DIGITAL Arkuda

Adding value to your business

Arkuda Digital Media Network SDK

White Paper

Executive summary

As a result of increase in the number of devices with communication ability and multimedia content, stored on PCs and other digital storage devices, there has been arisen a necessity for interoperability within multiple devices from different manufacturers. The end user would like to have an easy way of sharing media information between owned devices, for instance, show picture from digital camera to TV set, and print it on a printer, connected to a home network. The digital home conception is making allowance for the PC, CE, and Mobile Device domains integration through a seamless, easy to use, interoperable network, and provides a unique opportunity for manufacturers and consumers alike.

Digital Living Network Alliance (DLNA), a cross-industry organization, has published a common set of industry design guidelines for network connectivity. These use case driven guidelines allow seamless interoperation between devices from different manufacturers including imaging, audio and video devices.

Increased competition and changing economical environment creates challenging tasks for device manufacturers such as produce product with rich functionality, seamless integration capabilities as fast as possible. One of the possible ways to decrease time to market, mitigate the risks, get predictable result and save the budget is to use third-party provider for UPnP and Media Network compatibility implementation.

This white paper provides a background on the issues that device manufacturers face and explains how Arkuda Media Network SDK addresses these issues.

Introduction

The past few years consumers all over the world began to use more and more digital devices in everyday life. As a result they have to operate with enormous amount of content – images from their digital cameras and cell phones, audio downloaded from Internet and ripped form CDs on home PCs, video downloaded from Internet and BR/ DVD disks for their BR/DVD Players. This situation creates new requirement for device manufacturers and this requirement is convenient content interoperability. Consumers want the seamless integration among all digital devices in their home for easy content exchange across home network. They don't want to spend time for complicated digital devices integration installation and configuration. They should be able to quick and easily connect al their equipment and share their fast growing digital content libraries.

This white paper describes the main features of Arkuda Media Network SDK, architecture, and platforms compatibilities.

Business Challenge

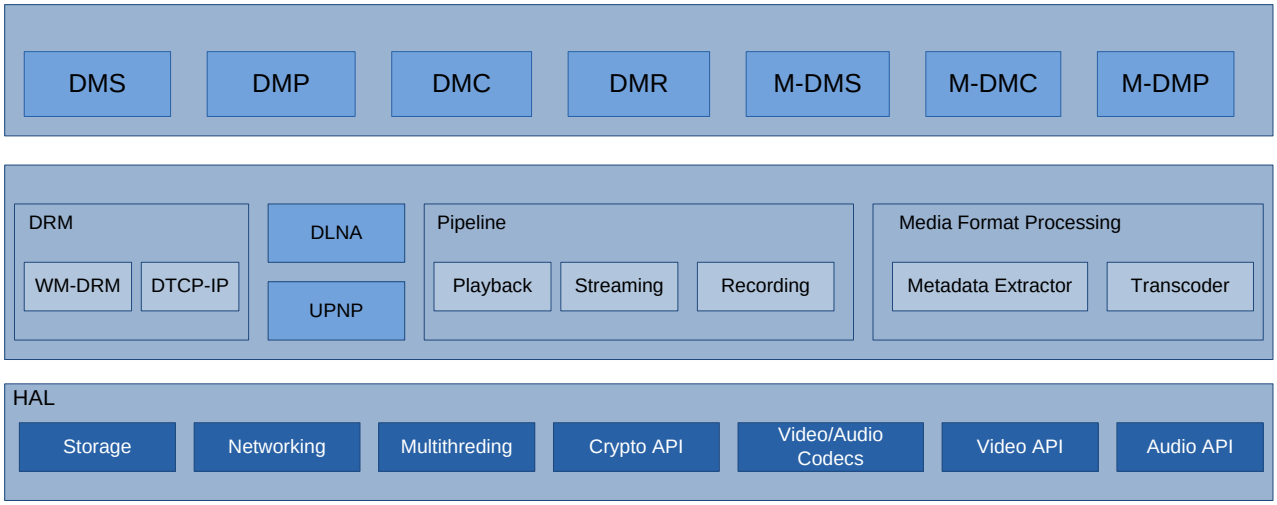
Market demand sets a complicated task for manufacturers – to provide the integration capabilities in their digital home products. The one of ways to do that is to enable diverse devices with compliance and interoperability. Implementation and maintenance of those abilities all alone requires significant investment of time and resources and availability of expensive specialists on board. In most cases, the best way for digital device manufacturers is to use third-party providers for UPnP and Media Network compatibility implementation and support.

SDK description

Arkuda Media Network SDK is cross-platform, extendable, plug-in enabled, C/C++ based. It includes implementation for the most popular device classes and provides wide set of components to build your own device class. It's designed for implementing solutions for following platforms:

- Windows
- Linux
- Android
- iPhone
- Mac OSs
- Symbian OS
- Windows Mobile
- QNX
- Broadcom platform

SDK has 3 layers – *Hardware Abstraction Layer (HAL)*, *Framework* and *Application*:



Hardware Abstraction Layer (HAL)

Layer consists of low-level objects which implements access to file system, network data transmission, Multitasking, crypto API, media codec API, media rendering API. All objects export C-based interfaces which hide platform dependent implementation.

Framework Layer

Layer consists of logically completed functional modules:

UPnP module provides discovery and publication of UPnP devices and services within the local network. Its implementation covers the basic UPnP services:

- Content Directory
- Connection Manager

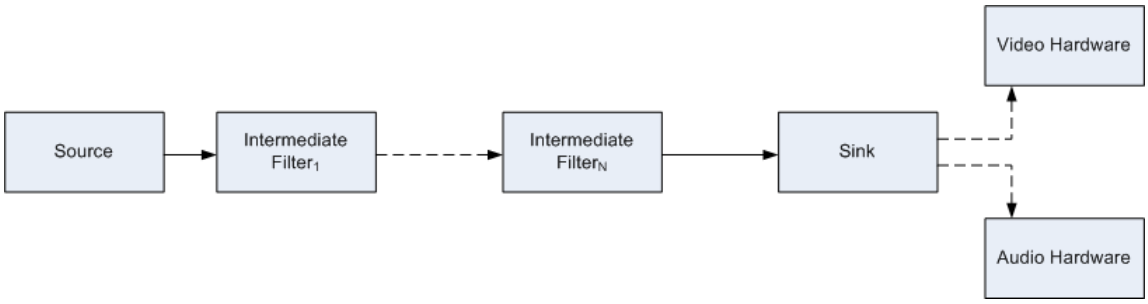
- AVTransport
- Scheduled Recording
- Rendering Control

Media Network module provides extensions for UPnP services:

- Media Network profile name recognition for media content
- Media Network device discovery and control
- Media Management
- Media Transport
- Link Protection

Media Format Processing module provides metadata extraction, runtime and offline media content trans-coding. Both sub-modules Metadata Extractor and Trans-coder have plug-in based architecture where each plug-in is responsible for particular media format.

Pipeline module provides media content recording, playback and streaming. Each sub-module has a set of components (filters) and rules which form data flow pipelines. For example, structure of playback pipeline:



DRM module provides data and copyright protection during transmitting media content over network. There are two sub-modules which implements possible ways of protection:

- DTCP-IP (includes case with advanced localization [AL=1])
- WM-DRM (Cardea, Janus)

Application Layer

Layer contains implementation for DMS, DMP, DMC, DMR, M-DMS, M-DMC, M-DMP media device classes in the form of standalone applications. Also it is easy to combine implementations for two or more media device classes to create combo device like DMP/DMS, DMP/DMR or DMP/DMC.

Features

Media Network Device Classes

Digital Media Server (DMS)
Digital Media Player (DMP)
Digital Media Controller (DMC)
Digital Media Renderer (DMR)
Mobile Digital Media Server (M-DMS)
Mobile Digital Media Player (M-DMP)
Mobile Digital Media Controller (M-DMC)
Mobile Digital Media Uploader (M-DMU)
Mobile Digital Media Downloader (M-DMD)

Media Network Device Capabilities

Upload Controller (+UP+)
Download Controller (+DN+)
Push Controller (+PU+)

DRM

DTCP-IP
Windows Media DRM 10 Network Devices

Media Formats

Supported by DMS

Image (JPEG, BMP, PNG, TIFF)
Audio (MP3, WAVE, AAC, AC-3, LPCM, AMR, WMA*)
Video (AVI, MPEG2-PS, MPEG2-TS, MPEG4, H.264, WMV*)

Supported by DMP

Image (JPEG, BMP, PNG, GIF, TIFF)
Audio (MP3, WAVE, AAC, AC-3, WMA)
Video (AVI, MPEG2-PS, MPEG2-TS, MPEG4, H.264, WMV)

UPnP

SOAP
SSDP
GENA

Media Transport

HTTP

Windows 7 Logo Certification

LLTD (Link Layer Topology Discovery)

Feature Highlights

- ✓ Robust, commercial, compatible UPnP and Media Network framework implementation.
- ✓ Includes implementation for the most popular media device classes
- ✓ Provides wide set of components to build your own media device
- ✓ Cross-platform solutions
- ✓ Real-Time systems capable
- ✓ Support for generic platforms - Windows, Linux, Mac OS X, QNX
- ✓ Support for mobile platforms - Android, iPhone, Symbian, Windows Mobile, and Embedded Linux.
- ✓ Full DRM support
- ✓ Plug-in extendable
- ✓ Component based – smooth integration within existing system
- ✓ HTTP transport
- ✓ Supports LLTD, needed for Windows 7 Logo Certification

Why Partner with Arkuda Digital?

Integrity

Arkuda Digital creates seamless workflow integration with our partners; as a result you don't need to make any significant changes in the existing processes. It allows us to exchange knowledge and expertise in a natural way, without additional efforts, and to act as a part of our partner's team.

Cost effectiveness

External development of the UPnP and Media Network integration allows you to save costs on team staffing, implementation, reducing headcount and supporting phases.

Efficiency

You don't have to pay a full salary to specialists requiring 40% utilization. You cover only the time spent on the particular task.

Time to market

You don't exert efforts on searching and hiring the engineering staff - we already have experienced teams of professionals in areas of UPnP, Media Network and cross-platform development who are ready to start work.

Predictability

We provide the predictable result within the agreed plan and budget which fits your business schedule. Any adjustments to the plans are reported in advance, ensuring timely delivery of the project.

Communication

Regular communication flow and feedback sessions with our partner's team allow us to find the best solutions and get the expected outcomes on schedule.

Flexibility

We can increase or decrease team size according to our partners' business needs. You don't have to invest your time and costs on headcount changes.

Transparency

We provide a complete picture of the project status. All activities are tracked on the daily basis. You will be able to see the real progress and have a possibility to check it against planned.
Documentation flow is clear, simple and available to all project staff.

Reliability

We take care of the developed and deployed systems support. You don't need to have all specialists onboard for a full salary to keep the system running. You only pay for the specific time spent on the system support.

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If you are interested in our services or any product by Arkuda Digital, please contact us for further queries.