WebRTC – Is it a Game Changer?

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Today's Agenda

Major Trends In IT and Telecom
- Cloud
- Ubiquitous Bandwidth
- Devices

WebRTC and the Webification of Communications
- Overview
- WebRTC Transformation

WebRTC Use Cases
- Enterprise UC
- Cloud Based WebRTC
- Contact Center
Three Big Trends

- Cloud
- Ubiquitous Bandwidth
- Devices
Three Big Trends

- Cloud
- Ubiquitous Bandwidth
- Devices
Devices Everywhere

1
Over 1 device per human (2012)

4 Billion
4 BILLION new Smartphones in 2016

400 Million
Samsung sold 400M devices in 2012, projects 500M in 2013, 400M Smartphones

Plethora
A plethora of endpoints – smart and browsing

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BYOD/BYOT

“Which of the following activities, if any, have you done in the past year in your job?”

- Used my own personal computer or personal smartphone to help me do my job: 43%
- Used a website or Internet-based service that my company doesn’t support to help me do my job: 19%
- Installed unsupported software to help me do my job: 16%

In aggregate, 53% of global info workers exhibit one or more of these behaviors.

“Do you use your software/devices for work or personal purposes?”

- Devices: 28% Personal only, 21% Work and personal equally, 28% Work only, 12% Mostly personal, 11% Mostly work
- Software: 13% Personal only, 13% Work and personal equally, 32% Work only, 21% Mostly personal, 21% Mostly work

61% of devices blend work and personal usage
66% of software blend work and personal usage

Percentage paying for at least one device used for work, whether reimbursed or not

- Overall: 55%
- Developed: 44%
- Emerging: 74%

Director or above: 77%
Manager/Supervisor: 64%
Individual worker: 46%

If you can’t be with the device you love...

......love the device you are with!

1. Base: 9,912 information workers
2. Base: 9,912 information workers
3. Base: Weighted average of responses by information workers who usetechnologies within the categories indicated above

Source: Forrsights Workforce Employee Survey, Q4 2011, Forrester Research
Three Big Trends

- Cloud
- Ubiquitous Bandwidth
- Devices
Moving to Ubiquity

Bandwidth

- 16-64Kbps Voice
- 16-64Kbps Data
- 100-200Kbps
- 200-400Kbps
- 1+ Mbps

Availability

- 1980: 40%
- 1990: 80%
- 2000: 90%
- 2010: 98%

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Edholm’s Law of Bandwidth

Economic Bandwidth (Exponential Scale) Bits per second

Time

Bandwidth is increasing in all areas in a relatively proportional exponential growth

WEBRTC

IEEE Spectrum Article By Steven Cherry / July 2004

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Fixed to Mobile substitution

Rich ecosystem

More applications

Growing number of smart phones

Rise of the millennial(s)

Move to indoor traffic
2016: Over 80% of wireless traffic generated indoors

My life in any device
New generation of devices and communicating machines

Fixed broadband life
Massively adopted now and “exportable” to mobile

2010: 400 per km2
2015: 12,800 per km2

Within 5 years, millennials will spread their “early-adopters” lifestyle into their adult lives & enterprises

The Millennials Generation born and/or raised with Internet (11-25 years old)

Connected broadband life style

Source: Bell Labs analysis
Three Big Trends

Cloud

Ubiquitous Bandwidth

Devices
What Is Cloud Computing?
Progression of Computing

<table>
<thead>
<tr>
<th>Terminals</th>
<th>The PC</th>
<th>The Network</th>
<th>The Web</th>
<th>The Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>Memory</td>
<td>Processing</td>
<td>Human IO</td>
<td>Internet &amp; www</td>
</tr>
</tbody>
</table>

LAN

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Virtualization is a Technology: Cloud is a Business Model

Power multiple “virtual machines” on one server with VMWare

Oracle

Application Servers

SQL

File

Email

Print

Cloud Services

Cloud Infrastructure

Cloud Servers

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Industry Trends

Cloud

Ubiquitous Bandwidth

Devices
WebRTC Strategies 2013
WebRTC – Game Change?

- WebRTC makes a browser into a softclient with a web site defined GUI
- Removes the need for a downloaded client application for communications
- Makes programming much easier
  - JavaScript level programming
  - 10-20M Programmers
- Estimate of 500M to 1.5B WebRTC enabled devices by the end of 2013
- Supported by Google, Mozilla, Opera, Ericsson (bowser)
Typical Client and Media Engine

Components

- **Audio**
  - Setup and control the hardware
  - RTP, compression, encryption, statistics, etc.
  - Produce low-latency audio from microphone
  - Conceal loss, de-jitter and play audio from the network
  - Cancel echo, VAD, reduce noise, etc.
  - Manage codecs

- **Video**
  - Render video, capture camera input
  - Video processing (blue screen, gamma, etc.)
  - Conceal loss, de-jitter and play video from the network
  - Cancel echo, VAD, reduce noise, etc.
  - Manage codecs
  - Bandwidth Management

Client/Media Engine Structure
Web RTC Puts the Media Engine into the Browser

WebRTC Media Processing

HTML – HTML5
Visual User Experience

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## Standardization

<table>
<thead>
<tr>
<th>IETF</th>
<th>W3C</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTCWEB WG formed after BOF at IETF 80, April 2011</td>
<td>W3C WEBRTC WG created May 2011</td>
</tr>
<tr>
<td>Focus on protocols and interoperability</td>
<td>High level APIs and device control (mid, camera, network)</td>
</tr>
<tr>
<td></td>
<td>PeerConnection API proposal originally proposed in WHATWG currently being discussed: <a href="http://dev.w3.org/2011/webrtc/editor/webrtc.html">http://dev.w3.org/2011/webrtc/editor/webrtc.html</a></td>
</tr>
</tbody>
</table>
WebRTC Implementations

Adding WebRTC to Any Web Server

WebRTC as an extension to existing networks of servers (Carriers)

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Vendor A UC Platform with WebRTC Control

Vendor C UC Platform with WebRTC Control

SIP

HTML & WebRTC API
VOIP RTP
SIP Signaling
Other WebRTC Enterprise Integrations

Integrating a Media Server with WebRTC

Web Server with WebRTC Control

Media Server

HTML & WebRTC API
VOIP RTP
Other WebRTC Enterprise Integrations

WebRTC and SIP Clients with Media Gateway

Web Server with WebRTC Control

Media Server

HTML & WebRTC API
VOIP RTP
Vendor Media
Vendor SIP

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Other WebRTC Enterprise Integrations

SIP Integration with RTP

Web Server with WebRTC Control

- HTML & WebRTC API
- VOIP RTP
- Vendor SIP
Other WebRTC Enterprise Integrations

Enabling an Existing Contact Center product with WebRTC
Interaction Experience 2.0

Getting the best Possible Employee to Interact with the Customer/Contact
- Contextual
- Optimized

Having ALL of the information to resolve the Customer/Contact problem
- Complete
- Accessible

Having the right communications modality the best possible experience
- Optimized
- Empathetic
Components of Interaction Experience 2.0

Web Infrastructure
- Web Site
- Servers
- Big Data

Real-time Experience
- Interaction
- UX
- Media Modality

Network
- RT Ready
- Available
- QoE
Path to Interaction Experience 2.0

**Interaction Experience 1.0**
- Legacy
- ACD
- Call Centers
- Contact Centres
- IVR

**Interaction Experience 2.0**
- Any Media
- Big Data Depth
- Any Employee
- Right time, employee, data
- Best possible outcomes

**Depth of Information**
- None
- Complete

**Telephony**

**Multi-modal Immersion**

**Interaction Capability**

**Hunt Groups**

**Ultimate Satisfaction**

**WebRTC Strategies 2013**
Big Data as part of Interaction Experience 2.0

Contextually Right Person

Right Employee

Any Employee

None

All Data

Right Information

"I see you have more information than I do."

"Problem Solved"

"How can I possibly help you?"

"Great meet – no answer."

"How can I possibly help you?"

"Great meet – no answer."

"I see you have more information than I do."

"Problem Solved"
The Web Disconnect

Typical Fortune 1000 Web Site

1 → 40 → 30 → 20 → 10

240,000 Discrete Contextual Links

Typical Fortune 1000 Contact Centre/IVR

375 Discrete Contact Routes

800-406-2345
866-675-4759
866-657-9867

The challenge is mapping to the current systems LIMITED resources

Question 1

Question 2

Question 3
Guest Portals: The Webification of Real-Time?
Guest Portals: The Webification of Real-Time?

Vendor A
UC Platform with WebRTC Control

Vendor G
Web UC Platform with WebRTC Control

Vendor SIP

HTML & WebRTC API

VoIP RTP

www.giantweb.com/portal/larryp

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The Data Channel

• Enables Real-Time Data to be sent between Peers
• UDP
• File Protocols
• Great for:
  – Gaming
  – Sensors
  – UC – Chat/Files/App Sharing
  – ........
Additive Communications
Is Cube Slam Cute or A Subversive Plot?

What Percentage of Web Activities would Benefit from Real-Time?
Enabling Media Servers for Other Real Time Applications
WebRTC and the Web

Replaces What Exists or Augmenting it

Real-time as adjunct to an activity

Real-time as extension of an interaction or app

Real-time all the time

Playing Cube Slam against Bob the Diversionary Bear

Chess Cam by Spacegoo
The Real-Time Web

Vendor A UC Platform with WebRTC Control

Vendor C UC Platform with WebRTC Control

Social System with WebRTC Control

Social System with WebRTC Control

Social System with WebRTC Control

Social System with WebRTC Control

Social System with WebRTC Control

Application with WebRTC Control

Application with WebRTC Control

Application with WebRTC Control

Social System with WebRTC Control

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WebRTC Timeline Q3 2013

IETF working group set up
Ericsson WebRTC demo at MWC
Chrome 29 Supports Android
Google open-sources GIPS IPR
Telefonica acquires TokBox

2011
Google, Cisco, Skype, Mozilla RTC-Web workshop
Chrome & Opera browsers start supporting WebRTC APIs

2012
Google open-sources GIPS IPR
Telefonica acquires TokBox

2013
Chrome supports WebRTC in stable Release
AT&T announces alpha WebRTC APIs

2014
Firefox supports WebRTC in stable release

2015

2016

Source: Disruptive Analysis WebRTC Strategy Report, June 2013
Assumptions - See disruptive-analysis.com for details
WebRTC forecasts: 4 billion devices

Device base supporting WebRTC growing from zero to 4bn in 4 years

Source: Disruptive Analysis WebRTC Strategy Report, June 2013 & Q2 Update June 2013
Definitions & methodology in report - See disruptivewireless.blogspot.com for details
Company Positions on WebRTC

**Promoters**
- Google
- Ericsson
- Cisco
- Thrupoint
- Acme Packet
- Alcatel-Lucent
- Siemens Enterprise Communications
- Avaya
- Genband
- Ingate

**Uncommitted /Following**
- Juniper Networks
- Microsoft
- Apple

**Telcos**
- AT&T
- Telefonica
- Deutsche Telekom
- France Telecom
Potential Barriers

• Microsoft may actively resist
  – Contrary to Friends and Family strength of Lync and Skype
  – Organizational shift may indicate probable support

• Apple is not committing
  – Could block app in App Store
  – Indications are they will support as a standard
  – H264/5 support an issue

• Open Issues
  – Video codecs – VP8/9 versus H264/5

• Security
  – Enterprise Firewalls and SBCs need WebRTC support
WebRTC enables any web server to deliver a unique real time communications experience, with simplicity and reliability, without dependence on service providers or other services.

WebRTC enables users to participate in a communications experience as delivered by any web site without downloads, registration or general cost.
Game Changer, Disrupter, Transformer?

Core Technology

Delivery

General

Industry Disruptions

Market and Societal Disruptions
WWW, web, browser Impact

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VoIP Impact
WebRTC Impact
....and the world changed

.....and it will again.......
WebRTC: A New Architecture for Communications

Chris Vitek
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ENTERPRISE USE-CASES
Immediate Opportunities:

– PBX Elimination
– Patient Collaboration Interface
– Large Financial – Customer Collaboration Interface
– Enterprise Software with Embedded Collaboration
– Global Toll-Free Access Without a Carrier
– Global Wireless Roaming on Data Connections
Enterprise UC Implementations

SIP Encapsulation Within SDP

Desk-Phone Elimination
PSTN Elimination
Work-at-home
Text
Directories

Presence
Desk-top Video
Micro-broadcasting
Audio
SIP Features
The Future of the Contact Centre

INTERACTION EXPERIENCE 2.0
Global Consumers Exploding

SAP, 2011
Contact Center: Loyalty Vs. Satisfaction

Loyalty

- Low Effort: 80%
- High Effort: 5%

Satisfaction

- Satisfied, Plan to Leave: 25%
- Not Satisfied, Plan to Stay: 30%

Corporate Executive Board, 2008
• 97% of buyers visit a web-site first.
  • BIA Kelsey, 2011

• By 2015 the Marketing Technologists budget will surpass the CIO’s budget.
  • Gartner Group, 2012
Big Data Adoption and Growth

Gartner, 2012

Big Data Market

- Total Spend ($billions)

- 2012
- 2013
- 4014
- 2015
- 2016

Big Data Market

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Digital Media Consumers in US

Comscore, Media Metrix, 2013
Path to Interaction Experience 2.0

Interaction Experience 1.0
- Legacy
- ACD
- Call Centers
- Contact Centres
- IVR

Dynamic Support with Minimal Effort
- Any Media
- Big Data Depth
- Any Employee
- Right time, employee, data
- Best possible outcomes

Interaction Experience 2.0
- Any Media
- Big Data Depth
- Any Employee
- Right time, employee, data
- Best possible outcomes

Chanelized Support

Interaction Capability

Telephony

Multi-modal Immersion

Depth of Information

Complete

None
Legacy Customer Service

Customer Phone → PSTN Switch → Enterprise Web Server → Enterprise IVR → Enterprise PBX → Customer Service → ANI & DNIS
WebRTC Enhancement

Customer Phone → PSTN Switch → Enterprise Web Server → Enterprise IVR → Enterprise PBX → Customer Service

ANI & DNIS

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Interaction Experience 2.0

WEBRTC
STRATEGIES

Customer Phone
Call Routing
Information about The browsing session goes
PSTN Switch
Big Data
Enterprise IVR
Targeted information customer service rep can handle the call possible.
Customer Service

Customer Web Browser
Enterprise Web Server
SBC
WebRTC

Customer Service

ANI & DNIS
Results:

- Customer Effort ↓
- IVR ✗
- Micro Targeting ↑
- Call Duration ↓
- CC Labor ↓
- PSTN Cost ↓
- Customer Loyalty ↑
- Marketing Spend ↓
Benefits for 1,000 Seat Center:

• Customer effort is reduced.
• Customer service labor expense reduction $6.6M/year (15%).
• PSTN reduction or elimination $800K/year.
• Survivability (Cat-Comms).
• Real-time marketing offers and talking points.
• Improved loyalty impact on marketing budget: $30M/year (10% of marketing budget).
Architecture - Banking
Technology

INTERACTION EXPERIENCE 2.0
Legacy Complexity
Integration With Legacy

- Customer Smartphone
- Session Border Controller
- PBX, ACD
- WebPBX, WebACD
- E-mail, chat, video
- Social Media, web, Mobile, QM, File Transfer, Reporting, CTI, IVR, Presence
- Big Data
Interaction Experience 2.0
Performance Reporting:

- Single Operating System
- Single Code Base
- Single Signaling Method
- Single Event Library
- Bi Directional Signaling
- Consistent time stamps
- Expanded Occupancy Metrics
- True Multi-Media Reporting

- Multiple Operating Systems
- Multiple Code Bases
- Multiple Signaling Methods
- Multiple Event Libraries
Legacy Management Interfaces
Management Interface:
WebRTC - Based Management Interface

- Single Operating System
- Single Code Base
- Single Signaling Method
- Single Event Library
Summary:

• **Ease-Of-Use:**
  • One-Click Access for Customers
  • Simplicity of Service Creation

• **Investment Protection:**
  • Same Codecs in enterprise Use Since 2002
  • All Major Manufacturers Are Supporting

• **Value:**
  • Least Expensive Development Environment
  • Disintermediates the PSTN Carrier

• **Support:**
  • Google and Mozilla Own 81% of Browsers
  • 79% of Smartphones in Q2 Were Android
  • 9 Million JavaScript Programmers
• Silicon Valley
  – November 19-21
  – Santa Clara Convention Center

Use code **SIPTOWRTC** when registering to get a 50% Discount from TMC
Thank You and Questions