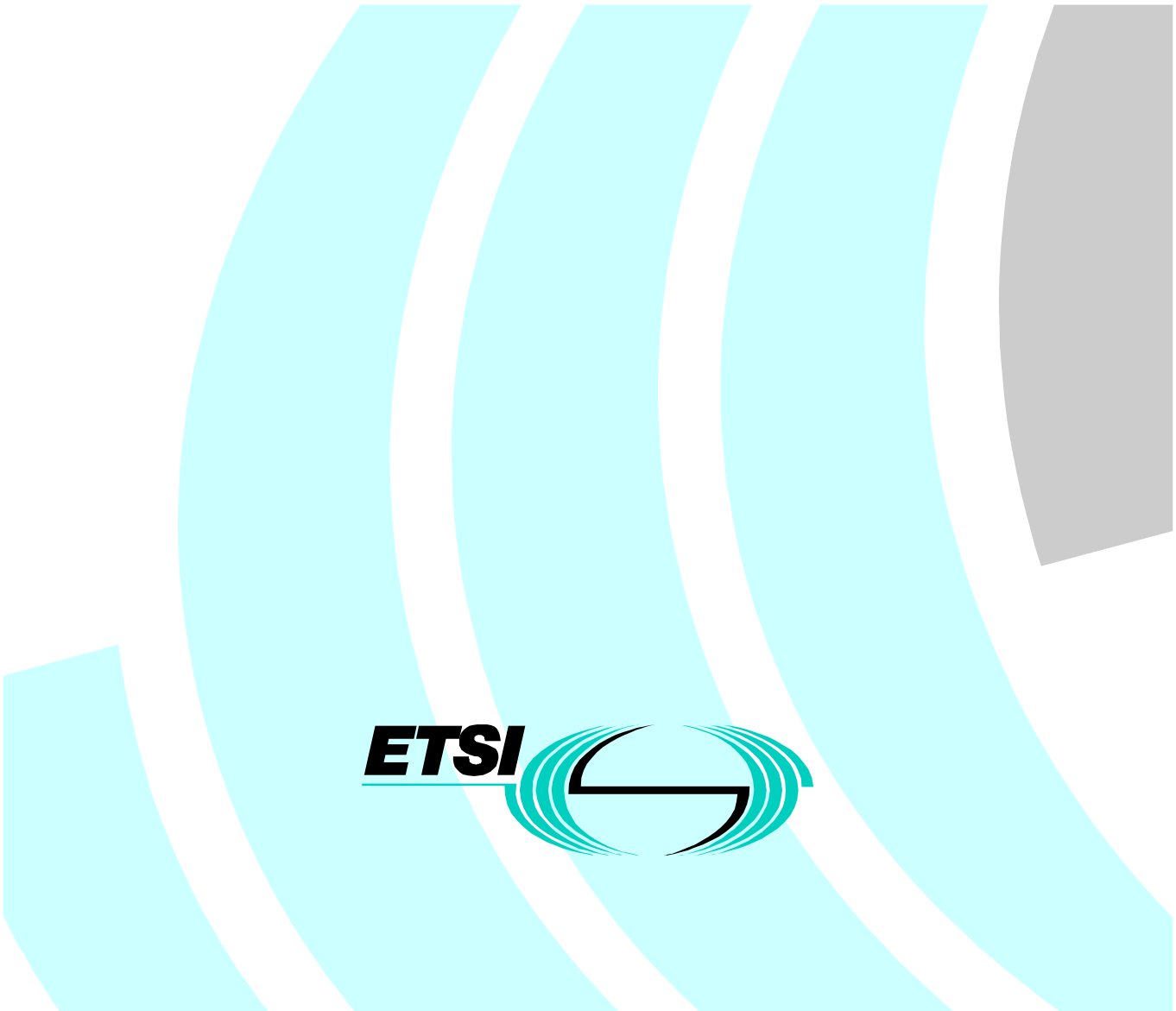
ETSI TS 101 763-2 V1.1.1 (2000-04)

Technical Specification

Broadband Radio Access Networks (BRAN);
HIPERLAN Type 2;
Cell based Convergence Layer;
Part 2: UNI Service Specific Convergence Sublayer (SSCS)



Reference
DTS/BRAN-0024003-2

Keywords
access, cell, hyperlan, UNI

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Foreword

This Technical Specification (TS) has been produced by the ETSI Project Broadband Radio Access Networks (BRAN).

The present document defines the functionality required for interworking HIgh PErformance Radio Local Area Network (HIPERLAN) Type 2 with ATM control plane functions defined for the User Network Interface (UNI) [3].

The Cell based Convergence Layer is split into several parts. Part 1, Common Part, describes the functionality for mapping ATM cells into data units used at the Data Link Control (DLC) layer. Further parts, each defining a Service Specific Convergence Sublayer (SSCS), describe the control plane functionality required to support a specific signalling protocol, e.g. ATMFs M-UNI protocol specification [4]. It is envisioned that several, independent, service specific parts will be added as market requirements develop in the future.

The present document is part 2 of a multi-part TS covering the HIPERLAN Type 2; Cell based Convergence Layer, as identified below:

Part 1: "Common Part";

Part 2: "UNI Service Specific Convergence Sublayer (SSCS)".

1 Scope

The present document describes the interworking between UNI signalling protocols and the HIPERLAN/2 control plane.

The present document is applicable to HIPERLAN/2 equipment supporting ATM UNI signalling according to one of the following UNI standard recommendations: Q.2931 [3], ATMF UNI 3.1 [5], ATMF UNI 4.0 [6] and M-UNI [4]. The present document addresses only the functionality required to map ATM UNI signalling over the HIPERLAN/2 network, i.e. between an HIPERLAN/2 Access Point and Mobile Terminal. It does not address the requirements and technical characteristics for wired network interfaces at the Access Point and at the Mobile Terminal.

The Cell based Convergence Layer consists of a Common Part Convergence Sublayer [7] and several Service Specific Convergence Sublayers (SSCS), which are defined in separate documents. The task of the Common Part of the Cell based Convergence Layer is to map between the fixed data unit of an ATM cell and the fixed data unit size used in the HIPERLAN/2 DLC layer. The Service Specific Convergence Sublayers all use services provided by the Common Part Convergence Sublayer and the HIPERLAN/2 Data Link Control (DLC) layer.

The present document does not address the requirements and technical characteristics for type approval and conformance testing. These are covered in separate Technical Specifications.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETSI TS 101 761-1: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Data Link Control (DLC) Layer; Part 1: Basic Data Transport Functions".

[2] ETSI TS 101 761-2: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Data Link Control (DLC) Layer; Part 2: Radio Link Control (RLC) sublayer".

[3] ITU-T Recommendation Q.2931 (1995): "Broadband Integrated Services Digital Network (B-ISDN) - Digital Subscriber Signalling System No. 2 (DSS 2) - User-Network Interface (UNI) - Layer 3 specification for basic call/connection control".

[4] ATM Forum (BTD-WATM-01.12): "Wireless ATM Capability Set 1 Specification - Draft".

[5] ATM Forum (af-uni-0010.000): "UNI Signalling 3.1".

[6] ATM Forum (af-sig-0061.000): "UNI Signalling 4.0".

[7] ETSI TS 101 763-1: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Cell based Convergence Layer; Part 1: Common Part".

[8] ATM Forum (af-lane-0084.000): "LANE v2.0 LUNI Interface".

[9] IETF RFC 1577: "Classical IP and ARP over ATM".

[10] ATM Forum (af-mpoa-0114.000): "Multi-protocol Over ATM Specification, Version 1.1".

[11] IETF RFC2364: "PPP over AAL5".

[12] IETF RFC 1755: "ATM Signalling Support for IP over ATM".

[13] ATM Forum (af-ilmi-0065.000): "ILMI 4.0".

[14] ETSI TS 101 475: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Physical (PHY) layer".

3 Definitions and abbreviations|

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

HIPERLAN/2: HIgh PErformance Radio Local Area Network Type 2, a short-range wireless LAN providing broadband local access. Standardized by ETSI Project BRAN

Protocol Data Unit (PDU): data unit exchanged between entities at the same ISO layer

Service Data Unit (SDU): data unit exchanged between adjacent ISO layers

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACF	Association Control Function
AP	Access Point
ATM	Asynchronous Transfer Mode
BRAN	Broadband Radio Access Networks (Project)
CPCS	Common Part Convergence Sublayer
CPE	Customer Premises Equipment
DLC	Data Link Control
DLCC-ID	Data Link Control Connection Identifier
DCC	DLC Connection Control
DUC	DLC User Connection
DUC-ID	DLC User Connection Identifier
ESI	End System Identifier
MAC-ID	Medium Access Control Identifier
MPOA	Multi Protocol over ATM
MT	Mobile Terminal
NP	Network Prefix
PPP	Point-to-Point protocol
RLC	Radio Link Control
SAP	Service Access Point
SSCS	Service Specific Convergence Sublayer
UNI	User Network Interface
M-UNI	User Network Interface + Mobility Extension
U-SAP	User Service Access Point
VC	Virtual Channel
VCI	Virtual Channel Identifier
VP	Virtual Path
VPI	Virtual Path Identifier

4 Convergence Layer architecture

The Convergence Layer (CL) resides on top of the Data Link Control (DLC) layer. The task of the Convergence Layer is to adapt the service requirements of different Higher Layers to the services offered by the HIPERLAN/2 DLC layer.

Two Convergence Layers can be distinguished in BRAN, a Cell based Convergence Layer and a Packet based Convergence Layer (see figure 4.1). Further Convergence Layers may be specified in the future. The Cell based Convergence Layer offers services to Higher Layers that use the fixed size ATM cell as the transfer unit. The Packet based Convergence Layer offers services to Higher Layers that use packets or frames of variable size or fixed size, which exceed the ATM cell size. Typical examples of these are Ethernet and the Internet protocol suite.

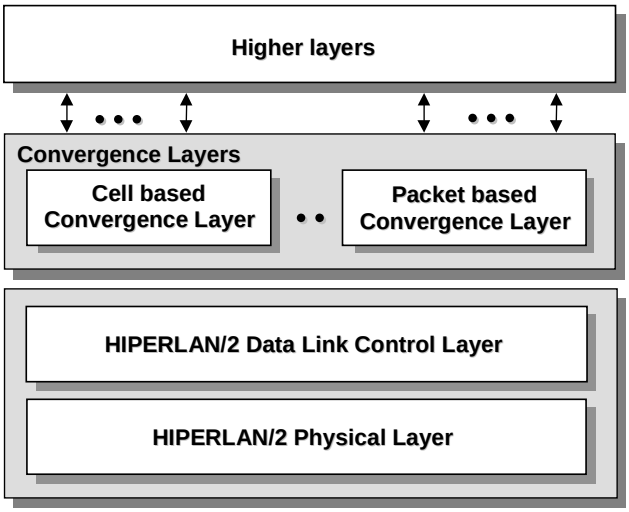


Figure 4.1: HIPERLAN/2 Convergence Layers

5 Cell based Convergence Layer

5.1 General

The Cell based Convergence Layer provides the capability to transfer User Service Data Units (User SDUs), that correspond to an ATM cell, transparently between users of the Convergence Layer. The Cell based CL itself consists of two parts, a Common Part Convergence Sublayer (CPCS) [7] and a Service Specific Convergence Sublayer (SSCS). It is intended that several different Service Specific Convergence Sublayers will be specified within BRAN. An Access Point may support several SSCSs simultaneously. The CPCS describes the user plane functionality, i.e. how the information contained in an ATM cell is mapped into a HIPERLAN/2 DLC transport unit (SDU) and vice versa. The CPCS performs the adaptation between the User SDU and the DLC-SDU. User SDUs belonging to different ATM connections can be multiplexed on one DLC connection. Multiple DLC connections can be set up. The SSCS defines the mapping of Control Plane procedures for connection and mobility management between HIPERLAN/2 and the ATM specific control plane.

The network model is shown in figure 5.1. HIPERLAN/2 Mobile Terminals (H/2 MTs) are attached to an ATM network via a HIPERLAN/2 Access Point (H/2 AP). The data transfer between MTs and the AP is ATM. Applications running in the MT and the CPEs that are attached to the ATM-network communicate via ATM. Additional protocols like LANE [8], Classical IP [9] MPOA [10], or PPP [11] may be invoked by the communicating applications. These protocols use services provided by the ATM transport network and are negotiated during connection establishment phase. See also [12].

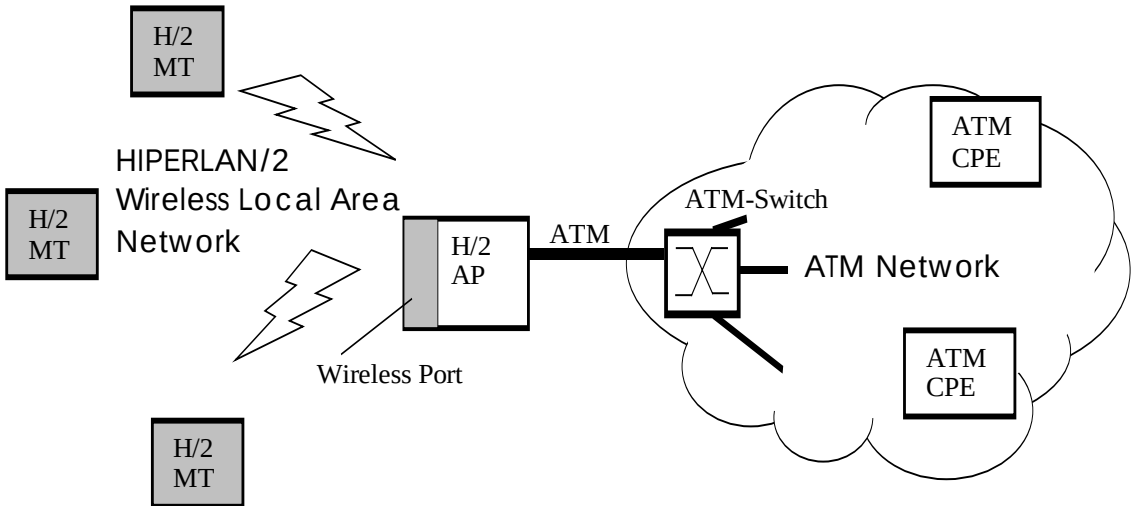


Figure 5.1: HIPERLAN/2 supporting ATM transport

5.2 UNI Service Specific Part Convergence Sublayer

5.2.1 Functional Model

The UNI Service Specific Convergence Sublayer is a part of the Cell based Convergence Layer. It provides the adaptation of the ATM User Network Interface (UNI) signalling to the Radio Link Control (RLC) functions of HIPERLAN/2. Functions include association, connection control, and disassociation.

It is assumed that standard UNI signalling is used for ATM connection control and mobility management [4], [18]. The AP may act as signalling endpoint for UNI signalling or may relay signalling traffic transparently to a signalling entity within the network, e.g. the ATM-switch the AP is attached to. The location of the SSCS in a specific entity, e.g. AP or ATM-switch, is implementation specific and therefore not specified within HL/2.

5.2.2 Cell Based Convergence Layer Planes

Figure 5.2 shows the protocol layers and the model of the planes for ATM-transport in HIPERLAN/2. Three planes are distinguished:

- User Plane;
- ATM Control Plane;
- HIPERLAN/2 Control Plane.

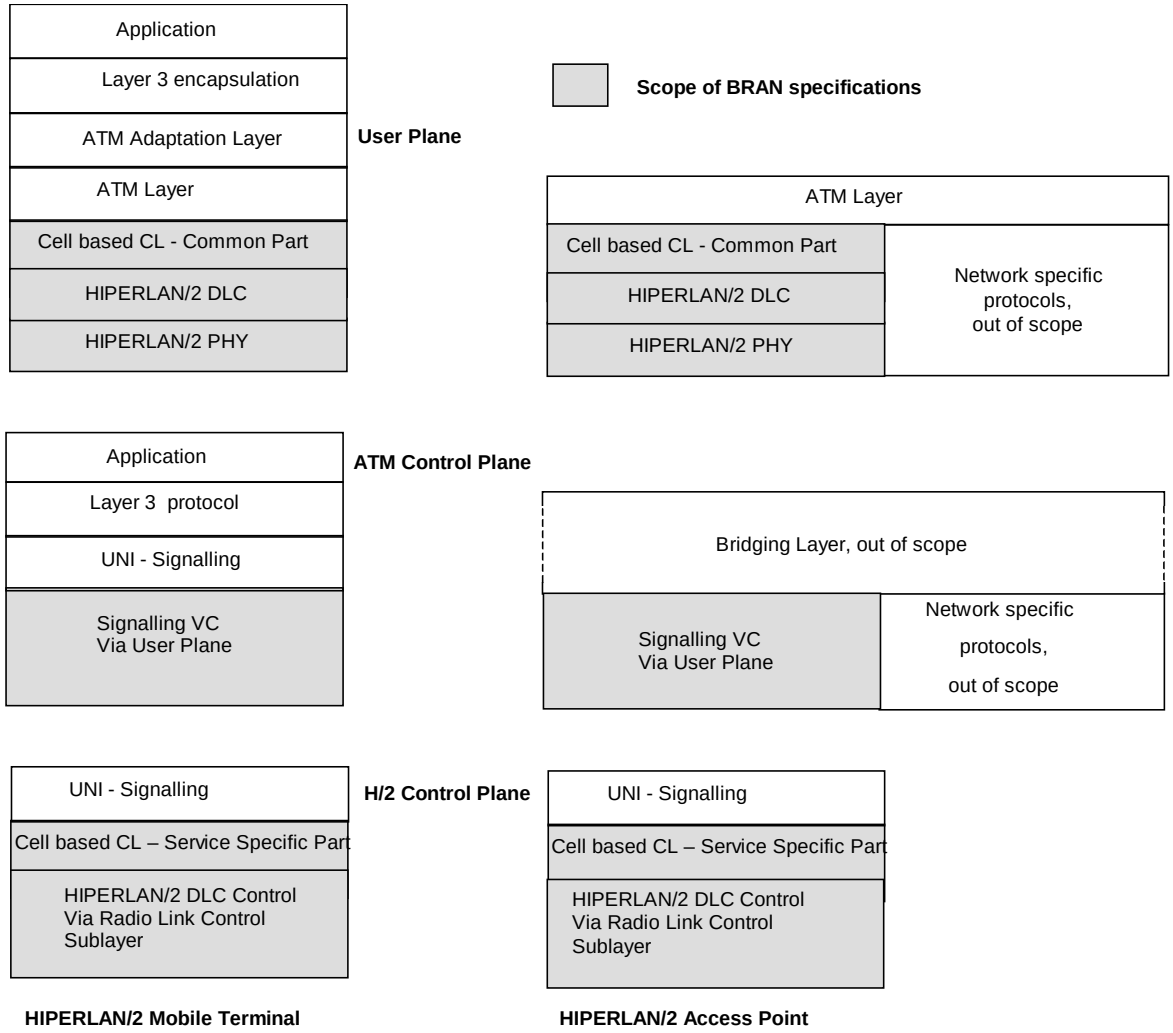


Figure 5.2: Protocol stacks in the MT and the AP

Table 5.1 lists the protocol layers as shown in figure 5.2 and their respective functions.

Table 5.1: Layer Decscription

Plane	Protocol Layer	Function
User Plane	Layer 3 encapsulation	Encapsulation of application data
	ATM Adaptation Layer (AAL)	ATM Segmentation and Reassembly
	ATM	ATM cell transport
	Cell based Common Part Convergence Sublayer	Adaptation between ATM-cell stream and HIPERLAN/2 DLC transport format
	HIPERLAN/2 DLC Layer	See [1]
	HIPERLAN/2 PHY Layer	See [14]
ATM Control Plane	Layer 3 protocol	Layer 3 protocols, like LAN emulation [8], Classical IP over ATM [9], [12], Multiprotocol over ATM [10], and PPP over ATM [11].
	UNI signalling protocol	ATM UNI Signalling including SAAL functionality
	Signalling VC	ATM Transport via User Plane
HIPERLAN/2 Control Plane	Cell based UNI Service Specific Convergence Layer	Mapping of UNI signalling to DLC control functions; configuration of connection mapping between ATM connection identifier <VPI, VCI> and HL/2 identifier <DLCC-ID, CL-Tag>
	HL/2 DLC control via Radio Link Control Sublayer	Radio Resource Control, Association Control, and DLC Connection Control; HL/2 specific control functions [1]

The bridging between wireless network and fixed network is out of the scope of BRAN.

To achieve interoperability between MTs and APs in a multivendor environment the control plane configuration should be signalled during association. The layer 3 protocol and encapsulation format used by the applications should be negotiated during the connection establishment phase using standard UNI signalling [3], [5], [6]. The B-LLI (Broadband Lower Layer Information) IE indicating the Layer 3 protocol and the encapsulation should be present in the appropriate signalling messages [8]…[12].

5.3 Service Access Point

The higher layer exchanges control primitives with the Cell based Service Specific Convergence Layer via the CL-Control SAP. The SSCS interacts with the Radio Resource Control, Association Control and DLC-Connection Control functions of the DLC-control plane, i.e. the Radio Link Control Sublayer (RLC) via the DLC-Control SAP. See figure 5.3. The interface to the Common Part Convergence Sublayer (CPCS) is not specified.

NOTE: The functionality of the Radio Resource Control, Association Control (ACF), and DLC-Connection Control (DCC) is not specified within BRAN.

Data that are exchanged with the peer SSCS are carried in RLC-messages. The coding of information elements is described in [2] and in subclause 7.3.2 of the present document.

An SNMP Management Information Base containing also Convergence Layer specific parameters for configuration, performance, and fault management will be defined in TS 101 762 (see Bibliography).

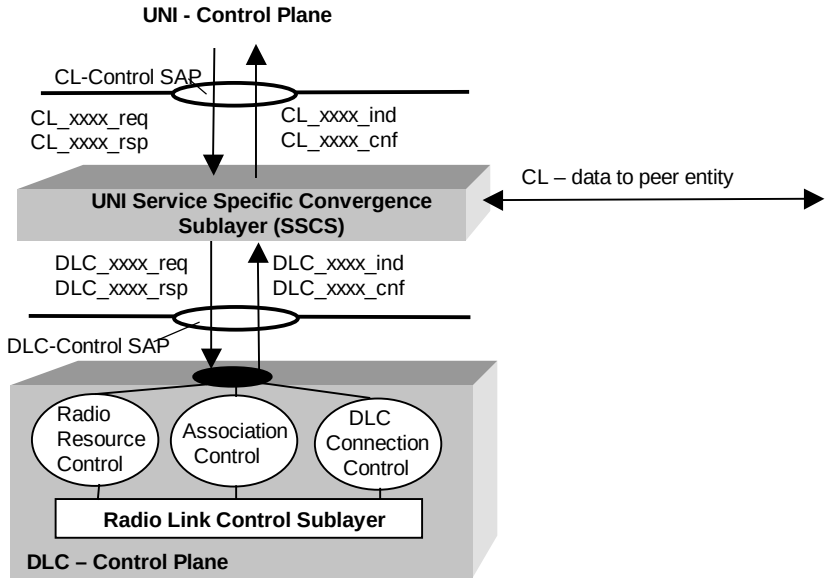


Figure 5.3: Control Plane and Service Access Points

5.4 Primitives

The Service Specific Part Convergence Sublayer exchanges service primitives with the Higher Layer and the DLC.

NOTE: The primitives are defined only for the purpose of describing layer-to-layer and sublayer-to-sublayer interactions. These primitives are defined as an abstract list of parameters, and their concrete realization may vary between implementations. No formal testing of primitives is intended. The following primitive definitions have no normative significance.

5.4.1 Primitive types

Interface between layers

Four primitive types may be used between different layers:

_req (request), for a higher layer to request service from a lower layer;

_cnf (confirm), for the layer providing the service to confirm the activity has been completed;

_ind (indication), for a layer providing service to notify the next higher layer of any specific service related activity;

_rsp (response), for a layer to acknowledge receipt of an indication primitive from the next lower layer.

5.4.2 Parameter definitions

Endpoint identifiers: some primitives contain an endpoint identifier. This identifier shall be used to distinguish primitives related to different protocol instances. As identifier the DLC User Connection ID, which is the concatenation of a MAC_ID and DLCC_ID [1], shall be used. The usage of this identifier is a local matter and not defined in the present document. The identifier is defined as:

- DLC User Connection ID (DUC_ID)

Message unit: each piece of higher layer information that is included in the primitive is called a message unit. A series of one or more message units may be associated with each primitive where each separate unit is related to one information element in the corresponding DLC layer message. The list of message units is derived from the message definitions by reference to the information elements that may contain information from or to the CL.

6 Procedures

6.1 General

The procedures are asymmetric and thus differ between Access Point and Mobile Terminal.

6.2 Association

6.2.1 General

The CL capabilities should be exchanged between MT and AP convergence layers during the HIPERLAN 2 association process. The mapping information between the ATM-Identifiers <VPI, VCI> and HIPERLAN 2 identifiers <CL-Tag, DLCC_ID> shall be conveyed during association in the DLC_INFO_TRANSFER procedure. Following the successful association, the MT triggers the establishment of one or multiple DLC-connections. The connection mappings between the ATM-Identifiers <VPI, VCI> and HIPERLAN 2 identifiers <CL-Tag, DLCC_ID> for the established DLC-connections shall be configured independently at the AP and the MT based on the mapping information conveyed during association. Clause B.1 shows the message sequence for association.

6.2.2 Convergence Layer Identification

The beacon that is periodically transmitted by the AP contains the Convergence Layer Information (CL-Info). The CL-Info shall contain the CL-ID identifying the support of the Cell based ATM-Service with UNI signalling and the CL version number (CL-version). The coding of CL-ID and CL-version is defined in clause 7.

6.2.3 CL-capabilities

The <<CL_ATTRIBUTES>> IE in the DLC_INFO_TRANSFER request primitive triggered by the MT during association, see [1] may contain the following CL specific information elements:

Information Element	Reference	Status	Total length (octets)	Description
VC-Identifier Range	Subclause 7.3.3	O	6	Upper and lower bound of supported VCI range.
Number of supported ATM – connections	Subclause 7.3.4	O	3	Number of simultaneous ATM connections, which are supported by the terminal.
Number of supported DLC- connections	Subclause 7.3.5	O	3	Number of simultaneous DLC- connections, which are supported by the terminal.
Peak Cell Rate	Subclause 7.3.7	O	6	Uplink and downlink peak cell rate supported by the terminal.
UNI-Version	Subclause 7.3.8	O	3	One or multiple UNI versions supported by the terminal.
ATM Address	Subclause 7.3.9	O	6	The End System Identifier of the Mobile Terminal.

In the absence of those information elements in the <<CL-ATTRIBUTES>> IE the corresponding default values shall be supported.

Upon receiving a DLC_INFO_TRANSFER indication the AP shall match the parameters the AP and the network supports. In the DLC_INFO_TRANSFER response primitive the connection mappings between VCI and <CL-Tag, DLC-Connection> and the matched parameters shall be returned to the MT. The following CL information elements are carried in the <<CL-ATTRIBUTES>> IE:

Information Element	Reference	Status	Total length (octets)	Description
VC-Identifier Range	Subclause 7.3.3	O Note 1	6	Upper and lower bound of supported VCI range.
Number of supported ATM – connections	Subclause 7.3.4	O Note 2	3	Number of simultaneous ATM connections, which are supported by the terminal.
Number of supported DLC- connections	Subclause 7.3.5	O Note 3	3	Number of simultaneous DLC- connections, which are supported by the terminal.
Connection Mapping	Subclause 7.3.6	M Note 4	Variable (≥4)	The mapping information between ATM VCI and CL-Tag for each DLC-connection.
Peak Cell Rate	Subclause 7.3.7	O Note 5	6	Uplink and downlink peak cell rate supported by the terminal.
UNI-Version	Subclause 7.3.8	O Note 6	3	One or multiple UNI versions supported by the terminal.
ATM Address	Subclause 7.3.9	O Note 7	13	The ATM Address network prefix (NP) used by the network.

NOTE 1: This IE is mandatory if the AP or the Network supports a VCI-Identifier range that is different from the one indicated in the corresponding IE that was received from the MT. The VC-Identifier range shall be within the boundaries of the Upper and lower bound VCI range supported by the MT. VCI upper bound supported by the MT shall be greater or equal than the VCI upper bound supported by the AP. The VCI lower bound supported by the MT shall be lower or equal than the VCI lower bound supported by the AP.

NOTE 2: This IE is mandatory if the AP or the Network supports fewer ATM connections than indicated in the corresponding IE that was received from the MT.

NOTE 3: This IE is mandatory if the AP or the Network supports fewer DLC-connections than indicated in the corresponding IE that was received from the MT.

NOTE 4: This IE is optional if the AP supports only one DLC-connection with a one-to-one mapping between lower octet VCI and CL-Tag. Only VCIs 0…255 are supported.

NOTE 5: This IE is mandatory if the AP or the Network does not support a peak cell rate lower than the one indicated in the corresponding IE that was received from the MT.

NOTE 6: This IE is mandatory if the MT indicated the support of multiple UNI-versions in the corresponding IE that was received from the MT. If the AP supports multiple UNI-versions only one UNI-version of those UNI-versions indicated by the MT shall be selected. This UNI-version shall be used to perform ATM control plane signalling as long as the MT is registered with the network.

NOTE 7: This IE is shall be present if the ATM Address IE, i.e. the ESI of the MT, is part of the DLC_INFO_TRANSFER that was previously received by the AP. The AP shall support address registration via DLC_INFO_TRANSFER.

The coding of the information elements is defined in subclause 7.3.

6.2.4 DLC-Connection Establishment

Following successful association, the CL-layer of the MT shall trigger the establishment of the DUCs by issuing the DLC-SETUP request primitive via the DLC-Control -SAP.

This DLC_SETUP request primitive shall contain the DLCC-IDs of connections that was indicated in the Mapping IE transferred as part of the association process.

NOTE: The mapping of the priority parameter that is part of the mapping IE to ATM QoS parameter is not defined within BRAN. It is recommended that the highest priority DUC be used for signalling and control traffic and the lowest priority for best effort services. VCIs should be allocated according to the QoS requirements. The allocation algorithm is out of the scope of BRAN.

Upon receiving a DLC_SETUP indication primitive the AP responds with a DLC_CONNECT request primitive including the DLC connections the MT shall use. The DLC-connection parameter carried in the DLC_SETUP indication primitive shall be identical to those indicated in the Mapping IE of the CL-ATTRIBUTES IE that is exchanged during association.

The SSCS of AP and MT shall configure the mapping information for the established DUCs. The SSCS in the AP shall then indicate to the user plane procedures that the MT has been successfully associated and user plane and ATM control plane operation may commence.

An indication is sent to the MT user plane that the MT is associated and user plane and ATM control plane operation may commence.

6.3 Handover

The procedures for Network Handover shall be the same as for the Association procedure described in subclause 6.2. The information field of the <<CL-ATTRIBUTES>> IE in the DLC_INFO_TRANSFER request primitive that is triggered by the MT during network handover, see [1], shall not contain values other the ones used before the handover was initiated, ie. no re-negotiation of connection parameters takes place.

6.3.1 Miscellaneous

When the AP notices that an MT has left or upon reception of a disassociation indication the AP shall remove all mapping entries for that MT and free the allocated resources assigned to the particular MT.

7 Convergence Layer specific parameters

7.1 Convergence Layer Identifier

The Convergence Layer ID used by the RLC shall be set according to the table below to signal the support of Cell based SSCS in the MT and AP. Bits 6-8 identify the Convergence Layer. In case of the Cell based Convergence Layer bits 1-5 identify the UNI Service Specific Convergence Sublayer (SSCS).

Bits 8 7 6 5 4 3 2 1	Meaning
0 0 0 0 0 0 0 0	UNI SSCS supported

All other values are reserved for other convergence layers.

7.2 Convergence Layer Version

The Convergence Layer Version number is an 8-bit field used in the RLC [1]. This field is split into two 4-bit subfields. The four most significant bits (bits 5-8) identify the version of the Common Part and the four least significant bits (bits 1-4) identify the version of the SSCS. The Convergence Layer Version number shall be set according to the table below to signal the support of the present document (V1.1.1) of the Cell based SSCS.

Bits 8 7 6 5 4 3 2 1	Meaning
x x x x 0 0 0 1	Cell based UNI SSCS version 1.1.1 supported

7.3 Information Elements for Cell based SSCS

7.3.1 Information element format

In order to transfer convergence layer specific information between AP and MT a number of CL information elements is defined. These information elements are transferred transparently by RLC messages using the <<CL-ATTRIBUTES>> information element [1]. Each convergence layer information element consists of Type field, Length field, and Information field (see figure 7.1).

The purpose of the Information Element Type is to identify the function of the information element being sent. The IE Type field is 8 bits, allowing for up to 256 information elements to be defined for a certain SSCS.

The Reserved field is for future use and shall be coded as zero.

The Length field indicates the length of the information field in octets. It does not include the length of the IE Type field, the Reserved field, or the length of the Length field itself.

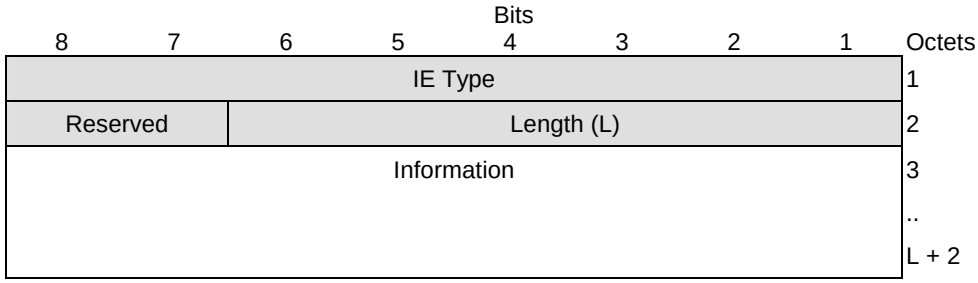


Figure 7.1: Convergence Layer information element structure

7.3.2 Information element type coding

The following IE Type codes are used in the Cell based SSCS:

Bits 8 7 6 5 4 3 2 1	Meaning
0 0 0 0 0 0 0 0	ATM VC Identifier-range (see subclause 7.3.3)
0 0 0 0 0 0 0 1	Number of Supported ATM - connections (see subclause7.3.4)
0 0 0 0 0 0 1 0	Number of Supported DLC - connections (see subclause 7.3.5)
0 0 0 0 0 0 1 1	Connection Mapping (see subclause 7.3.6)
0 0 0 0 0 1 0 0	Peak Cell Rate (see subclause 7.3.7)
0 0 0 0 0 1 0 1	UNI Version (see subclause 7.3.8)
0 0 0 0 0 1 1 1	ATM Address (see subclause 7.3.9)

All other values are reserved for future IEs.

7.3.3 ATM VC Identifier range

The <<ATM Identifier Range>> information element is used to indicate the continuous range of supported VCIs. It is optionally exchanged during association and handover.

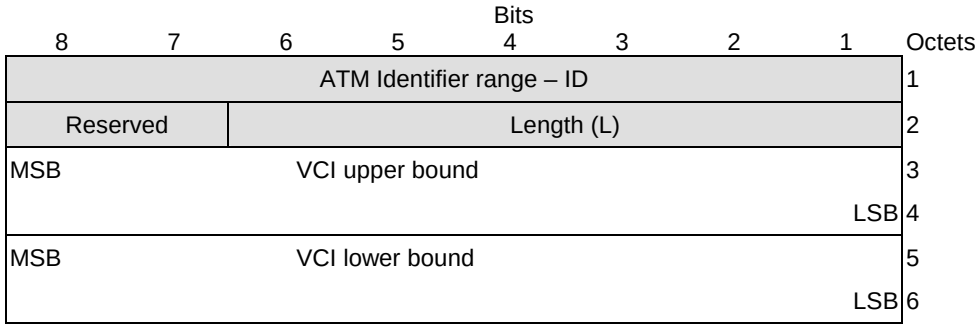


Figure 7.2: ATM VCI information element

If the <<ATM Identifier Range>> IE is not present, the MT and the AP shall support the following default values:

VCI lower bound: 0.

VCI upper bound: 255.

7.3.4 Number of supported ATM connections

The << Number of supported connections >> information element is used to indicate the number of simultaneous connections that are supported. It is optionally exchanged during association and handover.

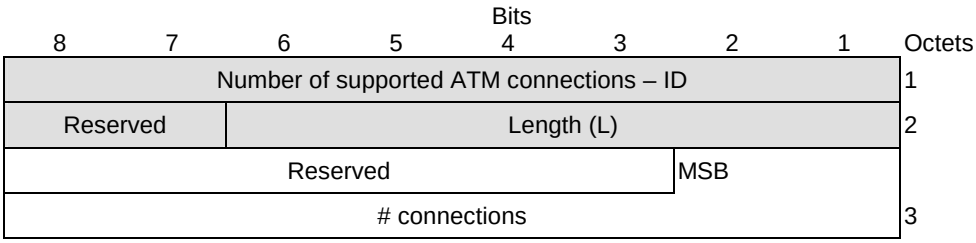


Figure 7.3: Number of supported ATM connections information element

If the << Number of supported ATM connections >> IE is not present, then the MT and AP (per associated MT) shall support the following default value:

Number of supported ATM connections: 32.

7.3.5 Number of supported DLC connections

The << Number of supported DLC connections >> information element is used to indicate the number of supported independent DLC - connections. It is optionally exchanged during association and handover.

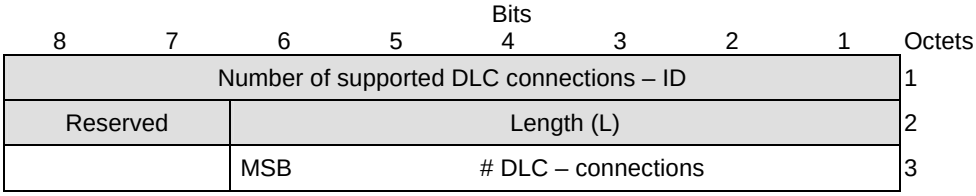


Figure 7.4: Number of supported DLC connections information element

If the << Number of supported DLC - connections >> IE is not present, the MT and the AP shall support the following default value:

Number of supported DLC connections: 1.

7.3.6 Connection mapping

The << Connection mapping >> information element is used to convey the mapping information of contiguous continuos ranges of VC-connections to corresponding ranges of CL-Tags and DLCC-IDs. The IE is optionally exchanged during association and handover.

The range field identifies the number of VCIs belonging to a continuous VCI-range. VCI-ranges are non-overlapping and contiguous. VCIs within a range are conveyed on one DLC-connection that is identified by the DLCC-ID. The VCIs belonging to a VC-range that are conveyed on one DLC-connection are mapped to a continuous range of CL-Tags starting with "0". If multiple VCI-ranges are conveyed on one DLCC-ID, contiguous ranges of CL-Tags, each corresponding to a VC-range, shall be formed in the order given by the IE. In any case the cumulative number of VCs mapped on one DLC-connection shall not exceed 256. The priority field indicates the priority that is assigned to the corresponding DLC-connection. Priority is assigned in descending order, i.e. priority field = 0 indicates highest priority. If a DLC-connection is used for multiple ranges of VCIs, all priority fields for the same DLC- connection shall have the same value. Annex B illustrates the mapping of the IE.

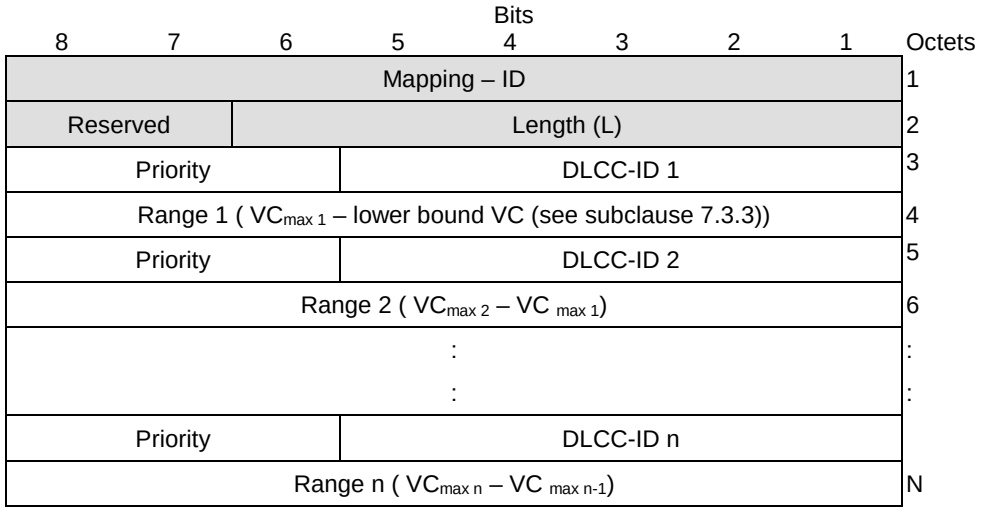


Figure 7.5: Mapping information element

Figure 7.6: Void

If the << mapping >> IE is not present, the MT and the AP shall map all VC-connections to DLCC-ID = 1. Maximum 256 connections with VCs ranging from 0 to 255 are supported. The ranges given in the mapping IE shall not conflict with ATM-VCI range IE (see subclause 7.3.3), the number of supported ATM connections (see subclause 7.3.4), and the number of supported DLC-connections IE.

NOTE: During Handover the MT shall only use those parameters in the Mapping IE that were negotiated between MT and AP during initial association.

7.3.7 Peak cell rate

The << Peak Cell rate >> information element is used to indicate the Peak Cell Rate in uplink and downlink direction that is supported. It is optionally exchanged during association and handover.

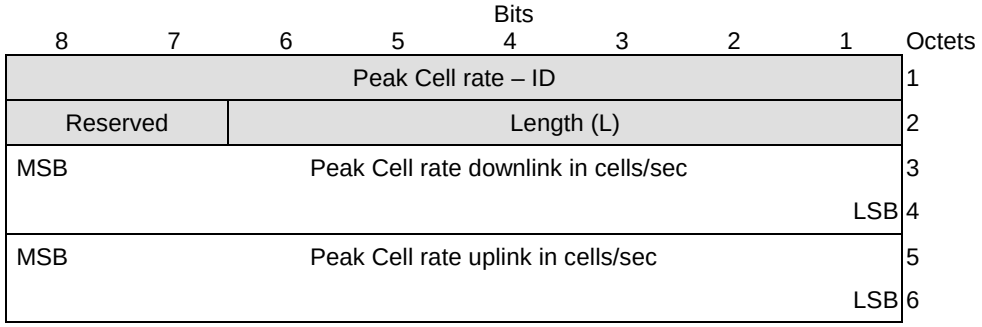


Figure 7.7: Peak Cell rate information element

If the << Peak Cell rate >> IE is not present, the MT and the AP shall support the following default value:

Peak Cell Rate in forward and backward direction: 2360 cell/s (approx. 1 Mbit/s)

7.3.8 UNI-version

The << UNI Version >> information element is used to indicate the UNI protocol specification that is supported. It is optionally exchanged during association and handover.

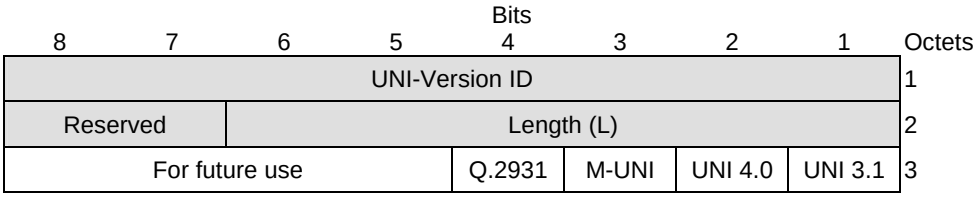


Figure 7.8: UNI-Version information element

A logical one in the corresponding position of the IE indicates that the UNI protocol version is supported.

UNI 3.1 refers to [5],

UNI 4.0 refers to [6],

M-UNI refers to [4],

Q.2931 refers to [3].

If the << UNI-IE >> IE is not present, the MT and the AP shall support UNI 3.1.

In case the MT supports multiple UNI signalling versions, all corresponding positions should be set to "one" during association. The response from the AP shall indicate the UNI-version that is used by the MT and the AP for the ATM control plane. The AP shall select a single UNI version only, i.e. no more than one position shall be set to "one".

During handover the MT shall indicate the single UNI-version that was negotiated during the initial registration. If the new AP does not support the UNI-version as indicated by the MT, the MT has to re-register.

7.3.9 ATM Address

The << ATM Address >> information element is used to announce the Endsystem Identifier (ESI) to the Access Point and the Network Prefix (NP) to the Mobile Terminal in case NSAP addressing is used. It is optionally exchanged during association and handover.

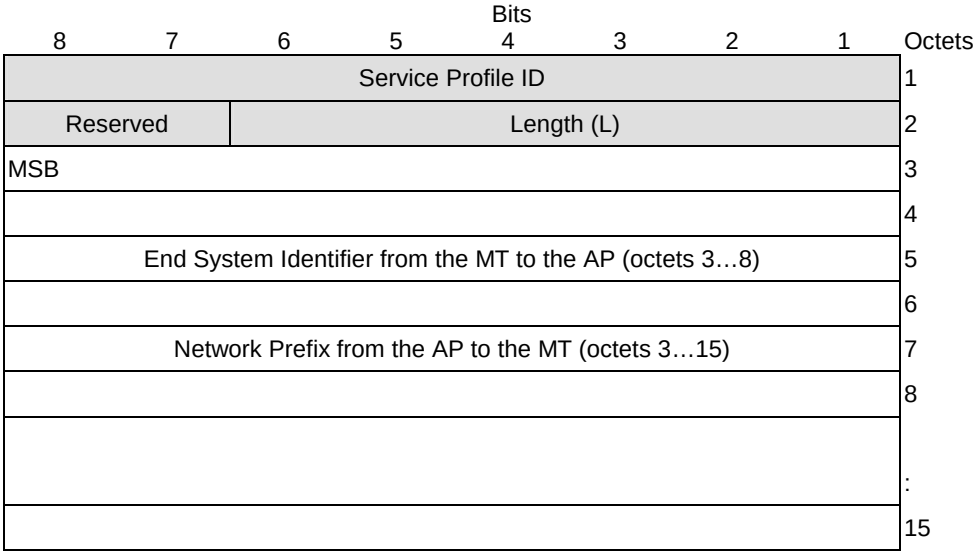


Figure 7.9: ATM Address Information Element

This IE substitutes the ILMI address registration procedure [13]. In case ILMI is used for address registration this IE shall not be used by the MT. However, the AP shall use the IE in the response if the corresponding IE was present in the previously received indication.

NOTE: Only one ESI per MT can be announced to the network.

7.4 Interface to the DLC

The DLC Control-SAP is specified in the RLC [2].

8 UNI SSCS - MIB

The Management Information Base parameters for the UNI SSCS will be defined in TS 101 762 (see Bibliography). These MIB parameters may be moved into this clause in a future edition of the present document.

Annex A (normative): Coding Conventions

Numbers are aligned so that the most significant bit (MSB) of the most significant octet is transmitted first.

The left most bit in the diagram below is the high order or most significant bit (MSB). That is, the bit labelled 8 is the most significant bit.

In a multi-octet field the left most bit of the whole field is the most significant bit. The left most octet (octet 1 in the figure below) is the most significant octet of a field. When a multi-octet quantity is transmitted the most significant octet is transmitted first.

Example: a 16-bit identifier value is coded in the following way (see below):

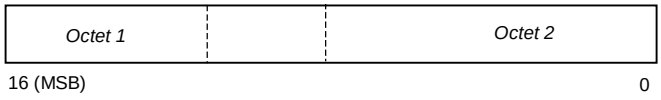


Figure A.1: Example, coding of a 16-bit identifier

MSB 8	7	6	Bits 5	4	3	2	LSB 1	Octets
Bits 40-47								1
Bits 32-39								2
Bits 24-31								3
Bits 16-23								4
Bits 8-15								5
Bits 0-7								6

Figure A.2: Corresponding coding in an IE or PDU

Annex B (informative): Association procedure for UNI SSCS

Figures B.1 to B.3 below highlight the sequence of RLC procedures at association time that is specific to the UNI SSCS.

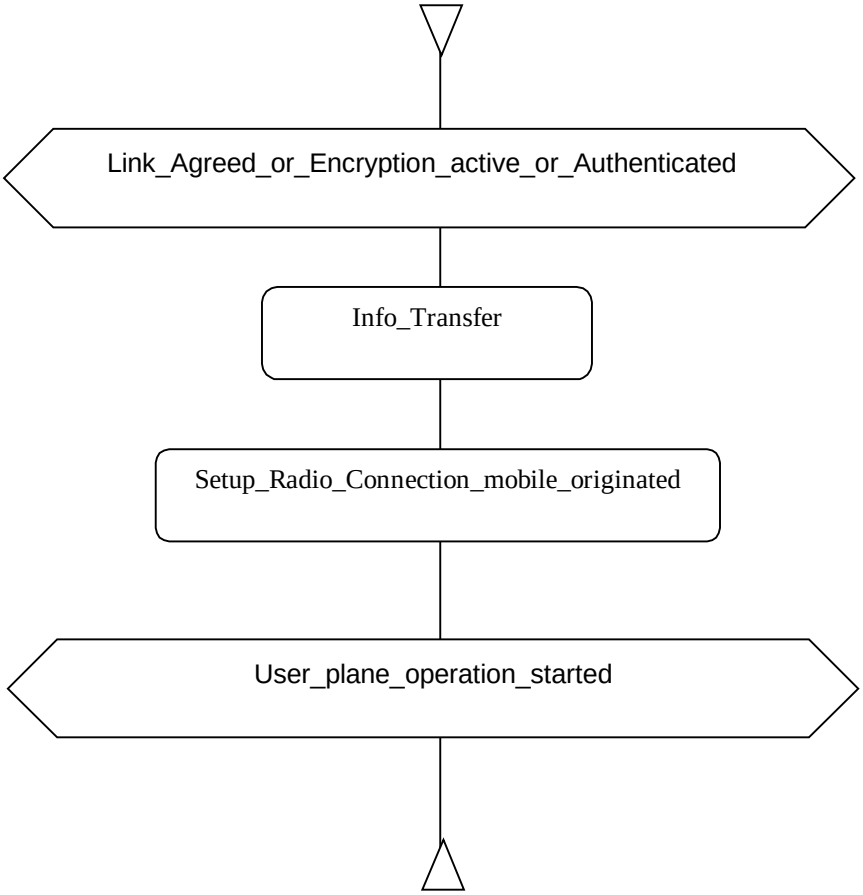


Figure B.1: High-Level association procedure for UNI SSCS

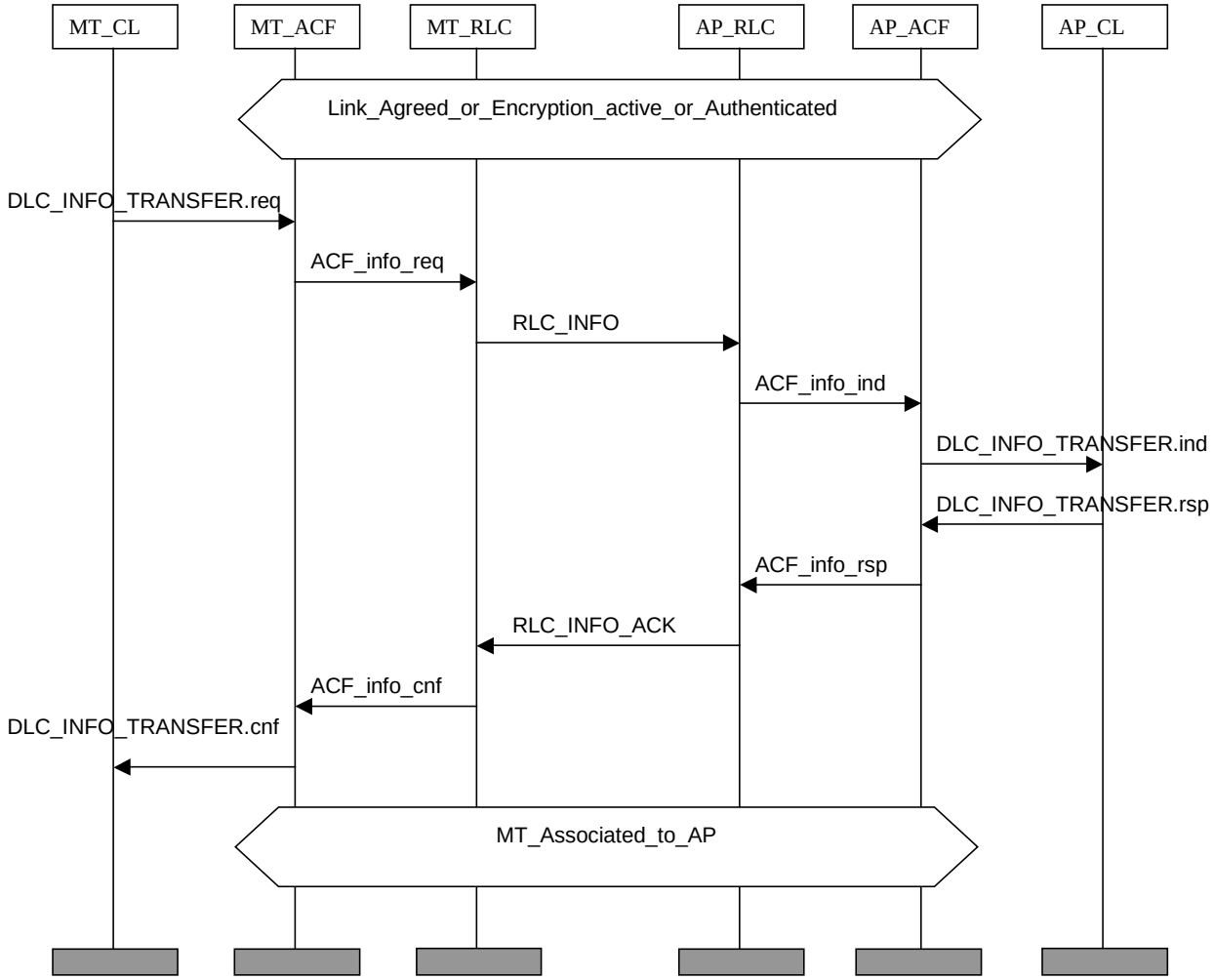


Figure B.2: Info transfer procedure

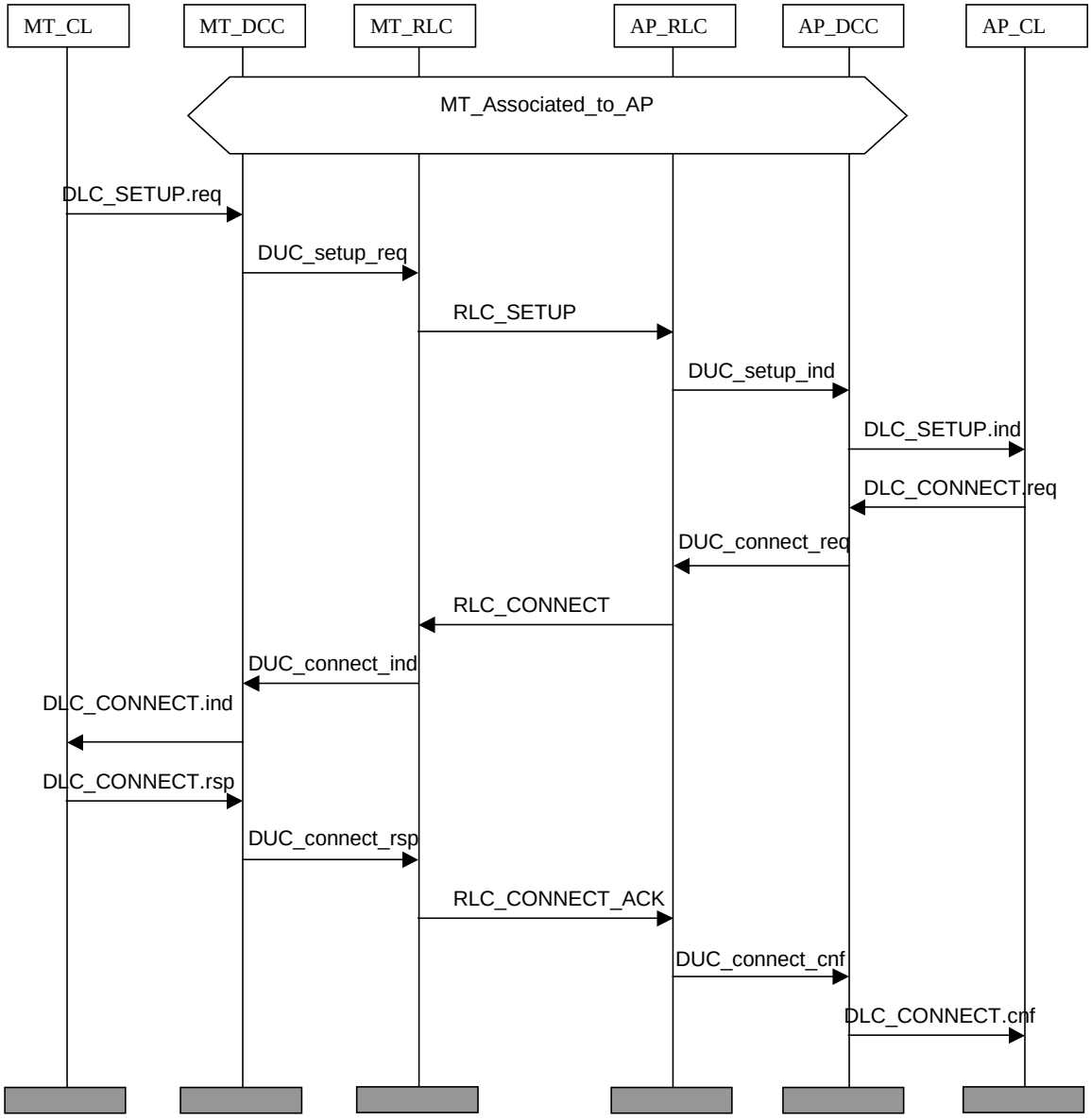
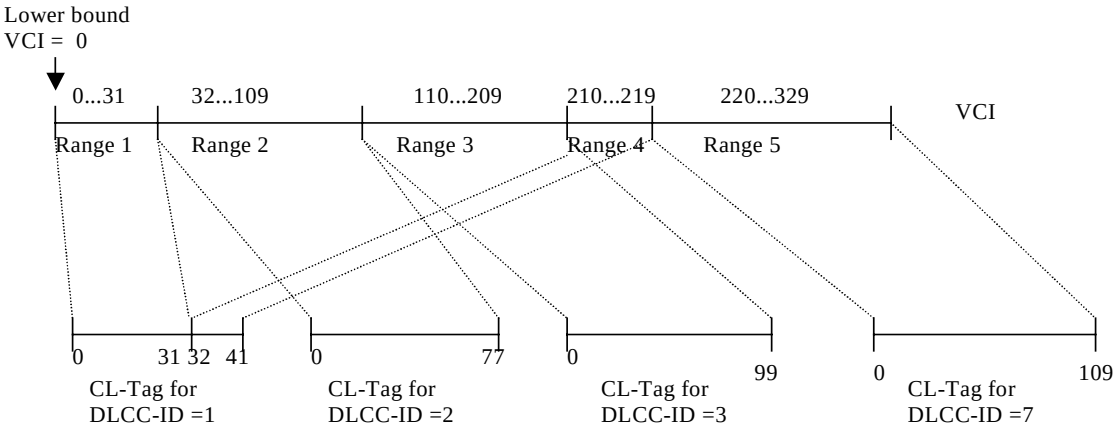


Figure B.3: MT originated DUC setup procedure

B.1 Connection Mapping Example

Figure B.4 illustrates the mapping of VCI ranges to CL-Tag and DLCC-ID and the coding of the corresponding mapping information element (Mapping IE). The Mapping IE is conveyed from the AP to the MT during association and handover. The identified DLC-connections are established following association and the mapping is configured in the AP and the MT.



Bits

8	7	6	5	4	3	2	1	Octets
Mapping – ID								1
Reserved			Length (L)					2
Priority = 0			DLCC-ID = 1					3
Range 1 = 32 (= VCI 0…31, if lower bound VCI = 0)								4
Priority = 4			DLCC-ID = 2					5
Range 2 = 78 (= VCI 32…109, if lower bound VCI = 0)								6
Priority = 3			DLCC-ID = 3					7
Range 3 = 100 (= VCI 110…209, if lower bound VCI = 0)								8
Priority = 0			DLCC-ID = 1					9
Range 4 = 10 (= VCI 210…219, if lower bound VCI = 0)								10
Priority = 7			# DLCC-ID = 7					11
Range 5 = 110 (= VCI 220…329, if lower bound VCI = 0)								12

Figure B.4: Mapping Example

The VPI is set to "0". Table B.1 shows the mapping of VCI into DLCC-ID, CL-Tag according to the example illustrated in figure B.4.

Table B.1: Mapping values for VCI, DLCC-ID, CL-Tag, and Priority according to figure B.4

VCI	DLCC-ID	CL-Tag	Priority
0 1 : 31	1	0 1 : 31	0
32 33 : 109	2	0 1 : 77	4
110 111 : 209	3	0 1 : 99	3
210 211 : 219	1	32 33 : 41	0
220 221 : 319	7	0 1 : 109	7

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

- ETSI TS 101 762: "Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Network Management".
- ETSI TR 101 031 (V2.2): "Broadband Radio Access Networks (BRAN); HIgh PErformance Radio Local Area Network (HIPERLAN) Type 2; Requirements and architectures for wireless broadband access.".
- ETSI TR 101 177 (V1.1): "Broadband Radio Access Networks (BRAN); Requirements and architectures for broadband fixed radio access networks (HIPERACCESS)".
- ETSI TR 101 378 (V1.1): "Broadband Radio Access Networks (BRAN); Common ETSI -ATM Forum reference model for Wireless ATM Access Systems (WACS)".

History

Document history		
V1.1.1	April 2000	Publication