TSG-RAN Meeting #17 ***RP-020552***
Biarritz, France, 3 - 6 September 2002

Title: **Agreed CRs (Rel-4 and Rel-5 category A) to TS 25.323**

Source: **TSG-RAN WG2**

Agenda item: **7.2.4**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Versio	Versio
R2-022378	agreed	25.323	054		Rel-4	Corrections to RFC3095 operation	F	4.5.0	4.6.0
R2-022379	agreed	25.323	055		Rel-5	Corrections to RFC3095 operation	A	5.1.0	5.2.0
R2-022380	agreed	25.323	056		Rel-4	Mismatches between Rel4 and R99 in PDCP	F	4.5.0	4.6.0
R2-022381	agreed	25.323	057		Rel-5	Mismatches between Rel4 and R99 in PDCP	A	5.1.0	5.2.0

3GPP TSG-RAN WG2 Meeting #31
Arlanda, Sweden, 19-23 August 2002

Tdoc ⌘R2-022378

CR-Form-v7

CHANGE REQUEST

⌘ **25.323** **CR** **054** ⌘ **rev** **-** ⌘ Current version: **4.5.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Corrections to RFC3095 operation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	RANimp-RABSE
Date:	⌘	18/06/2002
Category:	⌘	**F**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Misalignment of CID values in Tables 1 and 3. In Table 3 the mapping from PID values to CID values is erroneous. PROFILES parameter only restricts the allowed profiles for UL. It is clarified that in DL, all ROHC profiles can always be used.
Summary of change:	⌘	Usage of CID aligned throughout the specification. Clarified that in downlink, all the profiles defined in RFC3095 may always be used.
Consequences if not approved:	⌘	Mapping from PID values to CID values is erroneous.

Clauses affected:	⌘	5.1.1, 5.1.3.2, 5.1.3.5

Other specs Affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
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Below is a brief summary:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.1.1 Mapping of PID values

Depending on the configuration by upper layers (i.e. PDCP PDU type to be used and header compressor protocol), the PDCP sublayer shall be able to:

- identify different types of header compression protocols;
- identify different header compression protocol packet types within a header compression protocol; and
- identify different contexts for a header compression protocol.

The above requirements are realised by utilising the PID field in the PDCP PDU.

The mapping of the PID values shall follow the general rules listed below:

- PID values shall be mapped to the different packet types independently at each PDCP entity;
- PID value "0" shall indicate "no compression". PID value "0" shall be used in a PDCP PDU containing in its Data field a PDCP SDU that is unchanged by the Sender and that shall not be decompressed by the Receiver.;
- PID values are mapped in ascending order, starting from 1, for every configured header compression protocol, in the order of configuration by upper layer. The first available PID value is assigned to the first packet type of the header compression protocol as defined in the specification for this header compression protocol. PID values are mapped for all the specified packet types defined for the header compression protocol and in the order defined in subclause 5.1.2.1 for the respective header compression protocol;
- PID values are re-mapped for the PDCP entity after any reconfiguration of the header compression protocols for that entity.

The following table illustrates an example of the PID value mapping to the packet types when five arbitrary header compression methods are configured for one PDCP entity: RFC 2507[6], Methods A and B, RFC 3095 [8] and Method C. Method A, Method B and Method C are imaginary header compression protocols introduced for the purpose of illustration.

Table 1: Example of the PID value mapping table

PID Value	Optimisation method	Packet type
0	No header compression	-
1	RFC 2507	Full header
2	RFC 2507	Compressed TCP
3	RFC 2507	Compressed TCP nondelta
4	RFC 2507	Compressed non TCP
5	RFC 2507	Context state
6	Method A	Packet Type 1 of Method A
7	Method A	Packet Type 2 of Method A
8	Method B	Packet Type 1 of Method B
9	Method B	Packet Type 2 of Method B
10	RFC 3095	~~CID 0~~CID=0
11	RFC 3095	~~CID 1~~CID=1
12	RFC 3095	~~CID 2~~CID=2
13	Method C	Packet Type 1 of Method C
14	Method C	Packet Type 2 of Method C
15...31	Unassigned value	-

5.1.3 Robust Header Compression (RFC 3095)

The detailed operation of the, "RObust Header Compression (ROHC)" protocol is specified in IETF RFC 3095 [8].

5.1.3.1 Context identifiers

The context of the RFC 3095 protocol is defined in [8]. RFC 3095 can be configured to support one or several contexts. Each context is identified by a value known as the context identifier (CID). If CIDs are to be used, then the CID shall be either:

- included in the PDCP header; or
- included in the RFC 3095 packet format [8].

The choice of which of the above two methods to use is configured by upper layers. The mapping of the PID values is specified in subclauses 5.1.3.2 and 5.1.3.3, respectively for the above two methods.

5.1.3.2 Mapping of PID values for RFC 3095 with CIDs in PDCP PDU Header

The following PID values shall be mapped to the RFC 3095 header compression protocol in the order presented in the table where n is the number of PID values already mapped to other protocol packet types. As shown in the Table 3 below, the mapping of PID values for the RFC 3095 map to the CID values used by RFC 3095. The maximum CID value (x~~CID$_x$~~) is configured by upper layers. If this method is configured by upper layers, PDCP shall not introduce CIDs in the ROHC packet format.

Table 3: Mapping of PID values for RFC 3095 header compression protocol

PID value	Optimisation method	Packet type
n+1	RFC 3095	CID=0~~CID1~~
n+2	RFC 3095	CID=1~~CID2~~
…	RFC 3095	…
…	RFC 3095	…
n+x+1	RFC 3095	CID=x~~CID$_x$~~

5.1.3.3 Mapping of PID values for RFC 3095 with CIDs within ROHC packet format

The following PID value shall be mapped to the RFC 3095 header compression protocol as presented in the table where n is the number of PID values already assigned to other protocol packet types.

Table 4: Mapping of PID values for RFC 3905 header compression protocol

PID value	Optimisation method	Packet type
n+1	RFC 3095	RFC 3095 packet format

If this method is configured by upper layers,, PDCP shall not be configured to accommodate ROHC CIDs in the PDCP PDU header .

5.1.3.4 RFC 3095 Segmentation

The RFC 3095 protocol supports segmentation. The segmentation:

- can vary on a packet-by-packet basis; and
- does not add any overhead to packets that are not segmented.

The Segmentation option of RFC 3095 shall:

- not be used when RLC is configured in non-transparent mode [5], in which case the MRRU (maximum reconstructed reception unit) shall be set equal to 0;

- only be used when RLC is configured in transparent mode and the PACKET_SIZES_ALLOWED is used to configure ROHC packet sizes;
- be applied if the produced packet does not fit the largest packet as indicated by PACKET_SIZES_ALLOWED.

5.1.3.5 Protocol Parameters

RFC 3095 has two types of parameters [8]:

- configuration parameters: these are mandatory and must be configured between compressor and decompressor peers.
- implementation parameters: these are optional and, when used, stipulate how RFC 3095 operates.

These parameters are categorized in four different groups, as defined below:

- M: Mandatory and configured by upper layers.
- MO: Parameters that must be supported and when used can only be configured or triggered by upper layers.
- O: Optional RFC 3095 parameters that are not configured by upper layers. They may be used locally (i.e. UTRAN and/or in UE) for RFC 3095.
- N/A: These are not used in RFC 3095.

The usage and definition of the parameters shall be as specified below.

- CID_INCLUSION_INFO (M): This defines whether RFC3095 CID values are transferred within PDCP headers or RFC3095 packet format. See chapter 5.1.3.1 for more information.
- MAX_CID (M): This is the maximum CID value that can be used. One CID value shall always be reserved for uncompressed flows.
- LARGE_CIDS: This is not configured by upper layers but inferred from the configured value of MAX_CID according to the following rule:

  If MAX_CID > 15 then LARGE_CIDS = TRUE else LARGE_CIDS = FALSE.

- PROFILES (M): Profiles are used to define which profiles are allowed to be used by the UE in uplink. In downlink, all the profiles defined in [8] shall be supported. ~~All profiles defined in [8] shall be supported by the UE.~~
- FEEDBACK_FOR (N/A):
- MRRU (M): Segmentation is not used by default.
- NO_OF_PACKET_SIZES_ALLOWED (O).
- PACKET_SIZES_ALLOWED (MO): This parameter, if configured, governs which packet sizes in bytes may be used by RFC 3095. Thus, packet sizes not in the set of values for this parameter shall not be used.
- PAYLOAD_SIZES (O).
- NO_OF_PACKET_SIZES_USED (O).
- PACKET_SIZES_USED (O).
- CONTEXT_REINITIALIZATION (MO).
- MODE (O).
- CLOCK_RESOLUTION (O).
- REVERSE_DECOMPRESSION_DEPTH (M): Default value is that reverse decompression is not used.

3GPP TSG-RAN WG2 Meeting #31
Arlanda, Sweden, 19-23 August 2002

Tdoc ⌘R2-022379

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CHANGE REQUEST

⌘ **25.323** **CR** **055** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

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Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

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Source:	⌘	TSG-RAN WG2
Work item code:	⌘	RANimp-RABSE
Date:	⌘	18/06/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
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Other specs affected: ⌘	Y	N		⌘
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- FEEDBACK_FOR (N/A):
- MRRU (M): Segmentation is not used by default.
- NO_OF_PACKET_SIZES_ALLOWED (O).
- PACKET_SIZES_ALLOWED (MO): This parameter, if configured, governs which packet sizes in bytes may be used by RFC 3095. Thus, packet sizes not in the set of values for this parameter shall not be used.
- PAYLOAD_SIZES (O).
- NO_OF_PACKET_SIZES_USED (O).
- PACKET_SIZES_USED (O).
- CONTEXT_REINITIALIZATION (MO).
- MODE (O).
- CLOCK_RESOLUTION (O).
- REVERSE_DECOMPRESSION_DEPTH (M): Default value is that reverse decompression is not used.

3GPP TSG-RAN WG2 #31 ***R2-022380***
Stockholm, Sweden, 19th-23th August, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.323** **CR** **056** ⌘ **rev** **-** ⌘ Current version: **4.5.0** ⌘

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Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Mismatches between Rel4 and R99 in PDCP
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI4
Date:	⌘	22/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-4

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Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	At RAN2 #23 Helsinki meeting, there was big change in PDCP. R2-012166 is a shadow CR of R2-012165, just opened at the end of the meeting. However, there are mismatches of descriptions between R99 and Rel4. It is a CR producing error.
Summary of change:	⌘	There are corrections based on R99. - In 5.1.1, PID description is separately applied according to Header Compression mechanism. And the reference about the description of PID order is corrected. - In 8.3.2, the description of PID is changed. - In 8.3.3, the description of Data is changed. - In 9.1, the description of Invalid PDU type is changed.
Consequences if not approved:	⌘	Misalignment still remains between R99 and Rel4 in PDCP Specs.

Clauses affected:	⌘	5.1.1, 8.3.2, 8.3.3, 9.1

Other specs affected: ⌘	Y	N		⌘
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5.1.1 Mapping of PID values

Depending on the configuration by upper layers (i.e. PDCP PDU type to be used and header compressor protocol), the PDCP sublayer shall be able to:

- identify different types of header compression protocols; and

- if RFC2507:

  - distinguish ~~identify~~ different header compression protocol packet types within a header compression protocol; ~~and~~

- if RFC3095:

  - distinguish ~~identify~~ different contexts for a header compression protocol.

The above requirements are realised by utilising the PID field in the PDCP PDU.

The mapping of the PID values shall follow the general rules listed below:

- PID values shall be mapped to the different packet types independently at each PDCP entity;

- PID value "0" shall indicate "no compression". PID value "0" shall be used in a PDCP PDU containing in its Data field a PDCP SDU that is unchanged by the Sender and that shall not be decompressed by the Receiver.;

- PID values are mapped in ascending order, starting from 1, for every configured header compression protocol, in the order of configuration by upper layer. The first available PID value is assigned to the first packet type of the header compression protocol as defined in the specification for this header compression protocol. PID values are mapped for all the specified packet types defined for the header compression protocol and in the order defined in subclause 5.1.2.~~1~~2, 5.1.3.1 and 5.1.3.3 for the respective header compression protocol;

- PID values are re-mapped for the PDCP entity after any reconfiguration of the header compression protocols for that entity.

The following table illustrates an example of the PID value mapping to the packet types when five arbitrary header compression methods are configured for one PDCP entity: RFC 2507[6], Methods A and B, RFC 3095 [8] and Method C. Method A, Method B and Method C are imaginary header compression protocols introduced for the purpose of illustration.

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6	Method A	Packet Type 1 of Method A
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8	Method B	Packet Type 1 of Method B
9	Method B	Packet Type 2 of Method B
10	RFC 3095	CID 0
11	RFC 3095	CID 1
12	RFC 3095	CID 2
13	Method C	Packet Type 1 of Method C
14	Method C	Packet Type 2 of Method C
15...31	Unassigned value	-

8.3.2 PID

Length: 5 bits.

The PID field indicates the used header compression and packet type or a context identifier.

Bit	Description
00000	No header compression
00001-11111	Dynamically negotiated header compression identifier, as described in subclause 5.1.1

The PID field value indicates the used header compression protocol type and packet type or CID. A specific header compression protocol may utilize a certain range of consecutive values from the PID field value space for different packet types. The Receiving PDCP entity performs the necessary operation (e.g. header decompression) according to the PID field value. ~~There is no fixed relationship between the PID field value and the used optimisation / packet type; PID field values are mapped on PDCP set-up and re-configuration.~~

~~The PID field can also be used to represent context identifier values, as specified in subclause 5.1.1.~~

8.3.3 Data

The Data field may include either one of the following:

- Uncompressed PDCP SDU;
- Header compressed PDCP SDU;
- Header compression protocol feedback information.

~~If:~~

- ~~header compression is configured; and~~
- ~~PDU type = PDCP Data PDU, or PDU type = PDCP SeqNum PDU:~~
  - ~~PDCP SDUs with headers compressed; or~~
  - ~~Header compression protocol feedback information shall be mapped to the "Data" field.~~

~~Else:~~

- ~~if header compression is not configured; and~~
- ~~if RB is configured for "lossless Relocation"; and~~
- ~~if PDU type = PDCP No header PDU:~~
  - ~~uncompressed PDCP SDUs shall be mapped to the "Data" field.~~

9.1 Invalid PDU type

If a PDCP entity receives a PDCP PDU with a PDU Type set to Reserved (see subclause 8.3.1), it shall:

- discard the PDCP PDU.

If a PDCP entity is not configured for lossless SRNS Relocation and receives a PDCP SeqNum PDU, it shall:

~~- ignore the Sequence number field of the PDCP SeqNum PDU.~~

- discard the PDCP SeqNum PDU.

3GPP TSG-RAN WG2 #31 ***R2-022381***
Stockholm, Sweden, 19th-23th August, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.323** **CR** **057** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Mismatches between Rel4 and R99 in PDCP
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI4
Date:	⌘	22/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	At RAN2 #23 Helsinki meeting, there was big change in PDCP. R2-012166 is a shadow CR of R2-012165, just opened at the end of the meeting. However, there are mismatches of descriptions between R99 and Rel4. It is a CR producing error.
Summary of change:	⌘	There are corrections based on R99. - In 5.1.1, PID description is separately applied according to Header Compression mechanism. And the reference about the description of PID order is corrected. - In 8.3.2, the description of PID is changed. - In 8.3.3, the description of Data is changed. - In 9.1, the description of Invalid PDU type is changed.
Consequences if not approved:	⌘	Misalignment still remains between R99 and Rel4 in PDCP Specs.

Clauses affected:	⌘	5.1.1, 8.3.2, 8.3.3, 9.1

Other specs affected: ⌘

Y	N	
	X	Other core specifications
	X	Test specifications
	X	O&M Specifications

⌘

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.1.1 Mapping of PID values

Depending on the configuration by upper layers (i.e. PDCP PDU type to be used and header compressor protocol), the PDCP sublayer shall be able to:

- identify different types of header compression protocols; and

- if RFC2507:

  - distinguish ~~identify~~ different header compression protocol packet types within a header compression protocol; ~~and~~

- if RFC3095:

  - distinguish ~~identify~~ different contexts for a header compression protocol.

The above requirements are realised by utilising the PID field in the PDCP PDU.

The mapping of the PID values shall follow the general rules listed below:

- PID values shall be mapped to the different packet types independently at each PDCP entity;

- PID value "0" shall indicate "no compression". PID value "0" shall be used in a PDCP PDU containing in its Data field a PDCP SDU that is unchanged by the Sender and that shall not be decompressed by the Receiver.;

- PID values are mapped in ascending order, starting from 1, for every configured header compression protocol, in the order of configuration by upper layer. The first available PID value is assigned to the first packet type of the header compression protocol as defined in the specification for this header compression protocol. PID values are mapped for all the specified packet types defined for the header compression protocol and in the order defined in subclause 5.1.2.~~1~~2, 5.1.3.1 and 5.1.3.3 for the respective header compression protocol;

- PID values are re-mapped for the PDCP entity after any reconfiguration of the header compression protocols for that entity.

The following table illustrates an example of the PID value mapping to the packet types when five arbitrary header compression methods are configured for one PDCP entity: RFC 2507[6], Methods A and B, RFC 3095 [8] and Method C. Method A, Method B and Method C are imaginary header compression protocols introduced for the purpose of illustration.

Table 1: Example of the PID value mapping table

PID Value	Optimisation method	Packet type
0	No header compression	-
1	RFC 2507	Full header
2	RFC 2507	Compressed TCP
3	RFC 2507	Compressed TCP nondelta
4	RFC 2507	Compressed non TCP
5	RFC 2507	Context state
6	Method A	Packet Type 1 of Method A
7	Method A	Packet Type 2 of Method A
8	Method B	Packet Type 1 of Method B
9	Method B	Packet Type 2 of Method B
10	RFC 3095	CID 0
11	RFC 3095	CID 1
12	RFC 3095	CID 2
13	Method C	Packet Type 1 of Method C
14	Method C	Packet Type 2 of Method C
15...31	Unassigned value	-

8.3.2 PID

Length: 5 bits.

The PID field indicates the used header compression and packet type or a context identifier.

Bit	Description
00000	No header compression
00001-11111	Dynamically negotiated header compression identifier, as described in subclause 5.1.1

The PID field value indicates the used header compression protocol type and packet type or CID. A specific header compression protocol may utilize a certain range of consecutive values from the PID field value space for different packet types. The Receiving PDCP entity performs the necessary operation (e.g. header decompression) according to the PID field value. ~~There is no fixed relationship between the PID field value and the used optimisation / packet type; PID field values are mapped on PDCP set-up and re-configuration.~~

~~The PID field can also be used to represent context identifier values, as specified in subclause 5.1.1.~~

8.3.3 Data

The Data field may include either one of the following:

- Uncompressed PDCP SDU;
- Header compressed PDCP SDU;
- Header compression protocol feedback information.

~~If:~~

- ~~header compression is configured; and~~
- ~~PDU type = PDCP Data PDU, or PDU type = PDCP SeqNum PDU:~~
  - ~~PDCP SDUs with headers compressed; or~~
  - ~~Header compression protocol feedback information shall be mapped to the "Data" field.~~

~~Else:~~

- ~~if header compression is not configured; and~~
- ~~if RB is configured for "lossless Relocation"; and~~
- ~~if PDU type = PDCP No header PDU:~~
  - ~~uncompressed PDCP SDUs shall be mapped to the "Data" field.~~

9.1 Invalid PDU type

If a PDCP entity receives a PDCP PDU with a PDU Type set to Reserved (see subclause 8.3.1), it shall:

- discard the PDCP PDU.

If a PDCP entity is not configured for lossless SRNS Relocation and receives a PDCP SeqNum PDU, it shall:

~~- ignore the Sequence number field of the PDCP SeqNum PDU.~~

- discard the PDCP SeqNum PDU.