



Overview of the Pylon Anywhere™ File Sync Add-on

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

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Introduction

Pylon Anywhere increases mobile worker productivity by delivering mobile and wireless access to Lotus Notes or Microsoft Exchange information including email, calendar, contacts, and tasks. It provides direct, server-based synchronization ensuring always available access to email and PIM information from the most popular mobile devices. With access to up-to-date information, even when a desktop or laptop is inaccessible, mobile workers can keep in touch no matter where the day takes them.

Pylon Anywhere offers a file sync add-on which is available and priced separately. This add-on provides a simple way to manage electronic document distribution based on a powerful publish and subscribe model. Integrated into the Pylon Anywhere admin console, administrators use a simple GUI wizard to define the file publications. A server-based scanner automatically detects and replaces outdated files on mobile devices, sparing user time while protecting from human error.

Key benefits include:

- ◆ **Cut Costs Related to Email and Intranet** Pylon Anywhere's file sync add-on uses advanced technology to minimize the cost of publishing content. Checkpoint restart, byte-level differencing, and compression all conserve mobile bandwidth. Changed files are processed at the server in advance to decrease session length. Access to locally stored files ensures greater availability and decreases the need to dial in to the intranet or email server.
- ◆ **Offers Improved Control and Convenience** The file sync technology automatically detects and replaces outdated files on mobile devices, sparing user time while protecting from human error. Files are easily located in consistent locations and can be accessed anytime - even without a network connection. Users are alerted to any new information with hyperlinks for viewing. All activity is tracked in extensive system logs to facilitate support.
- ◆ **Helps Users Recover from Device Failure** The file sync technology can help users to recover quickly from the unpleasant incidents of device loss/theft and failure. File backup capabilities ensure that working files and folders are backed up to the server. When disaster strikes, a mobile device can be effortlessly reloaded with all of the user's working files, as well as the standard documents they are subscribed to.

Summary of Specifications

Feature Highlights

Publish and subscribe model
Web site spidering and link management
Publication definition wizard
Non-proprietary VB script for extensions
Parameterized publications
Extensive configurable standard actions
Change manager detects updates
Byte level file differencing
Multi-step file differencing
Check-point restart
Bandwidth throttling
Advance file compression
Publication availability scheduling
Failed publication rollback
Document transcoding for Palm
Offline file application
Easy access hyperlinks from client
Multiple encryption options
Wireless optimizations
APIs for client functionality
Clustered servers with failover
Dynamic load balancing
Admin controlled sync profiles
Dual settings for cradle vs. wireless
Connection management
MMC snap-in console
Authentication options
Flexible log viewing and reporting
Remote administration

Supported Devices

Pocket PC
Pocket PC 2002
Windows Mobile 2003
Pocket PC Phone Edition
Palm OS® PDAs and phones
Microsoft Smartphone 2002/2003

Authentication Sources

Active Directory
NT Domains
iPlanet™
Domino Authentication
Any LDAP compatible source
Internal / proprietary

Unique Features of the Pylon Anywhere File Sync Add-on

The Pylon Anywhere file sync add-on sets the industry benchmark based on product excellence in the following areas:

- ◆ [Publish-and-Subscribe Model](#)
- ◆ [Change Management](#)
- ◆ [Efficient Transport](#)
- ◆ [Great User Experience](#)
- ◆ [Strong Management Tools](#)
- ◆ [Flexible Security Options](#)

The following section details the add-on's capabilities in each of these areas. Major features are identified with their significance and associated benefits explained. Drawbacks of alternative approaches will also be highlighted where appropriate.

This functionality detail serves as an appropriate basis for developing selection criteria for an RFP or evaluation process.

Publish-and-Subscribe Model

The file sync add-on's publish-and-subscribe model provides the ultimate in flexibility. It can be used to service a broad range of user communities, bringing a personalized portfolio of relevant content to each user. It can also copy over portions of websites, portals or the corporate intranet to make these available for offline mobile access.

Publication Definitions File and web content delivery is specified in the administrative console as publications. A publication is composed of a set of actions that execute in order. A publication can be as simple as one action to download a file or directory from the server to a mobile device. Publications can also be complicated multi-step processes with conditional branching logic and execution of client-side scripts.

Subscriptions Once a publication has been specified, specific users or groups of users can be subscribed using the Pylon Anywhere Admin Console. Note that a group of users does not necessarily have to relate to their network domain, it is much more flexible.

Publication Wizard A powerful wizard is available to guide the process of creating new publications and subscribing users.

Standard Actions Library. This add-on includes a library of over 30 standard actions to use in setting up publications. These include actions such as

create/remove directories, download files to device, execute programs and scripts, copy/delete/rename/move files, reference inventory attributes, and upload files to the server. One action runs specified VB scripts, making it easy to extend the solution to handle your unique needs without relying on a proprietary scripting language.

Website Spidering Website delivery presents a special case because a single web page might be composed of dozens of files. Even a small website could have hundreds of files that change frequently. This add-on removes the hassle from building website publications by allowing administrators to point at a start page and specify the number of links deep if any the user should be able to traverse. The server then spiders the site and gathers up all the files necessary. Administrators can place file type restrictions on the website delivery in order to protect bandwidth and device storage, or to restrict file content that is not viewable on a specific device.

Website Link Manager Another challenge for offline access to websites is the links. Throughout the site, links point to specific URLs that will not be available when the site is copied over for offline use. This add-on copies all the linked files to a specific location on the target mobile device, and then revises appropriately all of the links within the HTML code. To the end user, it feels just like browsing the site online without any hint of the sophistication that makes it possible.

Extensive Action Configurations Each of the standard actions has its own particular set of configurable properties. Clients typically find that the flexibility granted by the standard actions lists and action properties allows them to easily accomplish 95% of file distribution tasks without requiring any custom scripting.

Non-Proprietary VB Script The library of standard actions can easily be extended with custom actions written in VB script. Beware of competitive products that use a proprietary scripting method, as this will drive up training and maintenance costs.

Availability Scheduling In order to control bandwidth consumption during peak hours, this add-on provides the ability to schedule publications for delivery during specific off-peak windows. Users synchronizing outside the administrator-defined window will not receive updates to these publications.

Dynamic Formulation of Groups Your organization may already be organizing users into groups using other tools. This add-on is open, and can take advantage of external data for group assignments. This is particularly useful where group assignments change frequently as part of normal business process.

API for Automating Subscriptions Likewise, you may have existing systems which dictate the file content that specific users are supposed to receive. You can still utilize the file sync add-on for its exceptional communications efficiency and reporting capabilities, while utilizing the subscription API for building links to external systems.

Parameterized Publications File sync publications can be parameterized for additional flexibility in bringing the right information to the right users. A common occurrence is creating a single parameterized publication that delivers all files in a particular directory, where the path name for the directory includes the user's

network login user name. This allows for totally customized delivery without requiring extensive publication maintenance.

Publication Prioritization Administrators can make sure that the most important files arrive first during the synchronization sessions using the publication prioritization feature. This is especially helpful when users are likely to have unreliable connectivity and/or not have time for full sync sessions. The most important document updates will be more likely to get through.

Bandwidth Sensitive Publication Availability Administrators can setup file publications to only download when an appropriate level of bandwidth is available. Thus a larger publication could wait for a high bandwidth connection before downloading.

Change Management

Change Manager This add-on includes a key component called Change Manager which runs on the server. It periodically scans the network file system and web servers for any changes to published files. The content owners do not need to do anything special to check in new or updated documents. The Change Manager will note the updates automatically, then prepare the files for transmission. A variety of pre-packaging techniques are used in advance to ensure that minimal processing takes place during the sync session, resulting in extremely efficient transmissions.

Byte-Level Differencing Many file updates are the result of small incremental changes. For example, one or two paragraphs in a 15 page standard contract may be updated by corporate counsel. The file sync add-on will compare the changed bytes between file versions, and send only these byte-level differences down to the client. So as an example, the changes for a 600 Kb document might only result in 15 Kb of data being transmitted.

Multi-Step Differencing If files change more frequently than a user synchronizes, then simple one step byte-level differencing is inadequate. This is because the differencing is only done from one version to the next, but if a user is several versions back, they would need to bring down the entire latest file. This add-on is unique in offering multi-step differencing, so that a new version of a file is compared to the last X versions for byte level differences, where X is configurable by the administrator.

Smart Differencing In some cases, enough changes to a file are made that byte-level differencing does not result in a significant bandwidth savings. In other words, the changes may turn out to be nearly as much data as the size of the new file. If the efficiency gain is minimal, this add-on will simply transmit the new file.

Advance Compression and Encryption The file sync add-on applies compression and encryption algorithms in advance as part of the file staging process. This further limits the amount of processing required during the sync session so that bandwidth is conserved and a single server can support a greatly increased number of concurrent users.

Document Transcoding for Palm The Palm OS platform does not offer the

ability to work with Microsoft Office documents. This add-on includes file viewers so that these files can be read on a Palm device. This add-on transcodes the source documents to the appropriate format in advance, so that the transcoded files are staged and ready to go.

Efficient Transport

Check-Point Restart Mobile communications can be unreliable with frequent line drops. This add-on uses check-point restart to minimize the impact of dropped lines. The server keeps track of the last acknowledged packet, and resumes transmission where it left off. For example, dropping a slow wireless connection after 90% of a 100K file update is transmitted does not require retransmission of the entire file. This has great usability implications and ensures more cost-efficient communications.

Bandwidth Throttling The term bandwidth throttling refers to the capability to set a maximum amount of bandwidth consumption per user per sync session. This controls connection timeframes and spreads out the impact of large file downloads. The file sync add-on will download parts of publications each time within the configurable limit, until the full file is assembled on the client ready for use. The system can also be setup to be sensitive to bandwidth consumption by other applications, and pull back on larger deliveries until greater bandwidth is available.

Rollback on Failure Real-world file publications can grow very complex with many steps and branching logic. When such a publication fails partway through the instruction set, you may want to rollback the initial steps. This add-on offers this capability for publications.

Offline File Application The file sync add-on further minimizes sync session lengths by applying file updates offline. This means that during the server connection, the staged file updates are transmitted. Only after the connection is ended are the updates uncompressed and unencrypted. Differenced files are then rebuilt, and the final product is moved onto the device's storage system.

Wireless Optimizations This add-on uses the Pylon Anywhere Mobile Gateway, a highly robust and efficient engine that manages communications between client and server components. The Pylon Anywhere Mobile Gateway uses an advanced message queuing architecture, packet optimization technology, and binary XML for extremely efficient communications over wireless networks.

Scalable Clustered Architecture This add-on supports a large number of concurrent users per server. It also supports clustered servers so that the solution can scale easily to accommodate the size of your user community and their connection concurrency.

Dynamic Load Balancing Within the server clusters, standard dynamic load balancing technologies can be applied to ensure processing demands are spread evenly for maximum performance. Competitive products assign users to specific servers for load balancing, locking out users when a specific server is down and potentially creating very uneven server loads.

Great User Experience

Effortless File Management The file sync add-on takes the effort out of receiving new information, figuring out where to file it, and cleaning out old versions. Users can spend more 'time on task' and waste less time organizing attachments. When a document is needed, there is no need to connect back to the Intranet, check for and download the latest version. Everything is up to date and readily accessible, regardless of the availability of a network connection.

File Healing The file sync add-on will even repair damaged or accidentally deleted files. At the next server connection, the required updates will be noted and performed. Users do not get held up searching for missing files or trying to recover lost data.

Easy Access Hyperlinks Users gain quick access to file and website deliveries via hyperlinks within the client software. Of course, the materials are also accessible outside of the Pylon Anywhere client via the device file system.

One Button Connect With the file sync add-on, the user can manually launch a synchronization session using the Pylon Anywhere client via a simple one-button connect. This initiates the network connection and starts the synchronization session. Many solutions overtax users with a multi-step sync process. One-button synchronization eases end user burden and increases the utility of the device.

Automatic Updates A variety of different update mechanisms are available to users to meet their changing needs. In addition to the user-initiated connection, this add-on also supports more automatic methods. The client software can be configured to wake-up periodically and initiate a connection on its own. The server can reach out and push a critical update to an addressable device on its own. And client-side APIs mean that the file update capabilities can be called from other applications and processes, including network login scripts.

Dual Sync Choices One very common situation is to have a handheld device switch back and forth between high speed cradle sync and a lower speed wireless connection. Instead of requiring the user to constantly switch their profile settings back and forth to accommodate, profiles support two different ways of synchronizing, called Sync and SyncXpress, each with its own settings. Users get a button for each sync method in the client.

Automatic Wireless Connection Management. When the Pylon Anywhere client synchronizes with the server, it first checks for an available network connection. If one is not found, a network connection is automatically initiated if possible. Most importantly, when the synchronization session is over, the client will automatically end the network connection. Less sophisticated solutions may not 'hang up' and thus may leave an expensive wireless connection open indefinitely.

Session Control The end user needs to have a view into the sync session as it happens, as well as having some basic controls. This add-on offers detailed status messages during the sync session and a cancel button to end the sync session if desired. The client software also includes a byte counter that is updated throughout the session. Users also have the ability to select the type of

information synchronized in a given session, including the ability to turn on or off optional publications based on expected sync time.

View Connection History The end user has access to the synchronization logs on their device. This is helpful for troubleshooting. For instance, if a wireless connection drops mid-sync, the Pylon Anywhere client will inform the user of the specific problem so that they know to just re-sync. Competitive products offer less useful generic updates such as 'Session Complete with Errors'. In this scenario, that approach would likely confuse the user and cause them to call into the helpdesk, increasing support costs unnecessarily.

Device Compatability The file sync add-on supports the broadest range of mobile devices, so that the right device for each user community can be utilized without compromise:

- ◆ Pocket PC, Pocket PC 2002 and Windows Mobile 2003 handhelds
- ◆ Pocket PC Phone Edition smartphones
- ◆ Microsoft Smartphone 2002/2003 devices
- ◆ Handheld PC, and other Windows CE devices
- ◆ Palm OS handhelds and smartphones

Multiple Connection Modes As today's mobile worker logs more and more time away from office LAN connections, multiple device connection modes need to be supported. The dual profile feature is especially valuable where users will switch frequently between connection methods. This add-on supports all of the following methods:

- ◆ Wireless public networks (GSM, GPRS, CDPD, TDMA, CDMA, etc.)
- ◆ Wireless LAN (i.e. 802.11)
- ◆ Ethernet Cradle
- ◆ PC Cradle (leveraging the PC network connection)
- ◆ Wireline modem
- ◆ Wireless phone attached to handheld
- ◆ Wireless infrared

Strong Management Tools

Single Integrated Administrative Console All administrative aspects of deploying and controlling the file sync add-on are managed through the Pylon Anywhere Admin Console, as are Pylon Anywhere's email/PIM capabilities, and Pylon Anywhere's systems management add-on. Competitive offerings typically require the use of multiple administrative consoles for the full infrastructure, or even for different aspects of a single product.

APIs for Client Components The file sync add-on includes the Pylon Anywhere client, an application for launching sync sessions. However, many

clients choose to embed the file sync capabilities within other applications and processes to provide a 'silent client' user experience. This add-on provides APIs to support this approach.

MMC Administration Pylon Anywhere features a Microsoft Management Console plug-in. This allows administrators to manage the core server attributes, the synchronization server software, and other common applications from the same admin console. In addition, it ensures a consistent and familiar look and feel to management tools. Web-based tools, an alternative approach, are generally less flexible and powerful, and more difficult to learn and use.

Remote Administration Basic but not to be forgotten, remote administration lets administrators manage the system while not physically located at the server.

Viewing Staged Files This add-on provides a view into all staged files so that administrators can look at the what is queued up to be sent out to device users. This includes the ability to inspect file differencing history which is helpful for troubleshooting. It is also useful for managing bandwidth by understanding the effects of differencing on specific publications.

Comprehensive Logging Detail The file sync add-on's detailed logging enables administrators to quickly and easily troubleshoot any problems end users are having. The logs can also be used for high level aggregate reporting to facilitate planning.

Flexible Logging Detail Level At certain times extremely detailed logging is beneficial, particularly during initial rollout or when environmental factors cause users to experience a high level of problems. During these times, administrators may wish to ramp up the level of system logging detail to facilitate troubleshooting. During more routine periods, the detail level could be turned down. There is always a bit of a trade-off between system performance and logging level, so this flexibility to meet changing needs is important. The file sync add-on provides this capability.

Log Data Stored in SQL Anywhere In addition to controlling the synchronization process, Pylon Anywhere allows administrators to track a variety of user behaviors and captures this data in a Sybase SQL Anywhere database. Storing log data in this manner enables hierarchical tree views of log data and also allows administrators to define custom reports using an included reporting tool called Interactive SQL.

Console-based Log Views Console-based log views are preferred to predefined report generation for day-to-day troubleshooting. The console approach makes viewing logs an integral part of defining system behavior and managing users, simplifying the process. Console-based log views also allow rapid drill down into specific log data to support troubleshooting. This add-on provides a wide variety of interactive log views from within the admin console. Logs can be sorted or filtered by a variety of factors including specific user, device, type of event or time period. Log views can be exported to MS Excel to be printed or used for further manipulation. Commonly used reports include a detail of delivery status by user for a specific publication, and also the ability to view the status of all publications subscribed to by a specific user.

Client Side Activity Logged at Server During sync sessions full client activity records are brought back to the server for central storage and viewing. This glimpse of the client side activity can be extremely helpful during debugging and providing helpdesk support.

Configurable Alert Delivery Administrators of this add-on have control over the frequency and delivery methods of administrative alerts. They can set threshold severity levels over what sort of errors trigger an alert. They can also choose the delivery mechanism for alerts, using SMTP email alerts to paging devices or mobile phones, and SNMP to route alerts into the network operations center.

Administrator Roles Often, an organization may have individuals responsible for different aspects of a Pylon Anywhere deployment. For this reason, Pylon Anywhere allows administrators to be defined with specific roles and permissions. Here, one administrator may have permission to modify profiles from the Pylon Anywhere Administration Console, while another administrator may only have permission to view log information.

Advanced User Management Administrators should be able to import user lists and user group assignments from existing directory services. This prevents duplicate administrative effort and decreases error potential. Pylon Anywhere offers a variety of integration options for user list management, as listed below. Multiple sources can be used simultaneously.

- ◆ Active Directory™
- ◆ iPlanet
- ◆ Any other LDAP-compliant source
- ◆ Windows NT® domains
- ◆ Text or other database sources

All user management is completely unified within the admin console regardless of the type or number of devices a user employs, or the directory services source the user comes from.

Flexible Security Options

Encryption Options The file sync add-on allows administrators to select the encryption options that best meets their needs for balancing level of security with communications efficiency. Administrators may assign different encryption options to different profiles. The following standard options are available:

- ◆ **SSL** Uses a secure socket connection to encrypt the data as it is transferred.
- ◆ **Triple DES** This FIPS 140-2 certified encryption offers 112-bit encryption strength using three 56-bit keys. It is a highly secure method, but can be inappropriate for very slow connections or mobile devices with limited processing power.
- ◆ **AES** This FIPS 140-2 certified encryption offers an advanced encryption method using 128-bit keys. It is optimized for wireless connectivity while

providing a highly secure connection. This is the most commonly selected encryption method.

- ◆ **No encryption** This option should only be used for devices which do not connect through the public Internet or that connect via other secure methods.

Pylon Anywhere administrators are given the flexibility to allow different groups of users to communicate using different protocols.

User Disablement Administrators are able to 'turn off' a specific user, user group, or device. For example, they may turn off the account of a stolen device so that no unauthorized persons are able to sync with company servers. Using Pylon Anywhere's systems management add-on, which is another available add-on to Pylon Anywhere, administrators have remote 'device kill' functionality as well.

Multiple Simultaneous Authentication Methods The selection of a user authentication option does not need to be a 'one size fits all' decision. This add-on supports the use of multiple methods to support different user communities running different applications. A given user can have only one authentication method, but different methods can be used from the same installation for different user groups.

Handheld VPN Support The file sync add-on is compatible with third party handheld VPN solutions such as Certicom's Movian product. This enables an additional layer of security and simplifies some network configuration issues.

Session-Based Key Exchange Each synchronization session generates new encryption keys to ensure security. If a malicious party manages to eavesdrop and somehow ascertain a session key, it will only be valid for that session. Given that synchronization sessions are typically short and frequent, it is difficult to compromise the encryption in a meaningful way.

Credential Expiration Options System administrators can prevent storage of network credentials on the device by forcing users to enter password each time they connect to the network to sync. To support more frequent synchronization including automatic synchronization, there is also an option to allow credentials to be stored for a configurable length of time. In this case, the actual user password is required during the first synchronization, and after successful connection the encrypted user credentials (but not the actual password) are stored on the device and considered valid by the server for a set length of time. This provides a flexible method to balance usability with extreme security.

Staged Files Encrypted This add-on packages changes at the server in an optimized file format. As part of an end-to-end security approach, the files are encrypted when stored at the server waiting for transmission.

Security Policy Enforcement The Pylon Anywhere systems management add-on can be deployed alongside the file sync add-on to enforce security policies such as power-on-password, number of failed password attempts, maximum number of 'no-sync' days allowable, and other settings.

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