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**3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"**

Data Service Options for Spread Spectrum Systems

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3RD GENERATION
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Data Service Options for Spread Spectrum Systems: cdma2000 High Speed Packet Data Service Option 33

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2 No text

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1 1 INTRODUCTION

2 1.1 General Description

3 This chapter defines requirements for support of high speed packet data transmission
4 capability on cdma2000 spread spectrum systems. Packet data transmission is supported
5 on cdma2000 Traffic Channels using primary or secondary traffic. For packet data
6 transmission using Service Option 33, the Radio Link Protocol Type 3 specified in
7 C.S0017-0-2.10 is used.

8 This standard specifies a packet data bearer service for communication between terminal
9 equipment and a packet data serving node (PDSN) via a base station/packet control
10 function (BS/PCF).

11 Packet data service options provide a means of establishing and maintaining Traffic
12 Channels for packet data service. Service Option 33 is used to request packet data service
13 through a PDSN supporting an Internet standard Point-to-Point Protocol (PPP) interface to
14 network layer protocols (see 4.1). Additional packet data service options may be defined in
15 future revisions to select other types of PDSN resources or services.

16 1.2 Terms

17 **Base Station (BS).** A fixed station used for communicating with mobile stations.
18 Depending upon the context, the term base station may refer to a cell, a sector within a
19 cell, or other part of the wireless system.

20 **BS.** See base station.

21 **BS/PCF.** The base station and packet control function considered as a single functional
22 entity.

23 **Data Circuit Terminating Equipment (DCE).** A DCE connects a DTE to the network. A
24 typical DCE would be a V-series modem.

25 **DTE.** Data Terminal Equipment.

26 **ESCAM.** *Extended Supplemental Channel Assignment Message* (see [16]).

27 **Forward Dedicated Control Channel.** A portion of a Forward Traffic Channel.

28 **Forward Fundamental Channel.** A portion of a Forward Traffic Channel.

29 **Forward Supplemental Channel.** A portion of a Forward Traffic Channel which operates
30 in conjunction with a Forward Fundamental Channel or Forward Dedicated Control
31 Channel in that Forward Traffic Channel to provide higher data rate services than using
32 only a Forward Fundamental Channel or Forward Dedicated Control Channel.

33 **FSCAMM.** *Forward Supplemental Channel Assignment Mini Message* (see [16]).

34 **Forward Traffic Channel.** One or more Forward CDMA channels used to transport user
35 and signaling traffic from the base station to the mobile station. See Forward Fundamental
36 Channel, Forward Dedicated Control Channel, and Forward Supplemental Channel.

37 **IP.** Internet Protocol.

- 1 **IPCP.** Internet Protocol Control Protocol (see [5]).
- 2 **LCP.** PPP Link Control Protocol (see [7]).
- 3 **Mobile IP.** Mobile Internet Protocol (see [10]).
- 4 **Mobile Station.** A station in the Public Cellular Radio Telecommunications Service
5 intended to be used while in motion or during halts at unspecified points. Mobile stations
6 include portable units (e.g., hand-held personal units) and units installed in vehicles.
- 7 **MSC.** Mobile Switching Center.
- 8 **MT0.** Mobile Termination 0 (see 1.4.1).
- 9 **MT2.** Mobile Termination 2 (see 1.4.1).
- 10 **NID.** Network Identification (see [16]).
- 11 **PCF.** Packet Control Function.
- 12 **PDSN.** Packet Data Serving Nodes.
- 13 **PPP.** Point-to-Point Protocol (see [7]).
- 14 **QoS.** See Quality of Service.
- 15 **Quality of Service.** The set of parameters and procedures associated with a service or
16 user, indicating some of the capabilities and constraints related to the delivery of the
17 service to the user.
- 18 **Radio Configuration.** A set of Forward Traffic Channel and Reverse Traffic Channel
19 transmission formats that are characterized by physical layer parameters such as
20 transmission rates, modulation characteristics, and spreading rate.
- 21 **Reverse Dedicated Control Channel.** A portion of a Reverse Traffic Channel.
- 22 **Reverse Fundamental Channel.** A portion of a Reverse Traffic Channel.
- 23 **Reverse Supplemental Channel.** A portion of a Reverse Traffic Channel which operates in
24 conjunction with a Reverse Fundamental Channel or Reverse Dedicated Control Channel in
25 that Reverse Traffic Channel to provide higher data rate services than using only a Forward
26 Fundamental Channel or Forward Dedicated Control Channel.
- 27 **Reverse Traffic Channel.** One or more reverse CDMA channels on which data and
28 signaling are transmitted from a mobile station to a base station. See Reverse Dedicated
29 Control Channel, Reverse Fundamental Channel, and Reverse Supplemental Channel.
- 30 **RFC.** Request for Comments. The generic name of a specification developed by the
31 Internet Engineering Task Force (IETF).
- 32 **RLP.** Radio Link Protocol.
- 33 **RSCAMM.** *Reverse Supplemental Channel Assignment Mini Message* (see [16]).
- 34 **SCRM.** *Supplemental Channel Request Message* (see [16]).
- 35 **SCRMM.** *Supplemental Channel Request Mini Message* (see [16]).

1 **Short Data Burst.** A Short Data Burst is a portion of a *Data Burst Message* that carries
2 service option data in the CHARi fields.

3 **SID.** System Identification (see [16]).

4 **SLIP.** Serial Line IP.

5 **sr_id.** Service Reference Identifier (see [14]).

6 **TCP.** Transmission Control Protocol.

7 **TE2.** Terminal Equipment 2 (see 1.4.1).

8 **Traffic Channel.** One or more CDMA channels on which data and signaling are
9 transmitted between a mobile station and base station. See Forward Traffic Channel and
10 Reverse Traffic Channel.

11 **UHDM.** *Universal Handoff Direction Message* (see [16]).

12 **1.3 References**

13 The following standards contain provisions which, through references in this text, become
14 provisions of this Standard. At the time of publication, the editions indicated were valid.
15 All standards are subject to revision, and parties to agreements based on this Standard are
16 encouraged to investigate the possibility of applying the most recent editions of the
17 standards indicated below. ANSI and TIA maintain registers of currently valid standards
18 published by them.

19 **1. EIA/TIA-232-E** *Interface Between DTE and DCE Employing Serial Binary*
20 *Data Interchange.*

21 **2. RFC 791** *Internet Protocol.*

22 **3. RFC 1055** *Nonstandard for transmission of IP datagrams over serial*
23 *lines: SLIP.*

24 **4. RFC 1144** *Compressing TCP/IP Headers for Low-Speed Serial Links.*

25 **5. RFC 1332** *The PPP Internet Protocol Control Protocol (IPCP).*

26 **6. RFC 1570** *PPP LCP Extensions.*

27 **7. RFC 1661** *The Point-to-Point Protocol (PPP).*

28 **8. RFC 1662** *PPP in HDLC-like Framing.*

29 **9. RFC 1700** *Assigned Numbers.*

30 **10. RFC 2002** *IP Mobility Support.*

31 **11. cdma2000 Release A** A family of standards which comprise the cdma2000 Mobile
32 Station-Base Station compatibility specification. The family
33 includes [12], [13], [14], [15], [16], and [17].

34 **12. C.S0001-A** *Introduction to cdma2000 Standards for Spread Spectrum*
35 *Systems*

- 1 **13. C.S0002-A** *Physical Layer Standard for cdma2000 Spread Spectrum*
2 *Systems*
- 3 **14. C.S0003-A** *Medium Access Control (MAC) Standard for cdma2000*
4 *Spread Spectrum Systems*
- 5 **15. C.S0004-A** *Link Access Control (LAC) Standard for cdma2000 Spread*
6 *Spectrum Systems*
- 7 **16. C.S0005-A** *Upper Layer (Layer 3) Standard for cdma2000 Spread*
8 *Spectrum Systems*
- 9 **17. C.S0006-A** *Analog Standard for cdma2000 Spread Spectrum Systems*
- 10 **18. A.S0001** *Inter-operability Specification (IOS) for cdma2000 Access*
11 *Network Interfaces*

12 **1.4 Overview of Packet Data Service**

13 1.4.1 Protocol Options

14 This standard provides the requirements for communication protocols on the links between
15 a mobile station and PDSN, including requirements for the R_m , U_m and A8/A9/A_{quater}
16 interfaces.

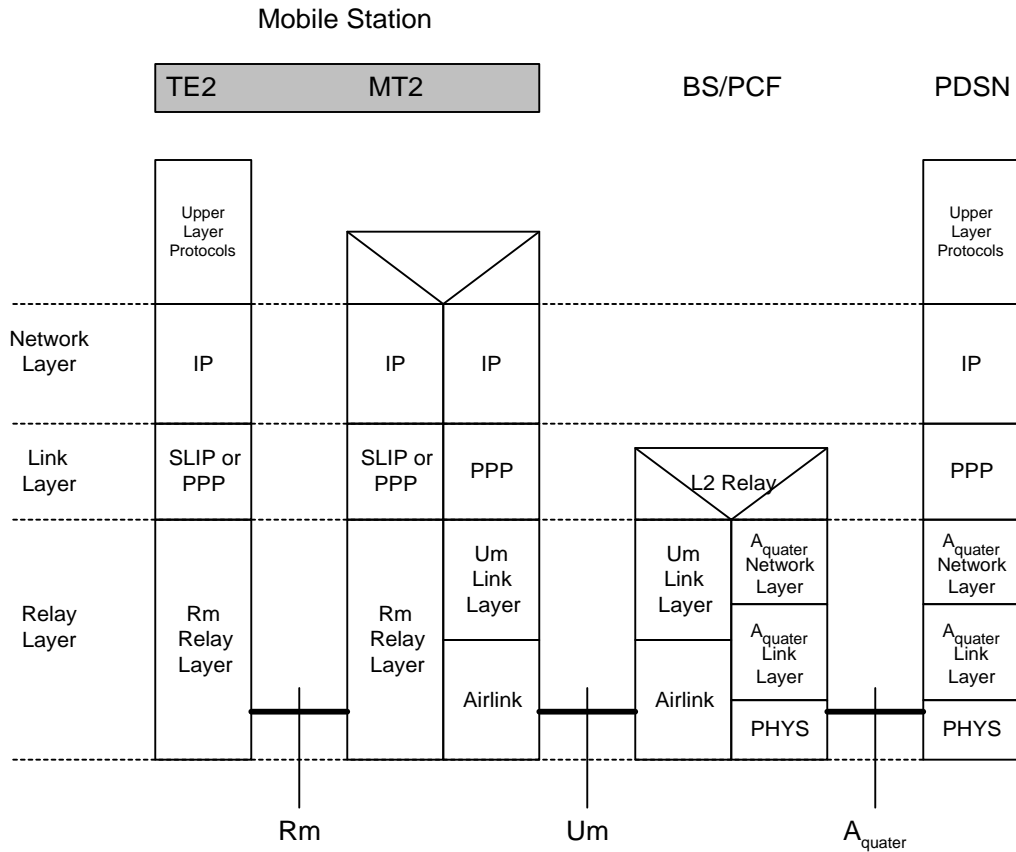
17 The Relay Layer provides lower layer communication and packet framing between the
18 entities of the packet data service reference model. Over the R_m interface between the TE2
19 and the MT2, the Relay Layer is not specified in this document. Over the U_m interface, the
20 Relay Layer is a combination of RLP Type 3 and the protocols defined in [11]. On the
21 A8/A9/A_{quater} interface, the Relay Layer uses the protocols defined in [18].

22 The two options for packet protocol stacks are presented in 1.4.1.1 and 1.4.1.2.

23 1.4.1.1 Relay Layer R_m Interface Protocol Option

24 The Relay Layer R_m interface protocol option supports TE2 applications in which the TE2 is
25 responsible for some aspects of packet data service mobility management and network
26 address management (e.g., IPCP). For the Relay Layer R_m interface protocol option, the
27 packet data service protocol stack is as shown in Figure 1.

28



1

2

Figure 2 Network Layer R_m Interface Protocol Option

3

In this protocol option, there are independent Link Layer connections between the TE2 and the MT2, and between the MT2 and the PDSN. The Link Layer between the MT2 and the PDSN is implemented using PPP, as defined in [7]. For the remainder of this chapter, this Link Layer connection is called the PDSN Link Layer.

7

The Link Layer between the MT2 and the TE2 should be implemented using PPP, as defined in [7]. Alternatively, the SLIP protocol as defined in [3] may be used. For the remainder of this chapter, this Link Layer connection is called the R_m Link Layer.

10

For this R_m interface protocol option, the Network Layer also provides independent services between the TE2 and the MT2, and between the MT2 and the PDSN. The TE2 includes routing protocols and operates as if locally connected to a network routing server. The MT2 includes both routing and packet data network registration and authentication protocols.

14

1.4.2 Packet Data Protocol States

15

1.4.2.1 PDSN Link Layer Connection States

16

The PDSN and the mobile station use a Link Layer connection to transmit and receive packet data. The PDSN Link Layer connection is opened when a packet data service option is first connected. Once a PDSN Link Layer connection is opened, bandwidth (in the form of Traffic Channel assignment) is allocated to the connection on an as-needed basis.

19

1 The PDSN Link Layer connection can be in any of the following states:

- 2 • Closed: The PDSN Link Layer connection is closed when the PDSN has no Link Layer
3 connection state information for the mobile station.
- 4 • Opened: The PDSN Link Layer connection is opened when the PDSN has Link Layer
5 connection state information for the mobile station.

6 The mobile station and PDSN maintain the state of the PDSN Link Layer connection as
7 defined above. The mobile station maintains the state of the PPP Link Control Protocol
8 (LCP), and manages the PDSN Link Layer connection using the LCP opening and closing
9 procedures defined in [7].

10 1.4.2.2 Mobile Station Packet Data Service States

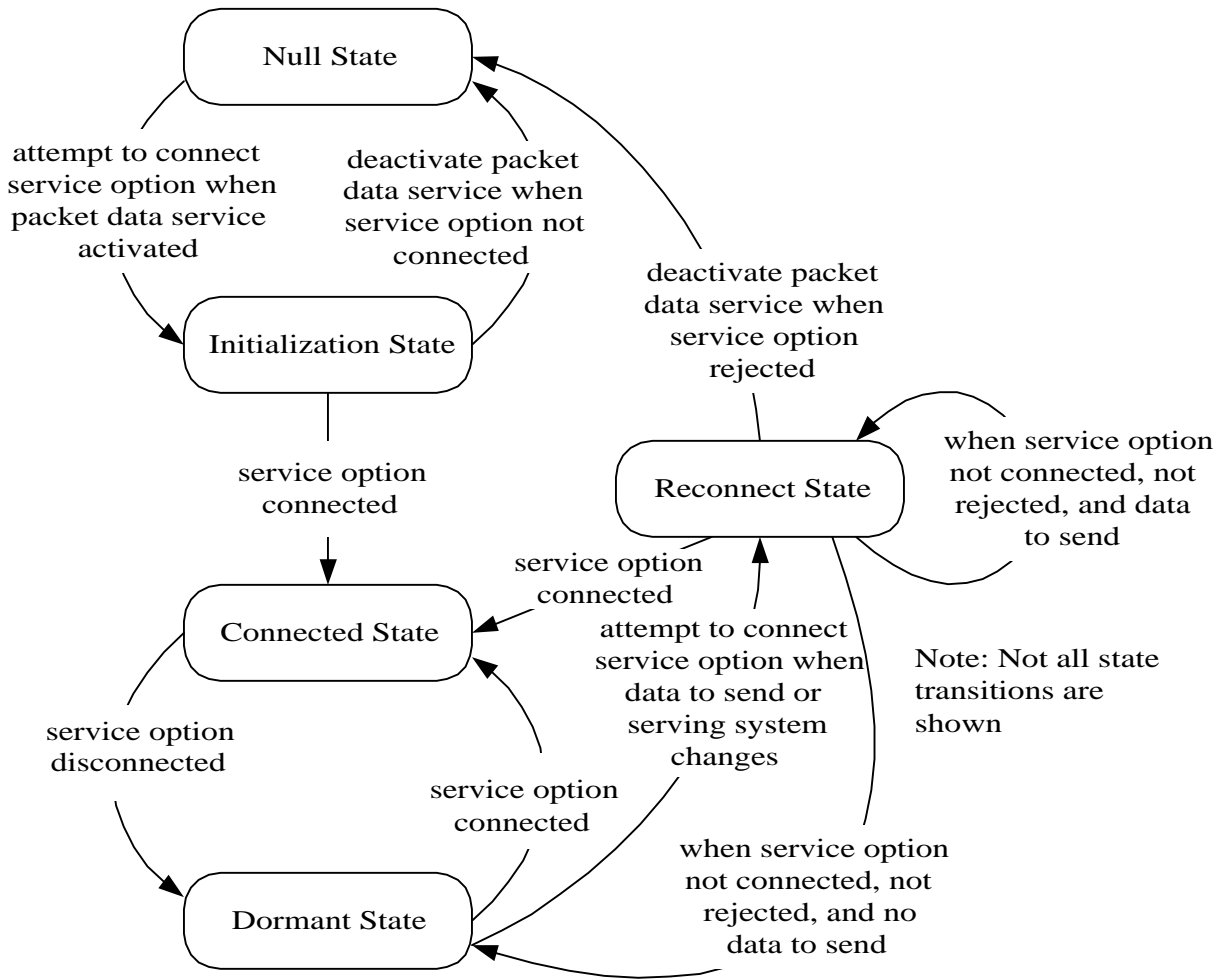
11 Packet data service processing in the mobile station consists of the following states.
12 Requirements for the transitions between these states are given in 2.2.2.1.1.

- 13 • *Inactive State* - In this state, the mobile station does not provide packet data service.
- 14 • *Active State* - In this state, the mobile station provides packet data service.

15 The mobile station performs the packet data service call control function described in
16 2.2.2.1.2. As illustrated in Figure 3, the packet data service call control function consists of
17 the states listed below:

- 18 • *Null State* - The packet data service call control function is in this state when packet
19 data service has not been activated.
- 20 • *Initialization State* - In this state, the mobile station attempts to connect a packet data
21 service option.
- 22 • *Connected State* - In this state, a packet data service option is connected.
- 23 • *Dormant State* - In this state, the packet data service option is disconnected.
- 24 • *Reconnect State* - In this state, the mobile station attempts to connect a previously
25 connected packet data service option.

26



1
2

3 **Figure 3 Packet Data Service Call Control States in the Mobile Station**

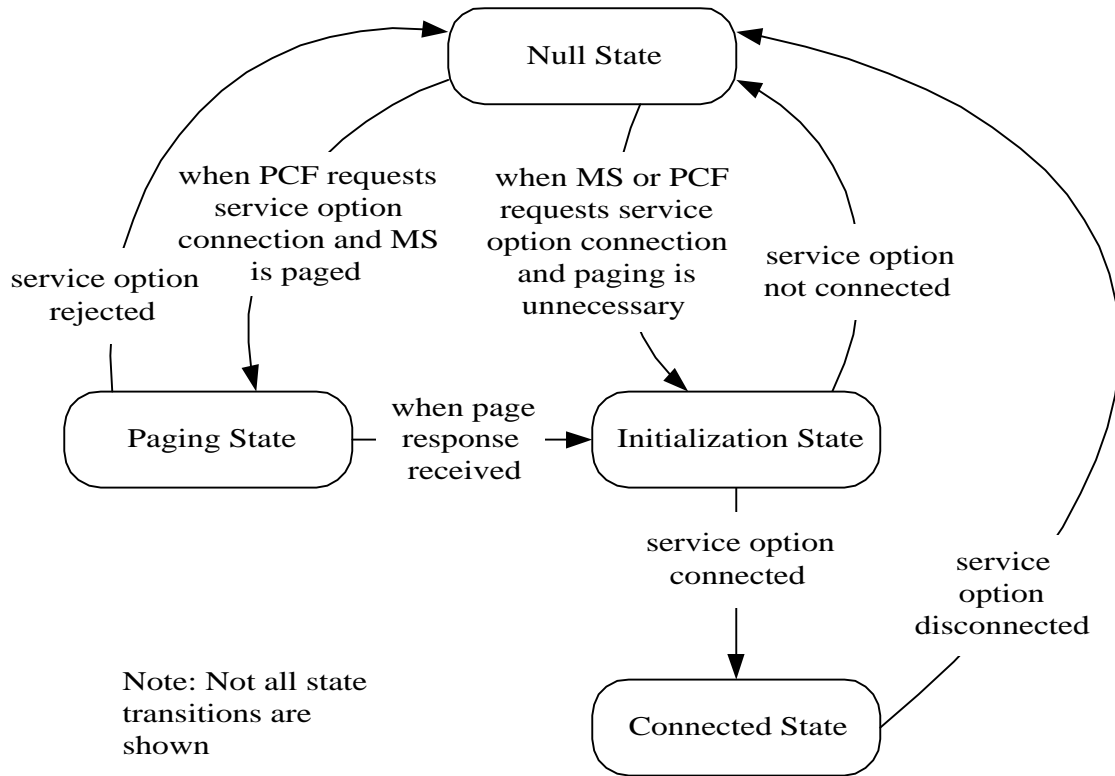
4

5 1.4.2.3 BS Packet Data Service States

6 The base station performs the packet data service call control function described in
7 2.2.2.2.1. As illustrated in Figure 4, the packet data service call control function consists
8 of the following states:

- 9 • *Null State* - In this state, the base station has no connection of a packet data service
10 option to the mobile station.
- 11 • *Paging State* - In this state, the PCF has requested that the base station connect a
12 packet data service option, and the base station has paged the mobile station.
- 13 • *Initialization State* - In this state, the base station awaits connection of a packet data
14 service option.

- 1 • *Connected State* - In this state, a packet data service option has been connected.
- 2



- 3
- 4
- 5

Figure 4 Packet Data Service Call Control States in the BS

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2 No text.

3

1 **2 RELAY LAYER**

2 **2.1 Introduction**

3 The Relay Layer spans across the R_m , U_m , and A8/A9/ A_{quater} interfaces. See Section 2.1 of
4 IS-707-A.3 for R_m interface requirements. U_m interface requirements for the Relay Layer
5 are described in the following sections.

6 RLP can be carried either as primary traffic or as secondary traffic. The mobile station and
7 the base station shall support the physical layer, multiplex options, radio link
8 management, and call control protocols as defined in [11].

9 At the A_{quater} interface, the PCF and the PDSN use the protocols recommended in [18] for
10 transport of end-user data and control information. Protocols used for the A8/A9 interface
11 between the base station and the PCF are specified in [18].

12 **2.2 U_m Interface Requirements**

13 2.2.1 RLP Requirements

14 At the U_m interface, the mobile station and the base station shall use the Radio Link
15 Protocol Type 3. In this specification, the Radio Link Protocol Type 3 will be called RLP.

16 For service option 33, the base station RLP may segment new data frames that it sends.
17 For service option 33, the mobile station RLP shall not segment new data frames that it
18 sends.

19 2.2.2 Service and Call Control Procedures

20 2.2.2.1 Mobile Station Procedures

21 The packet data service states for mobile stations are described in 1.4.2.2. Mobile station
22 states are described in [16].

23 When power is applied to the mobile station, the packet data service shall enter the *Inactive*
24 *State* and the packet data service call control function shall enter the *Null State*.

25 2.2.2.1.1 Packet Data Service Control Procedures

26 2.2.2.1.1.1 Inactive State

27 When the packet data service is in the *Inactive State*, the mobile station does not provide
28 packet data service. The means for determining when the packet data service enters the
29 *Active State* are left to the mobile station manufacturer.

30 When the packet data service enters the *Inactive State* from the *Active State*, if the Network
31 Layer R_m interface protocol option is selected, and the R_m Link Layer interface is
32 implemented using PPP, the MT2 should close the R_m Link Layer connection.

33 2.2.2.1.1.2 Active State

34 When the packet data service is in the *Active State*, the mobile station provides packet data
35 service.

1 2.2.2.1.2 Packet Data Service Call Control Function

2 2.2.2.1.2.1 Null State

3 The mobile station packet data service call control function is in the *Null State* whenever
4 the packet data service is in the *Inactive State*.

5 If the packet data service enters the *Active State*, the mobile station shall perform the
6 following:

- 7 • If the Network Layer R_m interface protocol option is selected, and the R_m interface Link
8 Layer is implemented using PPP, the MT2 shall initiate PPP configuration on the R_m
9 interface, using the procedures defined in [8].
- 10 • If the mobile station is in the *Mobile Station Idle State*, or when the mobile station enters
11 the *Mobile Station Idle State*, the mobile station shall initiate connection of the packet
12 data service option, as described in 2.2.3. The packet data service call control function
13 shall enter the *Initialization State*.
- 14 • If the mobile station supports concurrent services signaling, and the mobile station is in
15 the *Mobile Station Control on the Traffic Channel State*, the mobile station shall initiate
16 connection of the packet data service option, as described in 2.2.3. The packet data
17 service call control function shall enter the *Initialization State*.

18 If the packet data service call control function enters the *Null State*, the mobile station shall
19 indicate to the base station that the packet data service is inactive. The mobile station
20 shall disconnect the packet data service option, and if the mobile station does not support
21 concurrent services signaling, the mobile station shall disconnect the call.

22 2.2.2.1.2.2 Initialization State

23 While the packet data service call control function is in the *Initialization State*, the mobile
24 station shall perform the following:

- 25 • If the packet data service option is connected, the packet data service call control
26 function shall enter the *Connected State* when the call control instance enters the
27 *Conversation Substate*.
- 28 • The packet data service shall enter the *Inactive State* if any of the following occur:
 - 29 – The packet data service option cannot be connected; or
 - 30 – The mobile station enters the *Mobile Station Initialization State*; or
 - 31 – The mobile station exits the *System Access State* and enters any state other than
32 the *Mobile Station Control on the Traffic Channel State*.
- 33 • If the packet data service enters the *Inactive State*, the packet data service call control
34 function shall enter the *Null State*.

35 2.2.2.1.2.3 Connected State

36 When the packet data service call control function enters the *Connected State*, the mobile
37 station begins RLP initialization.

38 While in the *Connected State*, the mobile station shall perform the following:

- 1 • If the ~~mobile station exits the *Mobile Station Control on the Traffic Channel State* packet~~
 2 ~~data service option is disconnected, the mobile station shall perform the following:~~
- 3 ~~– the mobile station shall set the packet data dormant timer to the value specified~~
 4 ~~in 2.2.4 and start the timer;~~
- 5 ~~– the packet data service call control function shall enter the *Dormant State*.~~
- 6 • The mobile station shall maintain a packet data inactivity timer. The value of this timer
 7 shall not be less than 20 seconds. The timer should be reset whenever a non-idle-RLP
 8 data frame is sent or received. If the packet data inactivity timer expires, the mobile
 9 station should disconnect the packet data service option.
- 10 ~~• If the packet data service option is disconnected, the packet data service call control~~
 11 ~~function shall enter the *Dormant State*.~~
- 12 • If packet zone hysteresis is enabled (see 2.2.5) and if the mobile station sends or
 13 receives user data,¹ the mobile station shall set the packet zone hysteresis activation
 14 indicator to 1.
- 15 • If the packet data service enters the *Inactive State*, the packet data service call control
 16 function shall enter the *Null State*.
- 17 • When the amount of user data in the mobile station reaches an implementation defined
 18 threshold, the mobile station may request reverse high speed operation (see 2.2.7~~2.2.6~~).

19 2.2.2.1.2.4 Dormant State

20 While the packet data service call control function is in the *Dormant State*, the mobile
 21 station shall perform the following:

- 22 • The mobile station shall store the current value of SID, NID, and PACKET_ZONE_IDS.
- 23 • If the packet data service option is connected, the packet data service call control
 24 function shall enter the *Connected State* when the call control instance enters the
 25 *Conversation Substate*.
- 26 • If the packet data service enters the *Inactive State*, the packet data service call control
 27 function shall enter the *Null State*.
- 28 • If the packet data service has data to send and the mobile station chooses to use a
 29 Short Data Burst to send the data, the mobile station shall send the Short Data Burst
 30 according to 2.2.9.
- 31 • If packet zone hysteresis is enabled (see 2.2.5), and if the mobile station sends or
 32 receives a Short Data Burst containing user data, the mobile station shall set the
 33 packet zone hysteresis activation indicator to 1.
- 34 • If packet zone hysteresis is enabled (see 2.2.5), the mobile station shall maintain a
 35 packet zone hysteresis activation timer. If the packet zone hysteresis activation

¹ User data is assumed to be present whenever the mobile station or base station sends or receives a Short Data Burst or a non-idle, non-fill RLP data frame.

1 indicator is set to 1, the mobile station shall set the packet zone hysteresis activation
 2 timer to an implementation dependent value, greater than or equal to 0 seconds and
 3 less than or equal to 30 seconds, and shall start the timer. The mobile station shall
 4 then set the packet zone hysteresis activation indicator to 0.

- 5 • If any of the following occurs, the mobile station shall perform the remaining
 6 procedures in this section:
 - 7 – The packet data service has data to send, and the mobile station chooses not to
 8 use a Short Data Burst to send the data, and the mobile station is not
 9 prohibited (see [16]) from initiating connection of the packet data service
 10 option.the reconnect delay timer has not been set or has expired; or
 - 11 – The mobile station detects a change in the serving system SID or NID;~~or,~~
 12 ~~–~~ The mobile station detects a non-zero PACKET_ZONE_ID_S that is not currently
 13 stored in its packet data zone identifier list (see 2.2.5)
 - 14 • ~~The mobile station shall maintain a packet data dormant timer controllable by the base~~
 15 ~~station (see 2.2.4). The default value for this timer shall be 0 seconds. The timer shall~~
 16 ~~be reset upon entering the Dormant State. If the packet data dormant timer is enabled,~~
 17 ~~the~~ The mobile station shall delay any attempt to request a packet data service option
 18 until the expiration of ~~this~~ the packet data dormant timer.
 - 19 • ~~The mobile station shall clear the reconnect delay timer.~~
- 20 • If the mobile station is in the *Mobile Station Idle State* the mobile station shall initiate
 21 connection of the packet data service option, as described in 2.2.3. The packet data
 22 service call control function shall enter the *Reconnect State*.
- 23 • If the mobile station does not support concurrent services signaling, and the mobile
 24 station is not in the *Mobile Station Idle State*, the mobile station shall wait until entering
 25 the *Mobile Station Idle State* to begin initiating connection of the packet data service
 26 option.
- 27 • If the mobile station supports concurrent services signaling, and the mobile is in the
 28 *Mobile Station Control on the Traffic Channel State*, the mobile shall initiate connection
 29 of the packet data service option as described in 2.2.3. The packet data service call
 30 control function shall enter the *Reconnect State*.

31 2.2.2.1.2.5 Reconnect State

32 While the packet data service call control function is in the *Reconnect State*, the mobile
 33 station shall perform the following:

- 34 • If the packet data service option is connected, the packet data service call control
 35 function shall enter the *Connected State* when the call control instance enters the
 36 *Conversation Substate*.
- 37 • If the mobile station receives an indication from the base station that the packet data
 38 service option is rejected, the packet data service shall enter the *Inactive State*.

- 1 • If the packet data service option is not connected and the packet data service option
 2 has not been rejected, ~~and the mobile station has data to send,~~ the mobile station shall
 3 perform the following:
- 4 – ~~If the mobile station has data to send,~~ If the mobile station has data to send, the mobile station may discard the
 5 data.²
 - 6 – ~~If the mobile station received an indication from the base station that the mobile
 7 station should delay its next attempt to connect the packet data service option,
 8 the mobile station shall set a reconnect delay timer to the value indicated by the
 9 base station.~~ The packet data service call control function shall enter the
 10 *Dormant State*.
 - 11 • ~~If the packet data service option is not connected and the packet data service option has
 12 not been rejected, and the mobile station does not have data to send, the packet data
 13 service call control function shall enter the *Dormant State*.~~
 - 14 • If the packet data service enters the *Inactive State*, the packet data service call control
 15 function shall enter the *Null State*.

17 2.2.2.2 BS/PCF Procedures

18 2.2.2.2.1 Packet Data Service Call Control Function

19 2.2.2.2.1.1 Null State

20 When the base station packet data service call control function is in the *Null State*, the
 21 packet data service option is not connected. The following events can occur while the
 22 packet data service call control function is in this state:

- 23 • The mobile station can request connection of a packet data service option.
- 24 • The PCF can request the base station to send a Short Data Burst to the mobile station.
- 25 • The PCF can request the base station to connect the packet data service option.

26 2.2.2.2.1.1.1 PCF Initiated Service Option Connection

27 If the PCF requests the base station to send a Short Data Burst, the base station should
 28 perform the following:

- 29 • If the base station chooses not to use a Short Data Burst to send the data, the base
 30 station should inform the PCF that it does not accept the data.
- 31 • If the base station chooses to use a Short Data Burst to send the data, the base station
 32 should send the Short Data Burst according to 2.2.9.

33 If the PCF requests the base station to connect a packet data service option, the base
 34 station should perform the following:

² Mobile stations supporting applications that include higher-layer data retransmission protocols should always discard such data.

- 1 • If the mobile station is in *Mobile Station Idle State*, the base station should page the
2 mobile station, requesting the packet data service option. The packet data service call
3 control function should enter the *Paging State*.
- 4 • If the mobile station is not in the *Mobile Station Idle State*, and the mobile station does
5 not support concurrent services signaling, the base station should indicate to the PCF
6 that the mobile station is busy.
- 7 • If the mobile station is in the *Mobile Station Control on the Traffic Channel State*, and the
8 mobile supports concurrent services signaling, the packet data service call control
9 function should enter *Initialization State*.

10 2.2.2.2.1.1.2 Mobile Station Originated Service Option Connection

11 If the base station receives a request to connect a packet data service option from the
12 mobile station, the base station should perform the following:

- 13 • If the service option requested by the mobile station is not supported, the base station
14 should reject the requested service option.
- 15 • Otherwise, the base station should inform the PCF that the mobile is attempting to
16 connect the packet data service option. The base station then performs the following:
 - 17 – If the PCF accepts the packet data connection, the packet data service call
18 control function should enter the *Initialization State*.
 - 19 – If the PCF rejects the packet data connection, the base station should not
20 connect the requested service option, and should indicate to the mobile station
21 that the requested service option has been rejected.
 - 22 – If the PCF defers the packet data connection, the base station should not
23 connect the requested service option, but should not indicate to the mobile
24 station that the packet data service option was rejected.

25 2.2.2.2.1.2 Paging State

26 When the base station packet data service call control function is in the *Paging State*, the
27 base station should perform the following:

- 28 • If the base station receives a *Page Response Message* containing the same packet data
29 service option number that was used to page the mobile station, the packet data service
30 call control function should enter the *Initialization State*.
- 31 • If the base station does not receive a *Page Response Message*, the base station should
32 inform the PCF that the request for the packet data service option has been rejected.
33 The packet data service call control function should enter the *Null State*.
- 34 • If the base station receives a *Page Response Message* with a service option that is
35 different than the service option sent in the page, the base station should send a
36 *Release Order* rejecting the requested service option. The base station should inform
37 the PCF that the request for the packet data service option has been rejected. The
38 packet data service call control function should enter the *Null State*.

1 2.2.2.2.1.3 Initialization State

2 When the base station packet data service call control function enters the *Initialization*
3 *State*, the base station should attempt to connect the packet data service option according
4 to 2.2.3.2

5 If the packet data service option is connected, the packet data service call control function
6 should enter the *Connected State*.

7 If the packet data service option cannot be connected, the base station should perform the
8 following:

- 9 • If the mobile station does not support concurrent services signaling, the base station
10 should disconnect the call.
- 11 • The base station should inform the PCF that the mobile station has rejected the
12 connection attempt.
- 13 • The packet data service call control function should enter the *Null State*.

14 2.2.2.2.1.4 Connected State

15 When the base station packet data service call control function enters the *Connected State*,
16 the base station should perform the following:

- 17 • The base station should inform the PCF that the packet data service option has been
18 connected.
- 19 • The base station should perform RLP initialization. Upon completing RLP initialization,
20 the base station should transfer octets in sequence between RLP and the PCF.

21 If the PCF requests the base station to disconnect the packet data service option, the base
22 station should perform the following:

- 23 • The base station should disconnect the packet data service option. If the mobile station
24 does not support concurrent services signaling, the base station should disconnect the
25 call.
- 26 • The packet data service call control function should enter *Null State*.

27 While the packet data service call control function is in the *Connected State*, the base
28 station ~~should~~may maintain a packet data inactivity timer. The timer should be reset
29 whenever non-idle RLP data frames are sent or received. If the packet data inactivity timer
30 expires, or if the base station chooses to disconnect the packet data service option before
31 the timer expires, the base station should perform the following:

- 32 • The base station should disconnect the packet data service option.
- 33 • The base station should inform the PCF that the packet data service option has been
34 disconnected.
- 35 • The packet data service call control function should enter the *Null State*.

36 2.2.3 Initialization and Connection of Packet Data Service Options

37 The mobile station shall initiate connection of a packet data service option by requesting
38 the packet data service option in either a *Page Response Message*, *Enhanced Origination*

1 *Message*, or an *Origination Message*. When the mobile station sends an *Origination*
2 *Message* or an *Enhanced Origination Message* it shall perform the following:

- 3 • The mobile station shall indicate whether it has data to send (i.e., by setting the DRS bit
4 in the message sent by the mobile station).
- 5 • If the mobile station has stored a value of SID and if the stored value of SID is different
6 than the current value of SID, the mobile station shall include the stored value as the
7 value of the previous SID. Otherwise, the mobile station shall not include the stored
8 value.
- 9 • If the mobile station has stored a value of NID and if the stored value of NID is different
10 than the current value of NID, the mobile station shall include the stored value as the
11 value of the previous NID. Otherwise, the mobile station shall not include the stored
12 value.
- 13 • If packet zone based reconnection is enabled and if the mobile station has stored a
14 value of PACKET_ZONE_IDS and if the stored value of PACKET_ZONE_IDS is different
15 than the current value of PACKET_ZONE_IDS, the mobile station shall include the
16 stored value as the value of the previous packet zone identifier. Otherwise, the mobile
17 station shall not include the stored value.

18 If the mobile station packet data service call control function is in the *Dormant State*, the
19 mobile station shall set the SR_ID field to the value assigned to the last packet data service
20 option connection for this packet data service.

21 After initiating connection of a packet data service option, the mobile station connects the
22 service option as specified in 2.2.3.1.

23 2.2.3.1 Mobile Station Procedures

24 Packet data service options shall be negotiated and connected using the service
25 configuration and negotiation procedures defined in [16]. For any packet data service
26 option, the mobile station shall not propose a service configuration whose attributes are
27 inconsistent with the valid service configuration attribute table for the service option. The
28 mobile station shall not accept a service configuration whose attributes are inconsistent
29 with the valid service configuration attribute table for the service option. The default
30 service configuration for the packet data service option shall be as shown in the valid
31 service configuration attribute table for the service option.

1

Table 1 Valid Service Configuration Attributes for Service Option 33³

Service Configuration Attribute	Valid Selections
Forward Multiplex Option	0x1, 0x2, 0x704
Reverse Multiplex Option	0x1, 0x2, 0x704
Forward Transmission Rates	For the FCH, Rates 1, 1/2, 1/4, and 1/8 enabled. For the DCCH, Rate 1 enabled, Rates 1/2, 1/4, and 1/8 not enabled.
Reverse Transmission Rates	For the FCH, Rates 1, 1/2, 1/4, and 1/8 enabled. For the DCCH, Rate 1 enabled, Rates 1/2, 1/4, and 1/8 not enabled.
Forward Traffic Type	Primary or Secondary Traffic.
Reverse Traffic Type	Shall be identical to the Forward Traffic Type.
Forward FCH Radio Configuration	RC 3 , 4, 5, 6, 7, 8, 9
Reverse FCH Radio Configuration	RC 3 , 4, 5, 6
Forward DCCH Radio Configuration	RC 3 , 4, 5, 6, 7, 8, 9
Reverse DCCH Radio Configuration	RC 3 , 4, 5, 6
Forward Supplemental Channel Multiplex Option	0x3, 0x4, 0x809, 0x80A, 0x811, 0x812, 0x821, 0x822, 0x905, 0x906, 0x909, 0x90A, 0x911, 0x912, 0x921, 0x922, 0xf20
Reverse Supplemental Channel Multiplex Option	0x3, 0x4, 0x809, 0x80A, 0x811, 0x812, 0x821, 0x822, 0x905, 0x906, 0x909, 0x90A, 0x911, 0x912, 0x921, 0x922, 0xf20

2

3 If the packet data service option is connected when the call control instance enters the
4 *Waiting for Mobile Station Answer Substate*, or if the packet data service option becomes
5 connected while the call control instance is in the *Waiting for Mobile Station Answer*
6 *Substate*, the mobile station shall automatically send a *Connect Order* to the base station as
7 a message requiring acknowledgment without waiting for the user to explicitly command
8 the call to be answered. When the mobile station sends a *Connect Order*, the call control
9 instance enters the *Conversation Substate*.

³ See [16] for a description of selections.

1 2.2.3.2 BS Procedures

2 Packet data service options shall be negotiated and connected using the service
 3 configuration and negotiation procedures defined in [16]. For any service option, the base
 4 station shall not propose a service configuration whose attributes are inconsistent with the
 5 valid service configuration attribute table for the service option (see 2.2.3.1). The base
 6 station shall not accept a service configuration whose attributes are inconsistent with the
 7 valid service configuration attribute table for the service option.

8 ~~2.2.4 Optional Reconnect After Hard Handoff~~

9 ~~The base station may require the mobile station to reconnect the packet data service option~~
 10 ~~when the mobile station successfully completes a hard handoff (see [16]) in which the~~
 11 ~~Active Set or frequency assignment changes.~~

12 ~~The base station shall enable and disable this feature in the mobile station through the~~
 13 ~~Service Option Control Message. The default state within the mobile station for this feature~~
 14 ~~shall be disabled. Once enabled by the base station, the mobile station reconnects the~~
 15 ~~packet data service option after successful completion of a hard handoff in which the Active~~
 16 ~~Set or frequency assignment changes. The mobile station shall disable this feature when~~
 17 ~~one of the following events occurs:~~

- 18 ~~•The mobile station receives a Service Option Control Message disabling this feature.~~
- 19 ~~•The mobile station detects a change in the SID of the serving system.~~
- 20 ~~•Packet data service enters the Inactive State.~~

21 ~~The base station may send a Service Option Control Message (see [16]) to enable or disable~~
 22 ~~this feature. The Service Option Control Message shall include the type-specific fields~~
 23 ~~shown in Table 2.~~

24 ~~**Table 2 ORDQ Format and Type Specific Fields for Reconnect After Hard Handoff**~~

Field	Length (bits)
HHO_CNTL	3
RESERVED	2
FIELD_TYPE	3

- 25
- 26 ~~———— HHO_CNTL ———— Reconnect After Hard Handoff control.~~
- 27 ~~———— The base station shall set this field to the HHO_CNTL value~~
 28 ~~from Table 3 corresponding to the function that the mobile~~
 29 ~~station is to perform.~~
- 30 ~~———— RESERVED ———— Reserved bits.~~
- 31 ~~———— The base station shall set this field to '00'.~~
- 32 ~~———— FIELD_TYPE ———— Type-specific field designator.~~
- 33 ~~———— The base station shall set this field to '010'.~~
- 34

1 The HHO_CNTL field shall be set appropriately as specified in Table 3. If the mobile station
 2 receives a *Service Option Control Message* for the service option with FIELD_TYPE set to
 3 '010' and the HHO_CNTL field is not equal to a value defined in Table 3, the mobile station
 4 shall reject the message by sending a *Mobile Station Reject Order* with the ORDQ field set
 5 equal to '00000100'.

6 **Table 3 Reconnect After Hard Handoff Control Field**

HHO_CNTL (binary)	Mobile Station Action
'000'	Disable Reconnect After Hard Handoff
'001'	Enable Reconnect After Hard Handoff
All other HHO_CNTL values are reserved.	

7
 8 2.2.52.2.4 ~~Optional~~ Packet Data Dormant Timer Control

9 The mobile station shall maintain a packet data dormant timer controllable by the base
 10 station. The default value for this timer shall be zero seconds.

11 The base station may require a mobile station to establish a value for the Packet Data
 12 Dormant Timer~~packet data dormant timer~~. If this feature is enabled, a mobile station ~~shall~~
 13 will not originate a packet data service option until the timer has ~~expired~~exceeded the value
 14 established by the base station.

15 The base station shall enable and control this feature in the mobile station through the
 16 *Service Option Control Message*. The default state within the mobile station for base station
 17 control of the packet data dormant timer shall be disabled. When this feature is disabled,
 18 the mobile station ~~should~~shall set its packet data dormant timer to the default value of
 19 0 seconds ~~(see 2.2.2.1.2.4)~~. The mobile station shall disable base station control of the
 20 dormant timer when one of the following events occurs:

- 21 • The mobile station receives a *Service Option Control Message* disabling base station
 22 control.
- 23 • The mobile station detects a change in the SID of the serving system.
- 24 • Packet data service enters the *Inactive State*.

25 The base station may send a *Service Option Control Message* (see [16]) to control this
 26 feature. The *Service Option Control Message* shall include the type-specific fields shown in
 27 Table 2.

1 **Table 2 Type-Specific Fields for Data Dormant Timer Control**

Field	Length (bits)
DORM_CNTL	3
RESERVED	2
FIELD_TYPE	3
DORM_TIME	0 or 8

2

3 DORM_CNTL - Dormant timer control.

4 The base station shall set this field to the DORM_CNTL value
5 from Table 3 corresponding to the function that the mobile
6 station is to perform.

7 RESERVED - Reserved bits.

8 The base station shall set this field to '00'.

9 FIELD_TYPE - Type-specific field designator.

10 The base station shall set this field to '011'.

11 DORM_TIME - Value of packet data dormant timer.

12 If DORM_CNTL is set to '001', the base station shall include
13 this field and set it to the DORM_TIME value from Table 4
14 corresponding to the value of the packet data dormant timer
15 to be used by the mobile station.16 The DORM_CNTL field shall be set appropriately as specified in Table 3. If the mobile
17 station receives a *Service Option Control Message* for the service option with FIELD_TYPE
18 set to '011' and the DORM_CNTL field is not equal to a value defined in Table 3, the mobile
19 station shall reject the message by sending a *Mobile Station Reject Order* with the ORDQ
20 field set equal to '00000100'.21 If the mobile station receives a *Service Option Control Message* for the service option with
22 FIELD_TYPE set to '011' and the DORM_CNTL field set to '000', the mobile station shall
23 disable base station control of the minimum dormant timer value.24 If the mobile station receives a *Service Option Control Message* for the service option with
25 FIELD_TYPE set to '011' and the DORM_CNTL field set to '001', ~~and the mobile station~~
26 ~~supports a packet data dormant timer,~~ the mobile station shall enable base station control
27 of the timer and set the minimum value of the dormant timer to the value specified in the
28 ~~DORM_CNTL-DORM_TIME~~ field. If the current value of the mobile station's dormant timer
29 is less than the value specified in the DORM_TIME, the mobile station shall set the value of
30 its packet data dormant timer to the value specified in DORM_TIME. If the current value of
31 the mobile station's dormant timer is greater than or equal to the value specified in the
32 DORM_TIME, the mobile station may set the value of its packet data dormant timer to the
33 value specified in DORM_TIME.34 If the mobile station receives a *Service Option Control Message* for the service option with
35 FIELD_TYPE set to '011' and the mobile station does not support a packet data dormant

1 timer, the mobile station shall reject the message by sending a *Mobile Station Reject Order*
2 with the ORDQ field set equal to '00000110'.

3 When this feature is enabled, the mobile station's packet data dormant timer shall not be
4 set to a value less than the minimum value specified in the most recently received *Service*
5 *Option Control Message*. If the mobile station provides a means for user configuration of
6 the dormant timer, and the user attempts to set the value of the timer to a value less than
7 minimum specified value, the mobile station should provide the user with an error
8 indication. The means for providing the error indication is left to the manufacturer.

9

Table 3 Dormant Timer Control Field

DORM_CNTL (binary)	Mobile Station Action
'000'	Disable base station control of minimum dormant timer
'001'	Set the minimum dormant timer value to value specified in DORM_TIME field
All other DORM_CNTL values are reserved.	

10

11

Table 4 Minimum Value of Mobile Station Dormant Timer

DORM_TIME (binary)	Description
'00000000'	Dormant mode not supported by base station
'00000001' through '11111111'	Minimum mobile station packet data dormant timer value in tenths of seconds.

12

13 ~~2.2.62.2.5~~ Optional Packet Zone Reconnection Control

14 The ~~base-mobile~~ station may ~~be~~ required by the ~~mobile-base~~ station to ~~initiate reconnection~~
15 ~~of~~ the packet data service option (see 2.2.3) when ~~all of~~ the ~~following conditions are met~~:

- 16 • ~~the~~ packet data service is in the *Active State*;
- 17 • ~~the~~ packet data ~~service~~ call control function is in the *Reconnect State* or *Dormant State*;
- 18 ~~and and~~
- 19 • ~~the~~ mobile station detects a change in the non-zero packet data services zone identifier.

20 Packet zone based reconnection causes a mobile station to ~~initiate reconnection of~~ the
21 packet data service option whenever it moves into a new packet data zone not on its
22 internally stored list of visited packet data zones. A packet data zone is added to the list
23 whenever the mobile station ~~initiates connects-connection of~~ the packet data service option

1 while in the zone, and is deleted when the number of more recently visited zones is equal to
2 the maximum number of zones retained by the mobile station, or, if packet zone hysteresis
3 is enabled, when its packet zone hysteresis timer expires.

4 Packet zone hysteresis allows the mobile station to reduce the number of connections when
5 the mobile station is moving between two or more packet zones and the base station has
6 not required the mobile station to store more than one visited packet data zone.

7 The base station shall enable packet zone based reconnection in the mobile station by
8 transmitting a non-zero packet data services zone identifier (PACKET_ZONE_ID). The base
9 station may disable the packet zone based reconnection function in the mobile station by
10 sending a *Service Option Control Message* disabling the enabled feature. The base station
11 may re-enable the function in the mobile station by sending a *Service Option Control*
12 *Message* enabling the feature. The base station may control the number of entries a mobile
13 station is to retain in its list of visited packet data zones and may clear the list by sending a
14 *Service Option Control Message*.

15 The default state within the mobile station for the packet zone based reconnection feature
16 shall be disabled. The mobile shall enable the feature upon initial detection of a non-zero
17 packet data services zone identifier (PACKET_ZONE_ID_S). The mobile station shall then
18 add the packet data services zone identifier to its stored list of visited packet data zones.
19 Upon enabling the packet zone reconnection feature, the mobile station shall set the length
20 of the packet zone list to one entry until commanded otherwise by the base station. The
21 mobile station shall provide memory for storing up to 15 zone identifiers.

22 If the base station has enabled packet zone based reconnection and if the length of the
23 packet zone list is one entry, the mobile station may enable packet zone hysteresis. If the
24 base station sets the length of the packet zone list to a number greater than one, the mobile
25 station shall disable packet zone hysteresis and clear the packet zone hysteresis list.

26 When packet zone hysteresis is enabled, the mobile station shall perform the following:

- 27 • When the packet zone hysteresis activation timer expires, the mobile station shall set
28 the length of the packet zone list to 4 entries.
- 29 • If the length of the packet zone list is set to 4 entries, then before the mobile station
30 adds a new entry to the list, the mobile station shall perform the following:
 - 31 – The mobile station shall set a packet zone hysteresis timer for the most recently
32 added entry in the list to an implementation dependent value, greater than or
33 equal to 0 seconds and less than or equal to 60 seconds, and shall start the
34 timer.⁴
 - 35 – The mobile station shall then add the new entry to the list.
- 36 • When the mobile station sends or receives user data, the packet zone hysteresis
37 activation indicator is set to 1 (see 2.2.2.1.2.3 and 2.2.2.1.2.4). When the mobile
38 station sets the packet zone hysteresis activation indicator to 1, the mobile station shall

⁴ Using a value of 0 seconds for the packet zone hysteresis timer is equivalent to disabling packet
zone hysteresis.

1 delete all but the most recent entry in the packet zone list and shall set the length of the
 2 packet zone list to one entry.

3 The mobile station shall maintain the list of visited packet data service zone identifiers in
 4 most recently visited order sequence with the current zone contained in the first entry of
 5 the list. If packet zone hysteresis is not enabled or if the length of the packet zone list is
 6 one, entries shall be removed from the list in least recently visited order. If packet zone
 7 hysteresis is enabled and the length of the packet zone list is set to 4 entries, entries shall
 8 be removed from the list according to the following:

- 9 • An entry shall be removed from the list upon expiration of its packet zone hysteresis
 10 timer.
- 11 • When adding a new entry to a list that is currently full, the entry with the smallest
 12 remaining packet zone hysteresis timer value shall be removed from the list before
 13 adding the new entry.

14 The mobile station shall disable the feature and clear its list of visited packet data service
 15 zone identifiers when one of the following occurs:

- 16 • The mobile station receives a *Service Option Control Message* disabling the feature.
- 17 • The mobile station detects a PACKET_ZONE_ID_S field of value '00000000'.
- 18 ~~• The mobile station determines that the base station does not support packet zones.~~
- 19 • Packet data service enters the *Inactive State*.
- 20 • The mobile station detects a change in SID.

21 Once disabled, the mobile station shall re-enable the feature upon detection of a non-zero
 22 PACKET_ZONE_ID_S or upon receipt of a *Service Option Control Message* enabling the
 23 feature.

24 ~~If service negotiation is used, t~~The base station may send a *Service Option Control Message*
 25 (see [16]) to control this feature. The *Service Option Control Message* shall include the type-
 26 specific fields shown in Table 5 .

27 **Table 5 Type-Specific Fields for Packet Connection Control**

Field	Length (bits)
PKT_CON_CNTL	3
RESERVED	2
FIELD_TYPE	3
RESERVED	0 or 4
PKT_ZONE_LIST_LEN	0 or 4

28

29 PKT_CON_CNTL - Packet Zone Connection Control.

1		The base station shall set this field to the PKT_CON_CNTL
2		value from Table 6 corresponding to the function that the
3		mobile station is to perform.
4	RESERVED	- Reserved bits.
5		The base station shall set this field to '00'.
6	FIELD_TYPE	- Type-specific field designator.
7		The base station shall set this field to '100'.
8	RESERVED	- Reserved bits.
9		The base station shall set this field to '0000' if
10		PKT_CON_CNTL is set to '001' or '010'. The base station shall
11		omit this field if PKT_CON_CNTL is any other value.
12	PKT_ZONE_LIST_LEN	- Packet data zone identifier list length.
13		The base station shall include this field if PKT_CON_CNTL is
14		set to '001' or '010' to specify the number of packet data
15		service zone identifiers the mobile station is to retain in its
16		packet data zone identifier list. This field shall be within the
17		range '0001' through '1111', inclusive.
18		
19		The base station shall set the PKT_CON_CNTL appropriately as specified in Table 6.
20		• The base station shall set the value of PKT_CON_CNTL to '000' to disable the packet
21		zone based reconnection feature in the mobile station.
22		• The base station shall set the value of PKT_CON_CNTL to '001' to enable packet zone
23		based reconnection feature in the mobile station. The base station shall also include
24		the PKT_ZONE_LIST_LEN field in the type-specific fields of the <i>Service Option Control</i>
25		<i>Message</i> to specify the number of packet data service zone identifiers the mobile station
26		is to store in its internal list.
27		• The base station shall set the value of PKT_CON_CNTL to '010' to clear the packet data
28		service zone identifier list within the mobile station. The base station shall also include
29		the PKT_ZONE_LIST_LEN field in the type-specific fields of the <i>Service Option Control</i>
30		<i>Message</i> to specify the number of packet data service zone identifiers the mobile station
31		is to store in its internal list.
32		• The base station shall set the value of the PKT_CON_CNTL to '011' to request the mobile
33		station to transfer its internally stored packet data services zone identifier list to the
34		base station.

1

Table 6 Packet Zone Connection Control Field

PKT_CON_CNTL (binary)	Mobile Station Action
'000'	Disable packet zone connection control
'001'	Enable packet zone connection control
'010'	Clear the packet data zone identifier list
'011'	Transfer the packet data zone identifier list to base station
All other PKT_CON_CNTL values are reserved.	

2

3

4 If the mobile station receives a *Service Option Control Message* for the service option with
5 FIELD_TYPE set to '100' and the PKT_CON_CNTL field is not equal to a value defined in
6 Table 6, the mobile station shall reject the message by sending a Mobile Station Reject
7 Order with the ORDQ field set equal to '00000100'.

8 If the mobile station receives a *Service Option Control Message* for the service option with
9 FIELD_TYPE set to '100' and the PKT_CON_CNTL field is equal to a value defined in Table
10 6, the mobile station shall perform the following actions:

- 11 • If the value of PKT_CON_CNTL field is set to '000', the mobile station shall disable the
12 packet zone based reconnection feature and clear its list of stored packet data service
13 zone identifiers.
- 14 • If the value of the PKT_CON_CNTL field is set to '001', and the packet zone based
15 reconnection feature is currently disabled, the mobile station shall enable the feature.
16 The mobile station shall set the number of entries in its packet data services zone
17 identifier list to the value specified in the PKT_ZONE_LIST_LEN field of the *Service*
18 *Option Control Message*.
- 19 • If the value of the PKT_CON_CNTL field is set to '001', and the packet zone based
20 reconnection feature is currently enabled, the mobile station shall set the number of
21 entries in its packet data services zone identifier list to the value specified in the
22 PKT_ZONE_LIST_LEN field of the *Service Option Control Message*. If the value of the
23 PKT_ZONE_LIST_LEN is greater than or equal to the number of existing entries in the
24 list, the mobile station shall retain the current list entries. If the value of the
25 PKT_ZONE_LIST_LEN represents a decrease in the number of list entries, the mobile
26 station shall delete the least recently visited zone list entries.
- 27 • If the value of the PKT_CON_CNTL field is set to '010', the mobile station shall clear its
28 packet data service zone identifier list. The mobile station shall set the number of

- 1 entries in its packet data services zone identifier list to the value specified in the
 2 PKT_ZONE_LIST_LEN field of the *Service Option Control Message*.
- 3 • If the value of the PKT_CON_CNTL field is set to '011' and if packet zone hysteresis is
 4 not enabled, the mobile station shall transfer the contents of its stored packet data
 5 services zone identifier list to the base station. If the value of the PKT_CON_CNTL field
 6 is set to '011' and if packet zone hysteresis is enabled, then the mobile station shall
 7 transfer only the entry containing the current value of PACKET_ZONE_ID_s. The mobile
 8 station shall transfer the list using a *Service Option Control Message* including the type-
 9 specific fields shown in Table 7.

10 **Table 7 Type-Specific Fields for Packet Zone Connection Response**

Field	Length (bits)
PKT_CON_RESP	3
RESERVED	2
FIELD_TYPE	3
RESERVED	4
PKT_ZONE_LIST_LEN	4

11 The mobile station shall include PKT_ZONE_LIST_LEN
 12 occurrences of the following record:

PACKET_ZONE_ID	8
----------------	---

- 13
- 14 PKT_CON_RESP - Packet Zone Connection Response.
 15 The mobile station shall set this field to '000'.
- 16 RESERVED - Reserved bits.
 17 The mobile shall set this field to '00'.
- 18 FIELD_TYPE - Type-specific field designator.
 19 The mobile shall set this field to '100'.
- 20 RESERVED - Reserved bits.
 21 The mobile station shall set this field to '0000'.
- 22 PKT_ZONE_LIST_LEN - Packet Data Zone Identifier List Length.
 23 The mobile station shall set this field to specify the number of
 24 reported packet data service zone identifiers within the *Service*
 25 *Option Control Message*. This field shall be within the range of
 26 '0001' through '1111', inclusive.
- 27 PACKET_ZONE_ID - Packet data services zone identifier.
 28 The mobile station shall set this field to the packet data
 29 services zone identifier for each entry in its stored packet data
 30 zone identifier list.

1

2 2.2.72.2.6 ~~Optional~~ Strongest Pilot Monitoring and Reporting

3 The base station may require the mobile station, when the packet data service call control
4 function is in the *Connected State*, to monitor the strongest pilot in the Active Set and send
5 a *Periodic Pilot Strength Measurement Message* (PPSMM) when that pilot's rank in the Active
6 Set changes.

7 This allows the base station to track the strongest pilot(s) in the Active Set to enhance
8 forward Supplemental Channel assignment when operating with a reduced Active Set.

9 The base station shall enable strongest pilot monitoring and reporting in the mobile station
10 by sending a Service Option Control Message enabling the feature. The base station may
11 disable strongest pilot monitoring and reporting in the mobile station by sending a Service
12 Option Control Message disabling strongest pilot monitoring and reporting.

13 The default state within the mobile station for strongest pilot monitoring and reporting
14 shall be disabled. The mobile station shall begin strongest pilot monitoring and reporting
15 upon receipt of a Service Option Control Message enabling strongest pilot monitoring and
16 reporting.

17 The mobile station shall disable strongest pilot monitoring and reporting when one of the
18 following occurs:

- 19 • The mobile station receives a *Service Option Control Message* disabling strongest pilot
20 monitoring and reporting.
- 21 • The packet data service call control function exits the *Connected State*.

22 When strongest pilot monitoring and reporting is enabled, the mobile station shall send a
23 *Periodic Pilot Strength Measurement Message* (PPSMM) after the strongest pilot becomes
24 weaker than another pilot by a difference specified by $SP_MIN_DELTA / 2$ dB for an interval
25 specified by $SP_INTERVAL$ units of 80 ms. Once the mobile station has sent the PPSMM, it
26 begins to monitor the pilot reported as the strongest in the PPSMM as the strongest pilot.

27 The Service Option Control Message that the base station sends to the mobile station shall
28 include the type-specific fields shown in Table 8.

29 **Table 8 Type-Specific Fields for Strongest Pilot Monitoring and Reporting**

Field	Length (bits)
SP_MR_CNTL	1
RESERVED	4
FIELD_TYPE	3
SP_MIN_DELTA	3
SP_INTERVAL	4

30

31 SP_MR_CNTL - Strongest pilot monitoring and reporting control.

1		The base station shall set this field to '0' to disable strongest
2		pilot monitoring and reporting. The base station shall set
3		this field to '1' to enable strongest pilot monitoring and
4		reporting.
5	RESERVED	Reserved bits.
6		The base station shall set this field to '0000'.
7	FIELD_TYPE	Type-specific field designator.
8		The base station shall set this field to '101'.
9	SP_MIN_DELTA	- If the SP_MR_CNTL field is set to '0', the base station shall set
10		this field to '000'. If the SP_MR_CNTL field is set to '1', the
11		base station shall set this field to the minimum pilot strength
12		measurement difference between the strongest pilot and any
13		other Active Set pilot (in units of 0.5 dB) that must be
14		measured in order for the mobile station to send a <i>Periodic</i>
15		<i>Pilot Strength Measurement Message</i> . A difference of at least
16		SP_MIN_DELTA / 2 dB must be measured for SP_INTERVAL
17		successive intervals before a <i>Periodic Pilot Strength</i>
18		<i>Measurement Message</i> is sent.
19	SP_INTERVAL	- If the SP_MR_CNTL field is set to '0', the base station shall set
20		this field to '0000'. If the SP_MR_CNTL field is set to '1', the
21		base station shall set this field to the minimum interval (in 80
22		ms units) during which the indicated pilot strength
23		measurement difference (greater than or equal to
24		SP_MIN_DELTA) must be measured by the mobile station in
25		order for the mobile station to send a <i>Periodic Pilot Strength</i>
26		<i>Measurement Message</i> .

27

28 | [2.2.82.2.7](#) High Speed Operation

29 High speed operation uses a Supplemental Channel to increase the traffic channel's
 30 bandwidth. Forward high speed operation uses a Forward Supplemental Channel. Reverse
 31 high speed operation uses a Reverse Supplemental Channel.

32 The mobile station requests reverse high speed operation by sending a SCRMM, or, if
 33 permitted by the base station, a SCRMM to the base station. The mobile station includes a
 34 SCRMM_REQ_BLOB (see 2.2.7.2.1) in the REQ_BLOB field of the SCRMM or a
 35 SCRMM_REQ_BLOB (see 2.2.7.2.2) in the REQ_BLOB field of the SCRMM.

36 The mobile station also uses a SCRMM or SCRMM to report changes in the number of the
 37 Preferred Reverse Supplemental Channel Rate.

38 The base station controls both forward and reverse high speed operation by allocating
 39 Supplemental Channels for some time period. Allocation is specified in either the ESCAM,
 40 FSCAMM, RSCAMM, or UHDM.

41 | [2.2.8.12.2.7.1](#) Mobile Station Procedures for Reverse High Speed Operation

42 When the amount of user data in the mobile station reaches an implementation defined
 43 threshold, the mobile station may request reverse high speed operation by sending a SCRMM
 44 or SCRMM to the base station. If the mobile station sends a SCRMM, the mobile station shall

1 include a SCRM_REQ_BLOB (see 2.2.7.2.1) in the REQ_BLOB field of the SCRM and shall
 2 set the SIZE_OF_REQ_BLOB field to the number of octets in the SCRM_REQ_BLOB. If the
 3 mobile station sends a SCRMM, the mobile station shall include a SCRMM_REQ_BLOB (see
 4 2.2.7.2.2) in the REQ_BLOB field of the SCRMM. Once the mobile station has sent the
 5 SCRM or SCRMM, it should allow the base station one second to respond with an allocation
 6 message (ESCAM, RSCAMM, or UHDM) before repeating the request. If the mobile station
 7 determines that it cannot use the PREFERRED_RATE indicated in its request for high
 8 speed operation, the mobile station may send a SCRM or SCRMM to report the correct rate
 9 without waiting for an allocation message. The mobile station may cancel an outstanding
 10 request or request termination of a current assignment by sending a SCRM that does not
 11 include a REQ_BLOB field, and whose SIZE_OF_REQ_BLOB field is set to zero.
 12 Alternatively, the mobile station may cancel an outstanding request or request termination
 13 of a current assignment by sending a SCRMM with the DURATION field set to '0000'.

14 If, during reverse high speed operation, the mobile station determines that the user data in
 15 the reverse traffic buffer will exceed its implementation defined threshold when it exits
 16 reverse high speed operation, it may send a SCRM or SCRMM to the base station to request
 17 a continuation of reverse high speed operation. Once the mobile station has sent the SCRM
 18 or SCRMM, it should allow the base station one second to respond with an allocation
 19 message (ESCAM, RSCAMM, or UHDM) before repeating the request.

20 If the mobile station discontinues transmission and has not been granted permission to use
 21 discontinuous transmission, or permission has been granted and the mobile station
 22 discontinues transmission for more than the duration specified by
 23 REV_SCH_DTX_DURATION_S, it shall perform the following:

- 24 • If the base station has granted the mobile station reverse high speed operation for a
 25 finite duration (i.e., not infinite), the mobile station should perform one of the following
 26 two procedures:
 - 27 – The mobile station shall send a SCRM to the base station that does not include
 28 a REQ_BLOB field and whose SIZE_OF_REQ_BLOB field is set to zero, or
 - 29 – The mobile station shall send a SCRMM to the base station with the DURATION
 30 field set to '0000'.
- 31 • If the base station has granted the mobile station reverse high speed operation for an
 32 infinite duration, the mobile station shall perform one of the following two procedures:
 - 33 – The mobile station shall send a SCRM to the base station that does not include
 34 a REQ_BLOB field and whose SIZE_OF_REQ_BLOB field is set to zero, or
 - 35 – The mobile station shall send a SCRMM to the base station with the DURATION
 36 field set to '0000'.

37 [2.2.8.22.2.7.2](#) Reverse High Speed Operation Messages

38 [2.2.8.2.12.2.7.2.1](#) SCRM_REQ_BLOB Format

Field	Length (bits)
DURATION_UNIT	3

'0111'	10
'1000'	16
'1001'	32
'1010'	64
'1011'	96
'1100'	128
'1101'	256
'1111'	infinite

1

2

Table 11 Encoding of the RES_DATA Field

RES_DATA Field Value (binary)	Residual Data (bits)
'00'	No Data
'01'	$\frac{1}{4}$ of the total data transmitted at PREFERRED_RATE for DURATION time
'10'	$\frac{1}{2}$ of the total data transmitted at PREFERRED_RATE for DURATION time
'11'	$\frac{3}{4}$ of the total data transmitted at PREFERRED_RATE for DURATION time

3

4 | [2.2.92.2.8](#) Quality of Service (QoS)5 | [2.2.9.12.2.8.1](#) QoS Parameters

6 | The set of QoS parameters that apply to service option 33 is defined in Table 12.

7 | For each QoS parameter in Table 12, the set of allowable values that can be selected by
8 | service option 33 is defined. If a parameter value is not specified in Table 12, it shall be
9 | considered reserved and shall not be used.10 | The set of default parameters and default parameter values that apply to service option 33
11 | is identified in Table 12 using bold text and also by specification.

- 1 For assured mode packet data service, there are independently specified QoS parameters
 2 for the forward and reverse links. A mobile station may also specify both a requested value
 3 and an acceptable value for some QoS parameters, as indicated in Table 12.

4 **Table 12 QoS Parameters Applicable to Service Option 33**

QoS Parameter	Length (bits)	Allowable Value(s)	<u>Allowed QoS BLOB Type</u>
Assured Mode	1	'0' Non-assured mode packet data service. This is the default value.	<u>'0000'</u>
		'1' Assured mode packet data service.	<u>'0000'</u>
Non-assured Priority Applies only to non-assured mode. The priority referenced herein is the user's priority associated with this data service instance (a non-assured mode packet data service) .	4	If non-assured mode is requested by a mobile station and this parameter is omitted, it indicates that the user's priority should not be reduced. This is the default value.	<u>'0000'</u>
		'0000' Adjust the user's priority to 0.	
		'0001' Adjust the user's priority to 1/13 of the subscription priority value.	<u>'0000'</u>
		'0010' Adjust the user's priority to 2/13 of the subscription priority value.	<u>'0000'</u>
		'0011' Adjust the user's priority to 3/13 of the subscription priority value.	<u>'0000'</u>
		'0100' Adjust the user's priority to 4/13 of the subscription priority value.	<u>'0000'</u>
		'0101' Adjust the user's priority to 5/13 of the subscription priority value.	<u>'0000'</u>
		'0110' Adjust the user's priority to 6/13 of the subscription priority value.	<u>'0000'</u>
'0111' Adjust the user's priority to 7/13 of the subscription priority value.	<u>'0000'</u>		

		'1000' Adjust the user's priority to 8/13 of the subscription priority value.	<u>'0000'</u>
		'1001' Adjust the user's priority to 9/13 of the subscription priority value.	<u>'0000'</u>
		'1010' Adjust the user's priority to 10/13 of the subscription priority value.	<u>'0000'</u>
		'1011' Adjust the user's priority to 11/13 of the subscription priority value.	<u>'0000'</u>
		'1100' Adjust the user's priority to 12/13 of the subscription priority value.	<u>'0000'</u>
		'1101' Adjust the user's priority to the subscription priority value. <u>This is the default value.</u>	<u>'0000'</u>
		'1110' Reserved.	<u>None</u>
		'1111' Reserved.	<u>None</u>
Forward Link Priority	4	'0000' Adjust the user's priority to 0.	<u>'0000'</u>
Reverse Link Priority		'0001' Adjust the user's priority to 1/13 of the subscription priority value.	<u>'0000'</u>
Applies only to assured mode.		'0010' Adjust the user's priority to 2/13 of the subscription priority value.	<u>'0000'</u>
The priority referenced herein is the user's priority associated with this data service instance (an assured mode packet data service) .		'0011' Adjust the user's priority to 3/13 of the subscription priority value.	<u>'0000'</u>
		'0100' Adjust the user's priority to 4/13 of the subscription priority value.	<u>'0000'</u>
		'0101' Adjust the user's priority to 5/13 of the subscription priority value.	<u>'0000'</u>
		'0110' Adjust the user's priority to 6/13 of the subscription priority value.	<u>'0000'</u>

		'0111' Adjust the user's priority to 7/13 of the subscription priority value.	'0000'
		'1000' Adjust the user's priority to 8/13 of the subscription priority value.	'0000'
		'1001' Adjust the user's priority to 9/13 of the subscription priority value.	'0000'
		'1010' Adjust the user's priority to 10/13 of the subscription priority value.	'0000'
		'1011' Adjust the user's priority to 11/13 of the subscription priority value.	'0000'
		'1100' Adjust the user's priority to 12/13 of the subscription priority value.	'0000'
		'1101' Adjust the user's priority to the subscription priority value. This is the default value.	'0000'
		'1110' Reserved.	None
		'1111' Reserved.	None
Forward Link Minimum Requested User Data Rate	4	'0001' 8 kbps	'0000'
Forward Link Minimum Acceptable User Data Rate		'0010' 32 kbps	'0000'
Reverse Link Minimum Requested User Data Rate		'0011' 64 kbps	'0000'
Reverse Link		'0100' 96 kbps	'0000'
		'0101' 144 kbps	'0000'

Minimum Acceptable User Data Rate Applies only to assured mode.		<u>'0110'</u> 288 kbps	<u>'0000'</u>
		'0101' <u>'0111'</u> 384 kbps	<u>'0000'</u>
		<u>'1000'</u> - <u>'1111'</u> Reserved.	<u>None</u>
Forward Link Requested Data Loss Rate Forward Link Acceptable Data Loss Rate Reverse Link Requested Data Loss Rate Reverse Link Acceptable Data Loss Rate Applies only to assured mode. If RLP does not use its ARQ mechanism, data loss rate is defined as being numerically equal to the Frame Error Rate. If RLP uses its ARQ mechanism, data loss rate is defined as the ratio of the number of lost data octets to the number of transmitted data octets, measured	4	<u>'0001'</u> 1%	<u>'0000'</u>
		<u>'0010'</u> 2%	<u>'0000'</u>
		<u>'0011'</u> 5%	<u>'0000'</u>
		<u>'0100'</u> 10%	<u>'0000'</u>
		<u>'0101'</u> 10^{-3}	<u>'0000'</u>
		<u>'0110'</u> 10^{-4}	<u>'0000'</u>
		<u>'0111'</u> 10^{-6}	<u>'0000'</u>
		<u>'1000'</u> 10^{-8}	<u>'0000'</u>

above RLP.		<u>'1001'-'1111' Reserved.</u>	<u>None</u>
Forward Link Requested Maximum Delay	4	<u>'0001' 40 ms</u>	<u>'0000'</u>
Forward Link Acceptable Maximum Delay		<u>'0010' 120-80 ms</u>	<u>'0000'</u>
Reverse Link Requested Maximum Delay		<u>'0011' 360-160 ms</u>	<u>'0000'</u>
Reverse Link Acceptable Maximum Delay		<u>'0100' 240 ms</u>	<u>'0000'</u>
Applies only to assured mode. ⁵		<u>'0101' 320 ms</u>	<u>'0000'</u>
Maximum delay is defined as the to be <u>the maximum</u> amount of time allowed user data can be held in the transmit queue (i.e., from the time that an octet of user data <u>moment it is</u> submitted to the transmitting RLP for transmission until its actual transmission on a physical channel). <u>the transmitting RLP for transmission</u> until its actual transmission on a physical channel). <u>its actual transmission on a physical channel).</u> The user data may be discarded if the maximum delay restriction is not		<u>'0110' 480 ms</u>	<u>'0000'</u>
		<u>'0111' 640 ms</u>	<u>'0000'</u>
		<u>'1000' 1 second</u>	<u>'0000'</u>
		<u>'1001' 2 seconds</u>	<u>'0000'</u>
		<u>'1010' 3 seconds</u>	<u>'0000'</u>

⁵ The base station can use the maximum delay parameter to guide its selection of RLP parameters.

met. the receiving RLP either delivers the octet or aborts its delivery.	‘1011’ 5 seconds	‘0000’
	‘1100’-‘1111’ Reserved.	None

1

2 [2.2.9.22.2.8.2](#) Mobile Station Procedures

3 To use the default set of QoS parameters for service option 33, the mobile station ~~shall~~
 4 [should](#) not include a QoS BLOB in the signaling message it uses to request connection of
 5 the service option 33.

6 To propose any non-default QoS parameter value, the mobile station shall include a QoS
 7 BLOB, as specified in Table 13, in the signaling message it uses to request connection of
 8 service option 33. The mobile station shall set the parameters in the QoS BLOB using the
 9 values defined in Table 12. When requesting assured mode packet data service, the mobile
 10 station shall omit any QoS parameter for which it requests and can accept *best effort*
 11 service rather than a specific level of service.

12 If the mobile station does not receive a QoS BLOB in the signaling message used by the
 13 base station to connect service option 33, it shall use the default set of QoS parameters as
 14 defined in Table 12 for service option 33.

15 If the mobile station receives a QoS BLOB in the signaling message used by the base
 16 station to connect service option 33, it shall [perform the following](#):

- 17 • [The mobile station may reject the signaling message containing the QoS BLOB.](#)
- 18 • [If the mobile station does not reject the message containing the QoS BLOB, it shall](#)
 19 use the specified set of QoS parameters contained in the QoS BLOB.

20

Table 13 Mobile Station QoS BLOB

Field	Length (Bits)
QOS_BLOB_TYPE_INCL	2
MAX_QOS_BLOB_TYPE_SUPPORTED	0 or 4
QOS_BLOB_TYPE	0 or 4
ASSURED_MODE	0 or 1
NON_ASSURED_PRI_ADJ_INCL	0 or 1
NON_ASSURED_PRI_ADJ	0 or 4
F_QOS_INCL	0 or 1
F_ASSURED_PRI_ADJ_INCL	0 or 1
F_ASSURED_PRI_ADJ	0 or 4

F_DATARATE_INCL	0 or 2
F_REQ_DATARATE	0 or 4
F_ACC_DATARATE	0 or 4
F_DATALOSS_INCL	0 or 2
F_REQ_DATALOSS	0 or 4
F_ACC_DATALOSS	0 or 4
F_DELAY_INCL	0 or 2
F_REQ_DELAY	0 or 4
F_ACC_DELAY	0 or 4
R_QOS_INCL	0 or 1
R_ASSURED_PRI_ADJ_INCL	0 or 1
R_ASSURED_PRI_ADJ	0 or 4
R_DATARATE_INCL	0 or 2
R_REQ_DATARATE	0 or 4
R_ACC_DATARATE	0 or 4
R_DATALOSS_INCL	0 or 2
R_REQ_DATALOSS	0 or 4
R_ACC_DATALOSS	0 or 4
R_DELAY_INCL	0 or 2
R_REQ_DELAY	0 or 4
R_ACC_DELAY	0 or 4

1

2 QOS BLOB TYPE3 INCL - QoS BLOB type parameter(s) included indicator.4 The mobile station shall include this field and set it to a
5 non-reserved value in Table 14

1

Table 14 QoS BLOB Type Included Indicator Values

<u>Value</u>	<u>Description</u>
<u>'00'</u>	<u>Reserved</u>
<u>'01'</u>	<u>The QOS_BLOB_TYPE field is included and the MAX_QOS_BLOB_TYPE_SUPPORTED field is not included.</u>
<u>'10'</u>	<u>The MAX_QOS_BLOB_TYPE_SUPPORTED field is included and the QOS_BLOB_TYPE field is not included.</u>
<u>'11'</u>	<u>Both the QOS_BLOB_TYPE field and MAX_QOS_BLOB_TYPE_SUPPORTED fields are included.</u>

2

3

MAX_QOS_BLOB

4

TYPE_SUPPORTED - Maximum QoS BLOB type supported by the mobile station.

5

If the QOS_BLOB_TYPE_INCL field is set to '01', the mobile station shall omit this field.

6

7

If the QOS_BLOB_TYPE_INCL field is set to '10' or '11', the mobile station shall set this field to a non-reserved value in Table 15 corresponding to the maximum version of the QoS BLOB that is supported by the mobile station.

8

9

10

11

12

QOS_BLOB_TYPE - QoS BLOB type.

13

If the QOS_BLOB_TYPE_INCL field is set to '10', the mobile station shall omit this field.

14

15

If the QOS_BLOB_TYPE_INCL field is set to '01' or '11', the mobile station shall set this field to a non-reserved value in Table 15 corresponding to the version of the QoS BLOB included in the signaling message used to request connection of service option 33.

16

17

18

19

20

Table 15 QoS BLOB TYPE Values

<u>Value</u>	<u>Description</u>
<u>'0000'</u>	<u>QoS BLOB version 0</u>
<u>'0001'- '1111'</u>	<u>Reserved</u>

21

22

ASSURED_MODE - Packet Data Service QoS mode.

1	<u>If the QOS_BLOB_TYPE field is omitted, the mobile station</u>
2	<u>shall omit this field.</u>
3	<u>If the QOS_BLOB_TYPE field is included, the mobile station</u>
4	<u>shall include this field and shall set it as follows:</u>
5	If non-assured mode packet data service is requested, the
6	mobile station shall set this field to '0'. If assured mode packet
7	data service is requested, the mobile station shall set this field
8	to '1'.
9	<u>NON_ASSURED_PRI</u>
10	<u>ADJ_INCL - Non-assured mode priority adjustment included indicator.</u>
11	<u>If the ASSURED_MODE field is omitted or is set to '1', the</u>
12	<u>mobile station shall omit this field.</u>
13	<u>If the ASSURED_MODE field is set to '0', and no change to the</u>
14	<u>user's non assured mode priority is requested, the mobile</u>
15	<u>station shall set this field to '0'.</u>
16	<u>If the ASSURED_MODE field is set to '0', and a change to the</u>
17	<u>user's non assured mode priority is requested, the mobile</u>
18	<u>station shall set this field to '1'.</u>
19	<u>NON_ASSURED_PRI</u>
20	<u>ADJ - Non-assured mode priority adjustment.</u>
21	If the ASSURED_MODE field is set to '1', the mobile station
22	shall omit this field.
23	If the <u>NON_ASSURED_PRI_ADJ_INCLMODE</u> field is <u>omitted or</u>
24	<u>is set to '0', and no change to the user's non-assured mode</u>
25	<u>priority is requested,</u> the mobile station shall omit this field.
26	If the <u>NON_ASSURED_PRI_ADJ_INCLMODE</u> field is set to
27	<u>'0'1', and a change to the user's non-assured mode priority is</u>
28	<u>requested,</u> the mobile station shall <u>include this field and set</u>
29	<u>this field</u> to a value specified in Table 16 to indicate the
30	<u>negative</u> adjustment to be applied to the user's non-assured
31	mode priority value.

1

Table 16 User Priority Adjustment Values

Value	Description
'0000'	Adjust the user's priority to 0
'0001'	Adjust the user's priority to 1/13 of the subscription priority value
'0010'	Adjust the user's priority to 2/13 of the subscription priority value
'0011'	Adjust the user's priority to 3/13 of the subscription priority value
'0100'	Adjust the user's priority to 4/13 of the subscription priority value
'0101'	Adjust the user's priority to 5/13 of the subscription priority value
'0110'	Adjust the user's priority to 6/13 of the subscription priority value
'0111'	Adjust the user's priority to 7/13 of the subscription priority value
'1000'	Adjust the user's priority to 8/13 of the subscription priority value
'1001'	Adjust the user's priority to 9/13 of the subscription priority value
'1010'	Adjust the user's priority to 10/13 of the subscription priority value
'1011'	Adjust the user's priority to 11/13 of the subscription priority value
'1100'	Adjust the user's priority to 12/13 of the subscription priority value
'1101'	Adjust the user's priority to the subscription priority value
'1110'- '1111'	Reserved

2

3

F_QOS_INCL - Forward QoS parameters included indicator.

4

5

If the ASSURED_MODE field is omitted or is set to '0', the mobile station shall omit this field.

6

7

If the ASSURED_MODE field is set to '1', the mobile station shall include this field and shall set it as follows:

- 1 If and a forward QoS parameter is included, the mobile
 2 station shall set this field to '1'. Otherwise, the mobile station
 3 shall set this field to '0'.
- 4 F_ASSURED_PRI_
- 5 ADJ_INCL - Forward link assured mode priority adjustment included
 6 indicator.
- 7 If the F_QOS_INCL field is omitted or is set to '0', the mobile
 8 station shall omit this field.
- 9 If the F_QOS_INCL field is set to '1', and no change to the
 10 user's forward link assured mode priority is requested, the
 11 mobile station shall set this field to '0'.
- 12 If the F_QOS_INCL field is set to '1', and a change to the
 13 user's forward link assured mode priority is requested, the
 14 mobile station shall set this field to '1'.
- 15 F_ASSURED_PRI_ADJ - Forward link assured mode priority adjustment.
- 16 If the F_ASSURED_PRI_ADJ_INCL field is ~~not included~~omitted
 17 or is set to '0', the mobile station shall omit this field.
- 18 ~~If the F_ASSURED_PRI_ADJ_INCL field is included and set to~~
 19 ~~'0', the mobile station shall omit this field.~~
- 20 If the F_ASSURED_PRI_ADJ_INCL field is ~~included and~~ set to
 21 '1', the mobile station shall include this field and set this
 22 field to a value specified in Table 16 to indicate the negative
 23 adjustment to be applied to the user's assured mode forward
 24 priority value.
- 25 F_DATARATE_INCL - Forward minimum user data rate parameter included
 26 indicator.
- 27 If the F_QOS_INCL field is omitted or is set to '0', the mobile
 28 station shall omit this field.
- 29 If the F_QOS_INCL field is set to '1', the mobile station shall
 30 include this field and set it as specified in Table 17.

31

Table 17 Minimum User Data Rate Indicator Values

Value	Description
'00'	No minimum user data rate is specified
'01'	Only a minimum requested user data rate is specified
'10'	Only a minimum acceptable user data rate is specified
'11'	Both a minimum requested user data rate and a minimum acceptable user data rate are specified

32

1 F_REQ_DATARATE - If the F_DATARATE_INCL field is omitted or is set to '00' or
 2 '10' not included, the mobile station shall omit this field.
 3 ~~If the F_DATARATE_INCL field is included and set to '00' or~~
 4 ~~'10', the mobile station shall omit this field.~~
 5 If the F_DATARATE_INCL field is ~~included and~~ set to '01' or
 6 '11', the mobile station shall include this field and set it to a
 7 value specified in Table 18 that corresponds to the minimum
 8 requested user data rate for the forward link.

9 **Table 18 Minimum User Data Rate Values**

Value	Description
'0001'	8 kbps minimum user data rate
'0010'	32 kbps minimum user data rate
'0011'	64 kbps minimum user data rate
<u>'0100'</u>	<u>96 kbps minimum user data rate</u>
'0100' <u>'0101'</u>	144 kbps minimum user data rate
<u>'0110'</u>	<u>288 kbps minimum user data rate</u>
'0101' <u>'0111'</u>	384 kbps minimum user data rate
'0110' <u>'1000'</u> - '1111'	Reserved

10

11 F_ACC_DATARATE - If the F_DATARATE_INCL field is omitted or is set to '00' or
 12 '01' not included, the mobile station shall omit this field.
 13 ~~If the F_DATARATE_INCL field is included and set to '00' or~~
 14 ~~'01', the mobile station shall omit this field.~~
 15 If the F_DATARATE_INCL field is ~~included and~~ set to '10' or
 16 '11', the mobile station shall include this field and set it to a
 17 value specified in Table 18 that corresponds to the minimum
 18 acceptable user data rate for the forward link.

19 F_DATALOSS_INCL - Forward data loss rate parameter included indicator.
 20 If the F_QOS_INCL field is omitted or is set to '0', the mobile
 21 station shall omit this field.
 22 If the F_QOS_INCL field is set to '1', the mobile station shall
 23 include this field and set it as specified in Table 19.

1

Table 19 Minimum Data Loss Indicator Values

Value	Description
'00'	No data loss rate is specified
'01'	Only a requested data loss rate is specified
'10'	Only an acceptable data loss rate is specified
'11'	Both a requested data loss rate and an acceptable data loss rate are specified

2

3 F_REQ_DATALOSS - If the F_DATALOSS_INCL field is omitted or is set to '00' or
4 '10' not included, the mobile station shall omit this field.

5

6

~~If the F_DATALOSS_INCL field is included and set to '00' or '10', the mobile station shall omit this field.~~

7

8

9

10

If the F_DATALOSS_INCL field is ~~included and~~ set to '01' or '11', the mobile station shall include this field and set it to a value specified in Table 20 that corresponds to the requested data loss rate for the forward link.

11

Table 20 Data Loss Rate Values

Value	Description
'0001'	1% data loss rate
'0010'	2% data loss rate
'0011'	5% data loss rate
'0100'	10% data loss rate
<u>'0101'</u>	<u>10⁻³ data loss rate</u>
<u>'0110'</u>	<u>10⁻⁴ data loss rate</u>
<u>'0111'</u>	<u>10⁻⁶ data loss rate</u>
<u>'1000'</u>	<u>10⁻⁸ data loss rate</u>
'0101' <u>'1001'</u> - '1111'	Reserved

12

13 F_ACC_DATALOSS - If the F_DATALOSS_INCL field is omitted or is set to '00' or
14 '01' not included, the mobile station shall omit this field.

15

16

~~If the F_DATALOSS_INCL field is included and set to '00' or '01', the mobile station shall omit this field.~~

1 | If the F_DATALOSS_INCL field is ~~included and~~ set to '10' or
 2 | '11', the mobile station shall include this field and set it to a
 3 | value specified in Table 20 that corresponds to the acceptable
 4 | data loss rate for the forward link.

5 | F_DELAY_INCL - Forward delay parameter included indicator.

6 | If the F_QOS_INCL field is omitted or is set to '0', the mobile
 7 | station shall omit this field.

8 | If the F_QOS_INCL field is set to '1', the mobile station shall
 9 | include this field and set it as specified in Table 21.

10 | **Table 21 Maximum Delay Indicator Values**

Value	Description
'00'	No maximum delay is specified
'01'	Only a requested maximum delay is specified
'10'	Only an acceptable maximum delay is specified
'11'	Both a requested maximum delay and an acceptable maximum delay are specified

11 |

12 | F_REQ_DELAY - If the F_DELAY_INCL field is omitted or is set to '00' or '10'~~not~~
 13 | included, the mobile station shall omit this field.

14 | ~~If the F_DELAY_INCL field is included and set to '00' or '10',~~
 15 | ~~the mobile station shall omit this field.~~

16 | If the F_DELAY_INCL field is ~~included and~~ set to '01' or '11',
 17 | the mobile station shall include this field and set it to a value
 18 | specified in Table 22 that corresponds to the requested
 19 | maximum delay for the forward link.

1

Table 22 Maximum Delay Values

Value	Description
'0001'	40 ms maximum delay
'0010'	120-80 ms maximum delay
'0011'	360-160 ms maximum delay
<u>'0100'</u>	<u>240 ms maximum delay</u>
<u>'0101'</u>	<u>320 ms maximum delay</u>
<u>'0110'</u>	<u>480 ms maximum delay</u>
<u>'0111'</u>	<u>640 ms maximum delay</u>
<u>'1000'</u>	<u>1 second maximum delay</u>
<u>'1001'</u>	<u>2 seconds maximum delay</u>
<u>'1010'</u>	<u>3 seconds maximum delay</u>
<u>'1011'</u>	<u>5 seconds maximum delay</u>
'0100' <u>'1100'</u> - '1111'	Reserved

2

3 F_ACC_DELAY - If the F_DELAY_INCL field is omitted or is set to '00' or '01'~~not~~
4 included, the mobile station shall omit this field.

5 ~~If the F_DELAY_INCL field is included and set to '00' or '01',~~
6 ~~the mobile station shall omit this field.~~

7 If the F_DELAY_INCL field is ~~included and~~ set to '10' or '11',
8 the mobile station shall include this field and set it to a value
9 specified in Table 22 that corresponds to the acceptable
10 maximum delay for the forward link.

11 R_QOS_INCL - Reverse QoS parameters included indicator.

12 If the ASSURED_MODE field is omitted or is set to '0', the
13 mobile station shall omit this field.

14 If the ASSURED_MODE field is set to '1', the mobile station
15 shall include this field and shall set it as follows:

16 ~~If and~~ a reverse QoS parameter is included, the mobile station
17 shall set this field to '1'. Otherwise, the mobile station shall
18 set this field to '0'.

19 R_ASSURED_PRI_

20 ADJ_INCL - Reverse link assured mode priority adjustment included
21 indicator.

22 If the R_QOS_INCL field is omitted or is set to '0', the mobile
23 station shall omit this field.

1			If the R_QOS_INCL field is set to '1', and no change to the
2			user's reverse link assured mode priority is requested, the
3			mobile station shall set this field to '0'.
4			If the R_QOS_INCL field is set to '1', and a change to the
5			user's reverse link assured mode priority is requested, the
6			mobile station shall set this field to '1'.
7	R_ASSURED_PRI_ADJ	-	Reverse link assured mode priority adjustment.
8			If the R_ASSURED_PRI_ADJ_INCL field is <u>omitted or is set to</u>
9			<u>'0'</u> not included , the mobile station shall omit this field.
10			If the R_ASSURED_PRI_ADJ_INCL field is included and set to
11			'0', the mobile station shall omit this field.
12			If the R_ASSURED_PRI_ADJ_INCL field is included and set to
13			'1', the mobile station shall <u>include this field and set this</u>
14			<u>field</u> to a value specified in Table 16 to indicate the <u>negative</u>
15			adjustment to be applied to the user's assured mode reverse
16			priority value.
17	R_DATARATE_INCL	-	Reverse minimum user data rate parameter included
18			indicator.
19			If the R_QOS_INCL field is <u>omitted or is</u> set to '0', the mobile
20			station shall omit this field.
21			If the R_QOS_INCL field is set to '1', the mobile station shall
22			include this field and set it as specified in Table 17.
23	R_REQ_DATARATE	-	If the R_DATARATE_INCL field is <u>omitted or is set to '00' or</u>
24			<u>'10'</u> not included , the mobile station shall omit this field.
25			If the R_DATARATE_INCL field is included and set to '00' or
26			'10', the mobile station shall omit this field.
27			If the R_DATARATE_INCL field is included and set to '01' or
28			'11', the mobile station shall include this field and set it to a
29			value specified in Table 18 that corresponds to the minimum
30			requested user data rate for the reverse link.
31	R_ACC_DATARATE	-	If the R_DATARATE_INCL field is <u>omitted or is set to '00' or</u>
32			<u>'01'</u> not included , the mobile station shall omit this field.
33			If the R_DATARATE_INCL field is included and set to '00' or
34			'01', the mobile station shall omit this field.
35			If the R_DATARATE_INCL field is included and set to '10' or
36			'11', the mobile station shall include this field and set it to a
37			value specified in Table 18 that corresponds to the minimum
38			acceptable user data rate for the reverse link.
39	R_DATALOSS_INCL	-	Reverse data loss rate parameter included indicator.
40			If the R_QOS_INCL field is <u>omitted or is</u> set to '0', the mobile
41			station shall omit this field.
42			If the R_QOS_INCL field is set to '1', the mobile station shall
43			include this field and set it as specified in Table 19.
44	R_REQ_DATALOSS	-	If the R_DATALOSS_INCL field is <u>omitted or is set to '00' or</u>
45			<u>'10'</u> not included , the mobile station shall omit this field.

1		If the R_DATALOSS_INCL field is included and set to '00' or
2		'10', the mobile station shall omit this field.
3		If the R_DATALOSS_INCL field is included and set to '01' or
4		'11', the mobile station shall include this field and set it to a
5		value specified in Table 20 that corresponds to the requested
6		data loss rate for the reverse link.
7	R_ACC_DATALOSS	- If the R_DATALOSS_INCL field is omitted or is set to '00' or
8		'01', not included , the mobile station shall omit this field.
9		If the R_DATALOSS_INCL field is included and set to '00' or
10		'01', the mobile station shall omit this field.
11		If the R_DATALOSS_INCL field is included and set to '10' or
12		'11', the mobile station shall include this field and set it to a
13		value specified in Table 20 that corresponds to the acceptable
14		data loss rate for the reverse link
15	R_DELAY_INCL	- Reverse delay parameter included indicator.
16		If the R_QOS_INCL field is omitted or is set to '0', the mobile
17		station shall omit this field.
18		If the R_QOS_INCL field is set to '1', the mobile station shall
19		include this field and set it as specified in Table 21.
20	R_REQ_DELAY	- If the R_DELAY_INCL field is omitted or is set to '00' or '10', not
21		included , the mobile station shall omit this field.
22		If the R_DELAY_INCL field is included and set to '00' or '10',
23		the mobile station shall omit this field.
24		If the R_DELAY_INCL field is included and set to '01' or '11',
25		the mobile station shall include this field and set it to a value
26		specified in Table 22 that corresponds to the requested
27		maximum delay for the reverse link.
28	R_ACC_DELAY	- If the R_DELAY_INCL field is omitted or is set to '00' or '01', not
29		included , the mobile station shall omit this field.
30		If the R_DELAY_INCL field is included and set to '00' or '01',
31		the mobile station shall omit this field.
32		If the R_DELAY_INCL field is included and set to '10' or '11',
33		the mobile station shall include this field and set it to a value
34		specified in Table 22 that corresponds to the acceptable
35		maximum delay for the reverse link.

36

37 2.2.9.32.2.8.3 Base Station Procedures

38 To use the default set of QoS parameters for service option 33, the base station shall not
39 include a QoS BLOB in the signaling message it uses to connect service option 33.

40 To use any non-default QoS parameter value, the base station ~~should~~ shall include a QoS
41 BLOB, as specified in Table 23, in the signaling message it uses to connect service option
42 33. The base station ~~should~~ shall set the parameters in the QoS BLOB using the values
43 defined in Table 12. When using assured mode packet data service, the base station

1 should omit any parameter from the QoS BLOB for which it can only provide a *best effort*
2 service rather than a specific level of service.

3 If a mobile station proposes any non-default QoS parameter value, the base station should
4 attempt to accept the proposed value.

5 The base station may determine the maximum QOS BLOB version supported by the mobile
6 station as follows:

- 7 • If the base station receives a QoS BLOB from the mobile station, and if the QoS
8 BLOB includes the MAX_QOS_BLOB_TYPE_SUPPORTED field, the base station may
9 determine the maximum QoS BLOB version supported by the mobile station to be
10 the QoS BLOB version indicated by the MAX_QOS_BLOB_TYPE_SUPPORTED field.
- 11 • If the base station receives a QoS BLOB from the mobile station, and if the QoS
12 BLOB does not include the MAX_QOS_BLOB_TYPE_SUPPORTED field, the base
13 station may determine the maximum QoS BLOB version supported by the mobile
14 station to be the QoS BLOB version indicated by the QOS_BLOB_TYPE field.
- 15 • The base station may employ other means to determine the maximum QoS BLOB
16 version supported by the mobile station.

17 If the base station receives a QoS BLOB from a mobile station, and if the base station does
18 not support the QoS BLOB version indicated by the QOS_BLOB_TYPE field in the received
19 QoS BLOB, the base station should send a QoS BLOB to the mobile station containing a
20 MAX_QOS_BLOB_TYPE_SUPPORTED field set to the maximum QoS BLOB version
21 supported by the base station.

22 If the base station sends a QoS BLOB to a mobile station, and if the base station has
23 determined the maximum QoS BLOB version supported by the mobile station, the base
24 station shall not set the QOS_BLOB_TYPE field to a value greater than the value
25 corresponding to the maximum QoS BLOB version supported by the mobile station.

26

Table 23 Base Station QoS BLOB

Field	Length (Bits)
<u>MAX_QOS_BLOB_TYPE_SUPPORTED</u>	<u>4</u>
<u>QOS_BLOB_TYPE</u>	<u>4</u>
ASSURED_MODE	1
F_QOS_INCL	0 or 1
F_DATARATE_INCL	0 or 1
F_DATARATE	0 or 4
F_DATALOSS_INCL	0 or 1
F_DATALOSS	0 or 4
F_DELAY_INCL	0 or 1
F_DELAY	0 or 4

R_QOS_INCL	0 or 1
R_DATARATE_INCL	0 or 1
R_DATARATE	0 or 4
R_DATALOSS_INCL	0 or 1
R_DATALOSS	0 or 4
R_DELAY_INCL	0 or 1
R_DELAY	0 or 4

1

2 MAX_QOS_BLOB3 TYPE_SUPPORTED - Maximum QoS BLOB type supported by the base station.4 The base station shall set this field to a non-reserved value in
5 Table 15 corresponding to the maximum version of the QoS
6 BLOB that is supported by the base station.7 QOS_BLOB_TYPE - QoS BLOB type.8 The base station shall set this field to a non-reserved value in
9 Table 15 corresponding to the version of the QoS BLOB
10 included in the signaling message used to connect service
11 option 33.

12 ASSURED_MODE - Packet Data Service QoS mode.

13 If the base station will deliver non-assured mode packet data
14 service, it shall set this field to '0'. If the base station will
15 deliver assured mode packet data service, it shall set this field
16 to '1'.

17 F_QOS_INCL - Forward QoS parameters included indicator.

18 If the ASSURED_MODE field is set to '0', the base station
19 shall omit this field.20 If the ASSURED_MODE field is set to '1', the base station
21 shall include this field and shall set it as follows:22 If and a forward QoS parameter is included, the base station
23 shall set this field to '1'. Otherwise, the base station shall set
24 this field to '0'.25 F_DATARATE_INCL - Forward minimum user data rate parameter included
26 indicator.27 If the F_QOS_INCL field is omitted or is set to '0', the base
28 station shall omit this field.29 If the ASSURED_MODE F_QOS_INCL field is set to '1', the base
30 station shall include this field and shall set it as follows:31 If and the F_DATARATE field is included, the base station shall
32 set this field to '1'. Otherwise, the base station shall set this
33 field to '0'.

1	F_DATARATE	-	Forward minimum user data rate.
2			If the F_DATARATE_INCL field is <u>omitted or is</u> set to '0', the
3			base station shall omit this field.
4			If the F_DATARATE_INCL field is set to '1', the base station
5			shall include this field and set it to a value specified in Table
6			18 that corresponds to the minimum user data rate the base
7			station will provide on the forward link for service option 33.
8	F_DATALOSS_INCL	-	Forward data loss rate parameter included indicator.
9			<u>If the F_QOS_INCL field is omitted or is set to '0', the base</u>
10			<u>station shall omit this field.</u>
11			If the F_QOS_INCL <u>ASSURED_MODE</u> field is set to '1', <u>the base</u>
12			<u>station shall include this field and shall set it as follows:</u>
13			If and the F_DATALOSS field is included, the base station shall
14			set this field to '1'. Otherwise, the base station shall set this
15			field to '0'.
16	F_DATALOSS	-	Forward data loss rate.
17			If the F_DATALOSS_INCL field is <u>omitted or is</u> set to '0', the
18			base station shall omit this field.
19			If the F_DATALOSS_INCL field is set to '1', the base station
20			shall include this field and set it to a value specified in Table
21			20 that corresponds to the data loss rate the base station will
22			provide on the forward link for service option 33.
23	F_DELAY_INCL	-	Forward delay parameter included indicator.
24			<u>If the F_QOS_INCL field is omitted or is set to '0', the base</u>
25			<u>station shall omit this field.</u>
26			If the F_QOS_INCL <u>ASSURED_MODE</u> field is set to '1', <u>the base</u>
27			<u>station shall include this field and shall set it as follows:</u>
28			If and the F_DELAY field is included, the base station shall set
29			this field to '1'. Otherwise, the base station shall set this field
30			to '0'.
31	F_DELAY	-	Forward maximum delay.
32			If the F_DELAY_INCL field is <u>omitted or is</u> set to '0', the base
33			station shall omit this field.
34			If the F_DELAY_INCL field is included and set to '1', the base
35			station shall include this field and set it to a value specified in
36			Table 22 that corresponds to the maximum delay the base
37			station will provide on the forward link for service option 33.
38	R_QOS_INCL	-	Reverse QoS parameters included indicator.
39			<u>If the ASSURED_MODE field is set to '0', the base station</u>
40			<u>shall omit this field.</u>
41			If the ASSURED_MODE field is set to '1', <u>the base station</u>
42			<u>shall include this field and shall set it as follows:</u>

1		<u>If and</u> a reverse QoS parameter is included, the base station
2		shall set this field to '1'. Otherwise, the base station shall set
3		this field to '0'.
4	R_DATARATE_INCL	- Reverse minimum user data rate parameter included
5		indicator.
6		<u>If the R_QOS_INCL field is omitted or is set to '0', the base</u>
7		<u>station shall omit this field.</u>
8		If the <u>R_QOS_INCLASSURED_MODE</u> field is set to '1', <u>the</u>
9		<u>base station shall include this field and shall set it as follows:</u>
10		<u>If and</u> the R_DATARATE field is included, the base station
11		shall set this field to '1'. Otherwise, the base station shall set
12		this field to '0'.
13	R_DATARATE	- Reverse minimum user data rate.
14		If the R_DATARATE_INCL field is <u>omitted or is</u> set to '0', the
15		base station shall omit this field.
16		If the R_DATARATE_INCL field is set to '1', the base station
17		shall include this field and set it to a value specified in Table
18		18 that corresponds to the minimum user data rate the base
19		station will provide on the reverse link for service option 33.
20	R_DATALOSS_INCL	- Reverse data loss rate parameter included indicator.
21		<u>If the R_QOS_INCL field is omitted or is set to '0', the base</u>
22		<u>station shall omit this field.</u>
23		If the <u>R_QOS_INCLASSURED_MODE</u> field is set to '1', <u>the</u>
24		<u>base station shall include this field and shall set it as follows:</u>
25		<u>If and</u> the R_DATALOSS field is included, the base station
26		shall set this field to '1'. Otherwise, the base station shall set
27		this field to '0'.
28	R_DATALOSS	- Reverse data loss rate.
29		If the R_DATALOSS_INCL field is <u>omitted or is</u> set to '0', the
30		base station shall omit this field.
31		If the R_DATALOSS_INCL field is set to '1', the base station
32		shall include this field and set it to a value specified in Table
33		20 that corresponds to the data loss rate the base station will
34		provide on the reverse link for service option 33.
35	R_DELAY_INCL	- Reverse delay parameter included indicator.
36		<u>If the R_QOS_INCL field is omitted or is set to '0', the base</u>
37		<u>station shall omit this field.</u>
38		If the <u>R_QOS_INCLASSURED_MODE</u> field is set to '1', <u>the</u>
39		<u>base station shall include this field and shall set it as follows:</u>
40		<u>If and</u> the R_DELAY field is included, the base station shall set
41		this field to '1'. Otherwise, the base station shall set this field
42		to '0'.
43	R_DELAY	- Reverse maximum delay.

1 | If the R_DELAY_INCL field is [omitted or is](#) set to '0', the base
2 | station shall omit this field.

3 | If the R_DELAY_INCL field is ~~included and~~ set to '1', the base
4 | station shall include this field and set it to a value specified in
5 | Table 22 that corresponds to the maximum delay the base
6 | station will provide on the reverse link for service option 33.

7 | ~~If the R_DELAY_INCL field is included and set to '10' or '11',
8 | the mobile station shall include this field and set it to a value
9 | specified in Table 22 that corresponds to the acceptable
10 | maximum delay.~~

11 | [2.2.10.2.9](#) Short Data Burst

12 | [2.2.10.12.2.9.1](#) Short Data Burst Procedures

13 | Service Option 33 does not permit more than one Short Data Burst transmission to be
14 | outstanding for a given sr_id at the same time. Reception and transmission of a Short Data
15 | Burst may occur simultaneously.

16 | Attributes of a Short Data Burst include the data block, the data length, the service option
17 | number to which the data service was connected and the sr_id.

18 | A Short Data Burst is carried in a *Data Burst Message* (see 2.2.9.2). The data service
19 | prepares the information for the Short Data Burst and forwards it to the Upper Layer
20 | Signaling entity for assured mode delivery over the air. The BURST_TYPE field of the *Data*
21 | *Burst Message* shall be set to Short Data Burst (see TSB58) and the CHARi fields shall be
22 | set as shown in 2.2.9.3.

23 | The *Data Burst Message* shall be sent in assured mode, requiring confirmation of delivery.
24 | If the AUTH_DATA parameter is required for global challenge authentication, the first 24
25 | bits in the CHARi fields (or all the bits of the CHARi fields, if less than 24 bits), in order,
26 | shall be used to update the AUTH_DATA parameter (see 2.1.1.1.2.2 of [15]).

27 | After a *Data Burst Message* has been sent, the sender shall not send another *Data Burst*
28 | *Message* until it is determined that the previous *Data Burst Message* has completed.
29 | Completion shall be defined as successful delivery by receiving an acknowledgement of the
30 | transmitted message, or a determination that the message was not delivered.

31 | A mobile station or base station that supports Short Data Bursts shall process all *Data*
32 | *Burst Messages* received in which the BURST_TYPE field is set to the value corresponding
33 | to Short Data Burst. (See TSB58). The mobile station or base station shall discard the
34 | message without further processing if any of the following are true:

35 | • The MSG_NUMBER field is set to a value other than 1.
36 | • The NUM_MSGS field is set to a value other than 1.
37 | • The NUM_FIELDS field is set to zero.

38 | Otherwise, the mobile station or base station shall interpret the CHARi fields of the received
39 | *Data Burst Message* according to 2.2.9.3.

1 [2.2.10.22.2.9.2](#) Data Burst Message Format

MSG_NUMBER 8	BURST_TYPE 6	NUM_MSGS 8	NUM_FIELDS 8	CHAR _i 8* NUM_FIELDS
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Data Burst Message Format

2

Field	Length (bits)
MSG_NUMBER	8
BURST_TYPE	6
NUM_MSGS	8
NUM_FIELDS	8
CHAR _i	8 * NUM_FIELDS

3

4 MSG_NUMBER - Message Number.

5 This field shall be set to the number of this message within
6 the data burst stream.

7 The MSG_NUMBER field shall be set to 1.

8 BURST_TYPE - Data Burst Type.

9 This field shall be set to Short Data Burst as defined in
10 TSB58.

11 The BURST_TYPE field shall be set to '000110'.

12 NUM_MSGS - Number of messages in the data burst stream.

13 The NUM_MSGS field shall be set to 1.

14 NUM_FIELDS - Number of characters in this message.

15 This field shall be set to the number of occurrences of the
16 CHAR_i field included in this message.17 CHAR_i - Character.18 NUM_FIELDS occurrences of this field shall be set to the
19 corresponding octet of the data burst stream.20 [2.2.10.32.2.9.3](#) Short Data Burst Format

SR_ID 3	SO_OMIT 1	RESERVED 4	SO 16	DATABLOCK var
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Short Data Burst Format

21

Field	Length (bits)
SR_ID	3
SO_OMIT	1
RESERVED	4
SO	16
DATABLOCK	Variable

1
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3
4
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- SR_ID - Service Reference Identifier.
This field shall be set to the sr_id associated with the service instance.
- SO_OMIT - Service Option number omitted indicator.
The mobile station shall set this field to SDB_SO_OMIT_s.
If the P_REV_IN_USE is less than 7, the base station shall set this field to '0'. Otherwise, the base station shall set this field to '1'.
- RESERVED - Reserved bits.
This field shall be set to '0000'.
- SO - Service Option number.
If SO_OMIT is '0', this field shall be set to the service option number, 33, associated with the service.
If SO_OMIT is '1', this field shall be omitted.
- DATABLOCK - Data octets.
This field is set to the data octets included in this message.

1 **3 LINK LAYER**

2 **3.1 R_m Interface Link Layer**

3 The R_m Interface Link Layer applies only to the Network Layer R_m Interface Protocol
4 Option. If PPP is used as the R_m interface Link Layer, the R_m interface Link Layer shall
5 support negotiation of async control character mapping as defined in [8]. If software
6 flow control is used on the R_m interface, the TE2 shall negotiate mapping for the XON
7 and XOFF control characters. To provide the maximum throughput, the TE2 should
8 negotiate mapping only for the minimum number of control characters necessary for
9 proper operation. The MT2 should not request control character mapping on the R_m
10 interface, but shall perform control character mapping on that interface if negotiated by
11 the TE2.

12 The TE2 and MT2 shall frame PPP packets sent on the R_m interface using the
13 asynchronous framing protocol defined in [8].

14 3.1.1 Link Layer Connection Open

15 If PPP is implemented as the Link Layer protocol on the R_m interface, the MT2 shall
16 initiate PPP configuration on the R_m interface when packet data service is activated.

17 When the mobile station packet data service enters the *Active State*, the MT2 should
18 also send a physical layer establishment indication to the TE2 (see Section 2.1.1 and
19 Section 5 of C.S0017-0-2.3). If the PPP LCP in the TE2 is not in the Opened state, the
20 TE2 initiates PPP configuration according to the protocol defined in [7]. When the PPP
21 LCP enters the Opened state, PPP sends an establishment indication to higher protocol
22 layers. After a PPP establishment indication, network layer protocols are configured
23 using the appropriate network control protocols.

24 3.1.2 Link Layer Connection Closure

25 If PPP is implemented as the Link Layer protocol on the R_m interface, the MT2 should
26 close the PPP LCP on the R_m interface when the packet data service enters the *Inactive*
27 *State*.

28 **3.2 PDSN Link Layer**

29 For the PDSN Link Layer, requirements on the MT2 refer only to the Network Layer R_m
30 Interface Protocol Option.

31 The PDSN Link Layer protocol used for Service Option 33 is the Internet Point-to-Point
32 Protocol (PPP), in accordance with [7]. The PDSN Link Layer supports the PPP Link
33 Control Protocol (LCP) defined in [7] and the LCP extensions defined in [6].

34 The instances of PPP support control escaping in accordance with 4.2 of [8]. When the
35 Relay Layer R_m interface protocol option is selected, the MT2 does not activate an
36 instance of PPP.

37 The PDSN Link Layer supports negotiation of async control character mapping as
38 defined in [8]. The PDSN does not request control character mapping, but performs
39 control character mapping if negotiated by the mobile station.

1 When the Relay Layer R_m interface protocol option is selected, the MT2 shall perform
2 the necessary framing conversion,⁶ except that the MT2 shall not perform
3 asynchronous control character mapping, and the provisions of section 6 of [8] do not
4 apply to the MT2.

5 Both the mobile station and PDSN frame PPP packets sent on the PDSN Link Layer
6 using the octet-synchronous framing protocol defined in [8], except that there shall be
7 no inter-frame time fill (see 4.4.1 of [8])⁷. That is, no flag octets are sent between a flag
8 octet that ends one PPP frame and the flag octet that begins the subsequent PPP frame.

9 The base station shall pass octets between the mobile station and PCF without any
10 framing conversion. The PCF passes octets between the base station and the PDSN
11 without any framing conversion.

12 3.2.1 Link Layer Connection Open

13 If the Network Layer R_m Interface Protocol option is selected, and the mobile station
14 packet data service call control function enters the *Connected State* while the U_m
15 interface PPP LCP is not in the Opened state, the MT2 initiates PPP configuration
16 according to the protocol defined in [7]. When the PPP LCP enters the Opened state,
17 PPP sends an establishment indication to higher protocol layers. After a PPP
18 establishment indication, network layer protocols are configured using the appropriate
19 network control protocols.

20 If the Relay Layer R_m Interface Protocol option is selected, when the mobile station
21 packet data service enters the *Active State*, the MT2 should send a physical layer
22 establishment indication to the TE2 (see Section 2.1.1 and Section 5 of C.S0017-0-2.3).
23 If the PPP LCP in the TE2 is not in the Opened state, the TE2 initiates PPP configuration
24 according to the protocol defined in [7]. When the PPP LCP enters the Opened state,
25 PPP sends an establishment indication to higher protocol layers. After a PPP
26 establishment indication, network layer protocols are configured using the appropriate
27 network control protocols.

28 3.2.2 Link Layer Connection Closure

29 If the Network Layer R_m Interface Protocol Option is selected, then when the PPP
30 connection to the TE2 is closed, the MT2 shall close the PPP connection to the PDSN.

⁶Framing conversion in the MT2 consists of the insertion and removal of start bits, stop bits, and mark characters (see 4.4.2 and 4.5.2 of RFC 1662).

⁷ Due to the range of existing PPP implementations, a receiver should be able to process inter-frame time fill.

1 **4 NETWORK LAYER**

2 **4.1 Internet Protocol Support for the PDSN Link Layer**

3 Service Option 33 supports the Internet Protocol (IP) Network Layer (as defined in [2]).
4 For Service Option 33, the PDSN Link Layer supports the following PPP protocol
5 numbers:

6 0x0021 Internet Protocol
7 0x002d Van Jacobson Compressed TCP/IP
8 0x002f Van Jacobson Uncompressed TCP/IP
9 0x8021 Internet Protocol Control Protocol

10 For Service Option 33, the mobile station supports the IP Control Protocol (IPCP)
11 defined in [5]. The mobile station supports Van Jacobson TCP/IP header compression
12 ([4]). Van Jacobson TCP/IP header compression is configured through IPCP
13 negotiation.

C.S0017-0.12

1

2 No text.

3