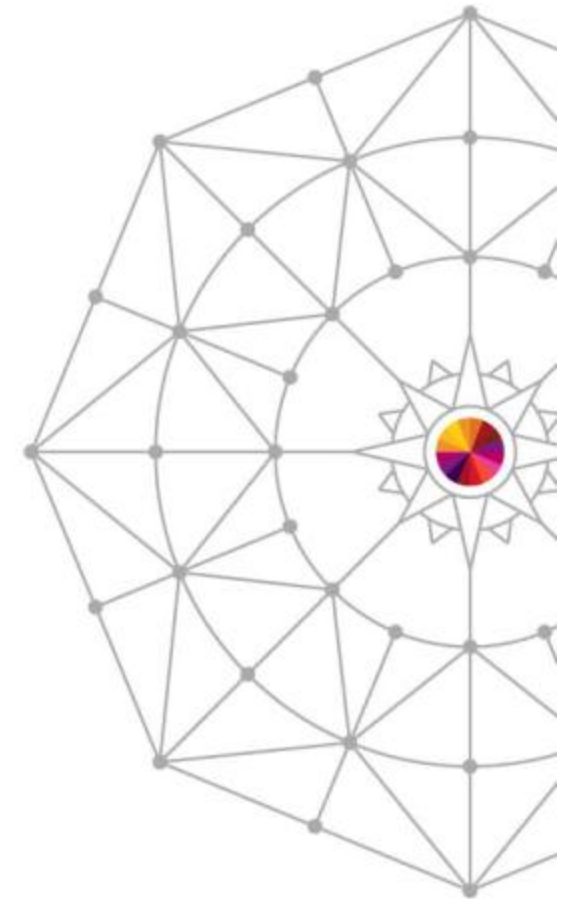# IBM Mobile Platform for System Z

Tony Duong
qcduong@us.ibm.com

Monday March 10, 2014 1:30 PM
Session 14629

Agenda

- Mobile Landscape
- IBM Worklight Mobile Platform
- Mobile on System Z
- CICS & Worklight Demo Application

Mobile is a mandatory transformation

10 Billion devices by 2020

61% of CIOs put mobile as priority
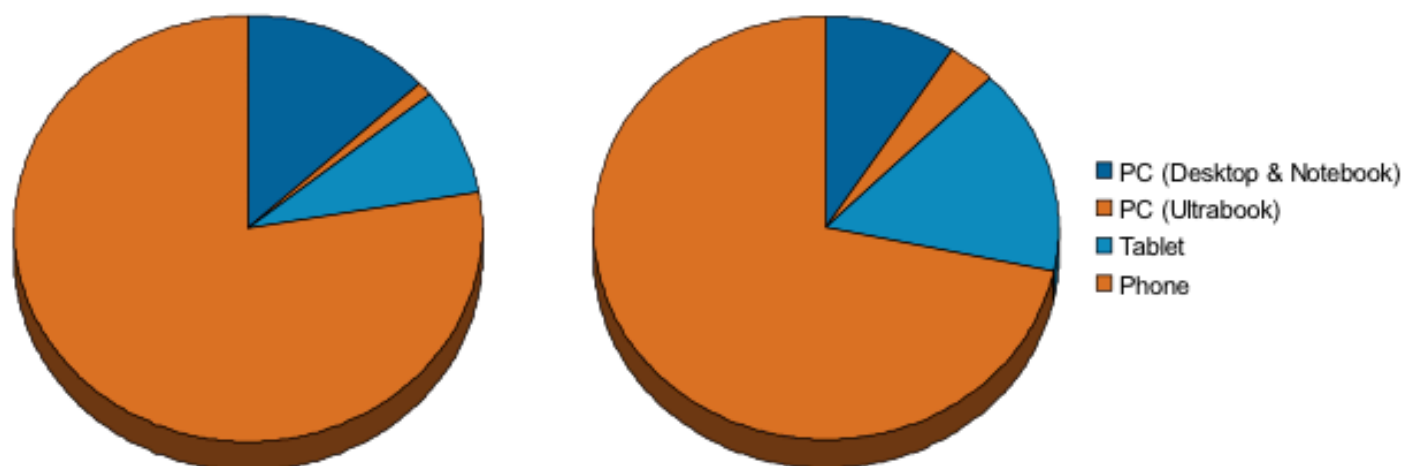
45% increased productivity with mobile apps

Complete your session evaluations online at www.SHARE.org/AnaheimEval

Mobile Devices are 80% of the devices sold to access the internet.

Worldwide Shipment of Devices to Access the Internet

2013

2017


- ■ PC (Desktop & Notebook)
- ■ PC (Ultrabook)
- ■ Tablet
- ■ Phone

Worldwide Devices Shipments by Segment (Thousands of Units)

Device Type	2012	2013	2014	2017
PC (Desk-Based and Notebook)	341,263	315,229	302,315	271,612
PC (Ultrabooks)	9,822	23,592	38,687	96,350
Tablet	116,113	197,202	265,731	467,951
Mobile Phone	1,746,176	1,875,774	1,949,722	2,128,871
Total	2,213,373	2,411,796	2,556,455	2,964,783

Source: Gartner (April 2013)
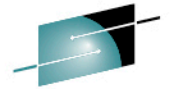
Mobile Internet users will surpass PC internet users by 2015

The number of people accessing the Internet from smartphones, tablets and other mobile devices will surpass the number of users connecting from a home or office computer by 2015, according to a September 2013 study by market analyst firm IDC.

PC is the new Legacy!

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Mobile is everywhere

1 **Mobile is primary**
91% of mobile users keep their device within arm's reach 100% of the time

2 **Insights from mobile data provide new opportunities**
75% of mobile shoppers take action after receiving a location based messages

3 **Mobile is about transacting**
96% year to year increase in mobile cyber Monday sales between 2012 and 2011

4 **Mobile must create a continuous brand experience**
90% of users use multiple screens as channels come together to create integrated experiences

5 **Mobile enables the Internet of Things**
Global Machine-to-machine connections will increase from 2 billion in 2011 to **18 billion** at the end of 2022

And holds enormous opportunities

Business to Enterprise

- Increase worker productivity
- Improved claims processing
- Increase revenue with sales engagements
- Extend existing applications to mobile workers and customers
- Reducing fuel, gas, or fleet maintenance costs where relevant
- Increase employee and business partner responsiveness and decision making speed
- Resolve internal IT issues faster
- Reduce personnel cost (utilizing personal devices instead of corporate devices)

Business to Consumer

- Improve customer satisfaction
- Deeper customer engagement and loyalty
- Drive increased sales through Personalized offers
- Customer service
- Competitive differentiator
- Improve brand perception
- Deeper insight into customer buying behavior for up sell and cross sell
- Improve in store experience with mobile concierge services

Creating business and IT challenges

Enterprise Business Model Changes
- New business opportunities based upon geolocation
- Anytime, anywhere business transactions
- Importance of social business interactions

App Development Lifecycle Complexity
- Complexity of multiple device platforms with fragmented Web, native, and hybrid model landscape
- Connecting the enterprise back-end services in a secure and scalable manner
- Unique mobile requirements (user interface, connected/ disconnected use, version upgrades, etc.)
- Faster time-to-market demands and iterative delivery

Mobile Security and Management
- Protection of privacy and confidential information
- Use of client-owned smartphones and tablets
- Visibility, Security & Management of mobile platform requirements

Top Mobile Adoption Concerns:

1. Security/privacy (53%)
2. Cost of developing for multiple mobile platforms (52%)
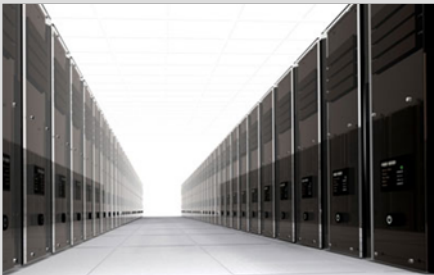3. Integrating cloud services to mobile devices (51%)

Source: 2011 IBM Tech Trends Report
https://www.ibm.com/developerworks/mydeveloperworks/blogs/techtrends/entry/home?lang=en

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Mobile Apps – Top Challenges

Creating rich, yet cost-effective mobile apps in a fragmented technological landscape.

Connecting the enterprise back-end services in a secure and scalable manner

Controlling the growing portfolio of applications deployed "in the wild"

IBM Worklight mobile 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

IBM Worklight goes beyond mobile app UI creation to deliver mobile optimized, standards-based, middleware and tools for enterprise-grade mobile applications and services creation
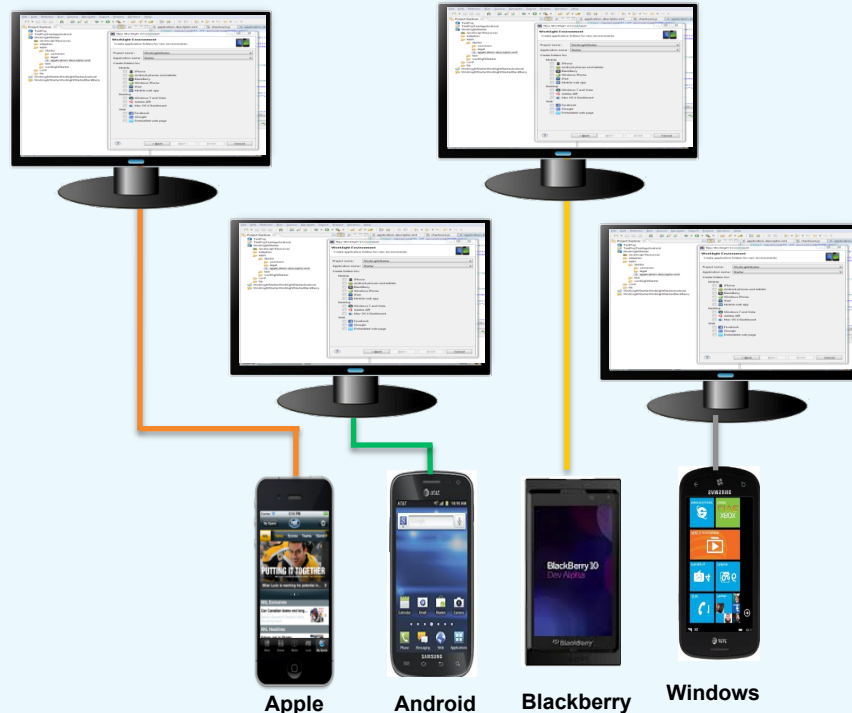
Multi-platform development with a shared codebase

From the complexity of many…

- Multiple sets of tools & frameworks
- Four codebases to develop and maintain

Apple **Android** **Blackberry** **Windows**

To the simplicity of one

- One development environment
- One codebase to develop and maintain

Apple **Android** **Blackberry** **Windows**

IBM Worklight

Controlled back-end integration

From multiple point-to-point integrations

- Multiple sets of integrations to enterprise resources to build and maintain

- YOU manage caching, synchronization and end-to-end encryption

App   DB   ERP Engine   Cloud Service
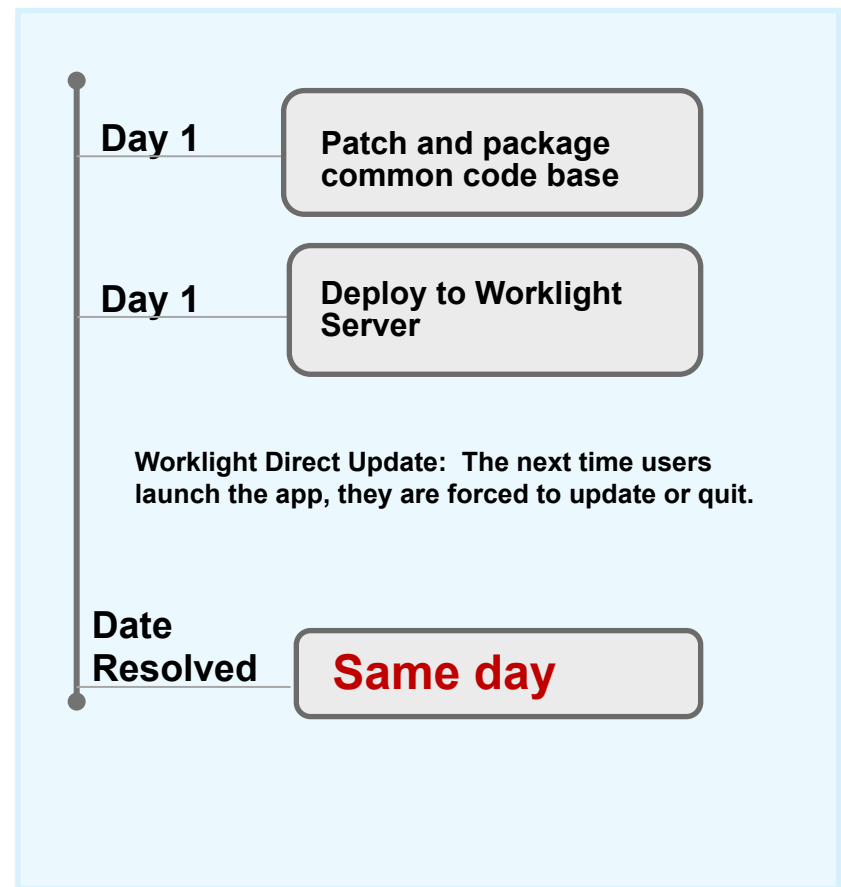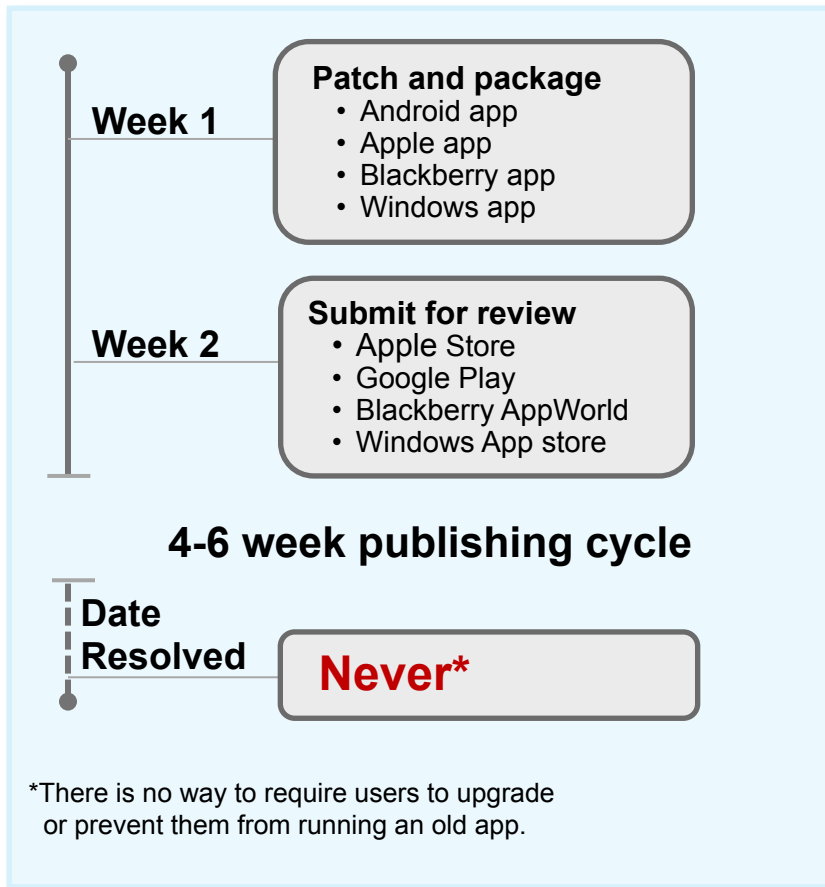
Apple   Android   Blackberry   Windows
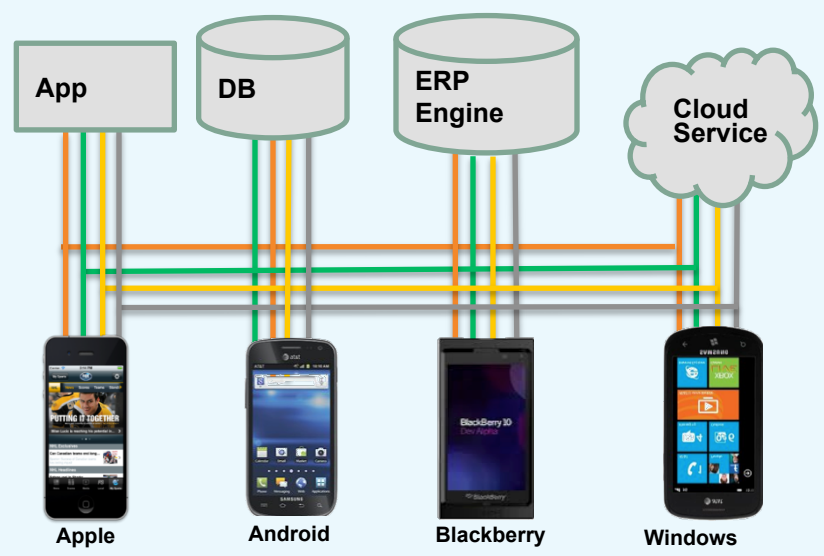
To streamlined, transparent access

- Worklight transforms enterprise data into mobile-friendly, JSON format

- Worklight Server manages caching, data synchronization and end-to-end encryption

App   DB   ERP Engine   Cloud Service

SQL   SAP

HTTP (REST, SOAP), JMS   HTTP, CAST IRON

Worklight Adaptors

WORKLIGHT SERVER

JSON

Apple   Android   Blackberry   Windows

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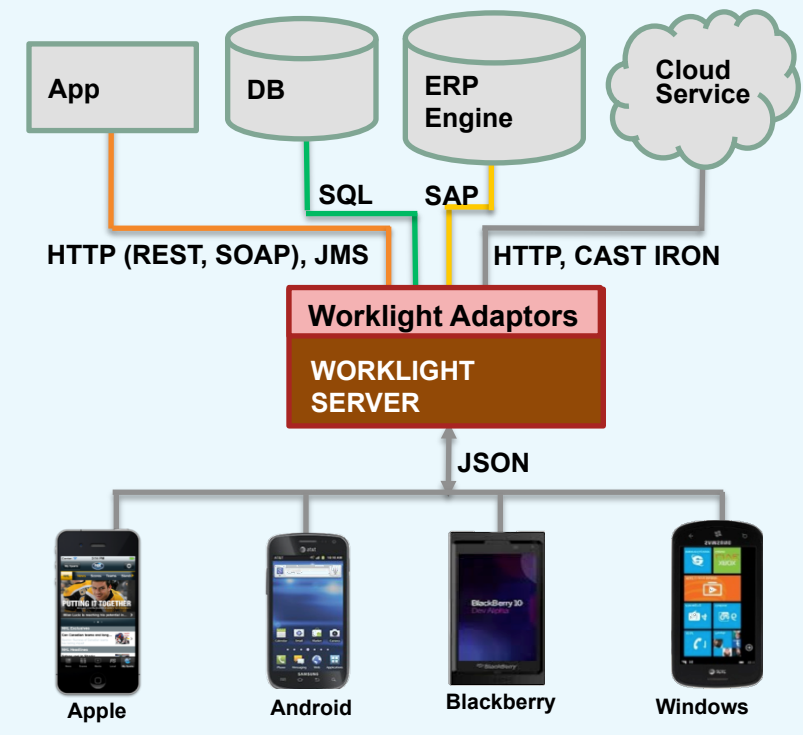
Timely and controlled updates

Week 1 — **Patch and package**
- Android app
- Apple app
- Blackberry app
- Windows app

Week 2 — **Submit for review**
- Apple Store
- Google Play
- Blackberry AppWorld
- Windows App store

4-6 week publishing cycle

Date Resolved — **Never***

*There is no way to require users to upgrade or prevent them from running an old app.

Day 1 — **Patch and package common code base**

Day 1 — **Deploy to Worklight Server**

Worklight Direct Update: The next time users launch the app, they are forced to update or quit.

Date Resolved — **Same day**

Centralized push notifications

From the complexity of many…

Multiple sets of push services to manage

To the simplicity of one…

Unified push management

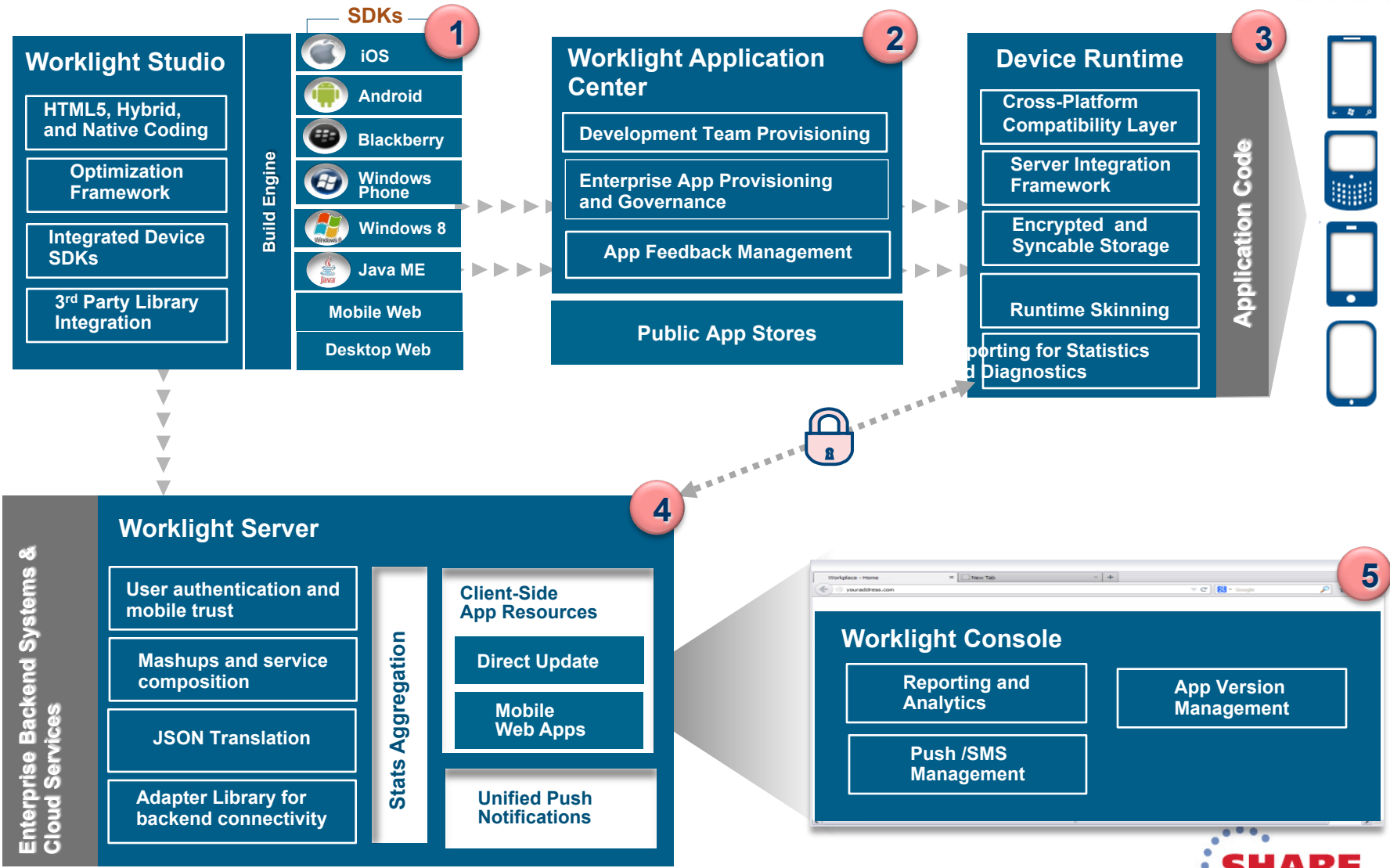# One App Store for all of your devices

Worklight AppCenter

WORKLIGHT SERVER

Apple   Android   Blackberry

IBM Worklight Application Center — Applications — Devices — Welcome Demo User — IBM.

You are in: Applications

Application Management

Available Applications

Add Application

1 - 5 of 9   Page 1 | 2   Previous | Next

Sort by: Label ∧ | OS | Update Date   Show inactive

App Center Installer
iOS (com.ibm.appcenter)
Installation: unrestricted | Administration: restricted
version 1 | 4/25/12 11:44 AM   (1)

Dojo Showcase
iOS (com.ibm.mobile.DojoShowcase)
Installation: unrestricted | Administration: restricted
version 20120404 | 4/25/12 7:29 PM   (0)

Dojo Showcase
Android (com.ibm.mobile.dojoshowcase)
Installation: unrestricted | Administration: restricted
version 20120404 | 4/26/12 1:11 PM   (0)

PhoneGap Showcase
iOS (com.ibm.mobile.PhoneGapShowcase)
Installation: unrestricted | Administration: restricted
version 20120404 | 4/25/12 7:29 PM   (1)

TestApp
Android (com.TestApp)
Installation: unrestricted | Administration: restricted

- Efficient deployment of development artifacts to stakeholders for test and feed-back
- Easier employees enablement for up to date mobile apps access
- Advanced control via ACL and LDAP support

IBM Worklight Components overview

Worklight Studio

- HTML5, Hybrid, and Native Coding
- Optimization Framework
- Integrated Device SDKs
- 3rd Party Library Integration

Build Engine

SDKs ①

- iOS
- Android
- Blackberry
- Windows Phone
- Windows 8
- Java ME
- Mobile Web
- Desktop Web

Worklight Application Center ②

- Development Team Provisioning
- Enterprise App Provisioning and Governance
- App Feedback Management

Public App Stores

Device Runtime ③

- Cross-Platform Compatibility Layer
- Server Integration Framework
- Encrypted and Syncable Storage
- Runtime Skinning
- Reporting for Statistics and Diagnostics

Application Code

Worklight Server ④

Enterprise Backend Systems & Cloud Services

- User authentication and mobile trust
- Mashups and service composition
- JSON Translation
- Adapter Library for backend connectivity

Stats Aggregation

Client-Side App Resources
- Direct Update
- Mobile Web Apps
- Unified Push Notifications

Worklight Console ⑤

- Reporting and Analytics
- App Version Management
- Push /SMS Management

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Technology · Connections · Results

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Mobile Operational Insights: Target Personas

IT Operations

*Focused on problem
determination, better
visibility across the platform*

App Developer

*Focused on problem
determination, help fix my app
issues*

Admin/Analyst

*Focused on platform wide trends
and how to do better*

Worklight Server - Adapters
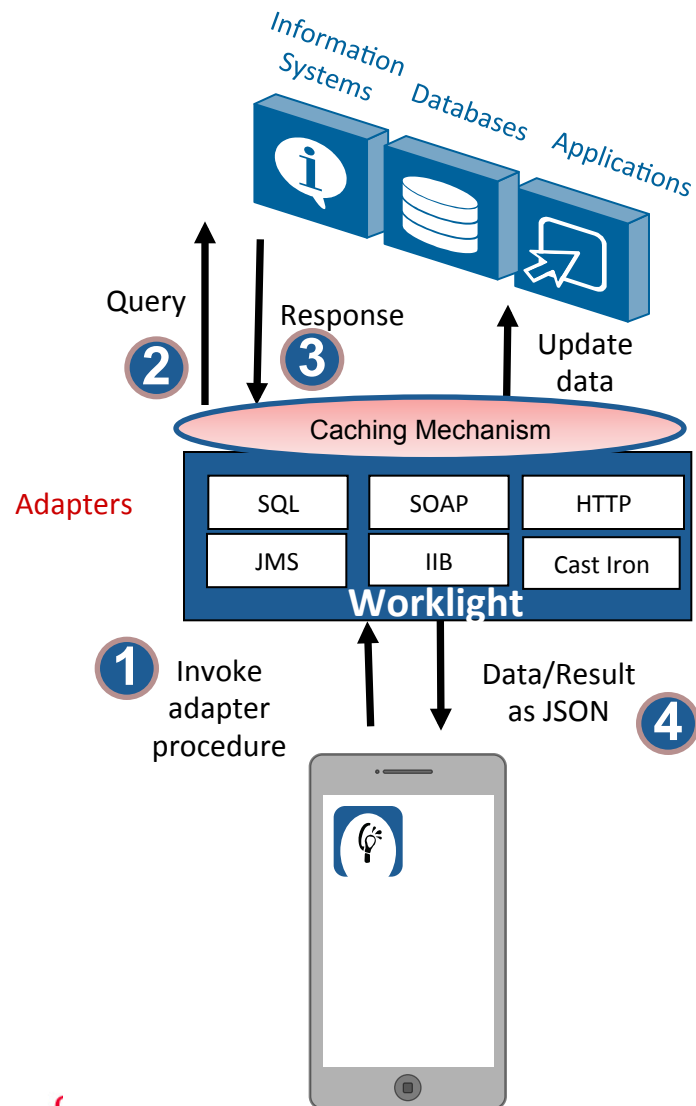
Universality
- Supports multiple integration technologies and back-end information systems

Read-only & Transactional Capabilities
- Adapters support read-only and transactional access modes to back-end systems

Fast Development
- Defined using simple XML syntax
- Easily configured with JavaScript APIs

Security
- Flexible authentication APIs for back-end connections
- Connected user identity control

Caching
- Leveraged to store data retrieved from back-end

Transparency
- Uniform exposure of back-end data for all adapter types

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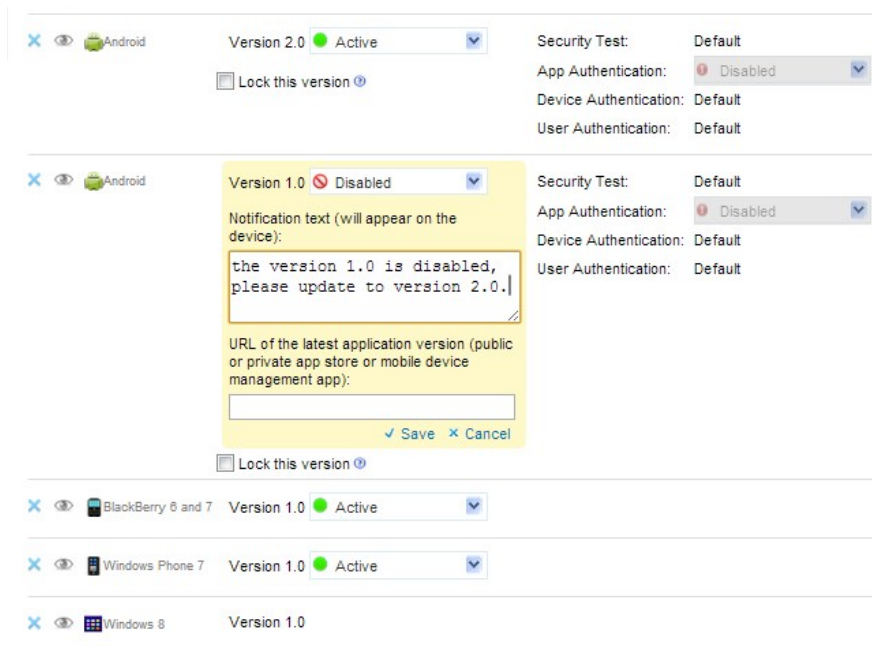
1. Web resources packaged with app to ensure initial offline availability
2. Web resources transferred to app's cache storage
3. App checks for updates on startup and foreground events
4. Updated web resources downloaded when necessary, with user confirmation or silently

App version Management

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
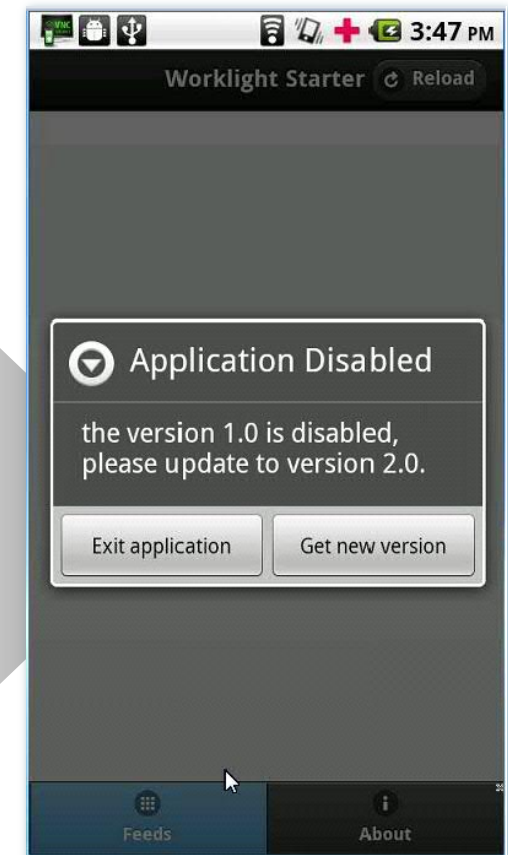
Application Center – Application Management
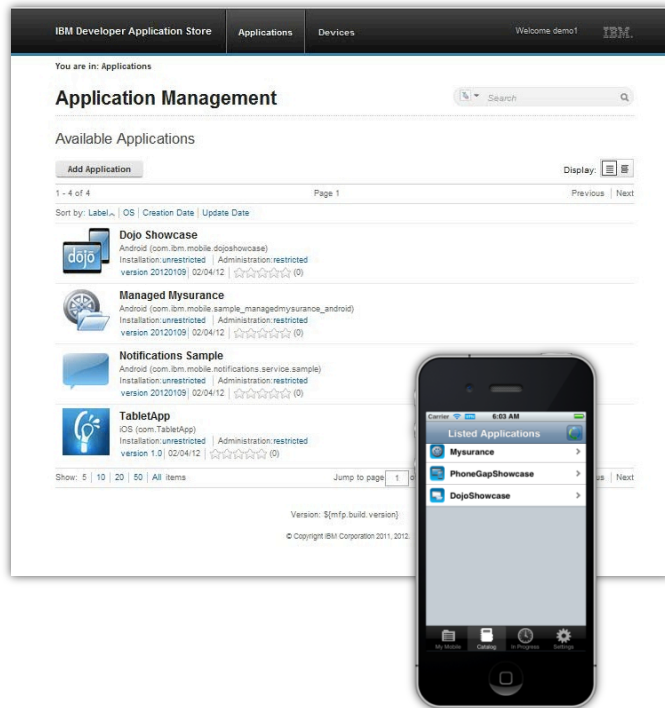
A cross platform private mobile application store similar to public app stores but focused on the needs of an organization or a team

Key capabilities:

- Delivers distribution and management of mobile applications within a company / teams

- Easy distribution of iOS and Android apps within a team

- Provides versioning and updates

- Centralizes rating and feedback information

- Controls who can modify or install an application with LDAP-based integration to define users and groups

- Easy to install and simple to run

- Integrates with IBM Endpoint Manager for app role-out to production

Data Collection and Analytics

Worklight Server

Data Collection and Stats Aggregation

Corporate BI Systems

Cloud-based Analytics

All Applications all Versions for the last 30 days

Mobile on System Z

Worklight Studio and Rational Developer for z

WebSphere Application Server on Linux

Worklight Server

Worklight App Code

interface with mobile devices.

Worklight Server and Console

Provides Mobile services:
- Application Mgmt
- Services Mgmt.
- Operational Support.

Worklight Adapters

interface with SoR data and transaction services.

Security Layer 1

Caching Service (Optional)

Caching Service (Optional)

Security Layer 2

z/OS

CICS, IMS, TPF
Anything with a SOAP or JSON interface.

DB2

IBM Information Bus

z/VM

Mobile Device

Mobile Applications

IBM Endpoint Manager
Mobile device management.

System z Mobile Enterprise with IBM Worklight

Linux on z   z/OS

Linux on z

Device

PhoneGap

Worklight
- Security and Authentication
- Back-end Data Integration
- Caching and local data

Application Code

Worklight Server on WAS

Server-side App Code	**Application Center Enterprise App Store**
Worklight Console	JSON Translation
Push Notifications	Authentication
Analytics	Adapter Library

SAP
SQL
WMB
SOAP
HTTP/REST
Cast Iron

z/OS

CICS

Worklight Video: http://www.youtube.com/watch?feature=player_embedded&v=zHnFw70XXXo

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Connectivity to System z -- via Worklight
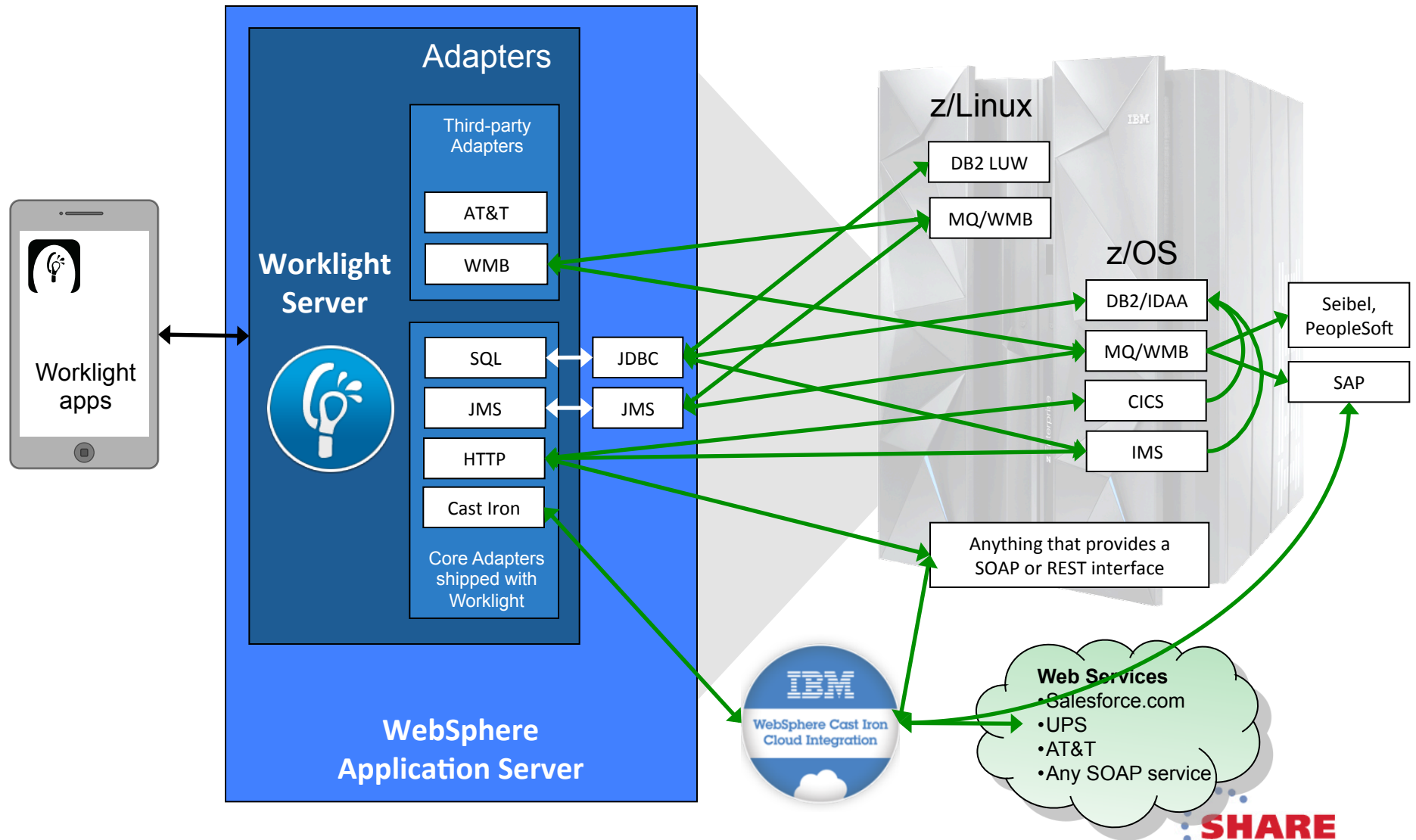
System z bridges Systems of Record and Systems of Engagement

Systems of Engagement

Systems of Record

Mobile Apps

Existing Web Apps

Cloud APIs
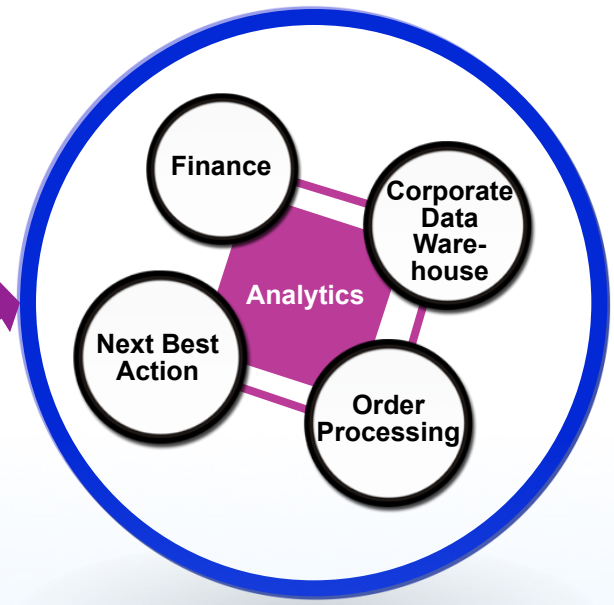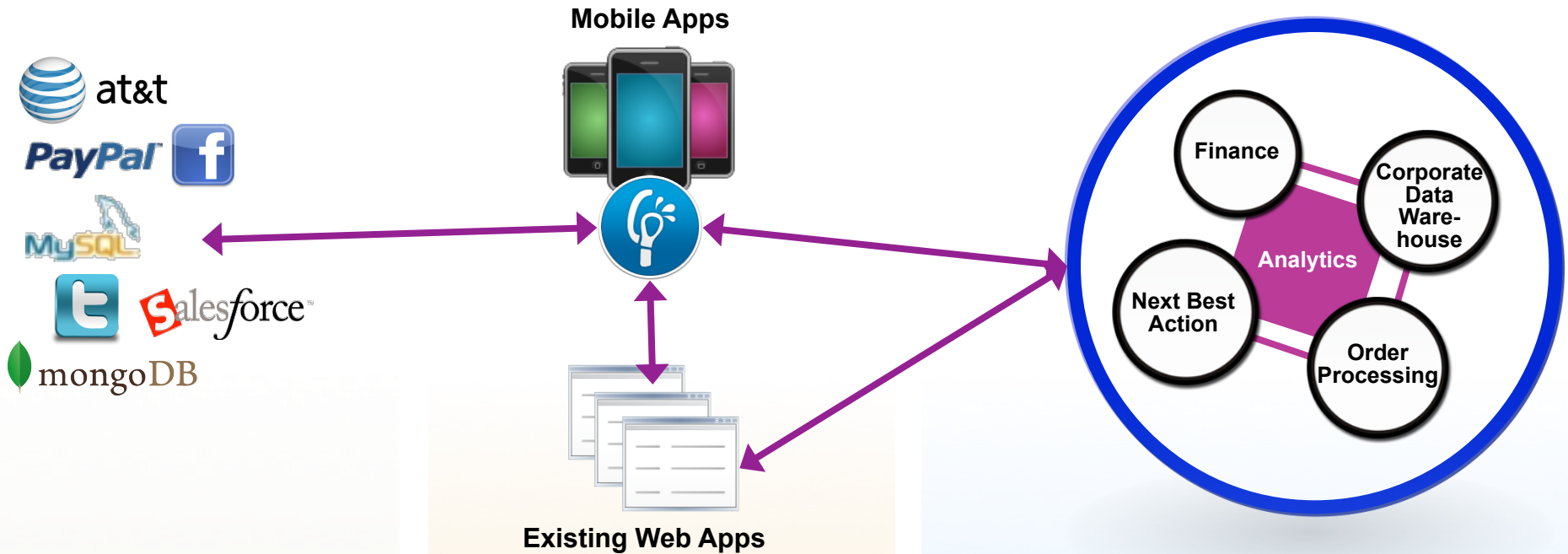
Systems of Engagement support rapid app development and growth

Linux on z

z/OS

Systems of Record are well integrated, trusted repositories of data and services

Finance

Corporate Data Ware-house

Analytics

Next Best Action

Order Processing

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Worklight Server on System z

z/OS

z/Linux

Worklight Server

Server-side Java App Code -- WAS	Application Center Enterprise App Store
JSON Translation	Worklight Console
Authentication	Push Notifications
Adapter Library	Analytics

Device Runtime

Application Code

SHARE in Anaheim
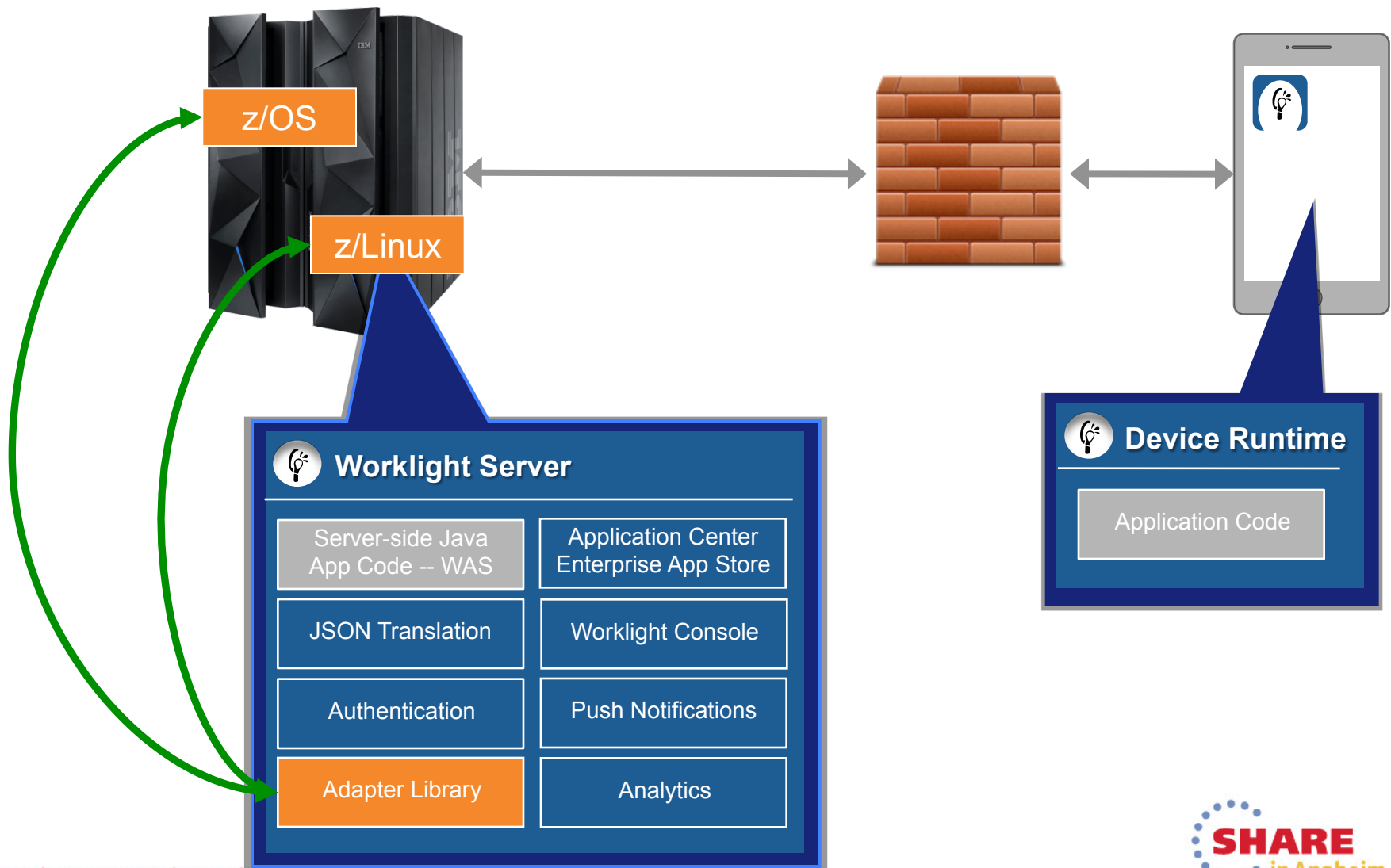
System z Unique Characteristics to support Mobile Applications

- Easy-to-consume APIs from CICS, DB2, IMS allow you to leverage your investment in z/OS transactions to quickly add a mobile channel.

- z/OS enables massive and simple scalability in a single footprint, to handle the workload of millions of devices and sensors

- Worklight security integrates with z/OS security providing end-to-end security and data privacy for mobile apps.

- z/OS Workload Management ensures your crucial applications remain responsive during sharp spikes in demand.

- Low-latency I/O. Mobile usage patterns favor short, read-only data requests (Users check account balances) So fast access to operational data, with low latency, is key. The mainframe offers exceptional I/O with dedicated hardware I/O processors. This reduces latency, which increases mobile app response times.

- Business Resiliency for critical mobile apps

Infrastructure matters for mobile applications. The System z platform's scalability, security, and resilience can enhance critical mobile applications.

CICS Application Walkthrough

Complete your session evaluations online at www.SHARE.org/AnaheimEval

CICS Application Overview
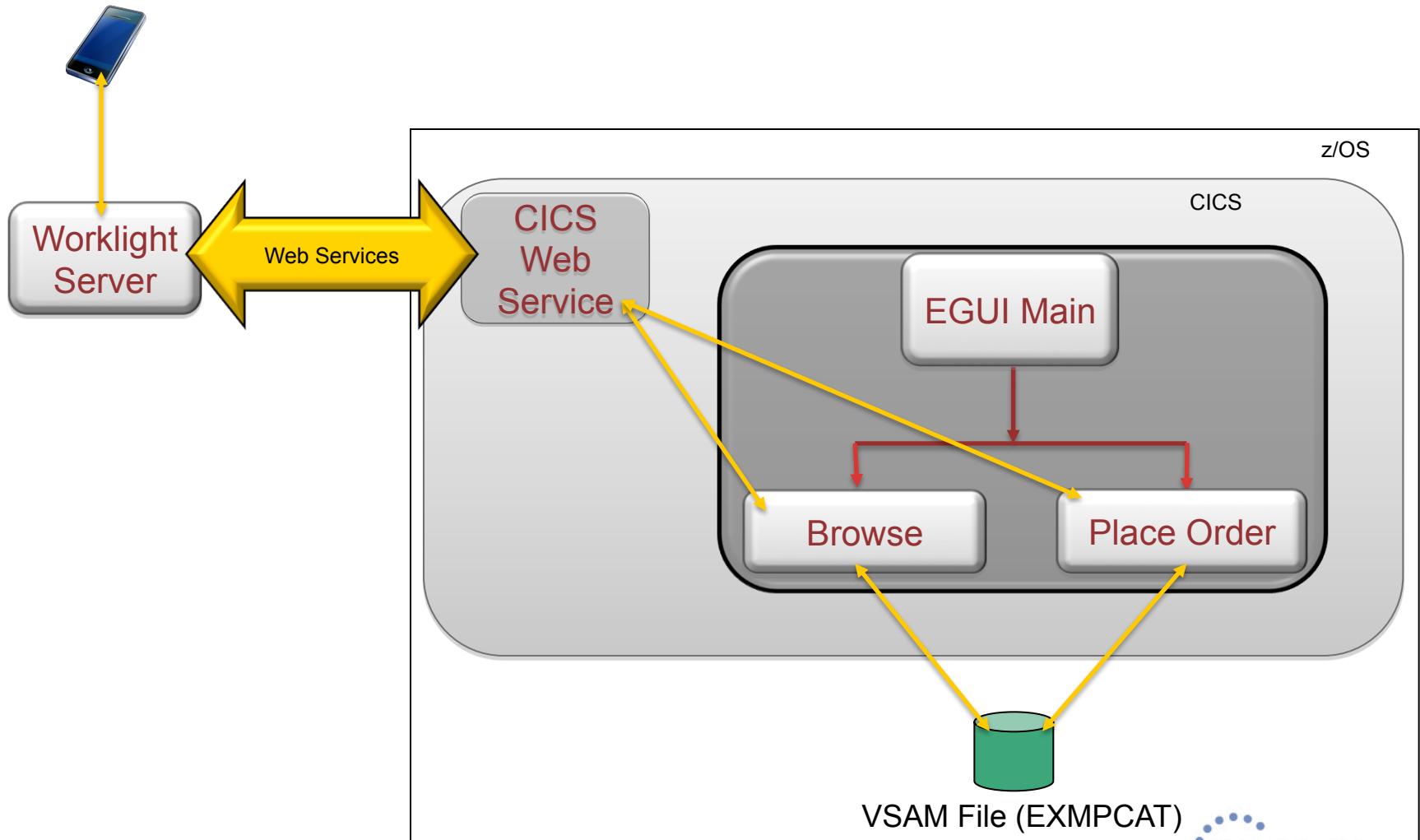
- CICS Catalog Manager Application
    - COBOL based CICS application
    - VSAM File
    - Separate Presentation Logic and Business Logic
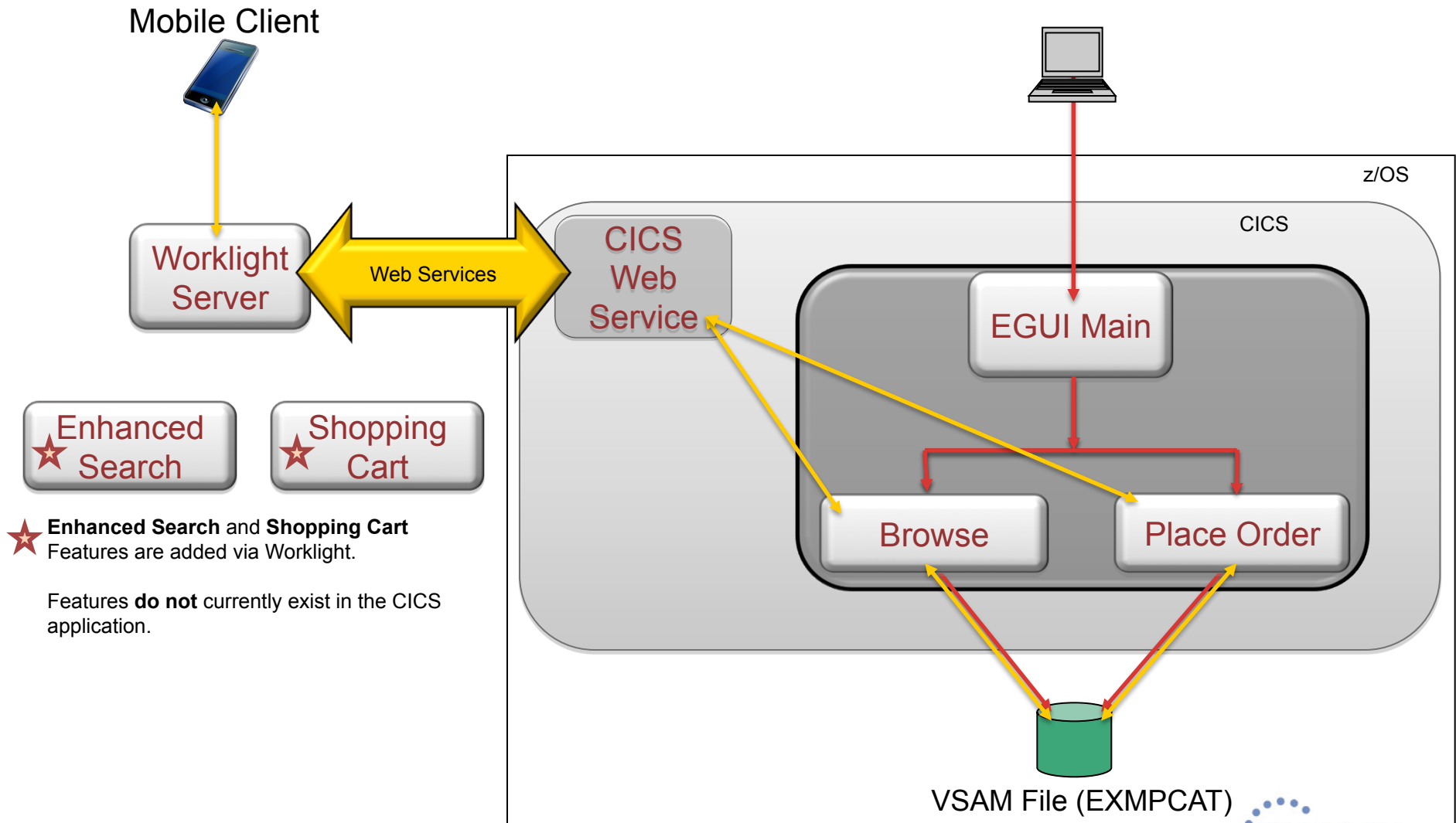   - Callable Interface - Commarea

Complete your session evaluations online at www.SHARE.org/AnaheimEval

Existing CICS Web Service Enabled App

3270 Client

z/OS

CICS

EGUI Main

Browse

Place Order

VSAM File (EXMPCAT)
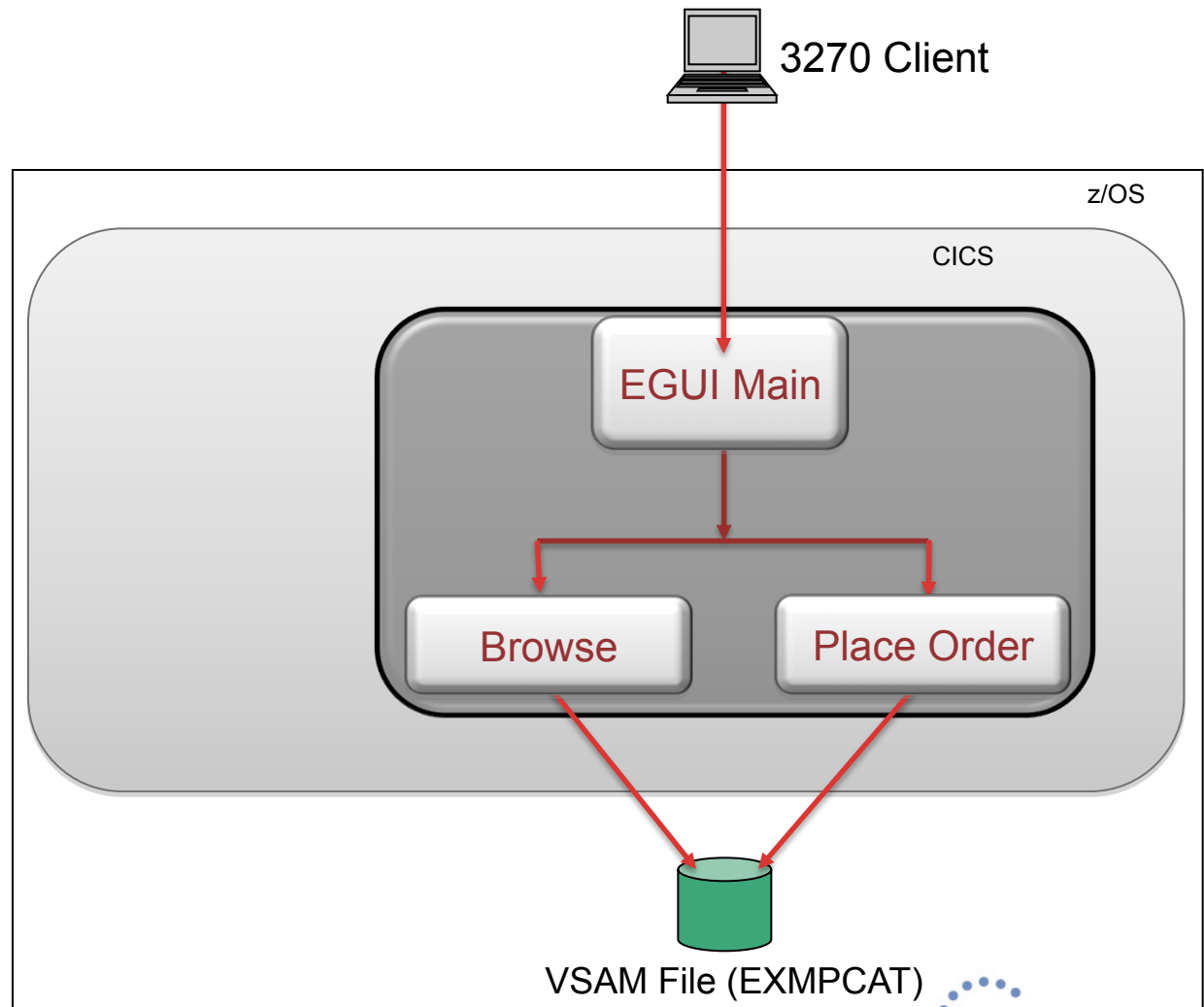
Worklight Modernizes the CICS Web Service Enabled App

Mobile Client

Worklight Server

Web Services

CICS Web Service

z/OS

CICS

EGUI Main

Browse

Place Order

VSAM File (EXMPCAT)

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Worklight Enhances the CICS Web Service Enabled App

Mobile Client

Worklight Server

Web Services

CICS Web Service

z/OS

CICS

EGUI Main

Browse

Place Order

VSAM File (EXMPCAT)

Enhanced Search

Shopping Cart

Enhanced Search and **Shopping Cart** Features are added via Worklight.

Features **do not** currently exist in the CICS application.

Worklight gives a Mobile UI to CICS Services

z/Linux

IBM Worklight Server

HTTP Adapter

IBM z/OS

CICS TS 4.2

CICS Web Service

CICS Mobile Feature Pack

CICS COBOL, C, PL/1, Java App

SOAP (XML)

JSON

Mobile Devices

CICS Resources

3

CICS application for Android and iOS
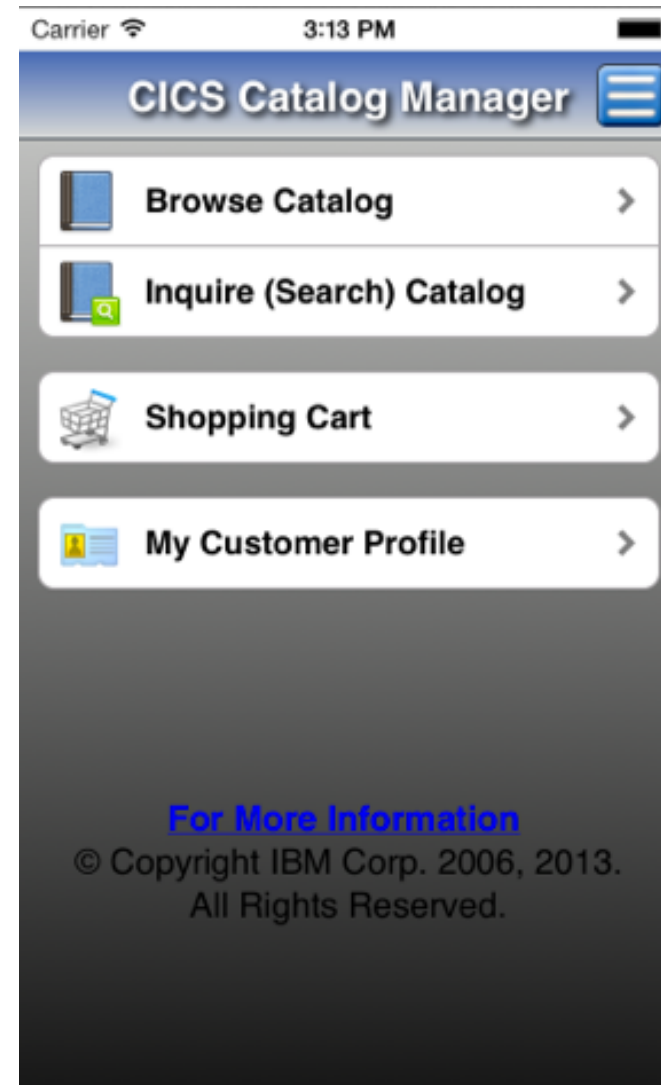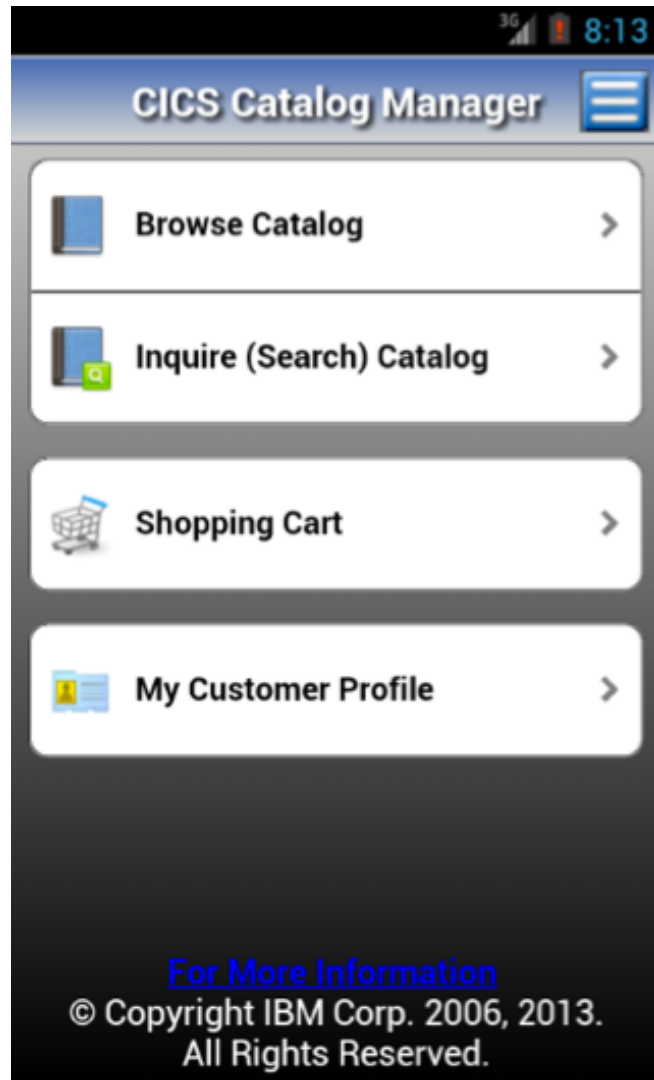
Worklight Topology

Worklight Server

Server-side Application Code		Client-side App Resources
JSON Translation	Stats Aggregation	Direct Update
Authentication		Mobile Web Apps
Adapter Library		Unified Push Notifications

Device Runtime

PhoneGap
- Cross Platform Technology

Worklight
- Security and Authentication
- Back-end Data Integration
- Post-deployment control and Diagnostics
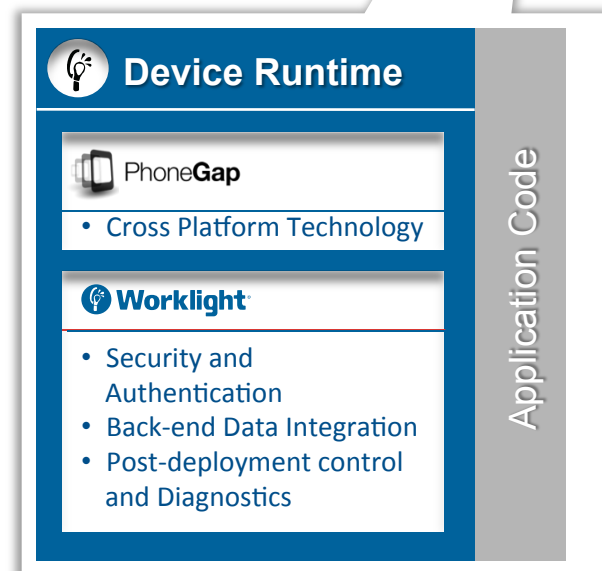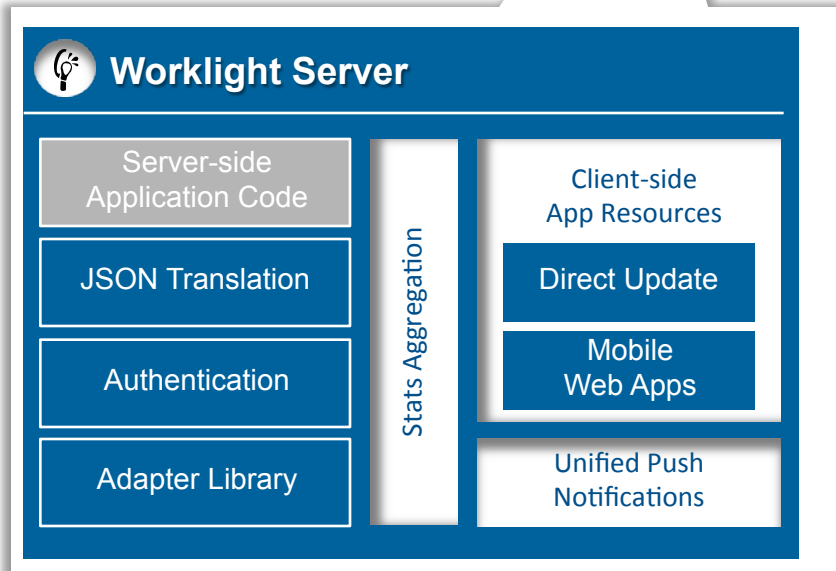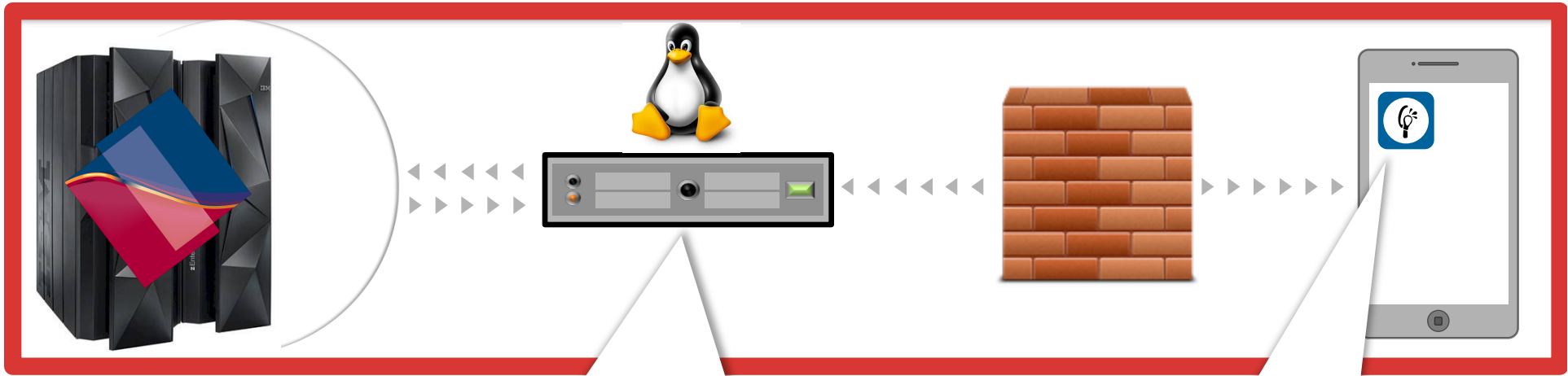
Application Code

Demo

- EGUI App
  - 3270 & iPhone
- Management – Console
  - Update
  - Disable
- Distribution – AppCenter
- Analytics - Console

Backup charts

Multiple mobile application development models support

Browser Access	Hybrid Apps - Web	Hybrid Apps - Mixed	Native Apps
Written in HTML5 JavaScript and CSS3. Quick and cheap to develop, but less powerful than native.	HTML5 code and Worklight runtime libraries packaged within the app and executed in a native shell.	User augments web code with native language for unique needs and maximized user experience.	Platform-specific. Requires unique expertise, pricy and long to develop. Can deliver higher user experience.

Browser Access

Mobile Browser

Web Code
```
<!DOCTYPE html
PUBLIC
<html>
<! - - created
2003-12-12 - -
<head><title>XYZ</title>
</head>
<body>
</p>
</body>
</html>
```

Hybrid Apps - Web

Native Shell

Web Code
```
<!DOCTYPE html
PUBLIC
<html>
<! - - created 2003-12-1
<head><title>XYZ</title
</head>
<body>
</html>
```

Device APIs

Hybrid Apps - Mixed

Native Shell

Web
```
<!
DOCTY
PE html
PUBLIC
created
2003-12
</p>
</body>
</html>
```
```
100101
010101
110100
101010
101010
100100
100101
1110010
011001
0
```

Device APIs

Native Apps

Native
```
10010101010111010010
10010010101110100100
11010101010100100100
10111100100110010101
01001010101010010101
01010101010101011111
10000010101010101010
01001010101010101000
11110101000111011010
01110101011111001010
11101010010110011110
```

Device APIs

Browser Access | **Downloadable** | **Downloadable** | **Downloadable**

Common web codebase facilitates reuse
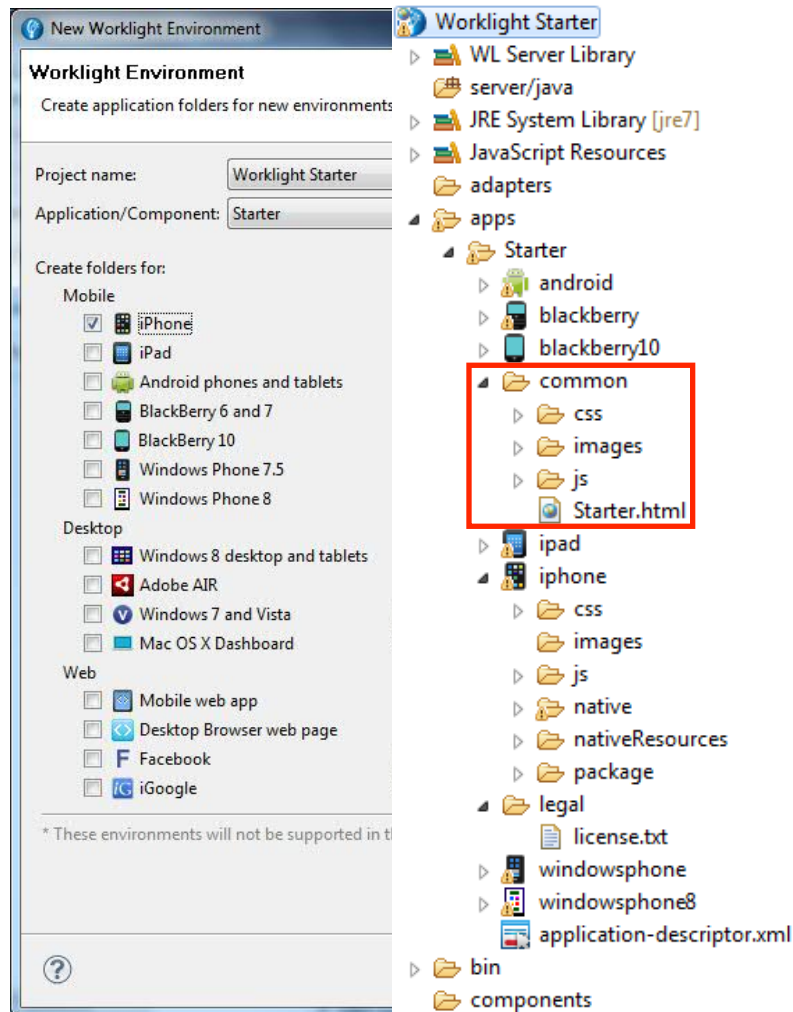
Common code up to 80%+

MobileOS specific and optimization code maintained in branches

JavaScript from an environment folder is <u>appended</u> to the same file in the common folder

CSS files from an environment folder will be <u>appended</u> to the CSS files in the common folder

HTML files from an environment folder will <u>override</u> files in the common folder

images from an environment folder will <u>override</u> files in the common folder

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

Single application App Store presence for Smartphone and tablets
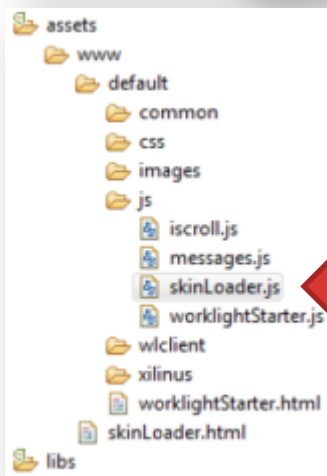
Developer-controlled JavaScript file run at app startup determines which skin to load

```
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>
```

Code Editing and live feed-back

Studio – WYSIWYG UI Construction *(HTML, JQuery or Dojo)*

Eclipse perspective for Worklight projects.

Optimized layout for hybrid app development

Rich page editor: drag-and-drop, palette of components, properties view, beautified outline, and raw editable source code

Changes to code automatically apparent in rich page editor, and vice-versa, for quick development

Change scale, orientation, and design/source split direction for optimal editor layout

Select from a range of device form factors

jQuery Mobile or Dojo Mobile widgets in the palette

Create and manage instances of dojo mobile "view" or jQuery mobile "page"

Property sheets for dojo mobile and jQuery mobile widgets

Rich mobile simulator for hybrid applications
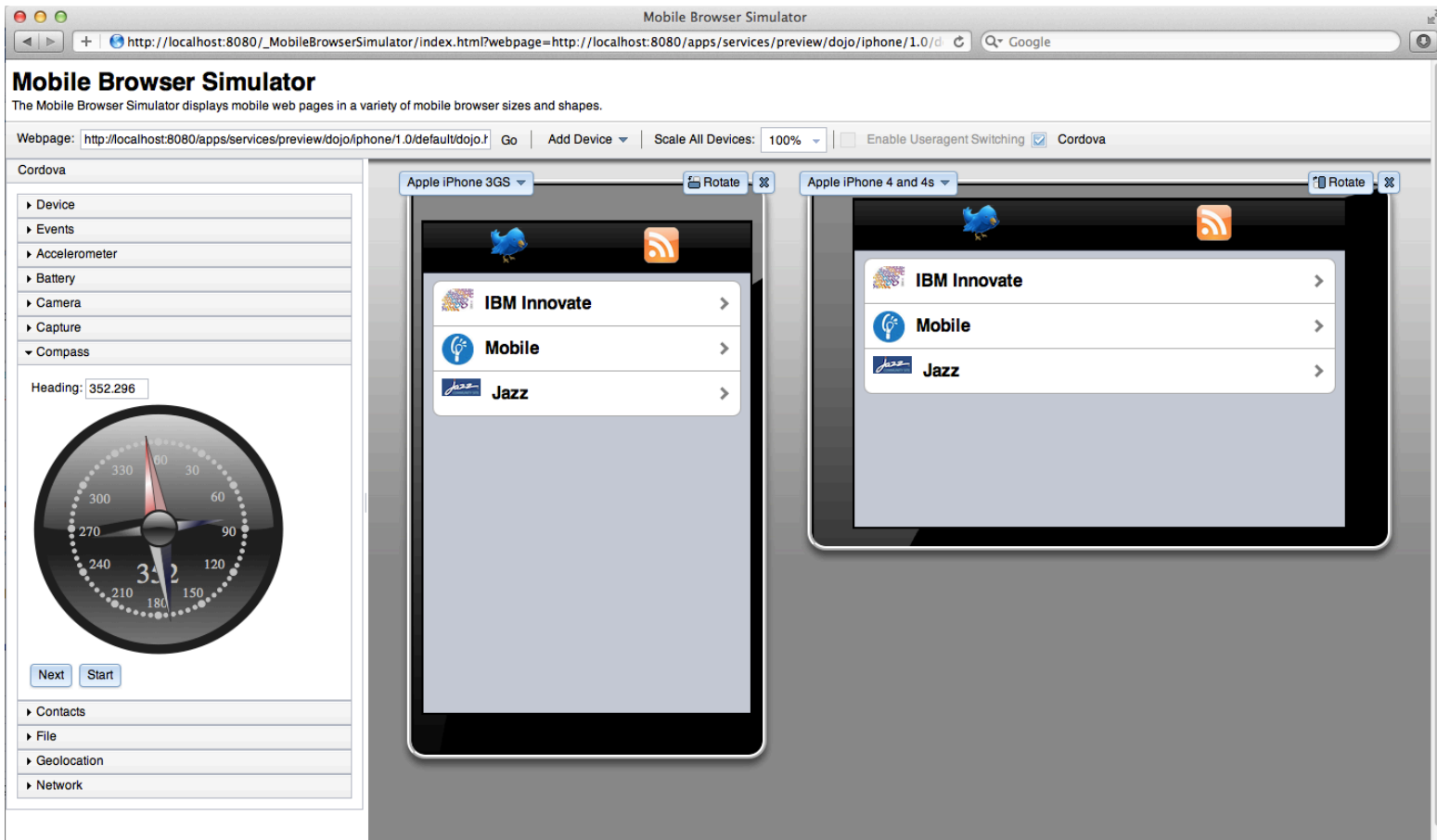
- Device specific tests early during development.
- Change device types, orientation, device settings (GPS, accelerometer, etc...)
- Supports Cordova and Worklight client API

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