% • (C.1.18.1.1, C.1.18.1.6) added to CV X′4696′ a destination MAC address for FRPVC

% • (C.1.18.1.3, C.1.18.1.4) updated V.25/V.25bis destination dial address and calling identification number information

% • (C.1.18.1.3, C.1.18.1.4, C.1.18.1.5, C.1.18.1.6) changed encodings of Token-Ring signalling information from canonical to noncanonical

% • (C.1.18.1.5) retired CV X′4695′ SDLC station role usage for SDLCNS and SDLCSW

The following revisions were made based on review comments to Document Number SV40-1010-01/DLUR-8 (APPN DLUR Architecture Reference Version 1.2). These changes are indicated by a pound sign (#) throughout the text.

• (5.6.2.1.2, 5.6.2.1.3, 13.1.7, 13.4.6, now C.1.20.1, C.2.12) added a new nondisruptive UNBIND-initiated CP-SVR pipe deactivation sense data to permit the DLUR to immediately reinitiate CP-SVR pipe activation while requiring the DLUR to select a different DLUS for the new pipe

• (5.6.3.2) updated the DLUR REQDISCONT processing to return a RSP(REQDISCONT) upon receipt of RSP(REQDACTPU)

• (5.7.3.2) clarified the sense code used in -RSP(BIND) or UNBIND for “surprise” CP-SVR pipe activation

• (6.2, 6.2.1, 6.2.2, new 6.2.4, 6.3, 6.3.1, 6.3.3, 13.1.2, 13.1.7, C.1.3.1, C.1.3.1.1, now C.1.20.1) added the DLUR support for forwarding PU/LU names

• (8.1.2) updated the DLUR processing of CV X′0C′ on +RSP(ACTLU)

• (8.1.4) updated the DLUR processing to unextend an extended BIND

• (8.1.4) updated the DLUR BIND adaptive session pacing processing

• (8.1.5) updated the DLUR +RSP(BIND) processing to include the Route Selection (X′2B′) control vector

• (8.2.1) updated the DLUS processing for setting the receipt of TDUs support DLUS capability

• (13.3.1, C.1.8, new C.1.15) added the Route Selection (X′2B′) control vector to the SESSST format X′03′ RU

• (appendix C) updated formats appendix, removing change bars for format changes published in SNA Formats edition GA27-3136-15

• (now C.1.19.1.1, now C.1.19.1.5) added an optional subfield for V.25bis destination dial address and calling identification number

• (now C.1.19.1.3, now C.1.19.1.5) changed FRPVC DSAP and SSAP from canonical to noncanonical format

• (now C.1.19.1.7, now C.1.19.1.8) corrected the wording of the address length field in subfields X′46A5′ and X′46A6′ for X.25

5.6.2 Abnormal CP-SVR Pipe Deactivation

There are other situations where the DLUS and DLUR should deactivate the CP-SVR pipe:

- If either the DLUR or DLUS should receive an UNBIND on its conloser session, it should return a positive RSP(UNBIND) on that session and, if its conwinner session is active or pending, send an UNBIND on the conwinner session.
- If an outage is detected on the CP-SVR pipe, and an UNBIND cannot be successfully routed to the session partner, then the DLUS or DLUR should deactivate and clean up both its conwinner and conloser sessions.
- Whenever a DLUR/S capabilities mismatch is detected, the CP-SVR pipe should be deactivated.

Reactivation of the CP-SVR pipe can be initiated from either the DLUS or DLUR, or both, upon completion of the deactivation of the current pipe (see 5.7, “Pipe And Session Failure Logic” on page 5-55 for more information on recovery of the CP-SVR pipe).

5.6.2.1 UNBIND-Initiated CP-SVR Pipe Deactivation

One of the DLUS requirements is to support forced deactivation of the DLUR-related sessions, i.e.,

- the CP-SVR pipe between the DLUS and the DLUR
- the SSCP-PU sessions between the SSCP in the DLUS and the PU serviced by the DLUR
- the SSCP-LU sessions between the SSCP in the DLUS and the LU serviced by the DLUR
- the LU-LU sessions involving the LU which has an SSCP-LU session with the SSCP in the DLUS

Normally, DACTLUs and DACTPUs would be sent followed by an UNBIND for the CPSVRMGR session. To speed things up, new sense data has been created for the CP-SVR pipe UNBIND which will indicate to the DLUR to deactivate some or all of the session types listed above. There are two major sense data categories:

- disruptive - all sessions (CPSVRMGR, SSCP-PU, SSCP-LU, LU-LU) will be deactivated by the DLUR for its PUs and LUs serviced by this DLUS
- nondisruptive - all sessions except active LU-LU sessions will be deactivated

5.6.2.1.1 Disruptive UNBIND-Initiated CP-SVR Pipe Deactivation: There is one disruptive session deactivation sense data, X′08A0 0007′. If sense data X′08A0 0007′ appears in the Extended Sense Data control vector (X′35′) in an UNBIND on the conloser CPSVRMGR session, the DLUR will:

- deactivate all SSCP-PU, SSCP-LU, and LU-LU sessions for its PUs and LUs serviced by this DLUS
- return a positive RSP(UNBIND) on the conloser session and, if its conwinner session is active or pending, send an UNBIND on the conwinner session

5.6.2.1.2 Nondisruptive UNBIND-Initiated CP-SVR Pipe Deactivation: There are four nondisruptive
session deactivation sense data: X′08A0 0008′, X′08A0 0009′, X′08A0 000A′, and X′08A0 000B′. If one of these sense data appears in the CV X′35′ in an UNBIND on the conloser CPSVRMGR session, the DLUR will:

- deactivate all SSCP-PU and SSCP-LU sessions for PUs and LUs serviced by this DLUS
- deactivate all active and pending LU-LU sessions for LUs
  - serviced by this DLUS, and
  - defined with ANS=STOP

- return a positive RSP(UNBIND) on the conloser session and, if its conwinner session is active or pending, send an UNBIND on the conwinner session

The distinctions between each of these sense data are:

- X'08A0 0008' - DLUR can immediately reinitiate CP-SVR pipe activation
- X'08A0 0009' - DLUR can immediately reinitiate CP-SVR pipe activation / this sense data is used when a protocol violation is detected
- X'08A0 000A' - DLUR should wait for a DLUS (need not be the same DLUS sending the UNBIND) to reinitiate CP-SVR pipe activation / DLUR-implementing products may choose to wait:
  - indefinitely, or
  - for a designated (either system- or user-defined) period of time for a CP-SVR pipe activation from a DLUS, after which the DLUR will go ahead with CP-SVR pipe activation, with either the same or a different DLUS.
- X'08A0 000B' - DLUR can immediately reinitiate CP-SVR pipe activation, but not with the same DLUS; if no other DLUS is defined at the DLUR, then the DLUR should perform the same actions as it does for sense data X'08A0 000A' when waiting for a DLUS to reinitiate CP-SVR pipe activation
  - At CP-SVR pipe activation, both DLURs and DLUSs will indicate support for this sense data by setting on the nondisruptive DLUS-DLUR session deactivation type X'08A0 000B' supported indicator in the DLUR/S Capabilities (X'51') control vector.

5.6.2.1.3 Reactivation After UNBIND-Initiated CP-SVR Pipe Deactivation: With two exceptions, after the CP-SVR pipe deactivation has completed, both the DLUS and the DLUR can immediately activate a new CP-SVR pipe, with the same or a different DLUR/S partner. The exceptions are:

- upon receipt of sense data X'08A0 000A', the DLUR must wait for a DLUS to activate the pipe; it is a product option as to whether the DLUR waits indefinitely or for a finite (system- or user-defined) period of time before activating a new CP-SVR pipe
- upon receipt of sense data X'08A0 000B', the DLUR can immediately reinitiate CP-SVR pipe activation, but not with the same DLUS; if no other DLUS is defined at the DLUR, then the DLUR should perform the same actions as it does for sense data X'08A0 000A' when waiting for a DLUS to reinitiate CP-SVR pipe activation

5.6.2.2 DLUR/S Capabilities Mismatches

A CP-SVR pipe should only be established between a DLUS and a DLUR with compatible capabilities. Exchanging the DLUR/S Capabilities control vector (CV X'51') assists a node in determining whether to allow a CP-SVR pipe to be activated between itself and a partner node.

- To ensure detection of a capabilities mismatch, the CV X'51' should be examined before the RU included in the GDS variable is processed.

Whenever a mismatch in DLUR/S capabilities is detected, the CP-SVR pipe should be deactivated. Whichever node detects the mismatch will initiate the pipe deactivation.

5.6.2.2.1 DLUS-Detected Capabilities Mismatch (DLUS-DLUR Pipe): Figure 5-7 on page 5-31 through Figure 5-8 on page 5-33 illustrate examples of DLUR/S capabilities mismatches detected by the DLUS during activation of a CP-SVR pipe between a DLUS and a DLUR.

New subfields in the range X'92'-X'F0' are being defined to carry the signaling information, e.g., addresses and dial digits, that is appropriate for each DLC and physical interface type. At present, subfields X'92' to X'96' have been defined.

13.1.7 DLUR/S Capabilities (X'51') Control Vector

This is a new control vector which describes the capabilities of the DLUS or DLUR to its partner.

For this, the initial level of DLUR/S support, there is:

- a one byte release field indicating Release 1 DLUR/S support (X'01'). Future releases will have their own values to aid in uplevel/downlevel support determination.
- a one byte indicator specifying whether the node is a NN (X'00') or an EN (X'01').
- a one byte indicator specifying whether the node is a DLUR (X'00') or a DLUS (X'01').
- a four byte Flow Reduction Sequence Number (FRSN)
- a one byte support indicator field, including:
  - an indicator for support of the RECEIVE_TDU_TP (X'22F0F0F4') service transaction program - when set, the sending node supports receipt of TDUs on this session
  - an indicator for limited DLUR support of ANS - when set, the DLUR only supports ANS=STOP; when not set, the DLUR supports both ANS=CONT and ANS=STOP
  - an indicator for limited DLUR multi-subnet support - when set, the DLUR responds to dependent LU searches with the OCR bit set; when not set, the DLUR responds to dependent LU searches with the OCR bit set
  - an indicator for network name forwarding support - when set, the DLUR will, if requested by the DLUS, forward Network Name control vectors on ACTPUs and ACTLUs to DLUR-served PUs and their associated LUs; when not set, the DLUR will always remove Network Name control vectors from ACTPUs and ACTLUs for DLUR-served PUs and LUs (for more details about PU/LU network name forwarding, see 6.2.4, "PU/LU Network Name Forwarding" on page 6-24)
  - an indicator for nondisruptive DLUS-DLUR session deactivation type X'08A0 000B' support - when set, the DLUR will process an UNBIND with X'08A0 000B' as described in 5.6.2.1, "UNBIND-Initiated CP-SVR Pipe Deactivation" on page 5-29; when not set, the DLUR cannot process this type of UNBIND
- four reserved bytes (for future use)

13.1.8 DLC XID Information Field

A new XID3 bit (byte 15, bit 1) has been defined to be the DLUR ACTPU Indicator. This bit will have significance when the ACTPU Suppression Indicator is reset (signifying an ACTPU is requested of the adjacent node). Setting the new bit will signify that the DLUR would prefer to receive the ACTPU over the CP-SVR pipe; resetting the new bit signifies no preference (received either on the TG dependent flow or encapsulated over the CP-SVR pipe).

A new bit, the DLUS-served LU registration indicator, is defined in format 3 of the XID I-field. This bit is only used by a NN. When it is used, setting the indicator signifies that the NN supports DLUS-served LU registration (option set 1116). Resetting the indicator signifies that NN does not support DLUS-served LU registration.

% • X′0891 000A′ - Invalid Network ID: the network ID in the Network Name control vector does not
% match the network ID of the target resource of the REQACTPU.

13.4.5 REQDACTPU

- X′0801 0028′ - REQDACTPU received for a PU which is known but already inactive
- X′0806 0034′ - REQDACTPU received for an unknown PU

13.4.6 UNBIND

- X′0877 0056′ - A CPSVRMGR session cannot be established over a LEN connection that is not of type TCP.
- X′088E 0008′ - The session could not be established because the Dependent LU Server detected an incompatibility between its capabilities and those of its Dependent LU Requester.
- X′088E 0009′ - The session could not be established because the Dependent LU Requester detected an incompatibility between its capabilities and those of its Dependent LU Server.
- X′088E 000F′ - An attempt was made to establish a CP-SVR pipe across a subnet boundary between a dependent LU server and a dependent LU requester with limited multi-subnet support.
- X′08A0 0007′ - DLUS-DLUR Session Deactivation (Disruptive): LU-LU sessions for DLUR-supported dependent LUs should be reset
- X′08A0 0008′ - DLUS-DLUR Session Deactivation (Nondisruptive): LU-LU sessions for DLUR-supported dependent LUs should not be reset
- X′08A0 0009′ - DLUS-DLUR Session Deactivation (Nondisruptive): protocol violation detected (LU-LU sessions for DLUR-supported dependent LUs should not be reset)
- X′08A0 000A′ - DLUS-DLUR Session Deactivation (Nondisruptive): DLUR should wait for DLUS reactivation of DLUS-DLUR session (LU-LU sessions for DLUR-supported dependent LUs should not be reset)

• X′08A0 000B′ - DLUS-DLUR Session Deactivation (Nondisruptive): DLUR should activate a
DLUS-DLUR session with a different DLUS if possible; otherwise, it should wait for DLUS reacti-
vation of the DLUS-DLUR session; LU-LU sessions for DLUR-supported dependent LUs should not
be reset

DLC Signaling Information (X′AE′) TG Descriptor Subfield

Byte	Bit	Content
0		Facility code: X′01′ RC/ICRD/FS (Reverse Charging/ICRD Status Selection/Fast Select) facility
1		RC/ICRD/FS parameter field
	0–1	Fast-select parameter: 00 fast-select not requested 01 fast-select not requested 10 fast-select requested with no restriction 11 fast-select requested with restriction
	2–3	ICRD parameter: 00 ICRD status not selected 01 ICRD allowance requested 10 ICRD prevention requested 11 reserved
	4–6	Reserved
	7	Reverse charging parameter: 0 reverse charging not requested 1 reverse charging requested **Note:** Only the reverse charging parameter is expected to be used in APPN.

C.1.19.1.10 DLC Signaling Information (X′CD′) TG Descriptor Subfield

DLC Signaling Information (X′CD′) TG Descriptor Subfield

Byte	Bit	Content
0–1		Subfield header; Key=X′CD′ (see -- Heading 'RUSPARS' unknown --)
2 – n		Subfield Data
For DLC Type = X25SVC:		
2 – n		X.25 Call User Data Data to be transferred from DTE to DTE in the call user data field of a call request packet immediately following the one-byte protocol identifier defined in subfield X′94′. A maximum of 15 bytes may be defined (n = 16) unless the fast-select facility is used. In that case, 127 bytes may be defined (n = 128). One use of this subfield is to convey a logon identifier.

C.1.20 DLUR/S Capabilities (X′51′) Control Vector

C.1.20.1 DLUR/S Capabilities (X′51′) Control Vector

The DLUR/S Capabilities control vector is exchanged by the dependent LU requester and the dependent LU server to describe their DLUR/S capabilities once a DLUS-DLUR session is activated.

DLUR/S Capabilities (X'51') Control Vector

Byte	Bit	Content
0–1		Vector header; Key=X'51' (see -- Heading 'RUSPARS' unknown -- and -- Table 'CV' unknown --)
2 – n		Vector Data
2		Dependent LU support level: X'01' Release 1
3		Node type: X'00' APPN network node X'01' APPN end node
4		DLUR/S node type: X'00' DLUR X'01' DLUS
5–8		Flow-reduction sequence number: a value that identifies the latest Topology Database Update GDS variable received by the sender of the DLUR/S Capabilities control vector from the receiver of the DLUR/S Capabilities control vector
9		Support indicators (bit is set to 1 if the sender supports the function):
	0	RECEIVE_TDU_TP (X'22F0F0F4') service transaction program supported: The sending CP supports receipt of TDUs on this session.
	1	Limited DLUR auto network shutdown (ANS) support: The DLUR terminates all LU-LU sessions immediately when connectivity to the DLUS is lost.
	2	Limited DLUR multisubnet support: The DLUR will not respond to dependent-LU searches when the Owning CP Respond (OCR) bit in the Find is set to 1.
	3	Network name forwarding supported: The sender supports DLUR forwarding of Network Name control vectors on ACTPUs and ACTLUs to DLUR-served PUs and their associated LUs.
	4	Nondisruptive DLUS-DLUR session deactivation type X'08A0 000B' supported: The sender supports the use of UNBIND with sense data X'08A0 000B' for CP-SVR pipe deactivation.
	5–7	Reserved
10–13		Reserved

C.1.21 Register Resource (X'12C3') GDS Variable

C.1.21.1 Register Resource (X'12C3') GDS Variable

The Register Resource GDS variable is used to request that one or more entries be added to a network node server's directory of network resources. The network node server returns a Register Resource reply GDS variable to report an error; no reply is sent if the registration is completely successful. A network node may send a Register Resource GDS variable on a directed Locate to a central directory server requesting that one or more entries be added to the central directory server's directory. A Register Resource GDS variable is included on the Locate reply from the central directory server to report an error.

Alternatively, a network ID was received as an entry in a Register GDS variable without an accompanying resource name, resulting in an invalid resource name at the receiver; the entry was not registered.

0005 The Network Name control vector appended to the received XID3 does not contain a valid CP name. The CP name, following the network ID, must be greater than 0 and less than 8 bytes in length.

0006 Invalid Network ID: The sender has deactivated CP-CP sessions with the adjacent nonnative CP because neither CP contains border node support (i.e., neither sets byte 9, bit 7, to 1 in the CP Capabilities GDS variable that it sends).

0007 Invalid Network ID: Establishment of a switched link connection failed because the network ID of the destination PU was not equal to that of the requesting SSCP.

0008 Insufficient control blocks for dynamic network ID assignment. A CONNOUT specified a network ID that is not currently defined and sufficient control blocks are not available.

0009 The network ID specified in the VRID List (X'1B') control vector is invalid.

000A Invalid Network ID: the network ID in the Network Name control vector does not match the network ID of the target resource of the REQACTPU.

C.2.12 08A0

08A0 Session Reset: An LU or PU is resetting an LU-LU session.

Bytes 2 and 3 following the sense code contain sense code specific information. Settings allowed are:

0000 No specific code applies.

0001 The identified LU-LU session had to be deactivated because of a forced deactivation of the associated SSCP-PU or SSCP-LU session, for example, because of a received DACTPU, DACTLU, or DISCONTACT. The LU will send an UNBIND with a reason code of X'0A' (SSCP Gone).

0002 The LU or session connection manager (SCM) will send UNBIND with a reason code of X'0F' (Cleanup).

0003 A gateway node is cleaning up the session because a gateway SSCP has directed the gateway node (via NOTIFY) to deactivate the session, for example, a session setup error or session takedown failure has occurred. The gateway node will send UNBIND with a reason code of X'11' (Gateway Node Cleanup).

0004 Reversed FRSN Values: The value in the Last FRSN Sent field is greater than the value in the Current FRSN field in a received TDU GDS variable (no retry). The CP will send an UNBIND with a reason code of X'0F' (Cleanup)

0005 TDU Sent Out of Order: The value in the Last FRSN Sent field of the current TDU GDS variable is less than the value of the Current FRSN field in the TDU GDS variable that immediately preceded it, or is greater than it and the receiver cannot store the out-of-sequence value (no retry). The CP will send an UNBIND with a reason code of X'0F' (Cleanup)

0006 Invalid FRSN Value: In a CP Capabilities GDS variable, the adjacent node indicated receipt of a TDU with a FRSN value greater than the last one sent.

0007 DLUS-DLUR Session Deactivation (Disruptive): LU-LU sessions for DLUR-supported dependent LUs should be reset.

0008 DLUS-DLUR Session Deactivation (Nondisruptive): LU-LU sessions for DLUR-supported dependent LUs should not be reset.

0009 DLUS-DLUR Session Deactivation (Nondisruptive): Protocol violation detected; LU-LU sessions for DLUR-supported dependent LUs should not be reset.

000A DLUS-DLUR Session Deactivation (Nondisruptive): DLUR should wait for DLUS reactivation of the DLUS-DLUR session; LU-LU sessions for DLUR-supported dependent LUs should not be reset.

| 000B DLUS-DLUR Session Deactivation (Nondisruptive): DLUR
| should activate a DLUS-DLUR session with a different DLUS if
| possible; otherwise, it should wait for DLUS reactivation of the
| DLUS-DLUR session; LU-LU sessions for DLUR-supported
| dependent LUs should not be reset.

C.2.13 8019

8019 Routing Exception: A node is unable to perform the required routing function for a request.

Bytes 2 and 3 following the sense code contain sense code specific information. Settings allowed are:

0000 No specific code applies.

0001 Unknown Routing Group Name.

0002 Unknown Routing Group Name, Routing Element Name combination.

0003 Reserved

0004 No connection is available for level of service required. When this SNA report code is used in an SNA condition report, it is accompanied by a supplemental report containing the service parameter triplet (or combination of triplets) for which a connection could not be found.

0005 The Routing and Targeting Instructions GDS variable is required but is not present.