

17081: Connecting Mobile Workloads with Back-end Systems

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The use of mobile devices for all business is *soaring* – as evidenced by Cyber Monday retail sales over the past two years

2014: "Cyber Monday Becomes *Mobile* Monday:

Cyber Monday mobile traffic accounted for >40% of all online traffic, **up 30.1% over 2013.** Mobile sales were also strong, reaching 22% of total Cyber Monday online sales, an increase of 27.6% year-overyear."*



Department Stores Cyber Monday

	Cyber Monday	Cyber Monday	
Transaction Metrics	2014	2014 vs. 2013	
Items per Order	3.25	2.20%	
Average Order Value	\$146.07	-9.74%	
Conversion Rate	5.05%	3.48%	
New Visitor Conversion Rate	3.91%	3.17%	
Shopping Cart Sessions	16.41%	0.86%	
Shopping Cart Conversion Rate	30.51%	3.95%	
Shopping Cart Abandonment Rate	69.49%	-1.64%	

Sales

17.92%

* http://www-01.ibm.com/software/marketing-solutions/benchmark-reports/benchmark-2014-cyber-monday.pdf

** http://www-01.ibm.com/software/marketing-solutions/benchmark-reports/benchmark-2013-cyber-monday.pdf

Order value down by almost 10% in 2014 but overall sales up from more orders



Mobile is changing the way customers interact – far more possibilities





Four key mobile development & delivery challenges

Accelerated time to market requirements

 Higher frequency of new releases puts added pressure on teams to deliver on time and with high quality



Delivering high quality apps

 Consumers demand a high quality user experience where quality is influenced as much by design as it is by function

Average ration for t	he surrent version:
Average rating for the second seco	
T Average rating for a	II versions: ★★★★ 1903 Ratings
****	235
****	110
*** 📟	235
** 📖	242

Connecting apps with existing enterprise systems

 Apps typically need to leverage existing enterprise services, which must be made mobileconsumable



 Enterprise wireless networks are running out of bandwidth to accommodate employee devices

Fragmentation and developing for multiple mobile platforms

 Highly fragmented set of devices, platforms, languages, and tools complicates development, test, and operations





Mobile continues to explode in the enterprise





Mobile/Wireless/Cloud

A mobile strategy is critically important to business today

- Enables premium customer service
- Broadens market reach
- Increases revenue
- Increases operational efficiency



IBM MobileFirst Portfolio serves a diverse set of client needs



The IBM MobileFirst Reference Architecture offers comprehensive guidance on designing mobile applications

- Has Models + Pictures (arch diagrams) + Information
- To accelerate mobile solutions development and deployment
- Contains architectural patterns for integration of cloud, enterprise and mobile systems
- Supports requirements from many industries: retail, banking, telecommunications & government
- Allows accelerated project delivery by customizing pre-populated assets
- Provides the framework for your Mobile Center of Excellence
- Provides templates for your own Mobile Reference Architecture
- Can be used for training







IBM MobileFirst Platform is flexible, based on your needs





IBM MobileFirst Reference Architecture contents





How to get the IBM MobileFirst Reference Architecture?

Contact your IBM representative to download PDFs of the IBM MobileFirst Reference Architecture

or,

If you are actively using IBM MobileFirst tools you can get the source of the MobileFirst architecture to adopt and customize as your own



The Reference Architecture describes solutions for connecting "Systems of Engagement" to "Systems of Record"

Mobile

System of Engagement

Systems of Engagement are introduced to handle:

- Agile and social connection to mobile users
- Interface to a vast array of device types
- Very frequent revisions of apps
- Easy-to-use, standards-based app development tools

Systems of Record

must be able to handle:

- Huge increase in system load
- Inconsistent, unpredictable peaks
- New security and privacy requirements





But first, some definitions

- <u>REST</u> web service (RESTful web service)
 - **Re**presentational **S**tate **T**ransfer, a simpler alternative to SOAP (XML) web services
 - Usually carries operation name and parameter data in the URL itself
 - Uses HTTP verbs (GET, POST, PUT, DELETE...) to indicate the type of operation
 - E.g. <u>http://myserver.com/apis/phonebook/lastnames/smith</u> with GET returns a phone number for customer "smith"
- Node.js
 - An open source, server-side JavaScript runtime based on Google's V8 JavaScript engine
 - Used for server-side application logic and runs on a variety of platforms
- Cloudant
 - A scalable, distributed, cloud-based NoSQL database that stores data in JSON format
- WebSphere Cast Iron
 - A cloud-based integration and orchestration service
- SoftLayer
 - High performance, global cloud infrastructure
- Bluemix
 - Cloud platform providing many services and components for easily building and running web or mobile systems of engagement
 - Runs on Softlayer



JavaScript Object Notation—JSON—is an industry-standard, text-based data format

- Widely adopted by the industry-the mobile data format of choice
- Simple structure an alternative to XML-ideal for mobile transfers
- Lightweight–uses less metadata
- Easily processed from JavaScript
- Typically carried in a RESTful web service request or response
- And mobile devices connect to the System of Engagement using JSON





IBM MobileFirst is a System of Engagement for mobile computing on z Systems

IBM MobileFirst –

A foundation for exceptional mobile experiences with z Systems

Highest Performance

Complete Integration

Ultimate Security

Low Cost



z Systems delivers unmatched performance for mobile applications



Characteristics of mobile workloads

- Increased web traffic. Mobile applications drive an increase in overall transaction rates.
 When a user can check their bank balance anytime, they tend to do it more often
- Think Sensors and Actuators. Mobile is more than smartphones. Think of any device relaying information to a server
- Mobile applications could cause huge spikes in transactions. With the increase in mobile traffic, there is not simply a concern in the growing average transaction volumes but with the magnitude of *peak transaction volumes* as well
- (Lack of) Speed kills. User experience is the dominant force in mobile interactions. They
 must be intuitive. They must be fast. They must work. They must show current data
- New mobile applications are often first deployed rapidly to cloud-based servers. According to Intel -- A new cloud server is required for every 600 smart phones (or 120 tablets) sold
 - This leads to over a million new servers required in 2013, not the case when the server is a zEnterprise System
- New class of users. Mobile is exposing IT resources to an even broader set of untrusted users at an even greater scale than the growth of web applications and e-commerce

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z Systems delivers the capacity and performance to securely and reliably support scalable and secure "Systems of Record"



- Support for huge transaction rates
 - A single IMS Fast Path has been benchmarked at over 100,000 TPS, sustained*
- Perfect workload management
 - z/OS Workload Manager insures that high priority jobs meet their service levels
- Massive scalability
 - Parallel sysplex and data sharing provide clustering and load balancing
- Capacity on demand
 - Add physical processors as needed to handle unexpected peaks
- Unparalleled qualities of service
 - Least amount of downtime of any commercially available server; built-in redundancy for highest availability
- Tough security



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Systems of Engagement connect to z Systems based on security and performance requirements



There are a lot of options for a System of Engagement to integrate with a mainframe System of Record





The IBM MobileFirst Platform offers two deployment models: on-premises or in the cloud with Bluemix





Systems of Record

- This example shows MobileFirst on-premises or offpremises integration with the mainframe
 - z/OS Connect provides a common RESTful interface



IBM MobileFirst Platform on-premises offers a variety of connectivity options

- The on-premises version of IBM MobileFirst Platform Foundation uses adapters to manage connectivity to back-end systems
- Adapters are written in JavaScript (or Java in IMF Platform Foundation V7.0)
- The HTTP adapter can be used for RESTful connectivity with a JSON payload



MobileFirst Platform Foundation Server, running on Linux on z Systems, provides centralized connectivity to z/OS applications



Legacy business applications can be mobile-enabled using MobileFirst and JSON web services



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Co-locating MobileFirst Platform Foundation Server on z Systems drives more throughput and yields lower cost per workload





Easily and quickly extend mainframe-based business applications to mobile users



IBM MobileFirst Platform Foundation Studio

- MobileFirst Platform Foundation Studio includes tools for mobile application development, with programming models and web support
- Fully integrated into the Rational Developer for System z (RDz) Eclipse-based platform



DEMO: Use MobileFirst Platform Foundation Studio to mobileenable a COBOL application





- 1. Wrap COBOL as a Web service (using RDz)
- 2. Develop a mobile app front end using MobileFirst Platform Foundation Studio (in RDz)
- 3. Deploy it to the MobileFirst Platform Foundation Server
- 4. Test with Mobile Browser Simulator



A centralized interface simplifies connectivity to business applications from the MobileFirst Platform





Interceptors enhance and protect access to business applications



- z/OS Connect is a feature of WebSphere Liberty Profile
 - A fast, lightweight, composable and dynamic server runtime
- Low cost option–Java-based, runs on zIIPs
- Also includes additional logging, security and metering services, plus an API



MobileFirst Platform on Bluemix uses Cloud Integration Secure Connectors to connect to a System of Record

Can also use IBM DataPower Gateway and optionally API Management



- The Secure Connector sets up a secure tunnel between a Bluemix service and the System of Record. The Connector is physically installed on the target on-premises SoR
- The service exposes a RESTful API in Bluemix for apps to access the SoR



There are 3 types of Bluemix Secure Connectors that create a secure tunnel between Bluemix and the SoR

There are three connector options with Bluemix

The Basic (Software) Secure Connector

- Simple software-based connector
- Establishes a tunnel between Bluemix applications and the network on which the Connector is installed
- Leverages secure (SSH) access that eliminates the need for a firewall port

The Standard (Cast Iron) Secure Connector

- Simple software-based connector
- Establishes a tunnel between Bluemix applications and the network on which the Connector is installed
- Leverages secure (HTTPS) access that eliminates the need for a firewall port

The DataPower Secure Connector

- Leverages an *on-premises* DataPower deployment as a secure gateway connection between backend resources (behind the enterprise firewall) and Bluemix applications
- Ensures high availability/fail-over and load-balancing requirements

Using IBM DataPower Gateway *in the DMZ* between Bluemix and the SoR without a Connector is a 4th option



The Basic Secure Connector is the simplest connection to the mainframe





Simple connection to the mainframe with the Standard Secure Connector for Cast Iron





The DataPower Secure Connector uses IBM DataPower Gateway running on-premises





4th option when IBM DataPower Gateway is used from Bluemix without a connector





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MobileFirst and z Systems have end-to-end, strong, coordinated security



Failure to secure mobile apps can cost millions and damage business credibility

Mobile malware grew 155% 😪 🕻 in 2011 614% 🛱 🛱 🛱 🛱 🛱 😭 😭

from March 2012 to March 2013

5

73% of all malware exploit holes in mobile payments by sending fraudulent premium SMS messages, each generating around **\$10** USD in immediate profit



Android is responsible for **92%** of all known mobile malware. An increase from **47%** in 2012... ...a significant threat given more than

1 BILLION

Android-based smart phones are estimated to be shipped in 2017*



There are more than

500 third-party app stores containing malicious apps



77% of Android threats could be largely eliminated today if all Android devices had the latest OS. Currently only 4% do

Source: Juniper Mobile Threat Report, 2013; * Canalys Smart Phone Report, June 2013



A comprehensive security stack protects the device, content, app and transaction

The IBM MobileFirst security stack

- IBM provides best of breed security layering on top of IBM enterprise hardware and software security
- iOS and Android 5 are examples of a secure mobile OS when not jail-broken or rooted

<u> </u>	Protects	
Jser, Device, App, Content	MobileFirst Platform Foundation	App-, user- and data-level end-to-end encryption
User, App, Transaction	ISAM for Mobile	SSO, session mgt., access policies, HOTP, RSA SecurID
Арр	AppScan	White box app code scanning, black box server
Арр	ARXAN	Tamper protection, self-repair, app flow obfuscation
App, Transaction	Trusteer	Malware protection, fraud prevention, jailbreak/root detection, anomaly and real-time fraud detection
Jser, Device, App, Content	MobileFirst Protect MaaS360	EMM, app security, management, containment, enterprise gateway
Jser, Device, App, Content	Device Ecosystem	Device and OS security



Use the MobileFirst Platform Foundation to address enterprise security requirements





QRadar adds actionable and comprehensive security intelligence across the entire data center





IBM MobileFirst embodies a System of Engagement for mobile computing on z Systems



The cost impact of increased transaction rates from mobile activity is greatly reduced with Mobile Workload Pricing



Mobile Workload Pricing for z/OS helps alleviate spikes caused by increased mobile usage – *and lowers costs!*



* Figures are for illustrative purposes only. Tracking process and records will vary by customer



For mobile on the mainframe IBM visit a MobileFirst Center of Competency for z Systems





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