Chapter 13. Format Changes

This section describes changes to RUs, control vectors, GDS variables, and sense data for Dependent LU Requester/Server architecture. The actual changes can be found in Appendix C, "Formats For DLUR/S Architecture" on page C-1. These changes will appear in the next edition of *Systems Network Architecture Formats*.

13.1 CP-SVR Pipe Format Changes

13.1.1 FID2 Encapsulation (X′1500′) GDS Variable

This is a new GDS variable used to carry SSCP-PU and SSCP-LU sessions on the CP-SVR pipe. This variable includes:

- a field indicating the length of the GDS variable
- a GDS ID of X′1500′
- a field indicating the length of the FID2 PIU
- the entire FID2 PIU (TH, RH, RU (including optional control vectors))
- one or more control vectors
  - a Security ID Control (X′25′) control vector
  - an Assign LU Characteristics (X′30′) control vector
  - an Extended SDLC Station (X′43′) control vector
  - a TG Descriptor (X′46′) control vector. See 13.1.6, "TG Descriptor (X′46′) Control Vector" on page 13-3 for details about the format changes for this control vector when it specifies the connection between the DLUR and the PU.
  - a new DLUR/S Capabilities (X′51′) control vector
  - a Fully-Qualified Procedure Correlation Identifier (FQPCID) (X′60′) control vector

    An FQPCID includes a PCID, a network-qualified CP name, and an optional PCID modifier. The network-qualified CP name is defined as follows:

    — DLUS-generated - the network-qualified SSCP name

    — DLUR-generated - the network-qualified CP(DLUR) name
  - a new XID Image (X′81′) control vector

Table 13-1. GDS X′1500′ Control Vectors		
	term used in flows	**RUs CV appears with**
X′25′		RSP(ACTPU), REQACTPU
X′30′	LU CHAR	ACTLU
X′43′	PU CHAR	ACTPU
X′46′	PU TG	ACTPU, REQACTPU
X′51′	DL CAP	ACTPU, RSP(ACTPU), REQACTPU, RSP(REQACTPU)
X′60′	FQPCID	all RUs
X′81′	XID	REQACTPU, RSP(ACTPU)

13.1.1.1 XID Image (X′81′) FID2 Encapsulation Control Vector

This is a new control vector, locally defined to this GDS variable, which contains either:

% • the I-field image of the XID0, XID1 or XID3 SDLC response of the external PU attached to the DLUR, or

• a DLUR-generated XID0 image for an internal PU or for an external PU which does not support XID.

13.1.2 ACTPU (Activate Physical Unit)

The Network Name (X′0E′) control vector (type X′F1′ - PU name) is included with the ACTPU when sent by a DLUS to a DLUR-serviced PU.

13.1.3 REQACTPU (Request ACTPU)

This is a new RU built by the DLUR and sent to the SSCP in the DLUS requesting that an ACTPU be sent to establish an SSCP-PU session with a DLUR-attached PU. This PU could be predefined or undefined to the SSCP ; it could be internal to the DLUR or downstream of the DLUR.

The REQACTPU has two formats:

- Format X′0′ - external PU
- Format X′1′ - internal PU

A positive response to REQACTPU indicates that the SSCP will send an ACTPU to the PU specified in the REQACTPU′s corresponding FID2 Encapsulation (X′1500′) GDS variable. A negative response to REQACTPU indicates that no ACTPU will be sent, and sense data will be included to specify the reason.

Appendix C. Formats For DLUR/S Architecture

C.1 Formats

% Change bars indicate architecture formats changes since the publication of
% GA27-3136-14. Some formats appear in this section without change bars; these
% formats are

% • DLUR/S format changes added to GA27-3136-14, or

% • formats which are pertinent to DLUR/S but did not previously appear in the
% open SNA formats document (they appeared in the licensed version).

Throughout this appendix, *reserved* is used as follows:

- Reserved bits or fields are currently set to 0′s (unless explicitly stated otherwise)
- Reserved values are those that currently are invalid

Correct usage of reserved fields is enforced by the sender; no receive checks are made on these fields.

C.1.1 XID

DLC XID Information Field

Byte	Bit	Content
0	0– 3	Format of XID I-field: X′0′ fixed format: only bytes 0–5 are included X′1′ variable format (for T1|2.0 to T4|5 node exchanges): bytes 0 – p are included X′2′ reserved X′3′ variable format (for T2.1 to T2.1|4|5 node exchanges): bytes 0 – p are included X′8′ – X′F′ defined for external standards organizations
	4– 7	Type of the XID-sending node: X′1′ T1 node X′2′ T2.0 or T2.1 node X′3′ reserved X′4′ T4 or T5 node
1		Length, in binary, of variable-format XID I-field (bytes 0 – p); reserved for fixed-format XID I-field
2–5|7		Node Identification

DLC XID Information Field

Byte	Bit	Content
2– 5	0– 1 1	Block number: an IBM product-specific number; see the individual product specifications for the specific values used *Note:* The values of all 0′s and all 1′s indicate that bytes 2– 5 do not contain a unique node identifier.
	12– 3 1	ID number: a binary value that, together with the block number, identifies a specific station uniquely within a customer network installation; the ID number can be assigned in various ways, depending on the product; see the individual product specifications for details *Note 1:* When the Block Number field does not contain all 0′s or all 1′s, a value of all 0′s in the ID number indicates that no ID number has been assigned. *Note 2:* For XID format 3, the contents of bytes 2– 5 of the Node Identification field are used in some instances as a role-negotiation-value to resolve contention in protocol roles of nodes, e.g., primary/secondary DLC roles or the ODAI value to be appended to the (OAF′, DAF′) values assigned at a node. When a role-negotiation value is needed and the node does not supply a unique node identification value, it supplies a random value in the ID Number field.
End of Format 0		
6 – p		Format 1 Continuation
6– 7		Reserved
8		Link Station and Connection Protocol Flags
8	0– 1	Reserved
	2	Link-station role of XID sender: 0 sender is a secondary link station (nonnegotiable) 1 sender is a primary link station (nonnegotiable)
	3	Reserved.
	4– 7	Link-station transmit-receive capability: X′ 0′ two-way alternating X′ 1′ two-way simultaneous
9		Characteristics of the node of the XID sender:
	0– 1	Reserved
	2– 3	Segment assembly capability of the path control element of the node: 00 the Mapping field is ignored and PIUs are forwarded unchanged 01 segments are assembled on a link-station basis 10 segments are assembled on a session basis 11 only whole BIUs are allowed
	4– 5	Reserved
	6	Short-hold mode status indicator (reserved if byte 9, bit 7 is set to 0): 0 sender not already engaged in a logical connection using short-hold mode 1 sender already engaged in a logical connection using short-hold mode
	7	Short-hold mode support indicator: 0 short-hold mode not supported 1 short-hold mode supported

DLC XID Information Field

Byte	Bit	Content
10–11		Maximum I-field length that the XID sender can receive:
	0	Format flag: 0 bits 1–15 contain the maximum I-field length (only value defined)
	1–15	Maximum I-field length, in binary
12	0–3	Reserved
	4–7	SDLC command/response profile: X′0′ SNA link profile (only value defined) *Note:* These profiles refer to the mandatory command/response support on an SDLC link, as follows: • For an SDLC link in normal response mode (NRM/NRME), having a point-to-point or multipoint configuration (determined from system definition), the support required is: **Commands** / **Responses** I-frames / I-frames RR / RR RNR / RNR Test / Test XID / XID SNRM / UA SNRME / UA Disconnect / DM - / RD - / Frame Reject Reject / Reject *Note 1:* The RD response is sent by the secondary station if and only if CS has decided to deactivate the link. *Note 2:* Reject is required only if both sender and receiver have two-way simultaneous transmit-receive capability. • For an SDLC link in normal response mode (NRM), having a loop configuration (determined from system definition), the support required is: **Commands** / **Responses** I-frames / I-frames RR / RR RNR / RNR Test / Test XID / XID SNRM / UA Disconnect / DM UP / - - / Frame Reject Configure / Configure - / Beacon - / RD *Note:* The RD response is sent by the secondary station if and only if CS has decided to deactivate the link.

DLC XID Information Field

Byte	Bit	Content
13	0– 1	Reserved
	2	SDLC initialization mode options: 0 SIM and RIM not supported 1 SIM and RIM supported
	3– 7	Reserved
14– 1 5		Reserved
16	0	Reserved
	1– 7	Maximum number of I-frames that can be received by the XID sender before an acknowledgment is sent, with an implied modulus for the send and receive sequence counts—less than 8 implies a modulus of 8; 8 or greater implies a modulus of 128
17		Reserved
For byte 9, bit 7 = 0 (short-hold mode not supported)		
18 – p		SDLC Address Assignment Field
18		Length (p minus 18), in binary, of the SDLC address to be assigned
19 – p		Secondary station address to be assigned
For byte 9, bit 7 = 1 (short-hold mode supported)		
18 – p		Short-Hold Mode Dependent Parameters
18		Reserved
19 – n		Dial Digits of XID Sender
19		Number, in binary, of dial digits
20 – n		Dial digits: a string of digits, each having the form X′Fn′ (0≤ n≤ 9)
n + 1 – p		Dial digits of an available short-hold mode port *Note:* This field is included only in an XID from a T4 or T5 node and only for an incoming call on an already logically busy (byte 9, bit 6 = 1) short-hold mode port. If this field is not included, then p = n.
n + 1		Number, in binary, of dial digits of an available short-hold mode port, if one exists
n + 2 – p		Dial digits of an available short-hold mode port: a string of digits, each having the form X′Fn′ (0≤ n≤ 9) *Note:* Byte n+1 is set to the value X′00′ and the n+2-p field is not included if no free alternate port is found. In this case, the station may retry later on the same port used for the current XID.
End of Format 1		
6 – p		Format 3 Continuation
6– 7		Reserved
8– 9		Characteristics of the node of the XID sender:

DLC XID Information Field

Byte	Bit	Content
	0	INIT-SELF support: 0 INIT-SELF may be sent to the XID sender. *Note:* If the XID sender does not contain an SSCP, it forwards any INIT-SELF received to the proper node for processing, which returns the response to the originator of the request. 1 INIT-SELF (or character-coded logon) cannot be sent to the XID sender. *Note:* For bits 0–1, the value 11 is reserved.
	1	Stand-alone BIND support: 0 BIND may be sent to the XID sender without a prior INITIATE sequence (i.e., XID sender supports independent-PLU session partners). 1 BIND may not be sent to the XID sender (i.e., the XID sender does not support independent-PLU session partners). *Note:* For bits 0–1, the value 11 is reserved.
	2	Whole-BIND-PIUs generated indicator: 0 This node can generate BIND PIU segments. 1 This node does not generate BIND PIU segments.
	3	Whole-BIND-PIUs required indicator: 0 This node can receive BIND PIU segments. 1 This node cannot receive BIND PIU segments. *Note:* The value 10 for bits 2–3 is reserved.
	4–7	Reserved
	8	ACTPU suppression indicator: 0 ACTPU for an SSCP-PU session requested 1 ACTPU for an SSCP-PU session not requested
	9	Networking capabilities indicator: 0 The sender is not a network node. 1 The sender is a network node.
	10	Control point services (reserved when bytes 8–9, bit 11 is 0): 0 CP services not requested or provided 1 CP services requested or provided: when network services are not provided on this TG by the XID sender (bit 9 = 0), CP services are requested; when network services are provided on this TG by the XID sender (bit 9 = 1), CP services are provided.
	11	CP-CP session support: 0 CP-CP sessions not supported on this TG 1 CP-CP sessions supported on this TG *Note:* The following combinations of bits 9, 10, and 11 are not valid: 010, 101, 110.
	12–13	XID exchange state indicators: 00 exchange state indicators not supported (set only by implementations not at the current level of SNA) 01 negotiation-proceeding exchange

DLC XID Information Field

Byte	Bit	Content
		10 prenegotiation exchange — the only other fields considered meaningful in this XID are: • Node Identification field • All control vectors • Networking Capabilities indicator, unless the APPN Peripheral Border Node indicator or the control vector X′46′ Extended Border Node indicator indicates the sender is a border node on this TG 11 nonactivation exchange — the XID fields that can change during a nonactivation exchange are: • Transmission Group Number • Network Name (X′0E′, CP name) control vector • Quiesce TG Request • Control Point Services • CP-CP Sessions Support • CP Name Change Support
	14	Nonactivation exchange secondary-initiated capability: 0 nonactivation exchange initiated by secondary station not supported 1 nonactivation exchange initiated by secondary station supported (only value used by current-level APPN nodes)
	15	CP name change support indicator: 0 The sender will fulfill nonactivation XID exchange protocols but, except for the Exchange State indicators, is not able to process fields in the received XID3 that differ from those sent in during the previous XID3 exchange. 1 The sender can process nonactivation XID3s that contain a CP name or TG number that differs from that received by the sending node during the last XID exchange.
10	0– 1	BIND pacing support over the TG (**Note**: See the Qualifier for Adaptive BIND Pacing Support field [byte 10, bits 6– 7] for this field′s relevance to dependent and independent LUs.)
	0	Adaptive BIND pacing support as a BIND sender: 0 adaptive BIND pacing as a BIND sender not supported 1 adaptive BIND pacing as a BIND sender supported
	1	Adaptive BIND pacing support as a BIND receiver: 0 adaptive BIND pacing as a BIND receiver not supported 1 adaptive BIND pacing as a BIND receiver supported *Note:* The combinations of bits 0 and 1 have the following meanings: 00 means adaptive BIND pacing is not supported; 01 means one-way adaptive BIND pacing is supported; 10 is invalid; 11 means adaptive BIND pacing is fully supported.
	2	Quiesce TG request indicator: 0 The sender requests that the receiving node generate a topology update stating that the TG from the receiver to the sender is operative. 1 The sender is requesting that the receiving node generate a topology update stating that the TG from the receiver to the sender is quiesced. *Note:* The requested topology update is generated only if the value sent in this field differs from that sent in the previous XID exchange.

DLC XID Information Field

Byte	Bit	Content
	3	PU capabilities support: 0 does not support receipt of ACTPU containing a PU Capabilities (X′80′) control vector 1 supports receipt of ACTPU containing a PU Capabilities (X′80′) control vector
	4	APPN peripheral border node (PBN) indicator: 0 Sending node is not a PBN. 1 Sending node is a PBN.
	5	Reserved
	6–7	Qualifier for Adaptive BIND pacing support: 00 Adaptive BIND pacing support applies to BINDs for BOTH independent and dependent LUs, and is nonnegotiable. 01 Adaptive BIND pacing support applies to BINDs for BOTH independent and dependent LUs, unless overridden by the partner node. 10 reserved 11 (Retired) Adaptive BIND pacing support applies to BINDs only for independent LUs. (**Note**: Nodes using this setting cannot be connected to those using the 00 setting.)
11–14		Reserved
15	0	Parallel TG support indicator: 0 parallel TGs not supported, only a single TG between the sender and the receiver is permitted 1 parallel TGs are supported, more than one TG between the sender and the receiver may be activated
	1	Dependent LU requester (DLUR) ACTPU indicator (reserved if the ACTPU Suppression indicator is set to 1, or if the sender is not a DLUR node): 0 DLUR XID sender has no preference on whether ACTPU is received on the TG dependent flow or encapsulated over the CP-SVR pipe. 1 DLUR XID sender prefers receiving ACTPU over the CP-SVR pipe.
	2	DLUS-served LU registration indicator (reserved if the sender is not an NN): 0 DLUS-served LU registration not supported 1 DLUS-served LU registration supported
	3–7	Reserved
16		Transmission group number: a binary value in the range 0 to 255
17		DLC type: X′01′ SDLC X′02′ System/370 channel to controller DLC
18 – n		DLC Dependent Section
18		Length, in binary, of the DLC Dependent Section field
For SDLC		
19		Link Station and Connection Protocol flags
19	0	Reserved

DLC XID Information Field

Byte	Bit	Content
	1	ABM support indicator: 0 XID sender cannot be an ABM combined station 1 XID sender can be an ABM combined station
	2–3	Link-station role of XID sender: 00 sender is a secondary link station (nonnegotiable) 01 sender is a primary link station (nonnegotiable) 10 reserved 11 sender is a negotiable link station (primary or secondary capability) *Note:* For ABM stations, the value of bits 2–3 is used only for the purposes of OAF′-DAF′ assignment and deciding which node sends the Set Mode command.
	4	Short-hold mode status indicator (reserved if byte 19, bit 5 is set to 0): 0 sender not already engaged in a logical connection using short-hold mode 1 sender already engaged in a logical connection using short-hold mode
	5	Short-hold mode indicator: 0 short-hold mode not supported 1 short-hold mode supported
	6–7	Link-station transmit-receive capability: 00 two-way alternating 01 two-way simultaneous
20	0	ABM nonactivation XID exchange initiator indicator: 0 XID sender is not the initiator of a nonactivation XID exchange on an ABM TG 1 XID sender is the initiator of a nonactivation XID exchange on an ABM TG XID command *Note:* Support for the ABM Nonactivation XID Initiator indicator is required for all ABM link stations that also support secondary-initiated nonactivation XID exchanges.
	1–7	Reserved
21–22		Maximum BTU length that the XID sender can receive:
	0	Format flag: 0 bits 1–15 contain the maximum BTU length (only value defined)
	1–15	Maximum BTU length, in binary
23	0–3	Reserved

DLC XID Information Field

Byte	Bit	Content
	4– 7	SDLC command/response profile: X′0′ SNA link profile (only value defined) *Note:* These profiles refer to the mandatory command/response support on an SDLC link, as follows: • For an SDLC link in normal response mode (NRM/NRME), having a point-to-point or multipoint configuration (determined from system definition), the support required is: **Commands** / **Responses** I-frames / I-frames RR / RR RNR / RNR Test / Test XID / XID SNRM/SNRME / UA Disconnect / DM - / RD - / Frame Reject Reject / Reject *Note 1:* The RD response is sent by the secondary station if and only if CS has decided to activate the link. *Note 2:* Reject is required only if both sender and receiver have two-way simultaneous transmit-receive capability. • For an SDLC link in normal response mode (NRM), having a loop configuration (determined from system definition), the support required is: **Commands** / **Responses** I-frames / I-frames RR / RR RNR / RNR Test / Test XID / XID SNRM / UA Disconnect / DM UP / - - / Frame Reject Configure / Configure - / Beacon - / RD *Note:* The RD response is sent by the secondary station if and only if CS has decided to activate the link.

DLC XID Information Field

Byte	Bit	Content
		• For an SDLC link in asynchronous balanced mode (ABM) (determined from the Link-Station Role of XID Sender field), having a point-to-point configuration, the support required is: **Commands** / **Responses** I-frames / - RR / RR RNR / RNR Reject / Reject SABME / UA Disconnect / DM Test / Test XID / XID - / Frame Reject *Note 1:* All commands and responses are transmitted and received in two-octet format (extended control field). *Note 2:* Frame Reject is not required to be transmitted; receive capability is required.
24	0–1	Reserved
	2	SDLC initialization mode options: 0 SIM and RIM not supported 1 SIM and RIM supported
	3–7	Reserved
25–26		Reserved
27	0	Reserved
	1–7	Maximum number of I-frames that can be received by the XID sender before an acknowledgment is sent (with an implied modulus on NRM connections for the send and receive sequence counts—less than 8 implies a modulus of 8; 8 or greater implies a modulus of 128). The value received in this field is the maximum number of I-frames that the XID receiver may send and have unacknowledged at any given time.
28(=n)		Reserved
For Channel DLC (System/370 Channel to Controller)		
		Note: The System/370 node always contains the primary link station for channel data link control (CDLC); the controller always contains the secondary station.
19–20		Indicators:
	0	Change CDLC parameters; may be set by the primary on a nonactivation XID; echoed by the secondary; reserved for both primary and secondary for other XID exchange types: 0 do not change CDLC parameters 1 change CDLC parameters to the values in this XID; the parameters that may be changed are buffer prefetch, number of read commands, buffer size, blocking delay, attention timeout, and time units

DLC XID Information Field

Byte	Bit	Content
	1	Attention timeout support; set by the secondary; reserved for the primary: 0 not supported 1 supported
	2	Reserved
	3	Change CDLC parameters support; specifies whether the XID sender supports changing CDLC parameters by means of a nonactivation XID exchange (see bytes 19–20, bit 0): 0 not supported 1 supported
	4–15	Reserved
21–22		Length, in binary, of the maximum link PIU (LPIU) that the XID sender can receive
23		Buffer prefetch: number of buffers suggested for the secondary to preallocate each time the secondary reads LPIUs from the primary
24–25		Number of Read commands: number of Read CCWs the primary must include in every read channel program used to read LPIUs
26–27		Buffer size: for the primary, the size of the input area associated with each Read CCW in channel programs used to read LPIUs; for the secondary, the approximate number of bytes available for LPIU storage in each buffer used for accepting LPIUs from the primary
28–29		Blocking delay: maximum interval that the secondary delays between the time it has an LPIU to send to the primary and the time it presents an Attention to the primary
30–31		Attention timeout: maximum interval that a secondary awaits a read channel program after presenting an Attention to the primary; if the timeout expires, a secondary-detected inoperative station condition is declared. This timeout value is also used for idle detection (1/2 Attention timeout [ATO] is used), second-chance Attention (1/2 ATO is used), and primary-detected inoperative station (3/2 ATO is used)
32–33		Previous number of Read commands: set by the secondary in an XID sent in reply to a change-CDLC-parameters nonactivation XID; otherwise, reserved. The field contains the value of the number-of-Read-commands parameter that was active prior to the change.
34–35		Previous primary buffer size: set by the secondary in an XID sent in reply to a change-CDLC-parameters nonactivation XID; otherwise, reserved. The field contains the value of the primary-buffer-size parameter that was active prior to the change.
36(=n)		Time units: specifies the time units used for Attention timeout and blocking delay X′00′ 100-millisecond time units X′01′ 1-millisecond time units

DLC XID Information Field

Byte	Bit	Content
n + 1 – p		Control vectors, as described in "Control Vectors" in -- Heading 'CF' unknown --. *Note:* The following control vectors may be included; they are parsed according to subfield parsing rule KL (see "Substructure Encoding/Parsing Rules" in -- Heading 'CF' unknown --). X'0E' Network Name control vector: type X'F1', PU name (present only from a T4|5 node XID sender) X'0E' Network Name control vector: type X'F4', network-qualified CP name (always present; the network identifier is always used; i.e., valid lengths of the network-qualified CP name are 3 to 17 bytes with an imbedded period separating the network identifier and CP name parts of the field) X'0E' Network Name control vector: type X'F7', local name of the ALS at the XID sender (present when the sending node provides a nonnegotiated representation of the link in addition to the negotiated TG number) X'10' Product Set ID control vector (always present when the Exchange State indicators are supported) *Note:* When included in XID, the Product Set ID control vector is limited to a maximum of 60 bytes. X'22' XID Negotiation Error control vector (present when an error during XID negotiation is detected; more than one may be present) X'32' Short-Hold Mode control vector (always present when the XID pertains to short-hold mode and the value of the Exchange State indicators is not "prenegotiation exchange") X'46' TG Descriptor control vector (present when the sending node is activating a TG through a virtual routing node, or when a border node is activating an intersubnetwork TG)

C.1.2 ACTLU

C.1.2.1 ACTLU (ACTIVATE LOGICAL UNIT)

SSCP→LU, Exp; SC

ACTLU is sent from an SSCP to an LU to activate a session between the SSCP and the LU and to establish common session parameters.

ACTLU (ACTIVATE LOGICAL UNIT)

Byte	Bit	Content
0		X'0D' request code