MBaaS: The Emerging Enterprise Platform

Mobile Backend as a Service

Jason Haley

Oracle Canada

Agenda

1 Introduction

2 Setting The Stage

3 The Platform

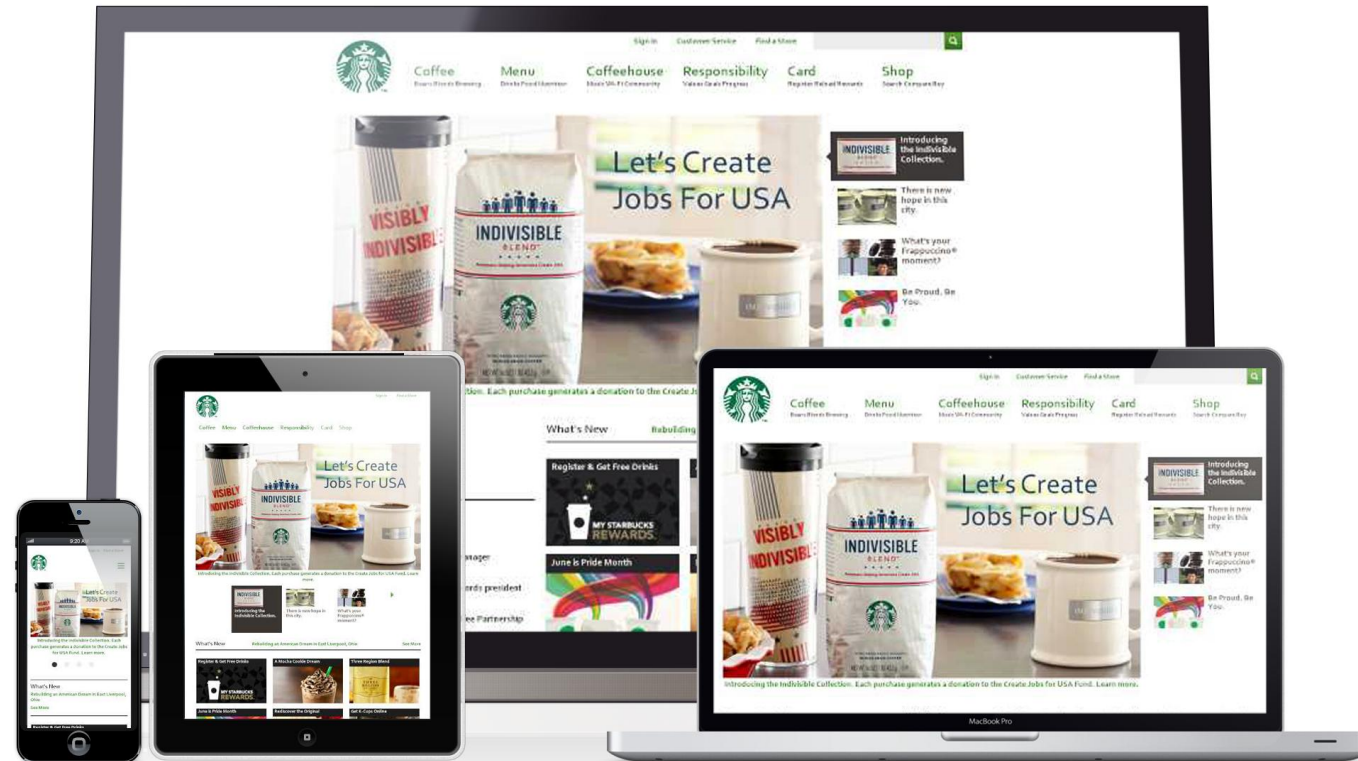4 Summary

Introduction

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It's not just a different sized-screen…

Deliver convenience with the right content at the right time

Appropriate experience across each touchpoint

Out of the Box Mobile Apps

Gets you started quickly, but still need to consider ...

- Backend version compatibility
- Comply with backend customizations
- Extend to enhance mobile context
  - Additional enterprise data sources
  - Public cloud data source
  - Device capabilities
- Secure mobile apps
  - Single sign on
  - Enterprise App Store
- Keep up with YOUR changing business timelines and requirements
- Multiple apps

CHANGING BUSINESS NEEDS?

BACKEND COMPATIBILITY?

ENHANCEMENTS?

SECURE?

COMPLIANCE?

DEVICE CAPABILITIES?

Enterprise Mobility Challenges

93% Concerned with **data loss** and other mobile breaches

- 113 phones stolen/min in US
- Malware rose by 197%

Source: CIO Survey 2014, Insight Crime 2014

2/3 **Time spent** on integration

- Multiple point solutions

Source: Triangle Research Survey 2014

78% Have no **mobile analytics** instrumented in their applications

Source: Information Week 2011

87% **Updating or releasing** mobile apps every 6 months or less

Source: Mobile Business Statistics, CSO Online 2014

Enterprise Mobility Challenges

Current On-premise Platforms

Mobile Enterprise Application Platform (MEAP)
Mobile Application Development Platform (MADP)

- Expensive, priced per seat

- Client development tightly coupled with backend infrastructure

- Backend infrastructure silo'd for mobile use cases

- Mobile apps deployed as front end to mobile backend apps

- Mobile developer not a 1st class citizen

- Security & Analytics are an afterthought

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MBaaS vs MEAP/MADP

- MBaaS is an evolution of existing on-premise mobile development platforms
  - Use connectors to talk to traditional enterprise applications (e.g. ERP)

- Similar to MEAP
  - Uses middleware to allow developers to link to backend systems without extensive coding

- Different from MEAP
  - Middleware backend service runs in the cloud (rather than deployed in-house)
  - Client side development decoupled from the backend
    - Mobile developers can use their preferred client dev tools
    - SDK is provided for the client side to connect to the backend

The Future of Mobile Apps and Development*

- **Key Findings**
  - Future apps will be built using many technologies and will operate in concert with other apps across many types of devices. New tools and skills will be required to address both the demand for, and the technical requirements of, these distributed apps.
  - Putting in place a predictable, secure mobile app integration platform offering flexible, rapid delivery of APIs will form a vital foundation for mobile enterprise app development. These APIs allow mobile apps to capture digital business moments.
  - Apps will become increasingly contextual, not just responding to the user's activities and profile, but dynamically adapting to services offered by the environment.
  - Mobile app developers are addressing the continual, rapid evolution of mobile platforms by systematically replacing code, preventing lock-in to particular versions.

- **Recommendations**
  - Construct a flexible, API-based framework for mobile app integration and embrace alternative app development approaches, such as codeless tools, to maximize agility and increase app delivery capabilities.
  - Build out contextual service catalogs with automated discovery support to accelerate app creation to exploit business moments.
  - Adopt a bimodal approach to unite IT teams and combine agility with stability to address digital opportunities.
  - Use continuous refactoring to avoid the creation of new legacy systems.

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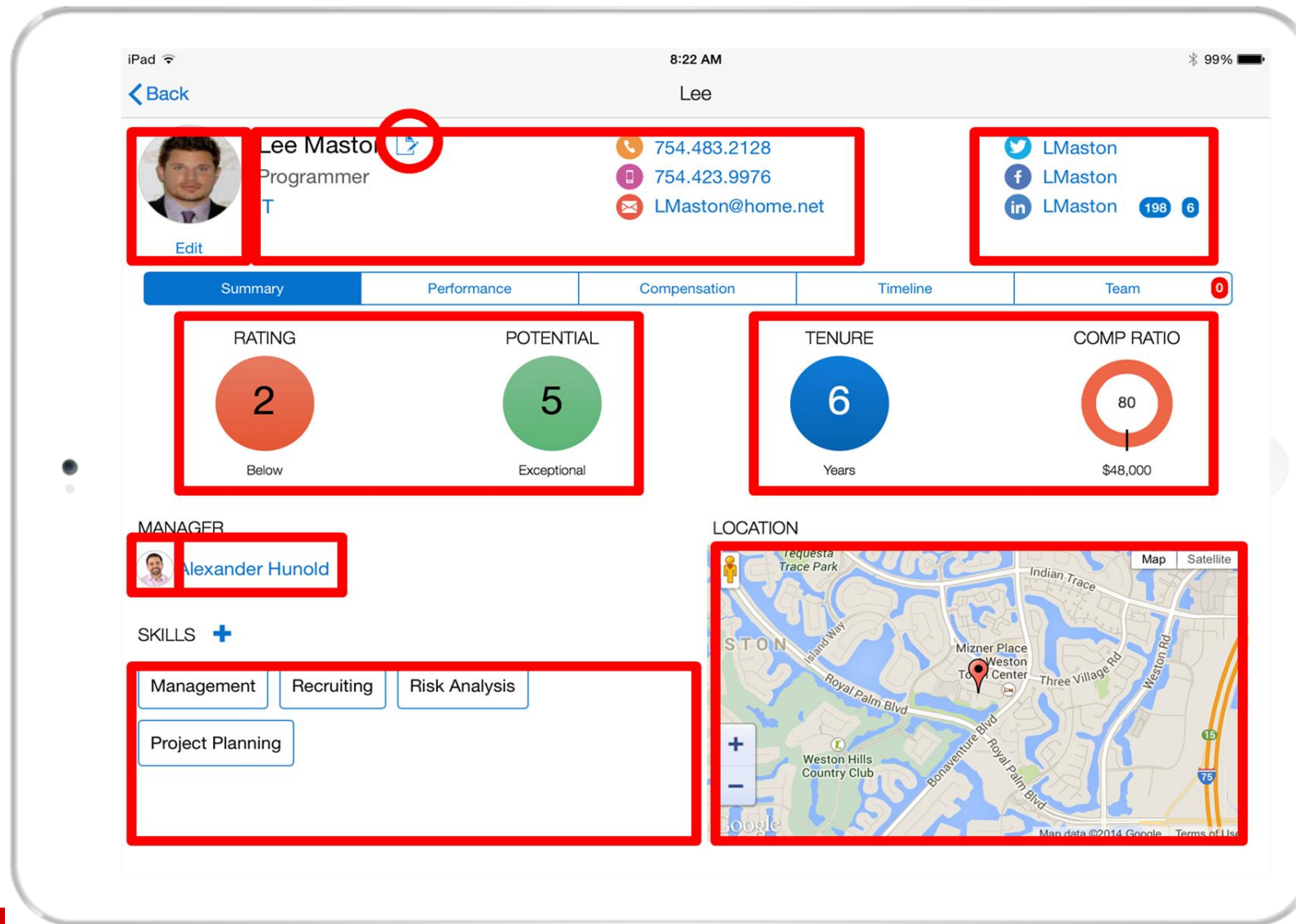
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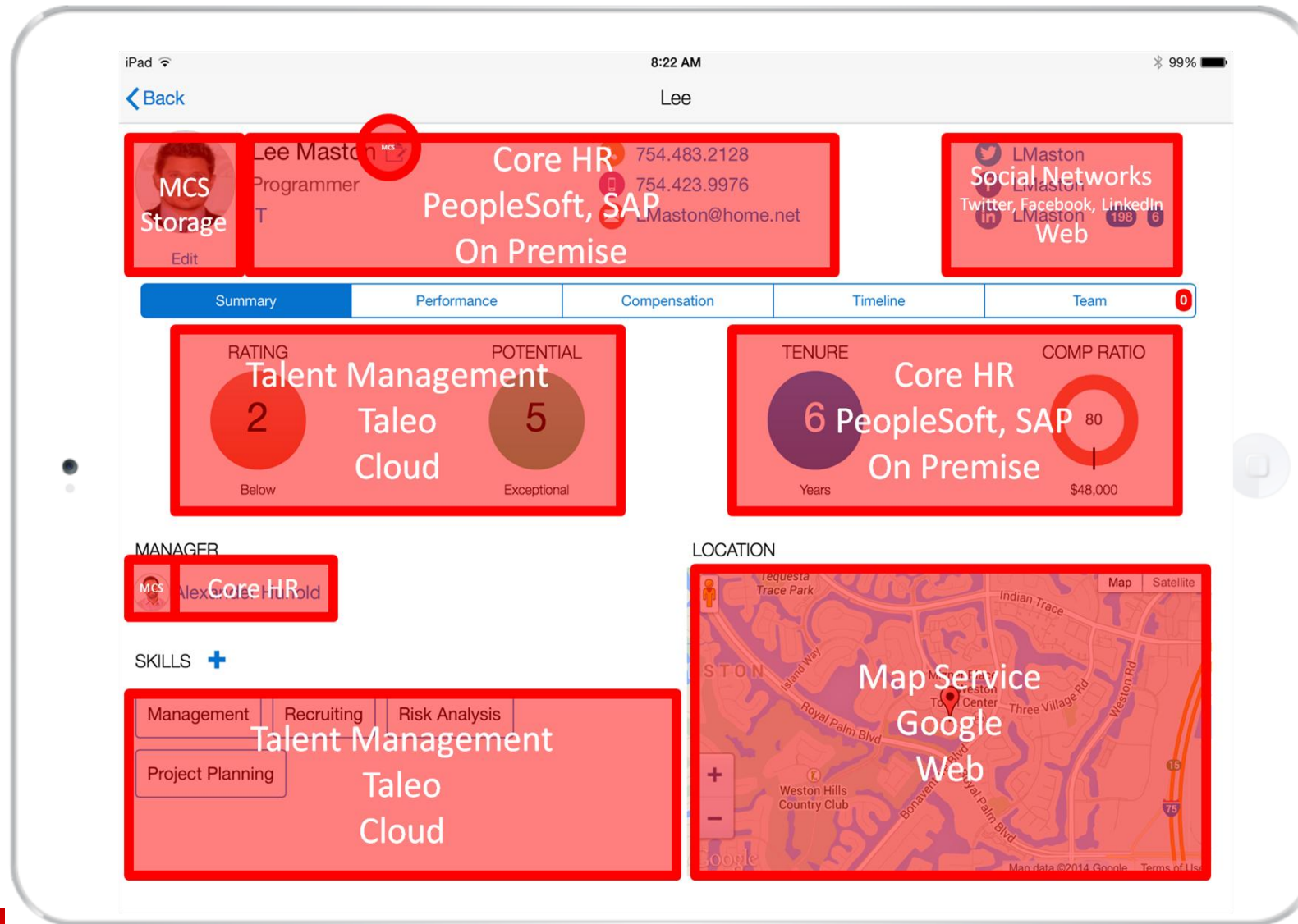
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Let's look at a fairly simple HR Mobile app
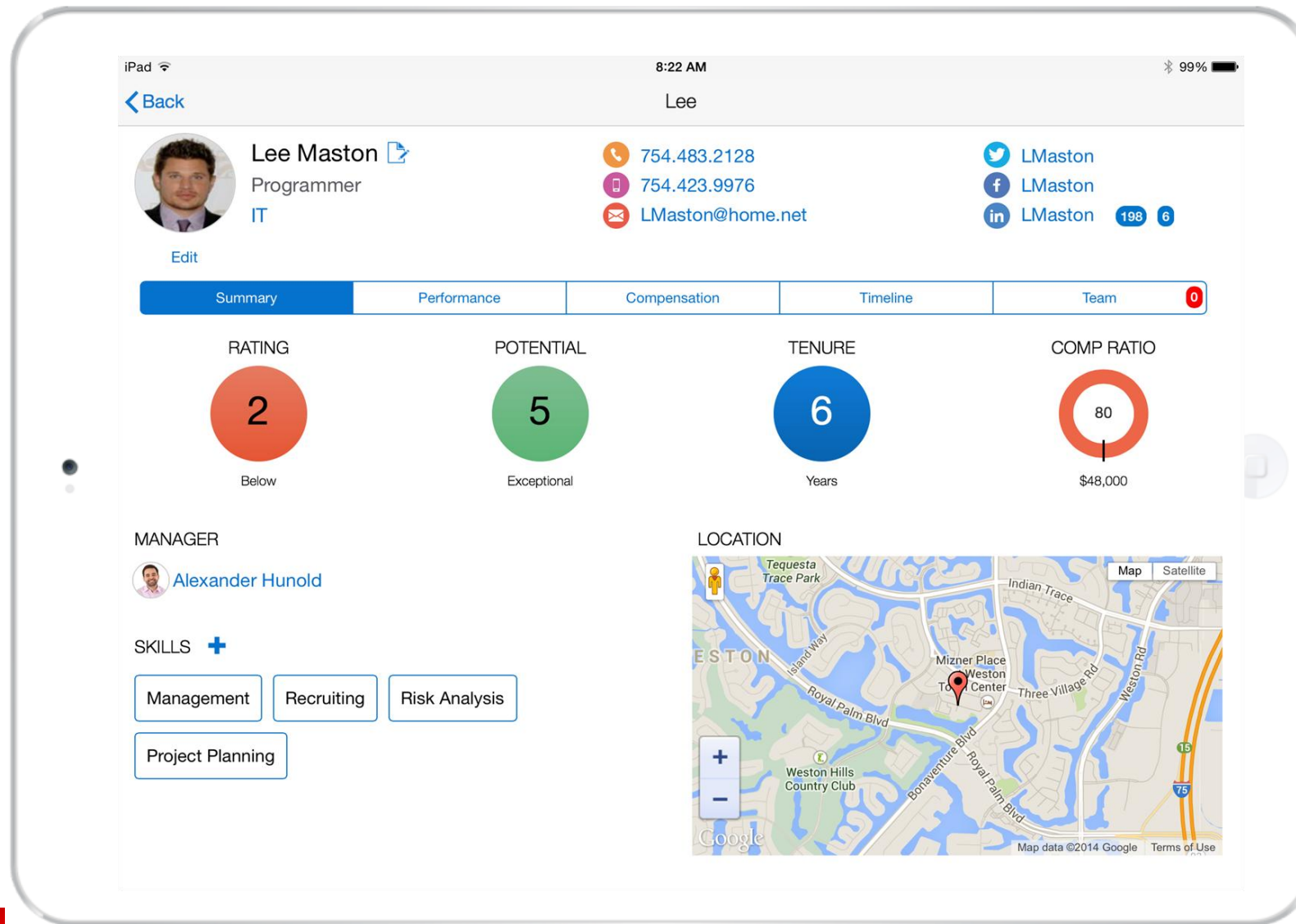
Decompose it into constituent parts

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And map it to the systems of record
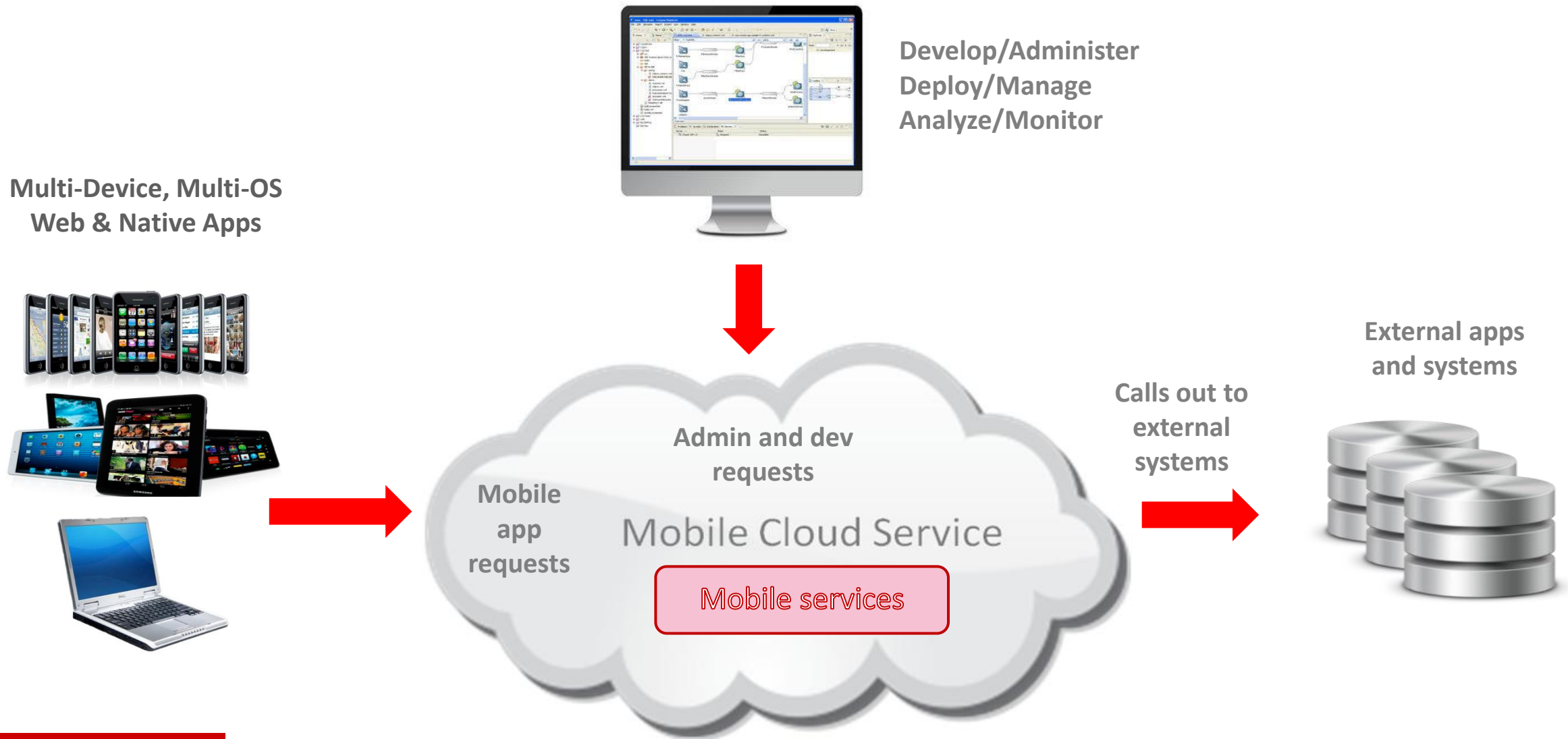
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This simple app soon became complicated to develop...

Client Dev Tools

Monitor & Analyze

Mobile Services

Integration

Security

Multiple Environments

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Setting the Stage

2

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What does the Platform look like?

Develop/Administer
Deploy/Manage
Analyze/Monitor

Multi-Device, Multi-OS
Web & Native Apps

External apps
and systems

Calls out to
external
systems

Admin and dev
requests

Mobile
app
requests

Mobile Cloud Service

Mobile services

Enterprise Mobile Platform Personas

Mobile Developer

"I create the mobile applications that call backend services"

Mobile Developer

Service & Java Developers

Service Developers

"I create the backend services that mobile applications call"

Mobile Program Manager

"I am responsible for the success of our mobilization strategy"
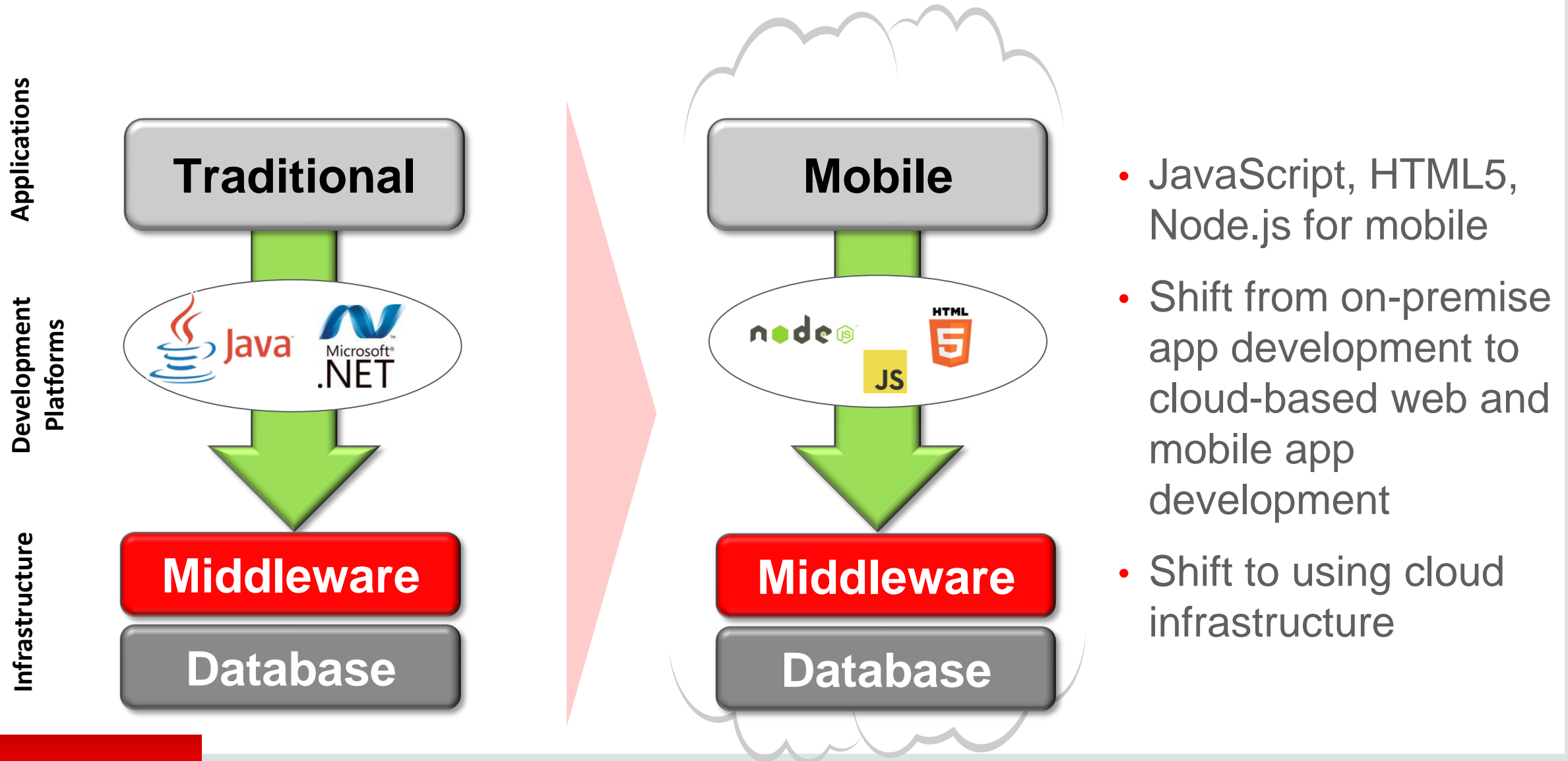
Mobile Program Manager

Enterprise Architect

Enterprise Architect

"I make sure we have a secure, scalable mobile solution"

.

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Application Development Platform Shift

- JavaScript, HTML5, Node.js for mobile

- Shift from on-premise app development to cloud-based web and mobile app development

- Shift to using cloud infrastructure

App Profiles

Business-to-consumer vs. Business-to-employee

B2C
Apps for the average Jane

- Masses of untrusted clients
- Little or no control over the device
  - Client-owned device(s)
  - Varied software versions and capabilities
- May or may not have a user profile
  - Self-registration

B2E
Apps for a limited "somewhat" trusted group

- Limited number of clients
- BYOD, or company-supplied
  - Can limit software versions
  - Can impose MAM or MDM solutions
- Full user profile in corporate IdM

Development To Production

Multiple Environments

- Different environments for different purposes

  - Development, Testing, Staging, Production

- Each environment separately managed

- Each has environment-specific resources

  - Data sources, users, permissions, etc.

  - Custom code deployments (testing, helper APIs, etc.)

- Want a way to move all assets from Dev -> Test -> Stage -> Prod

API Management

Controlling Access to Data Assets

- Define a set of REST-based APIs
  - RAML, RSDL, RADL, etc.

- Attach implementations to each API

- Specify authentication mechanisms, security policies, roles

- API catalog allows clients to browse available APIs

- At invocation-time the management layer hosts a runtime in which the implementation executes

- Measure and monitor application access

MBaaS: The Next Step

MBaaS = API Management ++

- API Management just the first step
  - Multi-channel access, but with full mobile support

- Set of core services available for all implementations
  - Includes functionality specially suited for mobile devices

- Build and plug in additional services for other types of access
  - Connect to external data and systems

- Sophisticated analytics
  - Mobile-driven events in addition to server-side recordings

The Platform

3

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Big Picture

Google

**Develop/Administer
Deploy/Manage
Analyze/Monitor**

APNS

Push
Notifications

GCM

Analytics

ALM

CLOUD
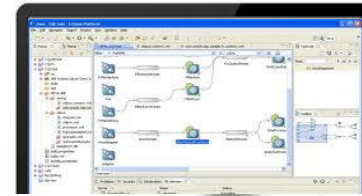
Geo-location

External apps
and systems

ON-PREMISE
PACKAGED
APPLICATIONS

MAM/
MDM

Mobil
app
reques

User
Management

**Multi-Device, Multi-OS
Web & Native Apps**

CUSTOM APPLICATIONS

PSR

Custom Code

Connectors

Flexibility to Access Any Data, Anywhere

- Configurable resources that can connect to
  - Other Cloud-based services
  - On-premise ERP and other systems
  - Any system exposed to invocation
  - Legacy systems
- Where all the real Enterprise data is stored
- REST, SOAP and other types of protocol connectors
- Typically stateless connections
  - Makes session model a little more difficult
- Configurable
  - Can set credentials and headers to be used when calling out to a connector

Push Notifications

Mass Device Messaging

- Integrated with multiple native platforms
  - Apple via APNS
  - Google via GCM
  - Others as required
- Push to a group of devices based on criteria
  - All devices registered with a given application
  - Role-based notification
  - All devices of a given type
- Still problems with vendor support and consistency
  - No QoS standards
  - No standard activity timeout or device TTL standards, etc.

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Analytics

Finding Stuff Out

- Analytics events generated from:
  - Client side device
  - Custom code
  - Platform itself
- Event Context
  - Device type, location, time-of-day, etc.
- Application usage
  - Client profiles
- System behavior
  - Performance, failures, etc.

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Advanced Mobile Analytics

Target	Analytics Data	Business Impact

Developer Analytics (Monitoring & Debugging)

Mobile Developer　　**Service & Java Developers**

- Transaction failures
- Slow Apps
- App Crashes
- Network Services Error
- API performance
- Security performance
- Geo - location

Company with $1B in annual mobile revenue e.g. Starbucks, Domino's Pizza
- 97% uptime = $2.5M loss / month
- 99% uptime = $0.8M loss / month
- 99.9% uptime = $82K loss / month

Advanced Business Analytics

Lines of Business

- Marketing
- Sales
- Service
- Delivery
- Factory Floor

- Sessions
- Events
- Funnels
- Retention
- Segments
- Attribution
- In-App Messaging
- Life time value tracking
- A/B Testing

Retail Co.: Engaging with users lead to over 20MM downloads = $13B in gross sales via mobile devices

Media Co: Grew digital subscription 50% in 12 months. Segmentation helped with creating profiles to increase reach to 1.3 million people per month

User Management

Declarative and Programmatic API Security

- Create and manage mobile users and roles in the system
- Declarative:
  - Set role-based access control on APIs
  - API management layer authenticates and authorizes each API call
- Programmatic:
  - Custom code can invoke UM service to obtain the roles of the caller
  - Can programmatically authorize users for specific operations
- Also supports the notions of Self-registration and anonymous access

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Object Storage

Unstructured Store

- For apps that just want to store object data
  - Generally just blobs
  - Key-value with natural or generated keys
  - Namespaces, location, or granularity attributes
- May also have JSON capabilities
  - JSON object read/write operations
  - Lookups, basic searching
- Objects stored in containers or collections
  - May set individual container isolation level
    - User, Application, Shared

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Relational Store

Traditional Database Capabilities

- DB service:
  - Scaled down version for the mobile platform
  - Other external service offered by the vendor
- Tenant control to create/manage the schema
- Limit client access
  - Prevent mobile apps/devices from operating on it directly
  - Only accessible via tenant business logic (custom code)

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Custom Code

Filling in the Business Logic

- Can invoke any of the built-in core services
  - Custom code just another core service – chained invocations
- Data input/output and transformations
  - Invoke storage services to read/write data within the platform
  - Use data connectors to read/write from/to the outside world
- May support one or more languages or environments
  - Special purpose mini-PaaS
  - Likely have fettered access to the provided environment
  - Will NOT have access to the execution infrastructure environment

Geo-location

Using Location Context

- APIs to indicate current location of a device

- Locality improves relevance in virtually any domain

- Make use of location as a domain–specific search filter

  - Only return results that apply to that zone

  - Use direction APIs and other geo-spatial features to extend to the neighborhood

- Mix with other contextual APIs for even more power/relevance

  - Ex. Add temporality to know where the nearest open bar is

Data Sync Service

Offline Access to Data

- Maintain a data cache on the device
  - Can be offline, or have roaming disabled
  - Improved performance
- Asynchronous pulls
  - Updates when back online
  - Calls batched back to the platform service
- Data should be markable as being device-cacheable

Client SDK

Client-side Library

- Optional separate download

- Native to the device platform

- Used by App developers who want additional client-side app support
  - Required if certain client-side services are used (e.g. sync service)

- Facilitates easier calling to mobile platform services

- Part of development tool set for rapid prototyping

- Integrate and package with client application

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Security

Secure At Every Turn

- Authentication using current protocols like OAuth 2
  - Token-based auth with token expiration
  - Login using 3rd party resource providers
- SSL for all device-to-platform transport
- Role-based API security
- Propagation of tokens to connectors
- Key and certificate management
- Tenant developers identity management

Admin Console

Develop, Monitor, Manage

- Central location where the platform engine can be monitored and managed

- Administrator and developer functions

  - Core services configuration

  - User management

  - Administrator-based notifications

- API Catalog

- Manage application assets

Summary

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Enterprise Mobile Landscape

MBaaS and API Management Vendors
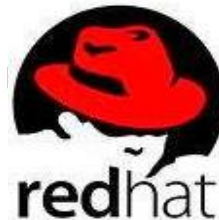
API Management

Mobile Backend as a Service

Summary

The future is still mobile

- Mobile devices are not only ubiquitous, both in the workplace and in the masses, but are diversifying

- Enterprises must "mobilize" their apps or be left behind

- Can't approach enterprise mobile apps in the same way as traditional web apps

- API management is a start for multi-channel apps, but isn't enough

- Enterprise applications need enterprise-grade MBaaS

- Analysts, developers, (and even managers!) agree that MBaaS will very soon be the platform underlying all enterprise mobile app development

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Vielen Dank!

Jason Haley

Oracle Canada: jason.haley@oracle.com