5.7.3.2 Single DLUS Race Conditions

Race conditions can exist between a DLUR and one DLUS. For example:

- ***CP-SVR pipe deactivation/SSCP-PU session activation race*** - a DLUR has just sent a REQACTPU to the DLUS, and it receives an UNBIND for the CP-SVR pipe with that DLUS
  - the DLUR has two options, equivalent to the Auto Network Shutdown function (user preference could optionally be predefined per PU):
    - the DLUR could deactivate the CP-SVR pipe and subsequently redrive reactivation of that pipe for the pending SSCP-PU session, retransmitting the REQACTPU on the new pipe (similar to ANS=CONT)
    - the DLUR could deactivate the CP-SVR pipe and the connection to the PU (similar to ANS=STOP)
- ***"surprise" CP-SVR pipe activation*** - a pipe is active and an activation request for the same pipe is received from the same DLUS
  - the activation request should come from a DLUS attempting to recover a CP-SVR pipe it has determined has gone down; since the DLUR has not yet determined that the pipe is down, the new activation request should be rejected (no available conwinner or conloser sessions to that DLUS, specifying sense code X′0805 0000′ in the -RSP(BIND), or in an UNBIND if BIND has already been processed due to implementation variations) - eventually the DLUR will determine that the pipe needs to be deactivated (for instance, receipt of UNBIND from DLUS) and will complete the pipe deactivation and then drive pipe reactivation
- ***SSCP-PU session deactivation race (DACTPU/REQDACTPU)*** - a node (either requester or server) is processing or has sent an SSCP-PU session deactivation request (DACTPU from the DLUS; REQDACTPU from the DLUR), and it receives an SSCP-PU session deactivation request for the same PU from the other node
  - DLUR processing
    - if the requester is in an awaiting RSP(REQDACTPU) state and it receives a DACTPU from the DLUS for that PU, it should accept and process that DACTPU request
    - if while processing the DACTPU, the +RSP(REQDACTPU) should arrive, the requester should accept the response and continue DACTPU processing

Figure 5-17 on page 5-62 through Figure 5-20 on page 5-71 illustrate examples of these race conditions:

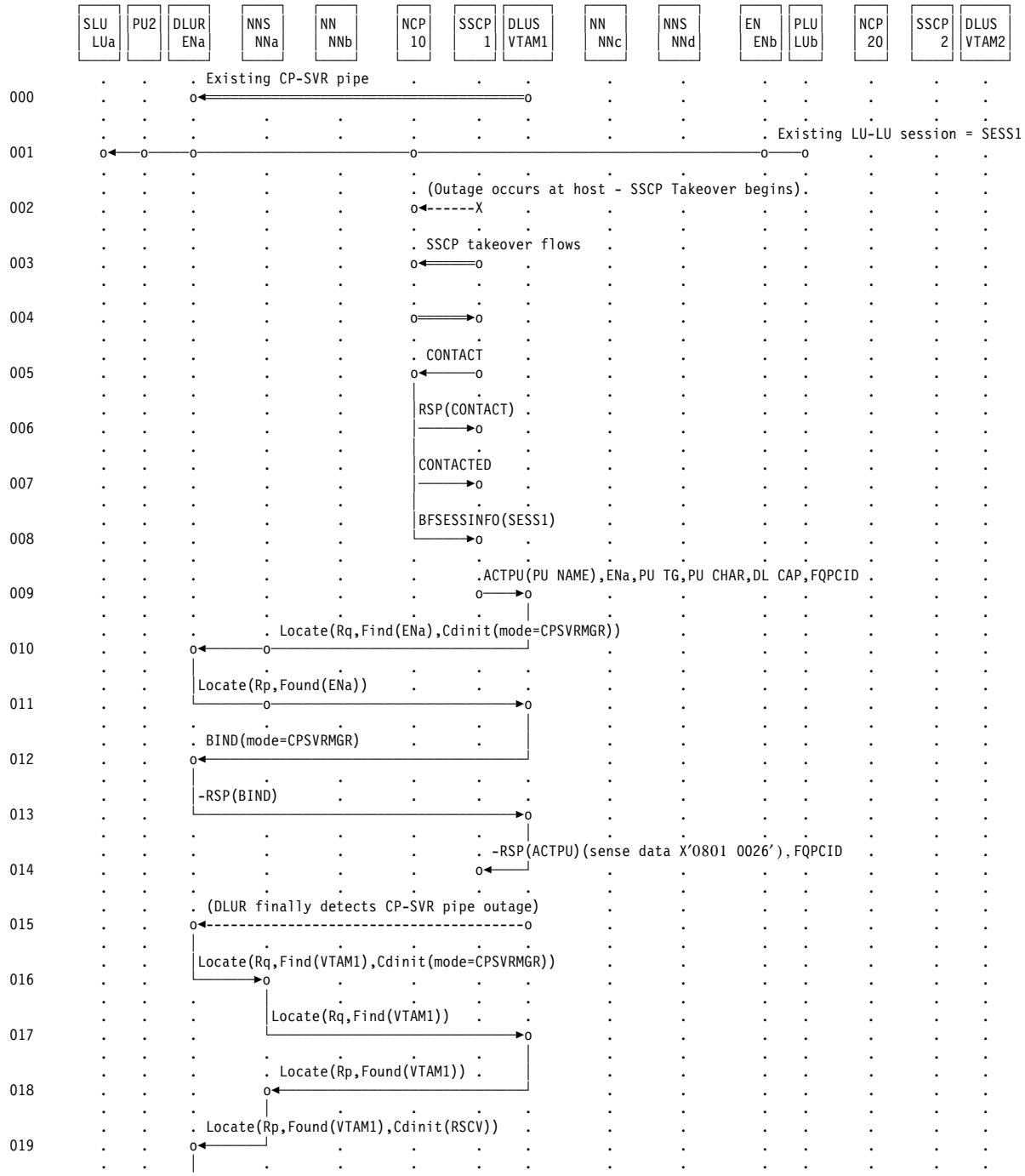
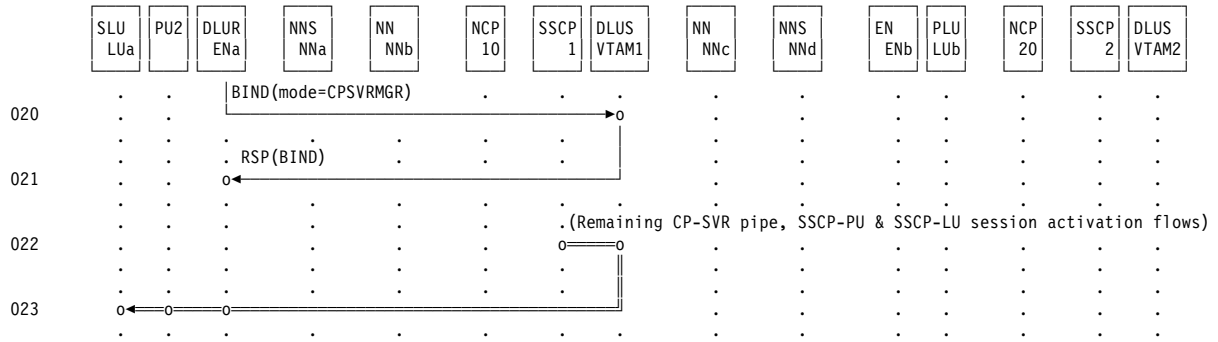


Figure 5-19. ″Surprise″ CP-SVR pipe activation


SLU LUa
PU2
DLUR ENa
NNS NNa
NN NNb
NCP 10
SSCP 1
DLUS VTAM1
NN NNc
NNS NNd
EN ENb
PLU LUb
NCP 20
SSCP 2
DLUS VTAM2
BIND(mode=CPSVRMGR)
020
RSP(BIND)
021
(Remaining CP-SVR pipe, SSCP-PU & SSCP-LU session activation flows)
022
023

1. The current LU-LU session between LUa and LUb routes through PU2, ENa, NNa, NNb, NCP10, NNc, NNd, and ENb.
2. The SSCP-NCP session between SSCP1 and NCP10 ends due to a host outage.
3. SSCP1 reacquires ownership of NCP10 and its attached resources.
4.
5.
6.
7.
8. When SSCP1 has acquired ownership of the link station through which the LU-LU session is routed, NCP10 builds and sends to SSCP1 a BFSESSINFO. This PIU indicates that a session exists between LUa (which it believes to be an independent LU) and LUb.
9. SSCP1 issues ACTPU to PU2 to restart its SSCP-PU session. SSCP1 passes the ACTPU to its DLUS component, VTAM1.
10. VTAM1 determines that ENa is the DLUR associated with PU2. VTAM1 then allocates a conwinner conversation between its Send_Encap_Msg_TP and the Receive_Encap_Msg_TP at the DLUR node. Since no session already exists to carry this conversation, VTAM1 starts one by sending out a Locate Find Cdinit for the CP_LU of the DLUR, mode=CPSVRMGR.
11. The DLUR ENa returns a Locate reply.
12. The DLUS VTAM1 uses the information in the Locate reply to calculate a route to the DLUR node and then builds and sends a BIND using the CPSVRMGR mode.
13. Since ENa has not yet received indication of the loss of the current CP-SVR pipe with VTAM1, it has no available conloser session to provide for the new CP-SVR pipe activation request. Therefore, ENa
sends back a negative response to the BIND indicating there is no available conloser session, specifying
sense code X′0805 0000′ in the -RSP(BIND) (or in an UNBIND if BIND has already been processed
due to implementation variations).
14. Upon receipt of the negative response to the BIND, VTAM1 converts the ACTPU request into a negative response (sense data X′0801 0026′) and returns it to SSCP1.
15. ENa finally receives indication of the failure of the CP-SVR pipe with VTAM1. Having an attached LU with an active LU-LU session, ENa will attempt to activate a CP-SVR pipe with a DLUS.
16. The DLUR node determines the the DLUS node to be contacted on behalf of PU2. Once the DLUS node has been determined, the DLUR node Allocates a conwinner conversation between its Send_Encap_Msg_TP and the Receive_Encap_Msg_TP (X′22F0F0F6′) at the DLUS node. Since no session using the CPSVRMGR mode between this DLUR and the DLUS already exists, the DLUR node initiates the normal APPN flow sequence to bring up such a session. This begins with the DLUR node sending a Locate Find Cdinit request to its network node server. The LU target of the session is the CP name of the DLUS node=VTAM1 in this case.
17. The NNS(ENa) issues either a broadcast or directed search for the CP_LU of the DLUS=VTAM1.
18. The DLUS node responds to the search request with a Locate Found reply.
19. The NNS(ENa) uses the information in the Locate reply to calculate a route to the DLUS node and passes this back to the DLUR in the form of an RSCV.
20. The DLUR node ENa issues a CPSVRMGR BIND request to the DLUS node VTAM1.

21. The DLUS node VTAM1 returns a positive response to the BIND.
22. The activation of the CP-SVR pipe and the SSCP-PU and SSCP-LU sessions proceeds normally.
23.