AfSessionWithQos

Subscription Parameters

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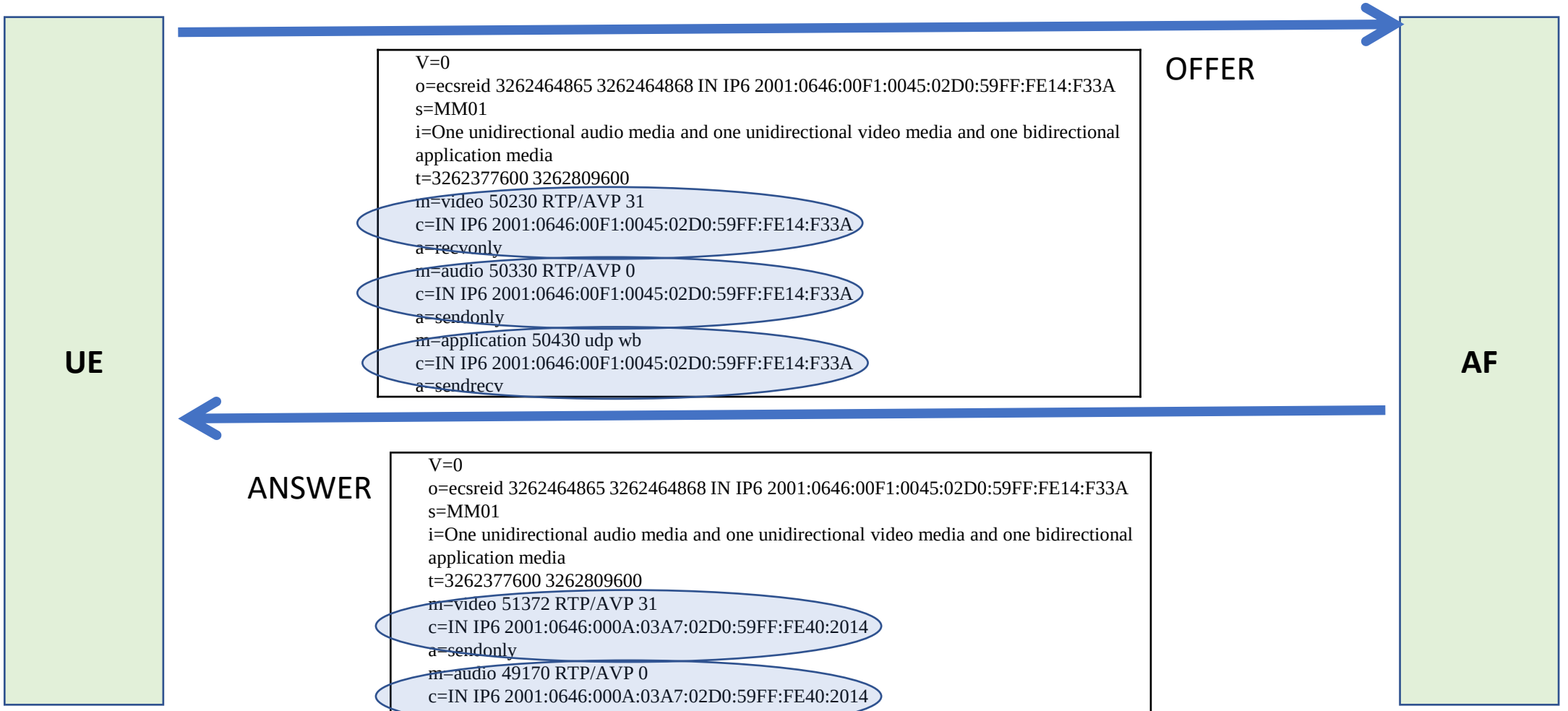
SDP example (from Annex B2 in TS 29.214 Policy and Charging Control over Rx reference point))



3 media components negotiated

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Resulting flow Identifiers

Order of 'm='-line	Type of IP flows	Destination IP address / Port number of the IP flows	Flow identifier
1	RTP (Video) DL	2001:0646:00F1:0045:02D0:59FF:FE14:F33A / 50230	<1,1>
1	RTCP DL	2001:0646:00F1:0045:02D0:59FF:FE14:F33A / 50231	<1,2>
1	RTCP UL	2001:0646:000A:03A7:02D0:59FF:FE40:2014 / 51373	<1,2>
2	RTP (Audio) UL	2001:0646:000A:03A7:02D0:59FF:FE40:2014 / 49170	<2,1>
2	RTCP DL	2001:0646:00F1:0045:02D0:59FF:FE14:F33A / 50331	<2,2>
2	RTCP UL	2001:0646:000A:03A7:02D0:59FF:FE40:2014 / 49171	<2,2>
3	UDP (application) DL	2001:0646:00F1:0045:02D0:59FF:FE14:F33A / 50430	<3,1>
3	UDP (application) UL	2001:0646:000A:03ª7:0250:DAFF:FE0E:C6F2 / 32416	<3,1>

Notice structure of Flow Id. Flow Id is a tuple comprised of;

- media component #
- IP Flow # within.

Also note that UL and DL components of the same IP Flow have the same IP Flow #.

For a bidirectional flow it is implicit that the Flow Id. is associated with a DL and a UL component.

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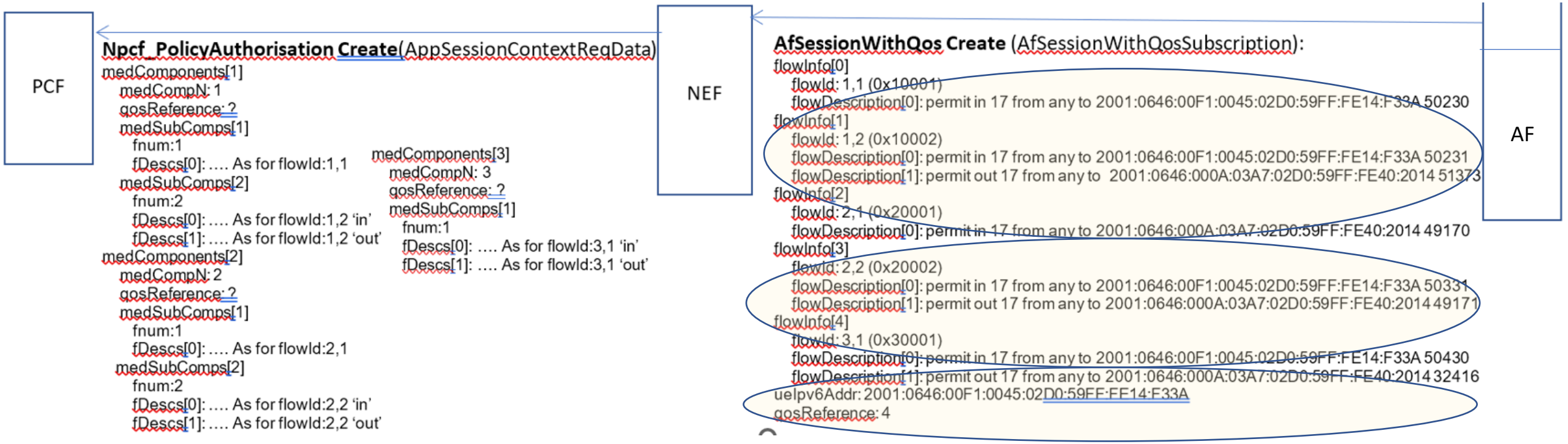
Resultant NEF and PCF API Calls



Now for PCF API, representation is better structured

Also there is 1 QosReference per media Component

Notice bidirectional flow is now represented in a single flowInfo with a UL and DL flow description.

Also there is only 1 QosReference

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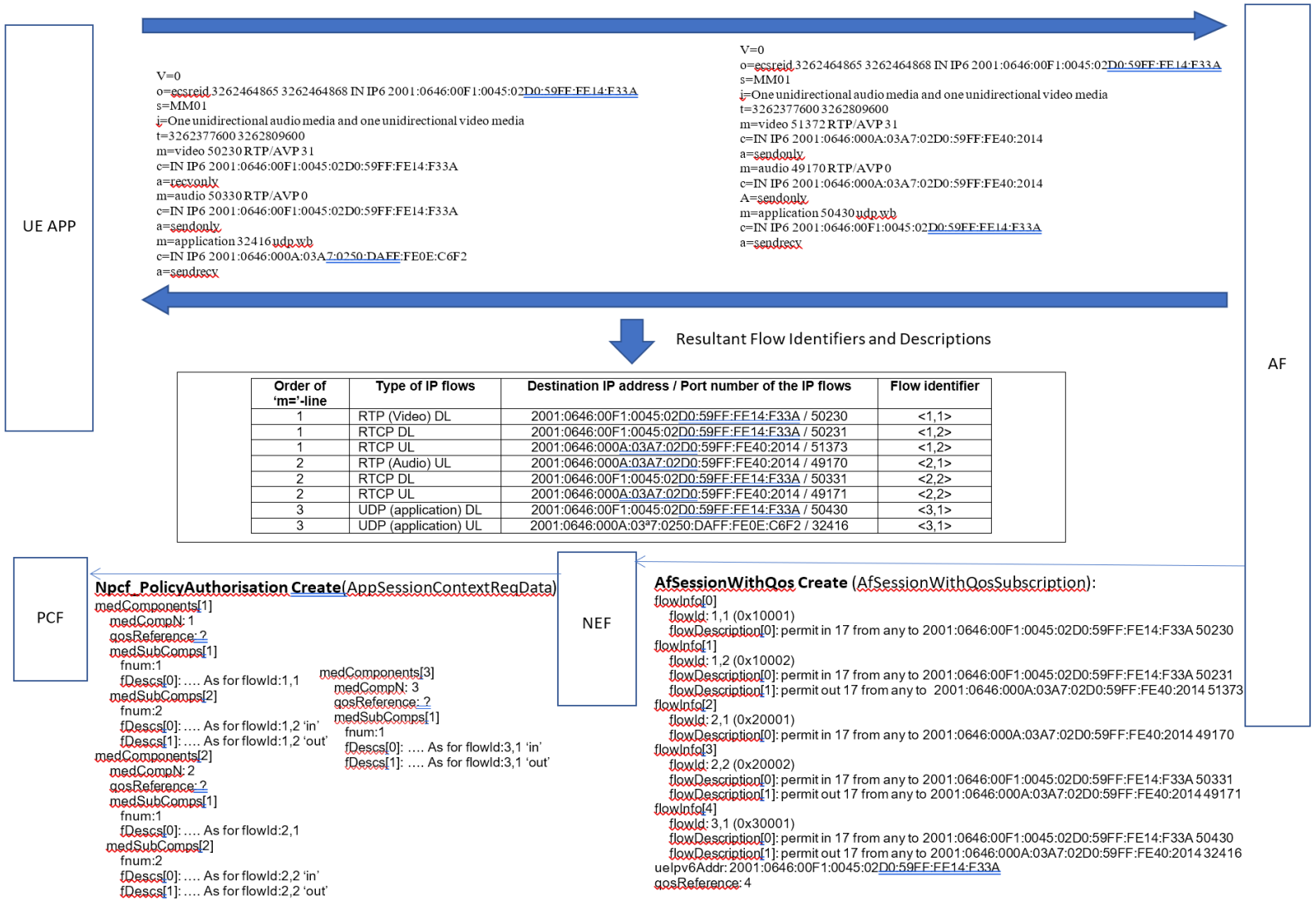
Overview



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2	RTP (Audio) UL	2001:0646:000A:03A7:02D0:59FF:FE40:2014 / 49170	<2,1>
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Take-aways

- Flowid in NEF API should not be just an integer, it should be a tuple representing a mediacomponent and a media subcomponent
- PCF API appears to have more usable structure than the NEF API!
- NEF API could be improved by clearly breaking out media component ids and constituent IP flows – preferably in a manner consistent with PCF API structure
- NEF API has one qosReference for all flowInfos (a.k.a. media components) – **this does not make sense! (e.g. same for RTCP and RTP)**
- If the Camara API simply provides a single unstructured flow id, it will be difficult to map this to the media component and subcomponents that the PCF requires when Camara comes to support multiple flows
- The 3gpp specifications may need to re-consider the restriction that the same 5QI (a.k.a. QosReference) needs to apply to each component of a bidirectional IP flow (e.g. TCP flow with exclusively 'to UE' data)
- Can we get some 3gpp input / verification on these concerns ?

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References

- TS 29.122 (not very helpful, does not pull out tuple structure)

Attribute name	Data type	Cardinality	Description
flowId	integer	1	Indicates the IP flow.
flowDescriptions	array(string)	0..2	Indicates the packet filters of the IP flow. Refer to subclause 5.3.8 of 3GPP TS 29.214 [10] for encoding. It shall contain UL and/or DL IP flow description.

- TS 29.514 (PCF Policy Authorisation Service)

Attribute name	Data type	P	Cardinality	Description	Applicability
medCompN	integer	M	1	Identifies the media component number, and it contains the ordinal number of the media component.	

Attribute name	Data type	P	Cardinality	Description	Applicability
medSubComps	map(MediaSubComponent)	O	1..N	Contains the requested bitrate and filters for the set of service data flows identified by their common flow identifier. The key of the map is the attribute "fNum".	
fNum	**integer**	M	1	Identifies the ordinal number of the service data flow.	

Rules for setting ‘fnum’ are defined in TS 29.514 Annex C.1.1 as follows:

A flow identifier is expressed as a 2-tuple as follows:

<The ordinal number of the position of the media component description in the SDI. The ordinal number of the IP flow(s) within the media component description assigned in the order of increasing downlink port numbers as detailed below.>

where both are numbered starting from 1. The encoding of the flow identifier is as indicated in 3GPP TS 24.008 [36].

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References (cont)

There seems to be no clear matching definition for ‘flow identifier in TS 24.008!!. The nearest thing is buried in 10.5.6.12 Traffic Flow template table 10.5.1.6.2:

- When the parameter identifier indicates Flow Identifier, the parameter contents field contains the binary representation of a flow identifier. The Flow Identifier consists of four octets. Octets 1 and 2 contains the Media Component number as specified in 3GPP TS 29.207 [100]. Bit 1 of octet 2 is the least significant bit, and bit 8 of octet 1 is the most significant bit. Octets 3 and 4 contains the IP flow number as specified in 3GPP TS 29.207 [100]. Bit 1 of octet 4 is the least significant bit, and bit 8 of octet 3 is the most significant bit.

This makes some sense as it matches the 2-tuple description in annex C.1.1 and would fit into an integer type.

References (cont)

A few definitions from 29.207 are useful here;

Media component: is a part of an AF session description (e.g. SDP) conveying information about media (e.g. media type, format, IP address, port(s), transport protocol, bandwidth, direction).

The media described by a media component can be either bi- or unidirectional. Media using RTP for transport may also have associated RTCP If so, the media component also conveys information about the associated RTCP (port and possibly bandwidth). An AF session description can consist of more than one media component.

For, SDP, a media component shall not be deleted nor its position changed within the SDP session description. An SDP media component line where the port number has previously been set to 0 may be reused for a new media component.

Flow identifier: used for the identification of the IP flows, described within a media component associated with an AF session. A Flow identifier consists of two parts: 1) the ordinal number of the position of the media component description in the session description information and 2) the ordinal number of the IP flow(s) within the media component description assigned in the order of increasing port numbers. Examples are provided in Annex C.

Annex C of 29.207 might therefore be interesting however TS 29.514 Annex C.1.1 goes on to say:

The rules for the allocation of flow identifiers to IP flows are defined in 3GPP TS 29.214 [20], Annex B.1.1. Derivation of flow identifiers from SDP are described in 3GPP TS 29.214 [20], Annex B.1.2, and examples are covered in 3GPP TS 29.214 [20], Annex B2, B3, B4 and B5.

Looking at Annex B.1.1 in TS 29.214, it appears to be a rewrite of Annex C in 29.207, therefore we should use Annex B.1 for reference. Annex B2 contains the example mapping to illustrate the concept, used in this slide deck.