

Troubleshooting X.25 Connections

This chapter presents troubleshooting information relating to X.25 connectivity. The first section, “Using the **show interfaces serial** Command,” discusses the use of the **show interfaces serial** command in an X.25 environment and describes some of the key fields of the command output.

The remaining sections describe specific X.25 symptoms, the problems that are likely to cause each symptom, and the solutions to those problems.

- No Connections over X.25 Link
- Excess Serial Errors on X.25 Link

Using the **show interfaces serial** Command

This section describes the information provided by the **show interfaces serial EXEC** command in an X.25 environment. For additional information about the output of the **show interfaces serial EXEC** command, refer to the “Troubleshooting Serial Line Problems” chapter and the Cisco IOS *Configuration Fundamentals Command Reference*.

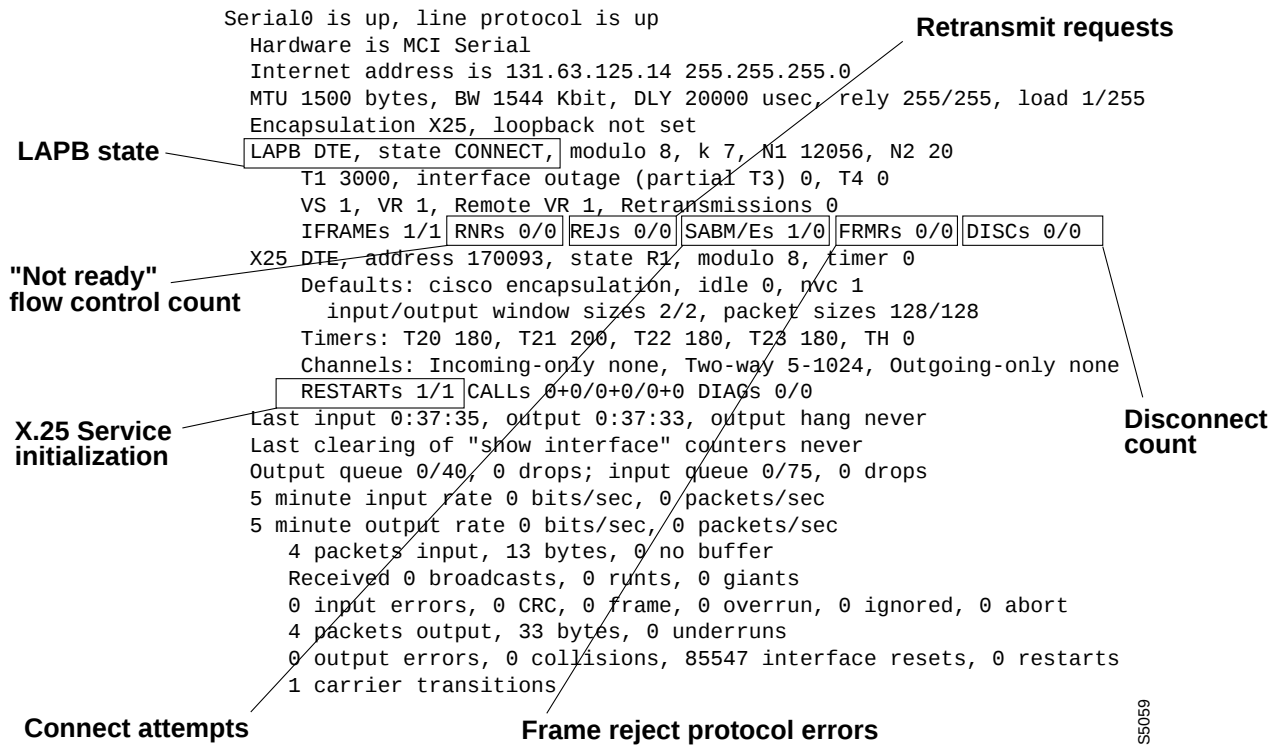
The **show interfaces serial** command provides important information useful for identifying problems in X.25 internetworks. The following fields provide especially important information:

- REJs—Number of rejects
- SABMs—Number of Set Asynchronous Balance Mode requests
- RNR—Number of Receiver Not Ready events
- FRMRs—Number of protocol frame errors
- RESTARTs—Number of restarts
- DISCs—Number of disconnects

All but the RESTARTs count are Link Access Procedure, Balanced (LAPB) events. Because X.25 requires a stable data link, LAPB problems will commonly cause an X.25 restart event that implicitly clears all virtual connections. If unexplained X.25 restarts occur, examine the underlying LAPB connection for problems.

Figure 17-1 shows the output of the X.25 version of the **show interfaces serial** EXEC command and indicates the important fields.

Figure 17-1 Output from the X.25 Version of the show interfaces serial Command



No Connections over X.25 Link

Symptom: Connections over an X.25 link fail.

Table 17-1 outlines the problems that might cause this symptom and describes solutions to those problems.

Table 17-1 X.25: No Connections over X.25 Link

Possible Problem	Solution
Link is down	Use the show interfaces serial EXEC command to determine whether the link is down. If the link is down, refer to the “Troubleshooting Serial Line Problems” chapter.
Incorrect cabling or bad router hardware	Step 1 Use the show interfaces serial EXEC command to determine the status of the interface. Step 2 If the interface is down, refer to the “Troubleshooting Serial Line Problems” chapter. If the interface is up but the line protocol is down, check the LAPB state in the output of the show interfaces serial command. Step 3 If the LAPB state is not CONNECT, use the debug lapb privileged EXEC command (or attach a serial analyzer) to look for SABMs being sent, and for UA packets being sent in reply to SABMs. If UAs are not being sent, one of the other possible problems described in this table is the likely cause. Step 4 If the show interfaces serial EXEC command indicates that the interface and line protocol are up but no connections can be made, there is probably a router or switch misconfiguration. Refer to the other possible problems outlined in this table. Step 5 Check all cabling and hardware for damage or wear. Replace cabling or hardware as required. For more information, refer to the “Troubleshooting Hardware and Booting Problems” chapter.
Misconfigured protocol parameters	Step 1 Enable the debug lapb privileged EXEC command and look for SABMs being sent. If no SABMs are being sent, disable the debug lapb command and enable the debug x25 events privileged EXEC command. Step 2 Look for RESTART messages (for PVCs) or CLEAR REQUESTS with non-zero cause codes (for SVCs). To interpret X.25 cause and diagnostic codes provided in the debug x25 events output, refer to the <i>Debug Command Reference</i> publication. Step 3 Verify that all critical LAPB parameters (modulo, T1, N1, N2, and k) and the critical X.25 parameters (modulo, X.121 addresses, SVC ranges, PVC definitions, and default window and packet sizes) match the parameters required by the service provider.
Misconfigured x25 map command	Step 1 Use the show running-config privileged EXEC command to view the router configuration. Look for x25 map interface configuration command entries. Step 2 Make sure that x25 map commands specify the correct address mappings. Step 3 If dynamic routing is being used in the network, verify that the broadcast keyword is included in the x25 map command. Step 4 Ensure that all router X.25 configuration options match the settings of attached switches. Reconfigure the router or the switch as necessary. Step 5 Enable the debug x25 events command and look for RESTART messages (for PVCs) or CLEAR REQUESTS with non-zero cause codes (for SVCs). To interpret X.25 cause and diagnostic codes provided in the debug x25 events output, refer to the <i>Debug Command Reference</i> publication.

Excess Serial Errors on X.25 Link

Symptom: The output of the **show interfaces serial** command shows REJs, RNRs, FRMRs, RESTARTs, or DISCs in excess of 0.5 percent of information frames (IFRAMEs).

Note If any of these fields are increasing and represent more than 0.5 percent of the number of IFRAMEs, there is probably a problem somewhere in the X.25 network. There should always be at least one SABM. However, if there are more than 10, the packet switch probably is not responding.

Table 17-2 outlines the problems that might cause this symptom and describes solutions to those problems.

Table 17-2 X.25: Excess Serial Errors on X.25 Link

Possible Problem	Solution
Incorrect cabling or bad router hardware	Step 1 Use the show interfaces serial EXEC command to determine the status of the interface. Step 2 If the interface is down, refer to the “Troubleshooting Serial Line Problems” chapter. If the interface is up but the line protocol is down, check the LAPB state in the output of the show interfaces serial command. Step 3 If the LAPB state is not CONNECT, use the debug lapb privileged EXEC command (or attach a serial analyzer) to look for SABMs being sent, and for UA packets being sent in reply to SABMs. Step 4 If the show interfaces serial EXEC command indicates that the interface and line protocol are up but no connections can be made, there is probably a router or switch misconfiguration. Step 5 Check all cabling and hardware for damage or wear. Replace cabling or hardware as required. For more information, refer to the “Troubleshooting Hardware and Booting Problems” chapter.