

### 9 IPMS Capabilities

#### 9.1 Basic Methodologies

The same messaging transport and package method will be used for all Local and Mobile Porting messages but there will be some differences:

- a) Some elements of given messages will differ between message types;
- b) Some elements of given messages will differ between classes of messages;
- c) Rules for turnaround will vary;
- d) Rules for validation will vary; and
- e) The IPMS will need to take these differences into account.

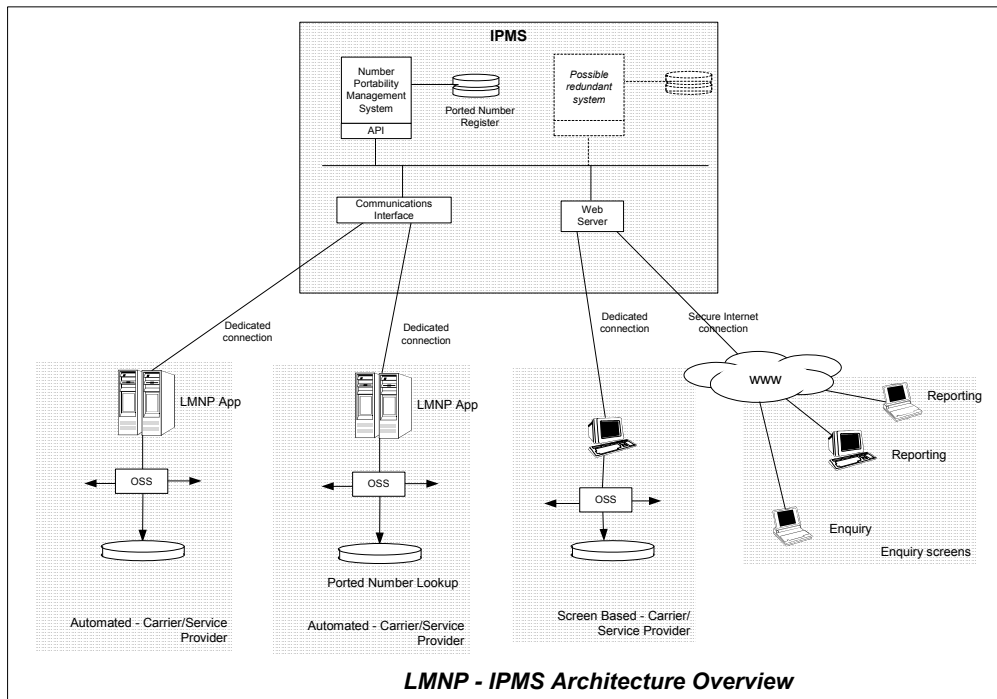
#### 9.2 Technology Specifications

This section sets out the required functions of the IPMS.

##### 9.2.1 Architecture

The IPMS is a centralised system, the role of which is to provide reliable message transport, process tracking, coordination, and management. It is a tool, which will facilitate LMNP but relies on the Networks being able to support portability. The IPMS will not handle call routing, but will be the sole authority on all Ported Numbers. This will be used by Carriers to update their own Networks.

## Architecture Overview of the IPMS:



The architecture is based around a logically centralised IPMS node. Physically this may be mirrored to achieve the required Service Levels.

The IPMS provides transaction processing logic to manage the porting process. Management of the porting process involves the IPMS maintaining a database of Ported Numbers (the Ported Number Register). All Carriers synchronise their Ported Number lookup tables with the IPMS. Typical information in the IPMS will include:

- a) Number and current Service Provider;
- b) Status of Numbers and when service is to be implemented;
- c) Tasks that are still to be completed and by what Service Providers.

All Service Providers shall access the IPMS via an IPMS API. All the participants in LMNP shall achieve rapid and reliable communication of their requests and responses from the IPMS.

Basic API functionality requires:

- a) The ability to accept requests to perform a function, –for example processing a Port Request;
- b) The ability to notify a Service Provider automatically to do something, for example the notification of a Port Activation; and
- c) Allowing a Service Provider system to monitor transaction queues for messages, and then respond to them with the appropriate result.

In the case of automated access, there is a direct interface with the API. A web server is to be available to allow Service Providers and Carriers to perform Port

related functions manually, as well as generate queries and reports. The Web server must also use the API to interface with the IPMS.

The API will be a “black box system”, meaning Service Providers and Carriers would only know the interface and messaging specifications. They will not require awareness of how the API communicates to the IPMS.

### 9.2.2 System Interface

The IPMS interface will be standardised to ensure ease of communication. It is likely to be based around some form of XML messaging. The IPMS will be able to communicate with parties via a web browser front-end or a machine-to-machine interface.

All the logic and business rules will be in a common layer in the IPMS. This will ensure that the same rules are used for all communication with the parties.

The ~~IPMS User Guide~~~~Operational and Support Manual for LMNP~~ may include detailed screen layouts and specifications for all aspects of web browser screen design.

### 9.2.3 Connection Methods

The type of connection between each party and the IPMS must meet basic standards for speed, security, and reliability.

Each party will access the IPMS by dedicated private communications connection or secure internet connection. If parties wish to use a VPN, this will need to be acceptable to all parties, to ensure system security and integrity.

Connections to the IPMS must be protected by software encryption/authentication protocols such as SSL and HTTPS.

### 9.2.4 Queues

The IPMS will use a set of transaction queues to facilitate the management of outstanding Port Events. ~~The contents of these queues and associated screens are described in the IPMS User Guide. There will be a Port Request queue, an Approved Port Request queue, and a Network updates queue, the characteristics of which may be specified in the Operational and Support Manual for LMNP.~~

Their usage will vary between those parties using a web-client and those using a machine-to-machine connection.

### 9.2.5 System Response Times

Most processes will require some immediate feedback in terms of basic checking or presentation of information to the user. Such on-line interactive use will be supported by short response times. Under normal system load, an interactive processing request ~~is intended to shall~~ be responded to in less than one second.

The response time will depend on the connection method used by an individual party, as well as the performance of the IPMS. Performance will be measured as the elapsed time for the IPMS to queue a response to the router at the central

site. Any further network latency introduced due to the capacity of the network connection or Client LAN will be the responsibility of the organisation.

### 9.2.6 Reliability

The reliability requirements ~~for~~ the IPMS aims for are:

- a) It ~~should~~must be available for transmitting messages 99% of the time on a 24 hour by 7 day a week basis, except for scheduled maintenance periods;
- b) It should not be unavailable for more than four contiguous Working Hours; and
- c) There will be no provision for a formal or structured fallback procedure for when the IPMS is down. It is expected that all Porting activity will halt during an outage. In such a situation, calls to Ported Numbers are not impacted.

### 9.3 Users and Security

A record must be created in the database for each user who has access to the IPMS. All transactions and responses made will be tracked and logged by user. User access controls will ensure that users are confined to the parts of the IPMS demanded by their role.

Processes will be available to enable user records to be maintained, along with security access and user preference options.

Parties to the LMNP Terms that use a machine-to-machine connection may use only a limited number of users, as few as one. They are expected to track their own user activity within their system, and may be required to do so if investigation of a given event is required.

Security access and user preference/default values will be held in user profile records. Groups of users within each party to the LMNP Terms who have common access requirements will share a common user profile. That will simplify the process of maintaining access for a large number of users. A user administrator responsible for user access and preferences will be able to change the preferences for a group of users by changing a single user profile record. Users will not have access to change their own user profile.

It will be possible to create, change and activate/deactivate user and user profile records. Those records may also be deleted, but only after all other references to the record have been removed from the database by archiving/ageing processes (to ensure data integrity).

### 9.4 Error Handling

The IPMS endeavours to~~must~~ ensure that the processes are reliable and accurate. The following tools will be used to minimise and handle errors:

- a) Logging of faults/abnormal events;
- b) The ability to rollback and/or recover within the IPMS; and
- c) Track process confirmations and acknowledgements.

### 9.5 Reporting and Data Extracts

A number of reports will be required to enable and manage the Porting processes. The reports detailed here may be supplemented during the implementation of the IPMS.

The following reports will be produced by the IPMS on a regular basis, outside of standard hours of operation. All reports will be available either in a form for viewing or in a standard format (such as comma separated value (CSV) format text files) for importing in to other applications. Automated processes will generate the regular reports.

Reports with a limited number of pages may be viewed directly from the web browser interface. Longer reports may be required to be downloaded, before viewing, to minimise the impact on system performance. ~~Details of which reports may be viewed on-line will be given in the Operational and Support Manual for LMNP.~~

Access to reports and data extracts will be controlled by parameters in the user profile.

The intention of the data extracts is to enable parties to the LMNP Terms to produce their own reports, in whatever format they prefer, involving any transactions to which they are a party.

Each IPMS userparty will have access to a data extract or report giving the details of any transaction performed by users belonging to their organisation.

~~Minimum information in the detailed data extracts and reports will include:~~

- ~~a) Local Number or Mobile Number;~~
- ~~b) Type of transaction;~~
- ~~c) User ID;~~
- ~~d) Carrier/Service Provider; and~~
- ~~e) Date/time of the transaction.~~

The reports will fit into the following categories:

- a) Ported Number Register Activity Logging, Status, and Audit;
- b) Service Level and Activity Monitoring of Service Providers and Carriers;
- c) Extracts for Directories and Emergency Services

Further details of these reports will be included in the IPMS User Guide.

### **9.5.1 Ported Number Register Daily Changes for Carriers**

~~All Carriers will have access to the same data extract of all Network routing updates (Ports and relinquishments). It will also be available as a formatted report.~~

~~This extract/report will automatically be produced daily. The data extracts will accumulate on the IPMS server in a file for each calendar month. This will provide fast access for the Carriers to the state of Ported Numbers at any time without unduly slowing the Porting processes. Each monthly file will remain available for the Carriers to download for one calendar year from the time of the original transaction.~~

~~Ports will only appear in this extract/report once the Port is complete.~~

~~Information will include the date/time when each update was first created in IPMS, Host Carrier ID, confirming carrier ID, date/time(s) when each update was confirmed as implemented by each Carrier, and date/time of final confirmation if all confirmations are complete.~~

### **9.5.2 Ported Number Register Daily Changes for Service Providers**

~~A separate data extract will be produced, for each Service Provider, of all transactions involving that Service Provider.~~

~~The Service Provider may choose to receive the data formatted as a report.~~

~~This extract/report will automatically be produced daily. The data extracts will accumulate on the IPMS server in a file for each calendar month. Each monthly file will remain available for the Service Provider to download for one calendar year from the time of the original transaction.~~

~~Information in the extract/report will include the following events:~~

- ~~a) Relinquishments;~~
- ~~b) Ports Requests made by this Service Provider, including Port status (e.g. approved, rejected, cancelled, expired, waiting);~~
- ~~c) Ports completed by new Host Carrier;~~
- ~~d) Date/times of when Network updates were confirmed by all Carriers;~~
- ~~e) Port Requests made to this Service Provider with date/time and the full details of the response;~~
- ~~f) Fault enquiries performed by the Service Provider; and~~
- ~~g) Fault enquiries performed by another Service Provider on Numbers Ported to this Service Provider.~~
- ~~h) Port Activations where the Service Provider is the LSP.~~

### **9.5.3 Full Ported Number Register**

~~A data extract for Carriers will be produced giving the current status of all Ported Numbers at the end of every day. Carriers are to be able to run this report at any time on request.~~

~~Carriers will have access to this register of the Host Carrier for every Ported Number. Host Carriers shall be able to use this process to verify the integrity of the IPMS database. The Carriers can also use this process to verify that their networks will route calls as expected by the other parties to the LMNP Terms.~~

The Register will list all Ported Numbers, their status (Ported, approved for Port, outstanding Port Request) of each Number, date when the status last changed, and the previous status.

Alternatively a list for a smaller range of Ported Numbers can also be retrieved from the IPMS.

#### **9.5.4 Ported Number by Carrier Summary Report**

A Ported Number by Carrier summary report lists the total quantity of Ported Numbers held by each Host Carrier at midnight on any given day. (This gives a quick summary that can be used by a Carrier to confirm that their internal records are up to date.)

This report will be produced daily or weekly.

The report will show quantity of Ported Local Numbers and Mobile Numbers as separate figures, the last Local Number and Mobile Number to be Ported to and away from each Carrier, and the Port Activation date and time of both Ports for each Carrier.

#### **9.5.5 Transaction Log Activity Report**

A party to the LMNP Terms may run a report of transactions performed by all its users. Alternatively this report may be requested for a single user.

This report will be produced daily or weekly and will show:

- a) User ID;
- b) Transaction type;
- c) Number; and
- d) Date/times;

#### **9.5.6 Performance Summary Report for Service Providers**

A performance summary report for Service Providers shall highlight transaction volumes and average times for transactions to be completed. Each Service Provider will have access to a version of this report for transactions initiated by their own users to allow them to monitor their performance and ensure they are meeting required Service Levels.

This report will be generated weekly or monthly.

It will show:

- a) Total number of relinquishments;
- b) Average and maximum time for relinquishments to be confirmed by Gaining Carrier;
- c) Average and maximum time for relinquishments to be confirmed by the Losing Carrier and third party Carriers;
- d) Total number of Port Requests created;
- e) Total number of Port Requests approved, withdrawn and rejected;

- f) Average time for incumbent Service Providers to respond to Port Requests;
- g) Total number of Ports confirmed by Carriers in their roles as Gaining Carrier, Losing Carrier, Donor Carrier, and other Carrier;
- h) Average and maximum time for Ports to be confirmed by Gaining Carrier;
- i) Average and maximum time for Ports to be confirmed by Losing Carriers;
- j) Average and maximum time for Ports to be confirmed by Donor Carriers; and
- k) Average and maximum time for Ports to be confirmed by other Carriers.

Other measurements could be added during the implementation phase as required.

### **9.5.7 Service Level Performance Summary Report**

This monthly report gives the average time and the maximum time taken for each Carrier to respond to Port, and for each Service Provider to respond to Port Requests, as well as the percentages for Port Request rejection and Port Request acceptance for both Port Requests made and received. The report will also show the system-wide average response time for the same transactions.

### **9.5.8 Activity Report**

A report will show a summary of Carrier and Service Provider activity over a date range as required. A summary output file will be produced quarterly and could be used by the IPMS administrator to generate invoices to parties to the LMNP Terms.

Parties to the LMNP Terms may run this report for their company's activities for a specified date range, either at a summary or detailed level.

### **9.5.9 Fault Enquiries Report**

This report will list the Number fault enquiries made by each party to the LMNP Terms, including the Number for each enquiry, the user ID, date and time. The report will also show a total count of fault enquiries made by each IPMS party. The IPMS administrator may use this report to verify acceptable use of the fault enquiry function.

### **9.5.10 Security Access Violations Report**

A report will be available to the IPMS administrator, listing failed attempts to access the IPMS via an invalid user ID or password.

### **9.5.11 Extract of Ports for Directory Services**

A regular data extract will be created listing each Port performed, showing the old and new Service Providers for the Ported Number. If agreed by the IPMS administrator, this data could be made available to companies providing telephone directory services. The directory companies could use this information to help maintain telephone directory listings and directory billing for the Service Providers and their Customers.

### **9.5.12 Extract of Ported Numbers for Emergency Services**

~~A regular data extract could be created listing each Port performed, showing Number, the Gaining Carrier, and the Gaining Service Provider. The GSP and Gaining Carrier may need to use this report and add Customer details (such as name and address) for supply to emergency services.~~

## 9.6 Enquiry Screens

Enquiry functions ~~are~~must be provided in the IPMS to ensure that various participants have the necessary visibility of Port Requests, Ports, and other Port related events to allow them to respond to other -parties' Ports and manage their own.

### 9.6.1 ~~Number Fault Enquiry Function~~

~~For fault and troubleshooting purposes an enquiry function will be available which will return all information held by the IPMS about a particular Number.~~

~~This function can be used to enquire on only one Number or SOM Number at a time. No wildcard search criteria or ranges will be accepted.~~

~~Information returned will include details of all changes to the Number status stored in the on-line transaction activity log. It will show the date and time when each Carrier confirmed implementation of the latest update to the Number. It will also reveal the name of the incumbent Service Provider, Host Carrier, and Donor Carrier for the Number.~~

~~Access to this fault enquiry function will be controlled by a separate security parameter on the user profile. All use of this function will be logged and reported to the IPMS administrator.~~

~~Users with access to this function should not be able to access Customer service oriented functions such as Port Request, unless those users are fixing faults and need access to those functions to perform that role.~~

### 9.6.2 ~~Port Request Status Screen – GSP~~

~~The Port Request status screen will show each outstanding Port Request that are in the Port Request Acceptance process or has been accepted. Ports would stay on this list until the Port Activation process commences.~~

~~It will list SOM Number, RFS Date, Port category, status, and Number(s) (limited quantity of Numbers) and will give an indication of when a response is expected.~~

~~Each entry would display a reminder if it were awaiting a response from the GSP to move forward.~~

### 9.6.3 ~~Port Request Status Screen – LSP~~

~~A Port Request status screen will show each outstanding Port Request that the LSP has in their queue. Ports will stay on this list until the response has been sent.~~

~~The Port Request status screen will list SOM Number, RFS Date, Port category, status, and Number(s) (limited quantity of Numbers) and will give an indication of when a response is expected.~~

Each entry will display a reminder if awaiting a response from the LSP to move forward.

#### **9.6.4 Approved Ports Status Screen**

An Approved Ports status screen will show the queue of approved Ports that are yet to be activated. The Ports in the queue will be those where the Carrier is the Gaining Carrier or the Losing Carrier. The GSP will also have visibility of its approved Ports.

Port status information will be displayed in RFS Date order. Any approved Ports that are subject to an Approved Port Change request will be highlighted, as will any that have changed as a result of an Approved Port Change request.

#### **9.6.5 Approved Port Changes (APC) Status**

An Approved Port Change screen will display any Port changes where the Carrier, LSP or GSP is either the requesting or responding party.

It will display Approved Ports that are subject to change in order of the oldest requests first. Both the respondent and requester will be able to access an individual Port change from the screen and respond to it.

### **9.7 Archiving**

Messages, logs, and histories must not be deleted and must be archived in a form that is readily accessible.

### **9.8 Migration**

~~It will be necessary~~ The IPMS has the capacity to migrate current porting data onto the IPMS.

New parties will be able to follow a migration process to move onto the IPMS and take part in LMNP.

### **9.9 Data Integrity/Synchronisation**

Where there is inconsistency between Carriers' data and the IPMS Ported Number Register, the IPMS will be considered to be the correct data. Carriers shall develop processes for using the reports specified in the LMNP Terms to verify their own routing tables and procedures for correcting them.