Qualcomm Overview

Samir Khazaka, Sr Dir
Head of Analyst Relations
April 2012

Placeholder for Opening Video

Mobile: A Vibrant, Unprecedented Opportunity

6B+

Mobile Connections

$1.3T

Annual Revenue (2011)

#1

Most Used Device

Source: Wireless Intelligence, Dec. ’11, CIA World Factbook, Dec. ’11, Chetan Sharma Consulting, Jul. ’11

The First Natural Wave of Growth

Mobile Computing Taking the Impact of the WEB to the Next Level

Retail

Advertising

Media/ Entertainment

Computing

Another Wave of Growth Coming

Reshaping Industries

Mobile Experience Becoming the Expectation in Other Device Categories

Mobile Is the New Architectural Approach

Always Connected

Always On and Up to Date

Power Efficient

Scale

An Era of Smart Connected Devices

Mobile at the Center of the Ecosystem

Enabling Smart Connected Devices

3G/4G Migration into New Connected Opportunities

Smartphone Expansion into New Mobile Categories

New, Adjacent Categories

Leadership Position Across Businesses

Mobile

Computing

Consumer Electronics

Internet of Everything

Networking

gobi by Qualcomm™

snapdragon by Qualcomm™

Qualcomm ATHEROS

Growth Drivers

Smartphones

Non-Handset Devices

Emerging Regions

Advanced Network Technologies

Connectivity

Smartphones

Consumer Demand Driving Continued Smartphone Innovation

Visually Stunning Graphics

High Performance

Mobile Broadband (3G/4G)

Seamless Connectivity (WiFi, BT)

~4B

Cumulative Smartphone Unit Sales Between 2011 and 2015

Source: Average of Gartner (September 2011), Strategy Analytics (September 2011), and IDC (September 2011).

Significant Smartphone Growth

Fastest in Emerging Regions

2010 Developed Regions

~0.3B units

2015 Emerging Regions | Developed Regions

1B+ units

Emerging Regions Projected to Be **50%+** of Smartphone Shipments in 2015

Source: Gartner (October 2011), regions defined by Qualcomm

The all-in-one mobile processor

snapdragon
by Qualcomm

Snapdragon Processor Leadership

Now: 370+

Devices Launched

1
Device
Q4 2009

55
Devices
Q4 2010

300+
Devices
Q4 2011

Source: Qualcomm data

Snapdragon Momentum

#1 AP

Shipments in Q4 2011

#1 GPU

Shipments in 2011

Source: Strategy Analytics, February 2012, Jon Peddie Research, February 2012

Snapdragon Platform: A System Level Approach

- Leading Hardware
- Drivers & Optional Advanced Features Software
- High Level Operating System
- Qualcomm Reference Designs
- Enabling Technologies
- HW & SW Development Tools & Customer Support

Snapdragon S4 Processors: A Comprehensive Portfolio

Solutions for Smartphones, Tablets, TVs and Computing Devices

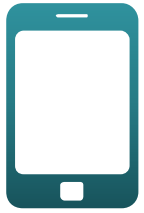
snapdragon by Qualcomm s4

Computing & TVs

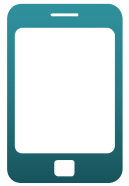
Computing that packs more punch

Mobile experience, meet TV

High



Mid



Powerful mobile performance

Entry

Where essential mobility starts

Accelerating Global Growth of 3G Smartphones

QRD

11
Launches

70+
Designs in the Pipeline

40
OEM/IDHs

Source: Qualcomm data

Non-Handset Devices

The Evolving Computing Opportunity

Over 650M

Mobile PCs and Tablets
Estimated to Be Sold in 2016

Source: *Gartner, Strategy Analytics and ABI; Average, Mar'12*

The Evolving Computing Landscape

Mobile Architecture Drives Improved User Experience and Form Factors

snapdragon by Qualcomm s4

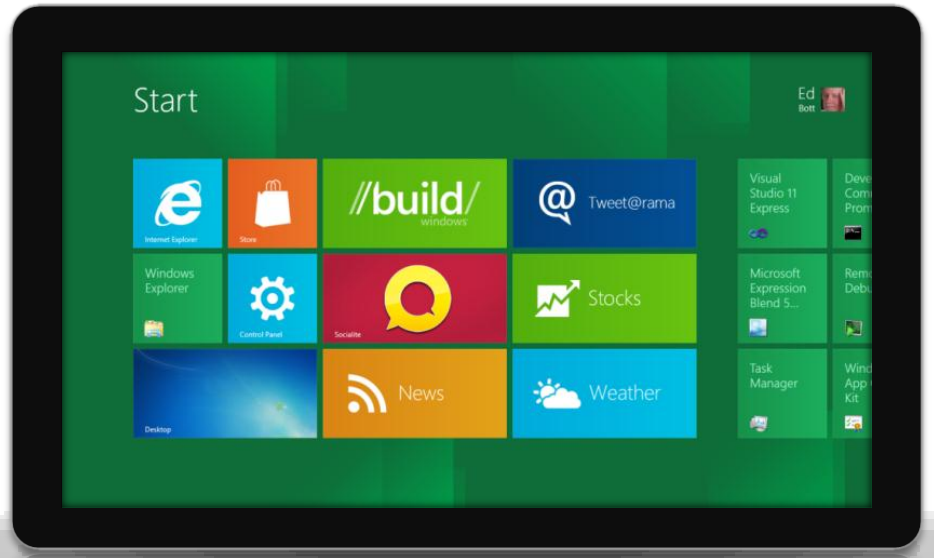
Windows RT

Snapdragon Leadership: Windows

Snapdragon Powers Windows

The Only Processor That Powers Windows Phone…

…And Spans to Power Windows RT



snapdragon™
by Qualcomm

Expanding Mobile Broadband Opportunities

Non-handset Mobile Broadband Device Shipments Expected To Grow At ~40% CAGR From 2010–2015

Sources: CAGR is based on average of ABI (September 2011), In-`Stat (June 2011), Informa (June 2011), Strategy Analytics (July 2011), Gartner (September 2011). Devices include USB modems, embedded notebooks/netbooks, MiFi routers, tablets, e-readers, gaming consoles, CE devices (portable navigation devices, portable media player, digital still cameras, digital camcorders), and M2M (telematics, utilities, security, tracking, healthcare, retail).

Addressing the Energy Gap

With Low-power, Sunlight Viewable, Color Mirasol Displays

Bambook Sunflower

China

Hanvon C18

China

Kyobo eReader

South Korea

Koobe Jin Yong Reader

Taiwan

mirasol™

Emerging Regions

Bridging the Digital Divide in Emerging Regions

12%
PC Installed Base

5%
Fixed Internet Penetration

78% Mobile Penetration

Source: Gartner (March 2011), Wireless Intelligence (Jan. '12), WBIS+ (Jan. '12).

Drivers for 3G Growth in Emerging Regions

3G Network Rollouts

Affordable Smartphones

Data Demand

~1.6B

New 3G Connections Forecasted in Emerging Regions by 2016

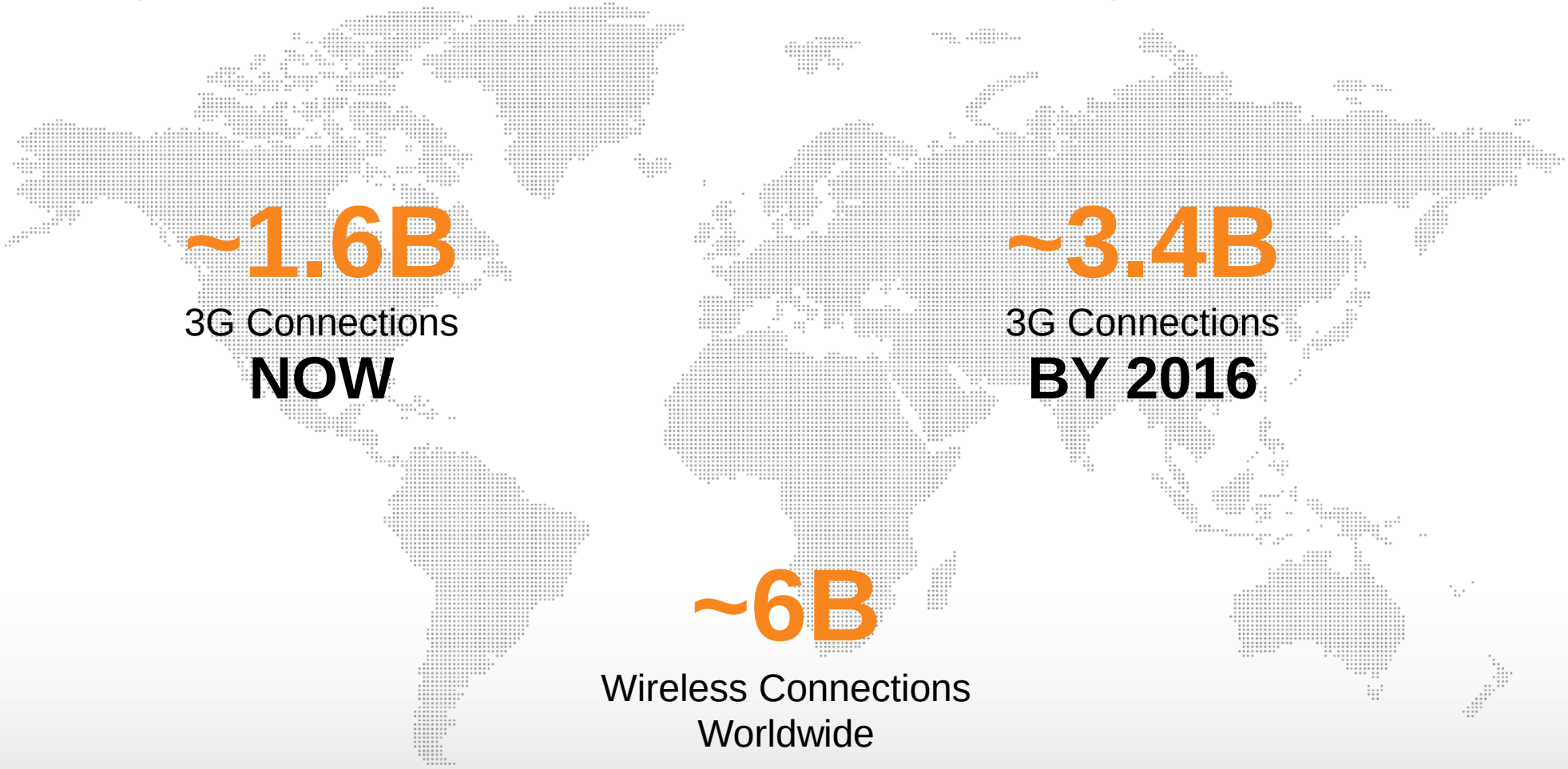
Source: Wireless Intelligence (Feb. ‘12)

Video Placeholder: Partner Video (from China and India…)

Advanced Network Technology Adoption

The Biggest Platform in the History of Mankind

Approximately 1.8B New 3G Connections to be Added by 2016



Source: Wireless Intelligence (Feb. ’12)

Data Traffic Growth

Mobile Data Traffic
Projected to Grow

10–12x*

from 2010–2015

Potentially

1000x**

from 2010–2020

* Strategy Analytics 2011 ** DoCoMo, 11/2010

Qualcomm is Leading LTE Technology

Already on Third Generation of LTE

2010

World's First
LTE/3G Chipsets

2011–2012

Second-generation
LTE Multimode Chipsets

**World's First Integrated
LTE/3G Mobile Chip**

2012–2013

Third-generation LTE
Multimode Chipsets

All Multimode, All Bands, Performance Evolution

Macro/WAN

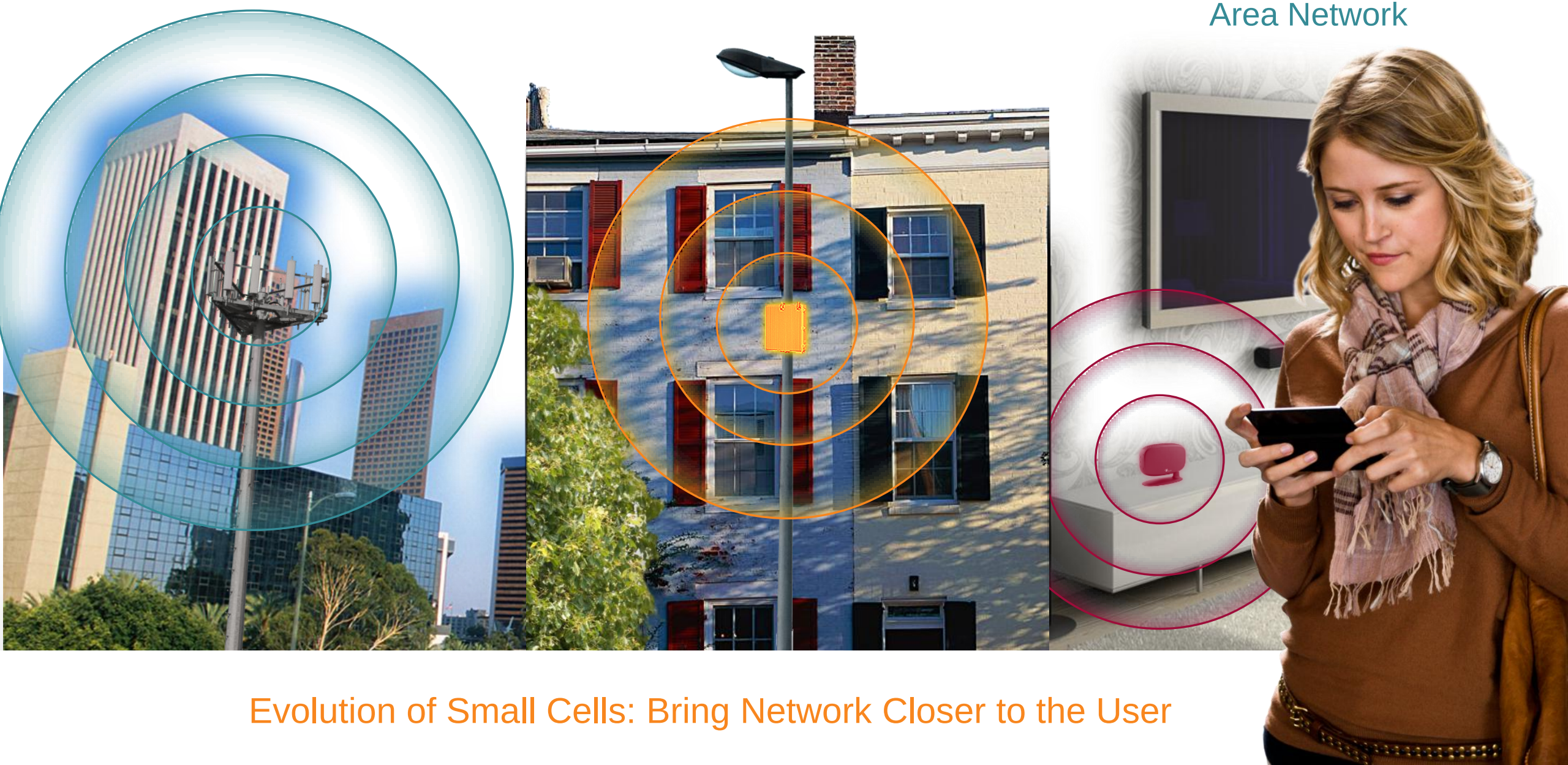
Cost Effective Wide Area Solution

Pico/Metro

Very Low-cost Targeted Solution

Femto/LAN

Extreme Low-cost Indoor Local Area Network



Evolution of Small Cells: Bring Network Closer to the User

Small Cells Everywhere

Lower Cost and Size

Modem Leadership Across Multiple Device

Delivering Fast, Reliable, Seamless Voice and Data Performance

gobi by Qualcomm™

Mobile

Computing

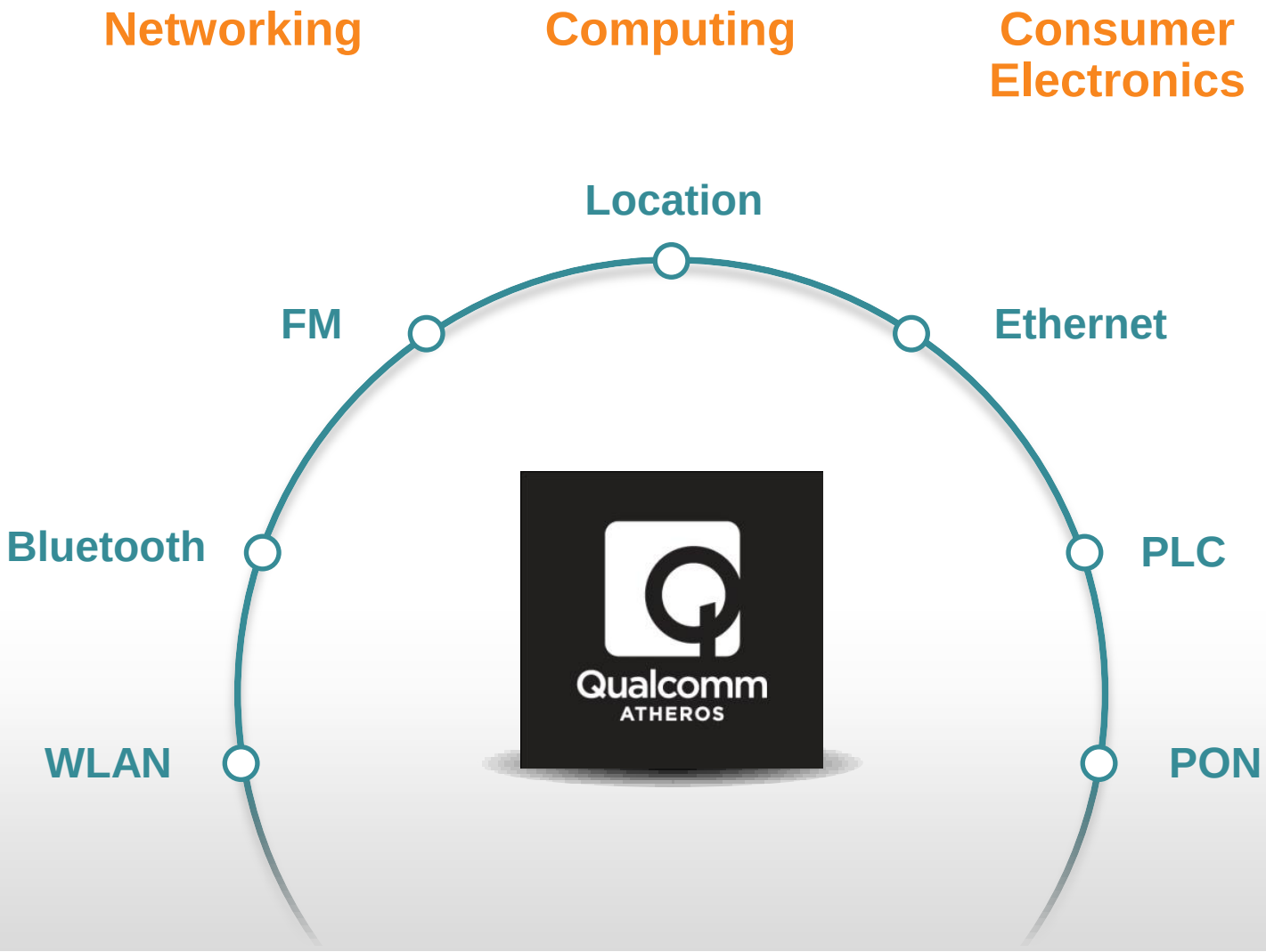
Internet of Everything

Networking

Gobi™ 3G, 4G, and 4G LTE Multimode Modems

Connectivity

Qualcomm Atheros: Enhanced Connectivity, New Channels



The Internet of Everything

The Connected Home

Wireless + Wired

MORE

Content | Devices | Services

Connected Car

Navigation Services

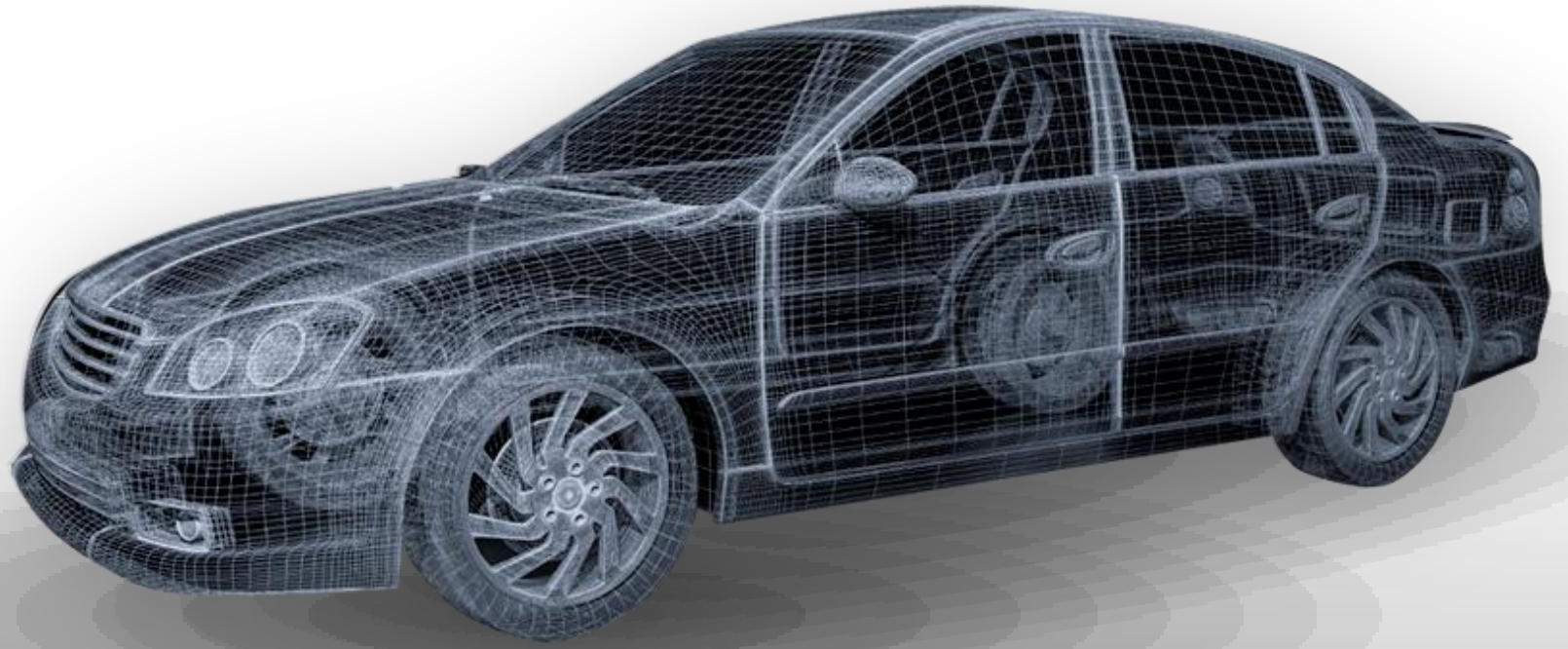
Safety and Security

Application Downloads

Content Streaming

Mobile Hotspot

Wireless EV Charging



QUALCOMM LIFE
a Qualcomm company

2net™
by Qualcomm Life

Consumers

Insurers

Care Providers

Digital 6th Sense

Smart Connected Experience—Our Growing Opportunity

Qualcomm Platform Approach

Application Processor

Multimode Modem

Connectivity

Development Tools, Enabling Technologies and Value-Added Software

Thank you

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Platform Strategy & Ecosystem Approach

Rob Chandhok
SVP & Pres, QIS, Pres, QuIC
April 2012

QUALCOMM®

Snapdragon™ Processor System Spans Hardware, Software, Services, and Ecosystem Tools

Leading Hardware

Drivers & Optional Advanced Features Software

High Level Operating System

Qualcomm Reference Designs

Enabling Technologies

HW & SW Development Tools & Customer Support

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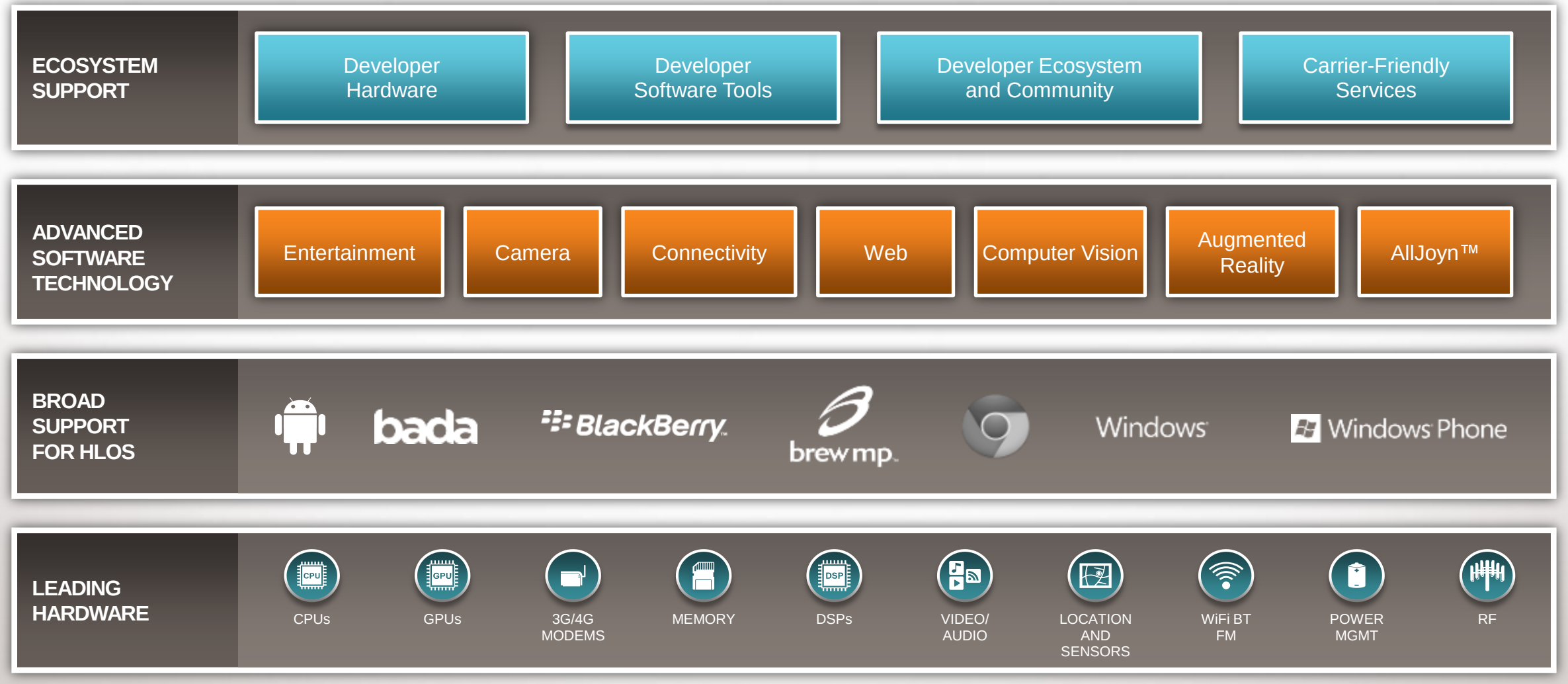
The Snapdragon Processor System Spans Hardware, Software, Services, and Ecosystem Tools



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Innovating new “Enabling Technologies”….

Web Technologies

- Accelerating and enabling a better Web experience

AllJoyn™

- Proximity based peer-to-peer networking

Computer Vision

- Understanding images from the real world to produce symbolic information

Augmented Reality

- Immersive and interactive mobile experiences

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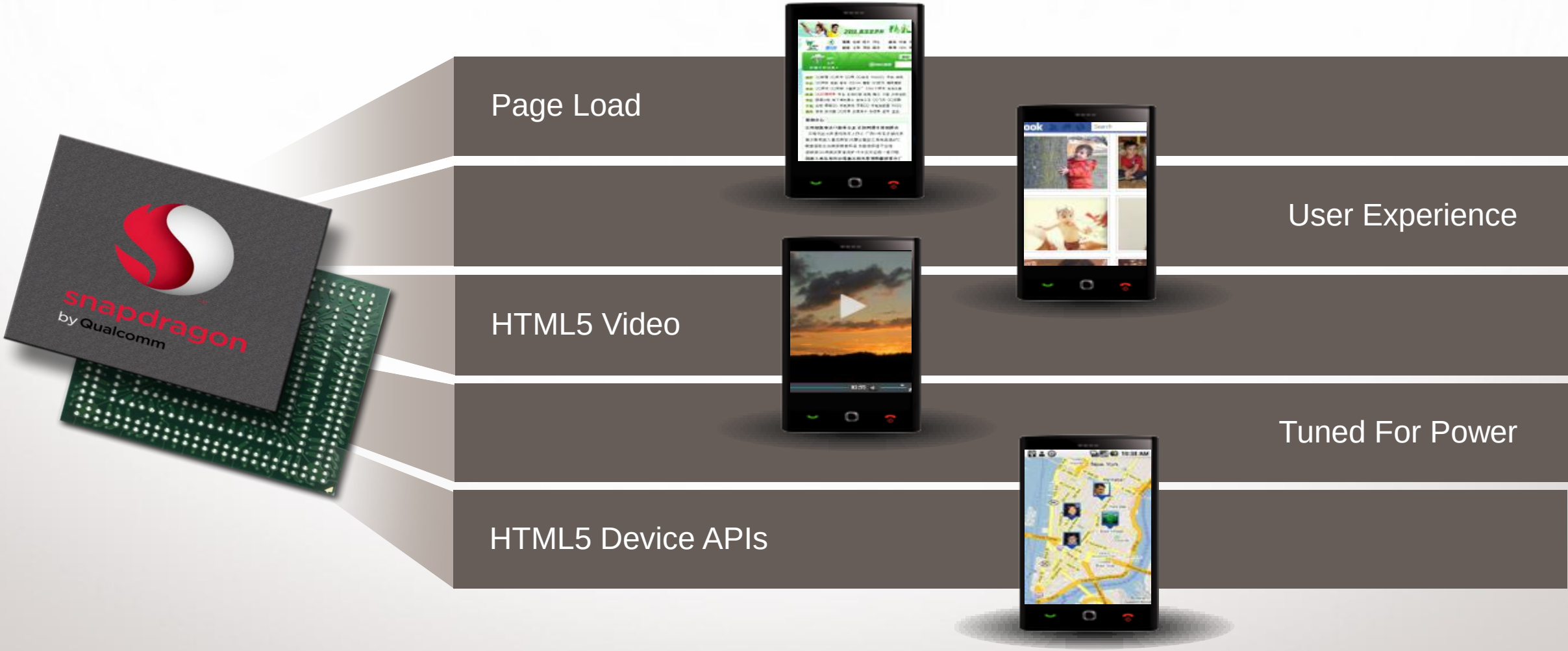
Accelerating and Enabling a Better Web Experience



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Web Optimizations Enable a Better Web Experience

30% faster average page download[1]

12x more objects rendered using Facebook JSGameBench[2]

12% faster Web browser performance using Google V8 benchmark[2]

41% better overall Web browser performance using Vellamo benchmark score[2]

Page Download

User Snappiness

Multimedia Streaming

Power Optimization

Enhanced Capabilities

Source: Tests performed by Qualcomm Innovation Center, Inc., February 2012

[1]Tested with 30 sites on WWAN and consistent environment on Qualcomm MDP8960 between optimized and stock Android 4.0.

[2] Comparing Snapdragon dual core S4 to competitor's quad core

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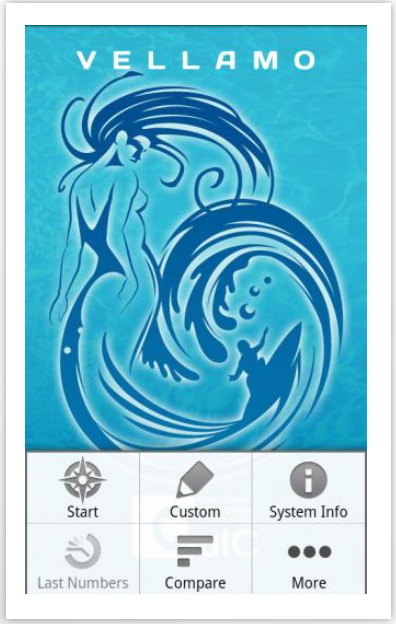
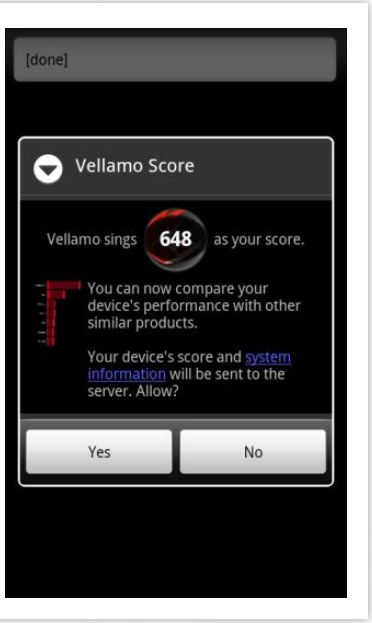
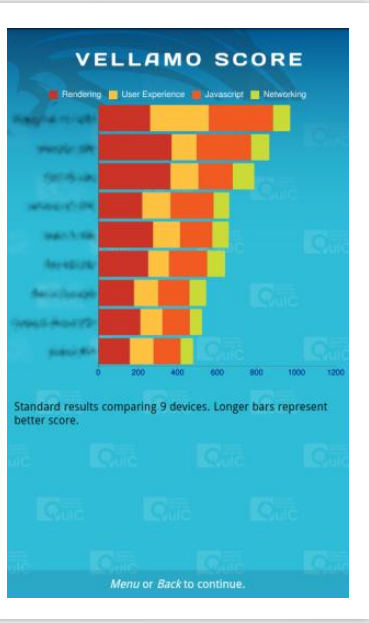
Browser Performance Measurement

Industry's First Mobile Browsing Benchmark







VELLAMO

Available for download at https://market.android.com/details?id=com.quicinc.vellamo
and at http://www.appchina.com/market/berry/search.action?q=vellamo

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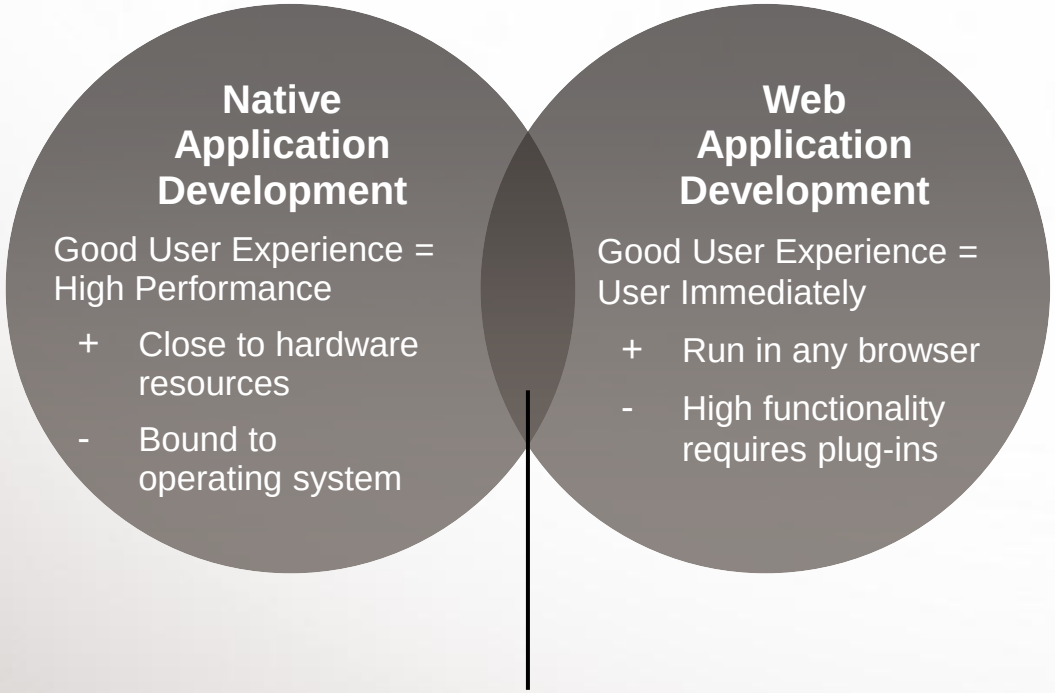
Web Apps: State of the Nation

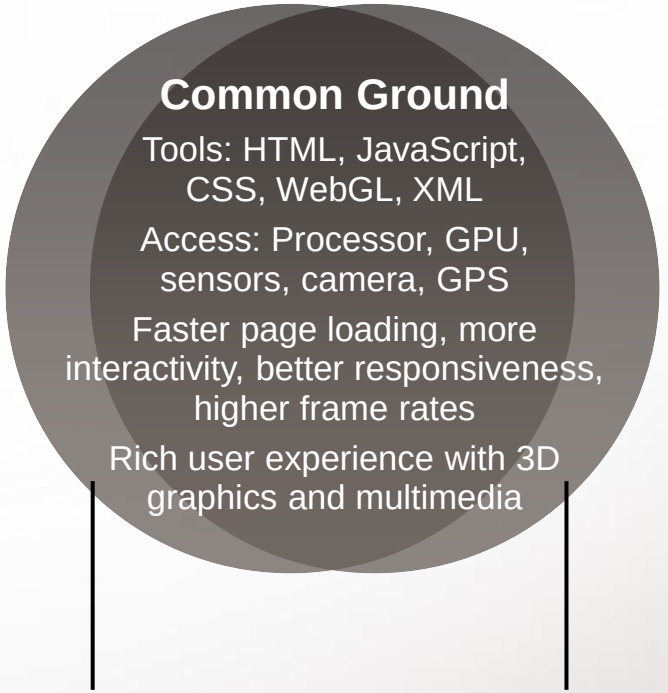
Current Mobile Applications Paradigm



Common Ground

Always On,
Always Connected

Future Mobile Applications Paradigm



Native

High-performance,
Function-specific
Applications

Web

Simple Web-only
Applications
(Search, Browsing)

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Enabling Rich Web App Device APIs

- Leading HTML5 device API enablement
- Basic APIs based on W3C
- Extended APIs unique to Snapdragon Processors

Today

Camera
- Zoom
- Filter effects
- Image Detection

Web Audio
- Capture
- Pitch
- Rate

File System
- Read/Write
- Copy/Move
- File Manager

Notifications
- Ambient
- Interactive
- Persistent

Future

Location +
- Single-location
- Geofencing
- Proximity alert

Sensors +
- Orientation
- Pitch
- Direction/Speed

Augmented Reality
- Image targets
- Frame markers

Proximity
Peer 2 Peer
- Discovery
- Security

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Snapdragon Processor Brand Rollout

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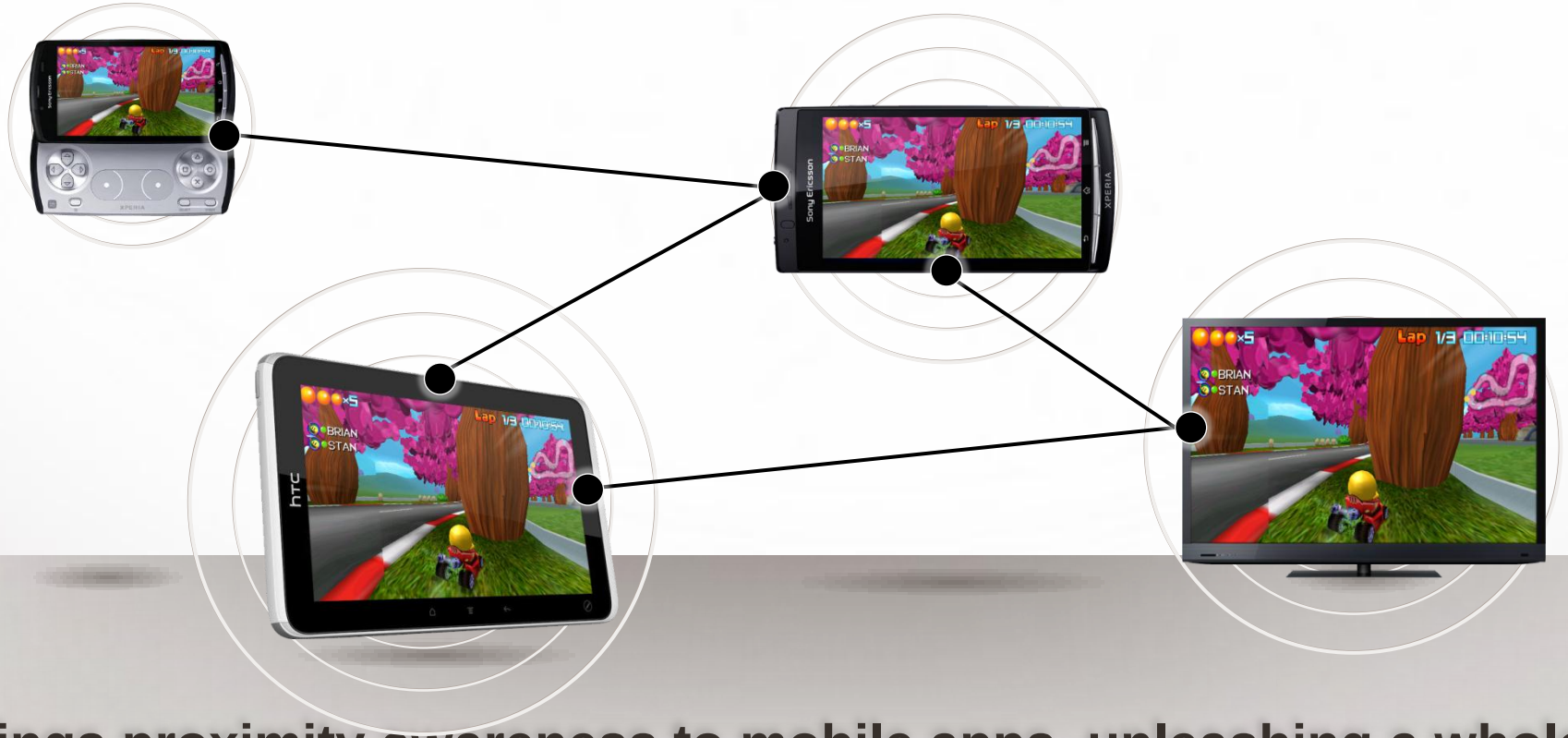
What Is AllJoyn™?

A Qualcomm Innovation Center Open Source Application Development Framework to Enable Ad Hoc, Proximity-based, Peer-to-peer Networking



AllJoyn brings proximity awareness to mobile apps, unleashing a whole new set of user experiences to smartphones, tablets, PCs, TVs, and more

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Why Peer-to-peer (P2P) Is Difficult

P2P Friction Developers Face Today

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Proximal Peer-to-peer with Snapdragon Processors has Huge Untapped Potential

Entertainment & Gaming Experiences

Multiscreen Experiences

Collaborative Experiences

Opportunity to help OEMs & Developers Differentiate with New, Custom Experiences Based on Proximity Awareness

AllJoyn Ushers in New User Experiences for Snapdragon-powered Smartphones, Tablets, PCs & TVs

Games

Office apps

Social networking

Imaging apps

TV connections

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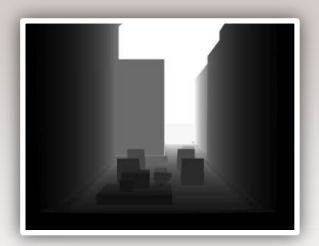
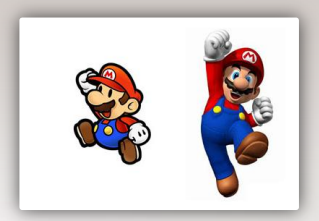
Computer Vision

Augmented Reality	Gestures	Background Subtraction	Panoramic Photography	Face Recognition	Text Recognition

Computational Photography	Adult Content Blocking	Depth Mapping	CV with Active IR Camera	2D to 3D Video Conversion	Image Stabilization
					

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High-performance Optimized Apps: Vuforia™

Create Compelling Mobile Augmented Reality Experiences

vuforia by Qualcomm

Immersive and Interactive Experiences

- 2D and 3D visual targets
- Support for iOS, Android, and Unity 3D
- Write a single native app that can reach over 400 models of smartphones and tablets

App Considerations

- Gaming
- Media and advertising
- Instructional
- Visual search
- Social networking
- Discovery

Snapdragon Developer Program Tools and Resources

- Vuforia SDK for Android
- Vuforia SDK for iOS
- Vuforia Developer's Guide
- Vuforia API
- Vuforia Licensing and Commercial Terms
- Vuforia Forum

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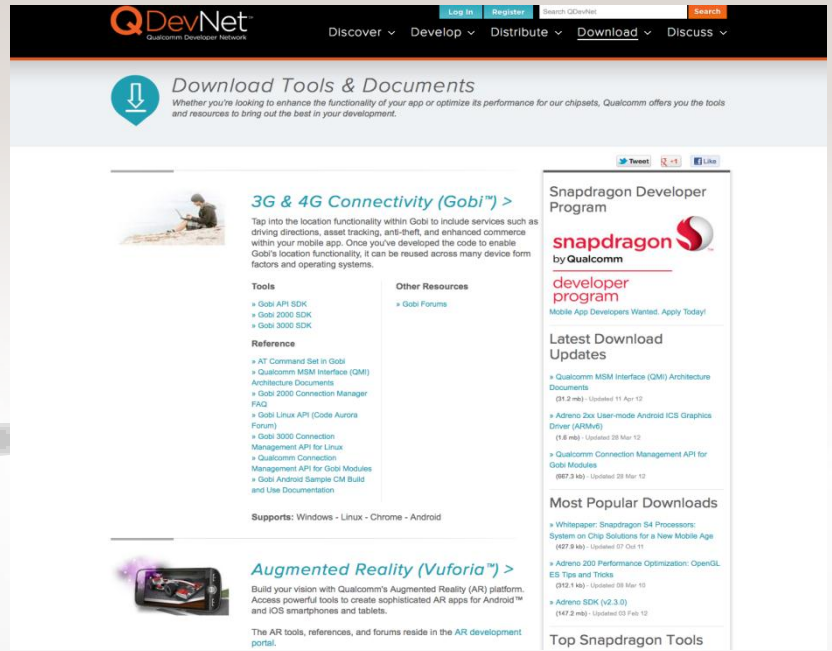
Comprehensive Ecosystem

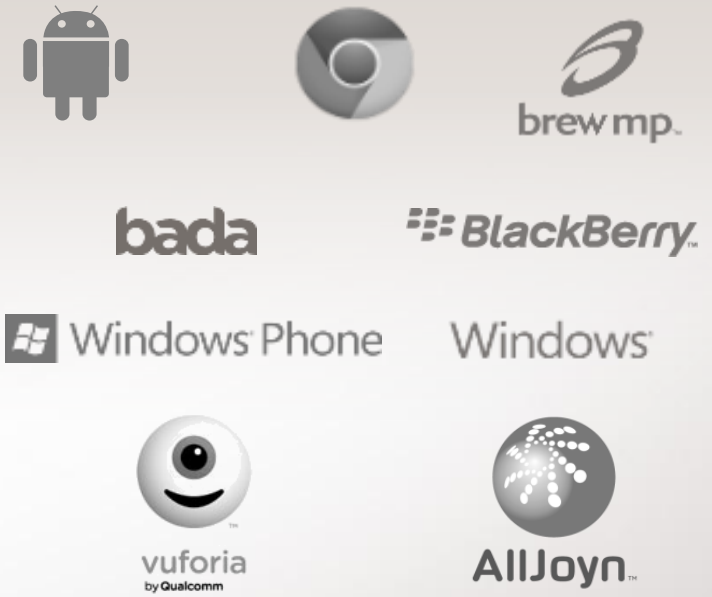
Develop | Discover | Distribute | Download | Discuss

Hardware Tools

Software Tools



Broad Ecosystem Support



Enormous Opportunity for Mobile Developers
Qualcomm Provides the Tools and Support Needed

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Snapdragon Developer Program

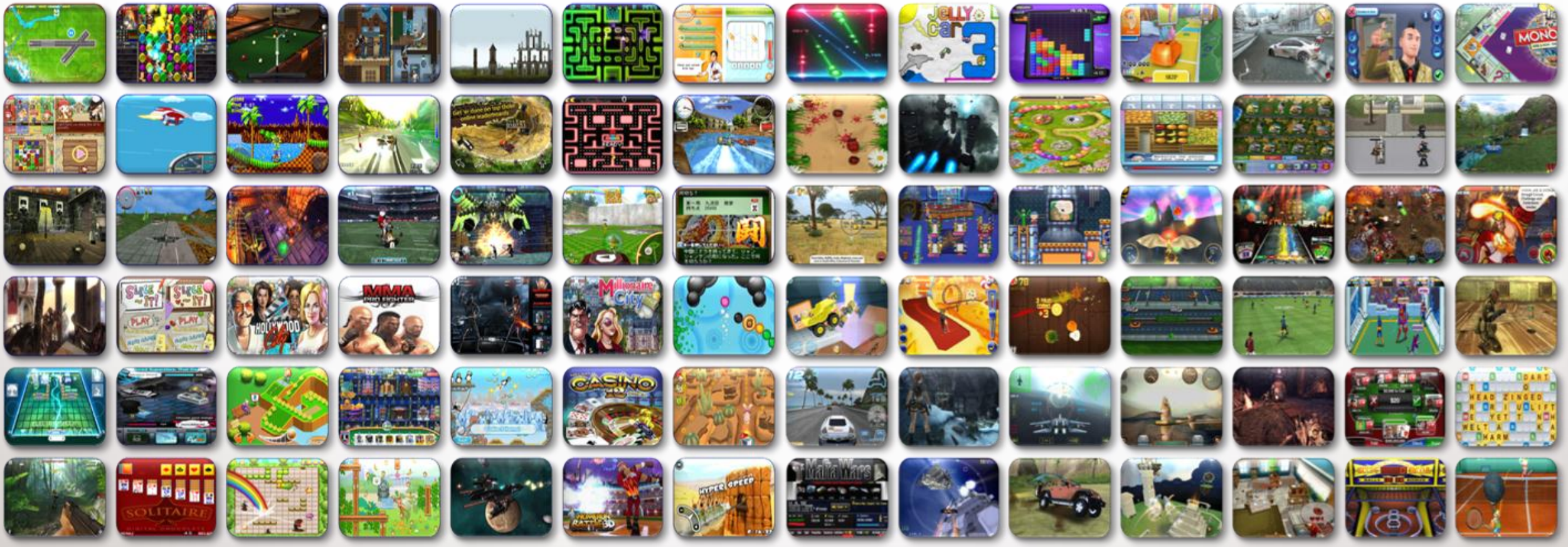
Advanced Software Technology Optimizations

QDevNet™ Qualcomm Developer Network

AllJoyn™	Add proximal discovery and P2P to your app
FastCV™	Add new user experiences into your camera-based apps
Adreno™ Gfx/Gaming	Create the most compelling games and 3D apps in the market
Vuforia™ Augmented Reality	Create compelling mobile augmented reality experiences
Optimized Multimedia	Offload compute-intensive work of video from software to high-definition video processing hardware
HTML5	Create web apps that run like native

Snapdragon Broad Game Developer Support

100+ Games Today, Exclusive Titles



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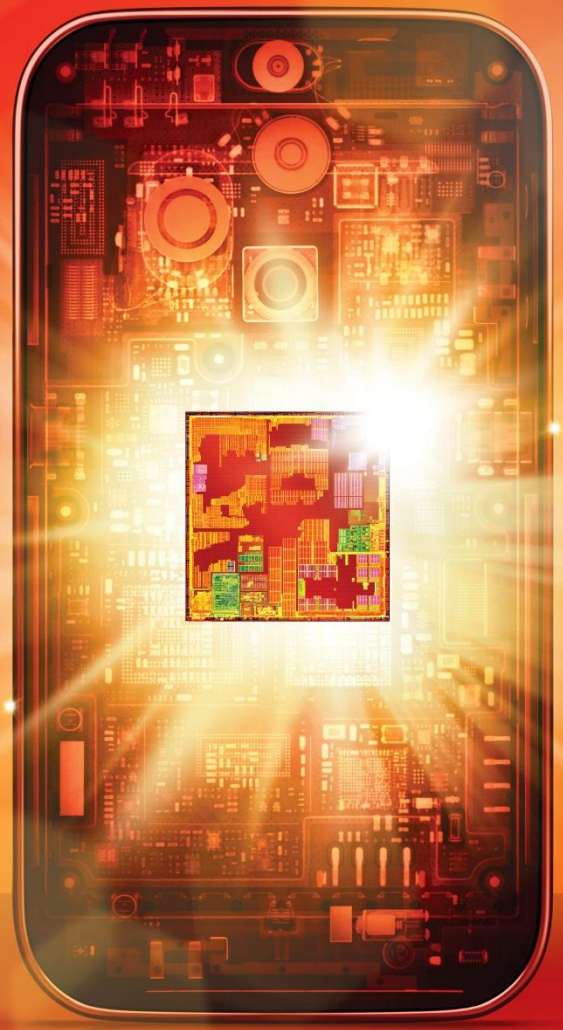
snapdragon
by Qualcomm

The all-in-one mobile processor.

qualcomm.com/snapdragon



Integration Brings Together Diverse Technologies into One Design

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Thank you

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Roadmap Update

Alex Katouzian,
SVP, Product Management
April 2012

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Modem Leadership Across Multiple Devices

Delivering Fast, Reliable, Seamless Voice and Data Performance

gobi by Qualcomm™

Mobile

Feature and Smartphones

Computing

Tablets, Laptops, All-in-One PCs

Consumer Electronics

Gaming, eReaders, DTV, STBs, PNDs

Networking

Switches, Routers, Gateways, PLC

Gobi™ 3G, 4G, and 4G LTE Multimode Mode Modems

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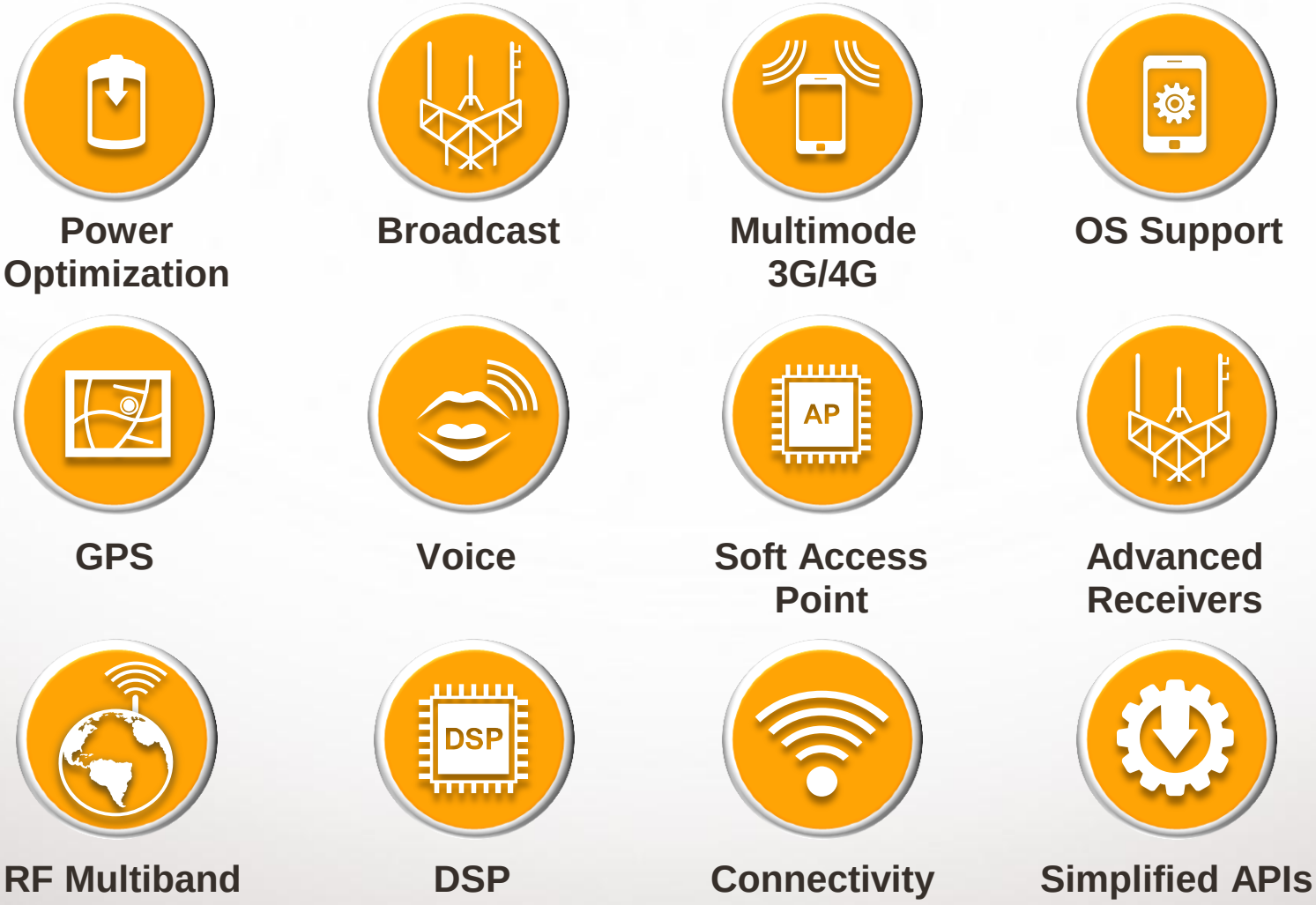
Qualcomm Modems Are Highly Integrated

Built Smarter to Work Smarter



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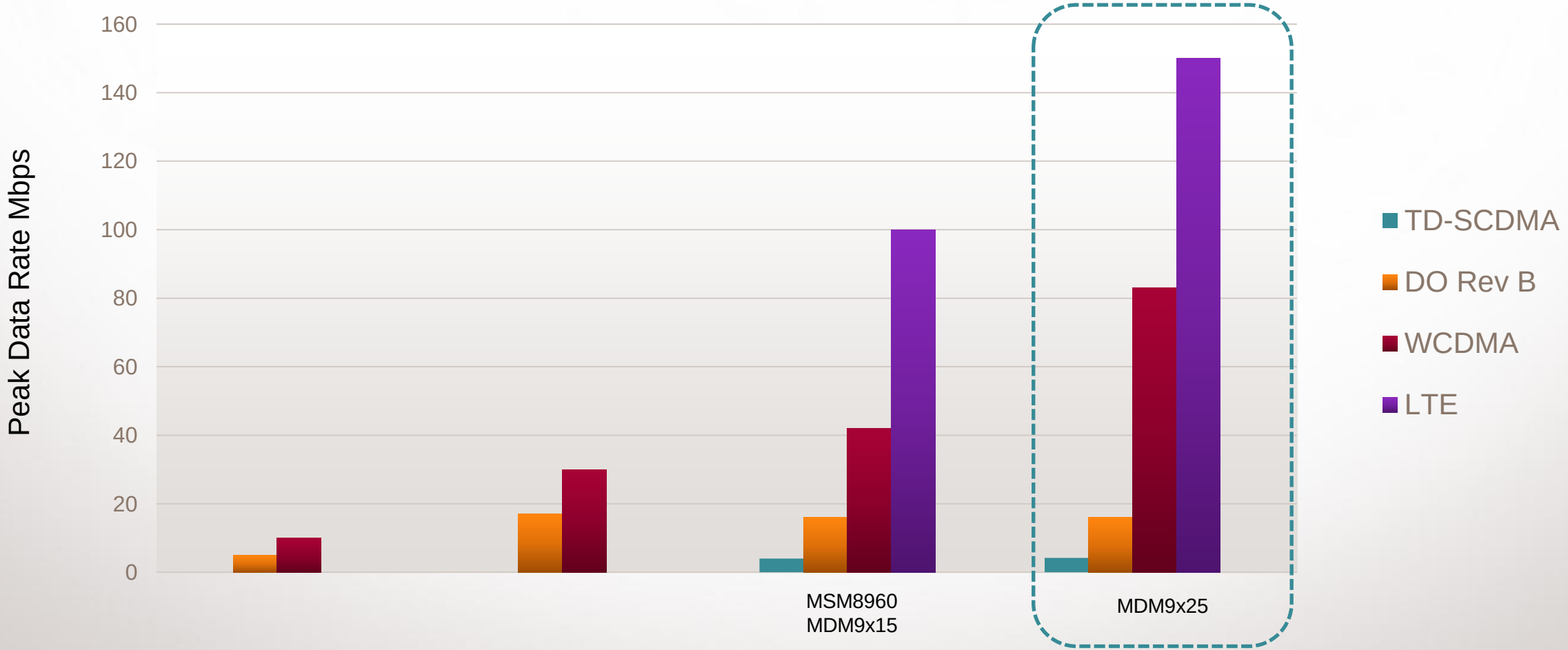
Integrated Multimode Modem Leadership

Qualcomm Modems Support Combination of Highest Data Speeds



Note: LTE example is FDD mode. TDD peak data rates also supported. Source: Qualcomm

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Leading in LTE Technology Development

Already on Third Generation of LTE

First Generation

World's First Integrated LTE/3G Modem Chips

6 modes supported

2010

Second Generation

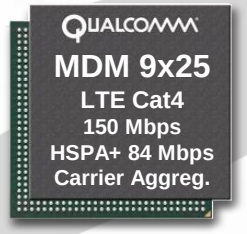
World's First Mobile Platform (8960) with integrated LTE/3G Multimode

7 modes supported: LTE FDD, LTE TDD, UMTS, EV-DO, CDMA 1x, TD-SCDMA, GSM/EDGE

2011–12

Third Generation

World's First Integrated LTE/3G Modem with Cat4 and Carrier Aggregation



2013

All Multimode, All Bands, Performance Evolution

Source: Qualcomm data.

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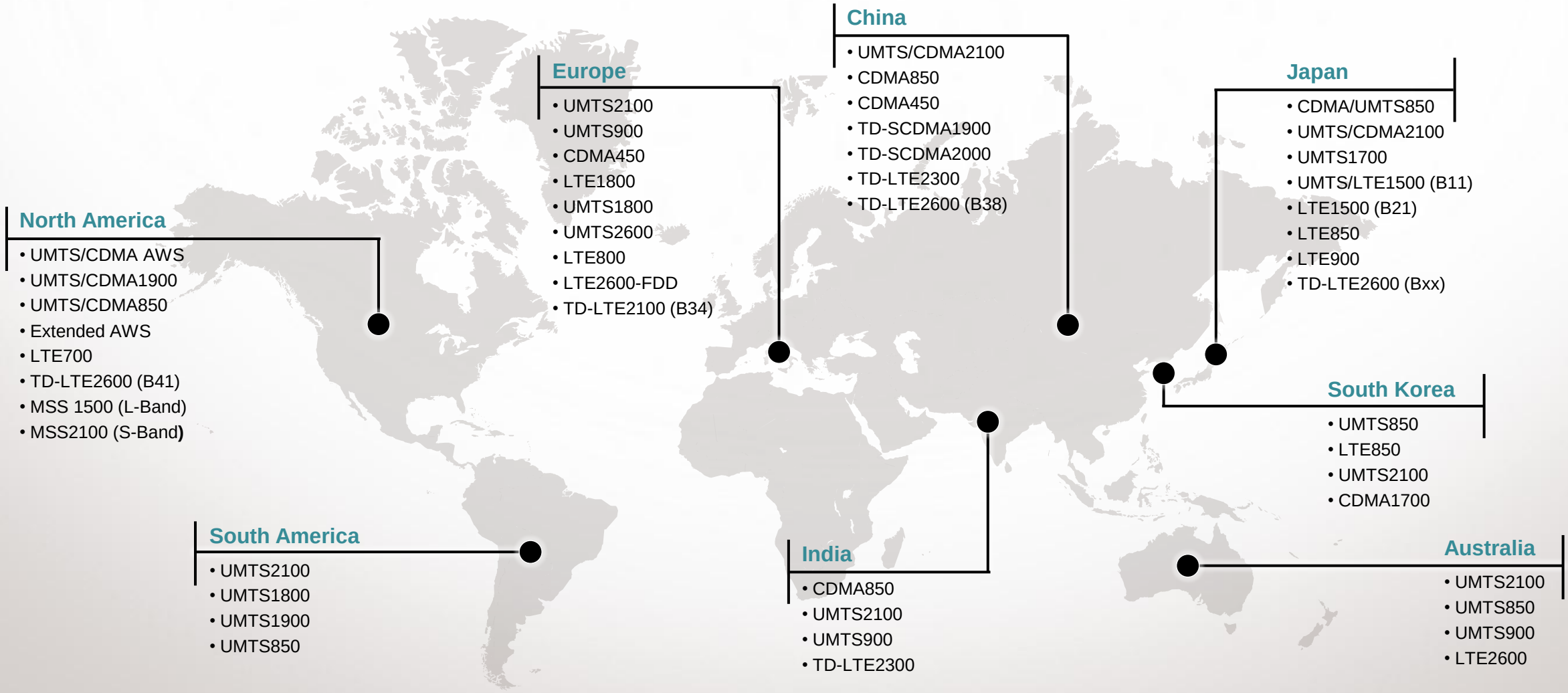
Qualcomm Supporting LTE Multimode Activities Globally

Support for Over 40 RF Bands Required



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MDM9615: Integrated LTE/3G World Mode Chipset

With Seamless Data and Voice Continuity Across LTE/3G

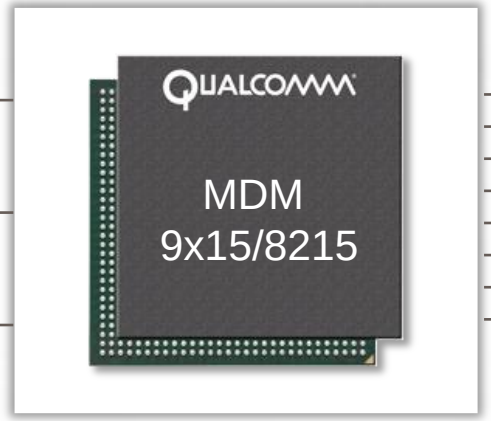
Supports widest range of RF bands

Integrated GPS/GNSS

Seamless WLAN*

LTE Voice Support
(2G/3G CS Fallback, SVLTE VoLTE with SRVCC)

Advanced Receivers
(QICE, QLIC, IC, Rx Diversity)



LTE FDD (100 Mbps DL / 50 Mbps UL)

LTE TDD (68 Mbps DL / 17 Mbps UL)**

DC-HSPA+ (42 Mbps UL / 5.7 Mbps DL)

Rev. B (14.7 Mbps DL / 5.4 Mbps UL)

CDMA2000 1X Advanced

TD-SCDMA

GSM/GPRS/EDGE

MDM9x15/8215 Sampled In November 2011

* With Companion QCA SOC Wi-Fi chipsets | ** Data Rates depend on TDD configurations

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LTE Multicast/Broadcast—Opportunities and Benefits

Drive ARPU and Reduce Cost

Deliver Live Events

- Live sporting events
- Breaking news
- “Must-see” live events
- Venuecasting

Distribute eMedia

- Catch-up TV
- Print media delivery
- Digital signage
- Targeted advertising
- eLearning

Offload Data

- Firmware Over the Air (FOTA)
- Featured applications
- Popular application updates
- Live tickers

Manage Congestion

- Breaking news triggered media content
- Top YouTube video clips
- Machine-to-machine

* for illustrative purposes only

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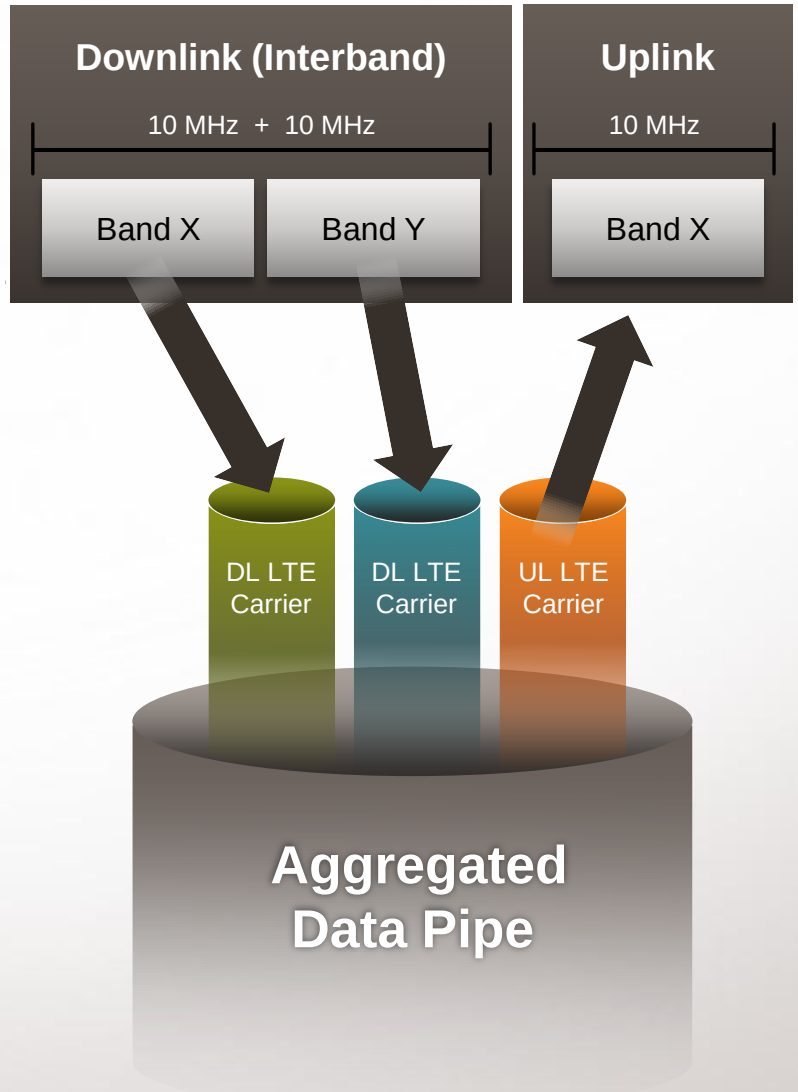
LTE Advanced: Carrier Aggregation

Key to Enabling Maximum Cat 4 Data Rates for Most Operators

- 3GPP Release 10 feature
- Enables higher peak, average user rates
- Combines fragmented LTE spectrum
- 150 Mbps data rates without contiguous 20 MHz
- Over 20 combinations considered in 3GPP
- Lead chipset:



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Snapdragon™ S4 Processors

Snapdragon: The All-in-One Mobile Chip

Standby

Messaging

Make a Call

Find Your Way

Surf the Web

Watch and Stream Movies

Gaming

Adapts to Deliver Unrivaled Mobile Experiences and Longer Battery Life

Note: Simulation for presentation purposes.

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AP Leadership Across Multiple Devices

Delivering Superior Performance at Ultra Low Power

Smartphones

Smartphones

Computing

Tablets, Laptops, All-in-One PCs

Consumer Electronics

Gaming, eReaders, DTV, STBs, PNDs

Snapdragon™ S4 Processors

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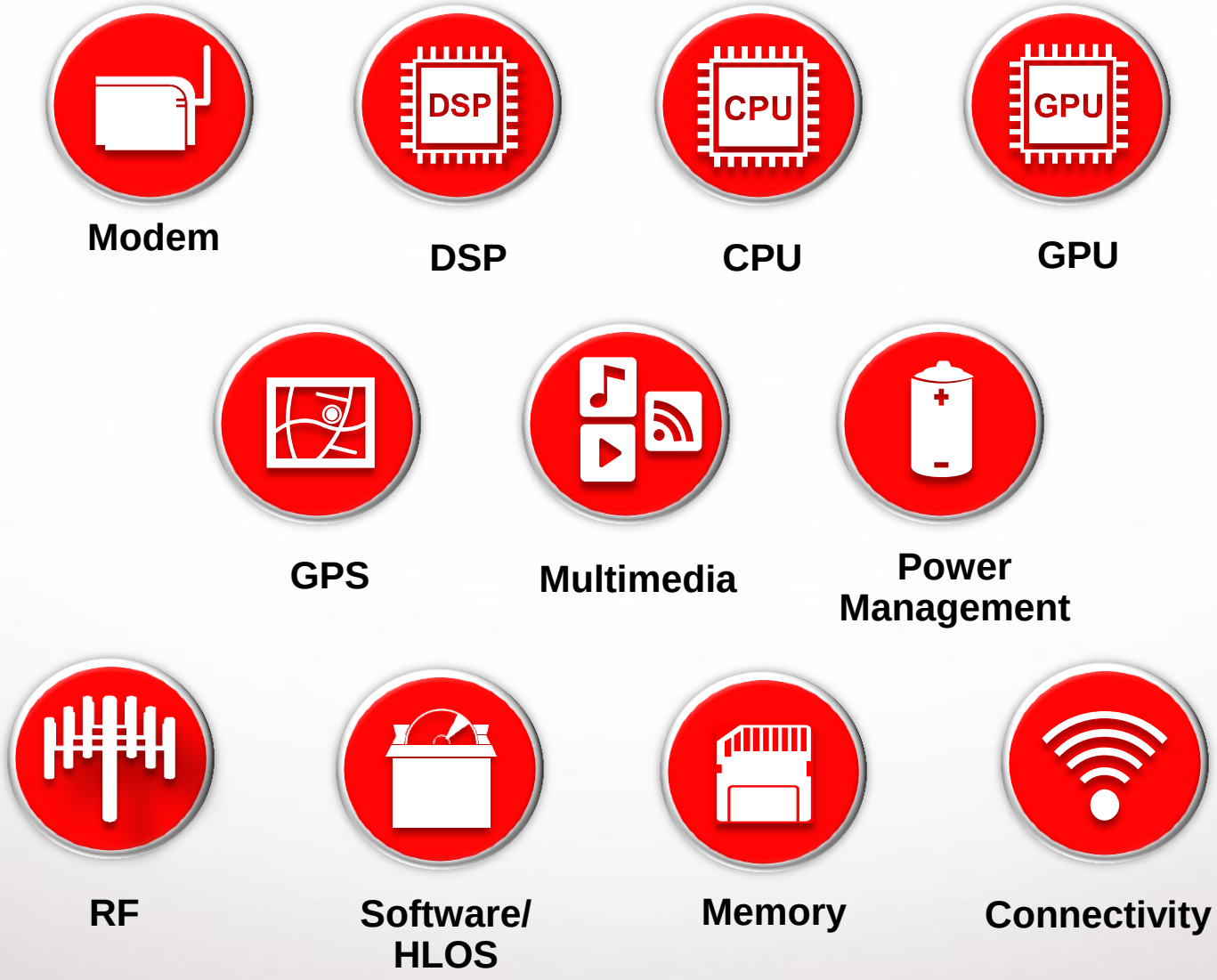
Best in Class Technologies



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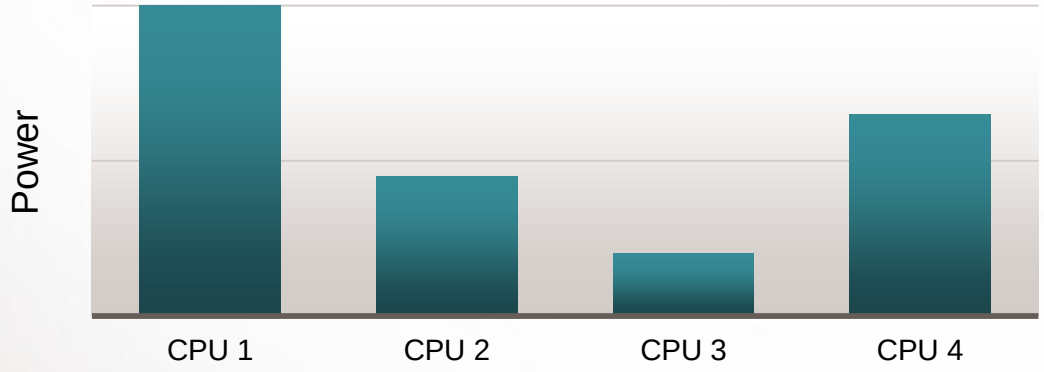
aSMP Advantage

aSynchronous MP

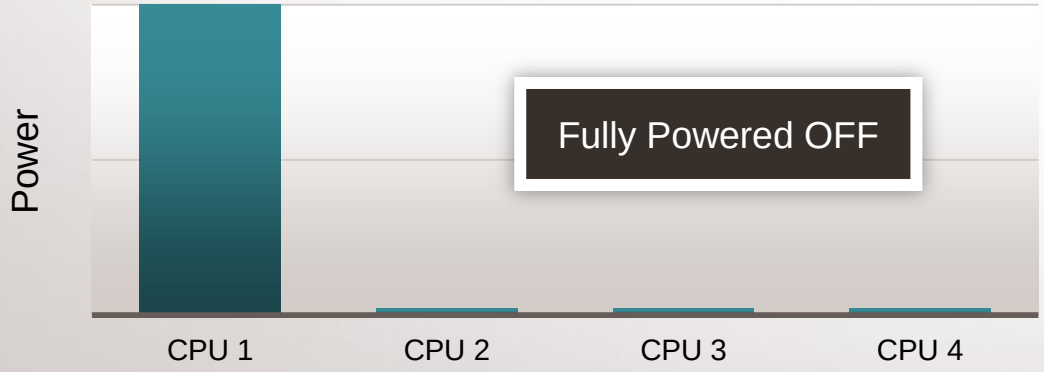
Multithread Mixed Workloads

All Four Cores Powered Up



Single Thread

Three Cores in Standby

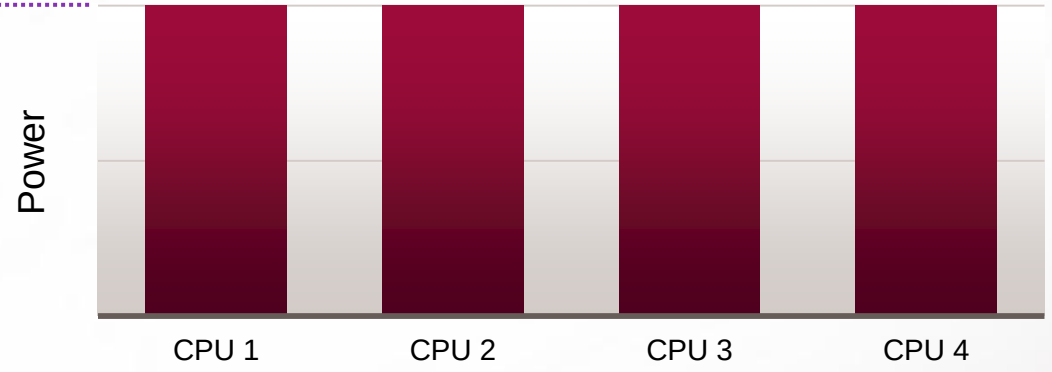


Highest CPU Workload

Synchronous MP

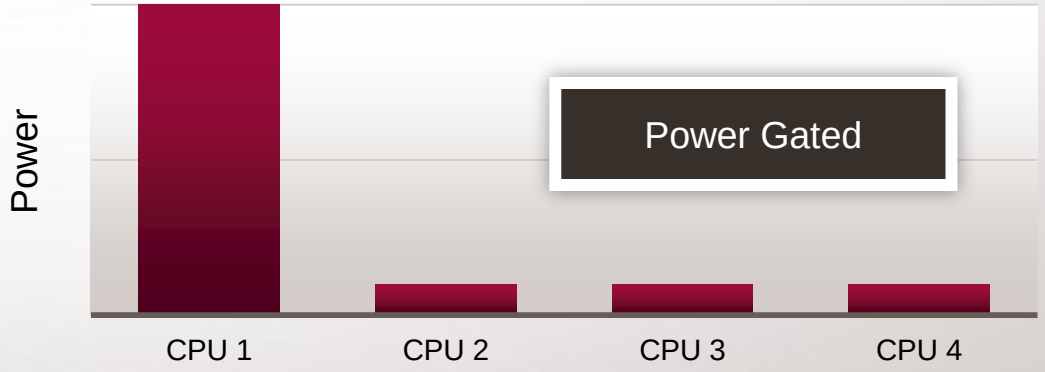
Multithread Mixed Workloads

All Four Cores Powered Up



Single Thread

Three Cores in Standby



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Video Placeholder

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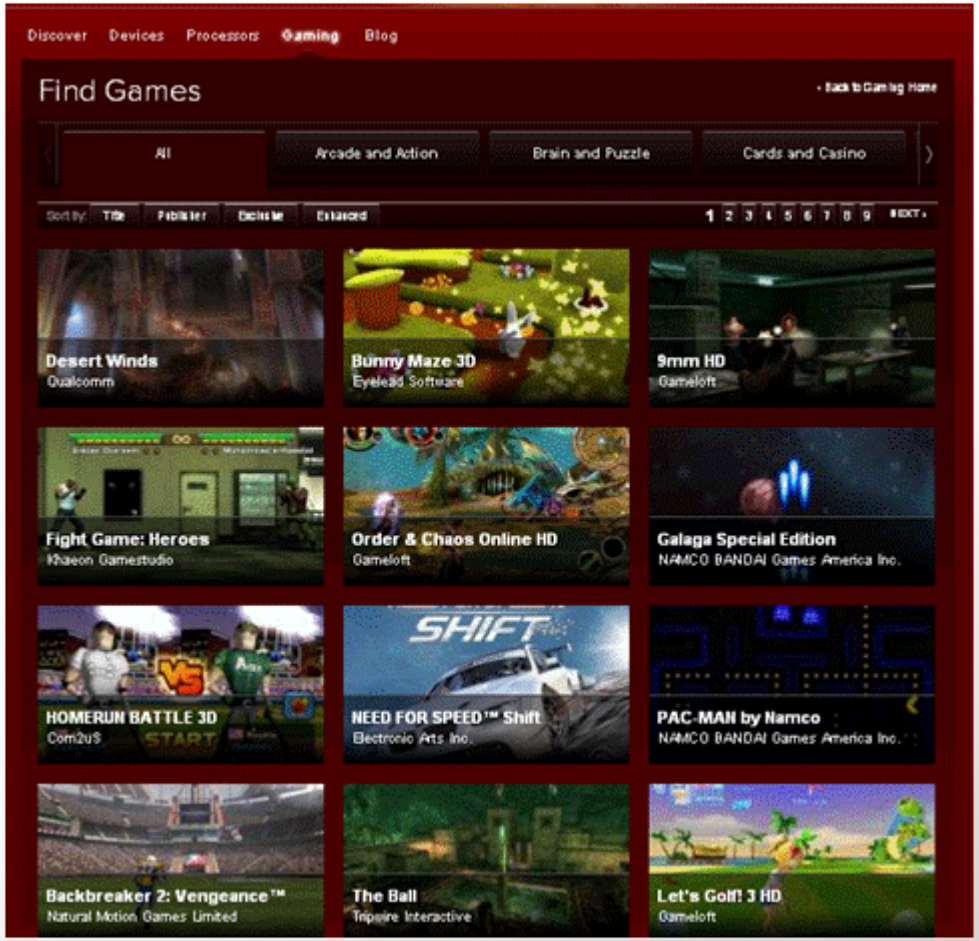
Snapdragon Processors
Broad Game Developer Support

100+ Games Today, Exclusive Titles



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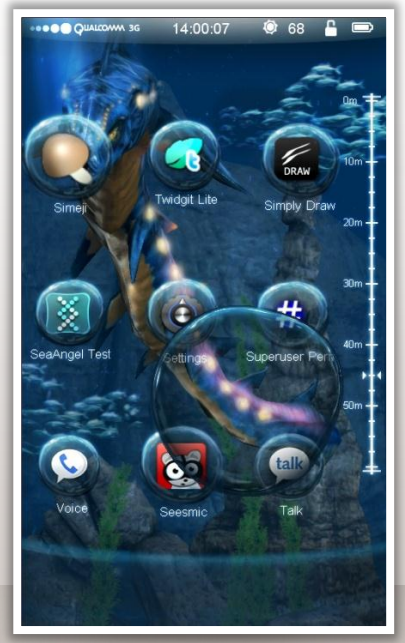
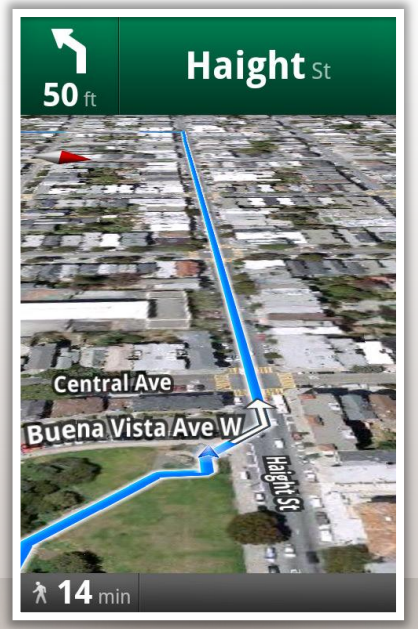
Mobile Apps That Benefit from **Graphics Acceleration**

Web Browsers



User Interfaces

Games



Navigation

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The Next Evolutionary Step: **Adreno 320**

"*Reign of Amira*" from Qualcomm

Adreno 225

- Powerful graphics processing capacity
- Advanced shader effects
- On large HD displays
- At high frame rates

Adreno 320

- 3x the graphics processing capacity of Adreno 225
- More shader effects
- Larger HD displays
- Higher frame rates

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Enabling Immersive Use of Digital Signal Processing

Qualcomm's DSP Access Program

Communications

Augmented Reality

High Definition Audio

Object Recognition

Gestures

Sensor Processing

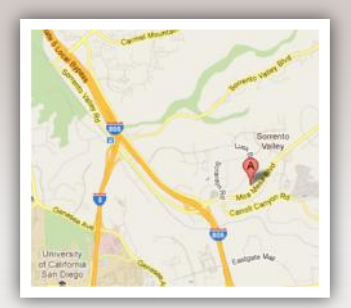

Image Processing

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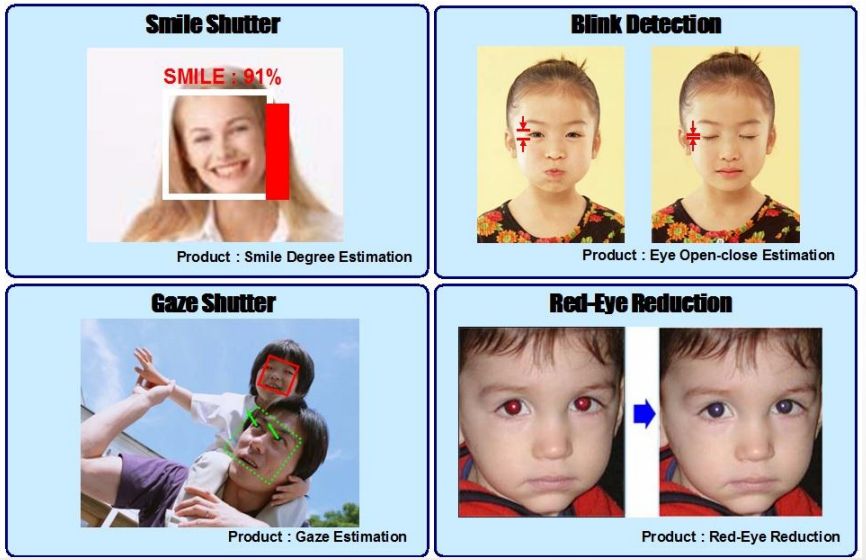
CAMERA

- Multi-shot / Zero Shutter Lag with Scalado Rewind
- Stereo 3D Video Capture and Playback



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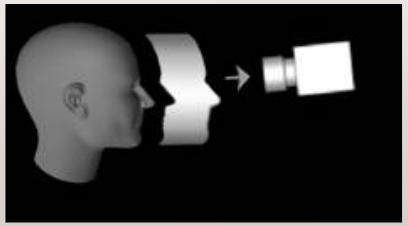
Gestures



- Ultrasonic Processing
- IR Scanning
- Coded/Structured Light Depth Mapping
- Stylus Based Gestures
- Stereo Sparse Depth Mapping
- Time-of-Flight Depth Mapping
- No-Look/Touch Free, Lean Back & Full Body

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SIGNATURE CREATIVE

CONNECTIVITY

- Browser Optimizations/HTML5 Mobile Web
- AllJoyn™

DIGITAL CHOCOLATE

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Video & Display

- 1080p Stereoscopic 3D Video playback
- 2D to 3D Video conversion
- Browser with HTML-5 and 1080p Flash video
- Wireless Display
- CnE Pro
- Flashless Boot
- Gesture Interface

"Samsung is excited to pioneer the mobile HD display revolution using Qualcomm's Snapdragon processor"

Samsung Senior Vice President Curtis Sasaki

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Audio

- Fluence PRO—Dual / Quad Mic Support
- SRS playback
- Ultrasound EPOS Pen
- Active Noise Cancellation

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Security

- Studio Access
- WideVine™

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Snapdragon S4 Processors: A Comprehensive Roadmap

Solutions for Smartphones, Tablets, TVs and Computing Devices

Mobile Experience, Meets TV

- S4 MPQ8064

Computing that Goes the Distance

- S4 APQ8064
- S4 Pro MSM8960T

Powerful Mobile Experiences

- S4 MSM8960
- S4 APQ8060A
- S4 MSM8660A
- S4 MSM8260A
- S4 MSM8930
- S4 APQ8030
- S4 MSM8630
- S4 MSM8230
- S4 MSM8627
- S4 MSM8227

Where Essential Mobility Starts

- S4 MSM8625
- S4 MSM8225

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Continued Snapdragon Innovation

S1	S2	S3	S4
1st 1Ghz CPU	1st to 1.4Ghz CPU	1st aSMP Dual to 1.5Ghz	1st Next Gen Architecture w. LTE 1.7Ghz
2008	2010	2011	2012

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Thank you

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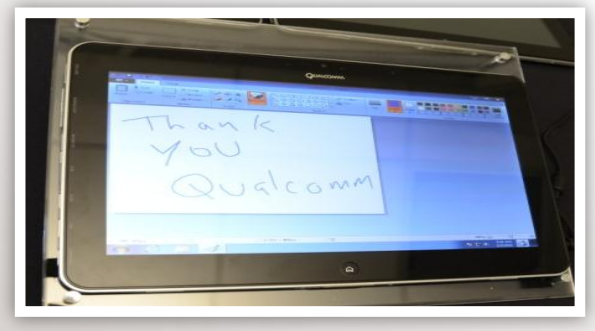
Windows RT on Snapdragon™ Processors

Terry Yen
VP, Business Development
April 2012

QUALCOMM®

Deep Collaboration with Microsoft for Windows® RT

- Extensive technical collaboration with Microsoft
- Development collaboration on new SW architecture & interfaces to take advantage of Snapdragon™ SoC
  - Power, modem, DX gfx, security, multimedia, connectivity, browser,…
- Chipset roadmap alignment with Windows RT
- Collaboration on reference hardware to enable the full vision of Windows RT



Nov. 2010 - 1st boot of Win8 on Snapdragon/8660

Sep. 2011 – MSFT Developer's Conference BUILD Keynote Demo on QT8660

Qualcomm Reference Tablet for MSFT "Hardware Seeding" Program Q1 '12

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Unique Snapdragon Value Propositions in Windows RT

Thin, Light Form Factors for Tablet and Clamshell PCs

Superior level of SoC integration coupled w/ low power system level design leads to thin, lightweight, and smaller board area designs

Exceptional Battery Life for Mobile Devices

Unique independent CPU control, real-time content adaptive backlight control plus low power system design

Fast Responsive UI of the ARM Devices

2nd gen custom, ARM compliant CPU provides superior performance

Advanced Mobile WWAN Connectivity

4G LTE with multimode support enables worldwide coverage w/ same solution

Rich Multimedia

Unique offerings with Dolby and SRS audio processing, Quad mic noise cancellation, ultrasonic stylus pen, multi-satellite GPS support

Comprehensive End-to-End Solution

- Industry-proven best-in-class chipset solutions w/reference hardware platform
- Comprehensive software package
- World-class tech support and tech documents

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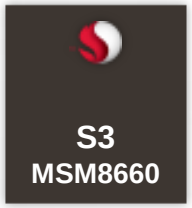
Microsoft Windows RT Key Updates

- WoA full steam ahead to launch same time as x86
- Metro Apps in the Windows Store will be able to support both Windows RT and traditional Windows on x86/64
- Windows RT can support all new Metro style apps, including apps from Microsoft for mail, calendaring, contacts, photos, and storage. Windows RT also includes industry-leading support for hardware-accelerated HTML5 with Internet Explorer 10
- Windows RT includes desktop versions of the new Microsoft Word, Excel, PowerPoint, and OneNote
- With Windows RT you can look forward to integrated, end-to-end products—hardware, firmware and WoA software, all built from the ground up
- New power state in Windows RT will bring an always-on, always-connected experience to Windows 8 when paired with a 3G/4G modem

Snapdragon Roadmap for Windows RT

First Generation

Dual Core Scorpion for
WinRT Development

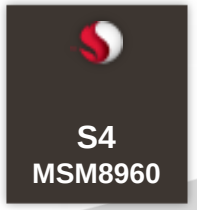


In Production

2011

Second Generation

Dual Core Krait
First to 28nm Fully Integrated SoC
for Windows RT Deployment

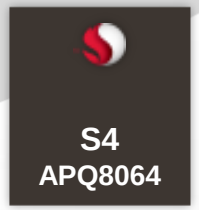


In Production

2012

Third Generation

Quad Core Compute Processing for
Multi-threaded Apps



Commercial June ‘12

2012/2013

Roadmap will support device breadth and depth across multiple OEM’s

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Thank you

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QUALCOMM®

IAR Asia Summit

Qualcomm Reference Design

Jeff Lorbeck
Sr VP, Product Management
April 2012

QUALCOMM®

Entry Level Smartphones Will Drive Future Mobile Growth

The mass migration from 2G feature phones to 3G smartphones in emerging regions requires innovation across the supply chain including low cost designs, simplified engineering and massive scale manufacturing

2G Feature Phone

3G Smartphone

Significant Smartphone Growth

Fastest in Emerging Regions

2010 Developed Regions

~0.3B units

2015 Emerging Regions | Developed Regions

1B+ units

Emerging Regions Projected to Be **50%+** of Smartphone Shipments in 2015

Source: Gartner (October 2011), regions defined by Qualcomm

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QRD Brings Real Value to Real People…

- Simplified process and engineering savings
- Accelerated Time to Market
- Feature innovation and differentiation
- Dedicated engineering support for customers
- Qualcomm quality across QRD portfolio

...By Delivering a Genuine Qualcomm Reference Design

A comprehensive handset development platform and ecosystem program providing tested and verified hardware and software components for rapid delivery of commercial high-volume smartphone devices with unique and differentiating user experiences

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QRD Addresses Critical Needs

A pre-engineered solution that combines strong support, flexibility and scale with...

Reduced Time to Launch

- Accelerated design and engineering
- Comprehensive HW and SW options: use as-is or customize
- Growing track record of introduction success

Minimized Non-recurring Engineering

- Provides significant savings on non-differentiating componentry
- Incremental investment can be focused on differentiation
- Allows maximum return on engineering investment

Design Flexibility and Feature Innovation

- Preferred vendor list of key HW components
- Third-party component lab, IHV lab, and ISV lab
- Rich software and ecosystem support

Broad Portfolio Enablement

- Support for worldwide cellular i.e. CDMA, WCDMA, Multimode
- Compatibility across HW/SW
- Full tier support for entry-level, low, mid, and beyond

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Reduced Time to Launch

Pre-Engineered Solutions Available Across Portfolio

Hardware Solutions

- Broad offering of components and drivers
- Preferred vendor list
- Complete component testing
- Manufacturer access to documents and tools
- **https://qrd.qualcomm.com**

Software Solutions

- Wide variety of pre-tested applications
- Fully optimized for power and resource utilization
- Proven complete SW platform

Ecosystem Solutions

- Download SDKs (e.g., AllJoyn)
- Development resources
- Forums
- **https://developer.qualcomm.com**

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Minimized Non-recurring Engineering

OEMs Can Optimize Where to Save or Apply Engineering Costs

Complete Phone

- Hardware, software, and ID
- Go-to-market ready
- GCF/CDG/CTS tested

PCBA

- PCBA solution (HW/SW)
- Customization/differentiation
- LCD/LCM, ID, UI, Apps
- Sensors and drivers

Specific Area/Feature

- Hardware or software design components
- PCB layout (6 layer)
- UI changes (PC tool)

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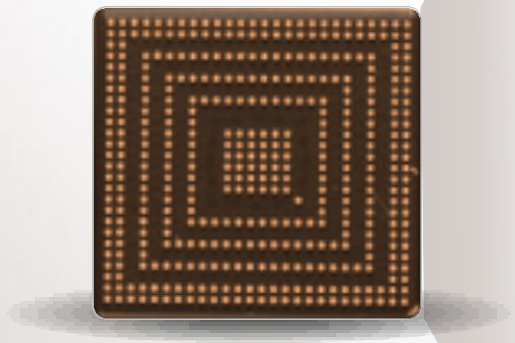
Design Flexibility and Feature Innovation

QRD Brings a Comprehensive List of collaborators to the Table

Chipset and AMSS



Tools, Testing, Documentation

CDG GCF

HW Components

LITEON GIANTPLUS

ATMEL ST

OmniVision SAMSUNG

CYPRESS PERFORM AKM

Synaptics TRULY

InvenSense Micron

Full BOM, HW Schematics, PCBA layout, Mechanical ID

SW Components

SinoVoice myriad

thinkfree BOUNDLESS

Tencent 腾讯

有道 youdao 手机

尚邮 UC优视科技

guobi 国笔科技 开心网

淘宝网 Taobao.com youku 优酷.com

支付宝 Alipay.com 因为信任 所以简单

Phone Software, UI

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Design Flexibility and Feature Innovation

- Chinese app market is rich and diverse
- Each core app area features multiple local analogs
- Collaboration with broad app market is key
- Qualcomm is actively working with full ecosystem

Source: QCT

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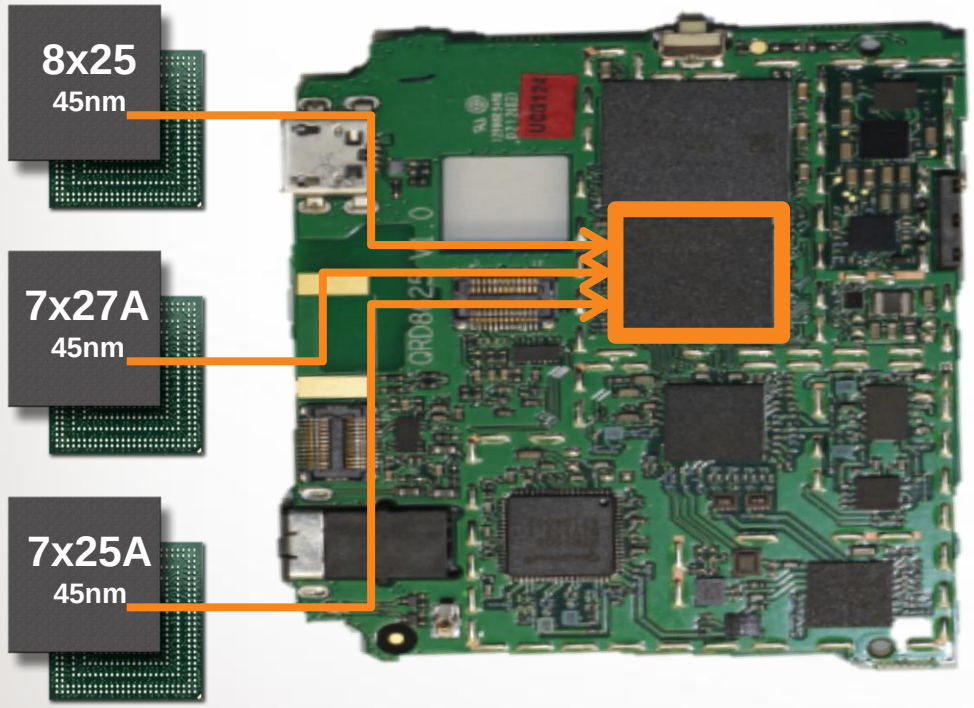
Broad Portfolio Enablement

1.2GHz
Dual Core
qHD
300M p/s

1GHz
WVGA
245M p/s

1GHz
HVGA
133M p/s



- 100% HW Reuse
  - Common RF
  - Common PMIC
  - Common Display I/F
  - Common Memory I/F
- Scalable from
  - Display: QVGA to qHD
  - CPU: 800MHz,1GHz,2x1.2GHz
  - UMTS, CDMA, WorldMode
- Single SW Baseline
  - Supports All 6 Chipsets

Pin for Pin compatibility allows single design for multiple products

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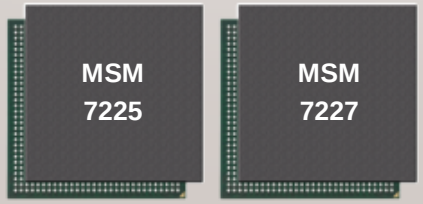
Multiple QRD Platform Generations

snapdragon by Qualcomm s1

Available

- Flash 10/Browser
- Android Gingerbread
- Performance
- DSDS

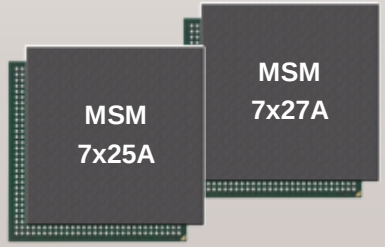


Q2’11/Q3’11

snapdragon by Qualcomm s1

Optimize

- Browser
- Java Apps/V8
- UI Response
- CPU



Q4’11

snapdragon by Qualcomm s4

Enhance

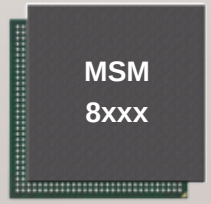
- Optimize (Cost, Performance)
- Innovate (New Features, Snapdragon)
- Dual-Core CPU

2012

snapdragon by Qualcomm

Future

- LTE
- Augmented Reality
- TrustZone



2012+

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QRD Is Gaining Momentum

Approaching steep ramp in launched devices

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NEW: Snapdragon™ S4 Processor for Entry Level

First Dual-Core Mobile Processor Targeted for Sub $200 Handsets

Interface	Connectivity	Networks	Camera	Memory	GPU	Power	Size
Android Ice Cream Sensors: (Proximity, Light, Gyro and Accelerometer)	GPS (AGPS) WiFi 802.11 b/g/n Bluetooth 3.0 FM Radio USB 2.0 3.5 mm Audio Jack	MSM8x25 (Dual Core 1 GHz) CDMA UMTS GSM /EDGE	Up to 8 Megapixel Up to 720P Front Camera LED Flash	NAND/DDR eMMC/DDR MicroSDHC (Up to 32GB)	Adreno 203	Battery: 1500 mAH Charging: Micro USB	Enabling devices <10mm thin

Introducing the New Snapdragon S4

MSM8x25 Dual-Core Processor Launching Soon

Snapdragon™ Processor Brand Momentum in Asia

Snapdragon processor marketing delivers additional value for QRD licensees

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Qualcomm Is Expanding in China

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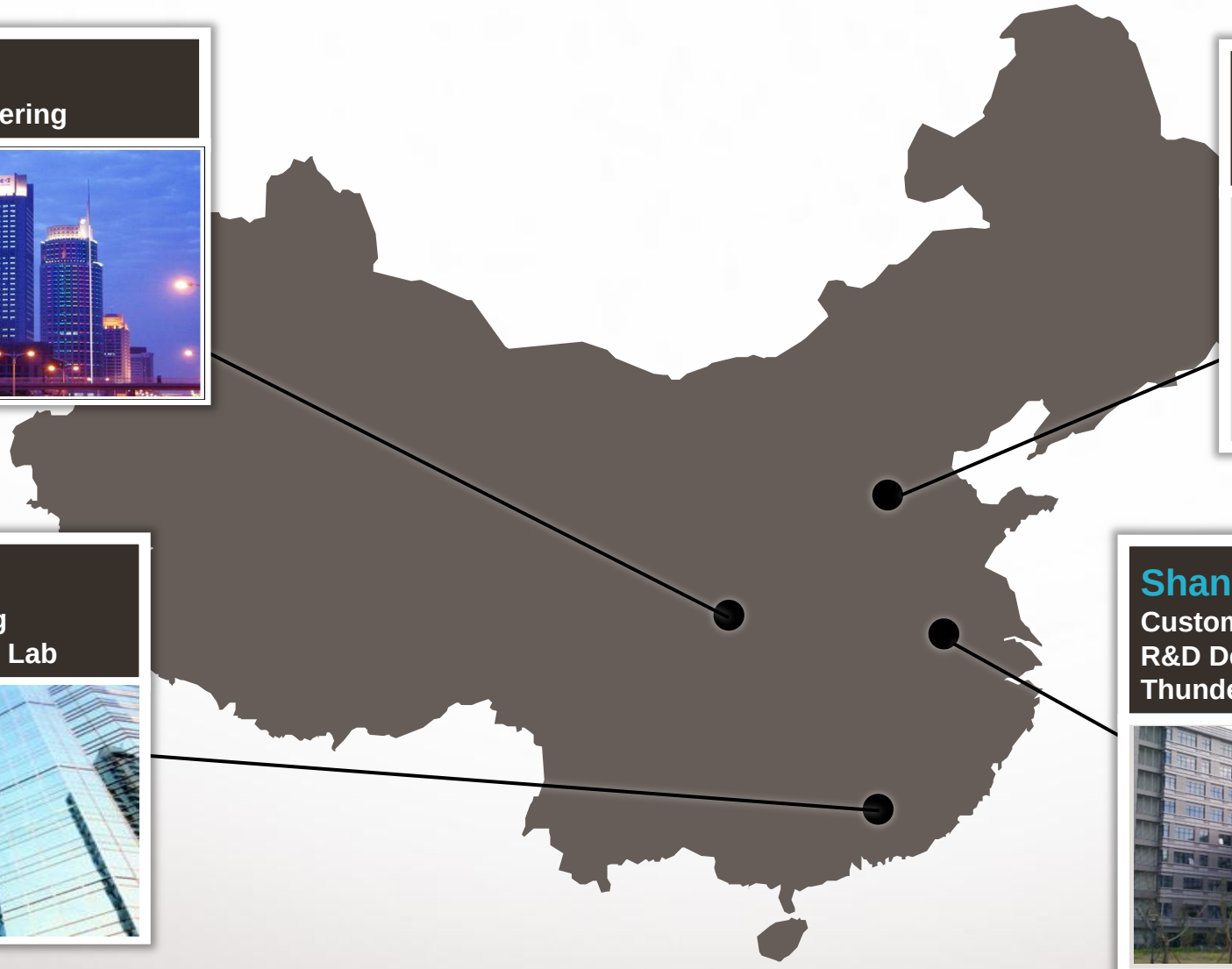
Qualcomm Is Heavily Invested in China



Xian
Customer Engineering

Beijing
Customer Engineering
Thundersoft HW Joint Lap

Shenzhen
Customer Engineering
Thundersoft HW Joint Lab

Shanghai
Customer Engineering
R&D Design Center
Thundersoft HW Joint Lab

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QRD Enables Long Term Regional Growth

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QRD Is Also an Easy Smartphone Entry Point for OEMs

Enabling the Emerging Migration to Higher Performance - a Whole World to Grow Into

Where Essential Mobility Starts

Step up to a new level of mobility with smartphones featuring Snapdragon processors by Qualcomm. Start posting status updates, checking email, sharing pics and video with friends, and even managing your business. Anywhere, all the time.

Powerful Mobile Performance

Smartphones and tablets featuring Snapdragon S4 processors by Qualcomm deliver dynamic, immersive experiences and powerful, battery-friendly performance that can put new possibilities in your hands.

Mobile Experience, Meet TV

Televisions and set-top boxes featuring Snapdragon™ S4 processors by Qualcomm® offer a compromise-free way to bring the best mobile experiences to the biggest screen in the house.

Computing That Packs More Punch

Performance so powerful, it isn't only for mobile devices. Ultra-thin and sleek computing devices featuring Snapdragon S4 processors by Qualcomm take seamless experiences and boundary-breaking battery efficiency to new places.

Entry | **Mid → High** | **Computing and TVs**

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Thank you

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QUALCOMM Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714

QUALCOMM®

Introduction to Qualcomm Atheros

Jason Zheng
Sr. VP, GM for IBU
April 2012

QUALCOMM®

QCA Strengthens Qualcomm Position in All Segments

Mobile

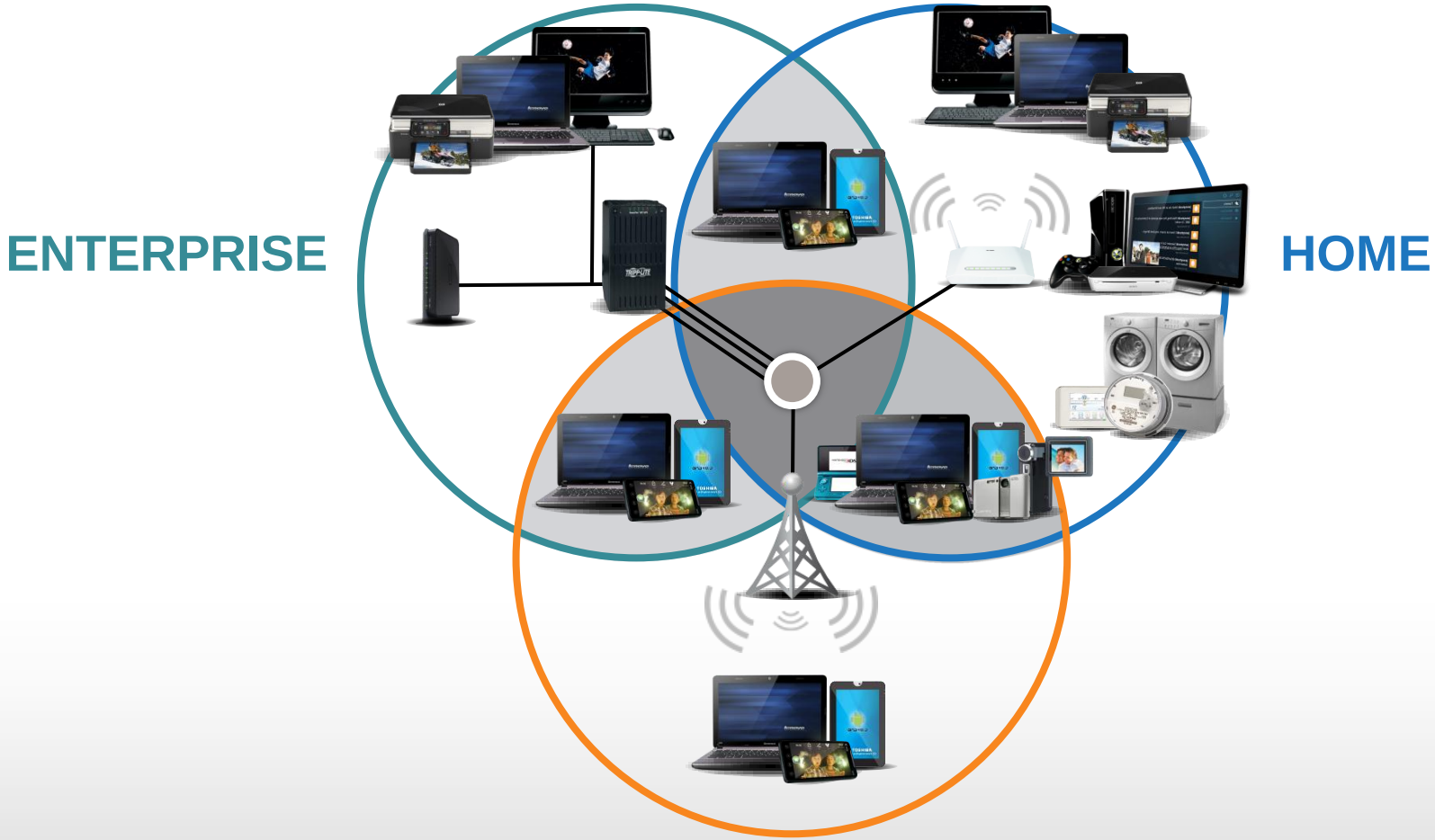
Computing

Consumer Electronics

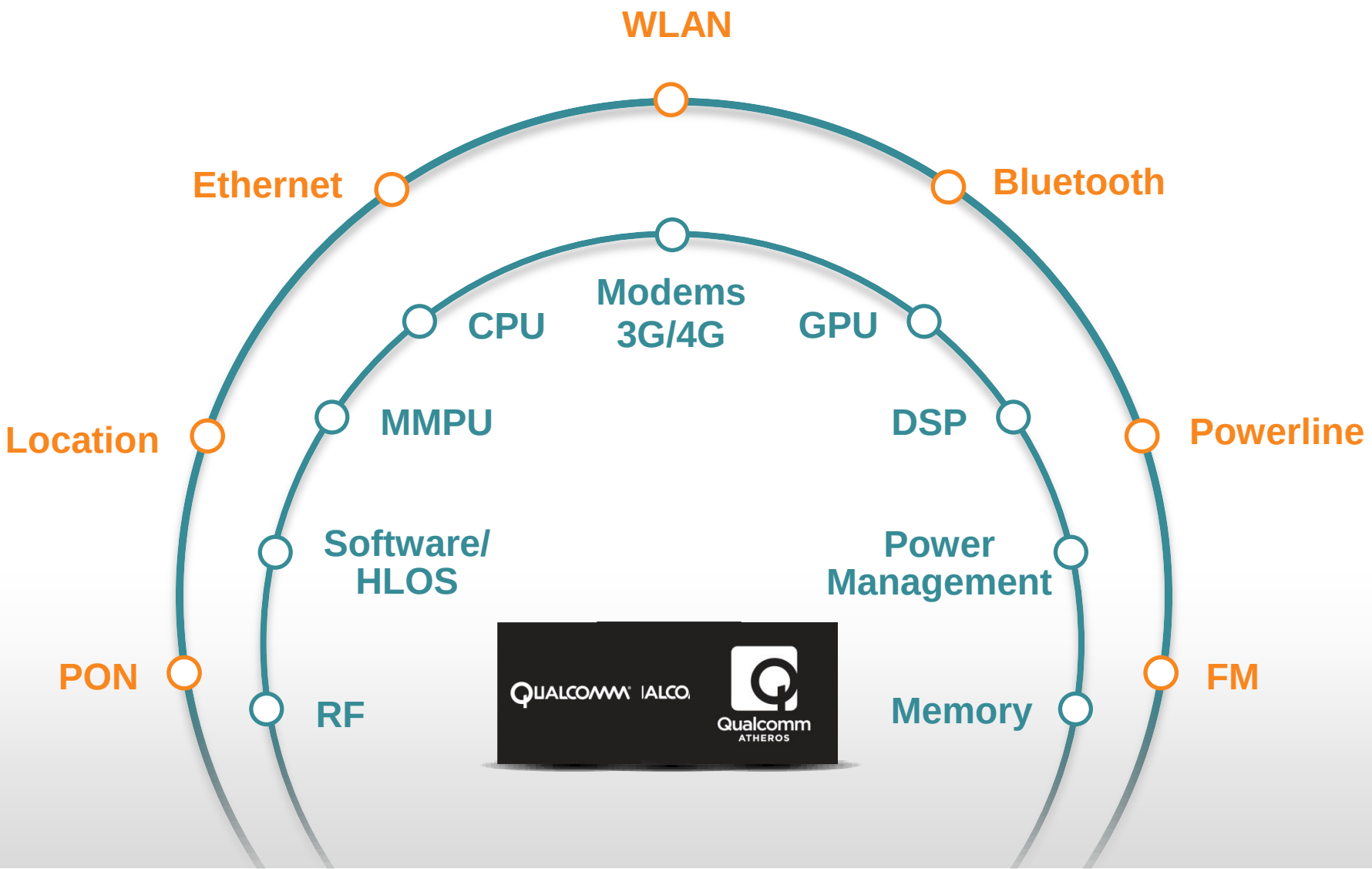
Networking

Qualcomm Atheros

Delivering on Qualcomm's Vision of the Internet of Everything



QCA Enhances Qualcomm's Connectivity Capabilities



Qualcomm Atheros Connects the Digital Home

From the cloud to the network to virtually **everything** in the home

TVs, Smartphones, Printers, Gateways & Smart Grid Storage & Desktop Computers

Partnerships with Tier 1 vendors:

Samsung Nokia
LG Netgear
Panasonic Motorola
Philips Motion
Pioneer (Vania Magnavox)
Ericsson ZTE
Fujitsu

computing OEMs
models

Qualcomm Atheros Assets for Networking the Home

AMP™ HomePlug Powerline

- Broadband access to rooms not reached by Wi-Fi
- Great for networking CE like TVs and set-top boxes already tethered to power
- Our HomePlug® AV-plus offers >500 Mbps capacity
- Nearly 100 million QCA PLC deployments in Europe, U.S. and China

XSPAN® Video-Over-Wireless

- Robust, whole home coverage of multimedia content
- 5 GHz (24 non-overlapping channels) to reduce network interference
- Software enhancements to eliminate latency

Hy-Fi™ Hybrid Wired/Wireless Networking

- When Wi-Fi doesn't reach the entire house…
- Powerline extends network coverage to rooms not reached by Wi-Fi
- Hy-Fi combines the range and reliability of Powerline with flexibility and mobility of Wi-Fi
- Powerline for fixed devices and Wi-Fi for mobile handsets, tablets and computers
- Given industry acceptance of Hy-Fi, IEEE has approved draft standard, 1905.1, for hybrid networking

Qualcomm Atheros is Enabling the Smart Home

- Low-power, low-resource Wi-Fi for M2M
  - Exceeds Wi-Fi standards for low-power
  - Not intended for “networking”, but maintaining low-data rate connection

- HomePlug Green PHY
  - New, innovative, “green” powerline standard
  - Interoperable with HomePlugAV (for networking)
  - Provides low-energy, low-cost, full home coverage at 10 Mbps
  - QCA launched industry’s first GreenPHY solution in FQ1, 2012
  - Fulfilled DoE grant to build Green PHY for M2M

- QCA M2M and networking solutions interoperate
  - Enables communications between the home’s content network and its M2M devices

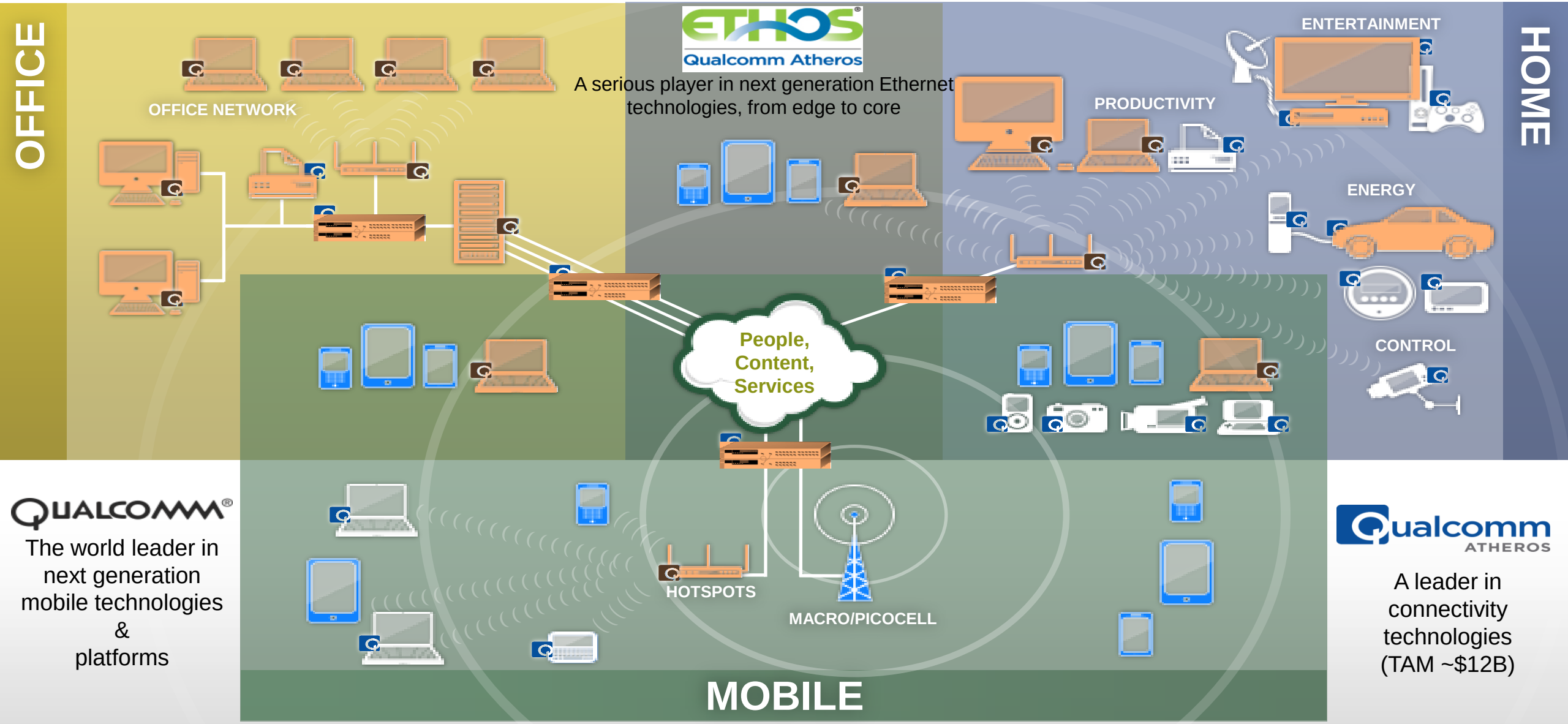
The Home Network as Platform

The Smart Router Will Expand the Network's Role to Better Manage Content

- Managing more content, more effectively over the network
  - Traffic analysis
  - Stream identification
  - Performance optimization

- More applications
  - Cloud-based services like home security, home health monitoring such as 2Net (anything that needs to be "controlled")
  - Moving content around the home and beyond with Skifta

The Connected World – Our Opportunity



QUALCOMM®

The world leader in next generation mobile technologies & platforms

Qualcomm ATHEROS

A leader in connectivity technologies (TAM ~$12B)

QCA Ethernet Success

PERSONAL COMPUTER

Desktop, Notebook, Netbook, Nettop, Motherboards

CONSUMER ELECTRONICS

TVs, Printers, Set Top boxes, Blue Ray, Gaming

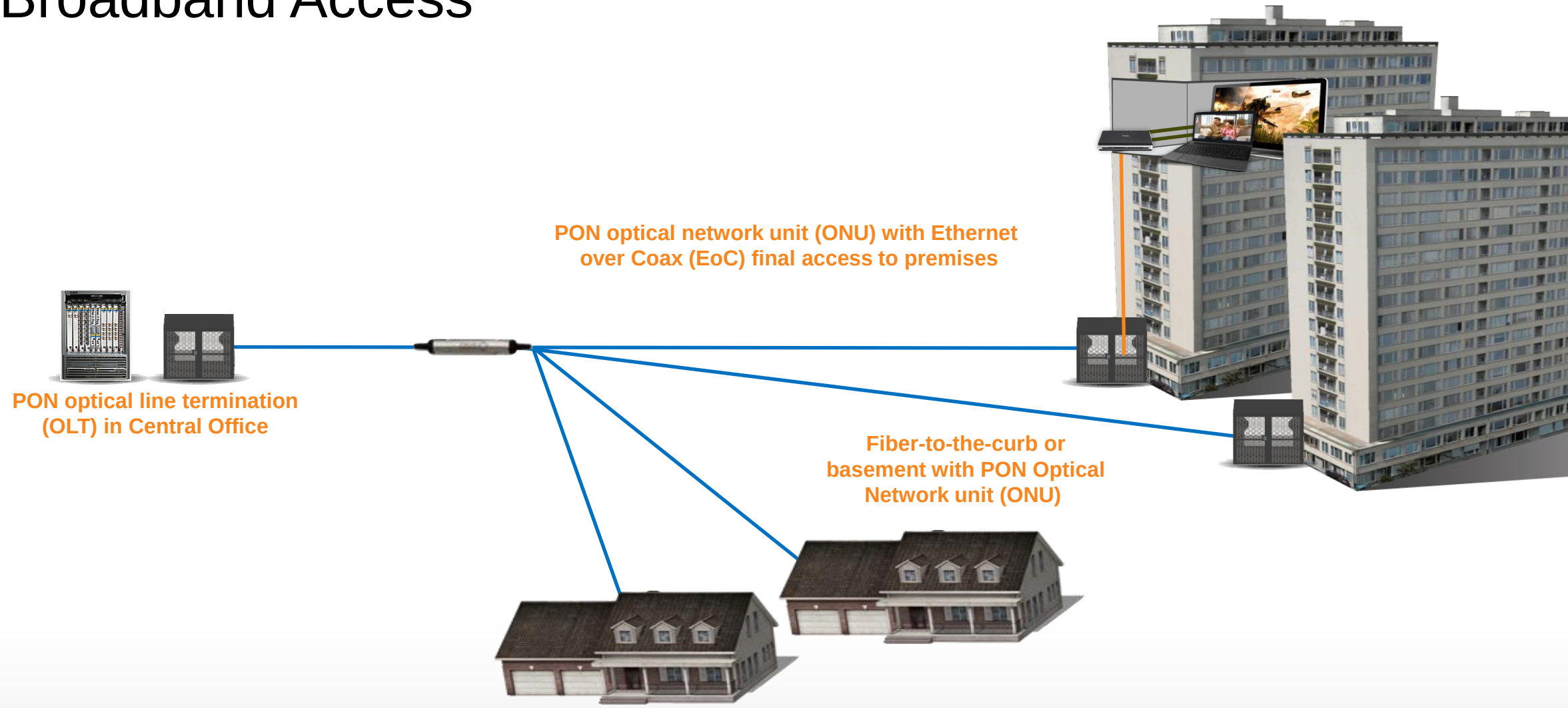
HOME NETWORKING

Carrier Gateways,
Home Routers
Media Gateways

ENTERPRISE & CARRIER NETWORKS

Ethernet Switches, Routers and Backhauls etc.

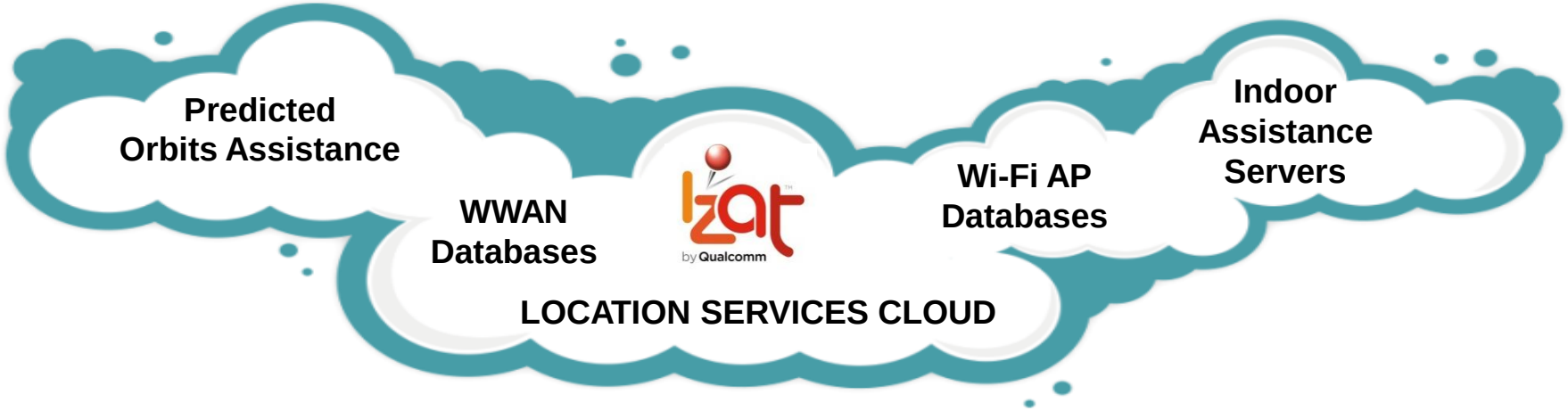
Passive Optical Networks and Ethernet-over-Coax for Broadband Access



QCA offer full range of xPON, DSL controller & EoC solutions for access network

Qualcomm Izat Location Portfolio: Where Location Is At

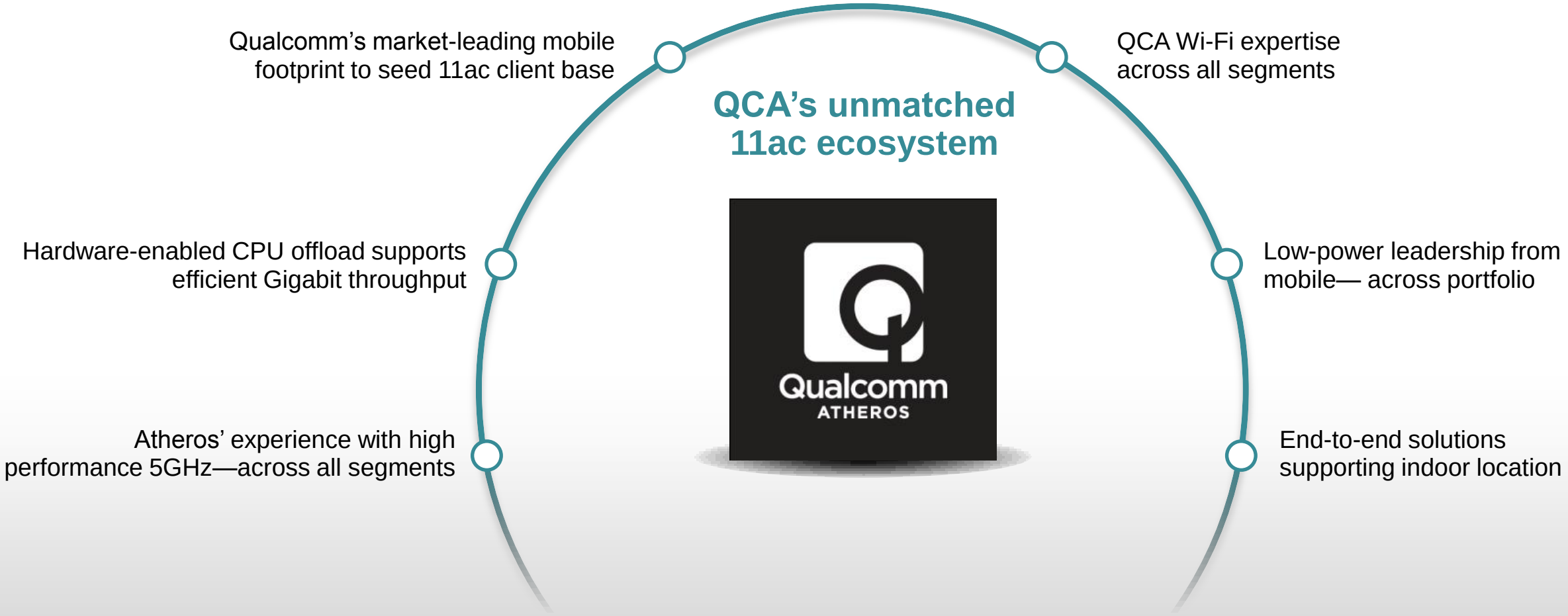
Enabling Seamless Location Awareness Everywhere



GNSS Chipsets	Indoor Location Systems	Augmented Positioning Techniques
Integrated Solutions (MSM & MDM Platforms)	End-to-End Solutions	Cell-ID
SoCs for Platforms Without Qualcomm WWAN	15 Day(Mobile & Network-Based)	Wi-Fi
GPS, Glonass & Other Satellites	Leverages Entire Portfolio to Deliver < 5 Meter Accuracy	MEMS & Inertial Sensors

Leveraging Qualcomm's Mobile Leadership Combined with Qualcomm Atheros' Wi-Fi Capabilities

To drive 11ac adoption with robust, end-to-end ecosystem



QCA's Ecosystem Ensures 11ac Performance

The technology must be on both ends of the link to deliver 11ac benefits

- Enabling customers' end products in first wave of Wi-Fi Certification

11ac Value Proposition

Video-grade Performance Across Increasingly Crowded, Busy Networks

Elimination of lag with interference-free 5GHz for video, gaming and other latency-sensitive applications

Increased rate-over-range at close- and mid-range with standardized mechanisms.

Driving **"practical" Gigabit wireless** performance

Significantly greater capacity—3x 11n per stream—with 80 MHz and 256 QAM to support **richer content faster**

Lower joules-per-bit to improve power efficiency, **extend battery life**

Driving toward greater spectral efficiency with MU-MIMO for **simultaneous support for more clients**

NETFLIX hulu ESPN THE TOTAL SPORTS NETWORK YouTube

Qualcomm Atheros 11ac Portfolio, 2012

Mobile

1-stream 11ac

Integrated BT 3.0/4.0 & FM

433 Mbps capacity

Dual-band 5/2.4GHz

Computing

1-, 2- and 3-stream 11ac

Integrated Bluetooth

866 Mbps/1.3 Gbps

Dual-band for all solutions

Consumer Electronics

1-, 2-, 3-stream 11ac

Dual-band, dual-concurrent

Paired with Snapdragon processors for smart TV platforms

Networking

2- and 3-stream 11ac

866 Mbps/1.3 Gbps

Dual-band for all solutions

11ac Summary

Qualcomm will drive 11ac consumer adoption with robust, end-to-end ecosystem

- Easing client transition to 11ac
  - Leveraging Qualcomm's strength in the mobile market
  - Snapdragon growing brand presence in smartphones and tablets
  - Easy migration path from 11n to 11ac with pin-compatible solutions
- Networking expertise to drive Gigabit wireless performance
  - Retail, enterprise and carrier segments
- Our portfolio will enable Wi-Fi CERTIFIED interoperability for end-products in first WFA test wave

Leveraging Qualcomm's mobile leadership with
Qualcomm Atheros' Wi-Fi expertise to drive Gigabit Wireless

Thank you

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