How to debug PRI/BRI with FreeTDM/Freeswitch

Introduction

As with every networking protocol, you should always start debugging at the lowest network layer, and move upward.

Physical Layer

To confirm that the physical layer is functioning properly:

1. Check their Wanpipe configuration files.
   #>vi /etc/wanpipe/wanpipeX.conf
   Confirm that their configuration files match the line configurations provided by Telco.
   a. Check the clock (TE_CLOCK) if this line is connected against a Telco, clock should be configured as **NORMAL**.
   b. Check that the d-channel number (TDMV_DCHAN) is set properly. For T1, TDMV_DCHAN should be set to 24. For E1, TDMV_DCHAN should be set to 16.

2. Check status of the cards.
   #>wanrouter status

   ### PRI Lines

   Confirm that the Wanpipe interface is in **Connected** state.

   a. If the line is in **Connected** state, go to **step 3**.
   b. If the line is in **Disconnected** state:
      a. Confirm that customer is using the right type of cable (straight or cross-over).
      b. Confirm with Telco that this line is enabled and provisioned.

   ### BRI Lines

   Some lines have a power-saving mode that results in the interfaces to stay in **Disconnected** state after they stay idle for a couple seconds.

   a. If your line is in **Connected** state, this is not a power-saving line, go to **step 4**.
   b. If your line is in **Disconnected** state, then you may or may not have a power-saving line, go to **step 4**.

3. Check whether there are any alarms on the line.
   #>wanpipemon –i <interface name> –c Ta
   a. All alarms should be **OFF**.

b. Repeat this command multiple times, and confirm that the **Performance Monitoring Counters** are not incrementing.

If any alarms are **ON**, or the Performance Monitoring counters are incrementing rapidly (several times in one second), then there are still physical layer errors.

a. Ask the customer to try a different cable.
b. Confirm that the card is not defective by using a loop-back plug.
<todo: need a document on how to test card using loop-back plug>
c. Customer should ask his Telco to come test the line.

4. Check for overruns.
#> ifconfig <interface name>
Confirm that the **overruns** counters are not incrementing.
<todo: need a document on how to debug/fix overruns>

Signaling – Q.921

1. Verify freetdm.conf and confirm that configuration parameters match the line configuration.
2. Verify freetdm.conf.xml and confirm that configuration parameters match the line configuration.
3. If Freeswitch is running, stop Freeswitch.
#>./freeswitch –stop
4. Start Freeswitch in command line mode, and confirm that there were no errors or warnings printed during Freeswitch load.
#>./freeswitch –nonat –nocal
5. Check signaling status:
#FS_CLI>ftdm sangoma_isdn show_spans

Confirm that:
1. Physical status is **OK**.
2. Signaling status is **UP**.

If signaling status is **UP**, go to "Signaling –Q.931" debugging.

If signaling status is not **UP**, enable Layer 2 (Q921) debugging.
#FS_CLI>ftdm sangoma_isdn trace q921 wp1

PRI lines

If you see only outgoing SABME's and no response from the remote switch, then this line is not provisioned, customer should contact Telco.

If you see FRMR frames (Frame Reject) going back and forth, then both lines are configured as either PRI-NET or PRI-CPE.

BRI Point-to-point lines

If you do not see any incoming or outgoing frames, then this could be a power-saving line, or the remote switch is configured as point-to-multipoint. Configure this line as point-to-multipoint and see if the signaling state changes to **UP**. If the signaling does not go **UP**, this could be a power-saving line, switch configuration back to point-to-point, and go to "Signaling –Q.931" debugging.

BRI Point-to-multipoint lines

If you see outgoing TEI requests, but the remote switch is not responding, this could be a point-to-point line, switch configuration to point-to-point, and see if signaling state changes to **UP**.

If you do not see incoming or outgoing frames, then this could be a power-saving line, "Signaling –Q.931" debugging.

Signaling – Q931

Enable Q931 trace
#FS_CLI>ftdm sangoma_isdn trace q931 <span name>

Test Incoming calls

If incoming call is successful, to go step 2.

If incoming call is not successful:
1. If you did not see any incoming SETUP message from the traces, then customer should contact his Telco to debug.
2. If an incoming SETUP message was received, but we responded with a RELEASE or DISCONNECT, then this is a problem with the dialplan, confirm that there are routing rules for the context used by this span.

BRI Lines

If you were suspecting a power-saving line, and the BRI link does not come up, then this is not a power-saving line, and you have a physical layer issue.

a. Confirm that customer is using the right type of cable (straight or cross-over).
b. Confirm with Telco that this line is enabled and provisioned.

Test outgoing calls

Make an outgoing call.

1. If the outgoing call was successful, then you are done!!

2. If outgoing call is not successful:

    a. If you did not see any outgoing SETUP message from the traces, then you are not dialing on the correct group, or your dialed number is invalid, check your dialplan.

    b. If an outgoing SETUP message was transmitted on the line, but the remote side did not respond with any message (RELEASE or DISCONNECT), customer should contact Telco.

    c. If an outgoing SETUP message was transmitted on the line, but the remote side rejected the call, look at the cause code. See this page for a description of Q.931 cause codes:

    http://internal.sangoma.com/files/Q931-Cause-codes/Q931_Disconnect_Cause_Code_List.pdf