Making Mobile Both Accessible *and* Secure

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Have you ever wondered:

- What are the costs to business of incompatible mobile security and accessibility?
- *What are the weak links in security processes?*
- What security gaps must be checked for in assistive technology on mobile devices?
- *How can an enterprise achieve accessibility and mobile security?*
- What factors need to be considered when developing a compatible mobile accessibility and security strategy?

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Agenda

- Bring Your Own Device pros and cons
- Examples of inaccessible security
- Risks of inaccessible security
- Risks of non-secure accessibility
- Focus items to achieve secure accessibility
  - Eleven items to consider when implementing a secure accessibilty strategy.
- Challenges you will encounter
- Summary

Applies to:

- Enterprise mobile deployment
- Mobile application development
- General security and accessibility issues

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Part 1. Risks Related to Inaccessible Security

"Companies spend millions of dollars on firewalls, encryption and secure access devices, and it's money wasted, because none of these measures address the weakest link in the security chain."

– Kevin Mitnick

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Personal mobile devices in the enterprise

Bring Your Own Device (BYOD)

- 73% of enterprises have personal devices accessing corporate resources (Source: Computer Weekly)
- 89% of IT departments WW support BYOD (Source: Cisco®)
- 46% of BYOD is unmanaged, either secret or ignored (Source: Ovum™)

Photo credit: Flickr/ blakespot

Benefits

- Employees have more life balance
- Employees feel more control
- Employees have device they like

- Enterprise saves costs of devices
- Enterprise gets more productivity
- Newer technology / Better care.

Risks

- Data loss
- Security breach
- Experts: "Bring your own danger"
- Employees lose device control
- Legal implications (e.g. HIPAA)

- **Security and Accessibility don't always work together**

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Standards in the United States

Expansion of Americans with Disabilities Act and Section 508 of U.S. Rehabilitation Act (in progress)

21st Century Communications and Video Accessibility Act

U.N. Convention on Rights of Persons with Disabilities and executive order to increase employment of people with disabilities

Evolving legislation driving accessibility into private sector and onto the Web

Standards Globally

U.N. Convention on the Rights of Persons with Disabilities – Signed by 153 countries; Ratified by 110

Rapid standards adoption and potential litigation in emerging markets

Public policies and government mandates for compliance with WCAG in Australia, Canada, China, Japan, Netherlands, U.S., U.K., and others

Governments adopting international conventions and technology standards for inclusion

Marketplace expectations

Select U.S. legal inquiries and litigation since 2008

Increasingly vocal consumers and advocacy hold organizations accountable

Significant Financial Risk

Target fined $6M plus future audits

U.S. Department of Transportation fined Delta Air Lines Inc. $2M for violating rules protecting air travelers with disabilities

How much is ***your brand*** worth?

Magnitude of risk has been in the 7-figure, $M USD range for enterprises.

The Impact of Inaccessible Security: Examples

Previous **PDF** encryption locked out users of assistive technologies, despite them being displayed to screen.

Blind users were unable to use the corporate **antivirus**. They had to use an alternative, less effective option.

CAPTCHA

•Some visual systems having success rates as low as 71% and some aural systems having success rates as low as 31%.*

•6.5 % of users any age and 12% of users as 45-64 have trouble with vision

Current

IBM Unauthorized person (non-IBMer) helps with system/disk encryption locks.

IBM If a vision-impaired user gets an exception for the firewall, they run a less desirable (Windows) option instead.

Near Future

IBM What is the alternative to spoken biometrics that can be overheard?

IBM Will touch-entered passwords be observable by others?

IBM Will PwDs or situationally disabled circumvent security due to accessibility?

*Stanford University Study:

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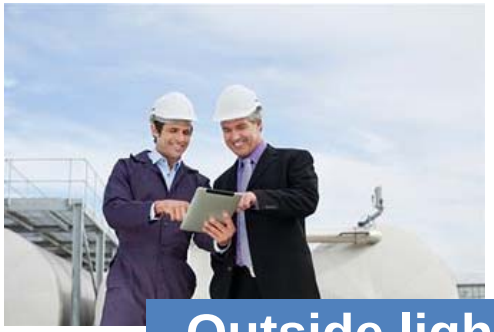
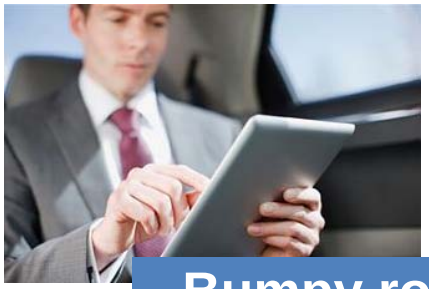
Security in Challenging Circumstances





If a security test fails an individual's *capabilities*, it fails as an implementation

If a security test fails the *situation*, it fails as a solution

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Four Incompatability Risks

The assistive technologies do not function correctly in a secure environment

1

2

Unverified assistive technologies leave exposures to security

3

Security is unusable

4

Secure solutions may not be able to be “retrofitted” for accessibility

Photo Credit: 2007-05-04T01:55:40Z **Articnomad** 356x500 (85218 Bytes) ***Security guard sleeping on duty***

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Part 2. Strategy and Process

Accessible Security & Secure Accessibility

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Focus items for integration to an enterprise

1. Determine standards
2. Embed into enterprise
3. Assess platform accessibility
4. Select support platforms
5. Fill gaps
6. Evaluate assistive technologies
7. Provide accessible authentication
8. Ensure accessible partitioning
9. Provide development and testing tools
10. Enable, monitor and enforce compliance

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Determine Standards

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Embed standards into enterprise

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- Mandates
- Processes
- Guidance
- Metrics
- Education
- Documentation
- Tools

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Accessibility advocate role

- Understands accessiblity
  - Needs of PwD
  - Assistive technologies
  - Standards
- Understands architectures and enterprise processes
  - Software stack
  - User Interface (UI) technologies
  - Documentation
- Provides guidance
- Educates teams and management
- Watches processes and implementation
- Suggests process improvement

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Assess Platform Accessibility

Operating System

Hardware

Carrier

Assistive Technologies

Job Task Applications

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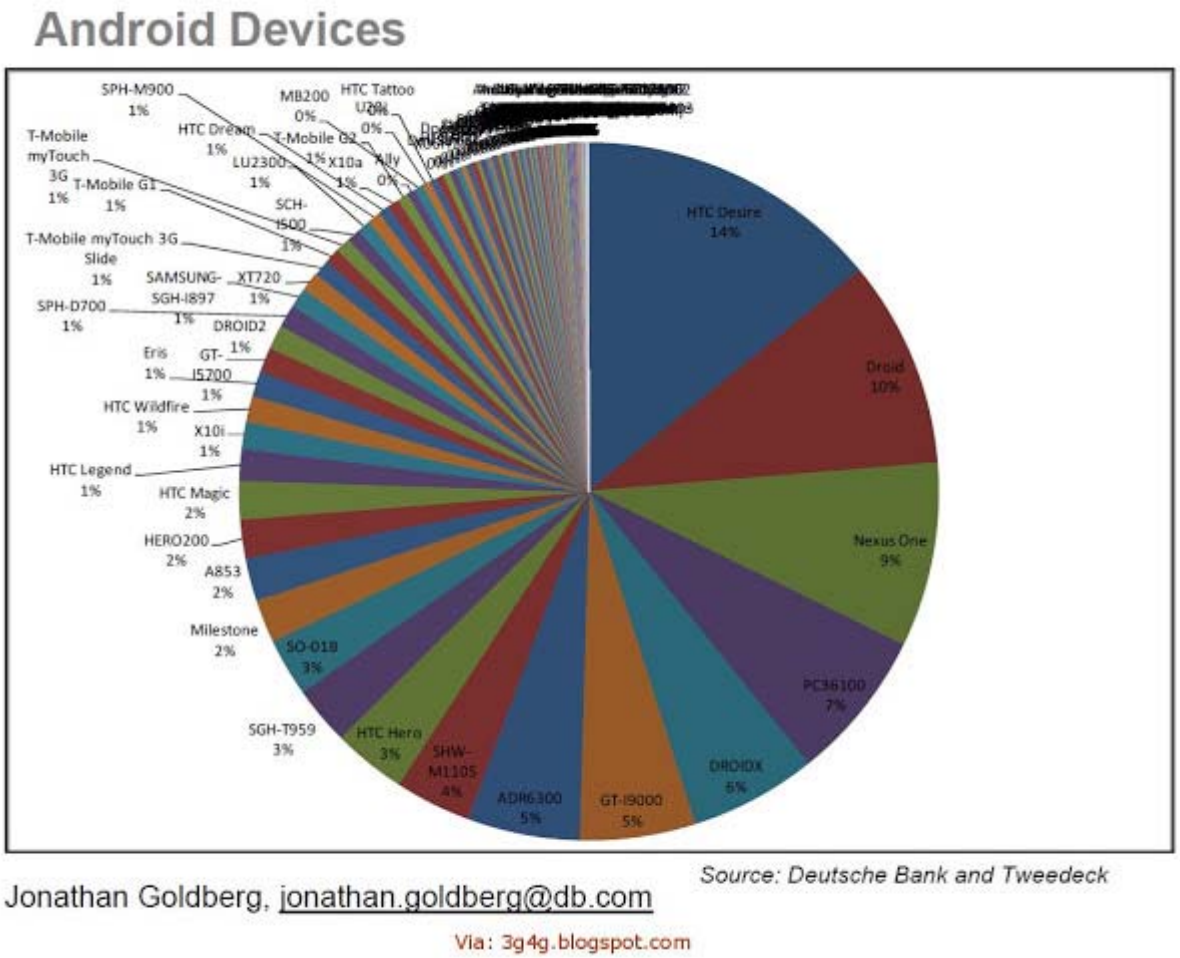
Select supported platforms



- Graph shows percentage of devices sold
- Fragmentation of Android™ devices makes supporting everything impossible
- Identify the devices used by your business

Source: From a presentation by Deutsche Bank in the 4th LTE North America Conference, 8 - 9 November 2011, Dallas, Texas, USA. Used with permission.

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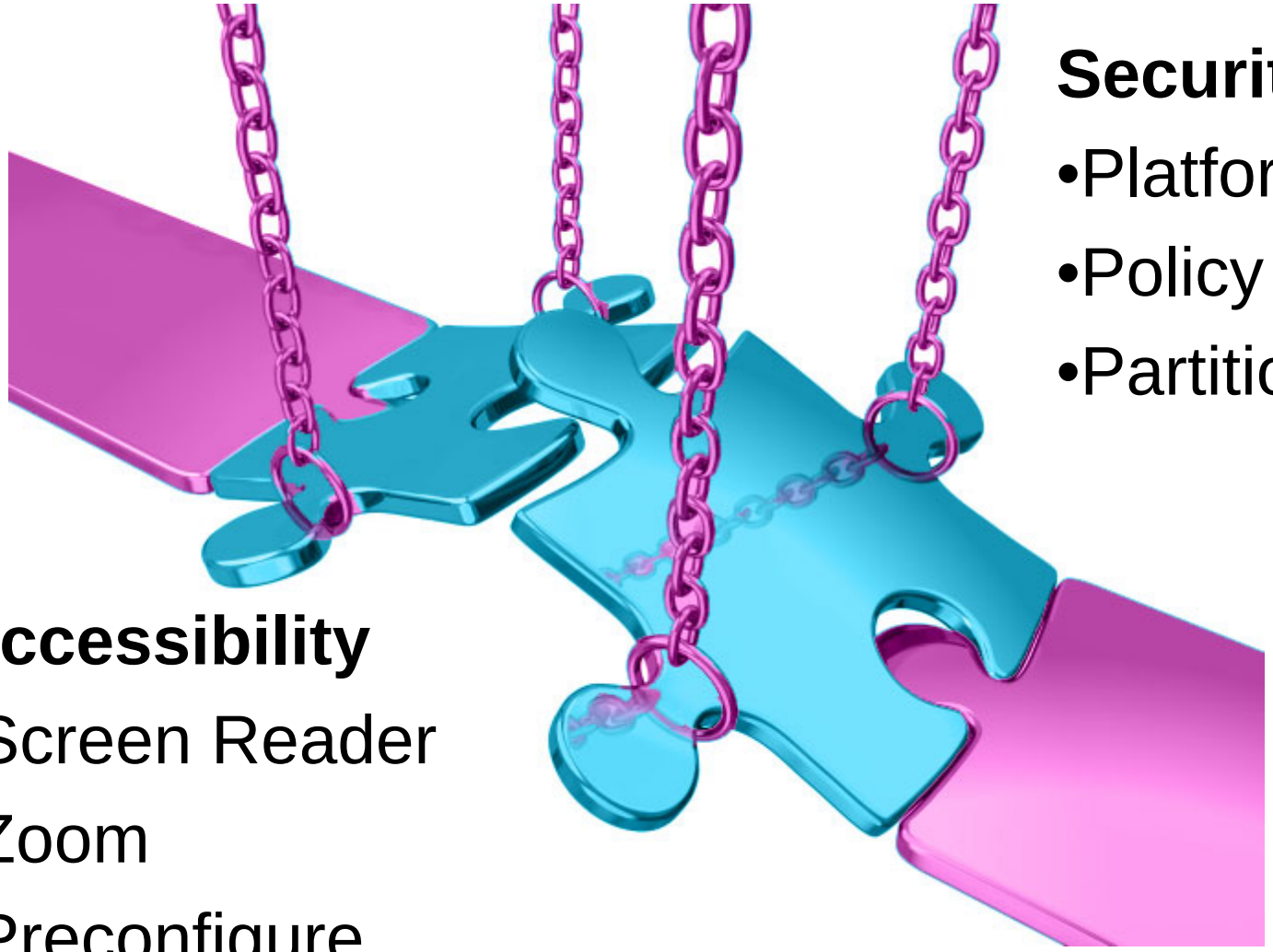
Fill gaps



Security

- Platform settings
- Policy
- Partitioning

Accessibility

- Screen Reader
- Zoom
- Preconfigure
- Development tools

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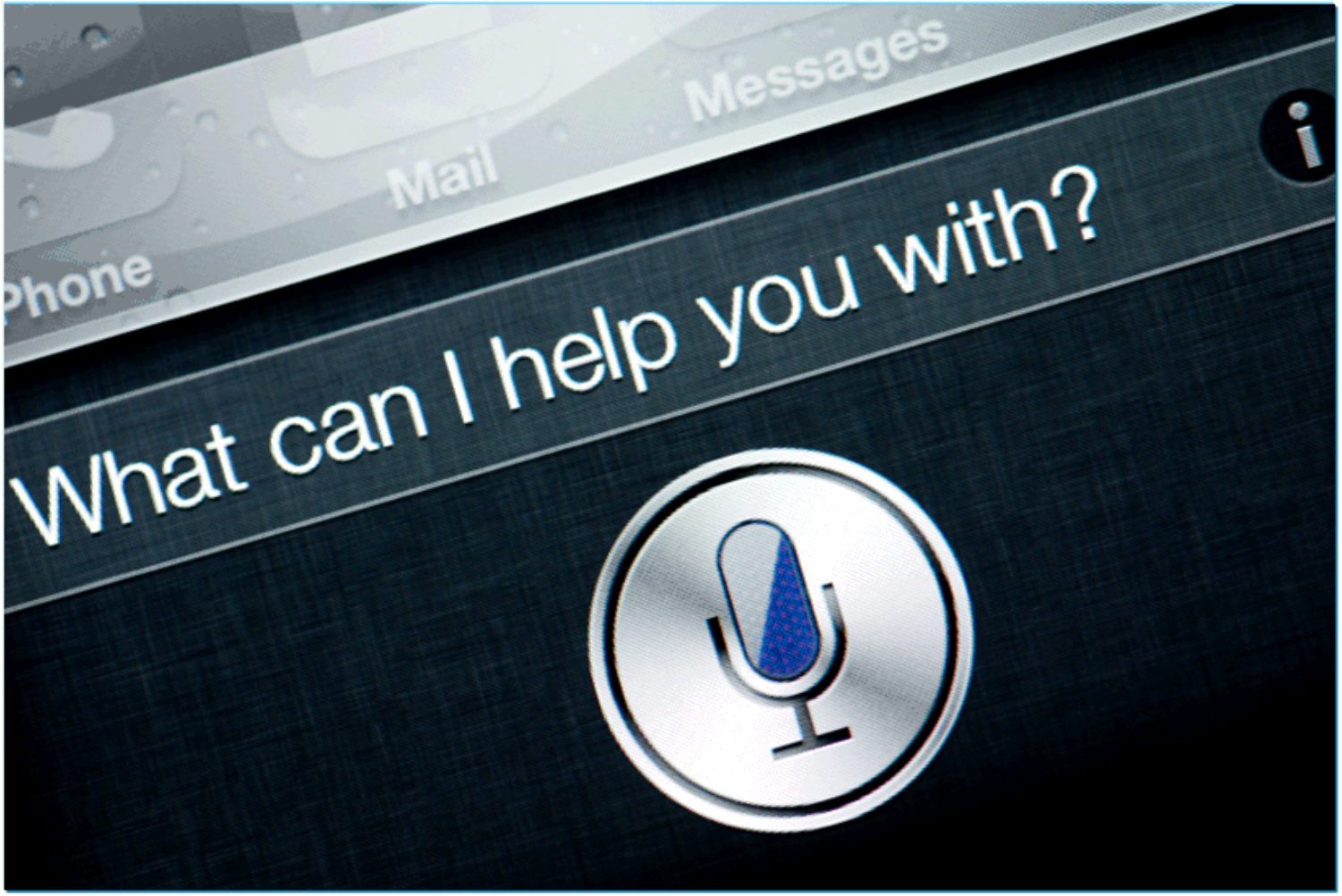
Evaluate assistive technologies for security (1)



Example: Siri®. What happens to the spoken phrases?

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Evaluate assistive technologies for security (2)

Does the required Assistive Technology:

- Run correctly when the Security is engaged?
- Have artifacts that leave unprotected content?
  - Logs
  - Buffers
  - Off-device processing
    - Transmission
    - Secure processing
  - Is encryption adequate?
- Work in public / private situations?
- Require network connection?

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Provide accessible authentication

Passwords: Consider length, complexity, time-outs, alternatives

Graphical Passwords: Not suitable for device without a mouse or touch-screen access

Biometric Authentication: Consider cost, environmental considerations, alternatives

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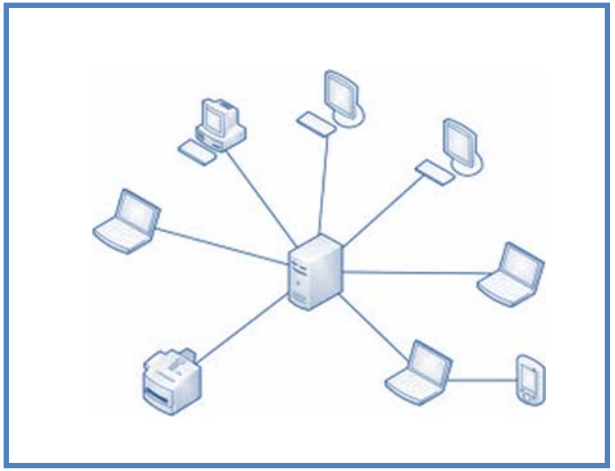
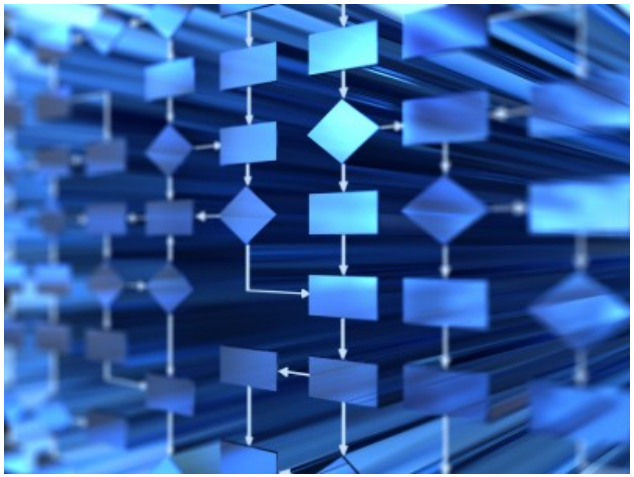
Ensure accessible partitioning (1 of 4)

Mobile Device Management



Device Security

Enterprise Applications



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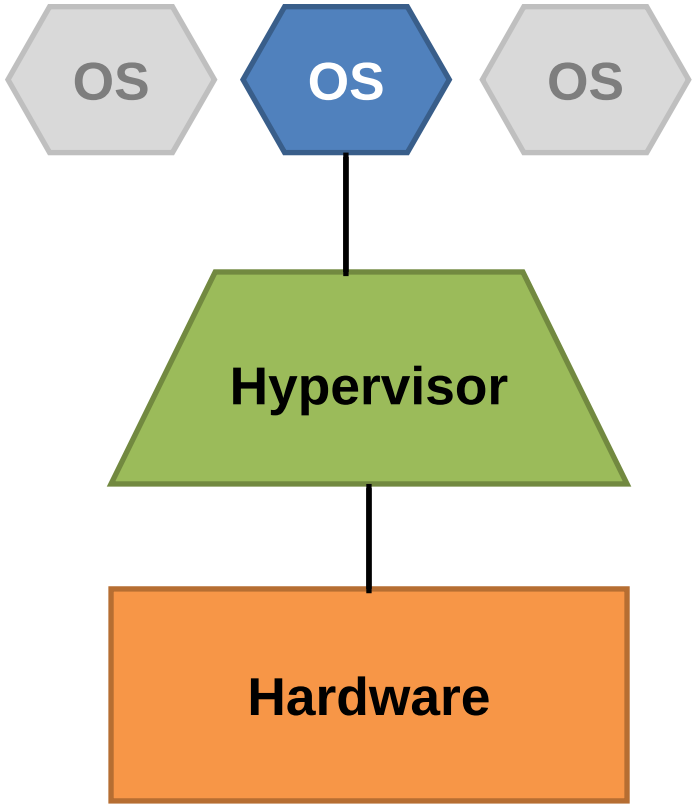
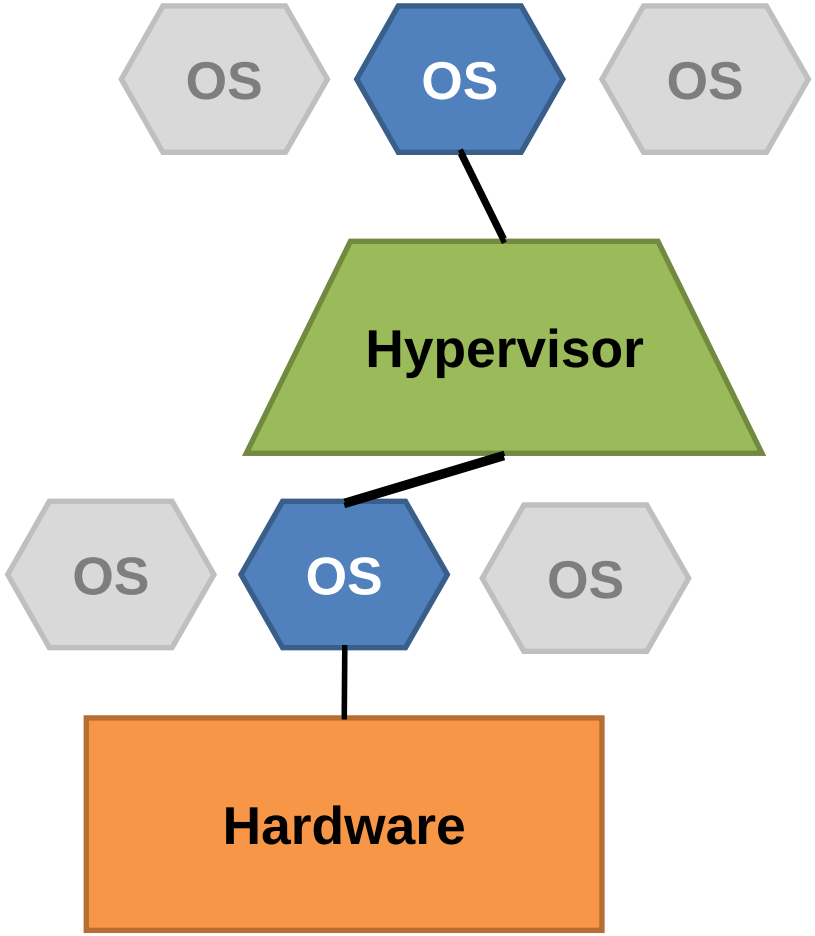
Ensure accessible partitioning (2 of 4)



Type 1
Bare Metal



Type 2
Hosted

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Ensure accessible partitioning (3 of 4)

Container Virtualization Solutions:

- The kernel of the device OS allows for multiple user-space instances
- Kernel limits impact of one container's activities on the other containers
- Think of this as UNIX “chroot” solution
- Cannot host a guest operating system different from the host one

Example: Enterproid™ Divide™

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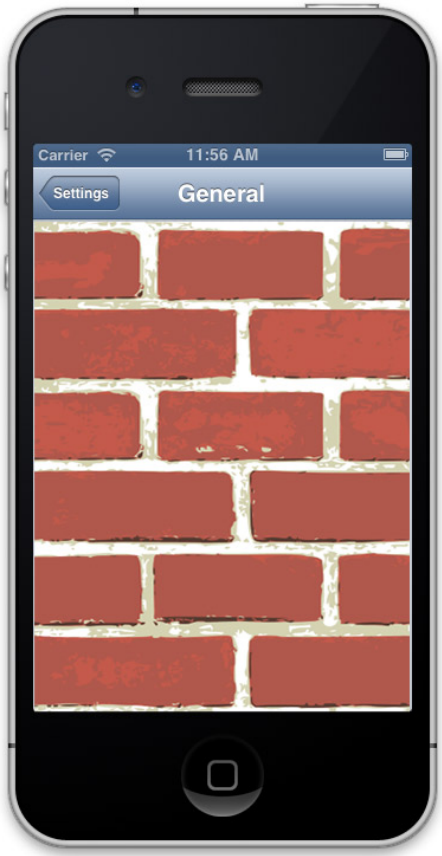
Ensure accessible partitioning (4 of 4)

Assessment considerations:

- Is the container solution compatible with assistive technologies
  - (e.g. Eyes Free Shell)?
- Is the container solution itself accessible?
- Are the provided enterprise applications accessible?
- Are assistive technologies available in both containers/workspaces?
- Do you have to recompile or rework assistive technologies?
- Do you need to make the assistive technologies available on the mobile device management server?



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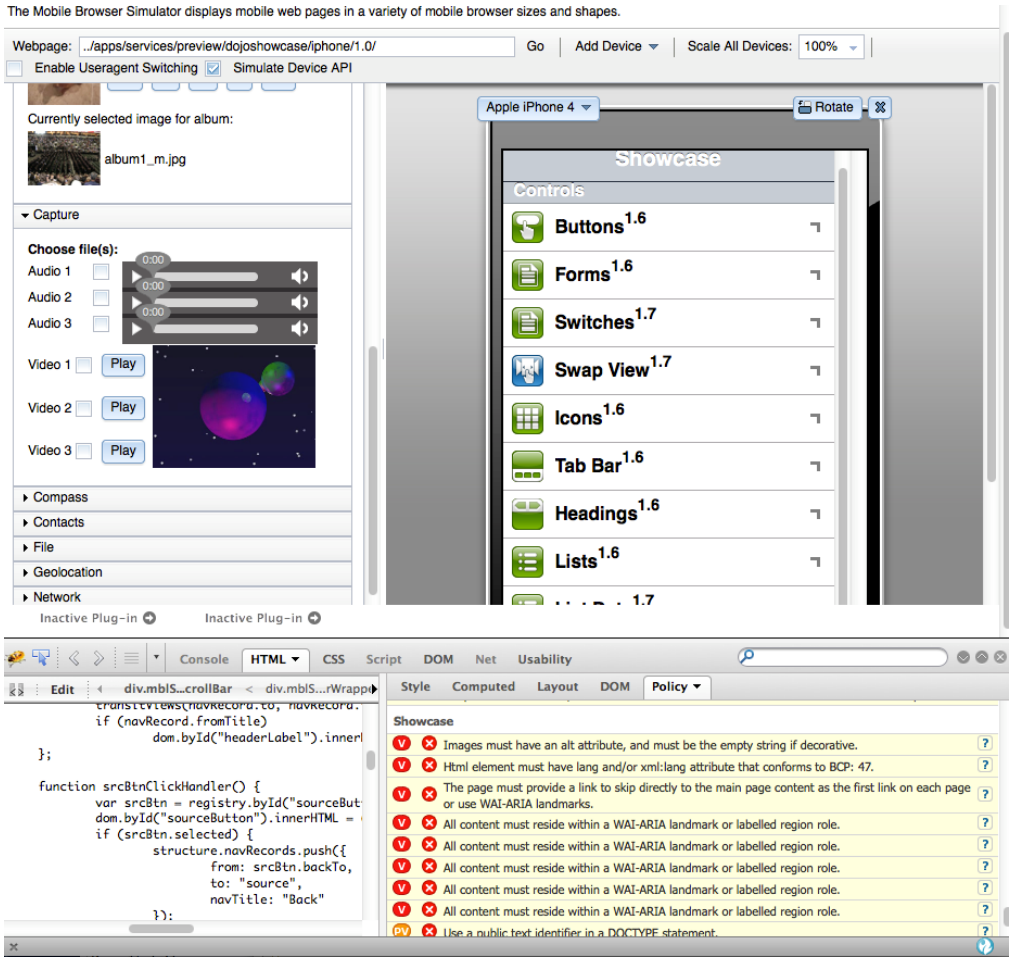
Provide development and testing tools

IBM Worklight for cross platform development

- Develop once - multiple platforms
  - CSS, JavaScript = look & feel
- Utilizes Cordova open source
  - Access to platform services
- Allows mix of native and web pages
- Support for Dojo Mobile, jQuery, Sencha touch™
- Server interaction and update
- Built in security transport layer
- Cross platform services



IBM Rational Policy Tester® for automated web testing

- Dynamic Assessment Plugin

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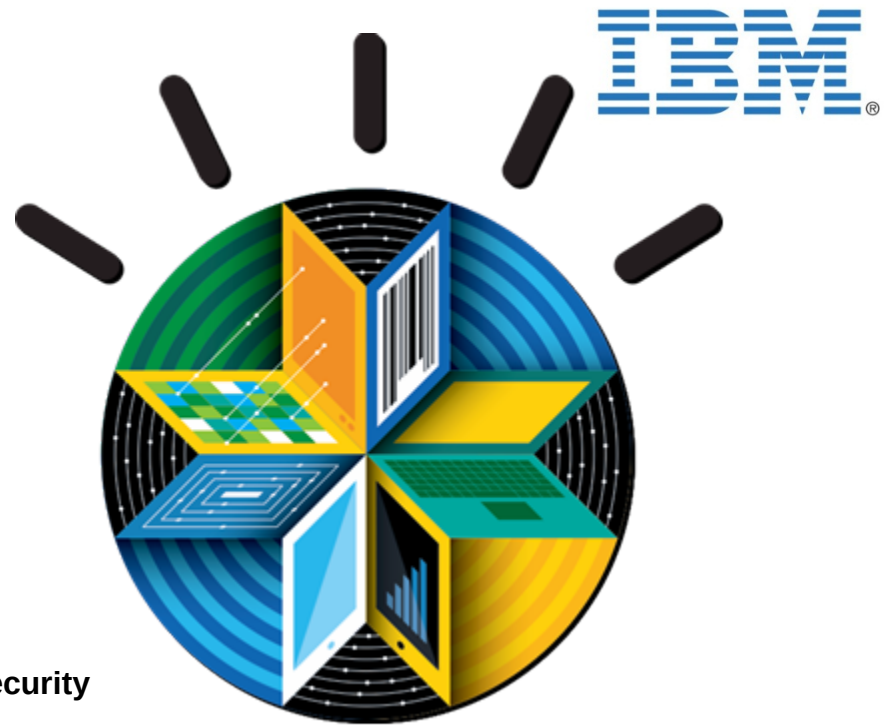
IBM MobileFirst™

IBM MobileFirst Platform
- **Worklight for development**
- **Rational Policy Tester**



IBM MobileFirst Management
- **Endpoint manangment for BYOD**

IBM MobileFirst Security
- **Access control**
- **Application vulnerability scanning**

IBM MobileFirst Analytics
- **Understand user behavior**

IBM Mobile First Services
- **Strategy and Design**
- **Development**
- **Integration**

More information: https://ibm.biz/BdxaRX

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Enable, monitor, and enforce compliance

How will compliance monitoring, enablement and enforcement be done?

- System settings
- Software inventory
- Software distribution
- Automation
- Monitoring
- Reporting
- Taking Action

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Part 3. Major Difficulties

“The only constant is change”

Heraclitus, greek philosopher, 500 BC

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Rapid Transformation of Standards

Initial Standards & Policies

2000

- **W3C:** WCAG 1.0
- **US:** Section 508
- **IBM:** CI 162
- **WCAG 1.0**
  - **Japan**
  - **Germany**
  - **Italy**
  - **France**
  - **UK**
  - **Netherlands**
  - **Korea**
  - **US states**
  - **…**

Next Generation

2005

2008

- **OASIS:** ODF Accessibility
- **IBM:** IAccessible2
- UN Convention on Rights of People with Disabilities
- **W3C:** WCAG 2.0
- **ISO:** Software
- **China:** WCAG 2.0 based Web standard

Telecom & Private Sector

2011

- **US:** CVAA, ADA
- **ITU Accessibility Initiatives**
- **EU:** Telecom directive
- **Japan & Canada:** CVAA-like regs in process
- **Canada:** WCAG 2.0 for federal gov't website
- **Ontario:** AODA
- **ISO:** JTC1: AT-IT Interop, IAccessible2
- **Korea:** Public and private sector websites

Cloud, Mobile, & Analytics

2012

2014

- **W3C:** WAI-ARIA, HTML5, SVG, IndieUI, WCAG2ICT
- **ISO:** Approved WCAG 2.0 as ISO/IEC 40500:2012
- **IMS GLC:** Access for All
- **US:** Section 508 procurement reg refresh
- **US:** DoL proposes 7% PwD employment target for fed. contractors
- **EU:** Mandate 376 standards, certification scheme, potential procurement regulation
- **EU:** Web Accessibility Directive
- **China:** New Web standard, government mandate on accessibility
- **Canada:** More provinces follow Ontario lead

Next

- **UN:** 124 ratifying countries
- **EU:** potential Accessibility Act, accessibility required to sell in EU market
- **US:** ADA Web standard

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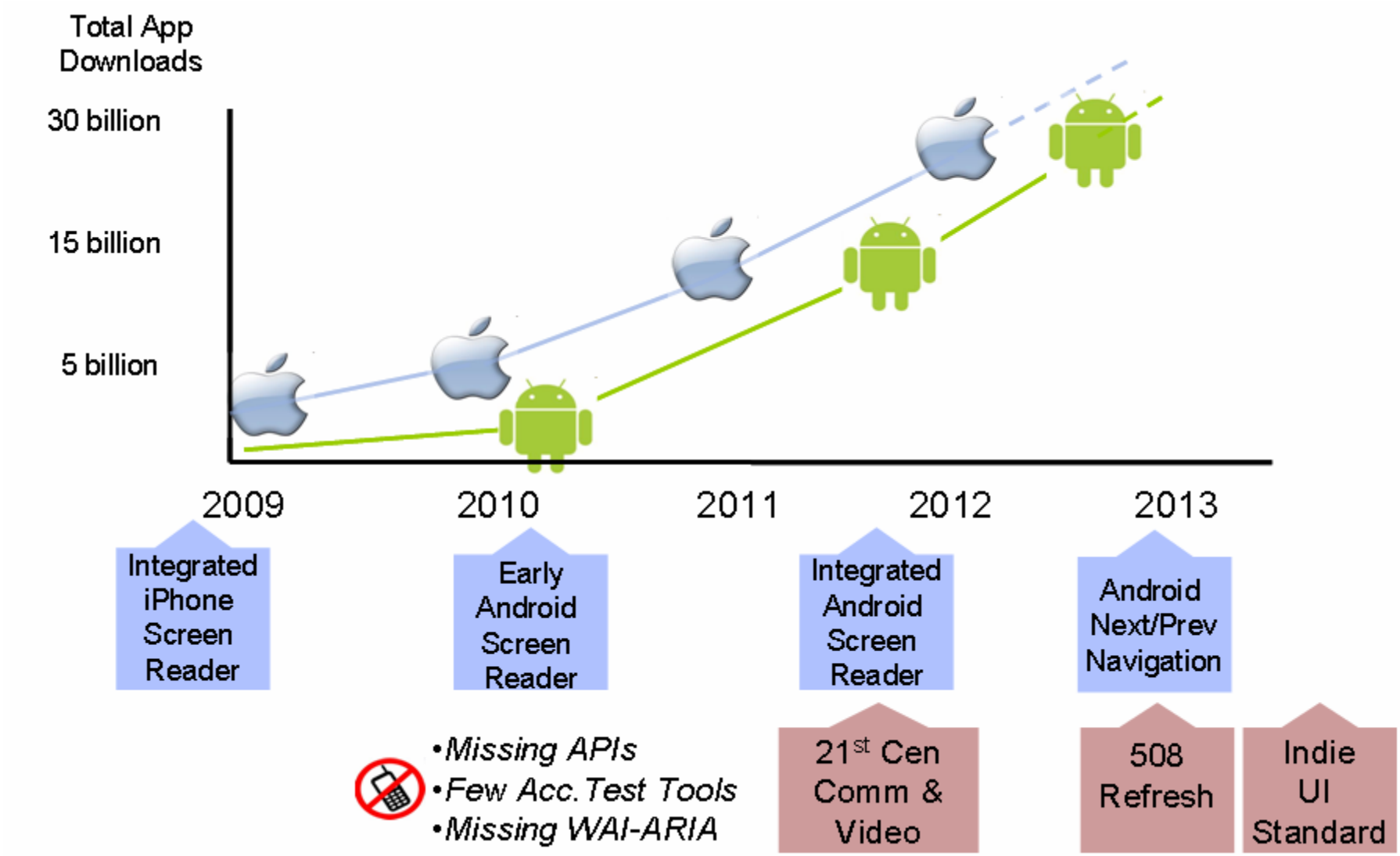
Mobile Standards Lagging Growth



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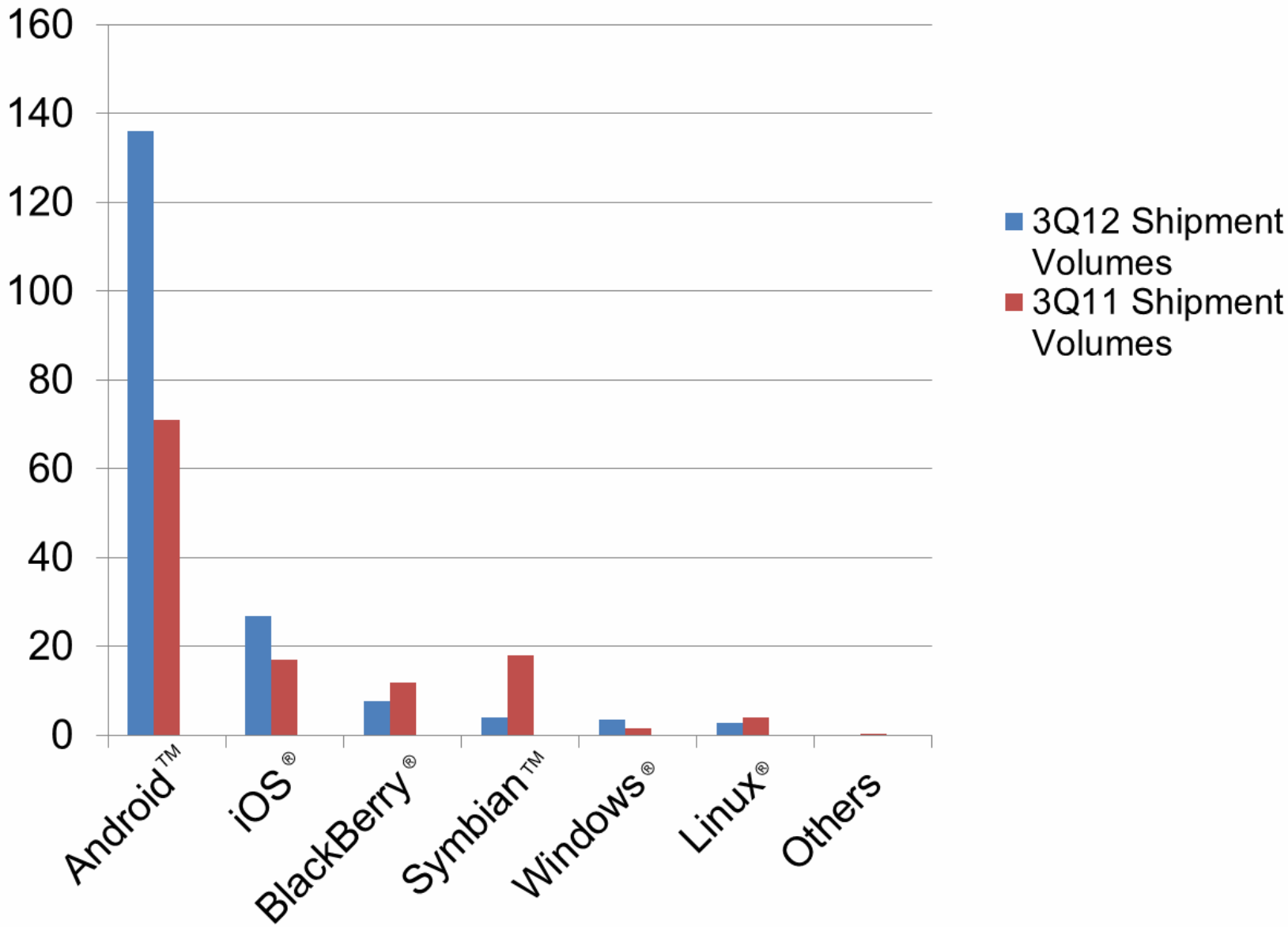
Diversity of Mobile Devices



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Emergence of New Security Technologies

- State of hypervisor solutions:
  - Vmware® newly emerging Type II hypervisor
  - Red Bend vLogix Mobile™ emerging Type I hypervisor
  - Others

- Biometric authentication solutions are emerging:
  - EyeVerify is working on software to bring eye vein verification to your smartphone
  - VoiceTrust is working on voice biometrics to secure mobile banking applications
  - Apple® entered into an agreement to purchase AuthenTec ® for approximately US$356 million. Predictions are that the next phone will have a fingerprint sensor.

- Mobile device management solutions
  - “10 New Mobile Device Management” solutions reported May 2012

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Integration from the start is better

- Retrofitting is historically very expensive
  - Requiring expensive rework or starting over
- Bolt on solutions may never work.
- Separation of accessibility and security development means potential failure

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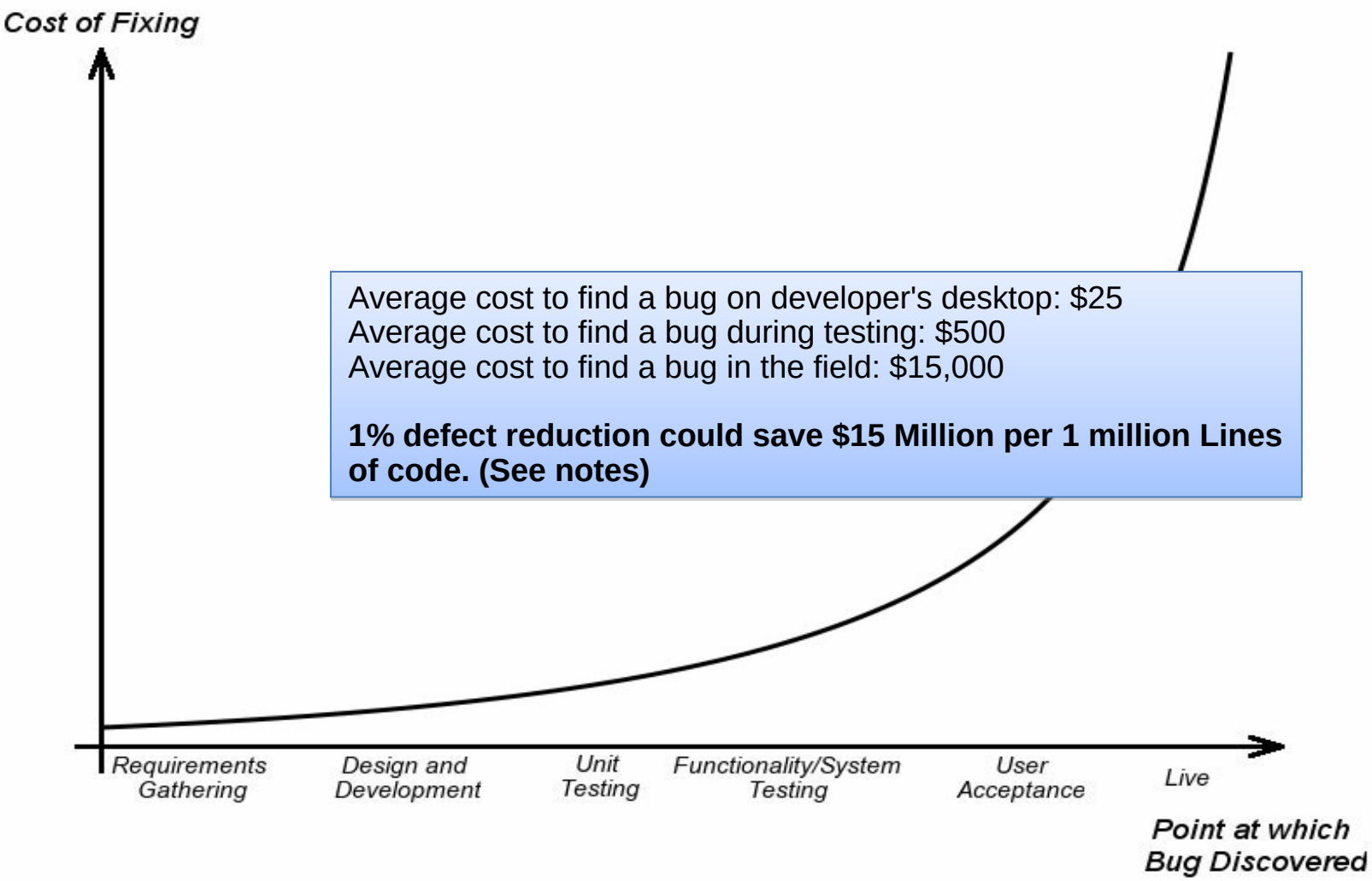
Build Accessibility In



Average cost to find a bug on developer's desktop: $25
Average cost to find a bug during testing: $500
Average cost to find a bug in the field: $15,000

1% defect reduction could save $15 Million per 1 million Lines of code. (See notes)

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Summary

- An enterprise mobile solution requires security and accessibility
  - Accessible security
  - Secure accessibility
- Secure accessibility steps
  - Standardize
  - Identify (and narrow) scope
  - Assess
    - Is security accessible
    - Is accessibility secure
  - Identify and fill gaps
  - Eliminate or separate known risks
  - Integration into the corporate fabric
    - Mandates, Processes, Development
  - Build it in

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  - William Bodin
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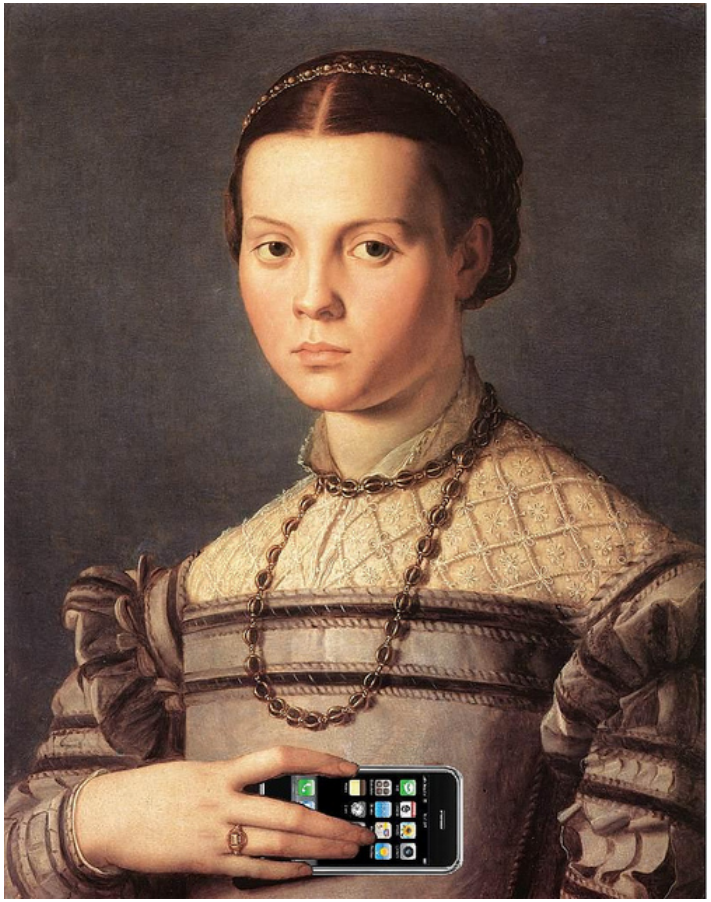

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thank you

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