IceWarp Unified Communications

SyncML Push Guide

Version 11.3

Contents

SyncML Push

What is SyncML Push?

SyncML Push technology, based on drafts created by the Open Mobile Alliance, extends the existing SyncML protocol specification by offering a method of server-initiated synchronization, i.e. the server alerts the device that new data is available so that the device can immediately synchronize.

An alert, known as a SAN (Server Alerted Notification), is sent to the device containing information about which server and database has changed, and which type of synchronization should be initiated by the client.

The SAN can travel by various communication channels, dependent on the capabilities of both the server and the client device.

What Is Push Email?

Push email is a completely distinct technology (where it designates the opposite of polling the server for new messages) based on other protocol stacks, such as IMAP.

It is used to deliver email (and only email) in real time to the client device, which must have a constant connection to the server.

Push email is supported in IceWarp Server since version 8.5, using the IDLE command of the IMAP protocol.

The client device should have an email client that supports IMAP and the IDLE command. This is available by default on most Windows Mobile and Symbian devices, and on a number of recent feature phones and consumer mobile phones. Many devices can also download compatible email clients.

The client should have the email account set up as an IMAP account and a polling interval should be set so that the connection to the server remains open, and is automatically re-opened if it is lost for some reason.

Push email can be freely combined with SyncML Push, but remember:

- they have nothing in common and have to be configured separately.

- Inbox synchronization should be set to use Push email *or* SyncML Push.

How does SyncML Push Work?

There are multiple technologies and methods used to push the notification (SAN) to the client device, each with pros and cons.

SMS Push

Sometimes referred to as WAP-PUSH, SMS Push is fairly universal, using SMS to deliver the notification to the device, making it available on all networks and most client devices.

There is an added cost to send the SMS(s) required to trigger the synchronization(s), plus any cost for data transferred over HSCSD, GPRS, EDGE, 3G or Wifi to complete the synchronization but there are facilities available which can help eliminate any overhead and minimize the amount of SMS messages to be sent.

SMS notification is also more resistant to network connectivity loss as most service providers will hold an SMS for re-delivery if it can't be delivered immediately.

Server TCP/IP Push

Server TCP/IP Push is designed for 3G networks where devices are available on a static, public, IP address which is directly reachable from the server. This method is therefore only suitable for carrier networks without NAT, and with simple routing.

Client TCP/IP Push

Client TCP/IP Push attempts to work around the network restrictions of Server TCP/IP Push by having the client establish the connection to the server.

The Client keeps the session alive and the Server sends notifications through the open connection when a change occurs.

This relies on the ability to run an compatible SyncML application on the client device that listens on a defined TCP port for incoming connections, limiting its use to devices equipped with an operating system.

Scheduled Polling

Scheduled Polling is a variation of the Client TCP/IP Push method, but clients only stay connected for a specified period of time.

This methods gives the server better scalability since only a percentage of clients will be connected at any one time, allowing the server to effectively support a higher number of client devices.

IceWarp Server Capabilities

IceWarp Server 9.2 and higher SyncML Push technology primer implements:

- SMS Push

- Client TCP/IP Push (ready for the future)

IceWarp Server's SMS Service is used to deliver the server alert through the wireless network, utilizing either:

- a remote third-party offering (if available via HTTP).

- another instance of IceWarp Server (via HTTP)

- an instance of IceWarp Server with any AT command compatible GSM modem.

A single instance of IceWarp Server can have multiple SMS Services defined, and you can mix and match HTTP and GSM modems on the instance. These multiple gateways will be used to effectively load-balance the delivery of SMSs.

Multiple instances of IceWarp Server can all point to the same instance of IceWarp Server as their gateway for SMSs, allowing multi-national corporations with multiple server to utilize a single sending point for all SMSs and possibly benefit from a low-cost bulk SMS plan.

Future plans for IceWarp Server include the ability to intelligently route an SMS to an appropriate Gateway for the destination. This would allow you take advantage of some country's free SMS sending plan.

Client Device Support

Client devices need to support SMS over GSM to receive the notification, and have to be able to establish a connection to the Internet using HSCSD, GPRS, EDGE, 3G (UMTS, CDMA) or Wifi.

IceWarp Server 9.2 technology primer initially only offered the full scope of features with Windows Mobile devices equipped with the latest Funambol client. Version 9.3 adds support for Nokia phones (certified for handhelds running Symbian), Sony-Ericsson and Synthesis.

Continuing development is to be expected in future versions, including TCP/IP Push, a dedicated SyncML client, semi-automatic sign-up, over-the-air provisioning and remote device wipe.

Feature Overview

IceWarp SyncML SMS Push

- ensures up-to-the-minute information on the client device at all times

- delivers the latest changes to the device in real-time (with at most a 30 second delay) as opposed to scheduled synchronizations

- fully automates the synchronization process - no user intervention

- supports all types of data types available on the device including, but not limited to, Contacts, Calendar, Tasks, Notes, Inbox and Briefcase

- enables multiple devices to reflect the same data from a single account via automatically propagated synchronization

- intelligently handles events received from the server API in order to minimize the number of notifications sent to a device when multiple resources are to be synchronized

- is resource-aware thanks to multi-threaded processing and multiple message queues

- gives the server administrator complete control over accounts, devices and data types to be alerted

- comes complete with an SMS service for small office, with the option of multiple GSM modems for corporate and support for carrier-class SMS gateways accessible through HTTP request for enterprise applications

New features in 9.3

- support for Symbian-based Nokia and SE handsets

- support for Synthesis client for Windows Mobile

- remote provisioning via Configuration SMS (using OMA/OTA standards)

- SSL encrypted connection support

- customizable synchronization URL with auto-correction

- performance optimizations

Architecture Overview
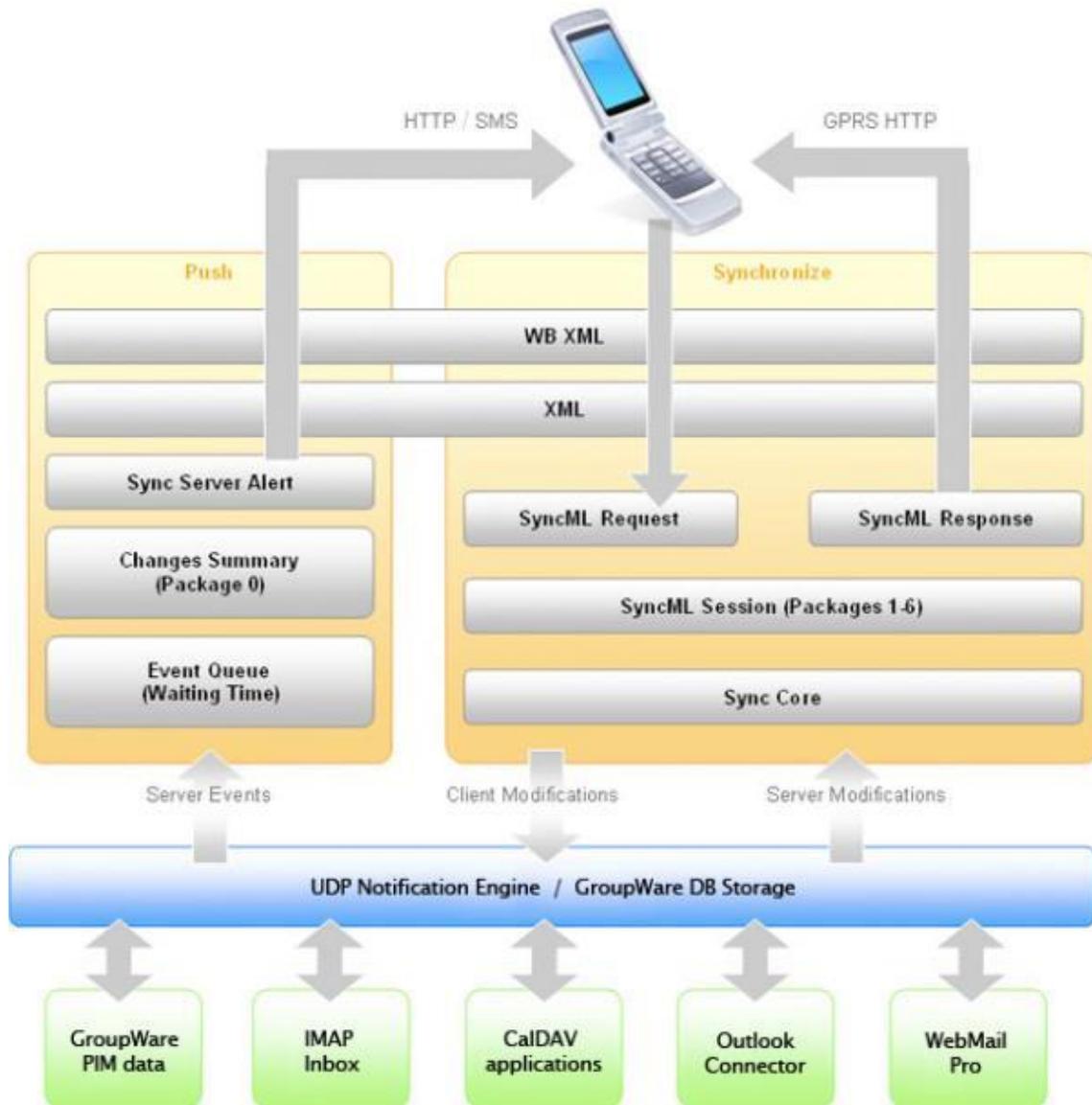
The UDP Notification Engine notifies the SyncML Push engine of any data changes on the Server. These changes may be made by a user interface (IceWarp WebClient, Outlook, CalDAV client) or upon receipt of a message to the user's mailbox.

The SyncML Push engine issues a sync alert to the relevant device by sending a specially formatted SMS.

The device, upon receipt of the alert, automatically initiates a two-way synchronization with the server.

All this is done with no user intervention.

Prerequisites

Server

1. Valid SyncML Server license – full or trial

2. Working SMS Service:

   A subscription to an SMS service over HTTP from a carrier or a 3rd party (or your own remote SMS service). You will also need to know the exact URL format to pass the server variables to it: %number%, %data%, %udh%, %binary%, %pid%, %dcs%, for detailed explanation refer to SMS Service Guide. Make sure that the remote service is capable of passing all of these variables, especially %udh% (Universal Data Header).

   or

   any AT command compatible GSM modem connected to the server via a physical or driver-based COM port, set so that it is able to communicate with the OS (e.g. via Hyperterminal), and equipped with an active SIM card.

3. A calling plan or service optimized for sending bulk SMS messages, depending on the number of users enabled for SyncML Push, data types they will synchronize and their general usage patterns.

Clients

1. Compatible client device, such as Windows Mobile device with Funambol client installed. The latest version of the client for Windows Mobile can be downloaded here:

   http://funambol.com/opensource/downloads.php

2. Set the device to process server requests without requiring confirmation by the user.

   E.g. on Nokia, navigate to Menu - Tools - Sync

   select IceWarp profile

   press Options - Edit Sync Profile - Connection Settings

   set ***Allow sync requests*** to ***Yes*** and ***Accept all sync requests*** to ***Yes***.

3. A data plan and working Internet connection are required for the synchronization with the server to complete successfully.

NOTE: Test should be performed to check that the synchronization process is working correctly via client request (i.e. starting the synchronization manually from the device).

SMS Service Configuration

Configure at least one SMS service, either on local COM port or on remote URL supplied by the service provider. Refer to the SMS Service Guide for more details on the available options.

User authentication is not required as messages sent from the SyncML Push engine will automatically bypass the authentication policy settings of SMS Service.

An example configuration of a locally connected Siemens modem is shown below.
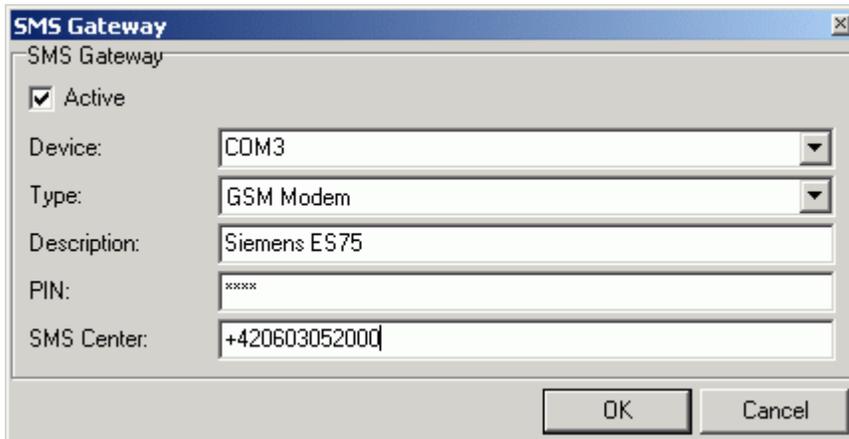
Server Configuration

Quick Guide

Follow this guide if you are already using SyncML synchronization and want to quickly enable a device for SyncML Push.

1. Under SyncML – Push, activate the engine by checking the Active box.

2. Add a user account that you wish to synchronize against, type its full email address or add it through the account selection dialog.

3. Make sure the account has SyncML enabled – on the **<domain>** and **<user>** – **Policies** tabs.

4. Add at least one device for the account.

5. Fill in the device properties accordingly, refer to the screenshot for an example and to the table further below for description of available options.

6. Tick the data types you wish to be synchronized (pushed, see note below).

The dialog automatically offers folders supported by selected device.

Predefined folder names will work out of the box, but can be renamed with the Edit dialog, where you can also change the synchronization type.

Folder Type hints help you to identify resource types that have been previously renamed or customized.

NOTE: Resource names are case-sensitive for Push and have to match on the device and in this dialog. The device matches the folder name exactly as included in the notification to its locally entered database name.
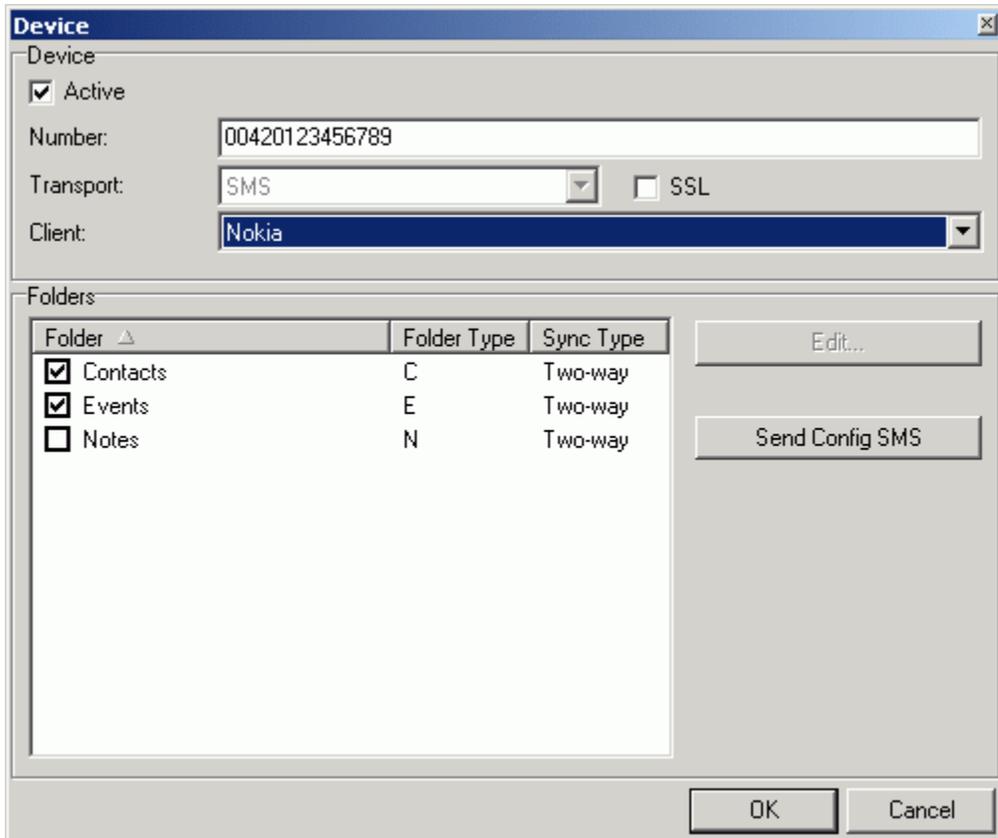
To quickly enable a device for SyncML Push that is not yet configured for SyncML, you can use the Over-The-Air (OTA) SMS configuration:

1. Follow the same steps as above.

2. When you select the Client, the Send Config SMS button will become available if the device supports OTA configuration (Nokia, Sony-Ericsson, Synthesis). Otherwise the button will be greyed out.

3. Click Send Configuration SMS button.

   The button will become greyed out until you leave this dialog, to prevent the settings being sent multiple times.

4. On the client device:

   open the received SMS.

   confirm that it's from a trusted server

   save the settings.

5. Still on the client device:

   navigate to Sync settings (e.g. on Nokia, go to menu - Tools - Sync - IceWarp - Edit Sync Profile - Connection Settings) and provide the password to the user's account.

   This is a security measure preventing remote exploit of the server data.

6. Finally, on a Nokia Client Device:

7. set the option Allow sync requests to Yes

8. set the option Accept all sync requests to Yes

9. this allows synchronization to occur without user confirmation each time.

To enable a new device for SyncML Push which doesn't support OTA configuration, please refer to the example in the **Client configuration** (on page 21) section and the step-by-step guides in the SyncML Guide, these will help you to configure the device manually. Then follow the steps outlined at the beginning of this Quick guide.

Setup SyncML

First you should activate the SyncML engine and grant access to all the accounts/domains that require it.

Select the SyncML tab in the IceWarp Server Administration GUI.

Selecting the SyncML tab shows the following screen:

Field	Description
Authentication type	Choose between three ways of allowing authentication. **Any (Basic or MD5)** IceWarp Server will accept authentication with either Basic (Base64) encryption or MD5 encryption. Basic authentication may be required for Users with older clients. **Require Basic** This option forces clients to use basic authentication. If a client attempts to connect using MD5 authentication IceWarp Server will request that it try again with Basic authentication. If a second attempt is made with MD5 authentication then the connection is rejected. **Require MD5** This option forces clients to use MD5 authentication. If a client attempts to connect using Basic authentication IceWarp Server will request that it try again with MD5 authentication. If a second attempt is made with Basic authentication then the connection is rejected. *NOTE: Selecting either of the "Require" options may stop some clients from using IceWarp Server's SyncML server. This is because some older clients do not have MD5 capabilities and some newer clients do not have Basic capabilities.*
URL	URL consists of: ▪ The server address or alias: <mail.domain.com> This address (alias) has to be set in a client exactly otherwise synchronization will not work. *NOTE: Default ports (80 for HTTP, 443 for HTTPS) are not specified. The use of different ports for control service is possible – they have to be defined on the System – Services – General tab in the Control service.*

	▪ The path specified by IceWarp Server – syncml
	NOTE: This part of URL (folder) can be changed provided that its content is moved into the newly defined folder.

Settings and User Accounts

The Push tab of the SyncML node shows the basic settings and a list of accounts already defined for SyncML Push.

Field	Description
Active	Check this option to activate the SyncML Push engine.
Push server UDP port	Specify the internal UDP port through which events generated by the server are transferred to the SyncML Push engine.
	This port need not be open as it is only used internally.
	You should only modify it if you wish to hook an external application to the SyncML Push notification facility instead of IceWarp Server built-in event notification service.
Synchronization URL	You can customize the URL that users will need to enter on the device as access to the SyncML server.
	Auto-correction will be performed after clicking the "Apply" button to ensure it agrees with options set elsewhere in server settings.
	Stay with the default if in doubt.

Check the Active tab to activate SyncML Push technology.

Leave default UDP port (32002) for listening to events coming from the internal notification service.

The Accounts area shows a list of defined accounts.

Use the Edit and Delete buttons to modify or erase selected account(s).

URL autocorrection applies to: SSL/plain connection port, http(s) protocol, slashes, index.html at the end is optional. Few illustrative examples:

mail.icewarp.com/syncml (HTTP port set in Services is 8080) will be adjusted to **http://mail.icewarp.com:8080/syncml/**

https://mail.icewarp.com:443/syncml/index.html (default HTTPS port set in Services is 443) will be adjusted to **https://mail.icewarp.com/syncml/index.html**

https://mail.icewarp.com:8080/syncml (HTTPS port set in Services is 8081) will be adjusted to **https://mail.icewarp.com:8081/syncml/**

Clicking the Add button will open the Push Account dialog, allowing you to add a new account (note that the same dialog is used to edit an account):
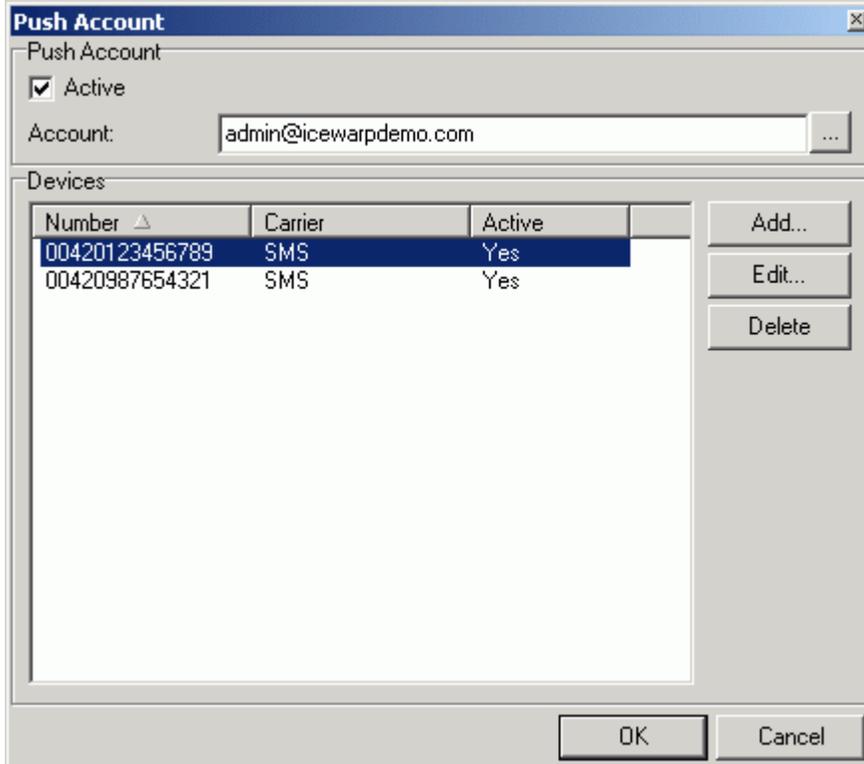
Field	Description
Active	Check this option to activate the account. If unchecked, notifications will not be sent, providing a way to temporarily disable SyncML Push from the server-side, for all assigned devices.
Account	Full email address of the account which is to be synchronized.
Devices	List of devices that have been already configured to synchronize against this account and also one with the other.

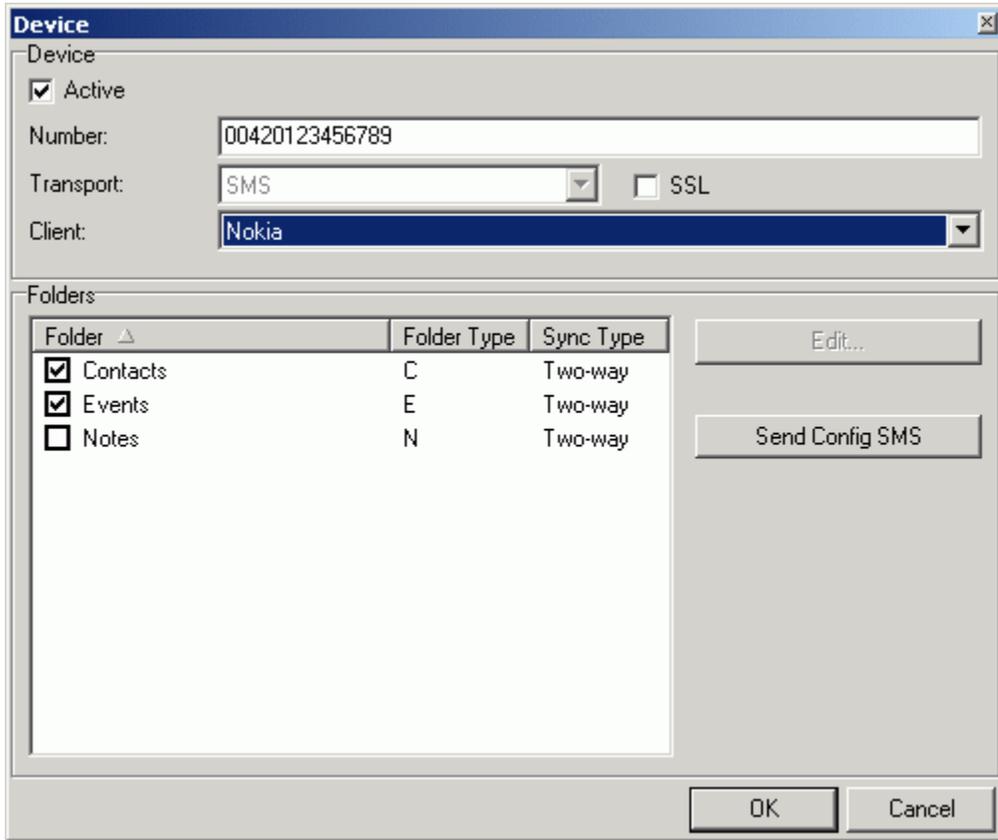Check the Active box to activate SyncML Push technology for this account.

Enter the Account in the Account field (or use the '...' button to open the standard Select Item dialog).

Use the Edit and Delete buttons to modify or erase a selected device(s) from the account.

Use the Add button to add a new device to this account. This mobile device will be actively notified about changes of server data.

The Device dialog will open:

Field	Description
Active	Check this option to enable this device for this account.
	If this is not checked then notifications will not be sent to this device, providing a way to temporarily disable SyncML Push from the server-side for the particular device.
Number	Enter the GSM number of the device.
	The number can be in any format that your SMS service is capable of delivering the message to:
	Local phone number
	International number in international format, using + sign
	International number in international format, using 00.
	*NOTE: For **multiple devices** configured to synchronize with the same account, the whole number entered here must exactly match the number provided by the client (where it's entered as part of SyncML server URL), having the purpose of uniquely identify the particular device.*
	A mismatch between the number you type here and the number you type on the device would result in 3 failed notifications, which will disable the device eventually from further notifications to be sent, until the mismatch is remedied and the device synchronized manually.
Transport	Select a transport method for SyncML Push to use for this device:

	SMS The server alert will be sent via a specially formatted SMS. **TCP** Reserved for future use. The server alert will be sent via open TCP/IP connection.

Client	Client selection specifies the feature set the device is capable of and other properties of the synchronization:
	
	    ▪ format of the server alert so that it's recognized by the client device,
	
	    ▪ the SyncML protocol version
	
	    ▪ supported folder types.
	
	Funambol
	
	Binary format, SyncML 1.2, widest range of folder types.
	
	Nokia
	
	WBXML format, SyncML 1.1, works with Nokia branded devices, Symbian certified.
	
	Sony Ericsson
	
	Select to setup user-initiated synchronization of SE handsets over-the-air. SyncML Push is not supported, Active checkbox will be disabled.
	
	Synthesis
	
	Binary format, SyncML 1.1.

SSL	Check this option to force SSL encryption of all data exchanged between the server and the device. Some devices may require the additional step of generating and installing a certificate.
Folders	In the Folders area you will see a list of folders that SyncML Push should send alerts for. Available folders are automatically adjusted to selected device capabilities. You can use the checkboxes to the left of the list to select which folders will be alerted. Default folder names correspond to default settings of the GroupWare Server. If you don't specify a folder name in the Edit dialog, the default folder names will be used. Hints (Contacts, Events, Mails, Tasks, Notes, Journals, Files) will help you to identify the folder type when folder name is customized- you can only alert one folder of the same type per device.

Send Config SMS	After you have filled all the preceding device properties and if this button is available, you can use it to wirelessly provision the device with these settings.
	This feature will configure (upon confirmation by the user):
	
	    ▪ sync profile (IceWarp), server URL, username, folders and sync type
	        To complete the configuration, user needs to specify on the device:
	
	    ▪ default network connection profile
	
	    ▪ password
	
	    ▪ set Allow sync requests to Yes
	
	    ▪ set Accept all sync requests to Yes
	
	This button is disabled for unsupported devices and after the configuration SMS is sent, until next configuration change.

Clicking the Edit button will open the Folder dialog.
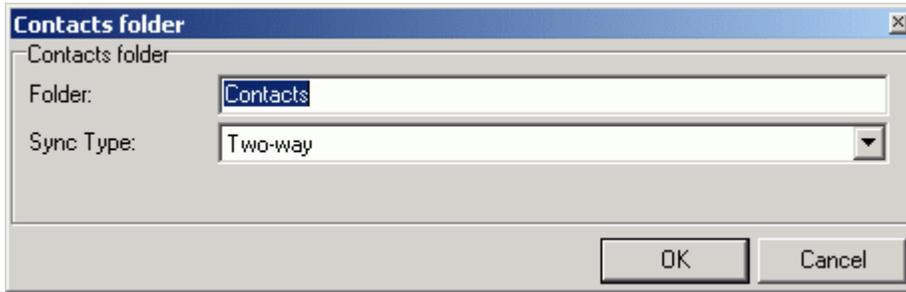
In the Folder box you should enter the name of the Folder on the Account that you want to synchronize. If you leave the field blank, the default folder name (the same as the folder name hint) will be used.

Folder names can be renamed here if they were customized (per server or by the user via IceWarp WebClient), or in case the user wants to synchronize against a newly created resource, e.g. a private calendar established through IceWarp WebClient.

NOTE: Resource names are case-sensitive for Push and have to match on the device and in this dialog. The device is matching the folder name included in the notification to its locally entered database name, there's no engine in the middle to resolve the case sensitivity like when the synchronization is initiated from the device to the server.

In the Sync Type pull-down menu you should select the type of synchronization you want SyncML to perform on this folder for this device:

Two-way

Two-way synchronization will result in the same data on the server and on the device, i.e. changes made on the devices will be also reflected by the server (and hence in IceWarp WebClient or Outlook).

One-way

One-way synchronization will reflect only the changes done on the server (in practice via IceWarp WebClient or Outlook Connector), without propagating the items created or modified on the device to the server.

Advanced Options

Account Configuration File

<InstallDirectory>\config\push_accounts.xml

This file is created on-the-fly by the Administration GUI interface, there should be no need to modify it manually.

Breaking the XML structure may result in a loss of functionality.

Disabled Devices List

<InstallDirectory>\config\push_disabled.xml

This file is created through the operation of the SyncML Push engine, and is used to save information about devices which have been temporarily disabled, either because they are unable to sync (out of coverage, no Internet connectivity, mis-configured SyncML settings) or because they have been temporarily disabled by the user through the push=0 parameter.

In the case of a restart of IceWarp Server, this file allows the engine to recall which devices should not be alerted.

Since it's not possible to recognize why the device was included to this list, re-activation of devices should be only done from the device itself, by removing or modifying the push=0 parameter and performing a manual synchronization.

Do not edit this file.

Settings File

<InstallDirectory>\config\push_settings.xml

This file lists advanced settings of the SyncML Push configuration file not available through the Administration GUI. Do not modify these settings unless you know exactly what you are doing or you have been instructed to do so by technical support staff.

If this file is not present, the engine defaults as shown below will be used.

```
<settings>
<delay>10</delay>
<expire>10</expire>
<trials>3</trials>
</settings>
```

<delay>, Notification delay (seconds)

Determines the shortest interval between consecutive alerts sent to the same device.

If the server data changes within this time period no further alert will be generated.

<expire>, Device synchronization timeout (second)

The maximum allowed time between an alert being sent and the synchronization starting.

If this period is exceeded, the number of unsuccessful notifications (trials) is incremented by one for the device in question.

If the number of unsuccessful attempts exceeds the <trials> setting, the device is put into the temporarily disabled devices list and no further notifications sent.

Once a successful synchronization occurs (automatic or manual) the count is reset to zero.

<trials>, Number of allowed unsuccessful synchronization attempts

Determines how many consecutive alerts can be sent to the device without the synchronization starting.

If this number is exceeded then the device will be temporarily disabled (via the ***Disabled devices list*** (on page 19)) and no further alerts will be sent until a valid synchronization occurs.

Client Configuration

Enabling Push on the Device

1. The device needs to be configured for SyncML synchronization. For more details, refer to SyncML Server documentation and the configuration guides available for particular platforms.

   NOTE: All data types (folders) that should be notified have to be set to be synchronized, and have the same folder name as configured on the server. The device can be configured to synchronize more data types than it is alerted about, but not less.

2. Perform a manual synchronization to ensure the synchronization completes without any errors.

3. Turn on support for accepting server alerts. In Funambol, it's found under Menu - Settings - Sync Method - select Push service.
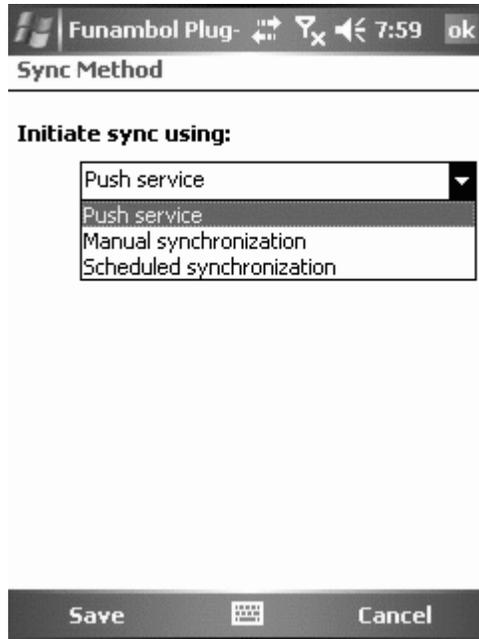
Enabling Push for Multiple Devices per one Account

If an account has more than one device configured for SyncML Push you should use a "push" variable in the URL pointing to your server.

http://hostname/syncml/index.html?push=number

leaving the hostname pointing to your server, adding **push** parameter after the question mark, where **number** is the phone number of your device, exactly as entered in SyncML Push device settings in the Administration GUI.

NOTE: If the number you enter here differs from the number defined on the server then the device will not be identified correctly as the device that an alert was sent to. This will result in an unsuccessful synchronization being logged, with the device eventually being disabled.

Temporarily Disabling Push from the Device

You can temporarily disable SyncML Push to a device, directly from the device, by using the "push" variable with a setting of 0.

http://hostname/syncml/index.html?push=0

This will cause the synchronization process to stop until the original URL is restored in the device, at which point synchronization will resume as normal.

This can be useful if you are going away on vacation and you do not want to keep synchronizing.

Re-activation of Push on the Device

To re-activate SyncML Push after it has been temporarily disabled as above, e.g. when returning from vacation, remove the push parameter from the URL, leaving the default path only:

http://hostname/syncml/index.html for single device,

> ***http://hostname/syncml/index.html?push=number*** for a multiple device account,

and perform a manual synchronization from within the device.

Resolving Number Mismatch with Multiple Devices

To re-activate SyncML Push for a disabled device simply review that the exact same number is entered in device configuration settings on the server and in the ***push=number*** parameter, and perform a manual synchronization from the device.

If the manual synchronization works successfully the device should be removed from the disabled list and automatic synchronization will continue as normal.

Troubleshooting

If you are having problems with SyncML Push you should check the SyncML Push, SyncML and SMS Service logs in the administration GUI (under system -> logs). An example of a successful alert is shown below.

```
SYSTEM          [14C4] 15:42:48 Device COM9 opened
SYSTEM          [14C4] 15:42:48 >>>  [3]
SYSTEM          [14C4] 15:42:49 >>> AT [4]
SYSTEM          [14C4] 15:42:49 <<< OK [6]
SYSTEM          [14C4] 15:42:49 >>> ATE0 [6]
SYSTEM          [14C4] 15:42:49 <<< OK [6]
SYSTEM          [14C4] 15:42:49 >>> AT+CPIN? [10]
SYSTEM          [14C4] 15:42:49 <<< +CPIN: READY [22]
SYSTEM          [14C4] 15:42:49 >>> AT+CSCA="+420603052000",145 [29]
SYSTEM          [14C4] 15:42:50 <<< OK [6]
SYSTEM          [14C4] 15:42:50 Device initialized
SYSTEM          [14C4] 15:42:50 >>> AT+CSMS=0 [11]
SYSTEM          [14C4] 15:42:50 <<< +CSMS: 1,1,1 [22]
SYSTEM          [14C4] 15:42:50 >>> AT+CMGL=4 [11]
SYSTEM          [14C4] 15:42:50 <<< OK [8]
SYSTEM          [14C4] 15:42:55 >>> AT+CMGL=4 [11]
SYSTEM          [14C4] 15:42:55 <<< OK [8]


SYSTEM          [10B4] 15:47:29 Add
0011000C912470425658300000A70CD4E2940A6A97E7F3F0B90C 200803101547290003.tmp
SYSTEM          [14C4] 15:47:29 >>> AT+CMGL=4 [11]
SYSTEM          [14C4] 15:47:29 <<< OK [8]
SYSTEM          [14C4] 15:47:29 Get
0011000C912470425658300000A70CD4E2940A6A97E7F3F0B90C 200803101547290003.tmp
SYSTEM          [14C4] 15:47:29 >>> AT+CMGF=0 [11]
SYSTEM          [14C4] 15:47:29 <<< OK [6]
SYSTEM          [14C4] 15:47:29 >>> AT+CMGS=25 [12]
SYSTEM          [14C4] 15:47:30 <<< > [4]
SYSTEM          [14C4] 15:47:30 >>>
0011000C912470425658300000A70CD4E2940A6A97E7F3F0B90C [53]
SYSTEM          [14C4] 15:47:32 <<< +CMGS: 46 [19]
SYSTEM          [14C4] 15:47:32 Sent
0011000C912470425658300000A70CD4E2940A6A97E7F3F0B90C 200803101547290003.tm$
```

Other things to try are:

- See if a manual synchronization works.

- Inspect the device log to pair the time information with the records of the SyncML logs.

- Review the settings on both the client and server side.

- Try with another account.

- Re-install the client application.

- Change the device.

Contact IceWarp technical support if the problem persists and include:

- relevant parts of the logs (SyncML Push, SyncML, SMS Service)

- device model, OS/firmware version

- Funambol/Synthesis SyncML client application version

- brief description of server setup (SyncML, Push, sync URL, IceWarp Web Server, Control service ports)

- what has been already attempted to address the issue

- any information we might find helpful for troubleshooting.