WDP and WCMP Wireless Data Gateway Adaption

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Continues the Technical Activities
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Contents

1. Scope

This document specifies the WDP and WCMP adaptation over the underlying access protocol between a WAP Proxy Server and a Wireless Data Gateway (such as an SMSC or a USSD server).

The tunnel protocol in the WAP architecture is based on a subset of the Short Message Peer-to-Peer Protocol (SMPP), version 3.4. SMPP includes support for the SMS bearer service (across the various network types) and the USSD bearer service (GSM network only).

This document details the elements of the SMPP protocol that are required and sufficient for carrying WDP and WCMP data units between a WAP Proxy Server and a Wireless Data Gateway. The Wireless Data Gateway is responsible for relaying the WDP and WCMP data units to and from the WAP capable wireless device (such as a mobile station).

Figure 1.1 shows a general model of the WAP protocol architecture and how SMPP fits into that architecture.

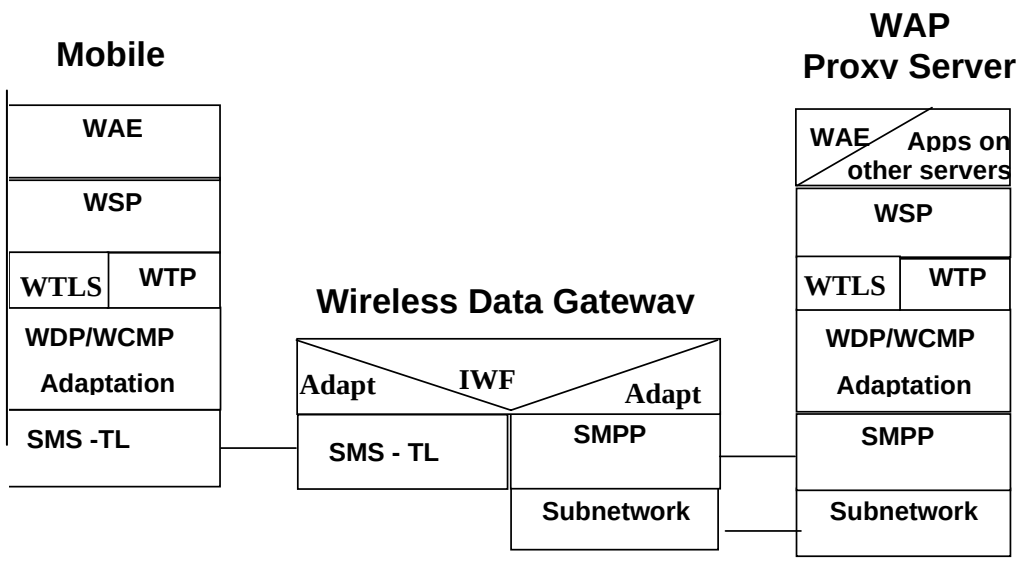

Figure 1.1 SMPP Tunnel in the WAP Architecture

2. References

2.1 Normative References

[IOPProc] "OMA Interoperability Policy and Process". Open Mobile Alliance™. OMA-IOP-Process-v1_0. URL:http//www.openmobilealliance.org/

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997. URL:http://www.ietf.org/rfc/rfc2119.txt

[SMPP34] Short Message Peer-to-Peer Protocol (SMPP) Specification. Version 3.4, Issue 1.2. http://www.smpp.org.

[WCMP] "Wireless Control Message Protocol", Open Mobile Alliance™, WAP-202-WCMP, http://www.openmobilealliance.org/.

[WDP] "Wireless Datagram Protocol", Open Mobile Alliance™, WAP-259-WDP, http://www.openmobilealliance.org/.

2.2 Informative References

[WAE] "Wireless Application Environment Specification", WAP Forum™, 16 June 1999. http://www.wapforum.org

[WAP] "Wireless Application Protocol Architecture Specification", WAP Forum™, 30 April 1998. http://www.wapforum.org

[WTP] "Wireless Transaction Protocol", Open Mobile Alliance™, WAP-224-WTP, http://www.openmobilealliance.org/.

3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope” and “General”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

None.

3.3 Abbreviations

CDMA	Code Division Multiple Access
DPF	Delivery Pending Flag
ETSI	European Telecommunication Standardisation Institute
GPRS	General Packet Radio System
GSM	Global System for Mobile Communication
iDEN	Integrated Digital Enhanced Network
IE	Information Element
IP	Internet Protocol
LSB	Least Significant Bits
MAP	Mobile Application Part
ME	Mobile Equipment
MMS	More Messages to Send
MO	Mobile Originated
MS	Mobile Station
MSB	Most Significant Bit
MSISDN	Mobile Subscriber ISDN (telephone number or address of device)
MT	Mobile Terminated
PDU	Protocol Data Unit
SAR	Segmentation and Reassembly
SME	Short Message Entity
SME-IF	Short Message Entity Interface
SMPP	Short Message Peer-to-Peer
SMS	Short Message Service
SMSC	Short Message Service Centre
TCP	Transmission Control Protocol
TDMA	Time Division Multiple Access
UDH	User-Data Header (see GSM 03.40)
UDHI	User-Data Header Indication (see GSM 03.40)
UDP	User Datagram Protocol
USSD	Unstructured Supplementary Service Data
WAP	Wireless Application Protocol
WCMP	Wireless Control Message Protocol
WDP	Wireless Datagram Protocol
WSP	Wireless Session Protocol
WTP	Wireless Transaction Protocol

4. General

The protocol between a WAP Proxy Server and a Wireless Data Gateway is required to be “wireless network technology independent”. This assures a true isolation from the network type and device type used. It also assures the end-to-end nature of the Wireless Data Protocol (WDP) and Wireless Control Message Protocol (WCMP) that are “tunnelled” between the WAP Proxy Server and the Mobile Station.

This document defines in an unambiguous manner how SMPP shall be implemented for a proper interworking in this context.

The following sections describe the protocol elements to be used, specific values of parameters to be used and recommends optional features.

5. SMPP Adaptation

Note:- This section of the document defines those specific elements of SMPP v3.4 which are required for WAP applications. It is intended that this document be used in conjunction with SMPP Protocol Specification v3.4 [SMPP34] (available from http://www.smpp.org).

5.1 General WDP/WCMP adaptation requirements

5.1.1 Underlying transport protocol

The underlying transport protocol for access between a Wireless Data Gateway and a WAP Proxy Server is TCP/IP. TCP/IP provides a reliable connection-oriented transport. Other protocols supported by SMPP, such as X.25, may also be used for the underlying transport connection.

5.1.2 Support for More Messages to Send

Some wireless network technologies allow a Wireless Data Gateway to keep a short message transaction open between the Gateway MSC and the MS in the case where there are more messages waiting to be sent from the Wireless Data Gateway to the MS. This feature is commonly referred to as “More Messages to Send”.

In a WAP system there are typically more than one mobile terminated message in the response from the WAP Proxy Server to the MS. The capability for the WAP Proxy Server to indicate that there are further messages for the MS could crucially improve the response time perceived by the user.

SMPP allows WAP Proxy Servers to set a *more_msgs_to_send* indicator on a per message basis. Independently of this SMPP parameter setting, Wireless Data Gateway implementations may choose (as an implementation option) to intelligently set the MMS parameter on the air interface when a multiple-fragment WDP message is been sent to the MS, i.e. without a specific indication from the WAP Proxy Server to set it.

5.1.3 Support for 'non Store-and-Forward' messages

Traditionally Wireless Data Gateways securely stored messages to a non-volatile disk file system before delivering them. Many interactive WAP applications do not require this feature and indeed the increased latency incurred may be undesirable, and perhaps even prohibitive, in many applications.

SMPP allows the WAP Proxy Server to send a datagram message using the ***data_sm*** PDU. Wireless Data Gateways implementations MAY choose not to securely store the WDP/WCMP datagram. A WAP Proxy Server requests datagram mode by setting the *esm_class* parameter in ***data_sm*** to the value corresponding to “datagram mode”.

5.1.4 Support for transferring binary data

WDP and WCMP messages are encoded in binary format. The adaptation layers in the Wireless Data Gateway and WAP Proxy Server MUST set the SMPP *data_coding* parameter to “8-bit binary” (0x04).

Some WAP Proxy Servers may encode WDP datagrams in textual format. In this case, the WAP Proxy Server MAY set the SMPP *data_coding* parameter to another character coding set scheme (e.g. IA5/ASCII).

5.1.5 Segmentation and Reassembly (SAR)

The WDP Tunnel Requirements allows various options for the Segmentation and Reassembly of WDP datagrams.

1. The WAP Proxy Server is performing Segmentation and Reassembly

   When sending a WDP datagram to the wireless device, the WAP Proxy Server segments the WDP datagram prior to tunnelling it over the SMPP connection to the Wireless Data Gateway. Each of the segments is transmitted in a separate ***data_sm*** PDU to the Wireless Data Gateway. In this case, the WAP Proxy Server MUST include the *sar_msg_ref_num, sar_total_segments* and the *sar_segment_seqnum* parameters in the ***data_sm*** PDU.

   When a WAP Proxy Server is receiving a WDP datagram from the wireless device, it can receive it in the form of a number of segments. Each segment is sent by the Wireless Data Gateway as message payload in separate ***data_sm*** PDUs. In this case, the Wireless Data Gateway MUST include the *sar_msg_ref_num, sar_total_segments* and the *sar_segment_seqnu*m parameters in the ***data_sm*** PDU. The WAP Proxy Server reassembles the complete WDP datagram once it has received all segments.

2. The Wireless Data Gateway implements a Segmentation and Reassembly function for WDP Datagrams.

   When sending a WDP datagram to the wireless device, the WAP Proxy Server sends a complete datagram in a single ***data_sm*** PDU to the Wireless Data Gateway. In this case, the WAP Proxy Server MUST not include the *sar_msg_ref_num, sar_total_segments* and the *sar_segment_seqnu*m parameters in the ***data_sm*** PDU.

   When a WAP Proxy Server is receiving a WDP datagram from the wireless device, it will receive it as a complete datagram from the Wireless Data Gateway. In this case, the Wireless Data Gateway MUST not include the *sar_msg_ref_num, sar_total_segments* and the *sar_segment_seqnum* parameters in the ***data_sm*** PDU.

3. Dual Segmentation and Reassembly

   This is a special case of SAR where both the WAP Proxy Server and the Wireless Data Gateway perform the Segmentation and Reassembly of a WDP datagram. In this scenario, the WAP Proxy Server transmits the WDP datagram as a sequence of segments over the SMPP tunnel to the Wireless Data Gateway. As an implementation option, the Wireless Data Gateway then reassembles the segments back into one complete WDP datagram, before it forwards the WDP datagram over the wireless interface. Depending on the technology of the wireless device, the Wireless Data Gateway may have to re-segment the datagram for transmission over the wireless interface.

   Similarly, the Wireless Data Gateway may reassemble a WDP datagram received as a series of segments over the wireless interface and then re-segment the WDP datagram for delivery over the SMPP tunnel to the WAP Proxy Server.

   The adaptation for the transmission of the WDP datagram segments over the SMPP tunnel is exactly the same as option 1 above for both directions of WDP datagram flow. In essence, the Dual Segmentation and Reassembly is an implementation option for the Wireless Data Gateway and no extra special adaptation is required.

5.1.6 WCMP Support

When sending a WCMP message to the MS, the WAP Proxy Server MUST indicate this to the Wireless Data Gateway by setting the *payload_type* parameter in ***data_sm*** to “WCMP” (0x01). The WCMP message is carried in the *message_payload* parameter. On receiving a ***data_sm*** with *payload_type* set to “WCMP”, the Wireless Data Gateway will transmit the WCMP messages to the wireless device using the network dependent mechanism as defined in [WCMP].

The Wireless Data Gateway can also relay a WCMP message from the wireless device to the WAP Proxy Server. In this case, the Wireless Data Gateway MUST set the *payload_type* parameter in ***data_sm*** to “WCMP” (0x01). The WCMP message is carried in the *message_payload* parameter.

5.1.7 Alert Notification

A WAP Proxy Server can request that the Wireless Data Gateway set a Delivery Pending Flag (DPF) for the delivery failure of a WDP datagram over the wireless interface. The exact delivery failure conditions are technology dependent (e.g. GSM

allows a DPF to be set for "memory capacity exceeded") and Wireless Data Gateway implementation specific. However, in general the failure condition can be characterised as being a "device unavailable" failure.

SMPP allows the WAP proxy server to request this setting on a per-datagram basis using the *set_dpf* parameter in the ***data_sm*** PDU**.**

The Wireless Data Gateway SHOULD then send an alert notification to the WAP Proxy Server when it or the wireless network infrastructure (e.g. HLR) detects that device has become available. It should be noted that the Wireless Data Gateway only sends this alert when the DPF setting for the wireless device had been requested in a previous ***data_sm*** operation.

The ***alert_notification*** PDU is used to send the alert to the WAP Proxy Server.

5.2 Mandatory SMPP PDUs

This section documents the SMPP PDUs that are mandatory for WDP/WCMP data tunnelling between a WAP Proxy Server and a Wireless Data Gateway.

5.2.1 DATA_SM

The ***data_sm*** PDU is used to carry WDP and WCMP datagrams. The type of payload is indicated via the *payload_typ*e parameter. Both the Wireless Data Gateway and the WAP Proxy Server MUST be capable of sending the ***data_sm*** PDU.

A WAP Proxy Server MAY select a delivery mode when tunnelling datagrams to the Wireless Data Gateway. The delivery mode indicates to the Wireless Data Gateway the mechanism to be used for delivering the datagram to the wireless device. The delivery mode is indicated in the *esm_class* parameter (message mode settings). The delivery modes available in ***data_sm*** for WAP datagrams are as follows:

1. Store and Forward

   This mode allows the WAP Proxy Server to request the Wireless Data Gateway to securely store the datagram until it is delivered or until it expires. This mode may be used for "push" applications. The WAP Proxy Server can control the expiration time by specifying the *qos_time_to_live* parameter in the ***data_sm*** PDU.

2. Datagram

   This mode allows the WAP Proxy Server to request the Wireless Data Gateway to relay the datagram to the MS, without necessarily securing the datagram for long-term storage. This mode is designed for "interactive applications". The WAP Proxy Server can control the lifetime of the datagram in the Wireless Data Gateway by specifying the *qos_time_to_live* parameter in the ***data_sm*** PDU.

The ***data_sm*** PDU also supports the various options for location of the Segmentation and Reassembly function in the WAP network. See section 5.1.5.

Section 5.4.7 details the individual parameter settings for the ***data_sm*** PDU for both the "mobile terminated" and "mobile originated" directions.

5.2.2 GENERIC_NACK

The GENERIC_NACK PDU is sent by the Wireless Data Gateway or the WAP Proxy Server to indicate the following SMPP protocol error conditions encountered when processing an SMPP request PDU.

- Invalid *command_length.* The length of the SMPP request PDU is not correct.
- Unknown *command_id*. The SMPP request PDU is either unknown or not supported.
- Corrupted SMPP PDU. The SMPP request PDU is detected to be corrupt.

5.2.3 BIND

The WAP Proxy Server must establish an SMPP session with a Wireless Data Gateway prior to the transmission of WDP/WCMP messages over the link. There are two mechanisms for setting up SMPP sessions. At least one mechanism MUST be supported by a WAP Proxy Server.

The first mechanism allows the WAP Proxy Server to issue both a ***bind_transmitter*** PDU and/or a ***bind_receiver*** PDU to set up distinct SMPP sessions for the different directions of WDP message flow.

The second mechanism allows a WAP Proxy Server to set up a single SMPP session for two-way WDP datagram flow using the ***bind_transceiver*** PDU.

5.2.3.1 BIND_TRANSCEIVER

The ***bind_transceiver*** PDU is used to establish a duplex messaging session between a WAP Proxy Server and a Wireless Data Gateway. The WAP Proxy Server can send datagrams to a wireless device (e.g. MS) and should be able to receive datagrams from a wireless device over a transceiver session.

The WAP Proxy Server provides identification and authentication information as part of the session establishment. See 5.4.1 for more details.

As an option, Wireless Data Gateways MAY allow trusted WAP Proxy Servers to establish an SMPP session without providing a password.

5.2.3.2 BIND_TRANSMITTER

The ***bind_transmitter*** PDU is used to establish a one way messaging session between a WAP Proxy Server and a Wireless Data Gateway. The WAP Proxy Server can only send datagrams to a wireless device (e.g. MS) over a transmitter session.

The WAP Proxy Server provides identification and authentication information as part of the session establishment. See 5.4.2 for more details.

As an option, Wireless Data Gateways MAY allow trusted WAP Proxy Servers to establish an SMPP session without providing a password.

5.2.3.3 BIND_RECEIVER

The ***bind_receiver*** PDU is used to establish a one-way messaging session between a WAP Proxy Server and a Wireless Data Gateway. The WAP Proxy Server will only receive datagrams originated from a wireless device (e.g. MS) over an SMPP receiver session.

The WAP Proxy Server provides identification and authentication information as part of the session establishment. See 5.4.3 for more details.

As an option, Wireless Data Gateways MAY allow trusted WAP Proxy Servers to establish an SMPP session without providing a password.

5.2.4 UNBIND

The UNBIND PDU is used by either the WAP Proxy Server or the Wireless Data Gateway to terminate the SMPP session. Thereafter the node should disconnect the link at TCP level.

5.3 Optional SMPP PDUs

This section documents the SMPP PDUs that are implementation options for WDP/WCMP data tunnelling between a WAP Proxy Server and a Wireless Data Gateway.

5.3.1 ENQUIRE_LINK

This PDU can be used by both the WAP Proxy Server and the Wireless Data Gateway to test the peer to peer communications and sanity level of an SMPP link. When implemented, the node sending the ***enquire_link*** PDU should note the following:

- The ***enquire_link*** PDU need only be sent after a certain idle (i.e. inactivity) period has been detected on the link. This period is defined using the SMPP *enquire_link_timer*.
- If a response is not received within a certain time period (defined by the SMPP *response_timer*), the node should disconnect the link at TCP/IP level.

5.3.2 ALERT_NOTIFICATION

This PDU is used by the Wireless Data Gateway to send an alert notification to the WAP Proxy Server. A Wireless Data Gateway sends an alert notification when it detects that a wireless device has become available and for which a DPF setting had been previously requested (by the WAP Proxy Server) in a failed datagram delivery to that wireless device.

The ***alert_notification*** PDU contains the address of the wireless device and the originating WDP entity address in the datagram which requested the DPF setting.

5.4 Detailed Parameter Value Recommendations

This section provides the recommended parameter values for the subset of the SMPP PDUs that are required for WDP and WCMP data tunnelling. Only those SMPP parameters that are mandatory or optional for WAP application are documented in this section.

Note:- This section of the document defines those specific elements of SMPP Protocol Specification v3.4 which are required for WAP applications. This section does not document generic SMPP details such as the SMPP header format. The reader should refer to the SMPP specification [SMPP34] for this generic information.

5.4.1 BIND_TRANSCEIVER

The ***bind_transceiver*** operation is used by a WAP Proxy Server to establish a duplex messaging session to a Wireless Data Gateway. The following tables provide the recommended parameter settings for the request and response PDUs.

5.4.1.1 BIND_TRANSCEIVER Request

Parameter	M/O	Size (bytes)	Recommended Value	Comment
system_id	M	1 - 15	identification string	Identifies the WAP Proxy Server
password	M	1 - 9	any character string	Trusted WAP Proxy Servers that do not need to send a password can set this parameter to NULL.
system_type	M	1 - 12	“WAP”	Indicates that the connecting system is a WAP Proxy Server.
interface_version	M	1	0x34	Identifies the version of the SMPP protocol supported by the ESME.
addr_ton	M	1	Any	TON for WAP Proxy Server address
addr_npi	M	1	Any.	NPI for WAP Proxy Server address
address_range	M	1 - 40	WAP Proxy Server address digits	A single address which identifies the WAP Proxy Server. This could be for example an IP address or a short code telephone number

				assigned to the WAP Proxy Server by the service provider.

5.4.1.2 BIND_TRANSCEIVER Response

Parameter	M/O	Size (bytes)	Recommended Value	Comment
system_id	M	1 - 15	identification string	Identifies the Wireless Data Gateway
sc_interface_version	M	1	0x34	Wireless Data Gateways should set the SMPP protocol version to v3.4.

5.4.2 BIND_TRANSMITTER

The ***bind_transmitter*** operation is used by a WAP Proxy Server to establish a one way messaging session to a Wireless Data Gateway. The following tables provide the recommended parameter settings for the request and response PDUs.

5.4.2.1 BIND_TRANSMITTER Request

Parameter	M/O	Size (bytes)	Recommended Value	Comment
system_id	M	1 - 15	identification string	Identifies the WAP Proxy Server
password	M	1 - 9	password character string	Trusted WAP Proxy Servers that do not need to send a password can set this parameter to NULL.
system_type	M	1 - 12	“WAP”	Indicates that the connecting system is a WAP Proxy Server.
interface_version	M	1	0x34	Identifies the version of the SMPP protocol supported by the ESME.
addr_ton	M	1	Any	TON for WAP Proxy Server address
addr_npi	M	1	Any.	NPI for WAP Proxy Server address
address_range	M	1 - 40	WAP Proxy Server address digits	A single address which identifies the WAP Proxy Server. This could be for example an IP address or a short code telephone number assigned to the WAP Proxy Server by the service provider.

5.4.2.2 BIND_TRANSMITTER Response

Parameter	M/O	Size (bytes)	Recommended Value	Comment
system_id	M	1 - 15	identification string	Identifies the Wireless Data Gateway
sc_interface_version	M	1	0x34	Wireless Data Gateways MUST set the SMPP protocol version to v3.4.

5.4.3 BIND_RECEIVER

The ***bind_receiver*** operation establishes a one way messaging session to a Wireless Data Gateway for receiving WDP and WCMP datagrams originated by wireless devices. The following tables provide the recommended parameter settings for the request and response PDUs.

5.4.3.1 BIND_RECEIVER Request

Parameter	M/O	Size (bytes)	Recommended Value	Comment
system_id	M	1 - 15	Identification string	Identifies the WAP Proxy Server
password	M	1 - 9	password character string	Trusted WAP Proxy Servers that do not need to send a password can set this parameter to NULL.
system_type	M	1 -12	"WAP"	Indicates that the connecting system is a WAP Proxy Server.
interface_version	M	1	0x34	Identifies the version of the SMPP protocol supported by the ESME.
addr_ton	M	1	Any	TON for WAP Proxy Server address
addr_npi	M	1	Any.	NPI for WAP Proxy Server address
address_range	M	1 - 40	WAP Proxy Server address digits	A single address which identifies the WAP Proxy Server. This could be for example an IP address or a short code telephone number assigned to the WAP Proxy Server by the service provider.

5.4.3.2 BIND_RECEIVER Response

Parameter	M/O	Size (bytes)	Recommended Value	Comment
system_id	M	1 - 15	identification string	Identifies the Wireless Data Gateway
sc_interface_version	M	1	0x34	Wireless Data Gateways MUST set the SMPP protocol version to v3.4.

5.4.4 UNBIND

The ***unbind*** operation clears down an SMPP session between a WAP Proxy Server and a Wireless Data Gateway.

Both the ***unbind*** and ***unbind_resp*** PDUs only contain an SMPP header part.

5.4.5 ENQUIRE_LINK

The ***enquire_link*** operation is used by a WAP Proxy Server and a Wireless Data Gateway to test the peer to peer communications and sanity level of an SMPP session.

Both the ***enquire_link*** and ***enquire_link_resp*** PDUs only contain an SMPP header part.

5.4.6 DATA_SM (WAP Proxy Server Initiated)

A WAP Proxy Server uses the ***data_sm*** PDU to send a WDP or a WCMP message to a Wireless Data Gateway. The Wireless Data Gateway should return a ***data_sm_resp*** PDU once it has accepted the message.

5.4.6.1 DATA_SM (WAP Proxy Server -> Wireless Data Gateway)

The following table provides the recommended values to be used by a WAP Proxy Server when sending a ***data_sm***.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
service_type	M	5	"WAP"	Indicates SMS application service is WAP
source_addr_ton	M	1	0x00 (Unknown)	International directory number
source_addr_npi	M	1	0x00 (Unknown) 0x01 (E.164) 0x0E (IP)	WAP Proxy Server can indicate the associated numbering plan of its own address.
source_addr	M	0 – 64	Address digits	address digits of WAP Proxy Server
dest_addr_ton	M	1	0x01	International directory number
dest_addr_npi	M	1	0x01	E164 numbering plan
dest_addr	M	1 – 64	Directory number digits	This is the MSISDN of the MS
esm_class	M	1	0x00 0x01 0x03	Default mode Datagram mode Store and Forward mode
registered_delivery	M	1	0x00 0x01	No SMSC receipt requested SMSC Delivery Receipt requested
data_coding	M	1	0x04 0x00 – 0x0F	8-bit binary other character sets.
source_port	O	2	0 – 65535	UDP port of originating WDP entity. This parameter MUST be present for a WDP message and SHOULD NOT be used for a WCMP message..
dest_port	O	2	0 – 65535	UDP port of destination WDP entity. This parameter MUST be present for a WDP message and SHOULD NOT be used for a WCMP message..
sar_msg_ref_num	O	2	0 – 65535	MUST be present if WAP Proxy Server is segmenting the WDP message.
sar_total_segments	O	1	2 – 255	MUST be present if WAP Proxy Server is segmenting the WDP message
sar_segment_seqnum	O	1	1 – 255	MUST be present if WAP Proxy Server is segmenting the WDP message
more_msgs_to_send	O	1	0x01	SHOULD be present if WAP Proxy Server has further WDP (segments) to send.
dest_addr_subunit	O	1	0x00 (unknown) 0x02 (ME)	WAP Proxy Server MAY include this parameter to direct the WDP/WCMP within the MS
dest_network_type	O	1	Any	WAP Proxy Server MAY include this parameter to direct the WDP/WCMP to a particular wireless network type
dest_bearer_type	O	1	Any	WAP Proxy Server MAY include this parameter to request the Wireless Data Gateway to select a particular bearer for

Parameter	M/O	Size (bytes)	Recommended Value	Comment
				the WDP/WCMP.
qos_time_to_live	O	4	Any	MAY be used to request the period of time that the Wireless Data Gateway should retain the WDP message if it fails to get delivered
payload_type	O	1	0x00 (WDP) 0x01 (WCMP)	This parameter MUST be present and set to 0x01 for a WCMP message
message_payload	M	1 – 65535	user data	WDP or WCMP content
set_dpf	O	1	0x00 or 0x01	Do not set DPF Setting of DPF requested.

5.4.6.2 DATA_SM_Resp (Wireless Data Gateway -> WAP Proxy Server)

The following table provides the recommended values to be used by a Wireless Data Gateway when returning a ***data_sm_resp***.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
message_id	M	1 – 64	Any	The message ID is the Wireless Data Gateway's handle to the datagram. It should be considered as an opaque value.
additional_status_info_text	O	1 – 255	Textual string	A Wireless Data Gateway may include a diagnostic text string for failure scenarios

5.4.7 DATA_SM (Wireless Data Gateway Initiated)

A Wireless Data Gateway uses the ***data_sm*** operation to send a WDP or a WCMP message to a WAP Proxy Server.

5.4.7.1 DATA_SM (Wireless Data Gateway -> WAP Proxy Server)

The following table provides the recommended values to be used by a Wireless Data Gateway when sending a ***data_sm***.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
service_type	M	5	"WAP"	Indicates SMS application service is WAP
source_addr_ton	M	1	0x01 (Int.)	International directory number
source_addr_npi	M	1	0x01 (E.164)	all MS's have E.164 directory numbers
source_addr	M	0 – 64	address digits	directory number digits of wireless device
dest_addr_ton	M	1	0x00 (unknown)	International directory number
dest_addr_npi	M	1	0x00 (unknown) 0x01 (E.164) 0x0E (IP)	WAP Proxy Server can either be addressed via an IP address or a telephone number address. Otherwise set to "unknown"
dest_addr	M	1 – 64	address digits	Address digits of WAP Proxy Server
esm_class	M	1	0x00	no special message mode
registered_delivery	M	1	0x00	no acknowledgements/receipts
data_coding	M	1	0x04 0x00 – 0x0F	8-bit binary Other character sets.
source_port	O	2	0 – 65535	UDP port of originating WDP entity. This

Parameter	M/O	Size (bytes)	Recommended Value	Comment
				parameter MUST be present for a WDP message and SHOULD NOT be used for a WCMP message..
dest_port	O	2	0 – 65535	UDP port of destination WDP entity. This parameter MUST be present for a WDP message and SHOULD NOT be used for a WCMP message..
sar_msg_ref_num	O	2	0 – 65535	MUST be present if WAP Proxy Server is reassembling the WDP message.
sar_total_segments	O	1	2 – 255	MUST be present if WAP Proxy Server is reassembling the WDP message
sar_segment_seqnum	O	1	1 – 255	MUST be present if WAP Proxy Server is reassembling the WDP message
source_network_type	O	1	Any	Wireless Data Gateway MAY include this parameter to indicate the type of wireless interface over which the datagram was received.
source_bearer_type	O	1	Any	Wireless Data Gateway MAY include this parameter to indicate the type of wireless bearer over which the datagram was received.
payload_type	O	1	0x00 (WDP) 0x01 (WCMP)	This parameter MUST be present and set to 0x01 for a WCMP message.
message_payload	M	1 – 65535	user data	WDP or WCMP content

5.4.7.2 DATA_SM_Resp (WAP Proxy Server -> Wireless Data Gateway)

The following table provides the recommended values to be used by a WAP Proxy Server when returning a ***data_sm_resp***.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
message_id	M	1 – 64	0x00 (NULL)	The Wireless Data Gateway does not need a handle to the WDP or WCMP datagram.
additional_status_info_text	O	1 – 255	Textual string	A WAP Proxy Server may include a diagnostic text string for failure scenarios

5.4.8 DATA_SM (Delivery Receipt from Wireless Data Gateway)

A Wireless Data Gateway uses the ***data_sm*** operation to send a final delivery receipt to the WAP Proxy Server.

5.4.8.1 DATA_SM (Wireless Data Gateway -> WAP Proxy Server)

The following table provides the recommended values to be used by a Wireless Data Gateway when sending a Delivery Receipt.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
service_type	M	5	"WAP"	Indicates SMS application service is WAP
source_addr_ton	M	1	0x01 (Int.)	

Parameter	M/O	Size (bytes)	Recommended Value	Comment
source_addr_npi	M	1	0x01 (E.164)	all MS's have E.164 directory numbers
source_addr	M	0 – 64	address digits	directory number digits of wireless device to which the receipt pertains
dest_addr_ton	M	1	0x00 (unknown)	
dest_addr_npi	M	1	0x00 (unknown) 0x01 (E.164) 0x0E (IP)	WAP Proxy Server can either be addressed via an IP address or a telephone number address. Otherwise set to "unknown"
dest_addr	M	1 – 64	address digits	Address digits of WAP Proxy Server
esm_class	M	1	0x04	indicates that *data_sm* contains a delivery receipt
registered_delivery	M	1	0x00	no acknowledgements
data_coding	M	1	0x00 (default) 0x01 (ASCII)	Should be set to 0x01 when providing an ASCII text string (in the message payload) that further describes the delivery receipt. Otherwise set to 0x00 if a text string is not included in the message payload.
receipted_message_id	M	1 – 64	Any	The Wireless Data Gateway's handle to the original WDP message. See 5.4.6.2
message_state	M	1	Any	Indicates state of the WDP message being receipted.
network_error_code	O	3	network specific error code	MAY be included by the Wireless Data Gateway to provide further information for a WDP, which failed due to a wireless network error.
message_payload	O	1 – 255	text string	Descriptive textual string for delivery receipt. MAY be included for informational purposes.

5.4.8.2 DATA_SM Response PDU

The following table provides the recommended values to be used by a WAP Proxy Server when returning a ***data_sm*** response for a Delivery Receipt.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
message_id	M	1 – 64	0x00 (NULL)	No handle required for a Delivery Receipt.

5.4.9 ALERT_NOTIFICATION

A Wireless Data Gateway uses the ***alert_notification*** operation to send an alert to the WAP Proxy Server indicating that the wireless device has become available.

5.4.9.1 ALERT_NOTIFICATION PDU

The following table provides the recommended values to be used by a Wireless Data Gateway when sending an alert.

Parameter	M/O	Size (bytes)	Recommended Value	Comment
source_addr_ton	M	1	0x01 (Int.)	
source_addr_npi	M	1	0x01 (E.164)	all MS's have E.164 directory numbers

source_addr	M	0 – 64	address digits	directory number digits of wireless device that has become available
esme_addr_ton	M	1	any	TON for the source address in the original datagram (*data_sm*)
esme_addr_npi	M	1	any	TON for the source address in the original datagram (*data_sm*).
esme_addr	M	1 – 64	address digits	Address digits of WAP Proxy Server
ms_availability_status	O	1	0x00 (available)	The availability status of the wireless device

Appendix A. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [IOPProc].

A.1 WAP proxy/server support

Item	Function	Reference	Status	Requirement
WDPWCMPAdapt-S-001	Datagram transmission (binary encoded using **data_sm**, **data_sm_resp** and **generic_nack** PDUs)	5.2.1, 5.2.2, 5.4.6	M	
WDPWCMPAdapt-S-002	Datagram reception (binary encoded using **data_sm**, **data_sm_resp** and **generic_nack** PDUs)	5.2.1, 5.2.2, 5.4.7	M	
WDPWCMPAdapt-S-003	WCMP transmission using *payload_type* parameter	5.1.6, 5.4.6.1	O	
WDPWCMPAdapt-S-004	WCMP reception using *payload_type* parameter	5.1.6, 5.4.7.1	O	
WDPWCMPAdapt-S-005	Bind Transceiver using **bind_transceiver** and **bind_transceiver_resp** PDUs	5.2.3.1, 5.4.1	O	
WDPWCMPAdapt-S-006	Bind Transmitter & Bind Receiver using **bind_transmitter**, **bind_transmitter_resp**, **bind_receiver**, **bind_receiver_resp** PDUs	5.2.3.2, 5.2.3.3, 5.4.2, 5.4.3	O	
WDPWCMPAdapt-S-007	Unbind using **unbind** and **unbind_resp** PDUs	5.2.4	M	
WDPWCMPAdapt-S-008	Enquire Link using **enquire_link** and **enquire_link_resp** PDUs	5.3.1	O	
WDPWCMPAdapt-S-009	Text-based encoding of WDP and WCMP messages using *data_coding* parameter	5.1.4, 5.4.6.1, 5.4.7.1	O	
WDPWCMPAdapt-S-010	Use of *more_msgs_to_send* parameter	5.1.2, 5.4.6.1	O	
WDPWCMPAdapt-S-011	Request Store and Forward mode using *esm_class* parameter	5.2.1, 5.4.6.1	O	
WDPWCMPAdapt-S-012	Request Datagram mode using *esm_class* parameter	5.2.1, 5.4.6.1	M	
WDPWCMPAdapt-S-013	Segmentation and re-assembly using SAR parameters	5.1.5, 5.4.6.1, 5.4.7.1	O	
WDPWCMPAdapt-S-014	Request SMSC Delivery Report using *registered_delivery* parameter	5.4.6.1	O	WDPWCMPAdapt-S-015
WDPWCMPAdapt-S-015	Receive SMSC Deliver Report using *esm_class*, *receipted_message_id* and *message_state* parameters	5.4.8	O	
WDPWCMPAdapt-S-016	Specification of network type for peer wireless device using *dest_network_type*, *source_network_type* parameters	5.4.6.1, 5.4.7.1	O	
WDPWCMPAdapt-S-017	Specification of bearer type for peer wireless device using *dest_bearer_type*, *source_bearer_type* parameters	5.4.6.1, 5.4.7.1	O	
WDPWCMPAdapt-S-018	Specification of validity period of individual messages using *qos_time_to_live*	5.4.6.1	O	
WDPWCMPAdapt-S-019	DPF request and processing of Alert Notifications using **alert_notification** PUD and *set_dpf* parameter in **data_sm** PDU	5.1.7, 5.3.2, 5.4.6.1, 5.4.9	O	
WDPWCMPAdapt-S-020	BIND support	5.2.3	M	WDPWCMPAdapt-S-005 OR WDPWCMPAdapt-S-006

Appendix B. Change History (Informative)

B.1 Approved Version History

Reference	Date	Description
Class 0	23-Jul-1999	The initial version of this document.
Class 2	27-Jul-1999	App A Added SCR tables. John Murtagh (johnm@aldiscon.ie)
Class 2 & 3	29-Jul-1999	Updates following review in WAP Message Centre Protocol DC teleconference 28-Jul-1999. John Murtagh (johnm@aldiscon.ie)
Class 2 & 3	03-Aug-1999	Updates following review in WAP Message Centre Protocol DC teleconference 28-Jul-1999. John Doyle (johnd@aldiscon.ie.)
WAP-159-WDPWCMPAdapt-19991105-d	05-Nov-1999	7.4.2.1, 7.4.2.2, 7.4.3.1, 7.4.3.2
Change request WDP WCMP WDG Adapt	9-Sept-1999:	Inclusion of the “interface_version” parameter in BIND_TRANSMITTER and BIND_RECEIVER.
WAP-159-WDPWCMPAdapt-19991105-a	05-Nov-1999	3.4, 7.4.1.1
Change request WDPWCMPAdapt	22-Oct-1999:	Inclusion of “interface_version” parameter in BIND_TRANSCEIVER to reflect a similar correction made in SMPP 3.4 (Issue 1.2).
WAP-159_001-WDPWCMPAdapt-20010712-a	07-Jul-2001	Correct SCR tables.
WAP-159_002-WDPWCMPAdapt-20010124-a	24-Jan-2001	Fix values of esm_class. Encourage omission of redundant port information when message type is WCMP.
WAP-159_003-WDPWCMPAdapt-20010713-a	13-Jul-2001	2 Label appropriate references as informative. Add trademark.
WAP-159-WDPWCMPAdapt-20010713-a	13-Jul-2001	All Editorial roll-up of SINs. Conversion to current template, which changed section numbering: 3 -> 2 & 7 -> 5.
WAP WDPWCMPAdapt-20010713-a	16-Dec-2003	Updated for OMA template
WAP-159-WDPWCMPAdapt-20010713-a	10-Jan-2005	Revert document numbering to WAP Forum format. Fixed references to WDP, WCMP and WTP