Broadcom Set-Top Applications and Wireless Solutions

April 22, 2012

Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved.

Overview

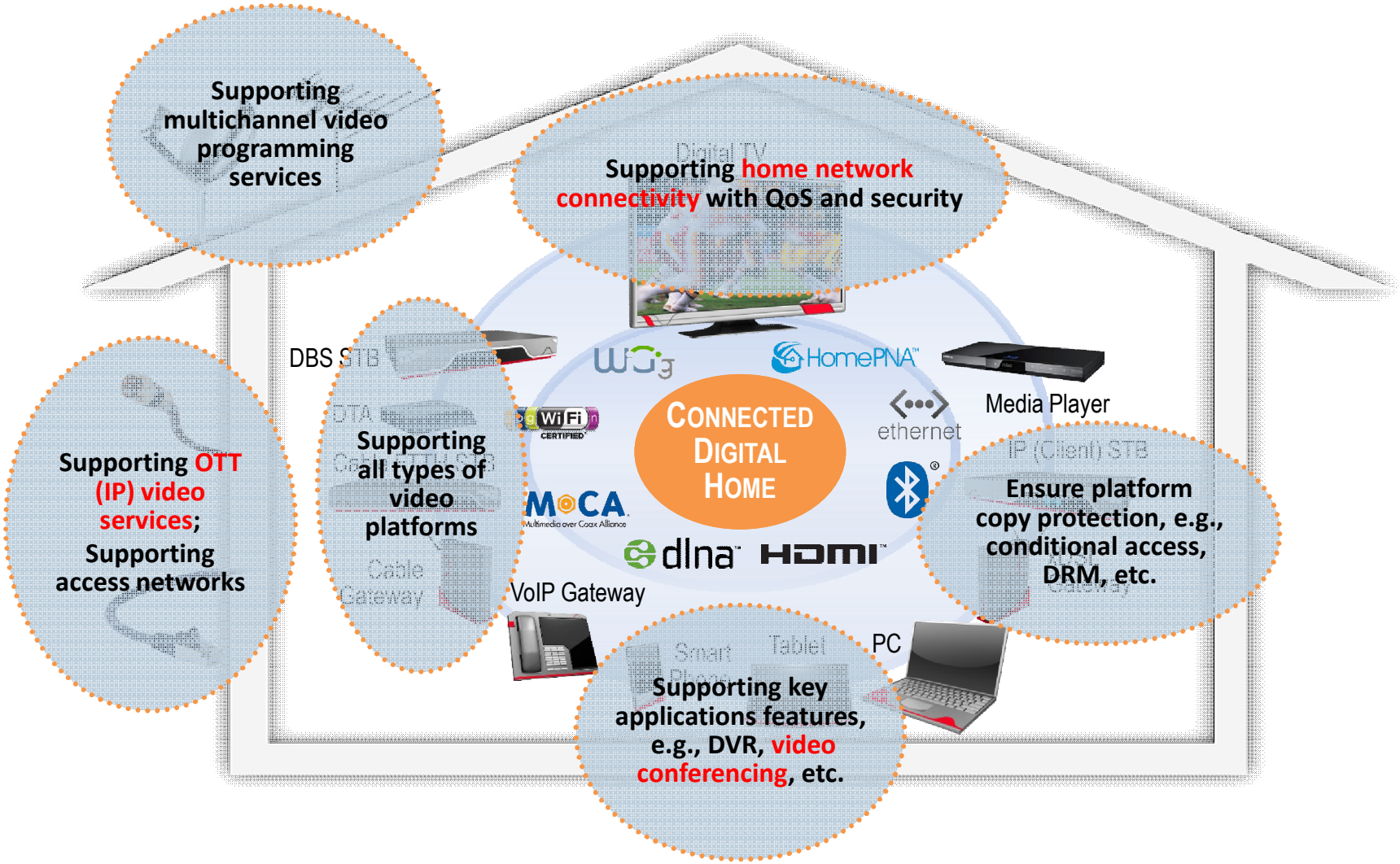
- Audio and Video Processing Technologies in Broadband SoCs
- Some Applications Basing on Wireless Device
  - Integrated Home Gateway Server
  - Wifi Display and Direct, in Home Digital Network
  - Other New Applications Enabled in Home Gateways
  - Challenges
- Wireless Solutions Introduction
  - Wifi
  - Bluetooth
  - NFC

Broadcom Proprietary & Confidential. © 2012 Broadcom Corporation. All rights reserved.

Audio and Video Processing Technologies in Broadband SoCs

Broadcom Proprietary & Confidential. © 2011 Broadcom Corporation. All rights reserved.

Top-Level Video Requirements Needed to Make the Connected Digital Home a Reality



Broadcom Proprietary & Confidential. © 2012
Broadcom Corporation. All rights reserved

Key Multimedia Home Networking Capabilities and Technologies

Network Types	Networking Capabilities
Access Networks	Various Home Gateways support DOCSIS CM, xDSL CPE and ONU
Home Networks	Key Home Networking Standards include MoCA, Ethernet, Wi-Fi and HomePlugAV

Video Applications	Key Technologies
Multi-Platform Video Delivery	Multi-Program Tuning and Demodulation, Multi-Stream Multiplexing and De-Multiplexing, Multi-Stream and Multi-Format Video Decoding and Encoding and Advanced Security and DRM
Multi-room DVR	Multi Streams Server-based Trick Mode
Gaming	High Performance 2D/3D Graphics Processing such as OpenGL ES 2.0 and OpenVG
Android Application	Ice Cream Sandwich, Adobe Flash, Connected Home App
Home Media Server	HTTP-Based Adaptive Streaming, e.g. Apple HTTP Live Streaming (HLS), Microsoft Smooth Streaming. HTTP progressive download, e.g. YouTube, HTML progressive download (HTML5 <video> tag)
Video Conferencing	Low-Latency Encoding and Transcoding for Supporting Video Phone

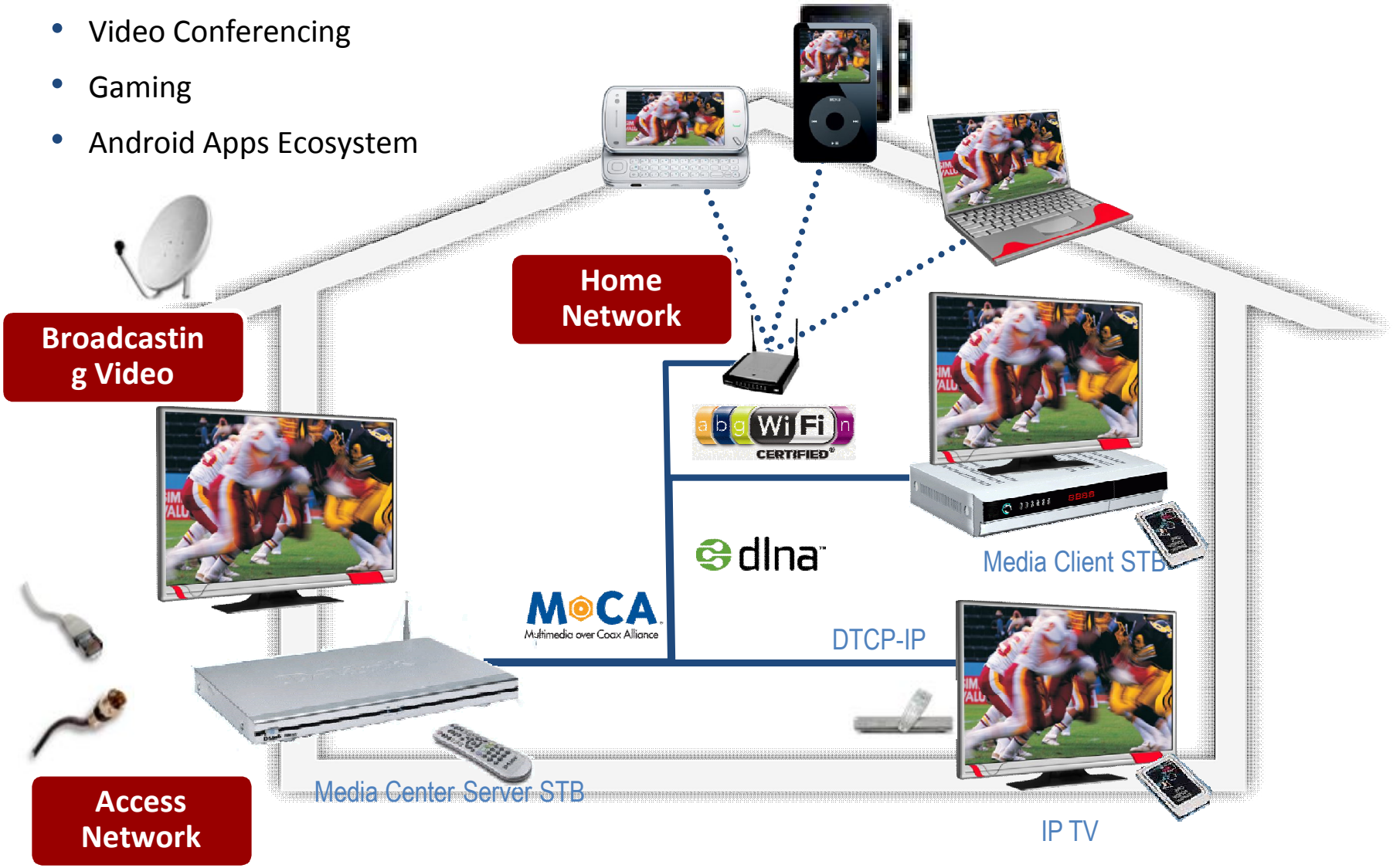
Broadcom Proprietary & Confidential. © 2012
Broadcom Corporation. All rights reserved

Set-Top Box Applications

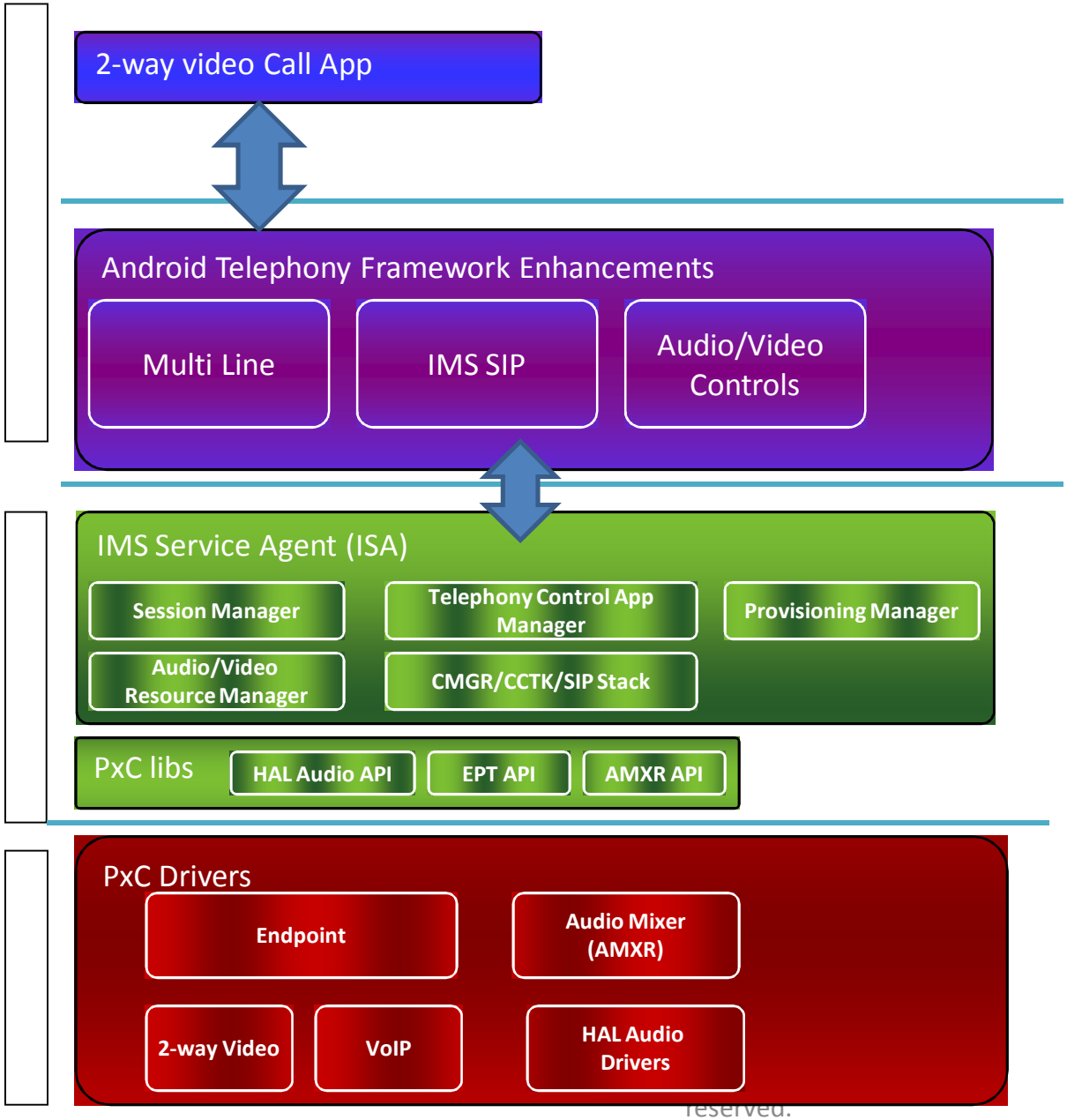
Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved.

Home Gateways Enable New Applications

- Video Conferencing
- Gaming
- Android Apps Ecosystem



Android Architecture leveraging PhonexChange components and More



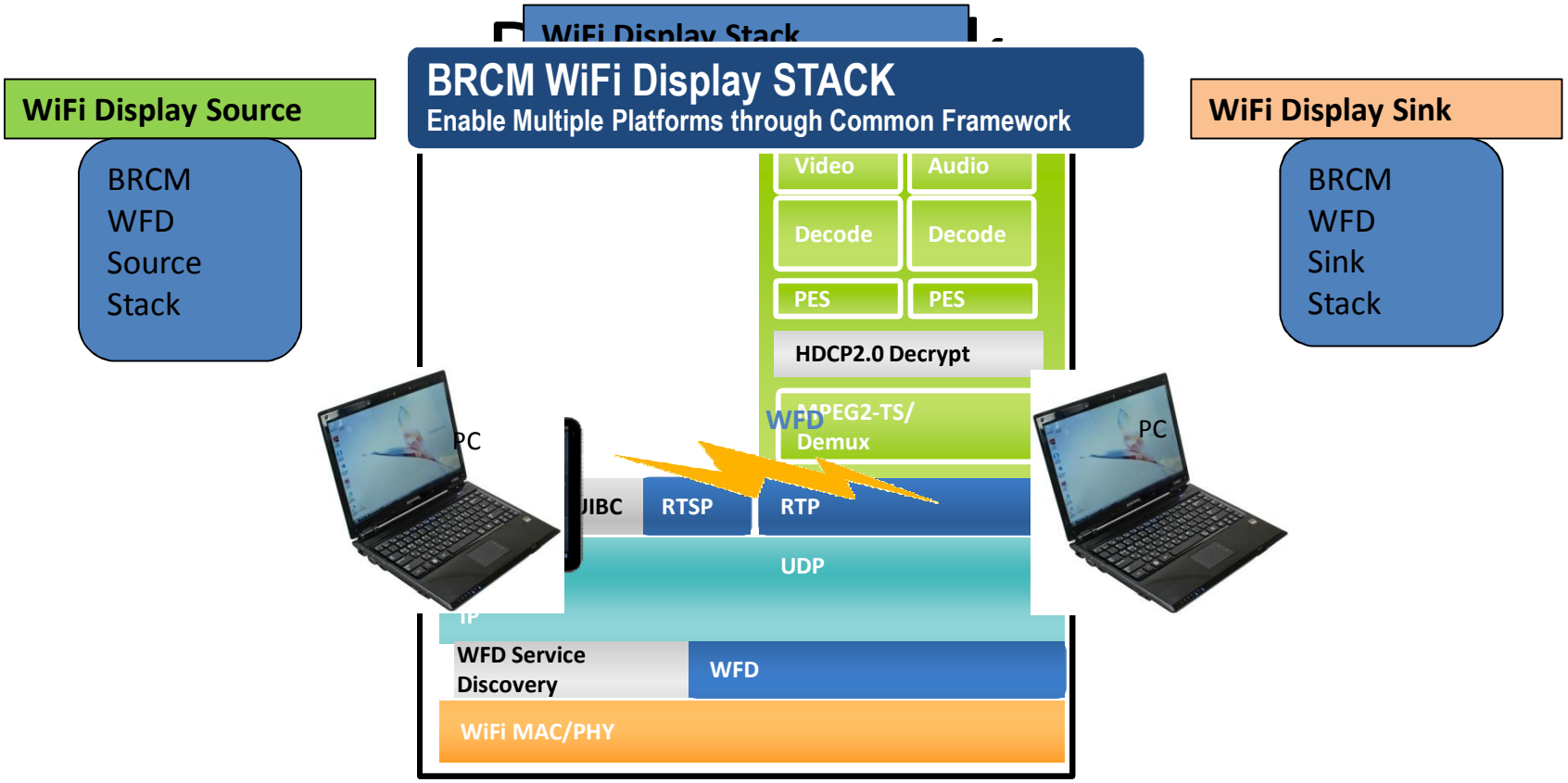
reserved.

WiFi Display for Multi-Screen Support

Seamless Media Sharing through WiFi Display

Broadcom Proprietary & Confidential. © 2012 Broadcom Corporation. All rights reserved.

BRCM Leadership – Common WiFi



BRCM WFD Stack → Scale Multiple Platforms → Seemless Interop → Advance Usage Mobile-2TV

Existing | WFD | System | Optional | A/V Blocks

Broadcom Proprietary & Confidential. © 2012 Broadcom Corporation. All rights reserved.

What is Wi-FI Direct?

- Wi-Fi Wifi-Direct is an emerging specification aimed at making often temporary WLAN connections easier to establish
- Multiple interesting use cases
  - Two mobile devices that wish to exchange data, play a multi-player game, etc but have no existing WLAN connection
  - One mobile device wants to share multimedia (pictures, videos, songs, etc.) to another device (such as a television, or a STB) at a friends house
  - One company visiting another company's campus wants to connect to a wireless projector or printer
- In all cases, no permanent network information need be shared to make connections
  - Home user doesn't have to give out his WPA-PSK passphrase
  - Corporate user doesn't have to compromise company security policies

Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved
Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved.
11

New Applications Enabled in Home Gateway

- OTT (Over The Top) for IPTV Application
  - Broadcom NetApp API
    - Wired interface(s)
    - Wireless interfaces
    - Bluetooth devices with commonly profiles
    - NFC for Payment and Context Aware Data Exchange
- Smart Box with Android System
  - Reference Integrated Application
- NGB (Next Generation Broadcast) Group for Cable Application
  - Home-Network Sub-Group and Access-Network Sub-Group
  - Wireless Sub-Group
  - Inter-Connection Sub-Group
  - Smart Terminals Sub-Group, for “Internet of Things”

Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved.

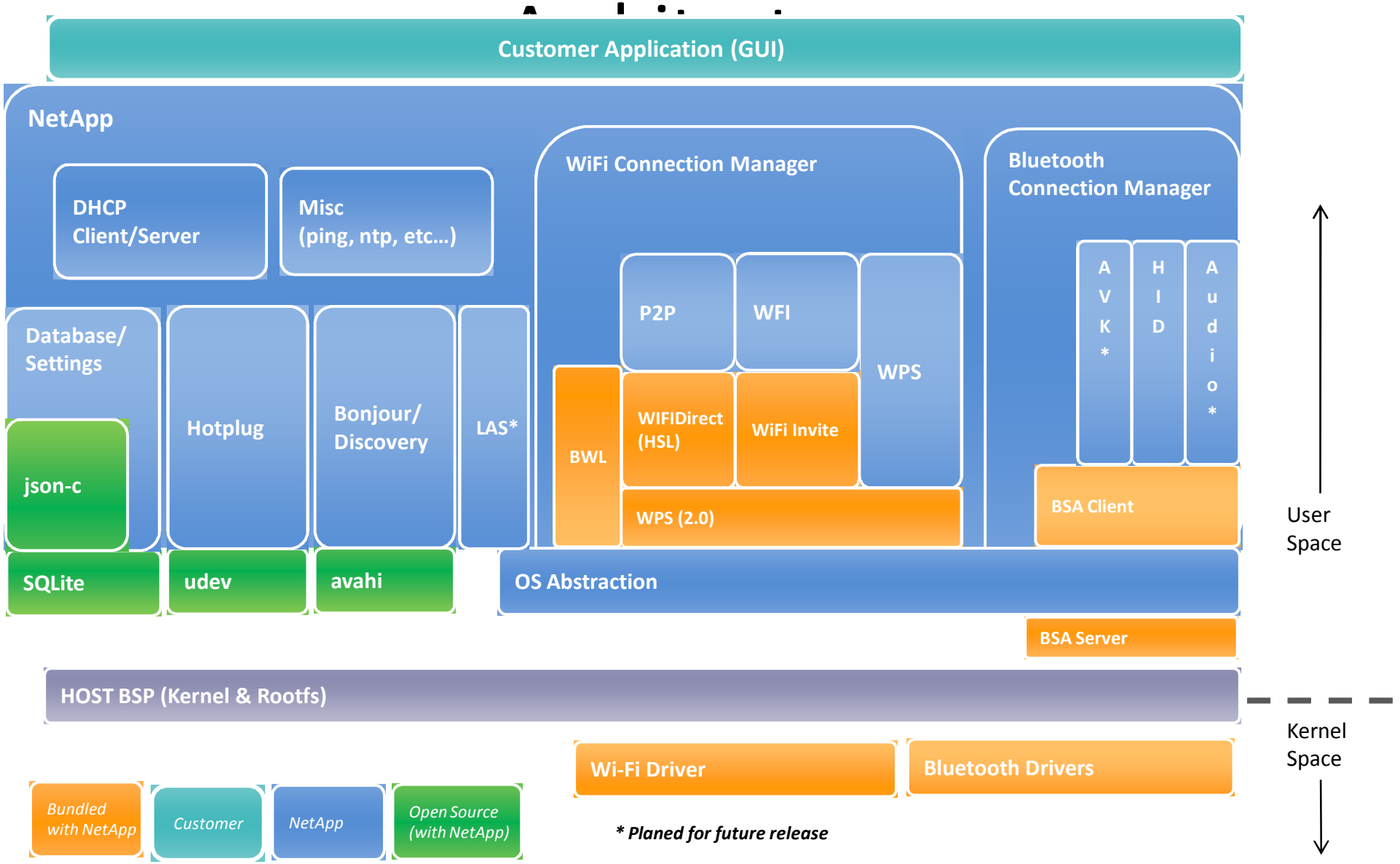
Driving Next Revolution @ Home

Broadcom Proprietary & Confidential. © 2010 Broadcom Corporation. All rights

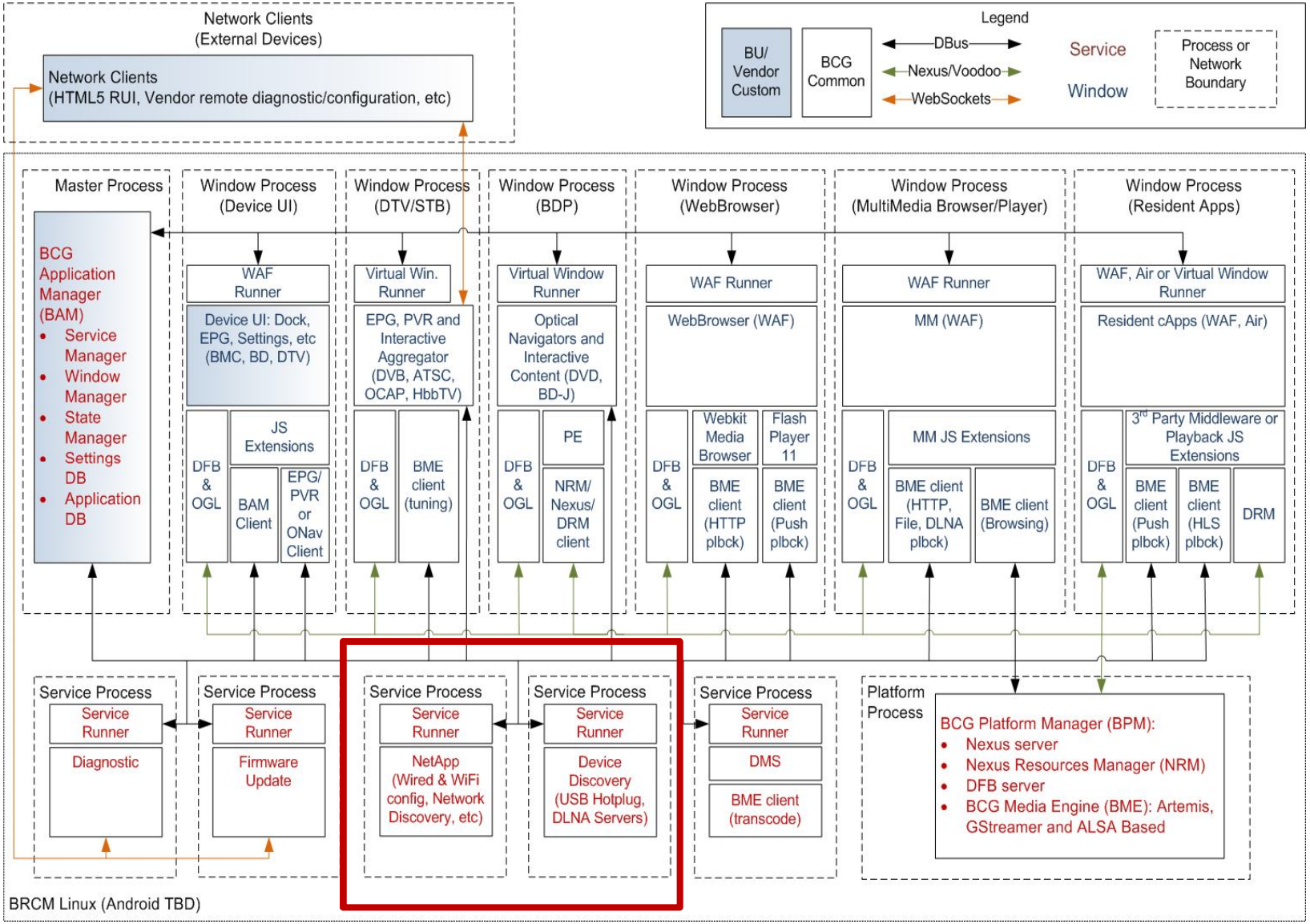
DTV Use case	3D Glasses	Keyboard, Remotes, and Voice Search HID Profile	Stereo Headset A2DP Profile
BT Advantage	Longer battery life and fewer interference issues over IR glasses	Full-keyboard makes it easier to navigate OTT content, and social network applications	Interference free high-quality audio experience

Broadcom Proprietary & Confidential. © 2011 Broadcom Corporation. All rights reserved.

Software Complexity – NetApp



Trellis Architecture Overview



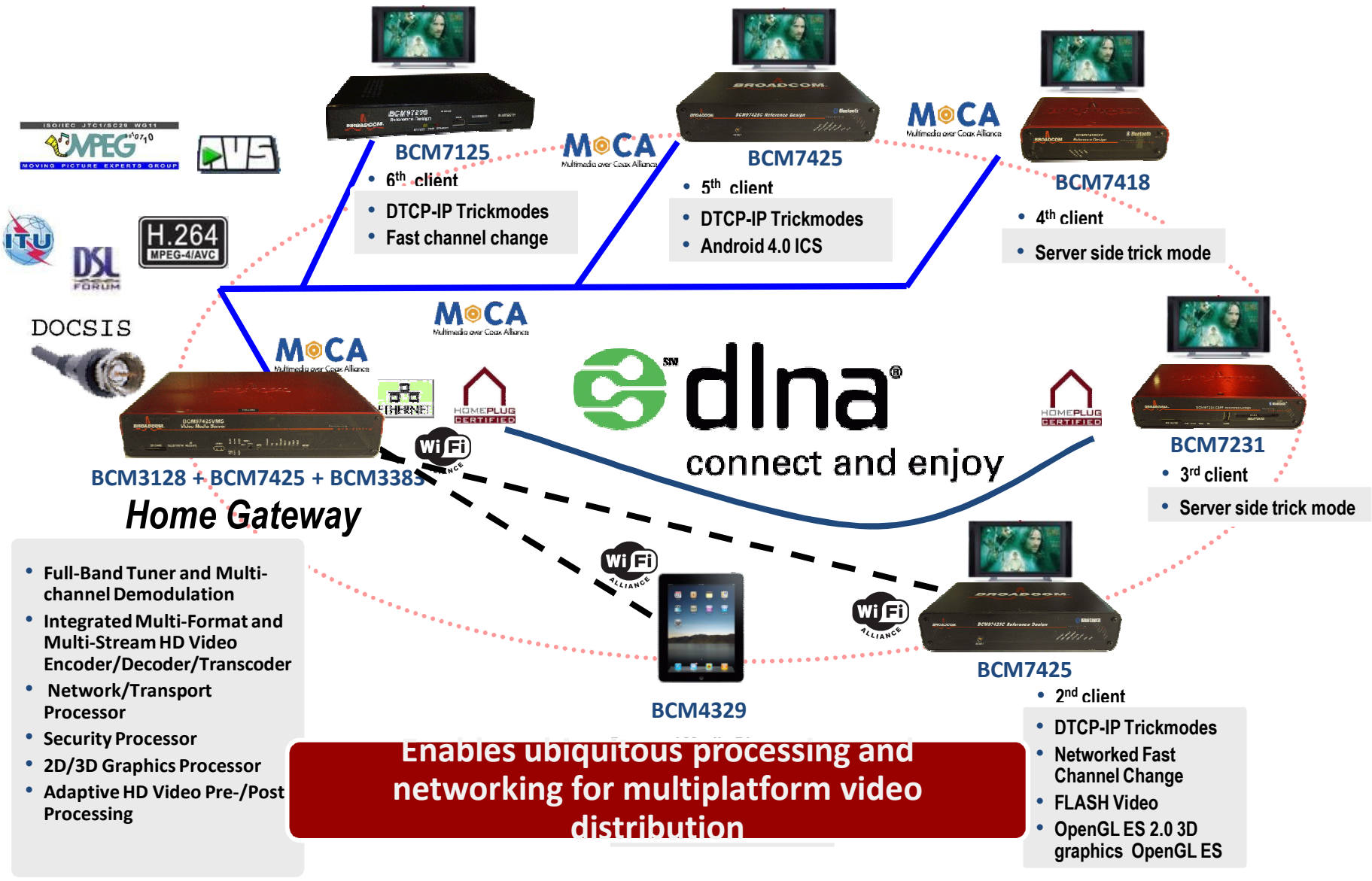
Broadcom Proprietary & Confidential. © 2011
Broadcom Corporation. All rights reserved

Broadcom Wireless Solutions

Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved.

Broadcom-based Devices Support All Relevant Technologies and Standards

- **Connected Home Ecosystem Based on Broadcom's Technology**



Wifi Solutions

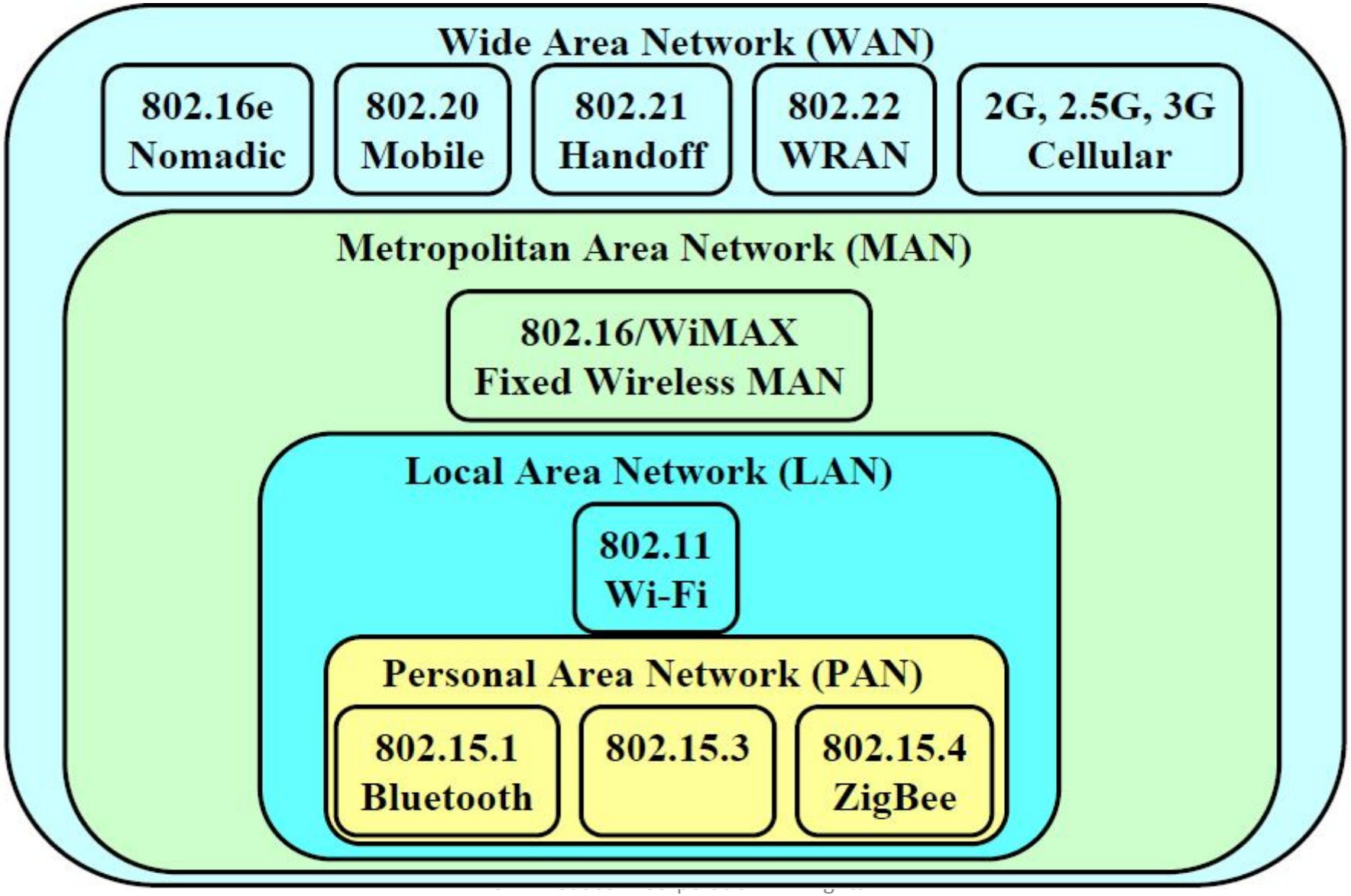
- Wlan Media supports three models:
  - NIC (4322, 43224, 43227, 43228)
    - Soft MAC
    - Supports PCIE devices
    - Current driver: KIRIN 5.101.82.x
  - BMAC (4323, 43234, 43235, 43236)
    - Split MAC
    - Supports USB, SDIO, HSIC
    - Current driver: KIRIN 5.102.98.x
  - FULL DONGLE (43234B, 43235B, 43236B)
    - Full MAC
    - Supports USB, SDIO, HSIC
    - Current driver: FALCON 5.90.188.x

Broadcom Proprietary & Confidential. © 2012 Broadcom Corporation. All rights reserved.

Thank you

Broadcom Proprietary & Confidential. © 2009 Broadcom Corporation. All rights reserved.

Reference: Wireless Standards



reserved.