



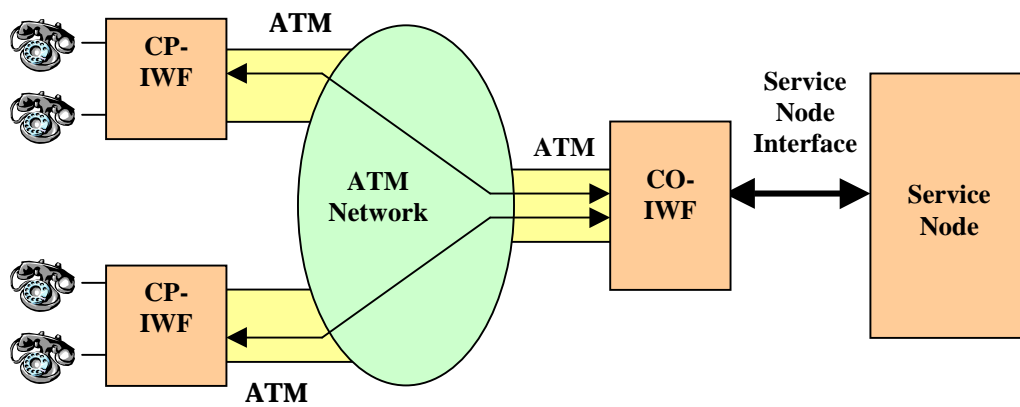
# NETBRICKS LES-SIG-BRICKS

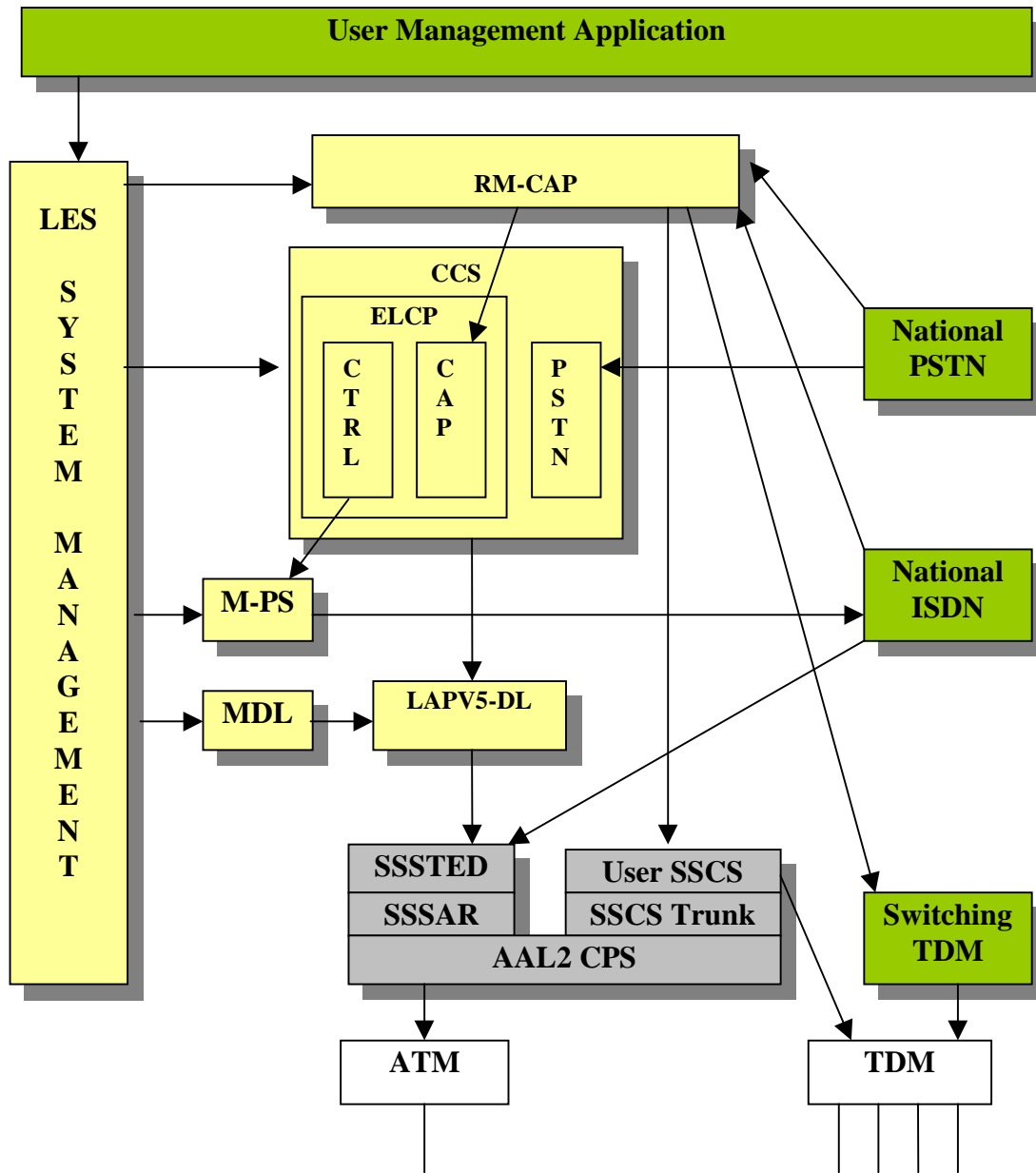
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## INTRODUCTION

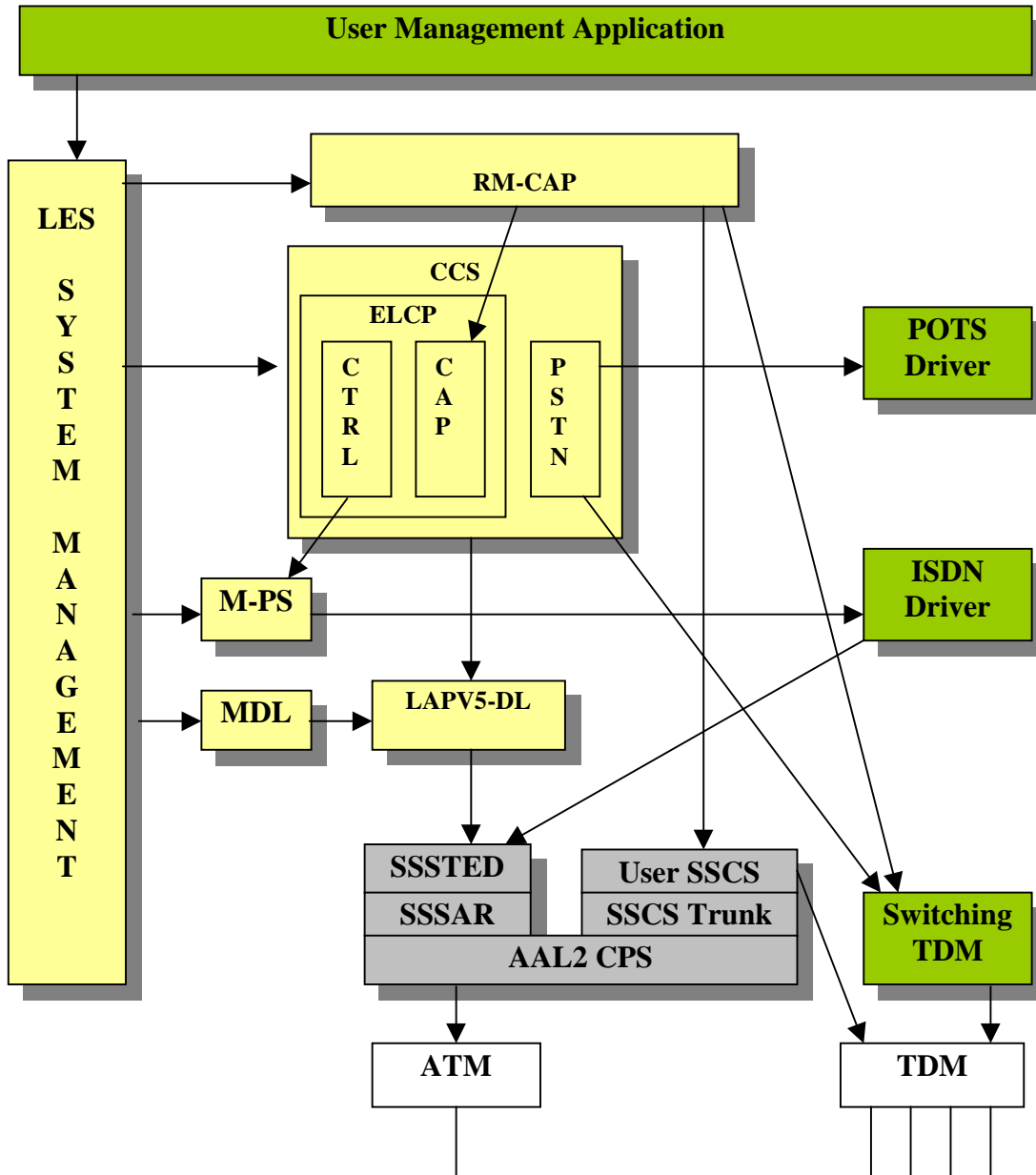
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LES-SIG-BRICKS is a complete implementation of the Loop Emulation Service using AAL2 protocols. Available as source or in an object code format for use with Netbricks V5-ENGINE hardware, it is fully compliant with Loop Emulation Service using AAL2 standard (AF-VMOA-0145.000).





- User application
- LES-SIG-BRICKS components
- Optional drivers (may be provided by NETBRICKS for most of current hardware components)



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LES-SIG-BRICKS includes several entities :

### Management

- **LES System Management** entity in charge of LES management procedure as Startup, Restart and block/unblock negotiation for user ports between CO-IWF and CP-IWF. It offers also a complete set of service primitives used by a User Management Application for provisioning and OAM functions.
- **M-PS Management Port Status FSM** entity in charge of Port Status FSM functions defined in ETSI standards ETS 300 324-1 and ETS 300 347-2.

### Layer 3

- **RM-CAP** entity in charge of Resource Manager for AAL2 Channel Allocation Procedure
- **CCS** entity managing 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** : sub-entity supporting CONTROL protocol defined in ETSI V5 standards ETS 300 324 clause 14.
  - **PSTN** : sub-entity supporting PSTN protocol defined in ETSI V5 standards ETS 300 324 clause 13.

### Layer 2

- **LAPV5-DL** entity supporting LAPV5-DL function defined in AF-VMOA-0145.000.
- **MDL** entity supporting 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
- **User SCS** : User SCS 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 LES-SIG-BRICKS users for their specific management.
- **National PSTN** entity in charge of National PSTN protocol (CO-IWF side).
- **POTS driver** entity 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** entity in charge of physical interface for ISDN user ports (CP\_IWF side), it 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.

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## LES-SIG-BRICKS Management API

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LES-SIG-BRICKS offers an Application Programming Interface to an external Management. This API is based on 3 groups of primitives as follow :

### 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

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## LES-SIG-BRICKS PSTN application interface

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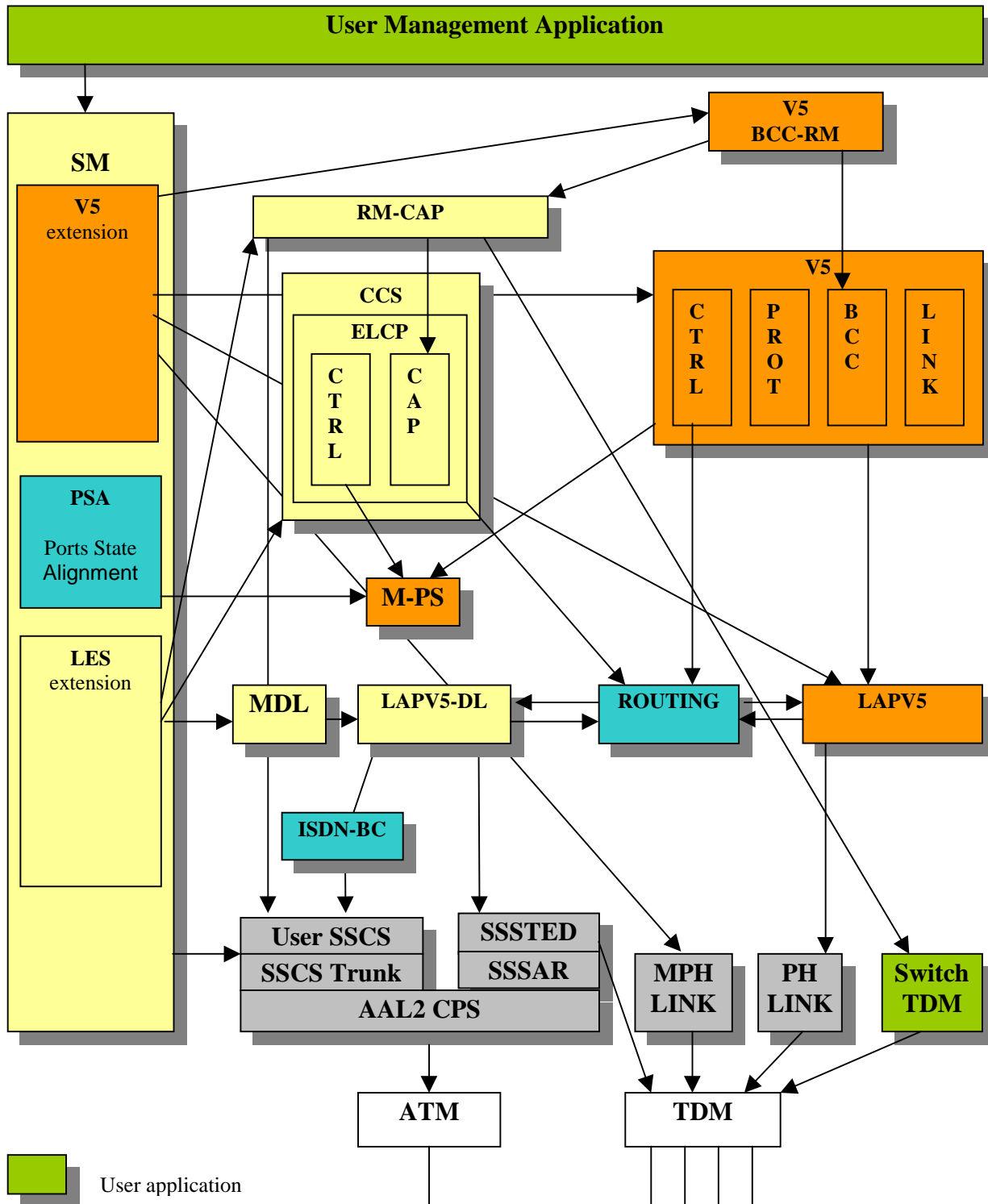
For systems that use CCS for PSTN signaling, LES-SIG-BRICKS offers an Application Programming Interface to an external application managing PSTN ports.

### CPE side primitives

Primitive	Direction	Description	Parameters or return code
<b>PH_FE_SUB_SEIZ_IN</b>	Sent	Subscriber seizure indication	V5-signal
<b>PH_FE_SUB_REL_IN</b>	Sent	Subscriber release indication	V5-signal
<b>PH_FE_EST_RQ</b>	Received	Establishment requested by CO	V5-signal
<b>PH_FE_EST_ACK</b>	Sent	Establishment acknowledge	V5-signal
<b>PH_FE_SIGNAL_RQ</b>	Received	Signal to be applied	V5-signal
<b>PH_FE_SIGNAL_IN</b>	Sent	Signal detected	V5-signal
<b>PH_FE_DISC_RQ</b>	Received	Path disconnection request	V5-signal
<b>PH_FE_DIS_COMP_IN</b>	Sent	Disconnect-Complete indication	V5-signal
<b>PH_FE_STATUS_IN</b>	Sent	Status to be sent to CO	cause

### CO side primitives

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



- User application
- Specific components for adaptation of LES for V5
- V5-Bricks components
- LES-SIG-Bricks components
- Optional drivers (may be provided by NETBRICKS for most of current hardware components)