



Delivering Modern Mobile Applications  
*using the IBM mobile DevOps solution*

Ashok Reddy  
Vice President, Product Management + Design

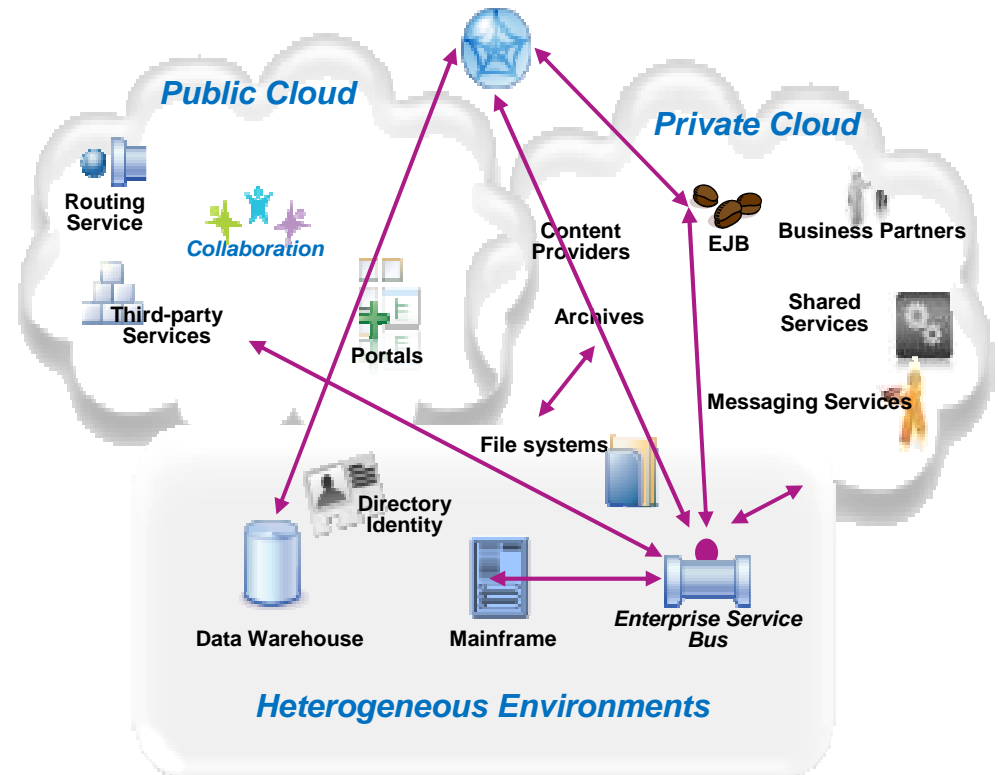
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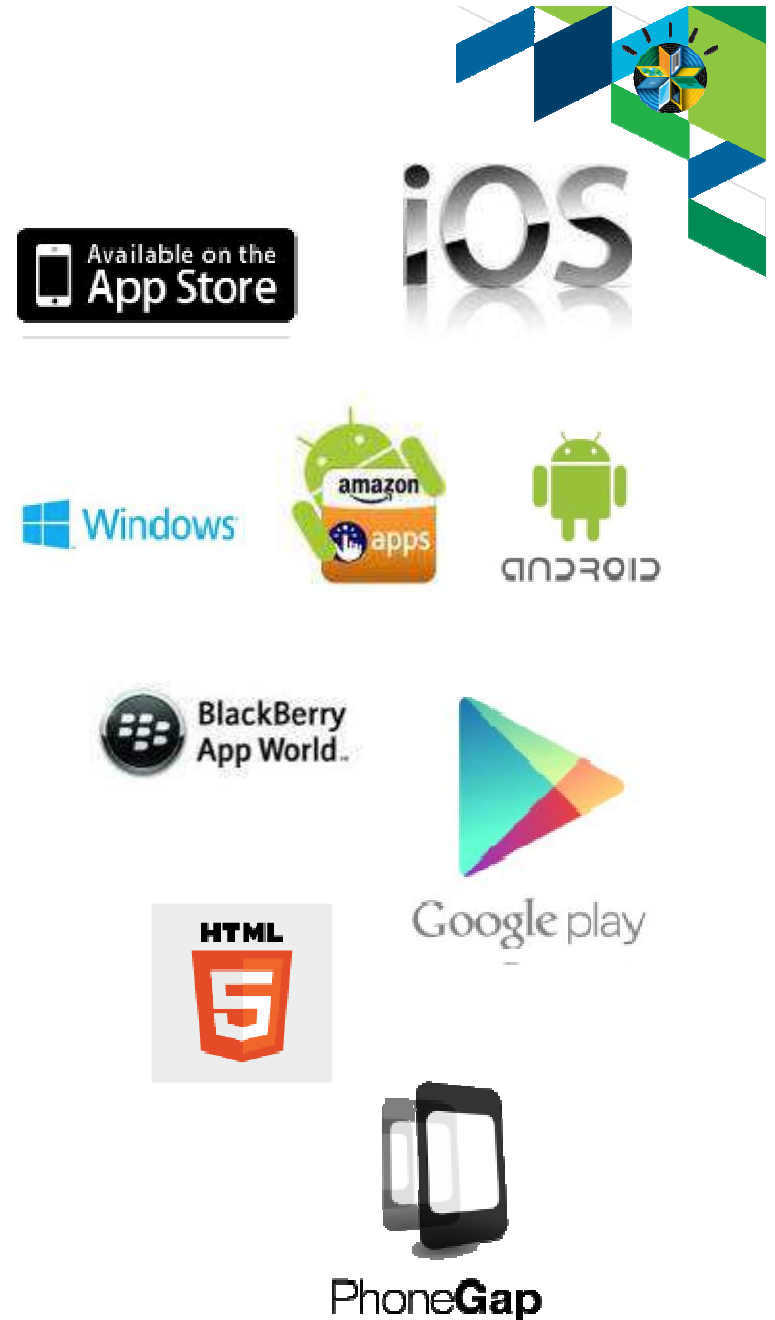
## DevOps for Mobile - Challenges

- Mobile Apps are the front-end to a complex (enterprise) back-end system
  - Mobile Apps are rapidly becoming a critical user interface to enterprise systems
  - But they are just one part of a multi-tier, multi-component application “eco-system”
  - Developing and delivering mobile apps requires coordination across that whole eco-system



## DevOps for Mobile - Challenges

- Fragmented Platforms
  - Multiple mobile operating systems
  - Multiple devices & form factors
  - Multiple implementation technology choices
- Frequently a mix of technology is involved for mobile app implementation
- App stores add additional asynchronous deployment step





# The IBM Mobile Enterprise Development Lifecycle

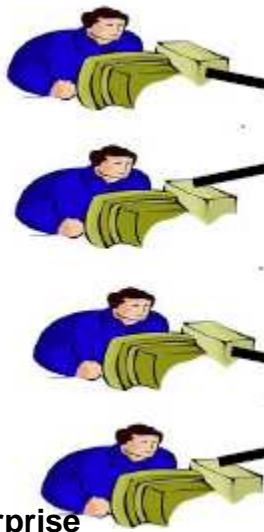






## Practice Continuous Integration

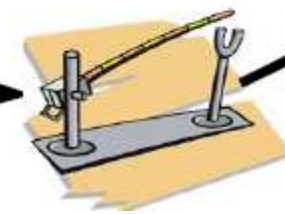
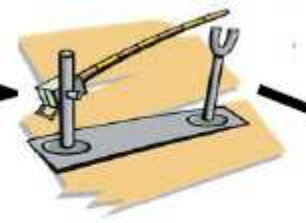
Mobile App  
Development  
Teams



Component  
team build

...

Component  
team build



Integration  
build

Enterprise  
Services  
Development  
Teams

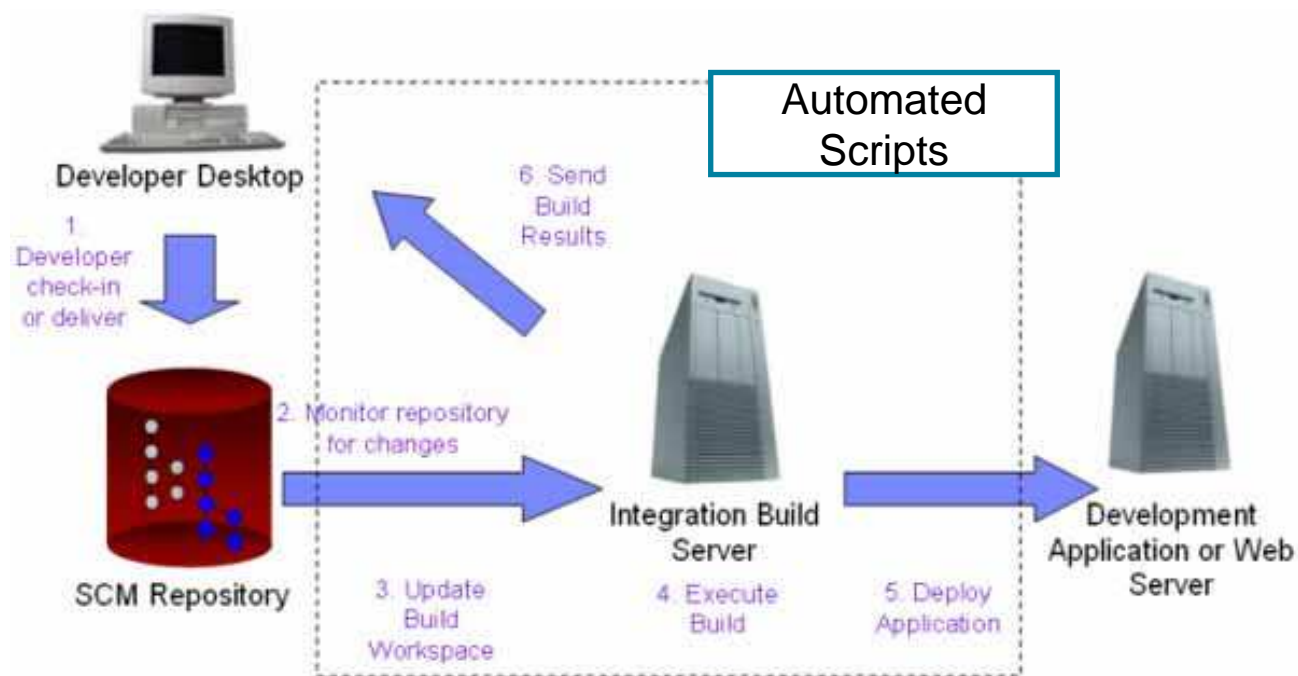


## Maintain separate build areas for each SDK version

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android" ... >  
  <uses-sdk android:minSdkVersion="4" android:targetSdkVersion="15" />  
  ...  
</manifest>
```



# Automated Build and Deploy scripts



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## DevOps for Mobile – Best Practices



Test each build on real supported devices



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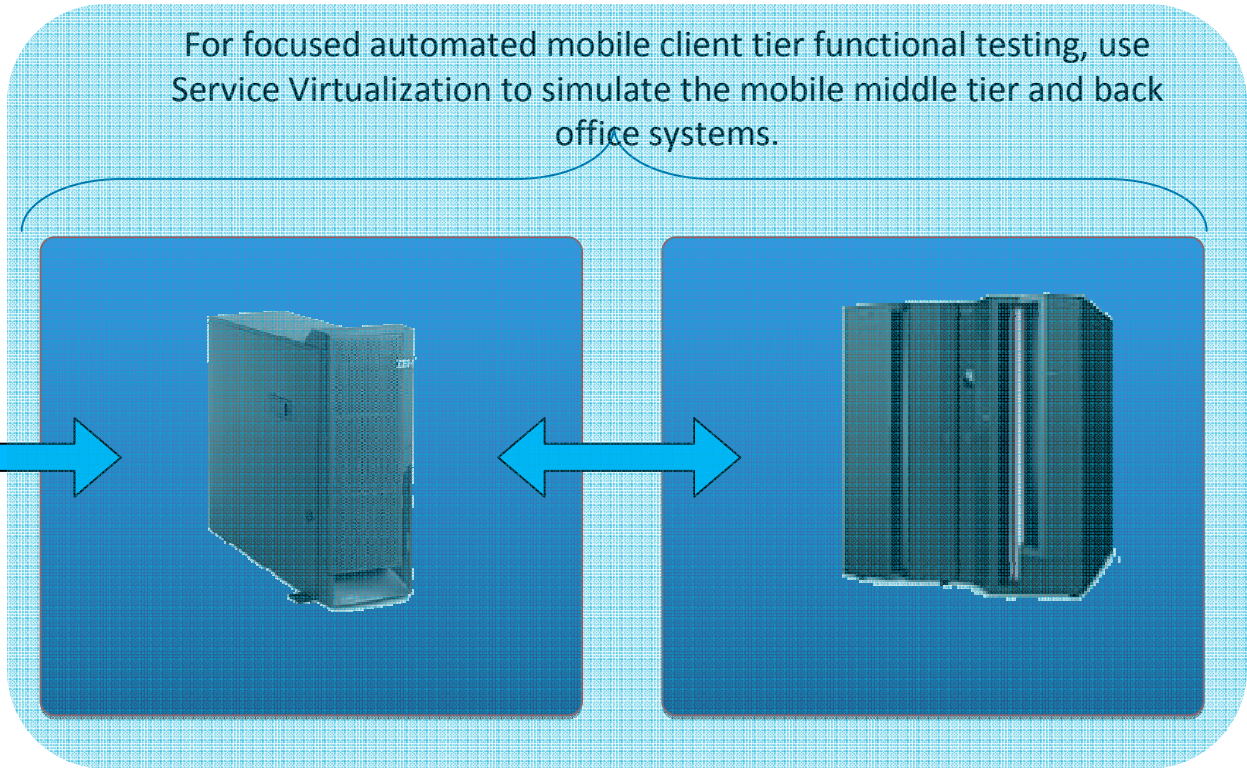


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# DevOps for Mobile – Best Practices

## Simulate Back-end Services

**Client Tier Devices  
UI Testing**

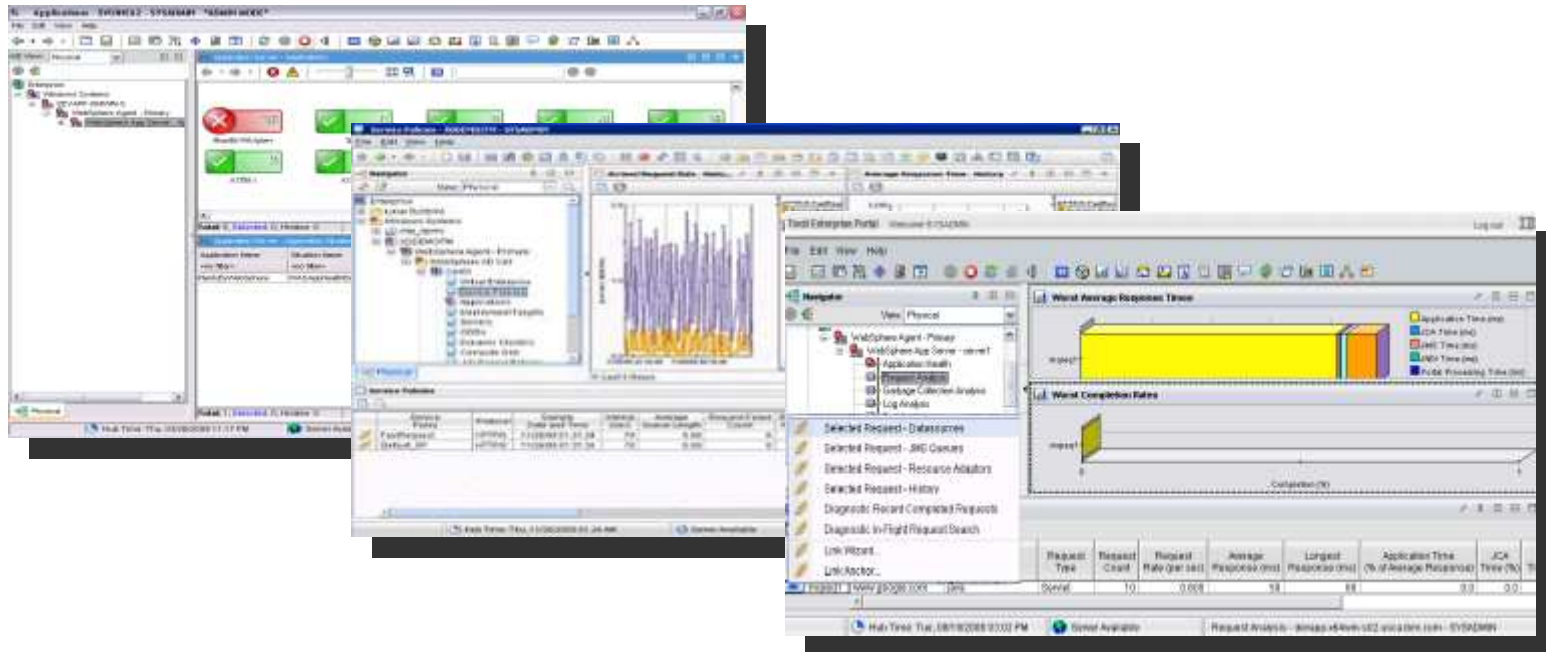




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# DevOps for Mobile – Best Practices

## Monitor deployed apps and back end services performance

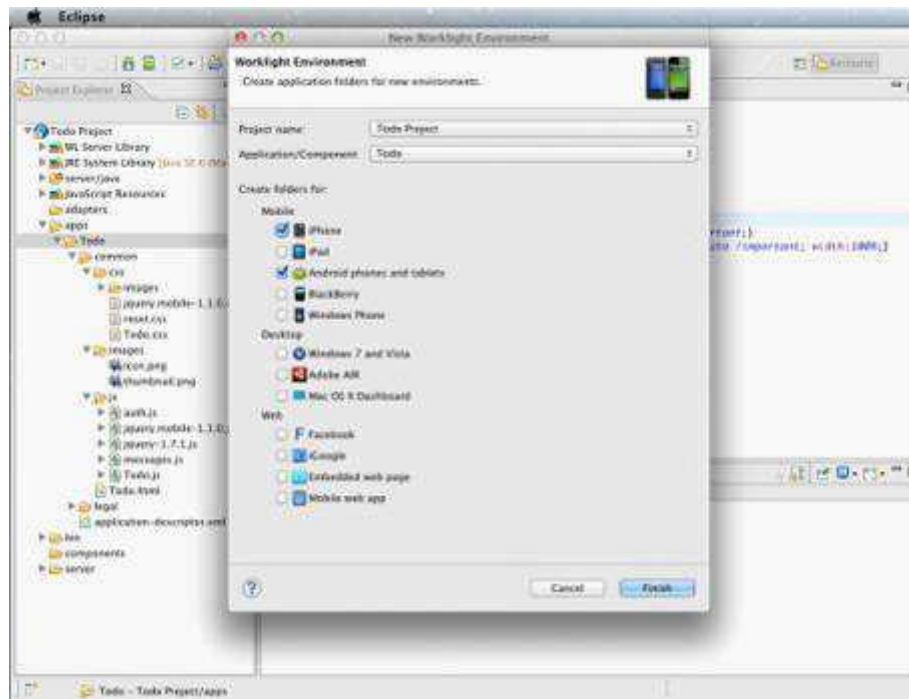




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## DevOps for Mobile – Best Practices

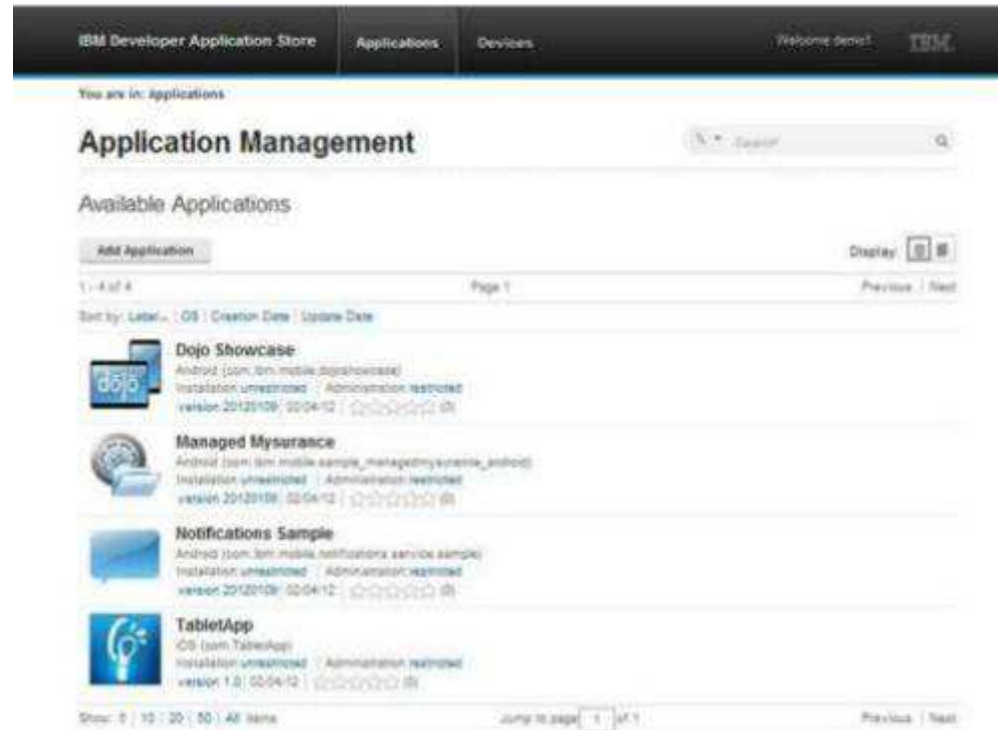
# Governance of provisioning profiles, certificates and API keys







# Use a 'Private' App store to test device deployment







## Convert App Store feedback into user stories



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Design the user experience and develop apps using a cross-platform development approach



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## IBM Worklight

*Mobile application platform to speed development and ongoing management of mobile apps*



- **Standards-based** cross platform mobile application development
- **Connect and synchronize** with back-end systems
- **Governance and security** at the application, network and data layer



"Best Mobile Development Solution" as voted by SIA members for 2013 CODiE Awards

### What's new in IBM Worklight 6.0

- ✓ Embedded functional testing
- ✓ Geo-location toolkit
- ✓ Analyze application usage and responsiveness

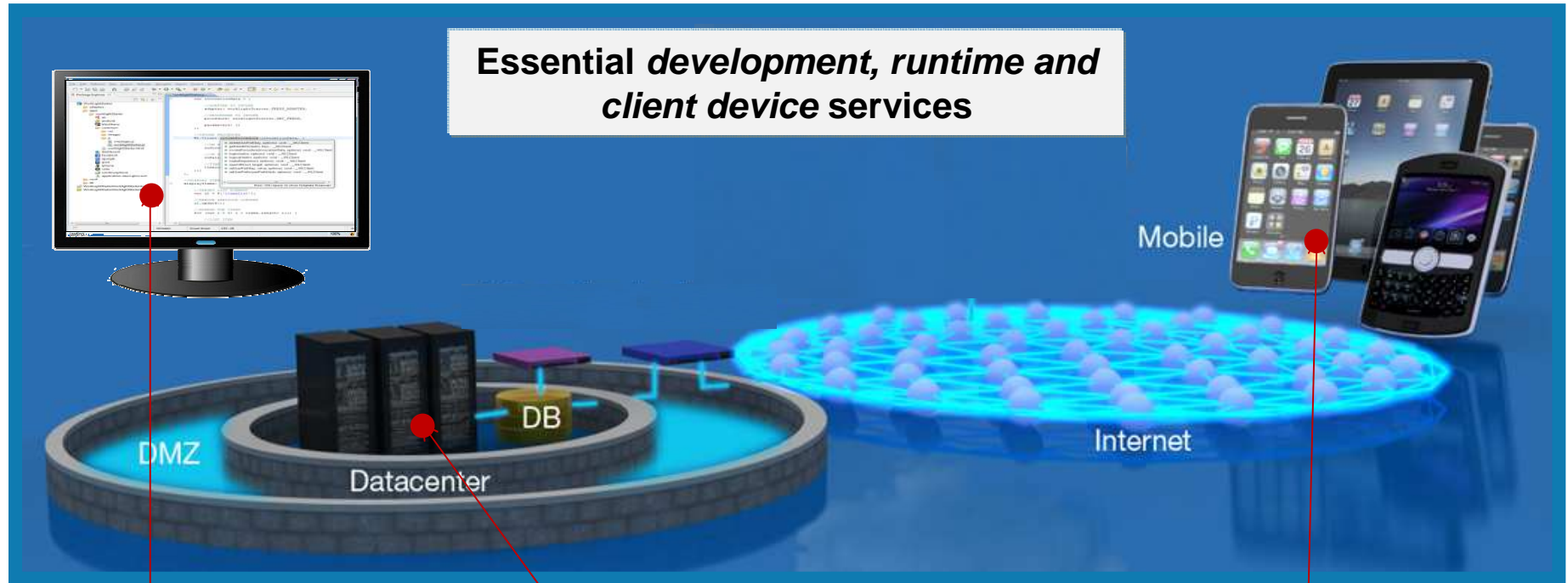
**New!**

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A mobile enterprise application platform (MEAP) leverages your existing investments so that you can extend your enterprise to mobile devices



**Essential development, runtime and client device services**

**Open standards-based development framework** optimized for code re-use across device platforms.

**Mobile application server** provides mobile-specific administrative, notifications, analytics and security services while leveraging existing investments in data, applications and infrastructure

**Client device layer** enables client-side security, enforces app upgrades, secures local storage and allows access to device features.



## Choose amongst various mobile application development models



### Browser Access

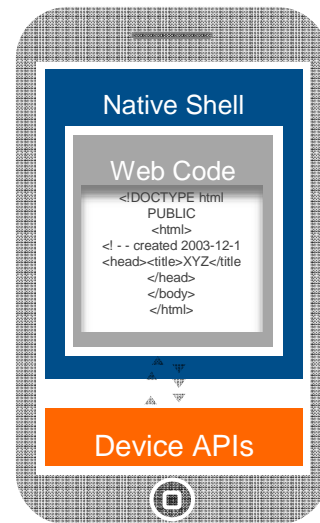
Written in HTML5 JavaScript and CSS3. Quick and cheap to develop, but less powerful than native.



Browser Access

### Hybrid Apps - Web

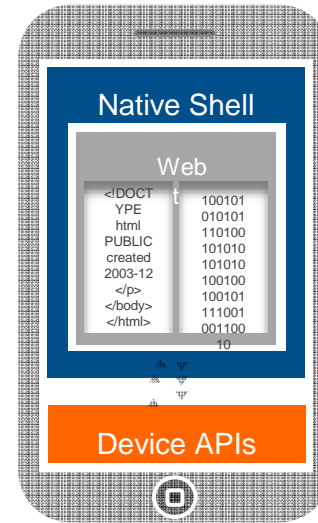
HTML5 code and Worklight runtime libraries packaged within the app and executed in a native shell.



Downloadable

### Hybrid Apps - Mixed

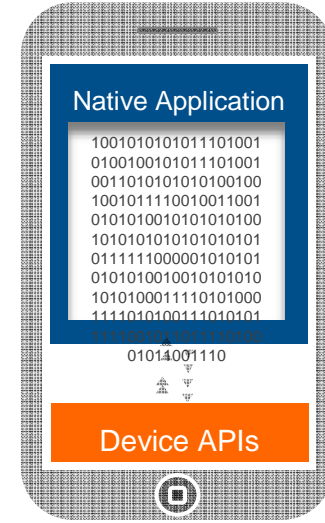
User augments web code with native language for unique needs and maximized user experience.



Downloadable

### Native Apps

Platform-specific. Requires unique expertise, pricy and long to develop. Can deliver higher user experience.



Downloadable

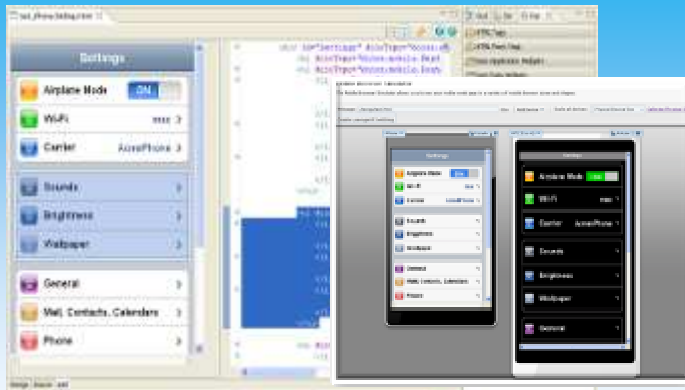
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# Integrated Mobile Collaborative Development

Enabling collaborative team development on mobile app projects

## IBM Worklight

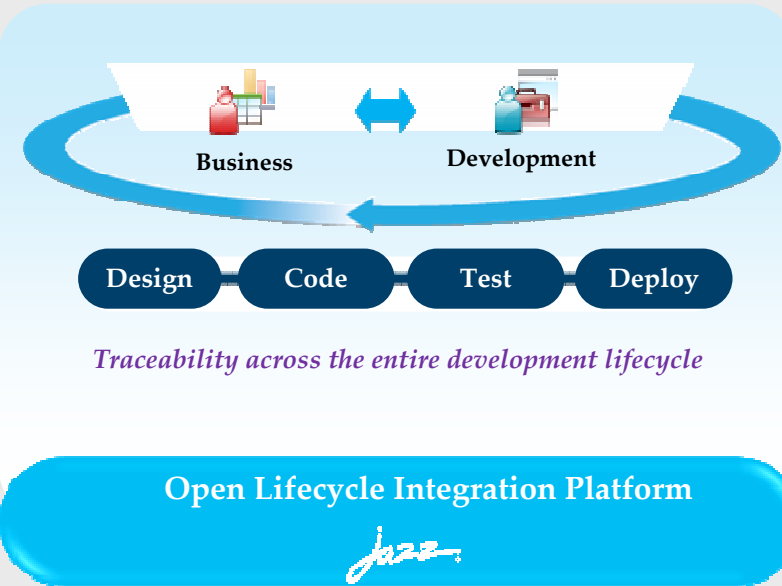


Construct, debug, and test mobile UIs

Mobile Application Platform

+

## Collaborative Lifecycle Management



Application Lifecycle Management

**IBM provides the only comprehensive mobile development solution currently in the market combining a mobile application platform, construction tools, and lifecycle management all integrated together**

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# Instrument the app for analytics, security, and management control



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## IBM Tealeaf CX Mobile

*Visibility into the customer mobile experience to improve conversions and grow revenue*

- Automatically **detect customer struggles, obstacles or issues**
- Drill down into **actual user behavior**, complete with gestures
- **Translate customer feedback** into actionable improvements
- **Correlate customer behavior** with network and application data



**New!**

### What's new in IBM Tealeaf CX Mobile V8.7

- ✓ Analyze mobile user behaviors – automatically instrumented in IBM Worklight mobile apps
- ✓ Capture and high-fidelity replay of mobile gestures on iOS and Android-based devices
- ✓ Add-on Heatmap, Link Analytics, Form Analytics, and Attention Map analytics for mobile-web applications

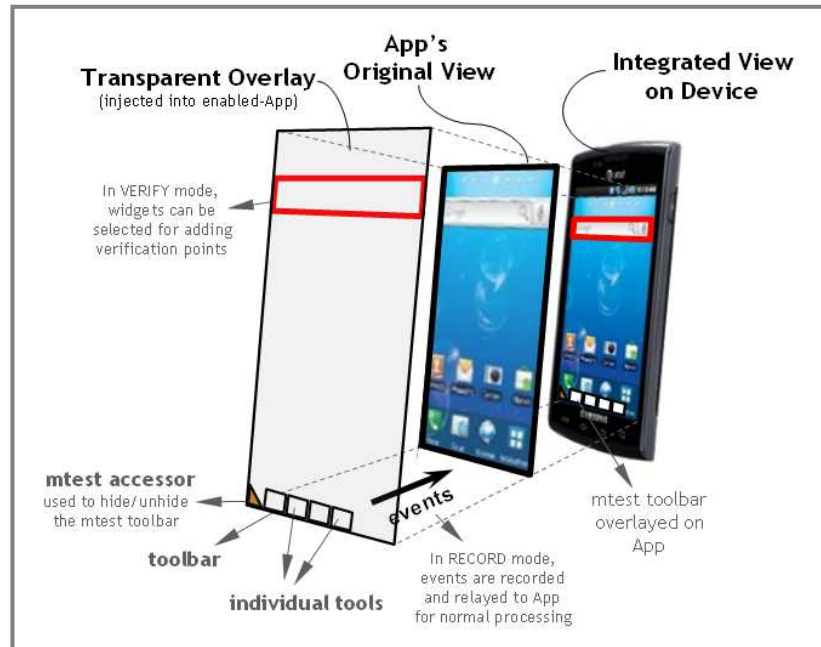




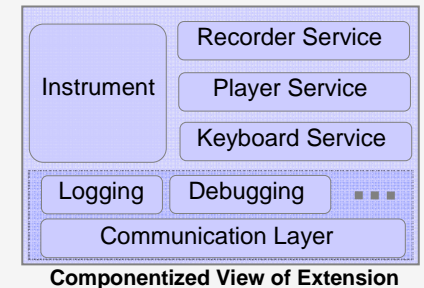
# Instrument mobile apps to enable functional test automation

## Record & Playback

Application instrumentation libraries provide a transparent overlay for user interaction with the mobile app. Architecture adheres to adapter model followed by other Rational quality management products.



**Architecturally**, our approach is to have an adapter that deals with all mobile devices. An extension specific to the mobile platform resides on the device. Event capture and playback services together with UI elements constitute each extension.



## Key Goals for Mobile Test Automation

- Dynamic Instrumentation of Mobile Applications
- Adapter model with specific extensions for multiple mobile platforms
- Capture with high-fidelity replay of multi-touch events

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# Integrate your app with back-end data, systems and cloud services



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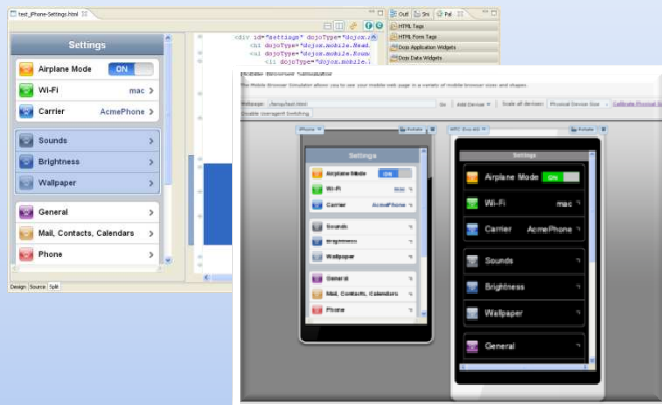
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## Rational IDEs with IBM Worklight

Design, code, build, test, and deploy mobile apps that run on a wide variety of mobile platforms; extend existing back-end services and data to mobile apps

### Integrated multi-platform development environments



**Construct, debug, and test mobile UIs**



**Refactor and extend existing logic on enterprise platforms (System z, Power) as mobile-consumable services**

IBM Worklight 5.0 is now included in the following IDEs (for development purposes only):

- Rational Developer for zEnterprise v8.5
- Rational Developer for Power Systems v8.5
- Rational Application Developer v8.5
- Rational Software Architect v8.5

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# Test earlier, more often, and for less with automated mobile app functional testing



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## What do mobile testers need?

### Test Management

- Test planning, reporting, and dashboarding
- Test case, suite, environment construction
- Integration with ALM
- Integration with multiple execution engines

### Manual Testing

- Still most used mobile testing method
- Necessary for some validation
- Integration with test management
- Frequently key in outsourcing and crowd sourcing scenarios

### Service Virtualization

- Isolate front-end from back-end
- Control over data and interface
- Decrease expensive set-up costs

### Security Testing

- Network connections
- Server data
- Client data
- Injections and data flow analysis

### Device Access

- Remotely accessible
- Shareable across teams / geographies
- Access to diverse selection
- Device clouds minimize cost of ownership

### Performance Testing

- Middle-tier and back-end
- Mobile client code
- Mobile network
- Mobile client experience

### Mobile UI Automation

- Device / platform agnostic
- Application instrumented automation
- Optical / image recognition automation

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## IBM Rational Test Workbench v8.5

*High quality mobile apps built and tested for a rapidly evolving mobile infrastructure*



New!

- **Mobile Test Automation**
  - Support Worklight and native iOS or Android mobile apps
- **Eclipse Client integration**
  - Integration with Rational Quality Manager and IBM Worklight Studio
- **End-to-end mobile testing**
  - Capture and replay of multi-touch events with virtualization of multi-tier systems



*“Being agile, we are developing tests as we write our code, so automating the functional tests of our mobile apps and using them for regression on multiple platforms makes our team much more productive!” - Mobile developer*

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The screenshot displays the IBM MobileFirst Test Editor interface. The main window is titled "Performance Test - MobileTesting/Calc2plus2(2).testsuite - Rational Test Workbench - Mobile Technical Preview". The interface is divided into several panes:

- Test Navigator:** Shows a tree view of the test suite structure, including "Mobile Testing", "Mobile Applications", "Recording Sessions", and "Tests".
- Test Contents:** Displays the test flow for "Calc2plus2(2)". The test resources include:
  - Launch application: Calculator 1.0
  - Click on Button '2'
  - Click on Button '+'
  - Click on Button '2'
  - Click on Button '='
  - Press Back
- Test Element Details:** Provides configuration for the selected test element "Click on Button '2'". Fields include:
  - Graphic object: Button
  - Object's action: Click
  - Object identified by: Text (Text: 2)
  - Object location: (automatic detection)
  - Think time (milliseconds): 0
  - Time out (seconds): 30
- Screen Capture:** Shows a screenshot of the calculator application with a red box highlighting the "2" button.
- Properties:** A table listing properties for the selected element:

Name	Value
Are links clickable	true
Content description	N/A
Error	N/A
Gravity	Center
Has set	
Height	
Highlig	
Hint	
Hint te	
Id (inte	
Insert b	
- Test Flow:** A list of test steps is shown, with two verification points highlighted in a black box:
  - Verify that Text equals 4.0 on Edit text
  - Verify that Is focus equals true on Edit text


## Test Editor

- Discover test flow
- Screen captures of test elements
- Insert test verification points





The screenshot shows the Rational Test Workbench interface. The main window displays a 'Mobile Execution Report' for a test named 'Calc2plus2' [Nov 30, 2012 9:49:32 AM]. The report includes the following details:

Test:	Calc2plus2 (last modified on Nov 30, 2012 3:22:42 PM)
Execution Status:	SUCCESS
Application:	 Calculator (version 1.0; imported on Nov 26, 2012 6:00:30 PM)
Device:	eeepc by asus (Android; API level 16)
Test Location:	/MobileTesting
Duration:	8 seconds

Below the summary, a list of test steps is shown:

- 1 Start com.example.calculator  
Time since start: 0 seconds
- 2 Click on **Button '2'**  
Time since start: 0 seconds

The interface also shows a tree view on the left with 'Mobile Reports' expanded to show the current report. A smaller inset window shows a detailed view of test steps 6, 7, and 8:

6	Verify that <b>Text</b> equals <b>4.0</b> on <b>Edit text</b> Time since start: 5 seconds Value=4.0
7	Verify that <b>Is focus</b> equals <b>true</b> on <b>Edit text</b> Time since start: 6 seconds Value=true
8	Press <b>Back</b> Time since start: 8 seconds

## Test Reports client

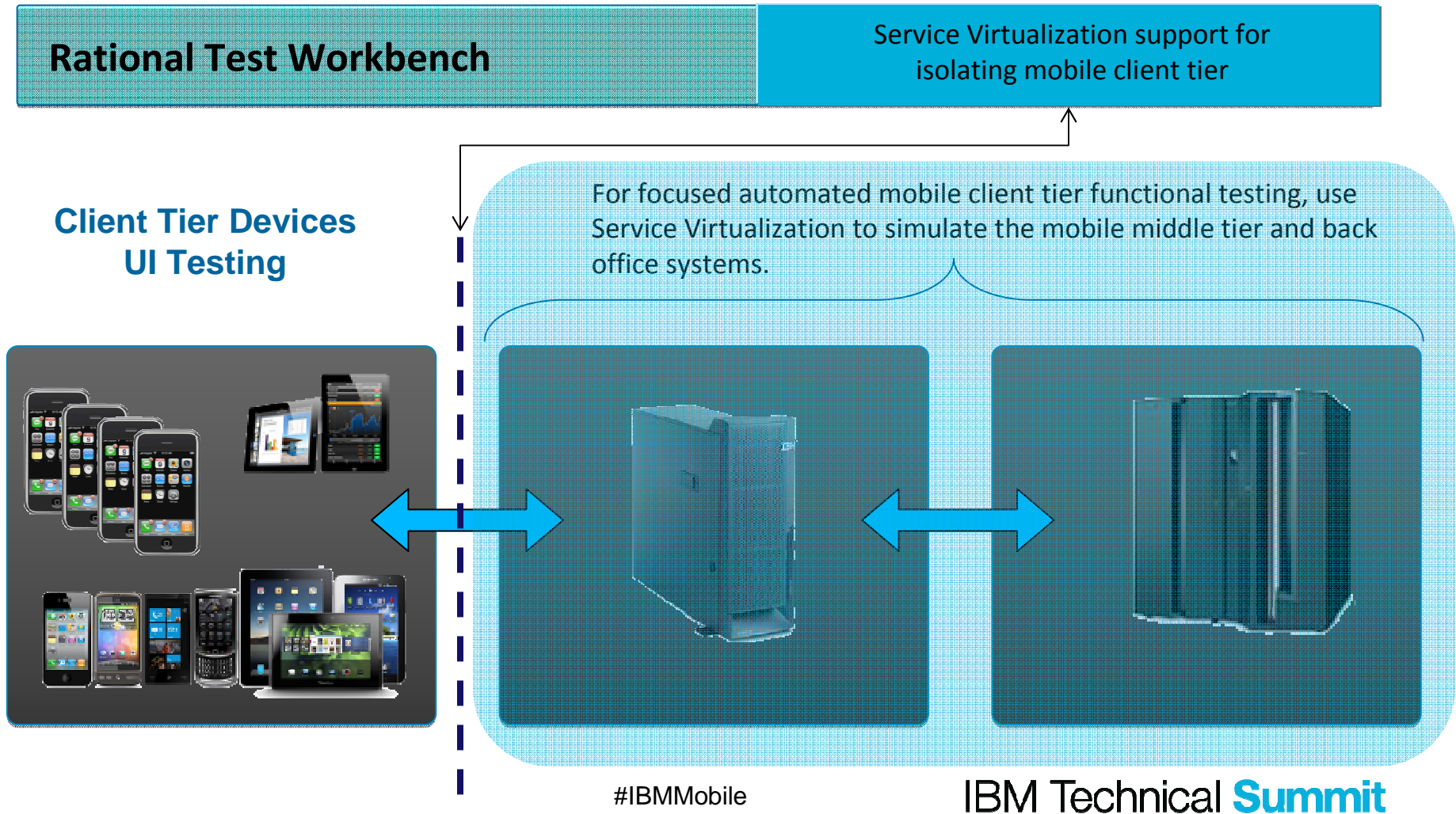
Available in workbench or moile client





# Virtualize back-end services to maintain agility

*Client Value: Mobile development team can meet aggressive schedules and reduce MIPS usage on enterprise systems*

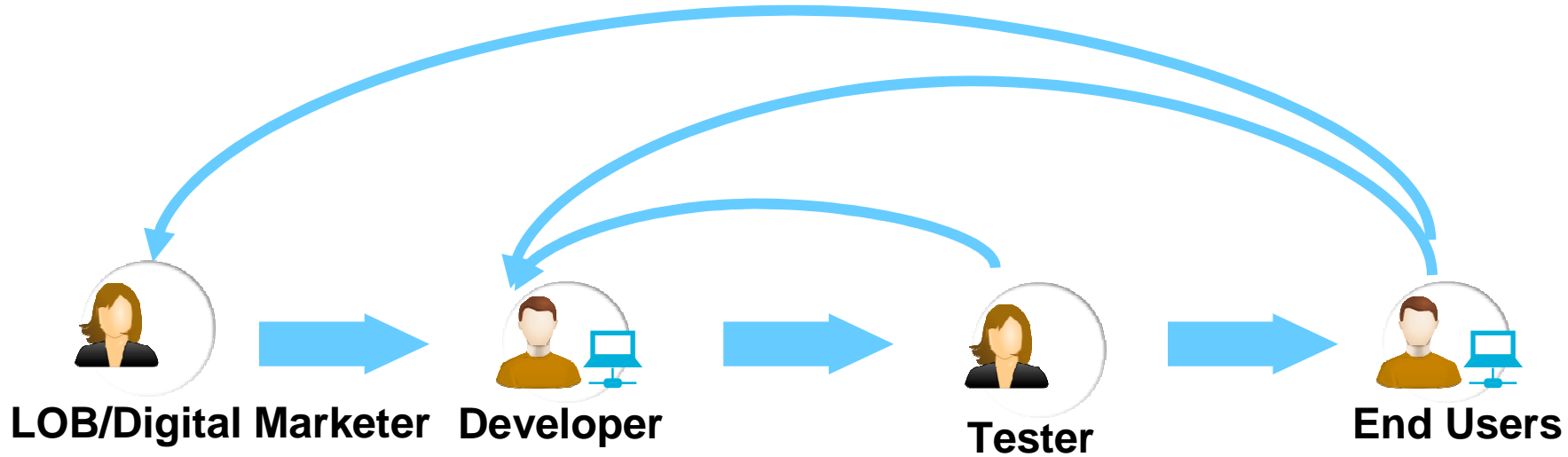




# Challenges once the mobile app is delivered to the field



“When someone leaves a negative review in the app store, it scars your app for life, you can’t respond to it, and you can’t learn more about the problem in order to fix it quickly.”  
- Mobile Orchard



- How effective our mobile app is at engaging customers?
- How can I stay on top of all the comments and feedback from customers and turn them into an actionable strategy?

- How could I get visibility to issues that customers experience in production so that I can address them quickly?
  - How can I get more people to test the apps so that we can cover different devices, network carriers, and OS versions?

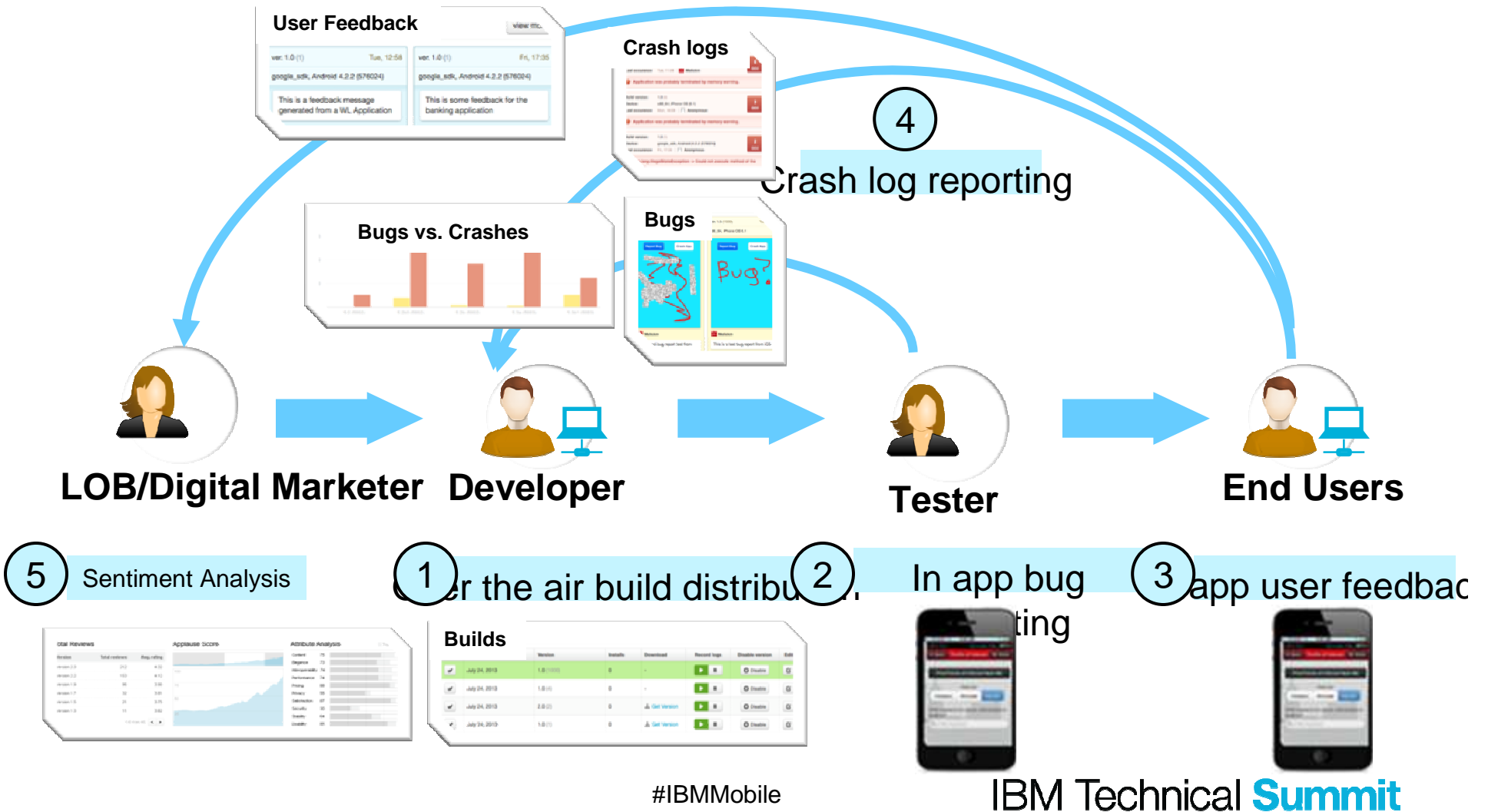
- How can I get the latest and greatest build without wasting my time to track that down?
- How can I quickly submit bug reports with screenshots and device details right from the application?

- How can I provide direct and constructive feedback?



# Reducing Time to Feedback (Q4 2013 Tech Preview)

Initial release will address five key use cases, attacking pain points for all key users





# Deploy using a combination of internal and external app stores



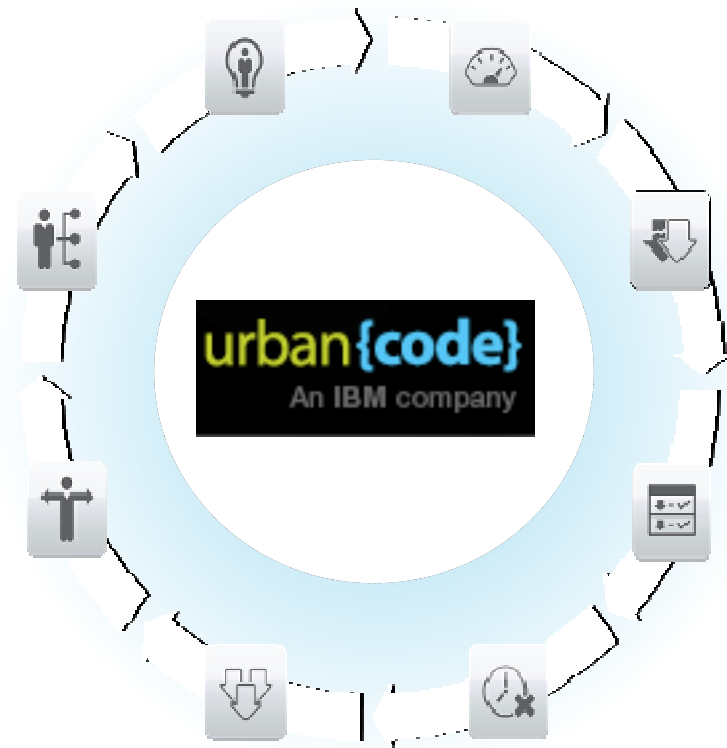
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## IBM UrbanCode delivers DevOps

*Enabling clients to more rapidly deliver mobile, cloud, big data analytics and traditional applications with complementary DevOps capabilities*



- **Drive down costs**
  - Reduce the amount of manual labor, resource wait-time, and rework
- **Speed time to market**
  - Increase frequency of software delivery
- **Reduce risk**
  - Deliver higher quality application releases with increased compliance

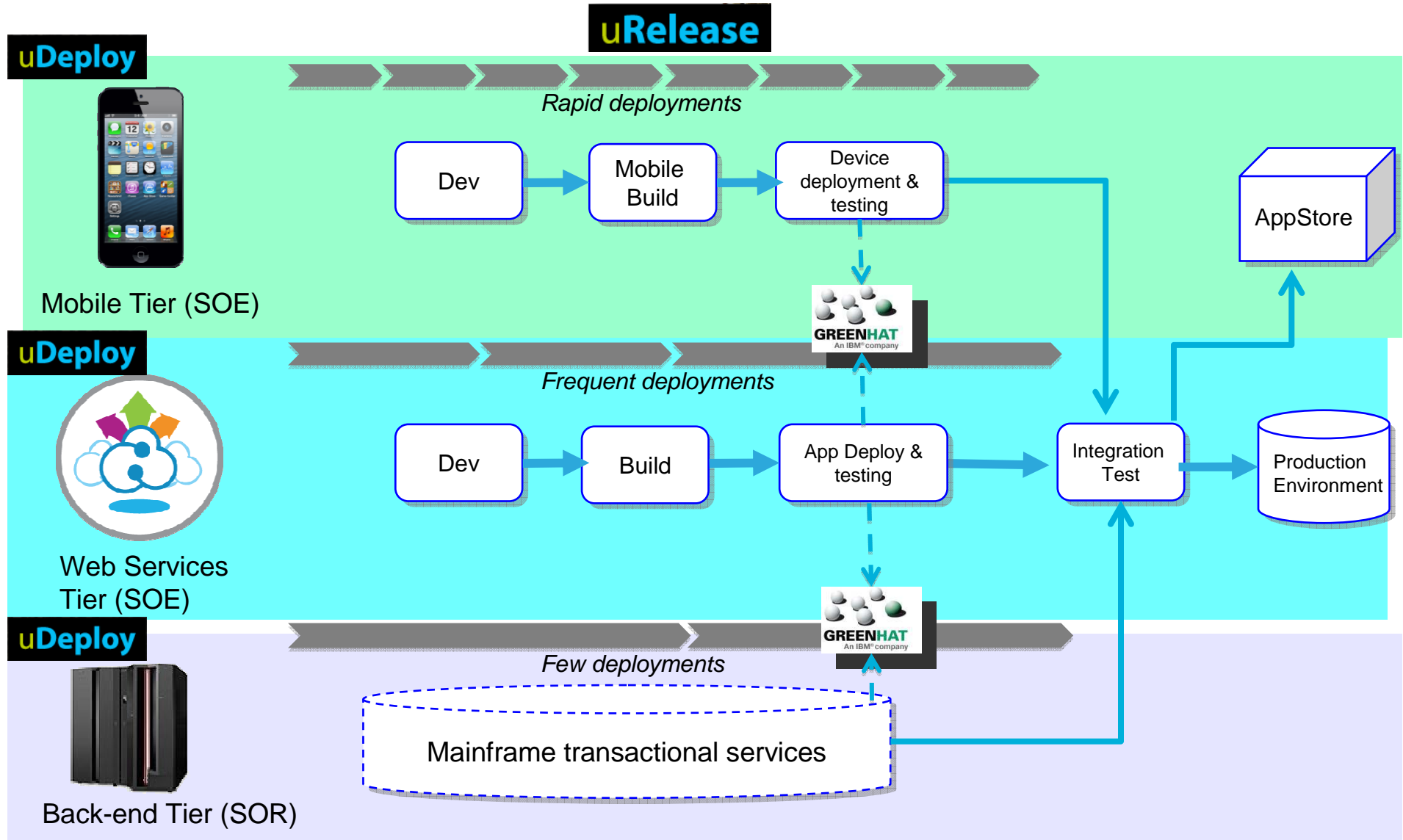


*“Mobile development moves more quickly than most enterprises are accustomed to. The coordination required, and the pace being driven by mobile, is a big factor driving DevOps in the enterprise.” - Eric Minick, UrbanCode*



# Distributed DevOps Pattern

Mobile apps need to be updated and released rapidly. Eliminate delays waiting for operations teams to setup test labs and longer cycles required to integrate with existing apps/services, and processes.





# Gartner has recognized IBM as a leader in the Magic Quadrant for Mobile Application Development Platforms

Magic Quadrant for Mobile Application Development Platforms  
 Ian Finley, Van L. Baker, Ken Parmelee, David Mitchell Smith, Ray Valdes, Gordon Van Huizen  
 Aug 7, 2013

*“As unprecedented numbers of enterprises build mobile applications, the mobile application development platform market continues to grow and evolve rapidly.”*

This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report.

The full report is available at

<http://ibm.co/13TU2Dm>

Figure 1. Magic Quadrant for Mobile Application Development Platforms



Source: Gartner (August 2013)

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## Educational Resources



– **Webcasts:**

[Delivering Mobile Applications Faster with Agile](#)

[Driving and managing innovative mobile banking and Insurance applications](#)

[Accelerate development of mobile apps featuring Rational Application Developer and the WAS Liberty profile](#)

– Solution Brief: [Develop Enterprise Mobile Applications](#)

– White paper: [Mobile Application Development Primer](#)

## A Mobile Application Development Primer

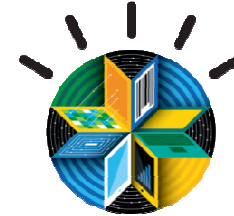
A guide for enterprise teams working on mobile  
application projects



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**1**

The Broadest  
Portfolio of  
Mobile  
Solutions

**2**

The Deepest  
Set of Services  
Expertise

**3**

New Industry  
Partnerships  
and Resources  
for Developers

**Thank you!**

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