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***Web Notification Service
Installation Guide***

Editor(s)

<p>Dennis Dahlmann</p> <p>Institute for Geoinformatics/ University of Muenster</p> <p>Robert-Koch-Straße 26-28</p> <p>48147 Muenster, Germany</p> <p>Phone: +49(0)251 83 31965</p> <p>Fax: +49(0)251 83 39763</p> <p>Email: Dahlmann@52north.org</p>
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Revision History

<i>Version</i>	<i>Date</i>	<i>Author(s)</i>	<i>Brief Description</i>
1.0	2006-02-28	Dennis Dahlmann	initial version
1.1	2006-04-07	Dennis Dahlmann	Changes done to make it easier to understand what the WNS does
1.1.1	2006-04-13	Dennis Dahlmann	3.3.1.1 c) edited that you have to change the username to your own username if you want to use the xmpp protocol
1.2	2006-12-14	Dennis Dahlmann	Installation procedure updated
2.0	2006-01-17	Dennis Dahlmann	Updated due to changes in OGC best practice paper 06-095

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For more information, contact:

52°North

Martin-Luther-King-Weg 24

48155 Münster

Germany

www.52north.org

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1**Introduction****1.1 Scope**

This document describes the WNS installation process.

This document applies to the following release version:

52N-WNS-v2-00-00

1.2 What happens during the installation procedure

The package you will download from the website contains an implementation of the Web Notification Service (WNS) as a Java Servlet. Executing the installation steps [build] will deploy this service in your Apache Jakarta Tomcat web container as a web application (webapp). To use the feature of storing the full XML messages you must install a database, here it is the Open Source XML database eXist. You will find the installation procedure as part of this document.

1.3 Notes concerning the WNS

The Web Notification Service acts as a protocol transducer. Incoming XML encoded messages will be forwarded to registered receivers using the following protocols: SMTP(email), SMS, FAX, PHONE, HTTP POST and XMPP.

1.4 The different user types

There are two different user types. The SingleUser and the MultiUser. The SingleUser is a user with a name and one or more protocol. If a protocol is not needed for registration (maybe you just want to register to get a message via email) just delete the other entries, don't leave it blank! The MultiUser is a group of SingleUsers and MultiUsers

1.5 The Web Notification Service DoNotification operation

The WNS is able to send message via different protocols. This operation needs the user ID of the user that should receive the message. The protocols for sending messages via SMS and phone are not appropriate to handle a XML structured message, so a short description of the message will only be send. But, of course, the calling service didn't know to which protocols the user is registered; therefore the short message must be entered in every DoNotification operation. There are three predefined types of message types.

The Notification message should be used for one-way-communication and is build from two elements, the payload with the message and the ServiceDescription. The ServiceDescription contains more detailed information about the calling service, even the URL.

The Communication message should be used for two-way-communication. This type is more complex than the Notification message and consist of four elements, the already know ServiceDescription, the as well known payload, the CorrID and the CallbackURL. The CorrID allows the calling service to map the response to an internally request. The CallbackURL says where to response.

The third type is the Reply message as the response of a Communication message. It consists of the CorrID and the payload.

1.6 The different protocol handler and their interaction

The Web Notification Service support different protocols. If you want to use a protocol you have to setup the specific handler. This means that you have to know some values, e.g. the SMTP name of your email server. If a SingleUser is registered to get messages by email, he can register another email address to the existent address. If the SingleUser wants to change the address, the address must be removed and a new address must be registered. If only one address per protocol is registered to the SingleUser and the SingleUser wants to remove it, the user can insert any valid value (no blank spaces and no characters if only numbers are allowed in the case of SMS, FAX, PHONE) to delete the entry, he doesn't have to insert the exact address to delete it.

This WNS comes with some predefined handlers. We tried to make the complete configuration as general as possible, so that other services can easily be used.

The service we have chosen to deliver SMS, FAX and PHONE message is www.Ecall.ch. As you can see on their webpage the complete service can be accessed by email. Therefore it is necessary to have a SMTP email server specified, because the WNS uses the Ecall.ch service via email. If a user is registered to SMS or FAX or PHONE an email will be send to Ecall. The specific format of the email can be found on their webpage. In section 3.3.1.1 c) you will find more information about the Ecall.ch account settings.

2 Requirements

- a) Windows 98 or higher [tested with Windows XP Professional SP2]
- b) Java Runtime Environment 1.6 [tested with JDK 1.6.0]
- c) Apache Tomcat Server 5.5 [tested with 5.5.20]
- d) eXist XML Database [tested with eXist-1.1.1-newcore]
- e) Apache Ant [tested with Apache Ant 1.6.5]
- f) For Testing: Internet Browser [tested with Microsoft Internet Explorer 7.0]

3 Installation Procedure

3.1 Get the Apache Tomcat Server

- a) Download Apache Tomcat Server 5.5 from
<http://tomcat.apache.org/download-55.cgi>
- b) Follow the installation instructions. Edit the password of the admin user!
- c) This is optional, but it provides you a listing of the files that are in the 52WNS

webapps folder.

Edit the file web.xml in the subfolder “conf” of your Tomcat installation directory, e.g. C:\Programme\Apache Software Foundation\Tomcat 5.5\conf. Now search for the <servlet> element with the <servlet-name> “default” Check the element <init-param> with the <param-name> “listings” and set the element <param-value> to true. After that you can see the listed files when you go to <http://localhost:8080/52nWNS>, after you have deployed the WNS to the Tomcat. If the value isn’t set to true you cannot see the files listed, which makes it harder for you to access these files.

```
<servlet>
  <servlet-name>default</servlet-name>
  <servlet-class>org.apache.catalina.servlets.DefaultServlet</servlet-class>
  <init-param>
    <param-name>debug</param-name>
    <param-value>0</param-value>
  </init-param>
  <init-param>
    <param-name>listings</param-name>
    <param-value>false</param-value>
  </init-param>
  <load-on-startup>1</load-on-startup>
</servlet>
```

Figure 1: Content of the web.xml in the Tomcat installation subfolder conf

d) Save the file and restart the Tomcat Server.

3.2 Get the eXist XML Database

a) Download the eXist Database WAR () file from

<http://prdownloads.sourceforge.net/exist/exist-1.1.1-newcore.war>

b) Rename the file to exist.war, this makes it easier to access the database. If you don’t change the filename you have to point to the right name for the eXist database, instead of using “exist” you have to use “exist-1.1.1-newcore”, if you use this version.

c) Go to <http://localhost:8080> and click at “Tomcat Manager” in the upper left corner under “Administration”. Type in the username and the password that you have chosen in 3.1.

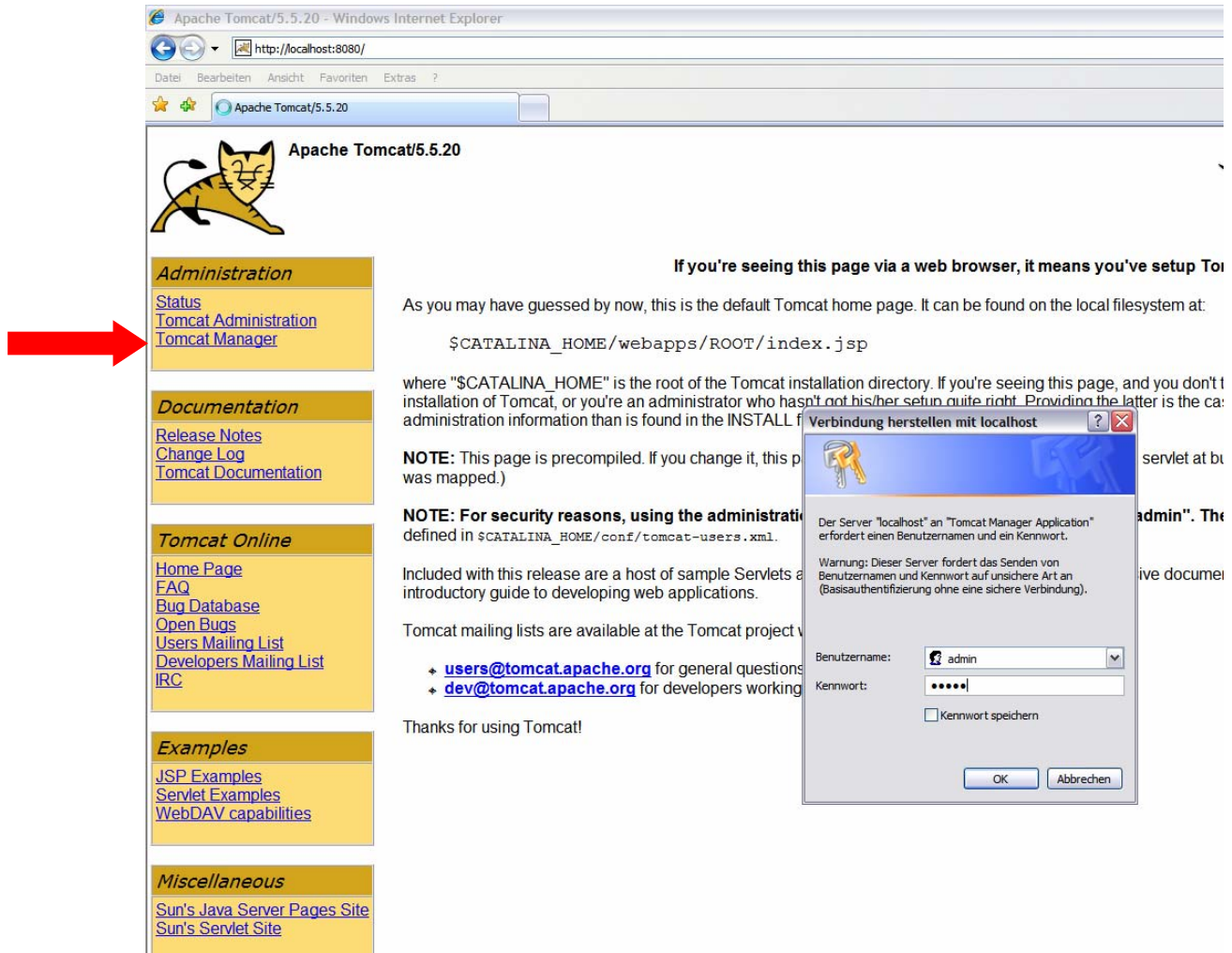


Figure 2: Tomcat Manager webpage

d) Scroll down till the section “Install”. Search for the downloaded eXist WAR file and select it. Click the “Install” button. After installing finished, the eXist database should be listed as an application in the list above.

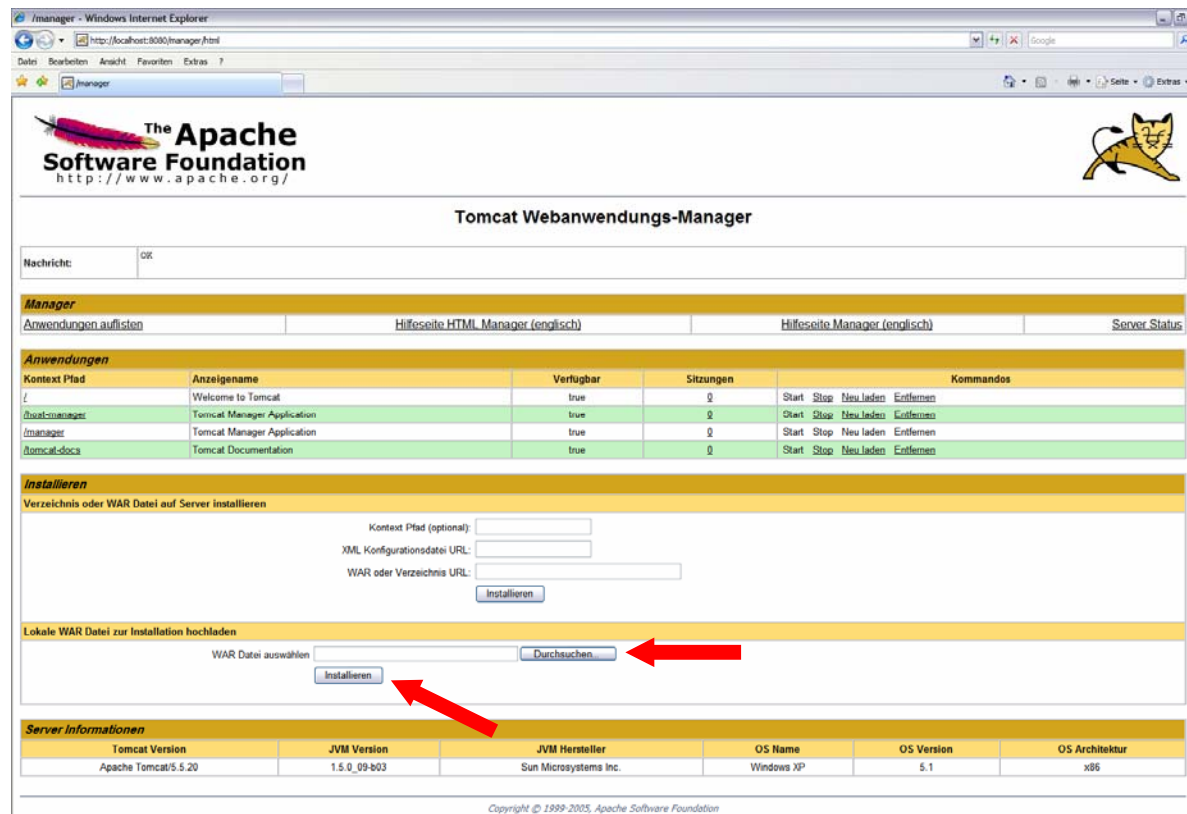


Figure 3: Install a local war file

e) To change the default password of the admin user open a web browser. Go to <http://localhost:8080/exist/> or if you haven't changed the filename <http://localhost:8080/exist-1.1.1-newcore>. On the lower left side of page you will find an orange button with the text "Launch", click it. This will start the GUI of the database.

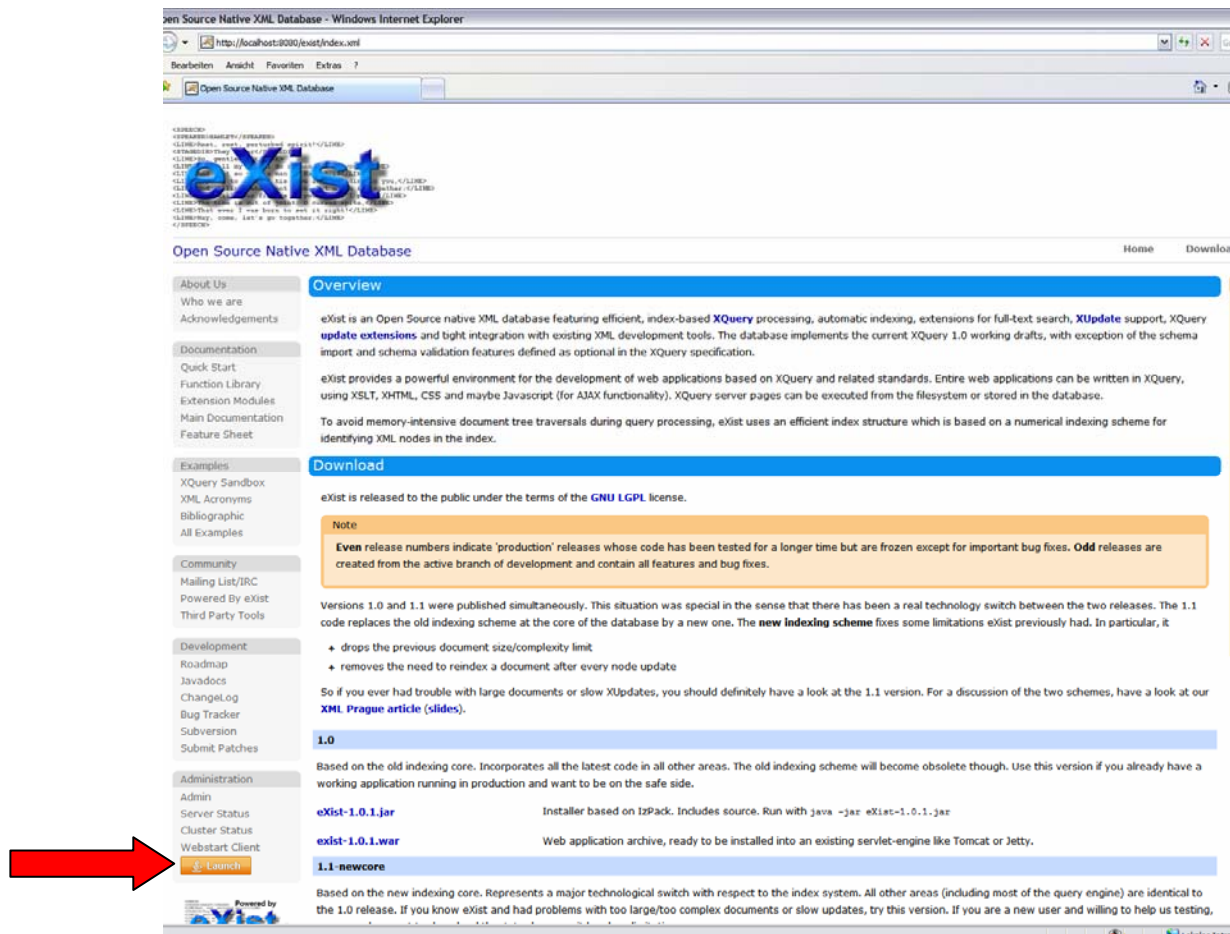


Figure 4: Launch button of the eXist database GUI

f) Login using the username “admin” and leave the password blank, this are the default values. Take care that the part in the URL value points to the right eXist path. Click “OK”.

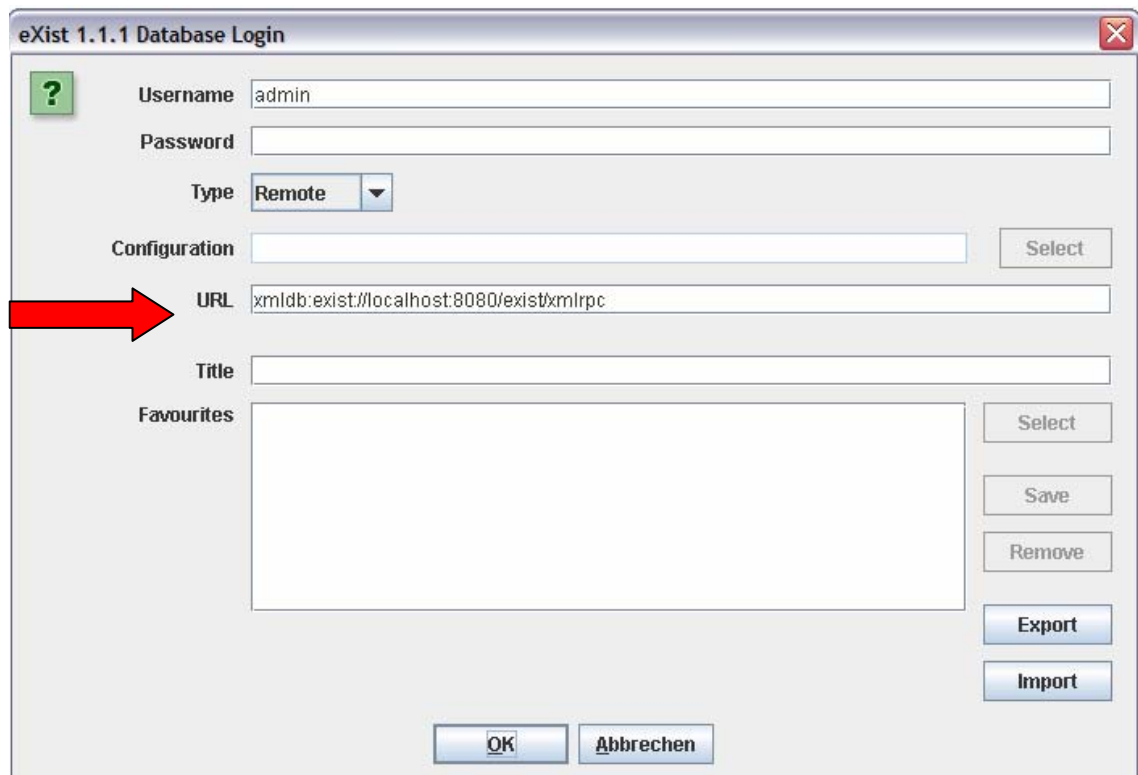


Figure 5: Create a connection to the eXist database

g) Now click on “Tools” and select “Edit Users”. Then select the “admin” user and enter the new password. Then click the “Modify User” button to save the password. Maybe there is an error message, but if you try again to login with the blank password it doesn’t work, you have to use the new password.

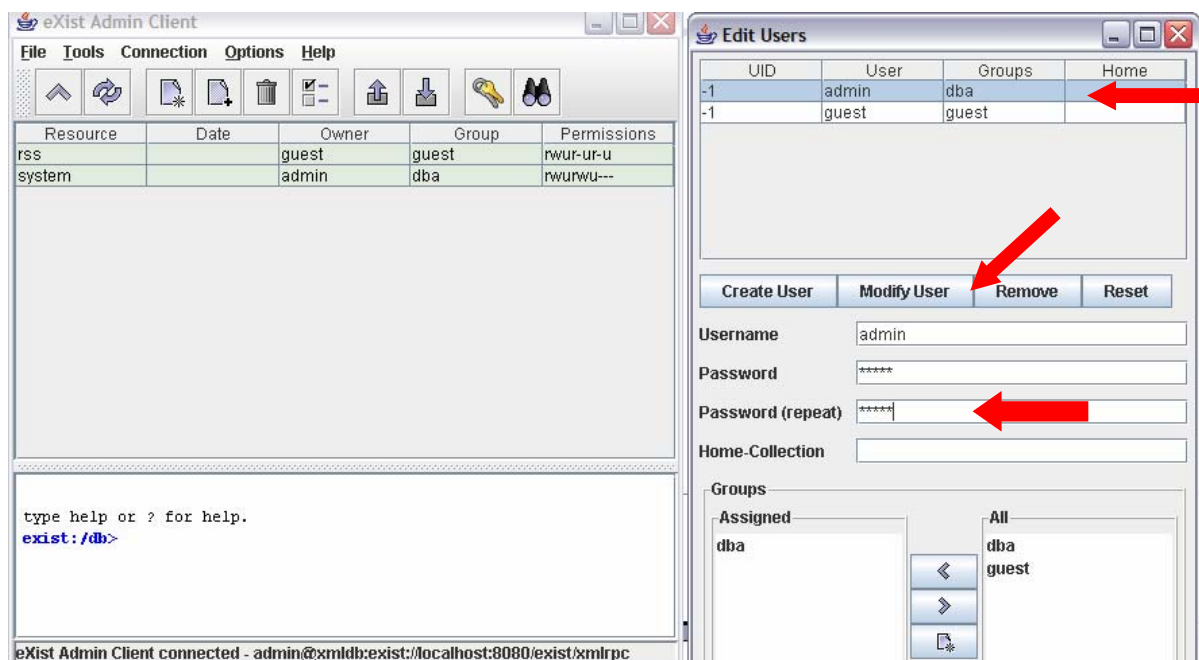


Figure 6: Edit the user

h) Quit!

3.3 Get Apache Ant

- a) Download Apache Ant from

<http://ant.apache.org/bindownload.cgi>

Follow the installation instructions given there.

3.4 Get the sources

- a) Get the WNS at http://sourceforge.net/project/showfiles.php?group_id=122215 or at <http://mars.uni-muenster.de:8080/52nWNS/52N-WNS-v2-00-00.zip> or download the distribution from the CVS at Sourceforge.net

Host	core-52n.cvs.sourceforge.net
Repository	/cvsroot/core-52n
Module	WNS
Tag	WNS-v2-00-00
User	Anonymous
Password	No password, leave it blank

Table 1: CVS repository

Extract the zip archive in your favorite folder, here it is C:\WNS

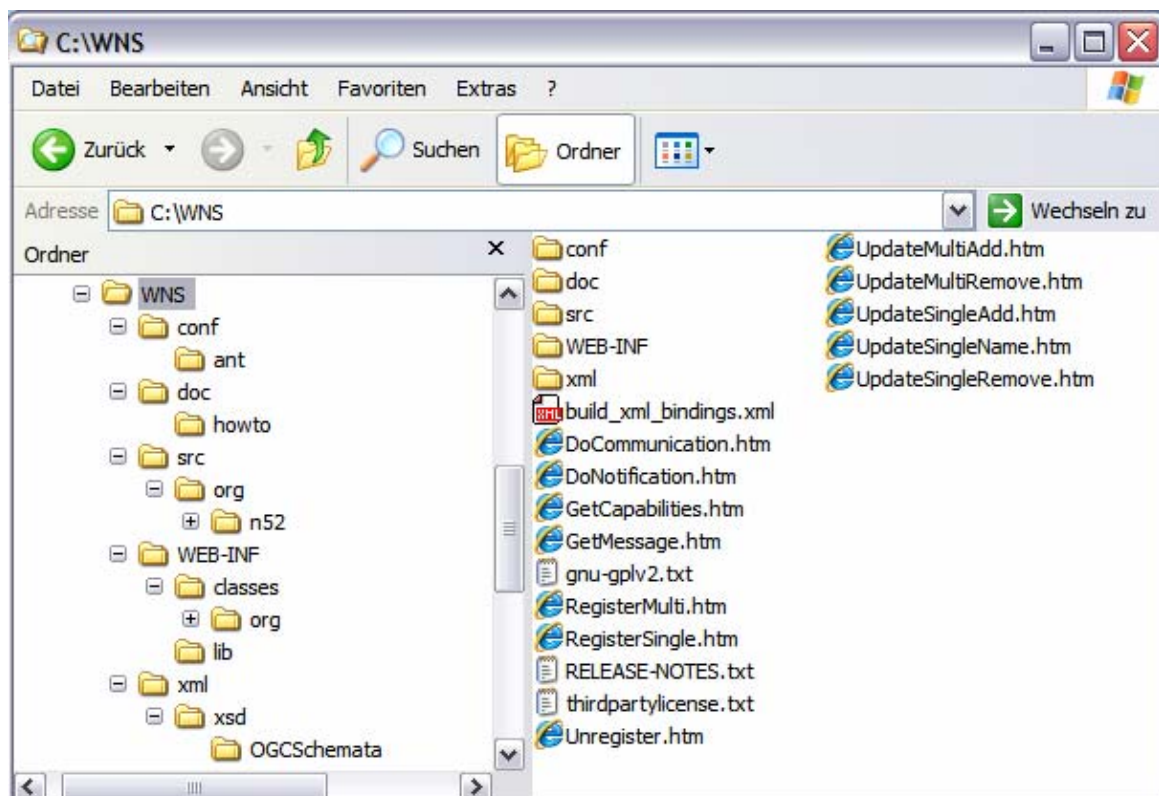


Figure 7: Directory structure of the distribution

You will find these different directories

src	The Java source files
conf/ant	This contains the Ant build script, and the configuration files
doc/howto	The installation guide
WebContent	The webapp directory that contains the config files and libraries
xml/xsd	The XML schemata that are used

Table 2: Directory structure of the distribution

These directories are contained in the distribution, doesn't matter if it is the zip file or from the CVS.

3.4.1 Configure the WNS configuration files

3.4.1.1 Configure the config.xml

- a) The config.xml file contains all the necessary information the WNS needs. This means that you setup all the needed services, e.g. the email server. If there is a handler that you will not use, just delete it or comment it out! Edit the config.xml file located in your conf/ant folder with your XML editor, a normal text editor will work also. Search for the element <RegisteredHandlers>
- b) These elements configure the different handler.
 - EMailHandler

The email handler is the major part of the WNS, because mainly the complete communication is done via email. If a SMS, FAX or PHONE protocol is used an email will be send to Ecall.ch.

Property	Description	Need to configure to Your own values?
Host	The host address of the SMTP server, e.g. smtp.gmx.de	YES
User	The username for the email account	YES
Passwd	The password for the user	YES
Sender	The complete email address, e.g. user@52north.org	YES
Authenticate	Does the server needs an authentication before sending a email, also known as "pop before send" or "pop auth". Valid values are true or false.	YES
Port	The port the SMTP server uses, default 25. If you use SSL the default port is 465.	YES
EmailSubject	A string that represents the subject of each email.	Not necessarily
SSL	Should the server connect via SSL? Valid values are true or false	YES
TLS	Should the server try to connect via TLS if it	YES

	is a non SSL connection? Valid values are true or false.	
--	--	--

Table 3: EmailHandler properties

- XMPPHandler

If you don't want to use the XMPPHandler function comment it out or delete the element in the config.xml!

Property	Description	Need to configure to your own values?
Provider	The name of the xmpp class to use for XMPP message sending	NO
User	The username that you have registered at the provider stated in Host	YES
Passwd	The password for the user	YES
Host	The hostname of the XMPP server, where the user is registered, e.g. jabber.org.	YES
Port	The port of the XMPP server, default 5222	Not necessarily

Table 4: XMPPHandler properties

- SMSHandler

Be sure that the EMailHandler is setup properly. To use the Ecall.ch service you have to configure the ecall.ch account settings. Login to your Ecall.ch account or even register a new one. Click on the link "Email access" in the section "Account settings". Insert the email address of the element <sender> from the <EMailHandler> element in the field "Allowed sender addresses" under the "Format 4: Numbers in 'TO:' field" section. Check at the top of the page that you accept messages that can be sent by email. Be sure that you have at least a private ecall account; this SMSHandler will not work with a free ecall account.

If you don't want to use the SMSHandler function comment it out or delete the entry in the config.xml!

Property	Description	Need to configure to your own values?
Provider	The full name of the class, e.g. org.n52.wns.sms.SMSHandlerEcall	NO
User	The username (optional, maybe needed for other service provider)	NO
Passwd	The password for the user (optional, maybe needed for other service provider)	NO
Host	The address where the WNS has to	NO

	send the email to, default msg.ecall.ch.	
--	--	--

Table 5: SMSHandler properties

The WNS will concat the phone number to this host address, so an email would be send to +491791234567@message.ecall.ch

- PhoneHandler

Be sure that the EMailHandler is setup properly. To use the Ecall.ch service you have to configure the ecall.ch account settings. Login to your Ecall.ch account or even register a new one. Click on the link “Email access” in the section “Account settings”. Insert the email address of the element <sender> from the <MailHandler> element in the field “Allowed sender addresses” under the “Format 7” section. Check at the top of the page that you accept messages that can be sent by email. Be sure that you have at least a private ecall account; this SMSHandler will not work with a free ecall account.

If you don’t want to use the PhoneHandler function comment it out or delete the entry in the config.xml!

Property	Description	Need to configure to your own values?
Provider	The full name of the class, e.g. org.n52.wns.communication.PhoneHandlerEcall	NO
User	The username (optional, maybe needed for other service provider)	NO
Passwd	The password for the user (optional, maybe needed for other service provider)	NO
Host	The address where the WNS has to send the email, default voice.ecall.ch.	NO

Table 6: PhoneHandler properties

The WNS will concat the phone number to this host address, so an email would be send to +492518330089@voice.ecall.ch

- FaxHandler

Be sure that the EMailHandler is setup properly. To use the Ecall.ch service you have to configure the ecall.ch account settings. Login to your Ecall.ch account or even register a new one. Click on the link “Email access” in the section “Account settings”. Insert the email address of the element <sender> from the <MailHandler> element in the field “Allowed sender addresses” under the “Format 6” section. Check at the top of the page that you accept messages that can be sent by email. Be sure that you have at least a private ecall account; this SMSHandler will not work with a free ecall account.

If you don't want to use the FAXHandler function comment it out or delete the entry in the config.xml!

Property	Description	Need to configure to your own values?
Provider	The full name of the class, e.g. org.n52.wns.communication.FaxHandlerEcall	NO
User	The username (optional, maybe needed for other service provider)	NO
Passwd	The password for the user (optional, maybe needed for other service provider)	NO
Host	The address where the WNS has to send the email, default fax.ecall.ch.	NO

Table 7: FAXHandler properties

The WNS will concat the phone number to this host address, so an email would be send to +492518339763@fax.ecall.ch

c) Save changes

d) In the next step you will edit the build.properties file that you will also find in the conf/ant folder. There are properties that have to be adjusted to your local settings and these values are marked MANDATORY. The other values are optional.

TOMCAT_HOME	The path of your local Tomcat installation (MANDATORY)
JAVA_HOME	The path of your Java installation (MANDATORY)
deploy.target.url	The URL where the WNS will be deployed, if the target URL has an worldwide individual name, than use this instead of localhost (MANDATORY)
Target.username	The username of the Tomcat, default admin (MANDATORY)
Target.password	The password of the user, see 3.1.c (MANDATORY)
Db.name	The name of the collection where the messages and the user document will be stored
Db.username	The username, see 3.2.g

	(MANDATORY)
Db.password	The password of the user, see 3.2.g (MANDATORY)
Db.url	The URL where the eXist database is available at (MANDATORY)
Db.duration	This is the duration in minutes when the database checks the stored messages for expired ones
Ttl	This is the duration that sets how long the messages will be longest stored
Log.level	This sets the log level, valid values are debug, info, warn, error, fatal
Exceptionlevel	Defines the level of the exceptions
Webapp.name	This is the name of the web application

Table 7: Some properties of the file build.properties

3.4.1.2 Configure the capabilities base information

- Edit the `config.xml` file located in your `conf/ant` folder with your XML editor, a normal text editor will work also. Search for the element `<CapabilitiesbaseInformation>`, can be found in `<ServiceProperties>`. These values will be found in the `GetCapabilities` request. This editing is not essential for the WNS to work, but it should be edited.
- Edit the elements `<ows:ServiceIdentification>` and `<ows:ServiceProvider>` to your individual needs.
- Save the changes

3.5 Bulding and deploy the WNS

In the next step you will use the Apache Ant tool to compile the Java sources, copy different files and deploy the application into your Tomcat.

- Make sure that your Tomcat is running
- Let's assume that you have extracted the `52n-WNS-v2-00-00.zip` into the folder `C:\52nWNS`.
- The Ant script file can be found in the `conf/ant` folder of the distribution and is named `build.xml`.
- If you want to build the WNS from inside an IDE, like Eclipse where Ant is already installed, you just have to run the `build.xml` file in the folder `conf/ant` as an "Ant Build"

- Or use this way:

Open a command prompt and switch to the WNS directory. You can do this by typing `cd C:\52nWNS\conf\ant` into your command prompt. To open a command prompt you insert `cmd` in the window after clicking the Windows “Start” button and then “`exec`”.

- Now enter “`ant`” into the command line and execute it
- The Ant script will give you detailed information of the status of the building, at the end there should be a “BUILD SUCCESSFUL”

3.6 Tests

Make sure that your tomcat is running. Under <http://localhost:8080/52nWNS> you will find many different test clients. With these test clients you can check the abilities of the WNS. Before you can start testing, make sure that you have configured the WNS properly. The test clients provide all the features that the WNS will provide. Also test data is inserted to make the testing easier for you.

The following tests can be done:

- GetCapabilities
- Register a SingleUser
- Register a MultiUser
- Unregister a user
- Update the name of a SingleUser
- Add one or more protocols to a SingleUser
- Remove one or more protocols from a SingleUser
- Add one or more user to a MultiUser
- Remove one or more user from a MultiUser
- Send a DoNotification message
- Get the full message from the database with a GetMessage request, if previously a message by SMS or FAX or PHONE was send.

If you want to send a message, either notification or communication you have first to register a SingleUser. If you want to register a MultiUser, that is a group of SingleUsers, a SingleUser, better more than one, must exist. Here is an example, the GetCapabilities test client.

WNSTestClient....

Server:	<input type="text" value="http://localhost:8080/52nWNS/wns"/>
Request:	<pre><?xml version="1.0" encoding="UTF-8"?> <wns:GetCapabilities xmlns:wns="http://www.opengis.net/wns" xmlns:gml="http://www.opengis.net/gml" xmlns:ows="http://www.opengis.net/ows" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.opengis.net/wns ../wnsGetCapabilities.xs d" service="WNS" /></pre> <div><input type="button" value="Clear"/> <input type="button" value="Send"/></div>

Figure 8: The WNS Test Client, here for the GetCapabilities request

3.6.1 GetCapabilities

- Open your Internet Browser. You can find the WNS GetCapabilities Test Client under <http://localhost:8080/52nWNS/GetCapabilities.htm>.
- Click the Send Button. The CapabilitiesResponse xml-document is now shown in your browser.

3.6.2 ListWNSUser

- Open your browser and follow the link:
<http://localhost:8080/52nWNS/wns?request=ListWNSUser>

3.6.3 GetMessage

- a) Open your browser and follow the link:
<http://localhost:8080/52nWNS/wns?request=GetMessage&MessageID=1234>

4

Troubleshooting

If you have any problems concerning that some files could not be found please check if you have used slashes instead of backslashes. For any more questions concerning the installation process visit the Twiki at <http://incubator.52north.org/twiki/bin/view/Sensornet/WebNotificationService> or contact Dennis Dahlmann, email: Dahlmann@52north.org

5

Appendix

5.1 Service exception codes

Service Exception	Description
NoApplicableCode	An other error occurred, see the details of the exception message
NoApplicable	An error occurred during the request
UnknownUserID	The user for this UserID is not founded
InvalidRequest	The request is not a valid one
UnknownUserID	The given UserID is not known
MessageIDExpired	The given MessageID is expired, that means that no message for this MessageID is available
InvalidParameterValue	See the OGC exception codes
MissingParameterValue	See the OGC exception codes
OperationNotSupported	See the OGC exception codes

Table 8: Service exception code listing