EMG 7
User's Guide

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1.1 What is EMG?

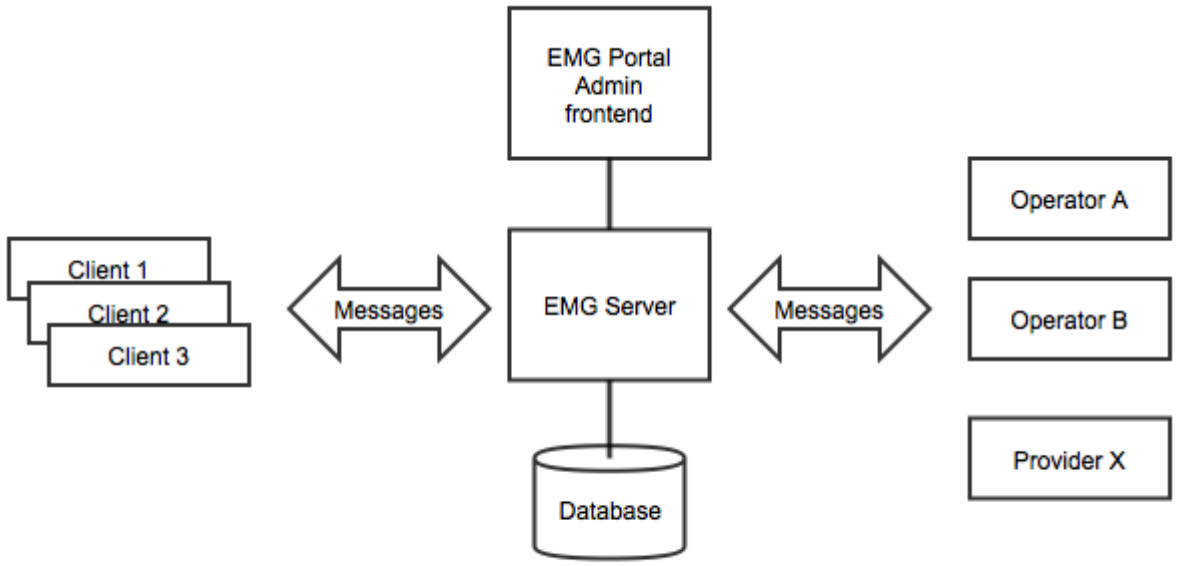
EMG is a messaging gateway / router that receive and forward messages, normally SMS, via different protocols such as SMPP, HTTP, SMTP (e-mail) and more.

EMG stands for high performance, flexibility and reliability.

EMG Portal 2 is a web based add-on providing an easy to use frontend for managing the EMG server and client accounts.

There are different EMG use cases but two common ones are

- EMG as a SMS aggregator / service provider platform
- Protocol conversion (SMPP <-> UCP, e-mail <-> SMS etc)



Sample EMG setup

1.2 Operating environment

EMG runs in Linux (or Solaris) and we currently recommend running EMG on CentOS / RedHat Linux 6.6, 64-bit.

Standard server hardware such as a Dell PowerEdge server or equivalent from another hardware supplier will be able to handled several hundred messages per second (mps).

For storage, SAS or SSD disk in a RAID configuration using a hardware RAID controller will provide necessary I/O throughput and reliability.

The EMG platform can be installed with EMG, EMG Portal and a MySQL database running on a single server.

For improved availability (HA) it is possible to configure EMG in a 3-node set up where MongoDB is used as a replicating message store and Percona XtraDB Cluster replaces MySQL.

1.3 Connectors

A connector in EMG implements one of the supported protocols and handle incoming or outgoing connections using that protocol.

For example a connector definition for a connector that handles incoming SMPP connections from customers would look something like this:

```
CONNECTOR smpp-in1 <
TYPE=INCOMING
PROTOCOL=SMPP
ADDRESS=0.0.0.0:2775
INSTANCES=10
USERDB=emg
>
```

An incoming SMPP connector that listens to port 2775 on all local ip addresses on the server. A max of 10 simultaneous connections are handled and inbound connections are authenticated from database.

A sample outbound connector for connecting to providerA via SMPP:

```
CONNECTOR smpp-providerA <
TYPE=OUTGOING
PROTOCOL=SMPP
ADDRESS=192.168.0.1:2775
INSTANCES=1
USERNAME=myUsername
PASSWORD=secret
STATIC
KEEPALIVE=60
IDLETIMEOUT=90
>
```

An outbound connector initiating a single SMPP connection to IP address 192.168.0.1 and port 2775. Login credentials are specified and the connector being "static" means it will always try to bind even if there is currently no messages to send.

A keepalive packet will be sent every 60 seconds if there is no other traffic and if 90 seconds has passed without any activity the connection will be torn down (and a reconnect will then be made since the connector is static).

The above are sample definitions from the EMG configuration files. When using EMG Portal the configuration is done in the EMG Portal web interface.

1.4 Basic message flow

The most basic message flow would be that EMG receives a message from a client on one connector (A), makes a routing decision and forwards the message to an operator / provider via another connector (B).

Normally a delivery report (DLR) would be requested for the message as well and when delivery to the recipient has been completed EMG would receive the delivery report from operator via connector B and route it back to the client via connector A.

1.5 Delivery reports (DLRs)

Delivery reports will, in most cases, be provided from the operator after succesful (or failed) delivery of the SMS to the receiving handset, if such a delivery report has been requested.

When a message is received from a client, EMG will create a "open delivery report" entry which will be used later to match the delivery report received back from the operator / provider.

EMG provides a lot of functionality in regards to delivery reports and it is also possible to inject delivery reports into EMG when delivery reports will not be automatically received from remote entity.

1.6 Queues

EMG keeps an outgoing queue per connector. It is usually not desirable to let queues grow within EMG expect for a shorter period of time with connectivity problems towards a provider, for example.

It is possible to limit the max total queue size within EMG or per connector. When the queue size has reached the specified limit, any attempts to send new messages to EMG will be rejected.

EMG Portal provides an easy way to clear a queue or move a queue from one connector to another.

1.7 Routing

Virtually any kind of message routing can be implemented in EMG but in the standard set up with EMG Portal a routing table can be managed that enabled routes to be defined based on recipient prefix, sending account, receiving and sending connector.

A more specific route will take priority over a more general route.

1.8 Billing

In the same way that routes are defined, price (and cost) per message can be defined depending on recipient number prefix, sending account and connectors involved.

EMG does not generate invoices but each message will be tagged with the price information from the matching price entry and that price information will be stored in the message log in the database (table "routelog").

It is then possible to generate invoice data from the database per client account for a specific period in time.

EMG can also keep track of a "charge balance" per account and each account can be defined as pre-paid or post-paid. For a post-paid account a negative balance is allowed but not for a pre-paid account.

1.9 Reporting

In EMG Portal there a a few different messages reports available directly in the web interface "out of the box" but in addition to this custom reports can be generated directly from the database.

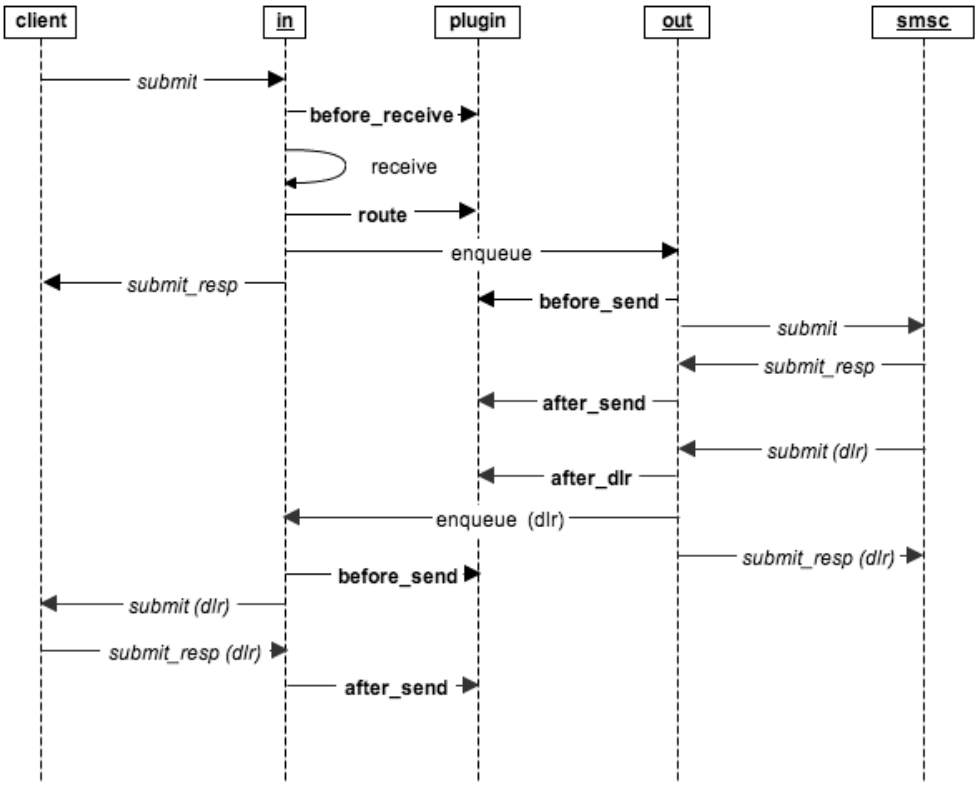
Since the message log (table "routelog") in the database can grow rapidly in a server with high traffic, an aggregation script is provided which will aggregate message data per hour thereby enabling much faster generation of reports.

1.10 Extending EMG

EMG can be extended and its behaviour customized through the use of plugins and custom connectors. Such plugins and custom connectors can be implemented in Perl or in C.

A plugin hooks in to the message flow and allows custom code to be executed.

Sample use cases for plugins can be rejecting message based on message properties such as addresses or content, routing based on information in external systems and more.



emg-plugincalls

Plugin hooks sequence diagram

1.11 EMG watchdog

The EMG watchdog enables external entities to monitor and control the EMG server process.

For example the EMG watchdog can be used from within the EMG Portal web interface to stop and start the EMG server process.

It also enables displaying EMG server log files in the web interface thereby eliminating the need to use the Linux command-line interface for many tasks.

2 What's new in EMG 7

2.1 Database-driven configuration

EMG 7 can use a configuration from a database.

In short EMG will use a minimal server.cfg and generate additional configuration files from the database tables when the keyword DBCONFIG is present.

EMG Portal 2 supports managing the configuration in the database.

The command "emgd -initdbconfig" can be run to import an existing server.cfg configuration into a database.

2.2 PDU log in database

The keyword PDULOGDB will enable logging of pdus in the database (table "pdulog") in the same way as ROUTELOGDB enables the messagelog (table "routelog").

EMG Portal supports displaying the pdu log in order to facilitate troubleshooting.

2.3 EMG watchdog

A new separate watchdog script has been implemented to monitor the EMG server (emgd) status and available disk space on server.

It also features an integrated http server which can be used by external applications (such as EMG Portal) to control the emgd process, browse EMG server log files and more.

Upon startup, shutdown and any issues discovered e-mail notifications will be sent to one or more specified e-mail addresses.

2.4 Max queue size per connector

A maximum queue size can be set per connector via the new connector keyword MAXQUEUESIZE.

If a message is routed to a connector where this keyword is set and the max limit has been reached the connector will be treated as unavailable and fail-over will occur if defined.

If no fail-over is defined or can be performed the message will be rejected with a "queue full" or "busy" depending on protocol.

2.5 Dynamic WINDOWSIZE

The window size specifies how many unacknowledged operations is permitted before sending of messages is paused.

The default value in EMG is 1 but with WINDOWSIZE=auto, and under sustained load, EMG will try to increase the window size step by step as long as the throughput improves.

When throughput decreases the window size is decreased as well.

2.6 New debug log file

The general log file grows much faster than any other log file when running in debug mode.

In EMG 7 the debug output has been moved from "general" log file into its own "debug" log file and only log level INFO and higher is written to the "general" log file.

2.7 Log file rotation improved

The "debug" log file has been assigned its own log file rotation keyword, LOGROTATE_DEBUG.

Thereby a bit more control over the log file rotation is possible:

```
# Keep a max of 20 debug log files, each up to 100 MB
LOGROTATE_DEBUG=100M:20
# For other log files a max of 10 files, each up to 20 MB, is kept
LOGROTATE=20M:10
```

Also the "security" log file has been removed. The entries that previously was written to "security" is now written to "general".

2.8 DLRMINMATCHLENGTH now defaults to 0

When matching deliver reports (dlrs) in SMPP EMG 6 tried to match the last three digits in the source and destination addresses in addition to the smsc id.

In EMG 7 this check has been disabled by changing the default to 0.

It can be reenabled by using DLRMINMATCHLENGTH=3.

2.9 DEFAULT_SMSCOP for HTTP (outgoing) now defaults to 3

The default operation for outgoing HTTP connectors has been changed from 1 (GET) to 3 (POST).

2.10 Reseller support

Database support has been added to support a future reseller view in EMG Portal and to support related billing.

2.11 Database changes

See "Schema changes" below.

2.12 Migrating to EMG 7.0

2.12.1 Binary compatibility

EMG 7.0 is only available for Linux 64-bit (compiled on CentOS 6.6).

2.12.2 Schema changes

New tables

"pdulog", "cfg_general", "cfg_connectors", "cfg_connectoroptions", "cfg_plugins", "cfg_satpools".

New columns

emguser: "parent_id"

routelog: "charge_reseller", "charge_reseller_id", "charcode"

Database migration

The schema of the routelog table has changed and it thereby needs to be migrated when upgrading to EMG 7.0.

Since the routelog table can contain a large number of entries it can take a considerable amount of time to apply the migration.

A rough estimation would be that about 1 million rows can be converted per minute.

It may be wise to perform the migration in a test environment before applying it to a production database.

2.12.3 Plugins

C plugins need to be re-compiled using the EMG 7 SDK.

Perl plugins should not be affected.

3 Acknowledgements

- OpenSSL
- LibXML
- PCRE
- PCRS
- Tokyo Cabinet

Please find acknowledgments for free and open source software (FOSS) in EMG below. More information is available in LICENSE, and LICENSE.FOSS.

3.1 OpenSSL

Acknowledgements in accordance with the OpenSSL license:

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org)

3.2 LibXML

Acknowledgements in accordance with the LibXML license:

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3.3 PCRE

Regular expression support is provided by the PCRE library package, which is open source software, written by Philip Hazel, and copyright by the University of Cambridge, England.

3.4 PCRS

Perl regular expression support is provided by the PCRS library package

Written and Copyright (C) 2000, 2001 by Andreas S. Oesterhelt, andreas@oesterhelt.org.

3.5 Tokyo Cabinet

Tokyo Cabinet: a modern implementation of DBM

Copyright (C) 2006-2009 Mikio Hirabayashi

4 Overview

Enterprise Messaging Gateway (EMG) is a messaging platform that can act as a SMS/MMS gateway/router, protocol converter or some other kind of mediation gateway.

Usually the job of EMG is to relay messages, performing message conversion and translation depending on the connectors used to receive and send the message.

4.1 Licensing

Enterprise Messaging Gateway licensing is based on number of messages per second per server. More specifically it is the total number of messages that all incoming connectors, server-wide, will accept per second. If, for example, there are two incoming connectors in a system licensed for 30 messages per second and they are fed with 20 messages per second each, the EMG server will impose a small delay so that in practice the connectors will process on average 15 messages per second each.

EMG is also licensed per server so that one license permits installation of EMG on one specific server. The license is generated for a specific server identity (hostid). For Solaris systems this equals to the output from the command hostid and for Linux it is the MAC, or hardware, address for the first network adapter in the system, interface eth0.

There is no license-related limitation as to how many connectors can be defined or how many clients or SMSC connections an EMG server can handle. One server can handle multiple client and SMSC connections using different protocols.

In order to be able to move a license from one server to another a new license needs to be generated by Nordic Messaging Technologies or one of its representatives.

4.2 Messages

The message is the most important entity in EMG. A message is represented as a unique object, identified by its unique message id, that is assigned a number of properties of which some can be set by the user and some are set by the system. Each property is a key-value pair, where the numeric key identifies the property. Usually a message are assigned at least the following, user-level, properties:

- ID, unique message id (key value 1)
- DESTADDRESS, destination address or recipient (8)
- MESSAGE, message data (16)

These properties are referred to as MGP options, where MGP stands for the Messaging Gateway Protocol. A list of key values can be found in the chapter "MGP options".

4.3 Binary messages and User-Data Header (UDH)

EMG supports binary, or 8-bit, messages including User-Data Header (UDH). This enables sending of ringtones, logos, WAP push, OTA and other messages containing other information than plain text. When converting from one protocol to another message and optionally splitting messages, UDH properties are preserved.

4.4 Long messages

According to the GSM specification one message (SMS) cannot exceed 160 septets or 140 octets in length. However, sometimes it is necessary to send more information than that in one message. This is solved by splitting the message into multiple messages and indicate that they belong together by using the GSM 3.40 UDH feature "concatenated message". EMG handles both splitting of messages and setting the corresponding UDH option automatically. In EMG one message is translated into one or more Physical Data Units (PDUs). Each PDU corresponds to one transferred SMS.

4.5 MMS

Starting with EMG 3, EMG supports sending and receiving multimedia messages, MMS. Protocols such as MM7, EAIF and PAP are supported. Basic conversion functionality is also included, for example e-mail to MMS and MMS to e-mail conversion.

4.6 Connectors

Messages are sent and received through so called connectors in the server. Each connector is of type incoming and outgoing, exists in one or more instances and implement one of the supported protocols. Outgoing connectors support failover and load balancing via the routing table.

4.7 Routing

The process of passing a message from one connector to another in order for it to reach its final destination is referred to as routing. The routing decision is based on the information in the routing table and message and connector properties.

4.8 Message life cycle

A message that is relayed through EMG passes a number of stages:

- Message is received via a connector and its attached parameters are parsed.
- A routing decision is made dependant on message information, connector information and the routing table. An outgoing connector is selected.
- Message is placed in the queue for the selected connector OR if an outgoing connector could not be selected the message is considered an orphan.
- Message is delivered through the connector if possible. If the connector fails, failover options are checked and the message may be re-routed correspondingly to another connector.

When a message is deleted or queried, first the routing log is checked. If the message has been relayed (usually to an SMSC) the endpoint is queried if possible. Message status RELAYED indicates that the message has been relayed but the final result is unknown. However, status DELIVERED indicates that the message has been delivered to the recipient. When a message is sent to an SMSC the message status is RELAYED until further information is available while if for example a HTTP connector delivers the message the status will be DELIVERED.

Messages placed in connector queues, or orphaned, can be made to expire when the validity period, if present for the message, is reached.

When running without message persistence option messages are stored in RAM during their life cycle and will be lost if server is stopped ungracefully. With the message persistence option messages, DLRs and keyword sessions are persisted on file for their life time.

4.9 Routing log

When a message is processed by EMG it is entered into the routing log. The routing log is used to keep track of the most recent messages, their state and what connector they were received and sent out at. The maximum number of entries in the routing log is defined by the keyword ROUTELOGSIZE. When the log exceeds the maximum size the oldest entry will be discarded.

4.10 Orphans

When an incoming message cannot be routed or is routed to a connector that does not exist it will be added to a special queue for so called orphaned messages. The maximum size of this queue is defined by the keyword ORPHANSSIZE. When the queue exceeds the maximum size the oldest entry will be discarded. If the value for this keyword is set to 0 orphaned messages will be discarded directly.

When the server is refreshed the queue for orphaned messages will be processed and if, for example, the routing table has changed orphaned messages may be successfully re-routed to a destination connector.

4.11 Protocol conversion

The different protocols supported by EMG differs somewhat in functionality and possibilities. This is especially true when going from an older version of a protocol to a newer version. This implies that some kind of conversion must take place. Some parameters may need to be added, some converted and some maybe even removed.

4.11.1 CIMD2 (Nokia)

CIMD2 supports two different types of Message Centers, SMSC and USSD. Some options are specific for one of the message center types.

The SMSC distinguishes between three types of SME:s (Short Message Entities, in this case the EMG application):

1. Send-only, the SME can only send messages
2. Querying, the SME requests delivery of messages or polls for messages
3. Receiving, the SME is always ready to receive a message. The querying type setup seems to be quite common and in this case the POLLRECEIVE keyword needs to be specified so that the SMSC will deliver messages.

EMG supports CIMD2 2-0en and compatible.

4.11.2 SMPP (SMS Forum)

This protocol, in version 3.4, is designed to support a variety of different messaging centers in different network types and hence is the protocol that provides the largest amount of options. However, for SMS in a GSM network many of the options are not used. SMPP has evolved to be the number one messaging standard and is widely used.

EMG can be configured to use both the submit_sm and the data_sm SMPP operations depending on protocol version (specified by INTERFACEVERSION) and the value of DEFAULT_SMSCOP. The submit_multi_sm operation is currently not supported.

SMPP 3.4 is a much more thorough specification than SMPP 3.3.

EMG supports SMPP 3.3, SMPP 3.4 and SMPP 5.0 and compatible.

4.11.3 UCP/EMI (CMG)

There a number of different operations for sending a message that remain from earlier versions of the protocol but which are now obsolete. The default operation and the operation that should be used is the Submit Short Message (51) operation.

EMG supports UCP/EMI 3.5, 4.0 and 4.6 and compatible.

4.11.4 OIS (Sema)

OIS is supported over TPC/IP. No authentication is used for these connections but full support for text, binary and messages using UDH is available.

EMG supports OIS according to the version 5.8 specification.

4.12 Performance

EMG is licensed based on messages per second. Above 140 messages per second the license is unlimited. The achieved performance depend on a number of factors: Hardware, operating system, protocol used, clients, SMSC etc. However, connectors using the messaging protocols supported (CIMD2, SMPP and UCP) are capable to process more than 4.000 messages per second in an ideal environment.

4.13 Plugins and custom connectors

It is possible to extend and customize EMG functionality through use of plugins and custom connectors. Plugins can be used to "hook in" to EMG at different places of the message life-cycle. Custom connectors can be used to implement custom protocols.

Plugins and custom connectors can be implemented in C or Perl.

More information is available on http://www.nordicmessaging.se.

4.14 Support

Support is available from your reseller and requires a valid support agreement. If you are missing information about your reseller, please contact Infoflex Connect via e-mail: support@infoflexconnect.se.

5 Installing or upgrading EMG

You may want to check out our step-by-step EMG 7 and EMG Portal 2 installation guide instead.

EMG installation/upgrade process includes several steps:

- Download software
- Get license key
- Install software
- Configure software
- Start server

5.1 Before installing EMG

We recommend starting out by applying relevant patches to your operating system. This particularly applies to Solaris. We recommend applying Oracle most current Recommended Patch Clusters for your Solaris version. Solaris patches are available from http://support.oracle.com.

To list installed patches in Solaris use "showrev -p".

5.2 Download software

Software can be downloaded from http://www.nordicmessaging.se/.

You can choose either to download a full distribution or a binaries-only distribution. When installing EMG for the first time you need to download the full distribution. However, when upgrading the binaries-only distribution is enough unless you want new versions of the configuration files. New configuration files are not necessary since EMG is backwards compatible with earlier releases.

5.3 Get license key

Contact your distributor or Nordic Messaging Technologies in order to get your evaluation license key or to purchase a permanent license.

When upgrading from earlier versions of EMG you need a new license key. Contact your reseller or e-mail support@infoflexconnect.se for more information on how to obtain a new license key.

5.4 Install software

5.4.1 Full distribution

Extract the components under the "/tmp" directory. This will create a directory, "/tmp/emg-dist", change to the new directory and execute the install script. The install script will ask a number of questions regarding your configuration and prompt you for the the license key.

```
# cd /tmp
# gzip -d emg700-41394-solaris-full.tar.gz
# tar xvf emg700-41394-solaris-full.tar
# cd /tmp/emg-dist
# sh ./INSTALL
```

During the installation you will be able to choose a directory for the configuration files. By default this directory is /etc/emg and will be referred to as EMGDIR in this documentation. If you choose to install the software using another directory for the configuration files, the environment variable EMGDIR needs to be set correspondingly in order for the programs to find the configuration files.

Example for setting the EMGDIR variable to an alternate directory, /opt/emg/etc, in Bourne shell or equivalent:

```
# export EMGDIR
# EMGDIR=/opt/emg/etc
```

After running the installation you should be able to execute "emgd -v" in order to display your license information.

Sample output from an INSTALL script session on Solaris:

```
# sh ./INSTALL
* * *  Enterprise Messaging Gateway 6.0.0 - INSTALLATION  * * *
EMG can be owned by the user root or by another user.
What user should be the owner of the EMG files? [root]
What group should be the group for the EMG files? [root]
Where should Enterprise Messaging Gateway configuration
configuration files go? [/etc/emg]
Where should EMG executables go? [/usr/bin]
* * *  Make sure this directory is in your PATH!  * * *
Creating directories...OK
Moving programs...OK
Moving data files...OK
Creating configuration file...OK
LICENSE INFORMATION
Enter your license information EXACTLY as received.
HOSTID     :
COMPANY    : DEMO
TELNO      : 123456
SERIAL     : emgDEMO
LICENSEDATA: 30/May/2013-30/Mar/2013-10-0-1
ACTIVATION : D8055F1BC5119EFB79B51C378CF01E6292CCCA6D
By creating /etc/init.d/emg the Enterprise Messaging Gateway server
can be automatically started on system boot.
Should the server be automatically started on system boot? [y]
Creating /etc/init.d/emg.
Linking /etc/init.d/emg to /etc/rc2.d/S99emg.
INSTALLATION FINISHED!
======================
```

The configuration file is placed in /etc/emg and named server.cfg.
The EMG server, emgd, can be started with "emgd".

Check the file /etc/emg/README for more information.

5.4.2 Binaries-only

The easiest way to upgrade an existing EMG software installation is to use the binaries-only distribution. Since EMG is backwards compatible with earlier versions no configuration changes should be needed unless new functionality needs to be accessed.

The upgrade procedure is as follows:

Log on to your system as the system administrator or the EMG user.

Find your current EMG binaries, for example emgd. They are usually located in /usr/bin. You can also execute "type emgd", which will locate the binary if it is in your current path.

Download the patch release tar-archive, in this example we use emg540-21394-solaris-binaries.tar.gz, and save it in the file system under /tmp or similar.

Uncompress the archive:

```
gzip -d /tmp/emg700-21394-linux-64bit-binaries.tar.gz
```

Stop emgd, "emgd -stop", and then make sure there are no emgd processes running, "ps -ef | grep emgd". All emgd processes need to be stopped before replacing the binaries.

Backup your current binaries in order to be able to revert to these files if needed. Sample backup procedure:

```
mkdir /tmp/emg-backup.150328/
cp /usr/bin/emg* /tmp/emg-backup.150328/
```

Extract the new binaries:

```
cd /usr/bin
tar xvf /tmp/emg600-31394-solaris-binaries.tar
```

Make sure they have appropriate owner and permissions (we use root in this example):

```
chown root /usr/bin/emg*
chmod 555 /usr/bin/emg*
chmod 500 /usr/bin/emgd
```

Verify that the new binaries execute ok (the command below should not give any error messages):

```
```

```
emgd -help
```

Verify that the server configuration is ok (if not, make required adjustments):

```
emgd -verify
```

Start the server:

```
emgd
```

Verify that the server is running:

```
ps -ef | grep emgd
```

You should now be up and running with your upgraded software.

5.5 Configure the software

Configuring the software usually involves
· Creating a server.cfg that includes configuration for the needed connectors.
· Creating a client.cfg with hostname, port and possibly authentication information for MGP clients.

After the installation there will be a sample configuration in EMGDIR.

5.6 Starting, stopping and refreshing the server

The server can be started by simply running

```
emgd
```

It is possible to set the debug level to DEBUG using the "-debug" option. It will also send the debug output to stdout.

```
emgd -debug
```

The server can be stopped using

```
emgd -stop
```

To refresh the server use

```
emgd -refresh
```

There are 3 different ways to refresh the server:

1. Run "emgd -refresh" (active connections are reset)
2. Run "emgd -reload" (active connections are not affected)
3. Use emgclient or another MGP client (requires MGP administrator privilege)

Reloading the server is done by running "emgd -reload".

5.7 On-disk message store

All EMG queues by default are stored on disk in an embedded database. When using EMG with MongoDB this information is stored in MongoDB instead.

The indexed files of the database are located in the EMG spool directory.

Do not try to modify these files manually since you will most likely end up with a corrupted database.

5.7.1 Files in SPOOLDIR

File	Description
connectorstate.hdb	Connector state (forceclose)
dlr.hdb	Open delivery report entries
kwsession.hdb	Keyword sessions
kwstore-n.hdb	Message id mapping info
qe.hdb	Messages
qeinfo.bdb	Message status information

File	Description
sat.hdb	SAT entries
seqno.hdb	Message sequence number (id)

The indexed files of the database are located in the EMG spool directory.

It is possible to export the contents of the database using "emgd -exportxml".

6 Connectors

6.1 Connectors

Connectors provide the interface between Enterprise Messaging Gateway and other systems and applications. For example, one connector can connect to an operator's SMSC and another connector can accept incoming messages via HTTP. Each connector can be available in one or more instances. The core functionality of EMG is to route messages from one connector to another.

When testing EMG or running benchmarks it can be useful to route message from an outgoing EMG connector to an incoming connector in the same server. We call this short-circuiting connectors.

6.2 Connector types

A connector can be one of two types: Incoming or outgoing. An incoming connector accepts incoming connections and an outgoing connector initiates connections. Please note however that whether a connector is incoming or outgoing does not tell anything about the direction of flow of the messages on the connector. Messages can be received on an outgoing connection, for example when connecting to a Nokia SMSC.

Both incoming and outgoing connectors can exist in 0 or more instances. However, normally an outgoing connector only needs one instance while an incoming connector needs several instances in order to be able to serve several simultaneous connections.

6.3 Connector modes

Connectors can be defined to be transmit-only, receive-only or both transmit and receive. This is not the same as incoming vs outgoing. For example when connecting to a SMSC an outgoing connector can poll for messages, which will then be received.

The connector mode is specified using the MODE keyword. By default connectors can both transmit and receive messages. Incoming messages on a transmit-only connector will be rejected.

In SMPP 3.3 however sessions will be used either for transmit or receive depending on the bind operation used. This means that in order to be able to both send and receive messages at least two connectors must be defined.

6.4 Static vs non-static

An outgoing connector can be defined as static using the STATIC keyword. This indicates that the connector should connect to the remote entity immediately even if there are no messages to send. The connector will still respect any idle timeout specified. If IDLETIMEOUT is set to a non-zero value the connector will disconnect after being idle the specified number of seconds and the immediately reconnect since it is configured as static.

Usually you would use IDLETIMEOUT=90 and set KEEPALIVE to a slightly lower value, for example 60 (seconds). This will keep the connection open by sending keepalive operations periodically to ensure the connection up.

6.5 Connector states

A connector can be in exactly one of the following states at a specific time:

IDLE
Connector is just created or has been dynamically disconnected. Static connectors should never be in this state during normal operation.

CONNECTED
Connector is connected to remote endpoint but has not been authenticated.

BOUND
Connector is authenticated and allowed to transmit and receive messages.

TERMINATING
Connector will perform a graceful shutdown as soon as possible.

DEAD
Connector is shut down.

ERROR
Connector has failed a repeated number of times and is awaiting a new retry period.

On top of the above a connector can be put "on hold", which means messages are accepted in the queue but no messages are transmitted. A message can be put on hold using the emgclient utility or another implementation using the MGP protocol.

Starting with EMG 6 it is also possible to "force close" a connector either using emgclient or via MGP API. The connector can either be bounced (forced to close but then released again to allow for immedia reconnect) or forced to close with this state persisted in which case the "force close" state will survive a server restart.

6.6 Instances

A connector is available in 0 or more instances. In order for the connector to be active and be able to send or receive messages it must be available in at least one instance.

Outgoing connectors usually only needs to be available in one instance. From EMGs point of view one instance is enough to handle hundreds of messages per second. However depending on delays imposed by the remote entity using more than one instance MAY increase performance.

Incoming connectors must be available in more than one instance in order to allow for several simultaneous connections. When an incoming request has been processed and the remote entity logs out and drops the connection the instance can be re-used. However, in some cases if the connection fails due to a network error for example it may take a while before this is detected and the session is cleared and available for use again. In this case it would be an advantage to have more instances than the expected number of simultaneous connections. If two incoming connections are expected maybe 5 instances would be suitable.

6.7 Message types

The default message type in EMG is SMS. This for example means that when a message is received on an SMTP connector it is automatically parsed and converted to a format that suits SMS and all attachments that are not text are discarded. In order to preserve the formatting for an incoming e-mail message it is therefore necessary to set the message type to e-mail by using DEFAULT_MSGTYPE=EMAIL. Then the conversion will not take place until the message is sent out over a connector of another message type.

The message types in EMG:

SMS
Default message type

MMS
Multimedia message (MMS)

EMAIL
E-mail message formatted according to RFC 822 or RFC 1521 (MIME)

WAPPUSH
WAP push message

DLR
Delivery report

6.8 Mappings

In order to translate between different character sets, being able to send and receive specific symbols etc it may be necessary to apply mappings to the message data.

Mappings in EMG are defined per connector using the MAPPING keyword. The keyword specifies a filename which contains the mapping or translation table. EMG handles one-to-one, one-to-many, many-to-one and many-to-many.mappings and both text and binary data can be processed.

The format of a mapping file is the following (fields are tab-separated), left-hand column specifies a source data looked for and right-hand column the replacement:

This is a comment in a sample mapping file.

First we define a mapping applied when a message is received
Both character string and hex codes can be used
First line translates all "a"s into "b"s
IN <
"a" "b"
"xyz" "zyx"
03,"a" "a",03,02
>

Then a mapping which will be applied to outgoing messages
First line will have no effect (as long as ascii char 0x41 is "A"
OUT <
"a",41,"b" "aAb"
01,02,03 20,20
>

Mappings are processed top to bottom and the following two examples will generate different result if applied to the string "aabacc".

```
# Example 1 (will generate "ddbdcc")
```

```
IN <
"a"   "d"
"aa"  "xx"
>
# Example 2 (will generate "xxbdcc")
IN <
"aa"  "xx"
"a"   "d"
>
```

Incoming (IN) mappings are applied when an incoming message is parsed before it is logged and routed. Therefore the EMG server only sees the translated message data.

Outgoing (OUT) mappings are applied to the message just before they are sent and leave EMG. Therefore the translated message data is never seen in the EMG server.

Characters can be removed by using an empty replacement, "".

By default mappings are only applied to 7-bit text messages. If you need to apply mappngs to binary or Unicode messages the connector keywords BINARYMAPPING and UCSMAPPING are available.

6.9 Address rewriting

Both source and destination addresses can be rewritten by EMG after a message has been received or before a message is sent. This is particularly useful to make sure that addresses comply with the format requirements of the receiving entity.

There are four keywords used for destination address rewriting applied in the order they appear below:

- REMOVEPREFIX
- REQUIREPREFIX
- REPLACEPREFIX
- REGEXP_DESTADDR

There are also four corresponding keywords for source address rewriting:

- REMOVEPREFIX_SOURCEADDR
- REQUIREPREFIX_SOURCEADDR
- REPLACEPREFIX_SOURCEADDR
- REGEXP_SOURCEADDR

These keywords handle outgoing messages via a specific connector while the corresponding keywords ending with "_IN" handle incoming messages, as in REPLACE_PREFIX_IN and REGEXP_SOURCEADDR_IN.

REPLACEPREFIX was introduced in EMG 2.5 and can do all that the REMOVE/REQUIRE-keywords can do and more. It takes as argument one or more comma-separated pattern /replacement pairs where each matched (prefix) pattern is replaced by the corresponding replacement. An empty pattern can be used to add a prefix and an empty replacement to remove a prefix. All pairs are applied sequentially in the order they appear.

An example:

REPLACEPREFIX=+/,00/,0/46

This example could be used in Sweden where we want to handle addresses received in the following formats:

+46123456	International format, + as prefix
46123456	International format, no prefix
0046123456	International format, 00 as prefix
070123456	National format

When messages are sent out the receiving SMSC expected format is usually an international format without any prefix. The above REPLACEPREFIX statement would perform the wanted rewrite. Once again, operations are performed in sequence from left to right.

First any prefix (`+' or `00') is removed if present, then if a national number was supplied the leading 0 is replaced by the country code (46). If instead a +-character was required for the connection only a small modification would be needed:

REPLACEPREFIX=+/,00/,0/46,/+

This example performs the same conversion as the earlier and in addition a "+" is added as the final step.

6.9.1 Masquerading

Address masquerading can be used to hide the real sender of a mobile originated (MO) message before forwarding the message to a third-party. This may be required by some operators in order to get permission to handle MO traffic.

The masquerading is performed using a simple but efficient obfuscation of the address and the algorithm used is reversible and unique for each address. An address with 1-9 digits will be translated into a 10-digit address. Addresses with 10-18 digits will be translated into a 20-digit address.

When using the masquerade keyword on a connector it will be applied to all messages sent and received over that connector.

See the connector keyword MASQUERADE for more information.

6.9.2 Source Address Translation (SAT)

Source Address Translation (SAT) is the procedure of replacing the source address of a message with another address and is most commonly used for implementing bidirectional e-mail to SMS services.

For an e-mail to SMS service an incoming e-mail will obviously have an e-mail address as source (sender) address and before forwarding the message to a mobile phone as SMS it is needed to replace the e-mail address with a valid GSM number. If the user should then be able to reply to the message by simply hitting the reply button the GSM number much be chosen so that the reply message can be routed back to EMG via the SMSC.

Further if the combination of source and destination address can be made unique for each message a specific mobile phone user receives it will be possible to map a specific reply to a message back to the original message sent to the user. We call this threaded messages.

All this functionality can be implemented using SAT pools in EMG where a SAT pool is a pool of source addresses from which EMG chooses an address for each message going out to a mobile phone via EMG.

For the connector where the e-mail is to be received the connector keyword SATPOOL_CREATE_IN is used to indicate that SAT entries should be created when messages are received. On the connector where a reply SMS arrives the SATPOOL_LOOKUP_IN keyword is used in order to perform the lookup for the previously created SAT entry and to rewrite the address back to the original e-mail address.

The SATPOOL_CREATE and SATPOOL_LOOKUP keywords works the same way but operates on messages being sent out via the connector where they are used.

Sample configuration (parts of configuration omitted):

```
SATPOOL sat1 <
ADDRESSRANGE=10010-10020
THREADED
>
CONNECTOR smtp-in1 <
PROTOCOL=SMTP
...
SATPOOL_CREATE_IN=sat1
# Keep source e-mail address intact
REGEXP_SOURCEADDR_IN=
ROUTE=smsc
...
>
CONNECTOR smsc <
PROTOCOL=SMPP
...
SATPOOL_LOOKUP_IN=sat1
ROUTE=smtp-out1
...
>
CONNECTOR smtp-out1 <
PROTOCOL=SMTP
INSTANCES=10
ADDRESS=#MX
DOMAIN=example.com
MAPPING=mappings/hso-iso8859-out.map
DEFAULT_MSGTYPE=EMAIL
>
```

6.10 Inheritance and virtual connectors

When having a large configuration with many connectors there will be many connectors with similar configurations. In order to minimize configuration and make it more readable it is possible to let connectors inherit attributes from other connectors and also defining virtual connectors which are only used for inheritance and never instantiated themselves.

Sample configuration:

```
# Parent for all outgoing SMSC connectors
CONNECTOR smsc-template <
TYPE=OUTGOING
INSTANCES=1
```

```
LOGMESSAGE=160
LOGPDU
VIRTUAL
>
CONNECTOR smsc1 <
INHERIT=smsc-template
ADDRESS=10.0.0.1:5000
PROTOCOL=SMPP
USER=user1
PASSWORD=secret
>
CONNECTOR smsc2 <
INHERIT=smsc-template
ADDRESS=10.0.0.2:5000
PROTOCOL=UCP
USER=user1
PASSWORD=secret
>
```

A connector can only inherit from one other connector but it is possible to have "inheritance chains" where connectors inherit in multiple levels. If a keyword is specified on both a parent connector as well as the child connector the keyword on the child connector is used.

6.11 Limiting connector queue sizes

By using the general keyword MAXTOTALQUEUESIZE it is possible to limit the total number of messages in the connector queues server-wide. This is useful when EMG is one of several components through which messages will pass and it is preferable not to let queues build in EMG. When the queue size limit has been reached EMG will reject further incoming messages using a, protocol specific, temporary error code, indicating that the client should check back later for a new try.

It is possible to use the IGNOREMAXTOTALQUEUESIZE keyword for a connector in order for it to accept messages even after the limit has been reached. This is useful for testing purposes as well as for priority connectors.

MAXTOTALQUEUESIZE does not impose an exact limit. It may be exceeded by a smaller amount of messages depending on current server conditions.

In EMG 5.2 MAXTOTALQUEUESIZE_SOFT was introduced providing a way to throttle messages softly by imposing a delay of 0.1 seconds when receiving a message and the specified queue size has been exceeded.

6.12 Retry schemes

It is possible to define custom retry schemes through connector keyword RETRYSCHEME.

EMG distinguishes between connector and message errors. If an error occurs for a static connector and the connector is disconnected it will automically try to reconnect and if a number of reconnects fail it will go ERROR temporarily and then another set of reconnects will be performed.

For message errors the default is to terminate the message with status "failed" if an error is received in response to the send operation (for example SMPP operation "submit_sm"). This is not always the case, especially if the error code indicates a temporary error. One such error is SMPP error code ESME_RTHROTTLED (0x58) which indicates messages more frequently than allowed.

6.12.1 Sample retry scheme

Sample retry scheme entry to handle ESME_RTHROTTLED:

```
#Type (C=Connector, M=Message) and command (*=any)
#   Error code
#         Retrytime (applies to type C only)
#            Connects (applies to type C only)
#               Maxsleep (applies to type C only)
#                  Hold delay (in seconds)
#                      Flags
M*  0x58  0  0  0   5  1
```

The above would cause a message, sent over the connector with any message operation, that is rejected with an error code of 0x58 to be requeued and put on hold for 5 seconds before next send attempt. The flag indicates the message is "good", ie that the error is not related to the specific message.

6.13 Sample configurations

Sample connector configurations.

6.13.1 Incoming MGP supporting up to 3 connections

```
CONNECTOR mgp-in1 <
TYPE=INCOMING
PROTOCOL=MGP
ADDRESS=localhost:7185
# Up to 10 connections
INSTANCES=3
# File where we find authentication info for users
USERS=mgp-users
>
```

6.13.2 Incoming SMPP supporting up to 10 connections

```
CONNECTOR smpp-in1 <
TYPE=INCOMING
PROTOCOL=SMPP
ADDRESS=localhost:9000
# Up to 10 connections
INSTANCES=10
# Remove prefixes and convert national swedish numbers
# to internationl format
REPLACEPREFIX_IN=+/,00/,0/46
REPLACEPREFIX_SOURCEADDR_IN=+/,00/,0/46
# File where we find authentication info for users
USERS=smpp-users
>
```

6.13.3 Incoming CIMD2 supporting 1 connection

```
CONNECTOR cimd2-in1 <
TYPE=INCOMING
PROTOCOL=CIMD2
ADDRESS=localhost:9000
# One connection only
INSTANCES=1
# File where we find authentication info for users
USERS=cimd2-users
# Force messages to be routed to connector ebe1
ROUTE=ebe1
>
```

6.13.4 Outgoing SMPP

```
CONNECTOR smsc1-smpp <
TYPE=OUTGOING
PROTOCOL=SMPP
# Connector to server 10.0.0.1 port 2775
ADDRESS=10.0.0.1:2775
# One instance is enough
INSTANCES=1
# Username/password to use when authenticating
USERNAME=smppuser
PASSWORD=secret
# Try to connect one time before considered connection failed
MAXFAILEDCONNECTS=3
# When connection failed sleep for 5 minutes before trying again
MAXFAILEDSLEEP=300
# If destination address does not start with "00", add it
REQUIREPREFIX=00
# IDLETIMEOUT defaults to 30 seconds
>
```

6.13.5 Outgoing UCP using authentication via operation 60

```
CONNECTOR smsc1-ucp <
TYPE=OUTGOING
PROTOCOL=UCP
# Connector to server 10.0.0.1 port 5000
ADDRESS=10.0.0.1:5000
# One instance is enough
INSTANCES=1
# Username/password to use when authenticating
USERNAME=ucpuser
PASSWORD=secret
# Type of number, short number alias (used by auth operation 60)
AUTHTON=6
# Number plan id, private(used by auth operation 60)
AUTHNPI=5
# Do not timeout when idle
IDLETIMEOUT=0
# Incoming messages should be routed to connector smpp-in1
ROUTE=smpp-in1
>
```

6.13.6 Outgoing UCP via modem

```
CONNECTOR smsc2-ucp <
TYPE=OUTGOING
PROTOCOL=UCP
# Phone number to operator's modem pool
ADDRESS=01122334456
# Modem is connected to /dev/ttyS0 (Linux?)
MODEM=ttyS0
# Init string to send before dialing
INIT_STRING=AT&F&K3
# One instance is all a tty can handle
INSTANCES=1
# Wait 2 seconds after connect
WAITDELAY=20
# Wait 2 seconds after message operation is sent
MSGDELAY=20
# Operator only allows us to send 2 messages per session
OPS_MAXPERSESSION=2
# If message does not contain a source address use this
DEFAULT_SOURCEADDR=7654321
>
```

6.13.7 Outgoing HTTP

```
CONNECTOR http1 <
TYPE=OUTGOING
PROTOCOL=HTTP
# We use full URL for HTTP
ADDRESS=http://www.myhost.com/cgi-bin/handlemessage.sh
# One instance is enough
INSTANCES=1
# Timeout after 5 seconds idle
IDLETIMEOUT=5
>
```

6.13.8 Outgoing EBE

```
CONNECTOR ebe1 <
TYPE=OUTGOING
PROTOCOL=EBE
# Program or script to execute
ADDRESS=/usr/local/bin/ebe-handlesms.sh
# One instance is enough, if more we need program to be thread-safe
INSTANCES=1
>
```

6.13.9 Outgoing GSM

```
CONNECTOR gsm1 <
# GSM connectors are always outgoing
TYPE=OUTGOING
PROTOCOL=GSM
# TTY to which GSM device is attached
MODEM=cua/a
# Only one instance is allowed
INSTANCES=1
# Poll for incoming messages every 30 seconds
POLLRECEIVE=30
# No SCA in PDU, needed for some GSM devices
#GSMNOSCA
# Memory storage is used (Ericsson devices)
#GSMSTORE=ME
# Required for setting dest address of received messages
FORCE_DESTADDR_IN=4670123123
>
```

7 Routing

When EMG is used with EMG Portal and the billing plugin the normal routing described here is overridden.

There are three different possibilities that determines what connector a message will be routed via.

They are (highest priority first):

- Any routing criteria specified for a message
- Any routing criteria specified for a connector
- The routing table

The routing table is definitely the preferred method since it provides functionality for load-balancing, failover and can be changed for a running server without having to restart the server.

Delivery reports (DLRs) are routed a little differently. They are routed back the same way as the original message from which the DLR was requested was received unless a ROUTEDLR keyword is defined on the connector where the DLR is received or if there is a ROUTEDLR keyword specified for the user that requested the DLR.

7.1 Specifying a routing criteria for a message

This can be accomplished by using the ROUTE message option. However, it can only be used when using the MGP, HTTP and SMTP protocol to send a message, since CIMD2, SMPP and UCP do not provide mechanisms for setting routing parameters. For example, from the command-line:

```
emgsend -o ROUTE=cimd2-1 109878 "Test message"
```

7.2 Specifying a routing criteria for a connector

This can be accomplished by using the ROUTE keyword in the server configuration file for a specific connector.

```
ROUTE=cimd2-1
```

Please note that the route only affects incoming messages via the connector. Outgoing messages are not affected by the ROUTE keyword since a routing decision has already been made prior to the message being sent via the outgoing connector.

7.2.1 The REDIRECT keyword

Some connectors can only send or received messages (uni-directional) such as SMPP 3.3 or HTTP connectors for example. Say that a DLR is routed back to a HTTP receive-only connector because the original message was received there the DLR would stay in the queue forever (or until it expires). To solve this problem it is possible to specify a REDIRECT keyword on the connector meaning that any message routed to the connector will be redirected to the connector specified by REDIRECT instead.

7.3 Routing table

The routing table is loaded from the file pointed to by the ROUTING keyword in the server configuration file.

The format of this file is 2 or 3 tab-separated fields per row: <name of incoming connector><TAB><name of outgoing connector(s)[<TAB><options>]

Comma "," is used to separate entries when there is more than one entry per field.The options field is optional and the options currently recognized are "LB" (Load Balancing), "KEYWORD" (see Keyword-based routing below), "KEYWORDSESSION", "USERNAME", "URL" and "PLUGINARG".

Example:

```
smpp-in1 smsc1-ucp
smpp-in2 smsc2-smpp,smsc3-smpp
mgp1 smsc4-ucp,smsc5-ucp LB
```

The first line specifies that incoming messages on connector smpp-in1 should be routed to the connector smsc1-ucp, the second line that messages on smpp-in2 should be routed to smsc2-smpp and if it is not available or in state ERROR it should route it via smsc3-smpp (fail-over). Finally the third line is similar to the second line with the exception that if both smsc4-ucp and smsc5-ucp are available load-balancing will take place and outgoing messages will be sent by alternating between the two connectors specified.

When using failover/load-balancing a maximum of 16 outgoing connectors can be specified.

The routing table also supports routing on source or destination address prefixes. This can be specified by, in the incoming connector field (the first field) a "<" character (source address) or ">" character (destination address) followed by a prefix. Multiple destination address prefixes can also be supplied in a file when using the "@" character. A "%" character is equivalent to a ">" character (destination address.

Example:

```
>4670123456 smsc1-ucp
@/etc/emg/smsc2-prefixes smsc2-smpp
mgp1 smsc4-ucp,smsc5-ucp LB
```

When checking the routing table EMG starts with the first entry and continues down until it finds a matching criteria. The following is an example of a bad routing table where line 2 and 3 will have no effect at all since all entries that match line 2 or 3 also matches line 1 and its position in the file gives it highest precedence.

```
%0 smsc1-ucp
%012 smsc2-smpp
%0123 smsc3-ucp
```

7.3.1 Regular expressions

Regular expressions can be used in routing rules, to some extent.

An incoming connector (first column) is always considered a regular expression. A connector named "connector1-in" would match all rules below:

```
connector1-in    connector2-out
connector1.*    connector2-out
```

```
.*    connector2-out
```

The last example would match all connector names and can therefore be used a s a "default route".

Source and destination addresses will also be indeterpreted as regular expressions when preceeded by a "/".

```
# Match all swedish numbers (destination) ending in "1"
>/46.*1    connector-out
# Match all italian numbers (sender) with 10 digits
# (after country code)
</39.........    connector-out
```

7.3.2 Advanced routing on message options

From EMG 5.2.8 it is possible to route based on any message option, even custom message options (added by plugins for example) by using a leading "?" on the corresponding line in the route table.

?SOURCEADDR$5,0x2001=token1,MESSAGELEN>10 http-out1

The above will route messages where source address ends in "5", has a message option with key 0x2001 set to "token1" and a message length of more than 10 to connector "http-out1".

When multiple options are separated with a "," a logical AND operation will be performed. Message option can be either a name of a MGP option key or the numeric value for the key.

The operator can be one of

^ Starts with
$ Ends with
< Less than
> Greater than
= Equals to
~ Regular expression matching

7.3.3 Setting message options

It is possible to modify message options in the routing table by using the keyword "SET:" in field 3. Multiple "SET:" occurrences is allowed.

```
smpp-in1  smpp-out1  SET:NOTE=route1,SET:0x2001=42
```

The above example will set the NOTE message option to "route1" and a custom message option with option key 0x2001 to "42".

7.4 Failover

If more than one connector is specified in the routing table and the first connector fails for some reason then the next specified connector is used. This mechanism is called failover. Failover occurs when a connector goes into state ERROR or DEAD and more than one connector is specified. During the failover the queue for the failing connector is moved to the next working connector. If there are no connectors alive at the moment then the queue entries remain in their current connector queue and waits for a connector to come back to life.

Sample configuration in routing table:

```
smpp-in1 smpp-out1,smpp-out2
```

7.5 Load balancing

When specifying load balancing for a group of connectors the connectors will be used in a round-robin manner. That is, the first message will be sent via the first specified connector, next message via connector 2 and so on. If a connector is in state ERROR or DEAD it will not be used for the load balancing until it comes back into an active state.

Sample configuration in routing table:

```
smpp-in1 smpp-out1,smpp-out2 LB
```

7.6 User-based routing

Routing can be done based on authenticated user by using the ROUTE or ROUTING keywords in the users file. If specified it will override any other routes specified for the connector or in the general routing table. However, message-specific routes will have the highest priority.

Sample users file:

```
# User-specific routing table
user1  secret  ROUTING=/etc/emg/routing.user1
# User-specific route
user2  secret  ROUTE=cimd2-ep
```

For more information check general keyword ROUTING and connector keyword USERS in appendix.

7.7 Routing to a specific user

When multiple clients connect through the same connector in order to receive messages it is important that each user receives only the messages addressed to that specific user and not any other user messages.

It is possible to route messages to a specific user by using the USERNAME keyword in the routing table.

```
>100  ucp-in  USERNAME=user100
>101  ucp-in  USERNAME=user101
```

The above will route messages based on destination address prefixes to that messages with a destination address startint with "100" will be routed to user "user100" while destination addresses starting with "101" will be routed to user "user101".

Please note that users defined as "ADMIN" in the users file will receive all messages regardless of what user the messages are addressed to.

7.8 Keyword-based routing

When accessing services via SMS from a mobile device (Mobile Originated or MO messages) it is sometimes useful to make routing decisions based on a keyword in the message. This can be accomplished in different ways. Either all messages can be routed to an EBE connector

where a shell script or program can parse the message and take action accordingly or EMG can directly parse the message and route it to different connectors depending on the destination address and a keyword in the message. The second method is more scalable due to the overhead for EBE connectors when creating new processes.

In order to use keyword-based routing in EMG the following is required:

- Routing is done via the routing table, there must be no ROUTE keyword on the connector or in the message since they will take precedence.
- The keyword must contain letters and digits only.
- The option PARSEMESSAGE must be used in the connector configuration where the message is received in order for EMG to be able to extract the keyword correctly.

Please note that after the message has been parsed for the keyword, the keyword will still be a part of the message body and is not removed from the message.

Keywords are case insensitive.

7.8.1 Sample scenario

In a sample scenario we want to set up a service where customers can request their current account balance by sending an SMS to a specific recipient number and including a keyword, "BALANCE".

Incoming messages, which are received from a Nokia SMSC via CIMD2, should be routed to a HTTP connector that forwards messages including the keyword to a HTTP server which processes the message and takes proper action.

Messages which contain the wrong keyword is bounced to the user with an error message.

7.8.2 Setting up the connectors

Outgoing connector where we connect to a Nokia SMSC using CIMD2 and receive messages:

```
CONNECTOR nokia-cimd2 <
TYPE=OUTGOING
PROTOCOL=CIMD2
ADDRESS=10.0.0.1:9971
INSTANCES=1
USERNAME=user
PASSWORD=secret
STATIC
KEEPALIVE=60
```

```
IDLETIMEOUT=0
# Message format is "<keyword> <rest of message>"
PARSEMESSAGE=KEYWORD MESSAGE
>
```

Outgoing connector that forwards messages to a cgi-script that integrates with the application:

```
CONNECTOR myapp-http <
TYPE=OUTGOING
PROTOCOL=HTTP
ADDRESS=http://localhost:8080/cgi-bin/myapp.cgi
INSTANCES=1
>
```

The "bouncer" connector which sends a message back to the user indicating that an invalid keyword was used:

```
CONNECTOR bouncer-ebe <
TYPE=OUTGOING
PROTOCOL=EBE
ADDRESS=/usr/local/bin/bouncer.sh
INSTANCES=1
>
```

7.8.3 Setting up the routing table

The routing table is processed top to bottom which means that we should include the keyword-related entry before any more general entries:

```
# Route message from everyone incl "BALANCE" to HTTP connector
nokia-cimd2    myapp-http  KEYWORD=*:BALANCE
# Route other messages to "bouncer"
nokia-cimd2    bouncer-ebe
```

The keyword KEYWORD takes two arguments, destination address, which can include wildcards, followed by the actual keyword. The keyword can also be a `*' which represents any keyword.

7.8.4 Keyword sessions

It is possible to use what is called keyword sessions meaning that a specific keyword starts a session and subsequent messages from the same subscriber need not start with the keyword while the session is active. This is particularily useful for chat services and similar.

Sample configuration:

```
nokia-cimd2    myapp-http  KEYWORD=*:CHAT,KEYWORDSESSION=3600
```

The argument to the KEYWORDSESSION keyword is the session lifetime in seconds. So, the session lifetime in the above example would be 1 hour (3600 seconds).

7.9 Concatenated Message Routing (CMR)

Since SMS are restricted to 160 characters (7-bit text) longer messages can consists of multiple messages which are assembled in the phone to one message, a concatenated message, larger than the 160 character limit. For example this can apply to ringtones, images and WAP push messages.

Sometimes it is necessary to make sure that the different parts of a concatenated message is routed via the same connector. We refer to this as CMR, Concatenated Message Routing.

CMR is enabled per connector using the CMR connector keyword in the server configuration file. Technically CMR checks the message UDH to see if the message is part of a concatenated message.

8 Sending messages

The messaging protocols, including the proprietary MGP, all include functionality to send and receive messages.

In general, messages are kept in the queue for the connector through which it should be sent until successfully sent or until a permanent error has occurred. Most errors are considered temporary though and will cause the message to stay in queue for further delivery attempts. When a temporary error has occurred for a message it is put in the end of the queue in order for other messages to be delivered meanwhile. It is possible to specify a maximum number of delivery attempts after which the message will be considered undeliverable and will be removed from the queue.

8.1 Using HTTP connector

When EMG sends a message to an HTTP server or similar it uses the URL defined by the ADDRESS keyword and adds options as HTTP parameters to form a complete GET or POST request depending on the DEFAULT_SMSCOP setting for the connector.

The response to the request must be 200 (OK) in order for the message to be considered delivered successfully.

When sending binary messages or UDH the message data will be hex encoded.

EMG supports persistent HTTP/1.1 connections.

EMG supports HTTP basic authentication using the XAUTH* keywords.

8.2 Using SMTP connector

When EMG sends a message using an outgoing SMTP connector this is done via a standard SMTP session using some special mappings for the options associated with the message.

SOURCEADDR
Put into the MAIL FROM address.

DESTADDR
Put into the RCPT TO address.

MESSAGE
Put into the DATA body.

All other message options are put into the message header as X-EMG-Option-<option> user-defined headers.

There are also a few specific connector keywords used by the outgoing SMTP connector:

QUOTEDSUBJECT=<c1c2>
This indicates that the message may include a subject and that the subject is enclosed using the characters c1 and c2 respectively.

Example:
If the keyword is used as follows:
QUOTEDSUBJECT=()
and the message body is
(This is the subject) ...and this is message body
the subject of the message will be set to "This is the subject" and the message body will be "... and this is the message body".

Outgoing messages are MIME encoded as text/plain using the ISO8859-1 character set.

EMG supports persistent SMTP connections using the RSET command.

EMG supports SMTP authentication using the XAUTH* keywords.

8.2.1 Sample outgoing SMTP session

Remote SMTP server lines begin with `>'.

```
>220 host.domain.com ESMTP
HELO nordicmessaging.se
>250 Please to meet you
MAIL FROM:<123456@nordicmessaging.se>
>250 Sender ok
RCPT TO:<987654@domain.com>
```

```
>250 Recipient ok
DATA
>354 Enter mail, end with "." on a line by itself
From: 123456@nordicmessaging.se
To: 987654@domain-com
X-EMG-Option-SOURCEADDR: 12345
This is the actual message!!!
.
>250 Message accepted for delivery
QUIT
>221 Closing connection
```

All message options can be used using the "X-EMG-Option-xxx:" user-defined headers. The UDH, if present in the message, will also be sent using a user-defined header with the UDH data hex encoded.

If successful, the message id is returned in the SMTP DATA command response.

When sending binary messages or UDH the message data must be hex encoded.

8.3 Using EBE connector

The EBE connector does not really send the message but rather forwards it to a script or program which will be executed with message information on standard input. This enables the user to invoke external programs and facilitates integration with third-party solutions.

The format of the message information will be two fields per row, where the first field is the message option key (a numeric value) and the second field is the actual value of the option. The fields are tab-separated.

```
1<TAB>1003
34<TAB>127.0.0.1
30<TAB>emguser
2<TAB>123456
8<TAB>56789
16<TAB>414243
```

The first row indicates that the message id is 1003 (message option 1). The second row that it was received from a client that connected from the IP 127.0.0.1 (localhost). See MGP options chapter for more information about message options.

The exit code of the script is used to indicate whether the delivery was successful or not. An exit code of 0 indicates success, 1 a permanent error and all other exit codes temporary errors (message is kept in queue for new retries).

Sample script:

```
#!/bin/sh
tmpfile=/tmp/ebe.$$
# Default exit code is 0 (OK)
ret=0
# Write message information to file.
# If cat fails set exit code to non-zero
cat >$tmpfile || ret=1
exit $ret
```

8.4 Using emgsend

The utility emgclient implements the MGP protocol and can be used to send messages from the command-line. It checks client.cfg and command-line arguments for server, port and authentication information. The assigned message id will be displayed on standard output by default.

Example sending a plain text message using emgsend.

emgsend -username emguser -password secret -o ROUTE=smsc1-ucp 070123456 "This is a test message"

Default values for host, port, username and password are taken from the client.cfg file.

Example sending a ringtone using to a Nokia phone (Nokia Smart Messaging). It is addressed to port 5505 in the phone and CHARCODE=2 indicates a binary message. The message is more than 160 octets so it will be split and 2 SMS will be sent to the phone.

The command-line is split over multiple lines. There is no space between the last digit and the trailing backslash.

```
emgsend -hex -o SOURCEPORT=0 -o DESTPORT=5505 \
  -o CHARCODE=2 461234567 \
0C010605041581158102 4A3A6505899195B185E995C80400E4D9\
0413220B1106889268495624B31261892CC4956249B124889348\
493624B31269892CC493424D112610922C495624C31255892284\
```

```
9A224B210718926C4966249B107109304495420D31249892AC49\
1620D21258892AC496624AB124D89248496424AB1259892AC493\
620D2124D0924C493624AB124D8926400001
```

Example sending Over The Air settings to an Ericsson T68 phone. It is addressed to port 49999 in the phone and CHARCODE=2 indicates a binary message. The message is more than 160 octets so it will be split and 2 SMS will be sent to the phone.

```
emgsend -hex -o SOURCEPORT=49154 -o DESTPORT=49999 \
  -o CHARCODE=2 461234567 \
01062C1F2A6170706C69636174696F6E2F782D7761702D70726F\
762E62726F777365722D73657474696E67730081EA01016A0045\
C60601871249018713110331323 32E34352E362E370001871C11\
03736F6E6F666F6E2E636F6D0001872270010186071103687474\
703A2F2F7761702E646B0001C6080187151103414243000101C6\
7F018715110357617000018717110368747 4703A2F2F7761702E\
646B00010101
```

8.5 Using emgclient

The utility emgclient can be used to send, query and delete messages and a few other administrative tasks. Online help is available.

9 EMG 7 and database config

9.1 Configuration in a database

EMG 7 can read connector configuration from a database.

In short EMG will bootstrap by reading `server.cfg` to find the database information and then the rest of the configuration options will be read from the database.

General configuration, connectors, plugins and sat pools will be read from the database. Database profiles must be configured in `server.cfg`.

Any general configuration options found in the database will be merged to the options present in the bootstrap `server.cfg`.

9.2 Requirements

The following information must be present in the general section of the `server.cfg` file.

- A database profile, using MySQL
- The keyword `DBPROFILE`, pointing to that profile
- The keyword `DBCONFIG`

9.3 Initiating

If you already have a working configuration in `server.cfg` you can run "`emgd --initdbconfig`" to import it into the database. This will import all configuration sections from `server.cfg` to the database except for the general keywords and any db section. After importing the configuration you should remove the connector, plugin and sat pool configuration sections from `server.cfg`.

You can also start with empty tables.

A minimal `server.cfg` for bootstrapping a `DBCONFIG` setup. It includes a mgp-in1 connector to enable cli management even if db config is cleared.

```
ROTATELOGS=100M:5ROTATELOGS_DEBUG=100M:20#DEBUGPDULOGDBROUTELOGDB
PERSISTFILESROUTING=routingDBPROFILE=emgDBCONFIG# If you have
multiple EMG nodes using the same database, assign each a unique
NODEID# NODEID=1 # Database profileDB emg <HOST=127.0.0.1PORT=3306
USERNAME=emguserPASSWORD=secretDBNAME=emgTYPE=MYSQLINSTANCES=4> #
Accept incoming connections via MGPCONNECTOR mgp-in1 <TYPE=INCOMING
PROTOCOL=MGPADDRESS=127.0.0.1:7185INSTANCES=5USERS=users>
```

9.4 EMG startup

When emgd is started and DBCONFIG is present the following will take place:

1. EMG will look for the most recent timestamp in "updated" columns in the cfg_* tables.
2. EMG will try to create the directory `$EMGDIR/dbconfig/<timestamp>`, where timestamp is the current time formatted as `YYYY-MM-DD_HH:MM:SS`
    a. If successful EMG will create configuration files using the data in the configuration tables in the database and try to start up using the newly created configuration files
    b. If the directory already exists EMG will instead start up from the configuration in the directory pointed to by symbolic link `$EMGDIR/dbconfig/lastok`.
3. If startup fails EMG will exit.
   If successful the timestamp will be written to table emgsystem with keyname = "dbconfig_lastok" and value = "<timestamp>". This enables applications such as EMG Portal to see which configuration is running.
   Also the symbolic link `$EMGDIR/dbconfig/lastok` will be updated to point to the dbconfig directory in use.

If EMG startup fails using a new configuration, on subsequent startup tries (manual or by watchdog) EMG will fallback on "lastok" configuration since the new configuration directory exists according to 2b) above.

9.5 Starting fresh

If you want to start over with the configuration from scratch you can stop emgd, delete all entries from the cfg_* tables and remove the dbconfig directory.

9.6 Updating

The configuration in the database can be updated freely (remember to set the "updated" column of the entries changed, EMG Portal of course does this). When the configuration is complete, restart emgd or run "`emgd --reload`".

9.7 EMG watchdog

With EMG 7 a watchdog for EMG is introduced. The watchdog is a small perl script that runs as a daemon and monitors the emgd process and the available disk space on the server.

E-mail notifications will be sent if problems are detected.

It also features an integrated web server enabling external applications to restart the emgd process using a simple http request.

It should be run on the same server as emgd runs and under the same user.

EMG Portal 2 includes support for communicating with the watchdog and thereby more EMG administration tasks can be performed without the need to use the cli.

9.8 Schema

```
CREATE TABLE cfg_connectors
(
    id INTEGER NOT NULL AUTO_INCREMENT,
    name VARCHAR (60),
    connector_order INTEGER,
    PRIMARY KEY(id),
    UNIQUE unique_connector_name (name)
);
CREATE TABLE cfg_connectoroptions
(
```

```
    id INTEGER NOT NULL AUTO_INCREMENT,
    connectorid INTEGER NOT NULL,
    keyorder INTEGER,
    keyname VARCHAR (255) NOT NULL,
    value VARCHAR (255),
    PRIMARY KEY(id)
);
CREATE TABLE cfg_general
(
    id INTEGER NOT NULL AUTO_INCREMENT,
    keyorder INTEGER,
    keyname VARCHAR (255) NOT NULL,
    value VARCHAR (255),
    PRIMARY KEY(id)
);
CREATE TABLE cfg_plugins
(
    id INTEGER NOT NULL AUTO_INCREMENT,
    name VARCHAR (60),
    updated DATETIME NOT NULL,
    instances INTEGER default 0,
    offset INTEGER default 0,
    library VARCHAR (1024),
    config VARCHAR (1024),
    PRIMARY KEY(id),
    UNIQUE unique_plugin_name (name)
);
CREATE TABLE cfg_satpools
(
    id INTEGER NOT NULL AUTO_INCREMENT,
    name VARCHAR (60),
    updated DATETIME NOT NULL,
    threaded SMALLINT,
    quoted_reply SMALLINT,
    ignore_destaddr SMALLINT,
    random SMALLINT,
    expire INTEGER,
    addressrange VARCHAR (1024),
    PRIMARY KEY(id),
    UNIQUE unique_satpool_name (name)
);
```

10 EMG Watchdog

EMG Watchdog is a perl script (emg_watchdog.pl) that is run as a background process, on the same server as EMG, which can monitor and control the emgd process. It is released with EMG 7 but can be used to control EMG 6 as well.

It implements a simple API based on HTTP and JSON for starting, stopping EMG and reading EMG server log files.

EMG Watchdog can be used from EMG Portal 2 to control the EMG process via the web-based interface.

10.1 Installation

The script provided is named "emg_watchdog.pl.sample". It is intended to be copied to "emg_watchdog.pl" and can be run in the background using

```
perl emg_watchdog.pl &
```

as the same user that runs the "emgd" process, normally "emg".

It depends on several CPAN modules that need to be installed before the script can be run.

```
cpan Email::Sender::Simple Email::Sender::Transport::SMTP Email::
Simple Email::Simple::Creator \
  Filesys::Df HTTP::Daemon HTTP::Status IPC::Shareable JSON Net::
Subnet URI::QueryParam
```

Before running the watchdog the configuration variables described below must be modified to match the local environment.

The latest version of the EMG Watchdog can be found on the URL below:

http://www.nordicmessaging.se/files/emg/emg_watchdog.pl.sample

10.2 Configuration

The most important variables below are "$emg_dir", "@notify_recipients" and "$mail_from".

Configuration variables in the script:

Variable	Default	Description
$emg_dir	/home/emg/etc	Directory where EMG configuration (server.cfg) is located
$logfile	$emg_dir/log /emg_watchdog.log	Log file for EMG watchdog
$emg_quickstop	1	Use "quick stop" for stopping emgd (signal emgd to stop, wait a few seconds and then kill it)
$check_interval	60	Specifies how often (in seconds) checks should be run
$notify_interval	21600	Specifies how often (in seconds) notifications should be sent for persistent error (21600 secs = 6 hours)
$fs_to_check	/	File system to check for used space
$fs_limit	80	File system usage limit (in %), notification will be sent when limit exceeded
$listen_port	3000	Port on which integrated web server listens for incoming requests
@notify_recipients	('')	Array with recipients for e-mail notifications (empty by default)
$mail_from	changeme_from@example.com	E-mail notification "From" address
$mail_subject_prefix	'EMG watchdog'	E-mail notification subject prefix (consider adding hostname for easier identification)
$smtp_server	127.0.0.1	

Variable	Default	Description
		IP address of SMTP server to use for sending e-mails
$smtp_port	25	Port of SMTP server to use for sending e-mails
$smtp_username	undef	Username for SMTP server authentication (undef = no auth)
$smtp_password	undef	Password for SMTP server authentication (undef = no auth)
$allowed_client_ips	127.0.0.1/32 192.168.0.0 /24	Allowed client ip addresses / subnets for web server access

10.3 Notifications

When specific events occur the watchdog will send e-mail notifications to the addresses configured (@notify_recipients).

- Monitor detected EMG was not running
- EMG manual stop requested via API
- EMG stopped
- EMG manual startup requested via API
- EMG started
- EMG startup failed
- Used disk space in monitored file system ($fs_to_check) exceeds configured percent (fs_limit)

10.4 Using the watchdog API

The watchdog features a built-in web server which by default listens on port 3000 and implements an api.

The web server port must be protected in order to make sure it cannot be accessed directly via the internet. Access must be protected either by a local firewall in the server (iptables) or by an external firewall in front of the EMG server.

URI	Description and parameters (M - Mandatory, O - Optional)
/api/ping	Check server status
/api/emg_start	Start EMG server
/api/emg_stop	Stop EMG server
/api/emg_status	Get status of EMG server
/api /get_log_file_list	Get list of log files
/api/get_log_file	Get contents of log file *Parameters:* file - Log file name (M) maxrows - Max number of rows to return (O, default: 100) search_string - Only return rows that include search_string, multiple terms can be separated by space (O)

10.5 Sample http request using wget

```
wget -q -O - http://127.0.0.1:3000/api/ping
```

should return the JSON response

```
{"status":"ok"}
```

11 Logging

Logging is performed by the EMG log server which runs in the emgd process but in a separate thread. It implements a special log queue in order to minimize impact on EMG performance.

11.1 Log files

The log files are, by default located in the EMGDIR/log directory and there are different files for different logs:

Log file	Description
general	Server log file where log entries with log level INFO or higher is written
debug	Server log file where log entries with log level DEBUG and DEBUG2 is written
pdu.*	Connector specific log file where all protocol operations will be logged
connector.*	Connector specific log file where the EMG representation of operations and messages will be logged (mgp format)

There are two ways to change the location of the log files:

1. Create a log file directory and make a symbolic link from EMGDIR/log to the new log file directory. This must be done while the server is stopped.
2. It is also possible to set an environment variable EMGLOGDIR, before starting the server, pointing to the directory where the log files should be written.

11.2 Log levels

The log level determines how detailed the logging should be and can be set both for the server-wide logs and for the connector-specific logs using the LOGLEVEL keyword in the general or connector context.

When the server is started with the --debug or --debug2 option the log level is set to DEBUG or DEBUG2 and the log messages are also displayed on stdout. This can be useful for debugging purposes.

It is also possible to use log file rotation based on size in order to limit the maximum amount of disk space occupied by log files.

11.3 Format of log files

All log files contain a timestamp with a precision down to one microsec. It also contains a message text and, if relevant, message properties. The default format is similar to the syslog format and does not include year. The general keyword LOGYEAR changes the date format in the timestamp to YYYY-MM-DD.

11.3.1 Connector log file

The connector log file includes all events for a specifiec connector. Specifically all messages sent and received will show up in one of the connector log files. A message which passes through EMG will show up at least two times usually in different log files. One entry when message was received and one entry when message was sent. It is possible for the same message to occur more than twice in log files, for example if sending the message first failed and the a retry was made which was successful. It is possible to differ between final and non-final entries since only the final entries include the ENDSECS (95) and ENDMSECS (96) message options.

```
<timestamp> (<instance>) <event> <OK/ERR> [(<info>)] [<options>]
```

Field	Description
timestamp	Mandatory. Default format is MMM DD hh:mm:ss.mmm. If LOGYEAR is used format is YYYY-MM-DD hh:mm:ss.mmm.
instance	Mandatory. Connector instance on which the event occurred.
event	Mandatory. Type of event that has occurred. Can be of one the following values: CONNECT, DISCONNECT, LOGIN, LOGOUT, SEND, RECEIVE, REJECT, MAXFAIL, EXPIRE
OK/ERR	Mandatory. Indicates whether the event was successful or failed
info	Optional. Information related to the event. A text string consisting of one or more comma-separated fields on a key[=value] format where the value part is optional and may be surrounded by quotation marks, ". Possible key values are: pdu, dlr, orphaned and info. Example: SEND ERR (pdu=1/1,info="72"): This would indicate a SEND event failed. The pdu sent was one out of one and the protocol specific error code was 72.
options	Optional. If the event is related to a message, the message MGP options would appear here on a key:value format.

Sample incoming connector log file

```
Sep 11 22:34:34.306 (2) CONNECT OK (info="127.0.0.1")
Sep 11 22:34:34.316 (2) LOGIN OK (info="emguser")
Sep 11 22:34:34.433 (2) RECEIVE OK (orphaned) 001:71 034:127.0.0.1
022:stenor 059:mgp 093:1031776474 094:393 008:1234 017:3
Sep 11 22:34:34.468 (2) LOGOUT OK
Sep 11 22:34:34.471 (2) DISCONNECT OK
```

The log file entry for an incoming MGP connector above shows that an incoming connection from localhost (127.0.0.1) was received, the user "emguser" logged in successfully and one message was received. The message could not be routed and was therefore orphaned. All message options are displayed on a key:value format, for example the recipient MSISDN, 1234, is indicated by MGP option 8 (MGP_OPTION_DESTADDR). Also the message body is not logged, only the message length, three characters, indicated by MGP option 17.

When an operation fails it will be indicate by the text ERR accompanied with a protocol-specific error code within the parenthesis.

Sample outgoing connector log file

```
Sep 11 22:35:28.664 (4) CONNECT OK
Sep 11 22:35:29.071 (4) LOGIN OK
Sep 11 22:35:30.275 (4) SEND OK (pdu=1/1) 001:71 034:127.0.0.1 022:
stenor 059:mgp 093:1031776474 094:393 008:1234 095:1031776530 096:2
69 017:3
Sep 11 22:35:40.512 (4) LOGOUT OK
Sep 11 22:37:29.007 (4) DISCONNECT OK
```

The log file entry for an outgoing CIMD2 connector above shows that a connection has been made with a sessionid of 4 and then one message consisting of one PDU has been sent successfully to the end-point. A number of message parameters can also be seen on the format "key:value".

When an operation fails it will be indicate by the text ERR accompanied with a protocol-specific error code within the parenthesis.

11.3.2 PDU log files

While the connector log files contains message related events encoded as MGP options the PDU log files contains the actual protocol-specific operations being sent and received per connector.

PDU log files will be created either if the connector log level is DEBUG or DEBUG2 or if the connector keyword LOGPDU is present for the connector in question.

11.4 Log file rotation

Log files can be rotated based on time or size using the general keyword ROTATELOGS.

11.4.1 Log file rotation based on time

When log file rotation should be accomplished based on time the log files are rotated with a specified interval. On rotation the current log files are renamed with a timestamp as suffix.

11.4.2 Log file rotation based on size

Log file rotation based on size is accomplished by renaming the log file when it has exceeded a specified size using an index as suffix. The most recently log file rotated out would have ".1" as suffix, the next most recent ".2" and so on up to the specified total number of log files (segments) to save.

11.5 Logging to a database

If a database has been prepared for use with EMG it is possible to put the connector log in the database. The connector log files will also be used but it may be convenient to add the information into a database for example for generating statistics in an efficient way.

11.5.1 Message log

The messages are stored in table "routelog".

11.5.2 Connector log

In order to put the connector log in a database the database must be prepared and a database profile referenced using the general keyword DBPROFILE. Also the general keyword CONNECTORLOGDB needs to be added to the server.cfg file in order to indicate that the log should be put in the database.

The connector log will be stored in the table "connectorlog" which can be found in the schema file included in the EMG distribution.

The event will given using the numeric event values as indicated below:

Value	Event
0	CONNECT
1	DISCONNECT
2	LOGIN

Value	Event
3	LOGOUT
4	SEND
5	RECEIVE
7	REJECT
i9	MAXFAIL
10	EXPIRE

12 Command reference

12.1 Overview

The client utilities described below can be run from the command-line prompt in the operating system. They check EMGDIR/client.cfg for information about host, port, username and password. If all or part of this information is missing from the configuration file it has to be specified on the command-line.

All command utilities display help information when executed with "-help" as argument.

emgsend -help

The utilities will return exit codes as follows:

Exit code	Description
0	Successful

Exit code	Description
1	Missing username or password
2	Server host or port missing
3	Not possible to connect to the server
4	Invalid argument
5	Access denied

In your shell you can display the exit code by running "echo $?" after executing a command.

Example:

```
# emgsend 12345 "Test"
758901
# echo $?
0
```

12.2 emgclient

Interactive utility that enables a user to operate on messages, display queues and more. It uses the MGP protocol to communicate with the server. To be able to perform all available tasks and display all queue and orphan entries the user needs to be defined as an administrator.

You can use "help" to display available operations in the current context.

12.2.1 Options

Option	Description
--host <host name | IP address>	Use specified hostname when connecting to server
--port <port number>	Use specified port when connecting to server
--username <username>	Username for server authentication

Option	Description
--password <password>	Password for server authentication

12.3 emgd

The EMG server.

12.3.1 Options

Option	Description
--debug	Set log level to DEBUG and display information on stdout.
--exportxml	Export contents of embedded database into XML file, emg.xml.
--fg	Run in foreground, do not detach from tty.
--hostid	Display hostid as emgd reads it.
--importxml	Import contents from XML file, emg.xml, into embedded database.
--refresh	Refresh running server. Will close all open sessions.
--reload	Refresh running server without closing current sessions.
--stop	Stop running server.
--threadcount	Count the number of threads can can be created. This gives a hint on the total maximum number of instances the EMG server can handle since each connector instance requires 1 or 2 threads depending on protocol used.
--upgradedb	Upgrade the database schema. If the number of records are large this may take several hours when altering existing tables.
--upgradesql	Print the SQL commands that would be executed to upgrade the database schema without actually executing them.

Option	Description
-v	Display version and license information.
--verify	Parse the configuration file and report found configuration errors (without starting the server).

12.3.2 Examples

```
# emgd
# emgd --debug
```

12.4 emgload

Used for load testing and benchmarks. Acts as a message load generator.

12.5 emgsend

Used to send messages using the MGP protocol.

By default the newly assigned message id is displayed when the message has been successfully sent to the server.

12.5.1 Options

Option	Description
--host <host name | IP address>	Use specified hostname when connecting to server
--port <port number>	Use specified port when connecting to server
--username <username>	Username for server authentication
--password <password>	Password for server authentication
-b <filename>	

Option	Description
	Read recipients from the specified file. Format of file is one recipient per line.
--file <filename>	Read the message body from the specified file.
--hex	Message is hex encoded.
-o	Specify message options.
-q	Do not display message id.
--url	URL to use for HTTP based protocols.

12.5.2 Examples

```
# emgsend 4670123456 "Test message"
# emgsend -hex 4670123456 414243
# emgsend -o ROUTE=cimd2-1 -o SOURCEADDR=sender 4670123456 "Test
message"
```

12.6 emgsink

Used for load testing and benchmarks. Acts as a message sink.

12.7 emgstat

Display information about connectors and connector states.

12.7.1 Options

Option	Description
--host <host name | IP address>	Use specified hostname when connecting to server
--port <port number>	Use specified port when connecting to server

Option	Description
--username <username>	Username for server authentication
--password <password>	Password for server authentication
--db	Show database instance information
-x	Display detailed connector instance information.

12.7.2 Output description

Column	Description
NAME	Connector name
INDEX	Connector index or position server.cfg file
TYPE	IN for incoming, OUT for outgoing connector
PROTO	Protocol
INST	Number of instances
USED	Maximum number of instances that is or has been in use since system start
STATE	Connector state
QSIZE	Connector queue size. If connector has a configured max queue size it will be appended as a suffix, for example "3/100"
AVG 1M	Number of messages per sec processed during the last minute
AVG 5M	Number of messages per sec processed during the last 5 minutes
	Number of messages per sec processed during the last 15 minutes

Column	Description
AVG 15M	

12.7.3 Example

```
# emgstat
NAME              INDEX TYPE PROTO INST USED STATE  QSIZE  AVG 1M
AVG 5M AVG 15M
mgp-in1               0 IN   MGP      1    1 BOUND      0  0.00    0
.00   0.00
smpp-in1              1 IN   SMPP     7    1 BOUND      0  0.00    0
.00   0.00
smtp1                 2 OUT  SMTP     0    0 DEAD       0  0.00    0
.00   0.00
ucp-andrew            3 OUT  UCP      1    0 IDLE       0  0.00    0
.00   0.00
ucp-d2                4 OUT  UCP      1    0 IDLE       0  0.00    0
.00   0.00
cimd2-euro            5 OUT  CIMD2    1    0 IDLE       0  0.01    0
.01   0.00
```

13 Configuration options

All configuration options that specifies a filename can use absolute paths or relative paths which in that case will be relative to EMGDIR (default: /etc/emg).

13.1 General options

13.1.1 BACKEND

Syntax: BACKEND=<string>

Specifies the default backend to use for storing internal information such as queues, delivery reports etc. By default this is stored in indexed files in the file system but it is also possible to reference a database profile of type "MONGODB" for using a MongoDB database for storage enabling use of multiple active EMG nodes.

See also: BACKEND_DLR

Introduced in EMG 6.0

13.1.2 BACKEND_DLR

Syntax: BACKEND_DLR=<string>

Specifies the backend to use for open delivery report entries.

See also: BACKEND

Introduced in EMG 6.0

13.1.3 BLACKLIST

Syntax: BLACKLIST=<filename>

Specifies which file contains the system-wide blacklist. The format of the file is one entry per row where each entry consists of two or optionally three tab-separated fields. The first field is the sender or source address, the second field the action and the third optional field is either SOURCEADDR or DESTADDR to specify the type of address to be blacklisted. If the type of address is omitted it defaults to SOURCEADDR.

Possible values for action are: REJECT or LOG. Lines beginning with "#" are not processed.

Example:

070123456<TAB>REJECT<TAB>DESTADDR
070654321<TAB>LOG

13.1.4 CMREXPIRE

Syntax: CMREXPIRE=<integer>

Specifies the number of seconds routing information for concatenated messages should be kept. This value should be enough for all parts of a concatenated message to pass through EMG. However, in order to minimize overhead it should be kept as low as possible.

Default value: 60

Introduced in EMG 2.4

13.1.5 CONNECTORLOGDB

Syntax: CONNECTORLOGDB

DEPRECATED: Use ROUTELOGDB instead.

Log connectorlog to DB. Requires DBPROFILE to be set.

13.1.6 CONNECTOR_LOGLEVEL

Syntax: CONNECTOR_LOGLEVEL=<string>

Default log level for connector-related messages.

See also: LOGLEVEL, LOGPDU

Default: Same as LOGLEVEL

13.1.7 DBPROFILE

Syntax: DBPROFILE=<string>

Default database profile to use. A database profile is defined by a DB < ... > section in the server.cfg file.

13.1.8 DEFAULT_CHARGE

Syntax: DEFAULT_CHARGE=<float>

Default charge to deduct from database field emguser.charge_balance when a message is received by EMG.

Default value: 1.0

Introduced in EMG 5.3.

13.1.9 DISABLE_CREDITS

Syntax: DISABLE_CREDITS

Disable credits handling usually enabled when using a database.

13.1.10 DISABLE_MESSAGEBODY

Syntax: DISABLE_MESSAGEBODY

Do not use messagebody table when EMG is using a database.

13.1.11 DISABLE_MESSAGEOPTION

Syntax: DISABLE_MESSAGEOPTION

Do not use messageoption table when EMG is using a database.

13.1.12 DLRSSIZE

Syntax: DLRSSIZE=<value>

Maximum number of DLR entries stored in the system. When this limit is reached DLR entries the oldest entries will be discarded and a DLR with DLR_EXPIRES_STATUS will be sent, default "unknown".

Default: 100.000

Introduced in EMG 3.

13.1.13 DLRVP

Syntax: DLRVP=<value>

Specifies after how many seconds a DLR will expire if not successfully sent.

Default: 3600 (1 hour)

Introduced in EMG 2.4a.

13.1.14 DNSTHREADS

Syntax: DNSTHREADS=<integer>

Maximum number of DNS threads to use for DNS lookups.

Default value: 1

Introduced in EMG 3.

13.1.15 EXPIRE_INTERVAL

Syntax: EXPIRE_INTERVAL=<integer>

Interval (in seconds) between scanning for expired objects. Scanning too often may lead to performance degradation under heavy load and with large queues.

Default value: 2

Introduced in EMG 3.0.17.

13.1.16 IDWINDOW

Syntax: IDWINDOW=<integer>

Specifies the number of message ids that should be allocated from seqno (message id) counter each time. Each allocation will cause a disk write and when seqno database is on share storage (for example NAS/NFS) increasing the value may increase performance. If emgd stops ungracefully message ids may be lost if value > 1. This is usually unwanted but not a big problem.

Default value: 1

Introduced in EMG 5.2

13.1.17 KWSTORE_EXPIRES

Syntax: KWSTORE_EXPIRES=<integer>

Specifies the max age (in seconds) for the kwstore-*.hdb files. When a file is older than the specified value it will be removed next time kwstore file rotation occurs.

Default value: 259200 (=3 days)

Introduced in EMG 5.2.2.

13.1.18 KWSTORE_ROTATE_SIZE

Syntax: KWSTORE_ROTATE_SIZE=<value>[:<integer>]

Specifies the max size that the kwstore-1.hdb file is allowed to grow to until it is rotated.

The format is two fields colon-separated where the first fields indicates the size and the unit. The unit can be "k", "m" or "g" for kilobytes, megabytes and gigabytes. If unit is omitted, the default unit is bytes. Second (optional) field indicates the max number of files to save.

Default value: 536870912 (=512 MB)

Introduced in EMG 5.2.2.

13.1.19 LOGLEVEL

Syntax: LOGLEVEL=<string>

Specifies which information should be logged. When a level is specified messages related to that level or higher (more severe) is logged. INFO is most useful for ordinary production use, while DEBUG can be useful to track down problems. Errors at level WARNING and ERROR may indicate configuration problems, badly formatted incoming data etc, and usually require some action to be taken.

Values:

DEBUG2	Lowest level, volume affects performance
DEBUG	Volume affects performance
INFO	Default level
WARNING	
ERROR	Only errors or more severe information is logged
CRITICAL	

Default value: INFO

13.1.20 LOGYEAR

Syntax: LOGYEAR

When used format for date part of timestamp in log files will be according to ISO 8601, "YYYY-MM-DD hh:mm:ss.mmmmmm".

There are two advantages to the standard syslog format: It includes year and it is easy to sort.

Introduced in EMG 2.5.

13.1.21 MAXTOTALQUEUESIZE

Syntax: MAXTOTALQUEUESIZE=<integer>

When the total queue size for all connectors in EMG has exceeded this value EMG will reject further incoming messages temporarily until queue size decrease below the specified value.

Useful for (hard) message throttling avoiding that a large queue builds in EMG.

Introduced in EMG 2.5.

13.1.22 MAXTOTALQUEUESIZE_SOFT

Syntax: MAXTOTALQUEUESIZE_SOFT=<integer>

When the total queue size for all connectors in EMG has exceeded this value EMG will impose a delay of 0.1 second for each message effectively limiting the speed at which messages are received. Can be used in combination with MAXTOTALQUEUESIZE which rejects messages and the soft level should then be set slightly lower than the hard limit for best result.

Useful for (soft) message throttling avoiding that a large queue builds in EMG.

Introduced in EMG 2.5.

13.1.23 MERGE_EXPIRES

Syntax: MERGE_EXPIRES=<integer>

Speficies after how many seconds entries open for merge will expire. When EMG is supposed to merge parts of a concatenated message into a long message

Default: 10

Introduced in EMG 5.3.2.

13.1.24 NODEID

Syntax: NODEID=<integer>

Message id prefix to use for EMG instance. The top 4 digits in the 64-bit message id, used in EMG 5.3 and later, are reserved for the node id which can be used to ensure unique message ids will be used by different EMG servers in a multi-node deployment.

Allowed values: 0-8999

Default value: 0

13.1.25 NOEXPIRE

Syntax: NOEXPIRE

Specifies that messages in queue and orphans should not expire in EMG based on the validity period (VP). By default if a message has a VP set and EMG cannot send it before that period of time has elapsed it will expire and be removed from the queue.

13.1.26 NOFLUSH

Syntax: NOFLUSH

When used, queues are not flushed to disk when emgd is stopped. All queue entries are lost.

In EMG 1.0h the name of the file to which entries are flushed changed name from flush.dat to queues.dat.

In EMG 3 when file persistance is used messages are stored in separate files under the directory specified by the SPOOLDIR configuration option.

Introduced in EMG 1.0h

13.1.27 NOLOGSERVER

Syntax: NOLOGSERVER

Usually logging is handled by a separate thread. However, this means that there is a small delay before the event that triggers a log message occurs until it is really logged. When tracking down some problems it is useful to have logging take place synchronously which is done using this keyword.

Introduced in EMG 2.4b

13.1.28 ORPHANSSIZE

Syntax: ORPHANSSIZE=<integer>

Maximum number of entries in orphans queue.

When the maximum size is exceeded the oldest entry is discarded.

Default value: 10000

Introduced in EMG 1.0h

13.1.29 PERMIT_LOCALHOST

Syntax: PERMIT_LOCALHOST

Used to always allow connections from ip localhost addresses 127.0.0.1 (ipv4) and ::1 (ipv6).

Introduced in EMG 5.5.1.

13.1.30 PERSISTFILES

Syntax: PERSISTFILES

Specifies that message persistence to file (embedded DB) should be used. Since EMG 5.2 this option does not require an additional license.

See also: SPOOLDIR

Introduced in EMG 3.

13.1.31 PERSISTSIZE

Syntax: PERSISTSIZE=<integer>

Specifies the maximum size (in bytes) of message body that will be stored in the same persist file as the other message options. If the message size exceeds the specified value, the message body will be placed in a separate file and will only be loaded when needed. This may save considerable amounts of memory when handling many messages with large message bodies.

Default: 1024

Introduced in EMG 3

13.1.32 ROTATELOGS

Syntax: ROTATELOGS=<integer>[:<integer>]

Rotate log files based on size or time.

When rotation should be performed based on time the specified value should be an integer followed by "s", "m", "h", "d" or "w" indicating number of seconds, minutes, hours, days or weeks. The log files will be renamed by appending a timestamp to the current file name and a new output file will be created.

When rotating based on size the format is two fields colon-separated where the first fields indicates the size and the unit. The unit can be "k", "m" or "g" for kilobytes, megabytes and gigabytes. Second field indicates the number of files to save.

ROTATELOGS=2M:10 indicates that each log file will be rotated out when the file size exceeds 2 MB and that the 10 most recent files would be saved (with suffixes 0-9).

Introduced in EMG 2.0. Size-based rotation introduced in EMG 2.5.

13.1.33 ROUTEDLR

Syntax: ROUTEDLR=<string>

Specifies to which connector DLRs should be routed. This is the default route which can be overridden by the ROUTEDLR keyword on a specific connector.

Introduced in EMG 2.4a.

13.1.34 ROUTELOGDB

Syntax: ROUTELOGDB

Specifies that route log entries should be saved in database. The route log contains status for messages.

Introduced in EMG 3

13.1.35 ROUTELOGSIZE

Syntax: ROUTELOGSIZE=<integer>

Maximum number of entries in routing log.

When using ROUTELOGDB, this value is the number of entries to keep in memory, and can be left at the default setting. Entries are never deleted from the database, regardless of this value.

When the maximum size is exceeded the oldest entry is discarded.

Default value: 10000

13.1.36 ROUTING

Syntax: ROUTING=<filename>

Specifies which file contains the routing table. The format of the file is one entry per row where each entry consists of minimum two and maximum three tab-separated fields. Lines beginning with "#" are not processed.

The fields are:

· Incoming connector or address
If field starts with "<" it will be matched to the source (sender) address.
if field starts with ">" it will be matched to the destination (recipient) address.
If field starts with "@" it is taken as a file containing destination address prefixes.
If field does not start with any of the characters above it is taken as a name of an incoming connector.
If the value of the field contains any of the characters "*.?[" it is considered a regular expression.

· Outgoing connector(s)
If more than one connector is specified fail-over and optionally load-balancing will take place for the specified connectors.

· Extra options:
LB, KEYWORD, KEYWORDSESSION, PLUGINARG, SET, USERNAME, or URL

LB is used to specify load-balancing between the outgoing connectors.

KEYWORD is used for keyword-based routing and specifies a source address/keyword pair combination where source address and keyword can be "*" used as wildcard.
Example: KEYWORD=*:BALANCE

KEYWORDSESSION Specifies that keyword sessions should be used enabling routing of subsequent messages from the same sender to the same destination even if they do not contain a valid keyword.

PLUGINARG A string that will be set as the PLUGINARG option on the message which can be used by external plugins.

SET Set message option(s). Please see Routing chapter for more info.

USERNAME=user Specifies that only specified user can receive the message over the connector to which the message is routed.

URL Specifies that a specific URL should be used when message is routed to a connector that uses a HTTP-based protocol.

13.1.37 SERVERNAME

Syntax: SERVERNAME=<string>

Specifies server name as passed to MGP clients upon login. For example used by the EMG SNMP Agent.

Default value is EMG.

Introduced in EMG 2.5

13.1.38 SHMKEY

Syntax: SHMKEY=<integer>

Each EMG server uses a shared memory segment. In order to be able to run multiple servers on the same machine each EMG server needs a unique shared memory key.

You can run the command "ipcs -m" to see what share memory keys are in use. Values are presented in hex.

Default value is 2555674929 (decimal).

Introduced in EMG 2.3

13.1.39 SPOOLDIR

Syntax: SPOOLDIR=<directory>

Directory to use for spool files. This include queue entries, SAT entries and message id file.

Default: $EMGDIR/spool

Introduced in EMG 3

13.1.40 SSL_KEYFILE

Syntax: SSL_KEYFILE=<filename>

Specifies the server-wide PEM-file where key and certificate is stored for use by SSL connectors.

Introduced in EMG 2.0

See also: Connector option SSL_KEYFILE

13.1.41 SSL_PASSWORD

Syntax: SSL_PASSWORD=<string>

Specifies the password, if any, used for the key file.

Introduced in EMG 2.0

See also: SSL_KEYFILE

13.1.42 TABLE_PREFIX

Syntax: TABLE_PREFIX=<string>

Use specified prefix when referencing DB tables.

If prefix is defined as "emg30_" then the connector log table will be referenced as "emg30_connectorlog". Please note that the schema SQL file needs to be edited and in order for the schema to be created accordingly.

Introduced in EMG 3.0

13.1.43 TIME_OFFSET

Syntax: TIME_OFFSET=<integer>

Specifies an offset, in minutes, to be added to the current time. Negative values are allowed. Useful, for example, when the server time is in UTC and log files etc should reflect the local time instead.

Introduced in EMG 3.0

13.1.44 WHITELIST

Syntax: WHITELIST=<filename>

Specifies which file contains the system-wide whitelist. The format of the file is one entry per row where each entry consists of two or optionally three tab-separated fields. The first field is the sender or source address, the second field the action and the third optional field is either SOURCEADDR or DESTADDR to specify the type of address to be whitelisted. If the type of address is omitted it defaults to SOURCEADDR.

Possible values for action are: OK or LOG. Lines beginning with "#" are not processed.

Example:

070123456<TAB>OK<TAB>DESTADDR
070654321<TAB>LOG

Introduced in EMG 2.0

13.2 Connector options

13.2.1 ACCESS

Syntax: ACCESS=<string>

Access control

Only valid for incoming connectors. Specifies which host(s) or subnet(s) are allowed to make connections to the connector.

Example:

# Only permit connections from the host 192.168.0.1
ACCESS=192.168.0.1/32
# Only permit connections from the subnets 10.2 and 10.3.1 ACCESS=10.2.0.0/16,10.3.1.0/24

13.2.2 ADDRESS

Syntax: ADDRESS=<string>

For protocol EBE the value is the program to be executed (including the full path to the program).

For protocol HTTP the value is a URL to be called.

For all other protocols the value is the IP address (IPv4 or IPv6) host and port separated with a ":". IPv6 addresses must be surrounded by brackets.

Example:

ADDRESS=/opt/emg/bin/report.sh
ADDRESS=localhost:7186
ADDRESS=[::1]:80
ADDRESS=http://www.example.com/sender/

IPv6 support introduced in EMG 5.5.

13.2.3 ADDRESSRANGE

Syntax: ADDRESSRANGE=<integer>

Specifies the address_range parameter for SMPP bind operations.

Applies to: SMPP (Outgoing)

See also: AUTHNPI, AUTHTON

13.2.4 ALLOWROUTE

Syntax: ALLOWROUTE

When specified non-admin users will be allowed to specify a message-specific route via ROUTE keyword.

Applies to: MGP, HTTP, SMTP (Incoming)

13.2.5 AUTHCODE

Syntax: AUTHCODE=<string>

Sets the field AC (authentication code originator) in UCP submit operation.

Applies to: UCP (Outgoing, operation 51)

13.2.6 AUTHNPI

Syntax: AUTHTON=<integer>

Number-Plan Indicator (NPI) for authentication operation

Applies to: SMPP (Outgoing), UCP (Outgoing, operation 60)

See also: AUTHTON

13.2.7 AUTHTON

Syntax: AUTHTON=<integer>

Type Of Number (TON) for authentication operation

Applies to: SMPP (Outgoing), UCP (Outgoing, operation 60)

See also: AUTHNPI

13.2.8 AUTOMATICTONNPI

Syntax: AUTOMATICTONNPI

When specified EMG will try to determine correct TON and NPI for source address based on the address format.

TON/NPI is determined according to the following rules:

If first digit is not numeric or "+", then alphanumeric.
If address length <=5 then shortcode.
Otherwise "unknown" which will then fall back on default values if defined.

Alphanumeric TON/NPI = 5/0
Shortcode TON/NPI = 3/0
Default TON/NPI = 1/0

The TON/NPI value used by this option can be modified using the AUTOMATICTONNPI_*_TON/NPI keywords.

Applies to: Outgoing messages

13.2.9 AUTOMATICTONNPI_ALPHANUMERIC_NPI

Syntax: AUTOMATICTONNPI_ALPHANUMERIC_NPI=<integer>

Introduced in EMG 3.0.

13.2.10 AUTOMATICTONNPI_ALPHANUMERIC_TON

Syntax: AUTOMATICTONNPI_ALPHANUMERIC_TON=<integer>

Introduced in EMG 3.0.

13.2.11 AUTOMATICTONNPI_DEFAULT_NPI

Syntax: AUTOMATICTONNPI_DEFAULT_NPI=<integer>

Introduced in EMG 3.0.

13.2.12 AUTOMATICTONNPI_DEFAULT_TON

Syntax: AUTOMATICTONNPI_DEFAULT_TON=<integer>

Introduced in EMG 3.0.

13.2.13 AUTOMATICTONNPI_SHORTCODE_NPI

Syntax: AUTOMATICTONNPI_SHORTCODE_NPI=<integer>

Introduced in EMG 3.0.

13.2.14 AUTOMATICTONNPI_SHORTCODE_TON

Syntax: AUTOMATICTONNPI_SHORTCODE_TON=<integer>

Introduced in EMG 3.0.

13.2.15 BINARYMAPPING

Syntax: BINARYMAPPING

Specifies that mappings should be applied to binary messages.

Introduced in EMG 5.

13.2.16 BLACKLIST

Syntax: BLACKLIST=<filename>

Specifies which file contains the connector-specific blacklist.

Format is same as for general keyword BLACKLIST.

Introduced in EMG 2.0

13.2.17 CDMA

Syntax: CDMA

When specified contatenated message UDH will always be added to binary messages even if only one part. This is required for correct functionality when using CMDA SMSC.

13.2.18 CDMA_NO_PORTS

Syntax: CDMA_NO_PORTS

Suppress port information from message payload.

13.2.19 CDRFIELDS

Syntax: CDRFIELDS=<string>

Only used by EMG Roamer.

13.2.20 CMR

Syntax: CMR

Enables Concatenated Message Routing (CMR) for connector. CMR is used for ensuring that different parts of the same contatenated message is routed via the same connector which is sometimes necessary in order for the receiving phone to be able to reassemble the message correctly.

13.2.21 DEFAULT_CHARCODE

Syntax: DEFAULT_CHARCODE=<string>

Default value for character code

13.2.22 DEFAULT_DESTADDRNPI

Syntax: DEFAULT_DESTADDRNPI=<integer>

Default value for destination address (recipient) NPI.

13.2.23 DEFAULT_DESTADDRNPI_IN

Syntax: DEFAULT_DESTADDRNPI_IN=<integer>

Same as DEFAULT_DESTADDRNPI but applies to recieved messages.

13.2.24 DEFAULT_DESTADDRTON

Syntax: DEFAULT_DESTADDRTON=<integer>

Default value for destination address (recipient) TON

13.2.25 DEFAULT_DESTADDRTON_IN

Syntax: DEFAULT_DESTADDRTON_IN=<integer>

Same as DEFAULT_DESTADDRTON but applies to recieved messages.

13.2.26 DEFAULT_DLR

Syntax: DEFAULT_DLR=<integer>

Default value for delivery receipt (DLR)

13.2.27 DEFAULT_DLR_IN

Syntax: DEFAULT_DLR_IN=<integer>

Default value for delivery receipt (DLR) for received messages.

13.2.28 DEFAULT_DLR_OUT

Syntax: DEFAULT_DLR_OUT=<integer>

Default value for delivery receipt (DLR) for sent messages.

13.2.29 DEFAULT_DLRADDRESS

Syntax: DEFAULT_DLRADDRESS=<string>

Specifies a default address for delivering DLRs.

Applies to: MM7

Introduced in EMG 3

13.2.30 DEFAULT_MSGTYPE

Syntax: DEFAULT_MSGTYPE=<string>

Specifies the default message type for messages received over the connector.

Values:
NORMAL SMS
EMAIL Email message (RFC 822 or RFC 1521, MIME)
MMS MMS

Default value is NORMAL.

13.2.31 DEFAULT_NT

Syntax: DEFAULT_NT=<integer>

Set default value for UCP option NT when field is empty in received UCP pdu.

13.2.32 DEFAULT_PROTOCOLID

Syntax: DEFAULT_PROTOCOLID=<integer>

Set default value for protocol id (GSM 3.40 TP-PID).

13.2.33 DEFAULT_QPRIORITY

Syntax: DEFAULT_QPRIORITY=<integer, 1-5>

Default queue priority for messages in EMG. The lower the value the higher priority. When queued messages are processed a message with lower priority always is transmitted before messages with higher priority. If no priority is specified a priority of 3 is assigned.

13.2.34 DEFAULT_SMSCOP

Syntax: DEFAULT_SMSCOP=<string>

Default value for SMSC operation

Protocol Value Operation used
SMPP 1 submit_sm
SMPP 2 data_sm (default for SMPP 3.4)
HTTP 1 GET (default)
HTTP 2 POST

13.2.35 DEFAULT_SOURCEADDR

Syntax: DEFAULT_SOURCEADDR=<string>

Default value for source address (sender)

13.2.36 DEFAULT_SOURCEADDRNPI

Syntax: DEFAULT_SOURCEADDRNPI=<integer>

Default value for source address (sender) number plan indicator (NPI).

13.2.37 DEFAULT_SOURCEADDRNPI_IN

Syntax: DEFAULT_SOURCEADDRNPI_IN=<integer>

Same as DEFAULT_SOURCEADDRNPI but applies to received messages.

13.2.38 DEFAULT_SOURCEADDRTON

Syntax: DEFAULT_SOURCEADDRTON=<integer>

Default value for source address (sender) type of number (TON).

13.2.39 DEFAULT_SOURCEADDRTON_IN

Syntax: DEFAULT_SOURCEADDRTON_IN=<integer>

Same as DEFAULT_SOURCEADDRTON but applies to received messages.

13.2.40 DEFAULT_VP

Syntax: DEFAULT_VP=<integer>

Default value for validity period (in seconds)

See also: FORCE_VP

13.2.41 DELAYFIRSTMESSAGE

Syntax: DELAYFIRSTMESSAGE=<integer>

Specifies a delay (in seconds) to be imposed before first message is sent over a connection.

Introduced in EMG 3.0.5.

13.2.42 DESTFULLNAME

Syntax: DESTFULLNAME=<string>

Specifies a default full name for destination address.

Applies to: SMTP (outgoing)

13.2.43 DLR_ERR_HEX

Syntax: DLR_ERR_HEX

Treat the error code "err" in SMPP delivery receipts as a hex value.

Applies both sent and received delivery reports.

13.2.44 DLREXPIRES

Syntax: DLREXPIRES=<integer>

Specifies the time, in seconds, before a DLR entry expires.

Default: 262800 (73 hours)

13.2.45 DLR_EXPIRES_STATUS

Syntax: DLR_EXPIRES_STATUS=<string>

Specifies the status to be set for messages when their corresponding DLR entry expires.

Allowed values: "UNKNOWN", "DELIVERED", "INPROCESS", "FAILED", "DELETED", "EXPIRED", "REJECTED", "CANCELED", "QUEUED", "ORPHANED", "RELAYED"

Default: "UNKNOWN"

13.2.46 DLR_SUPPORT

Syntax: DLR_SUPPORT=<integer>

Specifies whether remote entity is expected to send back delivery reports. If not supported (DLR_SUPPORT=0), EMG will generate a delivery report even if message is forwarded successfully.

Default: 0 (EBE, HTTP, MGP, SMTP, incoming UCP), 1 (other protocols)

Introduced in EMG 5.2.19.

13.2.47 DLR_TEXT_FORMAT

Syntax: DLR_TEXT_FORMAT=<integer>

Specifies the format used for delivery reports sent by EMG.

Value	Format
0	id, sub, dlvrd, submit date, done date, stat:, err:, text:
1	id, submit date, done date, stat, err
2	id, submit date, done date, stat, err, text
3	id, submit date, done date, stat
4	id, submit date, done date, stat, text
5	id, sub, dlvrd, done date, stat, err
6	id, sub, dlvrd, done date, stat, err, text

Applies to: SMPP

Default: 0

Introduced in EMG 5.5.

13.2.48 DLRIGNOREKEYWORD

Syntax: DLRIGNOREKEYWORD

Ignore message id and only compare source and destination address when searching for DLR.

Use of this keyword is stronly disencouraged since it will cause a linear search and have a severe impact on performance.

13.2.49 DLRMINMATCHLENGTH

Syntax: DLRMINMATCHLENGTH=<integer>

Minimum number of characters of address (starting from end) that must match when matching DLRs.

Default value: 3

Introduced in EMG 2.5b.

13.2.50 DOMAIN

Syntax: DOMAIN=<string>

If an address does not contain a domain part when being sent out over an SMTP connector the specified domain name is added.

Applies to: SMTP (outgoing)

13.2.51 ERRORCODE_MAP

Syntax: ERRORCODE_MAP=<filename>

Used to map error/reason codes in delivery reports to custom values.

It must point to a file with from and to value specified in two columns separated by tab. Valkues must be decimal values (base 10).

Introduced in EMG 5.5.1

13.2.52 FAILOVER

Syntax: FAILOVER=<string>

Specifies an alternate connector to use if an error is received for a specific message in response to the submit operation. The message is then re-routed to the specified connector.

Applies to: All protocols

Introduced in EMG 3.0.16

13.2.53 FAILOVER_ALL

Syntax: FAILOVER=<string>

Specifies an alternate connector to use if connector goes into "error" state. All messages in queue will be re-routed to the specified connector.

Applies to: All protocols

Introduced in EMG 3.0.17

13.2.54 FAILOVER_ALL_TO_SELF

Syntax: FAILOVER_ALL_TO_SELF

Prevent message from being re-routed to another connector when connector goes into "error" state. This can be useful if address-based routing is used but address is rewritten after routing has been performed and a re-route therefore would cause the message to be re-routed incorrectly.

Applies to: All protocols

Introduced in EMG 5.2.19

13.2.55 FIRST_TRN

Syntax: FIRST_TRN=<integer>

Specifies that another transaction number should be used instead of default. Applies to SMPP connectors that connect to a remote entity that requires a certain transaction number for the first transaction.

13.2.56 FORCE_CHARCODE

Syntax: FORCE_CHARCODE=<integer>

Replaces character code on the message with the specified value.

Values:

0 Default
1 IA5
2 8-bit
4 UCS2

13.2.57 FORCECLOSE

Syntax: FORCECLOSE

Specifies that the connection should be closed after the current request.

Applies to: HTTP

13.2.58 FORCE_DCS

Syntax: FORCE_DCS=<integer>

13.2.59 FORCE_DESTADDR

Syntax: FORCE_DESTADDR=<string>

If present the specified message destination address will be set to this value even if already present in the message.

13.2.60 FORCE_DESTADDR_IN

Syntax: FORCE_DESTADDR_IN=<string>

Same as FORCE_DESTADDR but applies to received messages.

13.2.61 FORCE_DESTADDRNPI

Syntax: FORCE_DESTADDRNPI=<integer>

If present the specified message destination address number plan indicator (NPI) will be set to this value even if already present in the message.

Introduced in EMG 2.4b.

13.2.62 FORCE_DESTADDRNPI_IN

Syntax: FORCE_DESTADDRNPI_IN=<string>

Same as FORCE_DESTADDRNPI but applies to received messages.

13.2.63 FORCE_DESTADDRTON

Syntax: FORCE_DESTADDRTON=<integer>

If present the specified message destination address type of number (TON) will be set to this value even if already present in the message.

Introduced in EMG 2.4b.

13.2.64 FORCE_DESTADDRTON_IN

Syntax: FORCE_DESTADDRTON_IN=<string>

Same as FORCE_DESTADDRTON but applies to received messages.

13.2.65 FORCE_DESTPORT_IN

Syntax: FORCE_DESTPORT_IN=<integer>

Set destination port (UDH) of received messages to the specified value.

Introduced in EMG 3.0.16

13.2.66 FORCE_DLR

Syntax: FORCE_DLR=<integer>

Specifies that DLRs should always be requested regardless what is set in the message received.

13.2.67 FORCE_DLR_IN

Syntax: FORCE_DLR_IN=<integer>

Specifies that DLRs should always be requested regardless what is set in the message received.

Applies to received messages.

13.2.68 FORCE_DLR_OUT

Syntax: FORCE_DLR_OUT=<integer>

Specifies that DLRs should always be requested regardless what is set in the message received.

Applies to sent messages.

13.2.69 FORCE_MESSAGE

Syntax: FORCE_MESSAGE=<string>

Replaces message body with the specified message body.

13.2.70 FORCE_PRIORITY

Syntax: FORCE_PRIORITY=<integer>

Replaces message priority with the specified priority.

13.2.71 FORCE_PROTOCOLID

Syntax: FORCE_PROTOCOLID=<integer>

Replaces message protocol id (GSM 3.40 TP-PID) with the specified protocol id.

13.2.72 FORCE_SERVICETYPE

Syntax: FORCE_SERVICETYPE=<integer>

Replaces message service type with the specified service type on messages sent over the connector.

13.2.73 FORCE_SERVICETYPE_IN

Syntax: FORCE_SERVICETYPE_IN=<integer>

Same as FORCE_SERVICETYPE but applies to messages received over the connector.

13.2.74 FORCE_SOURCEADDR

Syntax: FORCE_SOURCEADDR=<string>

If present the specified message source address will be set to this value even if already present in the message.

13.2.75 FORCE_SOURCEADDR_IN

Syntax: FORCE_SOURCEADDR_IN=<string>

Same as FORCE_SOURCEADDR but applies to received messages.

13.2.76 FORCE_SOURCEADDRNPI

Syntax: FORCE_SOURCEADDRNPI=<integer>

If present the specified message source address number plan indicator (NPI) will be set to this value even if already present in the message.

Introduced in EMG 2.4b.

13.2.77 FORCE_SOURCEADDRNPI_IN

Syntax: FORCE_SOURCEADDRNPI_IN=<integer>

Same as FORCE_SOURCEADDRNPI but applies to received messages.

13.2.78 FORCE_SOURCEADDRTON

Syntax: FORCE_SOURCEADDRTON=<integer>

f present the specified message source address type of number (TON) will be set to this value even if already present in the message.

Introduced in EMG 2.4b.

13.2.79 FORCE_SOURCEADDRTON_IN

Syntax: FORCE_SOURCEADDRTON_IN=<integer>

Same as FORCE_SOURCEADDRTON but applies to received messages.

13.2.80 FORCE_SOURCEPORT_IN

Syntax: FORCE_SOURCEPORT_IN=<integer>

Set source port (UDH) of received messages to the specified value.

Introduced in EMG 3.0.16

13.2.81 FORCE_VP

Syntax: FORCE_VP=<integer> or blank

Force the validity period to be set to the specified value (seconds) for all messages received through the connector. To compare with the DEFAULT_VP which sets the validity period for the message only if it is missing.

From EMG 5.2.8, if no value is specified ("FORCE_VP=") any existing VP information on the message received will be removed.

Introduced in EMG 1.0n as VP, changed to FORCE_VP in EMG 2.4.

See also: DEFAULT_VP

13.2.82 GSMNOSCA

Syntax: GSMNOSCA

SCA (Service Center Address) should not be included in PDU. Needed for some GSM devices.

13.2.83 GSMSTORE

Syntax: GSMSTORE=<string>

Specifies what kind of storage should be used for messages. Ericsson devices store messages in memory and require GSMSTORE=ME.

13.2.84 HEXID

Syntax: HEXID=<integer, 0 or 1>

In SMPP 3.3 message ids are returned in submit_sm_resp operations as a hexadecimal value while in SMPP 3.4 message ids are alphanumeric. However, some SMSCs do not comply with that or are configurable. Using this behavior it is possible to toggle how EMG should treat the message ids.

Applies to: SMPP

Introduced in EMG 3.

13.2.85 HOME_IMSI

Syntax: HOME_IMSI=<string>

Only used by EMG Roamer.

13.2.86 HOME_VLR

Syntax: HOME_VLR=<string>

Only used by EMG Roamer.

13.2.87 IDLETIMEOUT

IDLETIMEOUT=<integer>

Idle timeout (in seconds). When connector has been idle for the specified period of time the connector is disconnected. If a value of 0 is specified this feature is disabled and the connector will not timeout. Please note however that the connector will detect if the remote peer is disconnected by for example a network timeout.

Default values:
10 seconds (outgoing)
60 seconds (incoming)

13.2.88 IGNOREMAXTOTALQUEUESIZE

Syntax: IGNOREMAXTOTALQUEUESIZE

13.2.89 INHERIT

Syntax: INHERIT=<string>

Used to specify that connector options should be inherited from another connector (parent). A connector is only allowed to inherit from one other connector. If a connector option is present for the child connector then the> parent is ignored for that keyword.

Introduced in EMG 3.

See also: VIRTUAL

13.2.90 INITSTRING

Syntax: INITSTRING=<string>

Modem initialization string (AT-command sequence)

For dial-up connectors using a modem this keyword can be used to specify a command string to be sent to the modem before the AT dial command is sent.

13.2.91 INSTANCES

Syntax: INSTANCES=<integer, 0-999>

Number of instances for connector

A connector can exist in zero or more instances. Zero instances means the connector is dead. When a message is being sent via a connector any of the instances can be used. Normally you would specify 1 to get one instance of an outgoing connector until there is a specific reason to change this. Incoming connectors need to be available in more than one instance if you want to be able accept multiple connections simultaneously.

Please note that each connector instance will use two threads and that the total number of threads available in the operating system will be limited.

13.2.92 INTERFACEVERSION

Syntax: INTERFACEVERSION=<string>

Protocol version for the interface.

Values:
SMPP: "33", "34" or "50" for SMPP 3.3, 3.4 and 5.0 respectively.

Default values:
SMPP: "34"
MM7: "REL-5-MM7-1-2".

13.2.93 KEEPALIVE

Syntax: KEEPALIVE=<integer>

Time (in seconds) between keepalive packets

Only valid for outgoing connections. Specifies how often keepalive packets should be sent to avoid connection timeout on a static connection.

See also: STATIC

13.2.94 LIBRARY

Syntax: LIBRARY=<filename>

Used for customized connector implementations.

Applies to: Protocol DLL

Introduced in EMG 3.

13.2.95 LOCALDOMAINS

Syntax: LOCALDOMAINS=<string>

Specifies one or more domains handled by EMG and will be used together with keyword LOCALIPS to determine whether relaying is allowed or not.

Multiple occurances allowed.

Applies to: SMTP (incoming)

Introduced in EMG 3.

13.2.96 LOCALIPS

Syntax: LOCALIPS=<string>

Specifies one or more IP addresses to be considered local and will be used together with keyword LOCALDOMAINS to determine whether relaying is allowed or not.

Multiple occurances allowed.

Applies to: SMTP (incoming)

Introduced in EMG 3.

13.2.97 LOGLEVEL

Syntax: LOGLEVEL=<string>

Log level for connector-specific entries in general log file.

Values:DEBUG2, DEBUG, INFO, WARNING, ERROR, CRITICAL

See also: LOGPDU

13.2.98 LOGMESSAGE

Syntax: LOGMESSAGE=<integer>

Specifies that the message data, or part of the message data, should be logged to the connector log file. By default only the length of message is logged to the connector log file, not the contents.

The message data is hex encoded in the log file.

13.2.99 LOGPDU

Syntax: LOGPDU

At log level DEBUG or DEBUG2, the protocol data units that are sent and received by the connectors are logged to files with the names pdu.<connectorname>, in the log directory. Set the LOGPDU option to enable this log at other log levels.

Introduced in EMG 3.

13.2.100 LONGMESSAGE

Syntax: LONGMESSAGE=<integer, 0-255>

Number of messages a long message (longer than MESSAGELENGTH, default 160 septets) can be split into.

Default value: 4

13.2.101 LONGMODE

Syntax: LONGMODE=<string>

How to handle messages that exceed the maximum message length.

The maximum length of a message is the value of MESSAGELENGTH x the value of LONGMESSAGE. If a mesfsage exceeds that length it can either be truncated or rejected.

Values: REJECT, TRUNCATE

Default value: TRUNCATE

13.2.102 MAPPING

Syntax: MAPPING=<filename>

Specifies a file containing a mapping.

13.2.103 MASQUERADE

Syntax: MASQUERADE=<string>

Introduced in EMG 3.

13.2.104 MAXFAILEDCONNECTS

Syntax: MAXFAILEDCONNECTS=<integer>

Number of connection attempts before state ERROR

See also: RETRYTIME, MAXFAILEDSLEEP

13.2.105 MAXFAILEDSLEEP

Syntax: MAXFAILEDSLEEP=<integer>

Time (in seconds) to sleep in state ERROR.

Default: 60

See also: RETRYTIME, MAXFAILEDCONNECTS

13.2.106 MAXMESSAGELENGTH

Syntax: MAXMESSAGELENGTH=<integer>

Specifies the maximum length of a message that will be accepted. Messages longer will be rejected with the SMTP error code 552.

Default value: 30000 bytes

Applies to: SMTP (incoming)

13.2.107 MAXTRIES

Syntax: MAXTRIES=<integer>

Specifies the maximum number of times delivery may fail before message is considered undeliverable.

Default value: 10

Introduced in EMG 2.5.

13.2.108 MESSAGEID_PREFIX

Syntax: MESSAGEID_PREFIX=<string>

Specifies which message id prefix will be handled by remote entity. Used in raw multi-proxy mode to route cancel/delete/replace operations to the correct SMSC.

Applies to: Outgoing SMPP connector in raw proxy mode

13.2.109 MESSAGELENGTH

Syntax: MESSAGELENGTH=<integer>

Specifies the length of a message.

Default value: 160

Applies to: CIMD2, SMPP, UCP/EMI

See also: LONGMESSAGE, LONGMODE

13.2.110 MESSAGEMODE

Syntax: MESSAGEMODE=<string>

Introduced in EMG 3.

13.2.111 MESSAGES_PER_REQUEST

Syntax: MESSAGES_PRE_REQUEST=<integer>

Introduced in EMG 3.

13.2.112 MIMEBOUNDARY

Syntax: MIMEBOUNDARY=<string>

Introduced in EMG 3.

13.2.113 MMS_TEXT_CHARSET

Syntax: MMS_TEXT_CHARSET=<string>

Introduced in EMG 3.

13.2.114 MODE

Syntax: MODE=<string>

Specifies whether a connector should be allowed to transmit (TX), receive (RX) or both transmit and receive (TRX) messages.

A connector that receives a message but is only permitted to transmit messages will reject the operation.

If a message is put in the connector queue for a connector that is only allowed to receive message the message will simply remain in the queue.

For SMPP 3.3 connectors this keyword determines whether a bind_transmitter or bind_receiver will be issued during login. For TX and TRX bind_transmitter will be used, for RX bind_receiver.

Values: RX, TX, TRX

Default value: TRX

Introduced in EMG 1.0l.

13.2.115 MODEM

Syntax: MODEM=<string>

Modem device

Used for outgoing, dial-up connectors. Specifies the tty (without the leading `/dev/') to use for dialing when making a connection.

13.2.116 MODEM_BPS

Syntax: MODEM_BPS=<integer>

Bit rate (bps) between server and GSM modem.

Default value: 9600

Introduced in EMG 3.0.17.

13.2.117 MSGDELAY

Syntax: MSGDELAY=<integer>

Delay between messages (in seconds)

Used to specify that a delay should be applied after a message has been sent. This can be useful or even required for low-performance links, modem connections etc.

13.2.118 MSGRETRYTIME

Syntax: MSGRETRYTIME=<integer>

Introduced in EMG 3.

13.2.119 NOBINARYMAPPING

Syntax: NOBINARYMAPPING

Suppresses messages being applied to binary messages.

See also: NOUCS2MAPPING, BINARYMAPPING, USC2MAPPING

Introduced in EMG 2.5. From EMG 5 this is the default behaviour.

13.2.120 NOUCS2MAPPING

Syntax: NOUCS2MAPPING

Suppresses messages being applied to UCS2 (Unicode 16-bit) messages.

See also: NOUCS2MAPPING, BINARYMAPPING, USC2MAPPING

Introduced in EMG 2.5. From EMG 5 this is the default behaviour.

13.2.121 NOUSERMESSAGEREFERENCE

Syntax: NOUSERMESSAGEREFERENCE

Suppress adding SMPP optional parameter user_message_reference when using SMPP 3.4.

Introduced in EMG 3.

13.2.122 OPSENTEXPIRES

Syntax: OPSENTEXPIRES=<integer>

Specifies the number of seconds to wait for a response to a sent operation before expiring the operation.

Default value: 30

13.2.123 OPS_MAXEXPIRED

Syntax: OPS_MAXEXPIRED=<integer>

Maximum number of operations expired before disconnect.

Default value: 0 (never disconnect)

Applies to: CIMD2, OIS, SMPP, UCP

13.2.124 OPS_MAXOUTSTANDING

Syntax: OPS_MAXOUTSTANDING=<integer>

Obsoleted in EMG 5. Use WINDOWSIZE instead.

13.2.125 OPS_MAXPENDING

Syntax: OPS_MAXPENDING=<integer>

Obsoleted in EMG 5. Use WINDOWSIZE instead.

13.2.126 OPS_MAXPERSESSION

Syntax: OPS_MAXPERSESSION=<integer>

Maximum number of operations to send per session

When this limit has been reached the connector will disconnect.

Applies to: CIMD2, OIS, SMPP, UCP

13.2.127 ORIGIN

Syntax: ORIGIN=<string>

Adds MGP option MGP_OPTION_ORIGIN with the specified value to messages received on the connector.

Introduced in EMG 3.

13.2.128 PARSEMESSAGE

Syntax: PARSEMESSAGE=<string>

Used to parse a message for message options. The format for the supplied string is <message option>[<separator><message option>[...]]. The message is always expected to be the last option and indicates that the rest of the message contains the message body.

Example:

PARSEMESSAGE=DESTADDR MESSAGE

When a message is received it will be expected to contain the destination address followed by a space, ` `, and then the message body. In this case the destination address in the message will override any destination address supplied in other ways. The special keyword KEYWORD can be used for keyword-based routing and will be used together with keywords optionally specified in the routing table.

Applies to: All protocols (incoming)

13.2.129 PASSWORD

Syntax: PASSWORD=<string>

Used for outgoing connector authentication via the connector protocol.

Applies to: All protocols (outgoing)

13.2.130 PLUGIN

Syntax: PLUGIN=<string>

Introduced in EMG 3.

13.2.131 POLLRECEIVE

Syntax: POLLRECEIVE=<integer>

Time (in seconds) between message polls.

Indicates that the connector should connect periodically to allow for messages to be received over the incoming connector. This is used when EMG needs to connect to the SMSC in order to receive messages and the connection cannot be static.

Applies to: CIMD2 and SMPP (outgoing)

13.2.132 PRE_SPLITf

Syntax: PRE_SPLIT

Split long messages before they are processed by EMG. This will in effect cause one long message to be split into multiple messages where each message part will be assigned its own EMG message id.

If message credit handling is used messages for pre-paid customers will only be accepted if credit balance allows all message parts to be received. That is if credits balance is 3 and a message which will be split into 2 message parts is received and 2 recipients are specified only the message for the first recipient will be received and the other will be rejected.

Applies to: HTTP and SMTP (incoming)

Introduced in EMG 5.2.8.

13.2.133 PREFIX

Syntax: PREFIX=<string>

Introduced in EMG 3.

13.2.134 PRESERVESAR

Syntax: PRESERVESAR

Introduced in EMG 3.

13.2.135 PROMPT

Syntax: PROMPT=<string>

Specifies a string to be sent to the client side after connect before the protocol server starts. A newline will be added after the string.

Applies to: All protocols (incoming)

13.2.136 PROTOCOL

Syntax: PROTOCOL=<string>

Protocol used by the connector.

Values: CIMD2, DLL, EBE, GSM, HTTP, HTTPS, MGP, MM1, MM7, OIS, PAP, ROUTE, SMPP, SMTP, UCP

13.2.137 PROXY

Syntax: PROXY=<connector1>[,<connector2>[/LB|/MULTI]]

Specifies that the connector should operate in proxy mode. For more information see chapter "Proxy mode".

Applies to: UCP or SMPP incoming, must map to SMPP outgoing

Introduced in EMG 5.2.

13.2.138 PROXYRAW

Syntax: PROXYRAW=<connector1>[,<connector2>[/LB|/MULTI]]

Specifies that the connector should operate in raw proxy mode. For more information see chapter "Proxy mode".

Applies to: SMPP incoming, must map to SMPP outgoing

Introduced in EMG 5.4.

13.2.139 QUOTEDREPLY_SEPARATOR

Syntax: QUOTEDREPLY_SEPARATOR=<string>

Specifies separator to be used between reply and original message when using quoted reply option.

Default: "--- Original message below ---"

Introduced in EMG 3.0.

13.2.140 QUOTEDSUBJECT

Syntax: QUOTEDSUBJECT=<string>

Indicates that when a message is going to be sent out using SMTP the message subject is part of the message. The supplied string must consist of 2 characters where the first character indicates

Example:

QUOTEDSUBJECT=()

Message: "(This is the subject) And here comes the message body"

Will extract the string within parenthesis from the message above and use it as the subject of the message.

Applies to: SMTP (outgoing)

Introduced in EMG 2.0

13.2.141 REDIRECT

Syntax: REDIRECT=<connector>

Introduced in EMG 3.

13.2.142 REGEXP_DESTADDR

Syntax: REGEXP_DESTADDR=<regexp>

Rewrite destination address using a PCRE (Perl Compatible Regular Expression). Only applies to messages sent over the connector.

Introduced in EMG 3.

13.2.143 REGEXP_DESTADDR_IN

Syntax: REGEXP_DESTADDR_IN=<regexp>

Rewrite destination address using a PCRE (Perl Compatible Regular Expression). Only applies to messages received over the connector.

Introduced in EMG 3.

13.2.144 REGEXP_KEYWORD

Syntax: REGEXP_KEYWORD=<regexp>

Introduced in EMG 3.

13.2.145 REGEXP_MESSAGE

Syntax: REGEXP_MESSAGE=<regexp>

Rewrite message body using a PCRE (Perl Compatible Regular Expression). Only applies to messages sent over the connector.

Introduced in EMG 3.

13.2.146 REGEXP_SOURCEADDR

Syntax: REGEXP_SOURCEADDR=<regexp>

Rewrite source address using a PCRE (Perl Compatible Regular Expression). Only applies to messages sent over the connector.

Introduced in EMG 3.

13.2.147 REGEXP_SOURCEADDR_IN

Syntax: REGEXP_SOURCEADDR_IN=<regexp>

Rewrite source address using a PCRE (Perl Compatible Regular Expression). Only applies to messages received over the connector.

Introduced in EMG 3.

13.2.148 REJECT_EMPTY

Syntax: REJECT_EMPTY

Reject messages with an empty message body.

Introduced in EMG 3.0.3.

13.2.149 RELATIVE_VP

Syntax: RELATIVE_VP

Force relative time to be used in validity periods to be used (default is using absolute time).

Applies to: CIMD2, SMPP

Introduced in EMG 3.1.4.

13.2.150 REMOVEPREFIX

Syntax: REMOVEPREFIX=<string>

Removes prefix for destination address (DESTADDR).

The specified prefix will be removed if it exists in the destination address. It can be combined with REQUIREPREFIX and is applied before REQUIREPREFIX.

For example if REMOVEPREFIX=+ and REQUIREPREFIX=00 and the destination address is +4612345678 the `+' will be removed and the destination address will be padded with "00", the final destination address being 004612345678

Applies to messages sent via the connector..

13.2.151 REMOVEPREFIX_SOURCEADDR

Syntax: REMOVEPREFIX_SOURCEADDR=<string>

Same as REMOVEPREFIX but applies to source addresses.

Applies to messages sent via the connector.

Introduced in EMG 2.5.

13.2.152 REPLACEPREFIX

Syntax: REPLACEPREFIX=<string>

Specifies a sequence of source/target address rewrite patterns.

Applies to messages sent via the connector.

13.2.153 REPLACEPREFIX_IN

Syntax: REPLACEPREFIX_IN=<string>

Same as REPLACEPREFIX but applies to messages received.

Introduced in EMG 3.

13.2.154 REPLACEPREFIX_SOURCEADDR

Syntax: REPLACEPREFIX_SOURCEADDR=<string>

Same as REPLACEPREFIX but applies to source addresses.

Introduced in EMG 2.5.

13.2.155 REPLACEPREFIX_SOURCEADDR_IN

Syntax: REPLACEPREFIX_SOURCEADDR_IN=<string>

Same as REPLACEPREFIX_SOURCEADDR but applies to messages received.

Introduced in EMG 3.

13.2.156 REQUIREPREFIX

Syntax: REQUIREPREFIX=<string>

Required prefix for destination address (DESTADDR).

If specified this prefix will be added to destination addresses that do not have the prefix.

For example if REQUIREPREFIX=00 and the destination address is 4612345678 the destination address will be padded with "00", the final destination address being 004612345678.

Only applies to messages sent via the connector.

DEPRECATION NOTICE
It is recommended to use keyword REPLACEPREFIX instead.

13.2.157 REQUIREPREFIX_SOURCEADDR

Syntax: REQUIREPREFIX_SOURCEADDR=<string>

Same as REQUIREPREFIX but applies to source addresses.

Only applies to messages sent via the connector.

Introduced in EMG 2.5.

DEPRECATION NOTICE
It is recommended to use keyword REPLACEPREFIX instead.

13.2.158 RETRYSCHEME

Syntax: RETRYSCHEME=<string>

This parameters specifies a file where a custom retry scheme can be defined for connectors. The file should contain seven columns tab-separated:

Type C for connector, M for message. Can be followed by a command which is either "*" (any), a numeric value or a range
Error Error code (* = any)
Retrytime Retry time between connect attempts (in seconds), type C
Connects Max connects, type C
Maxsleep Max sleep when max connects is reached (in seconds), type C
Hold delay Delay before next message try (in seconds)
Flags (1 = Good message, 2 = Bad domain, 4 = Bad connector)

Introduced in EMG 3.

13.2.159 RETRYTIME

Syntax: RETRYTIME=<integer>

Specifies the time (in seconds) to wait before trying a reconnect after a connect failure.

Default: 30

Applies to: All protocols (outgoing)

See also: MAXFAILEDCONNECTS, MAXFAILEDSLEEP

13.2.160 REVDLR

Syntax: REVDLR

Reverse order of source address and destination address for DLRs sent out over the connector.

Introduced in EMG 3.

13.2.161 REVDLR_IN

Syntax: REVDLR_IN

Reverse order of source address and destination address for DLRs received over the connector. This may sometime be necessary for DLR matching to work when remote entity sends addresses in reversed order.

Introduced in EMG 3.

13.2.162 ROUTE

Syntax: ROUTE=<string, connector name>

Primary connector to route messages to. This option only applies to incoming messages via that connector.

13.2.163 ROUTEDLR

Syntax: ROUTEDLR=<string, connector name>

Specifies to which connector DLRs should be routed.

13.2.164 ROUTING

Syntax: ROUTING=<filename>

Specifies a connector-specific routing file to be used.

Introduced in EMG 3.

13.2.165 SATPOOL_CREATE

Syntax: SATPOOL_CREATE=<string>

Create a SAT entry for messages being sent over the connector.

Introduced in EMG 3.

13.2.166 SATPOOL_CREATE_IN

Syntax: SATPOOL_CREATE_IN=<string>

Same as SATPOOL_CREATE but applies to messages received over the connector.

Introduced in EMG 3.

13.2.167 SATPOOL_LOOKUP

Syntax: SATPOOL_LOOKUP=<string>

Specifies one or more SAT pools to be used for SAT lookups for messages being sent over the connector.

Multiple occurances allowed.

Introduced in EMG 3.

13.2.168 SATPOOL_LOOKUP_IN

Syntax: SATPOOL_LOOKUP_IN=<string>

Same as SATPOOL_LOOKUP but applies to messages received over the connector.

Multiple occurances allowed.

Introduced in EMG 3.

13.2.169 SAVE_SMSCIDS

Syntax: SAVE_SMSCIDS

Required on sending SMPP connector for protocol conversion from UCP to SMPP when support for UCP operation 54 (modify) is required.

Introduced in EMG 5.

13.2.170 SCAADDR

Syntax: SCAADDR=<msisdn>

Set Service Center (SMSC) address in message PDU.

Applies to: GSM

Introduced in EMG 3.0.3.

13.2.171 SCAADDRNPI

Syntax: SCAADDRNPI=<integer>

Set Service Center (SMSC) address NPI in message PDU.

Applies to: GSM

Introduced in EMG 3.0.3.

13.2.172 SCAADDRTON

Syntax: SCAADDRTON=<integer>

Set Service Center (SMSC) address TON in message PDU.

Applies to: GSM

Introduced in EMG 3.0.3.

13.2.173 SENDERADDRESS

Syntax: SENDERADDRESS=<string>

Applies to: MM7

Introduced in EMG 3.

13.2.174 SERVICETYPE

Syntax: SERVICETYPE=<string>

Defines the servicetype for SMPP submit_sm and data_sm operations.

Applies to: SMPP

13.2.175 SET_DLR_TEXT

Syntax: SET_DLR_TEXT=<string>

If this connector option is set, the first 20 characters of the original message or the "text:" part of the incoming delivery report, is added as the "text:" part of the outgoing delivery report.

It can also be set by a plugin. In C:

qe_option_replace(qe, MGP_OPTION_SMPP_DLR_TEXT, "dlr text");

In Perl:

$q->{'SMPP_DLR_TEXT'} = "dlr text";

Applies to: SMPP

Introduced in EMG 5.5.

13.2.176 SIMULATE

Syntax: SIMULATE

Simulate connector operation. No operations are actually sent.

13.2.177 SMPP_ESME_TO_UCP_EC_MAP

Syntax: SMPP_ESME_TO_UCP_EC_MAP=<file>

Acision mode configuration.

For more information, please visit:
http://www.nordicmessaging.se/tech-notes/emg/emg-52-acision-mode.html

13.2.178 SMPP_ESME_TO_UCP_MAP

Syntax: SMPP_ESME_TO_UCP_MAP=<file>

Acisision mode configuration.

For more information, please visit:
http://www.nordicmessaging.se/tech-notes/emg/emg-52-acision-mode.html

13.2.179 SMPP_NEC_TO_UCP_MAP

Syntax: SMPP_NEC_TO_UCP_MAP=<file>

Acisision mode configuration.

For more information, please visit:
http://www.nordicmessaging.se/tech-notes/emg/emg-52-acision-mode.html

13.2.180 SMPPTZ

Syntax: SMPPTZ=<string>

If specified overrides any specified timezone for SMPP time fields.

Applies to: SMPP (outgoing)

Introduced in EMG 3.

13.2.181 SOURCEADDR_GSM

Syntax: SOURCEADDR_GSM

Indicates that alphanumeric source addresses should be GSM encoded before used in SMPP.

Applies to: SMPP

Introduced in EMG 3.

13.2.182 SOURCEFULLNAME

Syntax: SOURCEFULLNAME=<string>

Specifies a "full name" to be used in "From:" address field for SMTP.

Applies to: SMTP

Introduced in EMG 3.

13.2.183 SSL

Syntax: SSL

Specifies that Secure Socket Layer (SSL) should be used for the connector.

Introduced in EMG 2.0

13.2.184 SSL_CAFILE

Syntax: SSL_CAFILE=<filename>

Specifies a file with certificates for CAs to trust for inbound SSL connections. If present, a client using a certificate issued by a CA certificate not present in the file will be rejected.

This keyword enables certificate-based authentication. The client certificate fingerprint (SHA1) can also be specified on the user (in the users file or on the user entry in database) in which case the fingerprint must also match.

The CA file is reloaded when a client connects if the file has been modified since the last connect.

Applies to: Incoming SSL connectors

13.2.185 SSL_KEYFILE

Syntax: SSL_KEYFILE

Specifies the connector-specific PEM-file where key and certificate is stored for use by SSL connectors initiating connections.

Applies to: Outgoing SSL connectors

13.2.186 SSL_PASSWORD

Syntax: SSL_PASSWORD

13.2.187 STATIC

Syntax: STATIC

Only valid for outgoing connectors. Specifies that the connector should connect on startup and stay connected. This will usually require that keepalive packets is sent periodically to avoid connection timeout. Also the IDLETIMEOUT should be set to 0 to avoid periodic disconnect + reconnects.

See also: IDLETIMEOUT, KEEPALIVE

13.2.188 SUBADDRESS

Syntax: SUBADDRESS=<string>

Defines the URL to use for the GET or POST operation. This keyword is no longer needed since the ADDRESS parameter understands and parses full URLs for addresses.

Example:

ADDRESS=localhost:8080
SUBADDRESS=http://localhost/cgi-bin/report.sh

Applies to: HTTP (outgoing)

13.2.189 SUBJECT

Syntax: SUBJECT=<string>

Sets the default subject.

Applies to: SMTP (outgoing)

13.2.190 SUPPRESS_EMGHEADERS

Syntax: SUPPRESS_EMGHEADERS

EMG will add "Received" headers to incoming SMTP messages unless this keyword is specified.

Applies to: SMTP (incoming)

Introduced in EMG 3

13.2.191 SYSTEMTYPE

Syntax: SYSTEMTYPE=<string>

Identifies the SMPP system_type field for a connector. May be involved in the authentication process for the connector.

Applies to: SMPP

13.2.192 TCPSOURCEIP

Syntax: TCPSOURCEPORT=<IP address>

For outgoing connectors the source IP address is set to the specified address. May be needed on a host with multiple addresses on network interfaces.

Applies to: All protocols

Introduced in EMG 3

13.2.193 TCPSOURCEPORT

Syntax: TCPSOURCEPORT=<integer, 0-65535>

For outgoing connectors the source port is set to the specified port. May be needed when for example an SMSC requires a specific source port for authentication.

Applies to: All protocols

13.2.194 THROUGHPUT

Syntax: THROUGHPUT=<integer, 1-1000>

Limits throughput for the connector in question. The value specified is the number of messages per second. A value of 0 means 0.5 messages per second.

Applies to: All protocols

Introduced in EMG 2.0

13.2.195 TYPE

Syntax: TYPE=<string, INCOMING | OUTGOING>

This indicates only whether the connector should accept incoming connections or initiate outgoing connections. It does not tell anything about the direction of the message flow. A message can be received on a outgoing connector and vice versa. This depends on the protocol used.

13.2.196 USC2MAPPING

Syntax: UCS2MAPPING

Specifies that mappings should be applied to Unicode messages.

Introduced in EMG 5.

13.2.197 UDHVIAOPTIONAL

Syntax: UDHVIAOPTIONAL

Usually UDH parameters for source port, destination port and concatenated messages is encoded into the UDH and is sent as part of the message data with the UDH indicator (UDHI) set.

However, when this option is used on a SMPP 3.4 connector these UDH parameters will be sent as optional parameters instead. Some applications that implement SMPP 3.4 may require this.

Applies to: SMPP 3.4 (outgoing)

13.2.198 URLHANDLER

Syntax: URLHANDLER=<string>

Maps a uri (HTTP request path) to a specific function in a plugin (C or Perl).

The format of the string is "/prefix:/path/to/file.pl:functionname".

Keyword can be used multiple times to add multiple mappings for same connector.

Example:

CONNECTOR http-custom <
PROTOCOL=HTTP
TYPE=INCOMING
ADDRESS=127.0.0.1:8080
URLHANDLER=/receiver:/etc/emg/plugins/http_receiver.pl:do_receive
>

This will cause a request to "http://127.0.0.1:8080/receiver" to invoke the function "do_receive" in the Perl plugin file referenced.

Keyword can be used multiple times to add multiple mappings for same connector.

Introduced in EMG 5.5.

13.2.199 USEDELTIME

Syntax: USEDELTIME

When specified message delivery times (scheduled messages) will be enforced within the EMG server rather than passed through to the SMSC. That is if a message has a delivery time in the future th message will be kept in the EMG queue until the time for delivery is reached rather than the message being passed to the SMSC with a scheduled delivery time set.

13.2.200 USEPRIORITY

Syntax: USEPRIORITY

Indicates that the X-Priority message header should be considered for setting the priority of the message.

Applies to: SMTP (incoming)

Introduced in EMG 2.0

13.2.201 USERDB

Syntax: USERDB=<string>

Specifies that user information for authentication incoming connections should be retrieved using the specified database profile.

13.2.202 USERNAME

Syntax: USERNAME=<string>

Used for outgoing connector authentication via the connector protocol.

Applies to: All protocols (outgoing)

13.2.203 USERS

Syntax: USERS=<filename>

The users file is used for authentication of incoming connections.

If filename starts with a slash `/' it is considered to be absolute, otherwise it is relative to EMGDIR.

The format of the file is one username/password combination per row with the fields tab-separated plus an extra optional field used as follows:

For MGP connectors:

ADMIN
User is administrator.

CLIENTCONFIG=<string>
String will be sent to client and can be used to affect client configuration from the server side. The client does not need to respect this field.

For all connectors:

AUTHIP=<IPv4 address string>
Authenticate user based on IP address (UCP-style).

CERT_FINGERPRINT=<string>
Certificate fingerprint to match when using cedrtificate-based authentication.

FORCE_SOURCEADDR_IN=<string>
Force the source address for all messages to the specified address.

MAXSESSIONS=<integer>
Limit maximum number of session for the specific user.

MODE=<string>
If set to "RX" for user then connector will only receive messages from user and not send messages.

ROUTE=<string, connector name>
Specify a connector that is the "default route" for the user. Used for user-based routing.

ROUTEDLR=<string, connector name>
Specify a connector to which to route DLRs requested by the user.

ROUTESAT=<string, connector name>
Specify a connector to which to route messages after a successful SAT lookup has been performeda.

ROUTING=<filename>
Specify a file containing a user-specific routing table. Used for user-based routing.

SATPOOL_CREATE=<string, SAT pool name>
Use specified SAT pool for messages received.

THROUGHPUT=<integer>
Limit throughput (in and out) for the specific user.

THROUGHPUT_IN=<integer>
Limit throughput (in) for the specific user.

THROUGHPUT_OUT=<integer>
Limit throughput (out) for the specific user.

Applies to: All protocols (incoming)

13.2.204 USESENDER

Syntax: USESENDER

Indicates that the message sender should be used as part of the message. The sender will be inserted before the message subject and body.

Applies to: SMTP (incoming)

Introduced in EMG 3

13.2.205 USESUBJECT

Syntax: USESUBJECT

Indicates that the message subject should be used as part of the message. The subject will be inserted before the message body but after the sender (if used).

Applies to: SMTP (incoming)

Introduced in EMG 2.0

13.2.206 VASID

Syntax: VASID=<string>

Used for MM7 SenderIdentification.

Applies to: MM7 (outgoing)

Introduced in EMG 3

13.2.207 VASPID

Syntax: VASPID=<string>

Used for MM7 SenderIdentification.

Applies to: MM7 (outgoing)

Introduced in EMG 3

13.2.208 VIRTUAL

Syntax: VIRTUAL

Specifies that the connector should not be instantiated in EMG but only used as a template for inheritance.

See also: INHERIT

Introduced in EMG 3

13.2.209 WAITBEFORECONNECT

Syntax: WAITBEFORECONNECT=<integer>

Introduced in EMG 3

13.2.210 WAITDELAY

Syntax: WAITDELAY=<integer>

Delay after connect (in seconds).

Applies to: All protocols (outgoing)

13.2.211 WAITFOR

Syntax: WAITFOR=<string>

Wait for specified prompt after connect

Applies to: All protocols (outgoing)

13.2.212 WHITELIST

Syntax: WHITELIST=<filename>

Specifies which file contains the connector-specific whitelist.

Format is same as for general keyword WHITELIST.

Introduced in EMG 2.0

13.2.213 WINDOWSIZE

Syntax: WINDOWSIZE=<integer>

Specifies how many operations can be sent before a response is required. For connections with high latency this can greatly improve performance. Values greater than 10 should be avoided. The remote entity may need to support windowing in order for correct operation.

Default value: 1

Applies to: CIMD2, OIS, SMPP, UCP

Introduced in EMG 5.

13.2.214 XAUTH

Syntax: XAUTH

Specified that the built in protocol mechanisms should be used for authentication.

Applies to: HTTP (basic auth) and SMTP (plain/login/cram-md5)

Introduced in EMG 2.5.

13.2.215 XAUTHPASSWORD

Syntax: XAUTHPASSWORD=<string>

Specifies a password for protocol authentication.

Applies to: Outgoing HTTP (basic auth) and SMTP (plain/login/cram-md5)

Introduced in EMG 2.5.

13.2.216 XAUTHUSERNAME

Syntax: XAUTHUSERNAME=<string>

Specifies a username for protocol authentication.

Applies to: Outgoing HTTP (basic auth) and SMTP (plain/login/cram-md5)

Introduced in EMG 2.5.

13.2.217 XPASSWORD

Syntax: XPASSWORD=<string>

External password

Used for connector authentication when authentication is done in more than one step.

13.2.218 XUSERNAME

Syntax: XUSERNAME=<string>

External username

Used for connector authentication when authentication is done in more than one step.

13.3 DB options

Options used when specifying database profiles.

Example:

```
DB mysql-db1 <
TYPE=MYSQL
HOST=localhost
PORT=3306
DBNAME=emgdb
USERNAME=emguser
PASSWORD=secret
>
```

13.3.1 DBNAME

Syntax: DBNAME=<string>

Database name

13.3.2 HOST

Syntax: HOST=<string>

Hostname used when connector to database.

13.3.3 INSTANCES

Syntax: INSTANCES=<integer>

Specifies how many instances should be created. Each instance represents one static connection to the database server.

13.3.4 PASSWORD

Syntax: PASSWORD=<string>

Password used for authentication when connecting to the database.

13.3.5 PORT

Syntax: PORT=<integer>

Port used when connecting to database.

13.3.6 SOCKET

Syntax: SOCKET=<string>

Specified a socket file to be used, when using a local MySQL database without TCP/IP.

13.3.7 TYPE

Syntax: TYPE=<string>

Type of database.

Values:

MYSQL	MySQL, used for auth and logging
MONGODB	MongoDB, used for distributed message store

13.3.8 USERNAME

Syntax: USERNAME=<string>

Username used for authentication when connecting to the database

13.4 SAT pool options

Options used when defining SAT pools.

Example:

SATPOOL sat1 <
ADDRESSRANGE=4670001-4670010
THREADED
>

13.4.1 ADDRESSRANGE

Syntax: ADDRESSRANGE=<string>

The addresses to use for the pool. You can specify a comma separated list of individual numbers, a range of numbers with identical prefixes and lengths, or any combination of these. When a range is specified, the lower and the upper limit must have the exact same number of digits.

Example: ADDRESSRANGE=460001-460010,460015

13.4.2 EXPIRE

Syntax: EXPIRE=<integer>

The numer of minutes a source address will be reserved for a specific SAT entry. After the specified time it can be reused.

Default: 4320 (3 days)

13.4.3 QUOTEDREPLY

Syntax: QUOTEDREPLY=<integer>

Specifies that original message should be quoted when a reply is received via SAT. Values can be 0 (off) or 1 (on).

Default: 0 (off)

13.4.4 RANDOM

Syntax: RANDOM

Specifies that pool addresses should be randomized before use. The numbers are still picked in the same order, so the first message to each recipient will always use the same number, but for different recipients the pool number allocation order will be random.

13.4.5 THREADED

Syntax: THREADED

Indicates that SAT pool should keep track of separate message threads between same sender and receiver.

13.5 Domain options

Options used for domain-specific behavior. Can be used to minimize risk of being classified as a spammer when delivering large amount of e-mails to recipients in specific domains.

Only applies to SMTP #MX connectors.

Example:

DOMAIN yahoo.com <
MAILSPERMINUTE=10
SESSION=1
>

13.5.1 MAILSPERMINUTE

Syntax: MAILSPERMINUTE=<integer>

Maximum number of e-mail to send per minute for domain.

Default: 0 (unlimited)

13.5.2 MAILSPERSESSION

Syntax: MAILSPERSESSION=<integer>

Maximum number of e-mails to send per SMTP session.

Default: 0 (unlimited)

13.5.3 PORT

Syntax: PORT=<integer>

Port to use when connecting to SMTP server for domain.

Default: 25

13.5.4 RETRYTIME

Syntax: RETRYTIME=<integer>

Time (in seconds) to wait if the DNS lookup does not find any valid MX hosts or if it is not possible to connect to the hosts found.

Default: 300 seconds

13.5.5 SESSIONS

Syntax: SESSIONS=<integer>

Maximum number of simultaneous SMTP sessions for domain.

Default: 1

13.6 Plugin options

Options used when defining plugins.

Example:

```
PLUGIN billing <
LIBRARY=/etc/emg/plugins/billing.so
INSTANCES=2
CONFIG=/etc/emg/plugins/billing.cfg
>
```

13.6.1 CONFIG

Syntax: CONFIG=<string>

The value to be used for the second argument to create_config(). Usually it is the name of the configuration file to be used by the plugin.

13.6.2 INSTANCES

Syntax: INSTANCES=<integer>

The number of threads to be used. If the plugin functions are not thread-safe set this to 1 which will make all calls serialized.

13.6.3 LIBRARY

Syntax: LIBRARY=<string>

The name of the shared library that implements the plugin.

If the name ends in ".pl" the plugin is considered a Perl plugin.

13.6.4 OFFSET

Syntax: OFFSET=<integer>

Offset for numeric result and error codes.

For result codes the specified value will be added and for error codes 2 x the value will be added.

14 MGP options

14.1 Overview

Messages are represented by MGP options within EMG. The option key is a numerical value which also has a text representation in many contexts, for example in the connector log files.

Some options only applies to certain protocols. These options are simply ignored by protocols which do not support them.

All numeric key values that are not used are reserved for future use.

Not all options applies to messages and many options are for internal use only.

The list below is a reference for more detailed use of options refer to the various code samples and configuration examples in the Tech notes.

14.2 Option keys in numerical order

Value	Option	Description
1	ID	EMG message id
2	SOURCEADDR	Source address
3	SOURCEADDRTON	Source address TON (Type Of Number)
4	SOURCEADDRNPI	Source address NPI (Number Plan Indicator)
5	SOURCESUBADDRESS	
6	SOURCEPORT	

Value	Option	Description
8	DESTADDR	Destination address
9	DESTADDRTON	Destination address TON (Type Of Number)
10	DESTADDRNPI	Destination address NPI (Number Plan Indicator)
11	DESTSUBADDRESS	
12	DESTPORT	
14	UDH	User Data Header
15	UDHLEN	Length of User Data Header
16	MESSAGE	Message body
17	MESSAGELEN	Length of message body
18	VP	
19	DLR	Indicates whether a delivery report (DLR) has been requested 0 - DLR not requested 1 - DLR requested
20	DELTIME	
21	SCTS	
22	USERNAME	Username for the user that submitted the message to EMG
23	PASSWORD	
24	NEWPASSWORD	

Value	Option	Description
25	MSGTYPE	1 - Normal message 5 - Delivery report (DLR)
26	MSGSUBTYPE	
27	MSGCLASS	
28	CHARCODE	0 - Default 1 - GSM / IA5 2 - 8-bit binary 3 - Latin-1 4 - UCS2
29	AUTHCODE	
30	USER	
31	REPLYPATH	
32	PRIORITY	
33	TARIFFCLASS	
34	REMOTEIP	IP address of client
35	SYSTEMTYPE	
36	SMSCOP	
38	ROUTE	A "hard" route for the message
39	ROUTEDLR	The route for subsequent delivery reports for the message
40	RETCODE	
41	SERVICETYPE	

Value	Option	Description
42	MESSAGEMODE	
43	PROTOCOLID	
46	USERRESPONSECODE	
52	MESSAGESTATE	
54	LONGMESSAGE	
55	LONGMODE	
57	CANCELMODE	
58	INTERFACEVERSION	
59	CONNECTOR	Receiving connector
60	OUTCONNECTOR	Sending connector
61	STATUS	Message status
62	SOURCENETWORKTYPE	
64	SMSCID	Message id from remote end
65	OPSENTEXPIRES	
66	DLREXPIRES	
68	TCPSOURCEPORT	
69	MAPPING	
70	DLRADDRESS	
71	DLRPID	

Value	Option	Description
72	DOMAIN	
73	CONCATSMSREF	
74	CONCATSMSSEQ	
75	CONCATSMSMAX	
76	REQUIREPREFIX	
77	AUTHTON	
78	AUTHNPI	
79	BILLINGID	
80	SINGLESHOT	
81	DLRID	
82	CONNECTORNAME	
83	STATE	
84	PROTOCOL	
85	INSTANCES	
86	QUEUESIZE	
87	TYPE	
88	QSTATS1	
89	QSTATS5	
90	QSTATS15	

Value	Option	Description
91	INSTANCE	
93	STARTSECS	Time when message received by EMG in seconds since epoch
94	STARTMSECS	Millisecs part of time when message received by EMG
95	ENDSECS	Time when message sent by EMG in seconds since epoch
96	ENDMSECS	Millisecs part of time when message sent by EMG
97	NOTE	
98	CLIENTCONFIG	
99	COMPANY	
100	NAME	
101	PBNAME	
102	PBTYPE	
103	REASON	
104	PBID	
105	ISADMIN	
106	UDHI	
107	REPLACEPID	
108	LRADDR	

Value	Option	Description
109	LRPID	
110	HPLMNADDR	
111	SUBJECT	
113	DCS	
115	HEADER	
116	KEYWORD	
117	REMOVEPREFIX	
118	QPRIORITY	EMG queue priority (1-5)
119	XUSERNAME	Username for receiving user, used for MO routing to specific client
120	MAXINSTANCES	
121	AVGINSTANCES1	
123	MODE	
124	DBSQL	
125	DBNAME	
126	DBDATA	
127	CREDITS	
128	SOURCEADDRTYPE	
129	DESTADDRTYPE	

Value	Option	Description
130	REQUIREPREFIX_SOURCEADDR	
131	REMOVEPREFIX_SOURCEADDR	
132	PDUSEQ	
133	PDUSEQMAX	
134	ORIGSOURCEADDR	
135	ORIGDESTADDR	
136	SERVICEDESCRIPTION	
137	SENDERTS	
138	IMSI	
139	VLR	
140	ORIGID	
141	SERVICEID	
142	ACLENTRYWHOID	
143	ACLENTRYWHEREID	
144	PLUGINARG	
145	MMSDESTADDR	
146	MSISDN	
147	XPRIORITY	
148	TCPSOURCEIP	

Value	Option	Description
149	SENDERADDRESS	
150	ORIGIN	
151	SUBMITTS	
152	DONETS	
153	MESSAGEID	
154	INREPLYTO	
155	REFERENCES	
156	QUOTEDREPLY	
157	QUOTEDREPLY_SEPARATOR	
158	SERVICETYPEIN	
159	SOURCEFULLNAME	
160	CONTENTTYPE	
161	CONTENTLOCATION	
162	DESTFULLNAME	
163	MESSAGEIDIN	
164	ARCORMOD	
165	ARCORFUNC	
166	ARCORUNIT	
167	SCAADDR	

Value	Option	Description
168	SCAADDRTON	
169	SCAADDRNPI	
170	REASONTEXT	
171	ITSSESSIONINFO	
172	LASTDLRSECS	
173	LASTDLRMSECS	
174	SMTP_RET	
175	INSTANCES_INUSE	
176	DESTNETWORK	
177	TARIFFNAME	
178	SMPPOPTION	
179	BUFFEREDSTATUS	
180	WAPAPPLICATION	
181	XSER_EXTRA	
182	MMS_RELAY_SERVER_ID	
183	DLR_IN	
184	DLR_OUT	
185	OPERATOR	
186	MESSAGE_ERROR	

Value	Option	Description
187	NETWORK_ERROR	
188	AUROUTE	
189	AUROUTELIST	
190	PROXY	
191	CHARGE	
192	CHARGE_COST	
193	CHARGE_PRICE_ID	
194	CHARGE_COST_PRICE_ID	
195	SMPP_PDU_HEADER	
196	SMPP_PDU_BODY	
197	MORE_MESSAGES	
198	SMPP_DLR_TEXT	
199	CUSTOM_OPTION	
200	LICENSEDATA	
201	CHARGE_RESELLER	
202	CHARGE_RESELLER_PRICE_ID	
203	SMPP_USSD_SERVICE_OP	
204	MAXQUEUESIZE	
205	MAXQUEUESIZE_SOFT	

14.3 Additional notes

14.3.1 User Data Header (UDH)

UDH options can be supplied in two ways. Some can be supplied by setting the corresponding MGP options, DESTPORT for example. It is also possible to include the UDH in the actual message data and set the User-Data Header Indicator (UDHI).

15 Error codes

In the connector log files protocol specific error codes may be displayed within parenthesis when send or receive operations fail. The most common of these error codes are specified below, per protocol.

- CIMD2
- SMPP
- UCP/EMI
- OIS
- HTTP
- SMTP
- MGP

15.1 CIMD2

Error code	Description
0	No error
1	Unexpected operation
2	Syntax error
3	Unsupported parameter error
9	Requested operation failed
100	Invalid login
102	Too many users with this login id
103	Login refused
300	Incorrect destination address

Error code	Description
302	Syntax error in user data parameter
303	Incorrect user data parameter combination

15.2 SMPP

Error code	Description
0	No error
3	Invalid command id
4	Invalid bind status for given command
5	ESME already in bound state
8	System error
10	Invalid source address
11	Invalid destination address
12	Message ID is invalid
13	Bind failed
14	Invalid password
15	Invalid system id
20	Message queue full
21	Invalid system type
88	Throttling error (ESME has exceeded allowed message limits)

Error code	Description
97	Invalid scheduled delivery time
98	Invalid message validity period

15.3 UCP/EMI

Error code	Description
1	Checksum error
2	Syntax error
3	Operation not supported by system
4	Operation not allowed
5	Call barring active
6	AdC (destination address) invalid
7	Authentication failure
22	Time period not valid
23	Message type not supported by system
24	Message too long

15.4 OIS

Error code	Description

Error code	Description
0	Success
1	Invalid data
2	atabase (message data store) full
3	SME busy
5	Duplicate message
6	Destination unavailable
20	Call barred by user
21	Transmission error
24	Unknown subscriber
25	Call barred by network operator (destination)
26	Call barred by network operator (originator)
120	Network failure

15.5 HTTP

Error code	Description
200	Success
400	Bad request
401	Unauthorized
403	Forbidden

Error code	Description
404	Not found
500	Internal error
501	Not implemented
301	Moved
304	Not modified

15.6 SMTP

Error code	Description
220	Service ready
250	Requested mail action ok
251	User not local will forward to
421	Service not available
450	Mailbox unavailable
451	Requested action aborted
452	Requested action not taken
500	Syntax error, command unrecognized
501	Syntax error in parameter or arguments
502	Command not implemented
503	Bad sequence of commands

504	Command parameter not implemented
550	Requested action not taken

15.7 MGP

Error code	Description
0	OK, no error
1	Unknown
2	Syntax error
3	Login
4	Already bound
5	Invalid arguments
6	Invalid command
7	Invalid message id
8	Invalid destination address
9	Invalid source address
10	No access
11	Message error
12	Invalid response
13	Communication error

14	Database error
15	UDH error
16	No credits left
17	Busy
18	Too long