






MHP 1.1 DVB-HTML part





Outline

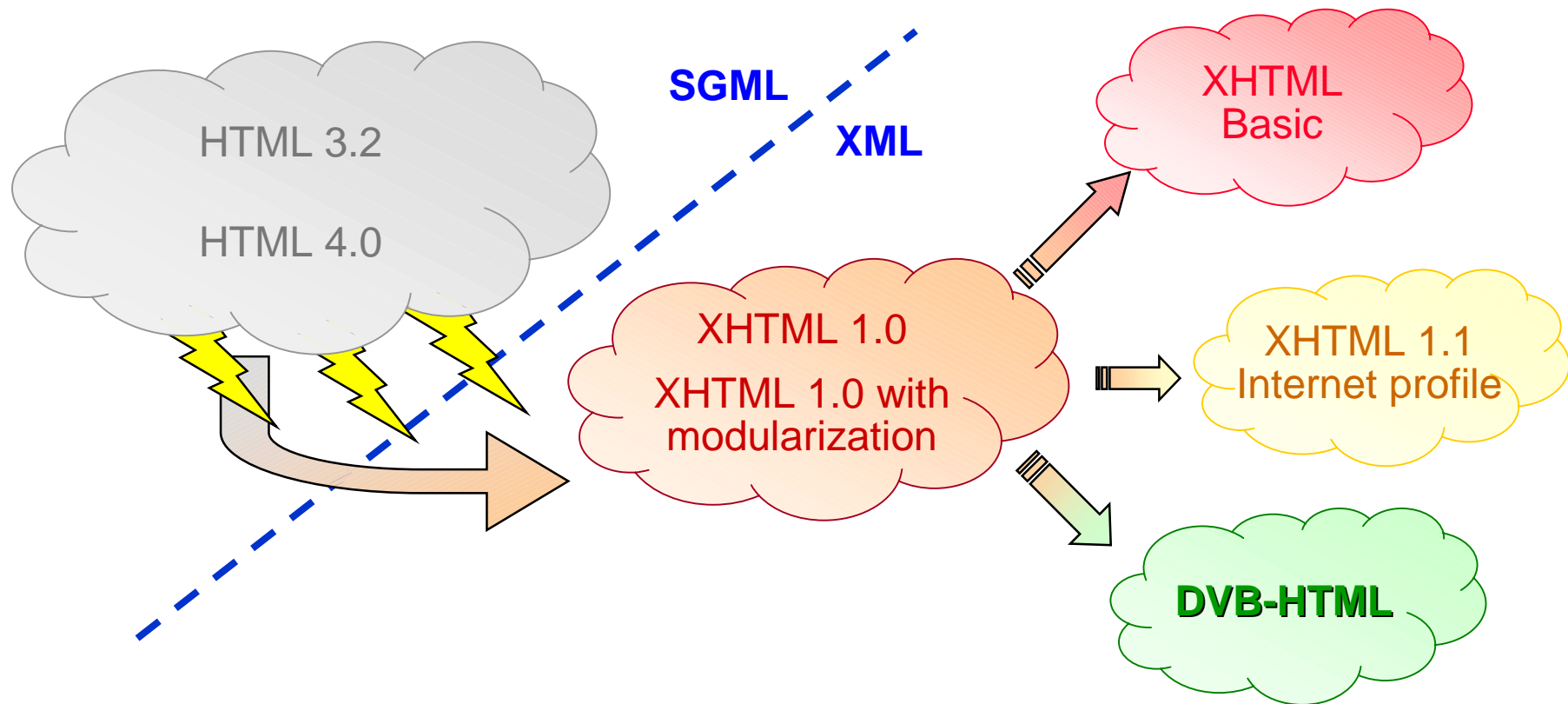
-  Overview
-  DVB-HTML components
-  DVB-HTML Lifecycle & Signaling
-  AV synchronization
-  Bridge with DVB-J, locators
-  Security
-  Conformance



DVB-HTML history

- 06/98 ⇒ **First discussions** about DVB-HTML occurred.
 - Should it be included in the specification ?
 - Should it be considered as a plug-in ?
- 07/98 ⇒ TAM decided that DVB-HTML is an **option** of MHP specification.
 - Enhanced Broadcast and Interactive Broadcast profiles only.
 - Creation of the HTML subgroup.
- 02/99 ⇒ **Technical requirements** (TAM186)
- 06/99 ⇒ **Technical white paper** (TAM263)
- 07/99 ⇒ DVB-HTML will have its **own chapter** in the MHP specification.
- 02/00 ⇒ MHP 1.0 specification release includes **parts** of the DVB-HTML chapter.
- 02/00 ⇒ MHP 1.1 specification release includes the **whole** DVB-HTML chapter

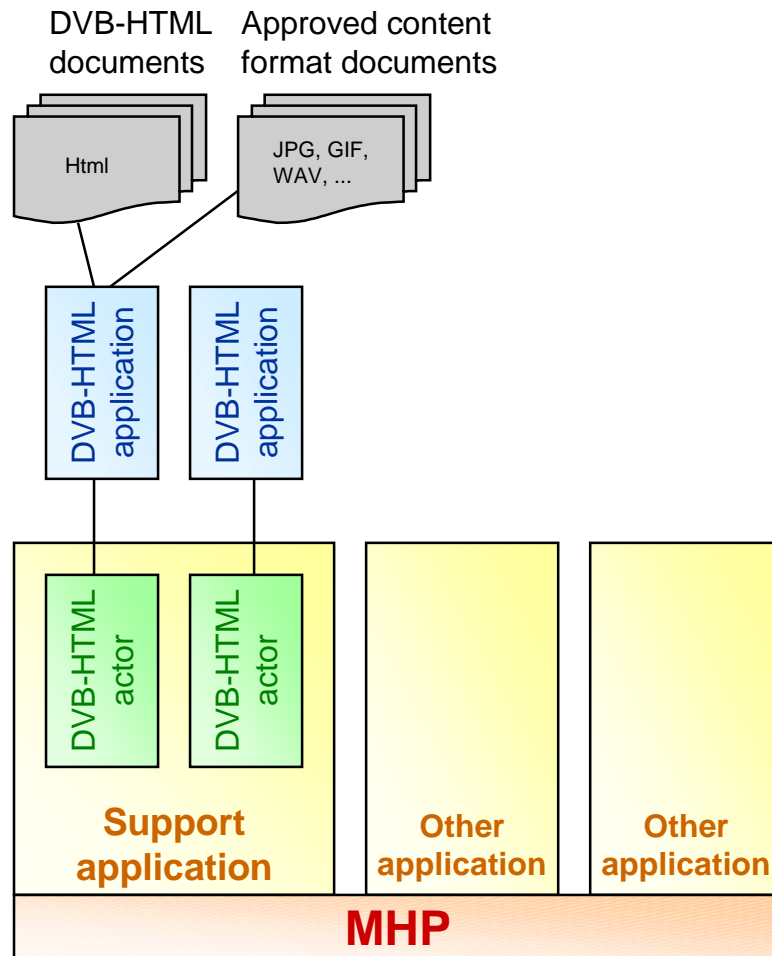
✈ DVB-HTML ≠ HTML !!!



- superset of XHTML Basic which targets the common intersection of the HTML tags for Web-enabled devices (TV, PC, mobile phones, ...).

- compatible with HTML3.2 tags without the legacy elements and attributes.

✈ What is a DVB-HTML application ?



DVB-HTML application

↪ set of files such as HTML, GIF, CSS, JPG, ...

Application boundary

↪ defined with a regular expression

DVB-HTML Support Application

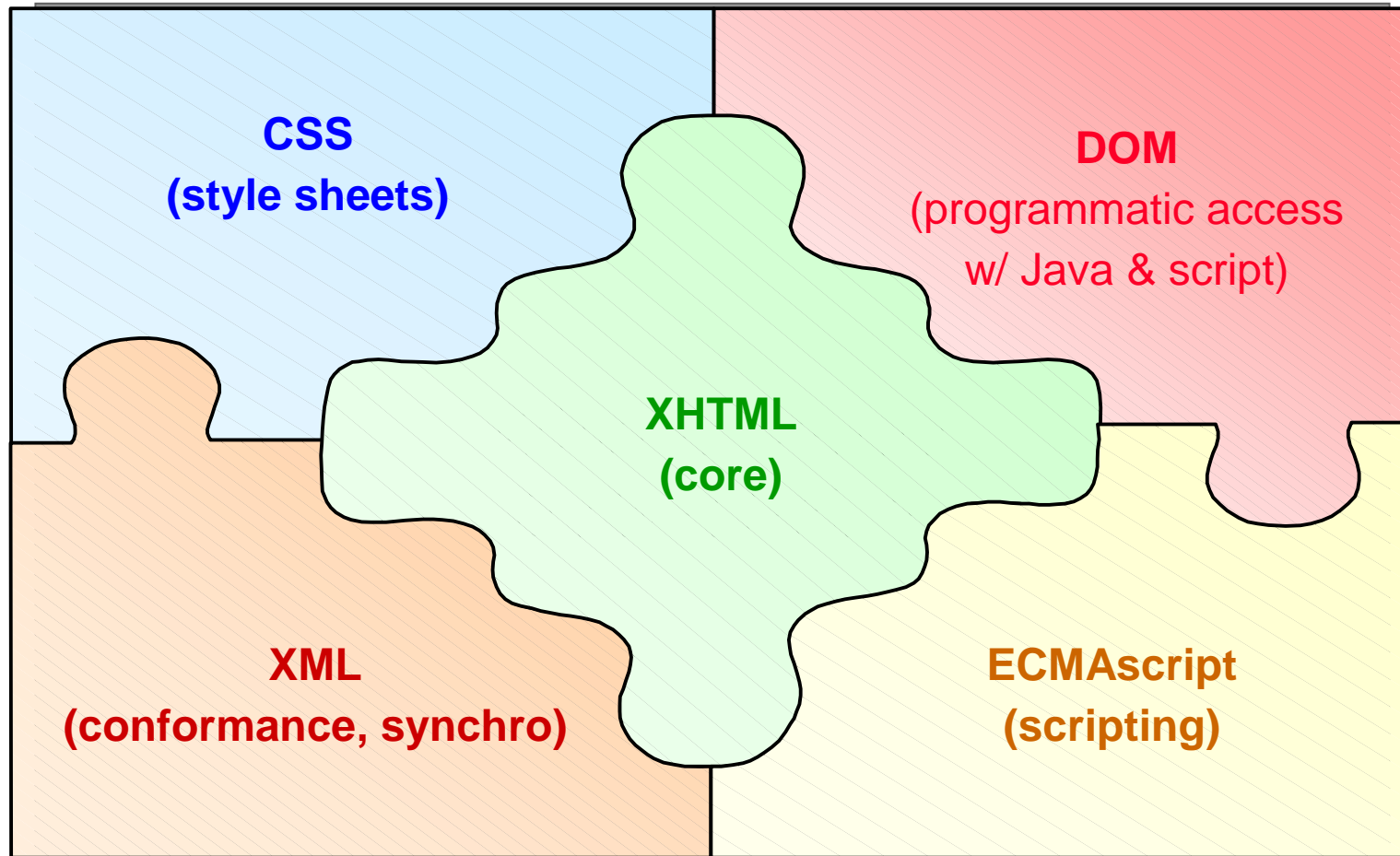
↪ interprets DVB-HTML documents
↪ may be a plug-in

DVB-HTML actor

↪ process running a unique application



DVB-HTML family





XHTML 1.0 : Modules selection

Modularization	Requ.
Structure	Yes
Text	Yes
Hypertext	Yes
List	Yes
Applet	No
Presentation	Yes
Edit	No
Bi-directional Text	Yes
Basic forms	No
Forms	Yes
Basic tables	Yes
Tables	No
Image	Yes
Client side img map	Yes

Modularization	Requ.
Server side img map	No
Object	Yes
Frames	Yes
Target	Yes
Iframe	Yes
Intrinsic events	No
DVB intrinsic events	Yes
Metainformation	Yes
Scripting	Yes
Style Sheet	Yes
Style attribute	Yes
Link	Yes
Base	Yes
Legacy	No



CSS : Cascaded Style Sheets

CSS Level 2 subset

- ↪ some datatypes are not required (aural types, opacity, color)
- ↪ @rules : @page is not required



screen area
videorect
viewport
initial block

@viewport extension

- ↪ allows to apply all CSS rules of the stylesheet on a given screen region
- ↪ properties : scene (% of screen), hres & vres (size in logical pixels), initial (root document rendering), background (image or video)

'dwb-tv' media type

- ↪ MHP shall support 'screen' & 'dwb-tv'
- ↪ differentiate TV-like env. / computer-like env.

Other extensions

- ↪ remote control nav.
- ↪ default style sheet



DOM : Document Object Model

DOM Level 2 modules

- ↪ core, views, CSS2 modules are required
- ↪ XML, CSS are not required
- ↪ bindings for Java and ECMAScript

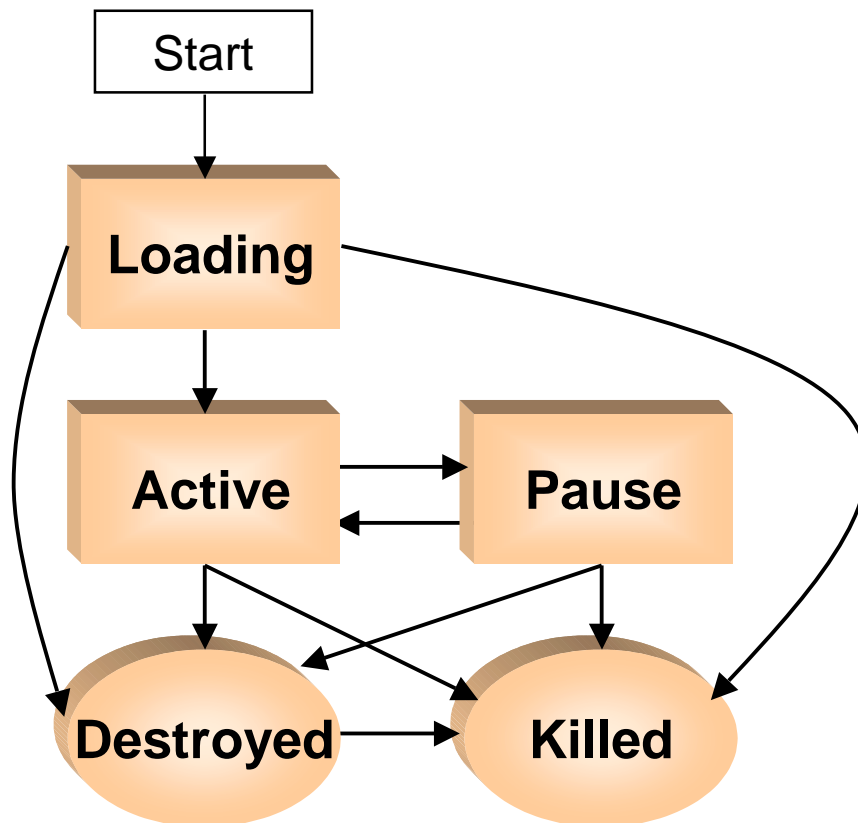
DOM Level 2 events

- ↪ Events, UIEvents & MutationEvents are required
- ↪ HTMLEvents & MouseEvents are not required
- ↪ MouseEvents is nevertheless recommended

MHP extensions

- ↪ DVB-HTML events, DVB events (lifecycle, triggers, DOM stable, key)
- ↪ environment object variables : document, navigator, window
- ↪ DVB Exceptions

↻ DVB-HTML lifecycle state machine



↻ Loading

- ↻ waiting for documents
- ↻ no rendering

▶ Active

- ↻ rendering documents
- ↻ consuming events

|| Pause

- ↻ release of some resources

💣 Destroyed

- ↻ same as active w/o resources

✘ Killed

- ↻ Performing clean-up

↻ DVB-HTML signaling

Same signaling as DVB-J

- ↻ PMT, AIT
- ↻ application control code, application descriptor, ...
- ↻ application_type = DVB-HTML

Application_descriptor

- ↻ parameters : string appended to the app. initial path

Application_location_descriptor

- ↻ physical root : transport specific
- ↻ initial path : URL relative to physical root
 - 'main/index.htm' is optional

Application boundary descriptor

- ↻ application_label
- ↻ regular_expression : can generate all URLs of the app.

Application & A/V synchronization

Media events carried over DSMCC Stream Event descriptors

- ↪ XML-based triggers
- ↪ Stream Event Message + Event Factory File ⇨ DOM Event

Event firing

- ↪ immediate (asynchronous)
- ↪ relative to time references based on NPT (Normal Play Time)
- ↪ relative to time references based on UTC (Universal Time)

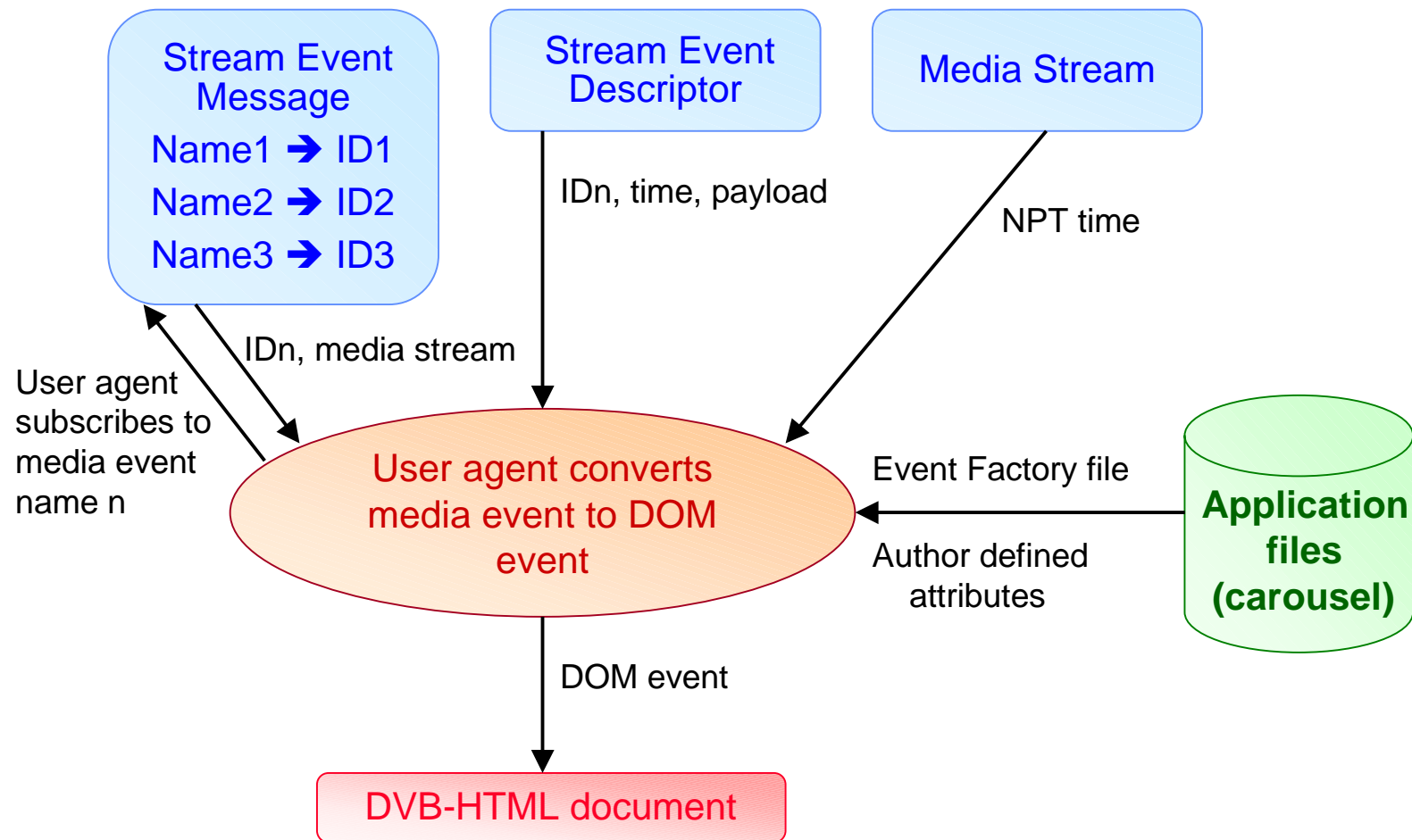
Media events

- ↪ DVB-HTML events, DVB events (lifecycle, triggers, DOM stable, key)
- ↪ system events (application-level events)
 - start displaying pre-fetched applications, slide shows
- ↪ trigger or authored events (document-level events)

Event registration

- ↪ Applications have to explicitly register to the trigger event.

🕒 Application & A/V synchronization



Bridge with Java APIs

DVB-HTML can benefit from Java programmatic environment

- ↪ Java Xlet embedding
- ↪ ECMAScript Java bridge

Java Xlet embedding

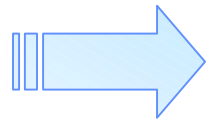
- ↪ use of <OBJECT> tag
- ↪ Xlet can expose methods
- ↪ Xlet signaled within DVB-HTML app.

```
<object type="application/dvbj" id="slideShow"
codetype="application/javatv-xlet"
classid="slideShow.class"
codebase="first_xlet/" height="180" width="320">
<param name="arg_0" value="Everest"/>
<param name="appid" value="0xbded"/>
</object>
```


ECMAScript Java bridge

- ↪ ECMAScript can access DVB-J via
 - DOM2
 - Inter-application communication API
- ↪ type conversion between ECMAScript and DVB-J
 - number, boolean, JavaArray, JavaClass, JavaObject

MHP locators




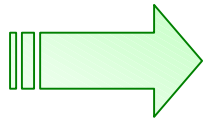
HTTP & HTTPS locators

 http:// , https://



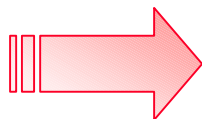
TV locators

 dvb://current
 dvb://current.av (tv:)
 dvb://current.audio
 dvb://current.video
 dvb://original



Application locator

 dvb://current.ait/Orgid.Appid?param=val&



AIT locator

 dvb://current.ait/app_root
 dvb://current.ait/app_icon



Exit locator

 exit: : link activation ⇔ application → KILLED state

DVB-HTML security model

Compatible with existing MHP security model (DVB-J)

- ↪ authentication of applications, sandbox running
- ↪ permissions for accessing protected resources

Privileged Runtime Code Extensions from untrusted source

- ↪ particular permissions for granting or preventing access
 - eval()
 - document.write()

Inter-application & Inter-frame security

- ↪ no DOM access to a document from an other application
- ↪ no communication is possible between framed applications
- ↪ application with frameset killed ⇒ framed application killed
 - rule also valid in case of termination due to service selection

Cookies security (ECMAScript & HTTP)

- ↪ storage limit but min of 20 cookies of 4096 bytes
- ↪ cookies lifetime = app lifetime if no persistent storage granted

✓ Conformance & XML validation

⌚ Documents shall be validated before broadcast

✓ **MHP 1.1 receivers that support DVB-HTML shall validate**

- ↪ any document signaled as DVB-HTML in the AIT
- ↪ any document whose FPI identifies a DVB-HTML document
 - Formal Public Identifier = "-//DVB//DTD XHTML DVB HTML 1.0//EN"

ⓘ **Invalid documents can be however conformant**

- ↪ proprietary extensions defined in a specific namespace

⚡ **User agent shall reject non conformant documents only**

Thanks to XML, DVB-HTML

- ↪ is an open solution in line with W3C standards
- ↪ favors interoperability (strict conformance mechanism)
- ↪ facilitates end-to-end integration with other XML formats

**Thank you
for your
attention.**

Have a nice break.

