



SkySQL Gateway

Debug & Diagnostic Support

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Change History

Date	Comment
20th June 2013	Initial Version
22nd July 2013	Updated with new naming MaxScale Addition of description of login process for the debug CLI Updates debug CLI output examples Addition of show users, shutdown maxscale, shutdown service, restart service, set server, clear server, reload users, reload config and add user commands.
23rd July	Rename of show users command to show dbusers and addition of the show users command to show the admin users. Addition of example configuration data.

Introduction

MaxScale is a complex application and as such is bound to have bugs and support issues that occur from time to time. There are a number of things we need to consider for the development stages and long term supportability of MaxScale

- Flexible logging of gateway activity
- Support for connecting a debugger to MaxScale
- A diagnostic interface to MaxScale

The topic of logging has already been discussed in another document in this series of documents about MaxScale and will not be covered further here.

Debugger Support

Beyond the language support for debugging using tools such as gdb, MaxScale will also offer convenience functions for the debugger to call and a command line argument that is useful to run MaxScale under the debugger.

Command Line Option

Normally when MaxScale starts it will place itself in the background and setup the signal masks so that it is immune to the normal set of signals that will cause the process to exit, SIGINT and SIGQUIT. This behaviour is normally what is required, however if you wish to run MaxScale under the control of a debugger it is useful to suppress this behaviour. A command line option, -d is provided to turn off this behaviour.

```
% gdb gateway
(gdb) run -d
```

Convenience Functions

A set of convenience functions is provided that may be used within the debugger session to extract information from MaxScale.

Printing Services

A service within MaxScale provides the encapsulation of the port MaxScale listen on, the protocol it uses, the set of servers it may route to and the routing method to use. Two functions exist that allow you to display the details of the services and may be executed from within a debugger session.

The `printAllServices()` function will print all the defined services within MaxScale and is invoked using the call syntax of the debugger.

```
(gdb) call printAllServices()
Service 0x60da20
  Service:          Debug Service
  Router:           debugcli (0x7ffff5a7c2a0)
  Started:          Thu Jun 20 15:13:32 2013
  Backend databases
  Total connections: 1
  Currently connected: 1
Service 0x60d010
  Service:          Test Service
  Router:           readconnroute (0x7ffff5c7e260)
  Started:          Thu Jun 20 15:13:32 2013
  Backend databases
    127.0.0.1:3308 Protocol: MySQLBackend
    127.0.0.1:3307 Protocol: MySQLBackend
    127.0.0.1:3306 Protocol: MySQLBackend
  Total connections: 1
  Currently connected: 1
(gdb)
```

It is possible to print an individual service if you know the memory address of the service.

```
(gdb) call printService(0x60da20)
Service 0x60da20
  Service:          Debug Service
  Router:           debugcli (0x7ffff5a7c2a0)
  Started:          Thu Jun 20 15:13:32 2013
  Backend databases
  Total connections: 1
  Currently connected: 1
(gdb)
```

Printing Sessions

Sessions represent the data for a client that is connecting through MaxScale, there will be a session for each client and one for each listener for a specific port/protocol combination.

Similarly there are two calls to print all or a particular session.

```
(gdb) call printAllSessions()
Session 0x60fdf0
    Service:  Debug Service (0x60da20)
    Client DCB:  0x60f6c0
    Connected: Thu Jun 20 15:13:32 2013
Session 0x60f620
    Service:  Test Service (0x60d010)
    Client DCB:  0x60ead0
    Connected: Thu Jun 20 15:13:32 2013
(gdb) call printSession(0x60fdf0)
Session 0x60fdf0
    Service:  Debug Service (0x60da20)
    Client DCB:  0x60f6c0
    Connected: Thu Jun 20 15:13:32 2013
(gdb)
```

Printing Servers

Servers are a representation of the backend database to which MaxScale may route SQL statements. Similarly two calls exist to print server details.

```
(gdb) call printAllServers()
Server 0x60d9a0
    Server: 127.0.0.1
    Protocol: MySQLBackend
    Port: 3308
Server 0x60d920
    Server: 127.0.0.1
    Protocol: MySQLBackend
    Port: 3307
Server 0x60d8a0
    Server: 127.0.0.1
    Protocol: MySQLBackend
    Port: 3306
(gdb) call printServer(0x60d920)
Server 0x60d920
    Server: 127.0.0.1
    Protocol: MySQLBackend
    Port: 3307
(gdb)
```

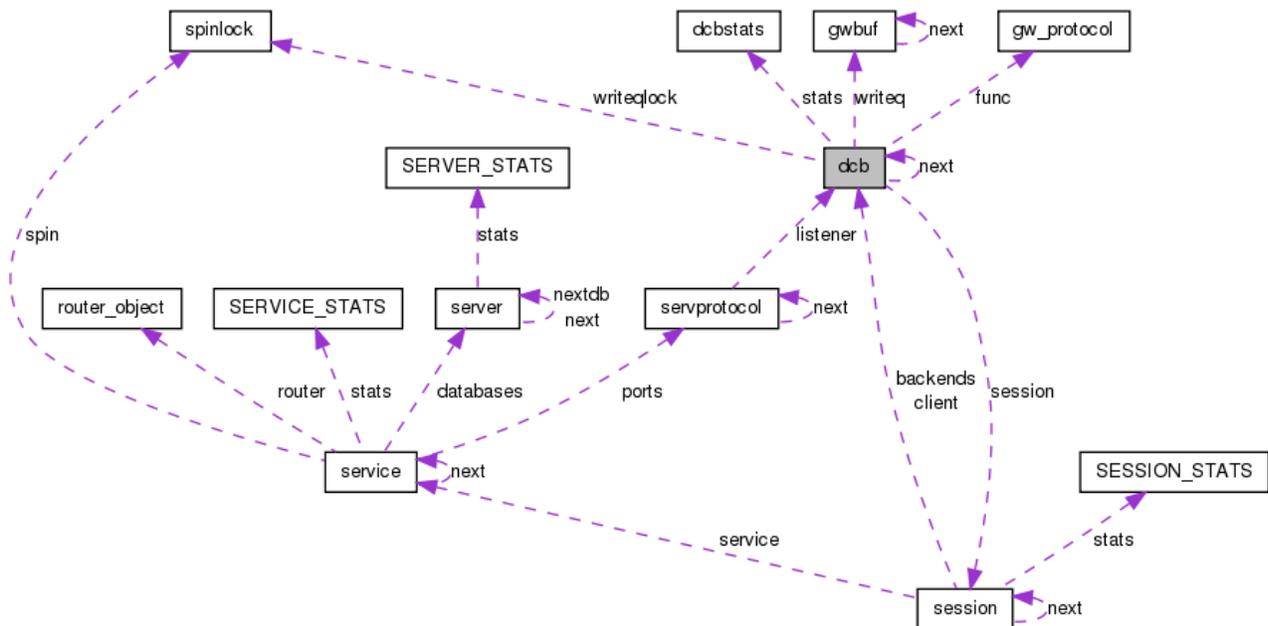
Modules

MaxScale makes significant use of modules, shared objects, that are loaded on demand based on the configuration. A routine exists that will print the currently loaded modules.

```
(gdb) call printModules()
Module Name      | Module Type | Version
-----
telnetd          | Protocol   | V1.0.0
MySQLClient     | Protocol   | V1.0.0
testroute       | Router     | V1.0.0
debugcli        | Router     | V1.0.0
readconroute    | Router     | V1.0.0
(gdb)
```

Descriptor Control Blocks

The Descriptor Control Block (DCB) is an important concept within MaxScale since it is this block that is passed to the polling system, when an event occurs it is that structure that is available and from this structure it must be possible to navigate to all other structures that contain state regarding the session and protocol in use.



Similar print routines exist for the DCB

```
(gdb) call printAllDCBs()
DCB: 0x60ead0
DCB state:          DCB for listening socket
Queued write data: 0
Statistics:
    No. of Reads:   0
    No. of Writes:  0
```

```

                No. of Buffered Writes:    0
                No. of Accepts: 0
DCB: 0x60f6c0
    DCB state:          DCB for listening socket
    Queued write data:  0
    Statistics:
        No. of Reads:    0
        No. of Writes:   0
        No. of Buffered Writes:    0
        No. of Accepts: 0
(gdb) call printDCB(0x60ead0)
DCB: 0x60ead0
    DCB state:          DCB for listening socket
    Queued write data:  0
    Statistics:
        No. of Reads:    0
        No. of Writes:   0
        No. of Buffered Writes:    0
        No. of Accepts: 0
(gdb)

```

Diagnostic Interface

It is possible to configure a service to run within MaxScale that will allow a user to telnet to a port on the machine and be connected to MaxScale. This is configured by creating a service that uses the debugcli routing module and the telnetd protocol with an associated listener. The service does not require any backend databases to be configured since the router never forwards any data, it merely accepts commands and executes them, returning data to the user.

The example below shows the configuration that is required to set-up a debug interface that listens for incoming telnet connections on port 4442.

```

[Debug Service]
type=service
router=debugcli

[Debug Listener]
type=listener
service=Debug Service
protocol=telnetd
port=4442

```

The `Debug Service` section sets up a service with no backend database servers, but with a `debugcli` module as the router. This module will implement the commands and send the data

back to the client.

The `Debug Listener` section setups the protocol and port combination and links that to the service.

Assuming a configuration that includes the debug service, with the listening port set to 4442, to connect from the machine that runs MaxScale you must first install telnet and then simply call telnet to connect.

```
-bash-4.1$ telnet localhost 4442
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Welcome the SkySQL MaxScale Debug Interface (V1.0.1).
Type help for a list of available commands.

MaxScale login: admin
Password:

MaxScale>
```

As delivered MaxScale uses a default login name of `admin` with the password of `skysql` for connections to the debug interface. Users may be added to the CLI by use of the `add user` command.

This places you in the debug command line interface of MaxScale¹, there is a help system that will display the commands available to you

```
MaxScale> help
Available commands:
  add user
  clear server
  restart monitor
  restart service
  set server
  show dcbs
  show dcb
  show dbusers
  show epoll
  show modules
  show monitors
  show server
  show servers
```

¹ Currently there is no authentication on this interface

```
show services
show session
show sessions
show users
shutdown gateway
shutdown maxscale
shutdown monitor
shutdown service
reload config
reload users
```

MaxScale> help show

Available options to the show command:

```
dcbs          Show all descriptor control blocks (network
connections)
dcb           Show a single descriptor control block e.g. show
dcb 0x493340
dbusers       Show statistics and user names for a service's
user table
epoll         Show the poll statistics
modules       Show all currently loaded modules
monitors      Show the monitors that are configured
server        Show details for a server, e.g. show server
0x485390
servers       Show all configured servers
services      Show all configured services in MaxScale
session       Show a single session in MaxScale, e.g. show
session 0x284830
sessions      Show all active sessions in MaxScale
users         Show statistics and user names for the debug
interface
```

MaxScale>

The commands available are very similar to those described above to print things from the debugger, the advantage being that you do not need a debug version or a debugger to use them.

Showing Services

The `show services` command will show all the services configured currently

MaxScale> show services

Service 0xf44c10

Service: Test Service

Router: readconnroute (0x7f7fd8afba40)

Number of router sessions: 0

Current no. of router sessions: 0

```

Number of queries forwarded:    0
Started:      Mon Jul 22 11:24:09 2013
Backend databases
    127.0.0.1:3309 Protocol: MySQLBackend
    127.0.0.1:3308 Protocol: MySQLBackend
    127.0.0.1:3307 Protocol: MySQLBackend
    127.0.0.1:3306 Protocol: MySQLBackend
Users data:      0xf454b0
Total connections: 1
Currently connected: 1
Service 0xf43910
    Service:      Split Service
    Router:      readwritesplit (0x7f7fd8f05460)
    Number of router sessions:    0
    Current no. of router sessions: 0
    Number of queries forwarded:    0
    Number of queries forwarded to master: 0
    Number of queries forwarded to slave: 0
    Number of queries forwarded to all: 0
    Started:      Mon Jul 22 11:24:09 2013
    Backend databases
        127.0.0.1:3308 Protocol: MySQLBackend
        127.0.0.1:3307 Protocol: MySQLBackend
        127.0.0.1:3306 Protocol: MySQLBackend
    Users data:      0xf449b0
    Total connections: 1
    Currently connected: 1
Service 0xea0190
    Service:      Debug Service
    Router:      debugcli (0x7f7fd910d620)
    Started:      Mon Jul 22 11:24:09 2013
    Backend databases
    Users data:      0xea2d80
    Total connections: 2
    Currently connected: 2
MaxScale>

```

Showing Sessions

There are two options to show sessions, either an individual session or all sessions

```

MaxScale> show sessions
Session 0x6f8f20

```

```

State:           Session Ready
Service:         Debug Service (0x649190)
Client DCB:      0x6f8e20
Client Address:  0.0.0.0
Connected:      Mon Jul 22 11:31:56 2013
Session 0x6f83b0
State:           Session Allocated
Service:         Split Service (0x6ec910)
Client DCB:      0x64b430
Client Address:  127.0.0.1
Connected:      Mon Jul 22 11:31:28 2013
Session 0x6efba0
State:           Listener Session
Service:         Debug Service (0x649190)
Client DCB:      0x64b180
Connected:      Mon Jul 22 11:31:21 2013
Session 0x64b530
State:           Listener Session
Service:         Split Service (0x6ec910)
Client DCB:      0x6ef8e0
Connected:      Mon Jul 22 11:31:21 2013
Session 0x618840
State:           Listener Session
Service:         Test Service (0x6edc10)
Client DCB:      0x6ef320
Connected:      Mon Jul 22 11:31:21 2013
MaxScale> show session 0x6f83b0
Session 0x6f83b0
State:           Session Allocated
Service:         Split Service (0x6ec910)
Client DCB:      0x64b430
Client Address:  127.0.0.1
Connected:      Mon Jul 22 11:31:28 2013
MaxScale>

```

Show Servers

The configured backend databases can be displayed using the `show servers` command.

```

MaxScale> show servers
Server 0x6ec840
Server:           127.0.0.1
Status:           Running

```

```

Protocol:      MySQLBackend
Port:          3306
Number of connections:  0
Current no. of connections:  0
Server 0x6ec770
  Server:          127.0.0.1
  Status:          Master, Running
  Protocol:       MySQLBackend
  Port:           3307
  Number of connections:  1
  Current no. of connections:  1
Server 0x6ec6a0
  Server:          127.0.0.1
  Status:          Slave, Running
  Protocol:       MySQLBackend
  Port:           3308
  Number of connections:  1
  Current no. of connections:  1
Server 0x6ec5d0
  Server:          127.0.0.1
  Status:          Down
  Protocol:       MySQLBackend
  Port:           3309
  Number of connections:  0
  Current no. of connections:  0

```

MaxScale>

Show DCBS

There are two forms of the show command that will give you DCB information, the first will display information for all DCBs within the system.

MaxScale> show dcbs

```

DCB: 0x6ef320
  DCB state:      DCB for listening socket
  Service:       Test Service
  Queued write data:  0
  Statistics:
    No. of Reads:      0
    No. of Writes:     0
    No. of Buffered Writes: 0
    No. of Accepts:    0

```

```

DCB: 0x6ef8e0
  DCB state:      DCB for listening socket
  Service:       Split Service

```

Queued write data: 0
Statistics:
 No. of Reads: 0
 No. of Writes: 0
 No. of Buffered Writes: 0
 No. of Accepts: 1

DCB: 0x64b180

DCB state: DCB for listening socket
Service: Debug Service
Queued write data: 0
Statistics:
 No. of Reads: 0
 No. of Writes: 0
 No. of Buffered Writes: 0
 No. of Accepts: 1

DCB: 0x64b430

DCB state: DCB processing event
Service: Split Service
Connected to: 127.0.0.1
Queued write data: 0
Statistics:
 No. of Reads: 2
 No. of Writes: 3
 No. of Buffered Writes: 0
 No. of Accepts: 0

DCB: 0x6f8400

DCB state: DCB in the polling loop
Service: Split Service
Queued write data: 0
Statistics:
 No. of Reads: 3
 No. of Writes: 1
 No. of Buffered Writes: 0
 No. of Accepts: 0

DCB: 0x6f8b40

DCB state: DCB in the polling loop
Service: Split Service
Queued write data: 0
Statistics:
 No. of Reads: 2
 No. of Writes: 0
 No. of Buffered Writes: 0
 No. of Accepts: 0

```

DCB: 0x6f8e20
  DCB state:          DCB processing event
  Service:           Debug Service
  Connected to:      0.0.0.0
  Queued write data: 0
  Statistics:
    No. of Reads:    8
    No. of Writes:   133
    No. of Buffered Writes: 0
    No. of Accepts:  0

```

MaxScale>

An individual DCB can be displayed by passing the DCB address to the `show dcb` command

```

MaxScale> show dcb 0x64b430
DCB: 0x64b430
  DCB state:          DCB processing event
  Connected to:      127.0.0.1
  Owing Session:    7308208
  Queued write data: 0
  Statistics:
    No. of Reads:    2
    No. of Writes:   3
    No. of Buffered Writes: 0
    No. of Accepts:  0

```

MaxScale>

Show Modules

The `show modules` command will display the list of the currently loaded modules

```

MaxScale> show modules
Module Name      | Module Type | Version
-----
MySQLBackend    | Protocol    | V2.0.0
telnetd          | Protocol    | V1.0.1
MySQLClient      | Protocol    | V1.0.0
mysqlmon         | Monitor     | V1.0.0
readconnrout    | Router      | V1.0.2
readwritesplit   | Router      | V1.0.2
debugcli         | Router      | V1.0.1

```

MaxScale>

Show Polling Statistics

Display statistics related to the main polling loop. The epoll cycles is the count of the number of times epoll has returned with one or more event. The other counters are for each individual events that has been detected.

```
MaxScale> show epoll
Number of epoll cycles:      7928
Number of read events:      2000920
Number of write events:     2000927
Number of error events:     0
Number of hangup events:    0
Number of accept events:    4
MaxScale>
```

Show Dbusers

The `show dbuser` command allows data regarding the table that holds the database users for a service to be displayed. It does not give the actual user data, but rather details of the hashtable distribution. The `show users` commands must be passed the address of the user table, this can be extracted from the output of a `show services` command.

```
MaxScale> show services
Service 0x6ec910
  Service:          Split Service
  Router:           readwritesplit (0x7ffff1698460)
  Number of router sessions:      1
  Current no. of router sessions: 0
  Number of queries forwarded:    2
  Number of queries forwarded to master: 0
  Number of queries forwarded to slave: 1
  Number of queries forwarded to all: 1
  Started:           Mon Jul 22 11:31:21 2013
  Backend databases
    127.0.0.1:3308 Protocol: MySQLBackend
    127.0.0.1:3307 Protocol: MySQLBackend
    127.0.0.1:3306 Protocol: MySQLBackend
  Users data:       0x6ed9b0
  Total connections: 2
  Currently connected: 1
  ...
MaxScale> show dbusers 0x6ed9b0
Users table data
Hashtable: 0x19243a0, size 52
  No. of entries:    16
```

```
Average chain length: 0.3
Longest chain length: 4
User names: pappo, rana, pesce, repluser, seven, pippo, nopwd,
ppp, root, prova, daka, havoc, masssi, massi, massim,
massimiliano
MaxScale>
```

Show Users

The `show users` command lists the users defined for the administration interface. Note that if there are no users defined, and the default admin user is in use, then no users will be displayed.

```
MaxScale> show users
Administration interface users:
Users table data
Hashtable: 0x25ef5e0, size 52
    No. of entries:      2
    Average chain length: 0.0
    Longest chain length: 1
User names: admin, mark
MaxScale>
```

Show Monitors

The `show monitors` show the status of the database monitors. The address of the monitor can be used for the `shutdown monitor` and `restart monitor` commands.

```
MaxScale> show monitors
Monitor: 0x80a510
    Name:      MySQL Monitor
    Monitor running
    Monitored servers: 127.0.0.1:3306, 127.0.0.1:3307,
127.0.0.1:3308, 127.0.0.1:3309
MaxScale>
```

Shutdown maxscale

The CLI can be used to `shutdown` the MaxScale server by use of the `shutdown` command, it may be called with the argument either `maxscale` or `gateway`.

```
MaxScale> shutdown maxscale
```

Shutdown monitor

The `shutdown monitor` command stops the thread that is used to run the monitor and will stop any update of the server status flags. This is useful prior to manual setting of the states of the server using the `set server` and `clear server` commands.

```
MaxScale> show monitors
Monitor: 0x80a510
    Name:      MySQL Monitor
    Monitor running
    Monitored servers: 127.0.0.1:3306, 127.0.0.1:3307,
127.0.0.1:3308, 127.0.0.1:3309
MaxScale> shutdown monitor 0x80a510
MaxScale> show monitors
Monitor: 0x80a510
    Name:      MySQL Monitor
    Monitor stopped
    Monitored servers: 127.0.0.1:3306, 127.0.0.1:3307,
127.0.0.1:3308, 127.0.0.1:3309
MaxScale>
```

It may take some time before a monitor actually stops following the issuing of a `shutdown monitor` command. Stopped monitors can be restarted by issuing a `restart monitor` command.

Shutdown service

The `shutdown service` command can be used to stop the listener for a particular service. This will prevent any new clients from using the service but will not terminate any clients already connected to the service.

The `shutdown service` command needs the address of a service to be passed as an argument, this can be obtained by running `show services`.

```
MaxScale> show services
Service 0x6edc10
    Service:      Test Service
    Router:      readconnroute (0x7ffff128ea40)
    Number of router sessions: 257
    Current no. of router sessions: 0
```

```

Number of queries forwarded:    1000193
Started:                        Mon Jul 22 11:31:21 2013
Backend databases
    127.0.0.1:3309  Protocol: MySQLBackend
    127.0.0.1:3308  Protocol: MySQLBackend
    127.0.0.1:3307  Protocol: MySQLBackend
    127.0.0.1:3306  Protocol: MySQLBackend
Users data:                     0x6ee4b0
Total connections:              258
Currently connected:            1
Service 0x6ec910
    Service:                Split Service
    Router:                  readwritesplit (0x7ffff1698460)
    Number of router sessions: 1
    Current no. of router sessions: 0
    Number of queries forwarded: 2
    Number of queries forwarded to master: 0
    Number of queries forwarded to slave: 1
    Number of queries forwarded to all: 1
    Started:                 Mon Jul 22 11:31:21 2013
    Backend databases
        127.0.0.1:3308  Protocol: MySQLBackend
        127.0.0.1:3307  Protocol: MySQLBackend
        127.0.0.1:3306  Protocol: MySQLBackend
    Users data:              0x6ed9b0
    Total connections:       2
    Currently connected:     1
Service 0x649190
    Service:                Debug Service
    Router:                  debugcli (0x7ffff18a0620)
    Started:                 Mon Jul 22 11:31:21 2013
    Backend databases
    Users data:              0x64bd80
    Total connections:       2
    Currently connected:     2
MaxScale> shutdown service 0x6edc10

```

Restart service

The `restart service` command can be used to restart a previously stopped listener for a service.

```
MaxScale> restart service 0x6edc10
```

MaxScale>

As with `shutdown service` the address of the service should be passed as an argument.

Restart Monitor

The restart monitor command will restart a previously stopped monitor.

```
MaxScale> show monitors
Monitor: 0x80a510
  Name:      MySQL Monitor
  Monitor stopped
  Monitored servers: 127.0.0.1:3306, 127.0.0.1:3307,
127.0.0.1:3308, 127.0.0.1:3309
MaxScale> restart monitor 0x80a510
MaxScale>
```

Set server

The `set server` command can be used to set the status flags of a server directly from the user interface. The command should be passed a server address that has been obtained from the output of a `show servers` command.

```
MaxScale> show servers
Server 0x6ec840
  Server:      127.0.0.1
  Status:      Running
  Protocol:    MySQLBackend
  Port:        3306
  Number of connections: 0
  Current no. of connections: 0
Server 0x6ec770
  Server:      127.0.0.1
  Status:      Master, Running
  Protocol:    MySQLBackend
  Port:        3307
  Number of connections: 1
  Current no. of connections: 0
Server 0x6ec6a0
  Server:      127.0.0.1
  Status:      Slave, Running
```

```
Protocol:      MySQLBackend
Port:          3308
Number of connections: 258
Current no. of connections: 0
Server 0x6ec5d0
  Server:      127.0.0.1
  Status:     Down
  Protocol:   MySQLBackend
  Port:       3309
  Number of connections: 0
  Current no. of connections: 0
MaxScale> set server 0x6ec840 slave
```

Valid options that are recognised by the `set server` command are `running`, `master` and `slave`. Please note that if the monitor is running it will reset the flags to match reality, this interface is really for use when the monitor is disabled.

Clear server

The `clear server` command is the complement to the `set server` command, it allows status bits related to a server to be cleared.

```
MaxScale> clear server 0x6ec840 slave
```

Reload users

The `reload users` command is used to force a service to go back and reload the table of database users from the backend database. This is the data used in the transparent authentication mechanism in the MySQL protocol. The command should be passed the address of the service as shown in the output of the `show services` command.

```
MaxScale> show services
Service 0x6edc10
  Service:      Test Service
  Router:       readconnroute (0x7ffff128ea40)
  Number of router sessions: 257
  Current no. of router sessions: 0
  Number of queries forwarded: 1000193
  Started:     Mon Jul 22 11:31:21 2013
Backend databases
  127.0.0.1:3309 Protocol: MySQLBackend
  127.0.0.1:3308 Protocol: MySQLBackend
```

```

        127.0.0.1:3307 Protocol: MySQLBackend
        127.0.0.1:3306 Protocol: MySQLBackend
Users data:          0x6ee4b0
Total connections:  258
Currently connected: 1
Service 0x6ec910
Service:            Split Service
Router:             readwritesplit (0x7ffff1698460)
Number of router sessions:      1
Current no. of router sessions: 0
Number of queries forwarded:    2
Number of queries forwarded to master: 0
Number of queries forwarded to slave: 1
Number of queries forwarded to all: 1
Started:            Mon Jul 22 11:31:21 2013
Backend databases
        127.0.0.1:3308 Protocol: MySQLBackend
        127.0.0.1:3307 Protocol: MySQLBackend
        127.0.0.1:3306 Protocol: MySQLBackend
Users data:          0x6ed9b0
Total connections:  2
Currently connected: 1
Service 0x649190
Service:            Debug Service
Router:             debugcli (0x7ffff18a0620)
Started:            Mon Jul 22 11:31:21 2013
Backend databases
Users data:          0x64bd80
Total connections:  2
Currently connected: 2
MaxScale> reload users 0x6edc10
Loaded 34 users.
MaxScale>

```

Reload config

The `reload config` command can be used to force MaxScale to re-read the `MaxScale.cnf` and update itself to the latest configuration defined in that configuration file. It is also possible to force the reading of the configuration file by sending a HangUp signal (SIGHUP) to the `maxscale` process.

```

MaxScale> reload config
Reloading configuration from file.

```

MaxScale>

Note, not all configuration elements can be changed dynamically currently. This mechanism can be used to add new services, servers to services, listeners to services and to update passwords. It can not be used to remove services, servers or listeners currently.

Add user

The `add user` command is used to add new users to the debug CLI of MaxScale. The default behaviour of the CLI for MaxScale is to have a login name of `admin` and a fixed password of `skysql`. Adding new users will disable this default behaviour and limit the login access to the users that are added.

```
MaxScale> add user admin july2013
User admin has been successfully added.
MaxScale> add user mark hambleden
User mark has been successfully added.
MaxScale>
```

User names must be unique within the debug CLI, this excludes the `admin` default user, which may be redefined.

```
MaxScale> add user mark 22july
User admin already exists.
MaxScale>
```

If you should forget or lose the the account details you may simply remove the `passwd` file in `$MAXSCALE_HOME/etc` and the system will revert to the default behaviour with `admin/skysql` as the account.