The Mobile Application Server

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Funambol, Inc. - Director Professional Services
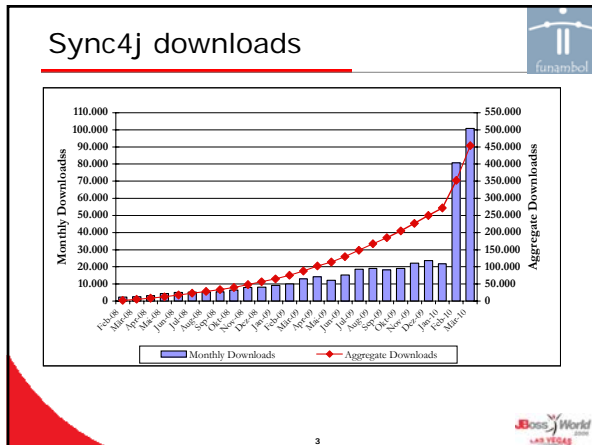http://funambol.com/opensource/presentations/
jboss-lasvegas.pdf

Introduction

- Sync4j; The mobile application server
- SyncML Technology
- Sync4j and Jboss
  - ✓ Real world applications
- Developing mobile applications
- Conclusion / Questions

Sync4j downloads

Sync4j Components

Contacts Calendar Email	Mobile Application Development	Application & Device Management

Mobile Application Server

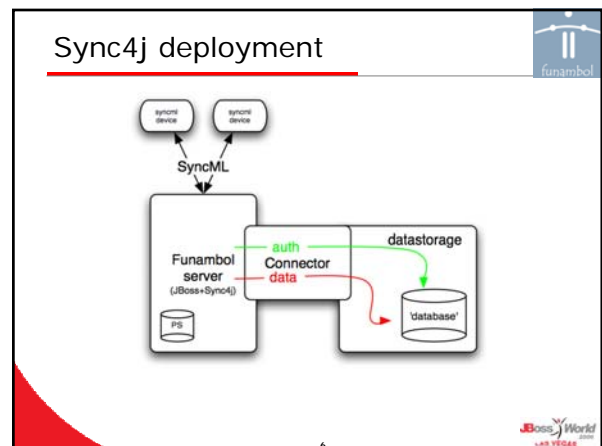
SyncML Technology

- SyncML Initiative started in 2000
  - ✓ Convergence of synchronization software
- Based on the concept of sharing changes
  - ✓ XML based messaging
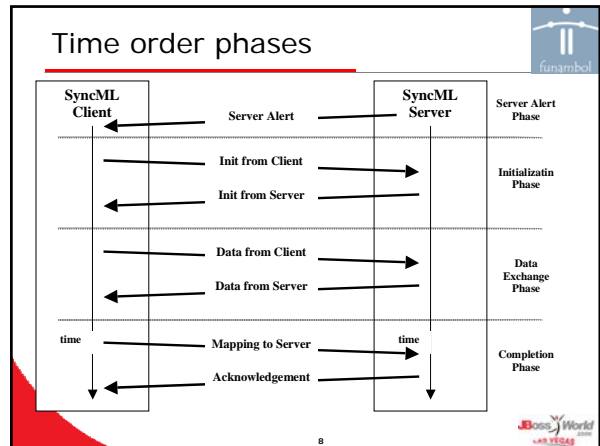 - ✓ All data types possible to synchronize

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Sync4j deployment

SyncML comm. phases

- Alert Phase
- Startup Phase
  - ✓ Authorization, Access Control, Sync Anchors
- Data Exchange Phase
  - ✓ Transfer of updates
- Completion Phase
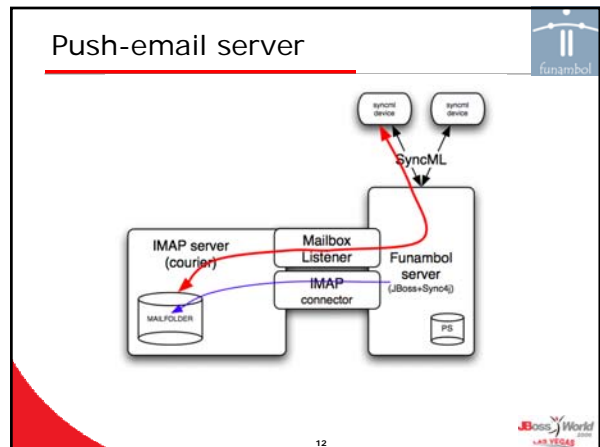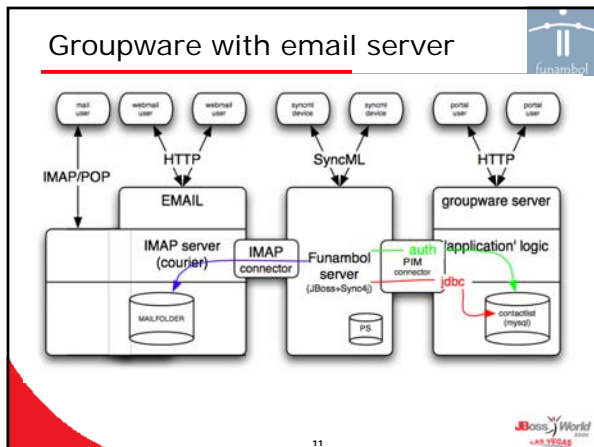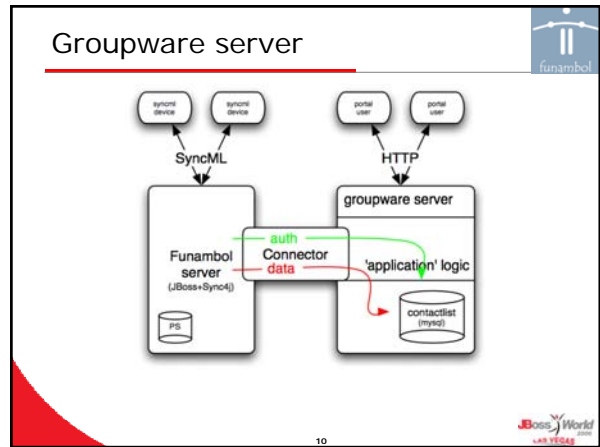 - ✓ Mapping, Sync Anchors

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Time order phases

Real world applications

- Groupware server (PIM)
  - ✓ Address book
  - ✓ Calendar
  - ✓ Tasks
  - ✓ Notes
- PUSH-Email
  - ✓ Email pushed on the mobile device
- Database synchronization

Groupware server

Groupware with email server

Push-email server

JBoss

- HTTP server
- Clustering
- Persistence
- Session Management
- DB Connection pooling
- Allows Sync4j to focus on SyncML

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Existing Connectors

- Exchange server
- Domino server
- Email (POP/IMAP)
- FileSystem
- DB to PIM
- SugarCRM
- LDAP
- DB

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Existing clients

- Mobile phones
- Outlook client
- Blackberry client
- iPod client
- Pocket PC client
- Palm client
- J2SE API
- J2ME API

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PIM reminders

- Memory
- Calendar application
  - ✓ Properties not supported
  - ✓ Small history
  - ✓ Small future
- For instance, text/vcard
  - ✓ Results in not supported properties
  - ✓ Differences in property encoding
  - ✓ Differences in property order

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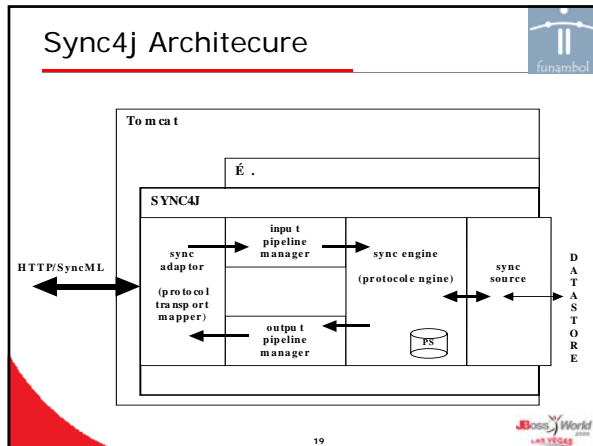
Case study: water application

- A utility services division of a Fortune 100 company.
- Sync4j is the foundation of its field force automation application using both PDAs and laptops.
- Sales reps and field service personnel use the Sync4j-based application to take measurements at customer sites, compare them with norms, check availability of inventory, place orders, and check order delivery status.
- Thanks to Oracle and SAP connectors, bi-directional synchronization and the C++ SDK.
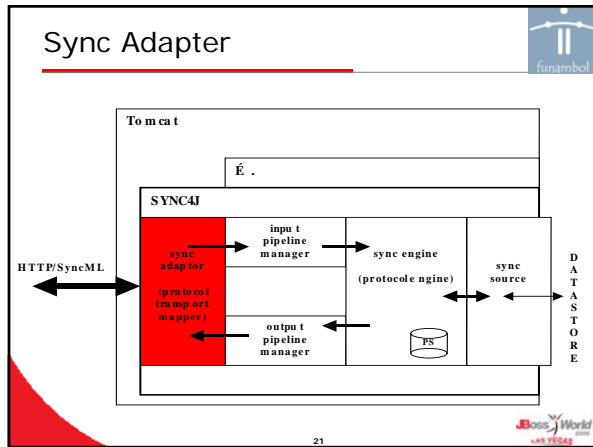
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Case study: phone backup

- Mobile operators
- Funambol mobile application server is the foundation of a phone backup system.
- Phone owners might loose their phone. It is not the device, but all the data is the most important loss.
- Thanks to PIM-to-DB connector phone data can be stored in a single server as backup.
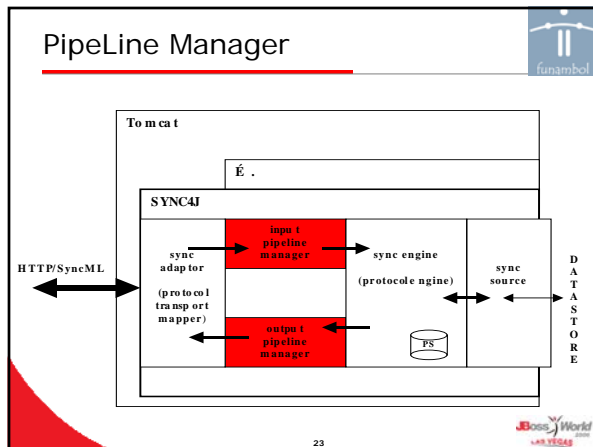
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Sync4j Architecure

Tomcat

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SYNC4J

HTTP/SyncML

sync adaptor (protocol transport mapper)

input pipeline manager

output pipeline manager

sync engine (protocole ngine)

sync source

PS

DATASTORE

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Sync4j APIs

- SyncAdaptor
  - ✓ Mime-type
    - · *application/vnd.syncml+xml*
    - · *application/vnd.syncml+wbxml*
- PipelineManager
  - ✓ Synclets
- SyncEngine
  - ✓ SyncStrategy
 - ✓ Authorization/Access Control
- SyncSource

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Sync Adapter

Tomcat

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SYNC4J

HTTP/SyncML

sync adaptor (protocol transport mapper)

input pipeline manager

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sync engine (protocole ngine)

sync source

PS

DATASTORE

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Sync4 Adaptor

- Conversion SyncML <=> internal representation
  - ✓ Mime-type
    - · *application/vnd.syncml+xml*
    - · *application/vnd.syncml+wbxml*
  - ✓ Tree-oriented internal representation

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PipeLine Manager

Tomcat

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SYNC4J

HTTP/SyncML

sync adaptor (protocol transport mapper)

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sync source

PS

DATASTORE

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Pipeline Manager

- Fixing message errors of known buggy devices
- Performing pre-engine checks in order to block incoming messages
- Logging of device capabilities devices in order to keep better track of them.

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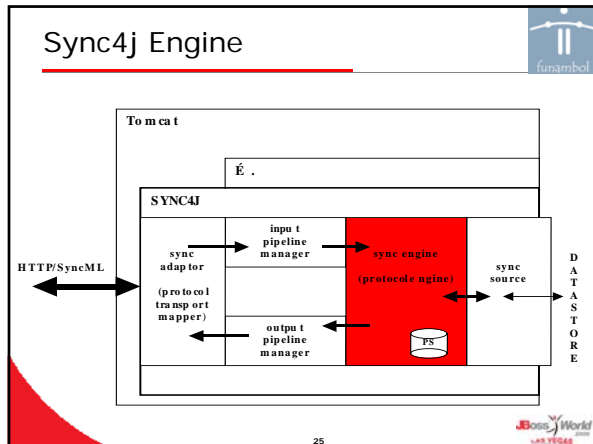
Sync4j Engine

Sync Engine

- The core of the Sync4j architecture
- Processing the changes and creates the update commands
- Conflict Resolution
- Authorization
- Access Control
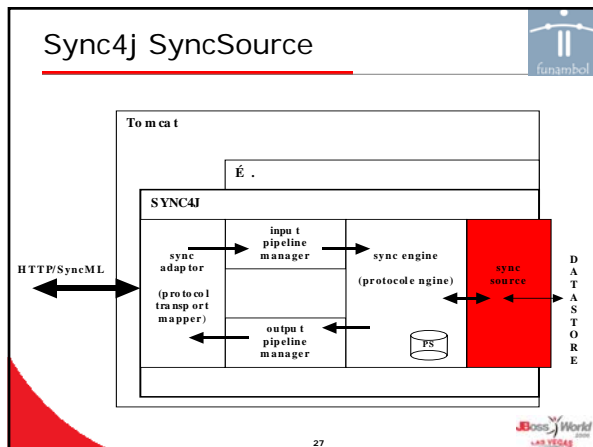
Sync4j SyncSource

SyncSource

- Connection to the data storage
- UNIQUELY identified by a URI
- Multiple might work on same data, but uses different formats on the server side
- Implements fast synchronization methods
- Implements slow synchronization methods

Server SyncSource (3.0)

- Implements fast synchronization methods
  - ✓ getAllSyncItemKeys
- Implements slow synchronization methods
  - ✓ getNewSyncItemKeys,
  - ✓ getUpdatedSyncItemKeys,
  - ✓ getDeletedSyncItemKeys
- Common:
  - ✓ getSyncItemFromId,
  - ✓ getSyncItemTwinKeys,
  - ✓ setSyncItem,
  - ✓ deleteSyncItem,
  - ✓ updateSyncItem

Developing mobile clients
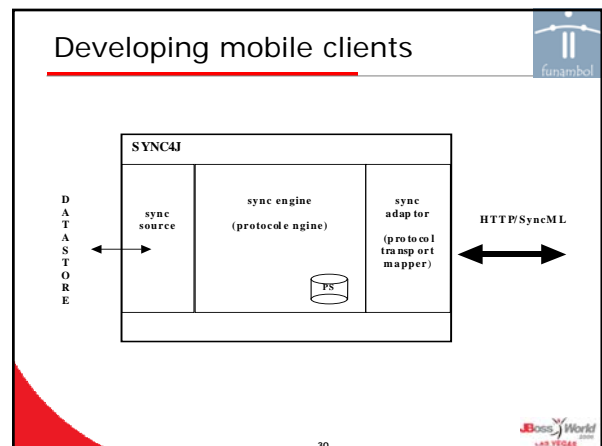
Sync4j Client APIs

- SyncAdaptor
  - ✓ Mime-type
    - · *application/vnd.syncml+xml*
    - · *application/vnd.syncml+wbxml*
- SyncSource

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Client SyncSource

- Connector for SyncML to the data storage
- Simialr, but not equal to a server SyncSource in order to safe resources
- Implements fast synchronization methods
  - ✓ getAllSyncItems,
  - ✓ getSyncItemTwin
- Implements slow synchronization methods
  - ✓ getNewSyncItems,
  - ✓ getUpdatedSyncItems,
  - ✓ getDeletedSyncItems,
  - ✓ setSyncItem,
  - ✓ deleteSyncItem

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Conclusions

- JBoss provides the HTTP framework and J2EE environment allowing code re-use, performance and scalability.
- Sync4j platform is a complete framework allowing you to focus on the mobile application
- Special care must be taken for the data types, but no limitation exist. The limitation is the mobile device.

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