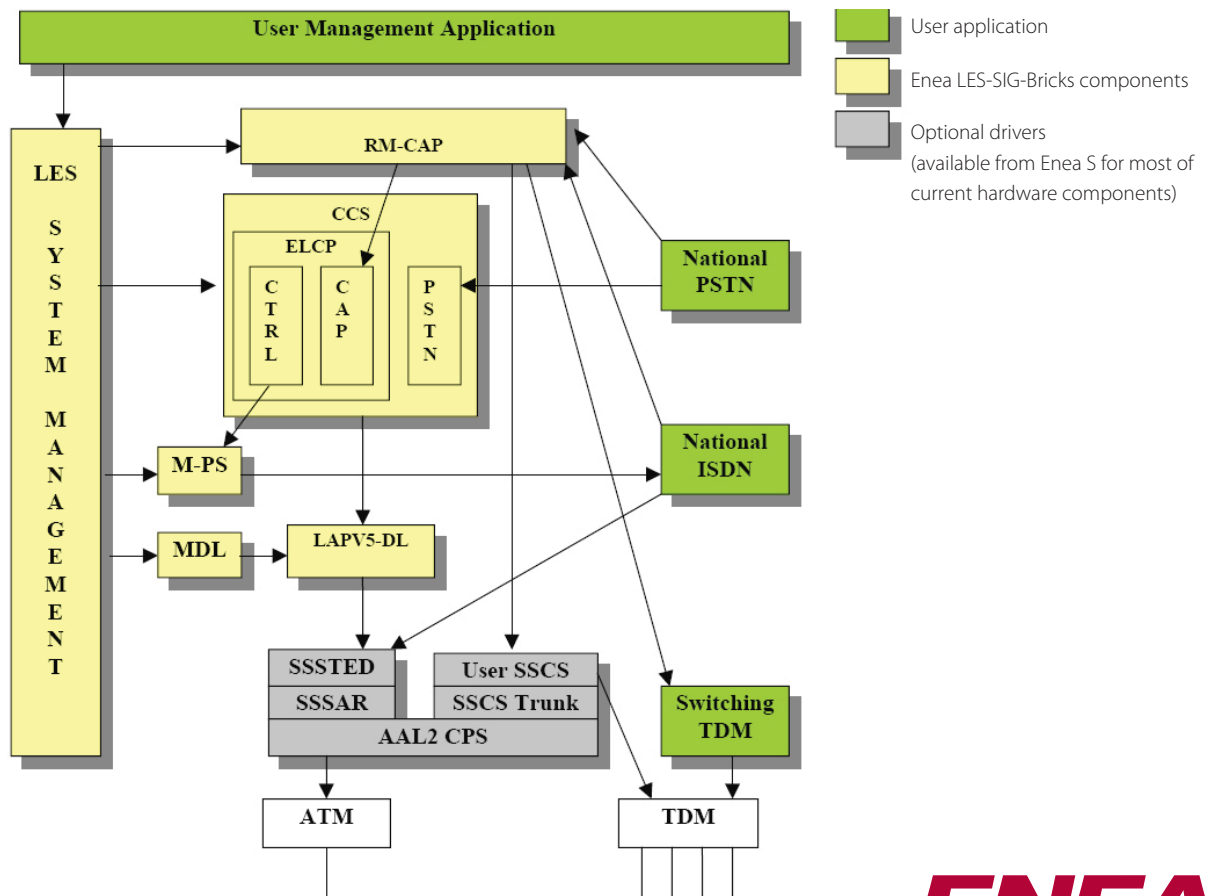
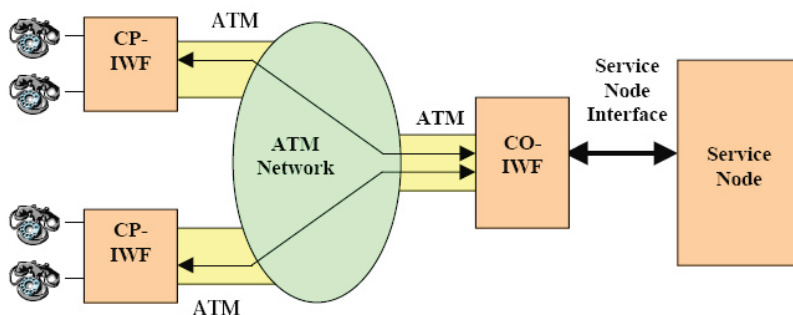


# ENEAS<sup>®</sup> LES-SIG-BRICKS



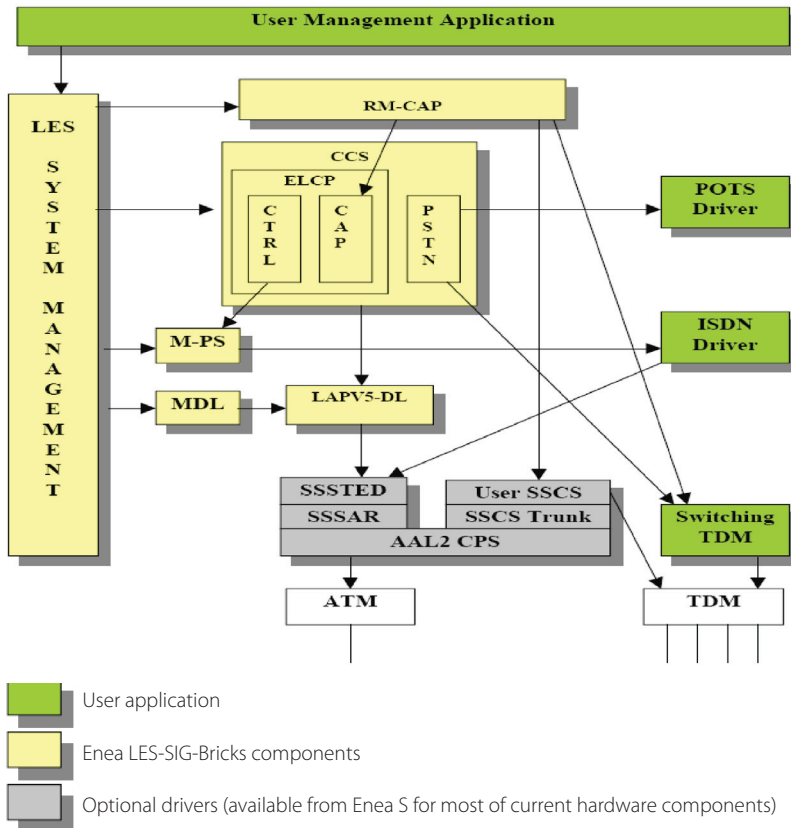
## Loop Emulation Service Protocols over ATM

Enea<sup>®</sup> LES-SIG-Bricks is a complete implementation of the Loop Emulation Service using AAL2 standard (AF-VMOA-0145.000) protocols. Enea LES-SIG-Bricks is available in source or object code format for use with Enea's Netbricks V5-ENGINE hardware.



Enea LES-SIG-Bricks Architecture – CO-IWF.





- User SSCS: User SSCS as defined in I.366.2.
- AAL2-CPS driver for ATM/AAL2 as defined in I.363.2.

**User Application**

- User Management entity developed by Enea LES-SIG-Bricks users for specific management requirements.
- National PSTN entity in charge of National PSTN protocol (CO-IWF side).
- POTS driver in charge of physical interface for PSTN user ports (CP\_IWF side).
- National ISDN entity in charge of National ISDN protocol (CO-IWF side).
- ISDN driver in charge of physical interface for ISDN user ports (CP\_IWF side). Includes sending & receiving ISDN D-Channel frames, managing ISDN port activation and sending alarms to M-PS entity.
- TDM Switching entity in charge of switching TDM time-slots for connection to a given AAL2-CID.

Enea LES-SIG-Bricks Architecture – CP-IWF.

**Enea LES-SIG-Bricks Components**

Enea<sup>®</sup> LES-SIG-Bricks provides the following entities:

**Management**

- LES System Management. Manages procedures such as startup, restart and block/unblock negotiation for user ports between CO-IWF and CP-IWF. It also provides a complete set of service primitives used by the User Management Application for provisioning and OAM functions.
- M-PS Management Port Status FSM. Provides Port Status FSM functions as defined in ETSI standards ETS 300 324-1 and ETS 300 347-2.

**Layer 3**

- RM-CAP. Resource Manager for AAL2 Channel Allocation Procedure.
- CCS. Manages CCS multiplexing. This entity includes 3 sub-entities, one for each LES protocol:

- CAP: AAL2-Channels Allocation Protocol defined in AF-VMOA-0145.000 clause 5.3.1.1
- CTRL: supporting CONTROL protocol defined in ETSI V5 standards ETS 300 324 clause 14.
- PSTN: supporting PSTN protocol defined in ETSI V5 standards ETS 300 324 clause 13.

**Layer 2**

- LAPV5-DL. Implements LAPV5-DL as defined in AF-VMOA-0145.000.
- MDL. Provides Management of Data-link layer.

**Layer 1**

- SSSTED/SSSAR: Specific Convergence Sub-layer for data transmission as defined in I.366.1.
- SSCS trunk: service Specific Convergence Sub-layer for trunking as defined in I.366.2.





## Enea LES-SIG-Bricks Management API

Enea LES-SIG-Bricks provides an Application Programming Interface to external management. The API utilizes three groups of primitives:

GENERAL MANAGEMENT PRIMITIVES			
Primitive	Direction	Description	Parameters or return code
API_SET_CONFIG_RQ	Sent	Provisioning request	Provisioning parameters table
API_SET_CONFIG_CO	Received	Confirmation of provisioning	Accept or reject cause
API_RESET_CONFIG_RQ	Sent	Remove Provisioning request	CPE internal identifier
API_RESET_CONFIG_CO	Received	Confirmation of remove	Accept or reject cause
API_START_RQ	Sent	Startup or restart a CPE	CPE internal identifier
API_START_CO	Received	Confirmation of startup	Running or reject cause
API_STOP_RQ	Sent	Stop the gateway	Urgent or slow procedure
API_STOP_CO	Received	Confirmation of stop	Ok or reject cause
API_INFO_RQ	Sent	Request traffic information	
API_INFO_CO	Received	Traffic information	Statistics

PORTS MANAGEMENT			
Primitive	Direction	Description	Parameters or return code
API_PORT_GET_RQ	Sent	Request port characteristics	Port internal identifier
API_PORT_GET_CO	Received	Confirmation	Port characteristics
API_PORT_MODIFY_RQ	Sent	Request modification of port characteristics	Port identifier & characteristics
API_PORT_MODIFY_CO	Received	Confirmation	Accept or reject cause
API_PORT_BLOCK_RQ	Sent	Request a port blocking	Port internal identifier
API_PORT_BLOCK_CO	Received	Blocking confirmation	
API_PORT_UNBLOCK_RQ	Sent	Request a port unblocking	Port internal identifier
API_PORT_UNBLOCK_CO	Received	Unblocking confirmation	

ALARMS MANAGEMENT			
Primitive	Direction	Description	Parameters or return code
API_REPORT_IN	Received	Alarm or event indication	Type of alarm identifier of concerned object



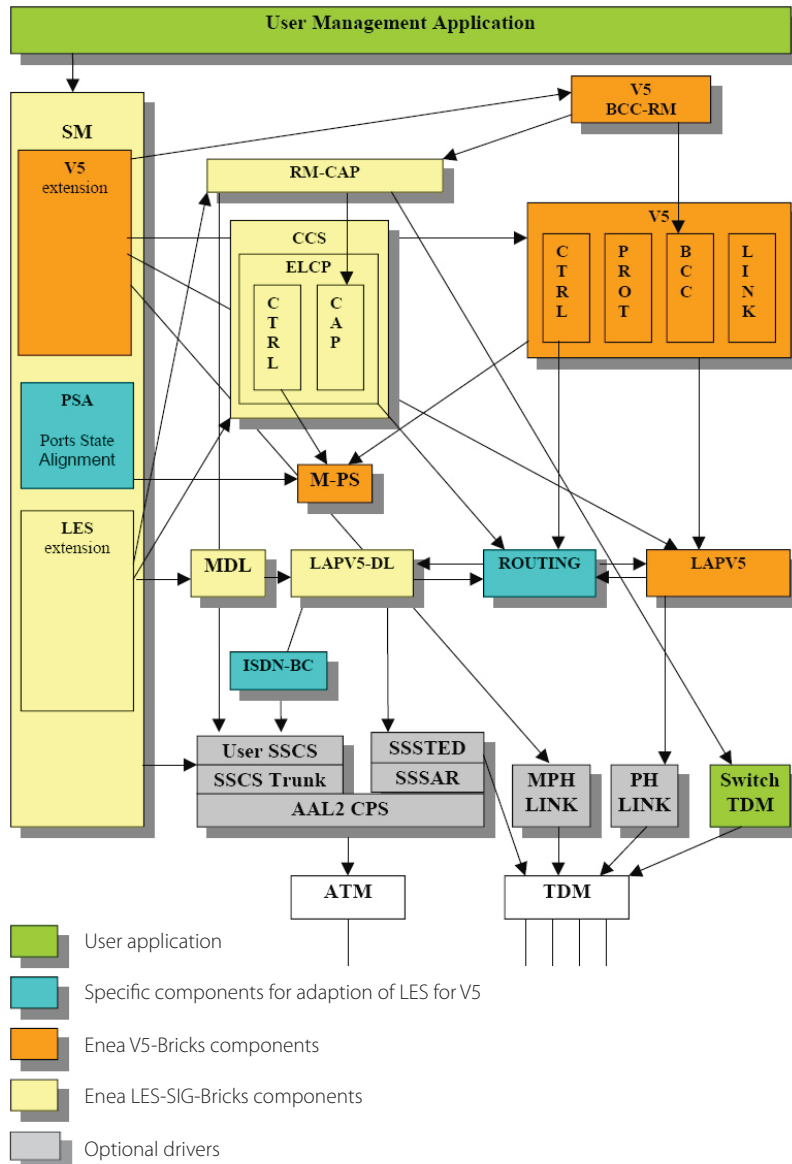
## Enea LES-SIG-Bricks PSTN Application Programming Interface

For systems that use CCS for PSTN signaling, Enea LES-SIG-Bricks offers an Application Programming Interface to an external application managing PSTN ports.

CPE SIDE PRIMITIVES			
Primitive	Direction	Description	Parameters or return code
PH_FE_SUB_SEIZ_IN	Sent	Subscriber seizure indication	V5-signal
PH_FE_SUB_REL_IN	Sent	Subscriber release indication	V5-signal
PH_FE_EST_RQ	Received	Establishment requested by CO	V5-signal
PH_FE_EST_ACK	Sent	Establishment acknowledged	V5-signal
PH_FE_SIGNAL_RQ	Received	Signal to be applied	V5-signal
PH_FE_SIGNAL_IN	Sent	Signal detected	V5-signal
PH_FE_DISC_RQ	Received	Path disconnection request	V5-signal
PH_FE_DIS_COMP_IN	Sent	Disconnect-Complete indication	V5-signal
PH_FE_STATUS_IN	Sent	Status to be sent to CO	Cause

CO SIDE PRIMITIVES			
Primitive	Direction	Description	Parameters or return code
PS_FE_ESTABLISH_RQ	Sent	Establish request	V5-signal
PS_FE_ESTABLISH_IN	Received	Establish indication from CP	V5-signal
PS_FE_EST_ACK_RS	Sent	Acknowledgement	V5-signal
PS_FE_EST_ACK_CO	Received	Establish confirmation	V5-signal
PS_FE_LINE_SIGNAL_RQ	Sent	Signal to be applied	V5-signal
PS_FE_LINE_SIGNAL_IN	Received	Signal detected	V5-signal
PS_FE_DISCONNECT_RQ	Sent	Path disconnection request	V5-signal
PS_FE_DISC_COMP_RQ	Sent	Disconnect-Complete request	V5-signal
PS_FE_DISC_COMP_IN	Received	Disconnect-Complete indication	V5-signal
PS_FE_PROT_PAR_RQ	Sent	Protocol Parameter	Parameters
PS_FE_RES_UNAV_IN	Received	Resource unavailable	Cause, IE

# ENEAA<sup>®</sup> LES-SIG-BRICKS



Enea LES-SIG-Bricks + Enea V5-Bricks Architecture for Voice Gateway.

