

Does Your Cloud Support A Mobile-First Strategy?

A Joyent White Paper

Executive Summary

Smart companies know that going mobile involves more than just having an app. You need a mobile-first strategy that capitalizes on the changes in how people work, interact, and communicate as a result of mobile computing. Companies trying to build next-generation mobile applications on yesterday's architecture and tools are setting themselves up for failure. Today's rapid crossover to mobile devices as the primary means for computing challenges every assumption about how applications and services should be designed and delivered.

To operate in this brave new mobile-first world, companies need cutting-edge speed, scalability, and performance. Are you ready? Read on to discover the architectural considerations that can put developers and service providers at the forefront of the global mobile economy.

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Introduction

Talking to a bank teller to get cash? Visiting a store for every purchase? Consulting a map for directions? That was our world before GPS, mobile phones, ATMs, and the Internet. These advances, though seemingly incremental, have fundamentally changed the way we communicate, gather information, and manage our daily lives.

Today, mobile devices are reweaving the fabric of our everyday personal and professional lives. Today, the average person carries more computing power in a pocket than the entire NASA team did when they first landed a man on the moon. What will happen when nearly every person on the planet has access to this power? A societal shift is occurring in developed countries – one that will only expand as mobile device usage become ubiquitous throughout the world.

At the same time, another transformation – cloud computing – is making it possible for businesses to “rent” vast amounts of computer capacity and software services on demand, paying for only what they use. The massive amounts of time and money saved, vs. those for traditional IT deployment, completely change the economic landscape, knocking down barriers that once kept smaller players from introducing new services or technologies.

But what makes cloud truly transformative is mobile: Any cloud-based service can now use any device to be connected anywhere at any time. Together, mobility and cloud computing will reshape how people communicate, conduct commerce, and engage with their environment. To support this emerging mobile-first society, companies must transform both their business models and their operations. The clock is ticking – and the winners will be developers and organizations that understand and embrace the new order.

The Impact of Widespread Smartphone Adoption

Today's technology scene can seem overheated. Apple is the most valuable company on earth. New apps reach tens of millions of users within weeks. Names like Research in Motion and Nokia are undone by rapid market changes. Underlying these developments is the unprecedented speed at which mobile device prices are dropping and adoption spreading; by 2016, smartphones and tablets will put PC-like power in the hands of more than a billion global consumers.¹ According to Google data, smartphones have reached mature adoption rates (above 50%) in six countries – Australia, Norway, UAE, UK, Saudi Arabia, and Sweden – with over 40% adoption in Denmark, Ireland, the Netherlands, New Zealand, Spain, Switzerland, and the US.² Smartphones are being adopted faster than any other technology in human history – including electricity, the telephone, radio, TV, computers, and the Internet.³ The result: an ultra-competitive market for mobile operating systems and devices.

And with smarter, faster devices come higher expectations. As more and more workers access applications via mobile device, traditional enterprise architectures struggle to keep up. Latency, downtime, and other performance issues are on the rise. In many cases, mobile consumers expect speed greater than what companies can provide. Employers, retailers – any company with a mobile interface – can no longer ignore these expectations. At a minimum, companies need to ensure that web pages and business systems are optimized for smartphones and tablets, or risk frustrating consumers, suppliers, and

¹ [Forrester](#)

² [Google Data](#)

³ [MIT Technology Review](#)

employees.⁴ Better yet, companies need the technology to execute on a strong, comprehensive mobile-first strategy.

The Impact of Cloud Computing Advances

Advancements in cloud computing have generated a whole new industry of cloud infrastructure providers. Traditionally, a company would buy hardware, install software, find somewhere to host it, and employ people to manage it. IT would have to provide enough hardware and software to cope with peak traffic levels, no matter how rare that peak. Case in point? The classic dilemma of online retailers facing massive Black Friday traffic. Cloud service providers, however, remove that limit, delivering communications, solutions, and applications from the cloud more quickly and inexpensively than ever before – at levels that can be adjusted on the fly. In fact, in a survey conducted by AFCOM⁵, 84% of current cloud users reported cutting application costs by moving to the cloud.

Cloud computing also allows developers to engage users in entirely new ways. Consider VOIP (voice over IP) on a phone, which allows for functions once available only via wireless cell connection or landline.

Six Reasons Mobile is Ripe for Monetization⁶

1. Rapid growth of mobile device ownership and usage
2. Opportunity for app and in-app monetization – 44% of apps are free and 56% paid (\$3.77 average cost)
3. Rapid growth of mobile commerce and payments
4. Large number of innovative developers

⁴ [Keynote Systems](#)

⁵ [AFCOM](#)

⁶ [Internet Trends, KPCB](#)

5. Broad base of sophisticated advertisers and marketers
6. Highly engaged consumer base

Implications for Application Developers

The simultaneous growth of mobile device use and cloud computing is triggering the greatest transformation in communications since the telephone. For the first time in history, any single application developer can instantaneously connect to, and engage with, any human or machine. What does this mean? How should developers adapt applications to new user patterns and behaviors? Let's look at four emerging design implications for application developers.

- **Crush.** China has surpassed the US as the world's dominant smartphone market, with more than a billion subscribers and roughly 400 million mobile web users.⁷ With more than three billion devices predicted to be in use worldwide by 2015, will your application be able to manage traffic and spikes resulting from user growth?
- **Customer experience.** Developers need to rethink performance – which means considering how mobile web pages are rendered for smartphone users. It's about both speed and experience: 57 percent of consumers will not recommend a business with a poorly designed mobile site.⁸ Similarly, 40 percent of consumers will go to a competitor's site after a bad mobile experience. Your application strategy must also account for opportunities generated by the convergence of web, mobile, voice, and media. Can your app deliver sophisticated content through smooth, intuitive interaction design – while being drop-dead gorgeous and immediately responsive?

⁷ [Analysys International](#)

⁸ [Compuware](#)

- **Compliance.** Mobile has found its way into the workplace, increasingly via employee-owned devices. “Bring your own device” (BYOD) is quickly becoming the dominant IT paradigm in industry; most organizations allow personal devices on their networks to some extent, while the majority of employed adults at least occasionally access workplace networks and data on their own smartphones, laptops, tablets, or desktops. CIO and managers need a BYOD strategy that addresses mobile device management, security, and enterprise data protection without inhibiting productivity. According to TechTarget⁹, the single biggest security concern related to extending mobility is the risk of lost or stolen devices, followed closely by risk associated with unprotected consumer devices gaining access to corporate resources. Companies must approach security differently in a mobile-first world. Can your security framework support employees and end users who want to use personal devices for work-related tasks and data access?
- **Commerce.** From on-the-spot parking payments in Norway to money services for the unbanked in Africa, mobile commerce is taking off. Gartner estimates 448 million mobile payment users and \$617 billion in transaction value by 2016.¹⁰ Are your applications designed to support the multitude of payment forms and settlement processes for global goods and services?

⁹ [TechTarget](#)

¹⁰ [Gartner](#)

Reach Customers Wherever They Are

Developers need to craft applications that can reach customers wherever they are. Often the best way is via mobile device — but that doesn't mean that open web developers should jump right into native apps for the iPhone, Android, or BlackBerry. Combining HTML5 and native web technologies – a hybrid development model – prevents developers from having to maintain large native code bases across multiple devices.

Mobile + Cloud Computing = Game-Changing Applications

We're still in the early stages of developing processes and user experiences to take advantage of rapidly evolving mobile and web technologies. Savvy customers are driving new functionality and design. Commercial opportunities are exploding along with device adoption. Advisory firm IDC predicts that by 2014 more than 76 billion mobile apps will have been downloaded – representing an app economy worth an estimated \$35 billion.¹¹

Today, early movers are designing game-changing apps that harness the mobile-cloud convergence. These innovators know that mobile is not simply another device to support via a shrunk website or screen-scraped application. Rather, it's evidence of a much broader shift to new systems of engagement that empower customers, partners, and employees with context-aware apps and smart products. Embracing a mobile-first strategy means rethinking infrastructure and operations, security and risk management, and enterprise architecture.

¹¹ [IDC](#)

Some companies embracing the new mobile-first approach:

7. **Voxer.** A social networking application that turns your phone into a walkie-talkie and an all-in-one messenger, in just a few weeks Voxer Walkie Talkie became the most popular app in its category on both the Apple App Store™ and Android Market™. Voxer chats include live voice, messaged voice, text, pictures, and location.
8. **LinkedIn Mobile.** LinkedIn recently launched an overhauled – some say gorgeous – mobile app. But for developers, the most exciting part is what's under the hood: The app is two to 10 times faster on the client side than its predecessor; on the server side, it uses a fraction of previous resources, thanks to a switch from Ruby on Rails to server-side JavaScript development technology Node.js. The LinkedIn team went from running 15 servers with 15 instances (virtual servers) on each physical machine to just four instances that can handle double the traffic.¹²
9. **Walmart.** Node.js allows Walmart to serve highly sophisticated features to mobile users on the client side. The retailer customizes content based on device type and browser capabilities, saving mobile shoppers a ton of time.
10. **Look.io.** The first company to provide a turnkey mobile-native platform that includes live chat and screen sharing, Look.io is changing the customer service arena – helping companies offer support over mobile in real time.
11. **Voxeo Labs.** With focus on core platform research, Voxeo uses open source standards to develop new convergent communications solutions that help Fortune 500 companies

¹² [VentureBeat](#)

capitalize on modern forms of communication enabled by mobile and cloud delivery of applications and data.

What Enables Success in A Mobile-First World?

We've outlined the opportunity, talked about what developers need to think about, and given examples of companies capitalizing upon the mobile-first movement. What are the main takeaways for success in a mobile-first economy?

Keep scale at the center of the conversation.

You need a backbone that can handle the interaction between the application tier and potentially billions of device endpoints. Scaling capacity – the marginal cost of scaling your service – is the most important factor when calculating profitability or margin. Millisecond acceleration of I/O speed and fractional improvement in CPU utilization can translate into massive improvements in profitability when attempting to serve one application to a global audience. Scalability, the ability to provide consistent quality regardless of size, is a key business requirement for mobile success. You need a highly scalable infrastructure, or hub, that can connect to many different back-end systems with multiple points of device synchronization.

Legacy tools are for legacy apps.

Current infrastructures and apps, built to page through individual web pages, cannot scale for massive concurrent mobile usage and throughput. Mobile usage patterns are inherently different, requiring applications to simultaneously handle millions of mini-requests for connection to content, security, email, and more. Businesses and application developers need to make calculated risks using newer application technologies and tools – such as HTML5, Node.js, and MongoDB – quickly becoming the de facto stack for modern, mobile, and user-intensive applications.

Data integrity and security is top priority.

Your enterprise architecture team must ensure that corporate assets and data are available for mobile use while preserving the security, performance, and scalability of back-end systems and desktop and mobile applications. You need advanced mobile device management and security monitoring that can lock down access to all corporate data and apps whenever a device is lost, compromised, or placed in a vulnerable state.

Today is an incredible time to start mobile-first initiatives. The availability of tools and technology delivered conveniently through modern cloud infrastructure services, along with a growing number of proof points and reference architectures, will accelerate success for companies getting started now.

The Future for Carriers

The mobile-first enterprise also has significant implications for mobile operators. Mobile carriers, especially in the US, will need to rethink their business and operating models. They're already seeing declines in voice and messaging business, and data revenue will peak soon. New networks need to do more than just carry voice and messaging; they must deliver the digital assets of people, businesses, and society. But existing planning, operations, and models will not support new technologies. Telcos and carrier service providers are no different from other businesses – they must reunderstand and reinvent their core business to reflect the needs of a mobile-first environment.

Analysts see growth potential in over-the-top (OTT) services – everything from healthcare apps to billing services. Carriers will have to work to provide these, competing not only with each other and with startups but also with the giants of the Internet. Successful carriers will transform their business models, constructing infrastructures that can handle the

new wave of high-performance digital delivery options. Those that cannot will be reduced to mere utilities, with commodity margins.

For mobile carriers, the challenge is to become an integral part of the Internet, controlling the pipeline of data, devices, and content.

Backhauling is one way to increase profitability: After carriers have uploaded to the cell tower, backhauling takes network traffic from the Internet and moves it to mobile. This shift is already happening in some regions.

Companies making the most of options for carriers:

- **Bharti Airtel**, one of the world's leading telecom providers, has significant presence in India, Sri Lanka, Bangladesh, and 17 African nations. It offers telecommunication services under wireless and fixed line technology, an integrated suite of telecom solutions for enterprise customers, and national and international long-distance connectivity. The company also deploys, owns, and manages telecom infrastructure through subsidiaries and joint ventures.
- **Telefónica**, one of the world's largest telecom providers, created Telefónica Digital in 2011 to seize opportunities beyond traditional network connectivity. Leveraging its impressive customer base, global reach, local distribution, and technical expertise, the company is driving revenues across mobile commerce and advertising, machine-to-machine, eHealth, video and content, digital security, and cloud computing. In May 2012, it launched TU Me, a message, VOIP, and photo-sharing app that gained 600,000 users in just three months. TU Me's biggest market is Spain, but its second and third are India and the US, where Telefónica is not present. Wise to the operators' dilemma, Telefónica is reinventing parts of its business that, while they may

cannibalize its core offerings, will help maximize its customer base.

- **Over-the-top (OTT) services.** The rise of the smartphone has been a mixed blessing for operators of mobile networks. Consumers have been eager to buy smartphones – and to amass data charges playing games, watching videos, and hanging out on social networks, as well as making calls and sending text messages. Yet smartphones have opened the door to disruptive newcomers. OTT, or value-added, services can take many forms, but voice and message apps have been the operators' biggest headache. Suppliers such as Skype, WhatsApp, and Voxer have been pinching network operators' customers by offering free app-based messaging and VOIP calls. In 2011 OTT messaging cost operators an estimated \$13.9 billion, or 9% of message revenue.¹³

Conclusion

Time is running out. Rapid advancements in mobile adoption and cloud computing are paving the way for market disruption in multiple industries. Decisions you make this year will determine if you can capitalize on the mobile-first economy. Do you have the right strategy in place? Are you investing in the right technologies? Are your developers considering the impact of crash, customer experience, compliance, and commerce on new apps? Do you have the ambition to disrupt your market, even cannibalize existing businesses, for future success?

One company is focused on helping mobile-first companies succeed. Joyent is a modern high-performance cloud infrastructure company. Our infrastructure-as-a-service (IaaS) offering delivers the superior performance and scaling that enable developers, architects, and

¹³ [The Economist](#)

business owners to create real-time online and mobile applications that exceed customer expectations.

To learn more about how Joyent helps innovative companies increase performance, deliver exceptional customer experiences, and reduce costs, visit us at www.joyent.com.