

Introduction to MHP 1.1.3, MHP 1.2 and MHP/GEM for IPTV

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Components of these Specifications

- **MHP 1.1.3**
 - The latest maintenance update to the MHP 1.1 series
- **MHP 1.2**
 - Extends based on MHP 1.1.3 with
 - Permanently running (“unbound”) applications
 - Optional support for network operator / service provider controlled devices
- **MHP – IPTV**
 - Included as a new profile in MHP 1.2.
 - Includes mapping from MHP APIs to DVB IPTV protocols
- **GEM – IPTV**
 - Generic IPTV solution for networks not using DVB defined protocols and signalling

MHP 1.1.3 Changes

Technical Details - Smart Cards

- Basic smart card usage
 - Added events for card insertion & removal
 - Derived from existing practice in Italy
 - Added “raw” APDU connection for smart cards not compatible with basic SATSA API
- Advanced smart card usage
 - Replaced cryptographic service provider management model with generic solution
 - Based on subset of MHP 1.2 Provider framework
 - Multiple applications can use a cryptographic service provider but each gets its own copy of the classes
 - General tidy-up from development of test specification

Technical Details - Graphics in HD Systems

- Reduced HD graphics resolutions
 - 1920x1080 changed from mandatory to optional
- Additional square pixel graphics resolution
 - 960x540 added for compatibility with OCAP and Blu-ray
- New AIT descriptor signals application graphics capabilities & behaviour
 - Which graphics resolutions an application supports
 - Behaviour of application when no supported graphics resolution is available
 - Behaviour of application when broadcast video is scaled by EPG or navigator
- I-frames in HD
 - No requirement for supporting i-frames simultaneously with HD video

Technical Details - Tidying Various APIs

- Service selection API
 - ServiceContext.select(Locator[]) and applications
 - Re-selecting the currently selected service
- Stored applications
 - Storing applications can be asynchronous as well as synchronous
 - Storing applications not in the AppsDatabase to a StoredApplicationService
 - Tidy-up from development of test specification
 - Re-write of stored application security requirements
- Component based players
 - Atomic video swap between background and component based players
 - Service selection when the video of the old service is in a component based player

Technical Details - Other Changes

- Java TV updated
 - Reference to version 1.0 replaced with reference to version 1.1 (JSR-927)
 - Most MHP errata to Java TV included in Java TV 1.1
- Tidy-up of integration of PBP into MHP
 - Graphics2D and DVBBGraphics
 - IxcPermission
- Solutions to smaller issues found by OCAP and Blu-ray implementers
- Miscellaneous
 - Update memory card API to latest version of OCAP
 - Reduce requirements for key lengths from 4096 to 2048

General MHP 1.2 Features

History of Unbound Applications

- MHP 1.0 applications tied to broadcast services
 - Changing service changes applications
- Some operator applications must run all the time
 - e.g. EPG, telephone caller-id
 - Can be “faked” in MHP 1.0 with applications tied to all services in a network
- OCAP extends MHP 1.0 with “unbound applications”
 - Run independently of selected broadcast service
 - Receiver reads list of initial unbound applications from network signalling
- MHP 1.2 adopts a subset of OCAP's unbound applications

Unbound applications in MHP 1.2

- Included from OCAP
 - Overall architecture
 - AIT descriptors for abstract services & unbound apps
 - org.ocap.service.AbstractService
- Function included but with different solution
 - Unbound applications carried in specially signalled DVB service
 - Storage of unbound applications changed from priority based caching to explicit storage
 - Re-uses org.dvb.application.storage package
 - Resource priorities changed from application level to service context level
- Not included at all
 - Application control of resource arbitration between unbound applications / abstract services

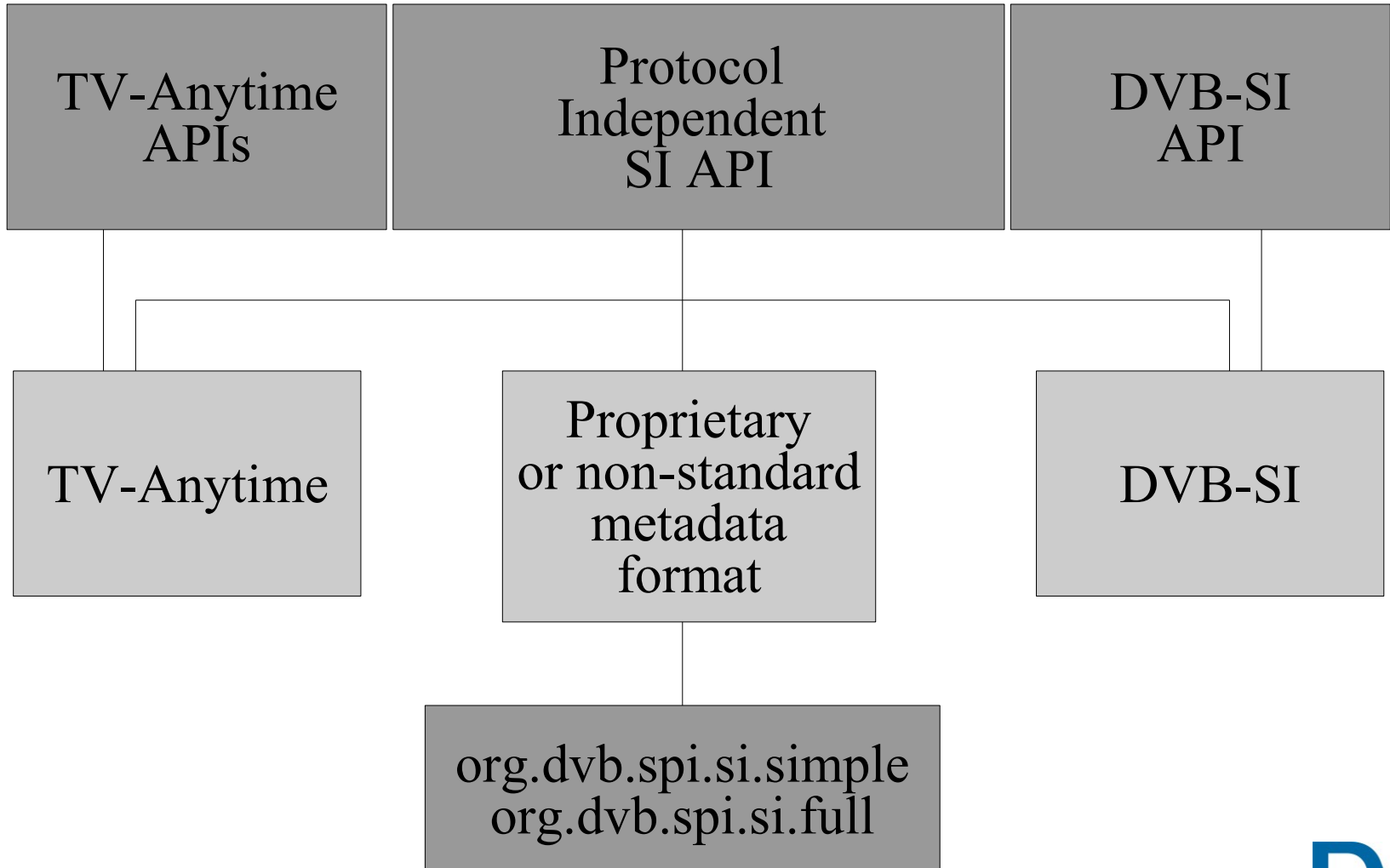
Providers (Adaptors, Protocol Translators)

- Provider framework enables standard APIs to work with protocols not in receiver middleware
 - e.g. already deployed non-standard protocols
 - e.g. standard protocols with very divergent interpretations
 - e.g. protocols evolved / defined after receiver deployment
- Providers included as part of MHP applications
 - Can be deployed without a system software update
 - Can be stored with existing application storage API
- 2 types of provider
 - XletBoundProviders where each Xlet has its own copy
 - SystemBoundProviders where there's one copy for the whole MHP terminal

Supported Providers

- **SelectionProvider**
 - Translator between service selection API / JMF and proprietary protocol for initiating content presentation
 - e.g. switched digital or RTSP
- **SimpleSIProvider**
 - Translator between system SI database and proprietary or non-standard metadata format
- **SIManagerProvider**
 - Over-rides Java TV SI manager for one Xlet
- **CryptographicServiceProviderProvider**
 - See MHP 1.1.3 “Advanced smart card usage”
- **InteractionChannelTransportProvider**
 - Translator between MHP 1.1 return channel download mechanism and proprietary file download protocols

Providers and Metadata Access



Operator Controlled MHP Terminals

Privileged Applications

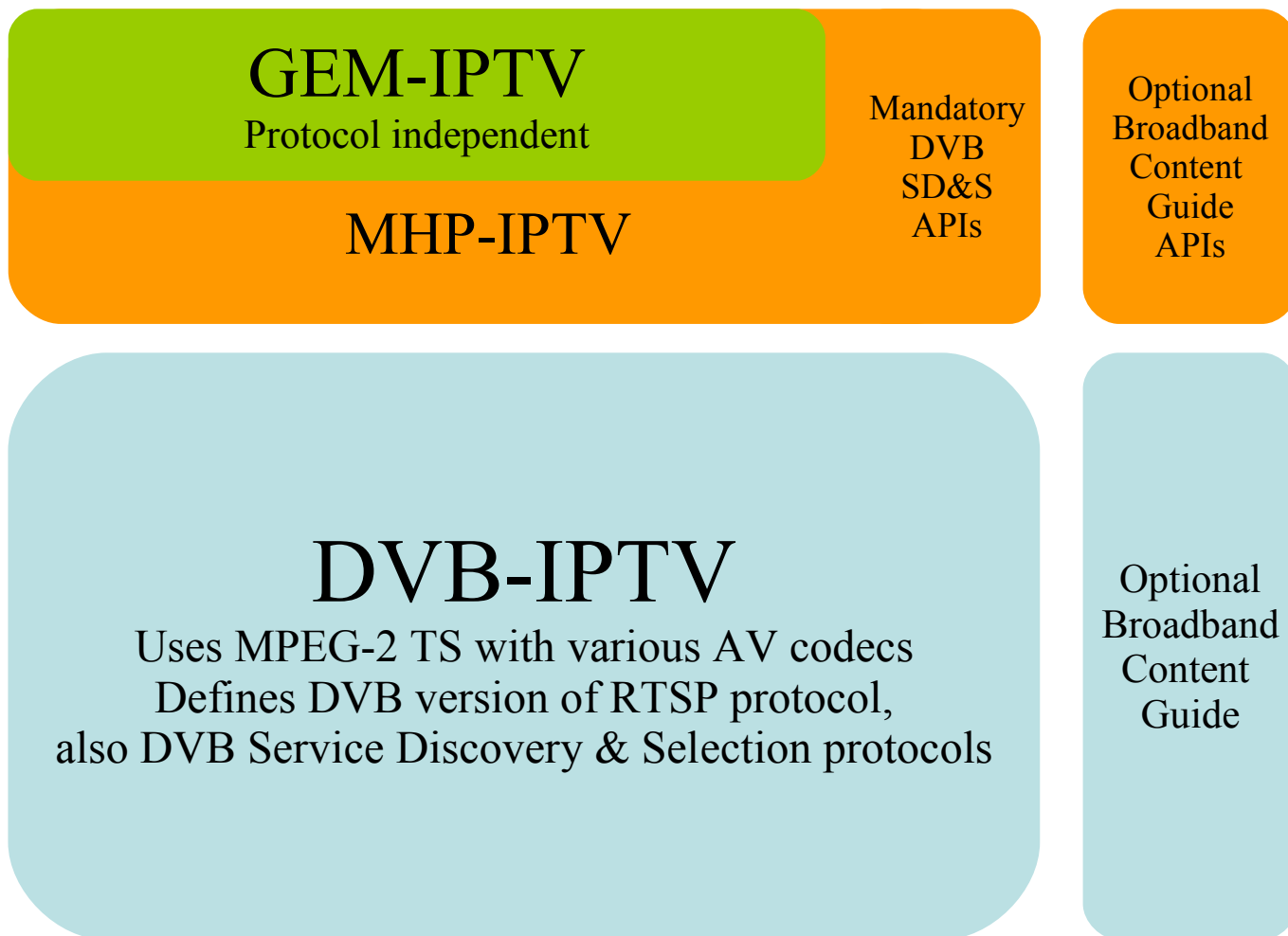
- Original MHP more focussed on retail products than operator controlled products
 - MHP deployments in operator controlled markets normally extend MHP to give operators more control
 - OCAP standardises such extensions to MHP – the so-called “monitor application”
- MHP 1.2 adds “privileged applications” to give operators more control
 - Based on design of OCAP's monitor application
 - Most of OCAP design adopted by reference
 - Require special authentication
 - System software download can clearly address this
 - More general solution not included in first specification

Privileged Application Capabilities

- Adopted from OCAP
 - Application & service management
 - Add & remove applications in the applications database
 - Create and manage services & service contexts
 - Control which permissions are granted to apps
 - Accept or reject broadcast applications
 - Other
 - Reboot platform
 - Receive notification of errors & resource depletion
- Specific to MHP
 - Approval of application storage requests from MHP 1.1 application storage API
- Not adopted from OCAP
 - Resource management
 - User event routing
 - Others (EAS, VBI, ..)

MHP / GEM for IPTV

Specification Profiles and Options



Specification Profiles and Options

- **DVB-IPTV**
 - Standard protocols for IPTV including
 - Broadcast / multicast service discovery
 - Video & audio content delivery
 - Standard profile of RTSP protocol
 - Optional broadband content guide
- **MHP-IPTV**
 - Integrates MHP with DVB-IPTV
 - Extensive re-use of existing APIs
 - Some new APIs including DVB-IPTV specific extensions to existing APIs
 - Broadband content guide remains optional
- **GEM-IPTV**
 - Designed for networks using proprietary IPTV systems
 - Subset of MHP-IPTV without DVB-IPTV protocols

GEM-IPTV in an Existing Network

GEM-IPTV

RTSP, IGMP & UDP protocol mapping

Protocol support for talking to
Proprietary IPTV systems
e.g. MSTV, OMP, Minerva etc

Common APIs for GEM-IPTV and MHP-IPTV

- Existing Java TV APIs
 - Service list API works for IPTV broadcast (multicast) services
 - Discovery of IPTV broadcast services
 - Metadata about IPTV broadcast services
 - Service selection API works for IPTV content
 - Java Media Framework works for IPTV content
- New APIs for IPTV
 - org.dvb.service adds support for hybrid receivers
 - See later for more details
- Content on demand metadata not included
 - Metadata access must be part of applications
 - Content on demand presentation via service selection API or JMF

Integration with DVB IPTV Specifications

- **javax.tv.service**
 - Mapping to DVB-IPTV SD&S protocol
 - Mapping to DVB-IPTV BCG protocol
- **New APIs**
 - org.dvb.service.sds extends Java TV for detailed access to SD&S protocol
 - org.dvb.tvanytime APIs give access to BCG
 - Re-used from MHP-PVR API
 - Extended for integration with Java TV and IPTV
- **Extensions to SD&S to signal MHP applications**
 - Largely a translation of existing MHP signalling to XML
 - MHP extensions in different namespace from DVB-IPTV schema

Hybrid Receivers

- Many IPTV receivers also have a classical tuner
 - DVB-T + IPTV common in markets
 - DVB-C + IPTV via DOCSIS possible
- Main feature is completion of Java TV's transport (in)dependent service concept
 - Services in the service list are transport independent
 - Applications use `TransportIndependentService`'s where they don't care how the service is received
 - Applications which care how a Service is received can transform a `TransportIndependentService` into a `TransportDependentService`
 - See org.dvb.service for more details
- 2 types of hybrid supported
 - Fully & partly standard

Fully Standard Hybrid Receivers

MHP-IPTV

DVB-C
DVB-S
DVB-T

DVB-IPTV

Partly Standard Hybrid Receivers

GEM-IPTV

Protocol independent

MHP-IPTV

DVB-C
DVB-S
DVB-T

Protocol support for
talking to proprietary
IPTV systems
e.g. MSTV, OMP,
Minerva etc

Partly Standard Hybrid Receivers

GEM-IPTV

Protocol independent

Existing GEM Target

Existing
GEM
Terminal
Specification

Protocol support for
talking to proprietary
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e.g. MSTV, OMP,
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