UK DTT Allocation of DVB Identifiers

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Introduction

The DVB Service Information (SI) includes identifiers that uniquely identify every transport stream and service broadcasting on UK DTT.

Values for these identifiers are normally allocated by the multiplex operator from agreed ranges. This document presents the allocation scheme for these identifiers.

Other identifiers, e.g. `network_id` and logical channel number (LCN) are allocated by Digital UK and are outside the scope of this document.

Numbering Scheme

`Transport_stream_id`s and `service_id`s can both be in the range of 0-65565 (0x0000 to 0xFFFF in hexadecimal). Due to DVB rules the whole of this range is available for use on UK DTT[1], and the allocation of a particular value to `transport_stream_id` and `service_id` is independent. However, these identifiers uniquely identify transport streams and services so they can only be used once to identify a transport stream and/or service on UK DTT.

In order to simplify the allocation of identifiers, and to allow each multiplex operator to plan for changes to the services they operate, the range has been subdivided between multiplex operators. Numerically these allocations make most sense in hexadecimal or octal. The allocation is shown in Table 1.

Range (octal)	Range (hex)	Range (decimal)	Multiplex operator	Use
0o000000-0o007777	0x0000-0x0FFF	0-4095		Not allocated
0o010000-0o017777	0x1000-0x1FFF	4096-8191	BBC	Mux 1 / PSB 1
0o020000-0o027777	0x2000-0x2FFF	8192-12287	D3/4	Mux 2 / PSB 2
0o030000-0o037777	0x3000-0x3FFF	12288-16383	SDN	Mux A / Com 4
0o040000-0o047777	0x4000-0x4FFF	16384-20479	BBC	Mux B / PSB 3
0o050000-0o057777	0x5000-0x5FFF	20480-24575	Arqiva	Mux C / Com 5
0o060000-0o067777	0x6000-0x6F9F	24576-28575	Arqiva	Mux D / Com 6
0o070000-0o071777	0x7000-0x73FF	28672-29695	NI JV	NI Mux
0o072000-0o077777	0x7400-0x7FFF	29696-32767	Various	Other regional (non-Local TV)
0o100000-0o117777	0x8000-0x9FFF	32768-40959	Comux	Local TV
0o120000-0o127777	0xA000-0xAFFF	40960-45055	Arqiva	Com 7
0o130000-0o137777	0xB000-0xBFFF	45056-49151	Arqiva	Com 8
0o140000-0o177777	0xC000-0xFFFF	49152-65535		Not allocated

Table 1 - Allocation of identifiers to multiplex operators

[1] `Transport_stream_id`s and `service_id`s can be reused provided the `original_network_id` is different. UK DTT has its own `original_network_id` which is used nationally.

Allocation of identifiers

At the launch of DTT a number of rules were established as to how these numbers were to be allocated. As DTT has evolved, both in terms of numbers of services and through DSO, some multiplex operators have modified its allocation scheme slightly such that these rules can now be viewed as recommendations, although many allocations still adhere to this approach. For Local TV a variation on these rules is described below.

The rules use an octal numbering scheme. Each identifier is viewed in octal in the form `0ommssrr` where:

- `mm` identifies the multiplex. From the above table, `mm` is `01` for Mux1 / PSB1, `02` for Mux 2 / PSB 2 etc.
- `ss` is `00` if the identifier is a `transport_stream_id`
- `ss` in the range `01-77` is used for `service_id`. The value identifies the service within the transport stream.
- `rr` identifies both the region of the transport stream and the regional variant of the service.
- For `transport_stream_id` the value for `rr` is in the range `01-77`.
- For the `service_id` of national services `rr` has a value of `00`
- For the `service_id` of regionalised services `rr` is in the range `01-77`. The value of `rr` denotes the region.
- For example, all BBC One variants `service_ids` have `ss` set to `01`. Different regional variants use different values for `rr`. The same value is used for both the `transport_stream_id` and the `service_id` of the BBC One variant within that transport stream.

This numbering scheme means that:

- The same value cannot be used for both a `transport_stream_id` and `service_id`
- 16 multiplexes are supported
- Each multiplex can hold 63 services
- Each multiplex can have 63 regional variants

Allocation for Local TV

For Local TV a few minor modifications are needed. Each identifier will be in octal in the form `0ommssrr` where:

- `mm` will be `10` for `transport_stream_ids`. A value of `11` is not allowed for `transport_stream_id`[2].
- `Service_ids` have can have a value of `10` or `11` for `mm` . Both values of `mm` for `service_id` will be allowed in the `transport_stream_ids` ranges with `mm` set to `10`.
- `ss` will be `00` if the identifier is a `transport_stream_id`
- `ss` will be range `01-77` when used for a `service_id`. The value identifies the service within the transport stream

[2] If a value of `11` for `mm` could to be allocated to `transport_stream_ids` there would be no way to uniquely identify the region of a transport stream or service simply by looking at the `rr` suffix, which is the idea of the existing numbering scheme. So this possibility has been removed.

- `rr` identifies both the region of the transport stream and the regional variant of the service.
- For `transport_stream_id` the value for `rr` is in the range `01-77`.
- For the `service_id` of national services `rr` has a value of `00`
- For the `service_id` of regionalised services `rr` is in the range `01-77`. The value of `rr` denotes the region. This matches the value of `rr` for the transport_stream_id of the containing transport stream.

If a single transport stream contains two regional variants of the same service and both variants only exist in that transport stream, then it will not be possible to fulfil the last rule. In this case another value of `ss` should be allocated.[3]

Procedure for Allocation of `transport_stream_id` for Local TV

The procedure for the allocation of `transport_stream_id` will be:

- All transport streams will be of the form `0o1000rr`.
- The value of `rr` will be allocated in order, starting at `01`

Example

The first allocated `transport_stream_id` will be `0o0100001`, which is 32769 in decimal. The

second allocated `transport_stream_id` will be `0o100002`, which is 32770 in decimal.

`Transport_stream_ids` are then allocated up to a value of `0o100077`, which is 32831 in decimal.

Procedure for Allocation of `service_id` for Local TV

The procedure for the allocation of `service_id` will be:

- All `service_ids` will be of the form `0o10ssrr` or `0o11ssrr`
- `Service_ids` in both ranges can be carried in transport streams with `transport_stream_id0o1000rr`.
- Initially, each service on Local TV will be allocated the prefix `0o10ss`. The value of `ss` will be allocated in order, starting at `01`.
- After all values of `ss` (`01-77`) within the prefix `0o10ss` have been allocated, services will be allocated the prefix `0o11ss`. Again, the value of `ss` will be allocated in order, starting at `01`.
- The value of `rr` will be set to `00` for national services. (So all national `service_ids` will be in the form `0o10ss00` or `0o11ss00`)
- If the service is regional, the value of `rr` should be in the range `01-77` and should match the value of `rr` for one of the transport streams that contains it. The same `service_id` would then be used in all the transport streams containing that service.
- If the service is regional and a single transport stream uniquely contains multiple variants of the service then both should have the same value of `rr` in their `service_ids`. A different value of `ss` should be allocated for the service.

Example

The prefix for the first allocated service will be `0o1001`. If it's a national service then the value of `rr` will be `00`. The `service_id` would then be `0o0100100`, which is 32832 in decimal.

[3] The alternative would be to allocate a different value of `rr`. By doing this there would be no way to uniquely identify the region of a service simply by looking at the `rr` suffix, which is the idea of the existing numbering scheme.

The prefix for the second allocated service will be 0o1002. If it's a regional service contained in transport_stream_id 0o100006 only then the value of rr will be 06. The service_id should be 0o100206, which is 32902 in decimal.

The prefix for the sixty-third allocated service will be 0o1077. If it's a regional service contained in transport_stream_ids 0o100011 and 0o100012 then the value of rr could be 11 or 12. The service_id could be 0o107711, which is 36809 in decimal, or 0o107712, which is 36810 in decimal.

The prefix for the sixty-fourth allocated service will be 0o1101. If it's a regional service contained in transport_stream_id 0o100022 only then the value of rr will be 22. The service_id will be 0o110122, which is 36946 in decimal.

The prefix for the sixty-fifth allocated service will be 0o1102. If it's a regional service with two regional variants, both contained a single transport stream with identifier 0o100007, then the value of rr must be 07 for both services. The service_id for one variant should be 0o110207, which is 36999 in decimal. The second variant would be allocated a second prefix, 0o1103, so would be given the service_id of 0o110307, which is 37063 in decimal.