COMPUTER RESEARCH
PRIVATE LIMITED

www.cr-pl.com
info@cr-pl.com

LSMS

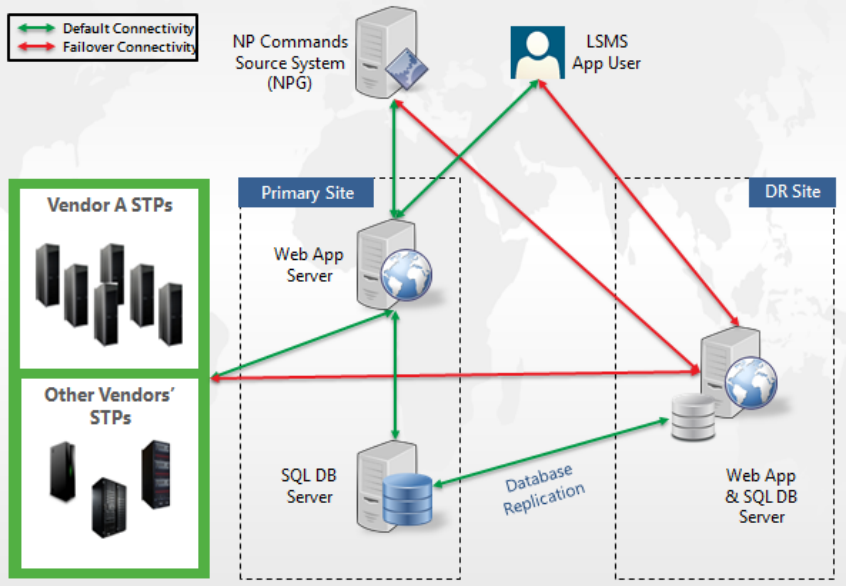
Local Service Management System

Number Portability Local DB Solution

LSMS

Mobile Number Portability Local DB Solution

The Local Service Management System LSMS, an entity of the number portability (NP) solution (MNP Local Database), receives NP data and synchronizes the NP data to Signaling Transfer Points STPs in operator's core network. It interworks with Number Portability Gateway (NPG) and manage the NP service processing. It is designed to support the interface and provisioning flows of Number Portability Gateway (NPG). The LSMS supports data consistency check during NP data synchronization.



MNP Local DB Solution

Key Features

1. The LSMS interworks with the Number Portability Gateway of the Operator to process the NP service flow.
2. The LSMS receives NP data delivered by the NPG and synchronizes the NP data to STPs in the core network.
3. LSMS helps users to manage subscriber services through flexible data configurations and establishing communication channel to transfer/ receive service requests between NPG and STPs

4. LSMS establishes connections with the service processing systems to manage service data in carrier network.
5. LSMS processes commands for definition, modification, and querying of subscriber subscription data.
6. LSMS sends commands acknowledgement back to NPG and stores logs in the database for reporting.
7. Average message response time will be +/- 400ms

Interfaces

- ✓ LSMS provides Socket Interface for NPG and STP.
- ✓ LSMS provides MML interface to interwork with STP and synchronize NP data.
- ✓ LSMS supports the query protocols such as LDAP for authentication/ authorization.
- ✓ LSMS can provide interface to other external systems based on client requirement.

NP Service Processing

The LSMS provide the following NP service processing abilities:

1. Processes NP services and NP service-related flows based on NPG requirements, including interaction flows with STPs.
2. Processes provisioning commands like port-in, port-out, cross-port etc received from NPG.
3. Synchronizes NP data based on the interface specifications for STP. When the NP data changes (for example, an NP subscriber is added or deleted, or subscriber change network with NP again), data is synchronized to STP in-time based on the interaction flow.
4. Generates alarms based on the NP data provisioning error and provides alarm reporting interface.
5. Supports 50 million subscribers

Carrier Commands Translation

System provides a functionality to define, map and translate the carrier commands by the translation engine.

Each mapping gets a unique identifier in the system. The identifier uniquely identifies each command from carrier system and helps engine to precisely translate to MML, meeting requirement of service execution by provisioning module. Users can flexibly define and map commands in translation setup module.

Transformation Engine

The engine translates the received carrier commands according to the definition in translation setup, marked with unique identifiers. Using the identifier engine searches the mapped MML commands.

On finding the corresponding mapping, the provided carrier command is translated into the MML Command that will be available for Provisioning engine for further processing.

Provisioning Engine

System provides the functionality to execute the carrier commands by the provisioning engine.

The Provisioning Engine will establish a connection with MML Server by sending a request at TCP port on specified IP. In case the connection is failed, the Provisioning Engine will keep on sending requests to MML server based on defined time interval to reconnect until the connection is established.

System also maintains connection status log for reporting and generates alarms as per the defined criteria.

Once the connection with the MML server is established, the Provisioning Engine scans the MML commands repository for commands availability. If commands are found, engine transmits these commands to MML server for execution in the network. For each command, Engine receives acknowledgement from the MML Server and maintains status log in both the cases whether command execution is successful or unsuccessful.

Batch Processing

Re-push

System facilitates to re-push unsuccessful commands by selecting required range from the pool.

Bulk Processing

System also provides the users with an option to manually process the commands as and when required. Users can execute the bulk of command files from the specified location, load manually in the system and process command by selecting the required NE on the interface.

NP Data Query

The LSMS provides the NP data query interface to query related information about NP subscribers. The NP query rights and query records can be managed, and related statistics functions are provided.

NP Data Export

The LSMS supports the NP data export functions. Number status history and transactional logs, Alarms and reports data can be exported. The .txt and .csv export formats are supported.

NP Data Consistency Check and Restoration

The function of NP data consistency check between the LSMS and multiple STPs is supported. The NP data in the NPDB can be restored from the LSMS. The NP data can be synchronized from the NPG to the NPDB.

Customization Abilities of NP Interaction Flow

The NP interaction flow can be customized to meet Operator requirements. The format, content, sending sequence, and responding mode of messages exchanged in the NP interaction flow can be customized.

NP Data Synchronization from the LSMS to Other System

The LSMS supports scheduled NP data export, and the exported data can be synchronized to other systems on the live network.

The LSMS provides an interface for NP data synchronization from the LSMS to other systems such as customer care based on Operator requirements. Operator must provide the descriptions about the interface types and the maximum connections supported by each type of interface.

Reconciliation

Data Reconciliation process involves in toning and cross-checking the subscribers profile and subscriptions in Network and Carrier Business Support systems. Module helps carriers to identify revenue leakages due to wrong or fraudulent subscriptions which are missing or have no action history in business support systems.

The reconciliation is performed on the data coming from the carrier's support systems and the network vendors systems. After the data from both the sources is collected the reconciliation process is performed and reports are produced identifying authentic reason to carrier revenue loss.

Alarm Interface

SMS

System provides the functionality to generate alert as SMS. SMS alerts can be configured for critical situations which require urgent attention of the users and has a great impact on the business continuity. For example an SMS alert can be defined for cases when connection between LSMS and NEs is down and system is unable to send commands for execution in the network. Users can configure desired SMSC for sending alerts on subscribed users.

Email

It also provides the functionality to generate alert as an email. Email alerts can for example, be linked with the command processing errors. System shall send an email alert on particular email-address when a command execution fails, the email shall contain the complete error log for user to understand the issue by reading email only. It provides a complete configurable setup in which an Email server can be configured for emails notifications.

Notification

System facilitates to provide the alert as a Notification on the separate section on the interface. Different types of Notifications can be configured e.g. when commands are available in the carrier source for execution, the system will indicate as Notification on the interface and user can start manual execution process.

Reporting

The Reporting Module is designed to provide a feature-rich and user-friendly web interface for managing reports within LSMS. Advanced reporting engine enables you to quickly generate

variety of built-in reports that can be printed or viewed on the web. The results of such reports can be exported as a ".CSV" file for further processing by MS-Excel or other applications.

The system contains variety of canned reports for each module and functionality in the system to facilitate users to instantly generate formatted information for decision making.

These parameterized reports include;

- ✓ System configurations
- ✓ Users profiles and activities
- ✓ Carrier & Provisioning command profiles and processing statuses
- ✓ NE profiles configurations
- ✓ Carrier Command Transformation & Provisioning Engine activities
- ✓ Commands processing and logs
- ✓ Alerts & Errors History
- ✓ Etc.

Dashboards

System facilitates the users with dashboards that show the NE monitoring linked with provisioning engine or Profile management. It also provides an interface on different performance indicators for the execution of the commands.

System Backup and Restoration

The system supports friendly graphical user interfaces. Backup and recovery of configuration is supported from daily backups.

Configuration data includes but not limited to IP address, interworking configuration data, configuration files, all threshold configuration data, and parameter or switch configuration. Service data includes subscriber information, subscriber data, and configuration data (such as numbers) required for service running.

The system supports cyclic system backup, backup files can be save on the remote directory with accessing permission.

Expired data such as message data, alarm data, and KPI data can be automatically deleted based on the configured storage strategy.

Support for Fault Monitoring Alarm Function at Each Level

The system supports the monitoring of abnormal connection between the LSMS STPs and provides the related monitoring alarms.

The system supports the monitoring of software running abnormality and service process abnormality and provides the related alarms.

System Performance Specifications

Table 1-1 System performance specifications

No	Category	Specification	Value
1	Capacity	Number of NP subscribers	Equal to 50 million
2		Number of concurrent connections between the LSMS and STP	16
3		Number of concurrent connections between the LSMS and NPG	8
4	Performance	Speed of NP subscriber addition or deletion	Equal to or more than 10 commands per second
5		Speed of NP data query	Equal to or more than 20 commands per second
6		Number of concurrent operation terminals	Equal to or more than 30
7		Delay of responses to common queries	Equal to or less than 6 seconds
8		Delay of responses to complex queries	Equal to or less than 30 seconds
9	Storage	Alarm data	Equal to 3 months
9		KPI data	Equal to 3 months
10		Statistics report data	Equal to 3 months
11		Operation logs	Equal to 3 months