Introduction to Managing Mobile Devices using Linux on System z

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System z Architecture and Technology
Mobile is the next evolution for connecting to the Data Center

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

Information developed using multiple platforms and transformed into web services

Information restricted and developed in the data center

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

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

**Systems of Record**
- Finance
- Corporate Data Warehouse
- Accounting
- Order Fulfillment

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

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Client drivers for mobile solutions span all industries

**Finance & Banking**
Manage their investment portfolios and accounts from 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, anyplace access to dashboards and critical information
Consider the typical business traveler today…

Electronic boarding pass
Traveler views boarding pass prior to leaving, at the airport, and at boarding

Seating map real time
Traveler views current seat, potential upgrades, capacity of plane

Flight status real time
Traveler views potential flight delays, airport information, connecting flights, notifications pushed to device

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

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<tr>
<td>10</td>
<td>125+</td>
<td>Doubling</td>
<td>200+</td>
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<tr>
<td>acquisitions to strengthen IBM’s position in mobile since 2006</td>
<td>patents for wireless inventions in 2012, bringing the total to 270</td>
<td>2013 investment in mobile solutions</td>
<td>IBM Software apps available in app stores; ~1M downloads</td>
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<td></td>
<td></td>
<td>Leader</td>
<td>in app design and managed services by Forrester and Gartner</td>
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IBM Worklight
IBM Cast Iron
IBM Endpoint Manager
Tealeaf CX Mobile
New IBM MobileFirst Portfolio
IBM Mobile Foundation
IBM Interactive Named Leader in App Design
Managed Mobility and MAPM services
IBM Security Access Manager for Cloud and Mobile
IBM Mobile Development Lifecycle Solution
IBM Connections Mobile
IBM MobileFirst Platform is shaping enterprise mobility

IBM MobileFirst Platform offers:

1. The Broadest Portfolio of Mobile Solutions
2. The Deepest Set of Services Expertise
3. New Industry Partnerships and Resources for Developers

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

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<th>18M</th>
<th>41%</th>
<th>90%</th>
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<tr>
<td>people use mobile devices for banking making up 8% of banking transactions</td>
<td>IT budget is spent for mobile computing</td>
<td>of the phones in Africa are mobile with deposit of money to mobile devices anywhere</td>
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- **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 apps vary and can impact 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 apps to the 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 apps on the 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 the 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
City and County of Honolulu keeps citizens informed

Technological transformation to increase citizen participation

Real time information for citizens
Mobile formatted information of government data from department budgets to planning and permitting

IBM Solution
IFLs deploying Linux on zEnterprise 114 to cloud-oriented applications using Maximo to help citizens report city problems and schedule work

Video
Securing and managing apps

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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 apps 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*
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

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<th>998M</th>
<th>88%</th>
<th>29%</th>
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<td>mobile cloud users by 2014</td>
<td>growth from 2009 to 2014 of cloud-based mobile applications</td>
<td>of users are open to scanning a mobile tag for a coupon</td>
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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
  - Rich, interactive BI interface.
  - Real-time monitoring, GPS integration and downloadable, offline reports
  - Security protocols protect sensitive and proprietary business information
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
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
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*