THE ROAD AHEAD **Open Source IVI**

DLNA in the Car

Oct 22, 2015/12:30 | Intended Audience

GENIVI

Wolfram Kusterer
Presentation Business Title and GENIVI Role
ACCESS Europe GmbH.

28-Oct-15

Agenda

- Consumer Requirements
- DLNA Overview
- Technologies for the Connected Home
- DLNA Use cases
- Technologies
- What's new in DLNA
- VidiPath Remote User Interface
- ACCESS Solutions for Connected Cars
- NetFront Living Connect
- NFLC 3.1 architecture
- Platform Availability
- Demo setup
- Main reasons why we are selected by our customer
- Backup slides: DLNA Use cases for Genivi

Consumer Requirements

- Consumer want to enjoy their personal and premium content on any device and any time

- Consumer want a simple solution to access content (less cabling, automated process, etc.)

- Consumer do not want to be forced to buy specific new devices but use their existing devices

DLNA: The Connected Consumer Experience
Guidelines: Interoperability for Media sharing

240 multi-industry companies
More than 16.000 Device Models Certified
More than 500 Million devices in the market

Digital Living Network Alliance (DLNA)

- Delivering on the vision of interoperability in the connected and digital media through:
  - Industry collaboration
  - Standards-based interoperability
  - Certification

- DLNA offers a certification program and extensive test tools for interoperability testing.

- Publishes interoperability guidelines.
  - Available for free on www.dlna.org
  - IEC 62481-x : The International Electrotechnical Commission (IEC) recognizes DLNA as an industry standard

Over 25,000 Certified Device Models
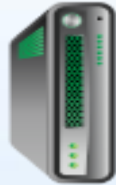
13,020 Televisions

1,701 Mobile Devices

178 Tablets

17 Software

6,917 Personal Computers

500 Network Attached Storage

319 Gateway /Routers

4 Game Consoles

1,424 Blu-ray & DVD Players

894 Audio Video System & Network Speakers

31 Appliances
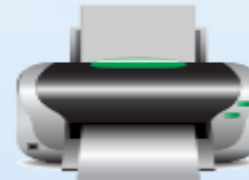
71 Printers

194 Cameras /Camcorders

131 Set Top Boxes

40 Projectors

DLNA Focus on Automotive

- Formed DLNA Automotive Task Force in 2006
- Published "DLNA in the Car" whitepaper in 2007
- Reinvigorated in 2014
- Bi-weekly calls Tuesdays 8am PT / 5pm CET
  - Time can moved
- New automotive project:
  - Update white paper on all the use cases that are supported by the guidelines today
  <ADD LINK Here when released>
  - Update guidelines for new use cases

DLNA Usages & Value for Consumer and Car OEM

Bring your own device

Driver and Passenger can bring their own device and connect wirelessly to the car infotainment system. They can enjoy their music stored on their personal devices on their car audio system. DLNA also allows pushing multimedia content and allows volume and playback control.

DLNA provides interoperability with many CE devices and is not limited to proprietary Apple or Android technology

Easy and secure connection to car UI

Passenger can use their tablet and mobile phone to get the UI from the head unit and they can control volume, audio playback or get information about car speed, location, etc.

DLNA provides a standardized and secure way to share the entire screen to tablet and mobiles
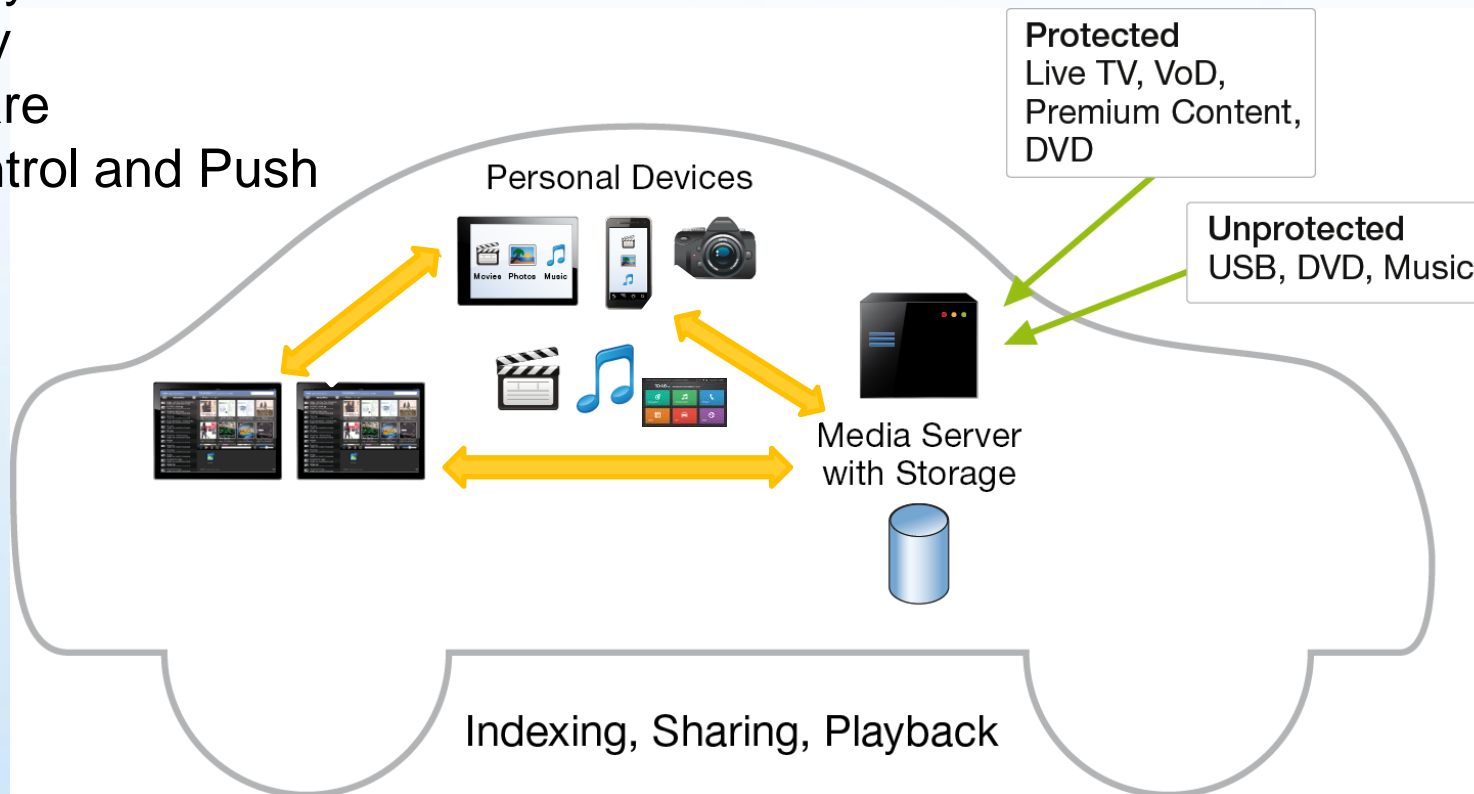
Interoperable solution for connected cars to enable more consumer use cases

Use Cases:

Bring your own device and

- Play
- Share
- Control and Push

Personal Devices

Protected
Live TV, VoD,
Premium Content,
DVD

Unprotected
USB, DVD, Music

Media Server
with Storage

Indexing, Sharing, Playback

What is new with DLNA?

Subscription TV user interface and content on all of your devices

- Certification is open
- New consumer-facing name will help subscribers find retail Certified devices

- HTML5 Remote User Interface (RUI)
- HTTP Adaptive Delivery (MPEG-DASH)
- DTCP-IP Link Protection
- Authentication of Certification (using DTCP-IP keys)
- Diagnostics – IEEE 1905
- Networked Devices Power Save
- Enhanced Television, Ad-Insertion & other TV services signaling

DLNA: Interoperability at All Layers
Narrowing the plethora of standards to a mandatory small set

Link Protection

| DTCP-IP |

How commercial content is protected on the Home Network

Media Formats

| MPEG-2, AVC/H.264, LPCM, MP3, AAC LC, JPEG, |

How media content is encoded and identified for interoperability

Media Transport

| HTTP |

How media content is transferred

Media Management

| UPnP AV 1.0 |

How media content is identified, managed, and distributed

Discovery & Control

| UPnP Device Architecture 1.0 |

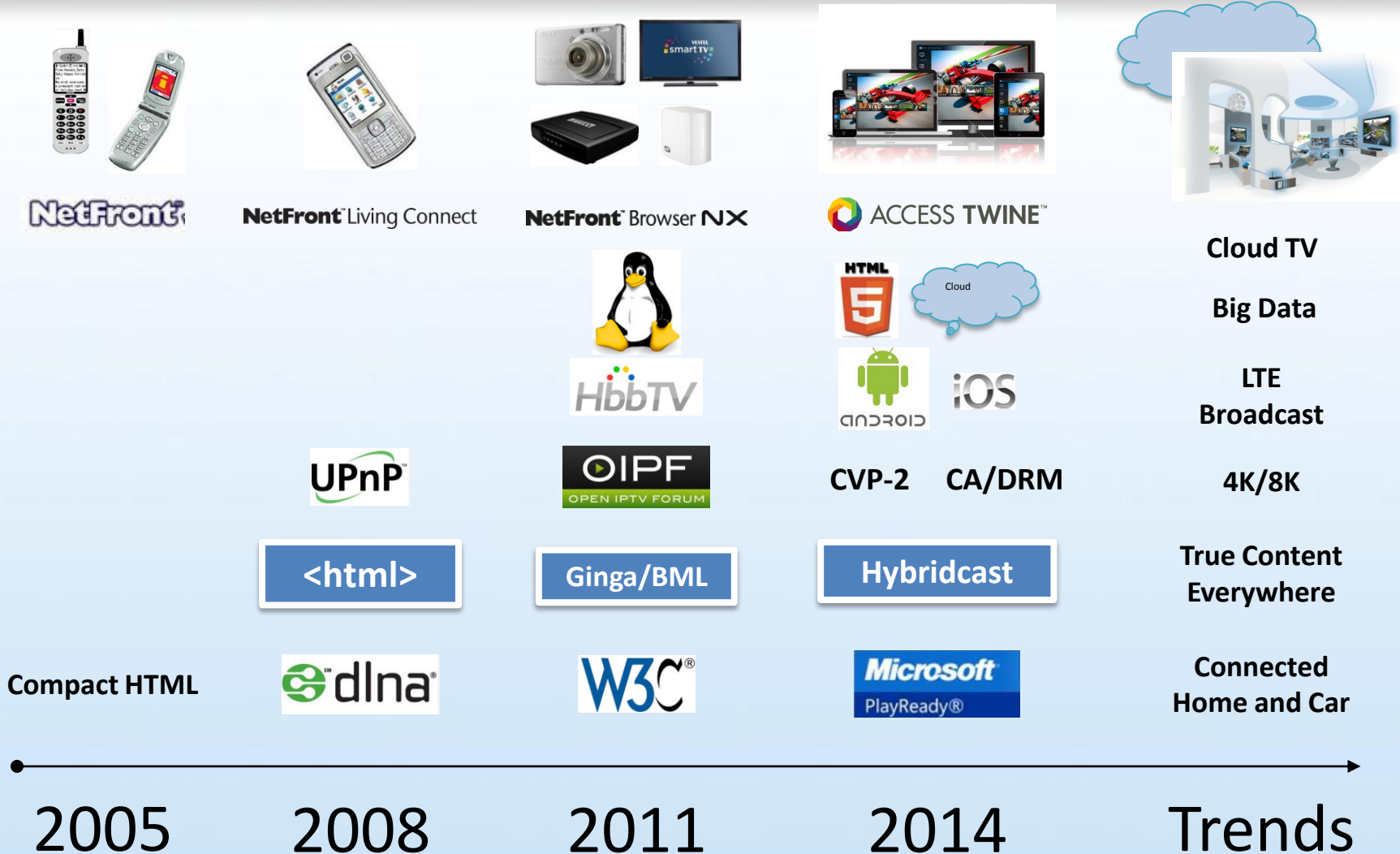How devices discover and control each other

IP Networking

| IPv4 Protocol Suite |

How wired and wireless devices physically connect and communicate

**Connectivity**

| Wired: Ethernet 802.3, MoCA Wireless: Wi-Fi 802.11 |

ACCESS Products for Automotive

2005	2008	2011	2014	Trends
NetFront	NetFront Living Connect	NetFront Browser NX	ACCESS TWINE	Cloud TV
		Linux / HbbTV	HTML5 / Cloud / Android / iOS	Big Data
	UPnP	OIPF (OPEN IPTV FORUM)	CVP-2 CA/DRM	LTE Broadcast
	<html>	Ginga/BML	Hybridcast	4K/8K
				True Content Everywhere
Compact HTML	dlna	W3C	Microsoft PlayReady®	Connected Home and Car

ACCESS Solutions for Connected Cars

1. **NetFront Living Connect 3.1**
   1. All DLNA Device classes (DMP, DMR, DMC, DMS)
   2. DLNA Technology component
   3. Secure HTML5 Remote UI
   4. Platform SDK for Linux
   5. Testing, Interoperability
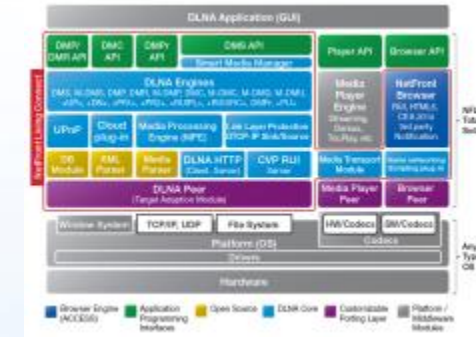
2. **Application SDKs**
   1. SDK for Android, iOS, Windows
   2. Sample application source code
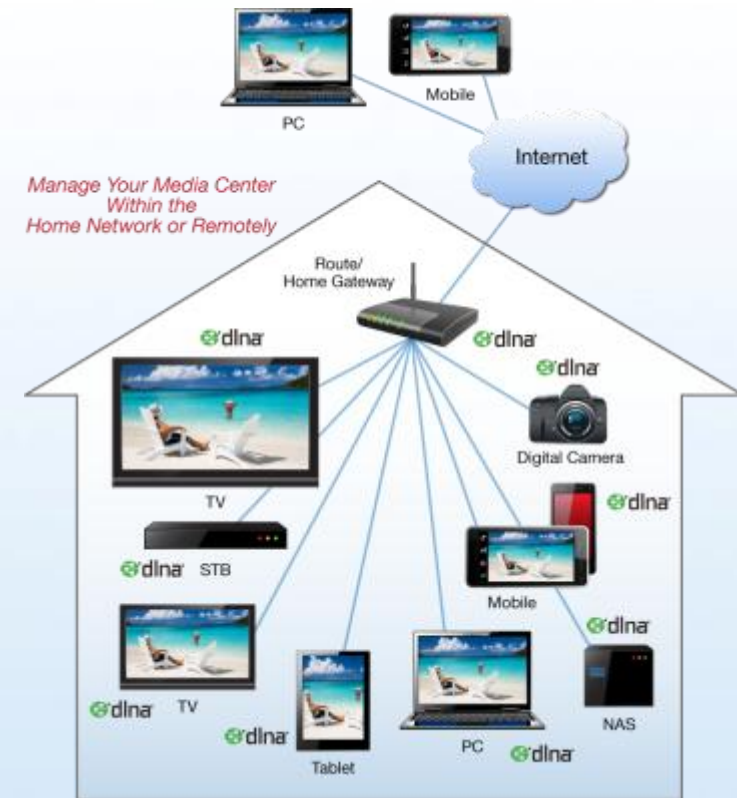   3. Professional services

3. **ACCESS Twine**
   1. Cloud solution
   2. Enables remote upload, download of content
   3. Enables remote access
   4. Software available for mobiles
      pc and embedded devices

NetFront Living Connect

- NetFront™ Living Connect is a Digital Living Network Alliance (DLNA) Technology Component™ solution that enables OEMs to quickly and efficiently implement DLNA functionality on consumer electronic devices including mobile phones, digital cameras, printers, DVD players, digital TVs, set-top boxes, network attached storage (NAS) boxes and more.

- NetFront Living Connect has achieved an extensive track record of successful DLNA Certified® device deployments on a variety of consumer electronic devices.

- It's optimized for embedded devices and features high portability and a flexible modularity that allow it to function with any OS or CPU while also providing for easy customization.
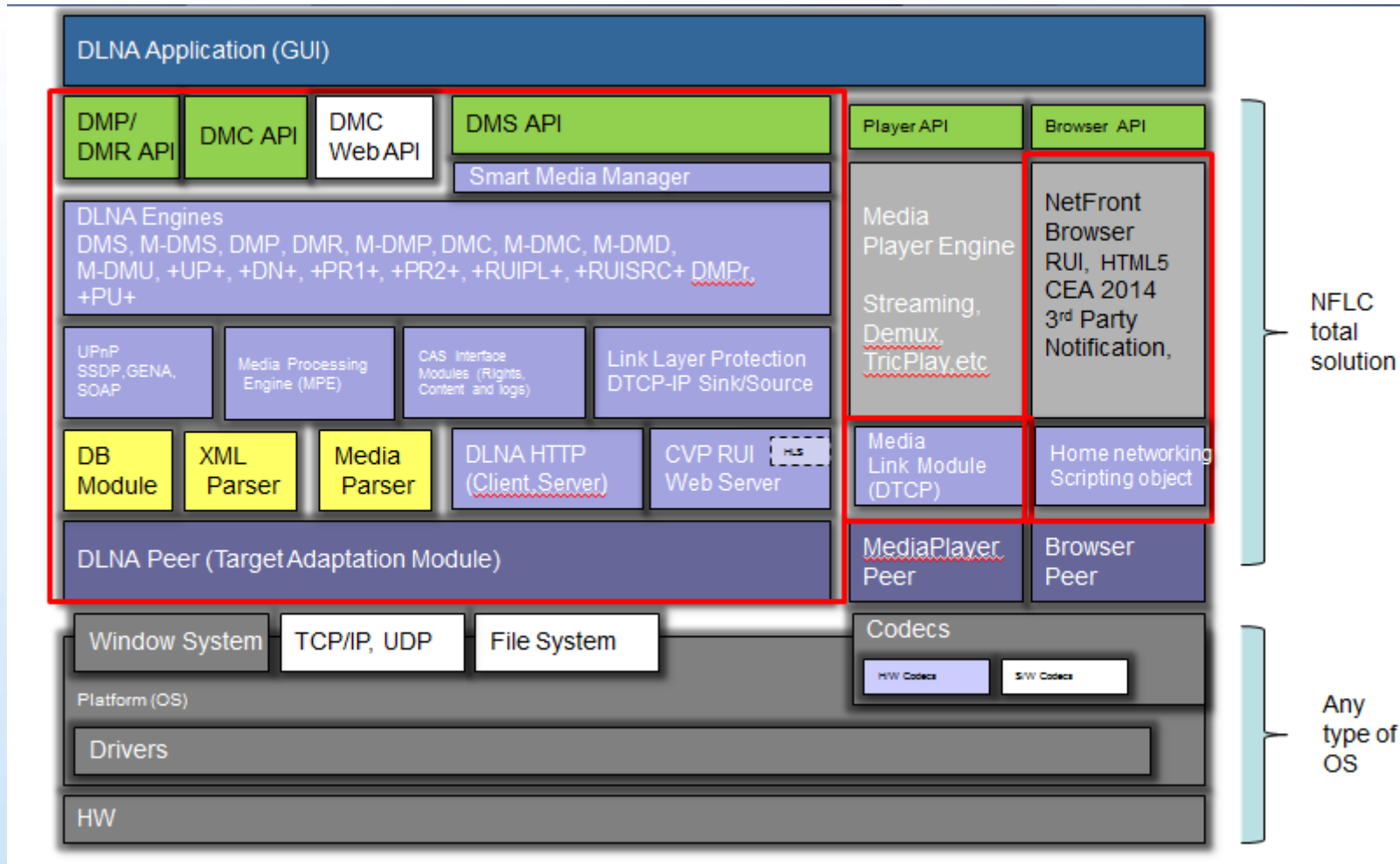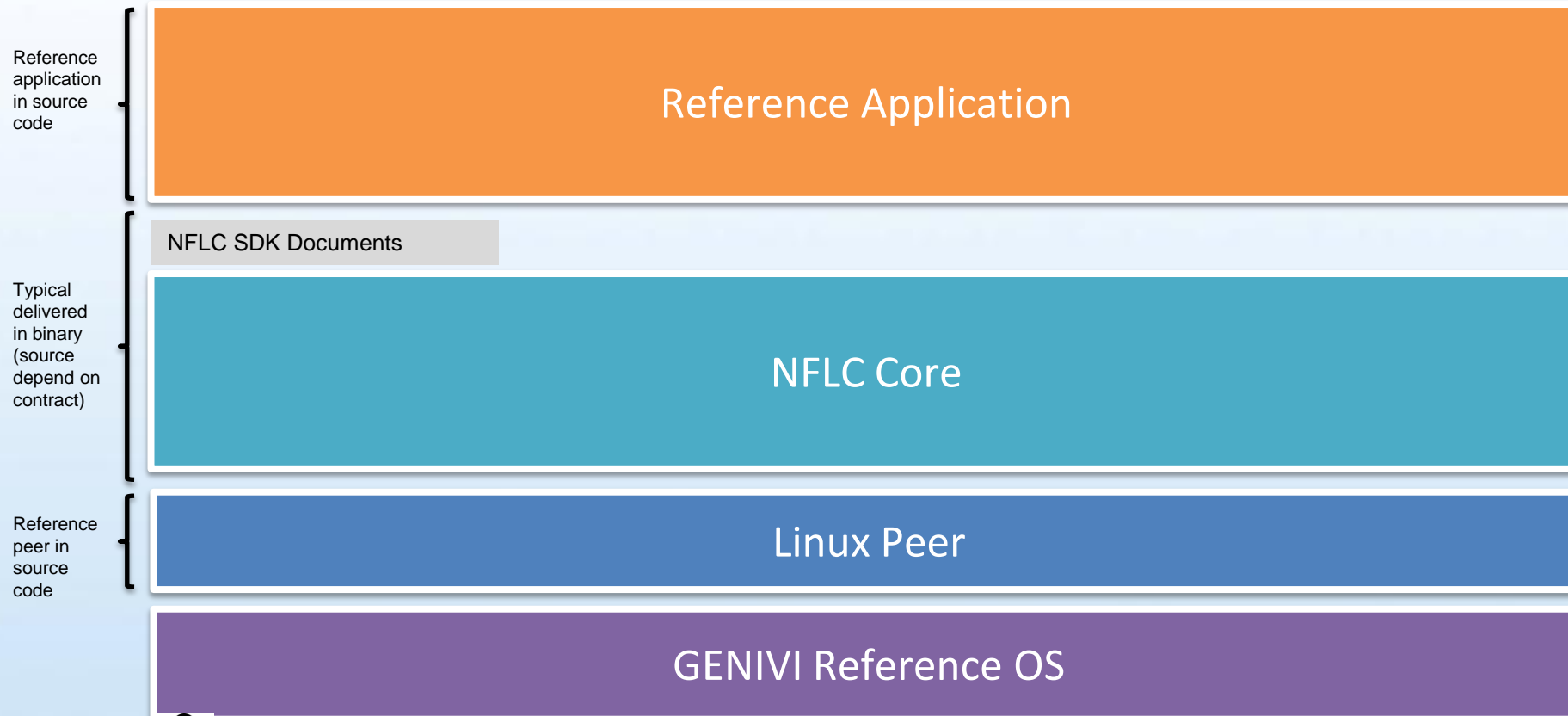
Platform Availability

- NetFront™ Living Connect is delivered as software development kit. The software can be provided to any C compliant platform but pre-developed SDK are available for GENIVI Platform

Reference application in source code

Reference Application

NFLC SDK Documents

Typical delivered in binary (source depend on contract)

NFLC Core

Reference peer in source code

Linux Peer

GENIVI Reference OS

ACCESS Twine Cloud Service to Connected Cars

Access your content from web or home

- Passenger and Driver can access all their personal content remotely over the network and enjoy their music at any time.

- No need to copy files anymore to USB drive or Mobiles

- Stream directly from home

- Option to store and Synchronize the Music right away to the car HDD storage

Car manufacture can create a higher brand loyalty if they provide connected services to their customer.

Demo setup
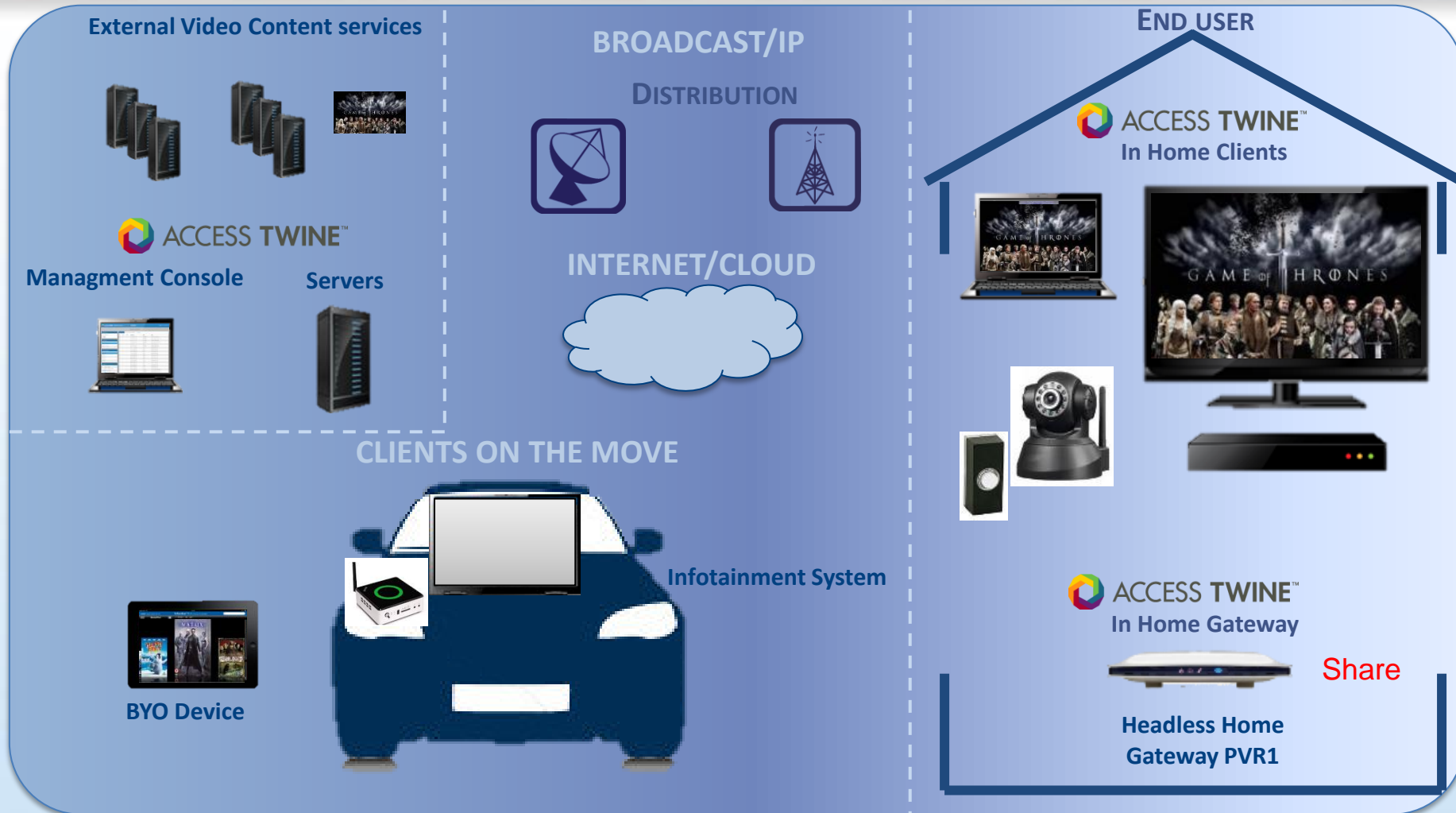
Main reasons
why we are selected by our customer

- Large Independent Global Software Company
  - More than 30 years in the market, 800 Employees Globally
  - Over 1.5 Billion Million CE devices deployed: DLNA & Browser
- Focus on Technical support,
  - local and experienced support teams in any region (China, Korea, US, Europe, etc.)
- Significant investment into DLNA
  - promoter member, strong support for advanced use cases like RUI, DTCP-IP, CS, etc.
- Development process focus on Certification
  - daily CTT testing, Attending any DLNA plugfest
- White label solution
  - we allow our customer to use any branding and UI
- Multiplatform SDK available
  - Linux, Android, iOS, and source SDK for any other platform
- Convergence support
  - expert in Operator , CE market and also Connected Car market

Thank you very much!

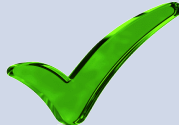| Alias	Title	Description	DLNA Certification Available
USEC1	DLNA 2-box pull to the IVI Unit	The Driver wants to browse and play music located on his mobile phone onto his IVI Front Unit while driving. The IVI system Front Unit in this case acts as a DLNA Digital Media Player, the mobile phone acts as a DLNA Digital Media Server. The content is pulled to the Front Unit, from the DMS, for immediate rendering. This use case is applicable to Photos, Music, and Videos.	✓
USEC2	USEC2 DLNA 2-box push to the IVI Unit	Prior to enter the car, the Rear Passenger was watching a video on his Tablet. He now wants to resume watching his video onto the car IVI Rear Screen. The IVI system Rear Unit in this case acts as a DLNA Digital Media Renderer, the Tablet acts as a DLNA Push Controller. The content is pushed to the Rear Unit, from the Tablet, for immediate rendering. This use case is applicable to Photos, Music, and Videos.	✓
USEC3	DLNA 2-box pull from the IVI Unit	The Rear Passenger enters the car with his Tablet in hands (no Rear Screens available). He knows the car IVI Front unit has a hard drive with a collection of movies that he wants to watch on his tablet. Thus, using his Tablet, he browses the movies list stored on the IVI system and starts watching his selection. The IVI system Front Unit in this case acts as a DLNA Digital Media Server, the Tablet acts as a DLNA Digital Media Player. The content is pulled from the Front Unit to the Tablet for immediate rendering. This use case is applicable to Photos, Music, and Videos.	✓
USEC4	DLNA 2-box push from the IVI Unit	The Driver browses the collection of cartoons stored on the hard drive of his IVI Front Unit, and selects his kid's favorite cartoon to be played onto the Tablet of his kid, sitting on the rear (with no Rear Screens available), has in hands. The IVI system Front Unit in this case acts as a DLNA Push Controller, the Tablet acts as a DLNA Digital Media Renderer. The content is pushed to the Tablet, from the Front Unit, for immediate rendering. This use case is applicable to Photos, Music, and Videos.	✓

Alias	Title	Description	DLNA Certification Available
USEC5	DLNA 3-box push	From the IVI Front Unit, the Driver wants to browse and play a video located on his mobile phone, and selects the car IVI Rear Screen to render it (same case if to render on the Tablet his kid has in hands). The Front Unit in this case acts as a DLNA Digital Media Controller, the IVI Rear Unit (or the Kid's Tablet) acts as a DLNA Digital Media Renderer, and the mobile phone as a DLNA Digital Media Server. The content is pushed to the Rear Unit (or Tablet) from the DMS, for immediate rendering, thanks to the order initiated by the DMC. This use case is applicable to Photos, Music, and Videos.	✔
USEC6	DLNA Content Synchronization	When the car enter the garage, thus when it reaches the coverage of the Driver's home network, it automatically synchronizes the latest music and video between the Driver's Media Center at home and his car IVI system. The new music and videos that are on the Media Center but not on the IVI system are downloaded to the IVI system. The new music and video that are on the IVI system but not on the Media Center are uploaded to the Media Center. The IVI system Front Unit in this case acts as a DLNA Download/Upload Synchronization Controller and the Media Center at home acts as a DLNA Digital Media Server. The content is downloaded/uploaded from/to the DMS to/from the IVI system Front Unit. This use case is applicable to Photos, Music, and Videos.	No, content synchronization not certifiable. Need tool update, reference devices and Test Plan update
USEC7	DLNA Download Controller to the IVI Unit	The Driver listens to his favorite Music Album from his IVI system while driving to the airport, he wants to continue listening the album when offline in the plane, using his mobile phone. Thus he downloads the album from the IVI system to his mobile phone. The IVI system Front Unit in this case acts as a DLNA Digital Media Server and the mobile phone acts as a DLNA Download Controller. This use case is applicable to Photos, Music, and Videos.	✔

Alias	Title	Description	DLNA Certification Available
USEC8	DLNA Upload Controller to the IVI Unit	The Driver wants to make sure he'll get a quiet long drive to his destination. He thus wants to upload his kids' favorite cartoons from his Media Center at home to his car IVI system before leaving. The IVI system Front Unit in this case acts as a DLNA Digital Media Server and the Media Center acts as a DLNA Upload Controller. This use case is applicable to Photos, Music, and Videos.	✓
USEC9	DLNA Upload Controller from the IVI Unit	The Driver listens to his favorite Music Album from his IVI system while driving at home, he wants to continue listening the album at home, using his Media Center. Thus he selects the album from the IVI system and uploads it to his Media Center. The IVI system Front Unit in this case acts as a DLNA Upload Controller and the Media Center acts as a DLNA Digital Media Server. This use case is applicable to Photos, Music, and Videos.	✓
USEC10	DLNA Download Controller from the IVI Unit	The Driver wants to make sure he can listen to his favorite Album prior to driving to his destination. Sitting in the car, within the garage, he thus wants to download it from his Media Center at home to his car IVI system before leaving. The IVI system Front Unit in this case acts as a DLNA Download Controller and the Media Center acts as a DLNA Digital Media Server. This use case is applicable to Photos, Music, and Videos.	✓

genivi-DLNAUsecases-260215-0731-2.pdf "Use cases" as Use Flows