A 3201 was used for this exercise but these instructions will also apply to the 3241.

1. Login with the name *superuser* and the password *superuser.*

2. Use the command **ip list interfaces** to find the current IP address. If it is not already set, configure the IP address to be on the same subnet as the 3224 with the following command:

```
ip set interface ip1 ipaddress 192.168.200.2
```

3. Now, using a computer plugged into the Ethernet of the modem, access the web GUI. Bring up the web page and click on **G.SHDSL** > **Configuration**. You will need to set it so that it can link up with the 3224. Use the following setting:

   – **Intended DSL Data Rate:** 2304

   – **Number of i Bit:** 0

   – **Annex Type:** Annex B

   – **Device Type:** Remote

   – **DSL Protocol:** hdlc

   – **Line Probe:** Disable

   – **Transmit Gain:** 0.0db

   – **Action:** Start

4. Click **Configur**e **& Activate.**

5. Click **System Configuration** > **Save**. Then, click **Save Configuration** The DSL link LED on your modem should now be lit.

Setup PPP on the modem

1. Click **Services Configuration** > **WAN**. Delete what is there if anything.

2. Click **Create new service**.

3. Select **PPP bridged**, and click **Continue.**

```
Description:  ppp-0
Interface: 1
```

4. Click **Create**.

Checking the link state

It is important to make sure that the physical link is up. If the link is not up, you will not be able to get PPP to work. The first line of output after the command shows that the link is up. **DSL 0 (hdlc0) is up** means that the link is enabled. **Link is up** means that the link between the 3224 and the modem is up.

```
(none)[dsl-0]# show
DSL 0 (hdlc0) is up, link is up
1 links in 11 attempts
21.5dB noise, 0.0dB far end atten.
Link active for 63 seconds
Terminal type is central (CO)
Speed is 2304kbps (36 timeslots)
Annex is B
General Errors
     0 LOS, 0 CRC, 0 DPLL
Rx Errors
     3 full, 0 empty
     1 slip
Tx Errors
     0 full, 0 empty
     0 slip, 0 stuff bits
(none)[dsl-0]#
```

Exit the interface.

```
(none)[dsl-0]# exit
(none)[config]#
```

Configuring PPP

Now that the link is up, PPP can be configured.

```
(none)[config]# interface ppp 0
```

The DSL interface needs to be bound to the PPP.

```
(none)[ppp-ppp0]# bind hdlc0
```

The PPP needs to be defined as a BCP.

```
(none)[ppp-ppp0]# ncp bcp
```

Enable the PPP.

```
(none)[ppp-ppp0]# no shutdown
```

Checking the PPP state

From the output below, you can see that the PPP link is up and should now pass traffic:

```
(none)[ppp-ppp0]# show
No Shutdown
Multilink: Disabled   Min-Initial-Frag-Size: None
Device(s):
hdlc0 (running) Active
Holdoff:   5 seconds
LCP:
Echo-Failure:   5  Echo-Interval:  5  Max-Configure: 10  Max-Failure: 10
Max-Terminate:  3  Restart:        3  MRU:         1540  MTU:         1540
BCP:
MAC:               02:a0:ba:6a:4c:00
Management-Inline: Enabled
(none)[ppp-ppp0]#
```

There are several main states that the PPP can be in.

• **Dead** - The link has failed to connect and is is a state of waiting before trying to restablish.

• **Establish** - The link is curently trying to establish.

• **Terminate** - The link is closing down the connection.

• **Running** - The link is up and running. You should be able to pass data.

Saving your configuration

To save your configuration, enter the following command:

```
(none)# copy running-config startup-config
```

Or, type:

```
(none)# write
```

Additional Information

For additional help or any questions, contact Patton Technical Support:

Contacting Patton

If you have any additional questions please feel free to contact Patton's Technical Support:

- E-mail support—e-mail sent to **support@patton.com** will be answered within 1 business day

- Telephone support—standard telephone support is available five days a week—from **8:00 am** to **5:00 pm EST** (**1300** to **2200 UTC**)—by calling **+1 (301) 975-1007**

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