

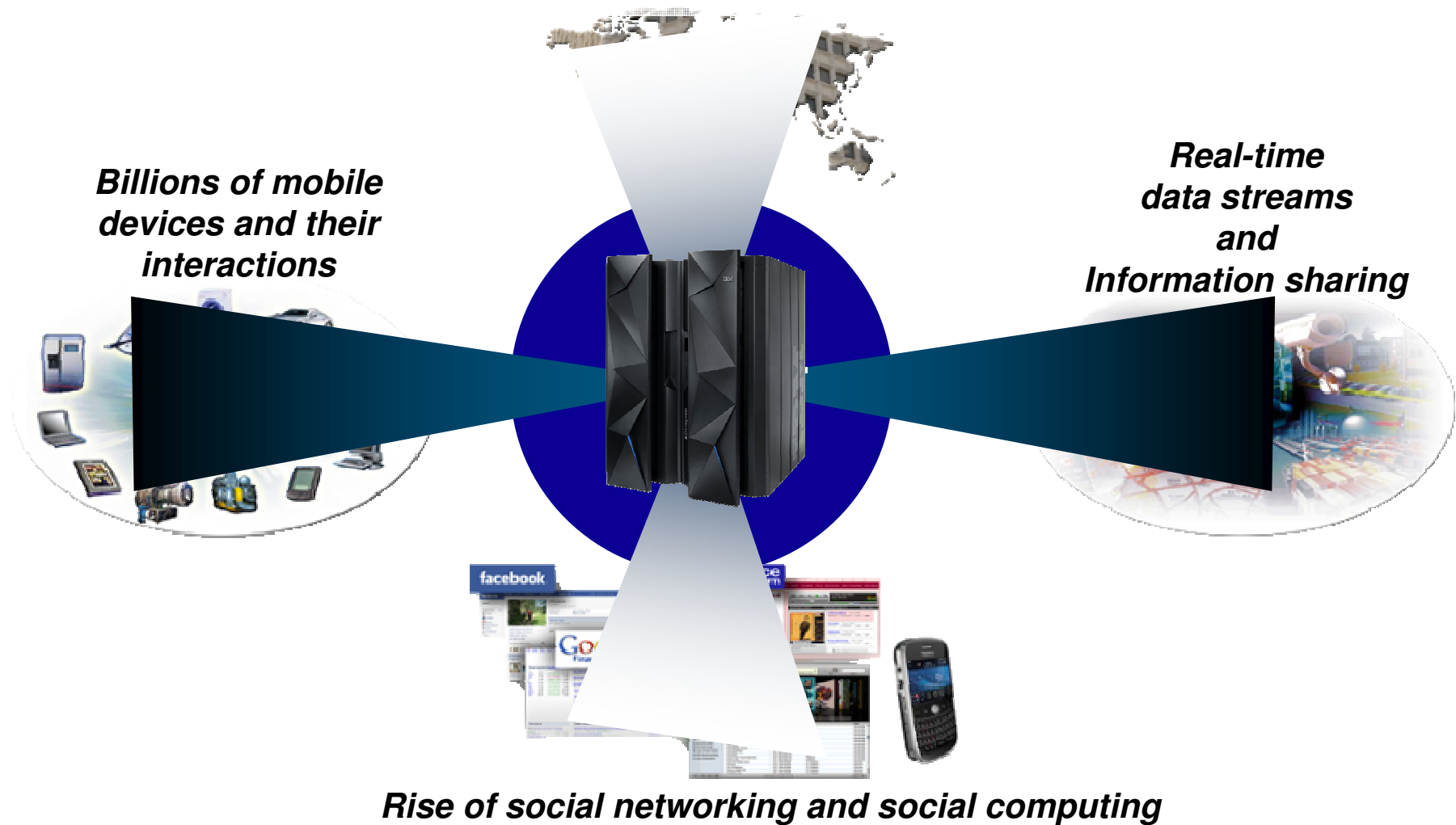
Mobile Computing on System z with IBM Worklight



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Globalization and Globally Available Resources





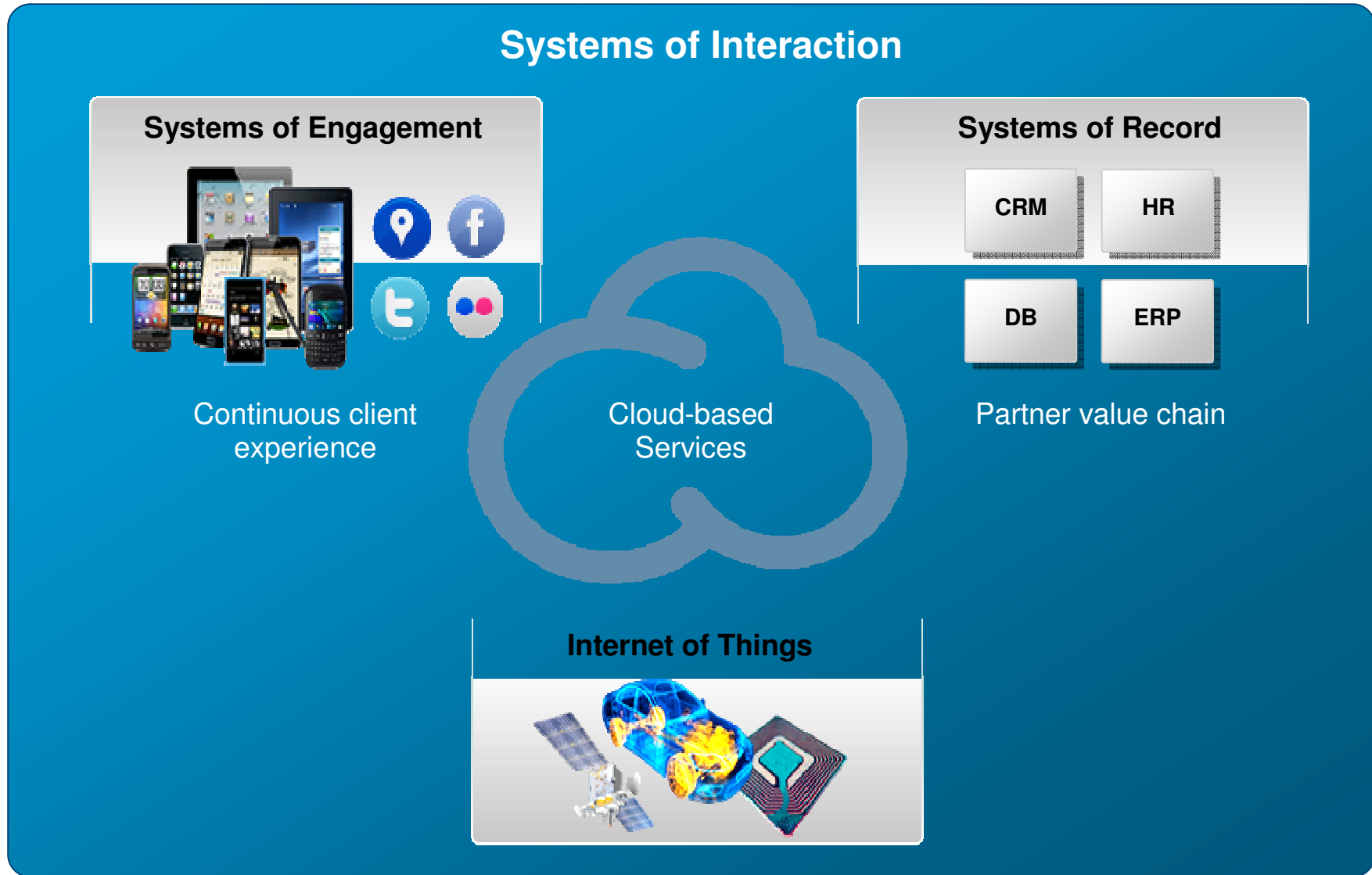
Business with anyone, anytime, anywhere is...



...Business. In Motion.

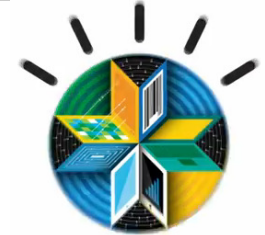


A new kind of system is required





Deepest and Most Rapid Transformation Today



Global machine-to-machine connections will increase from

2 billion in 2011 to

18 billion in 2022.



<http://www.youtube.com/watch?v=sHQe4FsJ0X4>



Key mobile development and delivery challenges

Delivering for multiple platforms

- Highly fragmented set of ...
 - Platforms and devices
 - Languages, APIs, and tools
- Native programming models not portable across platforms



Consumerization of IT and need to deliver high quality apps

- High quality user experience is a requirement
- Quality influenced as much by design as it is by function



Accelerated time to market requirements

- Higher frequency of releases and updates
- Added pressure on teams to deliver on time and with quality



Connecting apps and mobile users with existing enterprise systems

- Existing services typically need to be adapted, extended and scaled for mobile
- Enterprise wireless networks are running out of bandwidth to accommodate employee devices





Mobile First



- Mobile devices are emerging as **primary design point** for end-user access to IT
- More than a new access point to view existing back-end systems
- Mobile First is about: Behavior like consumer applications
 - constantly connected clients
 - quickly accomplishing single tasks and then move on
- **Is accelerating the integration of cloud, social, and analytics**

http://www.b2match.eu/system/softwaredays2013/files/Global-Technology-Outlook-2013_IBM.pdf?1366628169



Mobile is changing the way information is used

Information developed and controlled by users for mobile devices

Information developed using multiple platforms and transformed into web services

Information restricted and developed in the data center





Simplified Development – What is Difficult with Mobile Applications ?

Need to use familiar web technologies:

- HTML5, CSS, JavaScript

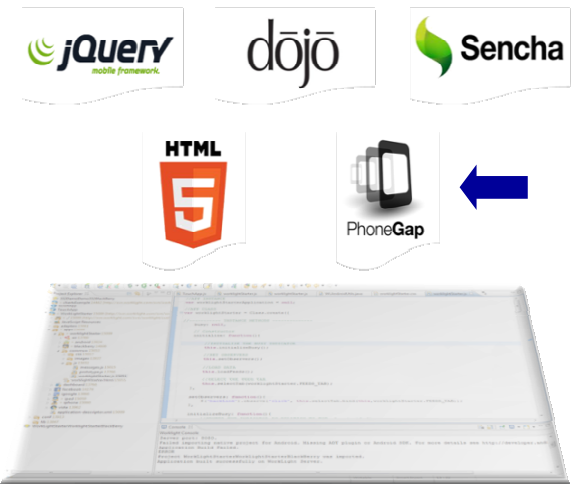
Plus (Hybrid applications)

Support all major mobile platforms with proprietary tools, languages and APIs:

- Android phones and tablets
- Windows 7 and Vista (Deprecated)
- BlackBerry 6 and 7
- BlackBerry 10
- iPad
- iPhone
- Mac OS X Dashboard (Deprecated)
- Mobile Web Application
- Windows 8 desktop and tablets
- Windows Phone 7.5
- Windows Phone 8



Leverage common HTML5 and mobile [libraries/frameworks](#):

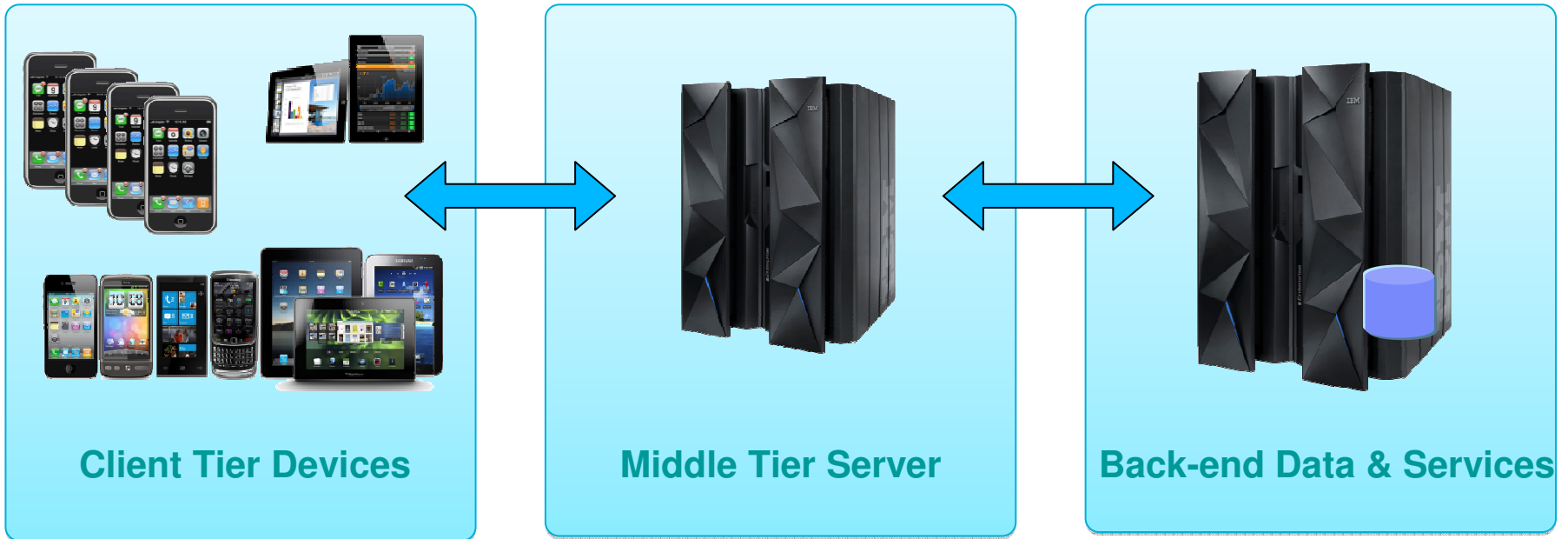




Multi-tier mobile environment

Systems of Engagement

Systems of Record



Client Tier Devices

Middle Tier Server

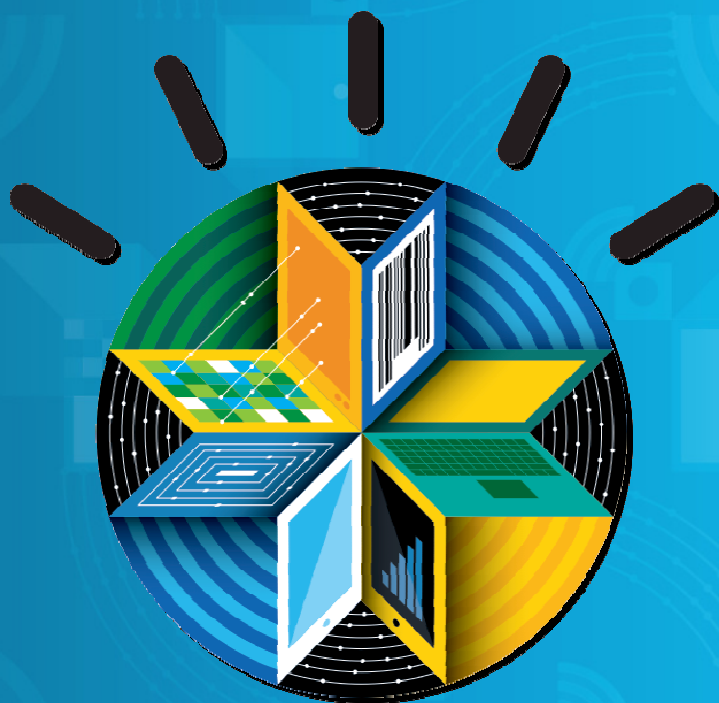
Back-end Data & Services

- OS Device Variety
- Screen size variety
- Various Smartphones
- Tablets

- Web Application Server
- Mobile Application Runtime Server
- Security components
 - Authentication
 - Crypto
- Back-end access services
- Caching of back-end services

- Databases and Data sources
- Transactional services
 - CICS
 - IMS
 - DB2

IBM MobileFirst



The Broadest Portfolio of Mobile Solutions

IBM MobileFirst Platform ←

IBM MobileFirst Management

IBM MobileFirst Security

IBM MobileFirst Analytics



 **Worklight**
The Foundation
for Mobile



IBM Worklight – Support for Different Mobile Application Styles



Web

- HTML, JavaScript, CSS
- Accessed from a mobile web browser
- No device-specific capabilities



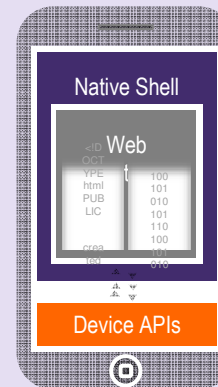
Mobile Web

- HTML, JavaScript, CSS
- Accessed from a mobile web browser; mobile-optimized UI
- Limited access to lower-level device capabilities



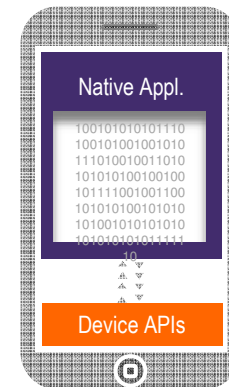
Hybrid Mobile

- HTML, JavaScript, CSS, with optional native code
- Installed and run like a native mobile app; mobile-optimized UI
- Access to lower-level device capabilities



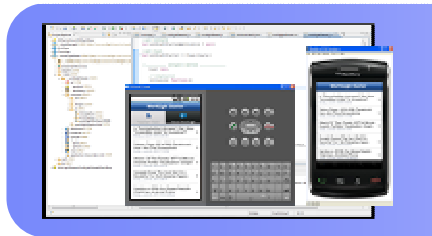
Native

- Native code
- Access to full set of lower-level device capabilities



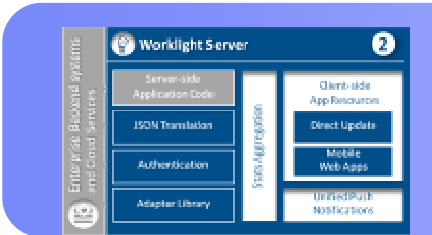


IBM Worklight - Components



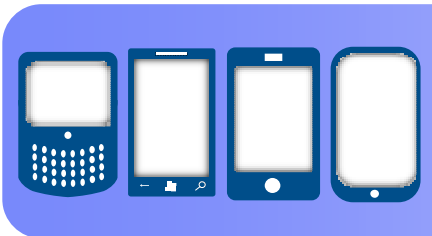
Worklight Studio

The most complete, extensible development environment
maximum code reuse and per-device optimization



Worklight Server

Mobile middleware offering unified push notifications,
version management, security and integration



Worklight Runtime Components

Extensive libraries and client APIs that expose and interface
with native device functionality and the Worklight Server



Worklight Console

A web-based console for real-time analytics and control
of your mobile apps and infrastructure





Worklight Platform Support

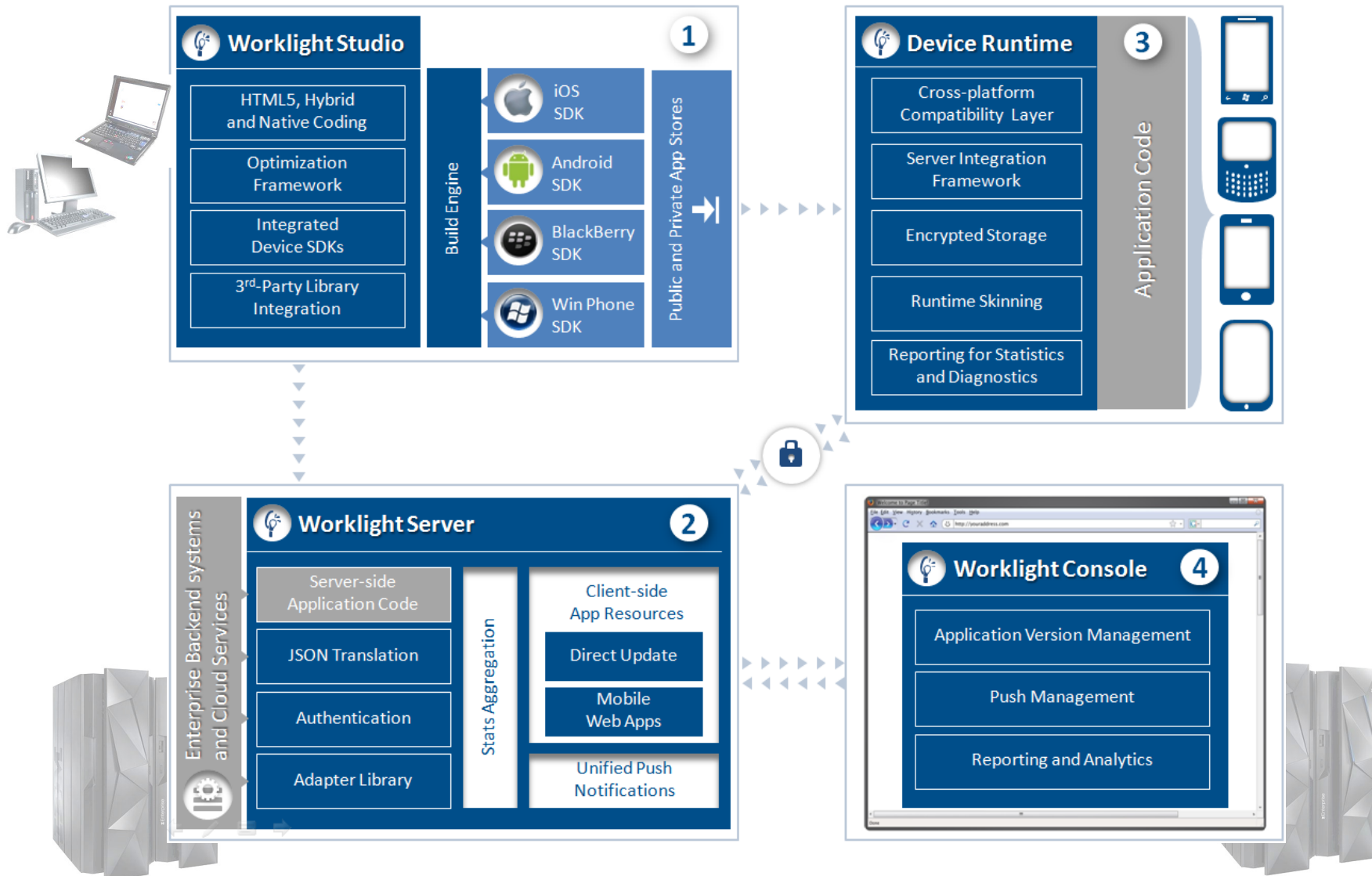
Worklight Server

- Supported application server
 - WebSphere 7 & 8 (Distributed | System z Linux)
 - WebSphere 8.5 Liberty Profile (included for Dev only), ND/Base (not included)
 - Apache Tomcat 7 (Linux | Windows | Mac OS X [development])
- Supported databases
 - DB2 Enterprise Server Edition V9.7 or later (DB2 LUW)
 - Apache Derby, SDK 10.8 (included), or later
 - Oracle 11g Database server, Standard or Enterprise Editions, release 1 or later
 - MySQL 5.1
- Supported OS
 - System z Linux SLES 10,11, RHEL 5,6.

<http://pic.dhe.ibm.com/infocenter/prodguid/v1r0/clarity-reports/report/html/prereqsForProduct?deliverableId=1322605181306>

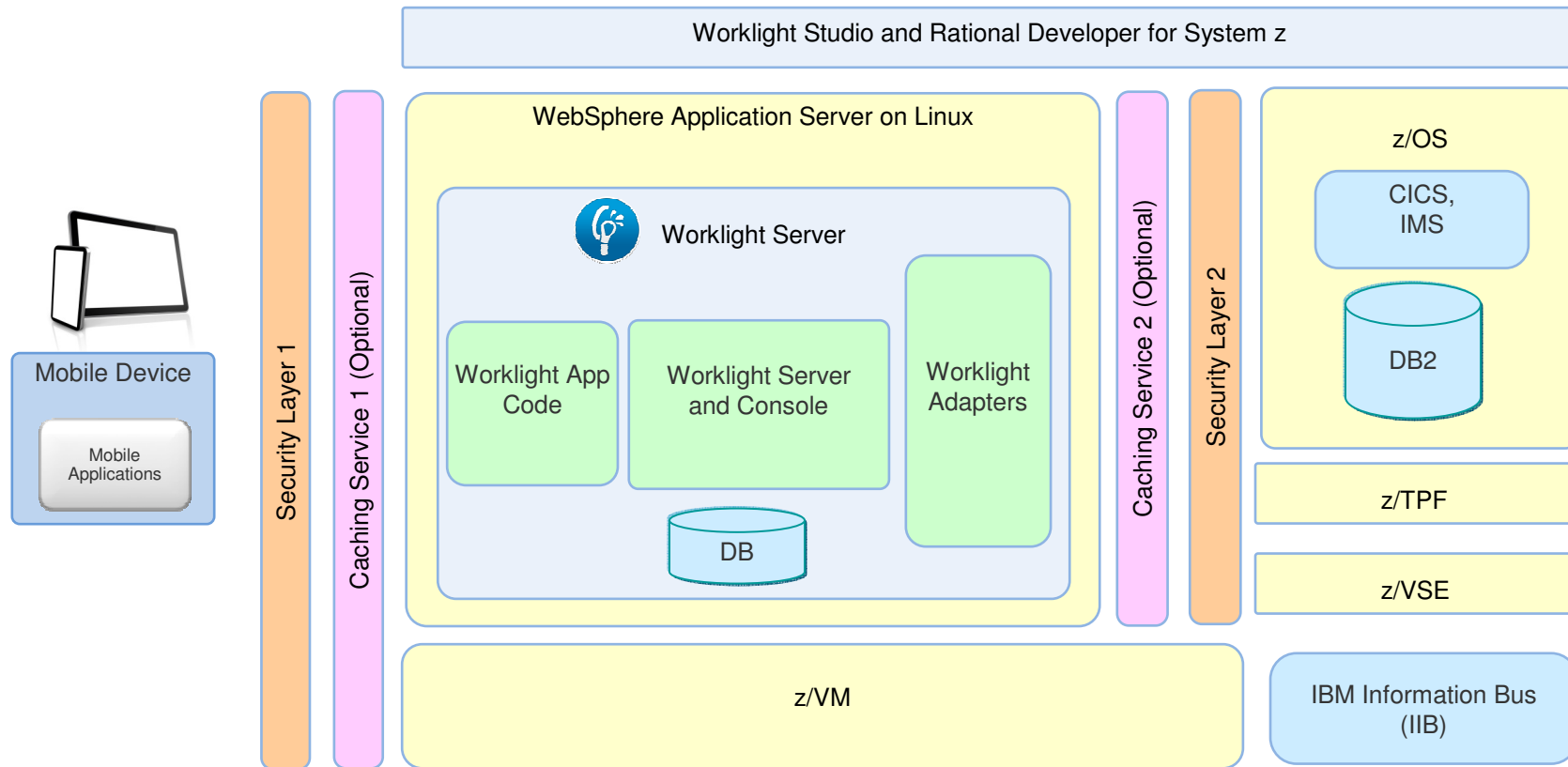


Architecture Overview



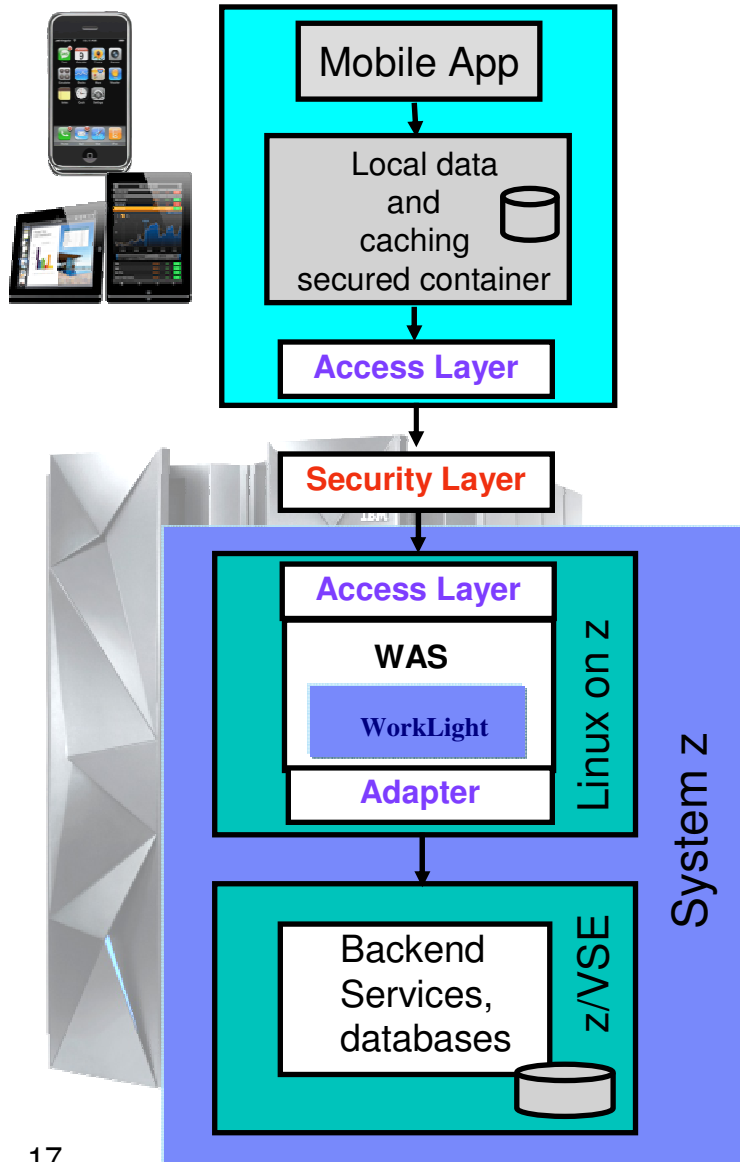


Mobile Architecture Overview for System z





Implementation layers for a mobile environment on System z



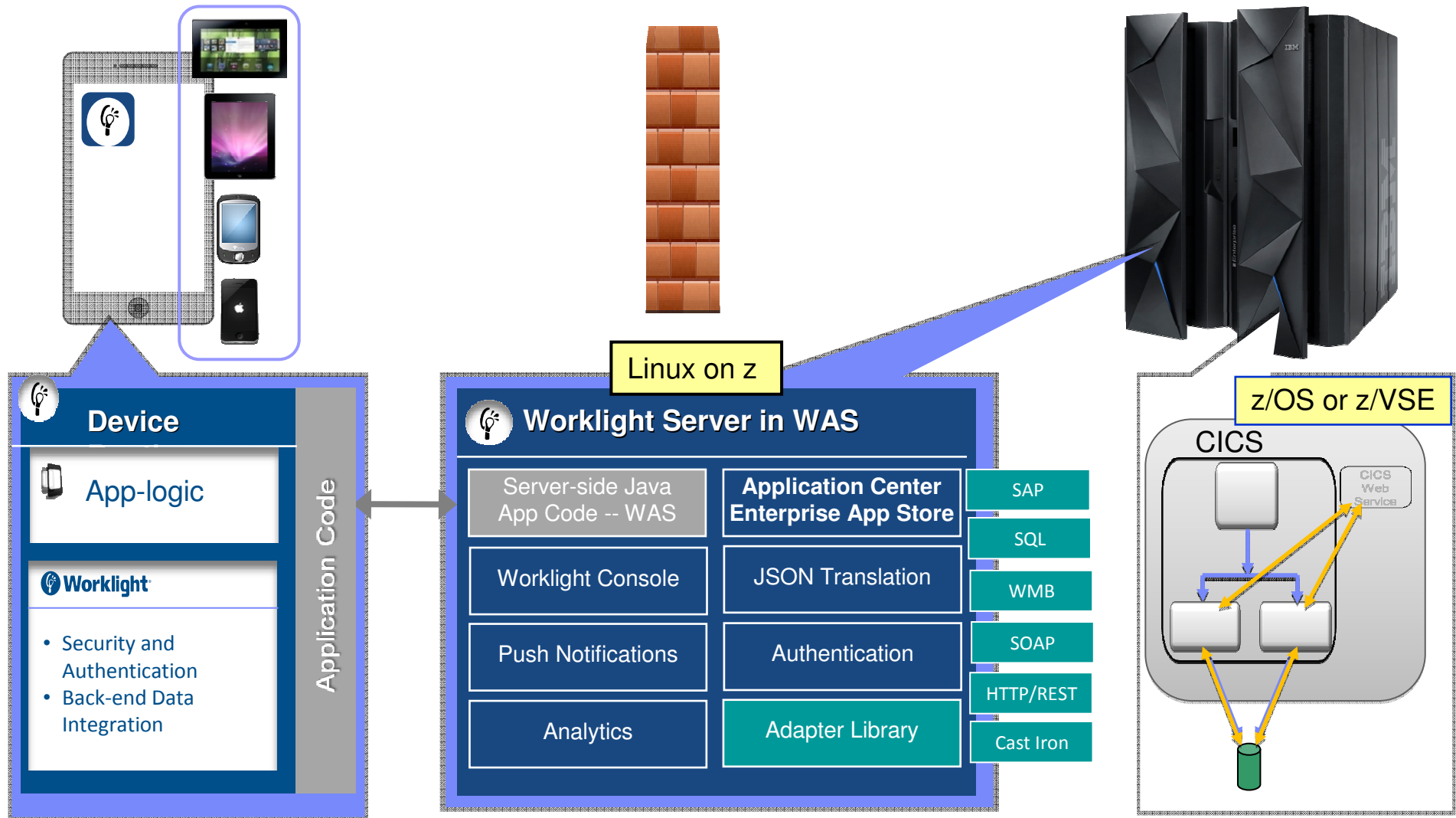
- **The Mobile App** running on a mobile device connects to the Worklight Mobile Environment using different protocols in the Access Layer.
- The local data and caching mechanism is encrypted
- The access to the System z Mobile Environment is done via a Security Layer for Authentication.

- **The Mobile environment** on System z can use different protocols in the Access Layer.
- The Worklight Server runs in a WebSphere Environment, taking advantage of the WAS technologies.
- The Adapters enable the communication with transactional services and databases.

- **The back-end services** on System z (i.e. z/VSE, z/OS), can be accessed from the mobile environment using the internal network.



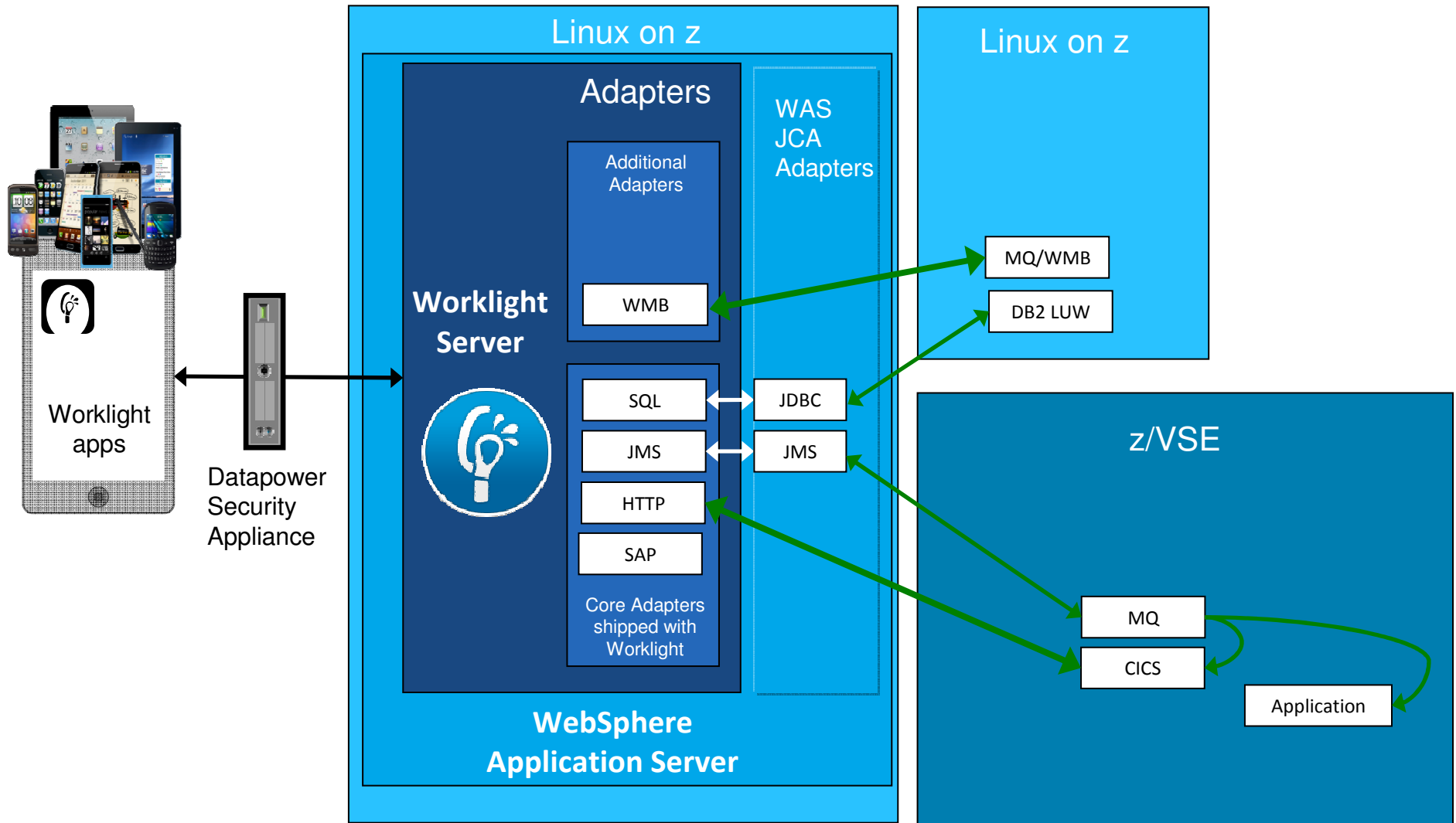
System z Mobile Enterprise with IBM Worklight Server



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

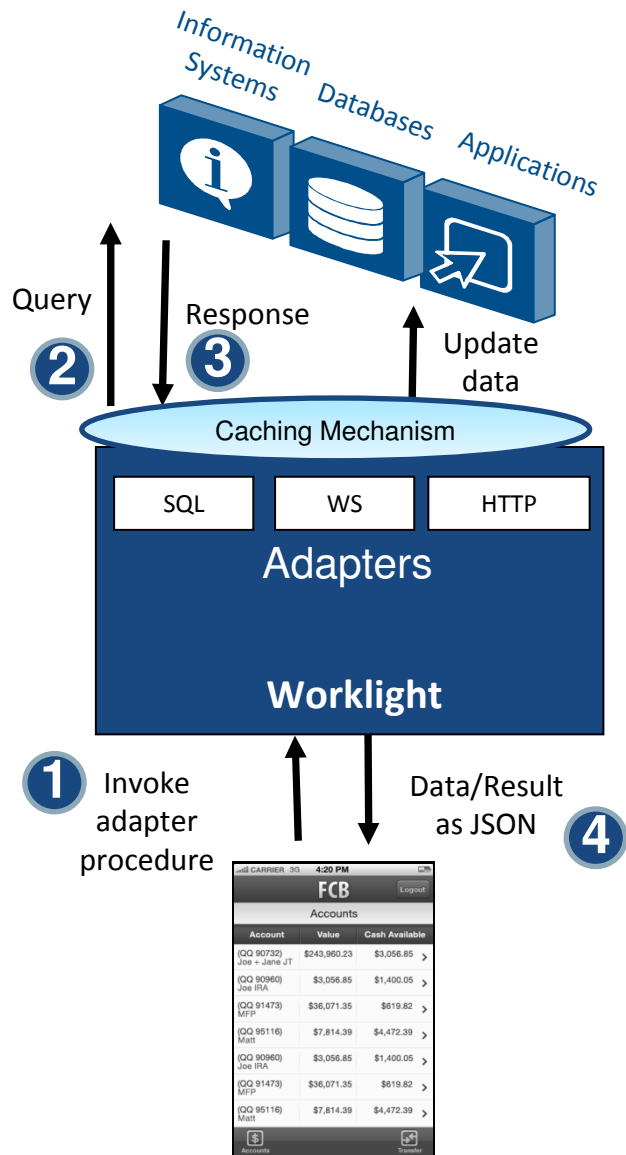


Implementation option of a Mobile environment on System z - Functional diagram with WAS and Worklight Adapters





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

Security

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

Caching

- Leveraged to store data retrieved from back-end

Transparency

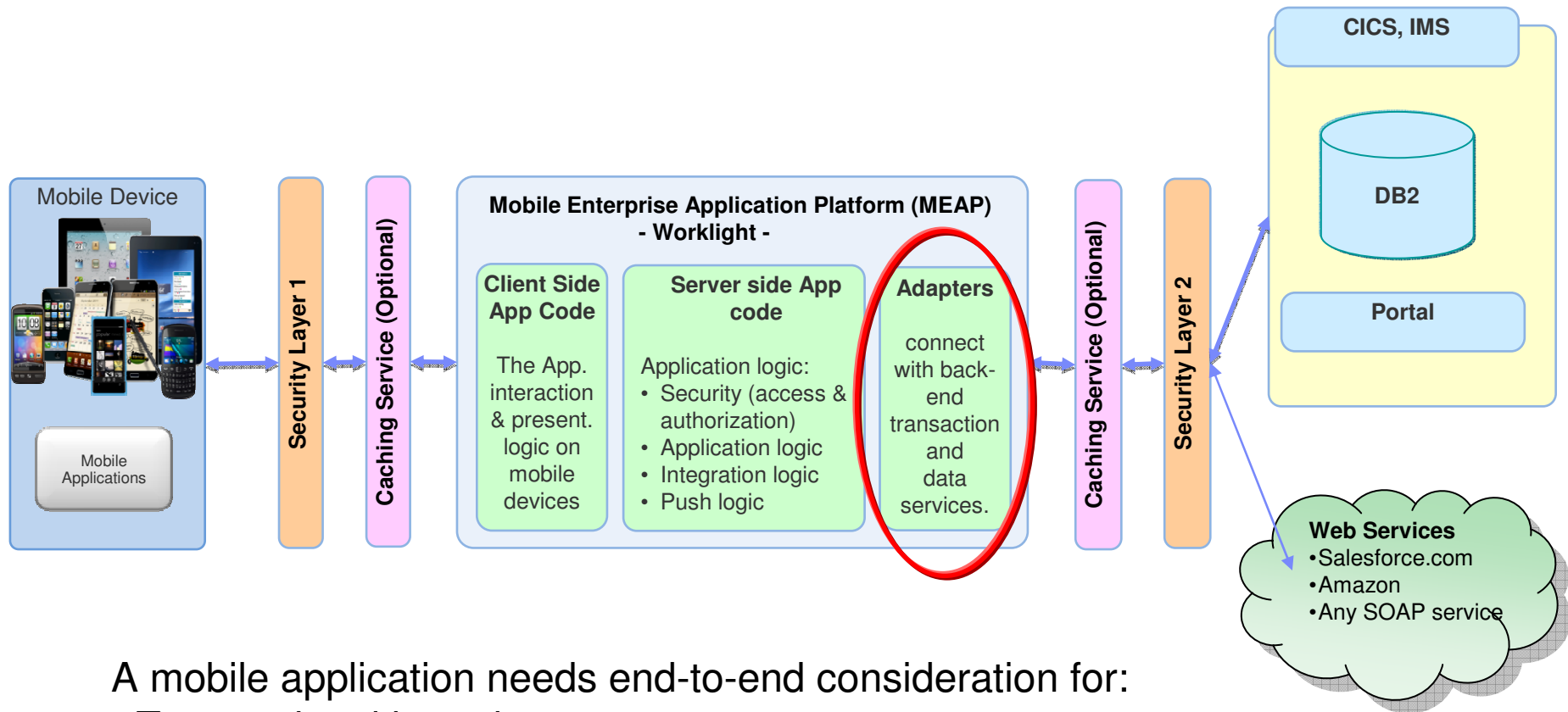
- Uniform exposure of back-end data for all adapter types

Fast Development

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



Mobile application overview diagram



A mobile application needs end-to-end consideration for:

- Transactional integrity
- Data integrity
- Security

Mobile application integration is realized with Worklight Adapters



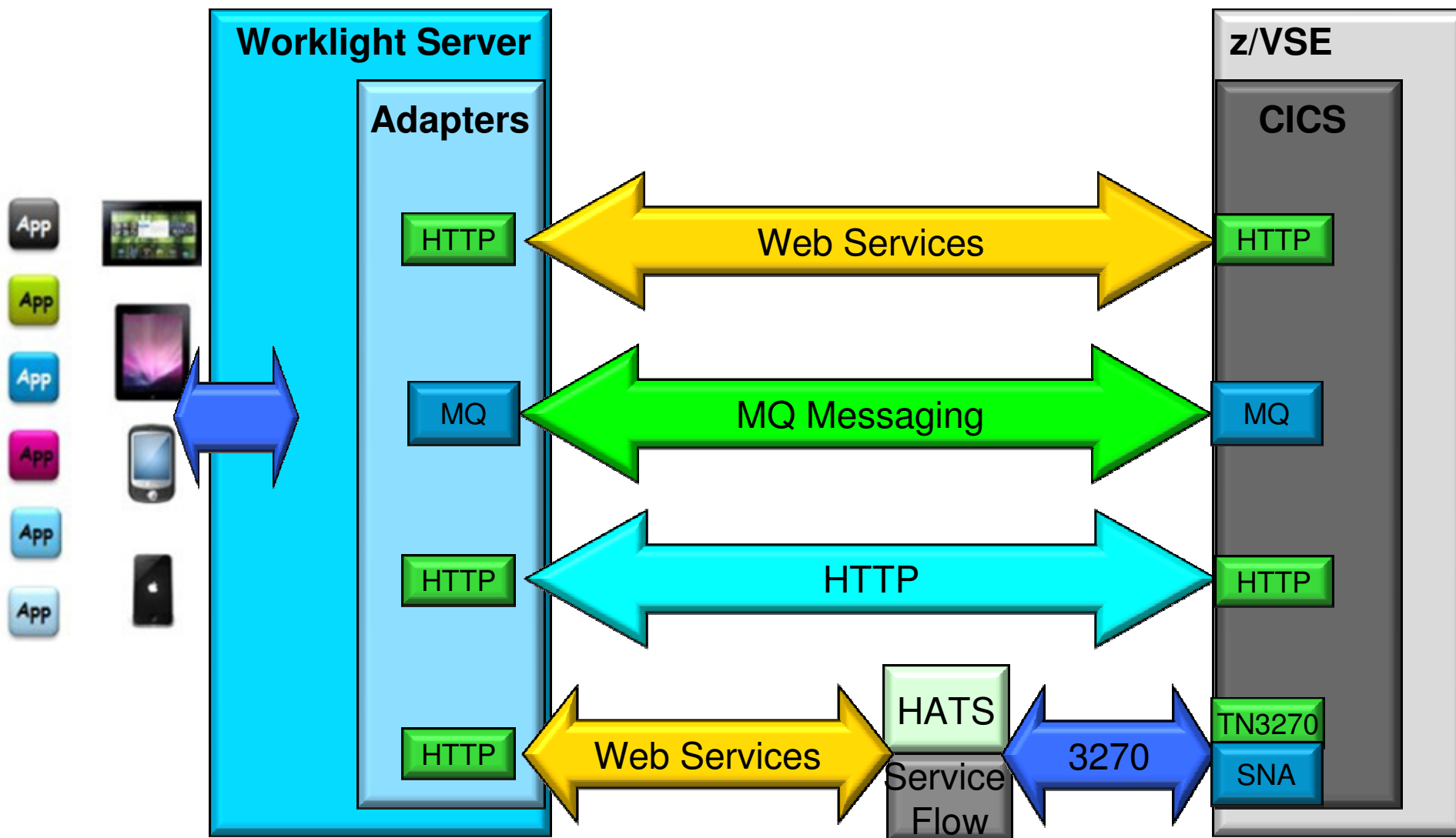
Connectivity of a Mobile Environment to System z Workloads

- Integration with System z and subsystems via **JSON and SOAP over HTTP adapters**
 - z/OS, CICS, IMS
 - zTPF, z/VSE
- Integration with Information Services via **JDBC**
 - DB2, InfoSphere Classic Federation
 - IMS DB, DL/I
 - VSAM
- Integration to existing WebSphere connectors – mainly Java - **with hybrid Adapters**
 - CTG
 - Java JNDI
 - WebSphere host adapters
- Integration with other environments / solutions – **with special adapters**
 - Web Portals – Web Middleware
 - SOA – IIB (former MQ Message Broker)
 - SAP, Siebel
 - Cloud – SCE, SCO
 - Mobile as a Service in cloud environments with IBM BlueMix
- Integration via **3rd party sites**
 - AT&T
 - IBM SoftLayer
 - Salesforce.com



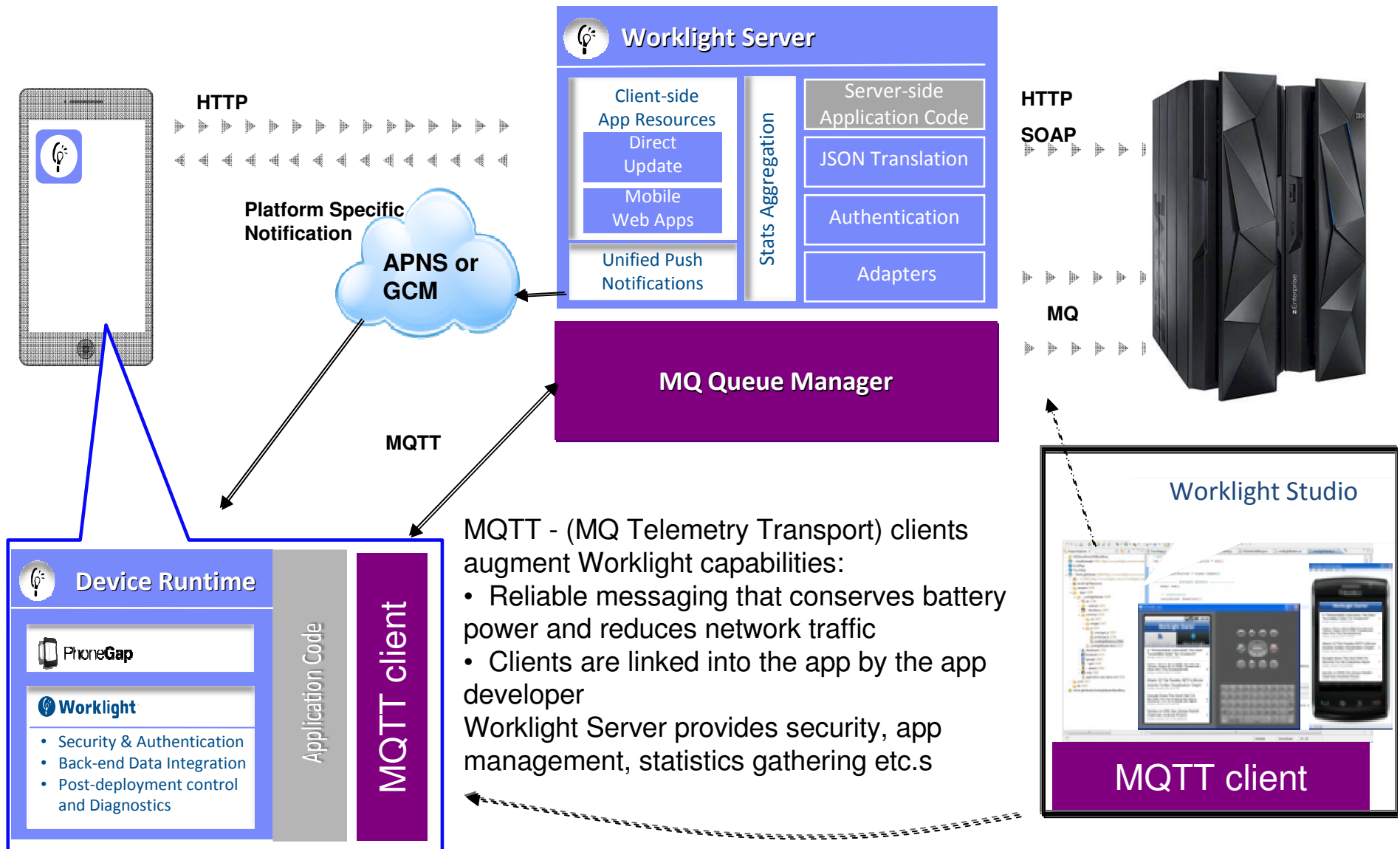


CICS Connectivity Options with Worklight





Lightweight MQ for Key Enterprise Messaging (MQTT)





Lightweight Web Services – Java Script Object Notation (JSON)

- The growth in mobile helped boost the popularity of JSON
- The lightweight data format is ideally suited to mobile data transfer
- As a result numerous tools and frameworks now support JSON...



IBM Worklight uses JSON:

- For communication between a mobile application and the Worklight Server
- Provides a JSON Store for offline storage of data
- Automatically converts Webservice SOAP replies into JSON

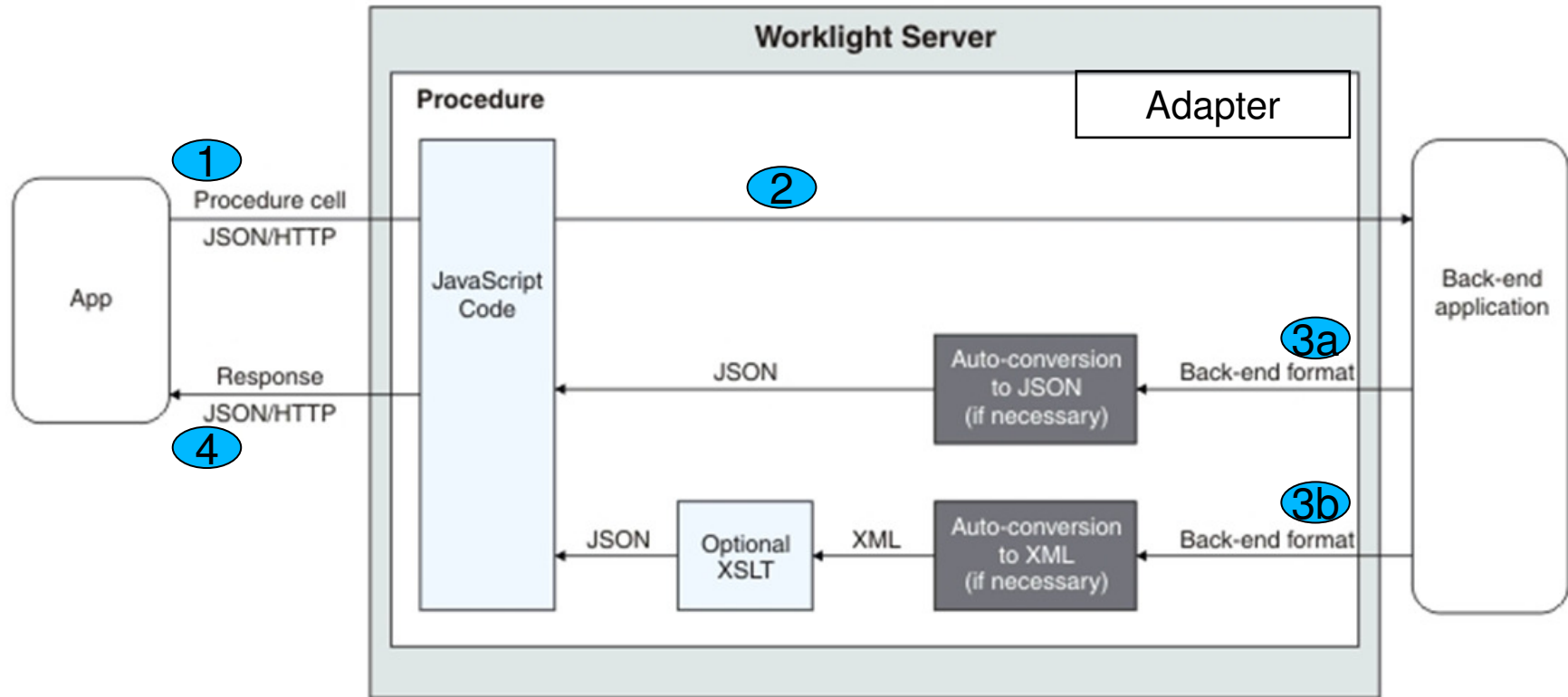
Numerous other frameworks depend upon JSON data...

Eg. jQuery & dojo use JSON:

- JSON Store
- Ajax calls
- All data interchange



Worklight Adapters

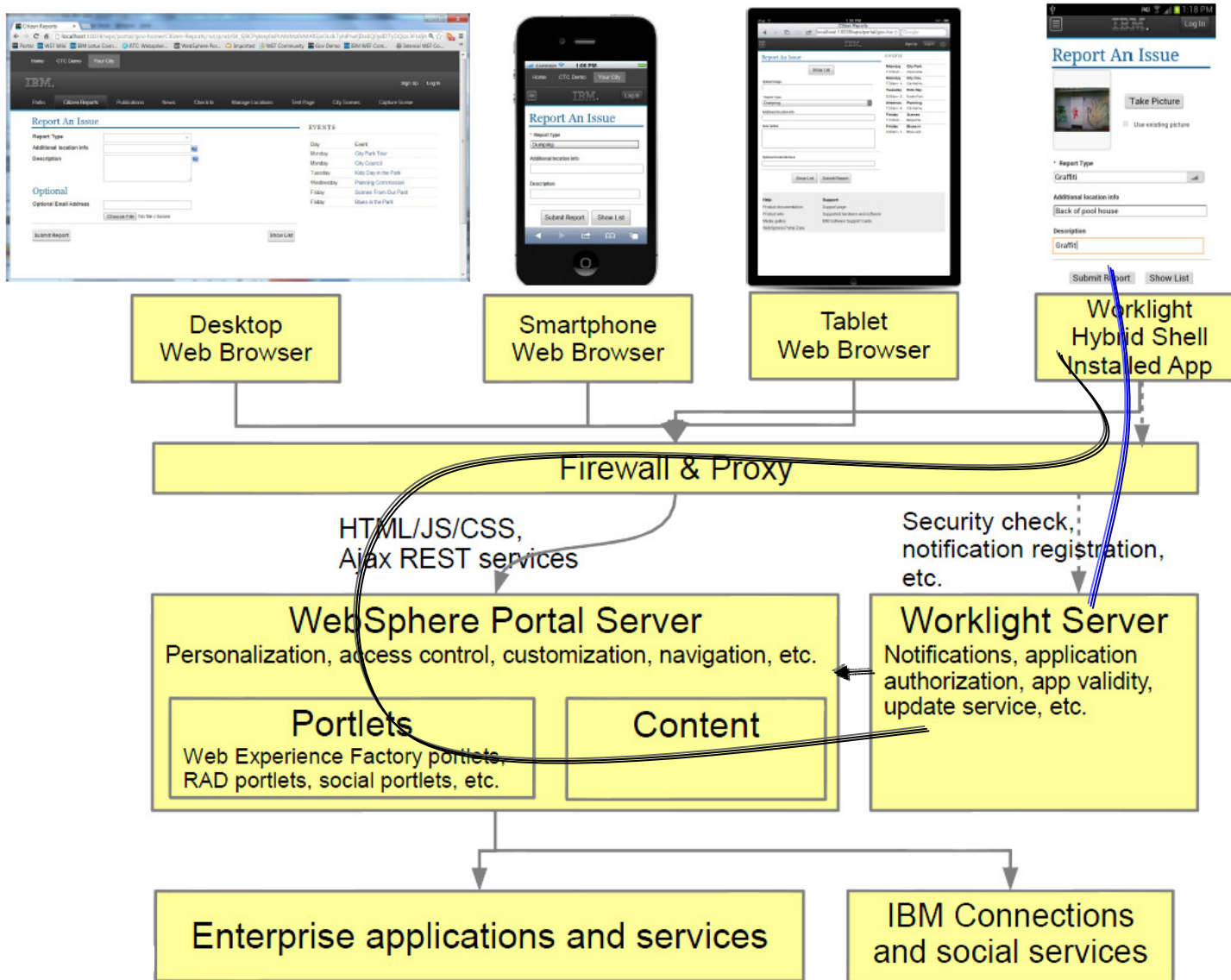


1. An adapter exposes a set of services, called procedures. Mobile apps invoke procedures by issuing Ajax requests.
2. The procedure retrieves information from the back-end application.
3. The back-end application then returns data in some format.
 - a. If this format is JSON, the IBM Worklight Server keeps the data intact.
 - b. If this format is not JSON, the IBM Worklight Server automatically converts it to JSON. Alternatively, the developer can provide an XSL transformation to convert the data to JSON..
4. The JavaScript implementation of the procedure receives the JSON data, performs any additional processing, and returns it to the calling app

http://pic.dhe.ibm.com/infocenter/wrklght/v5r0m5/index.jsp?topic=%2Fcom.ibm.worklight.help.doc%2Fdevref%2Fc_overview_of_ibm_worklight_adap.html



Multi-channel site – with WebSphere Portal and Worklight

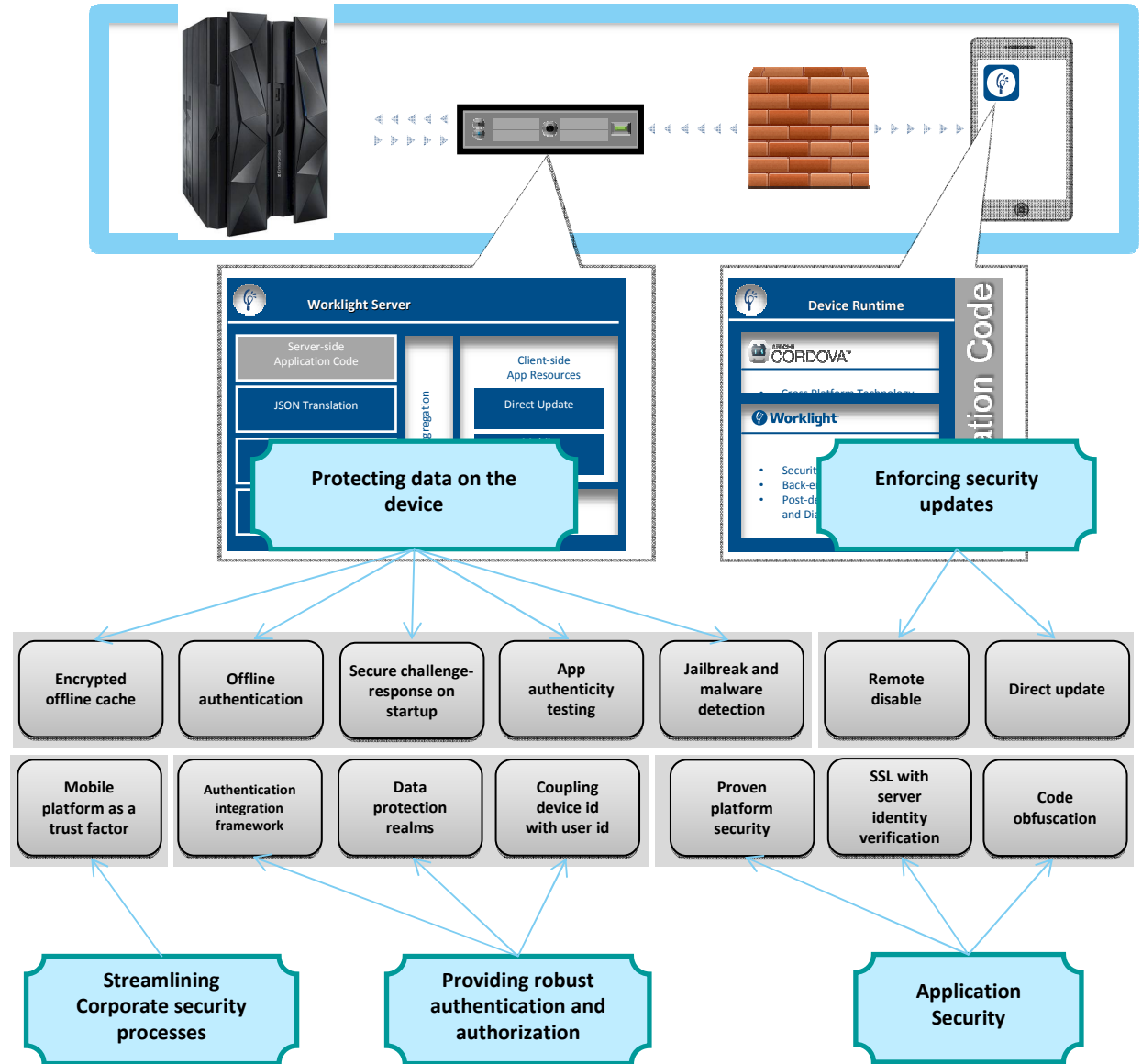


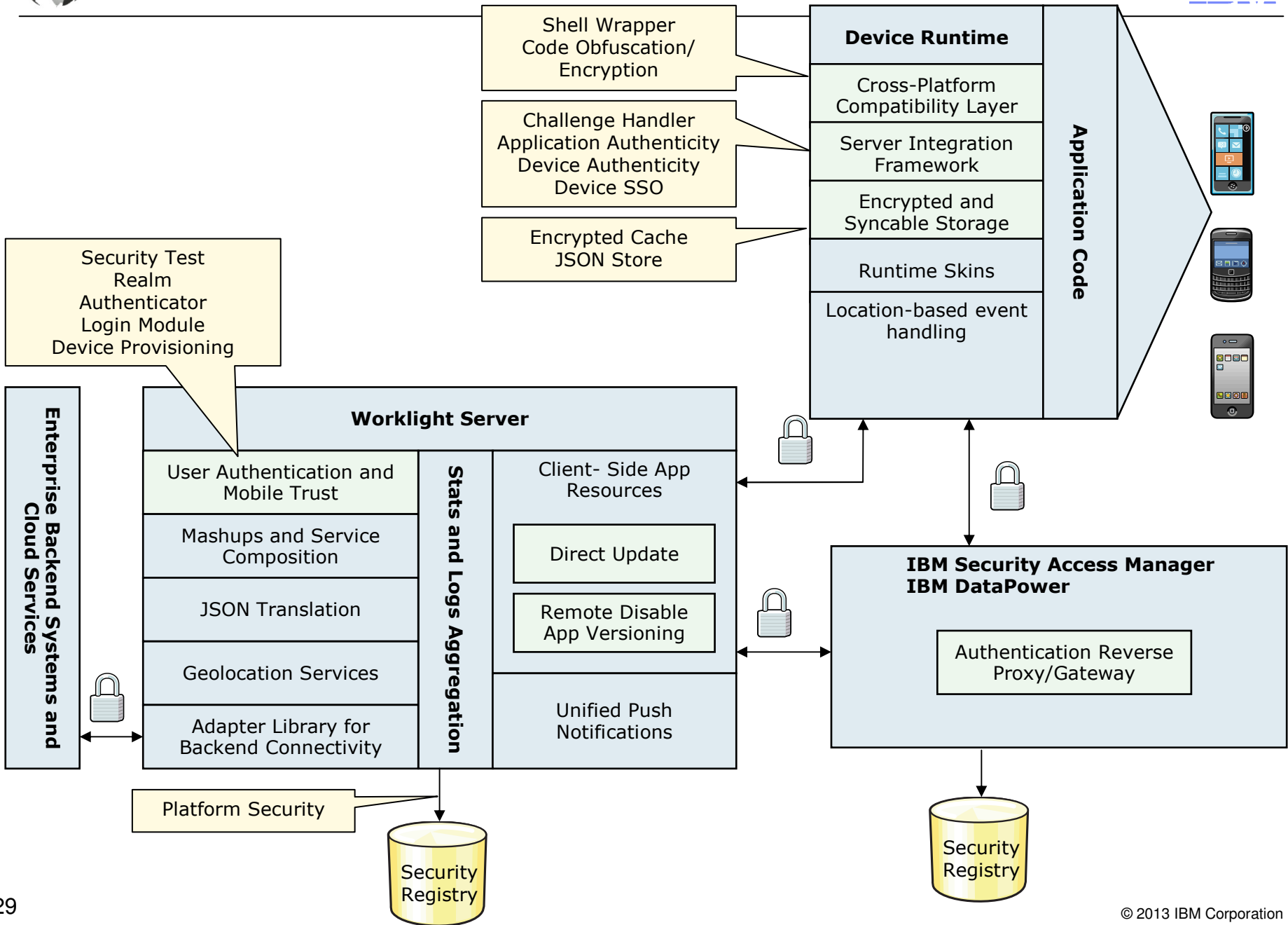
- Apps on Mobile devices:
- with WPS Web Sites
 - with apps from WL
 - with hybrid content from WPS through WL



Worklight Security Features

- Ensure that only specific applications on specific devices can connect to enterprise systems
- Extensible framework for authentication of mobile application users
- Encrypt data on the device
- Enforce security updates
- Propagate identity to enterprise systems

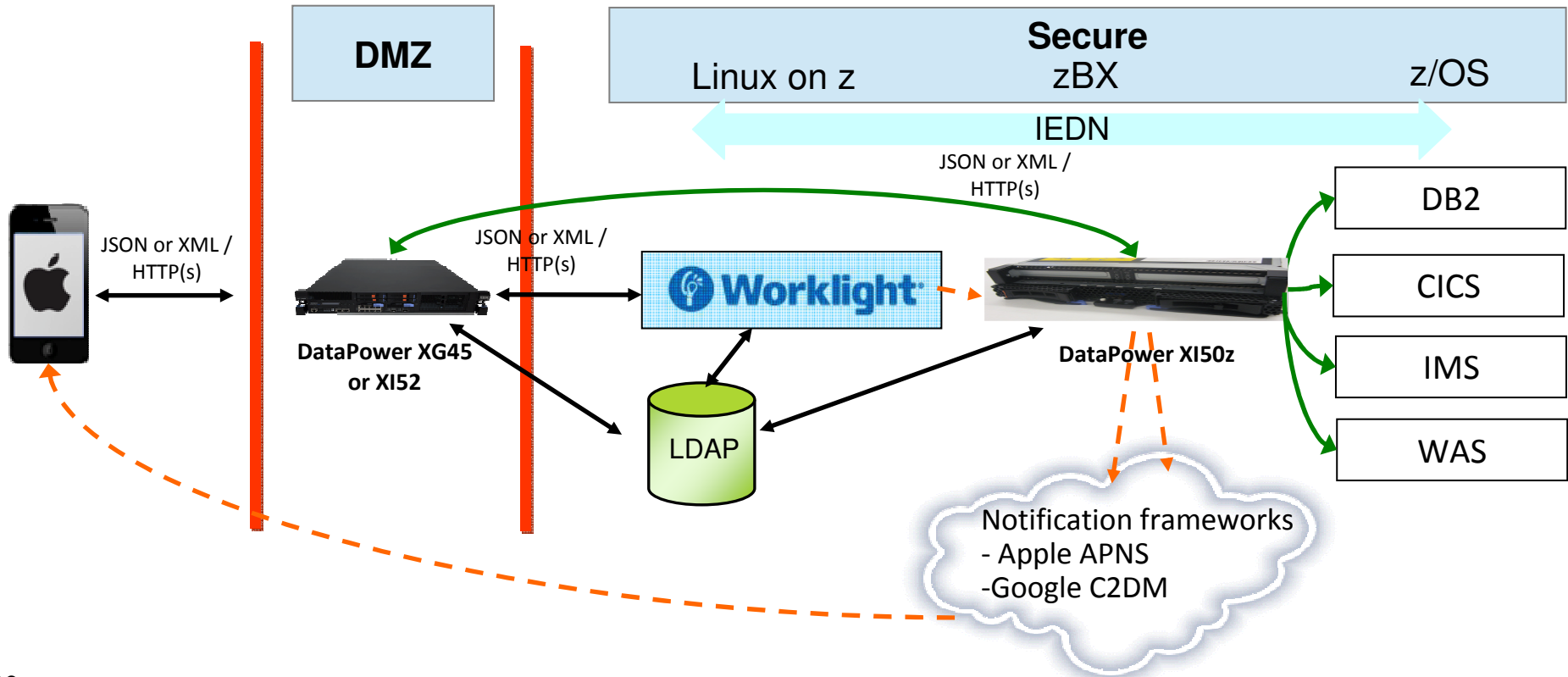






Security Topology – DataPower as a 2nd security layer

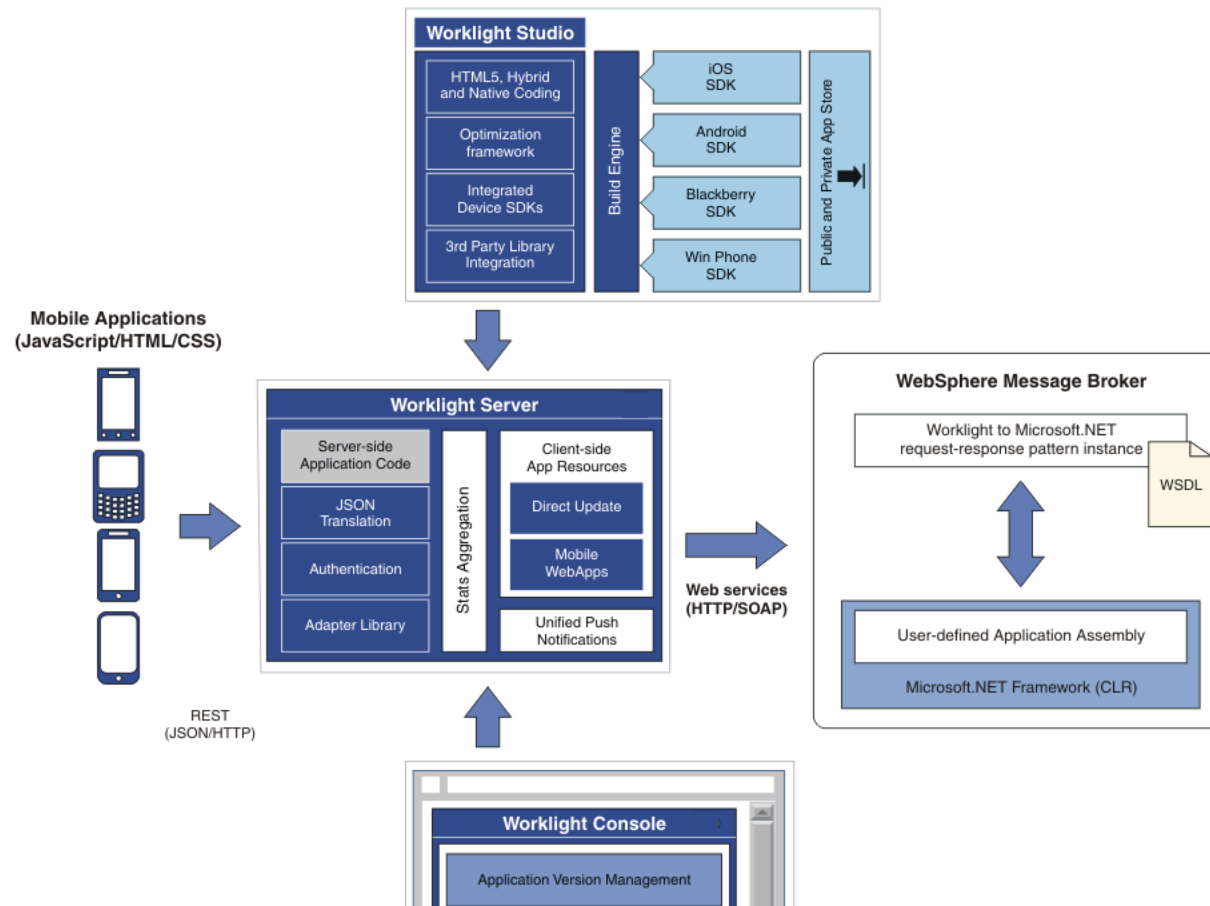
Capabilities	Deployment scenarios	System z benefits
<ul style="list-style-type: none"> DataPower XI50z (zBX blade) contains the same functionality as a stand-alone device or virtual appliance ... but benefits from co-location with System z services Defence in depth 	<ul style="list-style-type: none"> For offload of security processing (e.g SSL) and to perform identity mapping Secure proxy for push notifications from Worklight server to the mobile device 	<ul style="list-style-type: none"> DataPower XI50z acts as an additional security layer for backend services IEDN provides a secure private network for communication between zLinux, zBX and z/OS





IIB and Worklight to Microsoft .NET Service Enablement

- Creates a mobile-ready service around a Microsoft .NET application
 - Generates a web service implementation which is deployed to IIB (Message Broker)
 - Builds a Worklight integration adapter and a sample mobile application
 - Inbound data from the mobile application is sent to Worklight as JSON/HTTP
 - The adapter converts the JSON data into/from SOAP/HTTP for the .NET web service





Integration of Mobile as a Service (MaaS) – with BlueMix

<http://www.edbrill.com/ebrill/edbrill.nsf/dx/today-at-mobile-world-congress-and-pulse-ibm-has-announced-project-bluemix>

Ed Brill | Enterprise mobile, collaboration, travel, Chicago, and more

Today at Mobile World Congress and Pulse, IBM has announced "Codename: Bluemix"

February 24 2014



48

Tweet

5

Gefällt

Today is a busy day for [IBM MobileFirst](#).

We started the day here in Barcelona at [Mobile World Congress](#), a conference with 80,000 attendees from all over the world. [IBM's presence at Mobile World Congress \(#BMMWC\)](#) starts with a magnificent trade show booth, continues with hundreds of meetings, accelerates with a 1/2 day mini-conference Tuesday afternoon, and culminates with a keynote from CEO and Chairman Ginni Rometty on Wednesday evening.

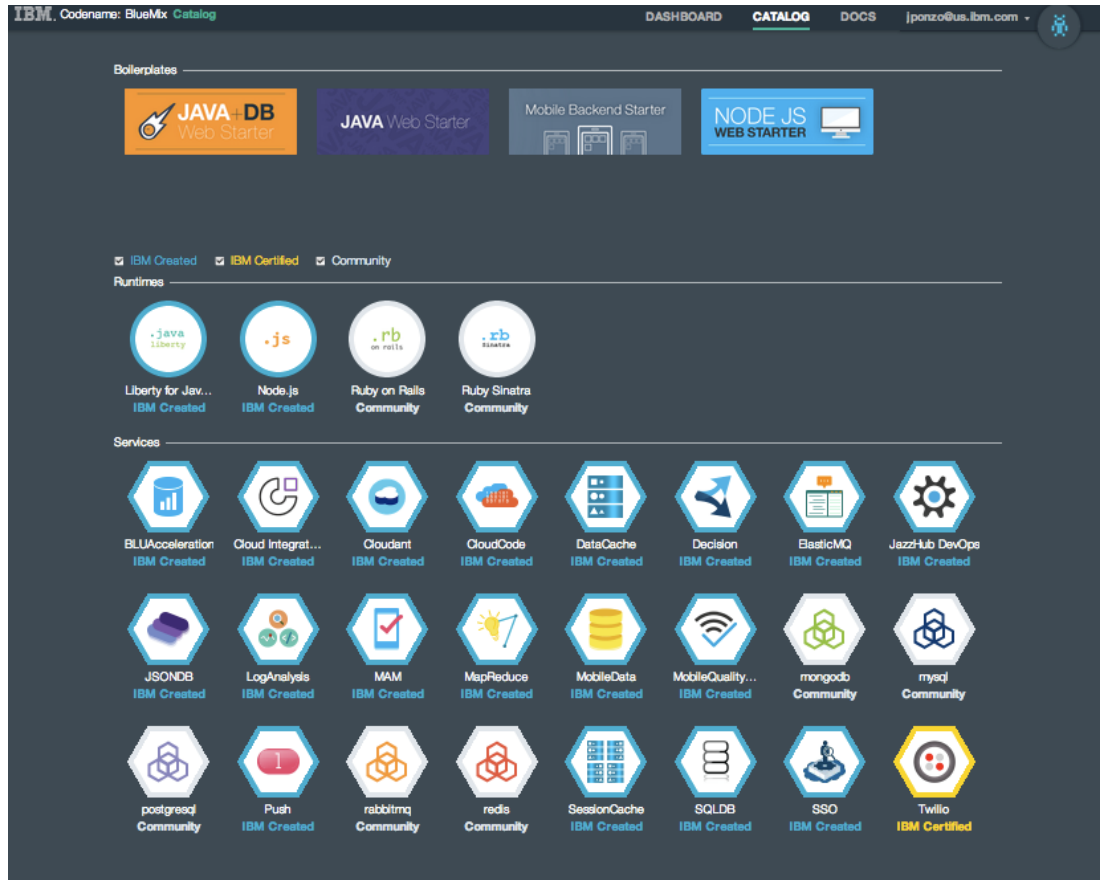
I've heard all the stories about MWC, which is 2nd only to CeBIT in terms of size of a European technology show, but being here is a whole different thing. The Fira Barcelona is almost a mile long, and the show continues throughout every one of eight buildings. I logged nearly 20,000 FitBit steps yesterday without any workout, or even really any sightseeing. There appear to be over 200 IBMers here, plus some recent acquisitions like The Now Factory and MaaS360 by Fiberlink, and we have several speakers throughout the week including [Andrew Grill](#) and those in our own 1/2 day conference - IBM GM Marie Wieck, IBM GM Rich Esposito, IBM Global Business Services partner Kevin Custis, and Fiberlink CEO Jim Sheward.

Meanwhile half a world away, in Las Vegas, [IBM is holding the annual Pulse conference](#), which has become our premier cloud event. And today at Pulse, we are announcing the public beta of [Codename "Bluemix"](#), the [new IBM cloud developer platform](#). From the individual developer to the VP of apps, aBluemix is an ideal cloud platform-as-a-service environment for building, deploying, and managing web and mobile apps. Both IBM and our partners are delivering modular cloud services for typical app use cases of today: integration, data



In quick summary... BlueMix can...

Delivering a Composable Services development environment



Run Your Apps

The developer can choose any language runtime or bring their own. Just upload your code and go.

DevOps

Development, monitoring, deployment and logging tools allow the developer to run the entire application

APIs and Services

A catalog of open source, IBM and third party APIs services allow a developer to stitch together an application in minutes.

Cloud Integration

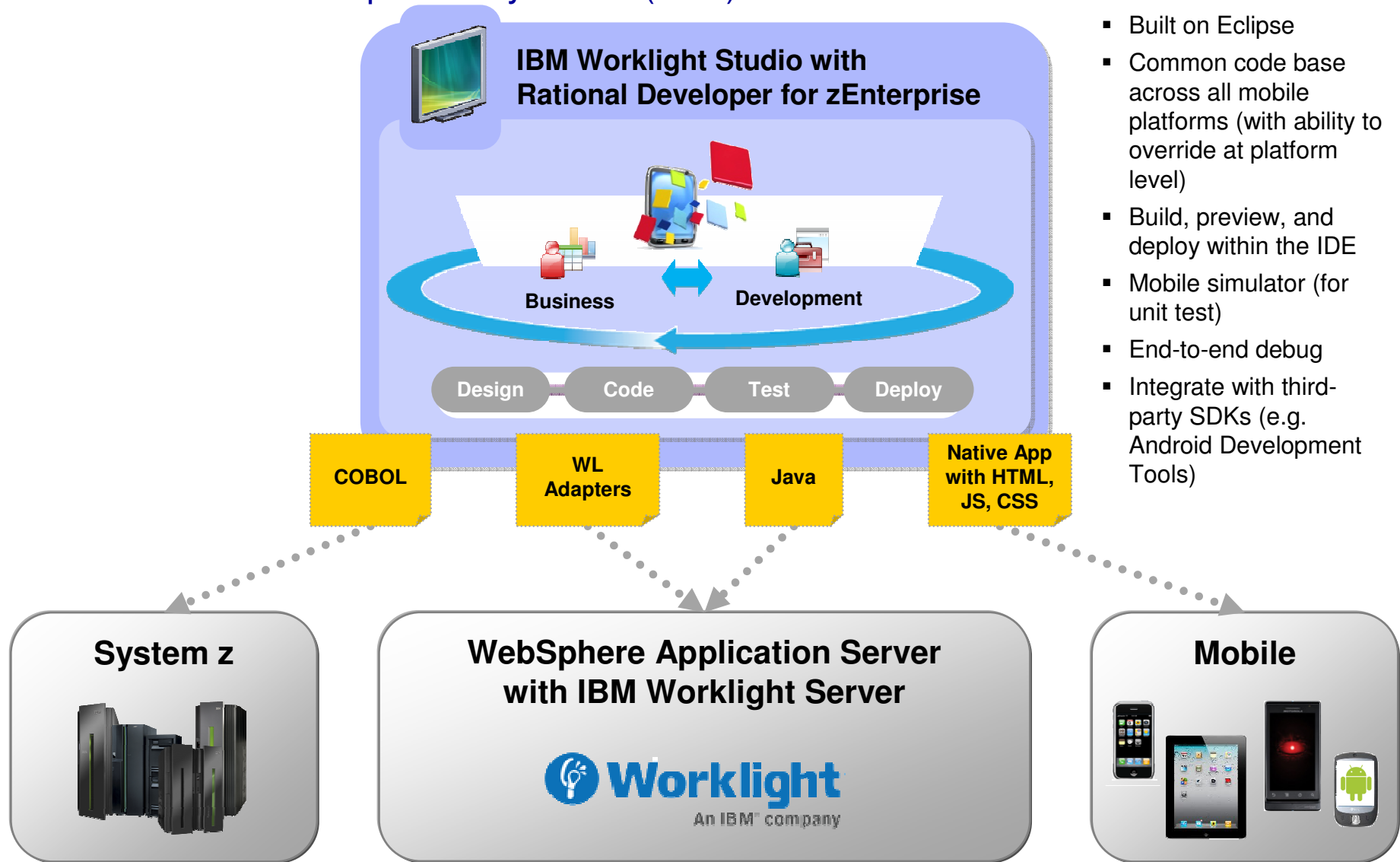
Build hybrid environments. Connect to on-premises systems of record plus other public and private clouds. Expose your own APIs to your developers.

Built on IBM SoftLayer

Runs on top of IBM's leading infrastructure as a service.



Development for IBM Worklight on System z with IBM Rational Developer for System z (RDz)





Studio- WYSIWYG Development Environment

The screenshot displays the Studio WYSIWYG Development Environment. The interface is divided into several sections:

- Project Explorer:** Shows the project structure for 'MobileEnterprise', including libraries (WL Server Library, JRE System Library), resources (JavaScript Resources), adapters (EGUIAtomAdapter, InquireCatalogWrapper, InquireSingleWrapper, PlaceOrderWrapper, zServersAtomAdapter, zServersHATSAdapter), and apps (EGUI, android, common, css, images, js, EGUI.html, iphone, legal, mobilewebapp, application-descriptor.xml, build-dojo.properties, build-dojo.xml, FileA, apps-backup, bin, components, dojo, referenceLib, server). The 'EGUI.html' file is selected.
- Design View:** Displays a mobile application design titled 'CIGS Catalog Manager'. It features a dark blue header with the title and three menu items: 'Browse Catalog', 'Inquire an Item', and 'Shopping Cart', each with a right-pointing arrow.
- Source View:** Shows the HTML source code for the design. The code includes a DOCTYPE declaration, a license notice, and a head section with meta tags for charset and viewport, a title tag, and link tags for a shortcut icon, an apple touch icon, and a stylesheet.
- Palettes:** On the right side, there are two palettes: 'HTML Tags' and 'Dojo Mobile Widgets'. The 'HTML Tags' palette lists various HTML elements like Link, Image, Paragraph, and headings. The 'Dojo Mobile Widgets' palette lists various mobile UI components like Accordion, Audio, Button, Carousel, and others.

```
<!DOCTYPE html>

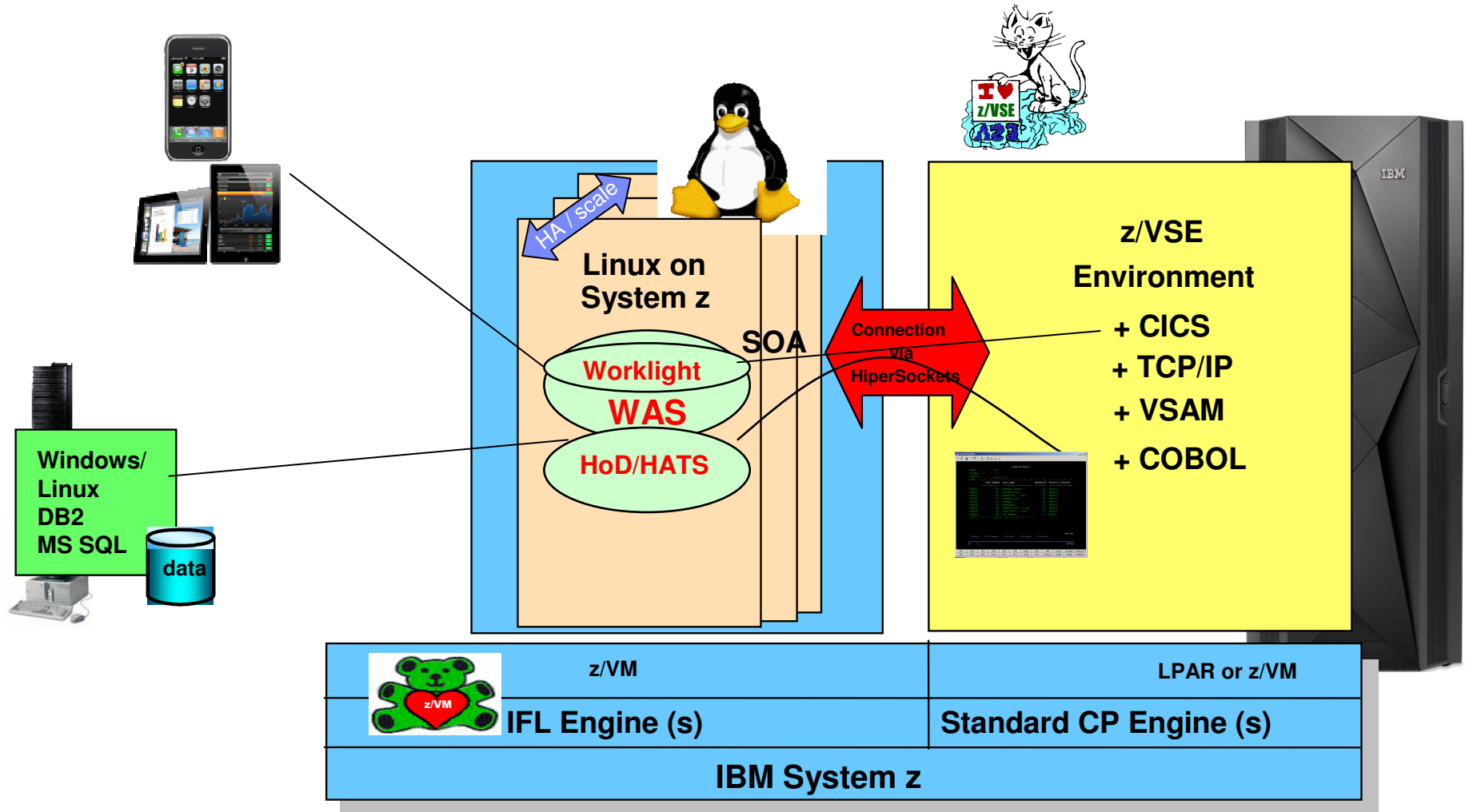
<!-- Licensed Materials - Property of IBM
5725-692 (C) Copyright IBM Corp. 2011, 2012. All Rights Reserved.
US Government Users Restricted Rights - Use, duplication or
disclosure restricted by GSA ADP Schedule Contract with IBM Corp. -->

<html>
  <head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0, maximum-scale=1.0, minimum-scale=1.0, user-scalable=0" />
    <title>EGUI</title>
    <link rel="shortcut icon" href="images/favicon.png" />
    <link rel="apple-touch-icon" href="images/apple-touch-icon.png" />
    <link rel="stylesheet" href="css/reset.css" />
```



Mobile computing environment for z/VSE customers

Integrate, simplify, single interface, with Linux as central access point





Implementation scenarios for System z Mobile Application functional types

▪ **Mobile Application with asynchronous remote access**

A mobile application that does not have a reliable network connection but needs to interact with an application server. The application should be functional regardless of network connectivity state.

Requirements:

- Security checks for Authentication before the access to Mobile Server
- The communication protocol has to be asynchronous (i.e. MQ or MQTT)
- Local data have to be stored and cached in encrypted format

▪ **Transactional Mobile Application**

A mobile application that has a reliable network connection and interacts with an (transactional) application server.

Requirements:

- Security checks/enforcement for Authentication before the Mobile Server
- Secured protocol has to be used (i.e. HTTPS with JSON or transactional web services)
- Transactional integrity has to be ensured/enforced

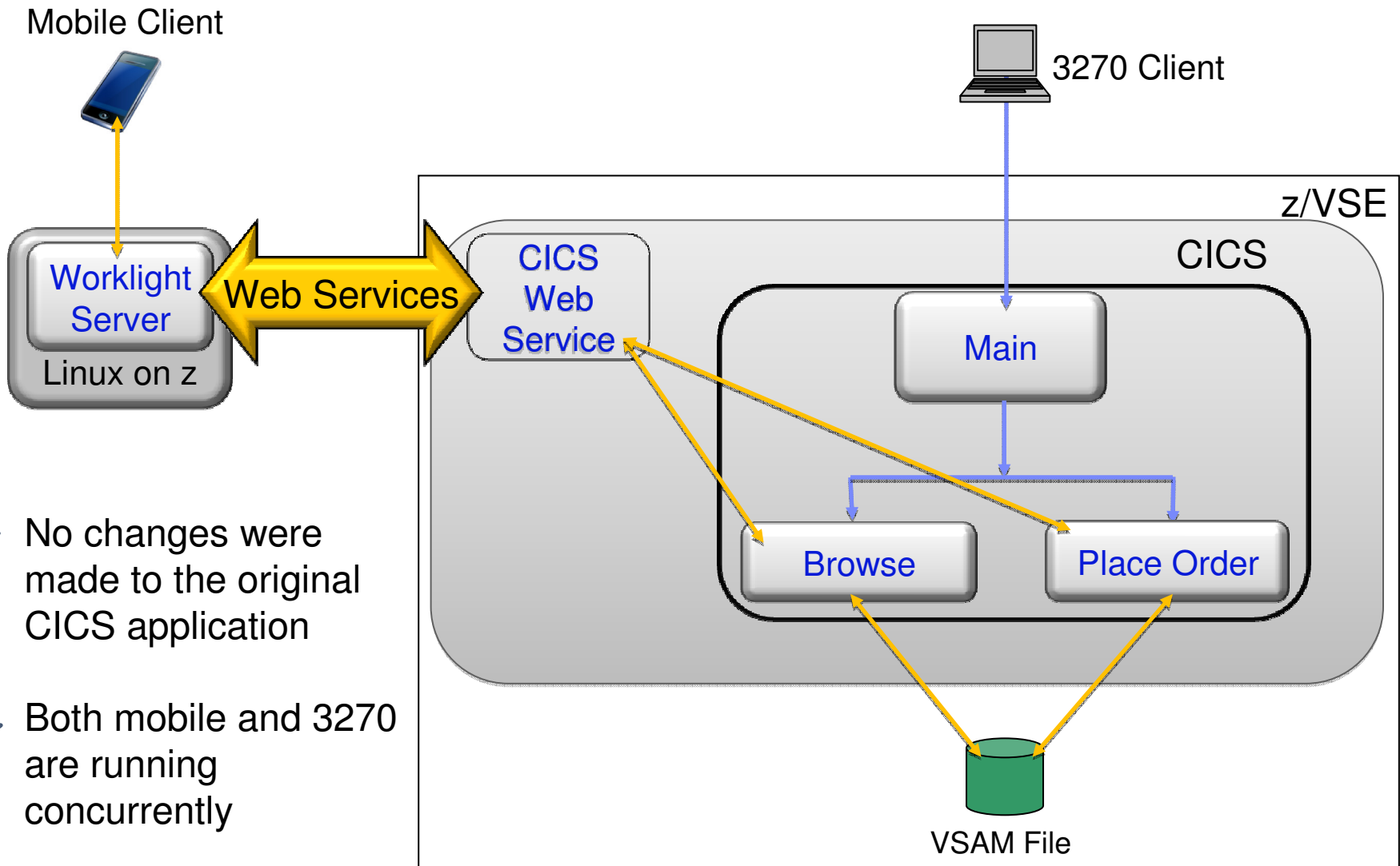
▪ **Standalone Mobile Application**

A mobile application that does not require any network connection.

- Is out of scope for a System z implementation (?)



Worklight Modernizes the CICS Web Service Enabled App



- ★ No changes were made to the original CICS application
- ★ Both mobile and 3270 are running concurrently



Cloud and Mobile Computing

- Consolidated distributed server landscape to **Linux virtual servers running on IBM zEnterprise**
- Created multi-platform private cloud optimized for all workloads

<http://youtu.be/ZygaG7noaDE>

- If you're a Nationwide® customer, **Nationwide Mobile** can help you pay your bill, contact your agent, get an auto policy quote or start the **claims process**



The screenshot displays the Nationwide Mobile app interface. At the top, it says "Nationwide Mobile" and "Nationwide Insurance - September 6, 2013 Finance". There are "Install" and "Add to Wishlist" buttons. Below that, there are "Home" and "Log In" buttons. The main menu includes: My Accounts, Insurance ID Cards, View My Agent, Accident Help, Claims, Auto Insurance Quote, About Us, and Contact Us. A "Get a Quote" overlay is visible, showing a dropdown for "Auto Insurance", a field for "Enter your zip code", and a "Continue" button. Below the "Continue" button are options: "Retrieve Quote", "-OR-", "Call 1-866-238-1495", "-OR-", and "Find a Local Agent". At the bottom of the overlay, it says "© 2013 Nationwide Mutual Insurance Company All rights reserved".

<https://play.google.com/store/apps/details?id=com.nationwide.mobile.android.nwmobile&hl=en>



CICS Mobile - Youtube Video

Home screen

- Worklight allows you to construct standard interface components that work across all mobile platforms
- Build powerful interfaces that drive existing mainframe applications written in C/C++, COBOL, PL/I, and Java

IBM CICS GenApp Mobile
An adventure with Johnny and Susan

0:34

0:32 / 4:14

CICS Mobile
CICS Hursley · 67 Videos
Abonnieren 123

287 Aufrufe
6 0

Mag ich Info Teilen Hinzufügen

Veröffentlicht am 23.04.2013
Learn about the new CICS TS features for mobile devices in this video, made by CICS Mobile developers at the IBM Hursley Software Development Laboratory.

Mehr anzeigen

http://www.youtube.com/watch?v=jc7d1o4_gj0



University of Florida goes mobile



Enabling 50,000 students, 5,400 faculty members and staff access to online features anytime, anywhere

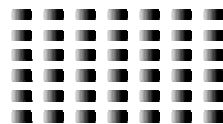
Data provided to students real time

Mobile formatted information of class schedules, textbooks, academic dates, grades, emergency information and campus map

IBM Solution

Accessing CICS with System z information via smartphones

Up to **1M** transactions/day





RCBC – Mobile Banking with zEnterprise

http://www.youtube.com/watch?v=_qKzw-YeqMY





New redbook on the way !

IBM

Draft Document for Review April 10, 2014 8:40 pm

SG24-8215-00

IBM System z in a Mobile World

A Design Guide to Develop and Deploy Secure Mobile Applications

- Understand the business benefits of mobility
- Integrate IBM System z into your mobile strategy
- Explore an integrated and secure mobile application

Aymeric Affouard
Andy Armstrong
Raymond Chiang
Tony Duong
Richard Gamblin
David Shute
Wilhelm Mild
Peter Siddell
Frank van der Wal
Nigel Williams
Richard Young

Redbooks

ibm.com/redbooks



Mobile: understand IBM System z value

Business challenges

Mobile is about re-imagining your business around constantly connected customers, partners and employees. to sell products or retain customers.

Business solution & Benefits

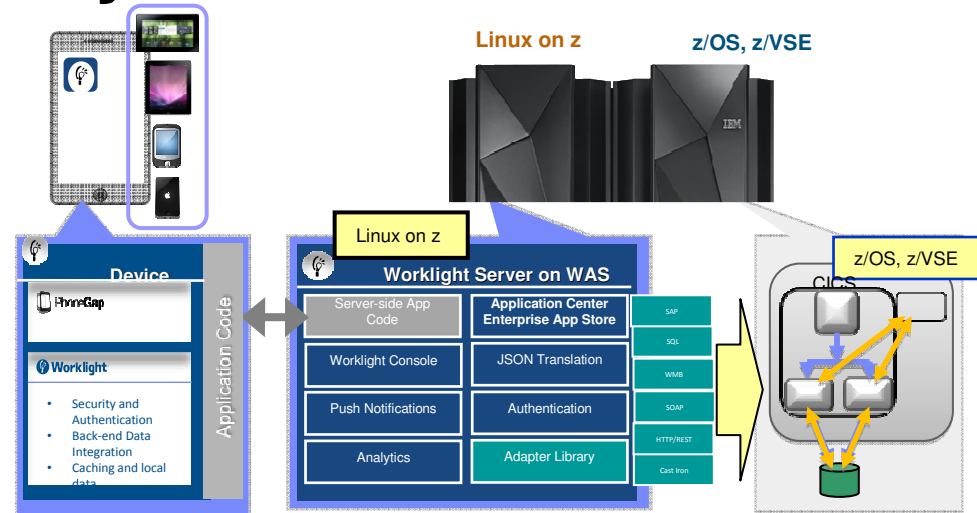
Mobile solutions are pushing companies to rethink the user experience, from the presentation of data to the interaction.

The mobile engagement allows you to build new insight into your customer's behavior so that you can anticipate their needs and gain a competitive advantage by offering new services.

IT Challenges

Mobile has characteristics that causes to rethink or redefine IT architectures and implementations.

- Unpredictable workloads that can vary any minute of the day.
- Very high demanding customers that expects 24/7/365 to be serviced. With fast response times.
- The security of Mobile ranges from mobile Endpoint security to prevent malicious attacks on back end systems. And everything in between.
- Integrating mobile apps into existing application landscape.



Infrastructure benefits

- Massive scalability in a single footprint, to handle the workload of millions of devices and sensors
- Workload Management to provide a quick reaction to sharp spikes in demand
- Hardware encryption speeds SSL applications
- System z may also have other roles in the overall security architecture e.g security policy management, certificate and key management
- Business Resiliency for critical mobile apps
- Integration of co-located existing Applications, Services and Systems of Record



Summary – z/VSE is enabled for Mobile environments

- **Mobile First – Mobile devices enable new business opportunities**
 - System z sub-systems as well as system management SW are being prepared for mobile access
 - CICS for Mobile Extensions
 - Rational Developer with Worklight Toolkit
 - Business Process Manager
- **Mobile Support Server will become a business critical application**
 - **System z** RAS (Reliability-Availability-Serviceability) capabilities make business sense
 - z/VM Scalability, – management of huge spikes in concurrent mobile access invocations
- **Adapter & Integration flexibility for special z/VSE workload**
- **Security – end-to-end - will be a key differentiator**
 - Worklight Server on System z Linux runs where the business data & transactions reside
 - Leverage hipersocket, IEDN (Intra Ensemble Data Network) for back-end system communication
 - Crypto card for SSL off-load

60%

of large companies are making their internal line-of-business applications accessible to workers on smart phones and tablets.



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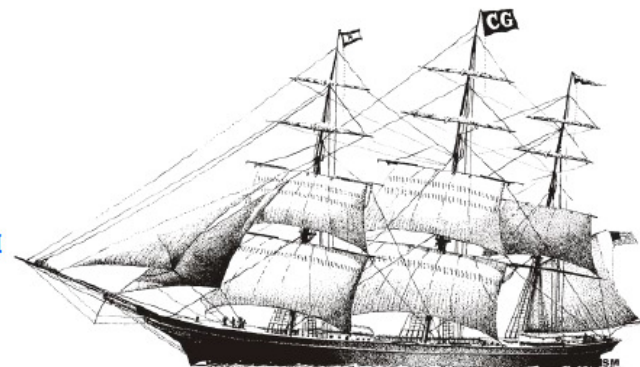
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April 23, 2013

Enabling Your Mainframe Data on Mobile Devices

Analyst: Mike Kahn

Introduction

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Additional information in Mobile Redbooks

- [*Transform Your Organization into a Mobile Enterprise with IBM Worklight*](#), *Solution Guide*, published 9 October 2013
- [*Extending Your Business to Mobile Devices with IBM Worklight*](#), SG24-8117-00 **Redbooks**, published 12 August 2013
- [*IBM MobileFirst Strategy Software Approach*](#), SG24-8191-00 *Draft Redbooks*, 5 December 2013
- [*System z in a Mobile World*](#), REDP-5088-00, *Point-of-View*, 24 January 2014
- [*IBM System z in a Mobile World*](#), *Solution Guide*, published 21 February 2014
- [*Implementing IBM CICS JSON Web Services for Mobile Applications*](#), TIPS1066 *Solution Guide*, 9 September 2013
- [*Securing Your Mobile Business with IBM Worklight*](#), SG24-8179-00, 7 October 2013
- [*Enabling Mobile Apps with IBM Worklight Application Center*](#), REDP-5005-00 1 June 2013
- [*Responsive Mobile User Experience Using MQTT and IBM MessageSight*](#), SG24-8183-00 *Draft Redbooks*, last update 18 December 2013
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Thank You!



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Additional Info

- System z – Meeting the Mobile Challenge:
<http://www-01.ibm.com/software/os/systemz/mobility/>
- InfoCenter IBM Worklight:
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