

DLNA in Automotive

GENIVI All Members Meeting

Paris, April 2016
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ACCESS : History

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ACCESS DLNA : Deployed

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Pioneer
uBee **Virgin media**
- Satellite**
HUMAX
SKY PerfectTV!
- IPTV**
PANTECH **at&t**
FASTWEB
swisscom
- DTT**
CABOT **s&t**

PC
Microsoft

NAS
WD Western Digital
PCL **Parvex Communications**

Mobile Apps and Devices
dlna **ACCESS**
life **android** **apple** **Do Co Mo**

DTV
VESTEL

Camera
SONY Cyber-shot

Blue-ray
SAMSUNG

STBs
PIRELLI BROADBAND SOLUTIONS
Pioneer **VESTEL**

CE

ACCESS™

Why DLNA in the car?

- Facilitator for “**BYOD**”
 - Consumers want to bring their own phones, tablets and other devices into the car
 - Consumers want to access their wherever it is stored
 - Consumers want to consume their media on any device in the car
- OEMs can provide a **branded experience**
 - Extends customer relationship beyond the vehicle
 - Custom apps keep control of the user experience within the OEM’s domain and help ensure interoperability
 - OEM branding rather than “California in the car”

DLNA actors for the car : Controller

- Detects available media (servers)
- Provides UI to navigate to content
- Selection of media
- Selection of output device (renderer)
- Playback control
- Potential DLNA controllers in the car
 - Main IVI unit in the front
 - Secondary IVI screens in the rear (rear-left, rear-right)
 - Passenger smart phones and tablets

DLNA actors for the car : Renderer

- Presents the content
 - Audio playback
 - Video playback
 - Image display
- Potential DLNA renderers in the car
 - Main IVI unit in the front
 - Screen and/or car audio system
 - Secondary IVI screens in the rear (rear-left, rear-right)
 - Passenger smart phones and tablets

DLNA actors for the car : Server

- Holds media content
 - Audio, video, images
 - Can provide media upload/download service
- Potential DLNA servers in the car
 - Main IVI unit
 - CDs, USB, internal storage
 - Passenger smart phones and tablets

GENIVI : DLNA Use Cases Overview (1)

- GENIVI Wiki lists a number of basic use cases
 - Basic use cases are for the IVI system to access media servers, present the content available and control the media presentation
 - “BYOD” (phone tablet) use cases are limited to selecting a renderer device from the IVI system controller
 - Lots of questions/comments asking for clarifications or further discussion
- A number of additional use cases and questions are discussed in textual form
- Further additional use cases, originated by Intel, are also listed from the perspective of the user
 - More complex and include control via user devices

GENIVI : DLNA Use Cases Overview (2)

- Basic use cases (contributed by JLR)
 - UC-DLNA-001 Start-Up
 - DLNA Media Server discovery
 - “Device Available” events raised
 - UC-DLNA-002 Shut Down
 - Stop all media presentation, indexing and media transfers, removes incomplete content
 - UC-DLNA-003 Activate DLNA
 - DLNA subsystem retrieves last status and restores (i.e. resumes playback from last stored position)
 - UC-DLNA-004 Source Switching (“deactivation”)
 - Saves playback status as source switched to another application

GENIVI : DLNA Use Cases Overview (3)

- Basic use cases (contd)
 - UC-DLNA-005 DMS available
 - New DMS detection and add to list of available servers
 - UC-DLNA-006 DMS unavailable
 - Remove server from list of available servers
 - UC-DLNA-007 Select Digital Media Renderer
 - Present list of available renderers
 - Allow user to select renderer, systems saves selection
 - UC-DLNA-008 DMS browsing and media selection
 - Folder structure presented and user can navigate
 - User selects media item(s) for playback and media is presented

GENIVI : DLNA Use Cases Overview (4)

- Basic use cases (contd)
 - Media Control
 - References Media Manager use cases for
 - Play, Pause, Stop, FF, REW
 - Next Item, Prev Item
 - End of Media Event
 - Enable/Disable Shuffle Mode
 - Get Track Status
 - Set Media Item Time (“seek”)
 - Media Item Unavailable Event

GENIVI : DLNA Use Cases Overview (5)

- Basic use cases (contd)
 - UC-DLNA-034 DLNA Import
 - Copy external media from another DLNA server to the IVI system
 - Includes detection of existing files and presentation of options for Overwrite, Overwrite All
 - Upload cancellation during operation
 - Out of space detection and remove of partially copied file

GENIVI : Additional Use Cases (1)

- USEC1 – IVI browses phone and plays media
- USEC2 – Tablet sends media to IVI rear
- USEC2B – Protected media streaming ** N/A **
- USEC3 – Tablet browses IVI media and plays on IVI
- USEC4 - IVI browses IVI media and plays on tablet
- USEC5 – IVI browses phone media and plays on IVI rear
- USEC6 – IVI media synchronisation with home server
home network detected
- USEC7 – Phone download from IVI for offline listening
- USEC8 – Home server media upload to IVI
- USEC9 – IVI upload media to home server
- USEC10 – IVI download media from home server

CVP-2 / VidiPath?

- DLNA specification initially aimed at pay TV providers to enable streaming of content protected media to their retail products such as TV's, smartphones, tablets, game consoles and more.
- **Includes “remote user interface”, or RUI**
 - Client authentication
 - HTML5 UI discovery
 - extending typical DLNA, video, audio, images discovery
 - Extend familiar OEM car interface to consumer devices
 - e.g. to control radio, media playback, air conditioning settings, etc.
 - Opportunity for OEMs to connect with their customers
 - Extend beyond the vehicle

The logo for VIDI PATH, with "VIDI" in a bold blue font and "PATH" in a lighter blue font with a stylized arrow pointing to the right.

Looking ahead for GENIVI

- Streaming video
 - Current mobile networks tend to be unreliable and typically are not robust enough to stream video content
 - As networks advance (e.g. 5G) then consumers will be able to access services like catch up TV services (e.g. BBC iPlayer in UK) and home content such as video recordings (PVR)
- High value / protected video
 - Protected (Digital Rights Managed, DRM) content such as Netflix, Amazon video or operator content such as Sky whilst in the car/on the move
- Social integration
 - Access video, photos and other content from social networks and online storage like Facebook, YouTube, Google Photos/Drive, Dropbox from the car
- Media statistics gathering
 - Capture consumer media behaviour to provide valuable data to help develop new business models (e.g. ad funded channels, targeted advertising, other offers from OEM)

Looking ahead – Connected Services

- Media Management
 - Consumers do not care on which devices content is stored
 - A single view of available media simplifies and enhances the user experience
 - Metadata enhancement
- Remote Access
 - Access to the home content from within the car
 - Media files (no need to copy library to car any more before journey – bandwidth and data plan permitting)
 - Documents
 - Recordings on home DLNA devices (PVRs)
 - Cloud Service needed to:
 - enable Remote Access
 - manage the ecosystem, access rights for devices and users
 - **ACCESS Twine** product provides this
 - Can be hosted in the cloud (e.g. Google, Amazon) or at OEM data centre
- Analytics
 - Cloud or OEM hosted service to support offline analytics
 - Enable OEMs to better understand how their customers use the IVI system
 - Can be integrated with other systems, such as car servicing and error status to provide information to customers via IVI and to enable the OEM/dealers to proactively contact their customers

ACCESS extensions

- **Controller application & SDK that can be included in OEM branded apps**
 - iOS, Android, Windows, MacOS
 - Can also be used to create standalone apps, if appropriate
- **DRM and Content Protection**
 - Microsoft PlayReady, Verimatrix, Irdeto, etc.
 - Link protection : DTCP-IP
- **“Follow me” content playback**
 - Playback started on one device can be continued on another
- **Social content and online storage access**
 - Facebook, YouTube, Google Drive, Dropbox available now
- **Internet DMS**
 - Online content made available via DLNA protocols
- **DMS aggregation**
 - Single view of all available content, whichever DMS is it stored on
- **Usage tracking**
 - Provide analytics information on media consumption
 - Can be used for recommendations or ad based services
- **Content Synchronisation**
 - Enable content to be synchronised between vehicle and home media server to ensure desired audio and video content is available in the car

Demonstration

- Set-up

- Hardware

- Google Nexus 9
- HTC One M8

- Servers

- Phone
- Mock-up IVI UI

- Controller

- Android tablet
- iOS tablet

- Renderers

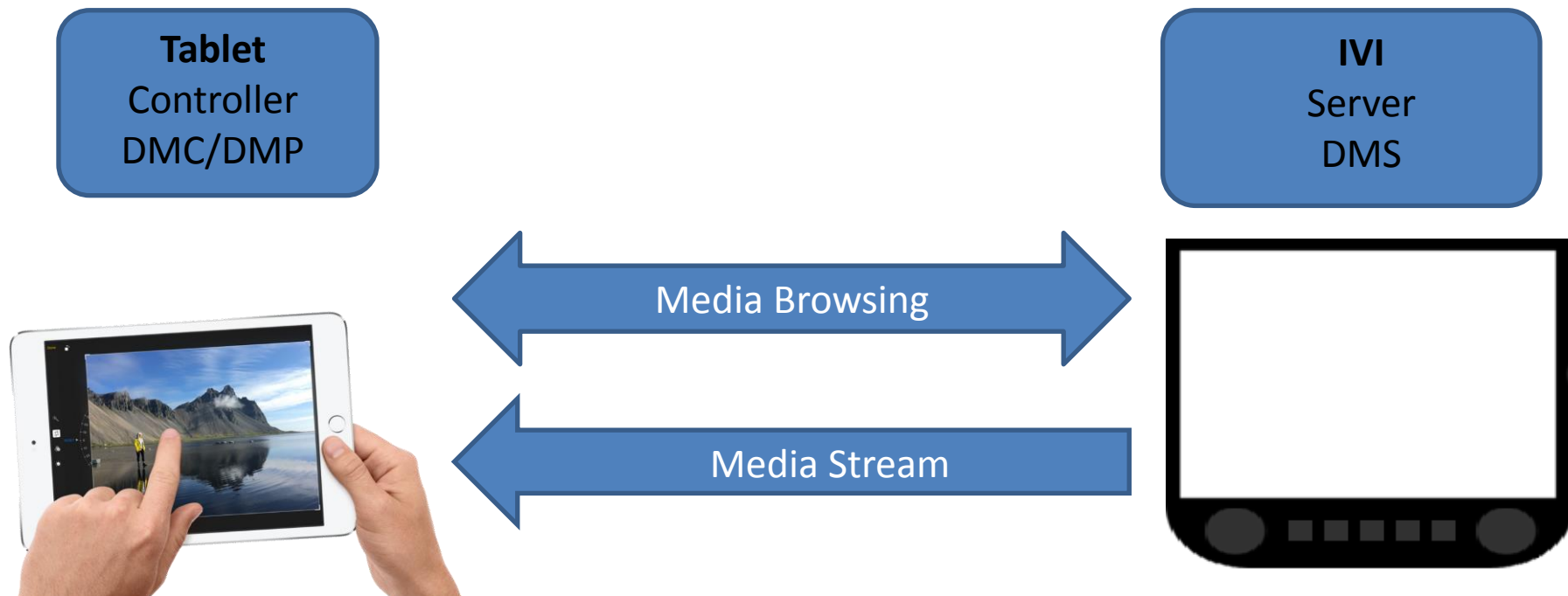
- Android phone
- Android tablet
- Mock up IVI system

Use cases

- Tablet browsing media content stored on IVI system
- Tablet playing IVI stored media
 - Audio & video
- Phone media push to IVI system
 - Audio and pictures
 - Follow-me audio playback (“render hopping”)
- Phone selection of IVI stored media and playback on tablet

Demo 1: Browsing and Playback

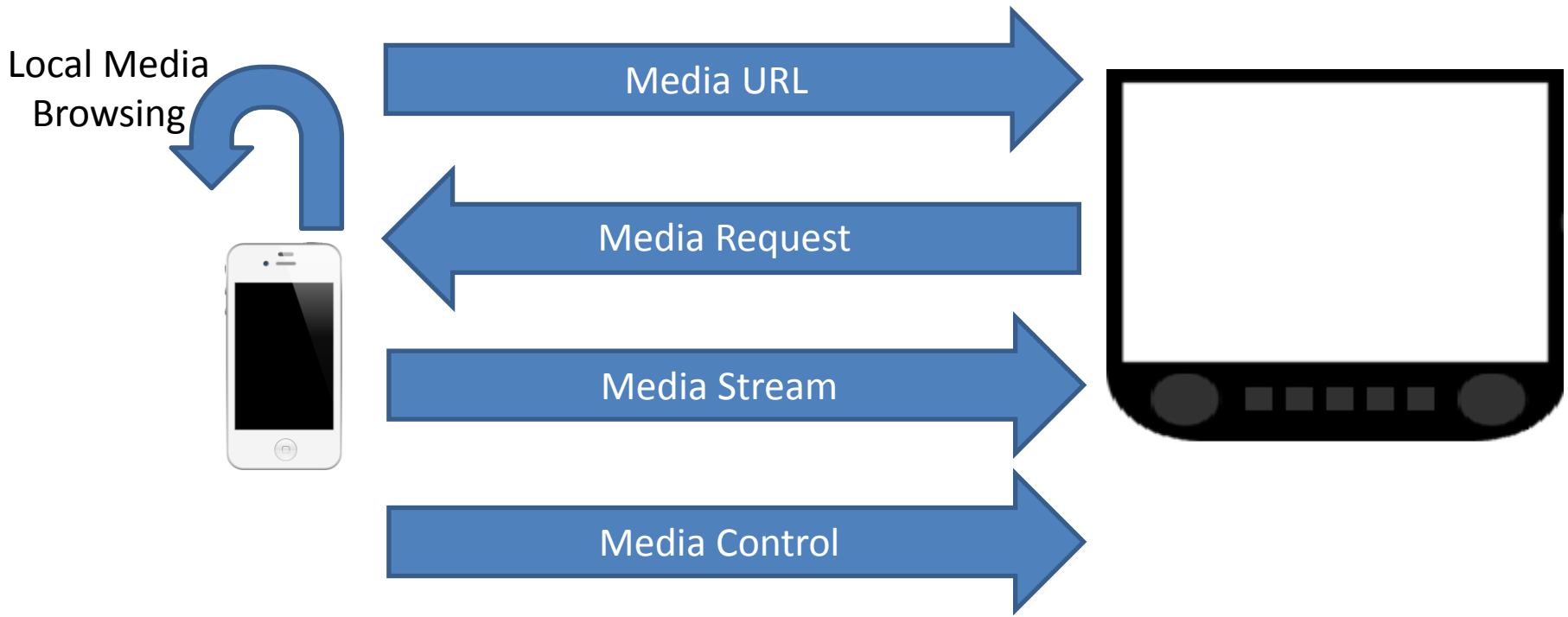
- Passenger browsing content stored on IVI system



Demo 2: Playback from smartphone - Local content push

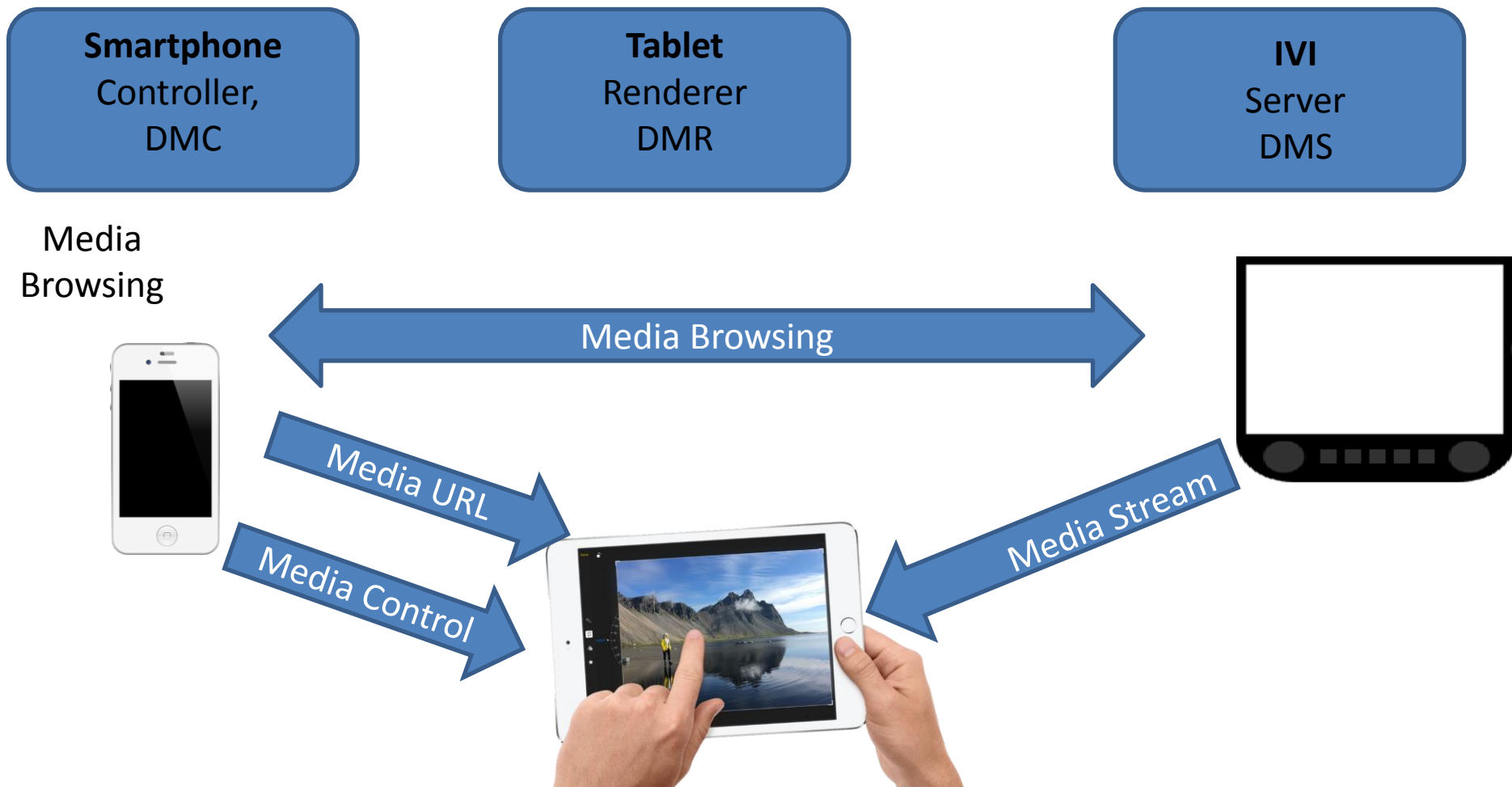
Smartphone
Controller, Server
DMC, Local Media
Push Server

IVI
Renderer
DMR



Demo 3: Playback from IVI

- Passenger browses IVI stored content, pushed to child's tablet in rear of car



Thank You

Q&A

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