Cloudy, with a High Chance of Mobility

How Mobile Cloud Will Redefine Mobility

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What happens when two of the hottest topics in the world of technology—"mobility" and "cloud"—collide? Big things—with lots of issues and outstanding questions. That is where we are today with *mobile cloud*.

The growth of mobility, and the way it has fundamentally changed our lives, is unprecedented. Close to 80 percent[1] of the world's population now enjoys access to a mobile phone, and new devices like the iPhone and Android smartphones are bringing a host of applications and services to the palm of one's hand. At the same time, cloud has become the new way of delivering—and charging for—IT services and functionality. Technology services and applications are increasingly being delivered and paid for on-demand from remote data centers, accessible through the "cloud" of interconnected networks that constitute the Internet. Everything from email, content storage, and applications like Salesforce.com to more complex computing and development platforms can now be accessed through simple browsers and delivered through the cloud, obviating the need for end-user applications and high-powered computers.

While some of these new cloud services are being delivered on mobile devices, we are only at the beginning. Mobile cloud stands not only to significantly increase the overall value of mobility, but also to radically alter the way we work and play. Imagine being able to access to all of your favorite personal and business applications and content from the palm of your hand, via a compact, easy-to-use, relatively inexpensive device? Mobile cloud could finally deliver the "anything, anywhere, anytime" world that technologists have long dreamed of.

While the promise and opportunity of mobile cloud seem obvious, what it actually is, and how it might evolve, are highly unclear. A scan of blogs, research reports, articles, and conference presentations reveals a large degree of hype but little substantive discussion of definitions and frameworks for assessing the overall opportunity. The Cisco Internet Business Solutions Group (IBSG) believes it is time to clarify the definition of "mobile cloud," and how it differs from the "traditional cloud." Mobile operators need to understand the opportunities presented by mobile cloud, how its future might unfold, and what is needed to ride this latest technological wave.

Cisco Internet Business Solutions Group (IBSG)

Mobile + Cloud—What Does It Mean?

While there is a lot of talk about mobile cloud, the definitions vary widely, if they exist at all. Cisco IBSG defines mobile cloud as mobile services and applications delivered from a centralized (and perhaps, virtualized) data center. Customers access these services on-demand using the browser or "thin client" on their mobile devices. This contrasts to "thicker clients" that are downloaded from app stores and reside (and run) on the mobile device. Mobile cloud services are agnostic about the type of device or operating system on which they run.

Mobile cloud is comprised of two categories of services:

- *Traditional cloud services:* the extension of traditional, wired cloud services (Saas, Iaas) to mobile devices (e.g., Mozy, Salesforce.com)
- *Unique mobile cloud services:* services that exploit features of the mobile device (e.g., camera, voice recognition) and the characteristics of mobility (e.g., location, presence) to create unique, cloud-delivered offerings (e.g., bar-code scanning, real-time translation)

Mobile Cloud Top 10 List

Based on market observations, research, industry experience, and interactions with mobile operators, Cisco IBSG has developed a list of hypotheses, or plausible predictions, for the future growth and development of mobile cloud. While predicting the future is never easy, we feel that given the huge uncertainty and paucity of information on the subject, it is important to help to frame the discussion and the opportunities that mobile cloud holds.

Cisco IBSG is currently undertaking primary research with mobile users to test these hypotheses and to better understand how end users perceive mobile cloud.

1. N-Screen: Delivering the Dream

N-Screen—the ability to easily access content and information across a range of screens, such as the TV, computer, and mobile phone—has been a longtime dream of technologists, industry executives, and bleeding-edge consumers. Cloud separates content and applications from the device, storing them on—and delivering them from—data centers on the network. Mobile cloud will significantly increase the rate of this migration as users rapidly appreciate the value of the cloud and the utility of accessing it through any device.

2. N-Persona: Merging and Separating Our Personal and Business Lives

Each of us knows all too well the challenge of managing and balancing our personal and business lives. For many of us, this means not only time-management challenges, but also juggling multiple devices and technologies aligned with different parts ("personas") of our lives. A laptop or PC for work, the home computer, and perhaps separate mobile phones are all too often the complicated norm. Mobile cloud will bring these technologies and separate aspects of our lives together. Imagine using a single mobile device to access not only your personal content and applications, but also those things you need to do your job. Equally, mobile cloud will allow us to choose which parts of our lives we want to access, and when. N-Persona provides the basis of new advertising models, as advertisers are no longer reaching individual devices. Now they can advertise to a persona that integrates across all of the individual devices.

3. Mobile Data 3.0: The Walls Finally Came Down

Mobile operators owned the first generation of mobile data: Users could access only the information, applications, and content that operators kept locked up behind their "walled gardens" on the handset (Mobile Data 1.0). The iPhone changed all of that with the advent of a vast array of services delivered through an App Store (Mobile Data 2.0). The walls haven't come down, however; instead, the perimeter of the walls has gotten wider. While the app stores of Apple, Google, BlackBerry, and others offer much greater selection of services than Mobile Data 1.0, we now effectively have "walled ecosystems." Mobile cloud offers the promise at last of a truly open ecosystem independent of device and operating system. In this third generation of mobile data, the app store evolves into a retail storefront, or distribution point, for multiple cloud services from varied providers.

4. "Cloud Is Cloud": Wireline Becomes Wireless

There is little doubt that what we now consider wireline or PC cloud services will migrate to mobile in a big way. We are already seeing this with many popular software applications (e.g., Salesforce.com) now available on mobile devices, and in the rise of new cloud services. Over time, however, the distinction between methods of access—wireline versus wireless—will become insignificant. When this happens, we will no longer place the term "cloud" before "mobile"—cloud will just be cloud.

5. Mobile Cloud Mashup: Creating Unique Mobile Services

As we described in our definition, mobile cloud is much more than simply transferring cloud services to mobile devices. There are unique cloud propositions that exploit the features of the device (e.g., camera, microphone/speaker), the network (e.g., location, presence), and the characteristics of mobility itself. Imagine using your phone's camera to take a picture of a building, which is visually recognized by the cloud service and connected with a wealth of relevant information. Or, use the device's microphone and speakers to hold a real-time conversation in a foreign language, with the cloud service acting as the interpreter. PC-centric mashups of different applications and services created a host of new and innovative services (such as those for Google Maps), and these mashups will be even more pronounced in mobile cloud.

6. New Devices: Is It a Phone, a Computer, or Something Else?

We will see the emergence of a new category of mobile devices based not on the traditional PC model, but instead built for the cloud. Cisco's recent launch of the new, business-friendly Cius™ device clearly demonstrates how cloud-based services such as telepresence, collaboration, and communications can be readily delivered directly into the hands of mobile users. These new, cloud-centric devices will drive demand for even more mobile cloud services.

7. Mobile Operators Back in the Game

The emergence of the "walled ecosystems" of the iPhone, Blackberry, Android, and other devices largely relegated mobile operators to being providers of network connectivity: their ability to deliver their own content to end users—and to add value to the overall mobile experience—was increasingly marginalized. Mobile cloud stands to change all that with the move to a more open environment. In fact, mobile cloud offers operators a great opportunity to enhance the experience by using the unique aspects of their network (e.g., location, QoS)

to differentiate and monetize new and enhanced mobile cloud services. Mobile operators will be able to provide their own augmented services and add value to other services by exposing these network APIs.

8. Making Smartphones Dumber, and Dumb Phones Smarter

Smartphones have seen phenomenal growth over the last couple of years. Analysts project that roughly one in five U.S. mobile customers currently has a smartphone.[2] These advanced devices, however, represent a relatively small portion of the close to 5 billion users of mobile devices globally.[3] This situation will continue for some time, as the high price of smartphones makes them inaccessible to poorer populations. Even in developed markets, some people shun smartphones not just due to price, but also because of poor battery life, the device's larger form factor, and features they deem unnecessary. Imagine, however, if many of the services and capabilities currently available on smartphones could be brought to lower-priced, more simplistic mobile devices. Mobile cloud will not only open new markets, but also will allow users who will never be able to afford smartphones—or feel the need for them—to experience many of the services and advantages that smartphone users currently enjoy. All without leaving the comfort of their own existing device.

9. The IT Department's New Best Friend

While Cisco IBSG believes that mobile cloud is a huge market opportunity, initial adoption and uptake of services will largely be driven by who is paying the bill. Consumers may see great value in the personal services and applications that mobile cloud can offer, but business users will be the first to pay for them. Mobile cloud is an effective way to meet the high demands of business users, without imposing a heavy burden on enterprise IT organizations. Mobile cloud also provides an effective means for IT departments to meet the challenging demands of simplicity, security, and device management—and IT's continual quest for lower costs. CIOs no longer have to certify and manage specific devices for enterprise networks, allowing employees to use their preferred devices to access the services and applications delivered through the mobile cloud.

10. Brave New World: Redefining the Industry Value Chain

With its emphasis on openness and new data center delivery models, mobile cloud will re-define the mobile industry as we know it. Currently, much of the industry's power and value has shifted to device manufacturers and their "walled ecosystems." This threatens to further disintermediate mobile operators, relegating them to little more than connectivity providers. The migration to mobile cloud, however, provides a new opportunity for mobile providers to add value and differentiation through the network. Mobile cloud also gives content owners and application developers a much more direct channel to mobile end users. In addition, new players such as technology providers and systems integrators can develop integrated mobile services and deliver them directly to their end customers.

A Cloudy Future for Mobile Operators?

Cisco IBSG believes that mobile operators are well positioned to prosper from the huge opportunity presented by mobile cloud. The more-open world of cloud-delivered services should benefit mobile operators as power shifts away from the app store world of "walled ecosystems" toward an open world in which providers of new services can readily interact directly with mobile end users. The N-Persona world of merged personal and business lives, enabled by mobile cloud, benefits mobile operators—particularly integrated operators who have both mobile and wireline operations as part of their portfolios. Lastly, mobile cloud provides operators with a great opportunity not only to differentiate their offerings from those of other cloud providers, but also to exploit their unique network and business capabilities to offer new and enhanced value-added services.

While the future may definitely be "cloudy" for mobile operators, success in mobile cloud is not a foregone conclusion. The traditional device rental and network subscription models that have been the mainstay of the mobile industry are far less relevant in the world of mobile cloud. Operators will not only need to find new ways to monetize these cloud services—they also must develop new operating models and capabilities to deliver and benefit from these services. Mobile operators will rarely possess all of the skills and capabilities needed to create, sell, and deliver these new cloud services; strategic partnerships will be essential for speed to market and market acceptance.

The window of opportunity for mobile cloud will not last for long. While the openness of the cloud environment provides mobile operators with a great chance to get back in the game, it also allows others to rush past them in pursuit of mobile-cloud gold. If mobile operators do not move quickly in developing their strategies and plans for mobile cloud, they risk being marginalized and banished to the role of simple providers of network connectivity.

For more information about mobile cloud opportunities for service providers, please contact:

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Endnotes

1. International Telecommunication Union, October 2010.
2. comScore, January 2010.
3. International Telecommunication Union, October 2010.

More Information

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