



*Next Generation Interactive Experience*

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tru2way™ is a trademark of Cable Television Laboratories, Inc.

# Tru2way Benefits

- Uniformity: same interactive guide experience regardless of device manufacturer
- Open APIs: Standards based rather than proprietary, enabling MSO and 3<sup>rd</sup> party application providers to write to standard APIs
- Time to market: write one application and run on all devices rather than writing multiple similar applications
- Device qualification: devices are qualified to a standard, so integration of new devices is faster and less costly
- Interactivity: DSG (DOCSIS Set-top Gateway) environment facilitates fast bidirectional communication
- Abstraction: middleware abstracts hardware from applications
- Network Agnostic: devices are agnostic to the conditional access system



# Tru2way Specification Hierarchy

*CableLabs OCAP / tru2way*

*DVB Globally Executable MHP (GEM)*

*Sun Java (VM, IO, AWT, JMF, Java TV, etc)*

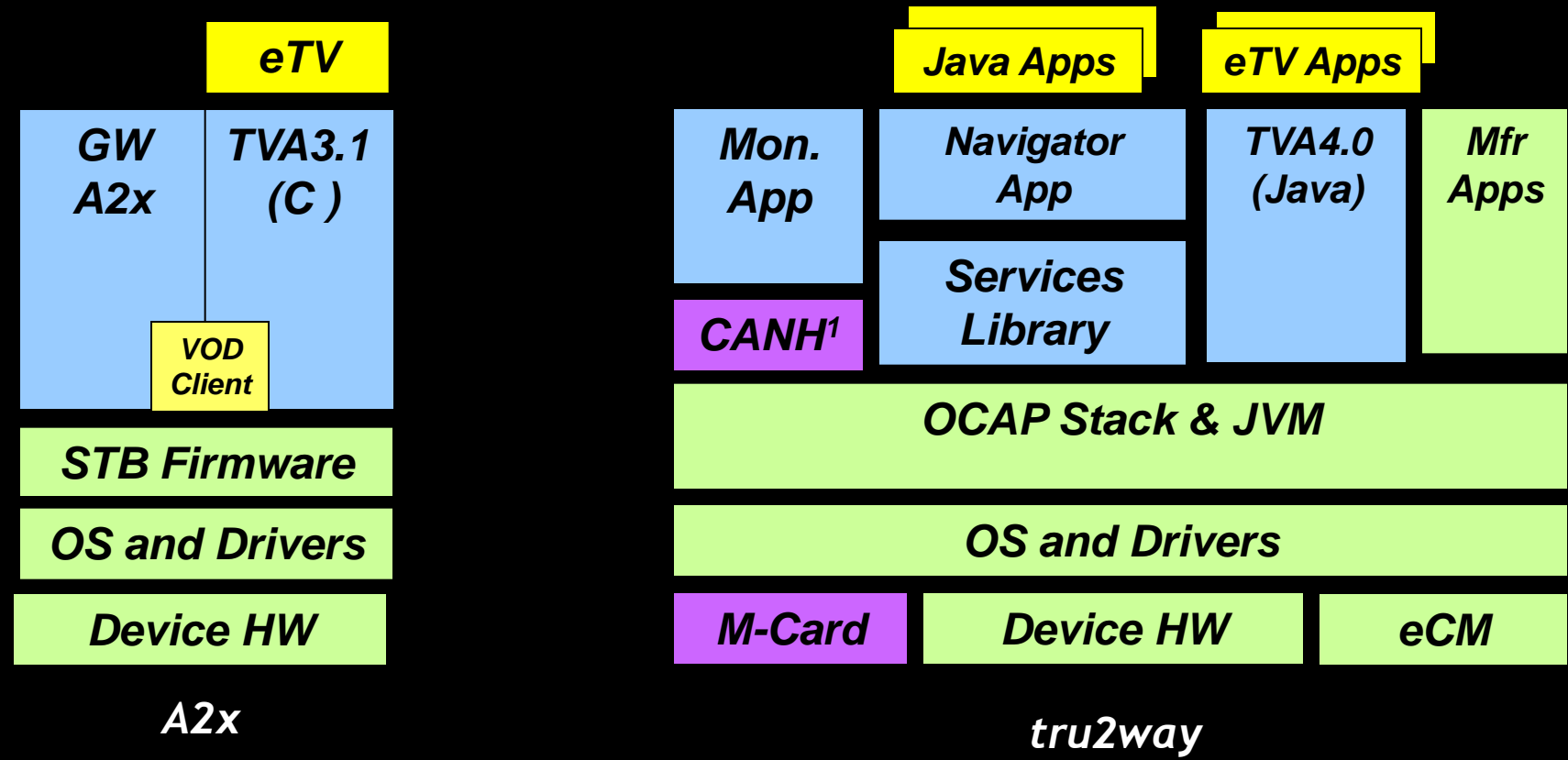
## CableLabs specifications:

- OCAP
- DVR Extension
- Front Panel Extension
- Device Settings Extension
- Home Networking Extension (DLNA / UPnP)
- eTV (Application Messaging and Binary Interchange Format)

# Tru2way Device Architecture

(Comcast Solution)

■ Device Mfr    
 ■ CA Provider    
 ■ Comcast (CVS)    
 ■ 3<sup>rd</sup> Party



# Tru2way Device Architecture

## Component

## Description

M-Card

CA System abstraction

Embedded Cable Modem (eCM)

DOCSIS/DSG

Tru2way (OCAP) Stack

Includes JVM, OCAP APIs, and underlying native implementation

Monitor App

Enforces MSO business policies

CANH

App layer CA abstraction.  
Used for authorization and PPV.

Services Library

Provides services to Navigator App

Navigator App

Provides user interface and feature logic

Manufacturer Apps

Diagnostics & Settings

eTV Apps

Interactive applications



# Tru2way Devices

## *OpenCable Host 2.x*

### Device Capabilities:

- Embedded DOCSIS cable modem
- CableCard Interface
- Fast processor and extensive memory

### Device Classes:

- Retail iDCR (Interactive Digital Cable Ready) televisions
- Retail settop/setback devices
- Leased DVR settops
- Leased non-DVR settops



# Tru2way Applications

## Types of Java Applications:

- Bound Applications – Delivered with a program
- Unbound Applications – Not tied to a program
- Monitor Application
  - Type of unbound application
  - Enforces MSO policy
  - Allows other apps to run
- Manufacturer Applications
  - Diagnostics
  - Watch TV
  - Settings



# Comcast tru2way Aspen Guide

### TV Listings

comcast 7:03pm

Biography 101 NBC  
7-8:30pm  
Dwight D. Eisenhower, (2004),  
As Supreme Allied Commander...

Today 7:00pm 7:30pm 8:00pm

101 NBC	Biography	Meet The Parents
103 ESPN	Totally NASCAR	French Open Finals
104 NICK	Fairly OddParents	Family Guy
105 TNT	Shane	SpongeBob SquarePants
106 ABC	Brat Camp	Home to Go
		Any Given Sunday

### On Demand

comcast 7:03pm

Top Picks

On Demand

- Top Picks
- Network Shows
- HD On Demand
- TV Entertainment
- Kids
- More choices
- Movies & Events
- Free Movies!
- Sports & Fitness
- Premium Channels
- Get Local

### DVR

comcast 7:03pm

My Recordings  
View a list of your DVR recordings.

- My Recordings
- Scheduled Recordings
- Set a Recording
- Series Priority

### Title Search

comcast 7:03pm

Title: AL  
Select any listing to see program information.  
You may change your title entry at any time.

Title	Results:
AL	The Alamo
Delete Space	The Alamo HD
A B C D E F	Alaskan Christmas
G H I J K L	Alaska on the Edge
M N O P Q R	Alaska: Wide Open
S T U V W X	Alabama Creek Confederacy
Y Z 1 2 3 4	Alabama Sunrise
5 6 7 8 9 0	





# Comcast tru2way Barcelona Guide

## Next generation tru2way user experience:

- HD (16x9) graphics
- Enhanced TV (eTV) Applications
- Navigator enhancements
- VOD enhancements
- Expanded search capabilities
- Personalization
- Remote DVR
- Anyroom DVR



# OpenCable Home Networking – mDVR



- One or more physical ports
- OCAP HN extension APIs
- DLNA
- UPnP DA and AV (content discovery)
- HTTP/RTP (content streaming)
- DTCP/IP (content protection)



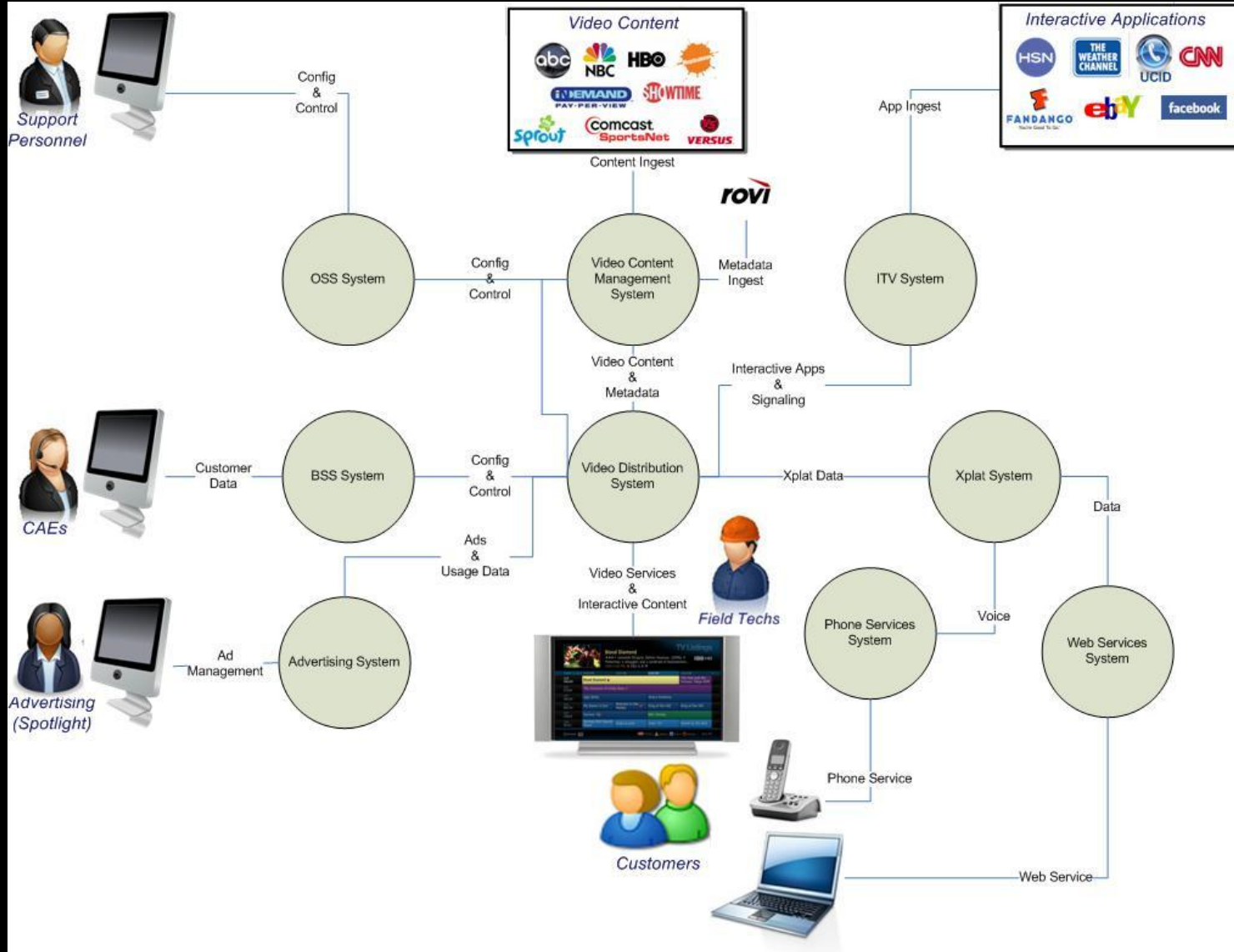
# Tru2way System

## System Highlights:

- High speed data system (DOCSIS/DSG)
- National/Regional infrastructure is easier to operate, maintain and upgrade
- System Information delivered to Host Devices as SCTE-65 over DSG Broadcast Tunnel
- Device firmware downloaded via OpenCable Common Download (TFTP)
- Application download signaled via XAIT over DSG Broadcast Tunnel and downloaded via HTTP
- SCTE-18 EAS delivered over DSG Broadcast Tunnel
- System monitoring via SNMP



# Tru2way System Context Diagram



Init  
Card/Host  
Interface

Boot

xfinity

## Welcome to Comcast

You're about to experience exciting TV programming and thousands of On Demand movies and shows on Comcast Digital Cable. Sit back, relax and enjoy.

# Tru2way References

- <http://www.tru2way.com>
- <http://www.cablelabs.com>
- <http://www.opencable.com>
- <https://opencable.dev.java.net>
- <http://www.mhp.org>
- <http://java.sun.com/products/javatv>
- <http://www.dlna.org>
- <http://www.upnp.org>

