



# Modern Mobility

Enabling a mobile workforce

FROM THE EDITOR'S DESK

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From the Editor's Desk | ALYSSA PROVAZZA

# Where Has All the IT Gone?

**WHEN NEW TECH** emerges, people often wonder whether it will be the technology that finally puts IT administrators out of their jobs for good. At a very basic level, technology exists and evolves to take a load off human beings. The telephone made it easier to communicate with one another, the computer made it easier to create content and the internet made it easier to find and share information.

Smartphones and tablets upped the communication and computing game even more, and now, they're making it easier for workers to do their jobs. People use mobile devices to send contracts back to the office, file expense reports while traveling and video chat with customers. If employees can do their jobs better by using consumer devices and apps, do

they still need legacy business applications, content management software and other tools made for the desktop? Do they still need IT?

The answer is yes. As long as there are workers, there will be IT departments. Sure, the mobile era has brought change when it comes to traditional admin tasks such as software provisioning and client management. Today's IT admins have to focus on delivering applications to various endpoints through various means—all while balancing usability and security. Mobile technology does give users more autonomy, but IT is still required to manage and secure that technology.

In fact, IT might play a more important role than ever before. At VMworld in August, VMware CEO Pat Gelsinger explained how the proliferation of new endpoints and cloud computing is ushering in a new age of IT: one where admins will be *more* involved. Those technologies change the way IT functions. But at the end of the day, businesses still need to control costs and handle security, compliance

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and day-to-day management tasks that a service provider can't always take on.

In this new age of IT, it's critical to keep track of how users access, share, store and secure content from all their different devices, operating systems and apps. It means understanding users' mindsets more and working with them closely to establish security and privacy policies that meet the requirements of all departments. To top it off, most organizations still rely on legacy desktop software and systems, and they will for a very long time. IT has

to manage all of that as well.

But what about the next stage in technology we're all hearing about—the long-awaited artificial (AI) intelligence boom? Gelsinger said 2019 will be the year we cross over from more human-driven devices running in the world to more machine-driven devices. If that's the case, perhaps IT really does have something to worry about. This month, columnist Maribel Lopez takes a closer look at the role AI plays in the mobile enterprise. Are you ready for the machines? ●

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MOBILITY NOW



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## HTML5: Should You Heed the Hype?

Developers are moving toward building more mobile apps for the web, but it's not because of advancements in HTML5.

**BY ALYSSA PROVAZZA**

**ALLEN WILLIAMSON SPENDS** his days developing web apps for the University of Massachusetts Lowell, but—perhaps surprisingly—HTML5 isn't a huge part of that job.

As a front-end developer, Williamson builds responsive web apps that students can access



on their desktops or mobile devices. But to do so, he uses a wider set of technologies, including JavaScript and Cascading Style Sheets (CSS). There are a few things developers can do with HTML5 that mean they don't need to rely on JavaScript and CSS, Williamson says, but JavaScript is still required for much of the web development process.

"It's absolutely necessary to use HTML5," Williamson says. "It's just not a huge part of the development process."

HTML5 refers to both the latest update to the HTML programming language itself and to all of the tool sets and features that allow developers to build apps for the web. It has garnered a lot of attention in the last two years because it marks the biggest changes to HTML in terms of supporting mobile devices. But despite strong adoption of the language, overall advancements in web technology—not HTML5 itself—are driving interest in web app development.

### WHAT'S NEW IN HTML5

JavaScript is the base language of all web programming, so it's required for most text and image coding. CSS helps form the layout and

presentation style—color, font size, etc.—of a webpage or app. Developers use HTML for web modules that require some kind of data input or output, such as forms or videos. It may sound more complex, but HTML is actually easier to learn than the more expansive code libraries of JavaScript and CSS.

The Web Hypertext Application Technology Working Group began work on HTML5 in 2004 and released the first draft for developers to start using in 2008. The World Wide Web Consortium published the finalized language in 2014.

HTML5 is specifically designed to render more modern-looking websites and for the lower power of smartphone and tablet screens. It improved on the webpage structure codes available for document creation and added more APIs to help developers create more complex websites with app-like interfaces. In addition, the language provides better support for multimedia, an element of web apps that has grown over the last few years as businesses modernize.

For mobile web apps, HTML5 includes new code tags that make it easier to specify where on a page to put something. That's useful for mobile development because applications

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with those tags can better handle different browser sizes or changes in browser orientation, such as when users turn their smartphones horizontally.

“Everything that we do needs to be mobile first ... so we consider screen size and how [users] are going to interact with it,” Williamson says.

His department, the Office of University Relations Web Services, takes advantage of HTML5’s new Canvas tag, which allows developers to draw graphics on the fly using JavaScript. The tag let them add a signature feature to one of their mobile web apps without requiring support for Flash. Support for more browsers and increased performance for video streaming in HTML5 are also improvements over HTML4.

### WEB APP TRADE-OFFS

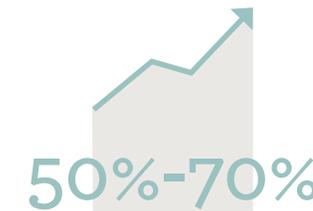
Web apps are very common today in the enterprise, with 54% of developers spending at least a portion of their time writing HTML and CSS, says Michael Facemire, principal analyst at Forrester Research in Cambridge, Mass. That’s because developers can build a single web app for multiple mobile devices and operating

## HTML by the Numbers



Developers who spend at least a portion of their time writing HTML and CSS

SOURCE: FORRESTER RESEARCH



The cost increase resulting from porting an already-created native app to a new OS

SOURCE: FORRESTER RESEARCH

systems—creating the popular new party line “build once, deploy anywhere.”

“For all the different devices that enterprises have to support their employees using or their business partners using, it’s becoming harder

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to dictate that they only use a certain kind of device,” Facemire says.

It can be costly to limit an organization to native apps that are tailored to a single device type or OS. Porting an app to a new OS increases the cost of the app by 50% to 70%, according to Forrester.

Plus, web apps offer some security benefits over native mobile apps. Most of the data users access is not stored locally within the mobile app or on the device, making it more difficult for a breach to occur. The Web Storage standard, a new plug-in in HTML5, only stores information such as configuration data or the last page a user visited—never usernames, passwords or other user-provided data.

“With web apps, you generally aren’t leaving a lot of data behind,” Facemire says.

Still, it can be tricky for IT departments to protect HTML5 apps because they are basically only as secure as the browser—an element that IT has less control over, says Vinay Raja, director of technology at Boston Technology Corporation, a software development firm in Marlborough, Mass. Native apps, on the other hand, allow developers to build in custom security features such as app- or file-level encryption and let IT control them through

third-party tools, such as enterprise mobility management software.

Functionality can also suffer when it comes to HTML5 apps.

“Everything depends on how the browser performs,” Raja says. “That’s the major issue we face regarding the performance and the functionality.”



Learn more about [what’s new in HTML5](#).

The capabilities of the browser and operating system dictate what an HTML5 app can do, especially in terms of supporting device features such as the camera. Developers might build camera functionality into an app, but then a user’s specific browser might require an extra plug-in for them to access that feature, making it cumbersome—or impossible, based on the OS—to use.

“You’re limited by the support of the hardware, the native side of it,” Raja says. “You try to exploit that to achieve whatever the app requires.”

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## THE STATE OF HTML5

Despite HTML5 becoming more popular in the past few years, the updated language itself is not what's pushing developers to build web apps for mobile, Facemire says.

"HTML5 is not the singular reason why folks are building web experiences for mobile," he says. "It's not the major thing moving the needle. You're not going to see a massive adoption later this year or sometime next year."

Instead, he adds, it's advances in other areas—such as expanded JavaScript libraries and better browsers—that have brought an uptick in mobile web app development. Despite the limitations browsers bring when it comes to security, they've at least gotten a lot faster in recent years, which boosts performance, Williamson says.

"There's not that much to be gained by doing a native app," he says. "With progressive web apps, there's a lot more we have access to on the device from the web."

Any developer working with web apps today is familiar with HTML5, so these skills are not especially more marketable than general web app development. It's better to have an understanding of which browsers and mobile platforms support which features within the

HTML code, Facemire says.

Still, "even native developers are trying to learn these skills," Raja says. "It's good to have experience with both [native and web]."

In fact, it's key to understand the nuances of web and native apps because many orga-



**"HTML5 is not the singular reason why folks are building web experiences for mobile."**

—MICHAEL FACEMIRE, Forrester Research

nizations can benefit from hybrid apps, Raja says. Developers write those apps with HTML5 and CSS, but users access them through app stores or from their devices' home screens rather than a browser. Hybrid apps appear on the device like a native app, so they can access native device features, yet they live on the web on the back end. That's the best of both worlds, Raja says. ●

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Under the Hood | ERIC KLEIN

All organizations have vulnerabilities of one form or another, making security an economic imperative.

# Mobile Networking Takes the Next Step

To support mobile devices, organizations should consider new technologies to boost the speed, security and management capabilities of their networks.

**NETWORK SECURITY IS** a huge challenge for organizations that have yet to determine how to efficiently manage mobile and cloud technologies.

Users won't relent until they have access to business applications and content available on their own devices from any location. That requires IT to put preventive measures in place for corporate content that users access

from any network. All organizations have vulnerabilities of one form or another, making security an economic imperative.

Attacks take many forms and can be difficult to detect. Sophisticated malware thwarts detection by using zero-day exploits and stealthy survival mechanisms. As a result, modern web, firewall and advanced threat protection (ATP) tools are compelling options for securing mobile networking. These technologies redefine on-demand network functionality while enabling security controls that don't degrade network performance. At the same time, IT still needs to use traditional network security methods—such as URL filtering, antivirus and antimalware detection and web application controls—to fortify the perimeter.

Granular app-level security policies aren't new, but next-generation firewall and ATP can add contextual elements. For instance, admins

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can take advantage of user and device location data to enforce fine-grained security policies through enterprise mobility management. This integration can also help IT enhance Wi-Fi security by allowing admins to set policies around users' connectivity to the company wireless network.

Another big advancement in networking that mobile admins should take advantage of is software-defined networking (SDN), which essentially decouples traditional networking hardware and software. Software-defined networks measure throughput in real time, bringing on-demand bandwidth to support the expanding data usage patterns of the cloud and mobile age. Network function virtualization (NFV) technology can complement SDN by boosting operational speeds, enabling fast provisioning and improving the scalability of virtual firewalls, load balancers and intrusion detection systems.

SDN and NFV technologies can help

# \$12.5 BILLION

The predicted value of the worldwide SDN market by 2020.

SOURCE: "SDN MARKET TO GAIN ENTERPRISE HEADWAY, DRIVEN BY THIRD PLATFORM AND CLOUD," IDC

automate security and policy enforcement through responsive protection across the entire attack continuum. Organizations should evaluate these technologies as part of any modernization initiative. These technologies are new, however, and vendors are still developing the global multi-tenant infrastructures needed to effectively deliver them with the quality of services and scalability businesses will require. ●

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Bots, voice navigation and machine learning have the opportunity to change how users interact with information.

# Got Bots?

Artificial intelligence technologies such as application bots and virtual assistants are poised to make their mark in mobile.

**MANY PEOPLE ASSOCIATE** artificial intelligence with the Terminator’s infamous Skynet system that takes over the world and attempts to eliminate mankind. Yet these technologies can provide services that are far more practical and desirable today.

Artificial intelligence (AI) has been a hot topic of debate since the 1960s. Now, AI has resurfaced in the form of machine learning and cognitive computing, which essentially allow computers to learn information by detecting patterns based on algorithms. These technologies have a better chance of success today

because of the ubiquity of mobile technology and powerful cloud-based analytics.

Mobile and cloud-based applications provide fertile ground for AI technology, such as chat bots and virtual assistants, to take advantage of internet algorithms. Credit card fraud detection and compromised password recognition for social networking sites are two examples of machine learning at work.

Apple, Google and Microsoft all highlighted how machine learning can improve messaging services at their developer conferences this year. Companies such as Baidu and WeChat already have virtual assistant messaging apps that allow consumers to use voice and text commands to find information, book services and purchase goods. Meanwhile, Amazon surprised everyone in the retail world with the success of the Alexa voice service and Echo speaker system.

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## MACHINE LEARNING POWERS MOBILE APPS

Bots, voice navigation and machine learning have the opportunity to change how users interact with information in three major ways:

- improved product discovery;
- faster completion of workflows and transactions; and
- more satisfied user experiences with lower support costs.

These technologies will also change how companies approach user engagement within their mobile apps and websites. It's difficult to get users to download a mobile application for a specific use, and the mobile web experience is often poor. So how can organizations make their services top of mind with customers and employees while they're on the go?

Bots—software that runs automated tasks, often via scripts, to offer information faster—provide one way of improving the experience without requiring users to download specific mobile applications. Bots enable users to access services easily by embedding them in software they already use, such as a messaging app. This approach connects many different

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## AI by the Numbers



Amount of jobs that automation technologies such as AI, cognitive computing and robots will replace by 2025

SOURCE: "THE FUTURE OF JOBS, 2025: WORKING SIDE BY SIDE WITH ROBOTS," FORRESTER RESEARCH



Amount of interactions on mobile devices that smart agents such as virtual assistants will facilitate by 2020

SOURCE: "TOP STRATEGIC PREDICTIONS FOR 2016 AND BEYOND: THE FUTURE IS A DIGITAL THING," GARTNER

experiences and creates a clear app workflow for the user. For example, a small retailer could embed access to its services via a bot within a banking app to push local promotions.



But there are also challenges. A company must ensure that its partners won't compromise the experience when its bot is embedded in another service.

The development team must construct its products and services in a manner that is accessible to third-party apps. This means embracing APIs and a microservices architecture, in which individual services exist separately but share common infrastructure to connect with one another. Additionally, developers need to work together to build the algorithms that allow a bot to recognize patterns and then aggregate and present data.

Data scientists and business analysts can use machine learning to construct their initial algorithms, but developers need to review the output to ensure the outcome was as they expected.

Bots can help businesses create more personalized interactions. So regardless of the market your company serves, business leaders should evaluate how bots can improve the customer and employee experience. ●

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The uses for Knox are specialized and generally involve only corporate-owned devices.

# Samsung Knox

Samsung has always taken the lead in developing Android devices with advanced enterprise mobility management features.

**WHILE SAMSUNG HAS** been working on Knox—an enterprise-grade mobile security platform that’s built into its Galaxy phones and tablets—the mobile device landscape has changed. The forces of BYOD and consumerization mean that many companies no longer standardize on a single device model or brand. Nevertheless, emerging uses mean that the market for enterprise mobile devices is still growing.

Today, Knox supports a wide variety of features and uses. But to understand Knox, it helps to look at the underlying Android landscape in the enterprise.

Google’s Android OS was always intended to be a flexible starting point that other parties could modify to suit their needs. For years, it had only basic device management capabilities, and many device manufacturers added custom management APIs. Samsung’s original effort in this area was called Samsung For Enterprise. In 2013, Samsung launched Knox, which added a new framework for separating work and personal data.

In 2014, Google finally enhanced Android’s core enterprise capabilities with Android for Work. There is now less of a need for individual device manufactures to create custom management APIs.

## WHAT DOES KNOX INCLUDE?

Still, manufacturers such as Samsung can differentiate their products by adding even more

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specialized management APIs—and more importantly, their own hardware-based security features.

In this area, Knox provides a hardware root of trust, secure boot, trusted boot and ARM Trustzone. These are all hardware-based security checks that Knox performs at the point



Learn the [top features of Samsung Knox](#).

of login to ensure the integrity of the device and the OS. Knox devices also support remote attestation, a capability that allows administrators to check on a device at any time and to get notifications when users make changes. Plus, they include a fuse-like mechanism that ensures that no one can use a hacked or rooted device.

Knox has its own mobile device management (MDM) APIs as well as work and personal profile separation features called Knox Workspace. But Knox devices also support the Android for Work management frameworks, and Android for Work can take advantage of

Knox hardware security.

Other Knox programs include the following:

- Customization, for companies that want to modify devices used as kiosks or for other specialized uses;
- Mobile Enrollment for bulk deployment and MDM configuration;
- Shared Device, which enables a multi-user mode; and
- Enabled Apps for developers to create individual apps that take advantage of Knox's security features without enrolling a device in MDM.

The Knox brand also encompasses several services, including cloud-based cross-platform MDM, identity management and consumer security that puts users in the driver's seat.

### WHY USE KNOX?

Samsung first marketed the persona separation features in Knox as a solution to BYOD. True BYOD means dealing with Apple iOS, other Android devices and whatever else comes in the door, however. Therefore, the uses for Knox are more specialized and

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generally involve only corporate-owned devices.

For companies that issue corporate phones to employees, Knox Workspace can ensure that employees can safely personalize their devices without compromising business data. Organizations that support field workers, public kiosks or point-of-sale terminals make for other strong use cases.

Knox devices have competition in these areas, but Samsung has some advantages.

Knox can be expensive, and there are cheaper devices that use Android for Work. Samsung Galaxy phones and tablets are upmarket flagship devices, and Knox Workspace requires a \$3.60 license fee per user per month. Still, Knox has the advantage of its hardware-based security and multiple government certifications, including Common Criteria, Federal Information Processing Standard 140-2 and approval from the United States

# 4 MILLION

The number of Knox users  
as of November 2015.

SOURCE: SAMSUNG

Department of Defense.

In addition, Knox faces competition from iOS devices, which also have support for a degree of dual work and personal profiles, a kiosk mode and management features tailored to corporate-owned devices. Here, Knox has the advantage of having more management options and greater customization capabilities. ●

**JACK MADDEN** is the author of *Enterprise Mobility Management: Everything You Need to Know About MDM, MAM and BYOD* and a blogger at BrianMadden.com. Follow him on Twitter: [@jackmadden](https://twitter.com/jackmadden).

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## DEVICE SPOTLIGHT

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# Samsung Galaxy Note 7

The productive S Pen and inking features, plus Samsung Knox security, distinguish the Note 7 as an ideal enterprise device.

A **WORLD-CLASS** and glare-busting display separate the Samsung Galaxy Note 7 from the smartphone pack. With a symmetrical build and curved display, the 5.7-inch Note 7 is ergonomically superior to any other big-screen phablet. Its Gorilla Glass 5 coating means the device can survive the occasional drop, and its IP68 rating means it's water resistant. The S Pen stylus works on a wet display—ideal for field workers who deal with rain or moisture.

Other new features include an iris scanner for unlocking the device and Secure Folder, which lets users protect personal files and apps with biometrics or passwords. There's also a USB Type-C port for data and charging, and a microSD for memory expansion returns after its absence on the Note 5.

Other smartphones handle email and web browsing just as well, but none match the productivity capabilities of Samsung's S Pen and software

and security features. The Note 7 costs more than some high-end 2-in-1s and Core-powered laptops, however. Users also must consider that Samsung had to recall the phone in September due to exploding batteries. ●

**DISPLAY:** 5.7-inch Quad HD dual-edge Super AMOLED 2560 x 1440 (518 ppi)

**OS:** Android 6.0.1 (Marshmallow)

**DIMENSIONS:** 6 x 2.9 x 0.3 inches

**WEIGHT:** 0.37 pounds

**PROCESSOR:** Qualcomm Snapdragon 820 quad core, 64 bit, 14 nanometer chip

**MEMORY:** 4 GB RAM (LPDDR4), 64 GB (Universal Flash Storage 2.0) capacity, microSD expansion

**CAMERAS:** Rear: Dual-pixel 12 megapixel (MP) with optical image stabilization; Front: 5 MP

**BATTERY:** 3,500mAh, Fast Charge tech

**CONNECTIVITY:** Wi-Fi 802.11 a/b/g/n/ac (2.4/5 GHz), multi-user multiple-input, multiple-output (2x2)

620 Mbps, Bluetooth v 4.2 Low Energy, ANT+, near-field communications, GPS, Glonass, BeiDou

**SENSORS:** Barometer, fingerprint, gyro, geomagnetic, Hall, heart rate, iris, proximity, RGB light

**PRICE:** Starting at \$849.99



PHOTOGRAPH: SAMSUNG

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Face Time With BIJU NAIR

## Helping Phones Find New Homes

Organizations can make good use of old mobile devices through recycling programs.

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**MOBILE DEVICES AREN'T** permanent.

A consumer buys one, uses it for a few years—if he or she is lucky—and then moves on to the next big thing. The same cycle occurs on a bigger scale in companies that buy devices for their employees. But many times, these discarded devices are still usable. At the very least, their parts are still valuable.

Hyla Mobile aims to give new life to old devices. The 7-year-old company runs the buyback and recycling programs for major wireless carriers and organizations such as Facebook, which relies on refurbished devices



to spread the use of mobile technology in the developing world.

Here, Biju Nair, Hyla's president and CEO, discusses how mobility affects the environment and how smartphone recycling benefits the business world.

### What does modern mobility mean to you?

Being ... productive while being mobile, being able to respond much more quickly. It has tended to cut down on a lot of B.S. There were days when you could say something completely random without having full knowledge. These days, when you say something, immediately people pull out their smartphones and Google it.



### How can businesses get the most out of their device purchases?

Take a company like Uber. They are signing up drivers every single day. They are making devices available to those drivers. They have to get the most cost-effective devices which suit their needs. They are a buyer ... because they would like to take advantage of lightly used, highly functional, refurbished devices that they can pass on.

### What are the environmental implications of the mobile boom?

Hyla, from its inception, has collected and repurposed roughly 42 million devices, and we have been able to successfully divert more than 17 million pounds of e-waste away from landfills.

People very quickly get bored with an environmental discussion if they cannot see the actual value associated with it. If somebody's spending \$5 to \$10, they are able to further downstream sell the precious metals, plastics

and other components and probably extract another \$20 or \$30 worth of value out of it.

### How can businesses make buyback and recycling part of their efforts?

We run programs for our carrier customers, not only on the consumer side of things but also on their B2B channels. Instead of individual employees going on a website or into a store, we enable corporations. We send a box, and they're able to collect devices and ship them. We tell them the value. Through our portal, we tell them how much e-waste they've directed away from a landfill.

### What's the best dish you can cook?

I can grill a really good steak.

### If you could travel anywhere in the world, where would you go?

Bhutan. It is the happiest country in the world. It is the only country that, in addition to measuring GDP, they also measure the gross domestic happiness of the citizens. I'm really curious as to what is their secret. ●

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HELPING PHONES FIND NEW HOMES

UX MARKS THE SPOT



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SAY WHAT?

# UX Marks the Spot

UX must factor into all mobile decisions, from security to application development.



**“Biometrics have become increasingly helpful in securing mobile content and devices. It doesn’t take away from the user experience.”**

—**MICHAEL OH**, CTO and founder, TSP LLC



**“Organizations bring desktop and web app thinking to mobile app dev, and that’s completely the wrong thing to do.”**

—**VAN BAKER**, mobile analyst, Gartner



**“Apps are experiences. It’s about how you combine these experiences.”**

—**BRIAN KATZ**, director of end-user computing mobile strategy, VMware



**“When should you use web and when should you use apps? It all depends on your strategy and goals and your audience’s key characteristics.”**

—**STEVE ROBINS**, principal, Solution Marketing Strategies

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