

# THE FUTURE OF THE MOBILE CLOUD

by Alfred Boschulte and Victor Schnee

www.mobilecloudera.com

---

## **\*\* TABLE OF CONTENTS \*\***

### **VOLUME 1**

#### **The Mobile Cloud: Restructuring the Mobile Industry**

62 PAGES | 29 Tables and Charts | June 2012

#### **Executive Summary**

##### **Chapter 1 - Mobile Cloud: the “Web Gang” vs. “Mobile Giants” Conflict**

The “Web Gang” Led By Google, Apple, Amazon, Facebook, Microsoft

The Mobile Giants - Verizon Wireless, AT&T

The Mobile Cloud and the 4-Element Power Picture

- Chart 1. Former Relationship of 3 Ecosystems
- Chart 2. Mobile Industry Power Picture - 4 Key Elements

The Underlying Struggle: The Web Gang vs. The Mobile Giants

##### **Chapter 2 - The Coming Mobile Data Traffic DELUGE And Industry Risk**

Consensus Forecasts Underestimate Potential Market by Factor of 10X

- Table 1. Cisco vs. Our Estimates Of Traffic Per U.S. Cell Sites 2015

The Mobile Industry “In Denial”

- Table 2. Global Mobile Data Traffic 2012-2014: Wireless Broadband Alliance Forecast vs. Cisco VNI

The DELUGE and The Mobile Cloud

##### **Chapter 3 - The CLOUD and Emergence of the Mobile Cloud**

The Cloud: Getting to the Critical Elements

- Figure 1. The Cloud

Broadband - the Key to Ascendancy of the Mobile Cloud

- Table 3. Broadband Users Per 100 POPs, U.S. 2008 & 2010
- Chart 3. Broadband Wireless To 2016

Cloud - Drivers of Growth

Mobile Cloud and Device Evolution: Users As Part of the Cloud

- Table 4. Increase In Mobile Device CPU Capabilities Pre-2000-2015
- Figure 2. Cloud “Folding In” On Itself: User As Part Of Cloud

The Mobile Cloud Imperative

From the Business Cloud to the Mobile Cloud

## **Chapter 4 - The Stages of Development of the Mobile Cloud**

### Three Stages of Mobile Cloud Development

- Table 5. 3 Stages of the Mobile Cloud: Timing, Focus and Network Status

### Social Networks and Search

### The Cloud and Users - User Empowerment: Beyond Social Search

### “A Cloud You Can Trust”

- Figure 3. Cloud Security vs. Scalability Tradeoff

### Dramatic Impact of the Mobile Cloud

## **Chapter 5 - Defining the Mobile Cloud Market**

### The Market - Wireless Subscriber Growth

- Table 6. Growth of Wireless Connections, U.S. 2006-2016

### Device Proliferation

- Table 7. Growth In Wireless Devices, U.S., 2010 - 2016

### Usage Studies - Changing User Behavior

- Table 8. Cisco “Mobile Cloud” Services
- Table 9. Relative Data Consumption, By Type of Smartphone
- Table 10. Breakdown of Mobile Internet Traffic Category of Device
- Table 11. Breakdown of WiFi Traffic, by Originating Type of Device
- Table 12. Mobile Media Applications Usage By Category of Application
- Table 13. Estimated Breakdown of Smartphones vs. Feature Phones

### Interdependence of Apps - Major Impact on Usage

### Field Sales Example of Exploding Cloud-Based Usage

### Siri: A Case Study of the Gang vs. the Mobile Giants

### Web Gang vs. Mobile Giants: Other Examples - Augmented Reality; Health Monitoring;

### Security - Video Monitoring

### Outliers - NO; Harbingers - YES

## **Chapter 6 - The Mobile Giants’ Dilemmas**

### The Two Major Dilemmas For the Carriers

### The Speed-Up In The Business Cycle

- Chart 4. Approximate Increase In Device Power 2000-2011/12

### Verizon Wireless As An Example

- Table 14. Verizon Wireless - Growth of Capex 2002-2011
- Table 15. Verizon Wireless - Capex Growth vs. Revenue Growth 2002-2011
- Chart 5 VZ Wireless: Capex vs. Revenue Growth

### Growth of WiFi

### WiFi’s Potential

- Table 16. Percent of Traffic Coming From WiFi Connections, By Device Type

## **Chapter 7 - Key Players' Mobile Cloud Strategy Options**

### **Overview**

- Table 17. Web Gang vs. Mobile Carriers: Key Differences & Entanglements

### **The Web Gang: Key Strategy Options**

### **The Mobile Giants: Key Strategy Options**

- Chart 6. North American Mobile Carrier "End of Profit"
- Table 18. Verizon Wireless Capex as % of Revenue, 2009-2011
- Chart 7. Carrier vs. Offload Traffic - U.S., 2011 and 2015
- Table 19. Total Traffic - Carriers vs. Offload U.S., 2011 and 2015

### **Cable - Comcast: Key Strategy Options**

## **VOLUME 2**

### **Mobile Cloud Implementation Issues and Opportunities**

86 PAGES | 21 Tables and Charts | November 2012

### **Executive Summary**

#### **Overview: Mobile Cloud - A Surging Area**

- Figure 1. CLOUD WORLD

#### **Cloud World and the Mobile Cloud**

#### **The Cloud Ecosystem - Rushing Towards the Mobile Cloud**

#### **Segmenting The Mobile Cloud Market**

#### **Personal Clouds - the Mobile Imperative**

#### **Enterprise - The Rise of the Mobile Cloud A Many-Faceted Development**

#### **SMBs Progression From Cloud to Mobile Cloud**

#### **Carriers' Role In the Mobile Cloud**

#### **The "Web Gang" Versus The Carriers - At The Flash Point**

#### **The Big VISION - Making The Mobile Cloud Work**

#### **A Note About Methodology Of This Study**

## **Chapter 1 - Making the Mobile Cloud Work - Key Issues**

### **Framework**

- Table 1. Key Issues In Developing The Mobile Cloud

#### **Personal Cloud Market - Select Key Issues**

#### **Enterprise Mobile Clouds - Select Key Issues**

#### **SMBs - Select Key Issues**

#### **Carriers - Select Key Issues**

#### **Key Issue: Software And The Cloud**

## **Chapter 2 - Defining the Mobile Cloud**

Understanding the Challenge of the Mobile Cloud

Defining the Mobile Cloud

Clouds - By User Type

- Figure 2. Breakdown of Clouds By User Type

Clouds By Cloud Type

- Figure 3. Clouds By Type of Solution & Typical Providers

Clouds By Application Capability

- Figure 4. Storage, Syncing, Sharing Illustrations
- Figure 5. Collaboration Illustration

## **Chapter 3 - Personal Clouds**

Mobile Brings Personal Clouds To The Forefront

Documenting Factors Underlying The Personal Cloud Phenomenon

- Table 2. Summary Results of Funambol Cloud User Survey

Personal Clouds - Motivations of Giant Players

- Table 3. Giant Players - Apple, Google, Microsoft, Amazon, Facebook - Summary Comparisons

Device Maker Personal Clouds - Pre-Emptying The Market?

- Table 4. U.S. Smartphone Market - OS and Manufacturer Market Shares (2/12)

Apple's Path To The iCloud

- Table 5. Apple iPhone Evolution

The iCloud

The Personal Cloud Market

Rationales For Personal Cloud Services

Device-Centric Clouds vs. Independent Clouds

- Funambol - Open Source Personal Cloud
- Dropbox - A Leader In Independent Personal Clouds
- SugarSync
- Table 6. Personal Cloud Storage - Sample Pricing
- Samsung
- Pogoplug

## **Chapter 4 - Enterprise Mobile Clouds**

Overview of the Enterprise Area

Enterprises And Personal Cloud

- Wyse Technologies - Dell
- Polkast

SaaS Companies

- Salesforce.com

Mobile Applications Development Platforms

- Antenna Software
- Smartsoft
- CloudPointe
- Box (formerly Box.net)
- Verivo
- FeedHenry
- SAP - Sybase
- IBM
- Table 7. IBM Survey Results - Enterprise Objectives For Adopting Clouds
- Hewlett-Packard
- FileTrek
- Egnyte

#### Mobile Device Management

- MobileIron
- Good Technology
- RES Software
- Zenprise
- AirWatch
- Fiberlink

#### Enterprise Security - Intel Survey

- Table 8. Enterprise Security - Intel Survey, Selected Results

#### Enterprise Security - HP Study

### Chapter 5 - SMB Mobile Clouds

#### SMB Cloud Market - Microsoft's View

#### SMBs and the Cloud - Parallels' View; Dell Survey

- Table 9. Parallels - 2012 SMB Cloud Study, Selected Findings

#### The Role of MSPs in Cloud Services for SMBs

- Table 10. MSP Cloud Service Offerings Statistics - 2012
- Table 11. MSP 3<sup>rd</sup> Party Cloud Service Usage Statistics - 2012

#### SMBs and the Mobile Cloud

#### MSPs and Mobile Cloud for the SMB Market

#### Big Carrier SMB Players -AT&T and Verizon

### Chapter 6 - Carriers' Role in the Mobile Cloud

#### Overview

#### Carrier Enablers For The Mobile Cloud

- Aepona
  - Figure 6. Network As A Service (NaaS) - Aepona Schematic
  - Figure 7. Neustar Intelligent Cloud Components
- Synchronoss

- Ericsson

#### Mobile Carrier Cloud Initiatives

- Rogers Communications - The OneAPI Test And Beyond

#### Tier One Carriers and the Cloud

- Verizon - Acquisitions and the Cloud
- ATT's Development-Based Strategy
  - Figure 8. AT&T's Encore Platform
  - Figure 9. AT&T's Watson Engine Schematic
- Vodafone's Mixed Approach To Cloud

#### C-RAN - A Potential Game Changer

- Figure 10. C-RAN Cloud Radio Access Networks: Today vs. 2015

#### Addendum. ECONOMIC IMPACT OF THE MOBILE CLOUD

### VOLUME 3

#### The Future of Mobile Cloud Apps

66 PAGES | 13 Tables and Charts | March 2013

#### Executive Summary

##### Mobile Cloud APP WORLD

- Figure 1. Mobile Cloud App World

##### Enterprise - The Unique Issues

##### Personal (including Consumer and General) Mobile Cloud Apps

##### Verticals

##### Transcending Capabilities: Voice Control, Augmented Reality, and the Future of Mobile Cloud Apps

##### Mobile Networks and Mobile Cloud Apps: Google Versus The Carriers

##### Search, Social Networking and Mobile Cloud Apps

#### Chapter 1 - Defining Mobile Cloud Apps

##### Mobile Cloud APP WORLD

- Figure 1. Mobile Cloud App World

##### Segmenting the Mobile Cloud APPS WORLD

##### From "Apps" To "Mobile Cloud Apps"

##### Complexity: Mobile Cloud Apps - From the Simple to the Sublime

- Table 1. Cisco "Mobile Cloud" Services
- Table 2. Appcelerator Survey of Mobile Apps Developers

##### Mobile Cloud Apps - Are They "Apps," "Services," "Functions"?

## **Chapter 2 - Enterprises and Mobile Cloud Apps**

### Enterprises and the Mobile Cloud

#### New Disciplines

##### BaaS - Backend as a Service

- FeedHenry
- CloudMine

##### MAM - Mobile Applications Management

- AppCentral
  - Figure 2. AppCentral MAM Solution
- Other MAM Companies: Symantec/Nukona
- Mocana
- Apperian

##### Outlook For MAM

## **Chapter 3 - Evolution of Personal (Consumer and General) Mobile Cloud Apps**

### Evolution of Mobile Cloud Apps - Key Elements

#### Context Awareness - Background

#### Defining "Context"

#### Evolution Of Context Awareness and Devices

- Figure 3. Context Awareness - Evolution 1990-2015

#### New Directions In Context Awareness

#### Sensors and Context

- Figure 4. Diagram From Google Context-Aware Smartphone Patent Application

#### Sensors and Data Mining

#### Context and Social Networking: Context Aware Web (CAwbWeb)

#### Facial Recognition

#### Animetrics

## **Chapter 4 - Vertical Case Studies: Medical/Healthcare and Automotive**

### Introduction

#### I. Medical/Healthcare Mobile Cloud Drivers

- Doctor-Oriented Mobile Cloud Apps
  - EZ Derm
  - MedMaster Mobility
    - Figure 5. MedMaster HIE Concept and Planned Capabilities
  - Iconic Data - SwiftPayMD
- Patient Monitoring
  - Chronic Care Management, Inc.
  - Entra Health Systems
- Medical Body Area Networks (MBANs)
  - Figure 6. Medical Body Area Network Concept

- Hospitals and Mobile Clouds
  - Mobility and Cloud: McKesson; Allscripts; Epic; Cerner
- Insurance-Based Apps
  - Castlight
  - Aetna
- Medical Mobile Cloud Platforms
  - Qualcomm Life
    - Figure 7. Qualcomm Znet Health Services Platform
  - Microsoft - HealthVault

## II. Automotive - Mobile Cloud Apps

- Figure 8. Vehicle Connectivity - Converging Elements
- Automotive - Vehicle Monitoring
  - Airbiquity - Connected Vehicles
  - FleetMatics
- Insurance and Automotive Monitoring
- Automotive - Infotainment
  - Verizon and AT&T - Automotive Initiatives
- Autonomous Vehicles

## Chapter 5. Transcending Capabilities

### Overview of Transcending Capabilities

#### I. From Speech Recognition and Response To Conversation

- Google, Apple, AT&T - Speech Technology Positioning
- Voice Command and Other Voice Players

#### II. Augmented Reality - Basics

- Google Glass - Wearable Media
- IBM -In-Store AR
  - Figure 10. IBM Graphic - The In-Store Opportunity
- Qualcomm and AR

## Appendix A. Transforming “Apps” to “Mobile Apps”

## Appendix B. The Cloud Continuum and the Escalating Domination of Mobile OSS

### The Cloud Continuum: Non-Mobile To Mobile

- Figure 11. The Cloud Continuum: Non-Mobile To Mobile



## **VOLUME 4**

### **Mobile Cloud Services Market Forecast and Outlook to 2017**

44 PAGES | 18 Tables and Charts | July 2013

#### **Executive Summary**

Overview: Forecasting the Mobile Cloud

Development of the Mobile Cloud - Major Changes

Issues Facing the Mobile Cloud

#### **Chapter 1 - The Ascendancy of the Mobile Cloud**

Overview - The Primacy of the Mobile Cloud

Key Implications of the Growth of the Mobile Cloud

Mobility and the Cloud Revisited

- Table 1. Elements of the Mobile Cloud

The Mobile Cloud: Turning In On Itself

#### **Chapter 2 - Mobile Cloud - 5 Major Changes**

The Five Major Changes Brought In By The Mobile Cloud

1. The Development of an Ever Wider Array of Devices (With Ever Improving Price/Performance)
2. Proliferation of Multiple Personal Clouds
3. M2M and Autonomously Generated Traffic “The Internet of Things” - a Limiting Concept
4. Identifying Users With Their Stuff, and Their Networks (Clouds) of Stuff, Rather Than As “Eyeballs”
5. Big Video, (Big Refers to Robustness and Ubiquity Not Big Screens, (e.g. Eyeglasses) Surpasses Big Data

#### **Chapter 3 - Mobile Cloud - 5 Key Issues**

The Five Major Issues Facing Development Of The Mobile Cloud

1. Quality, Robustness, Ubiquity and Security of RAN Links  
Table 2. RAN Speed Increases, By UMTS Generation, 1980s To 2015  
The Solution(s) to the RAN/Cloud Challenges
2. Marketing of the Personal Cloud(s) and Personal Cloud Persona(s)
3. Need for a Cloud OS, Including Hybridization of OS's for Personal Cloud Centricities
4. Movement of Processing and Information to the Edge
5. Carrier Business Model and Pricing Issues

## **Chapter 4 - Forecast Methodology**

### **Framework For Forecasting the Mobile Cloud Market**

- Table 3. Mobile Cloud Forecasting Methodology: Direct, Attributable & Indirect Revenue

## **Chapter 5 - Personal Cloud Forecast**

### **Personal Clouds**

- Table 4. Growth of Dropbox Users 2010-2012

### **Evolution of Personal Clouds**

#### **Market Size - Personal Clouds - IaaS (Storage)**

- Table 5. iCloud Growth In Users
- Table 6. iCloud Storage Pricing
- Table 7. iCloud Projected Pricing For 55GB Storage 2012-2017

#### **Market Forecast - Personal Clouds - SaaS/PaaS Zone**

#### **Market Forecast - Personal Clouds - Summary**

- Table 8. Mobile Personal Cloud - Direct Revenue Forecast 2017

## **Chapter 6 - Carrier Attributed Mobile Cloud Revenue Forecast**

### **Mobile Traffic Outlook**

- Table 9. Mobile Usage: Data vs. Voice 2012 & 2018 Projected
- Table 10. Data Center & Non-Data Center Traffic Projection 2016
- Table 11. Breakdown of Data Center Traffic 2016: Cloud vs. Traditional; Cloud Consumer vs. Business
- Table 12. Forecast of Growth of Mobile Data Traffic (Cisco VNI) 2012-2017

### **Demand Deluge: Especially Video Traffic Demand - Bottom-Up Analysis**

- Table 13. Breakdown of Key Mobile Apps By Category
- Table 14. Bandwidth Assumptions for Key Mobile Apps, 2010 vs. 2017
- Table 15. Estimated Breakdown of U.S. Cell Sites 2015 - by Traffic Load Category

### **Demand Deluge - Mobile Cloud Implications**

## **Chapter 7 - SAAS, PAAS, IAAS Mobile Cloud Forecast**

### **IaaS, PaaS, SaaS - Mobile Cloud Forecast**

#### **IaaS, Infrastructure As A Service**

#### **The SaaS/PaaS Zone (Software as a Service/Platform as a Service)**

#### **Summary of Mobile Cloud Direct Revenue Forecasts**

- Table 16. Mobile Cloud Direct Revenue Forecast 2017
- Figure 1. Mobile Cloud Revenue Forecast Chart 2017

## **Chapter 8 - Other Issues - Indirect Revenue, M2M**

Overview of Indirect Benefits

Forecast of Indirect Revenue: Example - Search

Forecast of Indirect Benefits: Example - Product Sales

M2M - Technology and Market Overview

M2M: The Mobile Cloud Imperative

M2M and Mobile Cloud Market Forecast

Summary of Market Impact Forecasts

- Table 17. Summary of Mobile Cloud Market Impact Forecasts 2017