Managing Restcomm jSS7

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Restcomm jSS7 comes with a convenient user-friendly Graphical User Interface (GUI) and a Command Line Interface (CLI) that will allow you to configure, monitor and manage the Stack. While the CLI tool allows complete configuration and control of the Stack, the GUI-based management enhances the usability of the platform and gives you the ability to create different SS7 configurations and manage the platform dynamically. This chapter will explain how to manage the Stack effectively using both the GUI and the CLI.

Linkset Management

Using CLI

You can manage Linksets and Links using CLI or GUI. You can create, delete, activate and deactivate linksets and links using the Shell command `linkset` with appropriate parameters. The `linkset` command can be used only when dahdi based cards are configured.

Using GUI

The GUI will allow you to manage your linksets and links efficiently using a user-friendly interface. Open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'linkset' link in the left panel. The main panel will display the names of all configured Linkset Management units. To configure or view the settings of a particular Linkset Management Unit you must click on the name of that unit. The GUI will look similar to the figure below and is divided into two tabs.

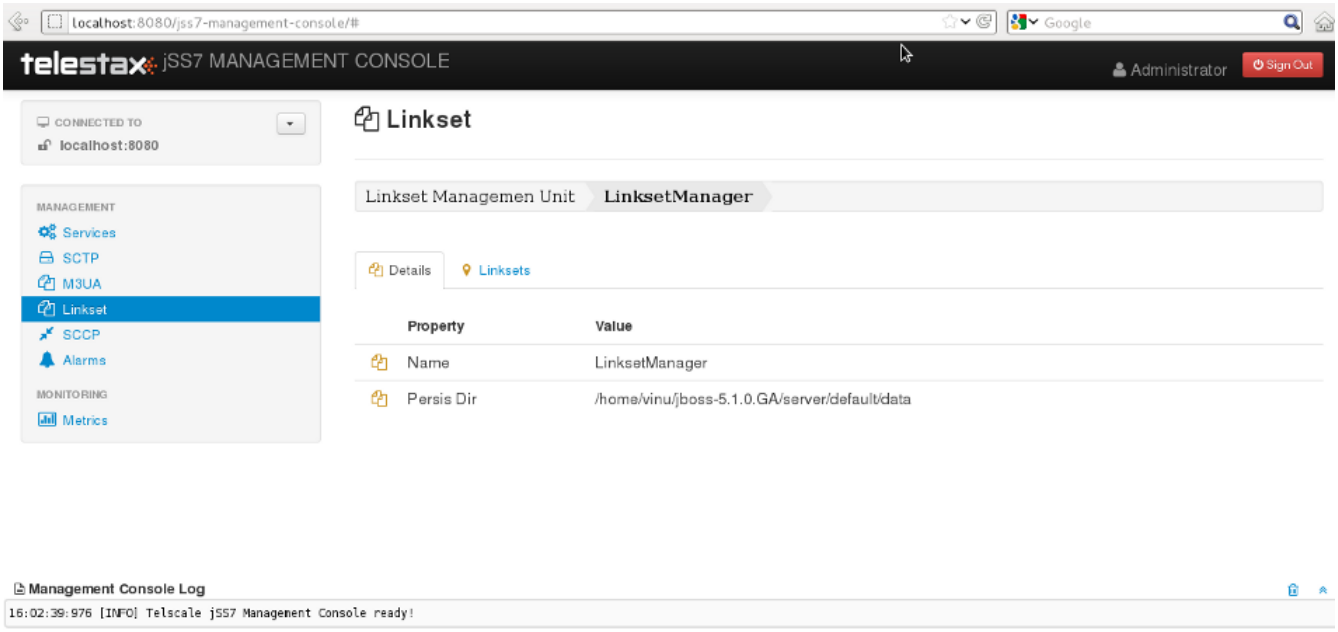

Figure 1. GUI - Linkset Management

The first tab will display the properties of the Linkset Management unit. These details displayed here are fetched from the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is

the server profile name. These properties cannot be modified here in the GUI. To modify them you must modifiy the *jboss-beans.xml* and restart the Server. The GUI will then display the modified values.

The other tab will allow you to manage all Linksets and Links within this Linkset Management unit.

View all Linksets and Links

Using CLI

You can view the current status of all correctly configured Linksets and Links by issuing the command `linkset show` as described below:

```
Name
    linkset show

SYNOPSIS
    linkset show

DESCRIPTION
    This command is used to view all Links and Linksets and their states.

    The possible states of a Linkset are:

    - UNAVAILABLE   :   Indicates that the Linkset does not have any 'available'
                links and cannot transport traffic.

    - SHUTDOWN  :   Indicates that Linkset has been shutdown.

    - AVAILABLE :   Indicates that the Linkset has atleast one 'available'
                link and can transport traffic.

    The possible states of a Link are:

    - UNAVAILABLE   :   Indicates that the Link is not 'available' to transport
                traffic. A Link is 'unavailable' if the Link is remotely
                or locally inhibited by a user. It can also be
                'unavailable' if MTP2 has not been able to successfully
                activate the link connection.

    - SHUTDOWN  :   Indicates the Link has been shutdown in the configuration.

    - AVAILABLE :   Indicates the Link is active and 'available' to transport
                traffic.

    - FAILED    :   Indicates that the Link is not 'shutdown' but is
                'unavailable' at Layer 2 for some reason. For example, the
                Initial Alignment may fail, or the link test messages sent
                by MTP 3 are not being acknowledged.
```

Using GUI

Navigate to the specific Linkset Management unit and switch to the 'Linksets' tab. Here you can view a list of all the Linksets created. Every correctly configured Linkset will be displayed in a row and for each Linkset, the first column will display the name of the Linkset. The icon adjacent to the name will be lit 'green' if the Linkset is currently active or 'orange' if inactive. The second column will indicate the current mode of the Linkset (Configured / Not Configured), the third column will allow you to activate / deactivate the Linkset and the fourth column will allow you to delete the Linkset.

To view the details of all the Links created within a specific Linkset click on the name of the Linkset whose details you wish to view. This will launch the 'Links' view and display all the configured properties of the selected Linkset in the first tab. The second tab in this view will allow you to view all Links in this particular Linkset. You can click on any Link name here to view the configured properties. You can click on the bread crumbs at the top to return to any of the previous pages you navigated through.

Create a new Linkset

Using CLI

You can create a new Linkset by issuing the command `linkset create` with appropriate parameters as described below:

```
Name
    linkset create

SYNOPSIS
    linkset create dahdi opc <point-code> apc <point-code> ni <network-id>
    <linkset-name>

DESCRIPTION
    This command is used to create a new Linkset of type Dahdi as explained below. You
    must ensure that appropriate linkset factories are deployed prior to creating any
    linkset.

PARAMETERS
    opc <point-code>      -   MTP Point code of the originating
                        signalling point. Takes an Integer Value.

    apc <point-code>      -   MTP  Point code of the adjacent signalling
                        point. Takes an Integer Value.

    ni <network-id>       -   Network Identifier and should be one of
                        the following values
                            0 - International Network
                            1 - Spare (for International use)
                            2 - National Network
                            3 - Reserved for National use

    <linkset-name>            -   Name of the Linkset to be created. This
                        will be used to identify the linkset.
                        Takes a String value.

EXAMPLES
    linkset create dahdi opc 3 apc 4 ni 0 dahdilinkset1

    The above command will create a new linkset of type Dahdi and name dahdilinkset1.
    The originating point code value is 3 and the adjacent point code value is 4 and
    the network is an international network.
```

Using GUI

Procedure: Create new Linkset using GUI

1. In the section for Linksets in the Linkset Management Unit window, click on the 'Create Linkset' button. This will launch a pop-up 'Create Linkset'.
2. In the 'Create Linkset' pop-up, add details of the new Linkset. You must ensure that you fill in all the mandatory parameters (OPC, DPC, NI and Linkset Name). For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new Linkset will be created with parameters as specified. If there is an error in creating the Linkset then you will find the details of the error in the Management Console Log section below.

4. Click on the 'Close' button to close the 'Create Linkset' pop-up.

Remove a Linkset

Using CLI

You can delete an existing Linkset by issuing the command `linkset delete` with appropriate parameters as described below:

```
Name
    linkset delete

SYNOPSIS
    linkset delete <linkset-name>

DESCRIPTION
    This command is used to delete an existing Linkset.

PARAMETERS
    <linkset-name>        -   Name of the Linkset to be deleted.

EXAMPLE
    linkset delete dahdilinkset1

    The above command will delete the Linkset identified by the name dahdilinkset1.
```

Using GUI

Procedure: Delete Linkset using GUI

1. Navigate to the 'Linksets' section in the Linkset Management Unit window and locate the row corresponding to the Linkset you wish to delete.
2. You must ensure that the Linkset is deactivated prior to deletion. If the Linkset is deactivated, the last column for 'Delete' will display a 'x' button in red and will be enabled. If the Linkset is currently active, the 'x' button will be disabled. You can only delete the Linkset if it is not active.
3. Click on the red 'x' button to delete the corresponding Linkset.

Activate Linkset

Using CLI

You can activate an existing Linkset by issuing the command `linkset activate` with appropriate parameters as described below:

```
Name
    linkset activate

SYNOPSIS
    linkset activate <linkset-name>

DESCRIPTION
    This command is used to activate an existing Linkset.

PARAMETERS
    <linkset-name>        -   Name of the Linkset to be activated.

EXAMPLE
    linkset activate dahdilinkset1

    The above command will activate the Linkset identified by the name dahdilinkset1.
```

Using GUI

Procedure: Activate a Linkset using GUI

1. Navigate to the 'Linksets' section in the Linkset Management Unit window and locate the row corresponding to the Linkset you wish to activate.
2. Click on the 'Activate' button in the actions column to activate the corresponding Linkset.
3. If the Linkset has been activated successfully you will find the status indicating the Linkset as 'Available' and the Linkset's icon will be lit green. If there is an error and the Linkset failed to activate, you will find details of the error in the Management Console log below.

Deactivate Linkset

Using CLI

You can deactivate a currently active Linkset by issuing the command `linkset deactivate` with appropriate parameters as described below:

```
Name
    linkset deactivate

SYNOPSIS
    linkset deactivate <linkset-name>

DESCRIPTION
    This command is used to deactivate an existing Linkset.

PARAMETERS
    <linkset-name>        -   Name of the Linkset to be deactivated.

EXAMPLE
    linkset deactivate dahdilinkset1

    The above command will deactivate the Linkset identified by the name
dahdilinkset1.
```

Using GUI

Procedure: Deactivate a Linkset using GUI

1. Navigate to the 'Linksets' section in the Linkset Management Unit window and locate the row corresponding to the Linkset you wish to deactivate.
2. To deactivate a Linkset currently active, click on the 'Deactivate' button in the actions column of the row corresponding to the Linkset.

Create a new Link

Using CLI

You can create a new Link by issuing the command `linkset link create` with appropriate parameters as described below:

```
Name
    linkset link create

SYNOPSIS
    linkset link create span <span-num> code <code-num> channel <channel-num>
    <linkset-name> <link-name>

DESCRIPTION
    This command is used to create a new Link within a Linkset. The Linkset must be
    created prior to executing this command.

PARAMETERS
    span <span-num>   -   Port number in the Card (indexed from 0).
                    Takes an Integer Value.

    code <code-num>       -   Signaling Link code
                    SLS (Signaling link selection) assigned to this
                    Link. Takes an Integer Value.

    channel <channel-num>     -   Time Slot number (TDM time slot).
                    Takes an Integer Value.

    <linkset-name>        -   Name of the Linkset within which the new Link is
                    being created.

    <link-name>       -   Name of the Link to be created. This will be used
                    to identify the Link. Takes a String value.

EXAMPLES
    linkset link create span 1 code 1 channel 1 linkset1 link1

    The above command will create a new Link identified as link1 within an existing
    Linkset identified as linkset1.
```

Using GUI

Procedure: Create new Link using GUI

1. In the section for Links in the Linkset Management Unit window, click on the 'Create Link' button. This will launch a pop-up 'Create Link'.
2. In the 'Create Link' pop-up, add details of the new Link. You must ensure that you fill in all the parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new Link will be created with parameters as specified. If there is an error in creating the Link then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Link' pop-up.

Remove a Link

Using CLI

You can delete an existing Link by issuing the command `linkset link delete` with appropriate parameters as described below:

```
Name
    linkset link delete

SYNOPSIS
    linkset link delete <linkset-name> <link-name>

DESCRIPTION
    This command is used to delete an existing Link within a Linkset.

PARAMETERS
    <link-name>       -   Name of the Link to be deleted.

    <linkset-name>        -   Name of the Linkset within which the Link resides.

EXAMPLE
    linkset link delete linkset1 link1

    The above command will delete the Link identified by the name Link1 within the
    Linkset linkset1.
```

Using GUI

Procedure: Delete Link using GUI

1. Navigate to the 'Links' section in the Linkset Management Unit window and locate the row corresponding to the Link you wish to delete.
2. You must ensure that the Link is deactivated prior to deletion. If the Link is inactive, the last column for 'Delete' will display a 'x' button in red. If the Link is currently active, the 'x' button will be displayed in orange. You can only delete the Link if it is inactive and the 'x' button is displayed in red.
3. Click on the red 'x' button to delete the corresponding Link instance.

Activate Link

Using CLI

You can activate an existing Link by issuing the command `linkset link activate` with appropriate parameters as described below:

```
Name
    linkset link activate

SYNOPSIS
    linkset link activate <linkset-name> <link-name>

DESCRIPTION
    This command is used to activate an existing Link within a Linkset.

PARAMETERS
    <link-name>       -   Name of the Link to be activated.

    <linkset-name>        -   Name of the Linkset within which the Link resides.

EXAMPLE
    linkset link activate linkset1 link1

    The above command will activate the Link identified by the name Link1 within the
    Linkset linkset1.
```

Using GUI

Procedure: Activate Link using GUI

1. Navigate to the 'Links' section in the Linkset Management Unit window and locate the row corresponding to the Link you wish to activate.
2. Click on the 'Activate' button to activate that Link within the Linkset.

Deactivate Link

Using CLI

You can deactivate a currently active Link by issuing the command `linkset link deactivate` with appropriate parameters as described below:

```
Name
    linkset link deactivate

SYNOPSIS
    linkset link deactivate <linkset-name> <link-name>

DESCRIPTION
    This command is used to deactivate an existing Link within a Linkset.

PARAMETERS
    <link-name>       -   Name of the Link to be deactivated.

    <linkset-name>        -   Name of the Linkset within which the Link resides.

EXAMPLE
    linkset link deactivate linkset1 link1

    The above command will deactivate the Link identified by the name Link1 within the
    Linkset linkset1.
```

Using GUI

Procedure: De-activate Link using GUI

1. Navigate to the 'Links' section in the Linkset Management Unit window and locate the row corresponding to the Link you wish to deactivate.
2. Click on the 'Deactivate' button to deactivate that Link within the Linkset.

SCTP Management

Using CLI

You can manage all SCTP related configurations through the Command Line Interface by using the `sctp` command. You can create, destroy, start and stop SCTP Servers / Associations by issuing the `sctp` command with appropriate parameters.

Using GUI

The GUI will allow you to manage your SCTP Servers and Associations efficiently using a user-friendly interface. Open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'SCTP' link in the left panel. The main panel will display the names of all configured SCTP Management units. To configure or view the settings of a particular SCTP Management Unit you must click on the name of that unit. The GUI will look similar to the figure below and is divided into three tabs.

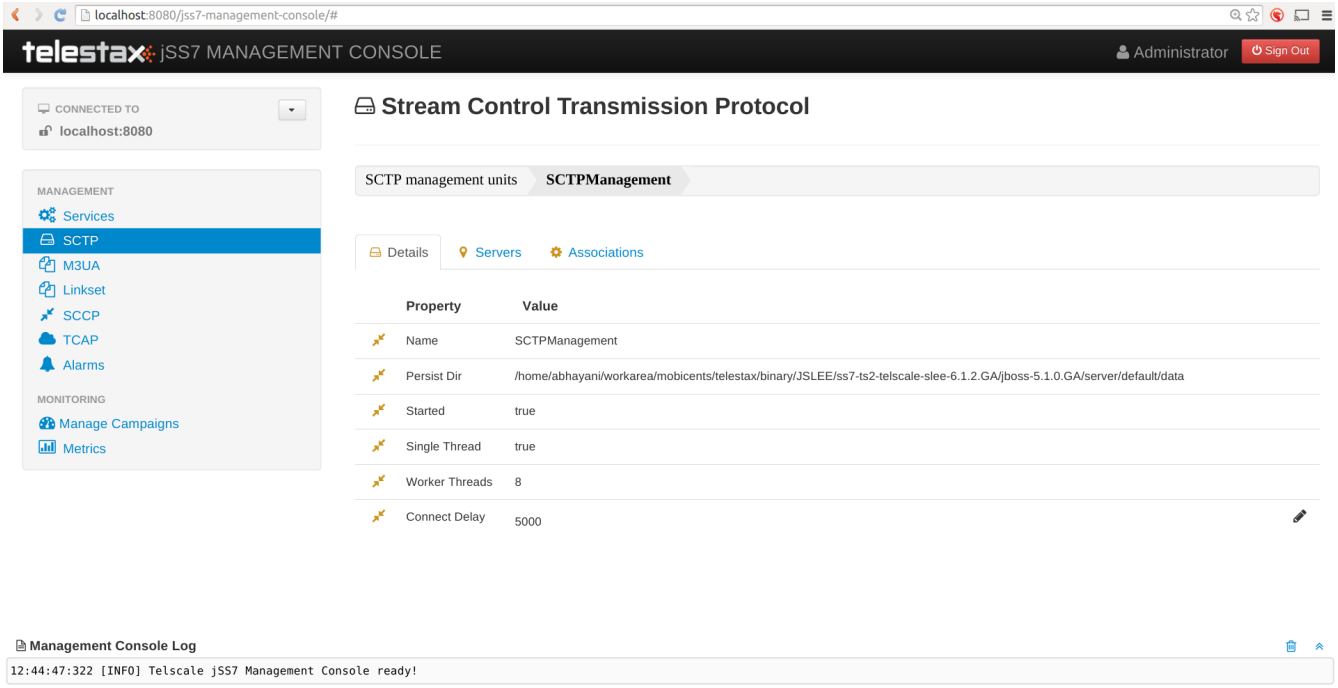

Figure 2. GUI - SCTP Management

The first tab will display the properties of the SCTP Management unit. These details displayed here are fetched from the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name. These properties can be modified here in the GUI. To modify them you must click the pencil, change the value and save. The GUI will then display the modified values.

The other two tabs will allow you to manage and monitor all Servers and Associations within this SCTP Management unit.

SCTP stack properties

Connect Delay

Using CLI

You can set the 'Connect Delay (milliseconds)' by issuing the command `sctp set connectdelay` with appropriate parameters as described below. You can verify this by issuing the command `sctp get connectdelay` which will display the value set for this property.

```
Name
    sctp set connectdelay

SYNOPSIS
    sctp set connectdelay <connectdelay> stackname <stack-name>

DESCRIPTION
    If the SCTP Socket is client-side, connectDelay specifies
    the delay time in milliseconds after which a connection
    with the server will be attempted. This delay is necessary
    when there is network disruption and the connection between
    the client and the server breaks, so that the SCTP stack
    doesn't continuously attempt to reconnect.
    Defalut is 30000 milliseconds.

PARAMETERS

    Standard Parameters

    <connectdelay>    -   Connect delay in milliseconds.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sctp set connectdelay 40000
```

Using GUI

On SCTP management page, click on pencil against the 'Connect Delay' property and text box becomes editable. Change value and save.

Thresholds for outgoing congestion control

Using CLI

SCTP library measures delays between the time when an outgoing message had been delivered from SS7 stack for sending and and the time when the message was sent to SCTP/TCP channel. The more time this delay the more we have a congestion level.

The delay thresholds when the congestion level is increased to level 1, 2 and 3 is configured by parameters cc_delaythreshold_1, cc_delaythreshold_2 and cc_delaythreshold_3 (in seconds).

The delay thresholds when the congestion level is decreased to level 0, 1, and 2 is configured by parameters cc_backtonormal_delaythreshold_1, cc_backtonormal_delaythreshold_2 and cc_backtonormal_delaythreshold_3 (in seconds).

You can set the thresholds (in milliseconds) by issuing the commands `sctp set cc_delaythreshold_1`, `sctp set cc_delaythreshold_2`, `sctp set cc_delaythreshold_3`, `sctp set cc_backtonormal_delaythreshold_1`, `sctp set cc_backtonormal_delaythreshold_2` or `sctp set cc_backtonormal_delaythreshold_3` with appropriate parameters as described below. You can verify this by issuing the commands `sctp get cc_delaythreshold_1`, `sctp get cc_delaythreshold_2`, `sctp get cc_delaythreshold_3`, `sctp get cc_backtonormal_delaythreshold_1`, `sctp get cc_backtonormal_delaythreshold_2` or `sctp get cc_backtonormal_delaythreshold_3` which will display the value set for this property.

```
Name
    sctp set cc_delaythreshold_1
    sctp set cc_delaythreshold_2
    sctp set cc_delaythreshold_3
    sctp set cc_backtonormal_delaythreshold_1
    sctp set cc_backtonormal_delaythreshold_2
    sctp set cc_backtonormal_delaythreshold_3

SYNOPSIS
    sctp set cc_delaythreshold_1 <threshold> stackname <stack-name>
    sctp set cc_delaythreshold_2 <threshold> stackname <stack-name>
    sctp set cc_delaythreshold_3 <threshold> stackname <stack-name>
    sctp set cc_backtonormal_delaythreshold_1 <threshold> stackname <stack-name>
    sctp set cc_backtonormal_delaythreshold_2 <threshold> stackname <stack-name>
    sctp set cc_backtonormal_delaythreshold_3 <threshold> stackname <stack-name>

DESCRIPTION
    For outgoing messages congestion control stack needs to have 3 thresholds
    - delays of outgoing messages before it will be sent to IP channel (3
    levels - 1, 2, 3). If a delay time in seconds becomes more then value for
    level 1, 2 or 3, the Association's congestion level becomes to 1, 2 or 3.
    Default values:
    for cc_delaythreshold_1 is 2.5 seconds.
    for cc_delaythreshold_2 is 8   seconds.
    for cc_delaythreshold_3 is 14 seconds.
    for cc_backtonormal_delaythreshold_1 is 1.5 seconds.
    for cc_backtonormal_delaythreshold_2 is 5.5 seconds.
    for cc_backtonormal_delaythreshold_3 is 10  seconds.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sctp set cc_delaythreshold_1 2.5
    sctp set cc_delaythreshold_2 8
    sctp set cc_delaythreshold_3 14
    sctp set cc_backtonormal_delaythreshold_1 1.5
    sctp set cc_backtonormal_delaythreshold_2 5.5
    sctp set cc_backtonormal_delaythreshold_3 10
```

Using GUI

On SCTP management page, click on pencil against the 'SCTP congestion Threshold 1' or other needed property and text box becomes editable. Change value and save.

View all SCTP (or TCP) Server Instances

Using CLI

You can view the details of all configured SCTP (or TCP) Server instances by issuing the command `sctp server show` as described below:

```
Name
    sctp server show

SYNOPSIS
    sctp server show stackname <stack-name> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all SCTP Server instances created.
    The information displayed will include the socket type (SCTP or TCP), name of the
    Server, state (whether started=false or true), the IP address and port that the
    Server is bound to. For multi-home SCTP Servers it will display all the
    IP addresses that are configured.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific SCTP Management unit and switch to the 'Servers' tab. Here you can view a list of all the Servers created. Every correctly configured Server will be displayed in a row and for each Server, the first column will display the name of the Server. The icon adjacent to the name will be lit 'green' if the server is currently running or if the server is stopped the icon will be lit 'orange'. The second column will indicate the current state of the Server (Started / Stopped), the third column will allow you to Start / Stop the Server and the fourth column will allow you to delete the Server.

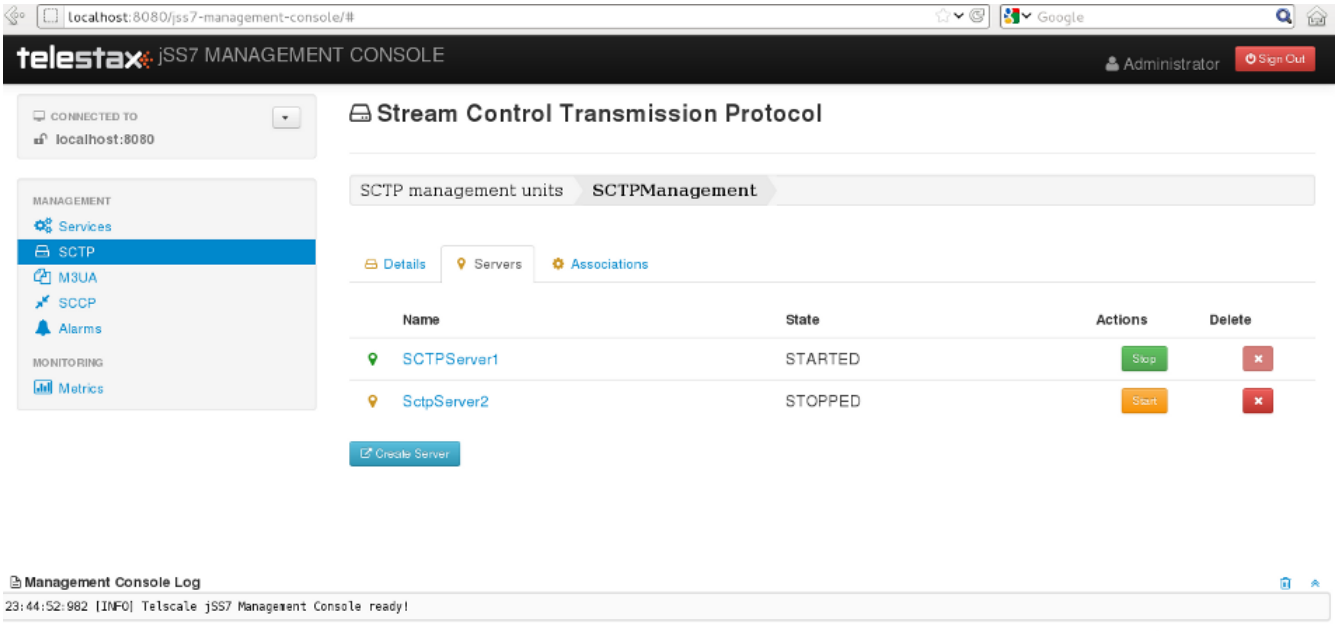

Figure 3. GUI - SCTP Management - Servers

In the screen above, click on the name of the Server whose details you wish to view. This will launch the Server Details and display all the configured properties of the selected Server. The second tab in this view will allow you to view all Associations linked to this particular Server. You can click on any Association name here to view the configured properties. You can click on the bread crumbs at the top to return to any of the previous pages you navigated through.

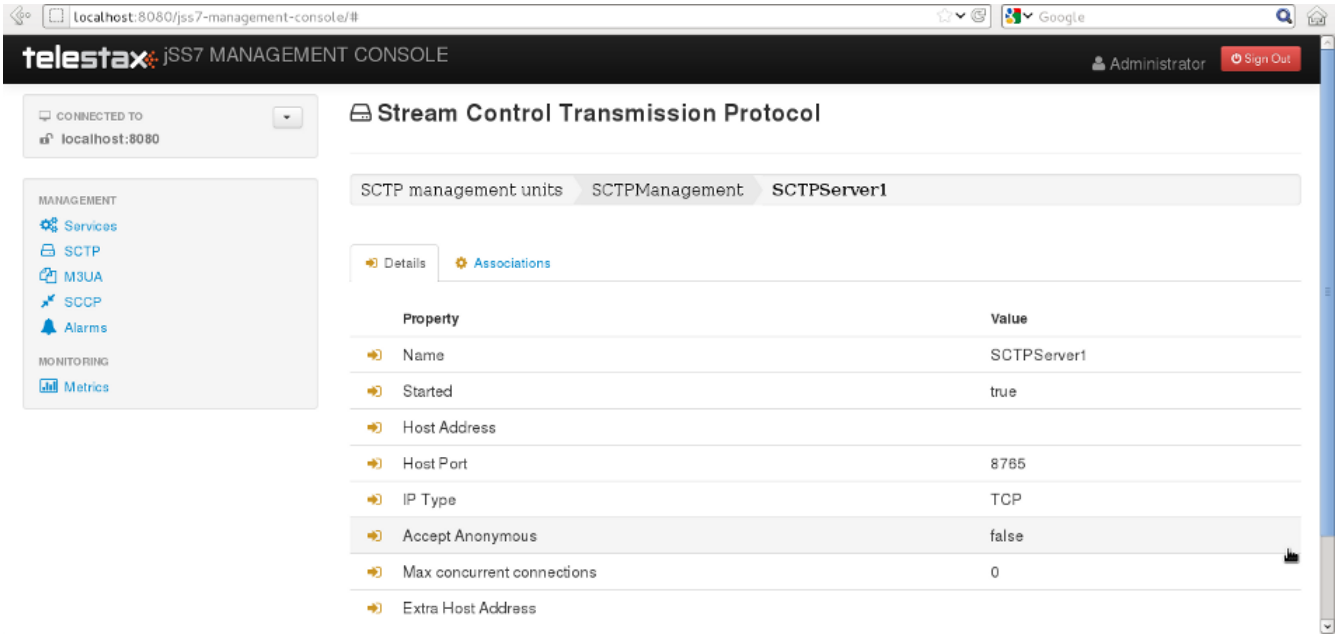

Figure 4. GUI - SCTP Management - Server Details

Create a new SCTP (or TCP) Server Instance

Using CLI

You can create a new SCTP Server by issuing the command `sctp server create` with appropriate parameters as described below:

```
Name
    sctp server create

SYNOPSIS
    sctp server create <sever-name> <host-ip> <host-port> <socket-type> stackname
<stack-name>

DESCRIPTION
    This command is used to create a new SCTP Server (or TCP Server) instance.

PARAMETERS

    Standard Parameters

    <server-name> -   Name of the new Server created. This must be
                    unique and takes any String value.

    <host-ip>     -   The host IP address to which the SCTP Server
                    socket will bind to.

                    For SCTP multi-home support, you can pass multiple
                    IP addresses as comma separated values. The Server
                    socket will bind to the primary IP address and
                    when it becomes unavailable, it will automatically
                    fall back to secondary address. If the socket-type
                    is TCP, these comma separated values will be
                    ignored and the Server socket will always bind to
                    the primary IP address (the first value in the
                    comma separated list).

    <host-port>       -   The host port to which the underlying SCTP Server
                    socket will bind to.

    Optional Parameters

    <socket-type> -   If you do not specify the socket-type as "TCP",
                    by default it will be SCTP.

    <stack-name>  -   Name of the stack on which this command is executed.
                        If not passed, the first stack configured in ShellExecutor
                        will be used.

EXAMPLES
    sctp server create TestServer 127.0.0.1 2905

    The above command will create a new SCTP Server identified as TestServer and bind
    the Server socket to the IP address 127.0.0.1 and port 2905.

    sctp server create TestServerMulti 10.2.50.145,10.2.50.146 2905

    The above command will create a new SCTP Server identified as TestServerMulti and
```

```
bind the Server socket to the IP address 10.2.50.145 and port 2905. If 10.2.50.145
is unavailable, the Server will automatically fall back to 10.2.50.146.

sctp server create TestServerTCP 127.0.0.1 2906 TCP

The above command will create a new TCP Server identified as TestServerTCP and
bind the socket to the IP address 127.0.0.1 and port 2906.
```

Using GUI

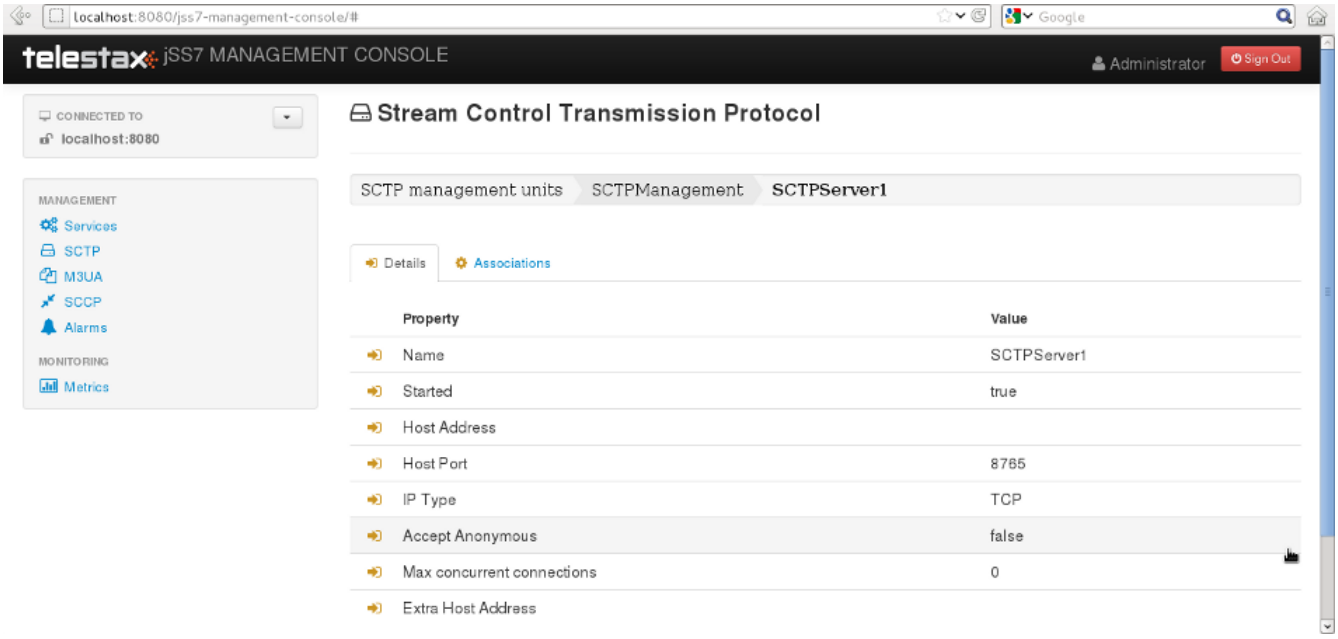

Figure 5. GUI - SCTP Management - Server Create

Procedure: Create new SCTP Server (or TCP Server) instance using GUI

1. In the section for Servers in the SCTP Management Unit window, click on the 'Create Server' button. This will launch a pop-up 'Create Server'.
2. In the 'Create Server' pop-up, add details of the new Server. You must ensure that you fill in all the mandatory parameters (Name, Host Address, Host Port, IP Type, Max Concurrent Connections). For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new SCTP Server (or TCP Server) will be created with parameters as specified. If there is an error in creating the Server then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Server' pop-up.

Modify a SCTP (or TCP) Server Instance

Using CLI

You can modify existed SCTP Server by issuing the command `sctp server modify` with appropriate parameters as described below:

```
```

```
Name
    sctp server modify

SYNOPSIS
    sctp server modify <sever-name> <stack-name> host <host-ip> port <host-port>
sockettype <socket-type>
    anonymconnect <accept-anonymous-connections> concurrentconnect <max-concurrent-
connections-count>
    extraaddresses <extra-host-addresses>

DESCRIPTION
    This command is used to modify a existed SCTP Server (or TCP Server) instance.

PARAMETERS

    Standard Parameters

    <server-name> -   Name of the Server which will be modified.

    <stack-name>  -   Name of the stack on which this command is executed.

    Optional Parameters

    <host-ip>     -   The host IP address to which the SCTP Server
                    socket will bind to.

    <host-port>       -   The host port to which the underlying SCTP Server
                    socket will bind to.

    <socket-type> -   Socket-type "TCP"/"SCTP".

    <extra-host-addresses>    -   For SCTP multi-home support, you can pass multiple
                    IP addresses as comma separated values. The Server
                    socket will bind to the primary IP address and
                    when it becomes unavailable, it will automatically
                    fall back to secondary address. If the socket-type
                    is TCP, these comma separated values will be
                    ignored and the Server socket will always bind to
                    the primary IP address (host-ip).

    <accept-anonymous-connections>    -   will server check ip and port of the CLient
                                        true/false

    <max-concurrent-connections-count>    -   set max concurrent connections

EXAMPLES
    sctp server modify TestServer sctpManagement1 port 2905

    The above command will modify a new SCTP Server identified as TestServer
    which belongs to SCTP management with name sctpManagement1 and modified
    the Server socket to the port 2905. Server MUST be stopped.
```

```
SEE ALSO
    sctp, sctp server destroy, sctp server start, sctp server stop, sctp server show,
    sctp association create, sctp association destroy, sctp association show
```

Delete a SCTP (or TCP) Server Instance

Using CLI

You can delete an existing SCTP Server by issuing the command `sctp server destroy` with appropriate parameters as described below:

```
Name
    sctp server destroy

SYNOPSIS
    sctp server destroy <sever-name> stackname <stack-name>

DESCRIPTION
    This command is used to delete an existing SCTP Server instance. You must ensure
    that the Server is stopped prior to deletion.

PARAMETERS

    Standard Parameters

    <server-name>     -   Name of the Server instance to be deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                        If not passed, the first stack configured in ShellExecutor
                        will be used.

EXAMPLES
    sctp server destroy TestServer

    The above command will destroy the Server identified by the name TestServer.
```

Using GUI

Procedure: Delete SCTP Server (or TCP Server) instance using GUI

1. Navigate to the 'Servers' section in the SCTP Management Unit window and locate the row corresponding to the Server you wish to delete.
2. You must ensure that the Server is stopped prior to deletion. If the Server is stopped, the last column for 'Delete' will display a 'x' button in red and will be enabled. If the Server is currently

running, the 'x' button will be disabled. You can only delete the server if it is stopped.

3. Click on the red 'x' button to delete the corresponding Server instance.

Start a SCTP (or TCP) Server Instance

Using CLI

You can start an existing SCTP Server by issuing the command `sctp server start` with appropriate parameters as described below:

```
Name
    sctp server start

SYNOPSIS
    sctp server start <sever-name> stackname <stack-name>

DESCRIPTION
    This command is used to start an existing SCTP Server instance. Upon executing
    this command, the underlying SCTP server socket is bound to the IP: Port
    configured for this Server instance at the time of creation using the
    "sctp server create" command.

PARAMETERS

    Standard Parameters

    <server-name> -   Name of the Server instance to be started.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                        If not passed, the first stack configured in ShellExecutor
                        will be used.

EXAMPLES
    sctp server start TestServer

    The above command will start the previously created Server instance identified
    by the name TestServer and bind the underlying socket to the IP address and port
    configured for TestServer at the time of creation.
```

Using GUI

Procedure: Start a SCTP Server (or TCP Server) instance using GUI

1. Navigate to the 'Servers' section in the SCTP Management Unit window and locate the row corresponding to the Server you wish to start.
2. Click on the 'Start' button in the actions column to start the corresponding Server instance. The

SCTP Server will be started and the underlying SCTP server socket will be bound to the IP: Port configured for this Server instance at the time of creation.

3. If the Server has started successfully you will find the status indicating the Server as 'Started' and the Server's icon will be lit green. If there is an error and the Server failed to start, you will find details of the error in the Management Console log below.

Stop a SCTP (or TCP) Server Instance

Using CLI

You can stop a currently running SCTP Server by issuing the command `sctp server stop` with appropriate parameters as described below:

```
Name
    sctp server stop

SYNOPSIS
    sctp server stop <sever-name> stackname <stack-name>

DESCRIPTION
    This command is used to stop an existing SCTP Server instance. Upon executing this
    command, the underlying SCTP server socket is closed and all resources are
    released.

PARAMETERS

    Standard Parameters

    <server-name>     -   Name of the Server instance to be stopped.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                        If not passed, the first stack configured in ShellExecutor
                        will be used.

EXAMPLES
    sctp server stop TestServer

    The above command will stop the currently running Server instance identified by
    the name TestServer, close the underlying socket and release all resources.
```

Using GUI

Procedure: Stop a SCTP Server (or TCP Server) instance using GUI

1. Navigate to the 'Servers' section in the SCTP Management Unit window and locate the row corresponding to the Server you wish to stop.

2. To stop a Server currently running, click on the 'Stop' button in the actions column of the row corresponding to the Server instance. When the Server is stopped the underlying SCTP server socket will be closed and all resources are released.

View all SCTP (or TCP) Associations

Using CLI

You can view the details of all configured SCTP (or TCP) Associations by issuing the command `sctp association show` as described below:

```
Name
    sctp association show

SYNOPSIS
    sctp association show stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all SCTP Associations created.
    The information displayed will include the Association type (SERVER or CLIENT),
    name of the Association, state (whether started=false or true). For a CLIENT
    Association it will also display the host-ip, host-port and peer-ip, peer-port
    values.

    For multi-home SCTP, it will display all the IP addresses that are configured.
    For a SERVER Association, it will display the configured peer-ip and peer-port
    values.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                        If not passed, the first stack configured in ShellExecutor
                        will be used.
```

Using GUI

Navigate to the specific SCTP Management unit and switch to the 'Associations' tab. Here you can view a list of all the Associations created. Every correctly configured Association will be displayed in a row and for each Association, the first column will display the name of the Association. The icon adjacent to the name will be lit 'green' if the Association is currently running or if the Association is stopped the icon will be 'orange'. The second column will indicate the current state of the Association (Started / Stopped) and the third column will allow you to delete the Association.

You cannot start or stop a SCTP Association here in this window. Every SCTP Association must be associated with an ASP (M3UA) and will automatically start or stop when the associated ASP is started or stopped. For more details on how to associate with an ASP, please refer to M3UA Management.

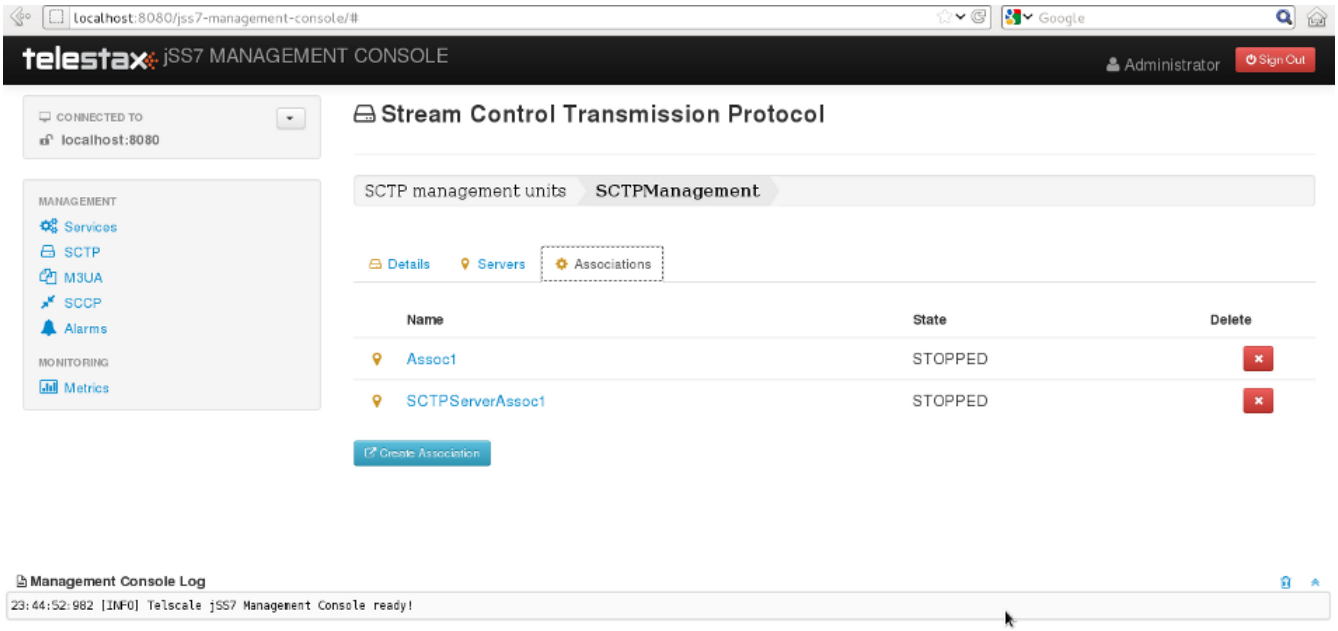

Figure 6. GUI - SCTP Management - Associations

In the screen above, click on the name of the Association whose details you wish to view. This will launch the Association Details and display all the configured properties of the selected Association.

Create a new SCTP (or TCP) Association

Using CLI

You can create a new SCTP Association by issuing the command `sctp association create` with appropriate parameters as described below:

```
Name
    sctp association create

SYNOPSIS
    sctp association create <assoc-name> <CLIENT | SERVER> <server-name> <peer-ip>
    <peer-port> <host- ip> <host-port> <socket-type> stackname <stack-name>

DESCRIPTION
    This command is used to create a new SCTP (Client side or Server side)
    association.

PARAMETERS

    Standard Parameters

    <assoc-name>      -   Name of the new Association created. This must be
```

```
                unique and takes any String value.

<CLIENT | SERVER> -   Specify if this association is client side or
                server side. If it is client side, it will
                initiate the connection to peer. If it is server
                side, it will wait for peer to initiate the
                connection. The connection request will be
                accepted from peer-ip: peer:port.

<peer-ip>     -   In a client side association, the server IP
                address to which the client is connecting to.

                In a server side association, the client IP
                address from which connections will be accepted.

<peer-port>       -   In a client side association, the server Port
                to which the client is connecting to.

                In a server side association, the client port from
                which connections will be accepted.

<host-ip>     -   In a client side association, the local IP address
                to which the socket will bind to.

                For SCTP multi-home support, you can pass multiple
                IP addresses as comma separated values. The
                Association will bind to the primary IP address
                and when it becomes unavailable, it will
                automatically fall back to secondary address.
                If the socket-type is TCP, these comma separated
                values will be ignored and the Assocation will
                always bind to the primary IP address (the first
                value in the comma separated list). This is
                required only for a client side Association.

                For a server side association, even if you specify
                these values it will be ignored.

<host-port>       -   In a client side association, the local port to
                which the socket will bind to. This is
                required only for a client side Association.

                For a server side association, even if you specify
                these values it will be ignored.

<server-name> -   In a server-side association, the server-name must
                be passed to associate with the Server identified
                by that name. You must ensure that the Server
                identified by server-name has already been created
                using the sctp server create command.
```

```
                    In a client-side association, this is not required
                    and you should not pass this parameter.

    Optional Parameters

    <socket-type> -   If you do not specify the socket-type as "TCP",
                    by default it will be SCTP. If it is a
                    SERVER SCTP Association, the socket-type must
                    match with the one specified while creating the
                    Server.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sctp association create Assoc1 CLIENT
    192.168.56.101 2905 192.168.56.1,192.168.56.1 2905

    The above command will create a new CLIENT SCTP Association identified as Assoc1.
    The client side will initiate the connection. It will bind the
    host-ip 192.168.56.1 and host-port 2905 to the Server IP 192.168.56.101 and
    port 2905.

    sctp association create Assoc2 SERVER TestServer 192.168.56.1 2905

    The above command will create a new SERVER SCTP association with the Server
    identified as TestServer and accept connections from peer whose IP address is
    192.168.56.1 and port 2905.
```

Using GUI

Procedure: Create new SCTP (or TCP) Association (Client side or Server side)

1. In the section for Associations in the SCTP Management Unit window, click on the 'Create Association' button. This will launch a pop-up 'Create Association'.
2. In the 'Create Association' pop-up, add details of the new Association. You must ensure that you fill in all the mandatory parameters: Name, Peer Address, Peer Port, Server Name (for Server side Association), Host Address and Host Port (for Client side Association). For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new SCTP Association (or TCP Association) will be created with parameters as specified. If there is an error in creating the Association then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Association' pop-up.

Modify existed SCTP (or TCP) Association

Using CLI

You can modify existed SCTP Association by issuing the command `sctp association modify` with appropriate parameters as described below:

```
Name
    sctp association modify

SYNOPSIS
    sctp association modify <assoc-name> <stack-name> <CLIENT | SERVER> servername
<server-name>
    peerhost <peer-ip> peerport <peer-port> host <host-ip> port <host-port> sockettype
<socket-type>
    extraaddresses <extra-host-addresses>

DESCRIPTION
    This command is used to modify a existed SCTP (Client side or Server side)
    association.

PARAMETERS

    Standard Parameters

    <assoc-name>  -   Name of the existed Association which will be modified.

    <stack-name>  -   Name of the stack on which this command is executed.


    <CLIENT | SERVER> -   Specify if this association is client side or
                    server side.

    Optional Parameters

    <peer-ip>     -   In a client side association, the server IP
                    address to which the client is connecting to.

                    In a server side association, the client IP
                    address from which connections will be accepted.

    <peer-port>       -   In a client side association, the server Port
                    to which the client is connecting to.

                    In a server side association, the client port from
                    which connections will be accepted.

    <host-ip>     -   In a client side association, the local IP address
                    to which the socket will bind to.
```

```
    <host-port>       -   In a client side association, the local port to
                      which the socket will bind to. This is
                      required only for a client side Association.

                      For a server side association, even if you specify
                      these values it will be ignored.

    <server-name> -   In a server-side association, the server-name.

                      In a client-side association, this is not required
                      and you should not pass this parameter.

    <socket-type> -   socket-type "TCP"/"SCTP". If it is a
                      SERVER SCTP Association, the socket-type must
                      match with the one specified while creating the
                      Server.

    <extra-host-addresses> - For SCTP multi-home support, you can pass multiple
                      IP addresses as comma separated values. The
                      Association will bind to the primary IP address
                      and when it becomes unavailable, it will
                      automatically fall back to secondary address.
                      If the socket-type is TCP, these comma separated
                      values will be ignored and the Assocation will
                      always bind to the primary IP address (host). This is
                      required only for a client side Association.

                      For a server side association, even if you specify
                      these values it will be ignored.



EXAMPLES
    sctp association modify Assoc1 sctpManagement1 CLIENT port 2476

    The above command will modify a CLIENT SCTP Association identified as Assoc1
    which belongs to SCTP management with name sctpManagement1.

    If an Association is connected stack will drop the connection firstly.
    Then the Association will reconnect itself.

SEE ALSO
    sctp, sctp server create, sctp server destroy, sctp server start,
    sctp server stop, sctp server show, sctp association destroy,
    sctp association show
```

Delete a SCTP (or TCP) Association

Using CLI

You can delete an existing SCTP Association by issuing the command `sctp association destroy` as described below:

```
Name
    sctp association destroy

SYNOPSIS
    sctp association destroy <assoc-name> stackname <stack-name>

DESCRIPTION
    This command is used to delete an existing SCTP Association identified by the
    name assoc-name.

PARAMETERS

    Standard Parameters

    <assoc-name>  -   Name of the Association to be deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sctp association destroy Assoc1

    The above command will destroy the Association identified by the name Assoc1.
```

Using GUI

Procedure: Delete SCTP Association (or TCP Association) instance

1. Navigate to the 'Associations' section in the SCTP Management Unit window and locate the row corresponding to the Association you wish to delete.
2. You must ensure that the Association is stopped prior to deletion. If the Association is stopped, the last column for 'Delete' will display a 'x' button in red. If the Association is currently running, the 'x' button will be displayed in orange. You can only delete the Association if it is stopped and the 'x' button is displayed in red.
3. Click on the red 'x' button to delete the corresponding Association instance.

M3UA Management

Using CLI

You can manage all M3UA Application Server, Application Server Process and Route related configurations through the Command Line Interface by using the `m3ua` command. You can create, destroy, start and stop ASPs by issuing the `m3ua asp` command with appropriate parameters. You can create, destroy, add and remove AS by issuing the `m3ua as` command with appropriate parameters. You can add and remove M3UA Routes by issuing the `m3ua route` command with appropriate parameters.

Using GUI

The GUI will allow you to manage your M3UA configurations efficiently using a user-friendly interface. Open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'M3UA' link in the left panel. The main panel will display the names of all configured M3UA Management units. To configure or view the settings of a particular M3UA Management Unit you must click on the name of that unit. The GUI will look similar to the figure below and is divided into four tabs.

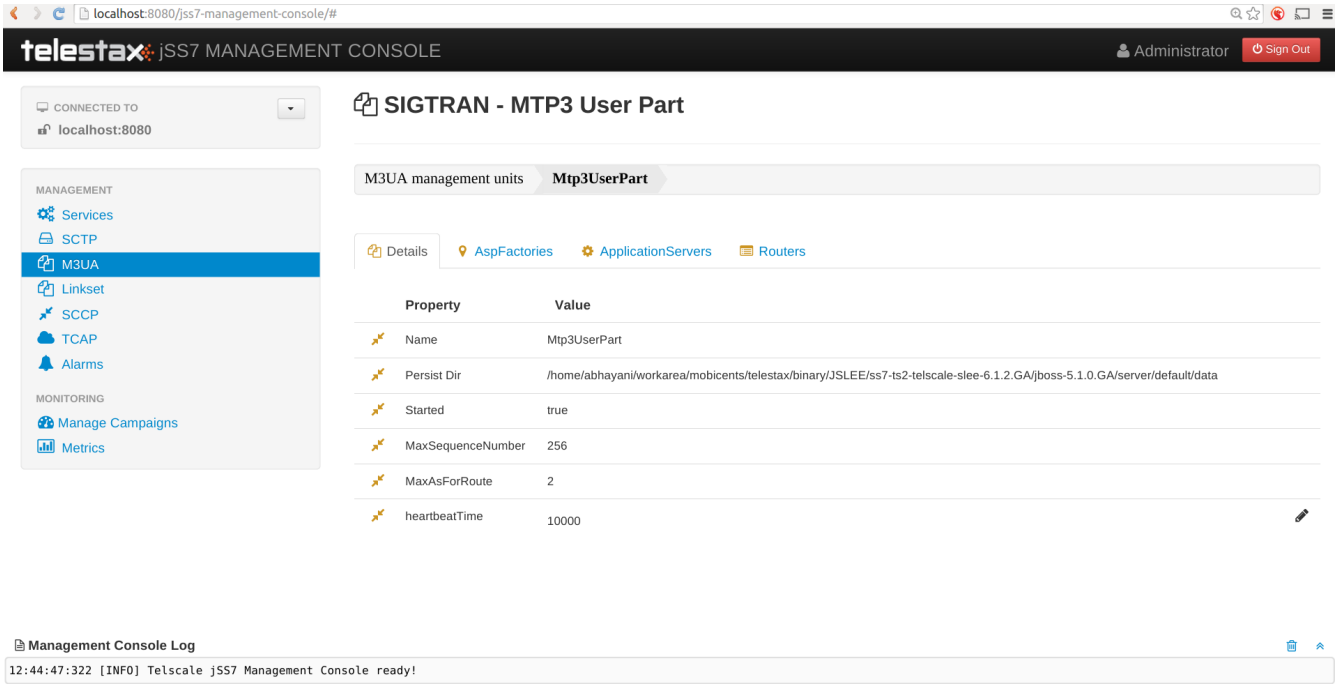

Figure 7. GUI - M3UA Management

The first tab will display the properties of the M3UA Management unit. These details displayed here are fetched from the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name. These properties can be modified here in the GUI. To modify them you must click the pencil, change value and save. The GUI will then display the modified values.

The other three tabs will allow you to manage and monitor all Servers, ASPs and Routers within this M3UA Management unit.

M3UA stack properties

Maximum Sequence Number

You can modify the settings for the parameter 'maxsequencenumber' only when the M3UA Stack is not running. In addition, this parameter cannot be modified through the CLI or GUI. You will have to invoke the setter function directly from the source code.

If you are using the JBoss Application Server, then you can set this parameter by adding a property (as shown below) to the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name.

```
/*Add property for the parameter 'maxsequencenumber' to jboss-beans.xml file and
specify the value*/
<property name="maxSequenceNumber">128</property>
```

The current settings of the parameter can be viewed in the GUI or by invoking the appropriate CLI command as described below.

Using CLI

You can retrieve the current settings of the parameter 'maxsequencenumber' by issuing the command `m3ua get maxsequencenumber`. However as explained above, you cannot modify the settings through the CLI.

```
Name
    m3ua get maxsequencenumber

SYNOPSIS
    m3ua get maxsequencenumber stackname <stack-name>

DESCRIPTION
    This command is used to retrieve the current settings of the parameter
    'maxsequencenumber'. The 'maxsequencenumber' parameter is used to specify
    the maximum sequence number used for load-balancing algorithm.

    Sequence number or Signalling Link Selection (SLS) is used for load-balancing
    between ASPs in AS and also between various AS for the same point-code.
    The parameter 'maxsequencenumber' controls the maximum SLS that should be
    used for this. It is safe to leave it at 256.

    The settings can be modified only when the M3UA Stack is not running.
    To modify this parameter you must invoke the setter function
    directly from the code or if you are using the JBoss AS, you can add a
    property to the XML descriptor file jboss-beans.xml. You cannot change the
    settings through the CLI.
```

Using GUI

In the M3UA management page, you can view the current settings of the 'Max Sequence Number' property. But as explained above, you cannot change the settings in the GUI. For more details about this parameter, refer to the detailed description about the parameter in the above section for CLI.

Maximum AS for route

You can modify the settings for the parameter 'maxasforroute' only when the M3UA Stack is not running. In addition, this parameter cannot be modified through the CLI or GUI. You will have to invoke the setter function directly from the source code.

If you are using the JBoss Application Server, then you can set this parameter by adding a property (as shown below) to the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name.

```
/*Add property for the parameter 'maxasforroute' to jboss-beans.xml file and specify
the value*/
<property name="maxAsForRoute">4</property>
```

The current settings of the parameter can be viewed in the GUI or by invoking the appropriate CLI command as described below.

Using CLI

You can retrieve the current settings of the parameter 'maxasforroute' by issuing the command `m3ua get maxasforroute`. However as explained above, you cannot modify the settings through the CLI.

```
Name
    m3ua get maxasforroute

SYNOPSIS
    m3ua get maxasforroute stackname <stack-name>

DESCRIPTION
    This command is used to retrieve the current settings of the parameter
    'maxasforroute'. The 'maxasforroute' parameter is used to specify
    the maximum routes for destination point code.

    Every destination point code should be configured in M3UA with the
    corresponding AS. The parameter 'maxasforroute' controls the
    maximum number of AS that can be used to route the message to the
    same Destination Point Code.

    It is better to always maintain this parameter as an even number for better
    load-sharing and a maximum of 2 is standard and widely accepted. You should
    not change this value if there is at least one route defined, else it will
    throw Exception for that route. You have to delete all the routes,
    change this property and redefine routes.

    The settings can be modified only when the M3UA Stack is not running.
    To modify this parameter you must invoke the setter function
    directly from the code or if you are using the JBoss AS, you can add a
    property to the XML descriptor file jboss-beans.xml. You cannot change the
    settings through the CLI.
```

Using GUI

In the M3UA management page, you can view the current settings of the 'Max As for Route' property. But as explained above, you cannot change the settings in the GUI. For more details about this parameter, refer to the detailed description about the parameter in the above section for CLI.

Heart Beat time

Using CLI

You can set the 'heartbeattime' by issuing the command `m3ua set heartbeattime` with appropriate parameters as described below. You can verify this by issuing the command `m3ua get heartbeattime` which will display the value set for this property.

```
Name
    m3ua set heartbeattime

SYNOPSIS
    m3ua set heartbeattime <heartbeattime> stackname <stack-name>

DESCRIPTION
    Each ASP can send HEART_BEAT to peer to determine the availability of
    link. If there is no traffic M3UA will initiate heart beat every
    'heartbeatTime' milli seconds. If 3 consecutive HEART_BEAT are
    missed, stack will close and re-initiate connection.

PARAMETERS

    Standard Parameters

    <heartbeattime>   -   Heart Beat time in milliseconds.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua set heartbeattime 30000
```

Using GUI

On M3UA management page, click on pencil against the 'heartbeatTime' property and text box becomes editable. Change value and save.

Enable M3UA statistic

Using CLI

You can set the 'statisticsenabled' by issuing the command `m3ua set statisticsenabled` with appropriate parameters as described below. You can verify this by issuing the command `m3ua get statisticsenabled` which will display the value set for this property.

```
Name
    m3ua set statisticsenabled

SYNOPSIS
    m3ua set statisticsenabled <statisticsenabled> stackname <stack-name>

DESCRIPTION
    You can enable/disable statistic via this property.

PARAMETERS

    Standard Parameters

    <statisticsenabled>   -   true/false.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua set statisticsenabled true
```

Using GUI

On M3UA management page, click on pencil against the 'statisticsEnabled' property and text box becomes editable. Change value and save.

Enable routing key management

Using CLI

You can set the 'routingkeymanagementenabled' by issuing the command `m3ua set routingkeymanagementenabled` with appropriate parameters as described below. You can verify this by issuing the command `m3ua get routingkeymanagementenabled` which will display the value set for this property.

```
Name
    m3ua set routingkeymanagementenabled

SYNOPSIS
    m3ua set routingkeymanagementenabled <routingkeymanagementenabled> stackname
<stack-name>

DESCRIPTION
    You can enable/disable routing key management via this property.

PARAMETERS

    Standard Parameters

    <routingkeymanagementenabled> -   true/false.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua set routingkeymanagementenabled true
```

Using GUI

On M3UA management page, click on pencil against the 'routingkeymanagementenabled' property and text box becomes editable. Change value and save.

Threads count for processing of incoming messages

You can modify the settings for the parameter 'deliverymessagethreadcount' only when the M3UA Stack is not running. In addition, this parameter cannot be modified through the CLI or GUI. You will have to invoke the setter function directly from the source code.

If you are using the JBoss Application Server, then you can set this parameter by adding a property (as shown below) to the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name.

```
/*Add property for the parameter 'deliverymessagethreadcount' to jboss-beans.xml file
and specify the value*/
<property name="deliveryTransferMessageThreadCount">4</property>
```

The current settings of the parameter can be viewed in the GUI or by invoking the appropriate CLI command as described below.

Using CLI

You can retrieve the current settings of the parameter 'deliverymessagethreadcount' by issuing the command `m3ua get deliverymessagethreadcount`. However as explained above, you cannot modify the settings through the CLI.

```
Name
    m3ua get deliverymessagethreadcount

SYNOPSIS
    m3ua get deliverymessagethreadcount

DESCRIPTION
    Returns the count of threads that will be used for message delivering
    to Mtp3UserPartListener's. Messages from SS7 peers (incoming messages)
    are processed by these threads. Messages to SS7 peers (outgoing messages)
    are processed by threads from user applications (not these threads).

    For single thread model this value should be equal 1.
```

Using GUI

In the M3UA management page, you can view the current settings of the 'DeliveryMessageThreadCount' property. But as explained above, you cannot change the settings in the GUI. For more details about this parameter, refer to the detailed description about the parameter in the above section for CLI.

MTP3 RoutingLabel Format

You can modify the settings for the parameter 'routinglabelformat' only when the M3UA Stack is not running. In addition, this parameter cannot be modified through the CLI or GUI. You will have to invoke the setter function directly from the source code.

If you are using the JBoss Application Server, then you can set this parameter by adding a property (as shown below) to the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` and also an extra separate bean - RoutingLabelFormat (to which we refer from). is the server profile name.

```
/*Extra bean for RoutingLabelFormat Enum*/
    <bean name="RoutingLabelFormat"
class="org.restcomm.protocols.ss7.mtp.RoutingLabelFormat">
        <constructor factoryClass="org.restcomm.protocols.ss7.mtp.RoutingLabelFormat"
            factoryMethod="getInstance">
            <parameter>ITU</parameter>
        </constructor>
    </bean>

/*Add property for the parameter 'routinglabelformat' to jboss-beans.xml file and
specify the value into M3UAManagementImpl mbean*/
        <property name="routingLabelFormat">
            <inject bean="RoutingLabelFormat" />
        </property>
```

The current settings of the parameter can be viewed in the GUI or by invoking the appropriate CLI command as described below.

Using CLI

You can retrieve the current settings of the parameter 'routinglabelformat' by issuing the command `m3ua get routinglabelformat`. However as explained above, you cannot modify the settings through the CLI.

```
Name
    m3ua get routinglabelformat

SYNOPSIS
    m3ua get routinglabelformat stackname <stack-name>

DESCRIPTION
    Returns RoutingLabelFormat option. Possible values are: ITU, ANSI_Sls8Bit,
    ANSI_Sls5Bit, Japan_TTC_DDI, Japan_NTT, China.
```

Using GUI

In the M3UA management page, you can view the current settings of the 'RoutingLabelFormat' property. But as explained above, you cannot change the settings in the GUI. For more details about this parameter, refer to the detailed description about the parameter in the above section for CLI.

Bit of SLS for loadbalancing between Linksets

Using CLI

You can set the 'uselsbforlinksetselection' by issuing the command `m3ua set uselsbforlinksetselection` with appropriate parameters as described below. You can verify this by issuing the command `m3ua get uselsbforlinksetselection` which will display the value set for this property.

```
Name
    m3ua set uselsbforlinksetselection

SYNOPSIS
    m3ua set uselsbforlinksetselection <true | false> stackname <stack-name>

DESCRIPTION
    Possible values are false or true. Sets which bit of SLS will be used
    for loadbalancing between Linkset. True value means lowest bit of SLS
    is used for loadbalancing between Linkset, false value means highest bit
    of SLS is used.

PARAMETERS

    Standard Parameters

    <true | false>    -   True value means lowest bit of SLS is used for
                          loadbalancing between Linkset, false value means
                          highest bit of SLS is used. Default value is false.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    m3ua set uselsbforlinksetselection false
```

Using GUI

On M3UA management page, click on pencil against the 'Use the lowest bit for link set selection' property and text box becomes editable. Change value and save.

View all M3UA Application Server Processes

Using CLI

You can view the details of all configured M3UA Application Server Processes by issuing the command `m3ua asp show` as described below:

```
Name
    m3ua asp show

SYNOPSIS
    m3ua asp show stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured Application Server
    Processes. The information displayed will include the name, the SCTP Association
    name and if it is started or stopped.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific M3UA Management unit and switch to the 'AspFactories' tab. Here you can view a list of all the ASPs created. Every correctly configured ASP will be displayed in a row and for each ASP, the first column will display the name of the ASP. The icon adjacent to the name will be lit 'green' if the ASP is currently running or if the ASP is stopped the icon will be lit 'orange'. The second column will indicate the current state of the ASP (true / false), the third column will allow you to Start / Stop the ASP and the fourth column will allow you to delete the ASP.

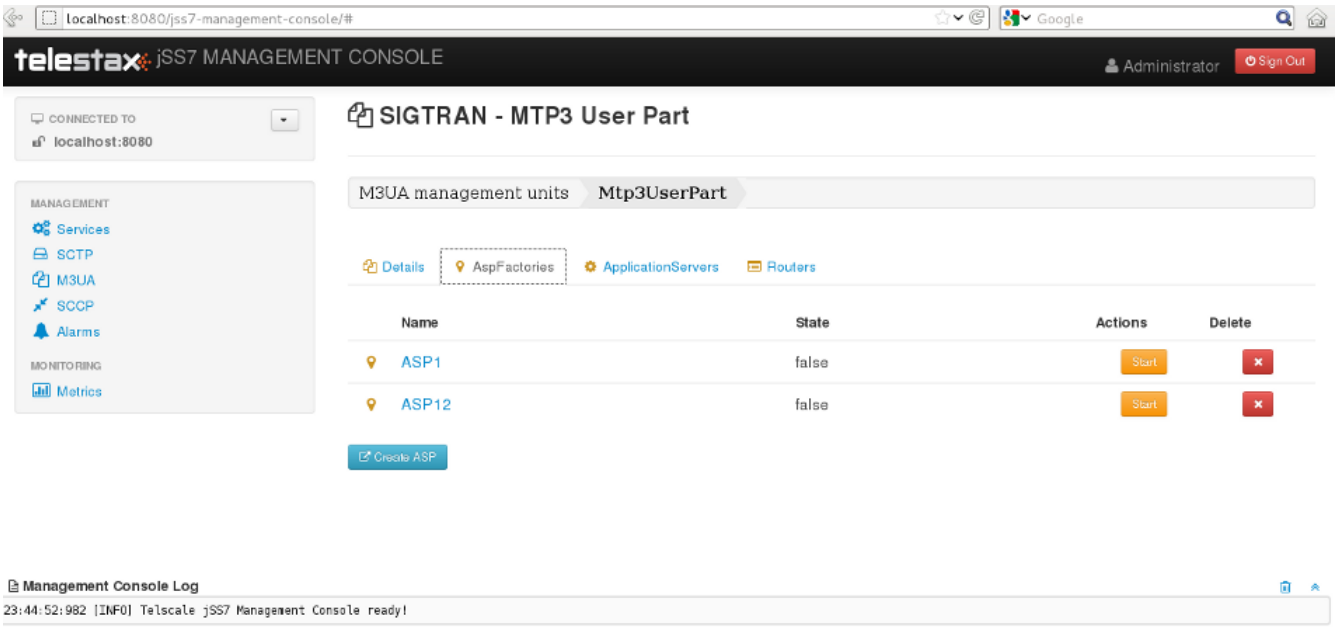

Figure 8. GUI - M3UA Management - AspFactories

In the screen above, click on the name of the ASP whose details you wish to view. This will launch the ASP Details and display all the configured properties of the selected ASP. The second tab in this view will allow you to view all connected Application Servers. You can click on the bread crumbs at

the top to return to any of the previous pages you navigated through.

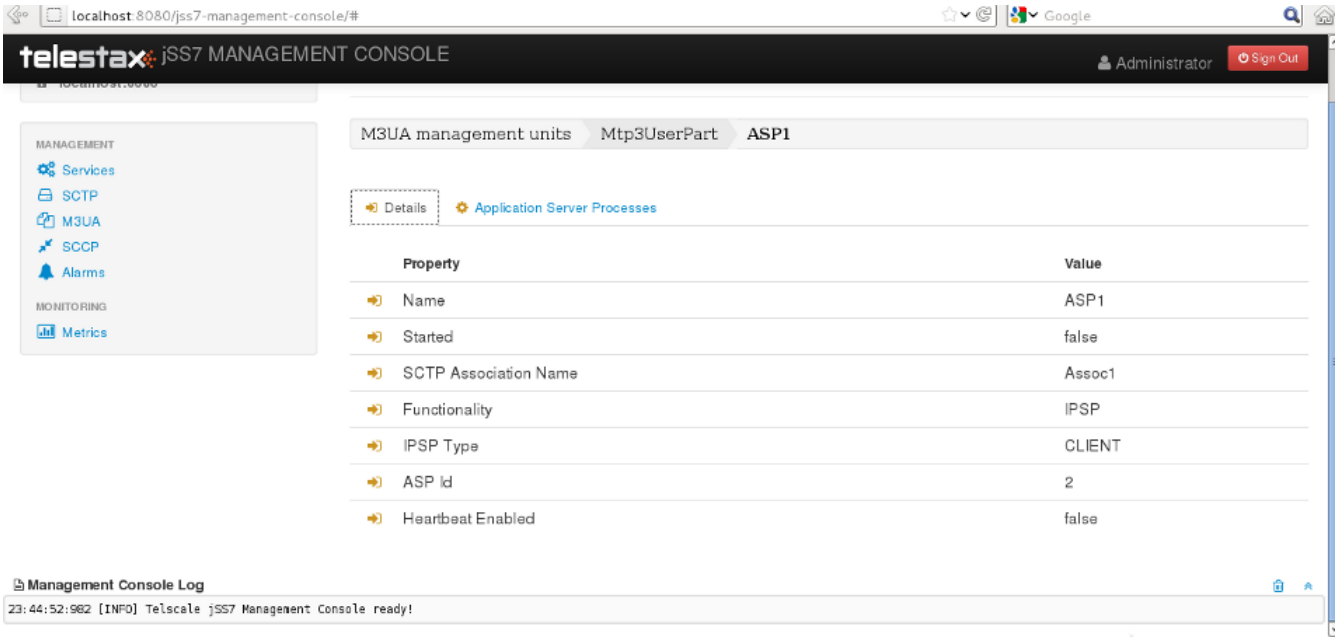

Figure 9. GUI - M3UA Management - ASP Details

Create a new M3UA Application Server Process

Using CLI

You can create a new M3UA ASP by issuing the command `m3ua asp create` with appropriate parameters as described below:

```
Name
    m3ua asp create

SYNOPSIS
    m3ua asp create <asp-name> <sctp-association> aspid <aspid> heartbeat <true|false>
    stackname <stack-name>

DESCRIPTION
    This command is used to create a new Application Server Process.

PARAMETERS

    Standard Parameters

    <asp-name>            -   Name of the new Application Server Process
                        created. This must be unique and takes any
                        String value.

    <sctp-association>        -   Name of the SCTP Association

    Optional Parameters
```

```
    <aspid>               -   Identifier for this newly created
                        Application Server Process. If this is
                        not passed, next available aspid will be
                        used.

    heartbeat <true|false>        -   If this parameter is enabled (value set to
                        true), then heartbeat mechanism is enabled
                        between M3UA peers. When this is enabled,
                        it sends a Heartbeat message every 10
                        seconds. If there is no response for the
                        third heartbeat then it assumes that the
                        underlying network is dead. So it closes
                        the connection and attempts to connect
                        again. The M3UA peers are brought back to
                        the same state as they were prior to
                        dying.

                        This is an optional parameter and if
                        unspecified, heartbeat mechanism is
                        disabled.

    <stack-name>  -   Name of the stack on which this command is executed.
                        If not passed, the first stack configured in ShellExecutor
                        will be used.

EXAMPLES
    m3ua asp create ASP1 Assoc1 aspid 12 heartbeat true

    The above command will create a new M3UA Application Server Process with name ASP1
    and id 12. Heartbeat mechanism is enabled.
```

Using GUI

Procedure: Create a new Application Server Process using GUI

1. Navigate to the tab 'AspFactories' in the M3UA Management Unit window and click on the 'Create ASP' button. This will launch a pop-up 'Create AspFactory'.
2. In the 'Create ASP' page, add details of the new ASP. You must ensure that you fill in all the mandatory parameters (Name, SCTP Association Name). For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section. You must ensure that a correctly configured SCTP Association is created and available prior to creating a new ASP. When the ASP is started or stopped, this corresponding SCTP Association will start / stop automatically.
3. Verify the details entered and then click on the 'Create' button. A new ASP will be created with parameters as specified. If there is an error in creating the ASP then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Server' pop-up.

Delete an Application Server Process

Using CLI

You can delete an existing M3UA ASP by issuing the command `m3ua asp destroy` with appropriate parameters as described below:

```
Name
    m3ua asp destroy

SYNOPSIS
    m3ua asp destroy <asp-name> stackname <stack-name>

DESCRIPTION
    This command is used to delete an existing M3UA Application Server Process
    identified by the name 'asp-name'. You must ensure that the ASP is stopped prior
    to issuing the command.

PARAMETERS

    Standard Parameters

    <asp-name>        -   Name of the ASP to be deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua asp destroy ASP1

    The above command will destroy the ASP identified by the name ASP1.
```

Using GUI

Procedure: Delete an Application Server Process using GUI

1. Navigate to the 'ASPs' section in the M3UA Management Unit window and locate the row corresponding to the ASP you wish to delete.
2. You must ensure that the ASP is stopped and unassigned from AS prior to deletion. If the ASP is stopped, the last column for 'Delete' will display a 'x' button in red and will be enabled. If the Server is currently running, the 'x' button will be disabled.
3. Click on the red 'x' button to delete the corresponding ASP.

Start an Application Server Process

Using CLI

You can start an existing ASP by issuing the command `m3ua asp start` with appropriate parameters as described below:

```
Name
    m3ua asp start

SYNOPSIS
    m3ua asp start <asp-name> stackname <stack-name>

DESCRIPTION
    This command is used to start an existing ASP. You must ensure that the ASP is
    assigned to at least one AS prior to starting it.

PARAMETERS

    Standard Parameters

    <asp-name>        -   Name of the ASP to be started.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua asp start ASP1

    The above command will start the ASP identified by the name ASP1.
```

Using GUI

Procedure: Start an Application Server Process

1. Navigate to the 'AspFactories' tab in the M3UA Management Unit window and locate the row corresponding to the ASP you wish to start.
2. Click on the 'Start' button in the actions column to start the corresponding ASP. You must ensure that the ASP is assigned to at least one AS prior to starting it.
3. If the ASP has started successfully you will find the status indicating the ASP running as 'true' and the icon will be lit green. If there is an error and the ASP failed to start, you will find details of the error in the Management Console log below.

Stop an Application Server Process

Using CLI

You can stop a currently running ASP by issuing the command `m3ua asp stop` with appropriate parameters as described below:

```
Name
    m3ua asp stop

SYNOPSIS
    m3ua asp stop <asp-name> stackname <stack-name>

DESCRIPTION
    This command is used to stop a currently running ASP.

PARAMETERS

    Standard Parameters

    <asp-name>        -   Name of the ASP to be stopped.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua asp stop ASP1

    The above command will stop the ASP identified by the name ASP1.
```

Using GUI

Procedure: Stop an Application Server Process

1. Navigate to the 'AspFactories' section in the M3UA Management Unit window and locate the row corresponding to the ASP you wish to stop.
2. Click on the 'Stop' button in the actions column to stop the corresponding ASP.
3. If the ASP has stopped successfully you will find the status indicating the ASP running as 'false' and the icon will be lit orange. If there is an error and the ASP failed to stop, you will find details of the error in the Management Console log below.

View all M3UA Application Servers

Using CLI

You can view the details of all configured M3UA Application Servers by issuing the command `m3ua as show` as described below:

```
Name
    m3ua as show

SYNOPSIS
    m3ua as show stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured Application Servers.
    The information displayed will include the configured
    functionality (AS or IPSP or SGW), mode (SE or DE), IPSP type (if applicable),
    routing context, traffic mode and network appearance values.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific M3UA Management unit and switch to the 'ApplicationServers' tab. Here you can view a list of all the ASs created. Every correctly configured AS will be displayed in a row and for each AS, the first column will display the name of the AS. The icon adjacent to the name will be lit 'green' if the AS is currently running or if the AS is stopped the icon will be lit 'orange'. The second column will indicate the current state of the AS (defined / undefined), the third column will allow you to delete the AS.

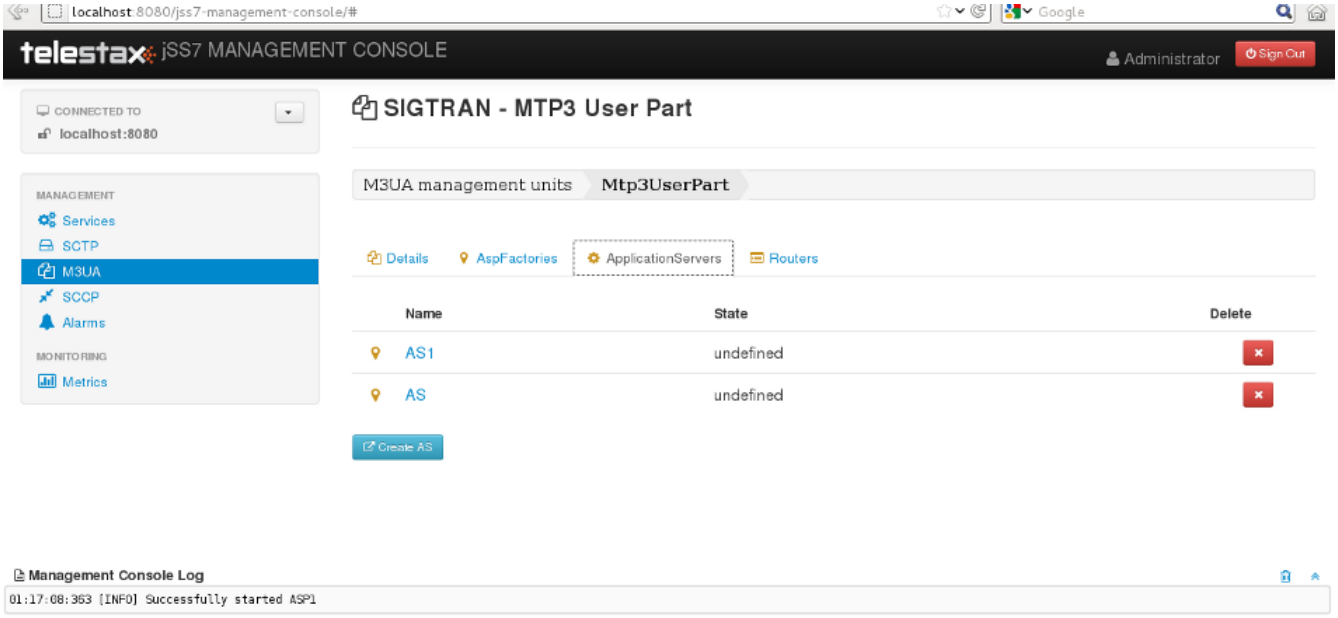

Figure 10. GUI - M3UA Management - ApplicationServers

In the screen above, click on the name of the AS whose details you wish to view. This will launch the AS Details and display all the configured properties of the selected AS. The second tab in this view will allow you to view the details of the connected ASP. You can click on the bread crumbs at the top to return to any of the previous pages you navigated through.

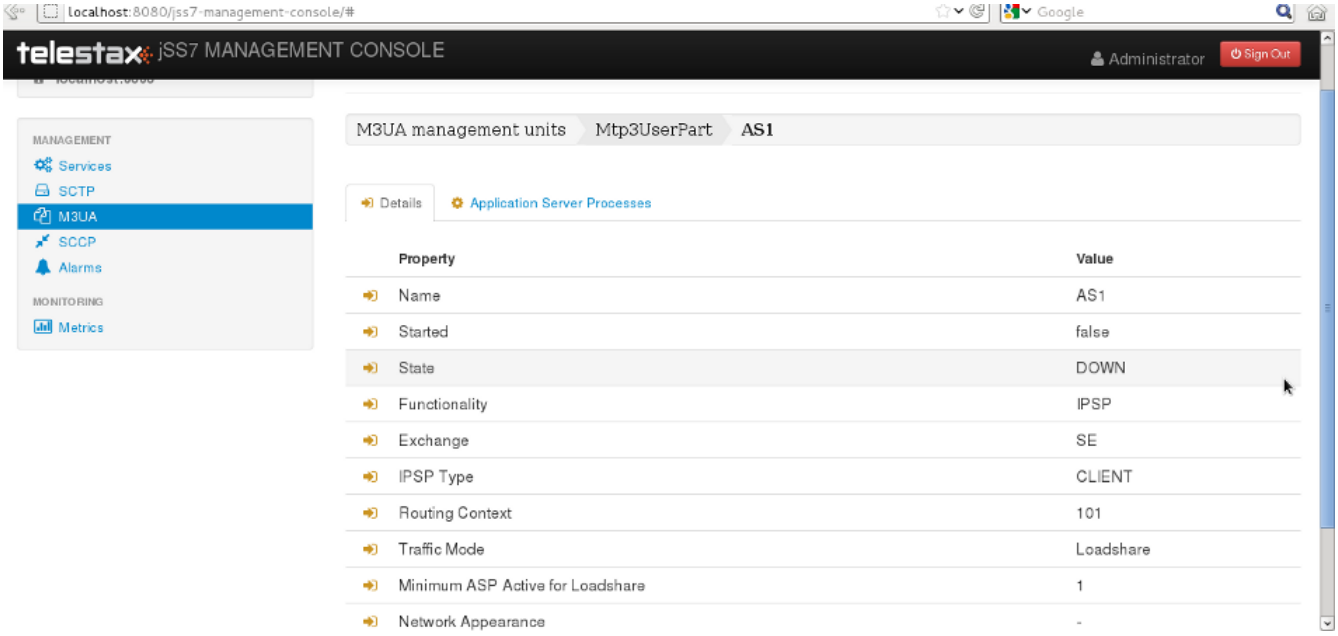

Figure 11. GUI - M3UA Management - AS Details

Create a new M3UA AS

Using CLI

You can create a new M3UA AS by issuing the command `m3ua as create` with appropriate parameters as described below:

```
Name
```

```
    m3ua as create

SYNOPSIS
    m3ua as create <as-name> <AS | SGW | IPSP> mode <SE | DE>
    ipspType <client | server> rc <routing- context> traffic-mode <traffic mode>
    min-asp <minimum asp active for TrafficModeType.Loadshare>
    network-appearance <network appearance value> stackname <stack-name>

DESCRIPTION
    This command is used to create a new Application Server.

PARAMETERS

    Standard Parameters

    <as-name>     -   Name of the new Server created. This must be
                      unique and takes any String value.

    <AS | SGW | IPSP> -   The type of the new Server is specified using this
                      parameter. The three possible values are
                      AS (Application Server), SGW (Signaling Gateway)
                      and IPSP.

    <SE | DE>     -   You must specify if Single Exchange or
                      Double Exchange of ASPSM (ASP State Maintenance)
                      and ASPTM (ASP Traffic Maintenance) messages
                      should be performed.

    <client | server> -   This is required if the newly created AS is of
                      type IPSP. You must specify is if it is of type
                      Client or Server.

    Optional Parameters

    <routing-context> -   This refers to the Routing Context configured for
                      M3UA Stack on SGW. This parameter is optional.

                      However for an ASP (Application Server Process)
                      assigned to this AS to be configured to process
                      signaling traffic related to more than one AS over
                      a single SCTP Association, it is mandatory to
                      specify a routing-context for the AS. If an ASP is
                      configured to always process signaling traffic
                      from one AS, irrespective of whether the received
                      messages have routing context set or not, it will
                      always be delivered to AS for further processing.

                      However if an ASP is configured to process
                      signaling traffic related to more than one AS over
                      a single SCTP Association and if a signaling
                      message is received without RC, then the ASP will
```

```
                    drop the message and send back an Error message.
                    A respective log4j error will also be logged.

    <traffic-mode>        -   You may choose to specify the traffic mode for
                    ASPs. At the moment jSS7 M3UA supports only
                    2 modes: loadshare and override. Broadcast mode is
                    not supported.

                    This is an optional parameter and if not specified
                    the default mode is 'loadshare'.

    <min-asp>          -   You may choose to specify the minumum asp
                    active for traffic mode 'loadshare' before the
                    payload starts flowing.

                    This is an optional parameter and if not specified
                    the default value is 1. Also if traffic-mode is not
                    'loadshare' setting this value has no effect.

    <network-appearance>  -   This is a M3UA local reference (typically an
                    integer) shared by SG and AS. This value together
                    with a Signaling Point Code, uniquely identifies a
                    SS7 node by indicating the specific SS7 network to
                    which it belongs. It can be used to distinguish
                    between signalling traffic, associated with
                    different networks, being sent between the SG and
                    the ASP over a common SCTP association.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua as create AS1 IPSP mode DE ipspType server rc 1 traffic-mode loadshare

    The above command will create a new M3UA Application Server identified as AS1,
    of type IPSP (Server), Double Exchange mode. The Routing Context is 1 and
    traffic-mode is 'loadshare'.

    m3ua as create AS2 AS mode SE rc 100 traffic-mode loadshare 2 network-appearance
12

    The above command will create a new M3UA Application Server identified as AS2,
    of type AS, Single Exchange mode. The Routing Context is 100,
    traffic-mode is 'loadshare' and minimun asp to be active for payload transfer is
2.
    The network-appearance value is 12.
```

Using GUI

Procedure: Create a new M3UA Application Server using GUI

1. Navigate to the tab 'ApplicationServers' in the M3UA Management Unit window and click on the 'Create AS' button. This will launch a pop-up 'Create AS'.
2. In the 'Create Application Server' pop-up, add details of the new AS. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new AS will be created with parameters as specified. If there is an error in creating the AS then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Application Server' pop-up.

Delete a M3UA AS

Using CLI

You can create a new M3UA AS by issuing the command `m3ua as create` with appropriate parameters as described below:

```
Name
    m3ua as destroy

SYNOPSIS
    m3ua as destroy <as-name> stackname <stack-name>

DESCRIPTION
    This command is used to delete an existing M3UA Application Server instance
    identified by the name 'as-name'. You must ensure that all ASPs are unassigned and
    the AS state is 'INACTIVE' prior to destroying the AS.

PARAMETERS

    Standard Parameters

    <as-name>     -   Name of the AS instance to be deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua as destroy AS1

    The above command will destroy the AS identified by the name AS1.
```

Using GUI

Procedure: Delete a M3UA Application Server using GUI

1. Navigate to the 'ApplicationServers' tab in the M3UA Management Unit window and locate the row corresponding to the AS you wish to delete.
2. You must ensure that all ASPs are unassigned from this AS and the current state of the AS is 'INACTIVE' (displayed as 'undefined') prior to destroying the AS. If the AS is inactive, the last column for 'Delete' will display a 'x' button in red and will be enabled. You can only delete the AS if it is inactive.
3. Click on the red 'x' button to delete the corresponding AS.

Assign an ASP to an AS

Using CLI

You can assign an ASP to an AS by issuing the command `m3ua as add` with appropriate parameters as described below:

```
Name
    m3ua as add

SYNOPSIS
    m3ua as add <as-name> <asp-name> stackname <stack-name>

DESCRIPTION
    This command is used to assign an Application Server Process to an Application
    Server. The AS and ASP must both be created prior to executing this command.

    You can configure an ASP to process signaling traffic related to more than one AS,
    over a single SCTP Association. However you must ensure that all the Application
    Servers that share the ASP are configured with a valid Routing Context value.

PARAMETERS

    Standard Parameters

    <as-name>     -   Name of the AS to which this ASP is being assigned.

    <asp-name>        -   Name of the ASP that is being assigned to the AS.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua as add AS1 ASP1
    - The above command will assign ASP1 to AS1.
```

Using GUI

Procedure: Assign an ASP to an AS using GUI

1. Navigate to the 'ApplicationServers' tab in the M3UA Management Unit window, locate the row corresponding to the AS you wish to assign an ASP and click on the name of the AS. This will launch the AS details page where all the properties of the AS will be displayed. Switch to the second tab in this view called "Application Server Processes". As shown in the figure below, you will find a list of all currently assigned ASPs to this selected AS.

GUI - M3UA Management - Assign ASP to an AS

1. image::images/GUI_M3UA_Management_ASP_Assign.png[]
2. Click on the 'Add ASP' button at the bottom. This will launch a pop-up named 'Add ASP' where all available ASPs will be listed in a drop down box.
3. Click on the 'Create' button to add the selected ASP to this AS. The ASP will be assigned to this AS and will be displayed in the ASP list for this AS.

4. You can configure an ASP to process signaling traffic related to more than one AS, over a single SCTP Association. However you must ensure that all the Application Servers that share the ASP are configured with a valid Routing Context value.

Unassign an ASP from an AS

Using CLI

You can unassign an ASP from an AS by issuing the command `m3ua as remove` with appropriate parameters as described below:

```
Name
    m3ua as remove

SYNOPSIS
    m3ua as remove <as-name> <asp-name> stackname <stack-name>

DESCRIPTION
    This command is used to un-assign an Application Server Process from an
    Application Server that it was previously assigned to.

PARAMETERS

    Standard Parameters

    <as-name>     -   Name of the AS from which this ASP is being
                    un-assigned.

    <asp-name>        -   Name of the ASP to be un-assigned.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    m3ua as remove AS1 ASP1

    The above command will remove ASP1 from AS1.
```

Using GUI

Procedure: Unassign an ASP from an AS using GUI

1. Navigate to the 'ApplicationServers' tab in the M3UA Management Unit window, locate the row corresponding to the AS you wish to unassign an ASP from and click on the name of the AS.
2. This will launch the AS details page where all the properties of the AS will be displayed. Switch

to the second tab in this view called "Application Server Processes". As shown in the figure above, you will find a list of all currently assigned ASPs to this selected AS.

3. Locate the row corresponding to the ASP you wish to unassign from this AS.
4. Click on the red coloured 'x' remove button in the row corresponding to the ASP you wish to remove. This action will unassign the ASP from this AS.

View all M3UA Routes

Using CLI

You can view the details of all configured M3UA Routes by issuing the command `m3ua route show` as described below:

```
Name
    m3ua route show

SYNOPSIS
    m3ua route show stackname <stack-name>

DESCRIPTION
    This command is used to display all configured routes.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific M3UA Management unit and switch to the 'Routers' tab. Here you can view a list of all the Routes created as shown in the figure below. Every correctly configured Route will be displayed in a row and for each Route, the first column will display DPC:OPC:SI values. The icon adjacent to the name will be lit 'green' if the Route is currently active or if the Route is inactive the icon will be 'orange'. The second column will indicate the current state of the Route (Active / Inactive) and the third column will display the name of the AS assigned to route messages for this DPC.

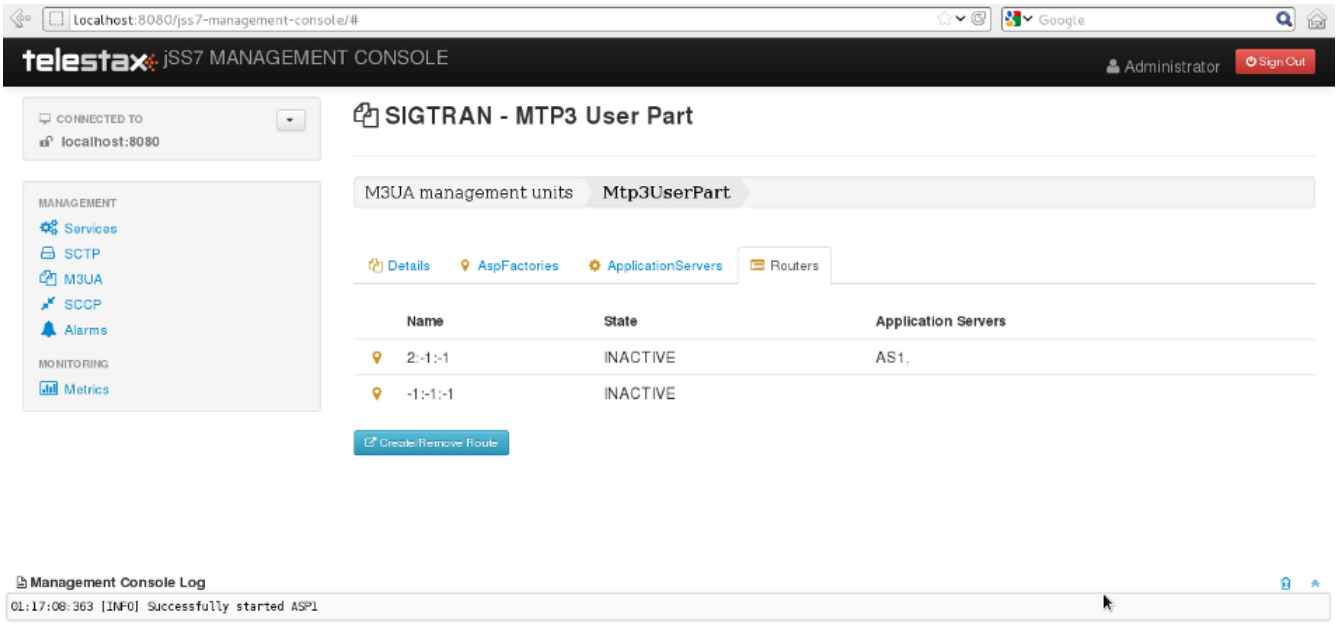

Figure 12. GUI - M3UA Management - Route

Create a new M3UA Route

Using CLI

You can create a new M3UA Route by issuing the command `m3ua route add` with appropriate parameters as described below:

```
Name
    m3ua route add

SYNOPSIS
    m3ua route add <as-name> <dpc> <opc> <si> trafficmode <traffic-mode> stackname
<stack-name>

DESCRIPTION
    This command is used to configure an AS to route message, i.e. configure the
    destination point code that the message will be routed to. You must ensure that
    the AS is created prior to executing this command.

PARAMETERS

    Standard Parameters

    <as-name>     -   Name of the AS assigned to route message for
                    this dpc.

    <dpc>         -   Destination Point Code.

    <opc>         -   Originating Point Code.

    <si>          -   Service Indicator.

    Optional Parameters
    <traffic-mode>    -   There can be two or more AS defined for each route.
                        The M3UA Stack will do load-balancing between these
                        AS depending on the traffic-mode set for this m3ua
                        route. Possible values are:
                        1. Override
                        2. Loadshare
                        3. Broadcast (Broadcast is not yet supported by M3UA)

    <stack-name>  -   Name of the stack on which this command is executed.
                        If this is not passed, the first stack configured in
                        ShellExecutor will be used.

EXAMPLES
    m3ua route add AS1 2 -1 -1
```

Using GUI

Procedure: Create a new M3UA Route using GUI

1. Navigate to the 'Routers' tab in the M3UA Management Unit window and click on the 'Create/Remove' button.
2. This will launch the pop-up 'Create/Remove Route', where you can add values for DPC, OPC, SI, traffic-mode and Application Server Name. For definition of these parameters, please refer to

the description of the CLI command for the same in the preceding section.

3. Verify the details entered and then click on the 'Create' button. A new Route will be configured with parameters as specified. If there is an error in creating the Route then you will find the details of the error in the Management Console Log section below.

Delete a M3UA Route

Using CLI

You can delete a M3UA Route by issuing the command `m3ua route remove` with appropriate parameters as described below:

```
Name
    m3ua route remove

SYNOPSIS
    m3ua route remove <as-name> <dpc> <opc> <si> stackname <stack-name>

DESCRIPTION
    This command is used to remove a previously configured route.

PARAMETERS

    Standard Parameters

    <as-name>     -   Name of the AS assigned to route message for
                      this dpc.

    <dpc>         -   Destination Point Code.

    <opc>         -   Originating Point Code.

    <si>          -   Service Indicator.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    m3ua route remove AS1 2 -1 -1
```

Using GUI

Procedure: Delete a M3UA Route using GUI

1. Navigate to the 'Routers' tab in the M3UA Management Unit window and click on the 'Create/Remove' button.

2. This will launch the pop-up 'Create/Remove Route'. Enter the values for DPC, OPC, SI and Application Server Name that you wish to remove from the list of Routes. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Click on the 'Remove' button to delete the Route corresponding to the parameters specified.

SCCP Management

SCCP provides connectionless and connection-oriented network services. This includes address(GTT) translation and routing, flow control, segmentation and reassembly. A global title is an address (e.g., a dialed 800 number, calling card number, or mobile subscriber identification number) which is translated by SCCP into a destination point code and subsystem number. A subsystem number uniquely identifies an application at the destination signaling point. is used as the transport layer for -based services.

The first step in configuring SCCP is defining service access points (sap). This step is mandatory. Each SCCP stack can use one or more Mtp3UserPart (Refer [_configuring_sccp] about Mtp3UserPart settings). A sap is a logical definition of the Mtp3UserPart [corresponding local SPC, network indicator (NI) and a set of destinations (remote SPC list)].

The second step is the definition of a list of available remote signaling pointcodes (SPC - rsp) and a list of available remote Sub-Systems (SNN - rss). This step is also mandatory. If routing only by GlobalTitle is used then it is not required to configure remote Sub-Systems.

Since acts as a message router, it is required to configure routing information. Rules (rule), primary and backup (address) (if backup addresses are available) addresses should be configured. If XUDT and LUDT messages are available in the SS7 network, you should configure a set of long message rules (lmr) that will allow long messages. This step is not mandatory. If no long message rules are configured only UDT messages will be used.

The last step is optional. You can configure a set of concerned signaling point codes (csp). Each point code will be announced when local SCCP user becomes unavailable.

Using CLI

You can manage all SCCP related configurations through the Command Line Interface by using the `sccp` command with appropriate parameters. You can create, modify, delete and view SCCP Service Access Points (sap) and Destinations (dest), Remote Signaling Point Codes (rsp), Remote Sub Systems (rss), Concerned Signaling Point Codes (csp), Routing information (rules, primary and backup addresses) and Long Message Rules (lmr). You can also set and get values for general parameters using this command.

Using GUI

The GUI will allow you to manage your SCCP configurations efficiently using a user-friendly interface. Open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'SCCP' link in the left panel. The main panel will display the names of all configured

SCCP Management units. To configure or view the settings of a particular SCCP Management Unit you must click on the name of that unit. The GUI will look similar to the figure below and is divided into tabs.

The first tab will display the properties of the SCCP Management unit. These details displayed here are fetched from the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name. These properties can be modified here in the GUI. To modify them you must click on pencil, make changes and save. The GUI will then display the modified values.

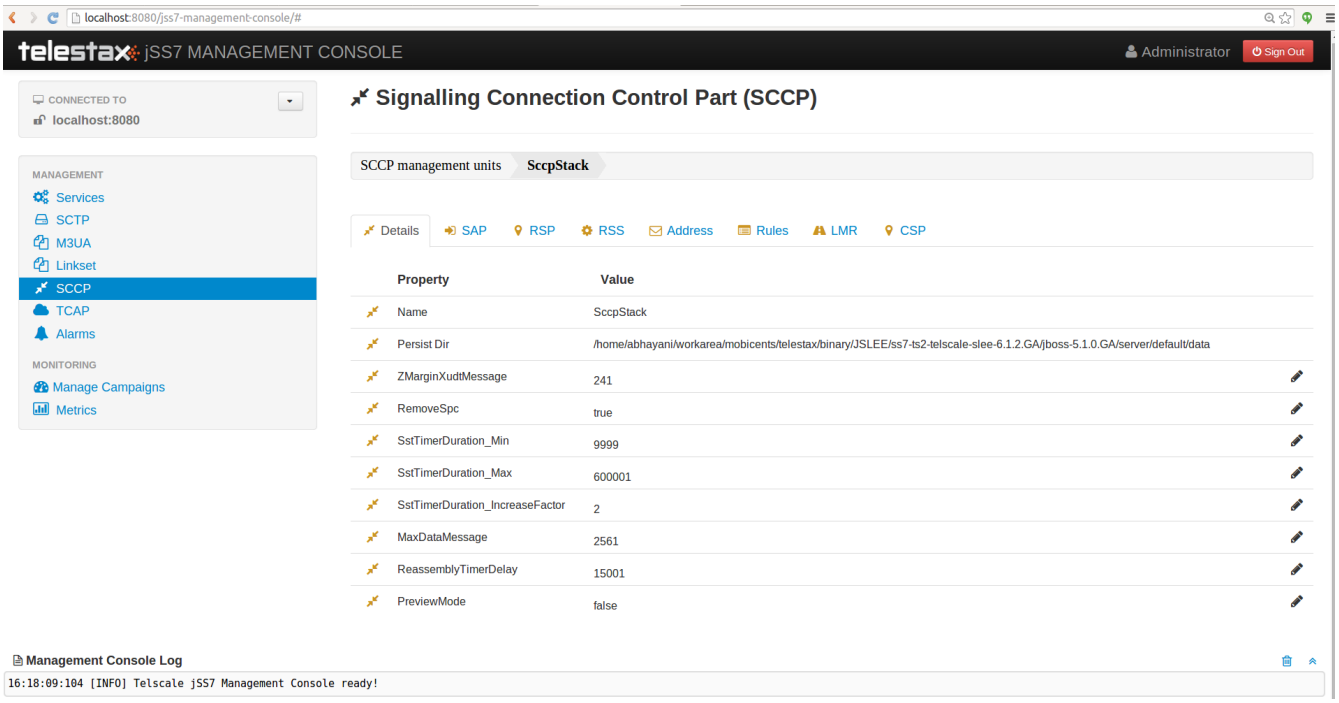

Figure 13. GUI - SCCP Management

The other seven tabs will allow you to manage all SCCP configurations within this SCCP Management unit.

SCCP stack properties

SCCP protocol version

Using CLI

We can specify which protocol specification will use SCCP stack (ITU-T or ANSI).

You can set the 'sccpprotocolversion' by issuing the command `sccp set sccpprotocolversion` with appropriate parameters as described below. You can verify this by issuing the command `sccp get sccpprotocolversion` which will display the value set for this property.

```
Name
    sccp set sccpprotocolversion

SYNOPSIS
    sccp set sccpprotocolversion <ITU | ANSI> stackname <stack-name>

DESCRIPTION
    Sets the value for sccpprotocolversion property ITU or ANSI.
    Default value is ITU.

PARAMETERS

    Optional Parameters

    <stack-name>    -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set sccpprotocolversion ITU
```

Using GUI

On SCCP management page, click on pencil against the 'ReservedForNationalUseValue of AddressIndicator' property and text box becomes editable. Change value and save.

Period of logging

Using CLI

You can set the 'periodoflogging' by issuing the command `sccp set periodoflogging` with appropriate parameters as described below. You can verify this by issuing the command `sccp get periodoflogging` which will display the value set for this property.

```
Name
    sccp set periodoflogging

SYNOPSIS
    sccp set periodoflogging <periodoflogging> stackname <stack-name>

DESCRIPTION
    Sets period of logging warning messages in ms. Default value is 10000.

PARAMETERS

    Standard Parameters

    <periodoflogging> -   Period in ms.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set periodoflogging 10000
```

Using GUI

On SCCP management page, click on pencil against the 'PeriodOfLogging' property and text box becomes editable. Change value and save.

Maximum Data Message

Using CLI

You can set the 'maxdatamessage' by issuing the command `sccp set maxdatamessage` with appropriate parameters as described below. You can verify this by issuing the command `sccp get maxdatamessage` which will display the value set for this property.

```
Name
    sccp set maxdatamessage

SYNOPSIS
    sccp set maxdatamessage <maxdatamessage> stackname <stack-name>

DESCRIPTION
    Sets Max available SCCP message data for all message types. Range is 2560 to 3952.
    If passed value is less than 2560, it sets to 2560 and if passed value is greater
    than 3952, it sets to 3952.

PARAMETERS

    Standard Parameters

    <maxdatamessage>  -   Maximum data message size.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set maxdatamessage 30000
```

Using GUI

On SCCP management page, click on pencil against the 'PreviewMode' property and text box becomes editable. Change value and save.

Preview Mode

Using CLI

You can set the 'previewmode' by issuing the command `sccp set previewmode` with appropriate parameters as described below. You can verify this by issuing the command `sccp get previewmode` which will display the value set for this property.

```
Name
    sccp set previewmode

SYNOPSIS
    sccp set previewmode <true | false> stackname <stack-name>

DESCRIPTION
    If set to true, stack only listens for incoming messages and does not
    send anything out of stack. Messages are silently dropped.

PARAMETERS

    Standard Parameters

    <previewmode> -   Set preview mode to true or false.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set previewmode false
```

Using GUI

On SCCP management page, click on pencil against the 'PreviewMode' property and text box becomes editable. Change value and save.

Reassembly Timer Delay

Using CLI

You can set the 'reassemblytimerdelay' by issuing the command `sccp set reassemblytimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get reassemblytimerdelay` which will display the value set for this property.

```
Name
    sccp set reassemblytimerdelay

SYNOPSIS
    sccp set reassemblytimerdelay <reassemblytimerdelay> stackname <stack-name>

DESCRIPTION
    Sets SCCP segmented message reassembling timeout (in milliseconds).
    Range is 10000 to 20000. If passed value is less than 10000, it sets to 10000 and
    if passed value is greater than 20000, it sets to 20000

PARAMETERS

    Standard Parameters

    <reassemblytimerdelay>    -   Re-assembly time delay in milliseconds

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set reassemblytimerdelay 20000
```

Using GUI

On SCCP management page, click on pencil against the 'ReassemblyTimerDelay' property and text box becomes editable. Change value and save.

Remove Signaling Point Code

Using CLI

You can set the 'removespc' by issuing the command `sccp set removespc` with appropriate parameters as described below. You can verify this by issuing the command `sccp get removespc` which will display the value set for this property.

```
Name
    sccp set removespc

SYNOPSIS
    sccp set removespc <false | true> stackname <stack-name>

DESCRIPTION
    If set, the signaling point code from SCCP called/calling address will
    be removed if corresponding routing is based on GT

PARAMETERS

    Standard Parameters

    <removespc>   -   true or false value.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set removespc true
```

Using GUI

On SCCP management page, click on pencil against the 'RemoveSpc' property and text box becomes editable. Change value and save.

Respect Point Code

Using CLI

You can set the 'respectpc' by issuing the command `sccp set respectpc` with appropriate parameters as described below. You can verify this by issuing the command `sccp get respectpc` which will display the value set for this property.

```
Name
    sccp set respectpc

SYNOPSIS
    sccp set respectpc <false | true> stackname <stack-name>

DESCRIPTION
    If set, the PC will be used for choosing primary or secondary address
    for outgoing messages if corresponding routing is based on GT

PARAMETERS

    Standard Parameters

    <respectpc>   -   true or false value.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set respectpc true
```

Using GUI

On SCCP management page, click on pencil against the 'RespectPc' property and text box becomes editable. Change value and save.

SST Timer Duration Increase Factor

Using CLI

You can set the 'ssttimerduration_increasefactor' by issuing the command `sccp set ssttimerduration_increasefactor` with appropriate parameters as described below. You can verify this by issuing the command `sccp get ssttimerduration_increasefactor` which will display the value set for this property.

```
Name
    sccp set ssttimerduration_increasefactor

SYNOPSIS
    sccp set ssttimerduration_increasefactor <ssttimerduration_increasefactor>
    stackname <stack-name>

DESCRIPTION
    Set multiplicator of SST sending interval (next interval will be greater then
    the current by sstTimerDuration_IncreaseFactor). Range is 1 to 4. If passed
    value is less than 1, it sets to 1 and if passed value is greater than 4,
    it sets to 4

PARAMETERS

    Standard Parameters

    <ssttimerduration_increasefactor> -   values from 1 to 4 for SST duration increase
                                        factor.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set ssttimerduration_increasefactor 1
```

Using GUI

On SCCP management page, click on pencil against the 'SstTimerDuration_IncreaseFactor' property and text box becomes editable. Change value and save.

SST Timer Duration Max

Using CLI

You can set the 'ssttimerduration_max' by issuing the command `sccp set ssttimerduration_max` with appropriate parameters as described below. You can verify this by issuing the command `sccp get ssttimerduration_max` which will display the value set for this property.

```
Name
    sccp set ssttimerduration_max

SYNOPSIS
    sccp set ssttimerduration_max <ssttimerduration_max> stackname <stack-name>

DESCRIPTION
    Sets Max (after increasing) SST sending interval (in 600000 - 1200000
milliseconds).
    Value can be from 600000 to 1200000. If value passed is less than 600000, it sets
to
    600000 and if value passed is greater than 1200000, it sets to 1200000

PARAMETERS

    Standard Parameters

    <ssttimerduration_max>    -   values from 600000 - 1200000 milliseconds.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set ssttimerduration_max 600000
```

Using GUI

On SCCP management page, click on pencil against the 'SstTimerDuration_Max' property and text box becomes editable. Change value and save.

SST Timer Duration Min

Using CLI

You can set the 'ssttimerduration_min' by issuing the command `sccp set ssttimerduration_min` with appropriate parameters as described below. You can verify this by issuing the command `sccp get ssttimerduration_min` which will display the value set for this property.

```
Name
    sccp set ssttimerduration_min

SYNOPSIS
    sccp set ssttimerduration_min <ssttimerduration_min> stackname <stack-name>

DESCRIPTION
    Set's min (starting) SST sending interval (in milliseconds). Value can be
    from 5000 to 10000.If value passed is less than 5000, it sets to 5000 and
    if value passed is greater than 10000, its set to 10000

PARAMETERS

    Standard Parameters

    <ssttimerduration_min>    -   values from 5000 to 10000.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set ssttimerduration_min 10000
```

Using GUI

On SCCP management page, click on pencil against the 'SstTimerDuration_Max' property and text box becomes editable. Change value and save.

ZMargin XUDT Message

Using CLI

You can set the 'zmarginxudtmessage' by issuing the command `sccp set zmarginxudtmessage` with appropriate parameters as described below. You can verify this by issuing the command `sccp get zmarginxudtmessage` which will display the value set for this property.

```
Name
    sccp set ssttimerduration_min

SYNOPSIS
    sccp set zmarginxudtmessage <zmarginxudtmessage> stackname <stack-name>

DESCRIPTION
    Sets segmentation length. If the XUDT message data length greater this value,
    segmentation is processed. Otherwise no segmentation.
    Range is 160 to 255. If passed value is less than 160, it sets to 160 and
    if passed value is greater than 255, it sets to 255.

PARAMETERS

    Standard Parameters

    <zmarginxudtmessage>  -   values from 160 to 255.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set zmarginxudtmessage 255
```

Using GUI

On SCCP management page, click on pencil against the 'ZMarginXudtMessage' property and text box becomes editable. Change value and save.

Timer A value for the congestion control

Using CLI

You can set the 'cc_timer_a' by issuing the command `sccp set cc_timer_a` with appropriate parameters as described below. You can verify this by issuing the command `sccp get cc_timer_a` which will display the value set for this property.

```
Name
    sccp get cc_timer_a

SYNOPSIS
    sccp get cc_timer_a stackname <stack-name>

DESCRIPTION
    Sets the Timer A value in milliseconds.
    This timer starts at next MTP-STATUS(cong) primitive coming.
    During this timer no more MTP-STATUS(cong) are accepted.

    Default value is 400.
    Possible values are between 60 and 1000.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set cc_timer_a 400
```

Using GUI

On SCCP management page, click on pencil against the 'Congestion control: Timer A' property and text box becomes editable. Change value and save.

Timer D value for the congestion control

Using CLI

You can set the 'cc_timer_d' by issuing the command `sccp set cc_timer_d` with appropriate parameters as described below. You can verify this by issuing the command `sccp get cc_timer_d` which will display the value set for this property.

```
Name
    sccp get cc_timer_d

SYNOPSIS
    sccp get cc_timer_d stackname <stack-name>

DESCRIPTION
    Sets the Timer D value in milliseconds.
    This timer starts after last MTP-STATUS(cong) primitive coming.
    After end of this timer (without new coming MTP-STATUS(cong))
    RSLM (the congestion level) will be reduced.

    Default value is 2000.
    Possible values are between 500 and 10000.

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set cc_timer_d 2000
```

Using GUI

On SCCP management page, click on pencil against the 'Congestion control: Timer A' property and text box becomes editable. Change value and save.

Can relay value

Using CLI

You can set the 'canrelay' by issuing the command `sccp set canrelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get canrelay` which will display the value set for this property.

```
Name
    sccp set canrelay

SYNOPSIS
    sccp set canrelay <canrelay>
    stackname <stack-name>

DESCRIPTION
    Enable (true) or disable (false) ability to be relay node with coupling

PARAMETERS

    Standard Parameters

    <canrelay>    -   boolean values true or false.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set canrelay true
```

Connection establishing timer delay value

Using CLI

You can set the 'connesttimerdelay' by issuing the command `sccp set connesttimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get connesttimerdelay` which will display the value set for this property.

```
Name
    sccp set connesttimerdelay

SYNOPSIS
    sccp set connesttimerdelay <connesttimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(conn est) timer delay (for how long connection waits for connection
    confirm message). Range is 60000 to 120000. If passed value is less than
    60000, it sets to 60000 and if passed value is greater than 120000,
    it sets to 120000

PARAMETERS

    Standard Parameters

    <connesttimerdelay>   -   values from 60000 to 120000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set connesttimerdelay 60000
```

Connection IT send timer delay value

Using CLI

You can set the 'iastimerdelay' by issuing the command `sccp set iastimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get iastimerdelay` which will display the value set for this property.

```
Name
    sccp set iastimerdelay

SYNOPSIS
    sccp set iastimerdelay <iastimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(ias) timer delay (after what period of time IT message will be sent
    if no messages was sent). Range is 300000 to 600000. If passed value is less
    than 300000, it sets to 300000 and if passed value is greater than 600000,
    it sets to 600000

PARAMETERS

    Standard Parameters

    <iastimerdelay>   -   values from 300000 to 600000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set iastimerdelay 300000
```

Connection message receive timer delay value

Using CLI

You can set the 'iartimerdelay' by issuing the command `sccp set iartimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get iartimerdelay` which will display the value set for this property.

```
Name
    sccp set iartimerdelay

SYNOPSIS
    sccp set iartimerdelay <iartimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(iar) timer delay (for how long connection waits to receive a message).
    Range is 660000 to 1260000. If passed value is less than 660000, it sets to
    660000 and if passed value is greater than 1260000, it sets to 1260000

PARAMETERS

    Standard Parameters

    <iartimerdelay>   -   values from 660000 to 1260000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set iartimerdelay 660000
```

Connection release complete message timer delay value

Using CLI

You can set the 'reltimerdelay' by issuing the command `sccp set reltimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get reltimerdelay` which will display the value set for this property.

```
Name
    sccp set reltimerdelay

SYNOPSIS
    sccp set reltimerdelay <iartimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(rel) timer delay (for how long connection waits for release complete
    message). Range is 10000 to 20000. If passed value is less than 10000, it
    sets to 10000 and if passed value is greater than 20000, it sets to 20000

PARAMETERS

    Standard Parameters

    <reltimerdelay>   -   values from 10000 to 20000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set reltimerdelay 10000
```

Connection released message repeat timer delay value

Using CLI

You can set the 'repeatreltimerdelay' by issuing the command `sccp set repeatreltimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get repeatreltimerdelay` which will display the value set for this property.

```
Name
    sccp set repeatreltimerdelay

SYNOPSIS
    sccp set repeatreltimerdelay <repeatreltimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(repeat rel) timer delay (for how long connection waits for release complete
    message or to repeat sending release message after T(rel) timer fire). Range is
    10000 to 20000. If passed value is less than 10000, it sets to 10000 and if passed
    value is greater than 20000, it sets to 20000

PARAMETERS

    Standard Parameters

    <repeatreltimerdelay> -   values from 10000 to 20000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set repeatreltimerdelay 10000
```

Connection resources release timer delay value

Using CLI

You can set the 'inttimerdelay' by issuing the command `sccp set inttimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get inttimerdelay` which will display the value set for this property.

```
Name
    sccp set inttimerdelay

SYNOPSIS
    sccp set inttimerdelay <inttimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(int) timer delay (for how long connection waits for release complete
    message or to release connection resources). Range is 0 to 60000. If passed
    value is less than 0, it sets to 0 and if passed value is greater than
    60000, it sets to 60000

PARAMETERS

    Standard Parameters

    <inttimerdelay>   -   values from 0 to 60000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set inttimerdelay 0
```

Connection work resume after restart time delay value

Using CLI

You can set the 'guardtimerdelay' by issuing the command `sccp set guardtimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get guardtimerdelay` which will display the value set for this property.

```
Name
    sccp set guardtimerdelay

SYNOPSIS
    sccp set guardtimerdelay <guardtimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(guard) timer delay (for how long connection waits to resume work
    after restart). Range is 1380000 to 1500000. If passed value is less
    than 1380000, it sets to 1380000 and if passed value is greater than
    1500000, it sets to 1500000

PARAMETERS

    Standard Parameters

    <guardtimerdelay> -   values from 1380000 to 1500000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set guardtimerdelay 1380000
```

Connection release after reset delay value

Using CLI

You can set the 'resettimerdelay' by issuing the command `sccp set resettimerdelay` with appropriate parameters as described below. You can verify this by issuing the command `sccp get resettimerdelay` which will display the value set for this property.

```
Name
    sccp set resettimerdelay

SYNOPSIS
    sccp set resettimerdelay <resettimerdelay>
    stackname <stack-name>

DESCRIPTION
    Set T(reset) timer delay (for how long connection waits to release after
    sending reset message). Range is 10000 to 20000. If passed value is less
    than 10000, it sets to 10000 and if passed value is greater than 20000,
    it sets to 20000

PARAMETERS

    Standard Parameters

    <resettimerdelay> -   values from 10000 to 20000 for timer delay.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set resettimerdelay 10000
```

Thread count in connections timers thread pool value

Using CLI

You can set the 'timerexecutors_threadcount' by issuing the command `sccp set timerexecutors_threadcount` with appropriate parameters as described below. You can verify this by issuing the command `sccp get timerexecutors_threadcount` which will display the value set for this property.

```
Name
    sccp set timerexecutors_threadcount

SYNOPSIS
    sccp set timerexecutors_threadcount <timerexecutors_threadcount>
    stackname <stack-name>

DESCRIPTION
    Set number of threads in thread pool for connections timers. Range is from 1
    to 100. If passed value is less than 1, it sets to 1 and if passed
    value is greater than 1000, it sets to 1000

PARAMETERS

    Standard Parameters

    <timerexecutors_threadcount>  -   values from 1 to 1000.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set timerexecutors_threadcount 10
```

Algorithm of the congestion control at SCCP level

Using CLI

You can set the 'cc_algo' by issuing the command `sccp set cc_algo` with appropriate parameters as described below. You can verify this by issuing the command `sccp get cc_algo` which will display the value set for this property.

```
Name
    sccp set cc_algo

SYNOPSIS
    sccp set cc_algo <international | levelDepended> stackname <stack-name>

DESCRIPTION
    Sets the algorithm of the congestion control at SCCP level for outgoing
    messages.
    Possible values are international or levelDepended.
    international algorithm - only one level is provided by MTP3 level
    (in MTP-STATUS primitive). Each MTP-STATUS increases N / M levels.
    international algorithm - MTP3 level (MTP-STATUS primitive) provides
    3 levels of a congestion (1-3) and SCCP congestion will increase to
    the next level after MTP-STATUS next level increase (MTP-STATUS 1
    to N up to 3, MTP-STATUS 2 to N up to 5, MTP-STATUS 3 to N up to 7).

    Default value is international.

PARAMETERS

    Standard Parameters

    <cc_algo> -   international | levelDepended.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set cc_algo international
```

Using GUI

On SCCP management page, click on pencil against the 'Congestion control: algorithm' property and text box becomes editable. Change value and save.

Blocking of outgoing messages in case of the congestion

Using CLI

You can set the 'cc_blockingoutgoungsccpmessages' by issuing the command `sccp set cc_blockingoutgoungsccpmessages` with appropriate parameters as described below. You can verify this by issuing the command `sccp get cc_blockingoutgoungsccpmessages` which will display the value set for this property.

```
Name
    sccp set cc_blockingoutgoungsccpmessages

SYNOPSIS
    sccp set cc_blockingoutgoungsccpmessages <false | true> stackname <stack-name>

DESCRIPTION
    Sets the value of if outgoing SCCP messages will be blocked in congestion.
    (depending on message type, UDP messages from level N=6).
    true means that message will be blocken in the congestion case,
    false means not.

    Default value is false.

PARAMETERS

    Standard Parameters

    <cc_blockingoutgoungsccpmessages> -   false or true.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp set cc_blockingoutgoungsccpmessages false
```

Using GUI

On SCCP management page, click on pencil against the 'Congestion control: blocking of outgoing messages' property and text box becomes editable. Change value and save.

View all Service Access Points (SAP)

Using CLI

You can view the details of all configured Service Access Points by issuing the command `sccp sap show` as described below:

```
Name
    sccp sap show

SYNOPSIS
    sccp sap show <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all Service Access Points. If an <id>
    is specified, the command will only display the details of the SAP identified by
    the value of the 'id' specified.

PARAMETERS

    Optional Parameters

    <id>          -   The id of the SAP whose details are to be displayed. If
                      this parameter is not specified, the details of all
                      defined SAPs will be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'SAP' tab. Here you can view a list of all the Service Access Points created. Every correctly configured Service Access Point will be displayed in a row with their defined values. The last column 'Action' will allow you to delete the Service Access Point.

Create a new Service Access Point

Using CLI

You can create a new Service Access Point by issuing the command `sccp sap create` with appropriate parameters as described below:

```
Name
    sccp sap create

SYNOPSIS
    sccp sap create <id> <mtp3-id> <opc> <ni> stackname <stack-name> networkid
<networkId>
    localgtdigits <localGtDigits>

DESCRIPTION
    This command is used to define a new Service Access Point.
```

```
PARAMETERS

    Standard Parameters

    <id>          -   The newly defined SAP will be identified using this 'id'.
                  This must be a unique number.

    <mtp3-id>     -   Mtp3UserPart index - used as an index of 'mtp3UserPart'
                  property of the SccpStack Bean. For each Mtp3UserPart,
                  a sap must be configured.

    <opc>         -   MTP Point code of the local signaling point. Takes an
                  Integer Value.

    <ni>          -   Network indicator that forms part of the
                  Service Information Octet (SIO).

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                  If not passed, the first stack configured in ShellExecutor
                  will be used.

    <networkId>     - A digital parameter that means to which virtual SS7 network
                  belongs Service Access Point (SAP). If this parameter is
                  skipped - networkId will be set to "0" when SAP creation.
                  Refer <xref linkend="design_multitenancy"/>.

    <localGtDigits> - Local GT digits. An incoming message will be brought to this
                  sap if GT digits of callePartyAddress matches to this value.
                  "null" value matches to any incoming message. If this parameter
                  is skipped - networkId will be set to "null" by default.


EXAMPLES
    sccp sap create 1 1 101 2 networkid 2 localgtdigits 999888777

    The above command will create a new Service Access Point identified by the
    number '1'. The values for 'mtp3-id', 'opc' and 'ni' are 1, 101 and 2
respectively.
```

Using GUI

Procedure: Create a new Service Access Point using GUI

1. Navigate to the 'SAP' tab in the SCCP Management window and click on the 'Create SAP' button. This will launch a pop-up 'Create SAP'.
2. In the 'Create SAP' pop-up, add details of the new Service Access Point. You must ensure that you fill in all the mandatory parameters (Id, MTP3 Id, OPC, NI). For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.

3. Verify the details entered and then click on the 'Create' button. A new SAP will be created with parameters as specified. If there is an error in creating the SAP then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create SAP' pop-up.

Modify a Service Access Point

Using CLI

You can modify the values of a Service Access Point by issuing the command `sccp sap modify` with appropriate parameters as described below:

```
Name
    sccp sap modify

SYNOPSIS
    sccp sap modify <id> mtp3-id <mtp3-id> opc <opc> ni <ni> stackname <stack-name>
networkid <networkId>
    localgtdigits <localGtDigits>

DESCRIPTION
    This command is used to modify a previously defined Service Access Point.

PARAMETERS

    Standard Parameters

    <id>          -   The id of the SAP whose values are being modified.

    Optional Parameters

    <mtp3-id>     -   Mtp3UserPart index - used as an index of 'mtp3UserPart'
                    property of the SccpStack Bean. For each Mtp3UserPart, a
                    sap must be configured.

    <opc>         -   MTP Point code of the local signaling point. Takes an
                    Integer Value.

    <ni>          -   Network indicator that forms part of the Service
                    Information Octet (SIO).

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

    <networkId>     - A digital parameter that means to which virtual SS7 network
                    belongs Service Access Point (SAP). If this parameter is
                    skipped - networkId will be set to "0" when SAP creation.
                    Refer <xref linkend="design_multitenancy"/>.

    <localGtDigits> - Local GT digits. An incoming message will be brought to this
                    sap if GT digits of callePartyAddress matches to this value.
                    "null" value matches to any incoming message. If this parameter
                    is skipped - networkId will be set to "null" by default.


EXAMPLES
    sccp sap modify 1 mtp3-id 2 opc 102 ni 2

    The above command will modify the values of the Service Access Point identified
    by the number '1'. The new values for 'mtp3-id', 'opc' and 'ni' are 2, 102 and 2
    respectively.
```

Delete a Service Access Point

Using CLI

You can delete a SAP by issuing the command `sccp sap delete` with appropriate parameters as described below:

```
Name
    sccp sap delete

SYNOPSIS
    sccp sap delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to delete a previously defined Service Access Point.

PARAMETERS

    Standard Parameters

    <id>          -   The id of the SAP that is being deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp sap delete 1

    The above command will delete the SAP identified by the number '1'.
```

Using GUI

Procedure: Delete a SAP using GUI

1. Navigate to the 'SAP' tab in the SCCP Management Unit window and locate the row corresponding to the SAP you wish to delete.
2. The last column for 'Delete' action will display a 'x' button in red and will be enabled.
3. Click on the red 'x' button to delete the corresponding SAP.

View all Destinations specified for a SAP

Using CLI

You can view the details of all Destinations specified for a Service Access Point by issuing the

command `sccp dest show` as described below:

```
Name
    sccp dest show

SYNOPSIS
    sccp dest show <sap-id> <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all Destinations specified for a
    Service Access Point. If an <id> is specified in the command, it will only display
    the details of the Destination identified by the value of the 'id' specified.

PARAMETERS

    Standard Parameters

    <sap-id>  -   The id of the SAP whose Destination details are to be
                displayed.


    Optional Parameters

    <id>          -   The id of the Destination whose details are to be
                    displayed. If this parameter is not specified, the details
                    of all Destinations defined within the SAP 'sap-id' will
                    be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'SAP' tab. Here you can view a list of all the Service Access Points created. Every correctly configured Service Access Point will be displayed in a row with their defined values. To view the Destination details of a specific SAP, click on the row corresponding to the SAP. The row will expand below to display the details of all configured Destinations.

Define a new Destination for a SAP

Using CLI

You can define a new Destination for a Service Access Point by issuing the command `sccp dest create` with appropriate parameters as described below:

```
Name
```

```
    sccp dest create

SYNOPSIS
    sccp dest create <sap-id> <id> <first-dpc> <last-dpc> <first-sls> <last-sls>
    <sls-mask> stackname <stack-name>

DESCRIPTION
    This command is used to define a new Destination for a Service Access Point.
    For every SAP in the system, you should configure one or more Destinations.

PARAMETERS

    Standard Parameters

    <sap-id>  -   The identifier of the SAP for which this new Destination
                is being defined. You must ensure that the SAP has been
                created prior to issuing this command.

    <id>      -   An identifier for this newly created Destination.
                The number must be unique within each SAP.

    <first-dpc>   -   The first value of the remote signaling point codes range.

    <last-dpc>    -   The last value of the remote signaling point codes range.
                If the Destination specifies only a single Signaling
                Point Code, this value must be equal to the value
                specified for 'first-dpc'.

    <first-sls>   -   The first value of the SLS range.
                SLS value range is from 0 to 255.

    <last-sls>    -   The last value of the SLS range.

    <sls-mask>    -   The mask value. SLS of a message will be exposed by
                performing a bitwise AND operation with this mask prior to
                comparing it with first-sls and last-sls values.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.


EXAMPLES
    sccp dest create 1 1 201 201 0 7 7

    The above command will create a new Destination (identified by number '1') for
    a Service Access Point identified by the number '1'. The values for 'first-dpc',
    'last-dpc', 'first-sls', 'last-sls' and 'sls-mask' are 201, 201, 0, 7 and 7
    respectively.
```

```
sccp dest create 2 1 300 399 0 255 255

The above command will create a new Destination (identified by number '2') for
a Service Access Point identified by the number '1'. The values for 'first-dpc',
'last-dpc', 'first-sls', 'last-sls' and 'sls-mask' are 300, 399, 0, 255 and 255
respectively. This Destination will cover all possible SLS values.
Therefore the value for first-sls =0, last-sls=255 and sls-mask=255
```

Using GUI

Procedure: Define a new Destination for a Service Access Point using GUI

1. Navigate to the 'SAP' tab in the SCCP Management window and click on the row corresponding to the SAP for which you would like to define a new Destination.
2. The SAP row will expand below to display the details of all configured Destinations. In this section for Destinations, click on the 'Create Destination' button. This will launch a new pop-up 'Create MTP3 Destination'.
3. In the 'Create MTP3 Destination' pop-up, add details of the new Destination being defined for the Service Access Point. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
4. Verify the details entered and then click on the 'Create' button. A new Destination will be created with parameters as specified. If there is an error in creating the SAP then you will find the details of the error in the Management Console Log section below.
5. Click on the 'Close' button to close the 'Create MTP3 Destination' pop-up.

Modify a Destination defined for a SAP

Using CLI

You can modify the values of a Destination defined for a Service Access Point by issuing the command `sccp dest modify` with appropriate parameters as described below:

```
Name
    sccp dest modify

SYNOPSIS
    sccp dest modify <sap-id> <id> first-dpc <first-dpc> last-dpc <last-dpc> first-sls
<first-sls> last-sls <last-sls>
    sls-mask <sls-mask> stackname <stack-name>


DESCRIPTION
    This command is used to modify the values of a Destination previously defined for
    a Service Access Point.

PARAMETERS

    Standard Parameters

    <sap-id>  -   The identifier of the SAP whose Destination is being
                modified.

    <id>      -   The identifier of the Destination that is being modified.

    Optional Parameters
    <first-dpc>   -   The first value of the remote signaling point codes range.

    <last-dpc>    -   The last value of the remote signaling point codes range.
                If the Destination specifies only a single Signaling
                Point Code, this value must be equal to the value
                specified for 'first-dpc'.

    <first-sls>   -   The first value of the SLS range.
                SLS value range is from 0 to 255.

    <last-sls>    -   The last value of the SLS range.

    <sls-mask>    -   The mask value. SLS of a message will be exposed by
                performing a bitwise AND operation with this mask prior to
                comparing it with first-sls and last-sls values.
    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp dest modify 1 1 first-dpc 201 last-dpc 299 first-sls 0 last-sls 255 sls-mask
255

    The above command will modify the values of the Destination identified by the
    number '1' within the Service Access Point identified by the number '1'.
    The new values for 'first-dpc', 'last-dpc', 'first-sls', 'last-sls' and 'sls-mask'
    are 201, 299, 0, 255 and 255 respectively.
```

Delete a Destination defined for a SAP

Using CLI

You can delete a Destination defined for a SAP by issuing the command `sccp dest delete` with appropriate parameters as described below:

```
Name
    sccp dest delete

SYNOPSIS
    sccp dest delete <sap-id> <id> stackname <stack-name>

DESCRIPTION
    This command is used to remove a previously defined Destination from a
    Service Access Point.

PARAMETERS

    Standard Parameters

    <sap-id>  -   The identifier of the SAP whose Destination is being
                deleted.

    <id>      -   The identifier of the Destination that is being
                deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp dest delete 1 1

    The above command will delete the Destination identified by the number '1' from
    the SAP identified by the number '1'.
```

Using GUI

Procedure: Delete a Destination defined for a SAP using GUI

1. Navigate to the 'SAP' tab in the SCCP Management Unit window and click on the row corresponding to the SAP from which you wish to delete a Destination.
2. The SAP row will expand below to display the details of all configured Destinations. In this section for Destinations, locate the specific Destination you wish to remove from the list.
3. In the row corresponding to the identified Destination, click on the red 'x' button in the actions

column to delete that Destination.

View all configured SCCP Addresses

Using CLI

You can view the details of all configured SCCP Addresses by issuing the command `sccp address show` as described below:

```
Name
    sccp address show

SYNOPSIS
    sccp address show id <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured addresses.
    If an <id> is specified in the command, it will only display the details of the
    Address identified by the value of the 'id' specified.

PARAMETERS

    Optional Parameters

    <id>          -   The id of the Address whose details are to be displayed.
                    If this parameter is not specified, the details of all
                    configured Addresses will be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'Address' tab. Here you can view a list of all the configured Addresses. Every correctly configured Address will be displayed in a row along with the defined values.

Create a new Primary/Backup address

Using CLI

You can create a new primary address or backup address of translation by issuing the command `sccp address create` with appropriate parameters as described below:

```
Name
    sccp address create
```

```
SYNOPSIS
    sccp address create <id> <address-indicator> <point-code> <subsystem-number>
    <translation-type> <numbering-plan> <nature-of-address-indicator> <digits>
    stackname <stack-name>

DESCRIPTION
    This command is used to create a new primary address or backup address of
    translation. You can create a new newCallingParty address as well
    using this command. The global title address information of this command is
combined with
    the global title being translated by examining the mask provided in the
    'sccp rule create' command.

PARAMETERS

    Standard Parameters

    <id>          -   A unique number to identify this address.

    <address-indicator>   -   The address indicator is the first field in a SCCP
                    Party Address (called/calling) and is one octet in
                    length. Its function is to indicate which
                    information elements are present so that the
                    address can be interpreted. In other words, it
                    indicates the type of addressing information that
                    is to be found in the address field. The
                    addressing information from the original global
                    title is then compared with the passed address
                    information to match the rule.

                    SCCP ADDRESS INDICATOR
                    --------------------------------
                    | 8 | 7 | 6 | 5 | 4 |3 | 2 | 1 |
                    --------------------------------

                    Bit '1'     : PC Indicator
                              (1 = included)

                    Bit '2'     : SSN Indicator
                              (1 = included)

                    Bit '3 - 6' : GT Indicator
                              (0000 = GT not included)
                              (0001 = GT includes
                                  Nature of Address)
                              (0010 = GT includes
                                  Translation Type)
                              (0011 = GT includes
                                  Translation Type,
                                  Numbering Plan and
```

```
                              Encoding Scheme)
                         (0100 = GT includes
                              Translation Type,
                              Numbering Plan and
                              Encoding Scheme and
                              Nature of Address)

                Bit '7'     : Routing Indicator
                         (0 = Route on GT,
                         1 = Route on PC + SSN)

                Bit '8'     : Reserved for National use.

                Only two fields of Address Indicator is used now for GTT:
                - GT Indicator (this is used for GlobalTitle type that
                  will be created)
                - Routing Indicator bit (0 = Route on GT, 1 = Route on
                  PC + SSN)
                GT Indicator for ITU-T network that is mostly used is -
                0100 (GT includes Translation Type, Numbering Plan and
                Encoding Scheme and Nature of Address). Digital value
                for it is - 16.
                For 0100 GT Indicator we will use two possible values:
                16 - 0100 GT Indicator and Route on GT
                80 - 0100 GT Indicator and Route on PC + SSN
                Even when SCCP stack works in ANSI mode Address Indicator
                value for CLI and GUI must have values that we use for
                ITU-T mode.

<point-code>      -   MTP Signaling Point Code.
                This parameter contains a point code to which message will
                be routed after GTT (DPC field).
                This parameter is mandatory.

<subsystem-number>    - This parameter contains SSN which will be placed
                into CalledPartyAddress. If you set this parameter to "0",
                SSN from CalledPartyAddress of an original message will be
                put into CalledPartyAddress.

<translation-type>    -   This is ignored if GT Indicator is 0000 or 0001.

                TRANSLATION TYPE VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1  - 63     International Service

                64 - 127    Spare
```

```
                128 - 254   National Network Specific

                255     Reserved for Expansion

                Value of this parameter will be placed into
                CalledPartyAddress. This parameter is mandatory if GT
                Indicator suppose this parameter is included into GT.
                Most used value: 0 - translation-type - Unknown

<numbering-plan>  -   The Number Plan (NP) field specifies the numbering
                plan which the address information follows. This
                is ignored if GT Indicator is 0000, 0001 or 0010.

                Value of this parameter will be placed into
                CalledPartyAddress. This parameter is mandatory if GT
                Indicator suppose this parameter is included into GT.
                Most used value: 1 - numbering-plan - ISDN/telephony

<nature-of-address>   -   The Nature of Address Indicator (NAI) field
                defines the address range for a specific numbering
                plan. This is only used if GT Indicator is 0100.

                Value of this parameter will be placed into
                CalledPartyAddress. This parameter is mandatory if GT
                Indicator suppose this parameter is included into GT.
                Most used value: 4 - nature-of-address - International

<digits>      -   The global title address information to translate
                to. Specified as string of digits divided into
                subsections using separator '/' depending on if
                the mask contains separator or not.
                The digits string can contain:

                DIGIT PATTERN

                Value       Description
                ---------------------------------
                -       padding - ignored

                /       separator used to split the digit
                        pattern into sections.
                        Each section is processed
                        differently as specified by the
                        mask parameter in the
                        'sccp rule create' command.

                We need this parameter if at least one section of Rule
                mask contains "R" (replace) value. Else set this field
                to "0". If this field is needed it should contain the
                same subsections as the rule mask has.
```

```
    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp address create 1 71 2 8 0 0 3 123456789
```

Using GUI

Procedure: Create a new Primary/Backup Address using GUI

1. Navigate to the 'Address' tab in the SCCP Management window and click on the 'Create Address' button. This will launch a new pop-up 'Create SCCP Address'.
2. In the 'Create SCCP Address' pop-up, add details of the new SCCP Address being defined. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new Address will be created with parameters as specified. If there is an error in creating the Address then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create SCCP Address' pop-up.

Modify a Primary/Backup Address

Using CLI

You can modify the values of a primary address or backup address of translation by issuing the command `sccp address modify` with appropriate parameters as described below:

```
Name
    sccp address modify

SYNOPSIS
    sccp address modify <id> address-indicator <address-indicator> point-code <point-
code> subsystem-number <subsystem-number>
    translation-type <translation-type> numbering-plan <numbering-plan> nature-of-
address-indicator <nature-of-address-indicator> digits <digits>
    stackname <stack-name>

DESCRIPTION
    This command is used to modify the values of an address
    previously defined.

PARAMETERS

    Standard Parameters
```

```
<id>          -   Identifier of the address to be modified.

Optional Parameters
<address-indicator>   -   The address indicator is the first field in a SCCP
                Party Address (called/calling) and is one octet in
                length. Its function is to indicate which
                information elements are present so that the
                address can be interpreted. In other words, it
                indicates the type of addressing information that
                is to be found in the address field. The
                addressing information from the original global
                title is then compared with the passed address
                information to match the rule.

                SCCP ADDRESS INDICATOR
                --------------------------------
                | 8 | 7 | 6 | 5 | 4 |3 | 2 | 1 |
                --------------------------------

                Bit '1'     : PC Indicator
                          (1 = included)

                Bit '2'     : SSN Indicator
                          (1 = included)

                Bit '3 - 6' : GT Indicator
                          (0000 = GT not included)
                          (0001 = GT includes
                              Nature of Address)
                          (0010 = GT includes
                              Translation Type)
                          (0011 = GT includes
                              Translation Type,
                              Numbering Plan and
                              Encoding Scheme)
                          (0100 = GT includes
                              Translation Type,
                              Numbering Plan and
                              Encoding Scheme and
                              Nature of Address)

                Bit '7'     : Routing Indicator
                          (0 = Route on GT,
                          1 = Route on PC + SSN)

                Bit '8'     : Reserved for National use.

                Only two fields of Address Indicator is used now for GTT:
                - GT Indicator (this is used for GlobalTitle type that
                  will be created)
                - Routing Indicator bit (0 = Route on GT, 1 = Route on
```

```
                  PC + SSN)
                GT Indicator for ITU-T network that is mostly used is -
                0100 (GT includes Translation Type, Numbering Plan and
                Encoding Scheme and Nature of Address). Digital value
                for it is - 16.
                For 0100 GT Indicator we will use two possible values:
                16 - 0100 GT Indicator and Route on GT
                80 - 0100 GT Indicator and Route on PC + SSN
                Even when SCCP stack works in ANSI mode Address Indicator
                value for CLI and GUI must have values that we use for
                ITU-T mode.

<point-code>        -   MTP Signaling Point Code.
                This parameter contains a point code to which message will
                be routed after GTT (DPC field).
                This parameter is mandatory.

<subsystem-number>  - This parameter contains SSN which will be placed
                into CalledPartyAddress. If you set this parameter to "0",
                SSN from CalledPartyAddress of an original message will be
                put into CalledPartyAddress.

<translation-type>    -   This is ignored if GT Indicator is 0000 or 0001.

                TRANSLATION TYPE VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1  - 63     International Service

                64 - 127    Spare

                128 - 254   National Network Specific

                255     Reserved for Expansion

                Value of this parameter will be placed into
                CalledPartyAddress. This parameter is mandatory if GT
                Indicator suppose this parameter is included into GT.
                Most used value: 0 - translation-type - Unknown

<numbering-plan>    -   The Number Plan (NP) field specifies the numbering
                plan which the address information follows. This
                is ignored if GT Indicator is 0000, 0001 or 0010.

                Value of this parameter will be placed into
                CalledPartyAddress. This parameter is mandatory if GT
                Indicator suppose this parameter is included into GT.
                Most used value: 1 - numbering-plan - ISDN/telephony
```

```
<nature-of-address> -   The Nature of Address Indicator (NAI) field
                defines the address range for a specific numbering
                plan. This is only used if GT Indicator is 0100.

                Value of this parameter will be placed into
                CalledPartyAddress. This parameter is mandatory if GT
                Indicator suppose this parameter is included into GT.
                Most used value: 4 - nature-of-address - International

<digits>      -   The global title address information to translate
                to. Specified as string of digits divided into
                subsections using separator '/' depending on if
                the mask contains separator or not.
                The digits string can contain:

                DIGIT PATTERN

                Value       Description
                ---------------------------------
                -       padding - ignored

                /       separator used to split the digit
                        pattern into sections.
                        Each section is processed
                        differently as specified by the
                        mask parameter in the
                        'sccp rule create' command.

                We need this parameter if at least one section of Rule
                mask contains "R" (replace) value. Else set this field
                to "0". If this field is needed it should contain the
                same subsections as the rule mask has.

<stack-name>  -   Name of the stack on which this command is executed.
                If not passed, the first stack configured in ShellExecutor
                will be used.
```

Delete a Primary/Backup Address

Using CLI

You can delete a Primary or Backup Address by issuing the command `sccp address delete` with appropriate parameters as described below:

```
Name
    sccp address delete

SYNOPSIS
    sccp address delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to remove previously defined addresses.

PARAMETERS

    Standard Parameters

    <id>      -   The identifier of the address that is being deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp address delete 1

    The above command will delete the address identified by the number '1'.
```

Using GUI

Procedure: Delete a Primary/Backup Address using GUI

1. Navigate to the 'Address' tab in the SCCP Management Unit window and locate the row corresponding to the Address you wish to delete.
2. In the row corresponding to the identified Address, click on the red 'x' button in the actions column to delete that Address.

View all configured SCCP Rules

Using CLI

You can view the details of all configured SCCP Rules by issuing the command `sccp rule show` as described below:

```
Name
    sccp rule show

SYNOPSIS
    sccp rule show id <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all Rules configured. If an <id> is
    specified in the command, it will only display the details of the Rule identified
    by the value of the 'id' specified.

PARAMETERS

    Optional Parameters

    <id>      -   The id of the Rule whose details are to be displayed.
                  If this parameter is not specified, the details of all
                  configured Rules will be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                  If not passed, the first stack configured in ShellExecutor
                  will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'Rules' tab. Here you can view a list of all the configured Rules. Every correctly configured Rule will be displayed in a row along with the defined values.

Create a new SCCP Rule

Sorting Algorithm

When you define Rules, a comparison function imposes ordering the collection of SCCP Rules using a sorting algorithm that is based on the GT digits. The algorithm is defined below:

1. Rules defined with OriginationType==localOriginated or OriginationType==remoteOriginated, are always at the top of the list. Rules defined with OriginationType==All are always at the bottom of the list.

   Among rules with the same values for OriginationType (All or localOriginated/remoteOriginated), the sorting is done using the below rules.

2. Rules with GT digits having no wildcard (* or ?) are always at the top of the list. Between two Rules with GT digits, both having no wildcards, the one with the shortest length is at the top of the list. For example, Digit1 "123456" will be above Digit2 "1234567890" and this will be above Digit3 "999/*
3. Rules with GT digits having the wildcard "?" are always above digits having the wildcard "**". For**

example, Digit1 "800/????/9" will be above Digit2 "999/

4. Between Rules with two GT digits both having wildcard "?", the one with the least number of wildcard "?" is at the top of the list. For example, Digit1 "800/????/9" will be above Digit2 "800/?????/9"
5. Between Rules with two GT digits both having an equal number of wildcard "?", the digit whose first appearance of "?" is after other, is at the top of the list. For example between Digit1 "80/??/0/???/9" and Digit 2 "800/?????/9", Digit2 is above Digit1. When a Rule is compared during Translation, comparison always starts from the top of the list.
6. If 2 rules have exactly same digits then rules are sorted using the above logic for calling digits.

Parameters backup-addressid (when ruleType parameter is "solitary"), loadsharing-algo (when ruleType parameter is not "loadshared"), newcgparty-addressid, origination-type, networkid, stackname and parameters for a calling party address (calling-ai, calling-pc, calling-ssn, calling-tt, calling-np, calling-nai, calling-digits-pattern) are optional. If newcgparty-addressid is not specified then calling party address will not be changed. If origination-type is not specified then a rule applies to all messages regardless of their origination. If networkid is not specified then networkid will be assigned to 0. If stackname is not specified then a rule will be applied to a default SCCP stack. If calling party address parameters are not specified then only called party address patterns will be taken into account.

Using CLI

You can create a new Rule by issuing the command `sccp rule create` with appropriate parameters as described below:

```
Name
    sccp rule create

SYNOPSIS
    sccp rule create <id> <mask> <address-indicator> <point-code> <subsystem-number>
    <translation-type> <numbering-plan> <nature-of-address-indicator> <digits>
    <ruleType> <primary-address-id> backup-addressid <backup-address-id>
    loadsharing-algo <loadsharing-algorithm> newcgparty-addressid
    <new-callingPartyAddress-id> origination-type <originationType>
    networkid <networkId> calling-ai <calling-address-indicator>
    calling-pc <calling-point-code> calling-ssn <calling-subsystem-number>
    calling-tt <calling-translation-type> calling-np <calling-numbering-plan>
    calling-nai <calling-nature-of-address-indicator>
    calling-digits-pattern <calling-digits-pattern> stackname <stack-name>

DESCRIPTION
    This command is used to create a new SCCP Routing Rule. You must ensure that
    primary and backup addresses are configured properly prior to executing this
    command.

PARAMETERS

    Standard Parameters
```

```
<id>          -   A unique number to identify this Rule.

<mask>          -   A mask defines which part of the originally dialed
                digits remains in the translated digits and which
                part is replaced by the digits from primary or
                backup address. A mask is divided into sections by
                separator '/'. The number of sections in a mask
                should be equal to the sections in digits passed
                in this command and the sections in primary or
                backup address. This paramter is mandatory.

                MASK DEFINITIONS

                Mnemonic    Function
                ---------------------------------
                -       Ignore

                /       Separator used to split the mask
                        into sections.

                K       Retain the original dialed digits
                        of this section in the translated
                        digits.

                R       Replace the original dialed digits
                        of this section with the same
                        section from primary or backup
                        address in the translated digits.

<address-indicator>   -   The address indicator is the first field in a SCCP
                Party Address (called/calling) and is one octet in
                length. Its function is to indicate which
                information elements are present so that the
                address can be interpreted. In other words, it
                indicates the type of addressing information that
                is to be found in the address field. The
                addressing information from the original global
                title is then compared with the passed address
                information to match the rule.

                SCCP ADDRESS INDICATOR
                --------------------------------
                | 8 | 7 | 6 | 5 | 4 |3 | 2 | 1 |
                --------------------------------

                Bit '1'     : PC Indicator
                          (1 = included)

                Bit '2'     : SSN Indicator
                          (1 = included)
```

```
                Bit '3 - 6' : GT Indicator
                          (0000 = GT not included)
                          (0001 = GT includes
                              Nature of Address)
                          (0010 = GT includes
                              Translation Type)
                          (0011 = GT includes
                              Translation Type,
                              Numbering Plan and
                              Encoding Scheme)
                          (0100 = GT includes
                              Translation Type,
                              Numbering Plan and
                              Encoding Scheme and
                              Nature of Address)

                Bit '7'     : Routing Indicator
                          (0 = Route on GT,
                          1 = Route on PC + SSN)

                Bit '8'     : Reserved for National use.

                Only GT Indicator is used in the current implementation.
                A Rule matches to an original address only if GT Indicator
                from address-indicator is the same in a rule and in an
                original address. GT Indicator for ITU-T network that is
                mostly used is - 0100 (GT includes Translation Type,
                Numbering Plan and Encoding Scheme and Nature of Address).
                If you also use 0100 - use digital value for it - 16.
                Even when SCCP stack works in ANSI mode Address Indicator
                value for CLI and GUI must have values that we use for
                ITU-T mode.

<point-code>      -   MTP Signaling Point Code. This is ignored if
                Bit '0' of address-indicator is not set.
                This parameter is not used in currentimplemetation and
                can be set to "0".

<subsystem-number>    -   This is ignored if Bit '1' of address-indicator is
                not set.
                This parameter is not used in currentimplemetation and
                can be set to "0".

<translation-type>    -   This is ignored if GT Indicator is 0000 or 0001.

                TRANSLATION TYPE VALUES

                Value       Description
                ----------------------------------
                0       Unknown
```

```
                1  - 63     International Service

                64 - 127    Spare

                128 - 254   National Network Specific

                255     Reserved for Expansion

                This paramter is mandatory.
                A Rule matches to an original address only if a value of
                this parameter is the same in a rule and in an original
                address. Values are compared only if GT type contains this
                parameter (see GT Indicator description in
                <address-indicator> parameter).
                Most used values:
                0 - translation-type - Unknown

<numbering-plan>  -   The Number Plan (NP) field specifies the numbering
                plan which the address information follows. This
                is ignored if GT Indicator is 0000, 0001 or 0010.

                NUMBER PLAN VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1       ISDN/Telephony Number Plan
                        (Recommendations E.163 and E.164)

                2       Generic Numbering Plan

                3       Data Numbering Plan
                        (Recommendations X.121)

                4       Telex Numbering Plan
                        (Recommendations F.69)

                5       Maritime Mobile Numbering Plan
                        (Recommendations E.210, E.211)

                6       Land Mobile Numbering Plan
                        (Recommendations E.212)

                7       ISDN/Mobile Numbering Plan
                        (Recommendations E.214)

                8 to 13     Spare

                14      Private Network or
```

```
                        Network-Specific Numbering Plan

                15      Reserved

                This paramter is mandatory.
                A Rule matches to an original address only if a value of
                this parameter is the same in a rule and in an original
                address. Values are compared only if GT type contains this
                parameter (see GT Indicator description in
                <address-indicator> parameter).
                Most used values:
                1 - numbering-plan - ISDN/telephony

<nature-of-address>   -   The Nature of Address Indicator (NAI) field
                defines the address range for a specific numbering
                plan. This is only used if GT Indicator is 0100.

                NAI VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1       Subscriber Number

                2       Reserved for National use

                3       National Significant Number

                4       International Number

                5 to 127    Spare

                This paramter is mandatory.
                A Rule matches to an original address only if a value of
                this parameter is the same in a rule and in an original
                address. Values are compared only if GT type contains this
                parameter (see GT Indicator description in
                <address-indicator> parameter).
                Most used values:
                4 - nature-of-address - International

<digits>      -   Specifies the string of digits divided into
                subsections using separator '/' depending on if
                the mask contains separator or not. The dialed
                digits should match with theses digits as per the
                rule specified below:

                DIGIT PATTERN

                Value       Description
```

```
                  ---------------------------------
                  -       padding - ignored

                  *       wildcard - matches any number of
                          digits

                  ?       wildcard - matches exactly one
                          digit

                  /       separator used to split the digit
                          pattern into sections.
                          Each section can be processed
                          differently as specified
                          by the mask parameter.

                  This parameter is mandatory. It should contain the same
                  subsections count as the rule mask has.

   <ruleType>       -   Takes one of the following values defined below.

                  RULE TYPE VALUES

                  Value       Description
                  ---------------------------------
                  solitary    Only one (primary) address is used
                          for routing.
                          (<backup-address-id> may be missed
                          in this case).

                  dominant    Both primary and backup
                          addresses are used and mandatory.
                          If both the addresses are
                          available, the primary address is
                          used for routing.

                  loadshared  Both primary and backup
                          addresses are used and mandatory.
                          If both the addresses are
                          available, either primary or
                          backup address is used for
                          routing.
                          The <loadsharing-algorithm> should
                          be configured in this case.

                  broadcast   Both primary and backup addresses
                          are used and are mandatory. All
                          messages are routed to both
                          addresses.

   <primary-address-id>  -   Identifies the SCCP Address used as the primary
                  translation.
```

```
Optional Parameters

<backup-address-id>   -   Identifies the SCCP Address used as the backup
                translation in case the pointcode specified by the
                primary address is not available. Backup address
                is used if <ruleType> is not "solitary".

<loadsharing-algorithm>   -   This parameter is mandatory if <ruleType> is
                "loadshared". The Loadsharing algorithm is
                configured here. Possible values of the parameter
                are:

                LOAD SHARING ALGORITHM VALUES

                Value       Description
                ---------------------------------
                bit4        if( (SLS & 0x10) == 0 )
                        <route to primary> else
                        <route to backup>

                        This algorithm is the best if all
                        traffic is local (mobicents stack)
                        originated

                bit3        if( (SLS & 0x08) == 0 )
                        <route to primary> else
                        <route to backup>
                        This algorithm can be used if not
                        all traffic is local
                        (mobicents stack) originated.
                        But only 8 links are acceptable in
                        both linksets.

                bit2        if( (SLS & 0x04) == 0 )
                        <route to primary> else
                        <route to backup>
                        This algorithm can be used if not
                        all traffic is local
                        (mobicents stack) originated.
                        But only 8 links are acceptable in
                        both linksets.

                bit1        if( (SLS & 0x02) == 0 )
                        <route to primary> else
                        <route to backup>
                        This algorithm can be used if not
                        all traffic is local
                        (mobicents stack) originated.
                        But only 8 links are acceptable in
                        both linksets.
```

```
                bit0        if( (SLS & 0x01) == 0 )
                        <route to primary> else
                        <route to backup>
                        This algorithm can be used if not
                        all traffic is local
                        (mobicents stack) originated.
                        But only 8 links are acceptable in
                        both linksets.


<new-callingPartyAddress-id>
            -   This address will replace the
                callingPartyAddresses of messages that fit a Rule.

<originationType> -   Takes one of the following values defined below.
                If the parameter is not defined, rule applies to
                all messages regardless of their origination.

                ORIGINATION TYPE VALUES

                Value           Description
                -------------------------------------
                localOriginated     If this parameter is
                            "localOriginated", then a
                            rule applies only for
                            messages originating from
                            local SCCP users
                            (for example a local
                            TCAP stack).

                remoteOriginated    If this parameter is
                            "remoteOriginated", then a
                            rule applies only for
                            messages originating from
                            SS7 network and not for
                            messages originating from
                            local SCCP users.

<stack-name>  -   Name of the stack on which this command is executed.
                If not passed, the first stack configured in ShellExecutor
                will be used.

<networkId>     - A digital parameter that means to which virtual SS7 network
                belongs a Rule. If this parameter is skipped - networkId will
                be set to "0" when a Rule creation.
                Refer <xref linkend="design_multitenancy"/>.

<calling-address-indicator>
            -   Address indicator for calling address matching.
                See above address-indicator
```

```
    <calling-point-code>
                -   Pointcode of calling sccp address. MTP Signaling Point Code.
                    This is ignored if Bit '0' of address-indicator is not set.

    <calling-subsystem-number>
                -   This is ignored if Bit '1' of address-indicator is
                    not set.

    <calling-translation-type>
                -   This is ignored if GT Indicator is 0000 or 0001.
                    See <translation-type> above for more details.

    <calling-numbering-plan>
                -   A digital parameter that specifies to which virtual SS7
                    network this rule belongs. If this parameter
                    is skipped - networkId will be set to "0" by default.

    <calling-nature-of-address-indicator>
                -   The Nature of Address Indicator (NAI) field
                    defines the address range for a specific numbering
                    plan. This is only used if GT Indicator is 0100.

     <calling-digits-pattern>
                -   Specifies the string of digits for pattern matching.
                    There is no mask for calling digits, hence the division separator
is ignored.
                    See above <digits> for more information on pattern matching.

EXAMPLES
    sccp rule create 1 R 71 2 8 0 0 3 123456789 solitary 1

    sccp rule create 2 R 71 2 8 0 0 3 123456789 dominant 1 1

    sccp rule create 2 R 71 2 8 0 0 3 123456789 loadshared 1 1 bit4

    sccp rule create 21 R 71 2 8 0 0 3 123456789 dominant 2 backup-addressid 1
loadsharing-algo bit3 newcgparty-addressid 1 origination-type remoteoriginated
calling-ai 18 calling-pc 0 calling-ssn 0 calling-tt 0 calling-nai 0 calling-np 0
calling-digits-pattern 567*
```

Using GUI

Procedure: Create a new Rule using GUI

1. Navigate to the 'Rules' tab in the SCCP Management window and click on the 'Create Rule' button. This will launch a new pop-up 'Create Rule'.
2. In the 'Create Rule' pop-up, add details of the new SCCP Rule being defined. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.

3. Verify the details entered and then click on the 'Create' button. A new Rule will be created with parameters as specified. If there is an error in creating the Rule then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Rule' pop-up.

Modify a SCCP Rule

Using CLI

You can modify the values of a Rule by issuing the command `sccp rule modify` with appropriate parameters as described below:

```
Name
    sccp rule modify

SYNOPSIS
    sccp rule modify <id> mask <mask> address-indicator <address-indicator> point-code
<point-code> subsystem-number <subsystem-number>
    translation-type <translation-type> numbering-plan <numbering-plan> nature-of-
address-indicator <nature-of-address-indicator> digits <digits>
    rule-type <rule-type> primary-address-id <primary-address-id> backup-addressid
<backup-address-id>
    loadsharing-algo <loadsharing-algorithm> newcgparty-addressid
    <new-callingPartyAddress-id> origination-type <originationType>
    networkid <networkId> calling-ai <calling-address-indicator>
    calling-pc <calling-point-code> calling-ssn <calling-subsystem-number>
    calling-tt <calling-translation-type> calling-np <calling-numbering-plan>
    calling-nai <calling-nature-of-address-indicator>
    calling-digits-pattern <calling-digits-pattern> stackname <stack-name>

DESCRIPTION
    This command is used to modify the values of a SCCP Route previously defined.

PARAMETERS

    Standard Parameters

    <id>          -   A unique number to identify this Rule.

    Optional Parameters
    <mask>            -   A mask defines which part of the originally dialed
                    digits remains in the translated digits and which
                    part is replaced by the digits from primary or
                    backup address. A mask is divided into sections by
                    separator '/'. The number of sections in a mask
                    should be equal to the sections in digits passed
                    in this command and the sections in primary or
                    backup address. This paramter is mandatory.
```

```
                  MASK DEFINITIONS

                  Mnemonic    Function
                  ---------------------------------
                  -       Ignore

                  /       Separator used to split the mask
                          into sections.

                  K       Retain the original dialed digits
                          of this section in the translated
                          digits.

                  R       Replace the original dialed digits
                          of this section with the same
                          section from primary or backup
                          address in the translated digits.

<address-indicator>   -   The address indicator is the first field in a SCCP
                  Party Address (called/calling) and is one octet in
                  length. Its function is to indicate which
                  information elements are present so that the
                  address can be interpreted. In other words, it
                  indicates the type of addressing information that
                  is to be found in the address field. The
                  addressing information from the original global
                  title is then compared with the passed address
                  information to match the rule.

                  SCCP ADDRESS INDICATOR
                  --------------------------------
                  | 8 | 7 | 6 | 5 | 4 |3 | 2 | 1 |
                  --------------------------------

                  Bit '1'     : PC Indicator
                            (1 = included)

                  Bit '2'     : SSN Indicator
                            (1 = included)

                  Bit '3 - 6' : GT Indicator
                            (0000 = GT not included)
                            (0001 = GT includes
                                Nature of Address)
                            (0010 = GT includes
                                Translation Type)
                            (0011 = GT includes
                                Translation Type,
                                Numbering Plan and
                                Encoding Scheme)
                            (0100 = GT includes
```

```
                              Translation Type,
                              Numbering Plan and
                              Encoding Scheme and
                              Nature of Address)

                Bit '7'     : Routing Indicator
                          (0 = Route on GT,
                          1 = Route on PC + SSN)

                Bit '8'     : Reserved for National use.

                Only GT Indicator is used in the current implementation.
                A Rule matches to an original address only if GT Indicator
                from address-indicator is the same in a rule and in an
                original address. GT Indicator for ITU-T network that is
                mostly used is - 0100 (GT includes Translation Type,
                Numbering Plan and Encoding Scheme and Nature of Address).
                If you also use 0100 - use digital value for it - 16.
                Even when SCCP stack works in ANSI mode Address Indicator
                value for CLI and GUI must have values that we use for
                ITU-T mode.

<point-code>      -   MTP Signaling Point Code. This is ignored if
                Bit '0' of address-indicator is not set.
                This parameter is not used in currentimplemetation and
                can be set to "0".

<subsystem-number>    -   This is ignored if Bit '1' of address-indicator is
                not set.
                This parameter is not used in currentimplemetation and
                can be set to "0".

<translation-type>    -   This is ignored if GT Indicator is 0000 or 0001.

                TRANSLATION TYPE VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1  - 63     International Service

                64 - 127    Spare

                128 - 254   National Network Specific

                255     Reserved for Expansion

                This paramter is mandatory.
                A Rule matches to an original address only if a value of
                this parameter is the same in a rule and in an original
```

```
                address. Values are compared only if GT type contains this
                parameter (see GT Indicator description in
                <address-indicator> parameter).
                Most used values:
                0 - translation-type - Unknown

<numbering-plan>  -   The Number Plan (NP) field specifies the numbering
                plan which the address information follows. This
                is ignored if GT Indicator is 0000, 0001 or 0010.

                NUMBER PLAN VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1       ISDN/Telephony Number Plan
                        (Recommendations E.163 and E.164)

                2       Generic Numbering Plan

                3       Data Numbering Plan
                        (Recommendations X.121)

                4       Telex Numbering Plan
                        (Recommendations F.69)

                5       Maritime Mobile Numbering Plan
                        (Recommendations E.210, E.211)

                6       Land Mobile Numbering Plan
                        (Recommendations E.212)

                7       ISDN/Mobile Numbering Plan
                        (Recommendations E.214)

                8 to 13     Spare

                14      Private Network or
                        Network-Specific Numbering Plan

                15      Reserved

                This paramter is mandatory.
                A Rule matches to an original address only if a value of
                this parameter is the same in a rule and in an original
                address. Values are compared only if GT type contains this
                parameter (see GT Indicator description in
                <address-indicator> parameter).
                Most used values:
                1 - numbering-plan - ISDN/telephony
```

```
<nature-of-address>   -   The Nature of Address Indicator (NAI) field
                defines the address range for a specific numbering
                plan. This is only used if GT Indicator is 0100.

                NAI VALUES

                Value       Description
                ---------------------------------
                0       Unknown

                1       Subscriber Number

                2       Reserved for National use

                3       National Significant Number

                4       International Number

                5 to 127    Spare

                This paramter is mandatory.
                A Rule matches to an original address only if a value of
                this parameter is the same in a rule and in an original
                address. Values are compared only if GT type contains this
                parameter (see GT Indicator description in
                <address-indicator> parameter).
                Most used values:
                4 - nature-of-address - International

<digits>      -   Specifies the string of digits divided into
                subsections using separator '/' depending on if
                the mask contains separator or not. The dialed
                digits should match with theses digits as per the
                rule specified below:

                DIGIT PATTERN

                Value       Description
                ---------------------------------
                -       padding - ignored

                *       wildcard - matches any number of
                        digits

                ?       wildcard - matches exactly one
                        digit

                /       separator used to split the digit
                        pattern into sections.
                        Each section can be processed
```

```
                        differently as specified
                        by the mask parameter.

                This parameter is mandatory. It should contain the same
                subsections count as the rule mask has.

<ruleType>        -   Takes one of the following values defined below.

                RULE TYPE VALUES

                Value       Description
                ---------------------------------
                solitary    Only one (primary) address is used
                        for routing.
                        (<backup-address-id> may be missed
                        in this case).

                dominant    Both primary and backup
                        addresses are used and mandatory.
                        If both the addresses are
                        available, the primary address is
                        used for routing.

                loadshared  Both primary and backup
                        addresses are used and mandatory.
                        If both the addresses are
                        available, either primary or
                        backup address is used for
                        routing.
                        The <loadsharing-algorithm> should
                        be configured in this case.

                broadcast   Both primary and backup addresses
                        are used and are mandatory. All
                        messages are routed to both
                        addresses.

<primary-address-id>  -   Identifies the SCCP Address used as the primary
                translation.


<backup-address-id>   -   Identifies the SCCP Address used as the backup
                translation in case the pointcode specified by the
                primary address is not available. Backup address
                is used if <ruleType> is not "solitary".

<loadsharing-algorithm>   -   This parameter is mandatory if <ruleType> is
                "loadshared". The Loadsharing algorithm is
                configured here. Possible values of the parameter
                are:
```

```
                LOAD SHARING ALGORITHM VALUES

                Value       Description
                ---------------------------------
                bit4        if( (SLS & 0x10) == 0 )
                        <route to primary> else
                        <route to backup>

                        This algorithm is the best if all
                        traffic is local (mobicents stack)
                        originated

                bit3        if( (SLS & 0x08) == 0 )
                        <route to primary> else
                        <route to backup>
                        This algorithm can be used if not
                        all traffic is local
                        (mobicents stack) originated.
                        But only 8 links are acceptable in
                        both linksets.

<new-callingPartyAddress-id>
            -   This address will replace the
                callingPartyAddresses of messages that fit a Rule.

<originationType> -   Takes one of the following values defined below.
                If the parameter is not defined, rule applies to
                all messages regardless of their origination.

                ORIGINATION TYPE VALUES

                Value           Description
                -----------------------------------
                localOriginated     If this parameter is
                            "localOriginated", then a
                            rule applies only for
                            messages originating from
                            local SCCP users
                            (for example a local
                            TCAP stack).

                remoteOriginated    If this parameter is
                            "remoteOriginated", then a
                            rule applies only for
                            messages originating from
                            SS7 network and not for
                            messages originating from
                            local SCCP users.

<stack-name>  -   Name of the stack on which this command is executed.
                If not passed, the first stack configured in ShellExecutor
```

```
                    will be used.

     <networkId>     - A digital parameter that means to which virtual SS7 network
                     belongs a Rule. If this parameter is skipped - networkId will
                     be set to "0" when a Rule creation.
                     Refer <xref linkend="design_multitenancy"/>.

    <calling-address-indicator>
                -   Address indicator for calling address matching.
                    See above address-indicator

    <calling-point-code>
                -   Pointcode of calling sccp address. MTP Signaling Point Code.
                    This is ignored if Bit '0' of address-indicator is not set.

    <calling-subsystem-number>
                -   This is ignored if Bit '1' of address-indicator is
                    not set.

    <calling-translation-type>
                -   This is ignored if GT Indicator is 0000 or 0001.
                    See <translation-type> above for more details.

    <calling-numbering-plan>
                -   A digital parameter that specifies to which virtual SS7
                    network this rule belongs. If this parameter
                    is skipped - networkId will be set to "0" by default.

    <calling-nature-of-address-indicator>
                -   The Nature of Address Indicator (NAI) field
                    defines the address range for a specific numbering
                    plan. This is only used if GT Indicator is 0100.

     <calling-digits-pattern>
                -   Specifies the string of digits for pattern matching.
                    There is no mask for calling digits, hence the division separator
is ignored.
                    See above <digits> for more information on pattern matching.
```

Delete a Rule

Using CLI

You can delete a Rule by issuing the command `sccp rule delete` with appropriate parameters as described below:

```
Name
    sccp rule delete

SYNOPSIS
    sccp rule delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to remove a previously defined Rule.

PARAMETERS

    Standard Parameters

    <id>          -   The identifier of the Rule that is being deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    sccp rule delete 1

    The above command will delete the Rule identified by the number '1'.
```

Using GUI

Procedure: Delete a Rule using GUI

1. Navigate to the 'Rules' tab in the SCCP Management Unit window and locate the row corresponding to the Rule you wish to delete.
2. In the row corresponding to the identified Rule, click on the red 'x' button in the actions column to delete that Rule.

View all configured Remote Signaling Points (RSP)

Using CLI

You can view the details of all configured Remote Signaling Points by issuing the command `sccp rsp show` as described below:

```
Name
    sccp rsp show

SYNOPSIS
    sccp rsp show id <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured Remote Signaling
Points.

    If an <id> is specified in the command, it will only display the details of the
    Remote Signaling Point identified by the value of the 'id' specified.

PARAMETERS

    Optional Parameters

    <id>      -   The id of the Remote Signaling Point whose details are
                  to be displayed. If this parameter is not specified, the
                  details of all configured Remote Signaling Points will be
                  displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'RSP' tab. Here you can view a list of all the configured Remote Signaling Pointcodes. Every correctly configured RSP will be displayed in a row along with the defined values.

Create a new Remote Signaling Pointcode

Using CLI

You can create a new RSP by issuing the command `sccp rsp create` with appropriate parameters as described below:

```
Name
    sccp rsp create

SYNOPSIS
    sccp rsp create <id> <remote-spc> <rspc-flag> <mask>
    stackname <stack-name>

DESCRIPTION
    This command is used to define a new Remote Signaling Point. Each remote signaling
    point that SCCP can communicate with must be configured using this command.

PARAMETERS

    Standard Parameters

    <id>          -   A unique number to identify this
                      Remote Signaling Point.

    <remote-spc>      -   The Remote Signaling Point

    <rspc-flag>       -   32 bit value. Not used for now.
                      Reserved for future

    <mask>            -   32 bit value. Not used for now.
                      Reserved for future

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    sccp rsp create 1 6477 0 0
```

Using GUI

Procedure: Create a new RSP using GUI

1. Navigate to the 'RSP' tab in the SCCP Management window and click on the 'Create RSP' button. This will launch a new pop-up 'Create Remote Signaling Pointcode'.
2. In the 'Create Remote Signaling Pointcode' pop-up, add details of the new RSP being defined. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new RSP will be created with parameters as specified. If there is an error in creating the RSP then you will find the details of the error in the Management Console Log section below.

4. Click on the 'Close' button to close the 'Create Remote Signaling Pointcode' pop-up.

Modify a Remote Signaling Pointcode

Using CLI

You can modify the values of a RSP by issuing the command `sccp rsp modify` with appropriate parameters as described below:

```
Name
    sccp rsp modify

SYNOPSIS
    sccp rsp modify <id> remote-spc <remote-spc> rspc-flag <rspc-flag> mask <mask>
stackname <stack-name>

DESCRIPTION
    This command is used to modify the values of a Remote Signaling Point previously
    defined.

PARAMETERS

    Standard Parameters

    <id>          -   Identifier of the Remote Signaling Point to be
                      modified.

    <remote-spc>      -   The Remote Signaling Point

    <rspc-flag>       -   32 bit value. Not used for now.
                      Reserved for future

    <mask>            -   32 bit value. Not used for now.
                      Reserved for future

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.
```

Delete a Remote Signaling Pointcode

Using CLI

You can delete a RSP by issuing the command `sccp rsp delete` with appropriate parameters as described below:

```
Name
    sccp rsp delete

SYNOPSIS
    sccp rsp delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to delete a Remote Signaling Point.

PARAMETERS

    Standard Parameters

    <id>      -   The identifier of the Remote Signaling Point that is being
                  deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp rsp delete 1

    The above command will delete the Remote Signaling Point identified by the
    number '1'.
```

Using GUI

Procedure: Delete a RSP using GUI

1. Navigate to the 'RSP' tab in the SCCP Management Unit window and locate the row corresponding to the RSP you wish to delete.
2. In the row corresponding to the identified RSP, click on the red 'x' button in the actions column to delete that RSP.

View all configured Remote Sub-Systems (RSS)

Using CLI

You can view the details of all configured Remote Sub-Systems by issuing the command `sccp rss show` as described below:

```
Name
    sccp rss show

SYNOPSIS
    sccp rss show id <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured Remote Sub-Systems.
    If an <id> is specified in the command, it will only display the details of the
    Remote Sub-System identified by the value of the 'id' specified.

PARAMETERS

    Optional Parameters

    <id>      -   The id of the Remote Sub-System whose details are to be
                  displayed. If this parameter is not specified, the details
                  of all configured Remote Sub-Systems will be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'RSS' tab. Here you can view a list of all the configured Remote Sub-Systems. Every correctly configured RSS will be displayed in a row along with the defined values.

Create a new Remote Sub-System

Using CLI

You can create a new RSS by issuing the command `sccp rss create` with appropriate parameters as described below:

```
Name
    sccp rss create

SYNOPSIS
    sccp rss create <id> <remote-spc> <remote-ssn> <rss-flag>
    <mark-prohibited-when-spc-resuming> stackname <stack-name>

DESCRIPTION
    This command is used to define a new Remote Sub-System. Each Remote Sub-System
    that SCCP can communicate with must be configured using this command. You must
    ensure that the Remote Signaling Point is configured prior to issuing this
    command.

PARAMETERS

    Standard Parameters

    <id>          -   A unique number to identify this Remote
                    Sub-System.

    <remote-spc>      -   The Remote Signaling Point where this Remote
                    Sub-System is being deployed.

    <remote-ssn>      -   The Remote Sub-System number.

    <rss-flag>        -   32 bit value. Not used for now.
                    Reserved for future.

    Optional Parameters

    <mark-prohibited-when-spc-resuming>
                -   Possible value: prohibitedWhenSpcResuming.
                    When this parameter is specified, the configured
                    subsystem is marked as prohibited when its
                    corresponding signaling point code has been
                    resumed.

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    sccp rss create 1 6477 8 0 prohibitedWhenSpcResuming
```

Using GUI

Procedure: Create a new RSS using GUI

1. Navigate to the 'RSS' tab in the SCCP Management window and click on the 'Create RSS' button. This will launch a new pop-up 'Create Remote Sub-System'.

2. In the 'Create Remote Sub-System' pop-up, add details of the new RSS being defined. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new RSS will be created with parameters as specified. If there is an error in creating the RSS then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Remote Sub-System' pop-up.

Modify a Remote Signaling Sub-System

Using CLI

You can modify the values of a RSS by issuing the command `sccp rss modify` with appropriate parameters as described below:

```
Name
    sccp rss modify

SYNOPSIS
    sccp rss modify <id> remote-spc <remote-spc> remote-ssn <remote-ssn> rss-flag
<rss-flag>
    prohibitedwhenspcresuming <mark-prohibited-when-spc-resuming> stackname <stack-
name>

DESCRIPTION
    This command is used to modify the values of a Remote Sub-System previously
    defined.

PARAMETERS

    Standard Parameters

    <id>          -   Identifier of the Remote Sub-System to be
                      modified.

    Optional Parameters

    <remote-spc>      -   The Remote Signaling Point where this Remote
                      Sub-System is deployed.

    <remote-ssn>      -   The Remote Sub-System number.

    <rss-flag>        -   32 bit value. Not used for now.
                      Reserved for future.

    <mark-prohibited-when-spc-resuming>
                 -   Possible value: prohibitedWhenSpcResuming.
                     When this parameter is specified, the configured
                     subsystem is marked as prohibited when its
                     corresponding signaling point code has been
                     resumed.

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.
```

Delete a Remote Signaling Sub-System

Using CLI

You can delete a RSS by issuing the command `sccp rss delete` with appropriate parameters as described below:

```
Name
    sccp rss delete

SYNOPSIS
    sccp rss delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to delete a Remote Sub-System.

PARAMETERS

    Standard Parameters

    <id>      -   The identifier of the Remote Sub-System that is being
                  deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    sccp rss delete 1

    The above command will delete the Remote Sub-System identified by the number '1'.
```

Using GUI

Procedure: Delete a RSS using GUI

1. Navigate to the 'RSS' tab in the SCCP Management Unit window and locate the row corresponding to the RSS you wish to delete.
2. In the row corresponding to the identified RSS, click on the red 'x' button in the actions column to delete that RSS.

View all configured Long Message Rules (LMR)

Using CLI

You can view the details of all configured Long Message Rules by issuing the command `sccp lmr show` as described below:

```
Name
    sccp lmr show

SYNOPSIS
    sccp lmr show id <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured Long Message Rules.
    If an <id> is specified in the command, it will only display the details of the
    Long Message Rule identified by the value of the 'id' specified.

PARAMETERS

    Optional Parameters

    <id>          -   The id of the Long Message Rule whose details are to be
                      displayed. If this parameter is not specified, the details
                      of all configured Long Message Rules will be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'LMR' tab. Here you can view a list of all the configured Long Message Rules. Every correctly configured LMR will be displayed in a row along with the defined values.

Create a new Long Message Rule

Using CLI

You can create a new LMR by issuing the command `sccp lmr create` with appropriate parameters as described below:

```
Name
    sccp lmr create

SYNOPSIS
    sccp lmr create <id> <first-spc> <last-spc> <long-message-rule-type>
    stackname <stack-name>

DESCRIPTION
    This command is used to define a new Long Message Rule. Long message rules specify
    which message types (UDT/XUDT/LUDT) will be used for outgoing message encoding
    depends on dpc. If long message rules are not configured only UDT messages
    will be used.

PARAMETERS

    Standard Parameters

    <id>          -   A unique number to identify this
                      Long Message Rule.

    <first-spc>       -   The first value of the remote signaling
                      point code range, for which this Long message Rule
                      will apply.

    <last-spc>        -   The last value of the remote signaling point code
                      range. If Long message rule specifies a single
                      signaling point code, this value must be equal to
                      first-spc.

    <long-message-rule-type>- Message types used for the remote signaling
                      point codes range.
                      Possible values : udt, xudt, ludt and ludt_segm.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    sccp lmr create 1 201 201 xudt

    sccp lmr create 2 230 239 udt
```

Using GUI

Procedure: Create a new LMR using GUI

1. Navigate to the 'LMR' tab in the SCCP Management window and click on the 'Create LMR' button. This will launch a new pop-up 'Create Long Message Rule'.

2. In the 'Create Long Message Rule' pop-up, add details of the new LMR being defined. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new LMR will be created with parameters as specified. If there is an error in creating the LMR then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Long Message Rule' pop-up.

Modify a Long Message Rule

Using CLI

You can modify the values of a LMR by issuing the command `sccp lmr modify` with appropriate parameters as described below:

```
Name
    sccp lmr modify

SYNOPSIS
    sccp lmr modify <id> first-spc <first-spc> last-spc <last-spc> rule-type <long-
message-rule-type>
    stackname <stack-name>

DESCRIPTION
    This command is used to modify the values of a Long Message Rule previously
    defined.

PARAMETERS

    Standard Parameters

    <id>          -   Identifier of the Long Message Rule to be
                      modified.

    Optional Parameters
    <first-spc>       -   The first value of the remote signaling
                      point code range, for which this Long message Rule
                      will apply.

    <last-spc>        -   The last value of the remote signaling point code
                      range. If Long message rule specifies a single
                      signaling point code, this value must be equal to
                      first-spc.

    <long-message-rule-type>- Message types used for the remote signaling point
                      codes range.
                      Possible values : udt, xudt, ludt and ludt_segm.
    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.
```

Delete a Long Message Rule

Using CLI

You can delete a LMR by issuing the command `sccp lmr delete` with appropriate parameters as described below:

```
Name
    sccp lmr delete

SYNOPSIS
    sccp lmr delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to delete a Long Message Rule.

PARAMETERS

    Standard Parameters

    <id>      -   The identifier of the Long Message Rule that is being
                  deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    sccp lmr delete 1

    The above command will delete the Long Message Rule identified by the number '1'.
```

Using GUI

Procedure: Delete a Long Message Rule using GUI

1. Navigate to the 'LMR' tab in the SCCP Management Unit window and locate the row corresponding to the LMR you wish to delete.
2. In the row corresponding to the identified LMR, click on the red 'x' button in the actions column to delete that LMR.

View all configured Concerned Signaling Point Codes (CSP)

Using CLI

You can view the details of all configured Concerned Signaling Point Codes by issuing the command `sccp csp show` as described below:

```
Name
    sccp csp show

SYNOPSIS
    sccp csp show id <id> stackname <stack-name>

DESCRIPTION
    This command is used to view the details of all configured Concerned Signaling
    Point Codes. If an <id> is specified in the command, it will only display the
    details of the Concerned Signaling Point Code identified by the value of the 'id'
    specified.

PARAMETERS

    Optional Parameters

    <id>          -   The id of the Concerned Signaling Point Code whose details
                      are to be displayed. If this parameter is not specified,
                      the details of all configured Concerned Signaling Point
                      Codes will be displayed.

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.
```

Using GUI

Navigate to the specific SCCP Management unit and switch to the 'CSP' tab. Here you can view a list of all the configured Concerned Signaling Point Code. Every correctly configured CSP will be displayed in a row along with the defined values.

Create a new Concerned Signaling Point Code

Using CLI

You can create a new CSP by issuing the command `sccp csp create` with appropriate parameters as described below:

```
Name
    sccp csp create

SYNOPSIS
    sccp csp create <id> <spc> stackname <stack-name>

DESCRIPTION
    This command is used to define a new Concerned Signaling Point Code. Concerned
    signaling point codes define a DPC list that will be notified when local SSN is
    registered (SSA messages) or unregistered (SSP messages).

PARAMETERS

    Standard Parameters

    <id>          -   A unique number to identify this
                  Concerned Signaling Point Code.

    <spc>         -   The Remote Signaling Point Code,
                  which will be notified.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                  If not passed, the first stack configured in ShellExecutor
                  will be used.


EXAMPLES
    sccp csp create 1 201

    sccp csp create 2 202
```

Using GUI

Procedure: Create a new CSP using GUI

1. Navigate to the 'CSP' tab in the SCCP Management window and click on the 'Create CSP' button. This will launch a new pop-up 'Create Concerned Signaling Point Code'.
2. In the 'Create Concerned Signaling Point Code' pop-up, add details of the new CSP being defined. You must ensure that you fill in all the mandatory parameters. For definition of these parameters, please refer to the description of the CLI command for the same in the preceding section.
3. Verify the details entered and then click on the 'Create' button. A new CSP will be created with parameters as specified. If there is an error in creating the CSP then you will find the details of the error in the Management Console Log section below.
4. Click on the 'Close' button to close the 'Create Concerned Signaling Point Code' pop-up.

Modify a Concerned Signaling Point Code

Using CLI

You can modify the values of a CSP by issuing the command `sccp csp modify` with appropriate parameters as described below:

```
Name
    sccp csp modify

SYNOPSIS
    sccp csp modify <id> <spc> stackname <stack-name>

DESCRIPTION
    This command is used to modify the values of a Concerned Signaling Point Code
    previously defined.

PARAMETERS

    Standard Parameters

    <id>          -   Identifier of the Concerned Signaling Point Code
                    to be modified.

    <spc>         -   The Remote Signaling Point Code, which will be
                    notified.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

Delete a Concerned Signaling Point Code

Using CLI

You can delete a CSP by issuing the command `sccp csp delete` with appropriate parameters as described below:

```
Name
    sccp csp delete

SYNOPSIS
    sccp csp delete <id> stackname <stack-name>

DESCRIPTION
    This command is used to delete a Concerned Signaling Point Code.

PARAMETERS

    Standard Parameters

    <id>      -   The identifier of the Concerned Signaling Point Code
                  that is being deleted.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                      If not passed, the first stack configured in ShellExecutor
                      will be used.

EXAMPLES
    sccp csp delete 1

    The above command will delete the Concerned Signaling Point Code identified by the
    number '1'.
```

Using GUI

Procedure: Delete a Concerned Signaling Point Code using GUI

1. Navigate to the 'CSP' tab in the SCCP Management Unit window and locate the row corresponding to the CSP you wish to delete.
2. In the row corresponding to the identified CSP, click on the red 'x' button in the actions column to delete that CSP.

TCAP Management

Transaction Capabilities Application Part , from ITU-T recommendations Q.771-Q.775 or ANSI T1.114 is a protocol for Signalling System 7 networks. Its primary purpose is to facilitate multiple concurrent dialogs between the same sub-systems on the same machines, using Transaction IDs to differentiate these, similar to the way TCP ports facilitate multiplexing connections between the same IP addresses on the Internet.

Using CLI

You can manage all TCAP stack properties through the Command Line Interface by using the `tcap` command.

Using GUI

The GUI will allow you to manage your TCAP configurations efficiently using a user-friendly interface. Open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'TCAP' link in the left panel. The main panel will display the names of all configured TCAP Management units. To configure or view the settings of a particular TCAP Management Unit you must click on the name of that unit. The GUI will look similar to the figure below.

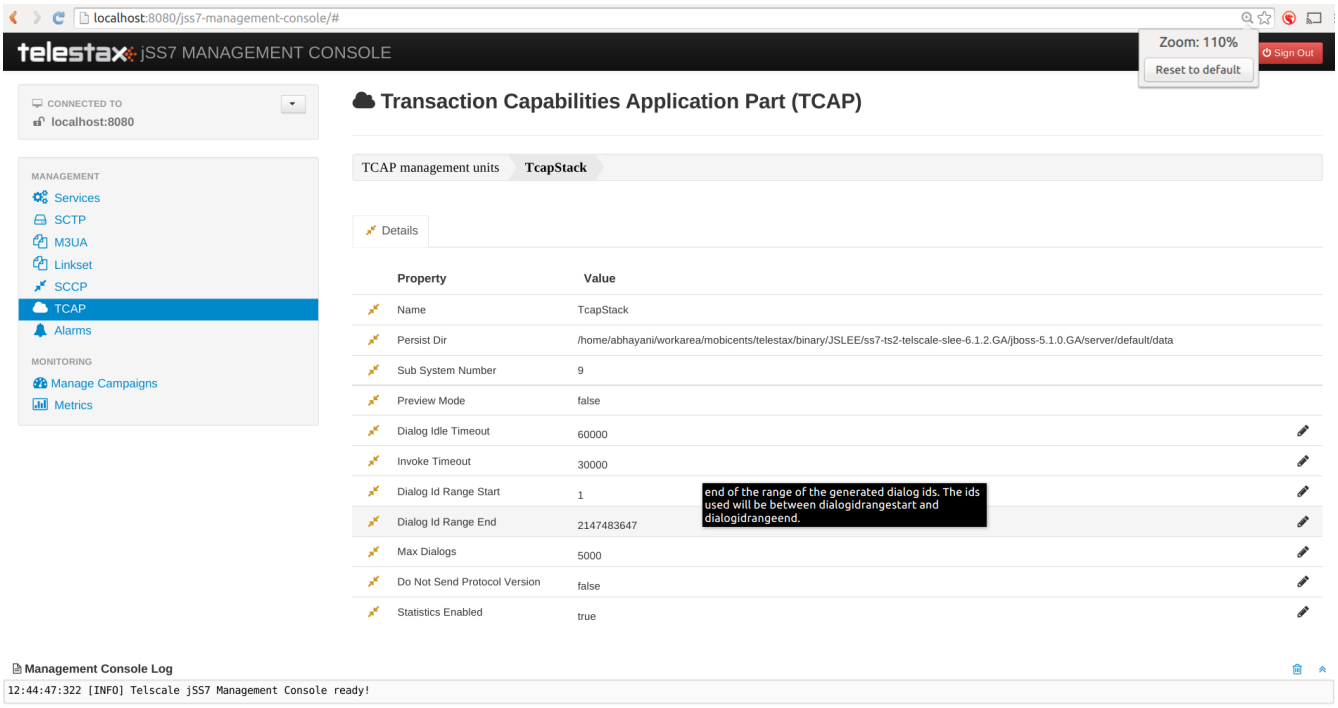

Figure 14. GUI - TCAP Management

The first tab will display the properties of the TCAP Management unit. These details displayed here are fetched from the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name. These properties can be modified here in the GUI. To modify them you must click the pencil, change value and save. The GUI will then display the modified values.

TCAP stack properties

Dialog Idle Timeout

Using CLI

You can set the 'dialogidletimeout' by issuing the command `tcap set dialogidletimeout` with appropriate parameters as described below. You can verify this by issuing the command `tcap get dialogidletimeout` which will display the value set for this property.

```
Name
    tcap set dialogidletimeout

SYNOPSIS
    tcap set dialogidletimeout <dialogidletimeout> stackname <stack-name>

DESCRIPTION
    Sets millisecond value for dialog timeout. It specifies how long
    dialog can be idle - not receive/send any messages.
    When a timeout occurs the method `TCListener.onDialogTimeout()` will be
    invoked. If a TCAP-User does not invoke `Dialog.keepAlive()` inside
    the method `TCListener.onDialogTimeout()`, the TCAP Dialog will be
    released.

PARAMETERS

    Standard Parameters

    <dialogidletimeout>   -   Timeout in milliseconds.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set dialogidletimeout 30000
```

Using GUI

On TCAP management page, click on pencil against the 'Dialog Idle Timeout' property and text box becomes editable. Change value and save.

Dialog Id Range End

TCAP stack can be configured to use a range of local DialogId values. You may install a set of TCAP Stack instances with different DialogId ranges. These ranges can be used for loadsharing of SS7 traffic between the TCAP instances. All the outgoing Dialogs will have id starting with `dialogIdRangeStart`. This value of `dialogIdRangeStart` cannt be greater than `dialogIdRangeEnd`. In addition, the value of `dialogIdRangeEnd - dialogIdRangeStart` must always be less than the value of `maxDialogs`.

Using CLI

You can set the 'dialogidrangeend' by issuing the command `tcap set dialogidrangeend` with appropriate parameters as described below. You can verify this by issuing the command `tcap get dialogidrangeend` which will display the value set for this property.

```
Name
    tcap set dialogidrangeend

SYNOPSIS
    tcap set dialogidrangeend <dialogidrangeend> stackname <stack-name>

DESCRIPTION
    End of the range of the generated dialog ids. The id's used will be
    between dialogidrangestart and dialogidrangeend.

PARAMETERS

    Standard Parameters

    <dialogidrangeend>    -   Dialog id range end.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set dialogidrangeend 30000000
```

Using GUI

On TCAP management page, click on pencil against the 'Dialog Id Range End' property and text box becomes editable. Change value and save.

Dialog Id Range Start

Using CLI

You can set the 'dialogidrangestart' by issuing the command `tcap set dialogidrangestart` with appropriate parameters as described below. You can verify this by issuing the command `tcap get dialogidrangestart` which will display the value set for this property.

```
Name
    tcap set dialogidrangestart

SYNOPSIS
    tcap set dialogidrangestart <dialogidrangestart> stackname <stack-name>

DESCRIPTION
    Start of the range of the generated dialog ids. The id's used will be
    between dialogidrangestart and dialogidrangeend.

PARAMETERS

    Standard Parameters

    <dialogidrangestart>  -   Dialog id range start.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set dialogidrangestart 1
```

Using GUI

On TCAP management page, click on pencil against the 'Dialog Id Range Start' property and text box becomes editable. Change value and save.

Do Not Send Protocol Version

Using CLI

You can set the 'donotsendprotocolversion' by issuing the command `tcap set donotsendprotocolversion` with appropriate parameters as described below. You can verify this by issuing the command `tcap get donotsendprotocolversion` which will display the value set for this property.

```
Name
    tcap set donotsendprotocolversion

SYNOPSIS
    tcap set donotsendprotocolversion <true | false> stackname <stack-name>

DESCRIPTION
    If set to true Protocol Version is not send in User Data part of Dialog

PARAMETERS

    Standard Parameters

    <donotsendprotocolversion>    -   If true doesn't send the protocol version

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set donotsendprotocolversion false
```

Using GUI

On TCAP management page, click on pencil against the 'Do Not Send Protocol Version' property and text box becomes editable. Change value and save.

Invoke Timeout

Using CLI

You can set the 'invoketimeout' by issuing the command `tcap set invoketimeout` with appropriate parameters as described below. You can verify this by issuing the command `tcap get invoketimeout` which will display the value set for this property.

```
Name
    tcap set invoketimeout

SYNOPSIS
    tcap set invoketimeout <invoketimeout> stackname <stack-name>

DESCRIPTION
    Sets the Invoke timeout for this invoke. This property specifies,
    by default, how long Invoke will wait for a response from a peer
    before a timeout occurs.
    If a TCAP-User does not specify a custom Invoke timeout when
    sending a new Invoke, this default value will be used for outgoing
    Invoke timeout. When this timeout occurs `TCListener.onInvokeTimeout()`
    will be invoked.
    invoketimeout should always be less than dialogidletimeout.
    This parameter affects if we use TCAP stack as the upperst level or
    we have implemented our own stack that reuses TCAP stack.
    Restcomm MAP and CAP stacks overrides this parameter at their levels
    and this parameter deos not affect these stacks.

PARAMETERS

    Standard Parameters

    <invoketimeout>       -   Sets the Invoke timeout in milliseconds

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set invoketimeout 30000
```

Using GUI

On TCAP management page, click on pencil against the 'Invoke Timeout' property and text box becomes editable. Change value and save.

Max Dialogs

Using CLI

You can set the 'maxdialogs' by issuing the command `tcap set maxdialogs` with appropriate parameters as described below. You can verify this by issuing the command `tcap get maxdialogs` which will display the value set for this property.

```
Name
    tcap set maxdialogs

SYNOPSIS
    tcap set maxdialogs <maxdialogs> stackname <stack-name>

DESCRIPTION
    Sets the maximum number of dialogs allowed to be alive at a given
    time. If not set, a default value of 5000 dialogs will be used.
    If stack ranges provided, maximum number dialogs naturally cannot
    be greater than the provided range, thus, it will be normalized to
    range delta (end - start).

PARAMETERS

    Standard Parameters

    <maxdialogs>  -   Sets the maximum concurrent dialogs alive at any given
                        point in time.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set maxdialogs 30000000
```

Using GUI

On TCAP management page, click on pencil against the 'Max Dialogs' property and text box becomes editable. Change value and save.

Preview Mode

You can modify the settings for the parameter 'previewmode' only when the TCAP Stack is not running. In addition, this parameter cannot be modified through the CLI or GUI. You will have to invoke the setter function directly from the source code.

If you are using the JBoss Application Server, then you can set this parameter by adding a property (as shown below) to the XML descriptor file *jboss-beans.xml*, which is located at *$JBOSS_HOME/server/profile_name/deploy/restcomm-ss7-service/META-INF*, where `profile_name` is the server profile name.

```
/*Add property for the parameter 'previewmode' to jboss-beans.xml file and specify
true or false*/
<property name="previewMode">true</property>
```

The current settings of the parameter can be viewed in the GUI or by invoking the appropriate CLI command as described below.

Using CLI

You can retrieve the current settings of the parameter 'previewmode' by issuing the command `sctp get previewmode`. However as explained above, you cannot modify the settings through the CLI.

```
Name
    tcap get previewmode

SYNOPSIS
    tcap get previewmode

DESCRIPTION
    This command is used to retrieve the current settings of the parameter
    'previewMode'. The 'previewMode' parameter is used for special processing
    mode.

    When Preview Mode is set to true:
    - In TCAP level the stack only listens for incoming messages and
    sends nothing.
    - Methods like send(), close(), sendComponent() and other such methods
    do nothing.
    - A TCAP Dialog is temporary. The TCAP Dialog is discarded after
    any incoming message like TC-BEGIN or TC-CONTINUE has been processed.
    - For any incoming messages (including TC-CONTINUE, TC-END, TC-ABORT) a new
    TCAP Dialog is created (and then deleted).
    - There are no timers and timeouts.

    The settings of this parameter can be modified only when the TCAP Stack is
    not running. To modify this parameter you must invoke the setter function
    directly from the code or if you are using the JBoss AS, you can add a
    property to the XML descriptor file jboss-beans.xml. You cannot change the
    settings through the CLI.
```

Using GUI

In the TCAP management page, you can view the current settings of the 'Preview Mode' property. But as explained above, you cannot change the settings in the GUI. For more details about this parameter, refer to the detailed description about the parameter in the above section for CLI.

Statistics Enabled

Using CLI

You can set the 'statisticsenabled' by issuing the command `tcap set statisticsenabled` with appropriate parameters as described below. You can verify this by issuing the command `tcap get statisticsenabled` which will display the value set for this property.

```
Name
    tcap set statisticsenabled

SYNOPSIS
    tcap set statisticsenabled <true | false> stackname <stack-name>

DESCRIPTION
    If set to true, statistics is enabled. Its recommended to keep this off
    for better performance and enabled statistics only when needed.

PARAMETERS

    Standard Parameters

    <statisticsenabled>   -   If true, statistics is enabled

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set statisticsenabled false
```

Using GUI

On TCAP management page, click on pencil against the 'Statistics Enabled' property and text box becomes editable. Change value and save.

Swap TCAP id bytes Enabled

Using CLI

You can set the 'swaptcapidbytes' by issuing the command `tcap set swaptcapidbytes` with appropriate parameters as described below. You can verify this by issuing the command `tcap get swaptcapidbytes` which will display the value set for this property.

```
Name
    tcap set swaptcapidbytes

SYNOPSIS
    tcap set swaptcapidbytes <true | false> stackname <stack-name>

DESCRIPTION
    If set to true, swap tcap id bytes is enabled..

PARAMETERS

    Standard Parameters

    <swaptcapidbytes> -   If true, swap tcap id bytes is enabled

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set swaptcapidbytes false
```

Using GUI

On TCAP management page, click on pencil against the 'Swap tcapid bytes Enabled' property and text box becomes editable. Change value and save.

Thresholds for Executors congestion control

Using CLI

TCAP stack and lower level stacks measure delays between the time when an incoming message has come from a peer for processing and scheduled for execution and the time when the execution of the message starts. The more time this delay the more we have a congestion level at Thread executors side.

The delay thresholds when the congestion level is increased to level 1, 2 and 3 is configured by parameters executordelaythreshold_1, executordelaythreshold_2 and executordelaythreshold_3 (in seconds).

The delay thresholds when the congestion level is decreased to level 0, 1, and 2 is configured by parameters executorbacktonormaldelaythreshold_1, executorbacktonormaldelaythreshold_2 and executorbacktonormaldelaythreshold_3 (in seconds).

You can set the thresholds (in seconds) by issuing the commands `tcap set executordelaythreshold_1`, `tcap set executordelaythreshold_2`, `tcap set executordelaythreshold_3`, `tcap set executorbacktonormaldelaythreshold_1`, `tcap set executorbacktonormaldelaythreshold_2` or

`tcap set executorbacktonormaldelaythreshold_3` with appropriate parameters as described below. You can verify this by issuing the commands `tcap get executordelaythreshold_1`, `tcap get executordelaythreshold_2`, `tcap get executordelaythreshold_3`, `tcap get executorbacktonormaldelaythreshold_1`, `tcap get executorbacktonormaldelaythreshold_2` or `tcap get executorbacktonormaldelaythreshold_3` which will display the value set for this property.

```
Name
    tcap set executordelaythreshold_1
    tcap set executordelaythreshold_2
    tcap set executordelaythreshold_3
    tcap set executorbacktonormaldelaythreshold_1
    tcap set executorbacktonormaldelaythreshold_2
    tcap set executorbacktonormaldelaythreshold_3

SYNOPSIS
    tcap set executordelaythreshold_1 <executordelaythreshold_1> stackname <stack-
name>
    tcap set executordelaythreshold_2 <executordelaythreshold_2> stackname <stack-
name>
    tcap set executordelaythreshold_3 <executordelaythreshold_3> stackname <stack-
name>
    tcap set executorbacktonormaldelaythreshold_1
<executorbacktonormaldelaythreshold_1> stackname <stack-name>
    tcap set executorbacktonormaldelaythreshold_2
<executorbacktonormaldelaythreshold_2> stackname <stack-name>
    tcap set executorbacktonormaldelaythreshold_3
<executorbacktonormaldelaythreshold_3> stackname <stack-name>

DESCRIPTION
    For Thresholds Executors congestion control stack needs to have 3 thresholds
    - delays in seconds between the time when an incoming message has come from a peer
    and scheduled for execution and the time when the execution of the message starts
    (3 levels - 1, 2, 3). If a delay time in seconds becomes more then value for
    level 1, 2 or 3, the Executors' congestion level becomes to 1, 2 or 3.
    Default values:
    for executordelaythreshold_1 is 1 second
    for executordelaythreshold_2 is 6 seconds
    for executordelaythreshold_3 is 12 seconds
    for executorbacktonormaldelaythreshold_1 is 0.5 seconds
    for executorbacktonormaldelaythreshold_2 is 3 seconds
    for executorbacktonormaldelaythreshold_3 is 8 seconds

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.
```

```
EXAMPLES
    tcap set executordelaythreshold_1 1
    tcap set executordelaythreshold_2 6
    tcap set executordelaythreshold_3 12
    tcap set executorbacktonormaldelaythreshold_1 0.5
    tcap set executorbacktonormaldelaythreshold_2 3
    tcap set executorbacktonormaldelaythreshold_3 8
```

Using GUI

On TCAP management page, click on pencil against the 'Executor congestion Threshold 1' property or other needed property and text box becomes editable. Change value and save.

Thresholds for Memory congestion control

Using CLI

TCAP stack and lower level stacks measure the percentage of message usage. The more memory we use the more we have a congestion level at memory resourse consuming.

The memory thresholds when the congestion level is increased to level 1, 2 and 3 is configured by parameters memorythreshold_1, memorythreshold_2 and memorythreshold_3 (in percents).

The memory thresholds when the congestion level is decreased to level 0, 1, and 2 is configured by parameters backtonormalmemorythreshold_1, backtonormalmemorythreshold_2 and backtonormalmemorythreshold_3 (in percents).

You can set the thresholds (in percents) by issuing the commands `tcap set memorythreshold_1`, `tcap set memorythreshold_2`, `tcap set memorythreshold_3`, `tcap set backtonormalmemorythreshold_1`, `tcap set backtonormalmemorythreshold_2` or `tcap set backtonormalmemorythreshold_3` with appropriate parameters as described below. You can verify this by issuing the commands `tcap get memorythreshold_1`, `tcap get memorythreshold_2`, `tcap get memorythreshold_3`, `tcap get backtonormalmemorythreshold_1`, `tcap get backtonormalmemorythreshold_2` or `tcap get backtonormalmemorythreshold_3` which will display the value set for this property.

```
Name
    tcap set memorythreshold_1
    tcap set memorythreshold_2
    tcap set memorythreshold_3
    tcap set backtonormalmemorythreshold_1
    tcap set backtonormalmemorythreshold_2
    tcap set backtonormalmemorythreshold_3

SYNOPSIS
    tcap set memorythreshold_1 <memorythreshold_1> stackname <stack-name>
    tcap set memorythreshold_2 <memorythreshold_2> stackname <stack-name>
    tcap set memorythreshold_3 <memorythreshold_3> stackname <stack-name>
    tcap set backtonormalmemorythreshold_1 <backtonormalmemorythreshold_1> stackname
<stack-name>
    tcap set backtonormalmemorythreshold_2 <backtonormalmemorythreshold_2> stackname
<stack-name>
    tcap set backtonormalmemorythreshold_3 <backtonormalmemorythreshold_3> stackname
<stack-name>

DESCRIPTION
    For Memory congestion control stack needs to have 3 thresholds
    - the percentage of memory usage (3 levels - 1, 2, 3). If memory usage becomes
more then value for
    level 1, 2 or 3, the Memory congestion level becomes to 1, 2 or 3.
    Default values:
    for memorythreshold_1 is 77 percents
    for memorythreshold_2 is 87 percents
    for memorythreshold_3 is 97 percents
    for backtonormalmemorythreshold_1 is 72 percents
    for backtonormalmemorythreshold_2 is 82 percents
    for backtonormalmemorythreshold_3 is 92 percents

PARAMETERS

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set memorythreshold_1 77
    tcap set memorythreshold_2 87
    tcap set memorythreshold_3 97
    tcap set backtonormalmemorythreshold_1 72
    tcap set backtonormalmemorythreshold_2 82
    tcap set backtonormalmemorythreshold_3 92
```

Using GUI

On TCAP management page, click on pencil against the 'Memory congestion Threshold 1' property or other needed property and text box becomes editable. Change value and save.

Blocking of incoming messages in congestion case

Using CLI

You can set the 'blockingincomingtcapmessages' by issuing the command `tcap set blockingincomingtcapmessages` with appropriate parameters as described below. You can verify this by issuing the command `tcap get blockingincomingtcapmessages` which will display the value set for this property.

```
Name
    tcap set blockingincomingtcapmessages

SYNOPSIS
    tcap set blockingincomingtcapmessages <true | false> stackname <stack-name>

DESCRIPTION
    If sets to true then incoming TCAP messages will be blocked
    (depending on congestion level, from level 2 - new incoming dialogs are
    rejected, from level 3 - all incoming messages are rejected.
    Default value: false

PARAMETERS

    Standard Parameters

    <blockingincomingtcapmessages> - if true messages was rejected in
                    congestion case.

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set blockingincomingtcapmessages false
```

Using GUI

On TCAP management page, click on pencil against the 'Blocking of incoming messages in congestion case' property and text box becomes editable. Change value and save.

SLS Range

Using CLI

You can set the 'slsrange' by issuing the command `tcap set slsrange` with appropriate parameters as described below. You can verify this by issuing the command `tcap get slsrange` which will display the value set for this property.

```
Name
    tcap set slsrange

SYNOPSIS
    tcap set slsrange <All | Odd | Even> stackname <stack-name>

DESCRIPTION
    slsRanger: set the value of SLS to odd or even or both.

PARAMETERS

    Standard Parameters

    <All> -   If set to All, SLS number can be odd or even value
    <Odd> -   If set to Odd, SLS number can get only odd value
    <Even>    -   If set to Even, SLS number can get only even value

    Optional Parameters

    <stack-name>  -   Name of the stack on which this command is executed.
                    If not passed, the first stack configured in ShellExecutor
                    will be used.

EXAMPLES
    tcap set slsrange All
```

Using GUI

On TCAP management page, click on pencil against the 'SLS Range' property and text box becomes editable. Change value and save.

Statistics

The GUI will allow you to create campaigns of fixed duration for gathering statistics data. Campaign allows to select time period over which these statistics have been gathered (in hours, minutes and seconds). Once Campaign is defined, the statistics can be observed by clicking newly created campaign name or you can also navigate to Metrics (click Metrics on left panel) to get graph of statistics.

Create Campaign

To create new campaign open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'Manage Campaigns' link in the left panel. The main panel will display the names of all existing campaigns and also button to create new campaign. The GUI will look similar to the figure below.

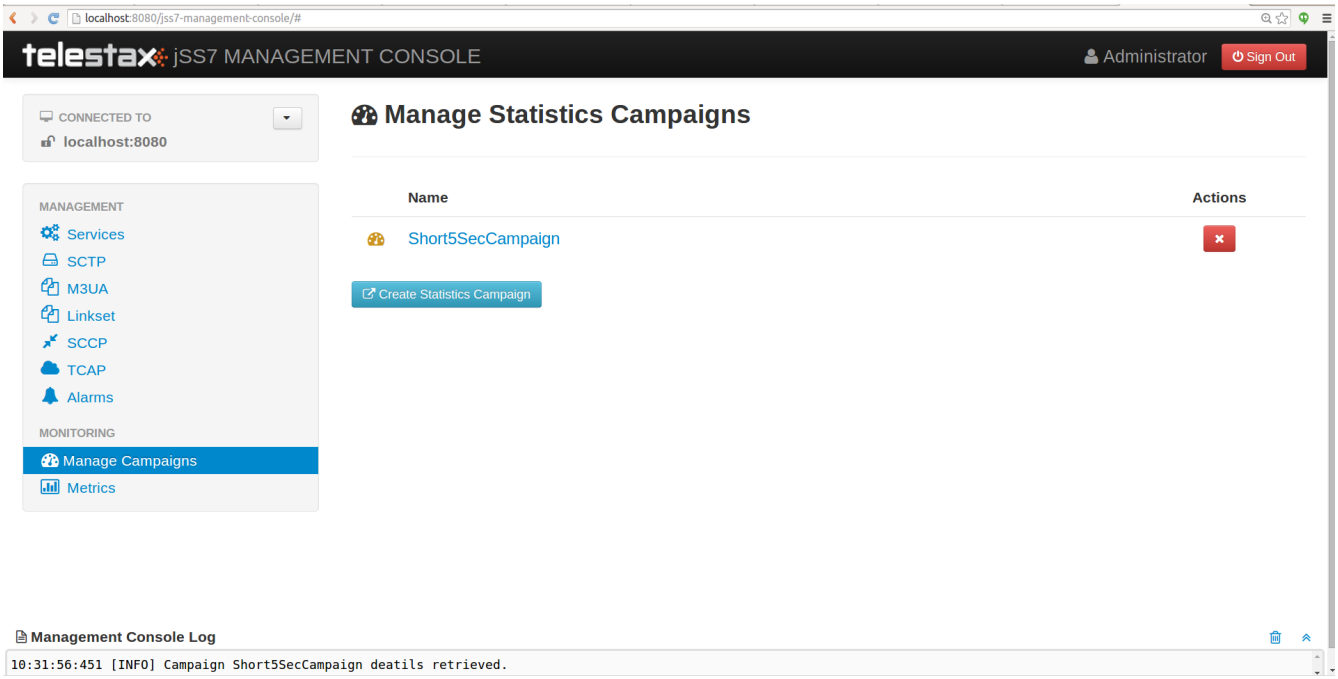

Figure 15. GUI - Campaigns

Click on 'Create Statistics Campaign' button to create new campaign. Select the stack from 'Counter Definition Set Name' drop down on which you want to define new campaign. Next select the time period from 'Duration' drop down and enter unique 'Campaign Name'. An 'Output format' field allows you to select a type of statistics logging: CSV, verbose or both of them.

The stack on which new campaign is defined must have set 'Statistics Enabled' property to true

View Campaigns

The GUI will allow you to view existing campaigns. On the main panel click campaign name. The GUI will look similar to the figure below and is divided into tabs.

The first tab will display the properties of the campaign. Second tab explains all the counters in this campaigns and their definition. Last tab provides the values for each of these counters. Last tab also displays the 'Start Time' and 'End Time' representing time duration for which sample was collected.

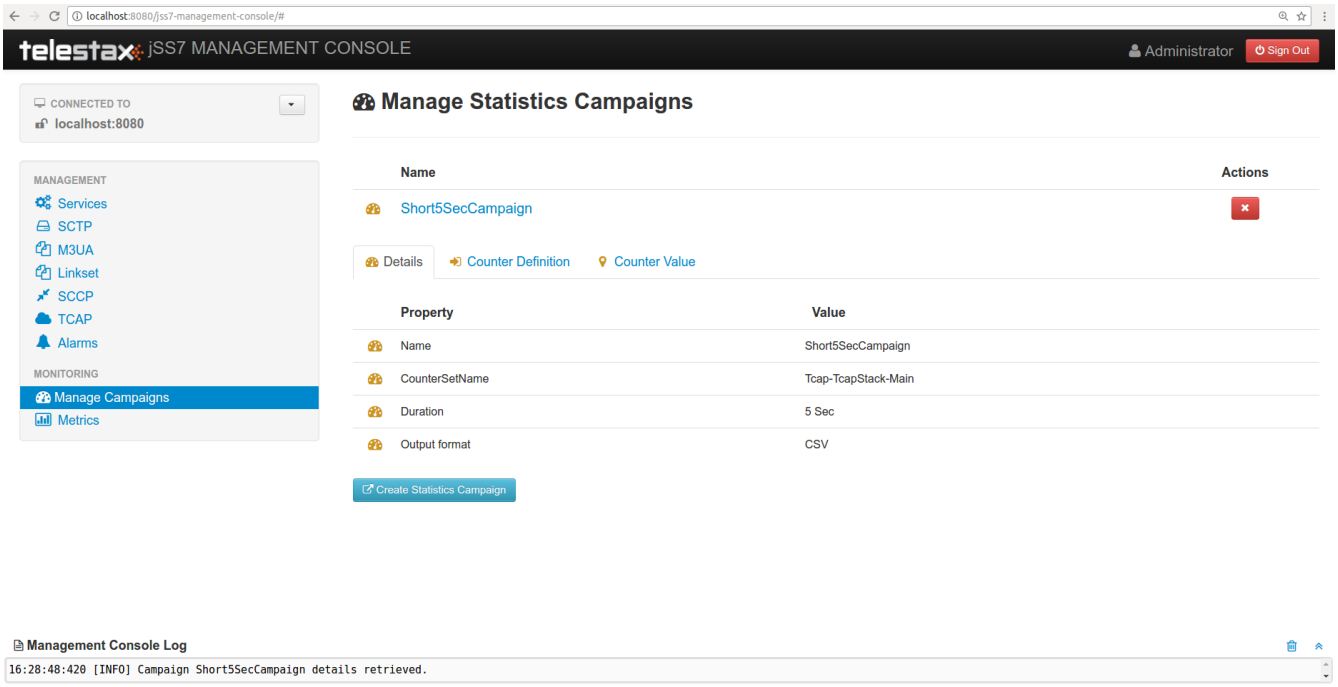

Figure 16. GUI - Campaigns View

Restcomm jSS7 doesn't persist the statistics, hence the data collected for campaign period refresh's every defined 'Duration'. User must refresh the page every 'Duration' period to gather statistics data for previous time period.

Nevertheless you can also click on 'Metrics' link on left panel, select the Campaign and observe the statistics graph. The metrics page gathers data from time page was loaded till user navigates away. Hence graph will show historic data from point page was loaded.

Logging Stats

The GUI will allow you to view stats in real time. But the stats are not stored in the Database for you to analyse at a later point of time. However Restcomm jSS7 gives you an option to have the stats logged every refresh period for all the existing campaigns. You can look at the log files at any point of time for analysing or understanding the performance.

If you wish to have stats logged, you must configure the settings in the file *jboss-5.1.0.GA/server/default/conf/jboss-log4j.xml*. If you are running the platform as standalone, then you should configure in *log4j.xml*.

Logging stats to main server log file

If you wish to have the stats logged in the main server log file located at *jboss-5.1.0.GA/server/default/log/server.log*, then you must add a new category to the *jboss-log4j.xml* as shown below and set priority value to "DEBUG". For verbose stats:

```
<category name="org.restcomm.protocols.ss7.oam.common.statistics.StatsPrinter"
additivity="false">
        <priority value="DEBUG" />
</category>
```

and for a CSV stats:

```
<category name="org.restcomm.protocols.ss7.oam.common.statistics.CsvStatsPrinter"
additivity="false">
        <priority value="DEBUG" />
</category>
```

Logging stats to a separate stats log files

If you wish to have the stats logged to a separate log files located at *jboss-5.1.0.GA/server/default/log/stats.log* and *jboss-5.1.0.GA/server/default/log/csvstats.log*, then you must add a new appenders to the *jboss-log4j.xml* and change category as shown below. You must set the priority value to "DEBUG".

```
<appender name="STATS" class="org.jboss.logging.appender.DailyRollingFileAppender">
<errorHandler class="org.jboss.logging.util.OnlyOnceErrorHandler"/>
<param name="File" value="$
{jboss.server.home.dir}
/log/stats.log"/>
<param name="Append" value="true"/>
<param name="MaxFileSize" value="500KB" />
<param name="MaxBackupIndex" value="1" />
<param name="Threshold" value="DEBUG"/>
<param name="DatePattern" value="'.'yyyy-MM-dd"/>
<layout class="org.apache.log4j.PatternLayout">
<param name="ConversionPattern" value="%d %-5p [%c] %m%n"/>
</layout>
</appender>
<category name="org.restcomm.protocols.ss7.oam.common.statistics.StatsPrinter"
additivity="false">
<priority value="DEBUG" />
<appender-ref ref="STATS"/>
</category>

<appender name="CSVSTATS" class="org.jboss.logging.appender.DailyRollingFileAppender">
<errorHandler class="org.jboss.logging.util.OnlyOnceErrorHandler"/>
<param name="File" value="$
{jboss.server.home.dir}
/log/csvstats.log"/>
<param name="Append" value="true"/>
<param name="MaxFileSize" value="500KB" />
<param name="MaxBackupIndex" value="1" />
<param name="Threshold" value="DEBUG"/>
<param name="DatePattern" value="'.'yyyy-MM-dd"/>
<layout class="org.apache.log4j.PatternLayout">
<param name="ConversionPattern" value="%d %-5p [%c] %m%n"/>
</layout>
</appender>
<category name="org.restcomm.protocols.ss7.oam.common.statistics.CsvStatsPrinter"
additivity="false">
<priority value="DEBUG" />
<appender-ref ref="CSVSTATS"/>
</category>
```

As of today Restcomm jSS7 exposes statistics only for TCAP. Future releases will allow statistics for M3UA, SCCP, MAP and CAP also.

Alarms

The GUI will allow you to view the Alarms (Critical, Major, Minor, Warning) in the system and filter them based on the severity. Open a Web Browser and navigate to http://localhost:8080/jss7-management-console/. Click on the 'Alarms' link in the left panel. The main panel will display all the

currently raised alarms. You can filter the view by using the checkboxes at the top to select/deselect the severity options and accordingly filter the display.

You will notice that as soon as the problem is resolved, the corresponding alarm will disappear from the view. In future releases, there will be an option to persist this alarms data and hence you will be able to view a history of alarms raised and resolved. But as of now, only currently active alarms will be displayed in this window.