



Understanding and Troubleshooting Pylon Anywhere™ Push and Alerts

*A whitepaper from iAnywhere Solutions, Inc.,
a subsidiary of Sybase, Inc.*

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What is Push?

Push technology is defined in the mobile application space as having a server application proactively send information to a client application without requiring the client application to ask for it. Push can be implemented in a number of ways, often determined by the connection method between the client and server. Examples of Push technology include triggering a mobile database application to synchronize when a new order is added to an enterprise database, or triggering a mobile email application to synchronize important new email to a handheld device as soon as it arrives at the email server.

Often, Push involves sending encoded messages from the server to the client instructing the client application to perform an action, such as synchronization. Here, the client is simply notified that new information resides on the server and that the application should retrieve it using an appropriate method, which is often secure and optimized for mobile communications. In other situations, the important information is pushed directly to the device to be used immediately by the client application.

What are Alerts?

Alerts are used to automatically notify an individual of new information. These alerts can notify people of sports scores, provide stock quote information, or distribute information from an enterprise application. Alerts are sent using email or Short Message Service (SMS), and are often delivered to an individual's email account or to a companion device such as an SMS-capable cell phone.

Why are Push and Alerts Important?

In an 'always available' solution where a client application uses a local set of data and synchronizes with the server's copy of the data, it is often imperative to notify the mobile worker as soon as important information is available at the server. Relying on end users to manually initiate synchronization with the server is often unrealistic, and gives way to the chance that the end user will get the information after it is too late to act on. For example, email is used as a primary communication mechanism between mobile sales representatives and their customers. If a customer sends an important email to the sales representative, but the sales representative forgets to synchronize his/her email for a few hours, it may be too late to send a timely reply. The sales representative may then appear unresponsive to his customers. Similarly, if mobile executives do not receive email messages as they arrive, they may miss vital information necessary to run their business in the most effective manner.

Push takes the onus off of the individual mobile worker to manually check for important new information throughout the day. Frequent manual checks can be costly and inefficient with respect to both the time it takes to check for the

information and the network charges incurred even if there is no new information to synchronize. Push can provide access to the most important information as it arrives, while minimizing network costs and impact on the end user. An approach often mentioned as an alternative to Push, called polling, relies on the client application to periodically check the server for important new information. Although complementary to Push in connected environments where bandwidth costs are minimal, such as local area networks (LANs), polling can incur unnecessary bandwidth charges if used extensively in a mobile environment. In addition, depending on the polling frequency, polling may not get the latest information to the end user at the moment it arrives on the server.

Alerts, although they often will not contain a large amount of information, notify the recipient immediately that important new information is available. The recipient can then take action on the alert, which often means checking email, browsing to a Web site, or placing a phone call.

Methods of Push

In order for devices to be Push-compatible, the server must have a way of proactively contacting the device. Today's networks and devices permit two distinct methods of communicating with devices to deliver Push messages.

For mobile devices that have integrated phones, Pylon Anywhere's Push capabilities can contact the device using SMS messages. SMS messages are short text messages, and can often be sent to these devices using traditional email, as these devices often have their own unique and static email address that usually incorporates the device's phone number, such as *1234567890@carrier.com*. Devices that fall into this category are Treo phones that run the Palm operating system, Symbian 7 UIQ phones, and phones that run the Microsoft Smartphone or Microsoft Pocket PC Phone Edition operating systems. These devices are often purchased directly from wireless carriers.

There is a wider range of mobile devices that do not have SMS capabilities, including those that use Wi-Fi networks. For these devices, a server could contact the device using a direct socket connection between the device and server, or could contact the device directly using the device's IP address. This proactive notification directly to a device is called IP or Network Push.

In order to use this Push method, the device must have a network connection, and the server must be aware of the device. With today's wireless wide area 2.5G and 3G networks, such as General Packet Radio Service (GPRS), devices are always online, although they often have IP addresses that change frequently, creating the need for a server to be continually notified as the IP addresses change. These devices are not provided a static IP address or DNS name. Other networks where devices have IP addresses are Wi-Fi networks, such as an office's wireless LAN, or any Local Area Network (LAN).

For a server application to communicate with a device using a Network Push solution, the client application on the device must listen on a specific network port, or must keep an open connection to the server. Once this connection or listener is in place, the server can send Push messages directly to the client application.

Pylon Anywhere's Push Capabilities

Pylon Anywhere provides push capabilities over SMS and IP networks for both Microsoft Exchange and Lotus Domino servers. The groupware server notifies Pylon Anywhere that new email exists for its users, and the Pylon Anywhere server determines if this new email should trigger a Push. End users create filters to allow the Pylon Anywhere server to make the determination of which emails are important to them.

Pylon Anywhere offers support for both SMS Push and Network Push. This provides broad device support for both integrated devices that can receive SMS messages, as well devices that leverage cradles, modems, and network cards for network connectivity. Pylon Anywhere Push is also aware of the battery level of the device, and can be configured to only be active while a device has a suitable amount of battery power. Push can also be configured to be active at specific times of a day only, eliminating needless Push messages when the user is unavailable.

When a Push message is received by a device, whether over SMS or Network Push, the Pylon Anywhere client will initiate the synchronization of the device's email Inbox to grab any new email from the server, including the important email message that triggered the Push. This is done to keep the user's Inbox as up to date as possible without user intervention. In addition to synchronizing the Inbox, a Push message will also trigger the synchronization of any messages in the device's Outbox, sending them to the server for automatic delivery.

Pylon Anywhere allows end users to configure two sets of synchronization settings. These two profiles on the device allow the end user to decide what attachments to download and how to truncate long email messages. To optimize the Inbox synchronization, the Sync profile on the device is used to control attachments and truncation when the synchronization is being done over a high-speed network such as LAN or Wi-Fi, while the SyncXpress profile is used over low-speed networks. It is important to note that email messages are not sent directly to the device in the contents of the Push message. Instead, the Push message triggers a full synchronization allowing Pylon Anywhere to leverage its secure and efficient synchronization protocol to transfer any new email from the server to the device.

Pylon Anywhere's Alert Capabilities

Pylon Anywhere provides Alert capabilities from both Microsoft Exchange and Lotus Domino groupware servers. The groupware server notifies Pylon Anywhere that new email exists for its users, and the Pylon Anywhere server determines if this new email should trigger an Alert. End users create filters to allow the Pylon Anywhere server to make the determination of which emails are important to them. Alerts can also be sent to remind users of trips and appointments, and daily calendar alerts can be sent to users in the morning to provide them with a complete list of their obligations for the day ahead.

Alert messages from Pylon Anywhere are sent from the Pylon Anywhere server as email messages, and can be delivered to other email accounts, email pagers, or SMS-capable phones. When Pylon Anywhere sends an Alert based on a new email message that has arrived at the server, it can send out the entire email message, or just the subject line. With Alerts, the recipient often takes action on the Alert when it is received, be it by checking email from Pylon Anywhere's Web or WAP interface, connecting and synchronizing his or her device, or by making a phone call.

Identifying New Email

In order for the Pylon Anywhere server to notify devices that new email has arrived, the Pylon Anywhere server first needs to know that new email exists at the groupware server. This component of Push and Alerts is implemented differently for Microsoft Exchange and Lotus Domino.

Identifying New Email - Exchange

For Microsoft Exchange environments, Pylon Anywhere is notified of new email through an Exchange Sniffer that is installed when the Pylon Anywhere server is first configured. This component is configured to automatically notify Pylon Anywhere of new email for Push and Alert subscribers. Using a courier account, a monitor account with read access to users' mailboxes, or user credentials stored on the server, Pylon Anywhere connects to the Exchange server to obtain the headers of this new email. Pylon Anywhere uses the user-defined filters to determine if the new email is one that warrants an alert or Push trigger.

The access method that the Pylon Anywhere server uses to read the users' Exchange mailboxes is configured on the Access tab of the Microsoft Exchange Profiles in the Pylon Anywhere Admin Console.

Identifying New Email - Domino

For Pylon Anywhere to be notified of new email in Lotus Domino, Pylon Anywhere requires a DLL to be installed on the Domino server. This installation is performed from the Pylon Anywhere Admin Console, from the Domino Push tab of the Pylon Anywhere Admin Console Properties page. Since a DLL is used, only mailboxes residing on Domino servers running in Windows environments can be monitored for Push and Alerts.

This DLL, called *nempnotify.dll*, monitors new mail arriving at the Domino server, and when new mail arrives, the DLL makes an HTTP request to the Pylon Anywhere server. This web request contains the username of the user receiving the new email. If this user has activated Push or Alert devices, the Pylon Anywhere server will use a courier account or the user's ID file to connect to the Domino server and obtain the header information of this new email. Pylon Anywhere then uses the user-defined filters to determine if the new email is one that the user wants to be alerted on, or have Push initiated from.

The access method that the Pylon Anywhere server uses to read the users' Domino mailboxes is configured on the Access tab of the Lotus Domino Profiles in the Pylon Anywhere Admin Console.

Identifying New Email - Troubleshooting

Is the Pylon Anywhere server being notified correctly?

As outlined above, an Exchange Sniffer is used to monitor for new email in a Microsoft Exchange environment. Log entries for the Exchange Sniffer are stored in log files called *ExchangeSniffer_<date>.log* in the *Log* directory of the Pylon Anywhere server installation. These log entries contain helpful troubleshooting information. Most often, the cause of problems with Exchange notification is an incorrect Exchange access configuration, meaning that the Pylon Anywhere server does not have permission to open the user's Exchange mailbox. As stated earlier, this access method is configured on the Access tab of the Microsoft Exchange Profiles of the Pylon Anywhere Admin Console. If Pylon Anywhere is installed in a DMZ, ensure that all ports required for Outlook/Exchange are configured correctly as outlined in the Microsoft Knowledge Base article #278339 at <http://support.microsoft.com/default.aspx?scid=kb;en-us;278339>.

In a Domino environment, a DLL is used to monitor the Domino server and notify Pylon Anywhere using HTTP requests. To troubleshoot this component, administrators should verify that the DLL was installed to the Domino server correctly. Also, the Domino server name should appear on the Domino Push tab of the Pylon Anywhere Admin Console Properties page. In addition, log entries for the HTTP requests are stored in the Internet Information Services (IIS) log files on the Pylon Anywhere server computer. These log files, usually located in the *winnt\system32\LogFiles\W3SVC1* directory, should contain entries for HTTP requests to a Web page called *notify.asp*. The parameters passed with this request should contain usernames of Domino server users. If no such entries exist for these requests, the connection to the Pylon Anywhere server from the Domino server must be verified. This can be done by opening a Web browser on the Domino server machine and browsing to the Pylon Anywhere web page.

Filters

With Pylon Anywhere, end users have the ability to define filters that dictate which email messages are important to them, and in turn should initiate a Push message or an Alert. Administrators can define default filters from the Pylon Anywhere Admin Console, and end users can configure their Push and Alert filters from the Pylon Anywhere Web site. These filters define the conditions that will be checked against the headers of any incoming email. Push and Alert filters are defined separately. Since headers are used for the comparison, end users can define filters based on sender, subject, priority, time, read/unread status, and meeting requests. If a new email satisfies these filters, the Pylon Anywhere server generates and sends a Push or Alert message.

For SMS Alerts, users are also able to specify if they would like to receive the

complete text of an email in the Alert, or simply the email subject.

When troubleshooting the various aspects of Push and Alerts, it is often beneficial to define a broad filter such as 'Push all email' to ensure that Push and Alerts aren't being sent simply because the incoming email does not meet the filter criteria.

Configuring SMTP Server for SMS Delivery

Messages for SMS Push and Alerts are sent from the Pylon Anywhere server as email using an SMTP server. The carrier uses an email-to-SMS gateway to convert these email messages to SMS, and delivers them to the destination. Recall that SMS-capable devices have a unique email address, often of the form *phone_number@carrier.com*.

An integral part of the SMS Push and Alerts setup is configuring Pylon Anywhere to communicate with an SMTP server. This SMTP server could be an existing SMTP server in an organization, or could be one that is configured on the Pylon Anywhere server computer. Often, the SMTP server capabilities of IIS are used on the Pylon Anywhere server computer. Details for configuring and troubleshooting the SMTP services in IIS can be found in the Microsoft Knowledge Base article #286421 at <http://support.microsoft.com/default.aspx?scid=kb;en-us;286421>. This component should be tested thoroughly as it is often the source of SMS-related issues.

Once an available SMTP server has been identified and configured, it must be defined in the Pylon Anywhere Admin Console. From the General tab of the Pylon Anywhere Admin Console Properties page, the administrator must define the SMTP server address and port, as well as a valid From address to use when sending Alert messages. The SMTP server address will be of the form *server.company.com*. If the IIS SMTP services on the local computer are being used, it is recommended that the complete computer name, including domain, is entered in the SMTP server field. The From address should be entered in the form *user@company.com*.

It is important to note that Pylon Anywhere will not use the defined From address when sending SMS Push messages. All SMS Push messages will be sent from the user *SYNCLOGC@domain*, where *domain* is the domain that was specified in the From address field. For example, if the default From address was configured as *smsdelivery@company.com*, SMS Push messages will be created using *SYNCLOGC@company.com* as the From address. In some cases, organizations may have rules on their SMTP server to only allow known users to send email messages. In these instances, *SYNCLOGC* should be configured as a valid user who has the ability to send email messages using the defined SMTP server.

Similarly for Alerts, the Pylon Anywhere server will attempt to populate the From address with the original sender's username. The SMTP server should be configured to allow this. Troubleshooting this aspect involves examining the log files of the SMTP server.

SMS Push

SMS Push is available for integrated devices that can receive SMS messages. These include Treo phones, Kyocera 7165 phones, Symbian 7 UIQ devices, Microsoft Smartphone devices, and Pocket PC Phone Edition devices. From the Pylon Anywhere web site, an end user can register a device by providing the device's SMS address, which is in email format and usually of the form *phone_number@carrier.com*. When registering the device, Pylon Anywhere will send a test message to the device with a confirmation number. This confirmation number is used to verify that the device can be reached using SMS, and also ensures that the device's SMS address has been entered correctly.

When the Pylon Anywhere server needs to send a Push message to trigger a device to synchronize, the SMS message is sent in email form through an SMTP server as the user *SYNCLG@domain.com* as outlined above. The carrier converts this message to SMS and delivers it to the device. It is important to note that this step relies on the carrier's network performance, and users may sometimes see delays in receiving SMS messages at times when the carrier's network is being heavily used.

On the device, the Pylon Anywhere client is listening for incoming SMS messages. Using either the From address or the body of the SMS message, the Pylon Anywhere client can distinguish SMS messages sent by Pylon Anywhere from other SMS messages. The content of SMS Push messages is not human readable as these messages are meant to be interpreted by the Pylon Anywhere client.

When an SMS Push message is received by a device, the Pylon Anywhere client will initiate the synchronization of the device's email Inbox to grab any new email from the server, including the important email message that triggered the Push. This is done to keep the user's Inbox as up to date as possible without user intervention. In addition to synchronizing the Inbox, a Push message will also trigger the synchronization of any messages in the device's Outbox, sending them to the server for delivery automatically. To optimize the Inbox synchronization, the Sync profile is used to control attachments and truncation when the synchronization is being done over a high-speed network such as LAN or Wi-Fi, while the SyncXpress profile is used over low-speed networks.

SMS Push Troubleshooting

Can the Pylon Anywhere server deliver SMS messages?

The most common problem encountered when configuring SMS Push is that the SMTP server has not been configured correctly. Instructions for troubleshooting the SMTP configuration are outlined above. If the device does not receive the device confirmation messages, the problem will most likely be due to an incorrect SMTP server setup.

A useful trick to use when troubleshooting SMS delivery is to register a separate

traditional or web-based email account as a Push destination. This will eliminate any carrier or device issues since the device confirmation emails and SMS Push messages can be received by a traditional email account.

Also, recall that SMS Push messages are sent from the user `SYNCLOGC@domain`, where *domain* is the domain that was specified in the default From address field from the Pylon Anywhere Admin Console. Ensure that this user can successfully send email messages through the defined SMTP server. One recommendation is simply to configure the default From address in the SMTP server setup as `SYNCLOGC@domain`, where *domain* is the actual domain. Then, if the device confirmation messages can be sent successfully, the SMTP server is configured correctly to send SMS Push messages.

Can the device receive SMS messages?

In some instances, devices may not be able to receive SMS messages, either because the SMS address has been entered incorrectly when registering the device from the Pylon Anywhere Web site or because the carrier does not allow SMS messages to be sent to it via email. To verify that a device can receive SMS messages, send a test email from a valid email account directly to the device's SMS address. If it is not received, contact the carrier. Some carriers may not deliver SMS messages to a device that is not registered for an SMS plan with the carrier, and other carriers may not provide an email to SMS conversion capability.

Is SMS Push enabled on the device?

The Push/ReadySync Settings on the device include checkboxes to enable/disable Push. The Advanced Push/ReadySync Settings include checkboxes to enable/disable SMS Push specifically. Ensure that both checkboxes are checked on the client.

Network Push

Pylon Anywhere's Network Push capabilities can be used by any Palm, Pocket PC, Microsoft Smartphone, or Symbian 7 UIQ device that has a network connection. Examples are devices with PCMCIA modems, Microsoft Smartphone or Pocket PC devices connected through a cradle and ActiveSync, devices on a Wi-Fi network or LAN, and others. Devices that connect to wireless networks such as GPRS and CDMA 1xRTT can also be used for Network Push. A device must have an established network connection to use Network Push.

When a device first establishes its network connection, the Pylon Anywhere client establishes a connection to a specific port on the Pylon Anywhere server. The specific port can be defined on the Server Name tab of the Pylon Anywhere Admin Console Properties. Port 3102 is used by default. It is extremely important to note that the port used by Network Push must be accessible from any network connection that will be leveraged for Network Push. For example, if Network Push is to be used from a device that uses a public Wi-Fi hotspot for its network connection, the Network Push port must be accessible from outside the corporate firewall.

Once the Pylon Anywhere client initiates the connection, the Pylon Anywhere server maintains that connection by periodically sending small amounts of data to keep the socket connection established. The data transfer is minimal, but the battery life of the device will be affected.

If a device loses its network connection, or if its IP address changes, the Pylon Anywhere client will reconnect to the server and a new socket connection will be maintained. This is common in some 3G networks. It is important to note that the Pylon Anywhere client always initiates the connection with the server. Devices do not need to have static IP addresses to use Network Push.

When the Pylon Anywhere server needs to send a Push message to trigger a device to synchronize, the server leverages the existing socket connection and sends a message directly to the device. Note that the client is not polling the server for changes with Network Push.

When a Network Push message is received by a device, the Pylon Anywhere client will initiate the synchronization of the device's email Inbox to grab any new email from the server, including the important email message that triggered the Push. This is done to keep the user's Inbox as up to date as possible without user intervention. In addition to synchronizing the Inbox, a Push message will also trigger the synchronization of any messages in the device's Outbox, sending them to the server for delivery automatically. To optimize the Inbox synchronization, the Sync profile is used to control attachments and truncation when the synchronization is being done over a high-speed network such as LAN or Wi-Fi, while the SyncXpress profile is used over low-speed networks. Recall that these two profiles on the device allow the end user to decide what attachments to download and how to truncate long email messages. Pylon Anywhere leverages its secure and efficient synchronization protocol to transfer new email from the server to the device.

Network Push Troubleshooting

Can the device connect to the server?

When a device is enabled for Network Push, it will attempt to connect to a specific port on the Pylon Anywhere server. If this connection is successful, the device will be registered as Active in the Network Push column of the Device list in the Pylon Anywhere Admin Console. If the device does not show up as Active from this view, the connection was not successful.

It is important to verify that the port used for Network Push (port 3102 by default) is accessible from the device. This can be verified using telnet. Telnet can be used to attempt to open a connection with the Network Push port. If the port is not accessible, Telnet will display an error. Telnet clients can be downloaded for Pocket PC devices as well, but often it is useful to use Telnet from a PC that is using the same network as the device experiencing difficulties. For example, if a Pocket PC device can not connect to the Network Push port from a Wi-Fi network, use Telnet from a PC in the same Wi-Fi network to test the availability of the port. If the port is not accessible, it is often a simple firewall or proxy server issue. An example Telnet command from a command prompt such as `telnet server.company.com 3102` is a simple test to verify the accessibility of the port. Problems with firewall or proxy configurations are often identified when devices are first used from public networks such as GPRS or Wi-Fi hotspots.

If the system administrator recently changed the port Network Push uses, the device will need to perform a synchronization to obtain the updated port number.

The Pylon Anywhere client also logs Network Push status and error messages on the device to assist in troubleshooting.

Is Network Push enabled on the device?

The Push/ReadySync Settings on the device include checkboxes to enable/disable Push. The Advanced Push/ReadySync Settings include checkboxes to enable/disable Network Push specifically. Ensure that both checkboxes are checked on the client.

Complementary Technologies

The technologies discussed in this document complement each other, and are often used in conjunction with one another. SMS Push and Network Push are often used together, allowing Push capabilities when a device has an established network connection and when a device is offline. The Pylon Anywhere server handles this configuration transparently.

Alerts are often used in conjunction with Push to provide immediate notification to a companion device in the situation where a device may not be reachable through SMS or Network Push, or where a device is in a briefcase or not accessible to the

user.

Pylon Anywhere's scheduled synchronization capability, ReadySync, is also often used in conjunction with Push and Alert capabilities to keep a device's email Inbox up-to-date on a regular basis. Using ReadySync with Push can also minimize the amount of data transferred during a Push-initiated synchronization session.

In addition to this document, a 'Best Practices' document accompanies the Pylon Anywhere software and discusses how to use Push effectively. That document also outlines the supported devices in greater detail, and sets expectations of how Push and ReadySync will perform in various situations.

Summary

The Push and Alert capabilities of Pylon Anywhere offer support for a wide range of devices and connectivity options. This technology allows users to be kept up-to-date on important email and activities. End users are empowered with the ability to define filters that determine exactly what information will trigger a Push.

Troubleshooting Push and Alerts is simplified with various configuration options, log messages, tools, and tips.

Alerts and Push complement Pylon Anywhere's synchronization and Web/WAP capabilities by proactively notifying users of important information and ensuring that end users always have the important information they need at their fingertips.

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