ORACLE
FUSION MIDDLEWARE

Oracle White Paper

Simplify Enterprise Mobility with the Oracle Mobile Platform

ORACLE

Disclaimer

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

Introduction: The New Normal 1
Escalating Usage Prompts Immediate Action 3
Facing Today's Mobile Challenges 3
Oracle's Comprehensive Mobile Solution 4
- Oracle Mobile Apps 5
- Oracle Mobile Platform 5
- Oracle Mobile Security 5

Oracle Mobile Platform: Any App, Any Device, Any Data—Secure 6
- Develop: Mobile Application Framework 6
- Integrate: Mobile Service Integration 7
- Secure: Mobile Identity and Access Management 8
- Deploy and Manage: Enterprise Scalability 8

Leverage Your Investments, Innovate for the Future 10
Conclusion: The Next Frontier 10

Introduction: The New Normal

For many years corporate IT departments looked to the desktop as the only way to present information from their corporate enterprise applications. But with the advent of mobile computing, applications are no longer tied to the desktop and end users expect to be able to switch between desktop, tablet or smartphone anytime, anywhere. This multi channel environment has become the new normal.

Of course, different constituencies have different reasons and perspectives on mobile computing. For example, line-of-business users want to be able to extend their enterprise applications to mobile devices and be productive anywhere, anytime. Keeping the workforce connected empowers everyone to make decisions, take action, and stay informed. IT developers and architects want to be able to extend their current skill sets and tools to embrace mobile paradigms, develop new types of mobile apps, and spearhead strategic, innovative endeavors for the enterprise.

In many cases the drive towards mobility is driven from within the organization, as innovative users and line of business managers accelerate the need for a mobile strategy. Responding to pressure from the user community to get new mobile applications up and running quickly, many IT shops have turned to device-specific development frameworks simply to satisfy urgent needs without considering the impact and cost of integration, security, ongoing maintenance and support. Each type of device has a unique method of application development and deployment as well as different ways of accessing, securing and presenting information.

These conflicting demands have led to growing disparity and confusion within the data center since the IT department has to develop and maintain multiple sets of mobile applications to support each user base and device type. The enterprise can't tolerate this disparity for long. As demand continues to rise for mobile access to corporate data and services, IT pros need to implement better strategies to meet these requests both short term and over time. It is too complicated to support many different applications across several mobile platforms—plus build separate interfaces for all of the associated desktop applications.

As mobile devices have become a preferred channel for how people share information and access applications, corporate IT shops find themselves in a quandary. Rather than continuing to develop applications first for the desktop and then making tactical mobile development choices, IT leaders want a consistent architecture that considers all channels—Web, mobile, and otherwise—a true multi-channel development platform. The enterprise wants to leverage multiple channels and many types of devices, 24/7. IT needs to expose their enterprise data and applications in a secure and standard way

regardless of the user interface that people choose to surface those applications. Achieving this goal requires a unified platform for building and accessing corporate applications. This unification has been difficult, partly due to the rapid growth of the mobile device industry and the expectations of business users, employees, customers and partners.

IT and Business need to work together to define the right mobile strategy. Mobile is now core to the enterprise and only the right blend of business, marketing, design, and technology expertise will enable the enterprise to succeed with business-to-employee and business-to-consumer mobile solutions.

How do you devise a mobile strategy that allows you to "build once and deploy everywhere" across both desktop and mobile devices? How do you innovate quickly and also build, maintain and support those custom applications that your enterprise needs today and tomorrow?

This paper describes a strategy for achieving these goals using the Oracle Mobile Platform, a unique enterprise mobility platform that complements and extends other products within the Oracle Fusion Middleware family. Business and IT organizations rely on this platform to:

- Leverage industry leading and enterprise-grade Oracle Fusion Middleware capabilities across enterprise and mobile applications
- Extend Oracle's enterprise applications to every line of business that requires access—anywhere on any device
- Engage IT leaders and developers with best-in-class mobile technologies such as framework, integration, and security
- Empower everyone with intuitive access to mobile business functionality

Escalating Usage Prompts Immediate Action

One thing is sure: doing nothing is no longer an option. Smartphone and tablet sales continue to accelerate. By 2015, there will be 7.4 billion wireless devices in the market and 1.2 billion smartphones will enter the market over the next five years, according to ABI Research.[1] Mobile computers are spreading faster than any other consumer technology in history. Smartphones outsell PCs. Touchscreens outnumber keyboards.[2]

Mobile phones are already well on their way to replacing cameras, cash, maps, remote controls, handheld gaming systems, boarding passes, tickets, cash registers, calculators, notepads, and much more. Mobile will especially play a leading role engaging consumers in emerging markets. According to Forrester Research, 75 percent of all new phones are being sold in Asia and Africa.[3]

Clearly, it is time for enterprises to act—and act decisively! Recent research from Forbes reveals that:

- 90% of CIO expect to deploy more than 25 mobile apps in 2014
- Mobile app development projects will outnumber native PC projects by a ratio of 4-to-1 by 2015
- The market for cloud-based mobile apps is expected to grow by 88% from 2009 to 2014

IT has an opportunity to work with line-of-business leaders to establish enterprise, cross-channel mobile strategies.

Facing Today's Mobile Challenges

The move to mobility is inevitable and the challenges faced by IT are significant. In a recent survey, the top three mobility challenges cited by CIOs were:

- Securing corporate information (41%)
- Integrating with other systems (31%)
- Supporting multiple devices (28%)

And while enterprises used to be more concerned about how they were going to develop their apps, today's CIOs are realizing that enterprise mobility is expensive. According to a recent McKinsey report it, up to $250 is spent annually per device for connectivity infrastructure and support.

1 *Forbes*, "The Latest Infographics: Mobile Business Statistics For 2012" (May 2, 2012)
2 *MIT Technology Review*, "Mobile Computing Is Just Getting Started," (March 1, 2013)
3 http://venturebeat.com/2013/02/14/forresters-top-10-trends-for-mobile-in-2013/

In the remainder of this paper, we will consider the essential aspects of a truly cross-channel mobile platform, and explain how Oracle Mobile Platform is helping to simplify enterprise mobility throughout the following stages of the lifecycle: develop, integrate, secure, deploy, manage.

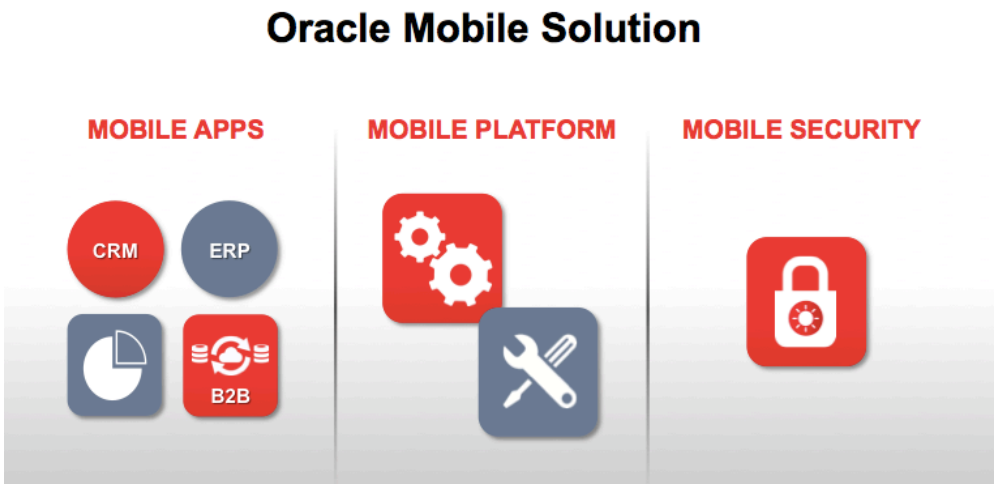
As you read, ask yourself these questions:

- How do I build an architecture that decouples end-user access from the systems that we have in place?
- Is there a development platform that lets us build a set of applications that can be deployed across multiple channels, both desktop and mobile?
- How do you establish mobile apps that can not only push and pull information, but also notify users and convey status updates based on real-time events?
- How do you reduce the burden of a growing volume of transactions on your back end systems?
- As the transaction volume rises, how do you service the requests with attention to performance, scale, and availability?
- When it comes to building, connecting and securing mobile apps, are there different considerations for business-to-consumer versus business-to-business or business-to-enterprise applications?
- Where are the primary costs? Are they mainly associated with developing mobile apps or with integrating, securing, deploying and managing those apps?

Let's explore how Oracle Mobile Platform simplifies enterprise mobility at each phase of the lifecycle.

Oracle's Comprehensive Mobile Solution

Oracle's mobile solution is a complete offering that includes out-of-the-box mobile apps, a mobile platform that you can use to develop, connect, and secure your own mobile apps, and mobile security that is integrated with the Oracle Mobile Platform and can also be leveraged separately as part of your overall enterprise security architecture.



Oracle Mobile Apps

Oracle offers dozens of pre-built mobile apps across all of its product lines including Oracle E-Business Suite, PeopleSoft, Siebel, JD Edwards, as well as the other applications across Oracle's portfolio. In addition, Oracle Fusion Tap provides secure mobile access to Oracle Cloud Applications including Human Capital Management, Talent Management, Customer Service & Support, and Project Portfolio Management, empowering business users to connect, analyze, and work when and how they want, on the devices of their choosing. This portfolio of mobile apps continues to grow as Oracle and its partners continue to develop new apps. Thanks to the unique capabilities of the Oracle Mobile Platform, these applications can be developed in weeks, which means the list of possibilities is growing all the time.

Oracle Mobile Platform

Oracle Mobile Platform provides a common technology framework for building, integrating, securing, deploying and managing mobile apps on any device. It supports a multi-channel, multi-device framework that allows you to build apps once and deploy them to iOS, Android and other platforms—with web, native and hybrid delivery. The remainder of this paper will focus on the Oracle Mobile Platform but before we continue, let's highlight the third component our Oracle's Mobile offering – Mobile Security.

Oracle Mobile Security

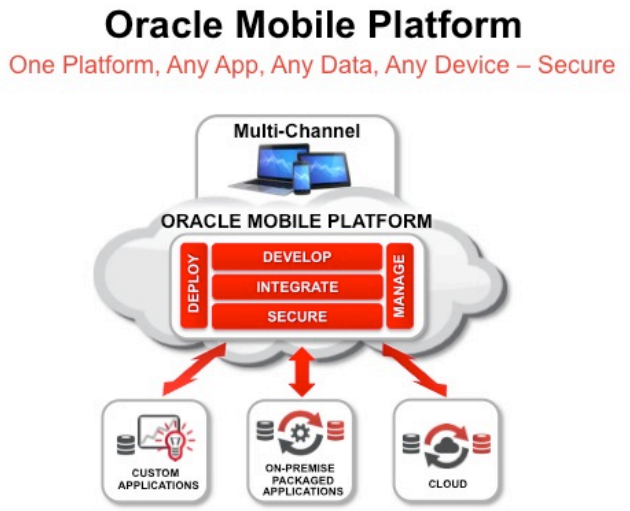
More and more people are using their personal mobile devices to connect to corporate networks. This "bring your own device" (BYOD) phenomenon is poised to increase. According to a recent article published in *Forbes*, 65 percent of companies allow personal devices to connect to the corporate network and 78 percent say that there are more than twice as many personal devices connecting to corporate networks now than there were two years ago.[4] These sobering statistics necessitate a security strategy that can allow employees to use their phones and tablets for personal tasks while protecting access to corporate applications and data.

Instead of developing or using a new mobile security architecture, astute organizations see the value in using the same enterprise-grade security solution that they currently use to protect their enterprise applications. Recognizing its importance and acknowledging that organizations may have different approaches to managing enterprise security, Oracle incorporates security both within the Oracle Mobile Platform and allows enterprises to leverage Mobile Security separately as part of their enterprise security architecture. Oracle's focus is on managing and securing access to enterprise applications while not interfering with how people use their personal devices for other purposes, such as playing games or sharing photos.

[4] *Forbes*, "The Latest Infographics: Mobile Business Statistics For 2012," (May 2, 2012).

Oracle Mobile Platform: Any App, Any Device, Any Data—Secure

Oracle Mobile Platform leverages Oracle Fusion Middleware infrastructure to expose enterprise applications and data as web services and restful API's that allow easy integration between mobile apps and back-end systems. This means that the same platform that you use to develop and maintain your enterprise applications can now be extended to develop, integrate, secure, deploy, and manage your mobile applications.



This platform provides a robust, high performance and highly scalable architecture that can run both web and mobile apps, meeting the 24/7 requirements of mobile access with consistent management throughout the application lifecycle. Apps created with Oracle Mobile Platform integrate easily with each other as well as with third party applications based on Java and other industry-standard languages and protocols. This platform also protects API's to uphold corporate security and compliance policies, with comprehensive capabilities for mobile identity management and mobile application management.

Develop: Mobile Application Framework

Oracle's Mobile Application Framework is a commercial Java and HTML5-based environment for building and extending enterprise-applications. Based on a hybrid mobile architecture, HTML5 provides common, cross-platform interfaces. Java, the world's most popular programming language, is used to develop the application logic. Applications are installed on-device, and offer access to native device services such as the camera, contacts, SMS and GPS. Offline application use is supported with the added persistence and security of encryption in a SQLite database. Overall, the architecture is designed for security and protection of enterprise investments from future technology shifts.

Leveraging Java and HTML5, the architecture's design enables developers to easily build and extend enterprise applications for iOS and Android platforms from a single code base. Developers do not

need to learn a new platform-specific language. They can build mobile apps once and deploy them to multiple operating systems with support for various form factors such as smartphones and tablets. Oracle takes care of monitoring and supporting the latest operating system releases. Given the popularity and flexibility of Java and HTML5, this architecture empowers enterprises to leverage their existing developer skill sets. Anyone with Java skills can readily build mobile applications.

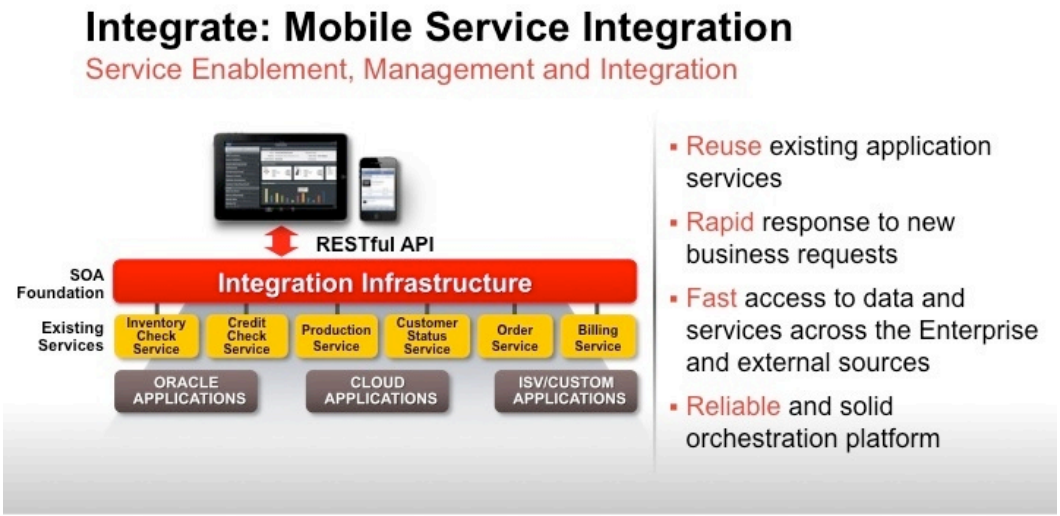
The Oracle Mobile Platform works with popular native, open-source and third party frameworks, just as it works with Oracle Mobile Application Framework, providing for a very open and flexible architecture.

Integrate: Mobile Service Integration

Integration is one of the leading challenges of mobile application development. Many Oracle customers have already addressed this challenge through their use of Oracle Fusion Middleware and service-oriented architecture (SOA).

Ideally mobile integration should be an extension of the SOA integration methods that you already have in place. The Oracle Mobile Platform utilizes standard technologies and tools to expose many data formats for exchange with any mobile application. Oracle supports all types of connections between applications on mobile devices and back end business systems. This means mobile applications don't have to be self-contained and data doesn't have to be stored on the device—perfect for popular "access and look-up" scenarios.

Mobile applications communicate with back-end applications through standard Web services. Oracle SOA and Oracle Service Bus allow enterprises to easily expose enterprise applications and data as virtual services and enable Web services and RESTful API connections with them. This allows developers to leverage their existing application and integration infrastructure as part of a highly reusable and scalable development and integration platform.



There are two primary ways to develop an enterprise mobile strategy with SOA:

- **Mobile Service Enablement:** Control end-to-end experience of mobile application from back-office to mobile front-end
- **API Management:** Expose IT assets as APIs to external mobile application developers

Oracle SOA Suite has offerings for Mobile Service Enablement and API management that address both strategies. An integral part of Oracle Mobile Platform, Oracle SOA Suite can address a myriad of mobile integration challenges, whether your apps reside on premises or in the cloud. Oracle's mobile service integration capabilities include complete lifecycle management services such as definition, creation, security, monitoring, and management. Developers can create RESTful services and expose them to an ecosystem of other developers to simplify the process of creating customizable applications from reusable components.

Secure: Mobile Identity and Access Management

Oracle Mobile Platform offers mobile and social single-sign-on so that you can easily connect your applications to existing access-management services. You can set policies governing how to access enterprise services from mobile devices. System administrators can trace each device and examine usage patterns to detect suspicious behavior. They can also establish single-sign-on across multiple applications from a single mobile client.

Oracle Access Management includes mobile access capabilities with support for REST APIs and OAuth. Oracle API Gateway acts as a control point for managing how internal users and applications are exposed to third-party cloud offerings while reducing security risks. You can leverage your existing Identity and Access Management investments by extending authentication, authorization and risk policies to mobile, cloud and enterprise applications—all without changing the backend applications.

Oracle API Gateway allows you to implement and enforce various security policies to protect application access through APIs. These include monitory, thread prevention, client throttling and other enforcement and management mechanisms. The gateway also integrates with Oracle Access Management to ensure corporate access policies are applied for each API, with consistent provisioning based on roles and other identity management constraints. Oracle Mobile Platform enforces a consistent security strategy across the database, business logic, and user interface layers, including authentication, access control, and encryption.

Deploy and Manage: Enterprise Scalability

Today's front-end services must be architected to handle an immense amount of traffic. Previously, when people used desktop computers for these tasks, they didn't access the sites nearly as frequently. Now that people always have these tiny computers in their pockets, they tend to check on a status, request an update, and run reports much more often.

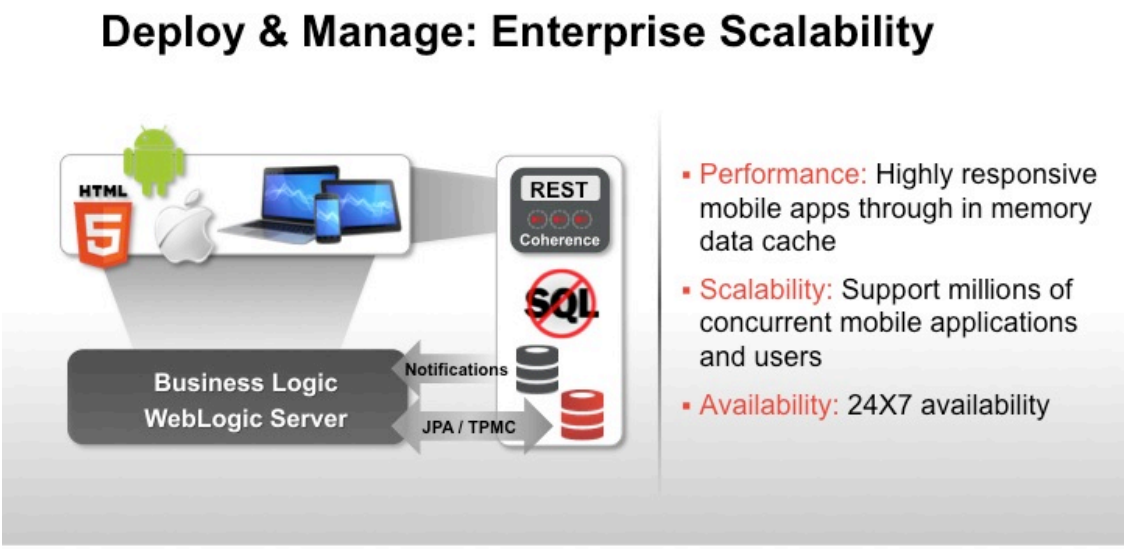
For example, in the travel industry, for every actual booking there are hundreds of sessions where people merely consider potential routes, costs, and possibilities. Many more people are interacting digitally with the airline yet only a fraction of those sessions result in a booking and subsequent

revenue. The volume of traffic is going up dramatically while the value of each transaction is going down. Thus there is also a pressing need to reduce the cost of each transaction, especially for read-only sessions.

As with any public-facing information system, performance, concurrency, and availability are essential. Corporations must be able to service lots of requests for information but only a few of them deliver revenue.

Employees want similar access to their enterprise applications from their mobile devices—which is increasingly becoming their "pocket enterprise." Consistent with customer-facing mobile applications, enterprise mobile users are also concerned with how well the site performs. They expect to have a productive and satisfying experience. That means companies need information systems that can service at scale and handle larger workloads for a smaller price point. Cost per transaction must go down or the IT costs will go up.

This phenomenon began with the Web but the proliferation of mobile applications is exaggerating the problem. You need an application server and load-balancing environment that can scale to meet these requirements. As part of the Oracle Mobile Platform, Oracle provides a framework for constructing mobile applications and business logic based on Oracle's robust WebLogic application server and Cloud Application Foundation. This proven runtime foundation ensures enterprise caliber reliability, availability, scalability, security, user management, performance, and virtualization, making it ideal for scaling both Web and mobile applications.



Oracle provides a versatile middleware foundation for running applications on conventional infrastructure, cloud-computing infrastructure, and engineered systems. Since mobile apps can be run from any device—anywhere and anytime—Oracle provides a robust server-side platform for running these applications. Oracle WebLogic Server is proven to support the high and unpredictable volume of

mobile clients. WebLogic Server provides support for open standards such as WebSocket, HTML5, and JSON. With the Oracle Mobile Platform, developers can develop once and deploy to many devices and channels ensuring the same degree of performance, scalability, and availability from their mobile apps as they expect from their enterprise applications.

Leverage Your Investments, Innovate for the Future

How do you simplify your mobile application architecture? How do you remove the need to code for unique devices and platforms? How do you use your existing architecture and skill sets? How do you leverage your current IT investments and empower the business with an enterprise mobility platform that is robust enough for today's enterprise demands and flexible enough to lead you into the future?

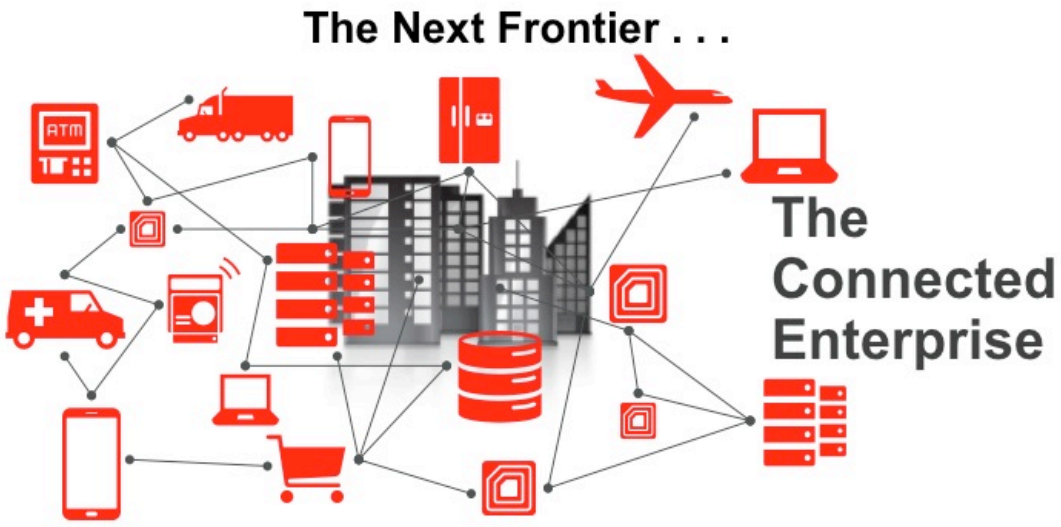
As we have seen, accommodating mobile devices is not just about providing the right client interface and user experience. It's about having a comprehensive architecture that complements and extends your current infrastructure, applications, and skill sets. Oracle Mobile Platform delivers:

- One enterprise platform that is open, integrated and secure
- Innovations on top of existing IT architectures
- Support for existing developer and IT skills
- Out-of-the-box Oracle Mobile Apps built on Oracle Fusion Middleware
- Consistent security and governance for mobile and enterprise apps

Mobile is another important channel to which you will surface information and functionality, an evolution of the carefully wrought information systems, data center infrastructure, and IT practices that you already have in place. Make sure you address these fundamental IT needs as part of your mobile strategy. If you have been utilizing services and decoupling providers from users, then you are already on the right path. Start by focusing on the data, not the client. Then put together a platform that allows you to scale up and down based on your business needs.

Conclusion: The Next Frontier

The next frontier for enterprise computing will see the convergence of the Internet of Things with mobile computing to create the Connected Enterprise. Being able to leverage mobile technology and make it meaningful by finding significant links to multiple, varied sources of data (for example linking biometric values with environmental factors, or calendar data with home control and monitoring) is what will lead to promising developments across industry segments. Oracle understands this trend and recognizes that the same mobile apps that are developed with Java-based tools are now integrated across all kinds of devices, from laptops to watches.



How do you thrive on this new frontier? Make sure that your short-term strategy for addressing mobility considers your long-term strategy for application development, deployment, integration, management and security. Oracle Mobile Platform, built on Oracle Fusion Middleware technology, will fully support your needs and requirements. It helps you tackle the performance, scalability, security and integration challenges of the mobile enterprise with a common development framework for all of your computing and data management needs.

For more information, visit: www.oracle.com/mobile

Simplify Enterprise Mobility with the Oracle Mobile Platform
Writer: David Baum
Contributing Author: Rimi Bewtra

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200

oracle.com/mobile

Oracle is committed to developing practices and products that help protect the environment

Copyright © 2014, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 1113

Hardware and Software, Engineered to Work Together