Nokia 9110 Communicator:
WWW SMS Forms Extension

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1. INTRODUCTION

This document specifies the functionality of the SMS features in the Nokia 9110 Communicator WWW browser and the interface between the browser and services based on WWW-SMS forms.

WWW-SMS Forms enables the Nokia 9110 Communicator's WWW browser to send requests, and receive the results, as Short Messages. The technology enables database queries without continuous on-line access to the resources. The services are available in SMS centers (SMSCs) as internal functionality or optionally in any Web server as external functionality.

WWW-SMS Forms technology is implemented in the Nokia 9110 Communicator's WWW browser. Standard HTML forms are used as an interface for entering the queries. However, HTML forms are extended to provide means for defining the service provider, type of service and service location in the outgoing SMS containing the query (request SMS). The service information, form extensions and the entire technology are opaque to the user. The response message is provided as either a normal SMS, an e-mail or a fax. The response can then also include an address to the WWW page (URL) containing the result of the query.

2. VOCABULARY

2.1 Acronyms

Acronym	Definition
HTML	Hypertext Markup Language (the language used for web text)
HTTP	Hypertext Transfer Protocol (the protocol for transmitting web text)
URI	Uniform Resource Identifier
URL	Uniform Resource Locator (web address)

2.2 Terms

Term	Definition
Request Form	An HTML form which defines the fields to be sent as a WWW-SMS. Identified by the SMS_FORM_INFO tag specified in A.2.
Request SMS	An outgoing WWW-SMS containing a query to a service.
(Naming) Scheme	Protocol specification part in URL, e.g. http, ftp, gopher, etc. Must always be followed by '://'.
URI	A generic set of all names/addresses which are short strings referring to objects.
URL	A subset of URIs, pointing out that currently most URIs are addresses instead of names of objects.
WWW Protocol Library	The library managing the socket traffic of the Nokia 9110 Communicator WWW browser.
WWW-SMS	A special short message with content formatted as specified by this document.
WWW UI	The user interface module of the Nokia 9110 Communicator WWW browser.

3. ARCHITECTURE

External Model

Figure 3-1 illustrates the connections between the entities participating in the WWW-SMS process.

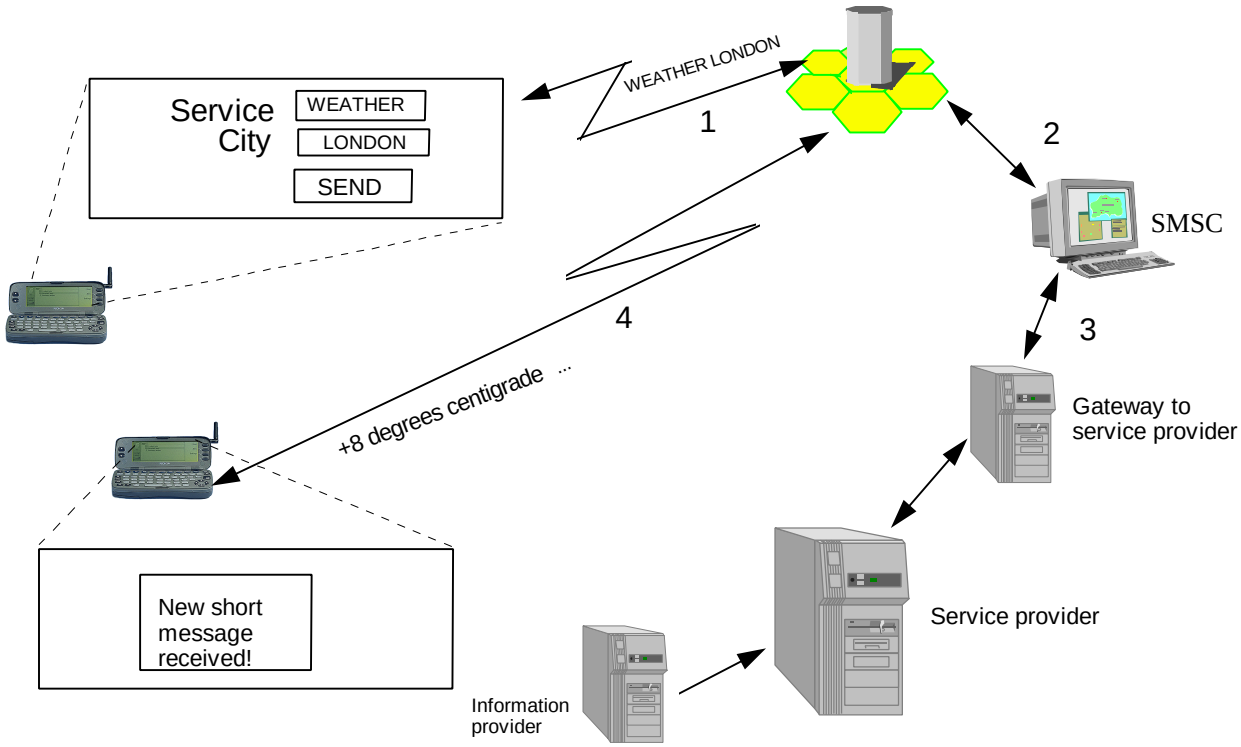

Figure 3-1 **WWW-SMS Example**

The process originates on any Web server providing WWW-SMS capable forms. These forms can be saved to a Nokia 9110 Communicator for later use. The user fills in the form and clicks the action-button.

WWW-SMS capable forms define the data needed to send the form contents as a SM to the service provider. This data includes the names of the service provider and the service, the type of form (request), etc. The receiver of the message is specified as a URL. The supported protocols can be limited.

When the message is received, the SMSC can process the request or forward the message to the address specified in the request form. The entity processing the request sends the response back as a normal SM. The message is processed by the Nokia 9110 Communicator as a regular SM.

The Service Provider system can be set up as a PC running TAPI (Telephone Application Programming Interface) software with an SMS capable GSM phone attached. This PC should have a connection to the Information Provider. More efficient service setups are available such as the Nokia Artus Text Web, which provides access for several users.

4. FUNCTIONALITY

Definition of Features

This part lists and defines the features of the WWW-SMS Forms independent of the architecture specified in chapter 3 above.

Support for locally stored HTML documents

Local HTML storage is implemented as a stand-alone feature of the WWW browser to be used by by the SMS feature as well as by the user in any situation. The user can save HTML documents from the browser's "Save" and "Copy HTML" menu items. The system saves the document to the "Downloaded files" subdirectory. A filename is created by the system and can be changed by the user (the extension of the file must be .htm). However, this is not recommended, since the user then has to define the new file to the hotlist. Since the title of the document is used as the hotlist item name, it is easier to edit by using the "Define"-->"Edit" menu items in the WWW application. The user can enter a new name for the new hotlist item, cancel the save, or overwrite the name (if a document with the same title already exists). The file name is never duplicated, as the system always chooses a non-existing file name.

When retrieving a locally stored document, the standard file-naming convention, without the drive letter definition, is used as the URL (e.g. file:///filename.htm). However, as all files saved locally are listed in the hotlist, the user should never need to type the URL for a local file.

4.1 Outgoing WWW-SMS

The outgoing WWW-SMS (request SMS) is sent from the WWW browser using the outbox interface. The format of the request SMS is as follows:

```
//WSMS##[CR|LF]¤
<Content type character>¤
[P<Service provider name>¤]
[N<Service name>¤]
[
F<File name>¤
[R<Form name>¤]
]
[L<Service location>¤]
[E<Encoding method>¤]
[V¤]
D[Document]
```

The field separator ¤ is GSM 3.40 character 36 and ISO-Latin 1 character 164.

The beginning string (//WSMS##) is used by the receiver to identify the SMS as a WWW SMS. The ## defines the manufacturer ID of the WSMS application if the receiver is a Nokia 9110 Communicator. This format provides for the creation of a Nokia 9110 Communicator application that can handle WWW SMSs. The geode token characters of such an application must be WSMS.

Note: The length of the manufacturer ID is not limited to two digits. New IDs currently have five digits.

Content type character defines the format of the document part. The character is I (Field-value pairs). Additional content types like H (HTML) or Z (Packed HTML) may be supported in the future. Currently, the format of the document part is always the following:

```
[<Field 1 Name>=]<Field 1 Value>¤
[<Field 2 Name>=]<Field 2 Value>¤
[<Field 3 Name>=]<Field 3 Value>¤
  ...
```

The *service provider* and *service* fields enable service categorization by the receiver. If the receiver does not provide multiple sessions, these fields can be ignored and omitted. However, if the corresponding fields are given in the request form, they must be forwarded by the WWW browser to the request SMS. The maximum length of the values of the *P*, *N* and *R* fields is 10 characters per field.

The *Service Location* is the address where the request will be sent. The field is a normal URL, so the message can be forwarded from the SMSC or the receiver of the message as e-mail, an HTTP request, or any other supported protocol. The content of the field is defined in the request form.

If the *Service Location* field does not exist in a message, it is interpreted by the receiver of the SM. Even if the field does exist, it is up to the receiver to provide the requested message forwarding service. If the requested service is not provided, the receiver should return an SM notifying the sender that the forwarding service is unsupported.

The maximum length of this string is theoretically 200, which is the maximum length of a URL in the Nokia 9110 Communicator's WWW browser. However, the service provider must control the length of the URL to allow all necessary data to fit in a single short message.

If the V-field exists in the header part of the message, the document part must also include the field names. Otherwise, the field values are given in the same order as defined in the form, without the field name definition. The field names and values are encoded if the *E*-field defines an encoding method. The header part of the message is always clear text. Initially, only base64 encoding will be supported. This mechanism is available in the basic WWW Protocol Library. If base64 encoding is used, the *E*-field has the value 'b6'.

4.2 SMS Forms

SMS Forms are defined by a special tag, SMS_FORM_INFO. This tag must immediately follow the FORM tag. SMS_FORM_INFO tag has the following fields:

Field name	Contents and definition
*FORM_TYPE	Defines this form as a request containing fields to be filled-in by the user and sent as the query.
PROVIDER	Name of the service provider. Can be used by the SMSC or external service center to identify the service category. Not interpreted by the browser and not received in the response SM.
SERVICE	Name of the service. Can be used by the SMSC or external service center to identify the service. Not interpreted by the browser and not received in the response SM.
*TARGET_NUMBER	The phone number used when sending the request SM. The SMS center number defined in the Nokia 9110 Communicator is used for sending any SM.
SERVICE_CENTER	The number of the SMSC. If a number is not given, the default number, defined in the Nokia 9110 Communicator, is used.
FIELD_NAMES	Defines the format of the document part of the outgoing message. If "Y", the document should include the names of the form fields with the values. If "N" or omitted, only the form values are sent in the same order as they appear in the HTML form.
PROTOCOL_ID	Protocol Identifier given to the service center. This feature not currently supported.

* = Obligatory field

In addition to the SMS_FORM_INFO tag, the FORM tag is extended to provide means for sending the location of the service in the request SM. If the *METHOD* field of the FORM tag is "SMS", the *ACTION* field defines the address of the service, sent in the *SL* field of the request SM (optional functionality).

The format definition of the SMS Forms is as follows:

```
<FORM
    [ACTION=“service_address”]
    METHOD={“POST”|”GET”|”SMS”}
    [ENCTYPE=“encryption mechanism”]
>
<SMS_FORM_INFO
    FORM_TYPE={“REQ”}
    [PROVIDER=“service_provider_name”]
    [SERVICE=“service_name” ]
    [FORM_NAME=“form_name”]
    TARGET_NUMBER=“target_number”
    [SERVICE_CENTER=“sms_center_number”]
    [FIELD_NAMES={“Y”|”N”}]
    [PROTOCOL_ID=“protocol_identifier”]
>
<STANDARD FORM TAGS>
...
</FORM>
```

5. MESSAGE FORMATS AND EXTENSIONS

This section defines the formats of the WWW SMS messages and the relative extensions to the HTML language.

5.1 Request SMS

```
//WSMS##¤
<Content type character>¤
[P<Service provider name>¤]
[N<Service name>¤]
[
F<File name>¤
[R<Form name>¤]
]
[L<Service location>¤]
[E<Encoding method>¤]
[V¤]
D<Document>
```

5.2 SMS Forms

```
<FORM
    [ACTION=“service_address”]
    METHOD={“POST”|”GET”|”SMS”}
    [ENCTYPE=“encryption mechanism”]
>
<SMS_FORM_INFO
    FORM_TYPE={“REQ”}
    [PROVIDER=“service_provider_name”]
    [SERVICE=“service_name” ]
    [FORM_NAME=“form_name”]
    TARGET_NUMBER=“target_number”
    [SERVICE_CENTER=“sms_center_number”]
    [PROTOCOL_ID=“protocol_identifier”]
>
<STANDARD FORM TAGS>
...
```

6. REFERENCES

|1| Hypertext Transfer Protocol Version 2/2+
Author: HTTP Working Group, IETF

|2| Hypertext Markup Language Version 2.0
Author: HTML Working Group, IETF