
S60 Platform: OMA Client Provisioning

Version 2.1
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S60 platform

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Change history

December 22, 2003	Version 1.0	Initial document release
June 9, 2004	Version 1.1	SIP and POC applications added
December 15, 2006	Version 2.0	All technical details revised.
November 9, 2007	Version 2.1	Minor editorial changes. Reference to the <i>S60 3rd Edition: SIP Settings Configuration Guide</i> added.

1. Introduction

Today's mobile devices use an increasing number of applications to access resources on the Internet via URLs, gateways, or databases. The first such application was the browser. This was soon followed by multimedia messaging capabilities, which, for example, allowed a user to send pictures to another user. More recently, devices began providing access to Internet mailboxes, instant messaging, and data synchronization for synchronizing users' phone contacts and calendar data with an Internet-based database.

Although the future promises even more sophisticated applications, an impressive range of capabilities is already available to average users. However, in order to take advantage of these capabilities, many settings must be implemented correctly — a challenge for most users. Over-the-air (OTA) provisioning was developed to facilitate the settings process (see reference document [3]). This proprietary solution can provision users' mobile devices with all the appropriate settings, one application at a time.

Open Mobile Alliance (OMA) Provisioning (see reference document [7]) has replaced the proprietary OTA method (see reference document [3]) on the newest mobile devices. With OMA Provisioning, the user interface has been generalized to reflect the fact that not one, but several applications are being provisioned at a time. This open standard describes how content is formed and sent to the device; it is also an extensible standard, meaning that when new parameters are introduced in the future, present-day devices will continue to work properly. Consequently, XML authors do not have to worry about different device versions when creating XML documents. OMA Provisioning uses WAP Push as a transmission method, which makes it network-independent.

OMA Bootstrap (see reference document [2]) adds security to OMA Provisioning in the form of server authentication. OMA Bootstrap is optional for S60 platform devices covered by this document.

This document is intended to be used as a developer's manual for creating XML documents that can be provisioned to mobile devices compliant with the S60 platform.

2. XML quick reference

This chapter provides an overview of the relevant elements of an OMA provisioning document (see reference document [1]). In general, the provisioning document consists of a number of characteristics. Each characteristic contains parameters (parms) and characteristics. The chapter also describes the relevant parms and their possible values.

2.1 Hierarchy of characteristics

The square bullets indicate the top level in the hierarchy; the round bullets and dashes indicate subcategories, for example, PXPHYSICAL can only exist if a PXLOGICAL parent exists.

- APPLICATION
 - APPADDR
 - PORT
 - APPAUTH
 - RESOURCE
- BOOTSTRAP
- PXLOGICAL
 - PORT
 - PXPHYSICAL
 - PORT
- NAPDEF
 - NAPAUTHINFO

APPLICATION and its subcategories (APPADDR, APPAUTH, and RESOURCE) are described in individual tables because there is no commonality in the ways these characteristics are used.

2.1.1 APPLICATION

Applications are configured using the APPLICATION characteristic. This characteristic is interpreted differently depending on the application, so Table 1 lists the parameters associated with each application type.

Application	APPID (see reference [5])	TO-PROXY	TO-NAPID	ADDR
E-mail receiving IMAP	143	N/A	Points to a particular NAPDEF	IMAP server
E-mail receiving POP3	110	N/A	Points to a particular NAPDEF	POP3 server

Application	APPID (see reference [5])	TO-PROXY	TO-NAPID	ADDR
E-mail sending	25	N/A	Points to a particular NAPDEF	SMTP server
Browser	W2	Points to a particular PXLOGICAL	Points to a particular NAPDEF	N/A
MMS	w4	Points to a particular PXLOGICAL	Points to a particular NAPDEF	MMS proxy relay. Note: If the referred access point already contains STARTPAGE, a new access point is created, and ADDR is stored there.
OMA DM	w7	N/A	Points to a particular NAPDEF	OMA DM server address
OMA DS	w5	N/A	Points to a particular NAPDEF	OMA DS server address
PoC	w9002	N/A	Points to a particular NAPDEF	PoC Server URI
IMPS	wA	Points to a particular PXLOGICAL	Points to a particular NAPDEF	Wireless Village Settings AP URI
SIP	W9010	N/A	Points to a particular NAPDEF	Address for outbound connection
Streaming	554	Points to a particular PXLOGICAL	Points to a particular NAPDEF	N/A

Table 1: APPLICATION parameters

2.1.2 RESOURCE

This characteristic specifies application-specific resources. There can be multiple RESOURCE characteristics inside one APPLICATION.

Application	STARTPAGE	URI	AACCEPT
Browser	Present => URI = Home page	Start page or bookmark address	N/A
OMA DS	N/A	Remote database URI	Type of MIME content

Table 2: RESOURCE parameters

2.1.3 APPADDR

This characteristic specifies the address and port of the remote server. In the S60 platform this is treated similarly as parameter ADDR directly under APPLICATION.

2.1.4 APPAUTH

This characteristic specifies the authentication credentials for an application.

Application	AAUTHLEVEL	AUTHNAME	AAUTHSECRET
E-mail receiving	N/A	User ID	Password for user ID
OMA DM	Server or client authentication (APPSRV or CLIENT)	User ID	Password for user ID
OMA DS	N/A	User ID	Password for user ID
Wireless Village	N/A	User ID	Password for user ID

Table 3: APPAUTH parameters

2.1.5 BOOTSTRAP

Bootstrapping allows continuous provisioning by specifying a trusted server address.

Parameter	Description	Possible values	Default value
PROVURL	Unique identifier for provisioned documents	URL	N/A

Table 4: BOOTSTRAP parameters

2.1.6 PXLOGICAL

Logical proxy is specified here. It contains information common to several actual proxies.

Parameter	Description	Possible values	Default value
PROXY-ID	Identifier for a particular PXLOGICAL	String	N/A
STARTPAGE	Start page for an access point	URL	None
NAME	Name of access point to create	String	Language dependent

Table 5: PXLOGICAL parameters

Note that if there is a browser or MMS APPLICATION characteristic referring to the logical proxy and both define the service address (APPLICATION / ADDR and PXLOGICAL / STARTPAGE are both filled), two access points are created.

2.1.7 PORT

Port number and service types are specified with the PORT characteristic. It is used for accessing proxies and Internet mail servers.

Parameter	Description	Possible values	Default value
PORTNBR	Port number. Only relevant if proxies are enabled.	Integer	0
SERVICE	Type of protocol to use	CL-WSP, CO-WSP, CL-SEC-WSP, CO-SEC-WSP or STARTTLS (see reference [1])	Application dependent

Table 6: PORT parameters

The SERVICE parameter is mandatory when the PORTNBR value is not 'well-known'. The well-known port numbers are 9200 (CL-WSP), 9201, 80, 8080 (CO-WSP), 9202 (CL-SEC-WSP), 9203, and 443 (CO-SEC-WSP). Note that the SERVICE parameter has no effect to the Browser and MMS applications because they always use HTTP, but the parameter is still needed, because the access point is not created otherwise. For those applications, for example, CO-WSP can be used safely.

2.1.8 PXPHYSICAL

A physical proxy defines the address and method of accessing an actual proxy. For a PXLOGICAL characteristic referred to by an APPLICATION characteristic, an access point is created on the device for every combination of PXPHYSICAL and the referred NAPDEF.

Parameter	Description	Possible values	Default value
PXADDR	IP address	IPv4	Dynamic
PXADDRTYPE	Address type of PXADDR	IPv4	IPv4
TO-NAPID	Points to a particular NAPDEF	NAPID	N/A

Table 7: PXPHYSICAL parameters

2.1.9 NAPDEF

NAPDEF defines how a mobile device can set up a network connection, either via circuit-switched data or GPRS. For every NAPDEF referred to by an APPLICATION characteristic, an access point is created on the device.

Parameter	Description	Possible values	Default value
NAPID	Identifier for a particular NAPDEF	String	N/A
BEARER	Identifier for bearer type	GSM-GPRS, GSM-CSD	N/A
NAME	Name of access point to create	String	Language-dependent
NAP-ADDRESS	Access point name or phone number	Domain name (GSM-GPRS) E164 (GSM-CSD)	N/A
NAP-ADDRTYPE	Address type of NAP-ADDRESS	APN (GSM-GPRS) E164 (GSM-CSD)	APN if GSM-GPRS, E164 if GSM-CSD
INTERNET	If present, indicates that NAPDEF can be used to access the Internet. Only used if the parameter TO-NAPID has the value INTERNET anywhere in the document. Also, forces the creation of an access point even though there are no referring APPLICATION characteristics.	N/A	N/A

Parameter	Description	Possible values	Default value
CALLTYPE	Call type for GSM-CSD.	ANALOG-MODEM, V.110 (ISDN) or V.120 (ISDN)	ANALOG-MODEM
LINKSPEED	Link speed for a data call. If greater than 14400, HSCSD is used.	AUTOBAUDING (ANALOG-MODEM), 9600, 14400, 19200, 28800, 38400, 43200	AUTOBAUDING
LOCAL-ADDRESS	The IP address for the device.	IPv4	Dynamic
DNS-ADDR	The DNS address to use for domain name resolution.	IPv4	Dynamic

Table 8: NAPDEF parameters

2.1.10 NAPAUTHINFO

This characteristic is intended for bearer authentication, for example, for CSD and GPRS it is PAP and CHAP.

Parameter	Description	Possible values	Default value
AUTHNAME	User name	String	N/A
AUTHSECRET	Password	String	N/A
AUTHTYPE	Authentication type	PAP, CHAP	PAP

Table 9: NAPAUTHINFO parameters

3. Examples

The example in this chapter illustrates the parameters that can be defined in an OMA Provisioning document, and how they are used on devices compliant with the S60 platform. The example is divided so that one part of the example is described in one section. The whole example consists of the parts in Sections 3.1–3.8.

3.1 Access point example

This first part of the example defines access points only and it cannot be used as such without some or all application-specific parts introduced in Sections 3.3–3.8. No application has yet been configured to use the access points; therefore, this provisioning document would be treated as empty on the device.

```
<?xml version="1.0"?>
<!DOCTYPE wap-provisioningdoc PUBLIC "-//WAPFORUM//DTD PROV 1.0//EN"
"http://www.wapforum.org/DTD/prov.dtd">
<wap-provisioningdoc version="1.0">

  <characteristic type="PXLOGICAL">
    <parm name="PROXY-ID" value="PROXY2"/>
    <parm name="NAME" value="Proxy"/>
    <parm name="STARTPAGE"
value="http://wap.sonofon.dk/index.wml"/>
    <characteristic type="PXPHYSICAL">
      <parm name="PXADDR" value="212.88.64.8"/>
      <parm name="PXADDRTYPE" value="IPV4"/>
      <parm name="NAME" value="ProxyPhysical"/>
      <parm name="TO-NAPID" value="mms5_wirelessfuture"/>
      <characteristic type="PORT">
        <parm name="PORTNBR" value="8080"/>
        <parm name="SERVICE" value="CL-WSP"/>
      </characteristic>
    </characteristic>
  </characteristic>

  <!-- Streaming Proxy -->
  <characteristic type="PXLOGICAL">
    <parm name="PROXY-ID" value="streaming-proxy"/>
    <parm name="NAME" value="NTN streaming proxy"/>
    <characteristic type="PXPHYSICAL">
      <parm name="PHYSICAL-PROXY-ID" value="streaming proxy"/>
      <parm name="PXADDR" value="195.134.231.66"/>
      <parm name="PXADDRTYPE" value="IPV4"/>
      <parm name="TO-NAPID" value="mms5_wirelessfuture"/>
      <characteristic type="PORT">
        <parm name="PORTNBR" value="8080"/>
      </characteristic>
    </characteristic>
  </characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="mms5_wirelessfuture"/>
    <parm name="BEARER" value="GSM-GPRS"/>
    <parm name="NAME" value="MMS5 wirelessfuture"/>
    <parm name="INTERNET" value=""/>
  </characteristic>
</wap-provisioningdoc>
```

```

    <parm name="NAP-ADDRESS" value="mms5.wirelessfuture.com"/>
    <parm name="NAP-ADDRTYPE" value="APN"/>
    <characteristic type="NAPAUTHINFO">
      <parm name="AUTHTYPE" value="PAP"/>
      <parm name="AUTHNAME" value="USERNAME"/>
      <parm name="AUTHSECRET" value="USRPWD"/>
    </characteristic>
  </characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="int_csd"/>
    <parm name="BEARER" value="GSM-CSD"/>
    <parm name="NAME" value="NTN CSD"/>
    <parm name="NAP-ADDRESS" value="+358331520444"/>
    <parm name="CALLTYPE" value="ANALOG-MODEM"/>
    <parm name="LINKSPEED" value="9600"/>
    <parm name="INTERNET"/>
    <characteristic type="NAPAUTHINFO">
      <parm name="AUTHTYPE" value="PAP"/>
      <parm name="AUTHNAME" value="iopname"/>
      <parm name="AUTHSECRET" value="ioppasswd"/>
    </characteristic>
  </characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="CSD"/>
    <parm name="BEARER" value="GSM-CSD"/>
    <parm name="BEARER" value="GSM-GPRS"/>
    <parm name="NAME" value="Sonofon CSD"/>
    <parm name="NAME" value="Sonofon GPRS"/>
    <parm name="NAP-ADDRESS" value="+4540900089"/>
    <parm name="NAP-ADDRESS" value="internet"/>
    <parm name="NAP-ADDRTYPE" value="E164"/>
    <parm name="NAP-ADDRTYPE" value="APN"/>
    <parm name="CALLTYPE" value="V.120"/>
    <parm name="CALLTYPE" value="V.110"/>
    <parm name="DNS-ADDR" value="10.10.10.10"/>
    <parm name="DNS-ADDR" value="20.20.20.20"/>
    <characteristic type="NAPAUTHINFO">
      <parm name="AUTHTYPE" value="PAP"/>
      <parm name="AUTHNAME" value="sonoUser"/>
      <parm name="AUTHSECRET" value="sonoPass"/>
    </characteristic>
  </characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="NAP1"/>
    <parm name="BEARER" value="WLAN"/>
    <parm name="NAME" value="NAP WLAN"/>
    <characteristic type="WLAN">
      <parm name="PRI-SSID" value="TMobile"/>
      <parm name="PRI-U-SSID" value=""/>
      <parm name="PRI-H-SSID"/>
      <parm name="NETMODE" value="INFRA"/>
      <parm name="SECMODE" value="WEP"/>
      <parm name="WEPAUTHMODE" value="OPEN"/>
      <parm name="WEPKEYIND" value="0"/>
      <characteristic type="WEPKEY">
        <parm name="INDEX" value="0"/>
        <parm name="LENGTH" value="64"/>
      </characteristic>
    </characteristic>
  </characteristic>

```

```

    <parm name="DATA" value="YWJjZGU="/>
  </characteristic>
  <characteristic type="WEPKEY">
    <parm name="INDEX" value="1"/>
    <parm name="LENGTH" value="128"/>
    <parm name="DATA" value="YWJjZGVmZ2hpajAxMg=="/>
  </characteristic>
  <characteristic type="WEPKEY">
    <parm name="INDEX" value="2"/>
    <parm name="LENGTH" value="64"/>
    <parm name="DATA" value="ASNKvN4="/>
  </characteristic>
  <characteristic type="WEPKEY">
    <parm name="INDEX" value="3"/>
    <parm name="LENGTH" value="128"/>
    <parm name="DATA" value="ASNFZ4mrwBI0VniavA=="/>
  </characteristic>
  <parm name="SECMODE" value="WPA-PRESHARED-KEY"/>
  <parm name="WPA-PRES-KEY-ASC" value="YWJjZGVmZ2g="/>
</characteristic>
</characteristic>
</wap-provisioningdoc>

```

Example 1: Code to define access points

3.2 Bootstrap example

In this example, only the bootstrap characteristic is presented. This should be combined with the access point example in Section 3.1 to create a real document. The parameter PROVURL contains the address of the trusted provisioning server. After the bootstrap has been received as an authenticated message, further messages from address <http://55555> will be implicitly authenticated.

```

<characteristic type="BOOTSTRAP">
  <parm name="PROVURL" value="http://55555"/>
</characteristic>

```

Example 2: Code to configure BOOTSTRAP characteristic

3.3 Browser example

In this example, only the application characteristic for the Browser is presented. This should be combined with the access point example in Section 3.1 to create a real document. It configures the Browser application to use proxy information from PROXY2 and network connectivity information from Browsing_CSD. A bookmark is created with the address <http://www.nokia.com>, and the same address is stored as the start page for Browser.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="w2"/>
  <parm name="NAME" value="Browser Account"/>
  <parm name="TO-PROXY" value="PROXY2" />
  <characteristic type="RESOURCE">
    <parm name="NAME" value="Bookmark Nokia Home"/>
    <parm name="URI" value="http://www.nokia.com"/>
    <parm name="STARTPAGE"/>
  </characteristic>
</characteristic>

```

```

    </characteristic>
</characteristic>

```

Example 3: Code to configure Browser settings

3.4 MMS example

In this example, only the application characteristic for Multimedia Messaging Service (MMS) is presented. This should be combined with the access point example in Section 3.1 to create a real document. It configures MMS to use PROXY1 as its access point, and `http://wap.mms.com` as the address of the MMS center.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="w4"/>
  <parm name="NAME" value="Sonofon MMS"/>
  <parm name="ADDR" value="http://mms.sonofon.dk"/>
  <parm name="TO-PROXY" value="PX1"/>
</characteristic>

<characteristic type="APPLICATION">
  <parm name="APPID" value="w4"/>
  <parm name="NAME" value="Sonofon MMS"/>
  <parm name="TO-PROXY" value="PX1"/>
  <characteristic type="RESOURCE">
    <parm name="NAME" value="MMS"/>
    <parm name="URI" value="http://mms.sonofon.dk"/>
    <parm name="STARTPAGE"/>
  </characteristic>
</characteristic>

```

Example 4: Code to configure MMS settings

3.5 E-mail example

In this example, only the application characteristic for e-mail is presented. This should be combined with the access point example in Section 3.1 to create a real document. The complete settings are combined from settings for the sending server (SMTP) and receiving server (POP3 / IMAP). The application ID uses port numbers as a value (see reference [8]) and is used to determine the setting type. The application ID is also used as a default port value, if the parm PORTNBR is not found from the settings when connecting to the server. In general, parm values are not checked, but the FROM field must contain a valid e-mail address or the settings will be discarded. In addition, if PROVIDER-ID is defined, it must have the same value in the SMTP and POP3 / IMAP settings. Transport Layer Security (TLS) is used if parm SERVICE is found and it contains the value STARTTLS.

SMTP settings are defined under their own application characteristic with an APPID value of 25.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="25"/>
  <parm name="PROVIDER-ID" value="MyMail"/>
  <parm name="TO-NAPID" value="Browsing_GPRS"/>
  <parm name="FROM" value="first.second@mymail.com"/>
  <characteristic type="APPADDR">
    <parm name="ADDR" value="smtp.mail.com"/>
  </characteristic type="PORT">

```

```

        <parm name="PORTNBR" value="25"/>
        <parm name="SERVICE" value="STARTTLS"/>
    </characteristic>
</characteristic>
<characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="username"/>
    <parm name="AAUTHSECRET" value="password"/>
</characteristic>
</characteristic>

```

Example 5: Code to configure SMTP settings

IMAP settings are defined under their own application characteristic with an APPID value of 143.

```

<characteristic type="APPLICATION">
    <parm name="APPID" value="143"/>
    <parm name="PROVIDER-ID" value="MyMail"/>
    <parm name="NAME" value="IMAP box"/>
    <parm name="TO-NAPID" value="Browsing_GPRS"/>
    <characteristic type="APPADDR">
        <parm name="ADDR" value="imap.mail.com"/>
        <characteristic type="PORT">
            <parm name="PORTNBR" value="143"/>
            <parm name="SERVICE" value="STARTTLS"/>
        </characteristic>
    </characteristic>
</characteristic>
<characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="username"/>
    <parm name="AAUTHSECRET" value="password"/>
    <!parm name="AAUTHTYPE" value="Disabled"/>
</characteristic>
</characteristic>

```

Example 6: Code to configure IMAP settings

POP3 settings are defined under their own application characteristic with an APPID value of 110.

```

<characteristic type="APPLICATION">
    <parm name="APPID" value="110"/>
    <parm name="PROVIDER-ID" value="MyMail"/>
    <parm name="NAME" value="POP box"/>
    <parm name="TO-NAPID" value="Browsing_GPRS"/>
    <characteristic type="APPADDR">
        <parm name="ADDR" value="pop.mail.com"/>
        <characteristic type="PORT">
            <parm name="PORTNBR" value="110"/>
            <parm name="SERVICE" value="STARTTLS"/>
        </characteristic>
    </characteristic>
</characteristic>
<characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="username"/>
    <parm name="AAUTHSECRET" value="password"/>
    <!parm name="AAUTHTYPE" value="Disabled"/>
</characteristic>
</characteristic>

```

Example 7: Code to configure POP3 settings

3.6 OMA DM example

In this example, only the application characteristics for OMA Device Management (OMA DM) are presented. A real document would include other characteristics, as in the previous example.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="w7"/>
  <parm name="PROVIDER-ID" value="com.mgmtsrv.manage"/>
  <parm name="NAME" value="Mgmt Server"/>
  <parm name="ADDR" value="http://www.mgmtserver.com:8080/manage"/>
  <parm name="TO-NAPID" value="Browsing_GPRS"/>
  <characteristic type="APPAUTH">
    <parm name="AAUTHLEVEL" value="APPSRV"/>
    <parm name="AAUTHTYPE" value="DIGEST,BASIC"/>
    <parm name="AAUTHNAME" value="servername"/>
    <parm name="AAUTHSECRET" value="serversecret"/>
    <parm name="AAUTHDATA" value="servernonce"/>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHLEVEL" value="CLIENT"/>
    <parm name="AAUTHNAME" value="clientname"/>
    <parm name="AAUTHSECRET" value="clientsecret"/>
    <parm name="AAUTHDATA" value="clientnonce"/>
  </characteristic>
</characteristic>

<characteristic type="APPLICATION">
  <parm name="APPID" value="w7"/>
  <parm name="NAME" value="Mgmt Server1"/>
  <parm name="TO-PROXY" value="170.187.51.4"/>
  <parm name="PROVIDER-ID" value="DM Id"/>
  <parm name="INIT"/>
  <characteristic type="APPADDR">
    <parm name="ADDR" value="http://www.mgmtserver1.com/manage"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="8080"/>
    </characteristic>
  </characteristic>
  <characteristic type="RESOURCE">
    <parm name="NAME" value="Calendar DB"/>
    <parm name="URI" value="Calendar"/>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHTYPE" value="HTTP-DIGEST"/>
    <parm name="AAUTHNAME" value="name1"/>
    <parm name="AAUTHSECRET" value="secret1"/>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHLEVEL" value="APPSRV"/>
    <parm name="AAUTHTYPE" value="DIGEST,BASIC"/>
    <parm name="AAUTHNAME" value="servername1"/>
    <parm name="AAUTHSECRET" value="serversecret1"/>
    <parm name="AAUTHDATA" value="servernonce1"/>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHLEVEL" value="CLIENT"/>
    <parm name="AAUTHNAME" value="clientname1"/>
    <parm name="AAUTHSECRET" value="clientsecret1"/>
  </characteristic>

```

```

    <parm name="AAUTHDATA" value="clientnonce1"/>
  </characteristic>
</characteristic>

```

Example 8: Code to configure OMA DM settings

3.7 OMA DS example

In this example, only the application characteristics for OMA Data Synchronization (OMA DS) are presented. A real document would include other characteristics, as in the previous example.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="w5"/>
  <parm name="TO-NAPID" value="Browsing_GPRS" />
  <parm name="NAME" value="Superman SyncML"/>
  <parm name="ADDR" value="http://metropolis.com:8080/service/sync"/>
  <characteristic type="RESOURCE">
    <parm name="URI" value="./contacts"/>
    <parm name="NAME" value="Contacts DB"/>
    <parm name="AACCEPT" value="text/x-vcard"/>
  </characteristic>
  <characteristic type="RESOURCE">
    <parm name="URI" value="./calendar"/>
    <parm name="NAME" value="Calendar DB"/>
    <parm name="AACCEPT" value="text/x-vcalendar"/>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="name4"/>
    <parm name="AAUTHSECRET" value="password4"/>
  </characteristic>
</characteristic>

<characteristic type="APPLICATION">
  <parm name="APPID" value="w5"/>
  <parm name="NAME" value="Mightyphone"/>
  <parm name="TO-NAPID" value="mms5_wirelessfuture"/>
  <characteristic type="APPADDR">
    <parm name="ADDR" value="http://208.184.103.68/syncml"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="8080"/>
    </characteristic>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="account"/>
    <parm name="AAUTHSECRET" value="password"/>
  </characteristic>
  <characteristic type="RESOURCE">
    <parm name="NAME" value="Calendar DB"/>
    <parm name="URI" value="Calendar"/>
    <parm name="AACCEPT" value="text/x-vcalendar"/>
  </characteristic>
  <characteristic type="RESOURCE">
    <parm name="NAME" value="Contacts DB"/>
    <parm name="URI" value="Contacts"/>
    <parm name="AACCEPT" value="text/x-vcard"/>
  </characteristic>

```

```

    <characteristic type="RESOURCE">
      <parm name="NAME" value="Notes DB"/>
      <parm name="URI" value="Notes"/>
      <parm name="ACCEPT" value="text/plain"/>
    </characteristic>
  </characteristic>

```

Example 9: Code to configure OMA DS settings

3.8 Wireless Village example

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="wA"/>
  <parm name="TO-PROXY" value="PROXY1" />
  <parm name="NAME" value="Wireless Village Settings"/>
  <parm name="ADDR" value="http://metropolis.com/service/imps"/>
  <characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="name3"/>
    <parm name="AAUTHSECRET" value="password2"/>
  </characteristic>
</characteristic>

```

Example 10: Code to configure Wireless Village settings

3.9 Push to Talk example

Push to Talk service is not part of the S60 platform as such, but it is a separate downloadable application. To run the Push to Talk over Cellular (PoC) client application in an S60 device, a Session Initiation Protocol (SIP) application is also needed. The following example describes the parameters needed to configure the PoC client.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="w9002"/>
  <parm name="NAME" value="My Settings - Push to Talk"/>
  <parm name="TO-NAPID" value="myapid"/>
  <characteristic type="APPADDR">
    <parm name="ADDR" value="123.123.123.123"/>
    <parm name="ADDRTYPE" value="IPv4"/>
    <parm name="PORTNBR" value="5060"/>
  </characteristic>
  <characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="username@domain.com"/>
    <parm name="AAUTHSECRET" value="password"/>
    <parm name="AAUTHDATA" value="Realm information"/>
  </characteristic>
</characteristic>

<characteristic type="NAPDEF">
  <parm name="NAPID" value="myapid"/>
  <parm name="BEARER" value="GSM-GPRS"/>
  <parm name="NAME" value="My Access Point name"/>
  <parm name="NAP-ADDRESS" value="ap.example.com"/>
  <parm name="NAP-ADDRTYPE" value="APN"/>
  <parm name="INTERNET"/>
  <characteristic type="NAPAUTHINFO">
    <parm name="AUTHTYPE" value="PAP"/>
    <parm name="AUTHNAME" value="MyAuthName"/>
  </characteristic>

```

```
<parm name="AUTHSECRET" value="MyAuthPassword"/>
</characteristic>
</characteristic>
```

Example 11: Code to configure Push to Talk

3.10 SIP

This section describes the parameters needed to configure a SIP profile. SIP profiles can be configured for multiple simultaneously-used SIP service providers, which support different types of server environments, for example, IETF, IMS, and Nokia Networks IMS Release 1 network. Each network setup requires different parameters to be present.

More detailed description about the semantics and applicable values of each parameter can be found from the [S60 3rd Edition: SIP Settings Configuration Guide](#) [9], which also describes the differences between the IMS and IETF profile types.

3.10.1 Mapping of OMA characteristics and parameters to SIP Profile parameters

Table 10 presents the mapping between SIP OMA Client Provisioning parameters and actual SIP configuration parameters and how the parameters are used in the OMA provisioning document. The Occurs column shows how many times the OMA parameter occurs or can occur in one context.

OMA /parameter	SIP Profile parameter	Value(s)	Occurs
APPLICATION/ APPID	Application identity registered in OMNA.	w9010	1
APPLICATION/ PROVIDER-ID	Identity of the SIP service provider.	As described in Provisioning Content 1.1 [1]. E.g., Operator X.	0 or 1
APPLICATION/ PTYPE	Service profile type (IETF, IMS, or proprietary SIP setting type name identification).	IETF or IMS or a name that identifies the type of SIP settings on the terminal side. E.g., the value is NokiapreR5Ims in SIP settings of type Nokia pre R5 IMS.	0 or 1
APPLICATION/ PUID	IMS Public User Identity or IETF Address-Of-Record (AOR). AOR must be given without any prefix, the sip: prefix will be automatically added.	IMS public user identity (entered only if HTTP Digest is used) e.g.,: user1public1@example.com. IETF e.g.: alice@atlanta.com	0 or 1

OMA /parameter	SIP Profile parameter	Value(s)	Occurs
APPLICATION/ NAME	Name of the SIP settings. This is shown to the user when the message is viewed in Inbox.	As described in Provisioning Content 1.1 [1]. E.g., OperatorX SIP.	0 or 1
APPLICATION/ APROTOCOL	Transport protocol used between SIP UE and outbound proxy / P-CSCF connection.	Transport protocol name. If present, the value is TCP or UDP. If missing, the protocol will be selected automatically.	0 or 1
APPLICATION/ TO-NAPID	IAP/APN used to connect to the service provider.	As described in Provisioning Content 1.1 [1].	1
APPLICATION/ SIGNALCMPR	Indicates whether the signal compression is in use.	Flag. If the parameter exists, signal compression is in use.	0 or 1
APPLICATION/ SECNEG	Indicates whether security negotiation is used.	Flag. If the parameter exists, security negotiation is in use.	0 or 1
APPLICATION/A PPADDR/LR	Indicates whether SIP loose routing parameter is used.	Flag. If the parameter exists, loose routing is used.	0 or 1
APPLICATION/ APPADDR/AD DR	In IMS, this is always the address of P-CSCF. If left empty, the address of P-CSCF will be automatically discovered. In IETF, this is the address of outbound proxy.	IMS e.g.: pcscf1.home1.net. IETF e.g.: atlanta.com or 192.192.192.197 or FEDC:BA98:7654:3:FED C:BA98:7654:3210.	0 or 1
APPLICATION/ APPADDR/PO RT/PORTNBR	Outbound proxy port.	E.g., 5060.	0 or 1
APPLICATION/ APPAUTH/AAU THNAME	User name for the realm on the outbound proxy.	Free text, e.g., alice.	0 or 1
APPLICATION/ APPAUTH/AAU THSECRET	Password for the realm on the outbound proxy.	Free text, e.g., djs9JUFj8g.	0 or 1
APPLICATION/ APPAUTH/AAU THDATA	Realm of the outbound proxy.	Must match the realm string that the proxy returns within its 407 response.	0 or 1

OMA /parameter	SIP Profile parameter	Value(s)	Occurs
APPLICATION/RESOURCE/URI	Registrar/S-CSCF as URI, which may include the address, port, and transport protocol to be used.	IMS: FQDN e.g., scscf1.home1.net:5060;transport=TCP. IETF: e.g., atlanta.com or 192.192.192.197:5060;transport=TCP or [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]:5060 or [FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]. Port and transport parameters are used as in SIP-URI according to IETF RFC 3261.	0 or 1
APPLICATION/RESOURCE/AUTHNAME	User name for registrar realm.	pre-IMS: e.g., user1_private@home1.net. In IETF: e.g., alice.	0 or 1
APPLICATION/RESOURCE/AUTHSECRET	Password for registrar.	Free text, e.g., ueF82DfKlr4g.	0 or 1
APPLICATION/RESOURCE/AUTHDATA	Realm of the registrar.	Must match the realm string that the registrar returns within its 401 response.	0 or 1

Table 10: Characteristics mapping**3.10.2 The length of parameter fields**

The length of the parameter fields of standard OMA provisioning parameters is listed in *Provisioning Content 1.1* [1], page 40. The length of the SIP OMA parameters that differ from the OMA specification are listed in Table 11. Parameters that have the same name as in OMA specification, but differ in length are also shown here.

Name	Value length in bytes
APPLICATION/PTYPE	32
APPLICATION/PUID	64
APPLICATION/SIGNALCMR	0
APPLICATION/SECNEG	0
APPLICATION/APROTOCOL	5

Name	Value length in bytes
APPLICATION/APPADDR/LR	0
APPLICATION/APPAUTH/AAUTNAME	72
APPLICATION/RESOURCE/AAUTHNAME	72

Table 11: The length of parameter fields

3.10.3 Sample proprietary Nokia pre-IMS SIP profile type settings message

In the following sample, the extensions to the OMA client provisioning are marked with *italic*.

```
<?xml version="1.0"?>
<!DOCTYPE wap-provisioningdoc PUBLIC "-//WAPFORUM//DTD PROV 1.0//EN"
"http://www.wapforum.org/DTD/prov.dtd">
<wap-provisioningdoc version="1.1">

  <characteristic type="APPLICATION">
    <parm name="APPID" value="w9010"/>
    <parm name="APPREF" value="SIP at office"/>
    <parm name="PROVIDER-ID" value="Nokia pre R5 IMS"/>
    <parm name="PTYPE" value="NokiapreR5Ims"/>
    <parm name="PUID" value="user1public1@home1.net"/>
    <parm name="NAME" value="Nokia pre R5 IMS settings "/>
    <parm name="APROTOCOL" value="TCP"/>
    <parm name="TO-NAPID" value="pre-IMSAPN"/>
    <parm name="SIGNALCMPR"/>
    <parm name="SECNEG"/>

    <characteristic type="APPADDR">
      <parm name=LR/>
      <parm name="LOCK"/>
      <parm name="AUTOREG"/>

      <parm name="ADDR" value="pcscf1.home1.net"/>
      <characteristic type="PORT">
        <parm name="PORTNBR" value="5060"/>
      </characteristic>
    </characteristic>

    <characteristic type="RESOURCE">

      <parm name="URI" value="scscf1.home1.net:5060;transport=TCP"/>
      <parm name="AAUTHNAME" value="sip:user1private@home1.net"/>
      <parm name="AAUTHSECRET" value="jasd7GEHfd78b"/>
      <parm name="AAUTHDATA" value="home1.net"/>
    </characteristic>
  </characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="pre-IMSAPN"/>
    <parm name="BEARER" value="GSM-GPRS"/>
  </characteristic>
</wap-provisioningdoc>
```

Example 12: Code to configure the PRE-IMS SIP client

3.10.4 Sample IETF SIP profile type settings message

In the following sample, the extensions to the OMA client provisioning are marked with *italic*.

```
<?xml version="1.0"?>
<!DOCTYPE wap-provisioningdoc PUBLIC "-//WAPFORUM//DTD PROV 1.0//EN"
"http://www.wapforum.org/DTD/prov.dtd">
<wap-provisioningdoc version="1.1">

  <characteristic type="APPLICATION">
    <parm name="APPID" value="w9010"/>
    <parm name="PROVIDER-ID" value="Operator X SIP"/>
    <parm name="PTYPE" value="IETF"/>
    <parm name="PUID" value="joe@example.com"/>
    <parm name="NAME" value="Operator X SIP settings"/>
    <parm name="APROTOCOL" value="TCP"/>
    <parm name="TO-NAPID" value="OperatorXInet"/>
    <parm name="SIGNALCMPR"/>

  <characteristic type="APPADDR">
    <parm name="LR"/>
    <parm name="ADDR" value="192.192.192.194"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="5060"/>
    </characteristic>
  </characteristic>

  <characteristic type="APPAUTH">
    <parm name="AAUTHNAME" value="joe"/>
    <parm name="AAUTHSECRET" value="jasd7GEHfd78b"/>
    <parm name="AAUTDATA" value="outbound at example.com"/>
  </characteristic>

  <characteristic type="RESOURCE">
    <parm name="URI" value="example.com:5060;transport=TCP"/>
    <parm name="AAUTHNAME" value="joe"/>
    <parm name="AAUTHSECRET" value="jasd7GEHfd78b"/>
    <parm name="AAUTDATA" value="registrar at example.com"/>
  </characteristic>
</characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="OperatorXInet"/>
    <parm name="INTERNET"/>
    <parm name="BEARER" value="GSM-GPRS"/>
  </characteristic>
</wap-provisioningdoc>
```

Example 13: Code to configure the IETF SIP client

3.11 Always online example

This example configures the PDP Context Manager application with possible values to ensure that a data connection exists whenever possible.

```

AlwaysON PDP context status
Values are XY, where X is related to 3G flag and Y is related to 2G
flag.
Possible values are:
"00", AlwaysOn is OFF for both 3G and 2G
"10", AlwaysOn is ON for 3G, OFF for 2G
"01", AlwaysOn is OFF for 3G, ON for 2G
"11", AlwaysOn is ON for 3G, ON for 2G

<wap-provisioningdoc version="1.1">
  <characteristic type="VENDORCONFIG">
    <parm name="NAME" value="MRBLOBBY"/>
    <parm name="AWON-PDPC" value="01"/>
    <parm name="T-RETRY" value="100"/>
  </characteristic>
</wap-provisioningdoc>

```

Example 14: Code to configure the PDP Context Manager application

3.12 MbxNbrAdapter

This example configures a Voice Mailbox application. This document is self-sufficient to perform the requirement.

```

<wap-provisioningdoc version="1.1">
  <characteristic type="APPLICATION">
    <parm name="APPID" value="w9027"/>
    <parm name="NAME" value="MbxNbrAdapter"/>
    <parm name="MBNMBR" value="9900582411"/>
    <parm name="MBTYPE" value="VIDEO"/>
  </characteristic>
</wap-provisioningdoc>

```

Example 15: Code to configure a Voice Mailbox application

3.13 Streaming

In this example, only the application characteristics for Streaming are presented. This should be combined with the access point example in Section 3.1 to create a real document. It configures the Streaming application to use proxy information from PROXY2 and network connectivity information from mms5_wirelessfuture.

```

<characteristic type="APPLICATION">
  <parm name="APPID" value="554"/>
  <parm name="TO-PROXY" value="streaming-proxy"/>
  <parm name="NAME" value="NTN Stream"/>
  <parm name="MAX-BANDWIDTH" value="128000"/>
  <parm name="MIN-UDP-PORT" value="6970"/>
  <parm name="MAX-UDP-PORT" value="32000"/>
</characteristic>

```

Example 16: Code to configure streaming settings

3.14 VoIP

In the following sample, the extensions to the OMA client provisioning are marked with *italic*. This is a complete document that can be used as such. VoIP application is configured to use SIP information through the APPREFs "SIP at office" and "SIP at home".

```

<wap-provisioningdoc version="1.1">
  <characteristic type="APPLICATION">
    <parm name="APPID" value="w9013"/>
    <parm name="PROVIDER-ID" value="Example provider"/>
    <parm name="NAME" value="VoIP settings "/>
    <parm name="TO-APPREF" value="SIP at office"/>
    <parm name="TO-APPREF" value="SIP at home"/>
    <parm name="SMPORT" value="16385"/>
    <parm name="EMPORT" value="32765"/>
    <parm name="MEDIAQOS" value="26"/>
    <parm name="NODTMFIB"/>
    <parm name="NODTMFOOB"/>

    <!-- Codec: AMR NB -->
    <characteristic type="CODEC">
      <parm name="MEDIASUBTYPE" value="0"/>
      <parm name="PRIORITYINDEX" value="0"/>
      <parm name="JITTERBUFFERSIZE" value="200"/>
      <parm name="OCTET-ALIGN"/>
      <parm name="MODE-SET" value="0-7"/>
      <parm name="MODE-CHANGE-PERIOD" value="8"/>
      <parm name="MODE-CHANGE-NEIGHBOR"/>
      <parm name="PTIME" value="100"/>
      <parm name="MAXPTIME" value="200"/>
      <parm name="VAD"/>
      <parm name="ANNEXB"/>
    </characteristic>

    <!-- Codec: G.711 A-law -->
    <characteristic type="CODEC">
      <parm name="MEDIASUBTYPE" value="3"/>
      <parm name="PRIORITYINDEX" value="1"/>
      <parm name="JITTERBUFFERSIZE" value="200"/>
      <parm name="OCTET-ALIGN"/>
      <parm name="PTIME" value="40"/>
      <parm name="MAXPTIME" value="100"/>
      <parm name="VAD"/>
      <parm name="SAMPLINGRATE" value="8000"/>
    </characteristic>

```

```

<!-- SIP-URIs for Bob's Enterprise SIP -->
<characteristic type="VOIPURIS">
  <parm name="TO-APPREF" value="SIP at Home"/>
  <parm name="IPVOICEMAILBOXURI"
</characteristic>

<!-- SIP-URIs for Bob's Home SIP -->
<characteristic type="VOIPURIS">
  <parm name="TO-APPREF" value="SIP at office"/>
  <parm name="IPVOICEMAILBOXURI"
value="robert@ipvoicemailbox.example.com"/>
</characteristic>
</characteristic><!-- APPLICATION VoIP w9013 -->

<characteristic type="APPLICATION">
  <parm name="APPID" value="w9010"/>
  <parm name="APPREF" value="SIP at office"/>
  <parm name="PROVIDER-ID" value="Example provider"/>
  <parm name="PTYPE" value="IETF"/>
  <parm name="PUID" value="robert@example.com"/>
  <characteristic type="APPADDR">
    <parm name="LR"/>
    <parm name="ADDR" value="outbound.example.com"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="5060"/>
    </characteristic>
  </characteristic>
  <!-- clip -->
  <parm name="TO-NAPID" value="Operator X IAP"/>
  <!-- clip -->
</characteristic><!-- APPLICATION -->

<characteristic type="APPLICATION"> <!-- SIP settings -->
  <parm name="APPID" value="w9010"/>
  <parm name="APPREF" value="SIP at home"/>
  <parm name="PROVIDER-ID" value="Example provider"/>
  <parm name="PTYPE" value="IETF"/>
  <parm name="PUID" value="robert@example.com"/>
  <characteristic type="APPADDR">
    <parm name="LR"/>
    <parm name="ADDR" value="gatekeeper.example.com"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="5060"/>
    </characteristic>
  </characteristic>
  <!-- clip -->
  <parm name="TO-NAPID" value="Operator Z IAP"/>
  <!-- clip -->
</characteristic><!-- APPLICATION -->

<characteristic type="NAPDEF">
  <parm name="NAPID" value="WLAN at office"/>
  <parm name="PROVIDER-ID" value="Example provider"/>
  <parm name="BEARER" value="WLAN"/>
  <parm name="SSID" value="Office"/>
  <!-- clip -->
</characteristic><!-- NAPDEF -->

<characteristic type="NAPDEF">
  <parm name="NAPID" value="WLAN at home"/>

```

```

<parm name="PROVIDER-ID" value="Example provider"/>
<parm name="BEARER" value="WLAN"/>
<parm name="SSID" value="publicwlan"/>
<!-- clip -->
</characteristic><!-- NAPDEF -->
</wap-provisioningdoc>

```

Example 17: Code to configure VoIP settings

3.15 Authentication

OMA Provisioning messages can be explicitly authenticated via OMA Bootstrap (see reference document [2]). This creates a trusted relationship with a provisioning server, which means that further messages from this server are implicitly authenticated. Non-authenticated messages can be received, but the user will receive a security warning before opening them. Explicit authentication is brought about by using a shared secret method. Four such methods are supported in this product: user PIN, user network PIN, user PIN MAC (Message Authentication Code), and network PIN.

The shared secret used in the network PIN method is the international mobile system identifier (IMSI) from the mobile device's SIM card, encoded into semi-octet form (see reference document [6]). In the user PIN and user PIN MAC methods, the user manually enters a secret code known only to the user and the provisioning server. The digits of the user PIN are included in the secret code as corresponding ASCII character values (that is, as ASCII encoded string). In the user network PIN method, the shared secret is the encoded IMSI appended with the user PIN.

In the semi-octet form, each decimal number in IMSI is encoded as a half-octet. Octets are filled starting with the least significant half. The first half-octet contains the binary value p001, where p denotes the parity of the length of the IMSI. For example, the IMSI 123456789012345 has 15 digits. The parity is 1. The hexadecimal representation of the semi-octet form would therefore be the following eight octets:

```
19 32 54 76 98 10 32 54
```

4. Terms and abbreviations

Term or abbreviation	Meaning
CSD	Circuit-switched data
GPRS	General packet radio service
GSM	Global System for Mobile Communications
HSCSD	High-speed circuit-switched data
IETF	IETF compliant SIP network
IMAP	Internet message access protocol
IMPS	Instant Messaging and Presence Services
IMS	IP Multimedia Release 5 compliant SIP network
MAC	Message authentication code
MMS	Multimedia messaging service
NokiapreR5ims	Nokia Networks IMS Release 1 network
OMA	Open Mobile Alliance
OTA	Over the air
PoC	Push to Talk over Cellular
POP3	Post Office Protocol version 3
SIP	Session Initiation Protocol
OMA DM	OMA Device Management
OMA DS	OMA Data Synchronization
TLS	Transport Layer Security
WAP	Wireless Application Protocol
WBXML	WAP Binary XML
Wireless Village	Initiative for creating a standard IMPS protocol
XML	Extensible markup language

5. References

- [1] Provisioning Content 1.1, Open Mobile Alliance (OMA-WAP-ProvCont-v1_1-20021112-C) (<http://www.openmobilealliance.org/>)
- [2] Provisioning Bootstrap Version 1.1, Open Mobile Alliance (OMA-WAP_ProvBoot-v1_1-20021112-C) (<http://www.openmobilealliance.org/>)
- [3] [Over The Air Settings Specification](http://www.forum.nokia.com/), Version 7.0 (<http://www.forum.nokia.com/>)
- [4] Binary XML Content Format Specification, WAP Forum (WAP-192-WBXML-20010725-a) (<http://www.openmobilealliance.org/>)
- [5] Open Mobile Naming Authority (OMNA), Open Mobile Alliance (<http://www.openmobilealliance.org/tech/omna/>)
- [6] Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification (GSM 04.08) (<http://www.etsi.org/>)
- [7] Provisioning Architecture Overview Version 1.1, Open Mobile Alliance (OMA-WAP-ProvArch-v1_1-20021112-C) (<http://www.openmobilealliance.org/>)
- [8] Internet Assigned Numbers Authority (<http://www.iana.org/>)
- [9] [S60 3rd Edition: SIP Settings Configuration Guide](http://www.forum.nokia.com/) (<http://www.forum.nokia.com/>)

Appendix A. Binary example

This appendix contains a WAP Binary XML (WBXML) encoded version of the example presented earlier in this document (see reference document [4] for more information). After each line, there is a brief description of what the byte(s) mean; usually it is just the name of the given characteristic or parm. To better understand the code listing, the significance of some of the bytes is explained here in more detail.

C5: The hex number C should be seen as its bit pattern, 1100, where the first two bits indicate that whatever immediately follows C has attributes and content. In this example it is the number 5, which is the token for wap-provisioningdoc. For wap-provisioningdoc, the attribute is 46 (version 1.0); and the content is all the characteristics following until the end of wap-provisioningdoc, indicated by 01.

C6: The hex number C is explained in the previous paragraph. It is immediately followed by the number 6, which is for the element characteristic. Therefore, the element characteristic has both attributes and content. The attribute is type, and the content consists of all the parms following until the end of the element is met. Parms have a token value of 7. 87 is written because the number 8 has a bit pattern of 1000, thus signaling that parm has attributes but no content. The attributes for parm are name and value. The value attribute has a token value of 06: Possible values are either 1 byte of token value or 03 followed by a string and terminated by 00. Therefore, in the BOOTSTRAP binary string, the parm NAME has the value `http://55555`.

```

03 WBXML version 1.3
0B Public identifier for "-//WAPFORUM//DTD PROV 1.0//EN"
6A Character set UTF-8
00 String table length
C5 46 01 Element wap-provisioningdoc (5) with attribute version 1.0
(46) and content following.
  C6 56 01 BOOTSTRAP
    87 18 06 03 687474703A2F2F353535353500 01 PROVURL
  01 BOOTSTRAP END

  C6 51 01 PXLOGICAL
    87 15 06 03 50524F58593100 01 PROXY-ID
    87 07 06 03 50726F7879203100 01 NAME
  C6 53 01 PORT
    87 23 06 03 383038300001 PORTNBR
  01 PORT END
  C6 52 01 PXPHYSICAL
    87 20 06 03 3133312E3131312E332E3400 01 PHYSICAL-PROXY-ID
    87 21 06 85 01 PORTNBR
    87 22 06 03 42726F7773696E675F4750525300 01 TO-NAPID
  01 PXPHYSICAL END
01 PXLOGICAL END

C6 51 01 PXLOGICAL
  87 15 06 03 50524F58593200 01 PROXY-ID
  87 07 06 03 50726F7879203200 01 NAME
C6 53 01 PORT
  87 23 06 03 3830383000 01 PORTNBR
01 PORT END
C6 52 01 PXPHYSICAL
  87 20 06 03 31332E32322E34352E353500 01 PXADDR
  87 21 06 85 01 PXADDRTYPE
  87 22 06 03 42726F7773696E675F43534400 01 TO-NAPID

```

```

01 PXPHYSICAL END
01 PXLOGICAL END

C6 55 01 NAPDEF
87 11 06 03 42726F7773696E675F43534400 01 NAPID
87 10 06 AA 01 BEARER
87 07 06 03 42726F7773696E672043534400 01 NAME
87 08 06 03 2B353535353535353535353500 01 NAP-ADDRESS
87 09 06 87 01 NAP-ADDRTYPE
87 0A 06 90 01 CALLTYPE
87 25 06 03 3936303000 01
C6 5A 01 NAPAUTHINFO
87 0C 06 9A 01 AUTHTYPE
87 0D 06 03 6E616D653200 01 AUTHNAME
87 0E 06 03 70617373776F72643200 01 AUTHSECRET
01 NAPAUTHINFO END
01 NAPDEF END

C6 55 01 NAPDEF
87 11 06 03 42726F7773696E675F4750525300 01 NAPID
87 10 06 AB 01 BEARER
87 07 06 03 42726F7773696E67204750525300 01 NAME
87 08 06 03 696E7465726E657400 01 NAP-ADDRESS
87 09 06 89 01 NAP_ADDRTYPE
C6 5A 01 NAPAUTHINFO
87 0C 06 9A 01 AUTHTYPE
87 0D 06 03 6E616D6500 01 AUTHNAME
87 0E 06 03 70617373776F726400 01 AUTHSECRET
01 NAPAUTHINFO END
01 NAPDEF END

C6 00 01 55 01 (code page 1) APPLICATION
87 36 06 03773200 01 APPID
87 39 06 0350524F58593200 01 TO-PROXY
C6 59 01 RESOURCE
87 00 00 07 06 03 426F6F6B6D61726B204E616D6500 01
(code page 0) NAME
87 00 01 3A 06 03 687474703A2F2F7761702E636F6D0001
(code page 1) URI
87 00 00 1C 01 (code page 0) STARTPAGE
01 RESOURCE END
01 APPLICATION END

C6 00 01 55 01 (code page 1) APPLICATION
87 36 06 03773400 01 APPID
87 39 06 03 50524F58593100 01 TO-PROXY
87 34 06 03 687474703A2F2F7761702E6D6D732E636F6D00 01 ADDR
01 APPLICATION END
01 WAP-PROVISIONINGDOC END

```

Example 18: Provisioning document code in WAP Binary XML format

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