Introduction to Managing Mobile Devices using Linux on System z

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System z Architecture and Technology

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Mobile is the next evolution for connecting to the Data Center

<table>
<thead>
<tr>
<th>91%</th>
<th>75%</th>
<th>96%</th>
<th>90%</th>
<th>900%</th>
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<tbody>
<tr>
<td>mobile users keep their device within arm’s reach 100% of the time</td>
<td>mobile shoppers take action after receiving a location based message</td>
<td>year to year increase in mobile cyber Monday sales between 2012 and 2011</td>
<td>users use multiple screens as channels come together to create integrated experiences</td>
<td>increase of global machine-to-machine connections by 2022 (2 billion in 2011 to 18 billion at the end of 2022)</td>
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Mobile is changing the way information is used

Information restricted and developed in the data center

Information developed using multiple platforms and transformed into web services

Information developed and controlled by users for mobile devices
System z bridges Systems of Record and Systems of Engagement

**Systems of Engagement**
- Mobile Apps
- Cloud APIs
- Systems of Engagement are cloud-based, decentralized, support rapid app development

**Systems of Record**
- Finance
- Corporate Data Warehouse
- Accounting
- Order Fulfillment
- Systems of Record are well integrated, trusted repositories

**Key Technologies**
- Linux on z
- z/OS

**Systems**
- Siloed Dept. Apps
- Cloud APIs
Client drivers for mobile solutions span all industries

**Finance & Banking**
Manage their investment portfolios and accounts anywhere for complete bank transactions

**Construction & Manufacturing**
Manage complex projects and operations on site and streamline survey and work order processes

**Insurance**
File, process and manage claims and document damages

**Retail**
Engage shoppers in new ways and intelligently target personalized and location sensitive marketing offers

**Travel & Transportation**
Provide up to date information specific to their itineraries and location and enable customer self-service

**Cross-Industry CIO’s Office**
Empower employees with anytime, anywhere access to dashboards and critical information
Consider the typical business traveler today…

<table>
<thead>
<tr>
<th>Electronic boarding pass</th>
<th>Seating map real time</th>
<th>Flight status real time</th>
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<tbody>
<tr>
<td>Traveler views boarding pass prior to leaving, at the airport, and at boarding</td>
<td>Traveler views current seat, potential upgrades, capacity of plane</td>
<td>Traveler views potential flight delays, airport information, connecting flights, notifications pushed to device</td>
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All information on the mobile device is connected to the back end and consistent with what airline personnel see.
IBM has been building up its mobile enterprise capabilities

- **10+** acquisitions to strengthen IBM’s position in mobile since 2006
- **125+** patents for wireless inventions in 2012, bringing the total to 270
- **Doubling** 2013 investment in mobile solutions
- **200+** IBM Software apps available in app stores; ~1M downloads
- **Leader** in app design and managed services by Forrester and Gartner
IBM MobileFirst Platform is shaping enterprise mobility

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<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td>The Broadest Portfolio of Mobile Solutions</td>
<td>The Deepest Set of Services Expertise</td>
<td>New Industry Partnerships and Resources for Developers</td>
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IBM MobileFirst Platform offers:

- Native, web, or hybrid app development
- Tools to build & test high quality apps for many devices
- Management, security, continuous delivery & distribution of apps
- Easy connectivity to existing data & services for mobile usage
- On-premises or managed service delivery
But mobile also brings business and IT challenges

Mobile devices are shared more often
- Personal phones and tablets shared with family
- Enterprise tablet shared with co-workers
- Social norms of mobile apps vs. file systems

Mobile devices have multiple personas
- Work tool with BYOD
- Entertainment device
- Personal organization
- Security profile per persona

Mobile devices are diverse
- OS immaturity for enterprise mgmt
- BYOD dictates multiple OSs
- Vendor / carrier dictates multiple OS versions

Mobile devices are used in more locations
- A single location could offer public, private, and cell connections
- Anywhere, anytime
- Increasing reliance on enterprise WiFi

Mobile devices prioritize the user
- Conflicts with user experience not tolerated
- OS architecture puts the user in control
- Difficult to enforce policy, application lists
And even more challenges for the data center

18M 41% 90%

people use mobile devices IT budget is spent for of the phones in Africa for banking mobile computing are mobile with deposit making up 8% of of money to mobile banking transactions devices anywhere

- **Inconsistent peaks 24/7 are common**
  Peaks of data can occur any time of day as well as exploding micro activity levels and being difficult to predict

- **Increased system load**
  Increase in overall transaction rates due to ease in accessing data anytime

- **New versions of apps occur weekly vs. yearly**
  Customers expect new features weekly vs. once a year

- **Development, control and support of apps and multiple devices is not standard**
  Users are not sophisticated but want the app on their device supported through non traditional methods

- **Employees are bringing their own device to work (“BYOD”)**
  200 Million employees do so today with access to confidential data

- **Security is paramount**
  Data must be secured from device to data
Mobile applications vary and can affect the data used

**Browser Access**
Written in HTML5 JavaScript and CSS3. Quick and cheap to develop, but less powerful than native

**Hybrid Apps - Web**
HTML5 code and runtime libraries packaged within the app and executed in a native shell

**Hybrid Apps - Mixed**
User augments web code with native language for unique needs and maximized user experience

**Native Apps**
Platform-specific. Requires unique expertise, pricey and long to develop but can deliver higher user experience
Building and connecting applications to zEnterprise

1.7M+ apps in the world today

70B apps will be downloaded in 2013

6x and 3x Google and Apple respectively have released major Android and iOS versions, than Microsoft has released major Windows PC versions

Build and Connect

System z mobile web, hybrid, and native app development

System z data, service and application integration

Lifecycle management

Building and connecting System z data to mobile devices to provide a better customer experience
Building mobile applications on zEnterprise

- Eclipse-based IDE for creating mobile applications with IBM Worklight Studio integrated with Rational Developer for z (RDz)

- Developer mobile tools with programming models and web support with WAS Developer Tools for Eclipse (WDT)

- Enterprise mobile application development for WebSphere Application Server with Rational Application Developer (RAD)

- Determine which apps need to be modified to support mobile with Rational Asset Analyzer

IBM Worklight - an open, comprehensive and advanced mobile application platform to build, run and manage mobile applications
Connecting mobile apps on zEnterprise

- Server side software components and adapters for channeling System z to mobile devices with IBM Worklight Server
- Mobile application support with WebSphere Application Server on System z
- Mobile protocol connectivity with core System z applications including CICS, IMS, TPF, MQ, WMB and DB2
CICS Mobile Demo

- Worklight on System z Linux
- Talks to CICS
- CICS sends push notifications to mobile devices
- All without changing any CICS transactions

http://youtu.be/6TkQ9PzeevQ
IMS Mobile Enablement

Mobile Devices

Web / Desktop

IMS Explorer for Dev
IMS Explorer for Admin
Web-enabled IMS apps

IMS Connect

z/Linux

IBM Worklight Server
HTTP Adapter
SQL Adapter
IMS SOAP Gateway
IMS Universal Driver
Connect API

z/OS

IMS Transaction Manager
IMS Application
Database Manager
IMS DB

ISPF
DB2 NoSQL (MongoDB) JSON Support

- The best of both worlds – NoSQL agility and flexibility built on the trusted foundation of DB2
  - Write applications using Mongo APIs to access data on DB2
  - Flexible schemas allow rapid delivery of applications
- Preserve traditional DBMS Capabilities, leverage existing skills and tools:
  - Multi-statement Transactions
  - Management/Operations
  - Security
  - Scale, performance and high availability
- Extend with advanced features (future)
  - Temporal semantics
  - Full Text search
  - Multi-collection joins
  - Combine with Enterprise RDBMS data
- Implementation leverages open source community drivers
- Available in DB2 for z/OS V10 now
## Securing and managing applications

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<th>$7.2M</th>
<th>47%</th>
<th>31%</th>
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<td>average organizational cost of a data breached</td>
<td>of all vulnerabilities are in web applications</td>
<td>data breaches caused by malicious attacks</td>
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### Secure and Manage

- Mobile governance
- Complete lifecycle security
- Secure network communications and management with System z

*Securing and managing System z data to mobile devices to ensure a secure system for sensitive data*
Securing mobile applications for sensitive data

- **Unified management and security control** for all mobile platforms with IBM Endpoint Manager
  - Detecting rooted/jail-broken devices
  - Enforcing security policies

- **Application security** with Worklight Studio
  - Encryption of local device storage
  - Authentication credential caching
  - Application authenticity testing and device whitelisting
  - Integration with enterprise security infrastructure
End to end security from mobile to the mainframe

- End to end capability of mobile users identity permits, auditing of transactions, and simplified identity mapping with RACF
- Advanced scalability of encryption processing with System z cryptography cards
- Centralized certificate management with z/OS PKI services
- Secured integration gateway for System z services, centralized key management and mobile access policy capabilities with DataPower XI50z
- High level security to backend applications via hipersockets or IEDN support with Worklight Server

*Worklight Server can also reside on Linux on z*
The Mobile Security ecosystem

**At the Device**
- Endpoint Manager for Mobile
- Trusteer
- WorkLight Runtime

**Mobile App**
- Secure Application
  - Utilize secure coding practices
  - Identify application vulnerabilities

- Integrate Securely
  - Secure mobile applications
  - Manage applications and enterprise app store

- WorkLight Server
  - Properly authenticate mobile users

- AppScan for Mobile
  - Recommend run on z

**Over the Network**
- Secure Access
  - Properly identify mobile users
  - Allow or deny access

- Monitor & Protect
  - Identify and stop mobile threats
  - Log network access, events, and anomalies

- QRadar
  - zSecure

**Within the Enterprise**
- Transaction Security
  - zSecure
  - RACF, PKI, Hardware crypto
E.Sun Bank secures IMS information for mobile banking

Meeting client demands and continually innovating

Banking information on diverse platforms
Mobile phone banking and cloud management for customers as an alternative from traditional banking

IBM Solution
WebSphere drives IMS transactions, accessing IMS and DB2 data to mobile devices
Extend and transform mobile with cloud and analytics

998M
mobile cloud users by 2014

88%
growth from 2009 to 2014 of cloud-based mobile applications

29%
of users are open to scanning a mobile tag for a coupon

Extend and transform

Sophisticated analytics with trends, dashboards, etc.
Real time information
Sharing of apps in a cloud environment

Extending and transforming System z data to mobile devices with top CIO initiatives
Analytics for mobile devices for deeper insights

• **Analyze mobile user behaviors** with Tealeaf
  – Automatically instrumented in IBM Worklight mobile apps
  – Capture and high-fidelity replay of mobile gestures on iOS and Android-based devices

• **Sophisticated dashboards and reports on mobile device** with Cognos Mobile
  – Real-time monitoring, GPS integration and downloadable, offline reports
  – Security protocols protect sensitive and proprietary business information
First National Bank (FNB)
Achieving sub-second response for hundreds of millions of monthly transactions on the mainframe Mobile and IMS

The need:
The ubiquity and convenience of cellphones and tablets as computing devices represented a clear growth opportunity for FNB; in South Africa, more people have cellphones and smart mobile devices than bank accounts. FNB wanted to launch a reliable, secure and highly responsive mobile channel before its competitors, and looked for a platform that would enable very short time-to-market.

The solution:
FNB integrated a new Java-based mobile front-end directly with tried-and-trusted business logic and core banking services running on IBM® Information Management System (IMS™) on an IBM zEnterprise® EC12 server. IBM IMS Enterprise Suite Connect APIs for Java and C and IBM IMS Enterprise Suite SOAP Gateway manage links between the channel applications and core functionality and data on the mainframe.

The benefit:
- Rapid deployment enabled FNB to gain first-mover advantage in the market, gaining the number one spot for mobile banking
- Ultra-low average end-to-end response times of 30 milliseconds ensure snappy performance for mobile banking users
- Fast, secure and reliable mobile banking generates more business for FNB and reduces its average cost per transaction

“We don’t start from the premise that the mainframe is best; rather, we look at the requirements—big data, huge numbers of concurrent processes, high performance, high scalability, high security—and then look at what technology can deliver all of those things. The answer is IBM zEnterprise and IMS.”

—Jay Prag, CIO – Hogan Channels, FNB

Solution components:
- IBM® zEnterprise® EC12
- IBM z/OS®
BMW Group
Develops eco-friendly innovation for smart drivers
Mobile and DB2

The need:
World-leading car manufacturer BMW Group wanted to develop sustainable and smarter driving strategies, in line with the market’s pressing requests. The company knew that any difficulties in managing the mountain of data created by these mobile applications would mean risking to lose business opportunities.

The solution:
BMW Group implemented IBM® DB2® 11 for z/OS®, which offers optimized management of information and workload and enhanced cost savings. Furthermore, the company is soon planning to leverage the latest-generation IBM zEnterprise® EC12 mainframe.

The benefit:
- Enabled BMW Group to allocate resources to the development of new mobility strategies, rather than database management
- Supported continuous workload increase on a 24/7 basis
- Reduced CPU use by 8-13 percent, improving cost-efficiency

“Despite still being very early in our performance testing, we have already seen CPU reductions of 8-13 percent on some of the workloads, thanks to the more efficient decompression algorithms that IBM DB2 allows us to run.”

— Manager, BMW Group

Solution components:
- IBM zEnterprise® EC12
- IBM DB2® 11 for z/OS®
- IBM z/OS
Rizal Commercial Banking Corp. transforms IT to gain 1.2M customers in one year

The need:
RCBC needed an IT infrastructure to support a core-banking system, called Finacle, from IBM Business Partner Infosys Ltd. that would help the bank improve efficiency, launch products faster and attain 10 million customers.

The solution:
An IBM® z10™ Enterprise Class platform and a range of IBM middleware products provide scalability, security and consistent performance at the high levels required by Infosys and RCBC, enabling new applications like mobile banking and “MyWallet.”

The benefit:
- Reduces new product launch times by 50 percent
- Helps the bank outpace the competition by an estimated two to three years on new product development
- Supports exponential customer growth through the scalability of the IBM System z platform

“The combination of Finacle and IBM gives us the functionality we want on a high-performance platform that is robust and resilient enough to handle the bank’s requirements moving forward.”
—Dennis Bancod, senior executive vice president and head for IT and operations,

Solution components:
- IBM® DB2® for z/OS
- IBM Rational® Build Forge® Enterprise Edition
- IBM Rational Team Concert™
Mobile and cloud with the zEnterprise

System z applications
Core CICS, IMS, DB2 and other applications and databases cloud and mobile ready

Mobile Devices
developed for the Cloud through web-based shared apps using Worklight

Infrastructure
Cloud orchestration, provisioning and automation with Tivoli solutions
System z service management extending to mobile

- Network visibility and management important to keeping mobile apps available and performing
  - OMEGAMON for Mainframe Networks

- Mobile as an extension of Cloud
  - Requires end-to-end asset management of mobile applications across distributed and System z

- Dynamic nature of Mobile drives critical requirement for enhanced automation
  - 24/7 availability requires high degree of mainframe System and Workload Automation
Why System z and mobile?

- System z is leader in transaction processing with the ability to handle volumes of critical data

- System z secures the data for mobile processing from mainframe to mobile device

- System z is the perfect environment for developing a mobile, cloud, and analytics integrated solution

**System z**

*A sophisticated platform for mobile computing*
Resources

- **Point-of-View paper.**
- Request a Demo
  - Banking, Retail, Government, Insurance
  - Use Worklight on Linux on System z
  - Use z/OS transactions.
- Try the System z Mobile demo applications
  - CICS Genapp.
  - CICS EGUI
  - IBM Remote - Sample application to manage HMC
- **System z Mobile home page**
  - Customer case studies
  - Analyst reports
  - Customer Videos