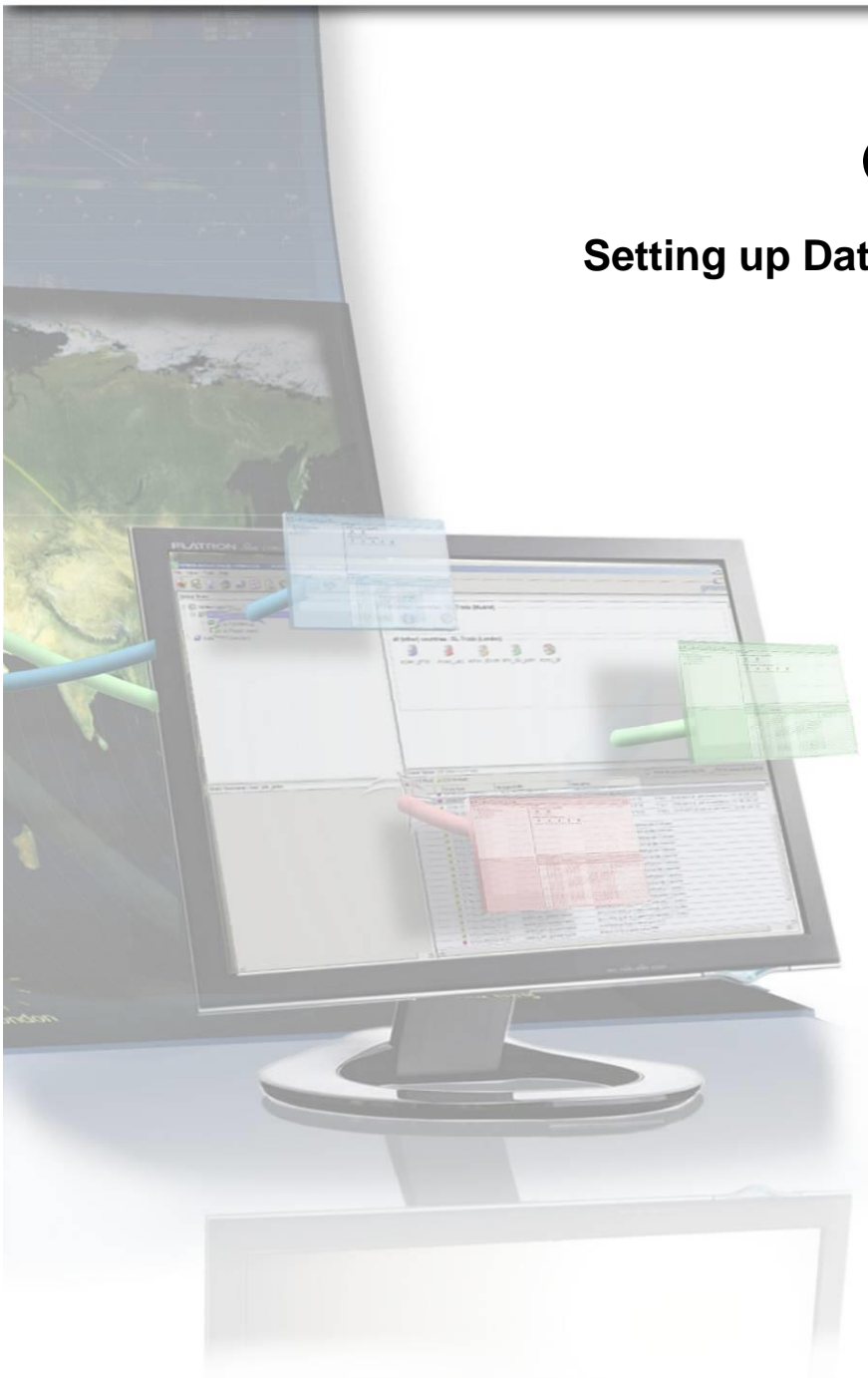




Geneos Databases

Setting up Databases for Geneos Logging

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Document Controls

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1 Introduction

This document provides details of how to set-up database on MySql, Oracle Sybase and SQL Server servers for use with Geneos.

The information included covers:

- sizing
- setting up user accounts with appropriate access
- useful commands for each type of database
- simple archiving scripts

It is assumed that the database server itself has already been installed. Please see section 17.1 - Database Schema of the Gateway 2 Reference Guide for information on the structure of the Geneos database.



2 The Geneos Database

2.1 A note on terminology

In Sybase, MySQL and SQLServer a particular server may contain a number of different databases. Tables are created within each database. Effectively each application uses a different database. Once connected to the server and using the database, tables can be accessed directly by table name.

In Oracle there is generally a single database instance per Oracle instance. Within each Oracle instance schemas are created which contain the tables for an application. Tables are referenced by schema_name.tablename. Each user is assigned a default schema upon creation; this schema name is the same as the user name.

For Oracle tables to be referenced without specifying the schema you must either be connected to Oracle as the user or use a synonym. Details on creating synonyms can be found in the Oracle section.

2.2 Database schemas – the creation scripts

At present the database schemas or creation scripts are available in the Production Release :: Other section of the Download page on the ITRS website <http://www.itrsgroup.com> appearing as

- Database Build Script GWY2 (Mysql)
- Database Build Script GWY2 (Oracle)
- Database Build Script GWY2 (Sybase)
- Database Build Script GWY2 (Microsoft SQL Server)

In future, these scripts will be packaged with the Gateway2 software and appear in the appropriate directory (mysql, oracle, Sybase or sqlServer) under resources/databases as schema-n.n.sql

2.3 Sizing

It is difficult to provide an accurate figure for the size of the database required as database sizing is affected by so many variables:

- The number of metrics stored and the interval at which these are stored
 - This itself is a function of the number of managed entities monitored, plug-ins used, etc
- The volatility of the metrics
- Archiving strategy

A minimal size for a database in Mbytes can be calculated using the following formula:-



Size = Number of Managed Entities * Number of months data to be stored * 10

In practice the size of the database required can be minimised by

- Keeping only a limited number of days of data
- Carefully considering what data is logged and only logging data which has a known use
- Specifying the interval at which items are logged and using margins

2.4 Archiving Strategies

There is no automated archiving of data from the database.

All data logged to the database is written with a Unix timestamp making it a relatively simple process to remove all data prior to a certain date, i.e. it is possible to develop a set of routines which enable a rolling 3 or 6 months worth of data to be kept.

Example archiving scripts can be found in the relevant database sections below.

2.5 Required Access Levels

The Geneos user used by the gateway needs to have select, insert, update access to the tables

The logins used by the ActiveConsole only need select access to the various tables.



3 MySQL

3.1 Required Client Libraries

Ensure 32bit MySQL client libraries (libmysqlclient_r.so.15.0.0) are installed on the host running the gateway and set-up the MYSQL_LIB and LD_LIBRARY_PATH in the start_gateway script appropriately.

For example if the client library is placed in the same directory as the gateway, the following entries will be required:-

```
MYSQL_LIB=.; export MYSQL_LIB
LD_LIBRARY_PATH=${GMD_HOME}/${PACKAGE_NAME}-${PORT}/lib/:${MYSQL_LIB}:${LD_LIBRARY_PATH}; export
LD_LIBRARY_PATH
```

3.2 Using MySQL

mysql is a command line client utility which allows you to connect to and administer a mysql database server.

Entering *mysql* with no paramters will attempt to connect to the mysql server on the localhost as the user root.

To connect as user <user_name> to a database <database_name> on a remote host <host_name> use

```
mysql -u<user_name> -h<host_name> <database_name>
```

Note there must be no space between -u and the user_name.

3.3 Setting up the database

Create a user

```
mysql> create user geneos user;
Query OK, 0 rows affected (0.08 sec)

mysql>
```

Create a database

```
mysql> create database geneos_db;
Query OK, 1 row affected (0.01 sec)

mysql>
```

Give the user appropriate permissions



```
mysql> grant all on geneos_db.* to 'geneos_user'@'localhost';
Query OK, 0 rows affected (0.03 sec)

mysql> grant all on geneos db.* to 'geneos user'@'%';
Query OK, 0 rows affected (0.01 sec)

mysql>
```

Note both grants (@'localhost' and '%') are needed if the user is going to be able to access the database from the localhost and remote hosts.

Adding identified by 'password', after the user on each grant entry, will give the user the password.

Giving the user full privileges (all) means that the user is a superuser and has full access to do anything within the geneos_db database except to grant privileges. To give the user the ability to grant privileges use "grant all on 'db_name' to 'user'@'host' with grant option; "

An example setting a password and giving grant privileges:

```
mysql> grant all on geneos db.* to 'geneos user'@'localhost' identified by 'geneos passwd' with
grant option;
Query OK, 0 rows affected (0.03 sec)
```

After all the grants have been completed issue a flush privileges command to ensure the privileges are reloaded from the grant tables

```
mysql> flush privileges;
Query OK, 0 rows affected (0.06 sec)
```

Load the schema

Assuming the schema is in the file geneos_db.sql, check the first line of the schema sets the database to the required database in this case geneos_db.

```
$ more geneos db.sql
use geneos_db;
CREATE TABLE ... ..
```

Run in the schema

```
mysql -ugeneos_user < geneos_db.sql
```

3.4 Useful Commands

3.4.1 Who am I?

```
mysql> select user();
+-----+
| user() |
+-----+
| root@localhost |
+-----+
1 row in set (0.02 sec)

mysql>
```

3.4.2 What databases exist?

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| geneos_cjt |
| gwy2 |
| test |
+-----+
4 rows in set (0.00 sec)

mysql>
```

3.4.3 What is the current database?

```
mysql> select database();
+-----+
| database() |
+-----+
| geneos db |
+-----+
1 row in set (0.00 sec)

mysql>
```

3.4.4 What users exist?

```
mysql> select user,password from mysql.user;
+-----+-----+
| user      | password |
+-----+-----+
| root      | *15ECE87A73876CA51D7444400EA7CD03BB8FA7B3 |
| root      | *15ECE87A73876CA51D7444400EA7CD03BB8FA7B3 |
| mysql     |          |
| sybase    |          |
| dmiller   |          |
| cjt       |          |
| *         |          |
| cjt2      |          |
| cjt2      |          |
| cjt_db    |          |
| cjt db    |          |
| someuser  |          |
| dmiller   |          |
+-----+-----+
13 rows in set (0.01 sec)
```

3.4.5 Switch to another database

```
mysql> use genes db;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql>
```

3.4.6 List the tables in the current database

```
mysql> show tables;
+-----+
| Tables in genes db |
+-----+
| event_table        |
| net_table          |
| node_ref_table     |
| os table           |
| processes table    |
| text_table         |
| var_ref_table      |
| version_table      |
+-----+
8 rows in set (0.00 sec)

mysql>
```

3.4.7 Get the details of a table

Get details of the columns in a table

```
mysql> describe os_table;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| timestamp | int(11)   | NO   |     | NULL    |       |
| node_ref  | int(11)   | NO   | MUL | NULL    |       |
| var_ref   | int(11)   | NO   |     | NULL    |       |
| value     | double    | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.29 sec)

mysql>
```

Null – if yes the column can contain nulls

describe <table_name> is a short cut for “show columns from table <table_name>”

Show details of an index on a table

```
mysql> show index from var_ref_table;
+-----+-----+-----+-----+-----+-----+-----+
| Table          | Non unique | Key name          | Seq in index | Column name | Collation |
| Cardinality | Sub part | Packed | Null | Index type | Comment |
+-----+-----+-----+-----+-----+-----+-----+
| var_ref_table |          0 | PRIMARY          |          1 | ref         | A         |
| 1 | NULL | NULL | | BTREE | |
| var_ref_table |          0 | var_ref_index    |          1 | varname    | A         |
| NULL | NULL | NULL | YES | BTREE | |
| var_ref_table |          0 | var_ref_index    |          2 | tablename  | A         |
| NULL | NULL | NULL | YES | BTREE | |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql>
```

Non_unique - 0 if the index cannot contain duplicates, 1 if it can

On the var_ref_table in the example above, var_ref_index is a unique index consisting of varname and tablename columns.

Count the number of rows in a table

```
mysql> select count(*) from event_table;
+-----+
| count(*) |
+-----+
| 6319742 |
+-----+
1 row in set (0.12 sec)

mysql>
```

3.4.8 Limit the number of rows returned

```
mysql> select * from os table limit 5;
+-----+-----+-----+-----+
| timestamp | node_ref | var_ref | value |
+-----+-----+-----+-----+
| 1246981633 | 2 | 1 | 48 |
| 1246981633 | 3 | 1 | 48 |
| 1246981633 | 4 | 1 | 30.9 |
| 1246981633 | 5 | 1 | 48 |
| 1246981693 | 4 | 1 | 29.5 |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql>
```

3.4.9 What access permissions does a user have?

Logged in as the user, use the show grants command:

```
mysql> show grants;
+-----+-----+-----+-----+
| Grants for geneos_user@localhost |
+-----+-----+-----+-----+
| GRANT USAGE ON *.* TO 'geneos user'@'localhost' |
| GRANT ALL PRIVILEGES ON `geneos db`.* TO 'geneos user'@'localhost' WITH GRANT OPTION |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql>
```

To list all the permissions a user has been given select from the mysql.user table


```
mysql> select * from mysql.db where user = 'cjt' and db = 'geneos_cjt';
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Host      | Db          | User | Select priv | Insert priv | Update priv | Delete priv | Create priv | Drop priv | Grant priv | References priv | Index priv | Alter priv | Create_tmp_table priv | Lock_tables priv | Create_view priv | Show_view priv | Create_routine priv | Alter_routine priv | Execute priv | Event priv | Trigger priv |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| %        | geneos_cjt | cjt  | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| Y        | N          | Y    | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| Y        | Y          |      | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| Y        |            |      | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| localhost | geneos_cjt | cjt  | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| Y        | N          | Y    | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| Y        | Y          |      | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
| Y        |            |      | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           | Y           |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.07 sec)

mysql>
```

3.4.10 Handling Timestamps

To convert from a date and time to a Unix timestamp use UNIX_TIMESTAMP(date)

```
mysql> select unix_timestamp('2009-12-24 09:24:10');
+-----+-----+-----+-----+
| unix_timestamp('2009-12-24 09:24:10') |
+-----+-----+-----+-----+
| 1261646650 |
+-----+-----+-----+-----+
1 row in set (0.02 sec)

mysql>
```

To convert from a Unix timestamp to a normal time use FROM_UNIXTIME(timestamp)

```
mysql> select from_unixtime(1261581335);
+-----+-----+-----+-----+
| from_unixtime(1261581335) |
+-----+-----+-----+-----+
| 2009-12-23 15:15:35 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

or

```
mysql> select from_unixtime(timestamp),value from os table where var ref = 151 and node ref = 7;
+-----+-----+-----+-----+
| from_unixtime(timestamp) | value |
+-----+-----+-----+-----+
| 2009-12-23 15:15:35      | 42332 |
| 2009-12-23 15:15:44      | 42336 |
| :                          | :     |
+-----+-----+-----+-----+
```



3.5 Creating additional Geneos tables

To create additional tables for Geneos data use the following statements substituting appropriately for <name> in TABLE and KEY sections

For numeric data –

```
CREATE TABLE `<name>_table` (  
  `timestamp` int(11) NOT NULL,  
  `node_ref` int(11) NOT NULL,  
  `var_ref` int(11) NOT NULL,  
  `value` double default NULL,  
  KEY `<name>_index` (`node_ref`,`var_ref`,`timestamp`)  
) ENGINE=MyISAM DEFAULT CHARSET=latin1 COLLATE=latin1_general_ci;
```

For text data -

```
CREATE TABLE `<name> table` (  
  `timestamp` int(11) NOT NULL,  
  `node_ref` int(11) NOT NULL,  
  `var_ref` int(11) NOT NULL,  
  `value` varchar(250) collate latin1_general_ci default NULL,  
  KEY `<name>_index` (`node_ref`,`var_ref`,`timestamp`)  
) ENGINE=MyISAM DEFAULT CHARSET=latin1 COLLATE=latin1_general_ci;
```

3.6 Creating additional read-only users

The ActiveConsole connects directly to the database to extract information, for imports into the Event Ticker and to plot historic graphs. The ActiveConsole can use the same user as the gateway or another user but as it is only reading data the ActiveConsole should ideally use a read-only user. In addition, if you wish to extract information from the database using Express Reports, some other reporting tool or run ad-hoc queries on the database you should probably use a read-only user.

3.6.1 Creating a read-only user

To create a read-only user, create a user

```
mysql> create user geneos ro;  
Query OK, 0 rows affected (0.08 sec)  
  
mysql>
```

Give the user appropriate permissions

```
mysql> grant select on geneos db.* to 'geneos ro'@'localhost';  
Query OK, 0 rows affected (0.03 sec)  
  
mysql> grant select on geneos db.* to 'geneos ro'@'%';  
Query OK, 0 rows affected (0.01 sec)  
  
mysql>
```




Note both grants (@'localhost' and '%') are needed if the user is going to be able to access the database from the localhost and remote hosts.

After all the grants have been completed issue a flush privileges command to ensure the privileges are reloaded from the grant tables

3.7 Archiving

A simple archiving script for MySQL. Replace all occurrences of <name> with the appropriate table.

```
/*
*****
/* Archive the <name> table, nothing subtle, just remove all records with a
/* timestamp earlier than @num_days
/*
/*
*****
DROP procedure archive <name> table;

DELIMITER $$

CREATE procedure archive <name> table
(
    in num days numeric
)
BEGIN

    delete
    from <name> table
    where timestamp < unix_timestamp(date_sub(curdate(), interval num_days day));

END $$

DELIMITER ;
```

To load this stored procedure into the database use

```
mysql -h hostname -u username -D database_name < archive_script_name.sql
```

Once the stored procedure has been loaded into the database it can easily be called from a simple shell script triggered by cron and containing the following lines:

```
#!/bin/sh

HOST=redhatws
USER=geneos user
PASSWORD=geneos password
DBASE=geneos_db

NUM_DAYS=90

mysql -h ${HOST} -u ${USER} -D ${DBASE} -P ${PASSWORD} << EOF
call archive_event_table($NUM_DAYS);
EOF
```



4 Sybase

4.1 Required Client Libraries

Ensure 32bit Sybase Server 15 client libraries are installed on the host running the gateway and set-up the SYBASE and LD_LIBRARY_PATH in the start_gateway script appropriately. Please see Sybase Software development kit for more details. [Software Developer's Kit 15.7 > Open Client and Open Server Programmers Supplement for UNIX > Open Client Client-Library/C](#). This is available at <http://infocenter.sybase.com/help/index.jsp>.

```
setenv SYBASE /export/share/dev/SYBASE
setenv LD_LIBRARY_PATH $SYBASE/OCS-12_5/lib:$SYBASE/lib:${LD_LIBRARY_PATH}
```

4.2 Interfaces file

Sybase clients rely on the interfaces file to determine where Sybase servers are on the network. Find the interfaces file on the server on which the gateway is running and ensure it contains an entry for the Sybase server you are attempting to connect to.

```
% pwd
/export/share/dev/SYBASE
% more interfaces
LINUX165
    master tli tcp /dev/tcp \x00021388c0a80aa50000000000000000
    query tli tcp /dev/tcp \x00021388c0a80aa500000000000000000

ITRSSOL5
    master tli tcp /dev/tcp \x00021004c0a80a290000000000000000
    query tli tcp /dev/tcp \x00021004c0a80a290000000000000000
:
:
```

4.3 Using isql

isql (Interactive SQL parser to Adaptive Server) is a command line client utility

```
isql -S<server_name> -U<user_name> -P<password>
```

The server_name should match an entry in the interfaces file.

4.4 Setting up the database

Create a user



```
1> sp_addlogin geneos_user, geneospasswd
2> go
Password correctly set.
Account unlocked.
New login created.
(return status = 0)
1>
```

Create a database

```
1> create database geneos_db
2> go
CREATE DATABASE: allocating 25600 logical pages (50.0 megabytes) on disk
'bigger_data'.
1>
```

Switch to the database

```
1> use geneos_db
2> go
```

Change the database owner

```
1> sp_changedbowner geneos user
2> go
DBCC execution completed. If DBCC printed error messages, contact a user with
System Administrator (SA) role.
Database owner changed.
(return status = 0)
1>
```

Load the schema

Assuming the schema is in the file `geneos_db.sql`, check the first line of the schema sets the database to the required database in this case `geneos_db`.

```
$ more geneos db.sql

use geneos_db
go

CREATE TABLE ... ..
```

Run in the schema

```
isql -S LINUX165 -U geneos_user -P geneospasswd < geneos_db.sql
```

4.5 Useful Commands

4.5.1 Who am I?

```

1> select user, user_id()
2> go

-----
geneos user                                3

(1 row affected)
1>

```

4.5.2 What databases exist?

```

1> sp_helpdb
2> go
name                db size  owner          dbid
-----
created
status
-----
RJB                 50.0 MB sa          6
Nov 29, 2005
mixed log and data
geneos_db           50.0 MB sa          16
Sep 14, 2009
mixed log and data
master              126.0 MB sa          1
Jan 25, 2005
mixed log and data
model               2.0 MB sa          3
Jan 25, 2005
mixed log and data
:
:

```

4.5.3 What is the current database?

```

1> select db name()
2> go

-----
geneos_db

(1 row affected)
1>

```

4.5.4 What users exist?

To find what users exist in a given database

```

1> use geneos db
2> go
1> sp_helpuser
2> go
Users name          ID in db  Group name      Login name
-----
dbo                 1 public       geneos user
(return status = 0)
1>

```



4.5.5 Switch to another database

```
1> use geneos db
2> go
1>
```

4.5.6 List the tables in the current database

```
1> select name from sysobjects where type = "U"
2> go
name
-----
version_table
node_ref_table
var_ref_table
event_table
os_table
net_table
processes_table
text_table
audit table

(9 rows affected)
1>
```

4.5.7 Get the details of a table

sp_help <table_name> will return full details about a table in the current database, including the columns and indexes.

```

1> sp_help os_table
2> go
Name                               Owner
-----
os_table                             dbo
  user table

(1 row affected)
Data located on segment              When created
-----
default                               Sep 14 2009 12:24PM
Column_name      Type                Length      Prec Scale Nulls Default_name
  Rule name      Access Rule name      Identity
-----
timestamp        int                    4 NULL NULL  0 NULL
  NULL           NULL
node_ref         int                    4 NULL NULL  0 NULL
  NULL           NULL
var_ref         int                    4 NULL NULL  0 NULL
  NULL           NULL
value           real                   4 NULL NULL  0 NULL
  NULL           NULL
index name      index description
  index keys
  index max rows per page index fillfactor index reservepagegap
  index created
-----

os index          nonclustered located on default
  node ref, var ref, timestamp

                               0          0          0
  Sep 14 2009 12:24PM

(1 row affected)
No defined keys for this object.
Object is not partitioned.
Lock scheme Allpages
The attribute 'exp row size' is not applicable to tables with allpages lock
scheme.
The attribute 'concurrency opt threshold' is not applicable to tables with
allpages lock scheme.

exp_row_size reservepagegap fillfactor max_rows_per_page identity_gap
-----
  1          0          0          0          0

(1 row affected)
concurrency_opt_threshold optimistic_index_lock dealloc_first_ttxpg
-----
  0          0          0

(return status = 0)
1>

```

Nulls – if 1 the column can contain nulls, if 0 then nulls are not allowed.
 The default for a database when creating a table is not null, can be changed with sp_dboption.

To just see the details of the indexes on a table use sp_helpindex



```
1> set rowcount 0
2> go
```

4.5.9 More user details

```
1> sp displaylogin geneos user
2> go
Suid: 11
Loginname: geneos_user
Fullname:
Default Database: master
Default Language:
Auto Login Script:
Configured Authorization:
Locked: NO
Date of Last Password Change: Sep 14 2009 11:19AM
Password expiration interval: 0
Password expired: NO
Minimum password length: 6
Maximum failed logins: 0
Current failed login attempts:
Authenticate with: ANY
(return status = 0)
1>
```

4.5.10 What access permissions does a user have?

To list all the permissions a user has been given within a database, use `sp_helprotect` specifying the user

```
1> use geneos_db
2> go
1> sp_helprotect geneos ro
2> go
```

grantor	grantee	type	action	object	column
granttable					
dbo	geneos ro	Grant	Select	audit table	All FALSE
dbo	geneos ro	Grant	Select	event table	All FALSE
dbo	geneos_ro	Grant	Select	net_table	All FALSE
dbo	geneos_ro	Grant	Select	node_ref_table	All FALSE
dbo	geneos ro	Grant	Select	os table	All FALSE
dbo	geneos ro	Grant	Select	processes table	All FALSE
dbo	geneos ro	Grant	Select	text table	All FALSE
dbo	geneos ro	Grant	Select	var ref table	All FALSE
dbo	geneos_ro	Grant	Select	version_table	All FALSE
dbo	public	Grant	Select	sysalternates	All FALSE
dbo	public	Grant	Select	sysattributes	All FALSE
dbo	public	Grant	Select	sysobjects	ckfirst FALSE
:					
:					

To list the permissions which a particular user has been given to a particular table use `sp_helprotect` specifying the table and user


```

1> sp_helprotect version_table, geneos_ro
2> go
grantor      grantee      type      action
  object      column      grantable
-----
dbo          geneos_ro   Grant     Select
  version_table All         FALSE
(1 row affected)
(return status = 0)
1>

```

4.5.11 Handling Timestamps

To convert from a date and time to a Unix timestamp use

```

1> select datediff(second,"January 1, 1970 00:00","24 Dec 2009 09:24:10")
2> go
-----
1261646650
(1 row affected)
1>

```

To convert from a Unix timestamp to a normal time use

```

1> select convert(char(26),dateadd (second,1261646650,"January 1 1970 00:00"),109)
2> go
-----
Dec 24 2009 9:24:10:000AM
(1 row affected)
1>

```

4.6 Creating additional Geneos tables

To create additional tables for Geneos data use the following statements substituting appropriately for <name> in table and index sections

For numeric data –

```

CREATE TABLE <name>_table (timestamp int not null,node_ref int not null,var_ref int not null,value
real);
go
CREATE INDEX <name>_index on <name>_table (node_ref,var_ref,timestamp)
go

```

For text data -

```

CREATE TABLE <name>_table(timestamp int not null,node_ref int not null,var_ref int not null,value
varchar(250));
go
CREATE INDEX <name>_index on <name>_table (node_ref,var_ref,timestamp)
go

```



4.7 Creating additional read-only users

The ActiveConsole connects directly to the database to extract information, for imports into the Event Ticker and to plot historic graphs. The ActiveConsole can use the same user as the gateway or another user but as it is only reading data the ActiveConsole should ideally use a read-only user. In addition, if you wish to extract information from the database using Express Reports, some other reporting tool or run ad-hoc queries on the database you should probably use a read-only user.

4.7.1 Creating a read-only user

To create a read-only user, create a user

```
1> sp addlogin geneos ro, geneospasswd
2> go
Password correctly set.
Account unlocked.
New login created.
(return status = 0)
1>
```

Add the user to the database, note you need to switch to the database first before issuing the `sp_adduser` command.

```
1> select user
2> go
-----
dbo

(1 row affected)
1> use geneos_db
2> go
1> sp adduser geneos ro
2> go
New user added.
(return status = 0)
1>
```

As the `dbo` give the read-only user access to the tables

```
1> grant select on version table to geneos ro
2> go
```

To give a user access to all the tables in a database the following approach can be used, (note this gives all permissions but all can be replaced by `select`). Generate a list of the tables surrounded by appropriate text to return a command:-

```
1> select "grant all on " + name + " to geneos_user" from sysobjects
2> where type = "U"
3> go
```

```
-----
grant all on version_table to geneos user
grant all on node_ref_table to geneos_user
grant all on var_ref_table to geneos_user
grant all on event_table to geneos_user
grant all on os_table to geneos_user
grant all on net_table to geneos_user
grant all on processes_table to geneos_user
grant all on text_table to geneos_user
grant all on audit_table to geneos_user
```

```
(9 rows affected)
```

```
1>
```

Then cut and paste the resulting output

```
1> grant all on version_table to geneos_user
grant all on node_ref_table to geneos_user
grant all on var_ref_table to geneos_user
grant all on event_table to geneos_user
grant all on os_table to geneos_user
grant all on net_table to geneos_user
grant all on processes_table to geneos_user
grant all on text_table to geneos_user
grant all on audit_table to geneos_user
```

```
2> 3> 4> 5> 6> 7> 8> 9> 10> 11>
```

```
12> go
```

```
1>
```

4.8 Archiving

A simple archiving script for Sybase. Replace all occurrences of <name> with the appropriate table. The loop and rowcount of 10000 avoids filling the transaction log.



```
/*
/* Archive the <name>_table, nothing subtle, just remove all records with a
/* timestamp earlier than @num days
/*
/*
/*****
drop proc archive_<name>_table
go

create proc archive_<name>_table
(
    @num days int
)
as

    declare @archive tm        int,
            @finished         char(1)

    select @num_days = @num_days * -1
    select @archive_tm = datediff(second,"January 1, 1970 00:00",
                                convert(char(15),
                                dateadd(dd, @num days, getdate()),106))

    set rowcount 10000

    select @finished = 'N'

    while @finished = 'N'
    begin

        delete
            from <name>_table
            where timestamp < @archive_tm

        if @@rowcount = 0 select @finished = 'Y'

    end

go
```

To load this stored procedure into the database use

```
isql -S hostname -U username -D database_name -P password < archive_script_name.sql
```

Once the stored procedure has been loaded into the database it can easily be called from a simple shell script triggered by cron and containing the following lines:

```
#!/bin/sh

DB_SERVER=SYBASE SERVER
DB_DATABASE=geneos db
DB_USERNAME=geneos user
DB_PASSWORD=geneos_passwd

NUM_DAYS=90

isql -S${DB_SERVER} -U${DB_USERNAME} -D${DB_DATABASE} -P${DB_PASSWORD} << EOF
exec archive_event_table "$NUM_DAYS"
go
EOF
```



5 Oracle

5.1 Required Client Libraries

Ensure 32bit Oracle client libraries (libclntsh.so) are installed on the host running the gateway and set-up the ORACLE_HOME and LD_LIBRARY_PATH in the start_gateway script appropriately.

```
setenv ORACLE_HOME /usr/oracle/oracle/product/10.2.0/client
setenv LD_LIBRARY_PATH ${ORACLE_HOME}/lib32:.
```

or

```
ORACLE_HOME=/usr/oracle/oracle/product/10.2.0/client; export ORACLE_HOME
LD_LIBRARY_PATH=${ORACLE_HOME}/lib32:.; export LD_LIBRARY_PATH
```

5.2 tnsnames.ora file

Oracle clients use the tnsnames.ora file to determine where Oracle servers are on the network. Find the tnsnames.ora file on the server on which the gateway is running and ensure it contains an entry for the Oracle database you are attempting to connect to.

```
EUMON01TCP, EUMON01,EUMON01.itrspc106.ldn.itrs =
  (DESCRIPTION =
    (ADDRESS =
      (PROTOCOL = TCP) (HOST = itrspc106.ldn.itrs) (PORT = 1521)
    )
    (CONNECT_DATA =
      (SID = EUMON01)
    )
  )
```

5.3 Using sqlplus

sqlplus is a command line client utility.

Before trying to use sqlplus you need to set-up ORACLE_HOME, e.g.

```
setenv ORACLE_HOME /usr/oracle/oracle/product/10.2.0/client
```

```
sqlplus <user_name>/<password>@<database_name>
```

```
sqlplus geneos_user/geneos_passwd@db_name
```

To set the line length and page length within sqlplus to a sensible values -

```
SQL> set linesize 132
SQL> set pagesize 60
```



5.4 Setting up the database

Create a user

```
SQL> create user geneos_user identified by geneos_passwd default tablespace USERS temporary
tablespace TEMP;

User created.

SQL>
```

Give the user appropriate access, connect and dba

```
SQL> grant connect, dba to geneos_user;

Grant succeeded.

SQL>
```

Load the schema, assuming the schema is in the file geneos_db.sql

```
sqlplus geneos_user/geneos_passwd@TESTDB @geneos_db.sql
```

5.5 Useful Commands

5.5.1 Who am I?

```
SQL> select user, uid from dual;

USER                                UID
-----
geneos_user                          58

SQL>
```

or

```
SQL> show user;
USER is "geneos_user"
SQL>
```

5.5.2 What users exist?

```
SQL> select username, default tablespace, temporary tablespace from dba users order by username;
```

USERNAME	DEFAULT_TABLESPACE	TEMPORARY_TABLESPACE
ANONYMOUS	SYSAUX	TEMP
CJT	USERS	TEMP
CTHOUMINE	USERS	TEMP
CTXSYS	SYSAUX	TEMP
DBSNMP	SYSAUX	TEMP

5.5.3 List the tables in the current database

```
SQL> select table name from tabs;
```

```
TABLE_NAME  
-----  
NODE_REF_TABLE  
VERSION_TABLE  
VAR_REF_TABLE  
EVENT TABLE  
OS_TABLE  
NET_TABLE  
PROCESSES_TABLE  
TEXT TABLE  
  
8 rows selected.  
  
SQL>
```

or select * from user_objects where object_type = 'TABLE';

5.5.4 Get the details of a table

A list of the columns

```
SQL> desc OS TABLE
```

Name	Null?	Type
TIMESTAMP	NOT NULL	NUMBER(38)
NODE_REF	NOT NULL	NUMBER(38)
VAR_REF	NOT NULL	NUMBER(38)
VALUE		FLOAT(63)

```
SQL>
```

A list of the indexes on the table

```
SQL> select distinct(INDEX NAME) from all ind columns where table name = 'OS TABLE' and  
index owner = 'geneos user';
```

```
INDEX NAME  
-----  
OS_INDEX  
  
SQL>
```

Full details of an index

```
SQL> select * from all_ind_columns where table_name = 'OS_TABLE' and index_name='OS_INDEX' and
index_owner='CTHOUMINE';
```

INDEX OWNER	INDEX NAME	TABLE OWNER	TABLE NAME
CTHOUMINE	OS_INDEX	CTHOUMINE	OS_TABLE
CTHOUMINE	OS_INDEX	CTHOUMINE	OS_TABLE
CTHOUMINE	OS_INDEX	CTHOUMINE	OS_TABLE

```
SQL>
```

Count the number of rows in a table

```
SQL> select count(*) from event table;
```

COUNT(*)
8977

```
SQL>
```

5.5.5 Limiting the number of rows returned

Add rownum <= <num_rows_required> to the where clause

```
SQL> select * from os table where rownum <= 4;
```

TIMESTAMP	NODE REF	VAR REF	VALUE
1251806387	1	1	11
1251806450	1	1	10
1251807151	1	1	11
1251807181	1	1	10

```
SQL>
```

5.5.6 What access permissions does a user have?

```
SQL> select * from session privs;
```

PRIVILEGE
ALTER SYSTEM
AUDIT SYSTEM
CREATE SESSION
ALTER SESSION
CREATE TABLESPACE
:
:



5.5.7 Handling Timestamps

To convert from a date and time to a Unix timestamp use

```
SQL> SELECT (to_date('24-dec-2009 09:47:08','dd-mon-yyyy hh24:mi:ss') - to_date('01-JAN-1970')) *
(86400) AS dt FROM dual;

          DT
-----
1261648028

SQL>
```

To convert from a Unix timestamp to a normal time use

```
SQL> select to_char(to date('01-jan-1970') + 1261648028 / 86400,'dd-mon-yyyy hh24:mi:ss') from
dual;

TO_CHAR(TO_DATE('01-
-----
24-dec-2009 09:47:08

SQL>
```

5.6 Creating additional Geneos tables

To create additional tables for Geneos data use the following statements substituting appropriately for <name>.

For numeric data –

```
CREATE TABLE <name>_table (timestamp int not null, node_ref int not null, var_ref int not null,
value real null) ;
CREATE INDEX <name>_index on <name>_table (node_ref, var_ref, timestamp) ;
ALTER TABLE <name>_table add constraint fk_<name>_table_node_ref FOREIGN KEY (node_ref)
REFERENCES node_ref_table (ref);
ALTER TABLE <name>_table add constraint fk_<name>_table_var_ref FOREIGN KEY (var_ref) REFERENCES
var_ref_table (ref);
```

For text data –

```
CREATE TABLE <name>_table (timestamp int not null, node_ref int not null, var_ref int not null,
value varchar(250)) ;
CREATE INDEX <name>_index on <name>_table (node_ref, var_ref, timestamp) ;
ALTER TABLE <name>_table add constraint fk_<name>_table_node_ref FOREIGN KEY (node_ref)
REFERENCES node_ref_table (ref);
ALTER TABLE <name>_table add constraint fk_<name>_table_var_ref FOREIGN KEY (var_ref) REFERENCES
var_ref_table (ref);
```

5.7 Creating additional read-only users

The ActiveConsole connects directly to the database to extract information, for imports into the Event Ticker and to plot historic graphs. The ActiveConsole can use the same user as the gateway or another user but as it is only reading data the ActiveConsole should ideally use a read-only user. In addition, if you wish to extract information from the database using Express



Reports, some other reporting tool or run ad-hoc queries on the database you should probably use a read-only user.

5.7.1 Creating a read-only user

To create a read-only user, create a user

```
SQL> create user geneos_ro identified by geneos_ro_passwd default tablespace USERS temporary
tablespace TEMP;

User created.

SQL>
```

and give the user connect access,

```
SQL> grant connect to geneos ro;

Grant succeeded.

SQL>
```

For user2 to access the tables of user1 you must have dba privileges and give user2 select access to the table of user1 and then create a synonym

grant select on "user1."table_name" to "user2";
create synonym "user2"."table_name" for "user1"."table_name"

e.g.

```
SQL> grant select on geneos_user.event_table to geneos_ro;

Grant succeeded.

SQL> create synonym geneos ro.event table for geneos user.event table;

Synonym created.
```

5.7.2 Listing synonyms

To list synonyms

```
SQL> select OWNER,SYNONYM NAME,TABLE OWNER,TABLE NAME from all synonyms where owner = 'GENEOS RO';
```

OWNER	SYNONYM NAME	TABLE OWNER	TABLE NAME
GENEOS_RO	EVENT_TABLE	GENEOS_USER	EVENT_TABLE
GENEOS_RO	NET_TABLE	GENEOS_USER	NET_TABLE
GENEOS_RO	NODE_REF_TABLE	GENEOS_USER	NODE_REF_TABLE
GENEOS RO	OS TABLE	GENEOS USER	OS TABLE
GENEOS RO	SOURCE TABLE	GENEOS USER	SOURCE TABLE
GENEOS RO	TEXT TABLE	GENEOS USER	TEXT TABLE
GENEOS_RO	VAR_REF_TABLE	GENEOS_USER	VAR_REF_TABLE
GENEOS_RO	VERSION_TABLE	GENEOS_USER	VERSION_TABLE



5.8 Archiving

A simple archiving script for Oracle. Replace all occurrences of <name> with the appropriate table.

```
/*
*****
/* Archive the <name>_table, nothing subtle, just remove all records with a
/* timestamp earlier than num_days
/*
*****
CREATE OR REPLACE PROCEDURE archive_<name>_table(num_days IN NUMBER)
IS
BEGIN
    delete
    from <name>_table
    where timestamp < (trunc(sysdate) - num_days - to_date('01-JAN-1970','DD-MON-YYYY')) * 86400;
END;
```

To load this stored procedure into the database use

```
sqlplus user @schema @TESTDB @archive_script_name.sql
```

and once this has loaded into sqlplus enter /

for example

```
sqlplus cthoumine/cthoumine@TESTDB @archive event table.sql
SQL*Plus: Release 10.2.0.1.0 - Production on Tue Dec 22 15:18:44 2009

Copyright (c) 1982, 2005, Oracle. All rights reserved.

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning, OLAP and Data Mining options

 8 /

Procedure created.

SQL>
```

Once the stored procedure has been loaded into the database it can easily be called from a simple shell script triggered by cron and containing the following lines:

```
#!/bin/sh

ORACLE_HOME=/usr/oracle/oracle/product/10.2.0/client
export ORACLE_HOME

USER=geneos_user
SCHEMA=geneos_user
DBASE=TESTDB

NUM_DAYS=90

/usr/oracle/oracle/product/10.2.0/client/bin/sqlplus ${USER}/${SCHEMA}@${DBASE} << EOF
exec archive_event_table($NUM_DAYS);
EOF
```



6 SQL Server

6.1 Required Client Libraries

This is currently only supported on Linux 32 bit Gateway at present. There are two versions of the package one using unixODBC and one using iodbc. The original package used iODBC and this is still available, however we have been advised by the developers of FreeTDS (The layer between ODBC and SQL Server) that the library is more stable with unixODBC.

Download the database library package depending on the version they will be named:

UnixODBC	sqlServerFreeTDS-0.91-unixODBC-2.3.2.tgz
iODBC	sqlServerLib_v2.tgz

Get these from the ITRS group Production Release : Other section of the website and ensure these are untarred on the host running the gateway and setup the SQLSERVER_LIB, ODBCINSTINI and LD_LIBRARY_PATH in the start_gateway script appropriately.

For example if the client library is placed in a directory called SQL-DB the following entries will be required:-

unixODBC

```
setenv SQLSERVER_LIB /opt/geneos/SQL-DB
setenv LD_LIBRARY_PATH ${SQLSERVER_LIB}:.
setenv ODBCHOME ${SQLSERVER_LIB}
setenv ODBCYSINI ${SQLSERVER_LIB}
setenv ODBCINSTINI odbcinst.ini
setenv GENEOS_ODBCLIB libodbc.so
```

iODBC

```
setenv SQLSERVER_LIB /opt/geneos/SQL-DB
setenv LD_LIBRARY_PATH ${SQLSERVER_LIB}:.
setenv ODBCINSTINI ${SQLSERVER_LIB}/odbcinst.ini
setenv GENEOS_ODBCLIB libiodbc.so
```

Also edit 'odbcinst.ini' file in \$\$SQLSERVER_LIB to set the current path of libtdsodbc.so

```
[FreeTDS]
Driver = /opt/geneos/SQL-DB/libtdsodbc.so>
```

Note: The SQL library we use will search for iODBC by default and if it is installed that library will take precedence. We override this in the gateway if GENEOS_ODBCLIB is set. This is set for you start_gateway / start_netprobe templates. This is recent change (GA3.0.16) so earlier gateways will not support this. The work-around is to place a symbolic link from libiodbc.so to libodbc.so in the same directory and ensure it comes first on the LD_LIBRARY_PATH.

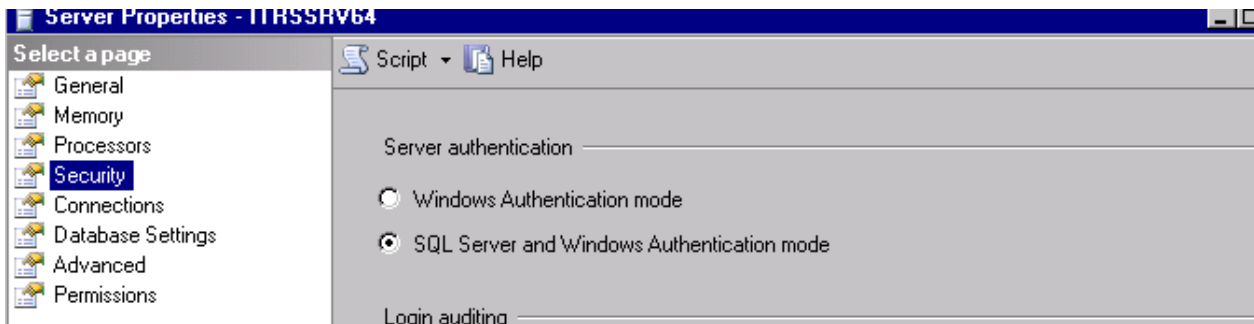
6.2 Installing the database

The steps to do this are considered to be outside the scope of this particular document. A number of useful on-line sources exist which go into detail. A link below is one such example.

<http://www.sqlserverclub.com/essentialguides/how-to-install-sql-server-2008-step-by-step-guide.aspx>

It should be noted that the default options during the install phase should be selected. If you are using MS SQL Server 2008 Express there is a bug in it where selecting the default instance box in the installation does not work. By entering MSSQLSERVER as the instance name the installer will install SQL Server with the default (i.e none) instance name.

It should also be noted that if you require the choice to either authenticate against Windows or a SQL created account then you should choose this option during the install.

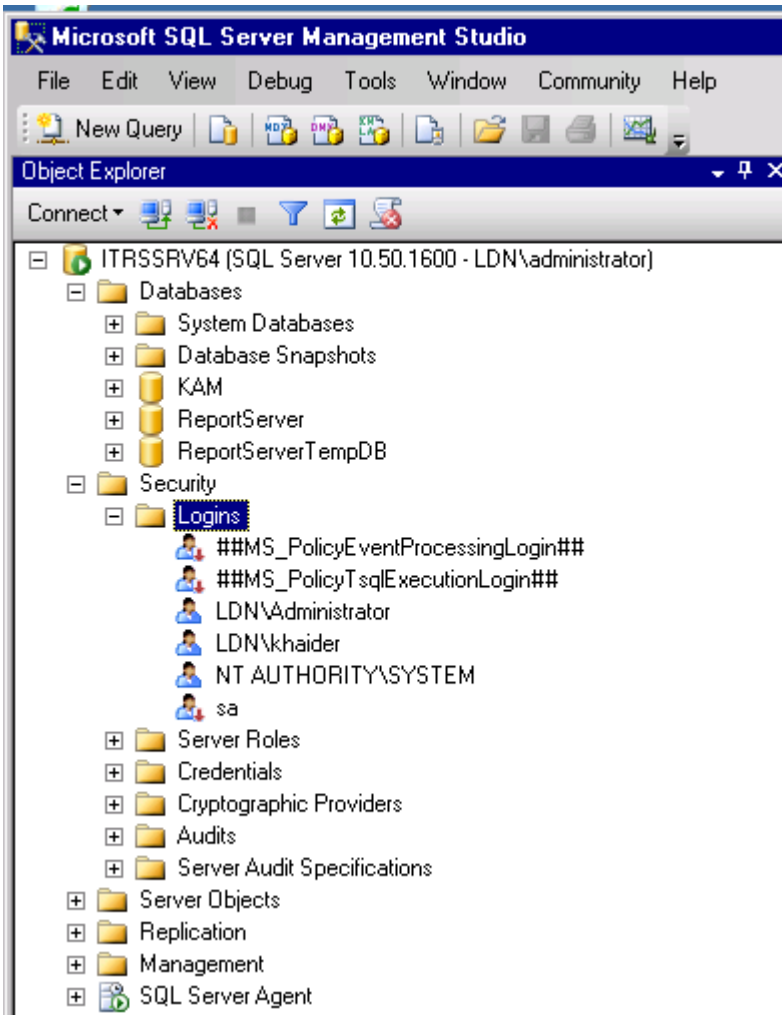


This can be changed later but does require a restart of the SQL-Server.

6.3 Setting up the database

6.3.1 Create a user (Windows authenticated)

Within Microsoft SQL Server Management Studio, open up the Security folder, and the Logins folder within it. Right click the Logins folder and choose New Login



Use a valid Windows NT application / user account for user credentials and enter the appropriate permissions.

Login Properties - LDN\rgould

Select a page

- General
- Server Roles
- User Mapping
- Securables
- Status

Script Help

Login name: Search...

Windows authentication
 SQL Server authentication

Password:
 Confirm password:
 Specify old password
 Old password:
 Enforce password policy
 Enforce password expiration
 User must change password at next login

Mapped to certificate
 Mapped to asymmetric key
 Map to Credential Add

Mapped Credentials	
Credential	Provider

Remove

Default database:
 Default language:

OK Cancel

Connection

Server: ITRSSRV64
 Connection: LDN\administrator
[View connection properties](#)

Progress

Ready

Login Properties - LDN\rgould

Select a page

- General
- Server Roles**
- User Mapping
- Securables
- Status

Script Help

Server role is used to grant server-wide security privileges to a user.

Server roles:

- bulkadmin
- dbcreator
- diskadmin
- processadmin
- public
- securityadmin
- serveradmin
- setupadmin
- sysadmin

Connection

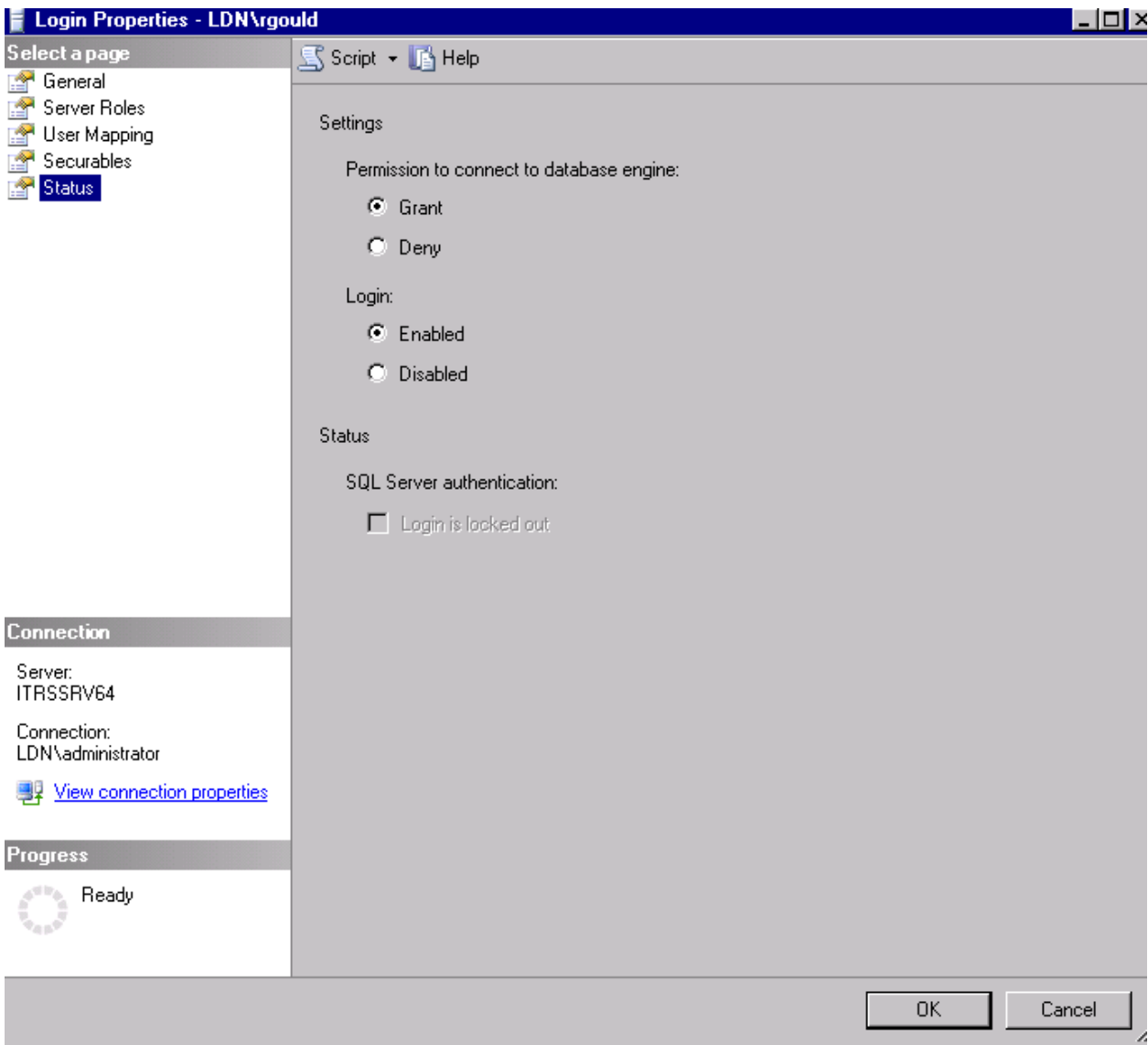
Server:
ITRSSRV64

Connection:
LDN\administrator

[View connection properties](#)

Progress

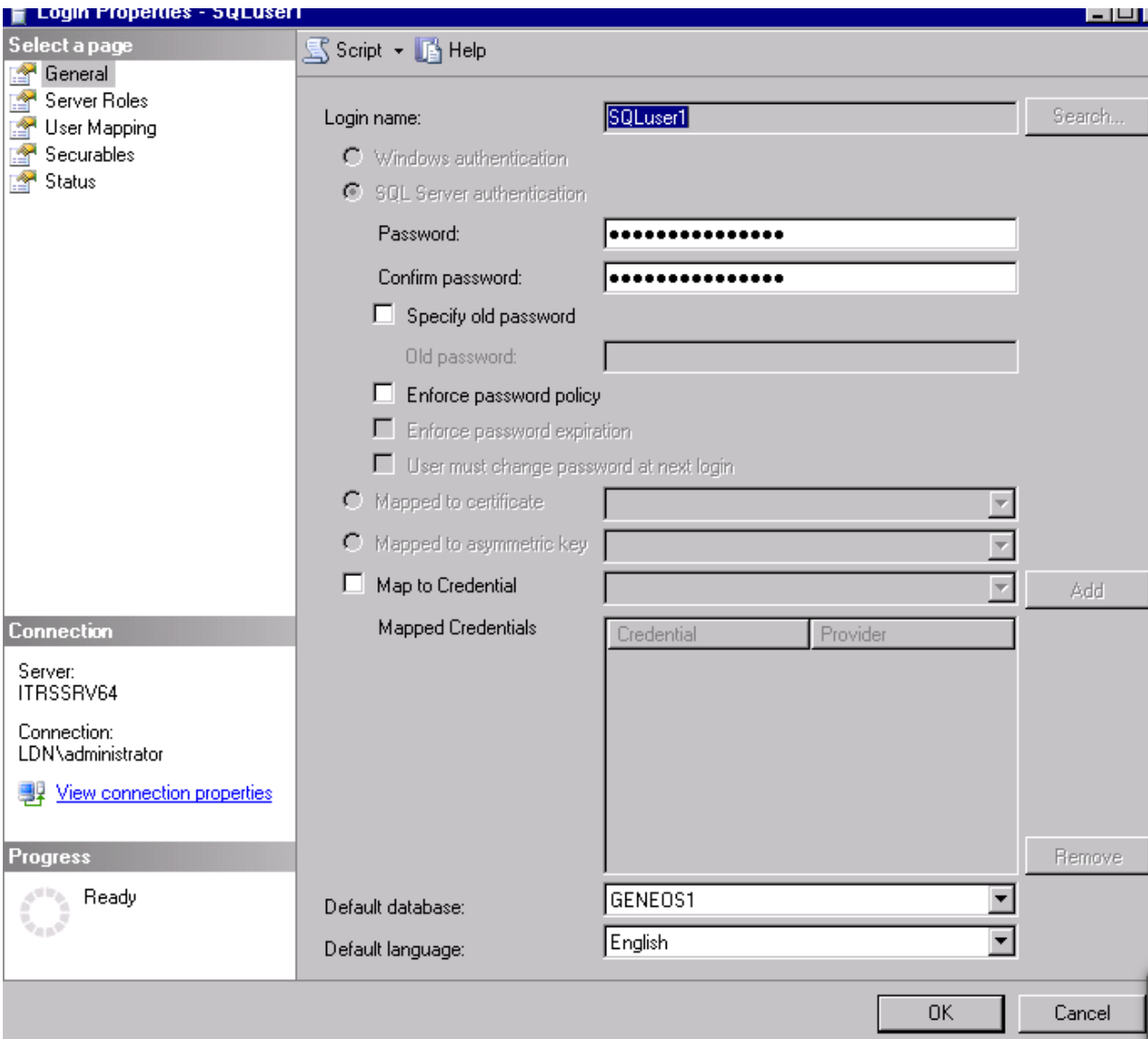
Ready



6.3.2 Create a user (SQL Server authentication)

Within Microsoft SQL Server Management Studio, open up the Security folder, and the Logins folder within it. Right click the Logins folder and choose New Login

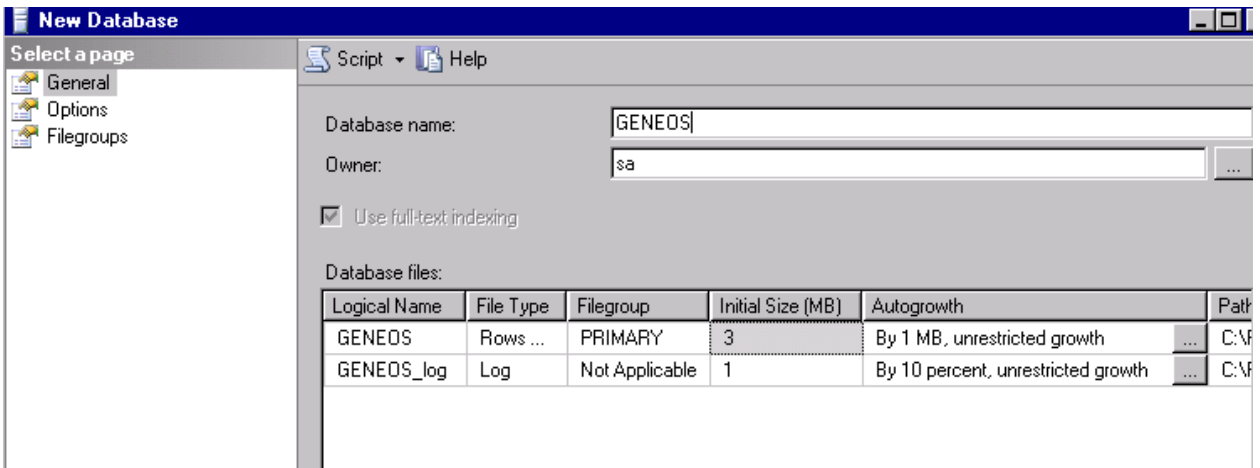
In the General tab enter a login name and assign a password to it.



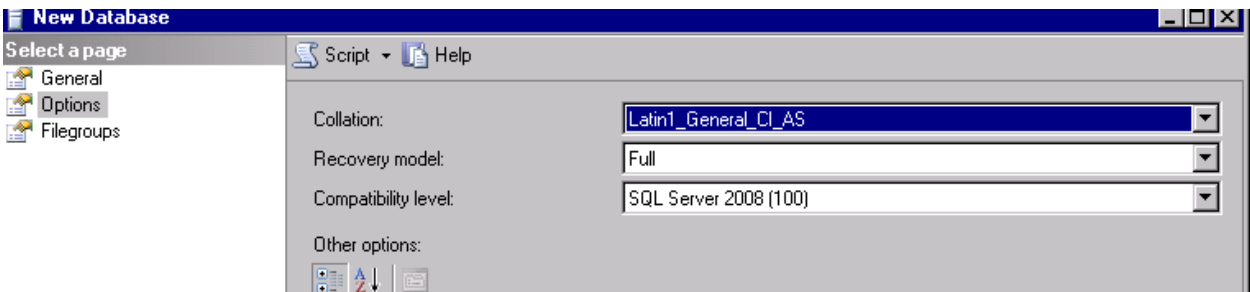
Accept the defaults on other tabs as seen in previous slides.

6.3.3 Create a database

Right click the Database folder and choose New Database. Give the database a name and assign the database an owner.

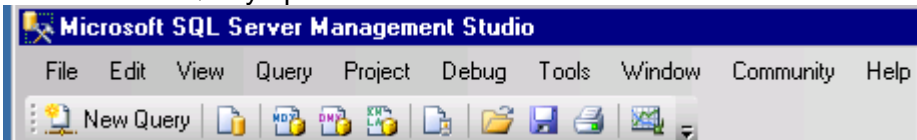


Assign Collation to be Latin1_General_CI_AS. Keep other settings as default.



6.3.4 Create tables / schema

Choose New Query option



Paste the schema / table details into the SQL query browser that appears with assumption that GENEOS is the database name

```
USE GENEOS;
```

```
IF OBJECT_ID (N'version_table', N'U') IS NOT NULL
    DROP TABLE version_table;
IF OBJECT_ID (N'node_ref_table', N'U') IS NOT NULL
    DROP TABLE node_ref_table;
IF OBJECT_ID (N'var_ref_table', N'U') IS NOT NULL
    DROP TABLE var_ref_table;
IF OBJECT_ID (N'event_table', N'U') IS NOT NULL
    DROP TABLE event_table;
IF OBJECT_ID (N'attribute_table', N'U') IS NOT NULL
```



```
DROP TABLE attribute_table;
IF OBJECT_ID (N'audit_table', N'U') IS NOT NULL
  DROP TABLE audit_table;
```

```
IF OBJECT_ID (N'os_table', N'U') IS NOT NULL
  DROP TABLE os_table;
IF OBJECT_ID (N'net_table', N'U') IS NOT NULL
  DROP TABLE net_table;
IF OBJECT_ID (N'processes_table', N'U') IS NOT NULL
  DROP TABLE processes_table;
IF OBJECT_ID (N'text_table', N'U') IS NOT NULL
  DROP TABLE text_table;
GO
```

```
-----
-- Table structure for table version_table
-----
```

```
CREATE TABLE version_table (
  major int default NULL,
  minor int default NULL
);
GO
INSERT INTO version_table (major, minor) VALUES (1, 2);
GO
```

```
-----
-- Table structure for table node_ref_table
-----
```

```
CREATE TABLE [node_ref_table] (ref numeric(10,0) identity, gateway varchar(50),node
varchar(50));
GO
CREATE UNIQUE CLUSTERED INDEX node_ref_index ON node_ref_table (node,gateway);
GO
```

```
-----
-- Table structure for table var_ref_table
-----
```

```
CREATE TABLE var_ref_table (ref numeric(10,0) identity, varname varchar(200), tablename
varchar(50))
GO
CREATE UNIQUE CLUSTERED INDEX var_ref_index ON var_ref_table (varname)
GO
```

```
-----
-- Table structure for table event_table
-----
```

```
CREATE TABLE event_table (ref numeric(10,0) identity, timestamp int not null, node_ref int not
null, varname varchar(200) not null, severity int not null ,description varchar(250))
GO
CREATE UNIQUE CLUSTERED INDEX ref_index ON event_table (ref)
GO
CREATE      NONCLUSTERED      INDEX      event_index      on      event_table
(timestamp,node_ref,varname,severity)
```



GO

-- Table structure for table audit_table

```
CREATE TABLE audit_table(timestamp int not null,username varchar(50),workstation
varchar(50),module varchar(50),managedEntity varchar(50),description varchar(250),node_ref
int default 0 not null)
GO
```

-- Table structure for table attribute_table

```
CREATE TABLE attribute_table (node_ref INTEGER NOT NULL, name varchar(255) NOT
NULL, value varchar(255) NOT NULL, PRIMARY KEY (node_ref, name))
GO
CREATE NONCLUSTERED INDEX attribute_index on attribute_table (name,value)
GO
```

-- Table structure for table os_table

```
CREATE TABLE os_table (timestamp int not null,node_ref int not null,var_ref int not null,value
real)
GO
CREATE INDEX os_index on os_table (node_ref,var_ref,timestamp)
GO
```

-- Table structure for table net_table

```
CREATE TABLE net_table (timestamp int not null,node_ref int not null,var_ref int not null,value
real)
GO
CREATE INDEX net_index on net_table (node_ref,var_ref,timestamp)
GO
```

-- Table structure for table processes_table

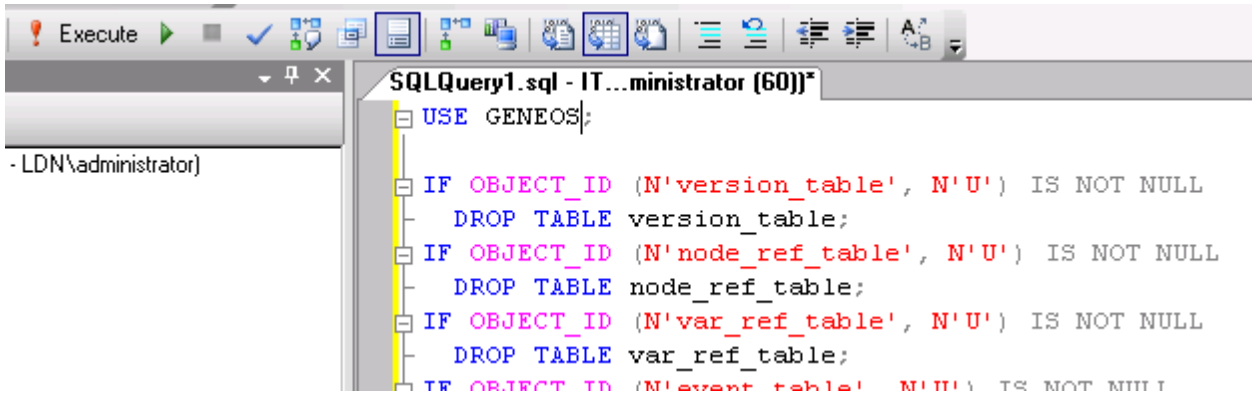
```
CREATE TABLE processes_table (timestamp int not null,node_ref int not null,var_ref int not
null,value real)
GO
CREATE INDEX processes_index on processes_table (node_ref,var_ref,timestamp)
GO
```

-- Table structure for table text_table

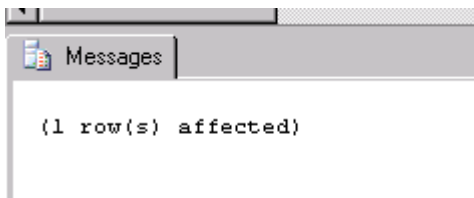
```
CREATE TABLE text_table (timestamp int not null,node_ref int not null,var_ref int not null,value
varchar(250))
GO
CREATE INDEX text_index on text_table (node_ref,var_ref,timestamp)
```

GO

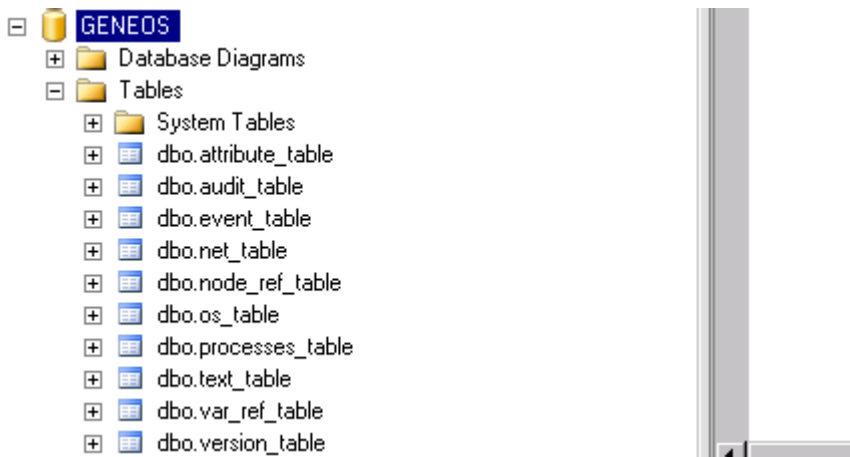
Click on Execute



A message will appear confirming this has been done



Right click the GENEOS database and choose Refresh and tables are now listed



7 Other

7.1.1 Renaming Gateways and the database

If the name of a gateway is changed, when the gateway is restarted it will fail to find the existing entries in the `node_ref_table` as these are linked to the old gateway name and as a result will create an entirely new set of `node_refs`. As a result whilst the historical information held in the database still exists it will not be available via the ActiveConsole and is effectively lost.

In order to avoid this, if changing the gateway name, the following procedure should be followed:-

1. Stop the gateway
2. Edit the `gateway.setup.xml` and change the gateway name

```
<gatewayName>old_gateway_name</gatewayName>
```

to

```
<gatewayName>new_gateway_name</gatewayName>
```

3. Change the gateway name in the `node_ref_table`

```
update node_ref_table
set gateway = "new_gateway_name"
where gateway = "old_gateway_name"
```

4. Restart the gateway

7.1.2 Renaming Managed Entities and the database

The name of a Managed Entity is stored in the `node_ref_table` as the `node`, a unique `node_ref` (number) is then assigned to this `node` and gateway combination. In other database tables the Managed Entity or `node` is referred to by this `node_ref`.

If the Managed Entity name is changed the gateway will not find the name of the managed entity in the `node_ref_table` and will automatically create a new row for the `node` / gateway combination and allocate it a new `node_ref` and will then store new information relating to the Managed Entity under the new `node_ref`. As a result the historic information held with-in the database for that Managed Entity will not be available via the ActiveConsole and is effectively lost.

In order to avoid this, if changing the name of a managed entity, it is necessary to perform the following procedure:

1. Stop the gateway
2. Rename the netprobe in the `gateway.setup.xml`



3. Change the node name in the node_ref_table

```
update node_ref_table
set node = "new_node_name"
where node = "old node name" and
gateway = "gateway_name"
```

4. Restart the gateway