NOKIA

Over The Air Settings Specification

Approved version: 6.5 5th December 2000

Doc. Number   DSS00234-EN

1. Change History

1.0	09-11-99	NMP	Approved

Description: Initial version of the Over The Air Settings Specification document.
Compatibility: -

2.0	09-11-99	NMP	Approved

Description: New CSD parameters CSD_CALLTYPE and CSD_CALLSPEED added.
Compatibility: -

3.0	09-11-99	NMP	Approved

Description: PORT parameters and encodings for PORT values added
Compatibility: -

4.0	09-11-99	NMP	Approved

Description: Support for security on/off included and port number description changed
Compatibility: -

5.0	02-12-99	NMP	Approved

Description: Several sections rearranged. New characteristics & parameters added: ISP_NAME, PROXY_AUTHNAME, PROXY_AUTHSECRET, BOOKMARK, NAME, URL.
Compatibility: GSM/SMS token has got new value. Several tokens removed

6.0	30-05-00	NMP	Approved

Description: Additions to how a homepage is specified in sections 7.4, and 7.6. Example in chapter 10 corrected to reflect changes regarding how homepage is specified. Error in WSP header in example in chapter 10 corrected.
Compatibility: Error in WSP header corrected. "1F" has been added.

6.5	05-12-00	NMP	Approved

Description: Support for GPRS and dynamic username and password added. Added parameters PPP_LOGINTYPE, PROXY_LOGINTYPE and GPRS_ACCESSPOINTNAME. Added values GPRS, MANUAL and DYNAMIC. Renamed CSD_AUTHTYPE to PPP_AUTHTYPE, CSD_AUTHNAME to PPP_AUTHNAME and CSD_AUTHSECRET to PPP_AUTHSECRET. Several sections rearranged.
Compatibility: Some elements have been renamed but their token values have not changed and there should then be no compatibility issues.

2. Contents

3. Glossary

For the purpose of this specification the following abbreviations apply.

XML	Extensible Markup Language
WBXML	WAP Binary Extensible Markup Language
DTD	Document Type Definition
WDP	Wireless Datagram Protocol
WTLS	Wireless Transport Layer Security
SMS	Short Message Service
CSD	Circuit Switched Data
USSD	Unstructured Supplementary Services Data
GPRS	General Packet Radio Service
PPP	Point-to-Point Protocol
URL	Uniform Resource Locater
MIME	Multipurpose Internet Mail Extensions

4. Introduction

This document specifies how to provide mobile phones with browser settings over the air. The evolution of the specification is depicted in "Section 1. Change History". This section also indicates to what extent the various versions are backward compatible from a specification viewpoint. Backward compatibility has been considered starting from version 4.3. Regarding compliance statements for specific mobile phone products, please refer to corresponding vendor-specific specifications, if applicable.

The document is structured as follows:

- Glossary

- Introduction
  A brief introduction to the document (this section).

- General description
  Contains a general description of how settings are provided to handsets.

- Description of the XML Document Type Definition (DTD).

- Description of the XML document with its elements and attributes.

- Description of the WBXML encoding of the XML document.

- References
  List of references related to the specification.

- Appendix – Examples
  Various examples of settings documents with binary encoding examples.

5. General description

In order to make handsets accept browser settings sent over the air, the settings must be provided in a binary encoded XML document with a specific MIME-type depending on the setting type. The settings must be pushed over SMS to a predefined WDP port (49999) as a WSP connection less unsecure push. Handsets able to receive settings over the air must always listen on this port. The different setting types are described below.

5.1. Setting types

Two (2) setting types are defined each with different purpose, they are:

- Browser settings

- Browser bookmarks

5.1.1. Browser settings

The browser settings are used to provide handsets with basic settings needed to establish a connection to be used for browsing. These settings may also include bookmarks. Browser settings are identified by the MIME-type **application/x-wap-prov.browser-settings**.

5.1.2. Browser bookmarks

The browser bookmarks are used to provide handsets with bookmarks of any kind that can be used for browsing. Browser bookmarks are identified by the MIME-type **application/x-wap-prov.browser-bookmarks**.

6. Description of the XML DTD

```
<!ELEMENT CHARACTERISTIC-LIST (CHARACTERISTIC)+>

<!ELEMENT CHARACTERISTIC (PARM*)>
<!ATTLIST CHARACTERISTIC
 TYPE       CDATA           #REQUIRED
 VALUE      CDATA           #IMPLIED
>

<!ELEMENT PARM EMPTY>
<!ATTLIST PARM
 NAME       CDATA           #REQUIRED
 VALUE      CDATA           #REQUIRED
>
```

7. Description of the XML document

Following is shown a simple example of a XML document:

```
<?xml version="1.0"?>
<!DOCTYPE CHARACTERISTIC-LIST SYSTEM "/DTD/characteristic_list.xml">
<CHARACTERISTIC-LIST>
     <CHARACTERISTIC TYPE="ADDRESS">
          <PARM NAME="BEARER" VALUE="GSM/CSD"/>
          <PARM NAME="PROXY" VALUE="192.122.10.120"/>
          <PARM NAME="CSD_DIALSTRING" VALUE="+358508124002"/>
          <PARM NAME="PPP_AUTHTYPE" VALUE="PAP"/>
          <PARM NAME="PPP_AUTHNAME" VALUE="wapuser"/>
          <PARM NAME="PPP_AUTHSECRET" VALUE="wappassw"/>
     </CHARACTERISTIC>
     <CHARACTERISTIC TYPE="NAME">
          <PARM NAME="NAME" VALUE="Mobilbank Settings"/>
     </CHARACTERISTIC>
     <CHARACTERISTIC TYPE="URL" VALUE="http://wap.dk"/>
     <CHARACTERISTIC TYPE="BOOKMARK">
          <PARM NAME="NAME" VALUE="Mobilbank"/>
          <PARM NAME="URL" VALUE=" http://wap.dk "/>
     </CHARACTERISTIC>
</CHARACTERISTIC-LIST>
```

In the following sections the different elements and attributes of a XML document is described.

7.1. The CHARACTERISTIC element

This element groups the browser settings into logical units of five (5) different types; ADDRESS, BOOKMARK, URL, NAME and ID.

7.1.1. General restrictions or rules concerning CHARACTERISTIC elements

Restrictions or rules related to a specific type is described in the sections related to the type.

7.2. The PARM element

The PARM element is used to provide the actual values for the individual settings parameters within each CHARACTERISTIC element.

7.2.1. General restrictions or rules concerning PARM elements

It is allowed to have the same PARM element within a CHARACTERISTIC type more than once but only the PARM element listed first will be used.

A PARM element can only be coded either as an inline string or as a single byte token.

If a PARM element is marked as required (see table 1) the element is needed in order to make the settings set useful. In general it is recommended to include all the required elements, but if a required element is missing handling of the settings set is manufacturer specific, but is could be one of the solutions below:

1) The entire settings set is discarded

2) Parts of the settings set is discarded

3) The settings set is accepted, the user is then required to add the missing parts manually when taking the set into use.

Please refer to the manufacturer specific support documents for clarification. If an optional PARM element is missing from the list or has a value the handset does not comply with, it is set to a default value if possible.

If a PARM element is coded as a single byte token the default value is shown underlined or is specified in exception cases.

If a PARM element is coded as inline string the default values is empty string.

All parameter lengths specified are recommended maximum sizes. Any manufacturer specific deviations from these values are specified in the manufacturer specific support specifications.

7.3. CHARACTERISTIC elements with TYPE=ADDRESS

Characteristics elements with the TYPE=ADDRESS attribute embrace settings concerning a particular bearer, e.g., GSM SMS or GSM CSD. Several address settings can be provided in one document. However, for each bearer, only the address settings listed first will be used. The type of the bearer is specified by a PARM attribute and depending on the bearer additional PARM elements are required or optional.

7.3.1. BEARER

The PARM element with the NAME=BEARER attribute is used to identify the bearer to be used for a specific setting set. VALUE can be assigned following:

VALUE -> (GSM/CSD | GSM/SMS | GSM/USSD | IS-136/CSD|GPRS)
(See WBXML attribute values defines in section 8.2.)

GSM/CSD is using Circuit Switched Data as bearer, GSM/SMS is using Short Message Service as bearer, GSM/USSD is using Unstructured Supplementary Services Data as bearer and IS-136/CSD is the name for the Circuit Switched Bearer used in the TDMA system. GPRS is the name for the bearer for General Packet Radio Service. The table below shows the association between the different bearers and parameters.

CHARACTERISTIC TYPE	PARM NAME	PARM VALUE	PARM Associated	Required
ADDRESS	BEARER	GSM/CSD	PROXY	√
			PORT	
			CSD_DIALSTRING	√
			CSD_CALLTYPE	
			CSD_CALLSPEED	
			PPP_AUTHTYPE	
			PPP_AUTHNAME	
			PPP_AUTHSECRET	
			PPP_LOGINTYPE	
			PROXY_AUTHNAME	
			PROXY_AUTHSECRET	
			PROXY_LOGINTYPE	
			ISP_NAME	
		GSM/SMS	PROXY	√
			PORT	
			SMS_SMSC_ADDRESS	√
		GSM/USSD	PROXY_TYPE	√
			PROXY	√
			PORT	
			USSD_SERVICE_CODE	√
		IS-136/CSD	PROXY	√
			PORT	
			CSD_DIALSTRING	√
			PPP_AUTHTYPE	
			PPP_AUTHNAME	
			PPP_AUTHSECRET	
			PPP_LOGINTYPE	
			PROXY_AUTHNAME	
			PROXY_AUTHSECRET	
			PROXY_LOGINTYPE	
			ISP_NAME	
		GPRS	PROXY	√
			PORT	
			GPRS_ACCESSPOINTNAME	√
			PPP_AUTHTYPE	
			PPP_AUTHNAME	
			PPP_AUTHSECRET	

CHARACTERISTIC TYPE	PARM NAME	PARM VALUE	PARM Associated	Required
			PPP_LOGINTYPE	
			PROXY_AUTHNAME	
			PROXY_AUTHSECRET	
			PROXY_LOGINTYPE	
			ISP_NAME	

Table 1 Association between bearers and parameters

7.3.2. PPP_AUTHTYPE

The PARM element with the NAME=PPP_AUTHTYPE attribute indicates which protocol to use for user authentication. VALUE can be assigned following:

VALUE -> (PAP | CHAP | MS_CHAP)
(See WBXML attribute values defines in section 8.2.)

PAP is short for Password Authentication Protocol, a type of authentication which uses clear-text passwords and is the least sophisticated authentication protocol, and CHAP stands for Challenge Handshake Authentication Protocol, a protocol used to negotiate the most secure form of encrypted authentication supported by both server and client. MS-CHAP (Microsoft(TM)-CHAP) is similar to the CHAP protocol, but is using an encryption scheme that is alternative to the one used for CHAP.

7.3.3. PPP_AUTHNAME

The PARM element with the NAME=PPP_AUTHNAME attribute indicates the login name to be used. VALUE can be assigned following:

VALUE -> login name (using inline string)

Maximum length of login name is 32 bytes.

7.3.4. PPP_AUTHSECRET

The PARM element with the NAME=PPP_AUTHSECRET attribute indicates the password/Secret to be used with the selected authentication protocol. VALUE can be assigned following:

VALUE -> password (using inline string)

Maximum length of password is 20 bytes.

7.3.5. PPP_LOGINTYPE

The PARM element with the NAME=PPP_LOGINTYPE attribute specifies whether a automatic or manual login should be performed in the PPP negotiation at the access point of the service provider.

VALUE -> (AUTOMATIC | MANUAL)
(See WBXML attribute values defines in section 8.2.)

Using the MANUAL logintype the user will be prompted for username and password when a browse session is started.

Using the AUTOMATIC logintype the user will be not be prompted for username and password when a browse session is started, but a static name and password from the WAP settingsset will be used.

7.3.6. PROXY

The PARM element with the NAME=PROXY attribute is used to identify the IP address of the WAP proxy in case of CSD and the service number in case of SMS. In case of USSD the PROXY can be either an IP address or an MSISDN number. This is indicated in the PROXY_TYPE PARM element. VALUE can be assigned following:

VALUE -> proxy (using inline string)

Maximum length of proxy is 21 bytes.

7.3.7. PROXY_TYPE

The PARM element with the NAME=PROXY_TYPE attribute is used to identify the format of the PROXY PARM element. VALUE can be assigned following:

VALUE -> (MSISDN_NO | IPV4)
(See WBXML attribute values defines in section 8.2.)

If PROXY_TYPE=MSISDN_NO the PROXY is a MSISDN number, if PROXY_TYPE=IPV4 the PROXY is an IP address.

PROXY_TYPE is only valid in GSM/USSD settings.

7.3.8. PROXY_AUTHNAME

The PARM element with the NAME=PROXY_AUTHNAME attribute indicates the login name to be used for gateway required authentication. Support of this PARM element is manufacturer specific. VALUE can be assigned following:

VALUE -> login name (using inline string)

Maximum length of login name is 32 bytes.

7.3.9. PROXY_AUTHSECRET

The PARM element with the NAME=PROXY_AUTHSECRET attribute indicates the password/secret to be used for gateway required authentication. Support of this PARM element is manufacturer specific. VALUE can be assigned following:

VALUE -> password (using inline string)

Maximum length of password is 20 bytes.

7.3.10. PROXY_LOGINTYPE

The PARM element with the NAME=PROXY_LOGINTYPE attribute specifies whether a automatic or manual login should be performed at the proxy.

VALUE -> (AUTOMATIC | MANUAL)
(See WBXML attribute values defines in section 8.2.)

Using the MANUAL logintype the user will be prompted for username and password when a browse session is started.

Using the AUTOMATIC logintype the user will be not be prompted for username and password when a browse session is started, but a static name and password from the WAP settingsset will be used.

7.3.11. PORT

The PARM element with the NAME=PORT attribute specifies whether connection less or connection oriented connections should be used VALUE can be assigned following:

VALUE -> (9200 | 9201 | 9202 | 9203)

(See WBXML attribute values defines in section 8.2.)

Use 9200 (or 9202) for connection less connections and 9201 (or 9203) for connection oriented connections.

If no PORT is specified, a default value of 9200 is assumed.

Note that port numbers 9202 and 9203 enable secure connections (by means of WTLS), whereas port numbers 9200 and 9201 disable secure connections.

7.3.12. CSD_DIALSTRING

The PARM element with the NAME=CSD_DIALSTRING attribute specifies the MSISDN number of the modem pool. VALUE can be assigned following:

VALUE -> msisdn_number (using inline string)

Maximum length of msisdn_number is 21 bytes.

7.3.13. CSD_CALLTYPE

The PARM element with the NAME=CSD_CALLTYPE attribute indicates the type of circuit switched call to be used for the connection. VALUE can be assigned following:

VALUE -> (<u>ANALOGUE</u> | ISDN)
(See WBXML attribute values defines in section 8.2.)

In general the call type should be set to ANALOGUE since ISDN is not generally available on all networks.

7.3.14. CSD_CALLSPEED

The PARM element with the NAME=CSD_CALLSPEED attribute indicates the desired call speed to be used for the connection. VALUE can be assigned following

VALUE -> (<u>AUTO</u> | <u>9600</u> | 14400 | 19200 | 28800 | 38400 | 43200 | 57600)
(See WBXML attribute values defines in section 8.2.)

Default value is AUTO when CSD_CALLTYPE is Analogue and 9600 when CSD_CALLTYPE is ISDN.

7.3.15. ISP_NAME

The PARM element with the NAME=ISP_NAME attribute indicates the name of the Internet Service Provider. Support of this PARM element is manufacturer specific. VALUE can be assigned following:

VALUE -> isp_name (using inline string)

Maximum length of isp_name is 20 bytes.

7.3.16. SMS_SMSC_ADDRESS

The PARM element with the NAME=SMS_SMSC_ADDRESS attribute indicates the MSISDN number of the SMS Service Centre. VALUE can be assigned following:

VALUE -> sms_smsc_address (using inline string)

Maximum length of sms_smsc_address is 21 bytes.

7.3.17. USSD_SERVICE_CODE

The PARM element with the NAME=USSD_SERVICE_CODE attribute indicates the USSD service code. VALUE can be assigned following:

VALUE -> ussd_service_code (using inline string)

Maximum length of ussd_service_code is 10 bytes.

7.3.18. GPRS_ACCESSPOINTNAME

The PARM element with the NAME=GPRS_ACCESSPOINTNAME attribute indicates the Access point name on Gateway GPRS Support Nodes (GGSN). Allowed characters: 'a'-'z', 'A'-'Z', '0'-'9', '.', '-' and '*'

VALUE -> access_point_name (using inline string)

Maximum length of access_point_name is 100 bytes.

7.3.19. Example

```
<CHARACTERISTIC TYPE="ADDRESS">
      <PARM NAME="BEARER" VALUE="GSM/CSD"/>
      <PARM NAME="PROXY" VALUE="192.122.10.120"/>
      <PARM NAME="CSD_DIALSTRING" VALUE="+358508124002"/>
      <PARM NAME="PPP_AUTHTYPE" VALUE="PAP"/>
      <PARM NAME="PPP_AUTHNAME" VALUE="wapuser"/>
      <PARM NAME="PPP_AUTHSECRET" VALUE="wappassw"/>
</CHARACTERISTIC>
```

7.4. CHARACTERISTIC elements with TYPE=URL

The CHARACTERISTIC element with the TYPE=URL attribute has only one attribute which indicates the URL of the home page. VALUE can be assigned following:

VALUE -> url (using inline string)

Maximum length of URL is 100 bytes.

7.4.1. Example

```
<CHARACTERISTIC TYPE="URL" VALUE="operator.com"/>
```

See section 7.6 which also describes an element required when specifying a homepage.

7.5. CHARACTERISTIC elements with TYPE=NAME

This element type must contain exactly one PARM element with NAME=NAME, which states the user-recognisable name to apply for the settings. The VALUE of the PARM element can be assigned following:

VALUE -> name (using inline string)

Maximum length of name is 20 bytes.

7.5.1. Example

```
<CHARACTERISTIC TYPE="NAME">
      <PARM NAME="NAME" VALUE="Operator"/>
</CHARACTERISTIC>
```

7.6. CHARACTERISTIC elements with TYPE=BOOKMARK

This element type must contain exactly two PARM elements, which define the name and URL for a homepage or for bookmarks.

When this element is used with the MIME-type **application/x-wap-prov.browser-settings** the first element indicates the homepage to be used together with the corresponding settings. Note that the URL included in this element and the CHARACTERISTIC element TYPE=URL are both required to define a homepage and their content must be equal, see section 7.4. A homepage and several bookmarks can be provided in one document of the MIME-type referred to above. However, the maximum number of bookmarks accepted is manufacturer specific.

When this element is used with the MIME-type **application/x-wap-prov.browser-bookmarks** the element indicates bookmarks only.

7.6.1. NAME

The PARM element with the NAME=NAME attribute indicates the name of the bookmark or homepage. VALUE can be assigned following:

VALUE -> bookmark_name (using inline string)

Maximum length of bookmark_name is 50 bytes.

7.6.2. URL

The PARM element with the NAME=URL attribute indicates the URL of the bookmark or homepage. VALUE can be assigned following:

VALUE -> bookmark_url (using inline string)

Maximum length of bookmark_url is 255 bytes.

7.6.3. Example

```
<CHARACTERISTIC TYPE="BOOKMARK">
     <PARM NAME="NAME" VALUE="Wap page"/>
     <PARM NAME="URL" VALUE="wap.dk"/>
</CHARACTERISTIC>
```

7.7. CHARACTERISTIC elements with TYPE=ID

This element type must contain exactly one PARM element, which defines an ID to be used to provide some security to the provisioning application. The ID should be known by the subscriber through the subscription or through other communication with the operator. When provisioning data containing the ID is received the user is able to verify the received ID with the ID previously received by other means from the operator. Support of this CHARACTERISTIC element is manufacturer specific.

7.7.1. NAME

The PARM element with the NAME=NAME attribute indicates the ID. VALUE can be assigned following:

VALUE -> id (using inline string)

Maximum length of id is 8 bytes.

7.7.2. Example

```
<CHARACTERISTIC TYPE="ID">
     <PARM NAME="NAME" VALUE="12345678"/>
```

</CHARACTERISTIC>

8. Description of the WBXML document

The XML document is binary encoded according to WBXML, [1] "WAP Binary XML Content Format", with the following allowed Global Tokens.

Global Token name	Token value
END	0x01
STR_I	0x03

Table 2 Allowed Global Tokens

Numerical values for the individual tokens are given below.

8.1. Tag tokens

All tokens are defined for code page 0.

Token name	Token value
CHARACTERISTIC-LIST	0x05
CHARACTERISTIC	0x06
PARM	0x07

Table 3 Tag Tokens

8.2. Attribute start tokens

Attribute name	Attribute value prefix	Attribute value
TYPE	ADDRESS	0x06
TYPE	URL	0x07
TYPE	NAME	0x08
NAME		0x10
VALUE		0x11
NAME	BEARER	0x12
NAME	PROXY	0x13
NAME	PORT	0x14
NAME	NAME	0x15
NAME	PROXY_TYPE	0x16
NAME	URL	0x17
NAME	PROXY_AUTHNAME	0x18
NAME	PROXY_AUTHSECRET	0x19

NAME	SMS_SMSC_ADDRESS	0x1A
NAME	USSD_SERVICE_CODE	0x1B
NAME	GPRS_ACCESSPOINTNAME	0x1C
NAME	PPP_LOGINTYPE	0x1D
NAME	PROXY_LOGINTYPE	0x1E
NAME	CSD_DIALSTRING	0x21
NAME	CSD_CALLTYPE	0x28
NAME	CSD_CALLSPEED	0x29
NAME	PPP_AUTHTYPE	0x22
NAME	PPP_AUTHNAME	0x23
NAME	PPP_AUTHSECRET	0x24
VALUE	GSM/CSD	0x45
VALUE	GSM/SMS	0x46
VALUE	GSM/USSD	0x47
VALUE	IS-136/CSD	0x48
VALUE	GPRS	0x49
VALUE	9200	0x60
VALUE	9201	0x61
VALUE	9202	0x62
VALUE	9203	0x63
VALUE	AUTOMATIC	0x64
VALUE	MANUAL	0x65
VALUE	AUTO	0x6A
VALUE	9600	0x6B
VALUE	14400	0x6C
VALUE	19200	0x6D
VALUE	28800	0x6E
VALUE	38400	0x6F
VALUE	PAP	0x70
VALUE	CHAP	0x71
VALUE	ANALOGUE	0x72
VALUE	ISDN	0x73
VALUE	43200	0x74
VALUE	57600	0x75
VALUE	MSISDN_NO	0x76
VALUE	IPV4	0x77
VALUE	MS_CHAP	0x78

TYPE	ID	0x7D
NAME	ISP_NAME	0x7E
TYPE	BOOKMARK	0x7F

Table 4 Attribute Start Tokens

9. References

[1] "WAP Binary XML Content Format", WAP Forum, Version 1.1. 16-Jun-1999. URL:
http://www.wapforum.org/

[2] "Extensible Markup Language (XML) 1.0", W3C Recommendation 06-October-2000. URL:
http://www.w3.org/TR/REC-xml

[3] "Wireless Session Protocol Specification", WAP Forum, Version 28-May-1999. URL:
http://www.wapforum.org/

[4] "Wireless Datagram Protocol Specification", WAP Forum, Version 14-May-1999. URL:
http://www.wapforum.org/

[5] "IANA MIBEnum Character Set Registry"
URL: ftp://ftp.isi.edu/in-notes/iana/assignments/character-sets

10. Appendix A – Examples

In the examples the reference to the DOCTYPE is shown for illustrative purpose.

10.1. GSM/CSD Settings set

MIME-type used: **application/x-wap-prov.browser-settings**.

10.1.1. XML Document content

```
<?xml version="1.0"?>
<!DOCTYPE CHARACTERISTIC-LIST SYSTEM "file://c:/settingspush/settings.dtd" >
<CHARACTERISTIC-LIST>
      <CHARACTERISTIC TYPE="ADDRESS">
            <PARM NAME="BEARER" VALUE="GSM/CSD"/>
            <PARM NAME="PROXY" VALUE="123.34.6.7"/>
            <PARM NAME="CSD_DIALSTRING" VALUE="+45"/>
            <PARM NAME="PPP_AUTHTYPE" VALUE="PAP"/>
      </CHARACTERISTIC>
      <CHARACTERISTIC TYPE="URL" VALUE=" http://wap.dk "/>
      <CHARACTERISTIC TYPE="NAME">
            <PARM NAME="NAME" VALUE="ABC"/>
      </CHARACTERISTIC>
      <CHARACTERISTIC TYPE="BOOKMARK">
            <PARM NAME="NAME" VALUE="Wap"/>
            <PARM NAME="URL" VALUE=" http://wap.dk "/>
      </CHARACTERISTIC>
</CHARACTERISTIC-LIST>
```

10.1.2. Binary encoding of XML document

SMS CONTENT – SMS 1/2

Binary value	Meaning	Description
0B	User-Data-Header (UDHL) Length = 11 bytes	WDP layer (start WDP headers).
05	UDH IE identifier: Port numbers	
04	UDH port number IE length	
C3	Destination port (high)	Port number 49999
4F	Destinating port (low)	
C0	Originating port (high)	
02	Originating port (low)	
00	UDH IE identifier: SAR	
03	UDH SAR IE length	
04	Datagram ref no.	
02	Total no. of segments in datagram	
01	Segment count	WDP layer (end WDP headers)

01	Transaction ID / Push ID	WSP layer (start WSP headers)
06	PDU type (push)	
2C	Headerslength (content type+headers)	
1F		Length greater than 30
2A	value length (value name not used)	
61,70,70,6C,69,63,61,74,69,6F, 6E,2F,78,2D,77,61,70,2D,70,72 ,6F,76,2E,62,72,6F,77,73,65,72, 2D,73,65,74,74,69,6E,67,73	'a','p','p','l','i','c','a','t','i','o','n','/','x','-','w','a','p','-','p','r','o','v','.','b','r','o','w','s','e','r','-','s','e','t','t','i','n','g','s'	MIME-Type = browser settings
00	Null termination of content type string	
81	charset (wellknown PARM.(short integer))	
EA	UTF-8 (using short integer)	WSP layer (end WSP headers)
01	Version	WBXML 1.1
01	Unknown public identifier	
6A	Charset	UTF-8
00	string table length	
45	CHARACTERISTIC_LIST with content	tag
C6	CHARACTERISTIC with content and attributes	tag
06	TYPE=ADDRESS	attribute name with prefix
01	end (attributes)	
87	PARM with attributes	tag
12	NAME=BEARER	attribute name with prefix
45	VALUE=GSM/CSD	attribute name with prefix
01	end (PARM)	
87	PARM with attributes	tag
13	NAME=PROXY	attribute name with prefix
11	VALUE	attribute name
03	Inline string	attribute value
31, 32, 33, 2E, 34, 35, 2E, 36, 2E, 37	'1', '2', '3', '.', '4' ,'5', '.', '6','.', '7'	
00	end inline string	
01	end (PARM)	
87	PARM with attributes	tag
21	NAME=CSD_DIALSTRING	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value

2B, 34,35	'+', '4', '5'	
00	end inline string	
01	end (PARM)	
87	PARM with attributes	tag
22	NAME=PPP_AUTHTYPE	attribute name with prefix
70	VALUE=PAP	attribute name with prefix
01	end (PARM)	
01	end (CHARACTERISTIC)	
86	CHARACTERISTIC with attributes	tag
07	TYPE=URL	attribute name with prefix
11	VALUE	attribute name
03	Inline string	attribute value
68, 74, 74, 70, 3A, 2F, 2F, 77, 61, 70, 2E, 64, 6B	'h', 't', 't', 'p', ':', '/', '/', 'w', 'a', 'p', '.', 'd', 'k'	
00	end inline string	
01	end (attributes)	
C6	CHARACTERISTIC with content and attributes	tag
08	TYPE=NAME	attribute name with prefix
01	end attributes	
87	PARM with attributes	tag
15	NAME=NAME	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value
41, 42, 43	'A', 'B', 'C'	
00	end inline string	
01	end (PARM)	
01	end (CHARACTERISTIC)	
C6	CHARACTERISTIC with content and attributes	tag
7F	TYPE=BOOKMARK	attribute name with prefix
01	end attributes	
87	PARM with attributes	tag
15	NAME=NAME	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value

SMS CONTENT – SMS 2/2

Binary value	Meaning	Description
0B	User-Data-Header (UDHL) Length = 11 bytes	WDP layer (start WDP headers).
05	UDH IE identifier: Port numbers	
04	UDH port number IE length	
C3	Destination port (high)	Port number 49999
4F	Destinating port (low)	
C0	Originating port (high)	
02	Originating port (low)	
00	UDH IE identifier: SAR	
03	UDH SAR IE length	
04	Datagram ref no.	
02	Total no. of segments in datagram	
02	Segment count	WDP layer (end WDP headers)
57, 61, 70	'W', 'a', 'p'	
00	end inline string	
01	end (PARM)	
87	PARM with attributes	tag
17	NAME=URL	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value
68, 74, 74, 70, 3A, 2F, 2F, 77, 61, 70, 2E, 64, 6B	'h', 't', 't', 'p', ':', '/', '/', 'w', 'a', 'p', '.', 'd', 'k'	
00	end inline string	
01	end (PARM)	
01	end (CHARACTERISTIC)	
01	end (CHARACTERISTIC_LIST)	

10.2. GSM/GPRS Settings set

MIME-type used: **application/x-wap-prov.browser-settings**.

10.2.1. XML Document content

```
<?xml version="1.0"?>
<!DOCTYPE CHARACTERISTIC-LIST SYSTEM "file://c:/settingspush/settings.dtd" >
<CHARACTERISTIC-LIST>
      <CHARACTERISTIC TYPE="ADDRESS">
            <PARM NAME="BEARER" VALUE="GPRS"/>
            <PARM NAME="PROXY" VALUE="123.45.6.7"/>
            <PARM NAME="GPRS_ACCESSPOINTNAME" VALUE="sonofon.com"/>
            <PARM NAME="PPP_AUTHTYPE" VALUE="PAP"/>
      </CHARACTERISTIC>
      <CHARACTERISTIC TYPE="URL" VALUE=" http://wap.dk "/>
      <CHARACTERISTIC TYPE="NAME">
            <PARM NAME="NAME" VALUE="ABC"/>
      </CHARACTERISTIC>
      <CHARACTERISTIC TYPE="BOOKMARK">
            <PARM NAME="NAME" VALUE="Wap"/>
            <PARM NAME="URL" VALUE=" http://wap.dk "/>
      </CHARACTERISTIC>
</CHARACTERISTIC-LIST>
```

10.2.2. Binary encoding of XML document

SMS CONTENT – SMS 1/2

Binary value	Meaning	Description
0B	User-Data-Header (UDHL) Length = 11 bytes	WDP layer (start WDP headers).
05	UDH IE identifier: Port numbers	
04	UDH port number IE length	
C3	Destination port (high)	Port number 49999
4F	Destinating port (low)	
C0	Originating port (high)	
02	Originating port (low)	
00	UDH IE identifier: SAR	
03	UDH SAR IE length	
04	Datagram ref no.	
02	Total no. of segments in datagram	
01	Segment count	WDP layer (end WDP headers)
01	Transaction ID / Push ID	WSP layer (start WSP headers)
06	PDU type (push)	
2C	Headerslength (content type+headers)	

1F		Length greater than 30
2A	value length (value name not used)	
61,70,70,6C,69,63,61,74,69,6F, 6E,2F,78,2D,77,61,70,2D,70,72 ,6F,76,2E,62,72,6F,77,73,65,72, 2D,73,65,74,74,69,6E,67,73	'a','p','p','l','i','c','a','t','i','o','n','/','x','-','w','a','p','-','p','r','o','v','.','b','r','o','w','s','e','r','-','s','e','t','t','i','n','g','s'	MIME-Type = browser settings
00	Null termination of content type string	
81	charset (wellknown PARM.(short integer))	
EA	UTF-8 (using short integer)	WSP layer (end WSP headers)
01	Version	WBXML 1.1
01	Unknown public identifier	
6A	Charset	UTF-8
00	string table length	
45	CHARACTERISTIC_LIST with content	tag
C6	CHARACTERISTIC with content and attributes	tag
06	TYPE=ADDRESS	attribute name with prefix
01	end (attributes)	
87	PARM with attributes	tag
12	NAME=BEARER	attribute name with prefix
49	VALUE=GPRS	attribute name with prefix
01	end (PARM)	
87	PARM with attributes	tag
13	NAME=PROXY	attribute name with prefix
11	VALUE	attribute name
03	Inline string	attribute value
31, 32, 33, 2E, 34, 35, 2E, 36, 2E, 37	'1', '2', '3', '.', '4' ,'5', '.', '6','.', '7'	
00	end inline string	
01	end (PARM)	
87	PARM with attributes	tag
1C	NAME=GPRS_ACCESSPOINTNAME	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value
73,6F,6E,6F,66,6F,6E,2E,63,6F, 6D	's','o','n','o','f','o','n','.','c','o','m'	
00	end inline string	
01	end (PARM)	
87	PARM with attributes	tag

22	NAME=PPP_AUTHTYPE	attribute name with prefix
70	VALUE=PAP	attribute name with prefix
01	end (PARM)	
01	end (CHARACTERISTIC)	
86	CHARACTERISTIC with attributes	tag
07	TYPE=URL	attribute name with prefix
11	VALUE	attribute name
03	Inline string	attribute value
68, 74, 74, 70, 3A, 2F, 2F, 77, 61, 70, 2E, 64, 6B	'h', 't', 't', 'p', ':', '/', '/', 'w', 'a', 'p', '.', 'd', 'k'	
00	end inline string	
01	end (attributes)	
C6	CHARACTERISTIC with content and attributes	tag
08	TYPE=NAME	attribute name with prefix
01	end attributes	
87	PARM with attributes	tag
15	NAME=NAME	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value
41,42,43	'A','B','C'	
00	end inline string	
01	end (PARM)	

SMS CONTENT – SMS 2/2

Binary value	Meaning	Description
0B	User-Data-Header (UDHL) Length = 11 bytes	WDP layer (start WDP headers).
05	UDH IE identifier: Port numbers	
04	UDH port number IE length	
C3	Destination port (high)	Port number 49999
4F	Destinating port (low)	
C0	Originating port (high)	
02	Originating port (low)	
00	UDH IE identifier: SAR	
03	UDH SAR IE length	

04	Datagram ref no.	
02	Total no. of segments in datagram	
02	Segment count	WDP layer (end WDP headers)
01	end (CHARACTERISTIC)	
C6	CHARACTERISTIC with content and attributes	tag
7F	TYPE=BOOKMARK	attribute name with prefix
01	end attributes	
87	PARM with attributes	tag
15	NAME=NAME	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value
57, 61, 70	'W', 'a', 'p'	
00	end inline string	
01	end (PARM)	
87	PARM with attributes	tag
17	NAME=URL	attribute name with prefix
11	VALUE	attribute name
03	inline string	attribute value
68, 74, 74, 70, 3A, 2F, 2F, 77, 61, 70, 2E, 64, 6B	'h', 't', 't', 'p', ':', '/', '/', 'w', 'a', 'p', '.', 'd', 'k'	
00	end inline string	
01	end (PARM)	
01	end (CHARACTERISTIC)	
01	end (CHARACTERISTIC_LIST)	