



Greg Truty – Distinguished Engineer, IBM MobileFirst Chief Architect
gtruty@us.ibm.com

Mobile Application Development in Worklight



IBM is expanding our mobile portfolio with new capabilities

125+ patents for wireless inventions in 2012, bringing the total to 270

1H 2012



IBM acquired:
IBM Worklight

IBM INTERACTIVE

Named leader in
interactive design

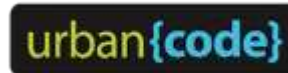


IBM acquired:
Emptoris Rivermine Telecom Expense
Management



IBM announced:
IBM Endpoint Manager for
mobile devices

1H 2013



IBM acquired:
Urban Code DevOps Platform



Worklight named 'Best Mobile
Development Solution'



IBM announced:
IBM MessageSight



IBM announced:
IBM MobileFirst

developerWorks Labs

IBM announced:
IBM mobile cloud services



IBM acquired:
Tealeaf CX Mobile



IBM announced:
Managed Mobility and MAPM Services



IBM announced:
IBM Security Access
Manager for Cloud
and Mobile



IBM announced:
IBM Connections Mobile

2H 2012

IBM MobileFirst Offering Portfolio



IBM MobileFirst Offering Portfolio



IBM Worklight: A mobile application platform

Speeding the development, integration and management of mobile applications and infrastructure

Accelerate Development

- Web, hybrid, and native development: open, flexible, standard-based, multi-screen/omni-channel
- Functional testing
- Development lifecycle tools and integration

Facilitate App Security and Trust

- Server-enforced authentication
- App authenticity and user-app-device binding
- Secure and syncable on-device storage
- App version enforcement

Enable User Engagement

- Unified push and SMS notifications
- Geolocation and context collections and intelligence
- Mobile-friendly integration

Support Mobile Analytics

- Efficient acquisition of analytics data
- Development, operational, and business analytics
- Offline and online event management integration

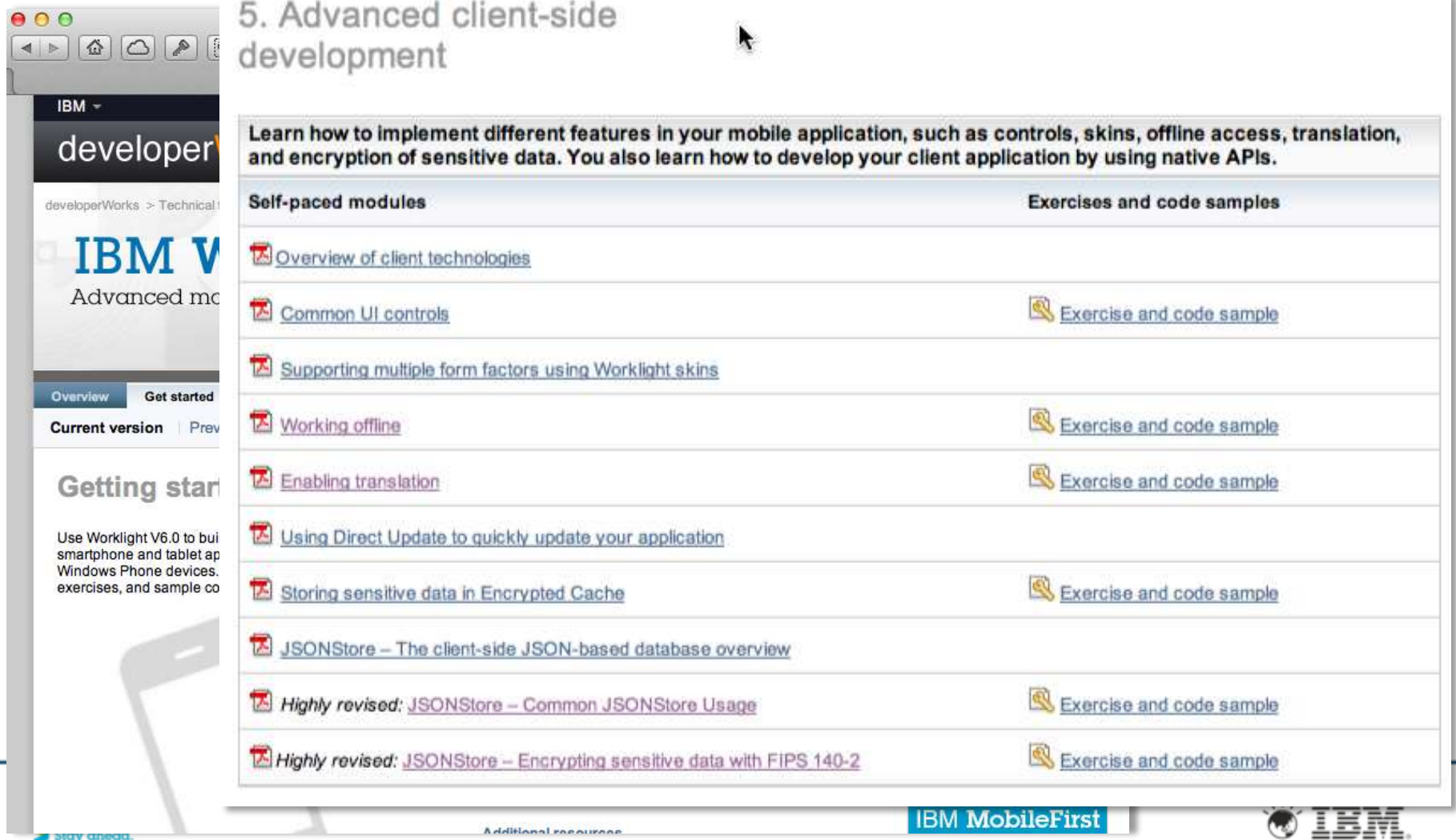


"Best Mobile Development Solution"
voted by SIIA members, 2013 CODiE Awards



Worklight Getting Started guides are available...

















<http://www.ibm.com/developerworks/mobile/worklight/getting-started.html>




The screenshot shows a browser window displaying the IBM DeveloperWorks website. The page title is "5. Advanced client-side development". Below the title, there is a summary paragraph: "Learn how to implement different features in your mobile application, such as controls, skins, offline access, translation, and encryption of sensitive data. You also learn how to develop your client application by using native APIs." The main content is a table with two columns: "Self-paced modules" and "Exercises and code samples". The table lists several modules, each with a corresponding exercise and code sample link. The modules include: "Overview of client technologies", "Common UI controls", "Supporting multiple form factors using Worklight skins", "Working offline", "Enabling translation", "Using Direct Update to quickly update your application", "Storing sensitive data in Encrypted Cache", "JSONStore – The client-side JSON-based database overview", "Highly revised: JSONStore – Common JSONStore Usage", and "Highly revised: JSONStore – Encrypting sensitive data with FIPS 140-2".

5. Advanced client-side development

Learn how to implement different features in your mobile application, such as controls, skins, offline access, translation, and encryption of sensitive data. You also learn how to develop your client application by using native APIs.

Self-paced modules	Exercises and code samples
 Overview of client technologies	
 Common UI controls	 Exercise and code sample
 Supporting multiple form factors using Worklight skins	
 Working offline	 Exercise and code sample
 Enabling translation	 Exercise and code sample
 Using Direct Update to quickly update your application	
 Storing sensitive data in Encrypted Cache	 Exercise and code sample
 JSONStore – The client-side JSON-based database overview	
 Highly revised: JSONStore – Common JSONStore Usage	 Exercise and code sample
 Highly revised: JSONStore – Encrypting sensitive data with FIPS 140-2	 Exercise and code sample

IBM MobileFirst



IBM Worklight: An Overview



Studio

Leading tools for cross-platform hybrid development that maximize code reuse and enable per-device optimization



Operational console

Operational management for deployments, version enforcement, and infrastructure access. Operational analytics provide real-time insight into application usage



Application center

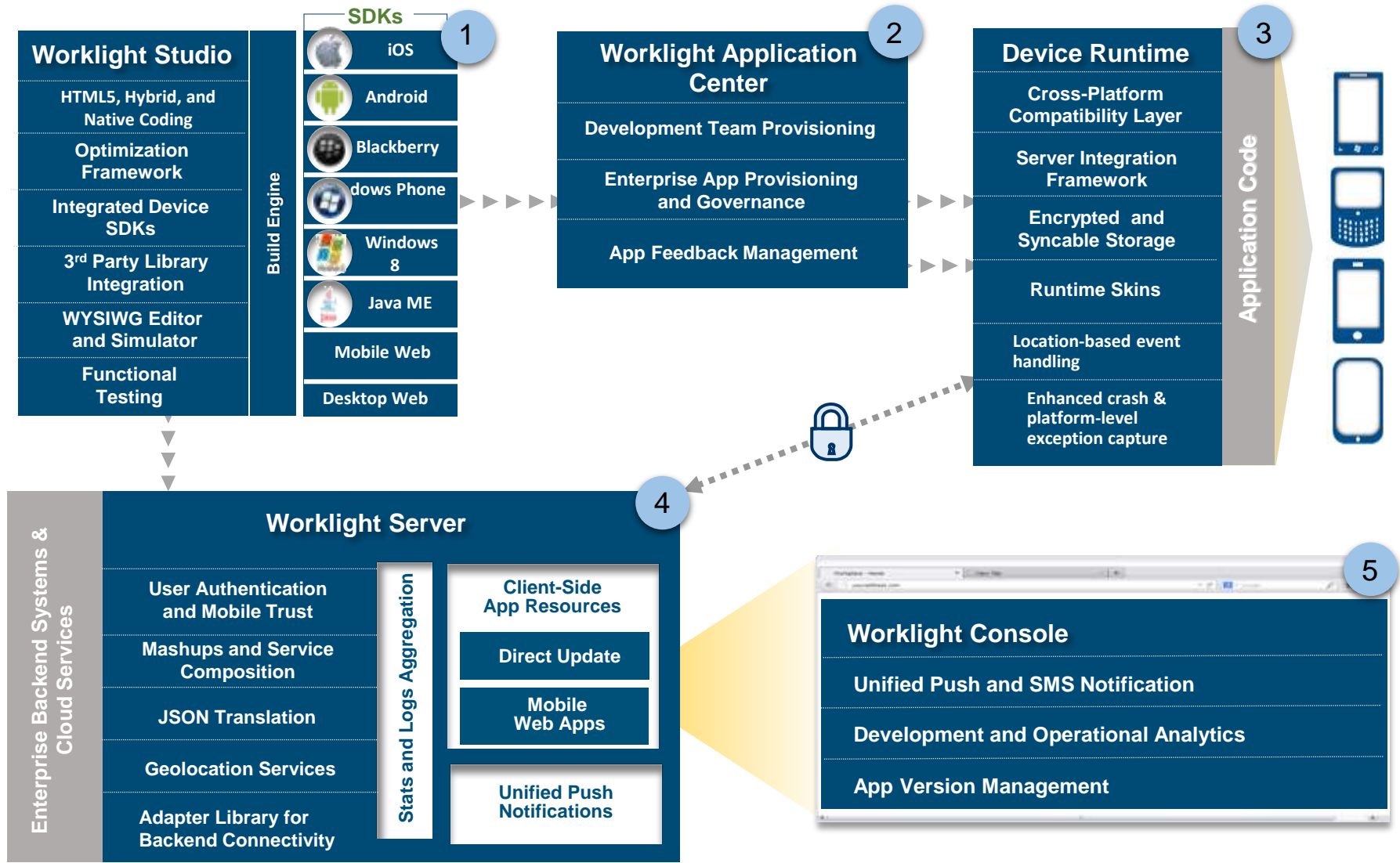
A cross-platform private mobile application store focused on the needs of a development organization or a team



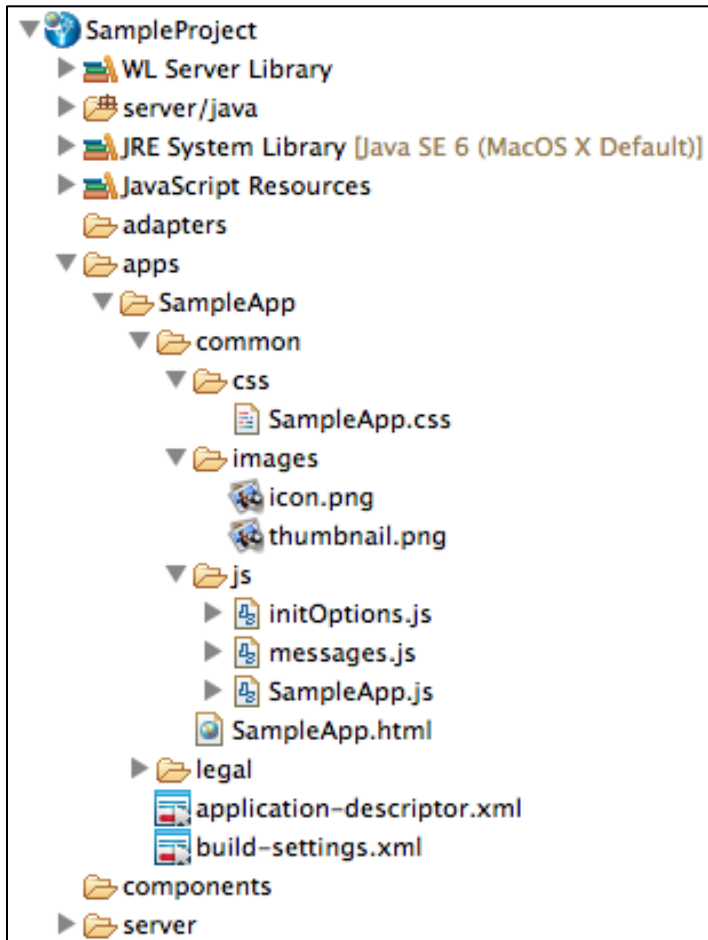
Application runtime

Cross-platform services for the mobile channel (including client and server components). Client APIs available for both pure **native** as well as **hybrid** development

IBM Worklight Components Overview



Worklight Studio – Common Code Structure



common resources serve as the basis for the optimized environments that may be added later.

- hold resources that are shared by all environments.

Library directories store Worklight and 3rd party library files for the project

js (JavaScript files)

- **initOptions.js** – initialization tasks
- **messages.js** – internationalization
- **SampleApp.js** – application code

SampleApp.html file is initially configured as main file

application-descriptor.xml

- contains reference to "mainfile"
- enable authentication (onDemand, onStartup)
- environment specific references

Worklight Studio - Environment Optimization

Create folders for:

Mobile

- iPhone
- iPad
- Android phones and tablets
- BlackBerry 6 and 7
- BlackBerry 10
- Windows Phone 7.5
- Windows Phone 8

Desktop

- Windows 8 desktop and tablets
- Adobe AIR

Web

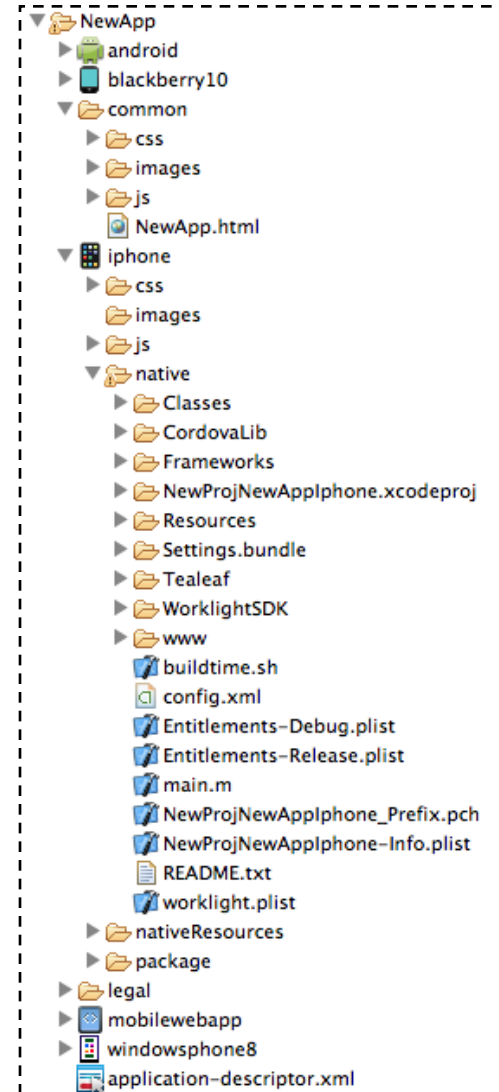
- Mobile web app
- Desktop Browser web page

JavaScript from an environment folder is appended to the same file in the common folder

CSS files from an environment folder will be appended to the CSS files in the common folder

HTML files from an environment folder will override files in the common folder

images from an environment folder will override files in the common folder



Integrated build and deploy with native tools

The image illustrates the process of building and deploying a mobile application using native tools. It features a screenshot of the Eclipse IDE with the 'Run As' context menu open over a project. The menu options include '1 Build All and Deploy', '2 Build Environment and Deploy', '3 Preview', '4 Preview...', and '5 Xcode project'. A blue arrow points from the 'Xcode project' option to the right. In the background, an iPhone 4.3 simulator is running the application, and a physical smartphone displays the same application. The application interface includes a 'Worklight' logo, navigation tabs for 'Welcome', 'Information', and 'About Us', and a main content area with the text: 'Welcome to IMPACT', 'This is a demonstration to showcase the flexibility of IBM Worklight v5.0', and 'We hope you enjoy it. Check us out at <http://www.worklight.com>'.

Edit within Worklight Studio

The screenshot displays the IBM Worklight Studio interface for editing a mobile application. The main workspace is split into three panels:

- Project Explorer (Left):** Shows the project structure for 'FlightTicket.html', including folders for 'apps', 'android', 'common', 'css', 'images', 'js', 'views', and 'iphone'.
- Design View (Center-Left):** Shows a mobile application design for a login page. It features a blue header with 'Login' and 'Sign up' buttons. Below is a text input field with the value 'demo', a 'Login' button, and three social media login buttons: 'Log in with Welbo', 'Log in with Facebook', and 'Log in with Twitter'. A dashed box indicates the current selection.
- Source View (Center-Right):** Shows the HTML and CSS code for the selected element. The code includes a meta tag for the viewport, a title, and various links to CSS files. The body contains a fieldset with a text input (value 'demo') and a password input (value 'demo').
- Palette (Right):** Lists various UI widgets available for use, including Button, Checkbox, Collapsible, Collapsible Set, Content, Control Group, Dialog, Field Container, Footer, Form, Grid, Header, Label, Link, List View, List View Item, NavBar, Page, Popup, Radio Button, Search Input, Select Menu, Slider, Text Area, Text Input, and Toggle Switch.

At the bottom of the Design view, there are tabs for 'Design', 'Source', and 'Split'.

Screen Patterns Based on Re-usable Mobile Patterns

40+ out-of-the-box common screen patterns:

- Authentication
- Configuration
- Lists
- Navigation and Search

Live preview using the underlying jQuery Mobile and Dojo Mobile widget libraries

The screenshot shows a mobile UI pattern selection interface. At the top, there are three radio buttons: "Create empty view", "Create view from UI pattern" (which is selected), and "Create view in an external page fragment". Below this, there are two main sections: "Categories" and "Patterns". The "Categories" section has a list with four items: "Authentication", "Configuration" (highlighted in blue), "Lists", and "Navigation and Search". The "Patterns" section shows a preview of a "Settings" screen in "Portrait" orientation. The "Settings" screen has a dark header with the title "Settings" and a list of settings: "Language" (English), "Volume Level" (High), "Button Color" (Blue), "Background Color" (White), and "Cache Size" (100 KB). At the bottom left, there is a checkbox labeled "Create view in an external page fragment".

This collage displays several mobile UI patterns. At the top left, there is a "Reset Password" form with an "Email" input field and a "Reset Password" button. To its right is an "Options Group A" with four toggle switches, all currently turned "ON". Below the "Reset Password" form is a "Settings" screen with a dark header and a list of settings: "Language" (English), "Volume Level", "Button Color", and "Background Color". To the right of the "Settings" screen is an "Editable List" with a dark header, a plus icon, and an "Edit" button, containing two items: "Item 1" and "Item 2". At the bottom left, there is a "Heading" screen with a dark header and a list of pages: "Page 1", "Page 2", and "Page 3". To its right is a grid of six pages: "Page 1", "Page 2", "Page 3" in the top row, and "Page 4", "Page 5", "Page 6" in the bottom row. At the bottom right, there is a "Product List" with four items: "Product 1", "Product 2", "Product 3", and "Product 4", each with "Price:" and "Unit Price:" labels and a plus icon.

Worklight Studio - Runtime Skins

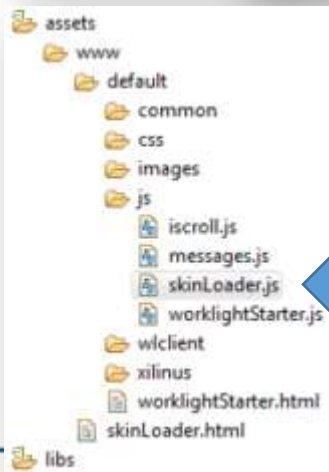


Skins provide support for multiple form factors in a single executable file for devices of the same OS family.

- Different screen sizes
- Different screen densities
- Different input methods

Skins are a sub-variant of an environment packaged in a single app

Decision on which skin to use is done by app at runtime



Developer-controlled JavaScript file run at app startup determines which skin to load

```
function getSkinName() {  
    var skinName = "default";  
    if (getVersion () == "2.2" ||  
        getVersion () == "2.1") {  
        skinName = "android.HTML5";  
    }  
    return skinName;  
}
```

```
<android>  
  <skins>  
    <skin name="default">  
      <folder name="common"/>  
      <folder name="android"/>  
    </skin>  
    <skin name="android.phone">  
      <folder name="common"/>  
      <folder name="android"/>  
      <folder name="android.phone"/>  
    </skin>  
    <skin name="android.tablet">  
      <folder name="common"/>  
      <folder name="android"/>  
      <folder name="android.tablet"/>  
    </skin>  
  </skins>  
</android>
```

Mobile Browser Simulator

Perform device-specific tests utilizing the Cordova and Worklight client API's

Mobile Browser Simulator

The Mobile Browser Simulator displays mobile web pages in a variety of mobile browser sizes and shapes.

The screenshot displays the Mobile Browser Simulator interface. At the top, there is a toolbar with the following elements: a URL bar showing 'http://192.168.0.197:10080/module_60_4_FlightTicket/apps/services/pr...', a 'Go' button, an 'Add Device' dropdown, a 'Scale All Devices' dropdown set to '100%', an 'Enable UserAgent Switching' checkbox, and a 'Simulate Device API' checkbox. Below the toolbar is a sidebar on the left with the following sections:

- Cordova**
 - Device
 - Events
 - Accelerometer
 - Battery
 - Plugged In:
 - Battery Level: 90 %
 - A slider ranging from 0% to 100%.
 - Camera
 - Capture
 - Compass
 - Heading: 331.896
 - A compass graphic showing a heading of 332.
 - Buttons: 'Next', 'Start', 'Generate Error'
 - Contacts
 - File
 - Geolocation
 - Network

The main area of the simulator shows two simulated mobile devices side-by-side:

- Apple iPhone 4:** Displays a login page with a 'demo' text input, a password input (masked with '****'), a blue 'Login' button, and three social login buttons: 'Log in with Weibo', 'Log in with Facebook', and 'Log in with Twitter'.
- Apple iPhone 5:** Displays the same login page, but the layout is scaled to fit the larger screen of the iPhone 5.

Centralized Build

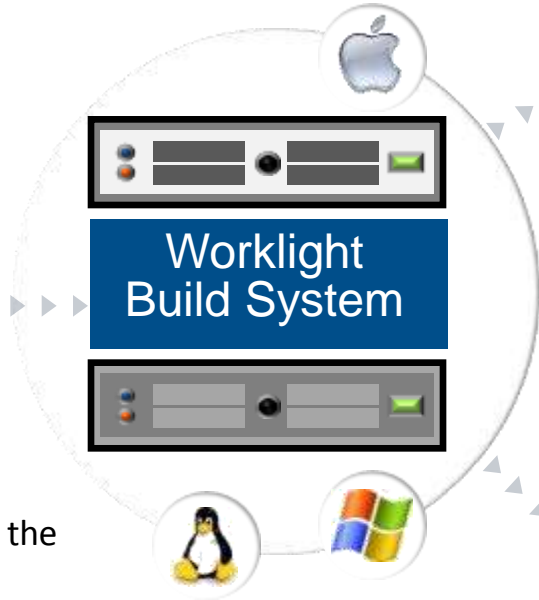
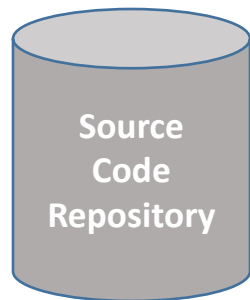
1. Create an Worklight project and application in Eclipse via Worklight Studio

2. Add a mobile environment of your choosing

3. Add app content

4. Build and deploy it to the Worklight Server

5. Use the specific environment tools to deploy to the device

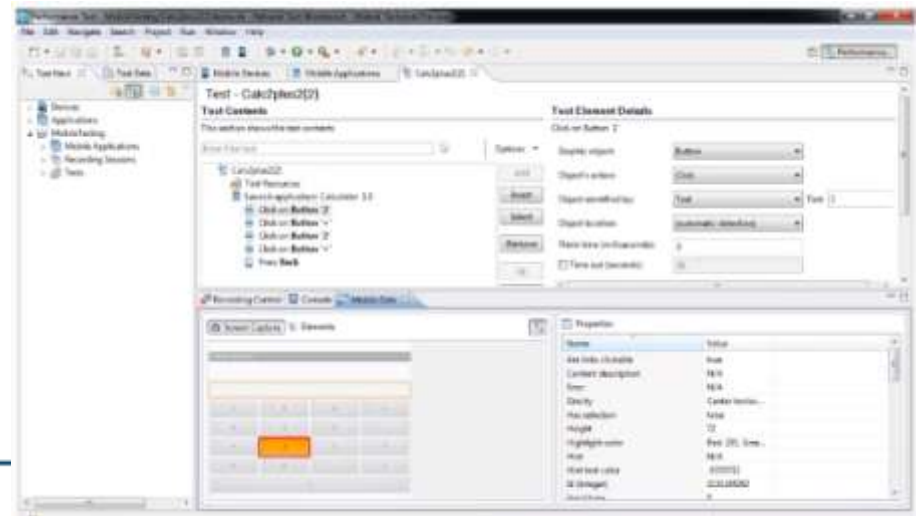


Mobile Functional Test Tools

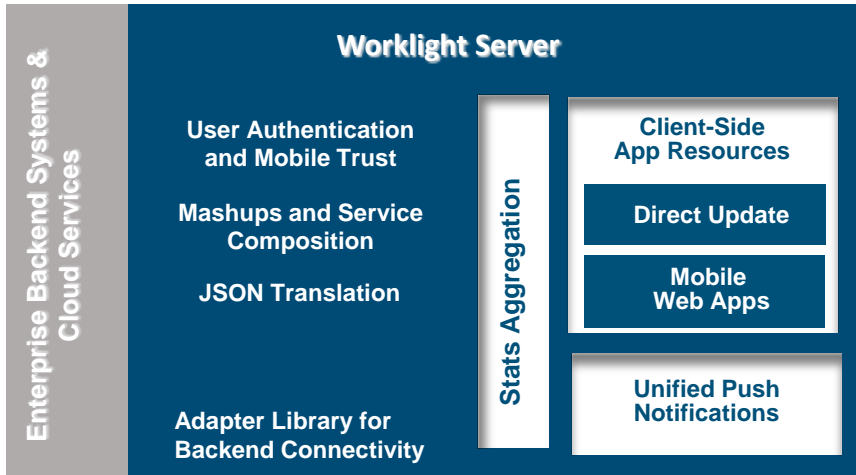
- Create, run, and automate tests on mobile applications
- Improve quality and time-to-value with industry-first app testing
 - Create resilient and code-less test cases
 - Record once, play back on multiple devices
- Standardized, eclipse based
- Comprehensive – Android and iOS, Native and hybrid
- Complete – Recording, editing, and running on mobile devices
- Resilient – Same test runs across multiple devices
- Also for non-developers – Scripts in natural language description

Deliver consistently
high quality across
your mobile app portfolio.

New in
Worklight 6.0



Worklight Server



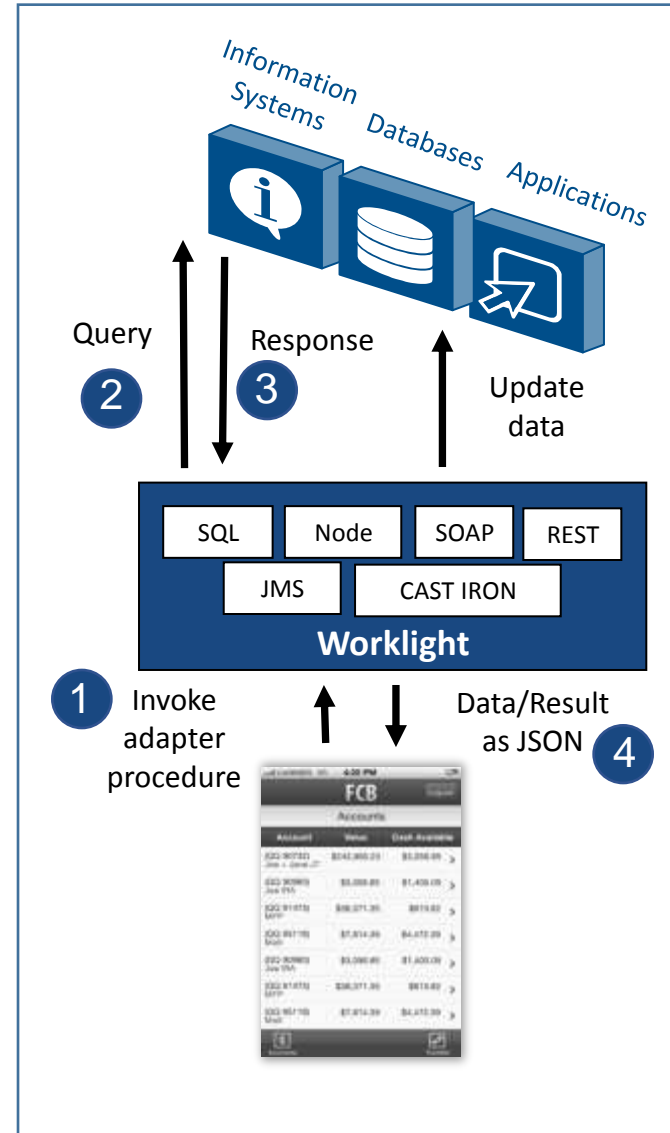
- Adapters with support for SOAP, REST, SQL, JMS, IBM Cast Iron, and Node.js (preview in 6.0)
- Performs Data Transformation to streamline back-end data for mobile consumption
- Server and device Security control
- Supports Physical Clustering for high availability
- Controls Application Deployment and Versioning
- Push Notification administration
- Analytics including user adoption, usage data, app crash and exceptions

The screenshot shows the "MyFeeds" management interface. It displays two application versions: "Version 1.1" (Active) and "Version 1.0" (Disabled). The "Version 1.1" entry has a notification text field containing "Upgrade to version 1.1" and a URL to the app store. Below the interface is a table titled "Active User Report" showing the number of active users over time.

Date	# of Users
10-Apr-2012	56
9-Apr-2012	2
8-Apr-2012	2
7-Apr-2012	3
6-Apr-2012	7
5-Apr-2012	11
29-Mar-2012	3
28-Mar-2012	1
27-Mar-2012	2
26-Mar-2012	1
25-Mar-2012	1
20-Mar-2012	6
21-Mar-2012	2
20-Mar-2012	1
14-Mar-2012	3
13-Mar-2012	10
12-Mar-2012	11
9-Mar-2012	1

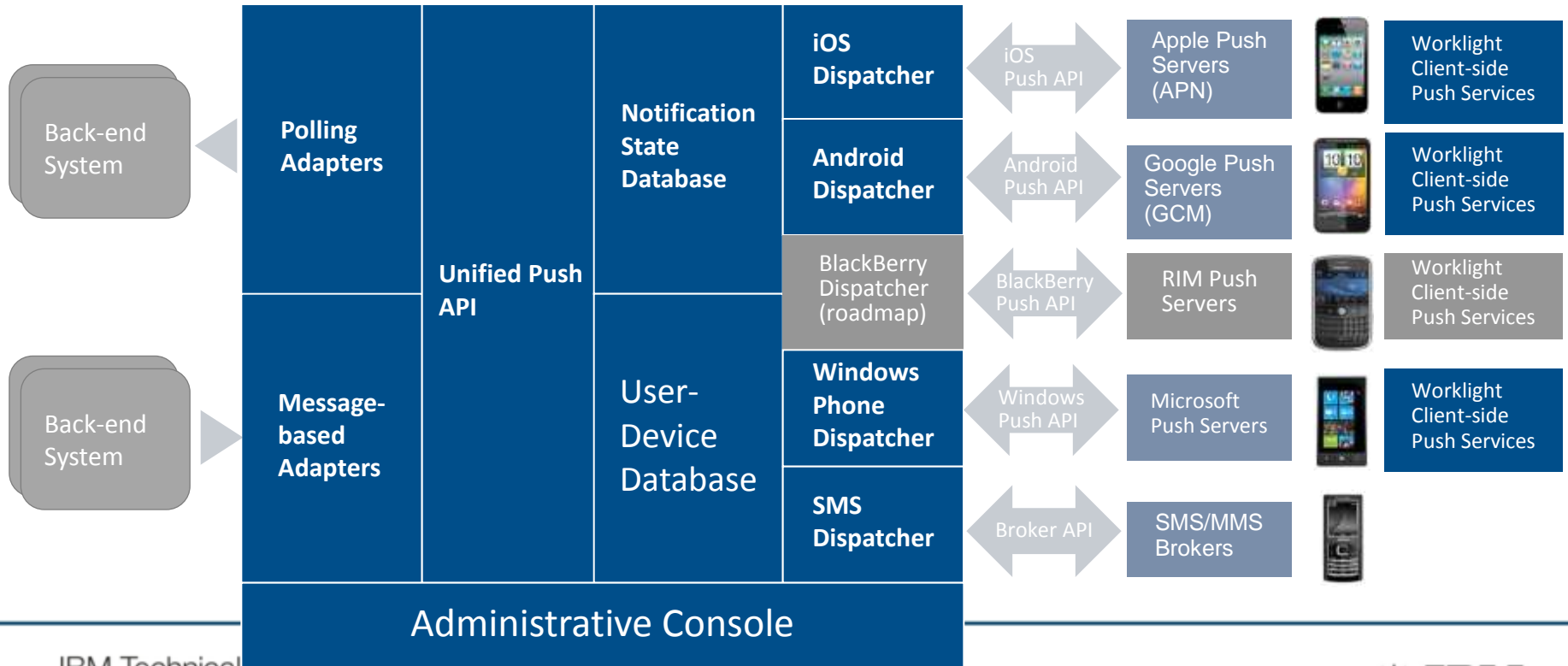
Worklight Server: Adapters

- Simplicity and Rapid Development
 - Defined using simple XML syntax, and easily configure with JavaScript API
- Security
 - Use of flexible authentication facilities to create connections with back-end systems
 - Adapters offer control over the identity of the connected user
- Transparency
 - Data retrieved from back-end applications is exposed in a uniform manner regardless of the adapter type
- Read-only as well as Transactional Capabilities
 - Adapters support read-only and transactional access modes to back-end systems



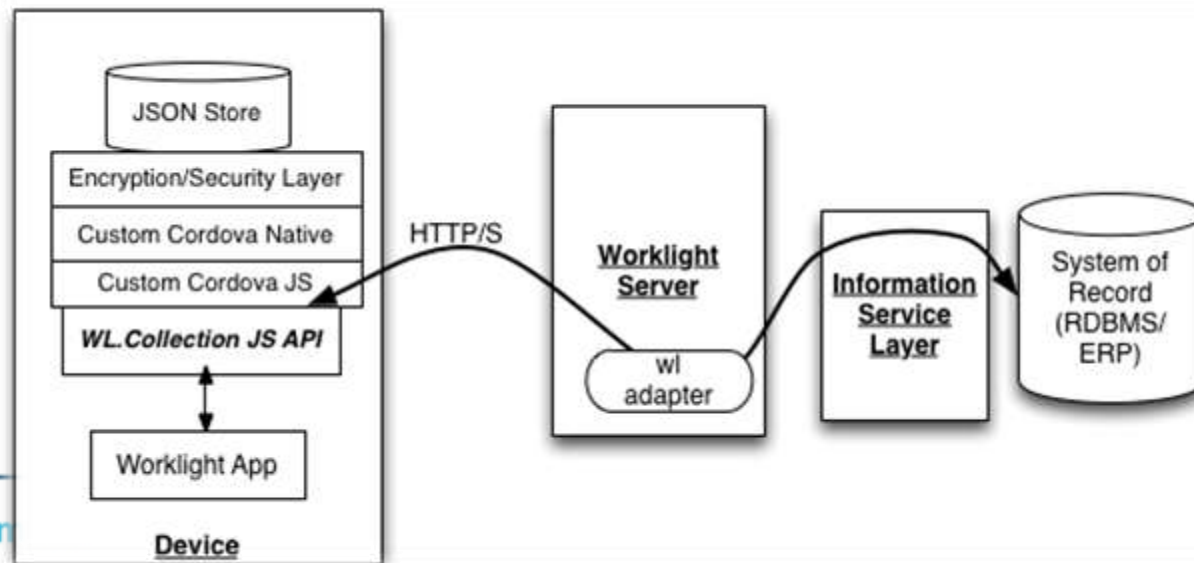
Unified Push Notifications

- Uniform access to push notifications providers
 - Register for, Notify and Receive a notification
- Register for and Send SMS based notifications
 - E.g., for JME



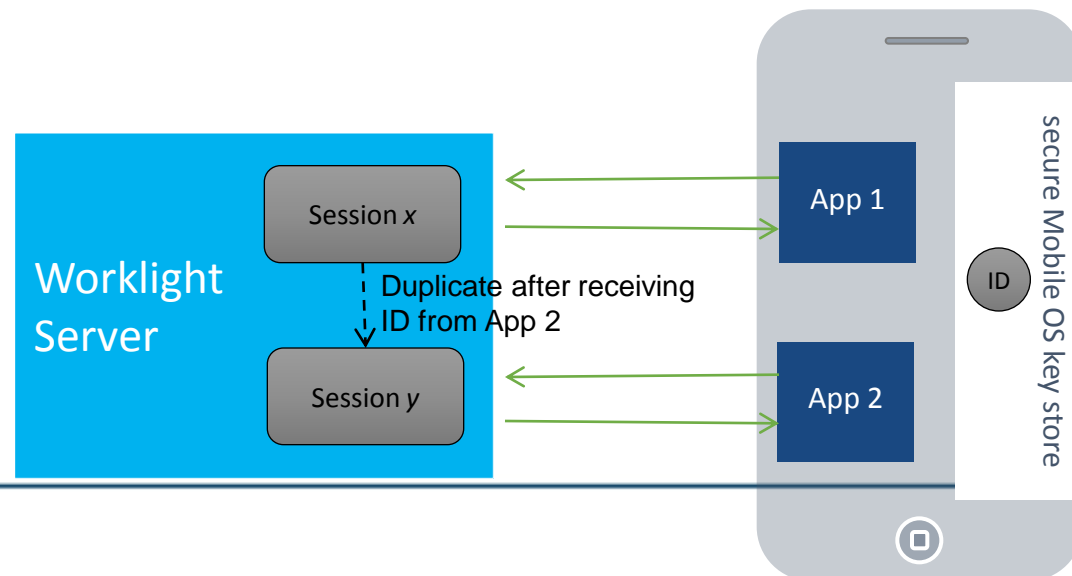
Mobile Data support

- **On-device, mobile database support:**
 - Embedded JSON mobile database
 - JavaScript APIs to store, query and update the data in offline mode using MongoDB like APIs
- **Encrypt sensitive data:** Using a key provided by developer or obtained as user's password
- **Server-to-client Sync:** Retrieve, store and keep data store up-to-date using adapters
- **Client-to-server Sync:** Simplify write actions on data while the app is offline and send these actions to the server



Device Single Sign-On (SSO)

- Device SSO Capability:
 - Device-side SSO enables a mobile user to authenticate him/her-self once and gain access to all apps from the same developer without being prompted to log in again at each of them
- Device SSO implementation:
 - Implemented using combination of server-side capabilities (realms) and unique device identification (device ID)
 - On successful login the authentication state is saved in the database and used for validations in subsequent sessions from the same device.



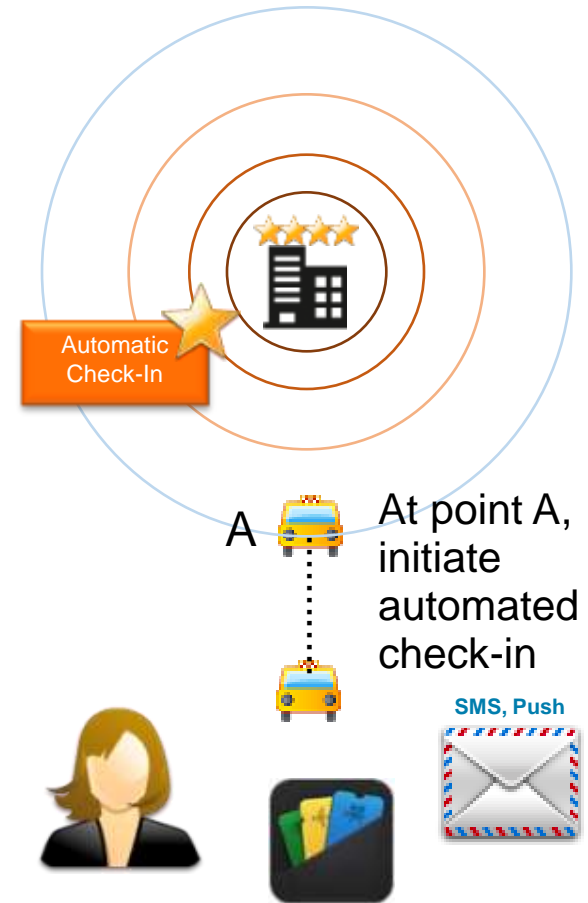
Transform business processes with geo-location

■ Challenges of geo-location

- Multiple geo modalities—Requires both GPS and WiFi sampling and interpolation
- Resource intensive –Continuous polling strains network and battery resources
- Enterprise integration – Meaningful action requires context from back-end systems

■ New toolkit makes geo-location practical

- Efficiently collect geo-location data (both GPS and WiFi)
- Set policies for acquiring geo data and sending it in batch
- Trigger business actions when user reaches a point of interest, or enters/exits a region
- Server-side logic enables meaningful reaction to important geo events



Example: Geo-enriched hotel check-in experience

Geo-Services features

- **Client-side**

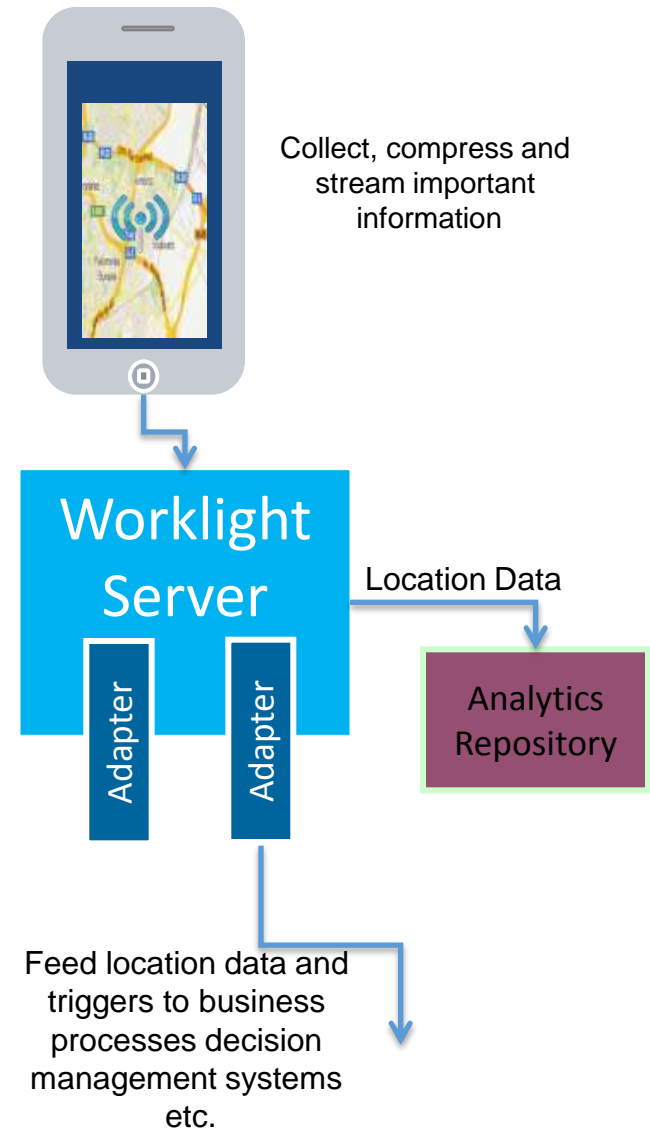
- Efficient sampling of GPS, cell triangulation, and WiFi
- Works for foreground, background and off-line apps
- Policy-based, batch data collection, compression and transfer for minimized battery and network usage
- Rich APIs for developer full control

- **Generated events:**

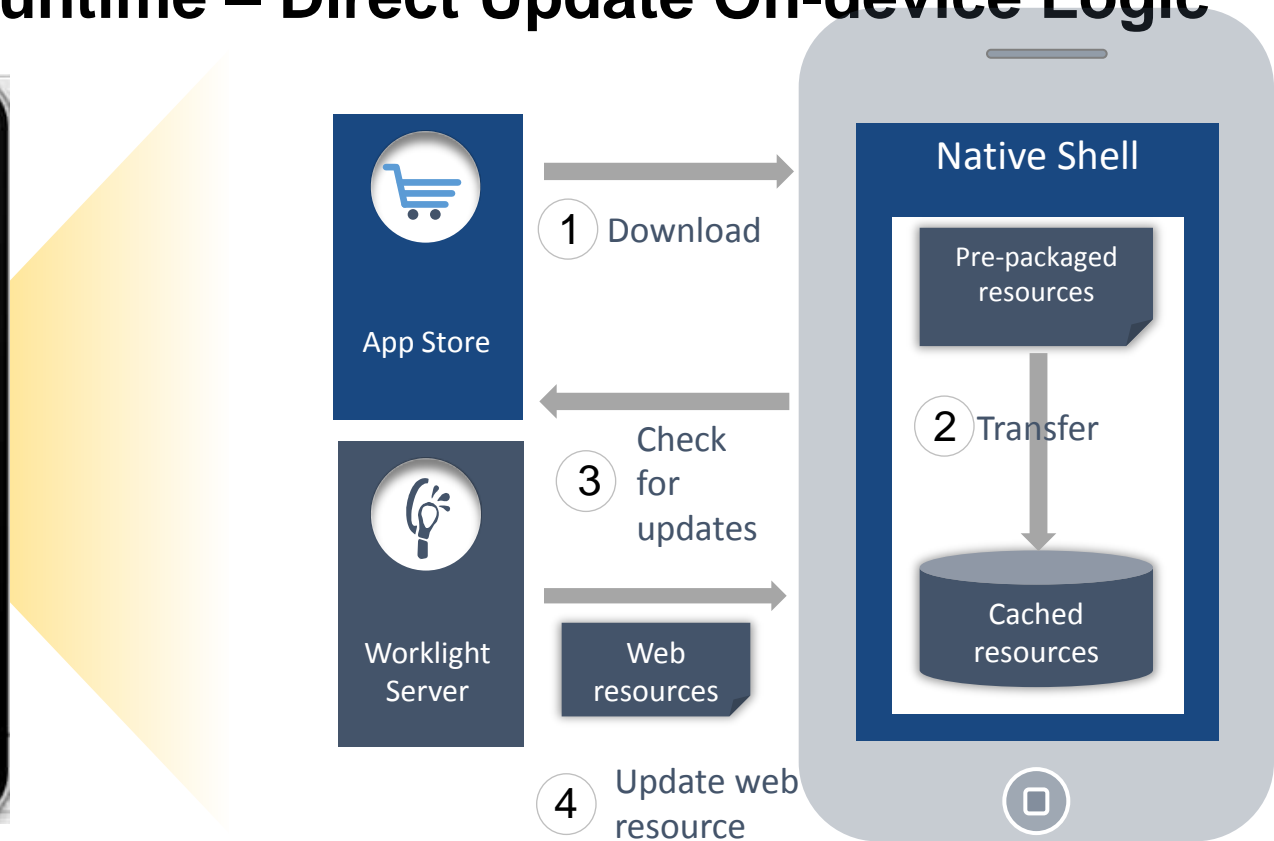
- Proximity to point of interest
- Entering, leaving a geo-fence

- **Server side maintains live context:**

- Reaction to important geo events
- Other business data enrichment
- Context information integration with business processes
- Storage for analytics



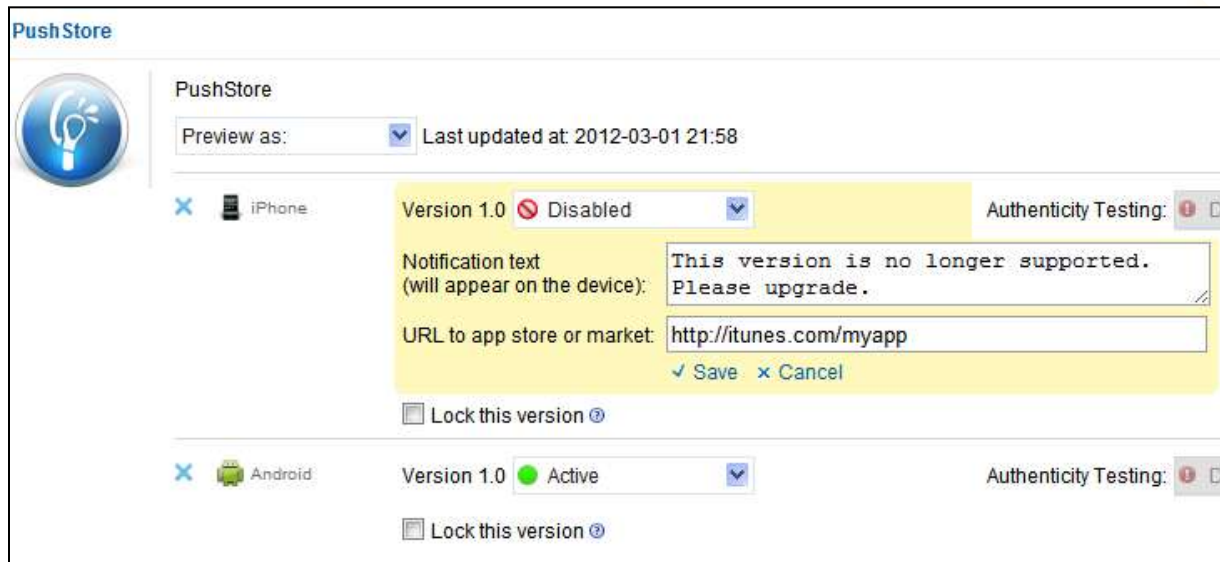
Worklight Runtime – Direct Update On-device Logic



1. Web resources packaged with app to ensure initial offline availability
2. Web resources transferred to app's cache storage
3. App checks for updates on startup and foreground events
4. Updated web resources downloaded when necessary, with user confirmation or silently

Disable Applications

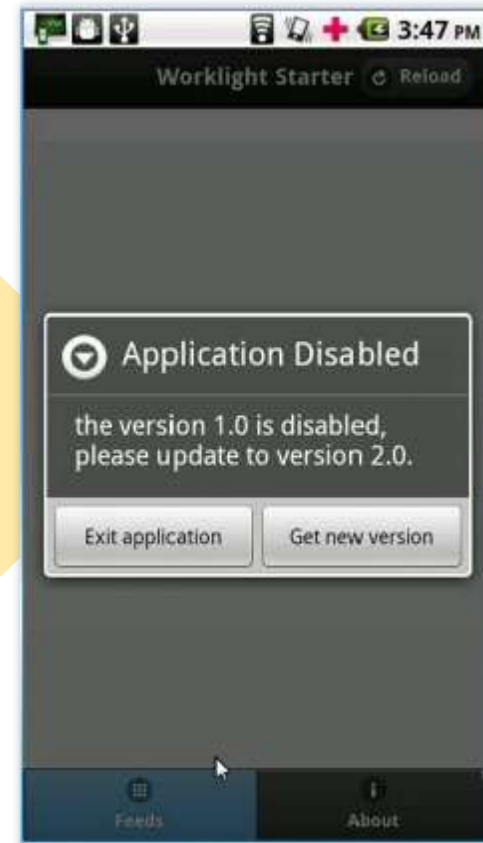
- **Remote Disable:** Deny access to an app of a specific version on a specific environment
 - Ensure users use the latest security fixes
 - Avoid using previously installed old versions that are no longer supported



The screenshot shows the 'PushStore' management interface. It features a 'PushStore' header with a lightbulb icon and a 'Preview as:' dropdown menu. Below this, there are two sections for different platforms:

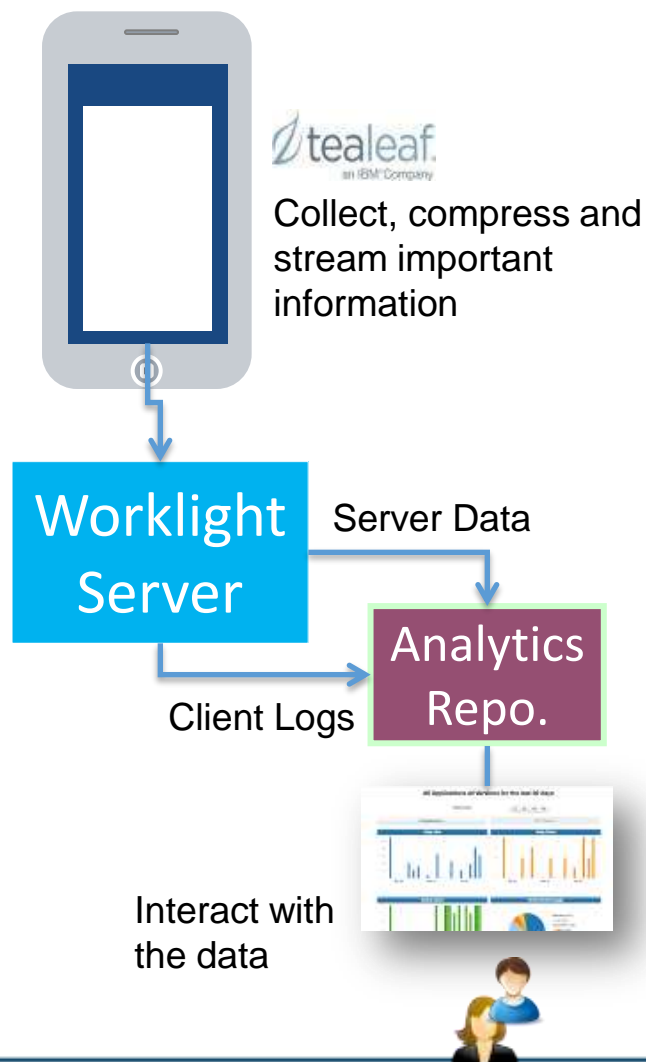
- iPhone:** Shows 'Version 1.0' with a red 'Disabled' status. A notification text field contains 'This version is no longer supported. Please upgrade.' and a URL field contains 'http://itunes.com/myapp'. There are 'Save' and 'Cancel' buttons.
- Android:** Shows 'Version 1.0' with a green 'Active' status.

Each platform section also includes a 'Lock this version' checkbox and an 'Authenticity Testing' status indicator.



IT operations insights with built-in mobile analytics

- Improved IT operations insights
 - Analyze application usage, responsiveness and pathways
 - Capture analytics that cross between the mobile application and the server
 - Easy upgrade to marketing insight for full Customer Experience Management (CEM)
- Device: Tealeaf instrumentation engine
 - Efficient collection and streaming of relevant mobile information device_id, device_os, app_id, Adapter, Datetime, spatial_coord
- Server: IBM Worklight Server
 - Log exceptions, security issues, and generic log messages.
 - APIs to log activities and location information
- Extensibility
 - New analytics repository with REST interfaces
 - Custom reports and JSON data exports in BI systems and pattern analysis
 - BIRT reports available for backward compatibility



Mobile Analytics Dashboards

Search

Source	Event Type	Timestamp	Application	Version
Server	Server Log	Thu 13 Jun 2013 04:41:48 PM PDT	N/A	N/A
Client	Client Session	Wed 12 Jun 2013 03:18:39 PM PDT	dolt	1.0
Client	Client Session	Wed 12 Jun 2013 03:18:16 PM PDT	dolt	1.0
Client	Client Session	Wed 12 Jun 2013 03:10:57 PM PDT	dolt	1.0

Summary by Source

Previous Next



Analytics Dashboard

Server Logs

Filter Pause

Timestamp	Thread Id	Severity	Source Class	Method	Message	View Stack
4/11/2013 8:04:24 PM	13	SEVERE	com.worklight.integration.util.Auth	AuthenticationContext	AnalyticsServiceImpl.loadProperties	View Stack
4/11/2013 8:03:59 PM	1	WARNING	com.worklight.common.util.Genres	getStringProperty	AnalyticsServiceImpl.loadProperties	View Stack
4/11/2013 8:03:53 PM	10	INFO	com.worklight.common.util.Genres	APNSMediator	Found IP address: 94.1.54.148	View Stack
4/11/2013 7:28:34 PM	2	WARNING	com.worklight.common.util.Genres	AuthenticationContext	worklight: FWLSE305: Application new reports are disabled.	View Stack
4/11/2013 7:28:24 PM	18	WARNING	com.worklight.common.util.Auth	getStringProperty	AnalyticsServiceImpl.loadProperties	View Stack
4/11/2013 7:28:23 PM	11	SEVERE	com.worklight.common.util.Auth	getStringProperty	worklight: FWLSE305: Application new reports are disabled.	View Stack
4/11/2013 7:28:23 PM	12	INFO	com.worklight.common.util.Genres	APNSMediator	Found IP address: 94.1.54.148	View Stack
4/11/2013 7:28:22 PM	1	WARNING	com.worklight.common.util.Genres	getStringProperty	Found IP address: 94.1.54.148	View Stack
4/11/2013 7:28:22 PM	2	WARNING	com.worklight.integration.util.Auth	DCMMediator	AnalyticsServiceImpl.loadProperties	View Stack
4/11/2013 7:28:21 PM	8	WARNING	com.worklight.common.util.Auth	getStringProperty	worklight: FWLSE305: Application new reports are disabled.	View Stack
4/11/2013 7:28:21 PM	7	INFO	com.worklight.common.util.Genres	AuthenticationContext	AnalyticsServiceImpl.loadProperties	View Stack
4/11/2013 7:28:20 PM	8	SEVERE	com.worklight.common.util.Genres	APNSMediator	worklight: FWLSE305: Application new reports are disabled.	View Stack

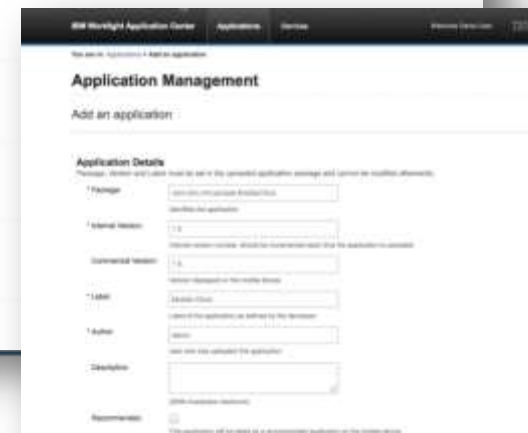


Application Center

The Worklight Application Center enables companies to easily set up an enterprise app store for their enterprise and development teams.

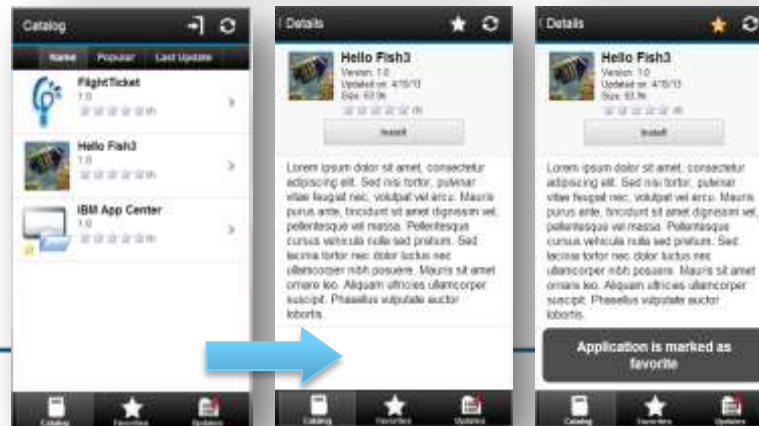
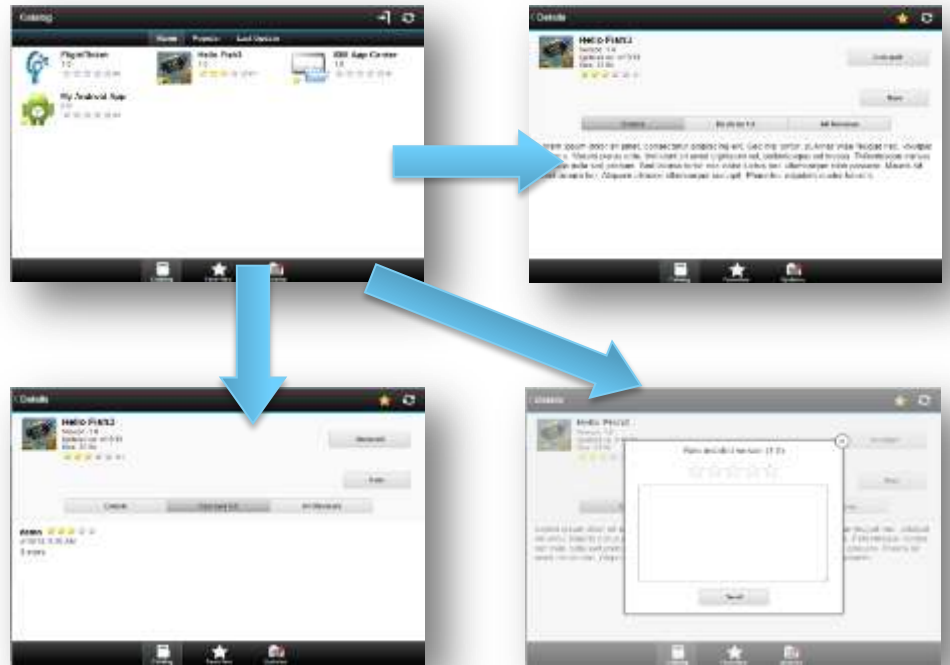
- The Application Center provides:
 - **Administrators** with fine-grained control over the distribution of mobile apps across the enterprise, including ACL and LDAP support;
 - **Employees** with a central location for the latest apps needed by their department and optimized for their device;
 - **Developers** with an easy way to distribute mobile builds and elicit feedback from development and test team members.

- Worklight Application Center
- Development Team Provisioning
- Enterprise App Provisioning and Governance
- App Feedback Management



Application Center v6.0 updates

- Redesigned mobile client
 - New UI incl. tablet form factor
 - Improved navigation (sort, ...)
- New push notifications for updates
- Favorite apps across devices
- Enhanced review & feed-back
 - View all on mobile client
- Apps filtered per mobile OS, user and mobile type (iPad vs iPhone)
- Improved command line tools
- Support of Federated User repositories on WAS 7
- Sharing of test-ready, instrumented apps



IBM Worklight Key Differentiators

Standards-based

- Tooling for HTML 5 development and device adaptation
- Application lifecycle management of HTML5 artifacts
- Leveraging de-facto standards to provide added value for developers

Flexibility and choice

- Native / hybrid / web
- Full coverage of the hybrid spectrum
- Leverage any 3rd Party JavaScript Framework: More Choice!

Consumability

- For developers: easy learning curve, small number of programming models, JS anywhere, small footprint
- Collaborative development
- Quick and Easy Installation and deployment

Security

- Flexible security model
- Portfolio integration
- Advanced in-app security features

Ecosystem

- IBM products already leveraging Worklight as a mobile standard
- Starting to build a catalog for third-party APIs
- MobileFirst Solutions for Testing, Team Dev, Analytics, Security and Mgmt

Three Ways to Get Started with IBM

1

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2

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3

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