

OMA Provisioning for Nokia 5100

Version 1.0; April 14, 2003

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Change History

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OMA Provisioning for Nokia 5100

Version 1.0; April 14, 2003

1 Purpose

The following document is intended as a user manual when writing XML documents for OMA provisioning for the Nokia 5100. The document uses concrete examples to illustrate the process.

2 Introduction

OMA Provisioning [CONTENT, PROVUAB, PROVBOOT] replaces the Nokia proprietary way of provisioning the Nokia mobile phones [NOKPROP]. With the OMA Provisioning several applications, not just one application, can be provisioned at a time. OMA Provisioning is an open standard with a description on how content is formed and sent to the device. The OMA Provisioning standard is extensible parameter-wise, meaning that in the future when new parameters are introduced to the standard, a present-day device will also work properly. This means XML authors do not have to worry about phone versions or model when composing XML documents.

OMA Bootstrap adds security to OMA provisioning in the form of server authentication. It is described in the OMA Bootstrap standard [PROVBOOTPROVBOOT].

3 XML Quick Reference

This chapter presents an overview of the relevant elements of an OMA provisioning document (cf [CONTENT]). In general, OMA Provisioning document consists of a number of *characteristics*. Each characteristic contains *parameters* and also some characteristics. The following sections provide an overview of relevant characteristics, as well as a description of relevant parameters and their possible values for each characteristic.

3.1 Characteristic Hierarchy

The solid bullets are the outermost level, and the open bullets represent children. For example, PXPHYSICAL can only exist if a PXLOGICAL parent exists.

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

3.2 BOOTSTRAP

- NAME: Name of the provisioning document
- PROVURL: Alternative name of the provisioning document

3.3 APPLICATION

- APPID: Identifier for application to be provisioned. Possible values: w2 (Browser), w4 (MMS) [WINA]
- TO-NAPID: Points to particular *NAPDEF*
- TO-PROXY: Points to particular *PXLOGICAL*
- ADDR: Absolute URI. Used only by a Multimedia Message Service (MMS) application (MMS proxy-relay)

3.4 RESOURCE

- STARTPAGE: Takes no value. See next line for meaning.
- URI: Absolute URI that is used by the browser if the STARTPAGE is present

3.5 PXLOGICAL

- PROXY-ID: Identifier for a particular *PXLOGICAL*

3.6 PORT

- PORTNBR: Port number. Relevant only if proxies are enabled

3.7 PXPHYSICAL

- PHYSICAL-PROXY-ID: Identifier for particular *PXPHYSICAL*
- PXADDR: IP address of type IPV4.
- PXADDRTYPE: Address type of PXADDR. Possible value: IPV4
- TO-NAPID: Points to a particular *NAPDEF*
- STARTPAGE: for selected application

3.8 NAPDEF

- NAPID: Identifier for a particular *NAPDEF*
- BEARER: Identifier for bearer type
Possible values: GSM-GPRS or GSM-CSD
- NAP-ADDRESS: Either Access Point Name or phone number depending on connection method
- NAP-ADDRTYPE: Address type of NAP-ADDRESS. Possible values are E164 (phone number in case of CSD) or APN (in case of GPRS)
- INTERNET: Takes no value. If present, indicates that *NAPDEF* can be used to access Internet.
- CALLTYPE: Possible values: ANALOG-MODEM or V.110 (ISDN)
- LINKSPEED: Possible values: AUTOBAUDING (for analog modem only), 9600 or 14400

3.9 NAPAUTHINFO

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

- AUTHNAME: User name
- AUTHSECRET: Password

4 Example

This following example illustrates where the parameter from the document will end up in the phone's UI. The fields marked in gray are the parameters that become visible somewhere in the UI. Then the UI itself is presented.

4.1 XML document

```

<?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="BOOTSTRAP">
    <parm name="NAME" value="Gnu"/>
  </characteristic>

  <characteristic type="PXLOGICAL">
    <parm name="PROXY-ID" value="timon.dk"/>
    <parm name="NAME" value="Timon Proxy"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="8080"/>
    </characteristic>
    <characteristic type="PXPHYSICAL">
      <parm name="PHYSICAL-PROXY-ID" value="Timon_Proxy"/>
      <parm name="PXADDR" value="timon.proxy.dk"/>
      <parm name="PXADDRTYPE" value="IPV4"/>
      <parm name="TO-NAPID" value="timon_GPRS"/>
    </characteristic>
  </characteristic>

  <characteristic type="PXLOGICAL">
    <parm name="PROXY-ID" value="gnu.dk"/>
    <parm name="NAME" value="gnu Proxy"/>
    <characteristic type="PORT">
      <parm name="PORTNBR" value="8080"/>
    </characteristic>
    <characteristic type="PXPHYSICAL">
      <parm name="PHYSICAL-PROXY-ID" value="gnu Proxy"/>
      <parm name="PXADDR" value="gnu.proxy.dk"/>
      <parm name="PXADDRTYPE" value="IPV4"/>
      <parm name="TO-NAPID" value="gnu_GPRS"/>
      <parm name="TO-NAPID" value="gnu_CSD"/>
    </characteristic>
    <characteristic type="PXPHYSICAL">
      <parm name="PHYSICAL-PROXY-ID" value="Bison Proxy"/>
      <parm name="PXADDR" value="bison.proxy.dk"/>
      <parm name="PXADDRTYPE" value="IPV4"/>
      <parm name="TO-NAPID" value="gnu_GPRS"/>
      <parm name="TO-NAPID" value="gnu_CSD"/>
    </characteristic>
  </characteristic>

  <characteristic type="NAPDEF">
    <parm name="NAPID" value="gnu_GPRS"/>
    <parm name="BEARER" value="GSM-GPRS"/>
    <parm name="NAME" value="gnu GPRS"/>
    <parm name="NAP-ADDRESS" value="internet"/>
    <parm name="NAP-ADDRTYPE" value="APN"/>
    <characteristic type="NAPAUTHINFO">
      <parm name="AUTHTYPE" value="PAP"/>
      <parm name="AUTHNAME" value="Zimba"/>
      <parm name="AUTHSECRET" value="Scar"/>
    </characteristic>
  </characteristic>

```

```

<characteristic type="NAPDEF">
  <parm name="NAPID" value="gnu_CSD" />
  <parm name="BEARER" value="GSM-CSD" />
  <parm name="NAME" value="gnu CSD" />
  <parm name="NAP-ADDRESS" value="+5555555555" />
  <parm name="NAP-ADDRTYPE" value="E164" />
  <parm name="CALLTYPE" value="ANALOG-MODEM" />
  <parm name="LINKSPEED" value="9600" />
  <characteristic type="NAPAUTHINFO">
    <parm name="AUTHTYPE" value="PAP" />
    <parm name="AUTHNAME" value="Pumba" />
    <parm name="AUTHSECRET" value="Sazu" />
  </characteristic>
</characteristic>

<characteristic type="NAPDEF">
  <parm name="NAPID" value="timon_GPRS" />
  <parm name="BEARER" value="GSM-GPRS" />
  <parm name="NAME" value="timon GPRS" />
  <parm name="NAP-ADDRESS" value="internet" />
  <parm name="NAP-ADDRTYPE" value="APN" />
  <characteristic type="NAPAUTHINFO">
    <parm name="AUTHTYPE" value="PAP" />
    <parm name="AUTHNAME" value="Rafiki" />
    <parm name="AUTHSECRET" value="Kiara" />
  </characteristic>
</characteristic>

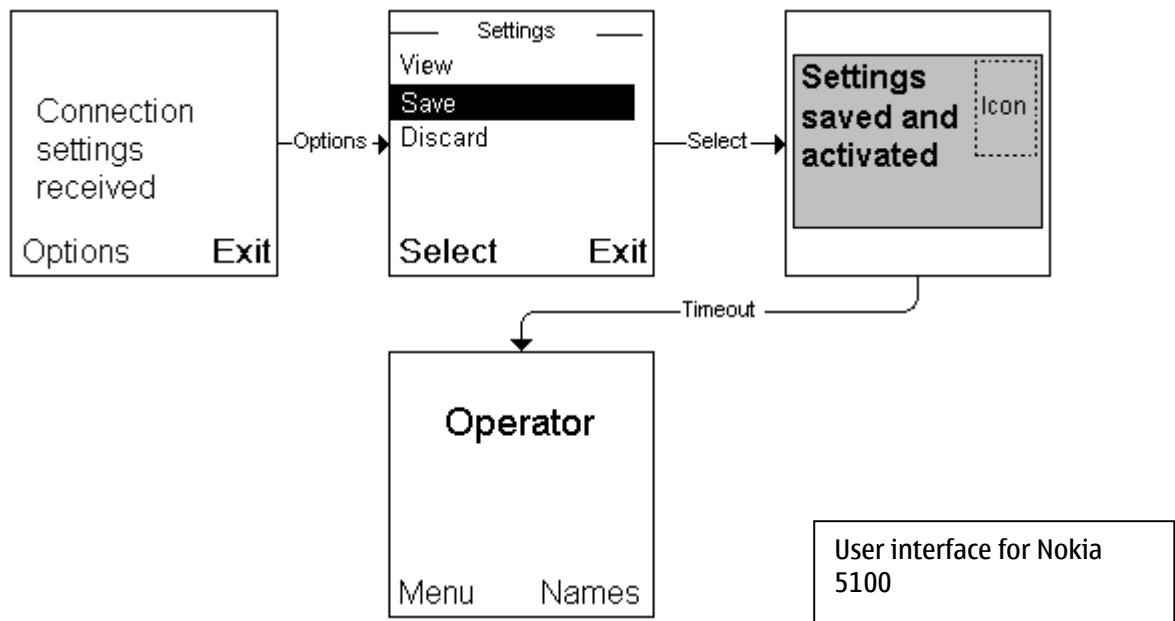
<characteristic type="APPLICATION">
  <parm name="APPID" value="w2" />
  <parm name="TO-PROXY" value="gnu.dk" />
  <parm name="NAME" value="Browser" />
  <characteristic type="RESOURCE">
    <parm name="URI" value="http://wap.gnu.dk" />
    <parm name="STARTPAGE" />
  </characteristic>
</characteristic>

<characteristic type="APPLICATION">
  <parm name="APPID" value="w4" />
  <parm name="TO-PROXY" value="timon.dk" />
  <parm name="ADDR" value="http://wap.timon.dk" />
</characteristic>
</wap-provisioningdoc>

```

The UI examples that follow are tied to this example XML document in the sense that all the grayed-out fields can be seen in the device's UI after the document has been saved.

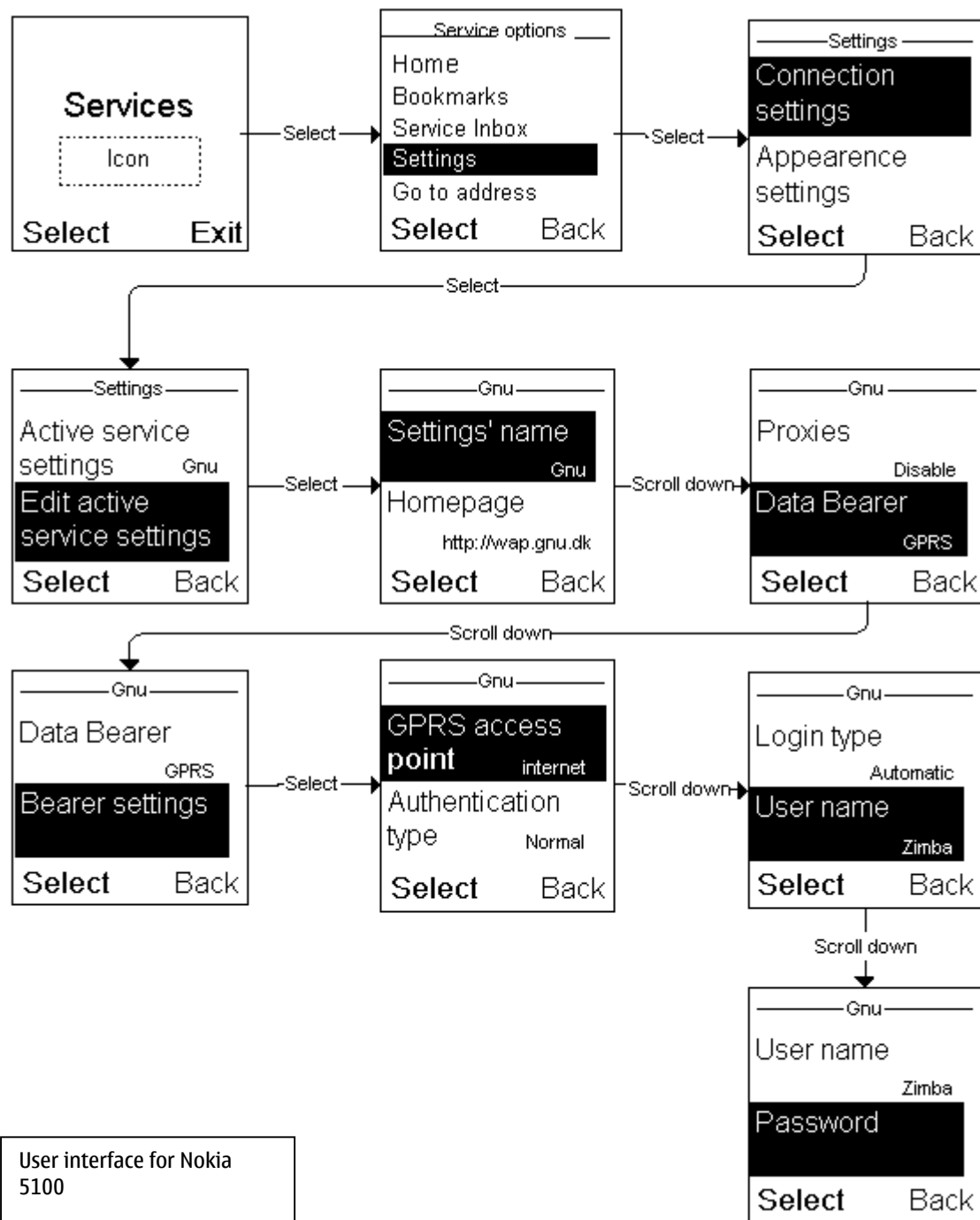
4.2 UI When Receiving WBXML Document



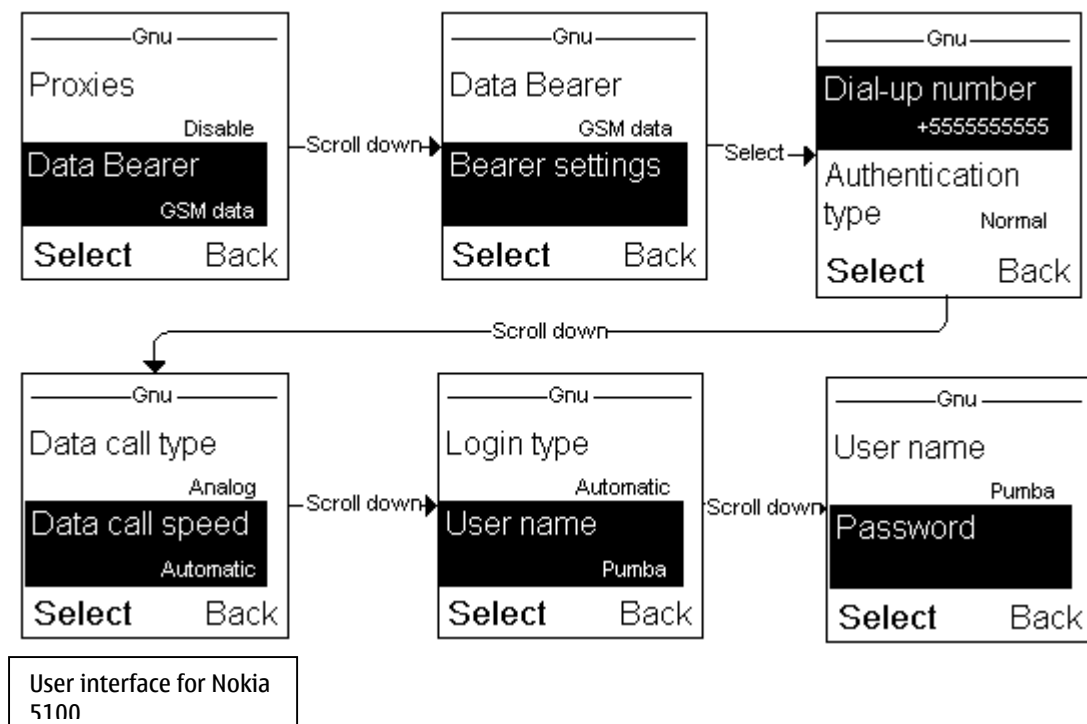
4.3 Browser Settings UI

The browser settings are located under the *Services* menu. To work, the browser requires a home page, proxy address(es), and bearer settings. Possible bearers are GSM-DATA (CSD) and GPRS.

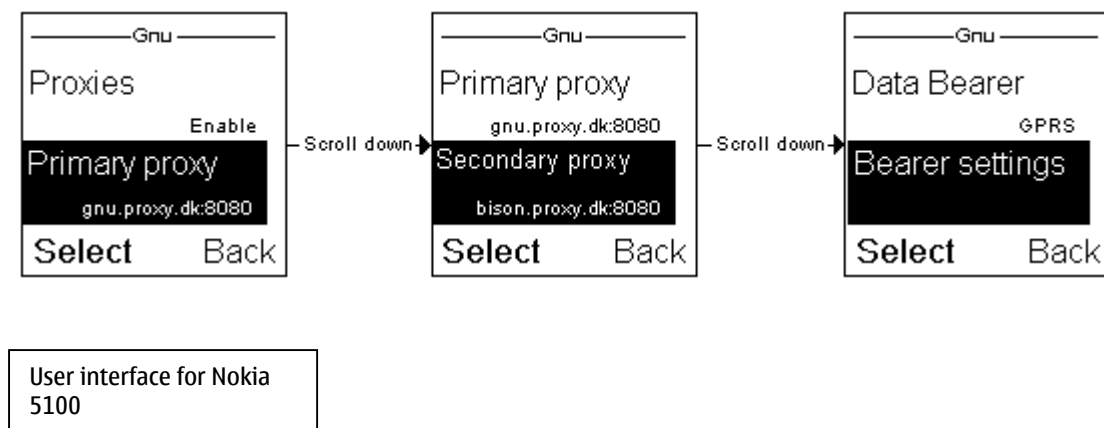
4.3.1 GPRS bearer selected



4.3.2 CSD bearer selected

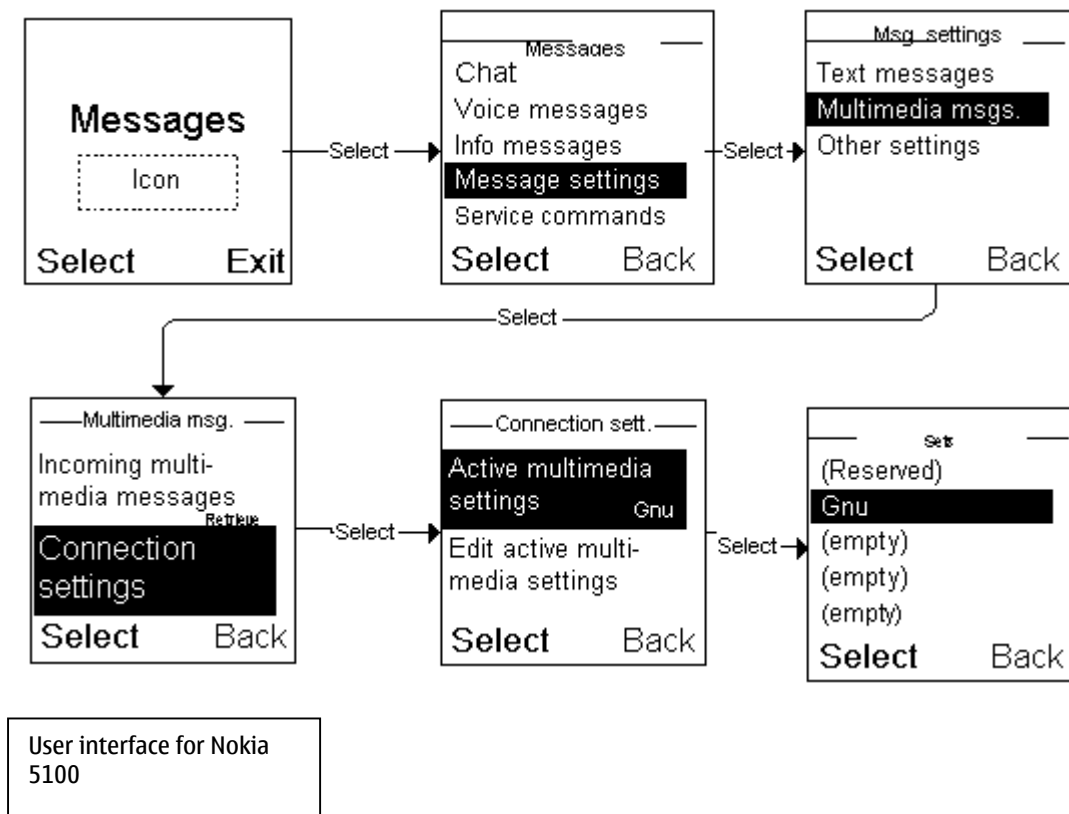


4.4 Proxies UI



4.5 MMS Settings

An MMS application requires the same settings as a browser, except for homepage that is not required by MMS. Instead, MMS settings require an MMS proxy relay. This information can be seen under the *homepage* field.



5 OMA Bootstrap

An OMA provisioning document can be used without *any* modification for OMA Bootstrap.

Essentially, OMA Bootstrap is OMA Client Provisioning plus server authentication. The server authentication is brought about using a *shared secret method*. Two such methods are supported in Nokia 5100: *user pin* and *network pin*.

The shared secret used in the *network pin* method is the IMSI from the SIM card. In the *user pin* method, the user must manually enter a secret code that is known only to the user and the provisioning server.

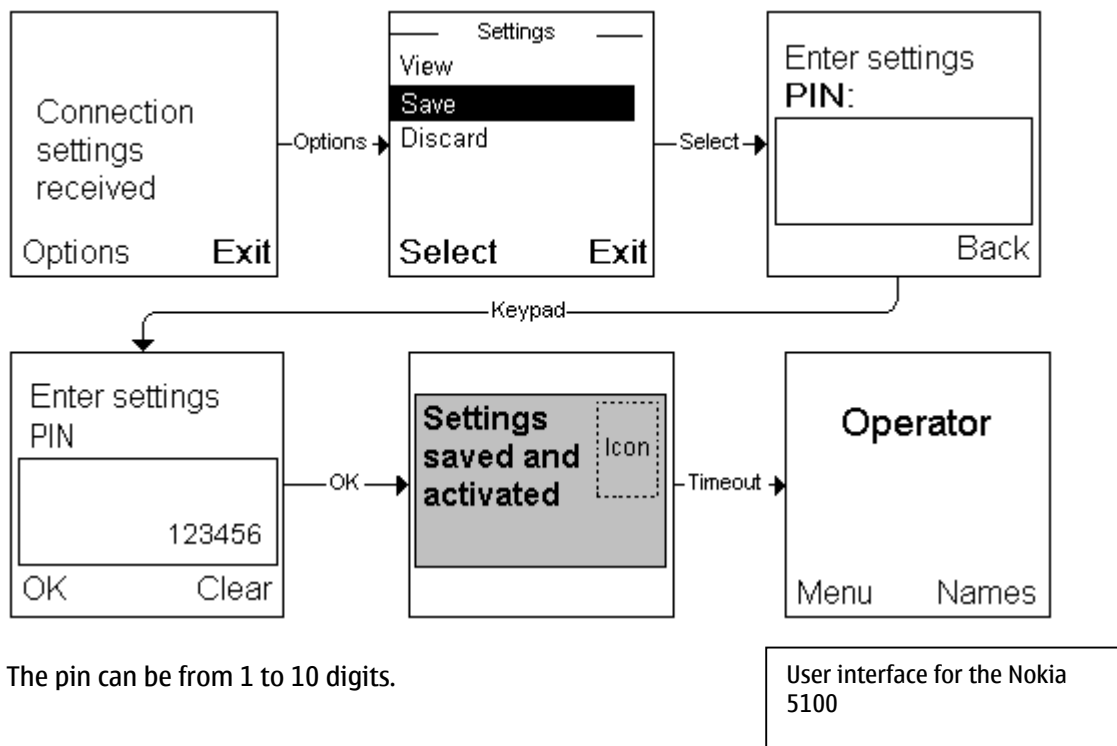
Settings received by OMA Bootstrap (bootstrap set) cannot be edited or viewed. The device has reserved room for one bootstrap set, which is located at the top of the *active settings set list*, as shown in Chapter 4.5, where the MMS part of the reserved bootstrap set has the name (*Reserved*).

5.1 Save Bootstrap Set (IMSI)

When receiving a bootstrap set this way, no indication to UI is displayed, which means that the device is silently provisioned. The shared secret is that the IMSI information can be obtained from the SIM card and then subsequently used in calculating a MAC value that is then compared to the one sent with the provisioning document. If the two values are identical, the sender has been authenticated successfully, and the device may store the document.

5.2 Save Bootstrap Set (User Pin)

In this method, the device also receives a Message Authentication Code (MAC) along with the actual provisioning document. The sender has computed this MAC using the document *and* a PIN (not the IMSI). When the device owner decides to save this document, he/she is prompted for this PIN and, when it is entered, the device is able to compute a MAC value that must match the one sent to the device.

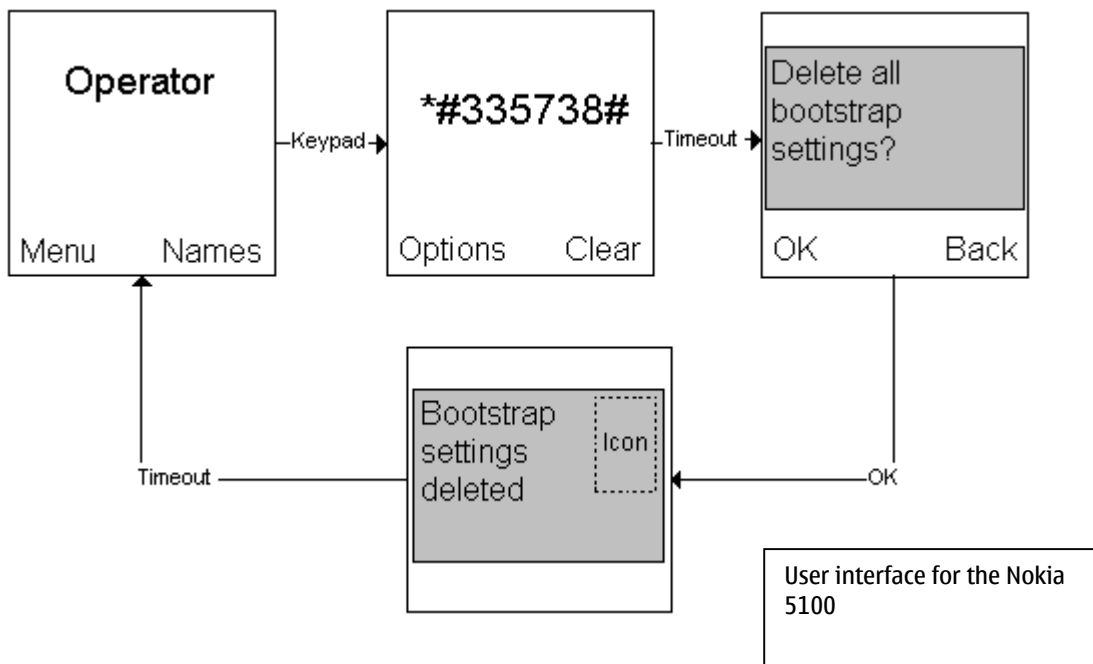


The pin can be from 1 to 10 digits.

User interface for the Nokia 5100

5.3 Delete Bootstrap Set

The name (*Reserved*) implies that the phone has not yet received the special bootstrap set. An incoming bootstrap set would be denied access if a bootstrap set had already been set. This is done to prevent the user from accidentally removing the special bootstrap set. The user can delete the bootstrap set should he/she wish to do so.



6 Terms and Abbreviations

Term or Abbreviation	Description
WBXML	WAP Binary XML Content Format
WINA	WAP Interim Naming Authority
WAP	Wireless Application Protocol
WSP	Wireless Session Protocol
MAC	Message Authentication Code

7 References

IANA	“Internet Assigned Numbers Authority” http://www.iana.org/
PROVBOOT	“Provisioning Bootstrap 1.1,” Open Mobile Alliance™, OMA-WAP-PROVBOOT-V1_1 http://www.openmobilealliance.org/
PROVUAB	“Provisioning User Agent Behaviour 1.1,” Open Mobile Alliance™, OMA-WAP-PROVUAB-V1_1 http://www.openmobilealliance.org/
NOKPROP	Over The Air Settings Specification, Version 7.0 http://www.forum.nokia.com/
WBXML	“WAP Binary XML Content Format,” WAP Forum™, WAP-192-WBXML http://www.openmobilealliance.org/
WINA	“WAP Interim Naming Authority,” Open Mobile Alliance™ http://www.wapforum.org/wina/

8 Appendix: Binary Example

This is the WBXML-encoded version of the example presented earlier in this manual [WBXML,CONTENT]. After each line is a short indication of what the byte(s) mean, most often only the name of the given characteristic or parameters. For a better understanding, some of the bytes are explained here.

C5: The hex number C should be seen as its bit pattern 1100, where the meaning of the first two bits is: whatever follows C (in this example, 5 is the token for wap-provisioningdoc) has attributes and content. For wap-provisioningdoc, the attribute is 46 (version 1.0) and the content is all the characteristics that follow until the end of wap-provisioningdoc is met - 01.

C6: The number 6 is for the element "characteristic." C is explained above. So, the element characteristic has both attributes and content. The attribute is type, and content consists of all the parameters that follow until the end of element is met. Parameters have the token value 7. So, why write 87? Again, the number 8 has the bit pattern 1000, thus signaling that the parameter has attributes but no content. The attributes for the parameter are name and value. The value attribute has the token value 06: Possible values are either one byte of token value or 03 followed by a string and terminated by 00. In the BOOTSTRAP case, the parm=NAME has the value="Gnu".

03 WBXML version 1.3

0B Public identifier for "-//WAPFORUM//DTD PROV 1.0//EN"

6A Character set used 6A = UTF8

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 07 06 03 47 6E 75 00 01 NAME

01 BOOTSTRAP end

C6 51 01 PXLOGICAL

87 15 06 03 74 69 6D 6F 6E 2E 64 6B 00 01 PROXY-ID

87 07 06 03 54 69 6D 6F 6E 20 50 72 6F 78 79 00 01 NAME

C6 53 01 PORT

87 23 06 03 38 30 38 30 00 01 PORTNBR

01 PORT end

C6 52 01 PXPHYSICAL

87 2F 06 03 54 69 6D 6F 6E 5F 50 72 6F 78 79 00 01 PHYSICAL-PROXY-ID

87 20 06 03 74 69 6D 6F 6E 2E 70 72 6F 78 79 2E 64 6B 00 01 PXADDR

87 21 06 85 03 00 01 TO PXADDRTYPE

87 22 06 03 74 69 6D 6F 6E 5F 47 50 52 53 00 01 TO TO-NAPID

01 PXPHYSICAL END

01 PXLOGICAL END

C6 51 01 PXLOGICAL

87 15 06 03 67 6E 75 2E 64 6B 00 01 PROXY-ID

87 07 06 03 67 6E 75 20 50 72 6F 78 79 00 01 NAME

C6 53 01 PORT

```
      87 23 06 03 38 30 38 30 00 01 PORTNBR
01 PORT END
C6 52 01 PXPHYSICAL
      87 2F 06 03 67 6E 75 20 50 72 6F 78 79 00 01 PHYSICAL-PROXY-ID
      87 20 06 03 67 6E 75 2E 70 72 6F 78 79 2E 64 6B 00 01 PXADDR
      87 21 06 85 03 00 01 PXADDRTYPE
      87 22 06 03 67 6E 75 5F 47 50 52 53 00 01 TO-NAPID
      87 22 06 03 67 6E 75 5F 43 53 44 00 01 TO-NAPID
01 PXPHYSICAL END
C6 52 01 PXHPHYSICAL
      87 2F 06 03 42 69 73 6F 6E 20 50 72 6F 78 79 00 01 PHYSICAL-PROXY-ID
      87 20 06 03 62 69 73 6F 6E 2E 70 72 6F 78 79 2E 64 6B 00 01 PXADDR
      87 21 06 85 03 00 01 PXADDRTYPE
      87 22 06 03 67 6E 75 5F 47 50 52 53 00 01 TO-NAPID
      87 22 06 03 67 6E 75 5F 43 53 44 00 01 01 TO-NAPID
01 PXPHYSICAL END
01 PXLOGICAL END
C6 55 01 NAPDEF
      87 11 06 03 67 6E 75 5F 47 50 52 53 00 01 NAPID
      87 10 06 AB 03 00 01 BEARER
      87 07 06 03 67 6E 75 20 47 50 52 53 00 01 NAME
      87 08 06 03 69 6E 74 65 72 6E 65 74 00 01 NAP-ADDRESS
      87 09 06 89 03 00 01 NAP-ADDRTYPE
C6 5A 01 NAPAUTHINFO
      87 0C 06 9A 03 00 01 AUTHTYPE
      87 0D 06 03 5A 69 6D 62 61 00 01 AUTHNAME
      87 0E 06 03 53 63 61 72 00 01 AUTHSECRET
01 NAPAUTHINFO END
01 NAPDEF END
C6 55 01 NAPDEF
      87 11 06 03 67 6E 75 5F 43 53 44 00 01 NAPID
      87 10 06 AA 03 00 01 BEARER
      87 07 06 03 67 6E 75 20 43 53 44 00 01 NAME
      87 08 06 03 2B 35 35 35 35 35 35 35 35 35 00 01 NAP-ADDRESS
      87 09 06 87 03 00 01 NAP-ADDRESSTYPE
      87 0A 06 90 03 00 01 CALLTYPE
      87 25 06 03 39 36 30 30 00 01 LINKSPEED
C6 5A 01 NAPAUTHINFO
      87 0C 06 9A 03 00 01 AUTHTYPE
      87 0D 06 03 50 75 6D 62 61 00 01 AUTHNAME
```

```
      87 0E 06 03 53 61 7A 75 00 01 AUTHSECRET
01 NAPAUTHINFO END
01 NAPDEF END

C6 55 01 NAPDEF
      87 11 06 03 74 69 6D 6F 6E 5F 47 50 52 53 00 01 NAPID
      87 10 06 AB 03 00 01 BEARER
      87 07 06 03 74 69 6D 6F 6E 20 47 50 52 53 00 01 NAME
      87 08 06 03 69 6E 74 65 72 6E 65 74 00 01 NAP-ADDRESS
      87 09 06 89 03 00 01 NAP-ADDRTYPE
C6 5A 01 NAPAUTHINFO
      87 0C 06 9A 03 00 01 AUTHTYPE
      87 0D 06 03 52 61 66 69 6B 69 00 01 AUTHNAME
      87 0E 06 03 4B 69 61 72 61 00 01 AUTHSECRET
01 NAPAUTHINFO END
01 NAPDEF END

C6 00 01 55 01 APPLICATION
      87 36 00 00 06 03 77 32 00 01 APPID
      87 00 01 39 00 00 06 03 67 6E 75 2E 64 6B 00 01 TO-PROXY
      87 07 06 03 42 72 6F 77 73 65 72 00 01 NAME
C6 00 01 59 01 RESOURCE
      87 3A 00 00 06 03 68 74 74 70 3A 2F 2F 77 61 70 2E 67 6E 75 2E 64 6B 00 01 URI
      87 1C 01 STARTPAGE
01 RESOURCE END
01 APPLICATION END
C6 00 01 55 01 APPLICATION
      87 36 00 00 06 03 77 34 00 01 APPID
      87 00 01 39 00 00 06 03 74 69 6D 6F 6E 2E 64 6B 00 01 TO-PROXY
      87 00 01 34 00 00 06 03 68 74 74 70 3A 2F 2F 77 61 70 2E 74 69 6D 6F 6E 2E 64 6B 00 01
ADDR
01 APPLICATION END
01 wap-provisioningdoc end
```