FREE TV AUSTRALIA OPERATIONAL PRACTICE OP- 72
Implementation of Content Reference IDs by Australian Television Broadcasters

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1 SCOPE

This document recommends the implementation of Content Reference IDs by Australian Television Broadcasters. Background on Content Reference IDs can be found in Annex A.

ETSI TS 102 323 - V1.5.1 - Digital Video Broadcasting (DVB); Carriage and signalling of TV-Anytime information in DVB transport streams (January 5, 2012) [5] defines how CRIDs and other URIs shall be encoded in DVB transport streams. It also defines a mechanism for defining a default authority and associated scoping rules for the purpose of improving the compaction of CRIDs.

Clause 6 of ETSI TS 102 323 defines how CRIDs and other URIs shall be encoded in the data structures defined in in DVB networks. This clause also describes the rules for default authorities which can be used to abbreviate CRID strings, saving on bandwidth.

The content_identifier_descriptor is called up in DVB Service Information in Table 12 of ETSI EN 300 488 Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems [3] with the defined descriptor tag value of 0x76. It is specified as being present in the Event Information Table.

The content_identifier_descriptor allows a CRID to be assigned to an event entry in an EIT sub_table, so providing a link to CRI or to metadata for that event's content. One or more instance of this descriptor may be carried in the event descriptor loop of an EIT schedule section or an EIT present/following section. There is no requirement for all EIT events to have a CRID assigned to them.

The content_identifier_descriptor supports two methods for defining the CRID to be associated;

- the CRID can be explicitly included in the descriptor, or
- the descriptor can refer to a CRID carried in a separate sub_table (an "indirect definition").

These methods of definition are interchangeable and each CRID included in a content identifier descriptor may be defined using any of these methods. The use of explicit CRID definition is recommended for interoperability.

Australian television broadcasters have implemented Content Reference IDs within the development of Hybrid Broadcast Broadband (Hbb) TV in Australia.
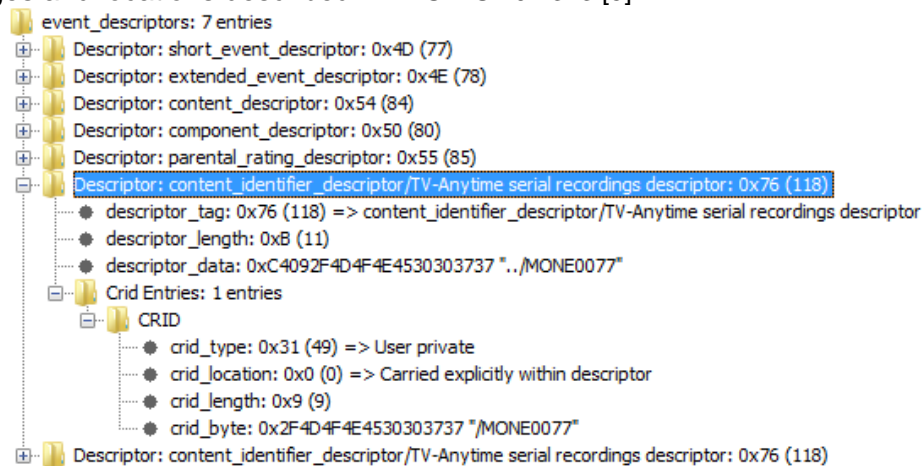
2 APPLICATION

2.1 DVB Implementation

Implementation of Content Reference IDs by Australian television broadcasters follows the syntax of Table 115 in Clause 12, the CRID type as found in Table 116, the CRID location found in as found in Table 117 and content identifier section found in Table 118 of ETSI TS 102 323 [5].

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2.2   Australian DVB Implementation

This section describes the specifics of the signalling of CRID values within Australian DVB Service Information.

An example instance is shown below. Please note the actual CRID payload is illustrated for example purposes only and actual implementations may vary in accordance with permitted values, ranges and locations described in ETSI TS 102 323 [5].

```
event_descriptors: 7 entries
  ⊞  Descriptor: short_event_descriptor: 0x4D (77)
  ⊞  Descriptor: extended_event_descriptor: 0x4E (78)
  ⊞  Descriptor: content_descriptor: 0x54 (84)
  ⊞  Descriptor: component_descriptor: 0x50 (80)
  ⊞  Descriptor: parental_rating_descriptor: 0x55 (85)
  ⊟  Descriptor: content_identifier_descriptor/TV-Anytime serial recordings descriptor: 0x76 (118)
        ◆  descriptor_tag: 0x76 (118) => content_identifier_descriptor/TV-Anytime serial recordings descriptor
        ◆  descriptor_length: 0xB (11)
        ◆  descriptor_data: 0xC4092F4D4F4E4530303737 "../MONE0077"
     ⊟  Crid Entries: 1 entries
        ⊟  CRID
              ◆  crid_type: 0x31 (49) => User private
              ◆  crid_location: 0x0 (0) => Carried explicitly within descriptor
              ◆  crid_length: 0x9 (9)
              ◆  crid_byte: 0x2F4D4F4E4530303737 "/MONE0077"
  ⊞  Descriptor: content_identifier_descriptor/TV-Anytime serial recordings descriptor: 0x76 (118)
```

2.2.1   Use of private_data_specifier_id

When the content_identifier_descriptor is used within the EIT, the same sub-table loop should also include a private_data_specifier_descriptor (tax 0x5F) with a private_data_specfier value of 0x000032000 to indicate that the CRIDs carried within the EIT conform to the usage described in this document and is specific to Australian Broadcasters.

Australian television broadcasters have developed a registry for DVB content_identifier_descriptor values based upon usage of the private_data_specifier.

Australian assignments for private_data_specifier_id in OP40 are

3.6   Private data specifier values

The private_data_specifier_id descriptor is identified by tag value 0x5F and may be found in the NIT, BAT, SDT, EIT or PMT.

Australia has been allocated the assignment of the values 0x00003200 to 0x0000320F to terrestrial broadcast operators by the DVB Project Office. The value 0x00003200 has been reserved for generic use by Australian broadcasters and the other values assigned as shown in Table 10 below.

Table 10. Australian private_data_specifier_id Assignments

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private_data_specifier_id value	Assignment
0x00003200	Generic broadcaster use
0x00003201	ABC
0x00003202	SBS
0x00003203	NINE
0x00003204	SEVEN
0x00003205	TEN
0x00003206 – 0x00003209	Reserved for future use
0x0000320A	Nine Affiliate / Regionals
0x0000320B	Seven Affiliate / Regionals
0x0000320C	TEN Affiliate / Regionals
0x0000320D	Independent Regional
0x0000320E	Imparja (all states)
0x0000320F	Southern Cross (all states)

2.2.2   Interpretation of crid_type values

Australian broadcasters apply crid_type values within the User Private range as follows:

Value	Semantics
0x31	references the item of content that this event is an instance of.
0x32	references a series that this event belongs to.
0x33	references a recommendation. This CRID can be a group or a single item of content.

2.2.3   Content length restrictions

The syntax of the CRID is to be compliant with TS 102 822-4 [6] and shall be constructed with the following length constraints.

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- The total length of the CRID plus any Instance Metadata Identifiers (IMIs) shall not exceed 64 bytes. The maximum lengths of each separate component of the CRID shall not exceed the values specified below:
  - o authority   - 32 characters (excluding leading 'crid://')
  - o data   - 29 characters (including leading '/')
  - o IMI   - 2 characters (including '#' separator)

2.2.4 Default Authority Descriptor usage and scope

In accordance with Clause 6.3 of ETSI TS 102 323 [5] Australian Broadcasters may choose to include a default_authority_descriptor in one or more of the following locations; the first or second descriptor loop of a NIT, or the service descriptor loop of a SDT.

The scope of a particular value of default authority is defined by the location of the default authority descriptor, summarized in the following table:

Default authority descriptor location	Scope of definition	Scopes this definition overrides
First descriptor loop of NIT	network	none
Transport stream descriptor loop of NIT	transport stream	network
Service descriptor loop of SDT	service	transport stream or network

2.2.5 Carriage of CRIDs in EIT schedule$_{actual}$

Australian television broadcasters may carry content reference information (CRIDs) for content referenced in the broadcaster's schedule (8 day) event information table. This information aligns with Section 4 of AS4599.1 – 2013.

It is expected that where present compliant PVR manufacturers utilise this information to manage scheduled recordings.

2.2.6 Carriage of CRIDs in EIT p/f$_{actual}$

Australian television broadcasters may carry content reference information (CRIDs) for content referenced in the broadcaster's present/following event information table.

It is expected that compliant PVR manufacturers utilise this information to accurately start and stop recordings that were scheduled via either an Event or Series CRID.

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3.0   REFERENCES

[1]	Australian Standard, Digital television – Terrestrial broadcasting Part 1: Characteristics of digital terrestrial television transmissions	**2.2.7 AS4599.1-2011**
[2]	Australian Standard, Digital television – Requirements for Receivers Part 1: VHF/UHF DVB-T television broadcasts	**2.2.8 AS 4933.1-2005:**
[3]	Digital Video Broadcasting (DVB);Specification for Service Information (SI) in DVB systems	**2.2.9 ETSI EN 300 468 V1.11.1 (2010-04)**
[4]	Digital Video Broadcasting (DVB); Guidelines on implementation and usage of Service Information	**2.2.10 ETSI TR 101 211 V 1.10.1 (2009-07)**
[5]	Digital Video Broadcasting (DVB); Carriage and signalling of TV-Anytime information in DVB transport streams	**2.2.11 ETSI TS 102 323 V1.5.1 (2012-01)**
[6]	Broadcast and On-line Services: Search, select, and rightful use of content on personal storage systems ("*TV-Anytime*"); Part 3: Metadata; Sub-part 1: Phase 1 - Metadata schemas_	**2.2.12 ETSI TS 102 822-3-1 V1.7.1 (2011-11)**
[7]	Free TV Australia Operational Practice 40 - Allocation of DVB service information codes for Australia	**2.2.13 Issue 3 - December 2012 -**
[8]	Free TV Australia Operational Practice 44 – Implementation of Electronic Service Guide Information	**2.2.14 Issue 5** **2.2.15 October 2012**
[9]	Free TV Australia Operational Practice 46 – Implementation of System Software updates in Australian DVB-T Systems using the simple Profile.	**2.2.16 Issue 2** **2.2.17 August 2006**

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Annex A (Informative)

Implementation of the Content Reference Identifier

The Uniform Resource Locator (URL) scheme Content Reference Identifier (CRID) has been devised to allow references to current or future scheduled publications of broadcast media content over television distribution platforms and the Internet. The initial intended application is as an embedded link within scheduled programme description metadata that can be used by the home user or agent to associate a programme selection with the corresponding programme location information for subsequent automatic acquisition.

The TV-Anytime Content Reference Identifier (CRID) is defined in ETSI TS 102 822-4 V1.5.1 (2010-07) Broadcast and On-line Services: Search, select, and rightful use of content on personal storage systems ("*TV-Anytime*"); Part 4: Phase 1 - Content referencing

The syntax of the CRID is URI compliant and is defined in ETSI TS 102 822-4. Its format is as follows:

> • crid://<CRIDauthority>/<data>

> An example being:

> • crid://company.com/foobar

> CRIDs are insensitive to the case of characters.

Before the process of content referencing can be employed, a selection process must supply a CRID. This CRID identifies a specific content item, but does not specify where that content item can be found. More detailed characteristics of the content, such as the price, the quality, the presence of commercials, etc., may not be known before the CRID is produced.

An "authority" is the body that creates a CRID, which they guarantee to be unambiguous. An "authority" will also provide the ability for the CRID to be resolved into locators or other CRIDs.

Location resolution is the process of translating a CRID into other CRIDs or locators. Location resolution involves mapping a location-independent content reference (the CRID) to its location in time (e.g. scheduled transmission time in a broadcast system) and space (e.g. TV channel, IP address).

An instance of content may be located on various media such as local storage, live broadcast stream, data broadcast stream, data file on the Internet and data stream via the Internet.

A locator specifies a location, and possibly time of availability, where a content item can be acquired. There will be many formats of locators as there are many different means by which a personal digital recorder (PDR) can acquire content. It is a requirement of a locator to ensure that it is possible for the PDR to parse enough of the locator to be able to decide if it has the ability to use the relevant transport mechanism.

The locator will be parsed and used by media-dependent methods to identify the content location and to acquire the content using the media or transport specific protocol. For example, a DVB locator will contain location parameters for a DVB stream, such as transport stream ID, service ID, table ID and event ID.

A CRID is the output of the search and selection process and is an unambiguous identifier that refers to a piece of content, however multiple CRIDs may refer to that same piece of content.