

ENTERPRISE 6.2
Training Guide

AIRCOM OPTIMA
Administrator
E103



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SECTION 1

1 Introduction to the AIRCOM OPTIMA Administrator Training Course

This Training Guide provides notes and supporting material for the AIRCOM OPTIMA Administration Course.

The purpose of this course is to provide AIRCOM OPTIMA Administrators with the skills required to understand AIRCOM OPTIMA's frontend and backend as well as the operation of the Administration module within AIRCOM OPTIMA.

However, this course does not cover the configuration and administration of AIRCOM OPTIMA's backend components such as the FTP program, parsers and loaders or altering the AIRCOM OPTIMA database.

1.1 Scope and Course Objectives

The AIRCOM OPTIMA Administration course is designed for engineers who will administer and manage the AIRCOM OPTIMA software tool after the installation.

Delegates should ideally have:

- A good understanding of Oracle database creation and administration procedures
- Previously attended the AIRCOM OPTIMA Tool User course

At the end of the course, delegates will be able to:

- Understand the architecture of AIRCOM OPTIMA
- Describe the ETL (Extraction, Transformation and Loading) process
- Run programs

- Use the ETL components
 - Data acquisition tools
 - Parser
 - Combiner
 - Validator
 - Loader
- Use the ETL supporting components:
 - Process Monitor
 - Opxlog
 - Directory maintenance
- Use the database components:
 - OSS maintenance
 - Summary
 - Data quality
 - Scheduling programs
 - Managing resources
- Use the application components
 - Report scheduler
 - Alarms module
- Perform a number of application administration tasks:
 - Administer users and groups
 - Administer alarms
 - Configure the application database
 - Administer the data dictionary
 - Define holiday days
 - Set administrator options
- Describe the new features in AIRCOM OPTIMA 6.2 that benefit administrators

2 System Overview

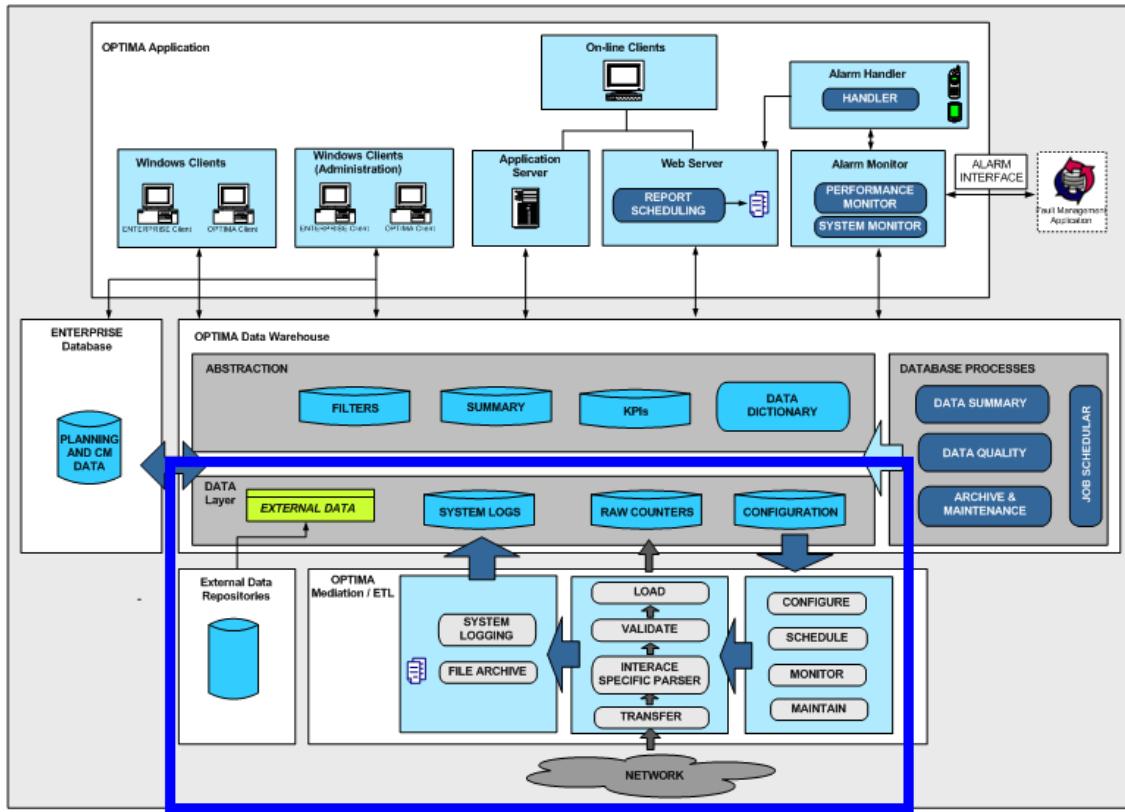
2.1 Objectives of this Session

During this session you will learn about:

- System components
- The ETL process
- Program IDs
- File locations and naming
- Running programs
- Common functionality

2.2 Architecture Overview

This picture shows an overview of the entire AIRCOM OPTIMA architecture:



AIRCOM OPTIMA architecture

These notes will refer to different sections of this architecture as they move through the system components.

2.3 System Components

The following table summarises all the components provided as part of the data loading architecture. For detailed configuration options for each component, see the following chapters.

Component	Description	Program Type	Executable Name
FTP	Transfers files from external server to the AIRCOM OPTIMA backend server. Has the ability to only transfer new files using existing listfile algorithm.	External	opx_FTP_GEN
Parser	Converts proprietary files format to a common CSV format.	External	opx_PAR
File Combiner	Merges the CSV files output by certain parsers into new combined CSV files.	External	opx_CMB_GEN
SNMP Agent	SNMP interface to the AIRCOM OPTIMA database.	External	opx_ALM_GEN

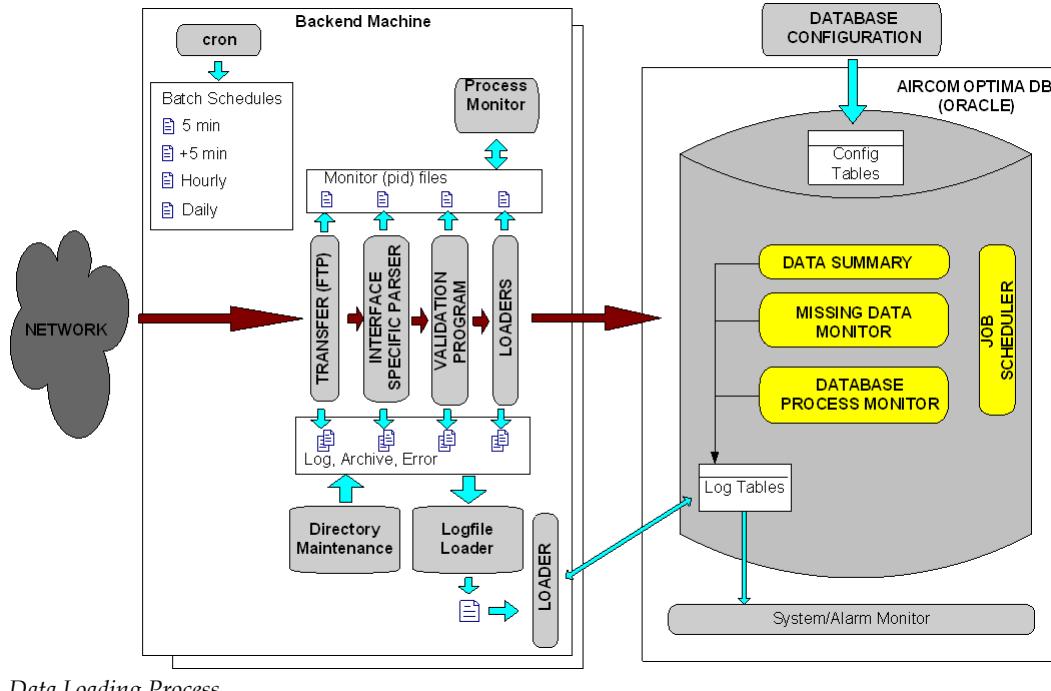
Component	Description	Program Type	Executable Name
SNMP Poller	Collects information from SNMP Agents.	External	opx_DAP_GEN_301
Loader	Loads CSV file into an AIRCOM OPTIMA table via an external table.	External and Database	opx_LOD_GEN
AIRCOM OPTIMA Summary	Summarises data within the AIRCOM OPTIMA database.	Database	AIRCOM_OPTIMA_Console
Data Quality	Reports on the quality of data, for example, data that is incomplete or missing.	Database	opx_DAQ_WIN
Directory Maintenance	Maintains a maximum number of most recent files in a specified set of directories.	External	opx_MNT_GEN
Process Monitor	Removes hung or crashed processes.	External	opx_MON_GEN
Job Scheduler	Schedules Oracle processes.	Database	OptimaJobScheduler
Logfile Utility	Utility for transferring the latest log information to an external Oracle table.	External	opxLog
Data Validation and Rules Engine	Splits CSV files into subfiles containing a subset of columns. Can also be used to re-order or check the columns in the CSV file.	External	opx_DVL_GEN
Data Acquisition	Transfers the data in one database to another database directly. Queries the database containing this data and stores the result to a CSV file.	External	opx_DAP_GEN_333
Report Scheduler	Configures the AIRCOM OPTIMA Scheduling System	External	OptimaReportScheduler
Alarms Notifier	Polls the database for recently raised alarms and sends alarm notifications via email or SMS.	External	AlarmNotifier



Database programs are run in Oracle. External programs are run external to the Oracle database in UNIX on the server. The executable name may be suffixed with additional identifiers for a particular installation. For example a Nortel Parser may be renamed opx_PAR_NOR_711.

2.4 The Data Loading Process

This diagram shows the data loading process:



Data Loading Process

This table describes the data loading process:

Component	Process
Network	Performance Management (PM) files are created in the network.
Cron/batch files	Schedule/combine program schedules.
FTP	Sends the PM files to the backend machine or server.
Parser	Converts the PM files into one or more CSV files.
Data Validation	Checks the column order of the CSV files and splits large files to match the database table structure.
Loader	Transfers the CSV files into the database.
Monitor (PID) files	Ensure that new instances of a program are not started if the previous instance is still running.
Process Monitor	Removes failed programs.
LogFile Utility	Combines log messages from all logs into a common file for analysis or loading into the database.
Directory Maintenance	Removes or archive old files from specified directories.

Once data has been loaded then there are a number of Database-based programs that are used to further analyse or manipulate the data:

Component	Process
AIRCOM OPTIMA Summary	Runs all summary processes, for example Busy Hour analysis or daily summaries. This program can also be used to load data from external Oracle databases. Summaries are organised as reports and individual reports (or groups of reports) and are scheduled by Oracle jobs using the Job Scheduler.
Data Quality	Used for Data Quality reports.
Configuration utility	Used to define configuration settings for database programs, these settings are stored in the database.
Alarms	Monitoring and alerting. Alarm monitoring can be configured based on missing data tables or any of the system logs to alert administrators by SMS and/or e-mail to any problems with any of the data loading programs.

2.5 About Program IDs

All AIRCOM OPTIMA components are given a unique identifier, known as a PRID, which is used to identify all processes involved with the backend. The PRID is used extensively in configuration, error logging and process monitoring.

The PRID is a nine character element that looks like this:

aaabbccccc

It is made up of three sub fields as described in this table:

Field	Subcomponent	Description	Values
aaa	Interface ID	Unique identifier for the interface (Nokia, Ericsson, Siemens and so on).	000 – 999 Allocated at design.
bbb	Program ID	Unique identifier for a type of backend program.	000 – 999 Allocated at design.
ccc	Instance ID	Unique identifier for an instance of a type of program on a machine. For example, if there are a number of loader programs running (each for a different type of CSV file) then each will be allocated a unique Instance ID.	000 – ZZZ Allocated on installation.

For example 000110001 is the first instance of a program of type 110 (a loader) running on interface 001.

 Unlike the Interface ID and Program ID, which are just numeric, the Instance ID is alphanumeric (using uppercase). This enables it to support more than 999 instances in the particular backend application - for example, more than 999 summaries in the Summary application.

The Instance ID is calculated by the package 'AIRCOM.OPTIMA_PACKAGE', which generates the Instance IDs in the following order - 000, 001, ..., 009, 00A, 00B, ..., 00Z, 010, 011, ..., 019, 01A, ..., 01Z, ..., 09Z, 0A0, .., 0ZZ, 100, ..., ZZZ .

If you are upgrading from a version older than 6.2, any existing Instance IDs will not be updated but any new Instance IDs will be calculated by using the next available alphanumeric ID.

 It is critical for the correct operation of the backend that all processes have a unique PRID allocated.

The PRID is set by one of the following methods:

- Assigned by the AIRCOM OPTIMA Installation Tool when adding an interface
- Configured manually in an INI file
- Assigned by a backend GUI when adding a report (Loader/Summary)

For external programs, the PRID will be read from the associated configuration file.

The database contains a table (INSTANCES) that provides a master list of PRIDs for all installed elements. If any new components are configured, record the PRID in this table.

 This table is automatically populated when adding interfaces using the AIRCOM OPTIMA Installation Tool or adding a report in the Loader/Summary GUI.

2.6 About File Locations and Naming

The exact file structure for a given installation is provided in the AIRCOM OPTIMA Implementation Plan. However, the following table summarises the default file locations and naming for the data loading architecture:

File Type	Name	Location	Comments
Executables and process scripts	opx_<exename>	\$AIRCOM OPTIMA/bin	All binaries and scripts start with opx for easy identification.
Scheduling scripts	opx<scriptname>.sh	\$AIRCOM OPTIMA /bin	Wrappers script for all backend processes which can be used to start the system.
Configuration	<exename>_<PRID>.ini	\$AIRCOM OPTIMA/ftp \$AIRCOM OPTIMA/parsers/<interface> \$AIRCOM OPTIMA/validate/<interface> \$AIRCOM OPTIMA/loaders/<interface>	Each backend program which has a configuration file.
Logs	<hostname>_<exename>_<PRID>_<date>.log	\$AIRCOM OPTIMA/log	A log file is generated for each backend process. By default, this happens on a daily basis but can be set to run on another time period. For more information, see Configuring the Process Monitor on page 148.
Monitor	<hostname>_<exename>_<PRID>.pid	\$AIRCOM OPTIMA/pids	Each backend process generates a PID file which is monitored by the Process Monitor.

File Type	Name	Location	Comments
Backup	Same as input file	\$AIRCOM OPTIMA/ftp/backup/backup \$AIRCOM OPTIMA/parsers/<interface>/back up \$AIRCOM OPTIMA/validate/<interface>/back up \$AIRCOM OPTIMA/loaders/<interface>/back up	All input files into the FTP, parser and validate and loaders can be optionally backed up in the backup directory.
Error	As input file	\$AIRCOM OPTIMA/ftp/backup/error \$AIRCOM OPTIMA/parsers/<interface>/error \$AIRCOM OPTIMA/validate/<interface>/error \$AIRCOM OPTIMA/loaders/<interface>/error	All input files into the FTP, parser and validate and loaders processes which fail to be processed are stored in the error directory.
Input	Input file name format unique to particular interface	\$AIRCOM OPTIMA/parsers/<interface>/in \$AIRCOM OPTIMA/validate/<interface>/in \$AIRCOM OPTIMA/loaders/<interface>/in	All input files into the parser, validate and loaders processes are placed in the input directory.
Output	Program specific	\$AIRCOM OPTIMA/parsers/<interface>/out \$AIRCOM OPTIMA/validate/<interface>/out	If multiple files are output these should be place in the output sub- directories.
Temporary	<hostname>_<exename>_<PRIDn>.tmp	\$AIRCOM OPTIMA/ftp/backup/tmp \$AIRCOM OPTIMA/parsers/<interface>/tmp \$AIRCOM OPTIMA/validate/<interface>/tmp \$AIRCOM OPTIMA/loaders/<interface>/tmp	Lock files and intermediate files stored locally are placed in the temporary directory.

 As the backend uses chained processes, the directories specified in the table above need not be physical directories but symbolic links to the previous or next directory in the data flow chain.

2.7 Running Programs

All AIRCOM OPTIMA processes are configured and scheduled in a similar way.

This section includes the following:

- Configuring programs
- Scheduling programs
- About log files
- About versioning
- The monitoring process
- Starting and stopping the data loading process
- Checking log files

2.7.1 Configuring Programs

All external AIRCOM OPTIMA programs read their configuration settings on program startup from a local configuration (INI) file. Database programs read their configuration from configuration tables in the database.

For external programs, the configuration file will be named using this convention, `ProgramName_PRID.ini`.

The configuration file is specified in the command line of the program being run. This is usually in the crontab entry or batch script. For example,
`opx_PAR_NOR_711_001711001.ini`.

Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor.

2.7.2 Scheduling Programs

All AIRCOM OPTIMA external programs are run in scheduled mode using the Unix scheduler, cron tab. For example, a parser may be scheduled to run on a periodic basis of every five minutes, in which case, every five minutes the parser will:

- Be started by cron tab
- Process any input files that are available at that instance
- Exit

If a program instance does not complete before the next time it is scheduled, then multiple instances of that program will occur. This is avoided by the use of a monitor file.

Before a program starts an instance, it checks if an associated monitor file exists. If one does exist, then this indicates that an instance is already running and so the program immediately exits. If a monitor file does not exist, the program starts and creates a monitor file. This file is uniquely associated to the program instance using the PRID and the `hostname` environment variable in a common directory (the default is `$OPTIMA/PIDS`). When the program has run, it removes the monitor file.

The Process Monitor ensures that monitor files are removed if programs crash or hang.

Multiple programs may be scheduled from a single cron entry by using a batch file. The programs may be scheduled to run sequentially or concurrently, the latter achieved by running the program in background mode (&) in the batch file.

2.7.3 About Log Files

All programs write messages to a log file or table (for database programs) in a standard format, which is described in the following table:

Field	Description	Format
Host Name	The name of the machine on which the program/database resides.	Text (256 characters).
PRID	Program ID	nnnnnnnn
Date	Data of message.	YYYY-MM-DD
Time	Time of message.	HH:MM:SS
Severity	Severity classification.	Allocated at design time.
Message Type	Unique identifier within the program for this particular type of message.	Integer Allocated at design time.
Message Text	Explanation of the message.	Text (256 characters)

The severity levels are defined as follows:

Severity	Severity Level	When Used
Debug	1	Debugging message. Only generated for tracing within a program.
Information	2	For status messages, for example parsed file successfully.
Warning	3	For error condition where there is the potential for a service affecting fault.
Minor	4	For error condition where there is the potential for a service affecting fault and corrective action is required.
Major	5	For error condition where there is a service affecting fault and urgent corrective action is required.
Critical	6	For error condition where there is a major service affecting fault and immediate corrective action is required.

You can assign the level of severity message that is logged for each program individually. For example, if a particular parser is assigned a Severity Level 3 (Warning) this would mean that only messages of severity Warning or above would be logged.

For external programs, messages are recorded in a separate log file for each program instance. The files have the following characteristics:

- All log files are stored in a common directory (\$AIRCOM OPTIMA/log).
- A new log file is created. By default, this happens on a daily basis but can be set to run on another time period. For more information, see Configuring the Process Monitor on page 148.
- The filename of the log file identifies the program, for example, <hostname>_<exename>_PRID_<date>.log.

Log files may be archived using the Directory Maintenance program. For example, using this program it will be possible to maintain a directory with only today's log files.

A log file utility is provided to allow the quick analysis of log messages and also filter messages for loading into the database.

2.7.4 About Versioning

All backend programs have a unique program ID and a descriptive code and version. The descriptive code and version should be used when reporting bugs and problems to AIRCOM International support. This is an example of the format:

```
ETL Loader program code LOD-GEN-010-GEN-110, release Version 6.2
```

You can either obtain the version details of the currently installed program from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
programname -v
```

In Unix:

```
programname -v
```

2.7.5 The Monitoring Process

All external backend processes are monitored to ensure that they have not crashed, runaway or hung. The Process Monitor uses the monitor files to check the health of programs.

Monitor files:

- Are created by all programs when each program starts running.
- Uniquely identify the AIRCOM OPTIMA program instance via the PRID contained in its filename, and the hostname environment variable (that identifies on which machine it is running). The program will also write the process identifier (PID) in the file.
- Provide a heartbeat function, which is created when the backend program regularly updates the timestamp of the monitor file using a touch function. For example, a parser will *touch* the file after parsing each file in the input directory.

The Process Monitor regularly scans all monitor files in the monitor directory to check:

- The PID in each file is still in the current OS process list. If it is not in the list, the associated program has crashed and so the Process Monitor will remove the monitor file.
- The timestamp of the monitor file is not too old according to the user-specified grace period. If the grace period has expired then the associated process is stopped from the current OS process list. For example, a parser may have a three hour grace period. If the parser monitor file has not been touched in the last three hours then the process is stopped and the monitor file is removed.



As all processes are scheduled, the parser will start again at the next schedule period.

For more information, see the AIRCOM OPTIMA Operations and Maintenance Guide.



The functionality to read the `hostname` environment variable rather than the `MachineID` in the `PRID` has been added in 6.2, and is not backwards compatible. Therefore if you have a 6.2 version of the Process Monitor, you must ensure that all of the applications that you are monitoring have been upgraded to version 6.2 as well. However, if you are still using a pre-6.2 version of the Process Monitor, you do not have to (but can) upgrade the backend applications that you are monitoring to 6.2.

2.7.6 Starting and Stopping the Data Loading Process

To start the backend data loading process on a workstation, manually run this command:

```
$OPTDIR/bin/opxstart.sh opxstartsystem.sh
```

This table describes the function of each part of the command:

Command	Function
<code>opxstart.sh</code>	Ensures the backend process is run with the correct environment.
<code>\$OPTDIR</code> (Environment Variable)	Sets the root location of the directory tree, that is the location under which <code>./bin</code> , <code>./etc</code> , <code>./parsers</code> , <code>./loaders</code> , <code>./validate</code> , and so on can be found.
<code>opxstartsystem.sh</code>	Places all of the backend job entries into the cron configuration. Each process should then start at their next scheduled time. The cron entries are stored in <code>\$OPTDIR/etc/optima.crontab</code> .

To stop the backend process, manually run this command:

```
$OPTDIR/bin/opxstart.sh opxstopsystem.sh
```

The `opxstopsystem.sh` command removes the crontab configuration and stops all backend processes based on a pattern match for filenames beginning with the string `opx`.



During initial configuration, the environment as setup by `opxstart.sh`, should be automatically configured for the AIRCOM OPTIMA user in the profile.

2.7.7 Checking Log Files

2.7.7.1 External Programs

Status messages for all external programs are located in a common directory. A new log file is created every day. You can choose the information level required in the log file by selecting a severity level. The available levels are: Debug, Information, Warning, Minor, Major and Critical. This restricts low level severity logging in required cases.

The Log file Utility combines log messages from all logs into a common file for analysis or loading into the database.

Log messages for external programs can be viewed by a number of different methods. The method used will depend on the specific issue that is being investigated.

Monitor a Particular Log File

In this case the specific log file associated with a program is identified and all messages displayed to a terminal using the UNIX *tail* command. For example the following command will cause the terminal screen to update with new messages as they are appended to the bottom of the log file:

```
tail -f <logfile name>
```

This is useful when monitoring, in real time, the operation of a particular program, for example a loader.

Using the utility opxlog

Use the utility *opxlog* to search all external program logs and retrieve particular messages for specific programs or time periods. This is useful when diagnosing programs across all external programs or searching for historical messages.

Using the Database Log Tables

During initial installation the system will be configured to load specific log messages from external programs into the database. In general, messages with severity Warning and above are loaded every hour into the following table:

```
AIRCOM International.COMMON_LOGS
```

Use the Data Explorer, standard reports and modules to display these messages. See the installation plan for details of the reports available.

2.7.7.2 Database Programs

All database programs log messages to Oracle tables. These are detailed for each program in the following chapters.

Use the Data Explorer, standard reports and modules to display these messages. See the installation plan for details of the reports available.

2.8 Common Functionality

All AIRCOM OPTIMA processes share some common functionality.

This section will include the following:

- Logging (Severity and Debug)
- Single shot or Continuous operation
- Heartbeat functionality
- PID Lock Mechanism

2.8.1 Logging

The log file for each application is stored in the directory defined in the configuration (INI) file for that application.

A new log file is created every day. The information level required in the log file is defined in the General Settings dialog box and will be one of the following:

- Debug
- Information
- Warning
- Minor
- Major
- Critical

These levels help the user to restrict low level severity logging if required. For example, if Minor is selected then only Minor, Major and Critical logging will occur.

 Utilities are provided for searching and filtering log messages and also for loading the messages into the database. For more information, see Checking Log Files on page 24.

2.8.2 Single Shot or Continuous Operation

Most of the AIRCOM OPTIMA backend applications can be run once (single shot) or continuously.

The RunContinuous parameter in the ini file controls this behaviour, and can be set to:

Value	Description
0	Have the application run once.
1	Have the application run continuously.

2.9 Session Summary Checklist

This checklist has been provided as a self-assessment of the objectives stated at the beginning of the session.

Please tick all objectives covered in this session.

- System components
- The ETL process
- Program IDs
- File locations and naming
- Running programs
- Common functionality



Additional Notes:

3 ETL Components

3.1 Objectives of this Session

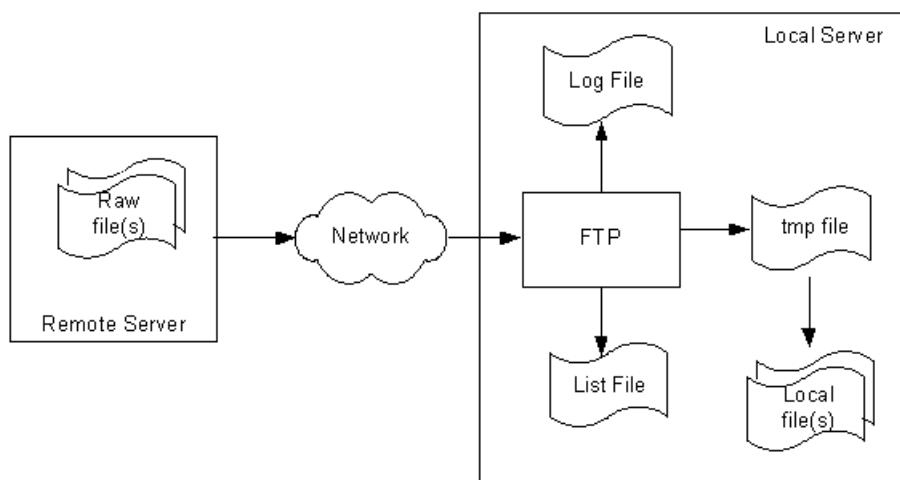
During this session you will learn about:

- Data Acquisition Tools
- Parser
- Combiner
- Validator (Splitter)
- Loader

3.2 About the FTP Application

The FTP application transfers data files from a remote server using File Transfer Protocol (FTP). The process is implemented as a Perl script and a number of scripts can be configured one for each remote server from which files are to be extracted.

This diagram shows the FTP process:



FTP Process

The FTP application regularly monitors a remote directory for new files. When new files are detected, they are transferred to the local machine. Transfer takes place using a local temporary file to ensure that the Parser does not start to parse the file before transfer is complete. Status and progress messages are recorded in a log file.

A local list file ensures that files are not transferred twice. The list file keeps a record of all files that exist on the remote server that have been downloaded. The list file is refreshed every time the application is run.

The script can be configured to only look for new files on the remote server for a given number of previous days. For example, if configured for three days then only directories for the latest three days are searched. This facility is based on all files on the remote server being located in a new directory each day.

The FTP application supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Error Files	If the application detects an error in the input file that prevents processing of that file, then the file is moved to an error directory and processing continues with the next file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.
Backup	The application can store a copy of each input file in a backup directory.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.2.1 About the FTP Modes

The FTP can be run in a number of different modes:

Mode	Description
FTP	The standard FTP application, which transfers data files from a remote server using File Transfer Protocol.
SFTP with SSH Key Authentication (Windows or UNIX)	<p>The FTP application in secured mode, using SSH Key Authentication.</p> <p>This mode uses passwordless key authentication, rather than the password parameter stored in the INI file, and so is particularly useful for systems where the security policy requires account passwords to be changed periodically.</p> <p> This method is strongly recommended, as it is faster and more reliable than the regular FTP method (described below).</p>
SFTP (UNIX only)	<p>The FTP application in secured mode, using password authentication.</p> <p>In this mode, you can also enable data compression during the SFTP transfer, which can reduce the volume of data transferred and the time required for the data transfer, provided that the SFTP server supports this option.</p> <p>Security authentication is based on the 'RemotePass' password parameter stored in the FTP Parameters section of the ini file.</p> <p> This method is supported in 6.2, but is not used by the AIRCOM OPTIMA backend as a default. It is strongly recommended that you use the SFTP with SSH Key Authentication method, as it is faster and more reliable.</p>

 If you want to use the FTP in either secured mode or secured mode with SSH Key Exchange Authentication, then you must install a number of additional modules. For more information, see:

- Installation Pre-requisites for Using the SFTP with SSH Key Exchange Authentication on page 32
- Installation Pre-requisites for Using the SFTP on page 30

3.2.2 Installing the FTP Application

The FTP application is a Perl script and requires Perl v5.8 or later to be installed on the local workstation.

To install the FTP application, install the following files in the backend binary directory:

- `opx_FTP_GEN_302.exe` (Windows)
- `opx_FTP_GEN_302` (Unix)

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

 For Windows, a Perl Interpreter must also be installed. AIRCOM International recommends using ActivePerl. You can read more about ActivePerl at this location:

<http://www.activestate.com/activeperl/>

To start the FTP, type the script name and a configuration file name into the command prompt. If you are creating a new configuration file, this is when you choose the file name.

In Windows type:

```
opx_FTP_GEN_302.exe opx_FTP_GEN_302.ini
```

In Unix type:

```
opx_FTP_GEN_302 opx_FTP_GEN_302.ini
```

In usual operation within the data loading process, all applications are scheduled. You should not need to start the FTP.

 If you want to use the FTP in either secured mode or secured mode with SSH Key Exchange Authentication, then you must install a number of additional modules. For more information, see:

- Installation Pre-requisites for Using the SFTP on page 30
- Installation Pre-requisites for Using the SFTP with SSH Key Exchange Authentication on page 32

3.2.2.1 Pre-requisites for Using the SFTP

If you want to use the FTP in secured mode (SFTP), then you must install the Net::SFTP CPAN module.

To do this for non-Windows operating systems:

 You cannot use this method with Windows operating systems. Instead, you must use SFTP with SSH Key Exchange Authentication on page 32. This method is strongly recommended for both Windows and non-Windows operating systems, as it is faster and more reliable.

1 Install the following components:

- Perl 5.8.x
- OpenSSL
- GMP 4.3.1

You can check if these are already installed, but this is done in different ways, depending on your OS. This table describes the options:

Check	OS	Command
If Perl has already been installed, and at which version	Sun Solaris	pkginfo grep -i perl perl -v
	HP-UX	swlist grep -i perl perl -v
	RedHat Linux	rpm -qa grep -i perl perl -v
If openssl and GMP have been installed	Sun Solaris	pkginfo grep -i gmp pkginfo grep -i openssl
	HP-UX	swlist grep -i gmp swlist grep -i openssl
	RedHat Linux	rpm -qa grep -i gmp rpm -qa grep -i openssl

- 2 If you are installing the Net::SFTP CPAN module on a server that has HTTP network access to the Internet, then run:

```
perl-MCPAN -e 'install Net::SFTP'
```

- or -

If you are installing the Net::SFTP CPAN module on a server that does not have HTTP network access to the Internet, then:

- Copy the SFTP CPAN library distribution (provided by AIRCOM) for your platform to the server where the AIRCOM OPTIMA FTP program will run. This consists of a gzip compressed TAR file containing all of the required perl modules.
- Decompress the file and extract it to the 'perl5' library directory on the server.
 Default locations are usually /usr/lib/perl5 or /usr/local/lib/perl5.

- 3 Follow the operating system-specific instructions that are included with the distribution.

If you also want to use SFTP compression, you must additionally install the following CPAN Perl modules:

- Compress::Zlib
- Compress::Raw::Bzip2
- Compress::Raw::Zlib
- Crypt::Blowfish
- Crypt::CBC
- Crypt::DES
- Crypt::DH

- Crypt::DSA
- Crypt::Primes
- Crypt::RSA
- Crypt::Random
- Digest::BubbleBabble
- Digest::HMAC
- Digest::MD2
- Digest::SHA
- IO::Compress
- IO::Zlib
- Net::SSH
- Net::SSH::Perl

3.2.2.2 Pre-requisites for Using the SFTP with SSH Key Exchange Authentication

To use the FTP in secured mode (SFTP) with SSH Key Authentication (which is the strongly recommended SFTP option), you must complete the following pre-requisites:

 If you are an AIRCOM installation engineer, all of these files are available on the intranet. Otherwise, please contact AIRCOM Product Support.

- 1 If your version of Perl is older or newer than '5.8.9 build 825':
 - Uninstall it from your machine
 - Install Active Perl using the 'ActivePerl-5.8.9.825-MSWin32-x86-288577.msi' file (leave everything as default)
- 2 Install OpenSSH using the 'setupssh.exe'. This is stored in 'setupssh381-20040709.zip'.
- 3 Reboot the machine if required, to ensure that the PATH and PERL5LIB environment variables are updated.
- 4 Check that the environment variables have been updated:
 - On the command prompt, type: `set p`.
 - The PATH environment variable needs to look something like:
`PATH=C:\Perl\site\bin;C:\Perl\bin;C:\Program Files\OpenSSH\bin;.....`
 - The PERL5LIB environment variable needs to look something like:
`PERL5LIB=C:\Perl\lib;C:\Perl\site\lib.`
 - To update the environment variables (for this session only), in the command prompt, type `set PATH=C:\Perl\site\bin;C:\Perl\bin;C:\Program Files\OpenSSH\bin;%PATH` and set
`PERL5LIB=C:\Perl\lib;C:\Perl\site\lib.`

 To ensure that the environment variables will always be available:

In Windows, select Start, Control Panel, System.

In the dialog box that appears, click the Advanced tab, and then click the Environment Variables.

In the System Variables pane, add or amend the PATH and the PERL5LIB environment variables.

To see the new/updated environment variables on the command prompt, you need to open a new one.

- 5 Check that the correct Perl version has been installed, by typing `perl -v` in the command prompt.
- 6 On the 'C:\' drive, browse to the Perl location, and delete the Perl folder and all of its contents.
- 7 Run the 'Perl_5.8.9.825_with_packages.exe' file, which will re-create and re-populate the original Perl folder on the C:\ drive with all necessary packages.
- 8 Open a command prompt and:
 - Change to the installation directory (the default is 'C:\Program Files\OpenSSH').
 - CD into the bin directory, in order to be in 'C:\Program Files\OpenSSH\bin', using the command `C:\>cd Program Files\OpenSSH\bin`.
 - Use `mkgroup` to create a group permissions file. For local groups, use the '`-l`' switch, and for domain groups (for example, the AIRCOMINT domain), use the '`-d`' switch:
`mkgroup -l >> ..\etc\group` OR `mkgroup -d >> ..\etc\group`
 - Use `mkpasswd` to add authorised users into the `passwd` file. For local users, use the '`-l`' switch. For domain users (for example, the AIRCOMINT domain), use the '`-d`' switch:
`mkpasswd -l [-u <username>] >> ..\etc\passwd` OR
`mkpasswd -d [-u <username>] >> ..\etc\passwd`



Notes :

- To add users from a domain that is not the primary domain of the machine, add the domain name after the user name.
 - Omitting the `username` switch adds ALL users from the machine or domain, including service accounts and the Guest account.
- 9 Still using the command prompt, create the SSH authentication private key:
 - Start the OpenSSH server, by typing: `net start opensshd`.
 - Create the private and public key by typing: `ssh-keygen -t rsa`.
 - When prompted to enter the file in which to save the key, type `id_rsa`.
 - When prompted to enter the passphrase, press <ENTER>.
 - When prompted to enter it again, press <ENTER>.

- The private key included in the 'id_rsa' file should be created in 'C:\Program Files\OpenSSH\bin'. Ensure that a copy also exists in 'C:\Documents and Settings\<user_name>\.ssh' as well.
 - If the '.ssh' folder does not exist and Windows does not allow you to create one manually, then you should:

Run ssh user@server_name or ssh user@IP_address.

When prompted to continue connecting, choose Yes. The .ssh folder created for you under 'C:\Documents and Settings\<user_name>\'.
 - Make a copy of the public key (file name id_rsa.pub), which should be in the same location as the private key/file (for example, 'C:\Program Files\OpenSSH\bin') as id_rsa.pub_username.
- FTP the 'id_rsa.pub_username' public key/file into the home/.ssh folder on the server where you will connect to download the files using the FTP application:
 - The .ssh folder on the server may need to have chmod 700 .ssh installed
 - Run `cat id_rsa.pub_DD_VM >> authorized_keys`
 - Check the IP Address and Host Name of your Windows machine, by typing `ipconfig /all` in the command prompt.
 - Log in as root on the server, to be able to add your IP address and host name in the /etc/hosts file.
 - Ensure that you can connect to the server machine by typing `ssh user@IP_address` in the command prompt.
-  If you have followed all of the steps, you should NOT get prompted for password. If you are, double check that you have got the private key/file in your home dir and the public key/file is in place in the server machine.

You can now run the FTP application in secure mode.

3.2.3 Configuring the FTP Application

The FTP is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. For more information about configuration (INI) file parameters, see Configuration (INI) File Parameters on page 37.

3.2.3.1 Using Commenting

The FTP configuration (INI) file supports the following types of commenting:

- Windows, using this symbol (;).
- UNIX, using this symbol (#).

Lines are parsed for the first occurrence of a comment symbol. Once a comment symbol is found, the rest of the line is ignored. Lines using the [Grouping] notation are also ignored but only if this symbol ([]) is found at the beginning of the line.

3.2.3.2 Using Environment Variables

The FTP configuration (INI) file supports the following methods of environment variable usage:

- Windows, using %ENV_VAR%
- UNIX, using \$ENV_VAR

To set an environment variable:

In Windows type:

```
SET ENV_VAR=xyz
```



Use echo %ENV_VAR% to check the settings.

In UNIX type:

```
ENV_VAR=xyz; export ENV_VAR
```



Use echo \$ENV_VAR to check the settings.



If you are batching the program, then the environment may not inherit the user environment. In this case, it is safer to reset environment variables before running the FTP application.

3.2.3.3 Using Regular Expressions

Regular expressions can be used in the FTP configuration (INI) file to define complex search criteria. For its regular expressions, the FTP configuration (INI) file uses the Perl engine. Perl is widely documented on the internet. For example, you can read more about Perl regular expressions at this location:

<http://search.cpan.org/dist/perl/pod/perlre.pod>

This table gives examples of some regular expressions that you might use in the FTP configuration (INI) file:

Regular Expression	Description
^	Match the beginning of a string. For example, the expression ^CSV will match CSV at the beginning of a string.
\$	Match the end of a string. For example, the expression CSV\$ will match CSV at the end of a string.
.	Match any character except newline. For example, the expression C.V will match a C followed by any single character (except newline) followed by a V.
*	Match 0 or more times. For example, the expression CS*V will match a C followed by zero or more S's followed by a V.
+	Match 1 or more times. For example, the expression CS+V will match a C followed by one or more S's followed by a V.
?	Match 1 or 0 times. For example, the expression CS?V will match a C followed by an optional S followed by a V.
	Alternation. For example, the expression C V will match either C or V.
()	Grouping. For example, the expression CSV(04 05) will match CSV04 and CSV05.
[]	Set of characters. For example, the expression [CSV] will match any one of C, S, and V.

Regular Expression	Description
{}	Repetition modifier. For example, the expression CS{2,4}V will match a C followed by 2, 3 or 4 S's followed by a V.
\	Quote (escape) the next character. For example, the expression C\V will match C.V exactly.

3.2.3.4 Using Multiple Virtual IP Addresses

The FTP application can connect to multiple virtual IP addresses that can be defined as a list of addresses in comma separate variables format. The remote directory should be the same for all hosts to connect to.

The FTP program connects to the IP addresses in the following way:

- 1 The application tries to connect to the first IP address in the list.
- 2 If it successfully connects, it starts downloading files and exits itself after finishing.

 If it does not connect to the first IP address, it tries the next IP address in the list and it logs a message for the failed connection. If all IP addresses fail to connect, then it logs a message to indicate this.

The FTP downloads from the first host with the following settings in the configuration (INI) file:

```
remoteHost = 192.168.3.253, 192.168.3.35, 192.168.3.37
remoteUser = optima,optima,optima
remotePass = optima,optima,optima
remoteDir = /export/home/optima
```

The FTP downloads from the second host if the first host is not valid with the following settings in the configuration (INI) file:

```
remoteHost = 192.168.3.39, 192.168.3.253, 192.168.3.35,
192.168.3.37
remoteUser = xxx,optima,optima,optima
remotePass = yyy,optima,optima,optima
remoteDir = /export/home/optima
```

3.2.3.5 Configuration (INI) File Parameters

AIRCOM International uses four logical groupings for the parameters in its FTP configuration (INI) files. The purpose of these groups is simply to assist you in finding associated configuration (INI) file settings. The following table describes the parameter groups:

This Group:	Contains the Parameters For:
Processing	Specifying how the FTP program will run. For example, it includes the parameters for setting when the FTP process should start and for how many days it should collect data. For more information, see Processing Parameters on page 37.
Directory	Specifying the directories that are used by the FTP program. For example, it includes the parameters for setting the directories for processing files and outputting logs. For more information, see Directory Parameters on page 39.
Filename	Matching FTP files and directories. For example, it includes the parameters for setting the file and directory masks and for prepending directory names to filenames. For more information, see Filename Parameters on page 39.
FTP	Specifying FTP connection details. For example, it includes the parameters for setting the location and login details of the remote host. For more information, see FTP Parameters on page 41.

Processing Parameters

The following table describes the Processing parameters for the FTP script:

Parameter	Description	Default	Required?
SFTP	0 - Use simple FTP. 1 - Use secured FTP. 2 - Use secured FTP with SSH Key Exchange Authentication.  Before you can use either of the secured FTP options, you must ensure that you follow the pre-requisites. For more information, see Installing the FTP Application on page 29.	2	Yes, in all INI files.
SFTPcompression	Used if you are using secured FTP 1 - Enable compression during SFTP file transfers, minimising the volume of data transferred, and time required for the data transfer.  For this option to function correctly, the SFTP server from where the data is received from must also support the compression option. If this option is not already enabled, this can be achieved by setting the "Compression yes" option in the /etc/ssh/sshd_config file on the SFTP server, and restarting the sshd daemon. 0 - Do not compress ASCII files.	1	Yes, if you are using SFTP
PRID	Program ID for the particular instance of the script. For more information, see About Program IDs on page 17.	-	Yes, in all INI files.
verbose	0 - Run silently. 1 - Print status messages to the screen.	0	No.

Parameter	Description	Default	Required?
logseverity	Sets the level of error reporting. The available options are: 1 - Debug level and above. 2 - Information level and above. 3 - Warning and above. 4 - Minor and above. 5 - Major and above. 6 - Critical only.	2	No.
backup	0 - Do not store backup copies of input files. 1 - Store backup copy of each input file in the backup directory.	1	No.
useMonitorFile	0 - Script does not use a monitor file. 1 - Script uses a monitor file.	1	No.
startOnDay	Number of days back from today to start searching for files to download.	0	No.
numberOfDays	Number of days counting back from startOnDay to search for new files on the remote host.	-	Yes, in all INI files.
unzipCommand	The executable file and its path, to use to unzip downloaded files. For example: unzipCommand=C:\Programs\gunzip.exe  Notes : <ul style="list-style-type: none">Only set this parameter if files are to be unzipped.Include all arguments.		No.
zipExtension	File extension of zipped files, for example, .zip.		Yes, if unzipCommand is configured.
untarCommand	The executable file and its path, to use to untar downloaded files. For example: untarCommand=C:\Programs\gtar.exe		No.
tarExtension	File extension of tarred files, for example, .gtar.		Yes, if untarCommand is configured.
datedDir	0 - Directories are not dated. However, files can be dated if dateFormat is not set to 0. n - The directory n levels down from remoteDir is a dated directory of format dateFormat.	-	Yes, in all INI files.
dateFormat	Date format to use for datedDir, in the format YearMonthDay, where the available options are: Year: YYYY or YY Month: MM or MTH{n}, where n is the number of characters and can be 2 or 3. For example, May would be MY using MTH2, MAY using MTH3, and May using Mth3. Day: DD		Yes, in all INI files.
noFilesInList	The number of downloaded files that will be maintained in a list file if datedDir and dateFormat are both set to 0. For example, if noFilesInList=1000, then 1000 files will be maintained in the list file.		Yes, if datedDir=dateFormat=0.

Directory Parameters

The following table describes the Directory parameters for the FTP script:

Parameter	Description	Default	Required?
optimaBase	Root path to the backend file system.	\$OPTIMA	Yes, in all INI files.
LogDirectory	Location of log directory.	\$OPTIMA/log	No.
ProcDirectory	Location of monitor (PID) file directory.	\$OPTIMA/prid	No.
FTPOutDirectory	Location of the output directory.  You can specify multiple output directories by listing directories separated by commas. With multiple directories, files are rotated between each directory when they are downloaded.	\$OPTIMA/ftp/\$PRID/in	No.
FTPDownloadDir	Location of the download directory.	\$OPTIMA/ftp/\$PRID/tmp	No.
FTPErrorDir	Location of the error directory.	\$OPTIMA/ftp/\$PRID/error	No.
FTPFileListDir	Location of the file list directory.	\$OPTIMA/ftp/\$PRID/list	No.
FTPBackupDir	Location of the backup directory.	\$OPTIMA/ftp/\$PRID/error	No.

Filename Parameters

The following table describes the Filename parameters for the FTP script:

Parameter	Description	Default	Required?
fileMask	Regular expression mask used for files.		Yes, in all INI files.
excludeMask	Regular expression mask used to exclude files.	^\$	No.
dirMask	Regular expression mask used for directories.  Use ^\$ to prevent directory recursion.		Yes, in all INI files.
MAXFileSize	0 - Download all files. n - Download files that are smaller than n bytes.	0	No.
ReplaceColonWith	Replace this symbol (:) in filename with value.  Spaces are always removed from filenames.	:	No.
PrependSeparator	Separate filename from prepend strings.	:	No.
PrependSubDir	Set depth from remoteDir to use directory name to prepend to filename after download.  You can prepend multiple directories to the file by specifying comma-separated values.		No.

Parameter	Description	Default	Required?
PrependSubStr	Regular expression to use a matched path of the directory name to prepend.  You must set PrependSubDir to use this option.		No.
PrependString	Prepend fixed string to filename.		No.
PrependTimestamp	0 - Do not prepend the creation timestamp. 1 - Prepend the creation timestamp of a file to its filename, in Unix True Constant format. Use this option when files are overwritten using the same filename.	0	No.
PrependHostname	0 - Do not prepend the remote hostname/IP address at the front of the filename. 1 - Prepend the remote hostname/IP address at the front of the filename.	0	No.
removeZipExtBeforeMatch	Remove zipExtension before checking if files need to be downloaded. This parameter also handles archived files on remoteHost.		No.
AppendSeparator	Separate filename from append strings.	:	No.
AppendSubDir	Set depth from remoteDir to use directory name to append to filename after download.  You can append multiple directories to the file by specifying comma-separated values.		No.
AppendString	Append fixed string to filename.		No.
AppendSubStr	Regular expression to use a matched path of the directory name to append.  You must set AppendSubDir to use this option.		No.
AppendBefore	This parameter works in combination with the other Append parameters. For example, if you set AppendBefore=.txt AppendSubDir=1 AppendSeparator=_ remote path = 20050503/1300/a filename of the file to be downloaded = <file_name>.txt, then the FTP produces the following output: <file_name>_20050503.txt.		No.
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0).	0	No
FolderFileLimit	The maximum number of output files that can be created in each output (sub) folder. There is a limit of 100,000 on Windows and 500,000 on Sun/UNIX.  Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.	10,000	No.
minimumFolderFileLimit	The minimum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be less than this, the application will not run. This is set as a read-only value.	100	Yes

Parameter	Description	Default	Required?
maximumFolderFileLimit	The maximum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be more than this, the application will not run. This is set as a read-only value.	100,000	Yes

FTP Parameters

The following table describes the FTP parameters for the FTP script:

Parameter	Description	Default	Required?
remoteHost	Remote hostname (or IP address) from which to download files.		Yes, in all INI files.
remoteUser	Username for login to the remote host.		Yes, in all INI files.
remotePass	Password for login to the remote host.		Yes, in all INI files.
remoteDir	Parent directory on remote host from which to download files. {dir1}[,{dir2}]  You can specify multiple remote directories by listing directories separated by commas.		Yes, in all INI files.
remoteArchiveDir	Archive directory (flat structure) on remoteHost to which files, when downloaded, are moved using the same final filename as used by AIRCOM OPTIMA.		No.
removeOnDownload	0 - Files are not deleted from remoteHost. 1 - Files are deleted from remoteHost when downloading is complete	0	Yes, in all INI files.
FTPStyle	The style of FTP: <ul style="list-style-type: none">• stdUNIX• stdWINDOWS- or -• DIR,X,X,X,SIZE,DATE,TIME,NAME,DATE,TIME,SIZEO RDIR,NAME		Yes, in all INI files.
FTPType	The mode of FTP: <ul style="list-style-type: none">• ASCII- or -• BINARY	ASCII	Yes, in all INI files.
FTPActive	Indicates whether the FTP is in passive mode (0) or active mode (1). In passive mode, the client initiates both connections to the server, solving the problem of firewalls filtering the incoming data port connection to the client from the server. In active mode, the client connects from a random unprivileged port ($N > 1023$) to the FTP server's command port, port 21. Then, the client starts listening to port $N+1$ and sends the FTP command PORT $N+1$ to the FTP server. The server will then connect back to the client's specified data port from its local data port, which is port 20.	0	No.
FTPTimeOffset	Time difference, in hours, between the local host and the remote host.		No.

Parameter	Description	Default	Required?
FTPSafetyPeriod	Safety period, in minutes, for files still being written to local machine.		No.
FTPDateFormat	The FTP date format.		Yes, if FTPSafetyPeriod or PrependTimestamp, and standard FTPStyle are not used.
FTPTimeFormat	The FTP time format.		Yes, if FTPSafetyPeriod or PrependTimestamp, and standard FTPStyle are not used.
FTPDirMatch	<ul style="list-style-type: none"> • drwx for Unix • <DIR> for Windows 	drwx	Yes, if remoteHost is a Windows server.

3.2.4 Maintenance of the FTP Application

In usual operation, the FTP application should not need any special maintenance. During installation, the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However, AIRCOM International recommends the following basic maintenance checks are carried out for the FTP application:

Check The	When	Why
Backup directory to ensure files have been transferred	Weekly	Files not transferring indicates a problem with the application.
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

3.2.4.1 Checking for Error Files

Files categorised as error files by the FTP application are stored in the directory as defined in the configuration (INI) file.

The log file is expected to have information related to any error files found in the particular directory. For more information about the log file, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.2.4.2 Stopping the FTP Application

The FTP application is designed to be scheduled and will terminate when all required files on the remote server have been downloaded. For more information, see Starting and Stopping the Data Loading Process on page 23.

3.2.4.3 Checking the Version of the FTP Application

If you need to contact AIRCOM International support regarding any problems with the FTP application, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_FTP_GEN_302.exe -v
```

In Unix:

```
opx_FTP_GEN_302 -v
```

For more information about obtaining version details, see About Versioning on page 22.

3.2.4.4 Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

3.2.5 Troubleshooting

FTP Application

Symptom	Possible Cause	Solution
Application not transferring files.	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings. Server not accessible - network problems.	Use Process Monitor to check last run status. Check crontab settings. Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The Process Monitor will do this automatically. Check log for error messages that may indicate the network problem.
Application exits immediately.	Another instance is running.	Use Process Monitor to check instances running.

3.3 About the Database Acquisition Tool

The Database Acquisition Tool is used when you have to transfer the data in one database to another database directly. The database Acquisition Tool queries the database containing this data and stores the result to a CSV file.

The Database Acquisition Tool can connect to the following databases:

- Oracle
- SQLServer
- InterBase
- ODBC
- DB2
- Informix
- Sybase
- MySQL
- PostgreSQL

 The database client libraries for these different databases should be on the system path in order for the Database Acquisition Tool to connect to them.

3.3.1 About the Database Acquisition Tool Modes

The Database Acquisition Tool queries the database using the following two methods:

Method	Description
Query Mode	The tool queries the database using a static SQL statement and the entire result set of the query is output to a CSV file. In this mode, the tool does not store a history of rows that have already been parsed from the database. Hence, no .lst file is created.
Date Query Mode	The query is filtered by the date and time field in the query. The tool maintains a history of rows previously parsed from database in .lst files. This means that the tool outputs only new rows to the output file.

3.3.1.1 About the Query Mode

In this mode, the Database Acquisition Tool queries the database and outputs the entire result set into a CSV file.

To do this, the Database Acquisition Tool needs the following:

- Database connection details
- Valid SQL query statement for the database being used
- Name to use as part of the output file name
- DATETIMEFORMAT for formatting any DATETIME fields in the output file

Example of the Query Mode

The following is an example of Table, Data, and INI file in the Query Mode:

Column Name	ID	Pk	Null?	Data Type
BSC	1	Y	VARCHAR2 (124)	
COLUMN2	2	Y	NUMBER	
COLUMN3	3	Y	VARCHAR2 (124)	
DATETIME	4	Y	DATE	
CELL	5	Y	NUMBER	

An example of table in query mode

BSC	COLUMN2	COLUMN3	DATETIME	CELL
BSC_1	2159	SQLAPI	11/06/2007 00:00:40	1
BSC_2	2158	SQLAPI	11/06/2007 00:01:20	2
BSC_3	2157	SQLAPI	11/06/2007 00:02:00	3
BSC_4	2156	SQLAPI	11/06/2007 00:02:40	4
BSC_5	2155	SQLAPI	11/06/2007 00:03:20	5
BSC_6	2154	SQLAPI	11/06/2007 00:04:00	6

An example of data in query mode

INI Example:

```
[MAIN]
InterfaceID=001
ProgramID=333
InstanceID=001

[DIR]
LogDir=C:\BackendTest\opx_PAR_GEN_757\log
TempDir=C:\BackendTest\opx_PAR_GEN_757\temp
PIDFileDir=C:\BackendTest\opx_PAR_GEN_757\prid
DirTo=C:\BackendTest\opx_PAR_GEN_757\out

[DBConfiguration]
DBString=OPT502
UserID=aircom
Password=Krw'jdep
DBClient=Oracle

[OPTIONS]
QueryMode=0
```

```
[QUERYMODE]
Name=MyQuery2
Query=select * from dbparser3
DateTimeFormat=YYYY/MM/DD HH24:MI:SS
```

 The ProgramID represents the Program Type ID, which along with the Interface ID and Instance ID makes up the Program ID (or PRID). For more information, see About Program IDs on page 17.

3.3.1.2 About the Date Query Mode

In this mode, the Database Acquisition Tool queries the database and filters the result set on a starting date and time and on an ending date and time. It outputs only new rows which have not been read previously from the database to the CSV file.

To do this, the Database Acquisition Tool needs the following information:

- Database connection details
- A valid SQL query statement for the database being used
- A name to use as part of the output file name
- A valid SQL query statement to query the current time on the database machine
- The DateTimeField column in the query to be used in the where clause
- The SQL query will have a where clause with begindatetime parameter and enddatetime parameter
- The SQL query should be ordered by the DateTimeField column to increase performance of the Database Acquisition Tool
- A list of key columns which make each row in the result set unique
- The granularity and look back period which will be used by the tool to calculate the begindatetime and enddatetime parameters.
- The tool will keep track of rows downloaded already by creating LST files in the LST folder. The list folder will contain sub folders for each day. Each of these sub folders will have up to 24 LST files for each hour. The content of each of these files will contain information about which rows have been read from the database already. Each line in the CSV file will be in format:

KeyField1 Value,,KeyFieldN Value, Minute and second portion of the DateTimeField.

- The tool will adjust the DateTimeField values in the output file if AdjustForDST is set.
- The DateTimeFormat for formatting any DateTime fields in the output file

Example of Date Query Mode

The following is examples of a table, some data, and an INI file in the Date Query Mode:

Column Name	ID	Pk	Null?	Data Type
BSC	1		Y	VARCHAR2 (124)
COLUMN2	2		Y	NUMBER
COLUMN3	3		Y	VARCHAR2 (124)
DATETIME	4		Y	DATE
CELL	5		Y	NUMBER

An example of table in the date query mode

BSC	COLUMN2	COLUMN3	DATETIME	CELL
BSC_1	2159	SQLAPI	11/06/2007 00:00:40	1
BSC_2	2158	SQLAPI	11/06/2007 00:01:20	2
BSC_3	2157	SQLAPI	11/06/2007 00:02:00	3
BSC_4	2156	SQLAPI	11/06/2007 00:02:40	4
BSC_5	2155	SQLAPI	11/06/2007 00:03:20	5
BSC_6	2154	SQLAPI	11/06/2007 00:04:00	6

An example of data in the date query mode

INI example:

```
[MAIN]
InterfaceID=001
ProgramID=333
InstanceID=001
LogSeverity=2
Verbose=1

[DIR]
LogDir=C:\BackendTest\opx_PAR_GEN_757\log
TempDir=C:\BackendTest\opx_PAR_GEN_757\temp
PIDFileDir=C:\BackendTest\opx_PAR_GEN_757\prid
DirTo=C:\BackendTest\opx_PAR_GEN_757\out
DirLst=C:\BackendTest\opx_PAR_GEN_757\lst

[DBConfiguration]
DBString=OPT502
UserID=aircom
Password=ZqoT'h/r
DBCClient=Oracle
```

```

[OPTIONS]
QueryMode=1

[DATEQUERYMODE]
Name=MyQuery
Query=select * from dbparser3 where DATETIME between
:begindatetime AND :enddatetime order by DATETIME
CurrentDateTimeQuery=select sysdate from dual
Granularity=3
LookBackPeriod=100

AdjustForDST=0
OffsetWhenDSTActive=0
OffsetWhenDSTInactive=0

DateTimeField=DATETIME
DateTimeFormat=YYYY/MM/DD HH24:MI:SS

NumberKeyFields=2
KeyField1=BSC
KeyField2=CELL

```

 The ProgramID represents the Program Type ID, which along with the Machine ID and Instance ID makes up the Program ID (or PRID). For more information, see About Program IDs on page 17.

3.3.2 Configuration

The Database Acquisition Tool is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The Database Acquisition Tool configuration (INI) file is divided into different sections.

The following table describes the parameters in the [DIR] section:

DirTemp	The location of temporary files created by the tool.
DirLog	The location of the log files.
PIDFileDir	The location of the monitor (PID) file.
DirTo	The location of output CSV files.
DirLst	The location of LST files. This directory is only needed when using QueryMode=1.

The following table describes the parameters in the [MAIN] section:

LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily
LogSeverity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical
RefreshTime	The pause (in seconds) between executions of the main loop when running continuously.
RunContinuously	0 - Have the Database Acquisition Tool run once. 1 - Have the Database Acquisition Tool continuously query the database.
PollingTime	If you have selected to run Database Acquisition Tool continuously, type the number seconds that must pass between each query to the database.
InterfaceID	The three-digit interface identifier.
ProgramID	The three-digit program identifier.
InstanceID	The three-character instance identifier.
Verbose	0 - No log messages are displayed on the console. 1 - Log messages are displayed on the console.
Iterations	This parameter is used when the application does not run in continuous mode so that it will be able to check for input files in the input folder for the number of required iterations before an exit. Integer values are allowed, like 1,2,3,4...

The following table describes the parameters in the [DBConfiguration] section:

DBString	Name of database the Database Acquisition Tool will connect to.
UserID	A string containing a user name to use when establishing the connection.
Password	A string containing a password to use when establishing the connection.
DBClient	One of the following: Oracle - Oracle client SQLServer - SQL Server client InterBase - InterBase client SQLBase - SQLBase client ODBC - ODBC client DB2-DB2 client Informix - Informix client Sybase - Sybase client MySQL - MySQL client PostgreSQL - PostgreSQL client

The following table describes the parameters in the [OPTIONS] section:

QueryMode	0 - The Database Acquisition Tool will read remaining parameters from the [QUERYMODE] section. 1 - The Database Acquisition Tool will read remaining parameters from the [DATEQUERYMODE] section.
-----------	--

The following table describes the parameters in the [QUERYMODE] section:

Name	A string which be included in the output file name. The output file will be outputted to DirTo and file name format be will Name__YYYYMMDDHH24MISSsss.csv.
Query	The SQL used to query the database. The user should check the SQL statement is valid before using in the INI file. The query can be validated by running in the database vendor query tool.
DateTimeFormat	The format of the outputted date: WWW - Replaced by the locale's abbreviated weekday name. DAY - Replaced by the locale's full weekday name. DD - Replaced by the day of the month as a decimal number. MONTH - Replaced by the locale's full month name. MON - Replaced by the locale's abbreviated month name. MMM - Replaced by the locale's abbreviated month name. MM - Replaced by the month as a decimal number. YYYY - Replaced by the year as a decimal number. YY - Replaced by the last two digits of the year as a decimal number. RR - Replaced by the year as a decimal number. AM - Replaced by the locale's equivalent of either am or pm. PM - Replaced by the locale's equivalent of either am or pm. HH24 - Replaced by the hour (24-hour clock) as a decimal number. HH - Replaced by the hour (12-hour clock) as a decimal number. MI - Replaced by the minute as a decimal number. SS - Replaced by the second as a decimal number.
AdjustforDST	0 - Disable DST adjustment. 1 - Enable DST adjustment in accordance to the offset settings.
OffsetWhenDSTActive	Define time adjustment in minutes whenever DST is active.
OffsetWhenDSTInactive	Define time adjustment in minutes whenever DST is inactive.

The following table describes the parameters in the [DATEQUERYMODE] section:

Name	A string which will be included in the output file name. The output file will be outputted to DirTo and file name format be will Name__YYYYMMDDHH24MISSsss.csv.
Query	The SQL used to query the database. The user should check the SQL statement is valid before using in the INI file. The query can be validated by running in the database vendor query tool.
DateTimeField	The field in the query which is the date and time field.

DateTimeFormat	<p>The format of the outputted date:</p> <p>WWW - Replaced by the locale's abbreviated weekday name.</p> <p>DAY - Replaced by the locale's full weekday name.</p> <p>DD - Replaced by the day of the month as a decimal number.</p> <p>MONTH - Replaced by the locale's full month name.</p> <p>MON - Replaced by the locale's abbreviated month name.</p> <p>MMM - Replaced by the locale's abbreviated month name.</p> <p>MM - Replaced by the month as a decimal number.</p> <p>YYYY - Replaced by the year as a decimal number.</p> <p>YY - Replaced by the last two digits of the year as a decimal number.</p> <p>RR - Replaced by the year as a decimal number.</p> <p>AM - Replaced by the locale's equivalent of either am or pm.</p> <p>PM - Replaced by the locale's equivalent of either am or pm.</p> <p>HH24 - Replaced by the hour (24-hour clock) as a decimal number.</p> <p>HH - Replaced by the hour (12-hour clock) as a decimal number.</p> <p>MI - Replaced by the minute as a decimal number.</p> <p>SS - Replaced by the second as a decimal number.</p>
NumberKeyFields	The number of key fields.
KeyField#	Key field number # starting from KeyField1, KeyField2 and so on.
CurrentDateTimeQuery	<p>The SQL to get current system data and time on the database machine.</p> <p>This shows a sample:</p> <p>Oracle</p> <pre>SELECT sysdate FROM dual</pre> <p>SQL Server</p> <pre>select getdate()</pre> <p>MS Access</p> <pre>select now()</pre> <p>Informix</p> <pre>select current as DATE_AND_TIME from systables where tabid = 1</pre>
Granularity	<p>A number to indicate the time period to use in the SQL:</p> <p>1 - The last quarterly interval</p> <p>2 - The last hour</p> <p>3 - The last day</p> <p>4 - The last week, week start from Sunday</p> <p>5 - The last month</p>
LookBackPeriod	The number of periods to look back.
AdjustforDST	<p>0 - Disable DST adjustment.</p> <p>1 - Enable DST adjustment in accordance to the offset settings.</p>
OffsetWhenDSTActive	Define time adjustment in minutes whenever DST is active.
OffsetWhenDSTInactive	Define time adjustment in minutes whenever DST is inactive.

3.3.3 Running the Database Acquisition Tool

The Database Acquisition Tool is executed from the command prompt by writing its executable name along with the path of INI file.

For example:

- Windows: C:/opx_DAP_GEN_333 opx_DAP_GEN_333.ini
- UNIX: \$./opx_DAP_GEN_333 opx_DAP_GEN_333.ini

3.4 About the AIRCOM OPTIMA CORBA Client

Common Object Request Broker Architecture (CORBA) allows distributed systems to be defined independently of a specific programming language.

The AIRCOM OPTIMA CORBA Client connects to the CORBA interface for PM data acquisition using the CORBA Naming Service running on the host or data source, which is usually an Element Management System (EMS) or a Network Management System (NMS).

Equipment vendors publish the details of their specific CORBA interface as Interface Definition Language (IDL) files. These IDL files are used to create the CORBA client and server applications.

As IDL files use a proprietary file format, a specific CORBA client is required for each specific CORBA interface. The requested data will be output as CSV files, either directly on the AIRCOM OPTIMA Mediation Device (MD) or on the NMS or EMS and downloaded to the MD via the AIRCOM OPTIMA FTP application.

You should refer to specific interface documents for the AIRCOM OPTIMA CORBA client deployed on a particular network.

The AIRCOM OPTIMA CORBA Client supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Error Files	If the application detects an error in the input file that prevents processing of that file, then the file is moved to an error directory and processing continues with the next file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.
Backup	The application can store a copy of each input file in a backup directory.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.5 About the SNMP Poller

This section describes the SNMP Poller, and explains:

- The basic concepts behind Simple Network Management Protocol (SNMP)
- Installing the SNMP Poller
- Configuring the SNMP Poller, using the SNMP Poller GUI
- Running the SNMP Poller

3.5.1 About Simple Network Management Protocol (SNMP)

In network management systems, Simple Network Management Protocol (SNMP) is used to monitor network-attached devices for conditions that require the attention of the administrator.

An SNMP-managed network is made up of three main components:

Component	Description
Managed device (also known as network elements)	A network node that contains an SNMP agent. Managed devices reside on a managed network, and collect/store management information, which is then made available to Network Management Systems using SNMP. Examples of managed devices are routers, bridges, hubs and printers.
Agent	A network-management software module, that resides in managed devices. An agent translates localised management information into a form that is compatible with SNMP.
Network Management System (NMS)	Uses different applications to monitor and control managed devices, and provide the bulk of processing and memory resources required for network management. One or more NMSs can exist on any managed network.

3.5.1.1 About Management Information Bases (MIBs)

SNMP uses an extensible design, where the available information is defined by Management Information Bases (MIBs).

MIBs use the notation defined by ASN.1, and describe the structure of the management data of a device subsystem, using a hierarchical namespace containing object identifiers (OID). An example MIB could be 1.3.6.1.4.1.XXXX.1.2.102.

The MIB hierarchy can be depicted as a tree with a nameless root, the levels of which are assigned by different organizations:

- The top-level MIB OIDs belong to different standards organizations
- Lower-level OIDs are allocated by associated organizations

The original MIB for managing a TCP/IP Internet was called MIB-I. MIB-II, published later, added a number of useful variables missing from MIB-I.

Each OID identifies a variable that can be read or set using SNMP. The OIDs describe a tree structure, where each number separated by a decimal point represents a branch on that tree. Each OID begins at the root level of the OID domain and gradually becomes more specific.

3.5.1.2 About SNMP Versions

In practice, SNMP implementations often support multiple versions - typically SNMPv1, SNMPv2c, and SNMPv3. This table describes these versions:

Version	Description
SNMPv1	The initial implementation of the SNMP protocol. Has been criticised for its poor security.
SNMPv2	Revises version 1 and includes improvements in the areas of performance, security, confidentiality, and manager-to-manager communications. Introduced GETBULK, an alternative to iterative GETNEXTs for retrieving large amounts of management data in a single request. SNMP v2c comprises SNMP v2 with the simple community-based security scheme of SNMP v1 and is widely considered the de facto SNMP v2 standard.
SNMPv3	Primarily added security and remote configuration enhancements to SNMP. SNMPv3 is the current standard version of SNMP.

Typically, SNMP uses UDP ports 161 for the Agent and 162 for the Manager.

The Manager may send requests from any available ports (source port) to port 161 in the agent (destination port). The agent response will be given back to the source port. The Manager will receive traps on port 162. The agent may generate traps from any available port.

3.5.1.3 About the SNMP Poller

The SNMP Poller enables you to collect information from SNMP agents using the SNMP Protocol. The SNMP Poller uses the following SNMP messages:

- GET PDU for scalar objects
- GETNEXT PDU for columnar objects

The SNMP Poller supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

By using the SNMP Poller Configuration dialog box, you can define the settings quickly and easily, which can then be saved in an INI file. For more information, see Configuring the SNMP Poller on page 55.

During configuration, you can specify what information will be collected by the SNMP Poller by defining reports. Within a report, you specify the scalar or columnar objects on which you require information. For more information, see Loading Managed Objects and Creating Reports on page 58.

When you have finished configuration, you can then run the SNMP Poller itself. When the report is run, the SNMP Poller outputs the information collected to a CSV file. For more information, see [Running the SNMP Poller](#) on page 81.

3.5.2 Installing the SNMP Poller

Before you can use the SNMP Poller, install the following files to the backend binary directory.

- opx_DAP_GEN_301.exe (Windows)
- opx_DAP_GEN_301 (Unix)

For the GUI:

- 1 Install the SNMP Poller GUI.msi to the backend binary directory.
- 2 Double-click the SNMP Poller GUI.msi to start the installation process.

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the [AIRCOM OPTIMA Operations and Maintenance Guide](#).

3.5.3 Configuring the SNMP Poller

To configure the SNMP Poller, it is recommended that you follow these steps, working through the tabs in the SNMP Poller Configuration GUI:

- 1 On the Reports-Managed Objects tab, load the managed objects and create reports in report groups.
For more information on how to do this, see [Loading Managed Objects and Creating Reports](#) on page 58.
- 2 On the Devices tab, define the devices (agents) on which you want to run the reports.
- 3 On the Reports-Devices tab, set which reports you want to run on which devices.
- 4 On the Pollers-Devices tab, define the poller machines, and set which devices they will poll.
- 5 On the Summary tab, view the details that you have configured.
- 6 Generate an INI file containing the settings that you have configured.



Important :

- As you complete the details on each tab, it is recommended that you save your configuration using the 'Save to database' button.
- In addition to the settings that you can configure automatically using the GUI, in the [MAIN] section of the INI file, you can also manually specify a `FolderFileLimit` parameter.

This parameter defines the maximum number of output files that can be created in each output (sub) folder, up to a limit of 100,000 on Windows and 500,000 on Sun/UNIX.

Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.

To use this parameter, ensure that the `UseFolderFileLimit` parameter is set to 1.

3.5.3.1 Prerequisites for Running the SNMP Poller Configuration

Before you can use the SNMP Poller Configuration GUI, ensure that:

- 1 You have installed:
 - .NET 3.5 (and the associated Service Pack)
 - Oracle Client for 10g or 11g (as applicable)
- 2 You have an AIRCOM OPTIMA 6.2 database, with a completely up-to-date schema.
- 3 You have run the 'create_SNMP_tables.sql' script on the database to which you want to connect.
- 4 You have installed the SNMP Poller GUI, using the setup.exe provided with the installation package.
- 5 You have a pre-defined set of MIBs (Management Information Bases), stored as CSV files. These contain data for the managed objects (that is, the characteristics of the managed device that you want to manage).

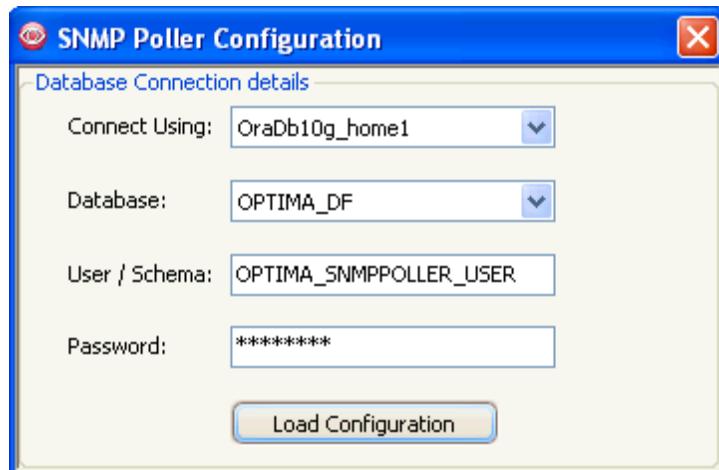
3.5.3.2 Logging into the SNMP Poller GUI

To log into the SNMP Poller GUI:

- 1 Open the SNMP Poller GUI.

To do this from the Windows Start Menu, select Start>All Programs>AIRCOM International>SNMP Poller GUI>SNMP Poller GUI.

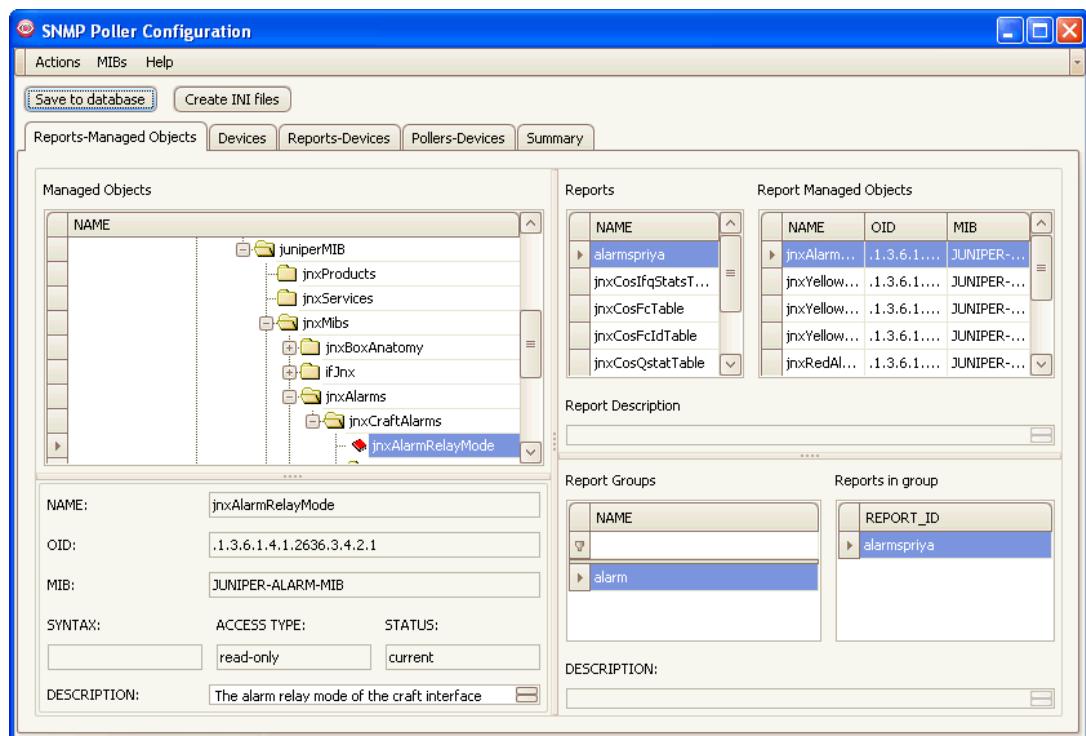
The SNMP Poller Configuration dialog box appears:



- 2 Type in the connection details (database name, username and password).

Click Load Configuration.

The SNMP Poller GUI appears:



In this dialog box, you can configure the SNMP Poller. The current configuration details are loaded and kept in memory, until you save them.

3.5.3.3 Loading MIBs and Creating Reports

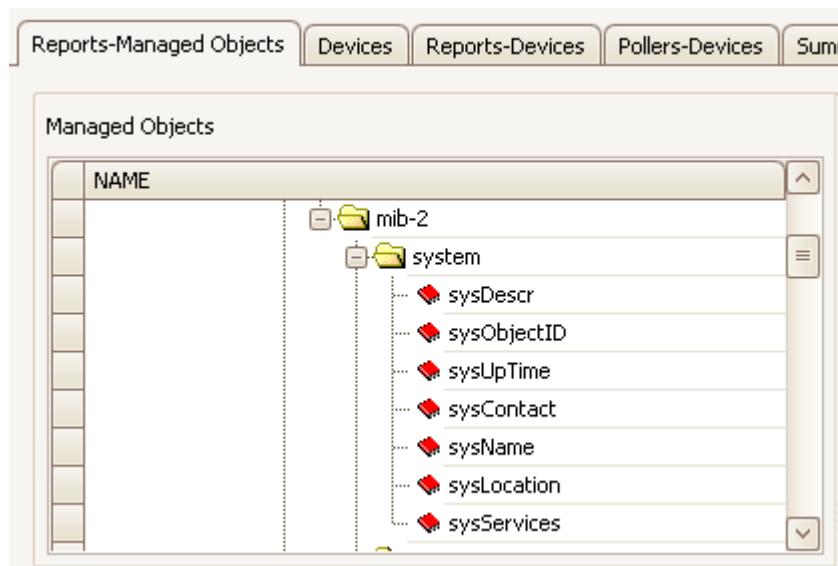
On the Reports-Managed Objects tab of the SNMP Poller GUI, you can load the MIBs and define which ones you want to report on by creating reports. You must then add these reports to report groups so that you can assign them to devices later.

 To do this, you must have a pre-defined set of MIBs (Management Information Bases), stored as CSV files. If they are not stored as CSV files, then you can convert them using the MIB to CSV option. For more information, see Converting MIB Files to CSV Files on page 62.

To load managed objects:

- 1 From the MIBs menu, click Load Managed Objects from CSV file.
- 2 In the dialog box that appears, locate the CSV file containing the MIBs that you want to load, and then click Open.

The required managed objects are loaded into the Managed Objects pane:

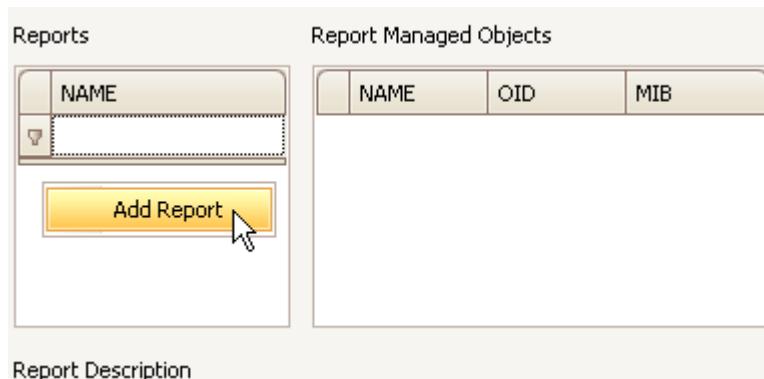


 You can remove a managed object (or an entire branch of managed objects) from the Managed Objects pane by right-clicking it, and then clicking Remove Managed Object (or Remove Managed Object Branch) from the menu that appears.

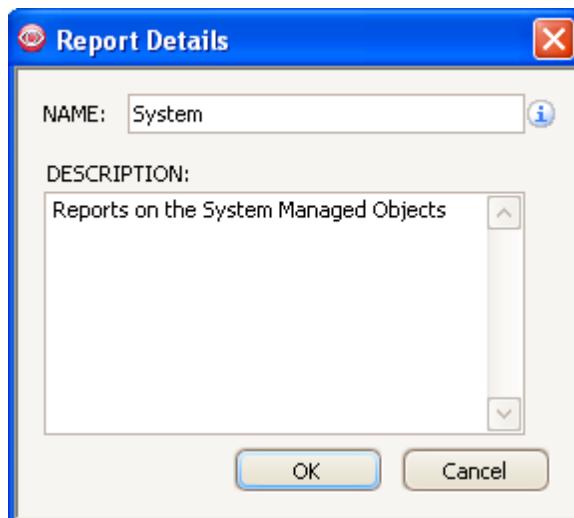
You can now create reports including these managed objects.

To create a report:

- 1 Right-click in the Reports pane, and from the menu that appears, click Add Report:



- 2 In the Report Details dialog box, type the name of the report and a description of what it contains:



- 3 Click OK.

The (empty) report is created.

- 4 To add a managed object to the report, in the Managed Objects pane, select the required managed object and then either:

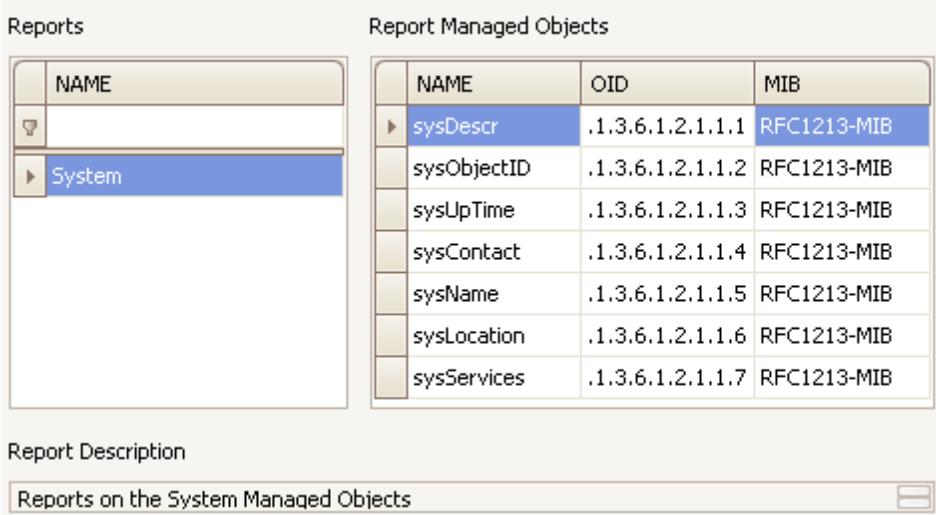
- Drag it into the Reports pane, and drop it onto the report name
- or -
- Drag it into the Report Managed Objects pane, and drop it into the white space

The managed object appears in the Report Managed Objects pane:

Report Managed Objects			
	NAME	OID	MIB
▶	sysDescr	.1.3.6.1.2.1.1.1	RFC1213-MIB

 You can assign an entire group of managed objects to a report, by dragging and dropping the folder that contains them.

This picture shows an example report, which will return management data on the 'System' group of managed objects (for example, sysName and sysLocation):



The screenshot shows the 'Reports' interface. On the left, under 'Reports', there is a tree view with a node labeled 'System'. On the right, under 'Report Managed Objects', there is a table listing several managed objects:

NAME	OID	MIB
sysDescr	.1.3.6.1.2.1.1.1	RFC1213-MIB
sysObjectID	.1.3.6.1.2.1.1.2	RFC1213-MIB
sysUpTime	.1.3.6.1.2.1.1.3	RFC1213-MIB
sysContact	.1.3.6.1.2.1.1.4	RFC1213-MIB
sysName	.1.3.6.1.2.1.1.5	RFC1213-MIB
sysLocation	.1.3.6.1.2.1.1.6	RFC1213-MIB
sysServices	.1.3.6.1.2.1.1.7	RFC1213-MIB

Below the table, under 'Report Description', is the text: 'Reports on the System Managed Objects'.

SNMP Report

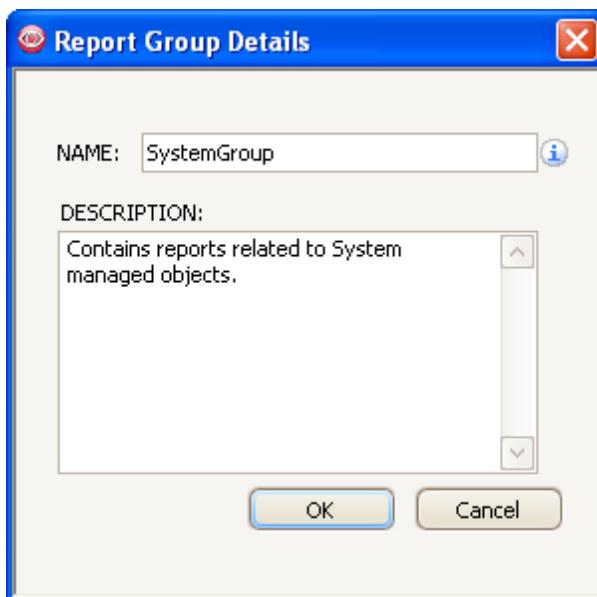
After you have created a report, you must add it to a report group, so that it can be assigned to a device later on.

To create a report group:

- 1 Ensure that you have created at least one report.
- 2 Right-click in the Report Groups pane, and from the menu that appears, click Add Report Group:



- 3 In the Report Groups dialog box, type the name of the report group and a description of what it contains:



- 4 Click OK.

The (empty) report group is created.

- 5 To add a report to the report group, in the Reports pane, select the required report and then either:

- Drag the report into the Report Groups pane, and then drop it onto the report name
 - or -
- Drag the report into the Reports in group pane, and then drop it into the white space

 You can select multiple reports, by clicking on each one by holding down the Ctrl button.

The report appears in the Reports in group pane:



- 6 Click the 'Save to database' button to save the report groups and reports.

Converting MIB Files to CSV Files

When you are loading SNMP MIBs into the SNMP Poller GUI, you can only load them as CSV files. If you do not already have the MIB files saved in CSV format, then you can convert them.

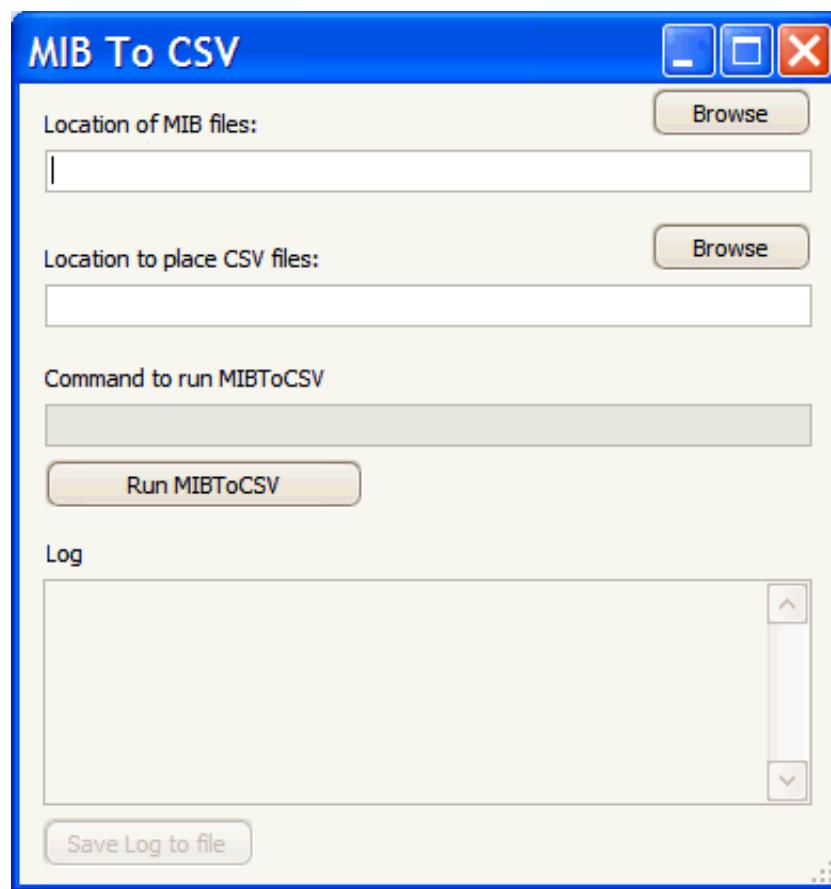


To use this conversion option, you must have the Java Runtime Environment (JRE) installed, and the Java command should be set on the system PATH. The conversion option uses a number of jar files (MibToCSV.jar and MIB parser library jar files), which are installed automatically the first time that you open the MIB to CSV dialog box, and are stored in C:\Program Files\AIRCOM International\Optima Backend\Bin\MIBToCSV.

To do this:

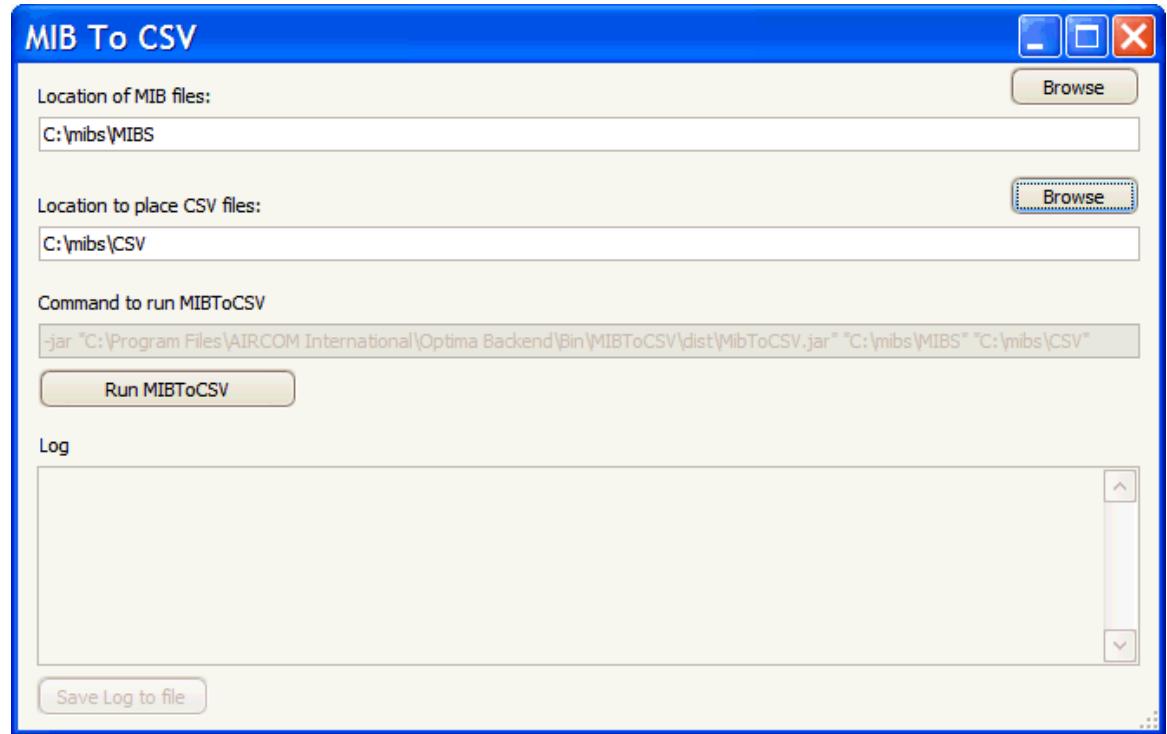
- 1 From the MIBS menu, click RunMIBToCSV.

The MIB to CSV dialog box appears:



- 2 In the Location of MIB files pane:
 - Click the Browse button
 - Locate the folder containing the MIB files that you want to convert
 - Click OK
 - 3 In the Location to place CSV files pane:
 - Click the Browse button
 - Locate the folder into which you want to save the converted CSV files
 - Click OK
-  The Command to run MIBToCSV appears automatically, and is read-only.

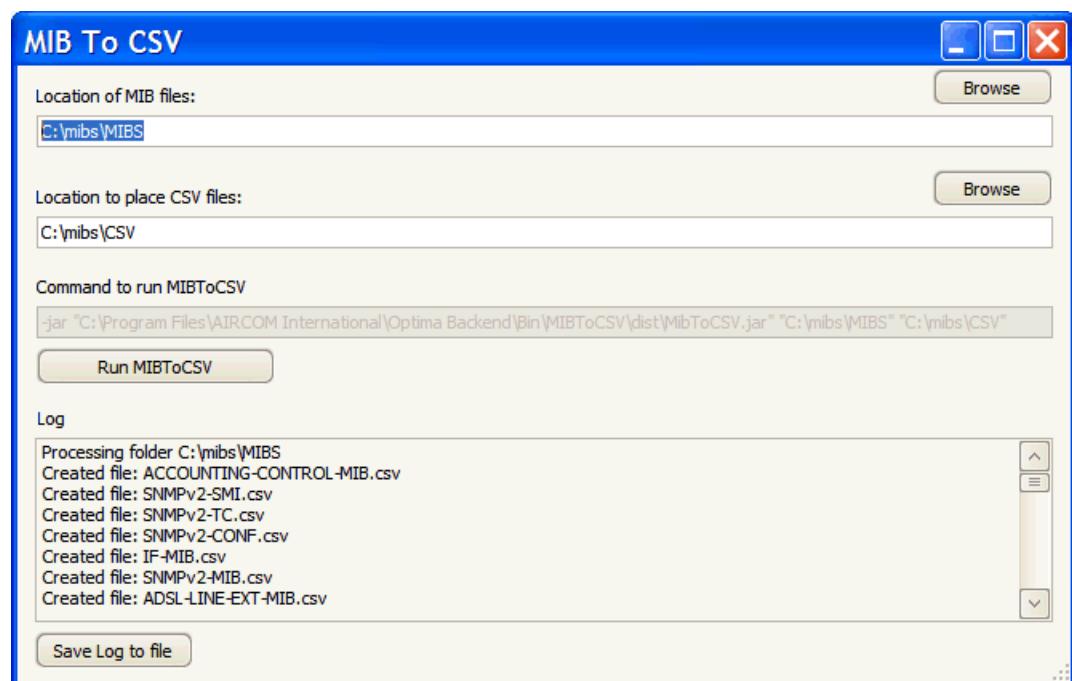
This picture shows an example of MIB to CSV dialog box:



- 4 Click the Run MIBToCSV button.

The selected MIB files are converted into CSV files.

The progress of the conversion is displayed in the Log pane:



- 5 If any errors have occurred during the conversion process, you can save the error log as a separate file to be, for example, distributed to relevant groups. To do this:
 - Click the Save Log to file button
 - In the dialog box that appears, choose a suitable location and type an appropriate filename
 - Click Save

Editing and Deleting Reports and Report Groups

On the Reports-Managed Objects tab on the SNMP Poller GUI, you can edit and delete reports and report groups.



Before deleting a report or report group, ensure that it is not in use, otherwise you may affect the rest of your configuration.

To edit the details of a report:

- 1 In the Reports pane, right-click the report that you want to edit.
- 2 From the menu that appears, click Edit Report.

The Report Details dialog box appears, in which you can edit the name and description of the report.

- 3 Click OK.

To remove a managed object from a report:

- 1 In the Report Managed Objects pane, right-click the managed object that you want to remove from the report.
- 2 From the menu that appears, click Remove.



To remove all managed objects from a report, right-click in the Report Managed Objects pane, and from the menu that appears, click Remove All.

To delete a report:

- 1 In the Reports pane, right-click the report that you want to delete.
- 2 From the menu that appears, click Delete Report.
- 3 Click Yes to confirm the deletion.

To edit the details of a report group:

- 1 In the Report Groups pane, right-click the report group that you want to edit.
- 2 Right-click, and from the menu that appears, click Edit Report Group.

The Report Group Details dialog box appears, in which you can edit the name and description of the report group.

- 3 Click OK.

To remove a report from a report group:

- 1 In the Reports in group pane, right-click the report that you want to remove from the report group.
- 2 From the menu that appears, click Remove report from group.
 - 💡 To remove all reports from a report group, right-click in the Reports in group pane, and from the menu that appears, click Remove All.

To delete a report group:

- 1 In the Report Groups pane, right-click the report group that you want to delete.
- 2 From the menu that appears, click Delete Report Group.
- 3 Click Yes to confirm the deletion.

3.5.3.4 Defining Devices (Agents) to be Polled

On the Devices tab of the SNMP Poller GUI, you can define the devices (agents) on which you want to run the reports. Devices are organised according to vendor, device type group and device type. To do this:

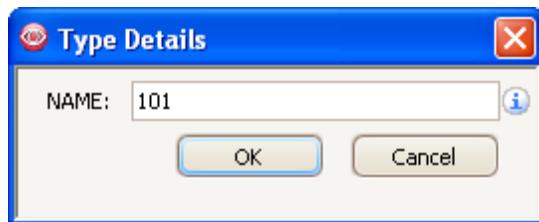
- 1 Right-click in the Device Types pane, and from the menu that appears, click Add Vendor.
- 2 In the dialog box that appears, type the vendor name and then click OK:



- 3 Right-click the vendor name, and from the menu that appears, click Add Type Group.
- 4 In the dialog box that appears, type the name of the type group and then click OK:



- 5 Right-click the type group name, and from the menu that appears, click Add Type. In the dialog box that appears, type the device type and then click OK:



You now have the correct structure for organising your individual devices. You can define the individual devices to be polled in two ways:

- Find and load existing devices
- or -
- Add devices manually

When you have defined your devices, click the 'Save to database' button to save them.

Finding and Loading Existing Devices

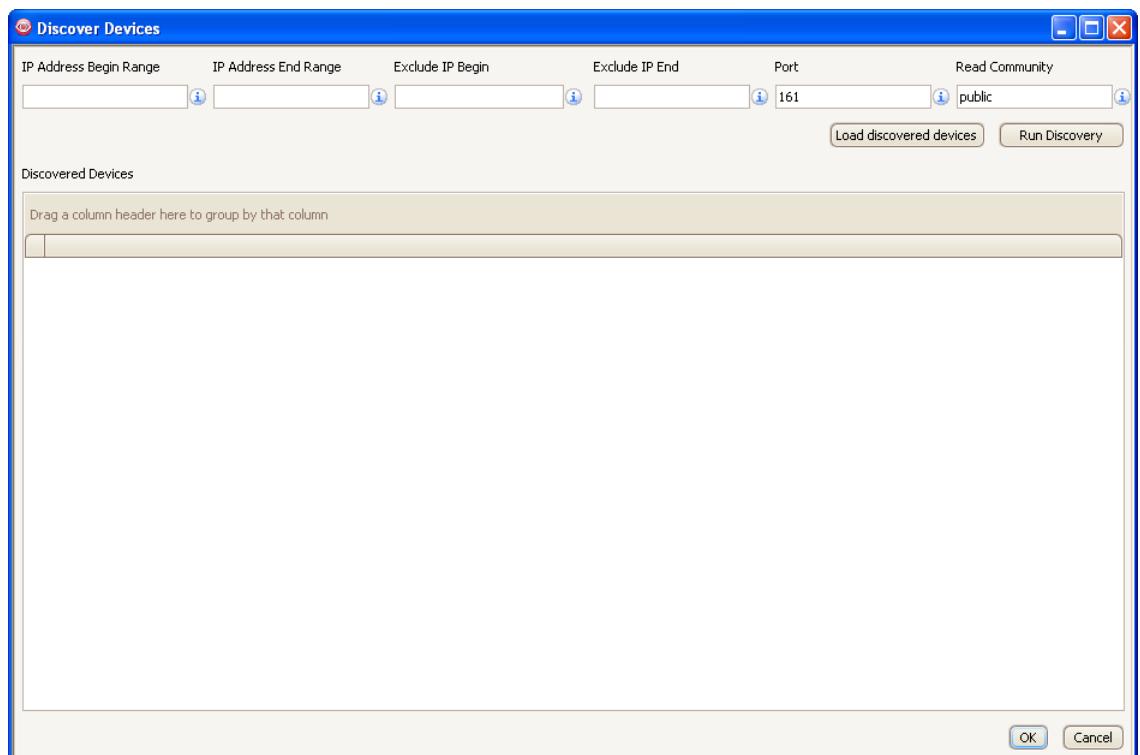
On the Devices tab of the SNMP Poller GUI, you can define the individual devices that will be polled. One way to do this is to search for existing devices, load their details into the SNMP Poller GUI, and then assign them to the corresponding device type.

To do this:

- 1 Click the Find Devices button.



The Discover Devices dialog box appears:



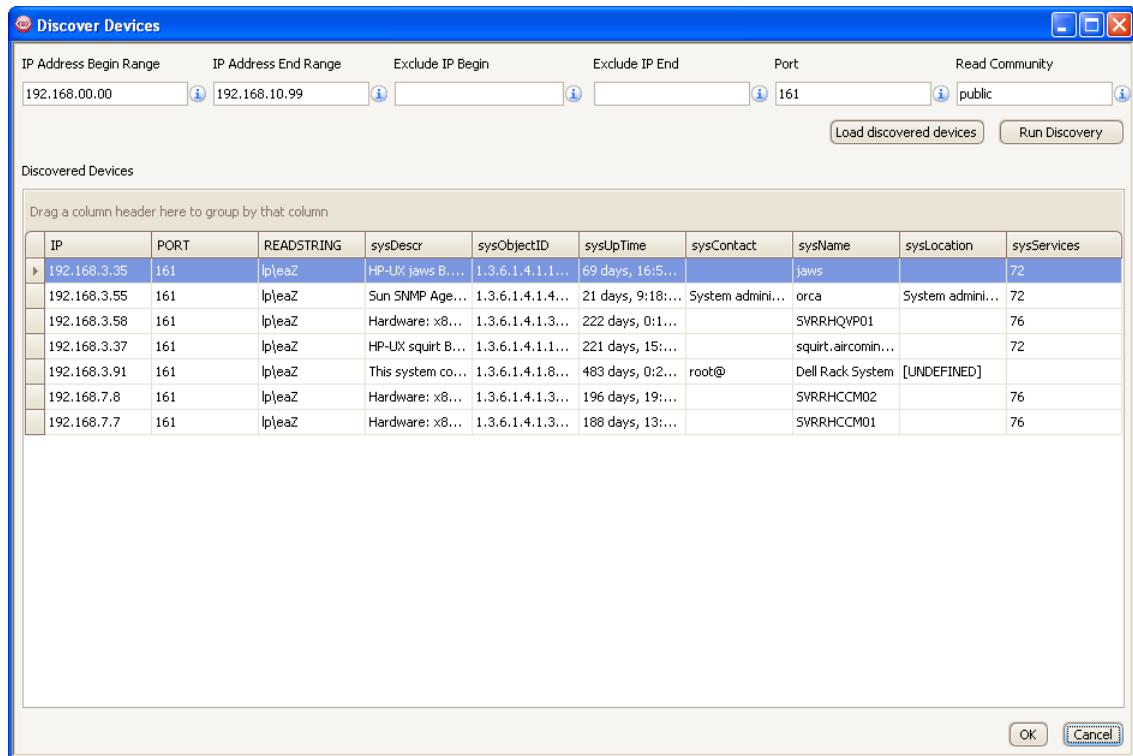
 The Discover Devices dialog box can be used to scan the network for any existing SNMP devices in the network, and identify any SNMP ALIVE devices.

- 2 Define the criteria that you want to use to search for existing devices. The criteria are described in this table:

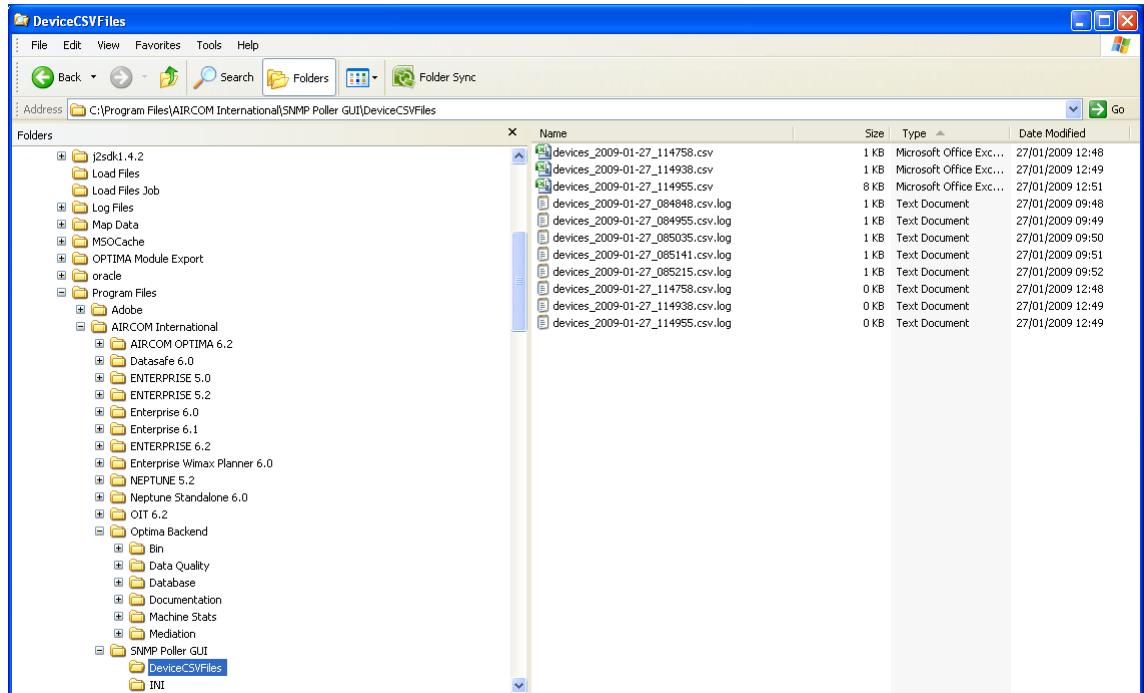
Item	Description
IP Address Begin Range and IP Address End Range	Set the start and finish range for the IP addresses of the required devices. If you know the IP address of the device that you are looking for, type the same value in the start and finish range.
Exclude IP Begin and Exclude IP End	If required, exclude certain IP addresses. This is particularly useful if you only eliminate a portion of IP addresses within the range because you already know that these are not applicable (for example, they may be assigned to servers). For example, rather than scan a whole network from (begin range) 192.168.0.0 and (end range) 192.168.255.255, you could choose to exclude a group of servers in between, from (exclude IP begin) 192.168.10.10 and (exclude IP end) 192.168.120.150.
Port	Choose the IP address port from which the device transmits the information.
Read Community	Define the Read Community, which is the community string to use in all poller requests.

- 3 When you have set all of the criteria, click the Run Discovery button.
 4 In the dialog box that appears, select the folder to which you want to save the results, and then click OK.

All of the found devices that meet the chosen criteria and are SNMP-compliant are displayed in the Discovered Devices pane:

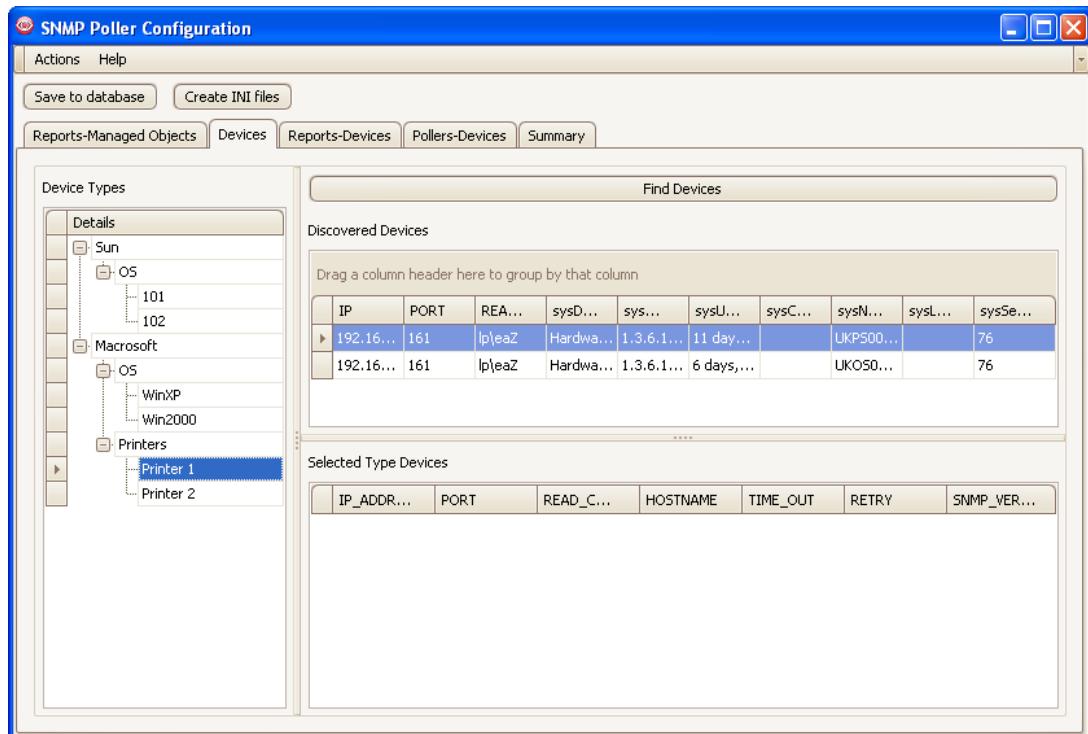


The results are saved automatically in a timestamped CSV file in the folder that you specified, for example:

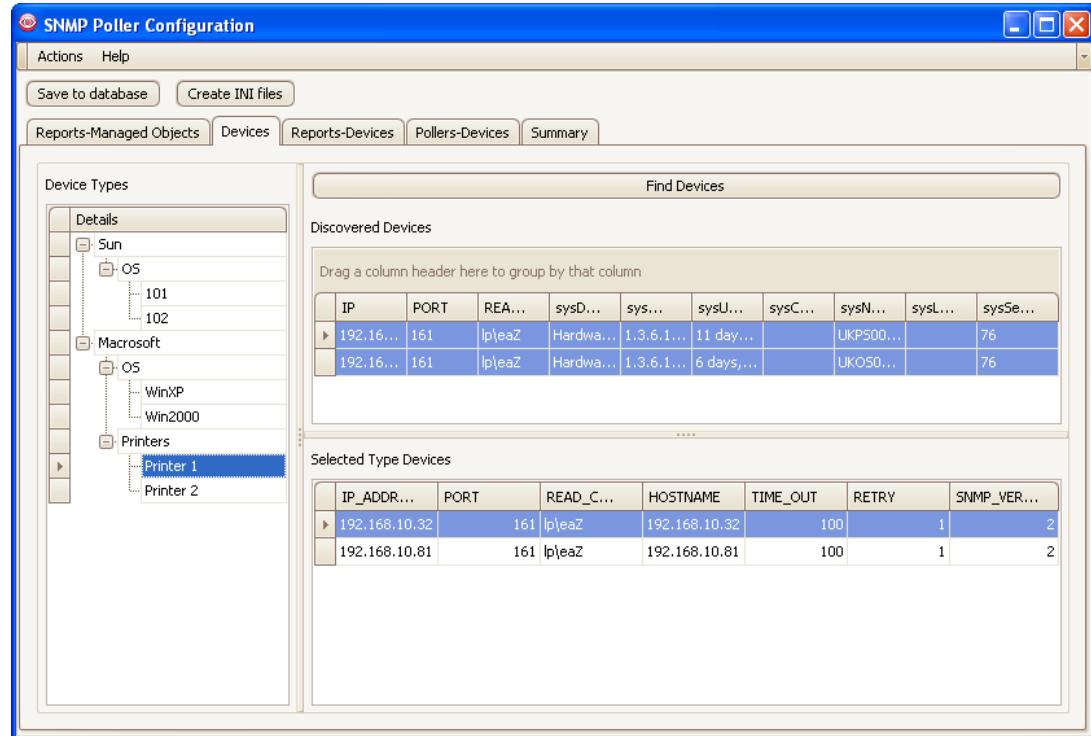


5 Click OK.

The discovered devices appear in the Discovered Devices pane of the Devices tab.



- 6 To assign them to their corresponding type, drag and drop them onto the type name in the Device Types pane. The selected devices appear in the Selected Type Devices pane:



If you have run a device discovery before, rather than re-scanning the network again (and creating superfluous data in the network), you can load the previous results. To do this:

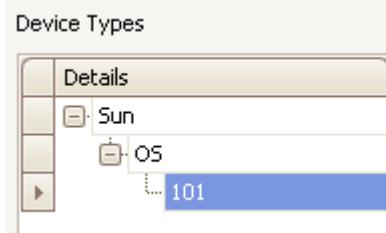
- In the Discover Devices dialog box, click the 'Load discovered devices' button
- Locate the required file
- Click Open

The devices discovered at that time and date are loaded into the Discovered Devices pane.

Manually Defining Devices

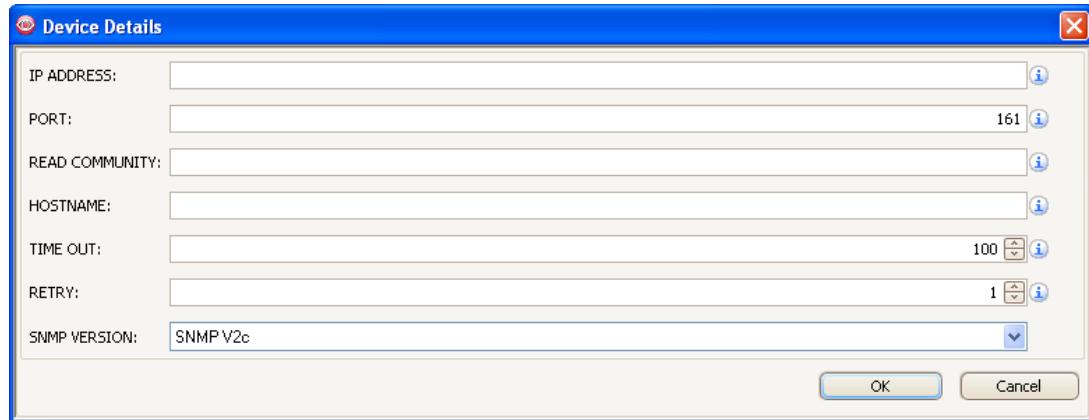
On the Devices tab of the SNMP Poller GUI, as well as searching for existing devices, you can also manually define devices for a particular device type. To do this:

- 1 In the Device Type pane, ensure that you have selected the required device type:



- 2 Right-click in the Selected Type Devices pane, and from the menu that appears, click Add Device.

The Device Details dialog box appears:



- 3 Define the required details for the device:

Item	Description
IP Address	The IP address of the device that the SNMP Poller will connect to.
Port	The number of the port from which the device transmits the information.
Read Community	The community string used in all poller requests.  The community string is encrypted when it appears in the Selected Type Devices pane, but is decrypted if you choose to edit the device details.
Hostname	The host name of the device.
Time Out	The number of seconds after which the device will be considered as 'timed out'.
Retry	The number of retries that the SNMP Poller will attempt after a 'timeout' when polling data from this device.
SNMP Version	The version of SNMP to use.

- 4 Click OK.

The device is added to the Selected Type Devices pane:

Selected Type Devices							
	IP_ADDR...	PORT	READ_C...	HOSTNAME	TIME_OUT	RETRY	SNMP_VER...
▶	10.0.0.101	8001	lp\eaZ	localhost	100	1	2

Editing and Deleting Devices

On the Device tab of the SNMP Poller GUI, you can:

- Rename vendors, device type groups and device types
- Edit and delete devices



Before deleting a report or report group, ensure that it is not in use, otherwise you may affect the rest of your configuration.

To rename a vendor, device type group or device type:

- 1 Right-click the item that you want to rename.
- 2 From the menu that appears, click Edit Vendor, Type Group or Type as required.
- 3 In the dialog box that appears, rename the item, and then click OK.

To edit a device:

- 1 In the Selected Type Devices pane, right-click the device that you want to edit.
- 2 From the menu that appears, click Edit Device.
- 3 In the Device Details dialog box, edit the device parameters as required.
- 4 Click OK.

To delete a device:

- 1 In the Selected Type Devices pane, right-click the device that you want to delete.
- 2 From the menu that appears, click Delete Device.
- 3 Click Yes to confirm the deletion.

3.5.3.5 Assigning Reports to Device Types

On the Reports-Devices tab of the SNMP Poller, if you have created:

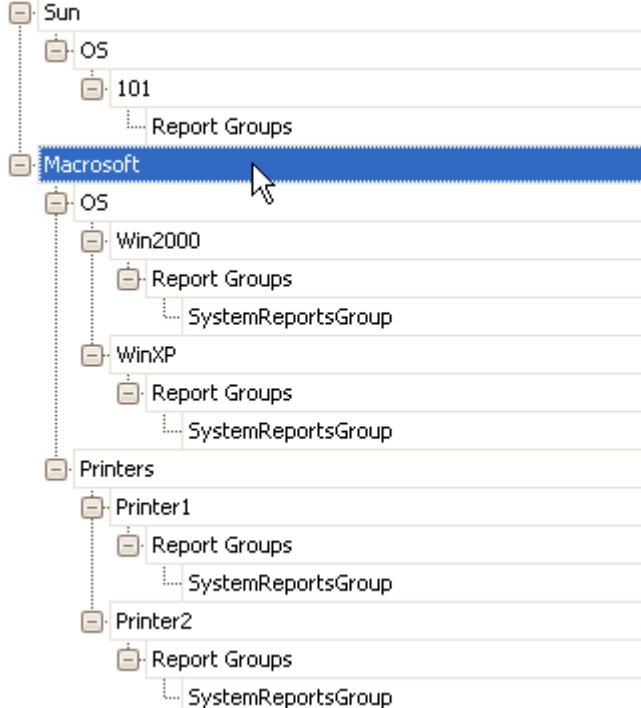
- Reports (in report groups)
- The devices (agents) that you want to use to poll data

You can map the two together, assigning the required reports to the device types that will run them. To do this:

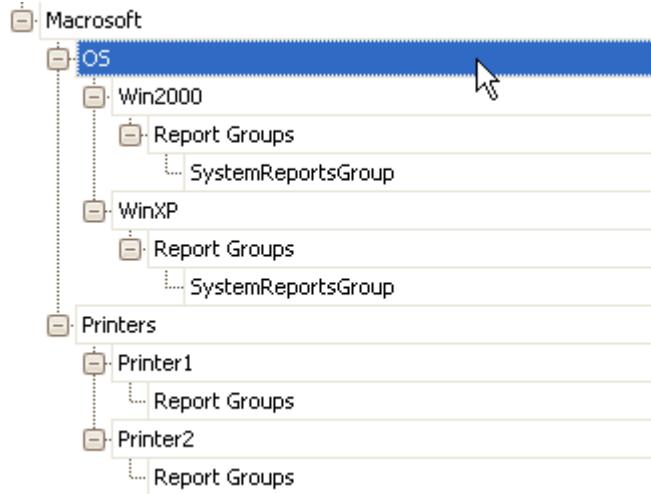
- 1 In the All Report Groups pane, select the required report group:



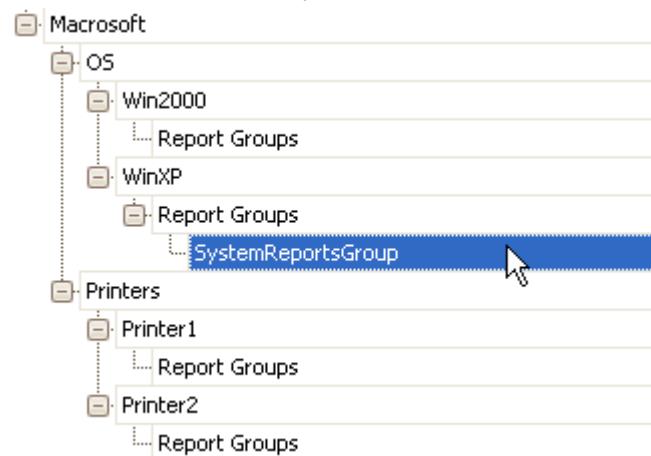
- 2 Drag the report group into the Devices pane, and then drop it onto the required device. Depending on the tree level onto which you drop it, the report group will be assigned at a different level:
 - If you drop it onto the vendor name, the report group will be assigned to all device types associated with this vendor:



- If you drop it onto the device type group, the report group will be assigned to all device types associated with this group:



- If you drop it onto the device type, the report group will be assigned to all devices of that device type:



 To undo an assignment, right-click the report group name, and from the menu that appears, click Remove Report Group. Then click Yes to confirm the deletion.

- Click the 'Save to database' button to save the assignments that you have configured.

3.5.3.6 Assigning Devices (Agents) to Machines

On the Pollers-Devices tab of the SNMP Poller GUI, you can assign devices (agents) to the machines from which you want to poll the data.

To do this:

- 1 Ensure that machines have been defined. This must be done manually using TOAD, creating an instance for each machine in the AIRCOM.MACHINES table:

MACHINES: Created: 13/11/2008 21:13:05 Last DDL: 13/11/2008 21:13:05			
Columns	Indexes	Constraints	Triggers
Data	Scripts	Grants	Synonyms
MachineID	Name	Description	
DB_Machine	DB_Machine	Database Machine	
poller_machine	poller_machine	Poller	

- 2 On the Poller-Devices tab, in the Devices pane, select the device type containing the device(s) that you want to assign.

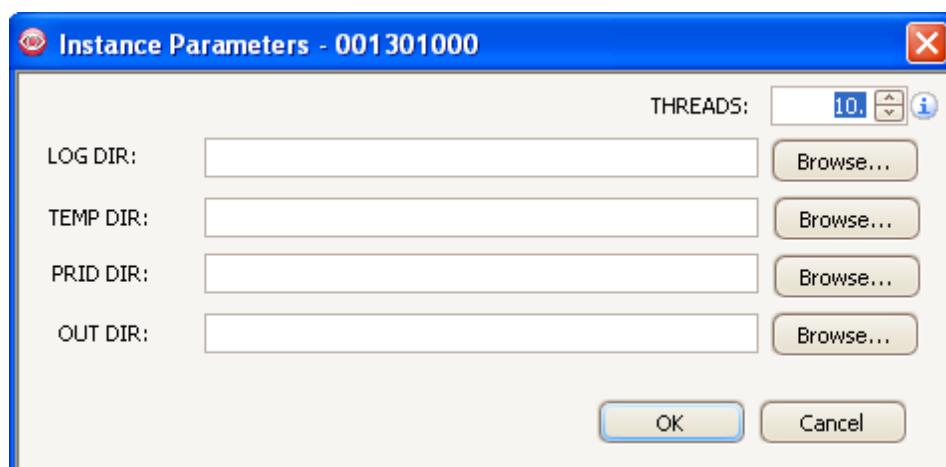
Details of the devices for that type appear in the Select Type Devices pane:

The screenshot shows the 'Select Type Devices' pane. On the left, a tree view labeled 'Devices' shows categories like Sun, Microsoft, and others. A specific device entry '101' under 'Sun OS' is selected. On the right, a grid view titled 'Select Type Devices' lists two entries:

PRID	IP_ADD...	PORT	READ_C...	HOSTNAME	TIME_OUT	RETRY	SNMP_VE...
	10.0.0.101	8001	lp\eaZ	localhost	100	1	2
	10.0.0.102	8001	l'_p]	localhost	100	1	2

If a device has not yet been assigned to a machine, it will not have a PRID.

- 3 To assign a particular device to a machine, drag the device into the Poller Instances pane, and drop it onto the required machine.
- 4 If you are assigning devices to a machine other than the DB Server machine, the Instance Parameters dialog box appears:





For subsequent assignments, the values that you specify for the first instance appear in the Instance Parameters dialog box as the default values.

- 5 Complete the details for the polling device on this machine, by either typing or clicking the Browse button to find the appropriate location:

Item	Description
LOG DIR	The folder for the log files created by the SNMP Poller.
TEMP DIR	The folder for the temporary files created by the SNMP Poller.
PRID DIR	The folder for the monitor (PRID) file.
OUT DIR	The folder for the generated reports.



You can increase or decrease the number of threads.

- 6 Click OK.

The device appears in the Selected Instance Devices pane:

IP_ADDR...	PORT	READ_C...	HOSTNAME	TIME_OUT	RETRY	SNMP_V...
192.168.10.32	161	1p\eaZ	192.168.10.32	100	1	2

It is also shaded in the Select Type Devices pane, and has a PRID assigned to it:

PRID	IP_ADDR...	PORT	READ_C...	HOSTN...	TIME_...	RETRY	SNMP_...
001301000	192.168.1...	161	1p\eaZ	192.168.1...	100	1	2
	192.168.1...	161	1p\eaZ	192.168.1...	100	1	2



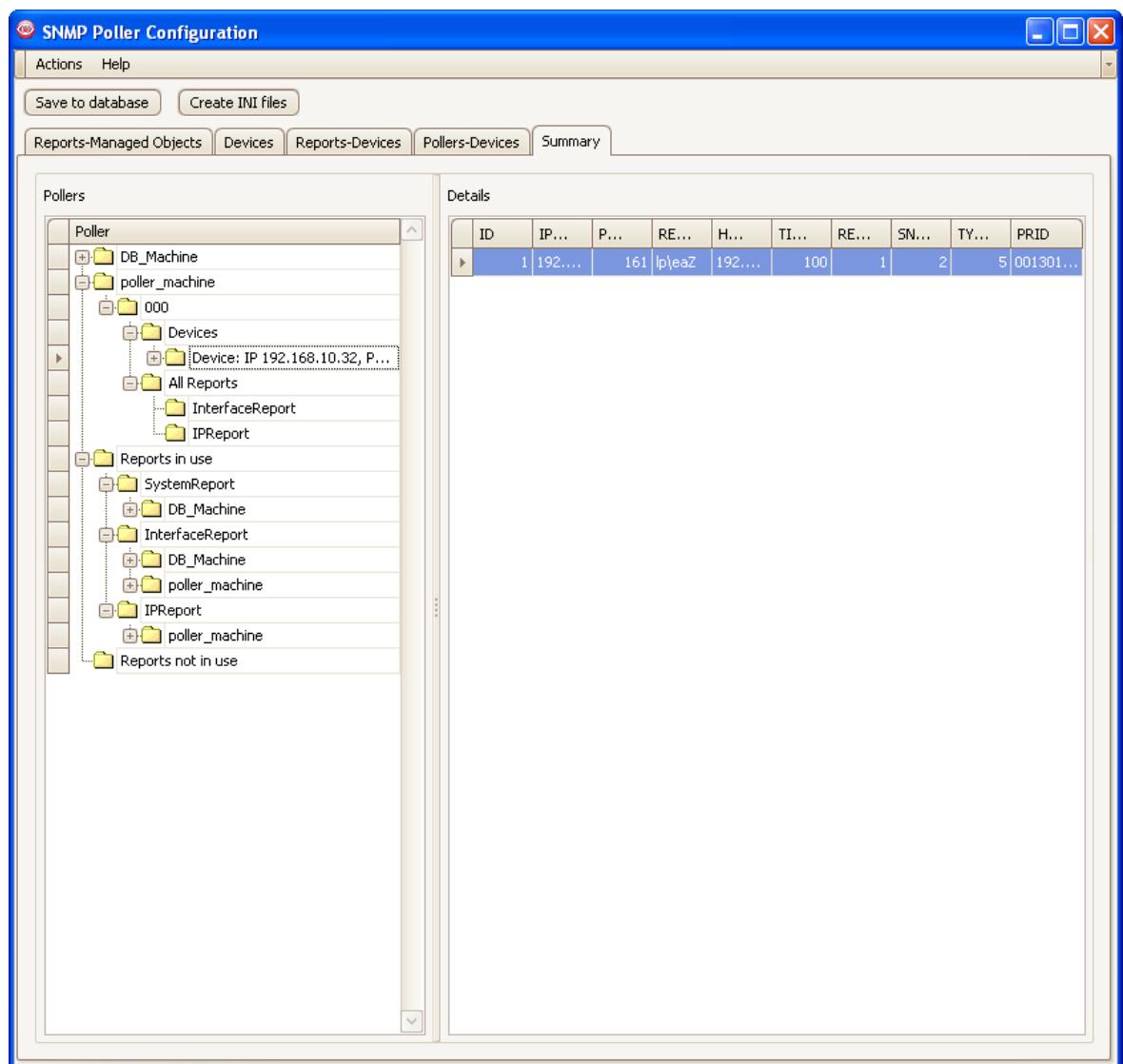
To remove an assignment:

- In the Selected Instance Device pane, right-click the device name, and from the menu that appears, click Remove Device. Then click Yes to confirm the deletion.
 - or -
 - Right-click in the Selected Instance Device pane, and from the menu that appears, click Remove All Devices. Then click Yes to confirm the deletion.
- 7 Click the 'Save to database' button to save the assignments that you have configured.

3.5.3.7 Viewing a Summary of the SNMP Poller Configuration

On the Summary tab, you can view a summary of the details that you have configured for the SNMP Poller.

This picture shows an example:



SNMP Poller Summary tab

The Summary tab lists:

- The devices attached to each machine
- The reports attached to each device
- The reports that are not in use

If you select an item in the Pollers pane, you can view more information in the Details pane.

3.5.3.8 Generating an INI File of SNMP Poller Settings

When you have finished configuring the SNMP Poller GUI, you can generate an INI file containing all of settings that you have configured. To do this:

- 1 Click Create INI files.
- 2 In the Browse For Folder dialog box that appears, select the required location for the new INI file:



You can create a new folder by selecting the required folder level and then clicking the Make New Folder button.

- 3 Click OK.

A new INI is created.

To see an example, see Example INI File Generated by the SNMP Poller GUI on page 78.

Example INI File Generated by the SNMP Poller GUI

This shows an example INI file that is generated by the SNMP Poller GUI:

```
[DIR]
LogDir=C:\Development\Test\opx_DAP_GEN_301\log
TempDir=C:\Development\Test\opx_DAP_GEN_301\temp
PIDFileDir=C:\Development\Test\opx_DAP_GEN_301\prid
DirTo=C:\Development\Test\opx_DAP_GEN_301\out

[MAIN]
InterfaceID=002
```

```
ProgramID=301
InstanceID=001
LogGranularity=3
LogSeverity=2
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000
```

[OPTIONS]

```
Threads=10
```

[SNMP_DEVICES]

```
NumberOfDevices=2
Device1=6
Device2=4
```

[6]

```
IPAddress=1.1.1.12
Port=8001
Hostname=1.1.1.12
SNMPVersion=2
CommunityRead=public
RetryNo=1
Timeout=100
NumberOfReportsUsed=2
Report1=system
Report2=ip
```

[4]

```
IPAddress=1.1.1.11
Port=8001
Hostname=1.1.1.11
SNMPVersion=2
CommunityRead=public
RetryNo=1
Timeout=100
```

```

NumberOfReportsUsed=2
Report1=system
Report2=ip

[REPORTS]
NumberOfReports=2
Report1=system
Report2=ip

[system]
Name=system
NumberOfManagedObjects=7
mo1=sysDescr,.1.3.6.1.2.1.1.1.0,0
mo2=sysObjectID,.1.3.6.1.2.1.1.2.0,0
mo3=sysUpTime,.1.3.6.1.2.1.1.3.0,0
mo4=sysContact,.1.3.6.1.2.1.1.4.0,0
mo5=sysName,.1.3.6.1.2.1.1.5.0,0
mo6=sysLocation,.1.3.6.1.2.1.1.6.0,0
mo7=sysServices,.1.3.6.1.2.1.1.7.0,0

[ip]
Name=ip
NumberOfManagedObjects=20
mo1=ipForwarding,.1.3.6.1.2.1.4.1.0,0
mo2=ipOutRequests,.1.3.6.1.2.1.4.10.0,0
mo3=ipOutDiscards,.1.3.6.1.2.1.4.11.0,0
mo4=ipOutNoRoutes,.1.3.6.1.2.1.4.12.0,0
mo5=ipReasmTimeout,.1.3.6.1.2.1.4.13.0,0
mo6=ipReasmReqds,.1.3.6.1.2.1.4.14.0,0
mo7=ipReasmOKs,.1.3.6.1.2.1.4.15.0,0
mo8=ipReasmFails,.1.3.6.1.2.1.4.16.0,0
mo9=ipFragOKs,.1.3.6.1.2.1.4.17.0,0
mo10=ipFragFails,.1.3.6.1.2.1.4.18.0,0
mo11=ipFragCreates,.1.3.6.1.2.1.4.19.0,0
mo12=ipDefaultTTL,.1.3.6.1.2.1.4.2.0,0
mo13=ipRoutingDiscards,.1.3.6.1.2.1.4.23.0,0
mo14=ipInReceives,.1.3.6.1.2.1.4.3.0,0

```

```

mo15=ipInHdrErrors,.1.3.6.1.2.1.4.4.0,0
mo16=ipInAddrErrors,.1.3.6.1.2.1.4.5.0,0
mo17=ipForwDatagrams,.1.3.6.1.2.1.4.6.0,0
mo18=ipInUnknownProtos,.1.3.6.1.2.1.4.7.0,0
mo19=ipInDiscards,.1.3.6.1.2.1.4.8.0,0
mo20=ipInDelivers,.1.3.6.1.2.1.4.9.0,0

```

3.5.4 Running the SNMP Poller

After you have configured the SNMP Poller, you can then start it.

To do this, type the executable name and a configuration file name into the command prompt.

In Windows type:

```
opx_DAP_GEN_301.exe opx_DAP_GEN_301_001301001.ini
```

In Unix type:

```
opx_DAP_GEN_301 opx_DAP_GEN_301_001301001.ini
```

Configuration file names should contain the PRID name, to make them unique.

After the SNMP Poller has collected information, the data is loaded into the database using the Loader. For more information about the Loader, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.5.4.1 Maintenance of the SNMP Poller

In usual operation, the SNMP Poller should not need any special maintenance. During installation, the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However, AIRCOM International recommends the following basic maintenance checks are carried out for the SNMP Poller:

Check The	When	Why
Backup directory to ensure CSV files have been transferred.	Weekly	Files not transferring indicates a problem with the application.
Log file for error messages.	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

Stopping the SNMP Poller

The SNMP Poller will terminate when all reports have been collected from the SNMP Agent. You can stop the SNMP Poller before it has finished collecting reports by pressing CRTL-C or by closing the console window.

Checking the Version of the SNMP Poller

If you need to contact AIRCOM International support regarding any problems with the Directory Maintenance application, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_DAP_GEN_301.exe -v
```

In Unix:

```
opx_DAP_GEN_301 -v
```

For more information about obtaining version details, see About Versioning on page 22.

Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

3.5.4.2 Troubleshooting

The following table shows troubleshooting tips for the SNMP Poller:

Problem	Cause	Solution
Cannot save configuration (INI) file	User has insufficient privileges on configuration (INI) file or directory The file is read only or is being used by another application	Enable permissions Make file writable Close the Parser to release the configuration (INI) file
Application exits immediately	Another instance is running. Invalid or corrupt (INI) file	Use Process Monitor to check instances running
SNMP session not created	Network problem	Report to system administrator
Report not created	Error in the MIBReportINI file	Check the OIDs are valid

3.6

About the AIRCOM OPTIMA Parser

The AIRCOM OPTIMA Parser converts the raw network files from proprietary file format into comma separated values (CSV) format.

Specific parsers are provided for each interface. This section describes settings that are common to all parsers. You should refer to specific interface documents for the parsers deployed on a particular network.

The parser's interface enables you to configure the required information for the CSV files, for example directory settings, common settings and specific reports settings. This means that only the required data is loaded into the database.

When the CSV files are created, the files are sent to the input directory for data validation. Once validated, the CSV files are moved to the input directory for the loader. The data is then loaded into the database table by the loader application.

The AIRCOM OPTIMA Parser supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Error Files	If the application detects an error in the input file that prevents processing of that file, then the file is moved to an error directory and processing continues with the next file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.
Backup	The application can store a copy of each input file in a backup directory.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.6.1

The Parsing Process

On start up, the AIRCOM OPTIMA Parser loads all the configuration settings from the INI file into memory. In some cases, the settings could contain information on how data will need to be processed.

The Parser checks for any file(s) in the input folder that match the file mask. The Parser opens the file and starts processing the data.

By default, the Parser extracts from the input raw file all available measurement objects. The output file will be in comma separated value (CSV) format. While a file is being processed, it is stored in a temporary folder. This is to prevent incomplete files being sent to the Data Validation application.

When the parsing process has finished successfully, the processed file is moved from the temporary folder to the output folder. If any problem is encountered, the file will be moved to the error directory and a message will be added to the log file.

3.6.2 Installing the AIRCOM OPTIMA Parser

Before you can use the AIRCOM OPTIMA Parser, you need to install a file to the backend binary directory.

This file is parser-specific, for example, the Nortel XML Parser requires the following file:

- `opx_PAR_NOR_711.exe` (Windows)
- `opx_PAR_NOR_711` (Unix)

 A full list of the latest parser files for each vendor is available from Product Support. Alternatively, if you are an AIRCOM employee, you can obtain this from the intranet, from the 'AIRCOM OPTIMA Backend Latest Releases' option.

3.6.3 Starting the AIRCOM OPTIMA Parser

To start the AIRCOM OPTIMA Parser, type the executable file name and a configuration file name into the command prompt.

For example, the Nortel XML Parser requires the following to be typed in:

In Windows:

```
opx_PAR_NOR_711.exe opx_PAR_NOR_711.ini
```

In Unix:

```
opx_PAR_NOR_711 opx_PAR_NOR_711.ini
```

 In usual operation within the data loading architecture, all applications are scheduled. In normal circumstances, you should not need to start the program manually. For more information, see Starting and Stopping the Data Loading Process on page 23.

3.6.4 Configuring the AIRCOM OPTIMA Parser

The AIRCOM OPTIMA Parser is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The AIRCOM OPTIMA Parser configuration (INI) file is divided into two sections.

The following table describes the parameters in the [DIR] section:

Parameter	Description
DirFrom	The location of the input files.
DirTo	Where the files are output after parsing.
DirBackup	The location of the backup files.
ErrorDir	Where files with errors are sent.
TempDir	The location of temporary files created during the parsing process.
LogDir	The location of the log files.
PIDFilePath	The location of the monitor files.

The following table describes the parameters in the [MAIN] section:

Parameter	Description
LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily
LogLevel/Severity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical
RefreshTime	The pause (in seconds) between executions of the main loop when running continuously.
RunContinuous	0 - Have the Parser run once. 1 - Have the Parser continuously monitor for input files.
StandAlone	0 - Run the Parser with a monitor file. 1 - Run the Parser without a monitor file. Do not select Stand Alone if the Parser is scheduled or the AIRCOM OPTIMA Process Monitor is used.
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0). The default value is 0 ('OFF').
FolderFileLimit	The maximum number of output files that can be created in each output (sub) folder. The default value is 10,000. There is a limit of 100,000 on Windows and 500,000 on UNIX/Sun.  Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.
minimumFolderFileLimit	The minimum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be less than this, the application will not run. This is set as a read-only value of 100.
maximumFolderFileLimit	The maximum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be more than this, the application will not run. This is set as a read-only value of 100,000.
TruncateHeader	0 - Do not truncate header column names. 1 - Truncate any header column name which is more than 30 characters long.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).

Parameter	Description
InstanceID	The three-character program instance identifier (mandatory).
EnableCombiner	1 – Create combiner history files. 0 – Do not create combiner history files.
EnableBackup	1 – Enable to backup original input raw file(s) after successfully being processed. 0 – Do not enable backup therefore delete the input raw file(s) after successfully being processed.
InputFileMask	Filter for input file to process, for example, *C*.*
AdjustforDST	1 – Enable DST adjustment in accordance to the offset settings. 0 – Disable DST adjustment.
OffsetWhenDSTActive	Define time adjustment in minutes whenever DST is active, for example, OffsetWhenDSTActive=+60.
OffsetWhenDSTInactive	Define time adjustment in minutes whenever DST is inactive, for example, OffsetWhenDSTInactive=-120.
Iterations	This parameter is used when the application does not run in continuous mode so that it will be able to check for input files in the input folder for the number of required iterations before an exit. Integer values are allowed, like 1,2,3,4...

3.6.5 Defining Reports

Reports specify what information will be extracted by the AIRCOM OPTIMA Parser. You define reports by editing parameters in the configuration (INI) file with a suitable text editor.

The following table describes the parameters in the [REPORTS] section:

Parameter	Description
Number	Type the number of reports to be extracted.
Reportn	Type the unique name of the report, where n is the execution order position of the report, for example, Report1 will be executed before Report2.
MoidElements	Type the name(s) of the object(s) which the Parser will search for. Multiple objects must be separated by commas.
InputMask	Type the format of the input files.

The following example shows the definitions for two reports called EB001_UTRANCELL_DLACCESS and EB002_DLACCESSSTRATUMCONF:

```
[REPORTS]
Number=2
Report1=EB001_UTRANCELL_DLACCESS
Report2=EB002_DLACCESSSTRATUMCONF

[EB001_UTRANCELL_DLACCESS]
MoidElements=RncFunction,UtranCell,DlAccessStratumConf
InputMask=*. *

[EB002_DLACCESSSTRATUMCONF]
MoidElements=RncFunction,DlAccessStratumConf
InputMask=*. *
```

For more information, see Example Parser Configuration (INI) File on page 89.

3.6.6 Maintenance

In usual operation, the Parser should not need any special maintenance. During installation, the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

Check The	When	Why
Input directory for a backlog of files	Weekly	Files older than the scheduling interval should not be in the input directory. A backlog indicates a problem with the program.
Error directory for files	Weekly	Files should not be rejected. If there are files in the error directory analyse them to identify why they have been rejected.
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

3.6.6.1 Checking for Error Files

Files categorised as error files by the Parser are stored in the directory as defined in the configuration (INI) file.

The log file is expected to have information related to any error files found in the particular directory. For more information about the log file, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.6.6.2 Stopping the AIRCOM OPTIMA Parser

If the Parser is scheduled, then it will terminate when all files in the input directory have been processed.

If the Parser is run continuously, then the input directory is monitored continuously. In this case, the Parser can be terminated. For more information, see Starting and Stopping the Data Loading Process on page 23.

3.6.6.3 Checking the Version of the Parser

If you need to contact AIRCOM International support regarding any problems with the Parser, you must provide the version details.

You can either obtain the version details from the log file or you can type in the print command at the command prompt.

For example, the Nortel XML Parser requires the following to be typed in:

In Windows:

```
opx_PAR_NOR_711.exe -v
```

In Unix:

```
opx_PAR_NOR_711 -v
```

For more information about obtaining version details, see About Versioning on page 22.

3.6.6.4 Checking the Parser is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

3.6.7 Troubleshooting

The following table shows troubleshooting tips for the AIRCOM OPTIMA Parser:

Symptom	Possible Cause	Solution
Application not processing input files.	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings. File(s) do not match the input mask(s).	Use Process Monitor to check last run status. Check crontab settings. Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The process monitor will do this automatically. Change the input masks.
Application exits immediately.	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.
Files in Error Directory.	Incorrect configuration settings. Invalid input files.	Check log file for more information on the problems. Check error file format.

3.6.8 Example Parser Configuration (INI) File

```
[DIR]
DirFrom=${OPTDIR}/parsers/nortelUTRAN/in
DirTo=${OPTDIR}/parsers/nortelUTRAN/out
DirBackup=${OPTDIR}/parsers/nortelUTRAN/backup
ErrorDir=${OPTDIR}/parsers/nortelUTRAN/error
LogDir=${OPTDIR}/log
TempDir=${OPTDIR}/parsers/nortelUTRAN/tmp
PIDFilePath=${OPTDIR}/pids

[MAIN]
LogGranularity=3
LogLevel=2
RefreshTime=1
TruncateHeader=0
RunContinuous=0
ProcessAll=1
StandAlone=0
InterfaceID=001
ProgramID=711
InstanceID=001
EnableBackup=0
EnableCombiner=0
AdjustForDST=0
OffsetWhenDSTActive=+60
OffsetWhenDSTInactive=-60
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000

[REPORTS]
Number=8
Report1=EB001_UTRANCELL_DLACCESS
Report2=EB002_DLACCESSSTRATUMCONF
Report3=EB003_RNCFUNCTION
Report4=EB004_RADIOBEARERSET
Report5=EB005_ULACCESSSTRATUMCONF
Report6=EB006_NODEQUIPMENT
Report7=EB007_BTSCELL
Report8=EB008_PA

[EB001_UTRANCELL_DLACCESS]
MoidElements=RncFunction,UtranCell,DlAccessStratumConf
InputMask=*..*

[EB002_DLACCESSSTRATUMCONF]
MoidElements=RncFunction,DlAccessStratumConf
InputMask=*..*

[EB003_RNCFUNCTION]
MoidElements=RncFunction
InputMask=*..*

[EB004_RADIOBEARERSET]
MoidElements=RncFunction,DlRadioBearerSet
InputMask=*.*
```

```

[EB005_ULACCESSSTRATUMCONF]
MoidElements=RncFunction, UlAccessStratumConf
InputMask=*. *

[EB006_NODEQUIPMENT]
MoidElements=NodeBEquipment
InputMask=*. *

[EB007_BTSCELL]
MoidElements=NodeBEquipment, BtsCell
InputMask=*. *

[EB008_PA]
MoidElements=NodeBEquipment, PassiveComponent, PA
InputMask=*. *

```

3.7 About the File Combiner

The File Combiners enable you to merge the CSV files output by certain parsers into new combined CSV files. CSV files can be combined before data validation or as part of the data validation process. For more information on data validation, see the AIRCOM OPTIMA Operations and Maintenance Guide.



The File Combiners only work with specific parsers. For more information contact AIRCOM International support.

There are two File Combiners:

- Single input File Combiner
- Multiple input File Combiner (recommended)

The File Combiners use a configuration file (INI) to store information about combining the files. The configuration file can be edited using a suitable text editor.

The content of each combined file is defined in a report, which is stored in the configuration file. Within a report, you specify which type of input files will be combined and which common columns of data from the input files will be included in the output file. For more information, see Defining Reports on page 94.

The File Combiners support these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Error Files	If the application detects an error in the input file that prevents processing of that file, then the file is moved to an error directory and processing continues with the next file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.
Backup	The application can store a copy of each input file in a backup directory.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.7.1 What is Combining?

The following process describes how files are combined by the File Combiners:

- 1 During parsing, the File Combiner-specific parser extracts data from raw input files and stores it in CSV files. The file name of each CSV file contains the object type that the File Combiner will use in the combining process, in the format:
`<raw file name>_<object type>_<process date time stamp>.csv`
- 2 On start up, the File Combiner loads the report(s) from the configuration file into memory. The report(s) contain the types of the files that are to be combined and their expected common columns. If there are multiple reports, the application will process them one at a time.
- 3 The File Combiner application loads the CSV files from the combined log file(s) and checks that the CSV files contain the types specified in the report.
- 4 The File Combiner opens the first CSV file and stores the number of rows it has in memory. This row count is used as a reference value to ensure that all files to be combined have the same number of rows. Files cannot be combined if they have different numbers of rows.
- 5 The File Combiner checks that the header columns of the CSV file match the common columns specified in the report. If the column comparison matches successfully, the other columns of the CSV file are stored in memory and the next CSV file is processed. When all CSV files have been processed, the File Combiner combines all of the stored columns into a new CSV file with a single common header. The new combined file is moved into the correct output folder.
- 6 While a file is being processed by the File Combiner, it is stored in a temporary folder. This is to prevent incomplete files being sent to the Loader input directory. When the combining process has finished successfully, the processed file is moved from the temporary folder to the Loader input directory.

If you are using the single input File Combiner, once a CSV file has been successfully created and saved, its file name and directory path are logged by the parser in a combined log file. For more information on parsing, see The Parsing Process on page 83.

3.7.2 Installing the File Combiners

Before you can use one of the File Combiners, you must install the appropriate file to the backend binary directory. This table describes the available options:

For this File Combiner	For this Operating System	Install this file
Multiple Input	Windows (with ActivePerl)	opx_CMB_GEN_903.pl
	Unix	opx_CMB_GEN_903.pl
Single Input	Windows	opx_CMB_GEN_900.exe
	Unix	opx_CMB_GEN_900

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.7.3 Starting the File Combiners

To start the required File Combiner, type the appropriate executable file name and a configuration file name into the command prompt.

This table describes the available options:

For this File Combiner	For this Operating System	Type the following into the command prompt
Multiple Input	Windows (with ActivePerl)	C:\opx_CMB_GEN_903.pl perl.ini
	Unix	./opx_CMB_GEN_903.pl perl.ini
Single Input	Windows	C:\opx_CMB_GEN_900.exe opx_CMB_GEN_900.ini
	Unix	./opx_CMB_GEN_900 opx_CMB_GEN_900.ini

3.7.4 Configuring the Single Input File Combiner

The File Combiners are configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The File Combiner configuration (INI) file is divided into different sections.

The following table describes the parameters in the [DIR] section:

Single Input File Combiner Parameter	Description
LogDir	The location of the log files created by the File Combiner.
TempDir	The location of temporary files created during the combining process.
PIDFileDir	The location of the monitor (PID) files.
DirFrom	The location of the log files output by the Parser.
DirTo	Where the files are output after combining.
DirBackup	The location of the backup files.
ErrorDir	Where files with errors are sent.
DirIncomplete	Where files that are incomplete are sent after the combining process.

The following table describes the parameters in the [MAIN] section:

Single Input File Combiner Parameter	Description
LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily
LogSeverity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical
RefreshTime	The pause (in seconds) between executions of the main loop when running continuously.
EnableBackup	0 - Do not store backup copies of input files. 1 - Store backup copy of each input file in the backup directory.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
InputFileMask	The file mask definition for combiner historic / log files.
Iterations	This parameter is used when the application does not run in continuous mode so that it will be able to check for input files in the input folder for the number of required iterations before an exit. Integer values are allowed, like 1,2,3,4...

The following table describes the parameters in the [OPTIONS] section:

Parameter	Description
MoveUncombinedFiles	Specifies what the File Combiner should do with uncombined files. The available options are: 0 - Do not move file. 1 - Move file to directory specified in DirIncomplete parameter. 2 - Delete file. 3 - Move file to directory specified in DirTo parameter plus last sub-path of original path.

For more information, see Example Single Input File Combiner Configuration (INI) File on page 95.

3.7.4.1 Defining Reports

Reports specify which input files will be combined and which common columns of data from the input files will be included in the output file. You define reports by editing parameters in the configuration (INI) file with a suitable text editor.

The following table describes the parameters in the [REPORTS] section:

Parameter	Description
Number	Type the number of reports to be combined.
Reportn	Type the unique name of the report, where n is the execution order position of the report, for example, Report1 will be executed before Report2.
Types	Type the names of the files you want to combine.
KeyFields	Type the common columns that you want to use in the report.
ExcludeFields	Type the columns you want to exclude from the report.

The following example shows the definitions for two reports called UtranCell and UeRc:

```
[REPORTS]
Number=2
Report1=UtranCell
Report2=UeRc

[UtranCell]
Types=pmSamplesCs12RabEstablish,pmNoDirRetrySuccess,pmULTraffic
VolumePsStr64Ps8
KeyFields=ffv,SubNetwork,SubNetwork1,MeContext,st,vn,cbt,mff,N
ewVnNode,neun,nedn_SubNetwork,nedn_SubNetwork1,nedn_MeContext,mt
s,gp,ManagedElement,RncFunction,UtranCell
ExcludeFields=DUMP

[UeRc]
Types=pmTransportBlocksAcUl,pmULRachTrafficVolume
KeyFields=ffv,SubNetwork,SubNetwork1,MeContext,st,vn,cbt,mff,N
ewVnNode,neun,nedn_SubNetwork,nedn_SubNetwork1,nedn_MeContext,mt
s,gp,ManagedElement,RncFunction,UeRc
ExcludeFields=DUMP
```

For more information, see Example Single Input File Combiner Configuration (INI) File on page 95.

3.7.4.2 Example Single Input File Combiner Configuration (INI) File

Here is an example Single Input File Combiner configuration file:

[COMMON]

```
LogDir=/var/optima/parsers/SiemensUTRAN/SiemensRNC/log
DirTo=/var/optima/parsers/SiemensUTRAN/Combiner/out
DirBackup=/var/optima/parsers/SiemensUTRAN/Combiner/backup
ErrorDir=/var/optima/parsers/SiemensUTRAN/Combiner/error
LogDir=/var/optima/log
TempDir=/var/optima/parsers/SiemensUTRAN/Combiner/tmp
PIDFilePath=/var/optima/pids
DirIncomplete=/var/optima/parsers/SiemensUTRAN/Combiner/out/INCOMPLETE
```

[MAIN]

```
LogGranularity=3
LogLevel=1
StandAlone=0
InterfaceID=001
ProgramID=900
InstanceID=050
InputFileMask=*.log
```

[REPORTS]

```
Number=5
Report1=RNC_STATS
Report2=CELLRRCRABCONNSTATS
Report3=CELLTRANSCODES
Report4=CELLSHOSTATS
Report5=CPSTATS
```

[RNC_STATS]

```
Types=rnc_paging1UraUtran,rnc_dhtAllocAtt
KeyFields=nEUserName,ElementFromFileName,fileFormatVersion,senderName
,senderTypePadded,senderType,vendorName,collectionBeginTime,measFileF
ooter,measTimeStamp,granularityPeriod,measObjInstId,measObjInstIdPadd
ed,measObjInstIdSenderName,suspectFlag
ReportActive=1
ExcludeFields=DUMP
```

[CELLRRCRABCONNSTATS]

```
Types=rrcEstabAtt,pchUsageRate
KeyFields=nEUserName,ElementFromFileName,fileFormatVersion,senderName
,senderTypePadded,senderType,vendorName,collectionBeginTime,measFileF
ooter,measTimeStamp,granularityPeriod,measObjInstId,measObjInstIdPadd
ed,measObjInstIdSenderName,suspectFlag
ReportActive=1
ExcludeFields=DUMP
```

[CELLTRANSCODES]

```
Types=transFromCellDchAtt,rabsPerQosClass
KeyFields=nEUserName,ElementFromFileName,fileFormatVersion,senderName
,senderTypePadded,senderType,vendorName,collectionBeginTime,measFileF
ooter,measTimeStamp,granularityPeriod,measObjInstId,measObjInstIdPadd
ed,measObjInstIdSenderName,suspectFlag
ReportActive=1
ExcludeFields=DUMP
```

```

[CELLSHOSTATS]
Types=hhoAllOutAtt,hhoAllOutAtt
KeyFields=nEUserName,ElementFromFileName,fileFormatVersion,senderName
,senderTypePadded,senderType,vendorName,collectionBeginTime,measFileF
ooter,measTimeStamp,granularityPeriod,measObjInstId,measObjInstIdPadd
ed,measObjInstIdSenderName,suspectFlag
ReportActive=1
ExcludeFields=DUMP

[CPSTATS]
Types=rncUsageRatio,rncUsageRatio
KeyFields=nEUserName,ElementFromFileName,fileFormatVersion,senderName
,senderTypePadded,senderType,vendorName,collectionBeginTime,measFileF
ooter,measTimeStamp,granularityPeriod,measObjInstId,measObjInstIdPadd
ed,measObjInstIdSenderName,suspectFlag
ReportActive=1
ExcludeFields=DUMP

```

3.7.5 Configuring the Multiple Input File Combiner

The Multiple Input File Combiner is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The Multiple Input File Combiner configuration (INI) file is divided into different sections.

The following table describes the parameters in the configuration (INI) file:

Parameter	Description	Default	Required?
NAME	The value given to the output measurement or the directory in which the resulting combined files are placed.	-	Yes
PRID	The Program ID for the particular instance of the File Combiner. It is composed of a 9-character identifier, made up of Interface ID, Program ID and Instance ID. For more information, see About Program IDs on page 17.	-	Yes
IN_DIR	The directory in which the input files are found. If SINGLE_DIRECTORY=1 then input files are to be found in this directory, otherwise input files are expected in subdirectories based on the name of the REPORTS.	-	Yes
OUT_DIR	The directory to which the files are output after combining. In the case of OUT_DIR, the directory under which the NAME directory is created and to which the combined files are output.	-	Yes
ERROR_DIR	The directory to which files with errors are sent.	-	Yes
BACKUP_DIR	The directory to which the input files are backed up. This uses the same subdirectory structure as IN_DIR.	-	Yes

Parameter	Description	Default	Required?
LOG_DIR	The directory for the log files created by the File Combiner application. Log files are named according to the following format: LOG_DIR + Path Separator + Program Name + _ + PRID + _ + current local date + .log	-	Yes
LIST_DIR	Not currently used. A list of filegroups that have already been processed.	-	Yes but not used at this time.
PRID_DIR	The directory where the PRID files are kept. PRID files are named according to the following format: PRID+DIR + Path Separator + Program Name + _ + PRID + .pid	-	Yes
NUM_REPORTS	The number of measurement groups to be combined. The report names themselves should correspond either to the sub-directory or to a component of the filename. This is so that the expected filename is matched to the group of files to be combined.	-	Yes
REPORTn={REPORTNAME}	The name of the measurement groups.	-	Yes
FILEFORMAT	A regular expression to determine the combined name from the input file name.	-	Yes
DO_BACKUP	0 – Do not store backup copies of input files. 1 – Store a backup copy of each input file in the backup directory.	0	No
REMOVEFROMFILENAME	This parameter takes comma-separated regular expressions to remove sections from the value matched by FILEFORMAT. This is so that more filenames can be grouped together as a filegroup. This is useful if there are sections in the filename that cannot be excluded by one regular expression.	-	Yes
DATEFORMAT	The date format to use to match the date part of the filename, in the form YYYYMMDD. This is converted into a series of regular expressions. For more information, see Converting DATEFORMAT to Regular Expressions on page 99.	-	Yes
STALEAFTER	Not currently used. The number of days to look back. Previously used in correlation with LIST_DIR.	-	Yes but not used at this time
KEYHEADERS	The headers in all input report files that are to be used as a 'primary' key to join 'rows' of files. These should appear in the INI file as a comma-separated string of key header columns, which the File Combiner divides into a list of strings.	-	No

Parameter	Description	Default	Required?
EXCLUDEHEADERS	The headers from any input report file that is to be removed from the output file. These should appear in the INI file as a comma-separated string of exclude header columns, which the File Combiner divides into a list of strings.	-	No
KEEPUNIQUEHEADERS	The headers that are in more than one input report file that will have the REPORTNAME prefixed to it to keep it unique after combination. These should appear in the INI file as a comma-separated string of keep unique header columns, which the File Combiner divides into a list of strings.	-	No
VERBOSE	Prints status messages to the screen. 0=Off 1=On	0	No
LOG_SEVERITY	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical	1	No
DELIMITER	The delimiter used between fields in the input file. This is most commonly a comma.	,	No
SAFETYPERIOD	How old a file must be (in minutes) before it is processed.	1	No
MIN_FILES_TO_COMBINE	The number of files (or elements of reports) which must be present before files are combined. For example, if you have 5 reports but only 4 of them consistently get files and MIN_FILES_TO_COMBINE= 4, then the 4 files will be combined even if the fifth one never arrives.	NUM_REPORTS	No
MAX_DELAY_ON_FILE	The number of minutes to wait for MIN_FILES_TO_COMBINE to be met before combining anyway.	1	No
SINGLE_DIRECTORY	Distinguishes between reports by filename rather than by the sub-directory they are in. 0=Off 1=On	0	No
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0).	0	No

Parameter	Description	Default	Required?
FolderFileLimit	<p>The maximum number of output files that can be created in each output (sub) folder.</p> <p>There is a limit of 100,000 on Windows and 500,000 on Sun/UNIX.</p> <p> Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.</p>	10000	No
minimumFolderFileLimit	<p>The minimum number of output files per folder that will be accepted.</p> <p>If the user sets the FolderFileLimit to be less than this, the application will not run.</p> <p>This is set as a read-only value.</p>	100	Yes
maximumFolderFileLimit	<p>The maximum number of output files per folder that will be accepted.</p> <p>If the user sets the FolderFileLimit to be more than this, the application will not run.</p> <p>This is set as a read-only value.</p>	100,000	Yes

For more information, see Example Multiple Input File Combiner Configuration (INI) File on page 101.

3.7.5.1 Converting DATEFORMAT to Regular Expressions

The Multiple Input File Combiner converts the DATEFORMAT pattern string in the INI file into a regular expression.

This table describes the rules that it uses:

Item	Rules
Month	<p>Replaces pattern MM with pattern [0-9] {2}</p> <p>Replaces pattern M[tT][hH](/0-9]+) with pattern \w{0-9}+}</p>
Year	<p>Replaces pattern YYYY with pattern [0-9] {4}</p> <p>Replaces pattern YY with pattern [0-9] {2}</p>
Day	<p>Replaces pattern DD with pattern [0-9] {2}</p> <p>Replaces pattern D with pattern \s?0-9 {1,2}</p>
Hour	<p>Replaces pattern HH24 with pattern [0-9] {2}</p> <p>Replaces pattern HH with pattern [0-9] {2}</p> <p>Replaces pattern [AP]M with pattern [AP]M/</p>
Minutes	Replaces pattern MI with pattern [0-9] {2}
Seconds	Replaces pattern SS with pattern [0-9] {2}
Date Separators	Replaces \ or / with /

To see an example of how the DATEFORMAT is processed, see Example of Converting DATEFORMAT to Regular Expressions on page 100.

Example of Converting DATEFORMAT to Regular Expressions

In this example, the parser has generated a CSV file, which is named based on the following format:

A20051023_1100_20051023_1400_xmlpd_total_number_of_successful_account_checks_20060329111650.csv

This means that the DATEFORMAT was set to AYYYYMMDD in the INI file.

Therefore, based on the rules of the Perl File Combiner, the DATEFORMAT is converted as follows:

- 1 The month check converts AYYYYMMDD to AYYYY[0-9]{2}DD
- 2 The year check converts this to A[0-9]{4}[0-9]{2}DD
- 3 The day check converts this to A[0-9]{4}[0-9]{2}[0-9]{2}
- 4 The format is unchanged by the remaining checks.

3.7.5.2 How File Groups Are Created

The Multiple Input File Combiner creates file groups according to the following process:

- 1 The input filename is compared with the DATEFORMAT regular expression, to ensure that the DATEFORMAT regular expression matches part of the filename.
If it does not match, then the input file is ignored.
- 2 The input filename is compared with the FILEFORMAT regular expression, to find which file group the input file belongs to.
If the filename does not match any part of the FILEFORMAT regular expression, it does not belong to any current file group and is ignored.
- 3 After the file group has been found, the File Combiner removes the list of REMOVEFROMFILENAME patterns from the file group name.

For example, in a scenario where:

- The input filename is
A20051023_1100_20051023_1400_xmlpd_total_number_of_successful_account_checks_20060329111650.csv
- The FILEFORMAT regular expression is: A[0-9]{8}_[0-9]{4}_[0-9]{8}_[0-9]{4}_xmlpd

The File Combiner will identify the file group as:

A20051023_1100_20051023_1400_xmlpd_

3.7.5.3 Example Multiple Input File Combiner Configuration (INI) File

Here is an example Multiple Input File Combiner configuration file:

```
NAME=CELLGPRS_CMB
PRID=001411028
IN_DIR=C:\base\optima\Interfaces\ericsson\Combiner\in
OUT_DIR=C:\base\optima\Interfaces\ericsson\Validator\in
ERROR_DIR=C:\base\optima\Interfaces\ericsson\Combiner\error
BACKUP_DIR=C:\base\optima\Interfaces\ericsson\Combiner\backup
LOG_DIR=C:\base\optima\log
LIST_DIR=C:\base\optima\tmp
PRID_DIR=C:\base\optima\pids
DO_BACKUP=1
REMOVEFROMFILENAME=GPR[S]*[0-9]
FILEFORMAT=[A-Z]+[0-9]-[A-Z]{2}[0-9]{6}
DATEFORMAT=MTH2DD
STALEAFTER=360
KEYHEADERS=SDATE,STARTTIME,OBJECTID
EXCLUDEHEADERS=INPUT_FILE_NAME,EXID2,EXID3,EXID4,ELEMENT
SAFETYPERIOD=5
SINGLE_DIRECTORY=0
VERBOSE=1
LOG_SEVERITY=0
NUM_REPORTS=3
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000
```

[REPORTS]

```
REPORT1=CELLGPRS
REPORT2=TRAFDLGPRS
REPORT3=TRAFULGPRS
```

3.7.6 Maintaining File Combiners

Usually the File Combiners should not need any special maintenance. During installation, the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However, AIRCOM International recommends the following basic maintenance checks are carried out for the File Combiners:

Check The	When	Why
Input directory for a backlog of files	Weekly	Files older than the scheduling interval should not be in the input directory. A backlog indicates a problem with the program.
Error directory for files	Weekly	Files should not be rejected. If there are files in the error directory analyse them to identify why they have been rejected.
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

3.7.6.1 Checking for Error Files

Files categorised as error files by the File Combiners are stored in the directory as defined in the configuration (INI) file.

The log file is expected to have information related to any error files found in the particular directory. For more information about the log file, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.7.6.2 Stopping File Combiners

If the File Combiner is scheduled, then it will only terminate when all files in the input directory have been processed.

However, if the File Combiner is run continuously, then the input directory is monitored continuously and in this case, it can be terminated.

3.7.6.3 Checking the File Combiner Version

If you need to contact AIRCOM International support regarding any problems with the File Combiners, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

For this File Combiner	For this Operating System	Type the following into the command prompt
Multiple Input	Windows (with ActivePerl)	C:\opx_CMB_GEN_903.pl perl.ini -v
	UNIX	\$./opx_CMB_GEN_903.pl perl.ini -v
Single Input	Windows	C:\opx_CMB_GEN_900.exe opx_CMB_GEN_900.ini -v
	UNIX	\$./opx_CMB_GEN_900 opx_CMB_GEN_900.ini -v

For more information about obtaining version details, see About Versioning on page 22.

3.7.6.4 Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

3.7.7 Troubleshooting File Combiners

The following table shows troubleshooting tips for the File Combiners:

Symptom	Possible Cause	Solution
Cannot save configuration (INI) file	User has insufficient privileges on configuration (INI) file or directory. The file is read only or is being used by another application.	Enable permissions. Make file writable Close the File Combiner to release the configuration (INI) file.
New configuration settings are not being used by the application	Settings are not saved to the configuration (INI) file. File created in the wrong location. The File Combiner has not restarted to pick up the new settings.	Check settings and location of file. Restart the File Combiner.
Application not processing input files	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings.	Use Process Monitor to check last run status. Check crontab settings (Unix only). Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The process monitor will do this automatically.
Application exits immediately	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.
Files in Error Directory	Incorrect configuration settings. Invalid input files.	Check log file for more information on the problems. Check error file format.

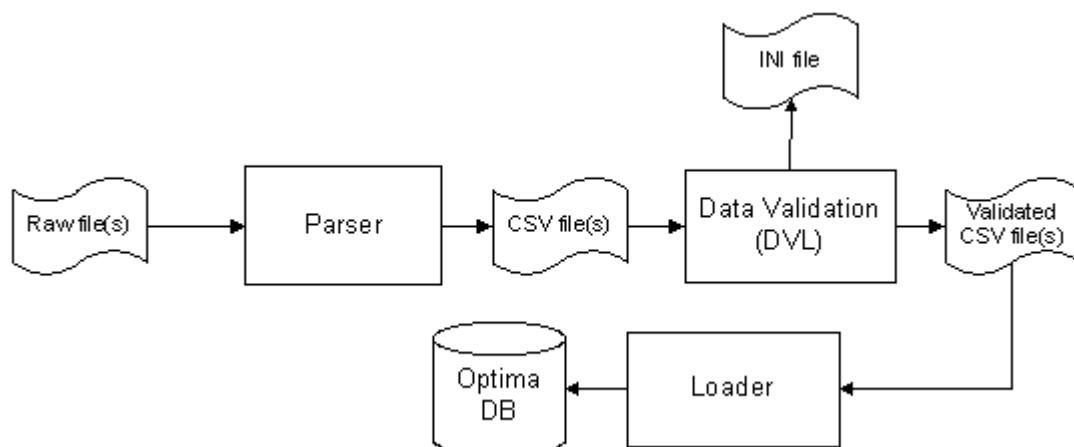
3.8 About the Data Validator

Data validation checks the CSV files created by the parser, ensuring column order, defaulting missing data values and splitting files if required. Once validated, the files are loaded into the database.

 The loader contains a number of validation options, which you can use instead of the separate Data Validation application. For more information, see the AIRCOM OPTIMA Operations and Maintenance Guide.

The data validation application uses a configuration file (INI) to store information about processing the files. The configuration file can be edited using a suitable text editor. For more information, see Configuring the Data Validation Application on page 106.

This diagram shows the data validation process:



Data Validation Process

The content of each output file from the data validation application is defined in a report, which is stored in the configuration file. Within a report, you can specify which columns of data from the input file will be included in the output file and the order in which they are required. You can define multiple reports to create multiple output files from a single input file.

If the data validation application is running when you make changes to the configuration (INI) file, you must restart the application for the changes to be effective.

The data validation program supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Error Files	If the application detects an error in the input file that prevents processing of that file, then the file is moved to an error directory and processing continues with the next file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.
Backup	The application can store a copy of each input file in a backup directory.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.8.1 The Validation Process

On startup, the data validation application loads the report(s) from the configuration file into memory. The report(s) contain the expected column(s) and the column(s) order for each output file.

The application checks for any file(s) in the input folder that match the file mask for the report and opens these files. The first row (header) of a file is split into different columns to get the actual order that will be compared with the column order listed in the report(s). If the column order comparison matches successfully, the file is validated and moved into the correct output folder. The output file may also be renamed based on the output file. If the column order does not match then the file needs to be processed further and the column order for the whole file is updated.

While a file is being processed by the data validation application, it is stored in a temporary folder. This is to prevent incomplete files being sent to the loader. When the validation process has finished successfully, the processed file is moved from the temporary folder to the output folder.

The output filename may also have a text value attached depending on the settings in the report. For more information about report settings, see Defining Reports on page 109.

3.8.2 Installing the Data Validation Application

Before you can use the data validation application, install the following file to the backend binary directory:

- opx_DVL_GEN_411.exe (Windows)
- opx_DVL_GEN_411 (Unix)

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.8.3 Configuring the Data Validation Application

The data validation application is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The data validation configuration (INI) file is divided into different sections.

The following table describes the parameters in the [DIR] section:

Parameter	Description
DirFrom	The location of the input files.
DirTo	Where the files are output after validation.
DirError	Where files with errors are sent.
DirBackup	The location of the backup files.
DirTemp	The location of temporary files created during the validation process.
DirLog	The location of the log files.
PIDFileDir	The location of the monitor (PID) files.

The following table describes the parameters in the [MAIN] section:

Parameter	Description
LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily (default)
LogSeverity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information (default) 3 - Warning 4 - Minor 5 - Major 6 - Critical
RefreshTime	The pause (in seconds) between executions of the main loop when running continuously.
RunContinuously	0 - Have the data validation application run once (default). 1 - Have the data validation application continuously monitor for input files.
EnableBackup	0 – Do not store backup copies of input files. 1 – Store backup copy of each input file in the backup directory.
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0). The default value is 0 ('OFF').

Parameter	Description
FolderFileLimit	<p>The maximum number of output files that can be created in each output (sub) folder.</p> <p>The default value is 10,000. There is a limit of 100,000 on Windows and 500,000 on UNIX/Sun.</p> <p> Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.</p>
minimumFolderFileLimit	<p>The minimum number of output files per folder that will be accepted.</p> <p>If the user sets the FolderFileLimit to be less than this, the application will not run.</p> <p>This is set as a read-only value of 100.</p>
maximumFolderFileLimit	<p>The maximum number of output files per folder that will be accepted.</p> <p>If the user sets the FolderFileLimit to be more than this, the application will not run.</p> <p>This is set as a read-only value of 100,000.</p>
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
EnableBackup	<p>1 – Enable to backup original input raw file(s) after successfully being processed.</p> <p>0 – Do not enable backup, and therefore delete the input raw file(s) after successfully being processed.</p> <p>The default value is 0.</p>
PollingTime	If you have selected to run data validation continuously, type the number seconds that must pass between each check for input files.
Iterations	<p>This parameter is used when the application does not run in continuous mode so that it will be able to check for input files in the input folder for the number of required iterations before an exit. Integer values are allowed, like 1,2,3,4.... The default is 5.</p> <p> If, during an iteration, no input files are found in the input folder, the program will exit.</p>

The following table describes the parameters in the [OPTIONS] section:

 These settings are not mandatory and the user can decide to use them.

Parameter	Description
SeparatorIn	Separator character for input files. The possible characters are: Comma "," Pipe " " Tab "TAB" Spaces "SPACE"
SeparatorOut	Separator character for output files. The possible characters are: Comma "," Semicolon ";" Pipe " " Tab "TAB" Spaces "SPACE"
HeaderLineNumber	The header line in the input file.
AvoidLineWithSubStrings=Avoid	Do not process the line where a specific string is found.
TrimHeader	Remove any spaces found around the header columns. Values 0-1.
TrimData	Remove any spaces found around the data values. Values 0-1.

3.8.4 Starting the Data Validation Application

To start the data validation application, type the executable file name and a configuration file name into the command prompt.

In Windows, type:

```
opx_DVL_GEN_411.exe opx_DVL_GEN_411.ini
```

In Unix, type:

```
opx_DVL_GEN_411 opx_DVL_GEN_411.ini
```

3.8.5 Defining Reports

Reports specify what information will be validated by the data validation application. You define reports by editing parameters in the configuration (INI) file with a suitable text editor.

The following table describes the parameters in the [REPORTS] section:

Parameter	Description
Number	Type the number of reports to be validated.
Reportn	Type the unique name of the report, where n is the execution order position of the report, for example, Report1 will be executed before Report2.
ReportActive	0 - Set the report to be non-active. Non-active reports are ignored by the data validation application. 1 - Set the report to be active.
UseETLLoader	0 - End line of output files will be dependent on operating system - WIN32 \r\n - UNIX \n 1 - End line of output files will always be UNIX format - UNIX \n
InputFileMask	Type in the file mask which the data validation application will match when selecting files to process.
OutputFileMask	Type the extension to give to output file names, for example, .csv.
MissingValue	Type the value to be used for any columns which are not in the file and are to be added to the database.
RemoveHeader	0 - Include header in the output file. 1 - Do not include header in the output file.
CheckLastRow	0 - Do not check for missing data in original file. 1 - Check for missing data in original file and log missing data in log file.
ColumnNumber	Type the number of header columns in the report.
Column	Type the column name.
CheckAllRows	Check if any data is missing in any line 0 - Do not check if any data is missing in any line 1 - Check if any data is missing in any line
ColumnsCaseSensitive	Make sure to compare the header columns as same case defined in the configuration (INI) file. 0 - Do not compare the header columns 1 - Compare the header columns

The following example shows the definitions for two reports called UTRANCELL_A and UTRANCELL_B:

```
[REPORTS]
Number=2
Report1=UTRANCELL_A
Report2=UTRANCELL_B

[UTRANCELL_A]
ReportActive=1
InputFileMask=*.csv
OutputFileMask=.csv
MissingValue=MISSING
RemoveHeader=0
UseETLLoader=0
CheckLastRow=0
ColumnNumber=8
Column1=subNetwork
Column2=subNetwork_1
Column3=ManagedElement
Column4=Start_Date
Column5=End_Date
Column6=RncFunction
Column7=UtranCell
Column8=VS.RadioLinkDeletionUnsuccess

[UTRANCELL_B]
ReportActive=1
InputFileMask=*.csv
OutputFileMask=.csv
MissingValue=MISSING
RemoveHeader=0
UseETLLoader=0
CheckLastRow=0
ColumnNumber=9
Column1=subNetwork
Column2=subNetwork_1
Column3=ManagedElement
Column4=Start_Date
Column5=End_Date
Column6=RncFunction
Column7=UtranCell
Column8=VS.3gto2gHoDetectionFromFddcell.RescueCs
Column9=VS.3gto2gHoDetectionFromFddcell.RescuePs
```

For more information, see Example Data Validation Configuration (INI) File on page 113.

3.8.6 Maintenance

In usual operation, the data validation application should not need any special maintenance. During installation, the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However, AIRCOM International recommends the following basic maintenance checks are carried out for the data validation application:

Check The	When	Why
Input directory for a backlog of files	Weekly	Files older than the scheduling interval should not be in the input directory. A backlog indicates a problem with the program.
Error directory for files	Weekly	Files should not be rejected. If there are files in the error directory analyse them to identify why they have been rejected.
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

3.8.6.1 Checking for Error Files

Files categorised as error files by the data validation application are stored in the directory as defined in the configuration (INI) file.

The log file is expected to have information related to any error files found in the particular directory. For more information about the log file, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.8.6.2 Stopping the Data Validation Application

If the data validation application is scheduled, then it will terminate when all files in the input directory have been processed.

If the application is run continuously, then the input directory is monitored continuously. In this case, the application can be terminated. For more information, see Starting and Stopping the Data Loading Process on page 23.

3.8.6.3 Checking the Version of the Data Validation Application

If you need to contact AIRCOM International support regarding any problems with the Data Validation application, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_DVL_GEN_411.exe -v
```

In Unix:

```
opx_DVL_GEN_411 -v
```

For more information about obtaining version details, see About Versioning on page 22.

3.8.6.4 Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

3.8.7 Troubleshooting

The following table shows troubleshooting tips for the data validation application:

Symptom	Possible Cause	Solution
Cannot save configuration (INI) file.	User has insufficient privileges on configuration (INI) file or directory. The file is read only or is being used by another application.	Enable permissions. Make file writable Close the data validation application to release the configuration (INI) file.
New configuration settings are not being used by the application.	Settings are not saved to the configuration (INI) file. File created in the wrong location. Data Validation application has not restarted to pick up the new settings.	Check settings and location of file. Restart the data validation application.
Application not processing input files.	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings.	Use Process Monitor to check last run status. Check crontab settings. Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The process monitor will do this automatically.
Application exits immediately.	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.
Files in Error Directory.	Incorrect configuration settings. Invalid input files.	Check log file for more information on the problems. Check error file format.

3.8.8 Example Data Validation Configuration (INI) File

```
[DIR]
DirFrom=C:\DVL\in
DirTo=C:\DVL\out
DirBackup=C:\DVL\backup
ErrorDir=C:\DVL\error
LogDir=C:\DVL\log
TempDir=C:\DVL\temp
PIDFileDir=C:\DVL\pids

[MAIN]
LogGranularity=3
LogLevel=2
RefreshTime=1
RunContinuous=0
StandAlone=0
InterfaceID=000
ProgramID=410
InstanceID=001
EnableBackup=1
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000

[REPORTS]
Number=2
Report1=UTRANCELL_A
Report2=UTRANCELL_B

[UTRANCELL_A]
ReportActive=1
InputFileMask=*.csv
OutputFileMask=.csv
MissingValue=
RemoveHeader=0
UseETLLoader=0
CheckLastRow=0
ColumnNumber=8
Column1=subNetwork
Column2=subNetwork_1
Column3=ManagedElement
Column4=Start_Date
Column5=End_Date
Column6=RncFunction
Column7=UtranCell
Column8=VS.RadioLinkDeletionUnsuccess
```

```

[UTRANCELL_B]
ReportActive=1
InputFileMask=*.csv
OutputFileMask=.csv
MissingValue=
RemoveHeader=0
UseETLLoader=0
CheckLastRow=0
ColumnNumber=9
Column1=subNetwork
Column2=subNetwork_1
Column3=ManagedElement
Column4=Start_Date
Column5=End_Date
Column6=RncFunction
Column7=UtranCell
Column8=VS.3gto2gHoDetectionFromFddcell.RescueCs
Column9=VS.3gto2gHoDetectionFromFddcell.RescuePs

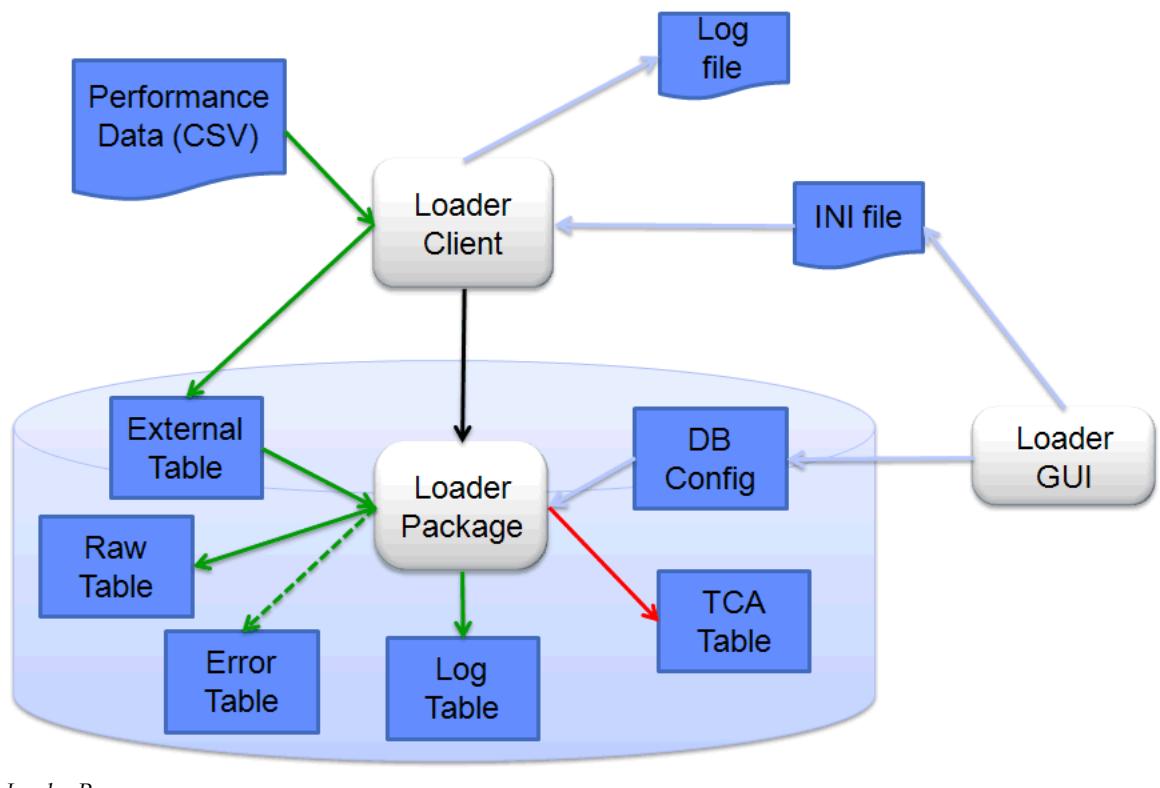
```

3.9 About the Loader

The Loader primarily loads transformed performance data into the database.

The Loader is configured via a Windows-based configuration utility with database connectivity. Multiple loaders can be configured and the necessary configuration information is written to both a configuration file and the loader configuration tables stored within the database.

This diagram shows the basic loader process:



The ETL Loader reads the current Loader report (configuration) information. The Loader then sends the data to a temporary Oracle external table. The data in this temporary table is then mapped to the destination table as specified in the loader configuration. The mapping of the raw data to the temporary table and the mapping of the temporary table to the destination table are defined using the ETL GUI.

In normal operation, the Loader requires:

- A Loader report to be configured.
- Data files in its input folder.

The Loader is invoked manually on the command line or automatically via a scheduler program, such as the Unix Crontab functionality.

As well as loading data, the Loader also contains validation options, which enable you to check the CSV files created by the parser, ensuring column order, defaulting missing data values and splitting files if required.

 If you use the validation options, you do not need to use the separate Data Validation application. However, for more useful information on the data validation process, see the AIRCOM OPTIMA Operations and Maintenance Guide.

3.9.1 Installing the Loader

Before you can use the Loader and the Loader Configuration GUI, install the following files to the backend binary directory.

For the Loader:

- opx_LOD_GEN_110_10g or opx_LOD_GEN_110_11g, depending on your Oracle version (Unix)
- opx_LOD_GEN_110_10g.exe or opx_LOD_GEN_110_11g.exe, depending on your Oracle version (Windows)

For the Loader Configuration GUI:

- opx_LOD_GEN_110_GUI.exe (Windows)

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

You must also:

- Install the AIRCOM OPTIMA Loader Oracle package in the database. Contact AIRCOM Support for installation and upgrade support for this component.
- Run the required database scripts. To do this:
 - Copy the loader scripts to a local folder with the same folder structure as originally defined. If you used the AIRCOM OPTIMA combined backend package, by default this will be C:\Program Files\AIRCOM International\AIRCOM OPTIMA Backend\Database\loader.
 - Open a command prompt, and change directory, to the directory containing the 'create_loader.sql'.
 - In the command prompt, type `sqlplus/nolog`.
 - Run the loader scripts as `@create_loader.sql` or `upgrade_loader_from_v6.1_to_v6.2.sql`, depending on whether it is a new database, or an upgrade of an existing database.
 - When prompted for usernames, passwords and TNS database names, enter them as required.
 - A 'create_loader.log' file is created for the installation, in the same location as `create_loader.sql`.

3.9.1.1 Starting the Loader

The Loader is a console application. Before you can start the Loader, you must ensure you have a valid configuration file and an AIRCOM OPTIMA database correctly configured and accessible.

To run the Loader, type in the executable file name and the configuration (INI) file name into the command prompt. For example:

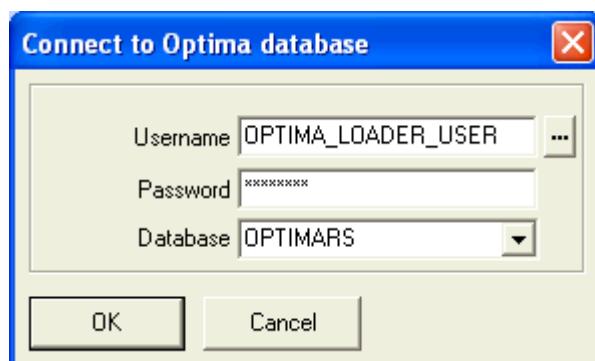
```
$OPTDIR/bin/opxLoad opxLoad_00000001.ini
```

3.9.1.2 Starting the ETL GUI

To start the ETL GUI:

- 1 Double-click the opx_LOD_GEN_110_GUI.exe:

The Connect to OPTIMA database dialog box appears:



- 2 Type a username and password. You can see a list of recently used usernames by clicking the Browse button.
- 3 From the list, select the database to which the Loader will send the data.

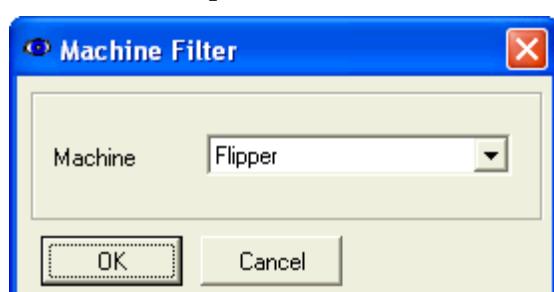
The database name must match the database alias on the local machine for the remote database, which is normally configured in the tnsnames.ora file.

- 4 Click OK.

The Machine Filter dialog box appears.

3.9.2 Selecting the Loader Machine

Once you have connected to the appropriate database, you can select the machine on which the Loader will be run by using the Machine Filter dialog box. This picture shows an example:



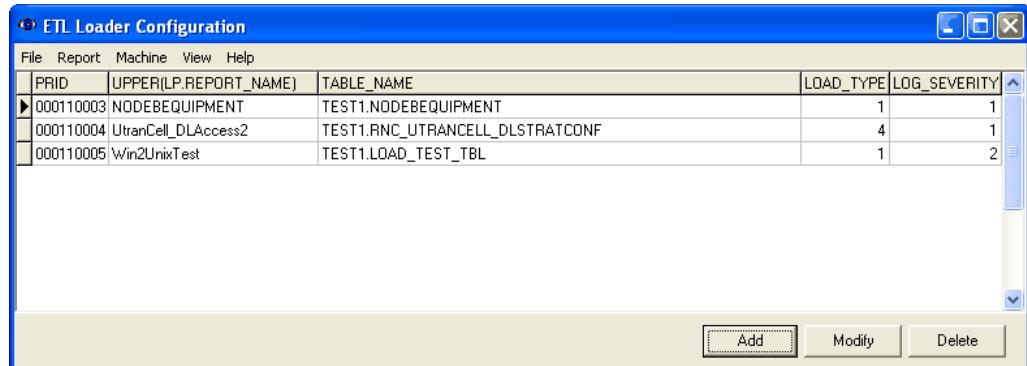
Machine Filter dialog box

To select the machine:

- 1 From the Machine list, select the name of the machine on which the Loader will be run.
- 2 Click OK.

3.9.3 About the ETL Loader Configuration Dialog Box

The ETL Loader Configuration dialog box shows a list of reports, which are used to configure the Loader. This picture shows an example:



ETL Loader Configuration window

This table describes the menu options:

Menu	Option	Description
File	Exit	Closes the ETL Loader Configuration dialog box.
Report	Add	Adds a new report.
	Modify	Edits the current report.
	Delete	Deletes the current report.
Machine	Select Machine	Opens the Machine Filter dialog box which enables you to select the name of the machine on which the Loader will be run.
View	Refresh	Refreshes the contents of the window.
Help	About	Provides useful information about the ETL Loader, for example, the version number.

This table describes the information that is shown for each report:

Column	Description
PRID	The Program Identifier, which is the Interface ID (3 numbers), Program ID (3 numbers) and Instance ID (3 characters, which can be a combination of numbers and uppercase letters).
Report Name	The user assigned name for the report.
Table Name	The name of the table to be loaded.
Load Type	Internal use only.
Log Severity	The severity level of the log.

From the ETL Loader Configuration window, you can add, modify or delete loader configuration reports.

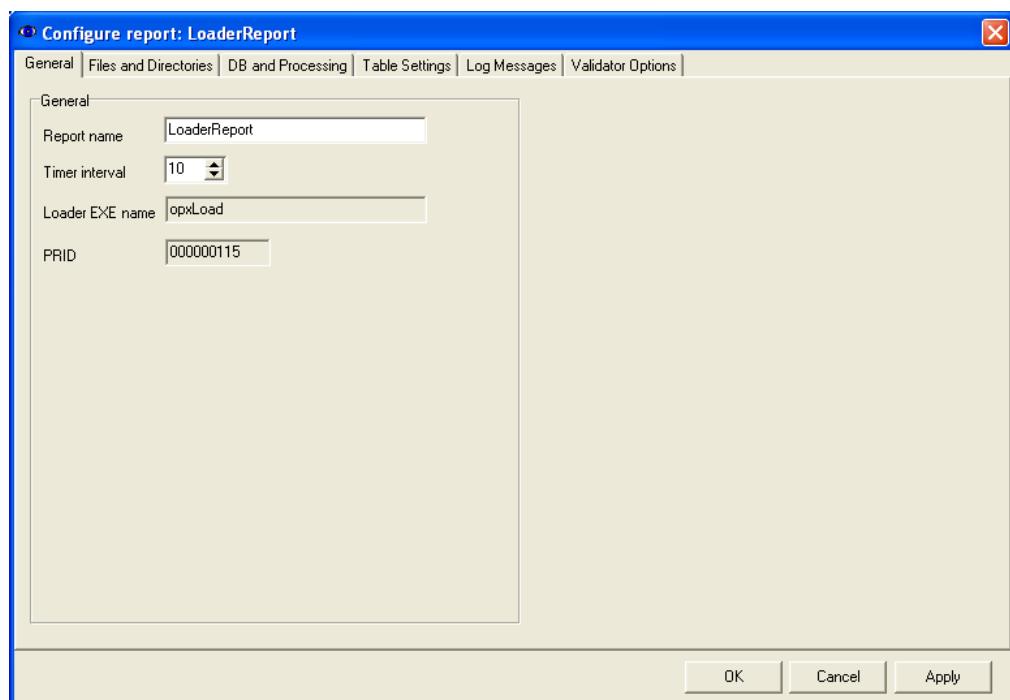
3.9.4 Configuring Reports

When you select to add or modify a loader configuration in the ETL Loader Configuration dialog box, the Configure Report window appears. This window has the following tabs, which you can use to configure the loader:

- General
- Files and Directories
- DB and Processing
- Table Settings
- Log Messages
- Validator Options

3.9.4.1 Defining the General Options for the Loader

The General tab allows you to set and modify the report name, how often new files are looked for and the name of the executable file. This picture shows an example:



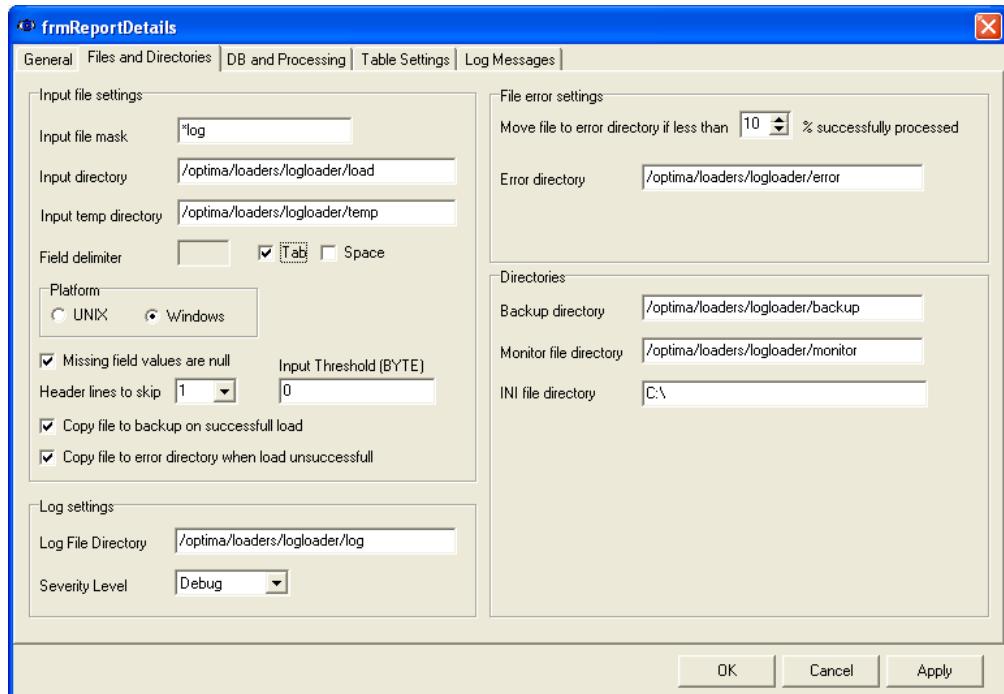
General tab

This table describes the information to complete the General tab:

Field	Description
Report Name	The name of the report. If you are modifying a report, you can change the name here.
Time Interval	The polling time, in seconds. This is how often the Loader will check the input file.
Loader EXE Name (read-only)	The name of the Loader binary executable file.
PRID (read-only)	The automatically assigned program identifier, which is unique to the Loader. For more information, see About Program IDs on page 17.

3.9.4.2 Defining the Files and Directories for the Loader

The Files and Directories tab allows you to specify the file settings and directories used in the Loader process. This picture shows an example:



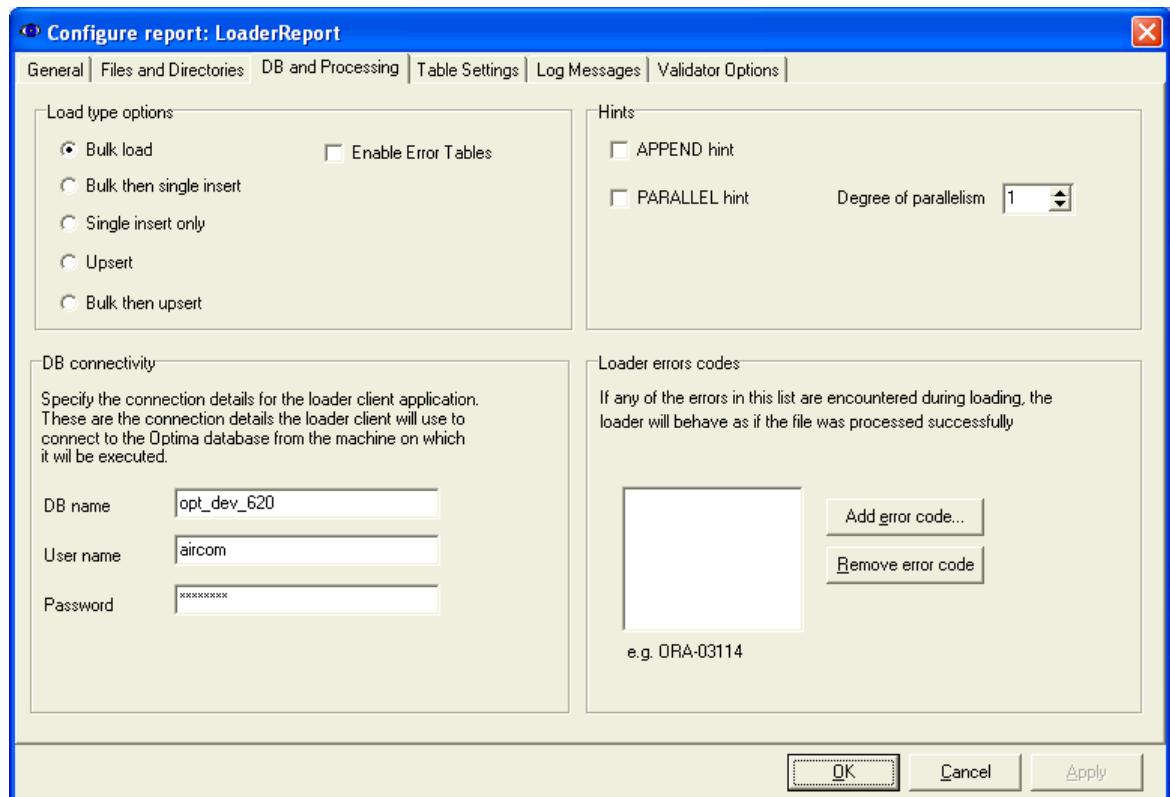
Files and Directories tab

This table describes the information to complete the File and Directories tab:

In This Field	Do This
Input File Mask	Type in the file mask which the Loader will match when selecting files to process.
Input Directory	Type the location of the input directory from which the raw data files will be processed.
Input Temp Directory	Type the location of the temporary directory.
Field Delimiter	Type the value you want to configure the Loader to use as a delimiter. If you want tab or space to be used as a delimiter, select the appropriate checkbox instead.
Tab	Select this checkbox if you want to configure the Loader to use tab as a delimiter.
Space	Select this checkbox if you want to configure the Loader to use space as a delimiter.
UNIX Platform	Select this radio button if the input files use a Unix style end of line character (Hex = 0A).
Windows Platform	Select this radio button if the input files use a Windows style end of line character (Hex = 0D 0A).
Missing Field Values are Null	Select this checkbox if you want a null value to be used when a value is missing from a record in the Loader input file. If you do not select this checkbox and there are missing field values, then an error will occur.
Header Lines to Skip	Select the number of lines from the top of the input file which you do not want to be loaded. For example, you can use this option to skip lines which contain headers or bad data.
Input Threshold (BYTE)	Type the value of the input threshold in bytes. The Loader can load several CSV files at once by combining them into a single external file. The input threshold is the maximum size of the single external file.
Copy File to Backup on Successful Load	Select this checkbox if you want a copy of the input file to be stored in the backup directory when the Loader process is successful.
Copy File to Error Directory when Load Unsuccessful	Select this checkbox if you want a copy of the input file to be stored in the error directory when the Loader process is unsuccessful.
Log File Directory	Type the location of the log file directory.
Security Level	Select the severity level for logging information when processing this report.
Move File to Error Directory if Less than % Successfully Processed	Set the minimum % of records to be loaded . If the number of records is less than this number, the input file will be moved to the error directory.
Error Directory	Type the location of the error directory.
Backup Directory	Type the location of the backup directory.
Monitor File Directory	Type the location of the directory where the Loader instances PID will be stored.
INI File Directory	Type the location of the directory where the initial configuration will be written.

3.9.4.3 Defining the Database and Processing Settings for the Loader

The DB and Processing tab allows you to determine how files are processed and loaded into the database. This picture shows an example:



DB and Processing tab

This table describes the information to complete the DB and Processing tab:

In This Field	Do This
Load Type Options	Bulk load
	Select this option to load data into the database in large chunks. This is the fastest method of loading data. However, if loading fails then none of the records in that chunk of data will be loaded.
	Bulk load then single insert
	Select this option to load data using the bulk load method but, if the bulk load fails then the same data will be loaded using one record at a time.
	Single insert only
Upstart	Select this option to update existing data in the destination table with incoming data in the loader input files (one record at a time). If none of the rows are affected by an update on a record then that record is inserted to the destination table.
	Bulk then upstart
	Select this option to use the bulk insert method but if the bulk insert fails then use an upstart.

In This Field	Do This	
	Enable Error Tables	<p>Select this option if you want to create an error log table, and store details of loading errors.</p> <p>This option is particularly useful if there is a reasonable chance that the data you want to load will produce 'primary key violation' errors, because if you use it in conjunction with the 'bulk then upsert' option, when the bulk load fails, the Loader will use the information logged in the error table to try to update/insert the errored rows correctly.</p> <p>For more information, see Checking the Loader Error Log Tables on page 134.</p> <p> This option is only available if you are using the 'Bulk load' or 'Bulk then upsert' load type options.</p>
Hints	APPEND hint	<p>Use the APPEND hint option when loading data into the database. This could provide increased performance under certain circumstances. Contact AIRCOM Support for more information, or consult your Oracle documentation.</p>
	PARALLEL hint	<p>Use the PARALLEL hint option when loading data to the database. This could provide increased performance under certain circumstances. Contact AIRCOM Support for more information, or consult your Oracle documentation.</p>
	Degree of Parallelism	Use the up and down buttons to set the degree of parallelism.
DB Name	Type the name of the database as defined on the Unix loader client machine containing the performance data table.	
Username	Type the username for the loader configuration instance.	
Password	Type the password for the loader configuration instance.	
Loader Error Codes	<p>Use this list to specify error codes that the Loader should ignore during loading. If the Loader encounters any of the error codes in this list during loading, it will ignore them and behave as if the loading process was successful.</p> <p>For more information, see Adding and Removing Loader Error Codes on page 124.</p> <p> You cannot use this option to ignore loading errors for the 'bulk load with error tables' or 'bulk then upsert with error tables' methods.</p>	

Adding and Removing Loader Error Codes

To add an error code to the Loader Error Code list:

- 1 On the DB and Processing tab, click the Add Error Code button.

The Add Oracle Error Code dialog box appears.

- 2 Type the error code you want to add.

 You must type a valid Oracle Error Code otherwise an error message will be displayed.

- 3 Click OK.

To remove an error code from the Loader Error Code list:

- 1 On the DB and Processing tab in the Loader Error Code list, select the error code that you want to remove.
- 2 Click the Remove Error Code button.

3.9.4.4 Defining the Table Settings for the Loader

The Table Settings tab contains the settings for the temporary and permanent tables used within the AIRCOM OPTIMA schema and for the location on the file system of the temporary external table and logs. This picture shows an example:

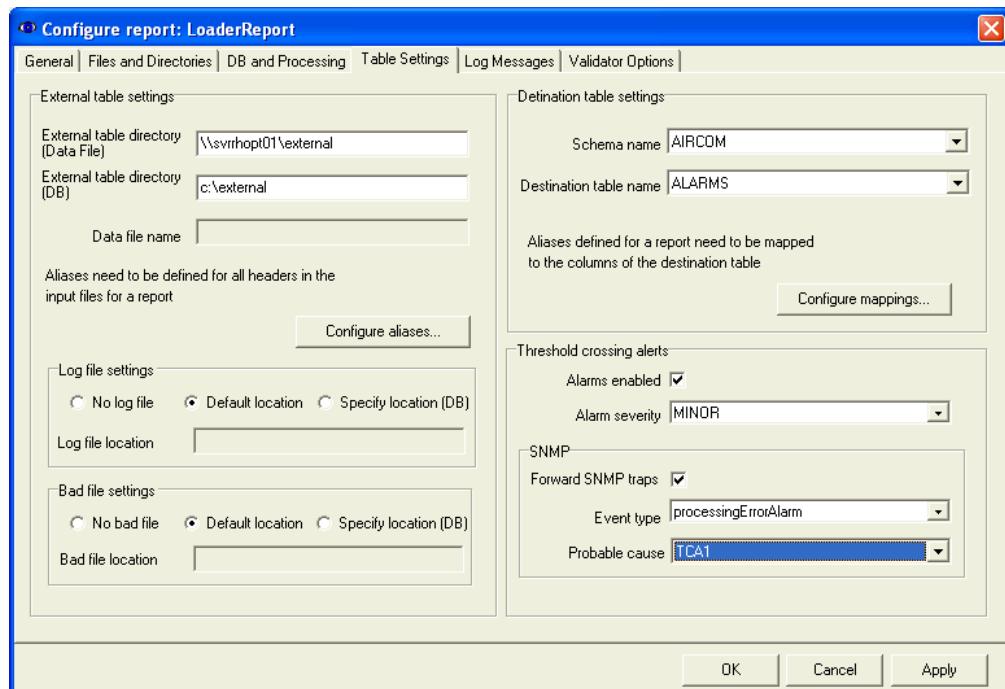


Table Settings tab

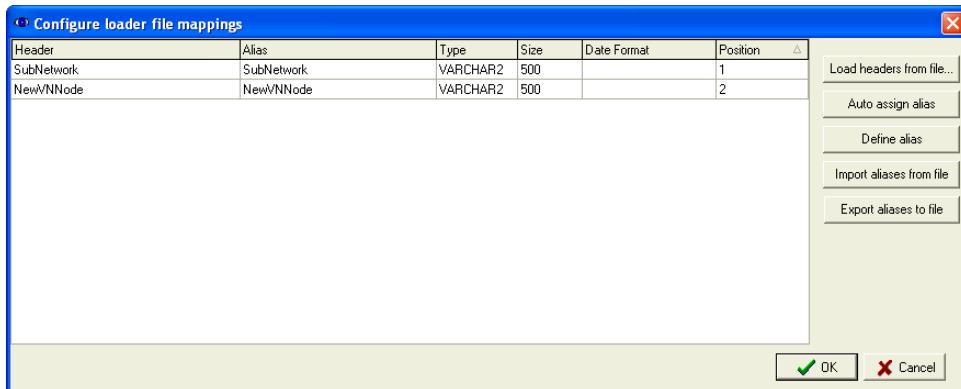
This table describes the information to complete the Table Settings tab:

In This Field	Do This	
External Table Directory (Data File)	<p>Type the location of the directory where the data file will be copied to. This will usually be a mapped drive pointing to the directory specified in the External Table Directory (DB) field.</p> <p> If the loader client is running on the database server, then this location will be the same as the External Table Directory (DB) location.</p>	
External Table Directory (DB)	<p>Type the location of the external table directory on the database server.</p> <p> AIRCOM International recommends that this directory is always a local directory on the database server and not a mapped drive pointing to a directory on another machine.</p>	
Data File Name	<p>Type the name of the external table.</p> <p>Click the Configure Aliases button to map column positions to meaningful aliases in the temporary table on a one-to-one basis. For more information, see Configuring Loader File Mappings on page 126.</p>	
Log File Setting	No log File	Select this option to prevent the creation of a log file.
	Default Location	Select this option to create a log file to the default location.
	Specify Location	Select this option to create a log file to the specified location.
Log File Location	<p>If you have selected Specify Location, type the location of the log file.</p> <p> Notes :</p> <ul style="list-style-type: none"> The log file location must be a local directory on the database server. The log file is produced by Oracle when accessing external tables. 	
Bad File Setting	No Bad File	Select this option to prevent the creation of a bad file log.
	Default Location	Select this option to create a bad file to the default location.
	Specify Location	Select this option to create a bad file to the specified location.
Bad File Location	<p>If you have selected Specify Location, type the location of the log file.</p> <p> Notes :</p> <ul style="list-style-type: none"> The bad file location must be a local directory on the database server. The bad file is produced by Oracle when accessing external tables. 	
Schema Name	Type the name of schema in which the destination table can be found.	
Destination Table Name	<p>Type the name of the database target table.</p> <p>Click the Configure Mappings button to:</p> <ul style="list-style-type: none"> Define the one-to-one or counter expressions mappings for raw data held in the external table to columns held in the destination table. Define Threshold Crossing Alerts (TCAs), which are loader-specific alarms raised on the data as it is loaded into AIRCOM OPTIMA <p>For more information, see Configuring Loader Table Mappings on page 127.</p>	
Threshold Crossing Alerts	<p>Select the Alarms enabled option if you want to enable any TCAs that you have defined during the mapping configuration.</p> <p>From the Alarms Severity drop-down list, choose the severity level for any TCAs that are raised.</p>	

In This Field	Do This
SNMP	If you have enabled TCAs - or want to use them in the future - select the Forward SNMP traps option to send TCA notifications by SNMP. Select the type of event and probable cause for the TCA from the available lists.

Configuring Loader File Mappings

When you click the Configure Aliases button on the Table Settings tab, the Configure Loader File Mappings dialog box appears. This picture shows an example:



Configure Loader File Mappings dialog box

This table describes the information in the dialog box:

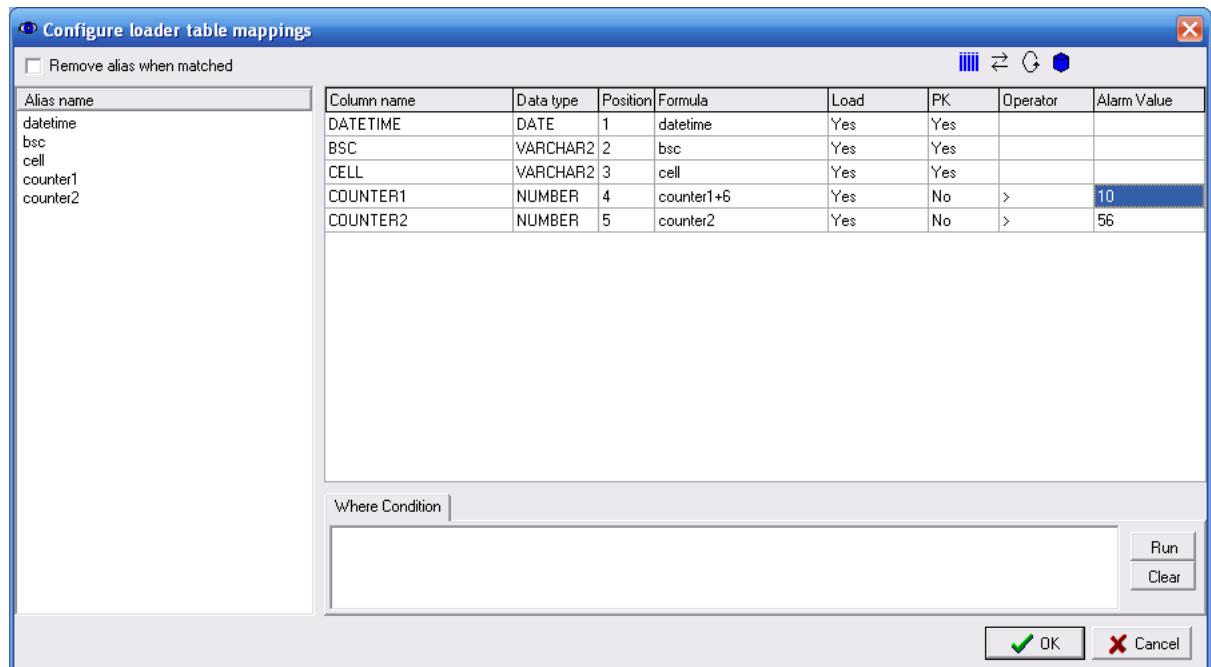
Column	Description
Header	The unique label given to the data position in the record. These are placeholder strings which are redefined to meaningful names by the Alias mapping.
Alias	Meaningful name given to the column position, which can be used in loadmap expressions.
Type	Oracle data type.
Size	Oracle data size.
Date Format	If the data type is specified as Date then PL/SQL format string for the expected date format is shown here.
Header Position	The position of the header in the input file.

To configure the aliases, click one of the buttons as described in the following table:

Click This Button	To Do This
Load Headers From File	Populate the header column from the first row of a data file. If the file does not contain a header row, then the first row of data is used.
Auto Assign Alias	Map the loaded headers directly to the alias column. Use this where the input file will provide meaningful headers.
Define Alias	Open the Assign Alias dialog box. Use this to modify an alias definition.
Import Alias From File	Read from a file with alias definitions defined.
Export Alias From File	Write alias definitions to a file.

Configuring Loader Table Mappings

When you click the Configure Mappings button on the Table Settings tab, the Configure loader table mappings dialog box appears. This picture shows an example:



Configure Loader Table Mappings dialog box

This table describes the information in the dialog box:

Column	Description
Alias Name	Name of the defined aliases representing the data which is to be mapped.
Column Name	Name of the target column when loading to the database.
Data Type	The data type of the database column.
Position	The column position in the table.
Formula	The PL/SQL formula used to map aliased data to a column in the database.
Load	States if the column in the database is to be loaded.
PK	States if the column in the database is a primary key column.
Operator, Alarm Value	<p>Define these values if you want a Threshold Crossing Alert (TCA) to monitor the value of this column when it is loaded into the database, and signal if any of the loaded values are incorrect.</p> <p>TCA are loader-specific alarms, which are raised as data is loaded into the AIRCOM OPTIMA database using the Loader. They indicate a discrepancy between the expected values according to the defined thresholds and the data loaded into the database after any modification during the loading process.</p> <p>A potential standard use may be to report on NULL values being inserted at load for faster reporting. This needs evaluation against Data Quality Nullness reports.</p> <ul style="list-style-type: none"> • Set the operator such as =, >, < or BETWEEN • Set the value (used in the conjunction with the operator) for which an alarm will be raised. <p>In the example picture above, TCAs have been set to trigger if the loaded value of COUNTER1 is greater than 10, and/or the value of COUNTER2 is greater than 56.</p> <p> Like performance and system alarms, raised TCAs are written to the ALARMS table, and can be forwarded using SNMP. For more information, see Defining the Table Settings for the Loader on page 124.</p> <p>These criteria are only available if the primary key of the destination table contains a date.</p> <p> When you set the Operator and Alarm Values criteria, ensure that you specify <i>alarm</i> values rather than acceptable values.</p>

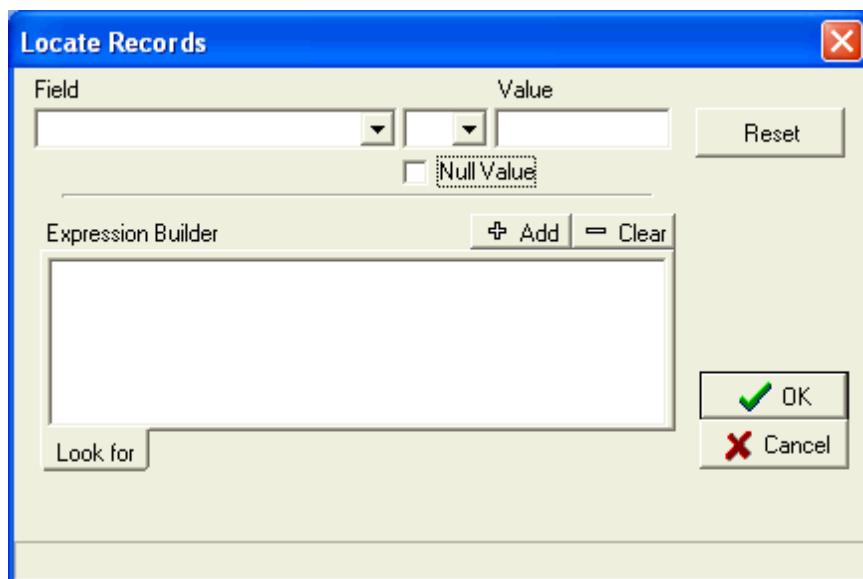
To configure the table mappings, click one of the buttons as described in the following table:

Click This Button	To Do This
Remove Alias When Matched	Remove entries from the alias name column when a one-to-one match is found in the formula.
	Load column data for the destination table from the database. For example Column name, Data type, Position, Load and PK fields.
	Match aliases to the destination table columns where a match exists.
	Clear the loader report configuration.
	Reload loader report information from database.
Run	Open the Locate Records dialog box. In the Locate Records dialog box, you can specify WHERE conditions to use when loading data between the external table and destination table.
Clear	Clear the Where Condition pane.

Adding a WHERE Condition

To add a WHERE condition:

- 1 In the Configure Loader Table Mappings dialog box, click Run. The Locate Records dialog box appears. This picture shows an example:



- 2 In the Locate Records dialog box, complete the following information:

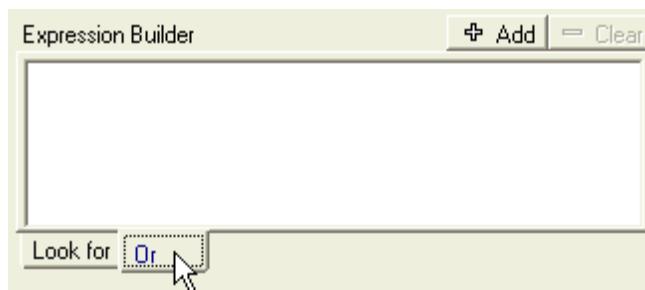
In This Field	Do This
Field	Select a field from the drop-down list.
Operator	Select an operator from the drop-down list.
Value	Type a value in the field
Null Value	Select this checkbox to use a null value instead of specifying an operator and value.

- 3 Click the Add button . The new condition is added to the Expression Builder pane.



To remove a condition from the Expression Builder pane, click the Clear button .

- 4 If you want to add an AND clause to your WHERE condition, repeat steps 2 to 3.
- 5 If you want to add an OR clause to your WHERE condition, click the OR tab at the bottom of the Expression Builder pane and then repeat steps 2 to 3.



To remove all of the conditions you have added, click Reset.

- When you have finished, click OK to save your changes and close the Locate Records dialog box.

Your WHERE condition is added to the Where Condition pane in the Configure Loader Table Mappings dialog box.

Defining TCAs for the Loader

When configuring the loader report, you can define TCAs (Threshold Crossing Alerts).

TCAs are loader-specific alarms, which are raised as data is loaded into the AIRCOM OPTIMA database using the Loader. They indicate a discrepancy between the expected values according to the defined thresholds and the data loaded into the database after any modification during the loading process.

TCAs are based on columns loaded into raw tables.

To define TCAs:

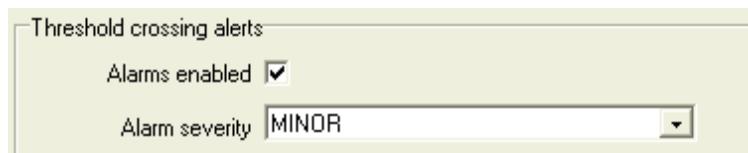
- On the Configure report dialog box, click the Table Settings tab.
- Click the Configure Mappings button.
- In the Configure loader table mappings dialog box, define the TCA threshold for each column for which you want to raise TCAs.

Select the operator and the corresponding alarm value - for example, '>' and '10' to raise a TCA if the column value is greater than 10:

Column name	Data type	Position	Formula	Load	PK	Operator	Alarm Value
DATETIME	DATE	1	datetime	Yes	Yes		
BSG	VARCHAR2	2	bsg	Yes	Yes		
CELL	VARCHAR2	3	cell	Yes	Yes		
COUNTER1	NUMBER	4	counter1+6	Yes	No	>	10
COUNTER2	NUMBER	5	counter2	Yes	No	>	56

- Click OK.
- On the Table Settings tab, in the Threshold crossing alerts pane:
 - Select the Alarms enabled option to enable the TCAs that you have defined
 - From the Alarms Severity drop-down list, choose the appropriate severity level for the TCAs when they are raised

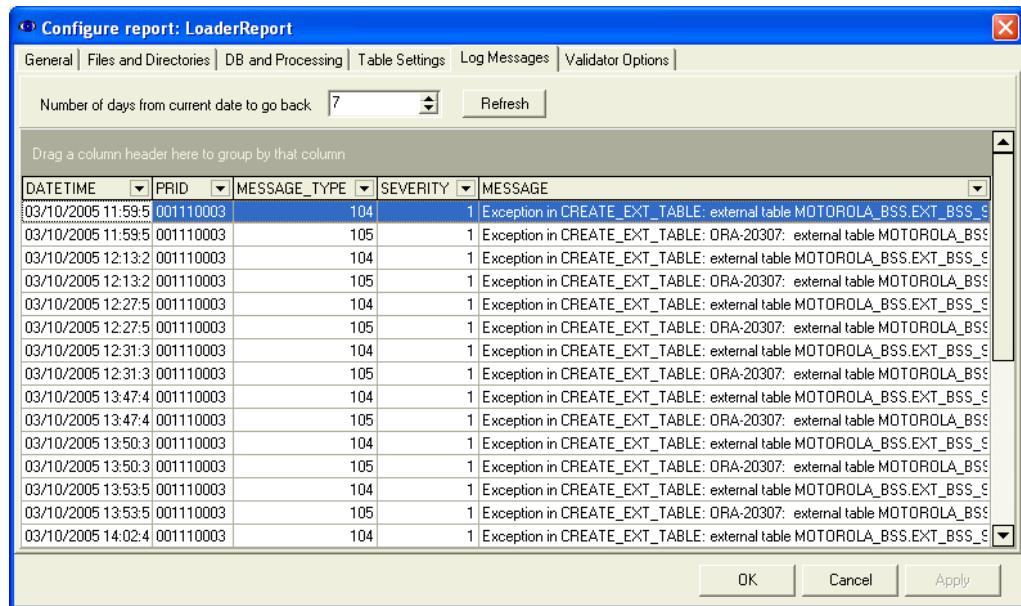
This picture shows an example:



- Click OK to save the TCA.

3.9.4.5 Defining the Log Messages for the Loader

Use the Log Messages tab to view the log messages produced for a report. To view a report's log message history, type the number of days history required in the 'Number of days from current date to go back' field and click Refresh. This picture shows an example:



Log Messages tab

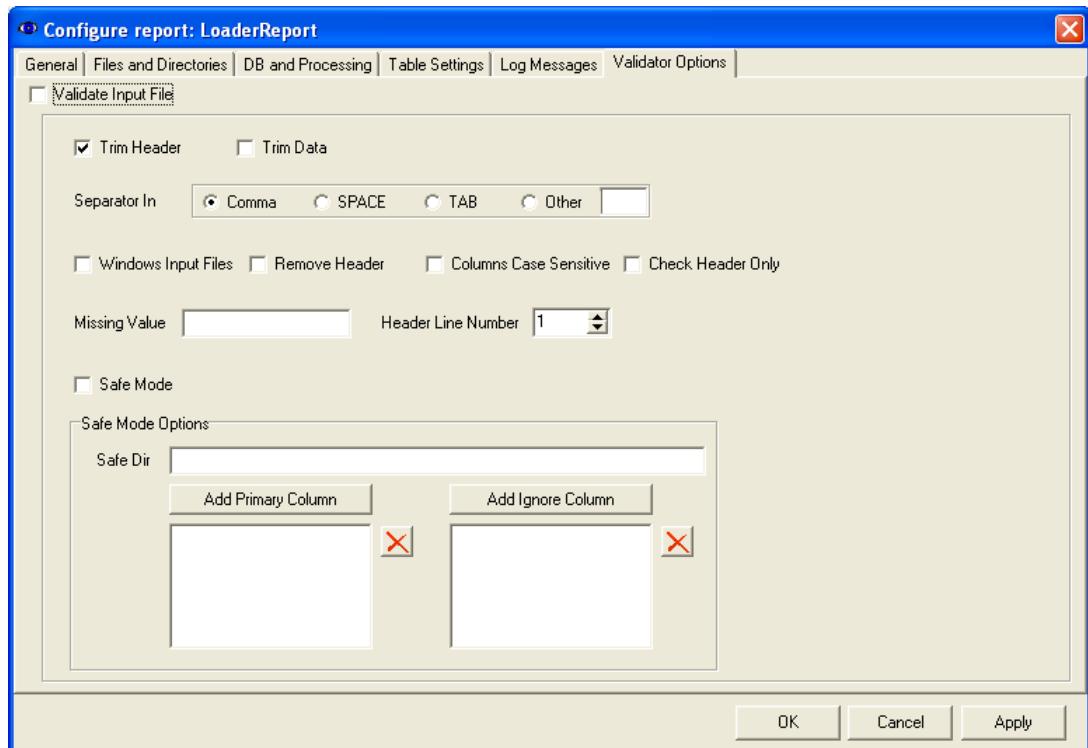
This table describes the information that is shown for each log message:

Column	Description
DATETIME	The date and time when the message was logged.
PRID	The Program Identifier, which is the Interface ID (3 numbers), Program ID (3 numbers) and Instance ID (3 characters, which can be a combination of numbers and uppercase letters).
MESSAGE_TYPE	The type of message that was logged.
SEVERITY	The severity level of the log message.
MESSAGE	The message that was logged.

3.9.4.6 Defining the Validator Options for the Loader

You can use the Validator Options tab to configure the Loader to perform the validation of the data before it is loaded.

This picture shows an example:



Example Validator Options tab

To configure the validation options:

- 1 Select the Validate Input File option.
- 2 Choose any trimming options that you want to use when validating the data. This table describes the options:

Option	Description
Trim Header	Removes any spaces found around the header columns.
Trim Data	Removes any spaces found around the data values.

- 3 Select the required separator for input files - comma, SPACE, TAB or another character.
- 4 Choose any additional options that you want to use when validating the data. This table describes these options:

Option	Description
Windows Input Files	Select this option if the files that are to be loaded/validated are in Windows format (where the lines end with \r\n).
Remove Header	Does not include the header in the output file.
Columns Case Sensitive	Compares the header columns to ensure that they are the same case.
Check Header Only	Only checks that the header is valid, not the entire file.

- 5 In the Missing Value box, type the value to be used for any columns which are not in the file and are to be added to the database.
- 6 In the Header Line Number box, specify the number of lines that need to be skipped in order to process the data.
- 7 You can choose to use Safe Mode.

Safe Mode enables you to generate a file containing the data for any new counters (or columns in the parser file header) that the parser outputs but were not expected based the configuration of the original report.

If you want to use Safe Mode:

- Select the Safe Mode option
- Define an appropriate directory for the generated new counter file to be stored.
- Select the primary and ignore columns for the new counter file:

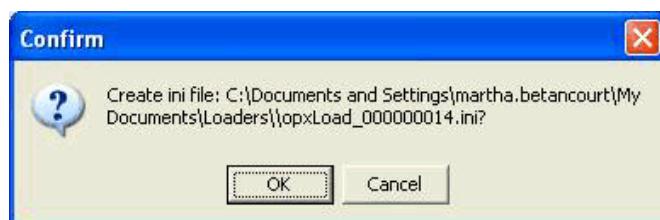
Column	Description
Primary	Primary columns are those which will be needed to load the new counter file. To add a primary column, click the Add Primary column button, type the name of the column and then click OK.
Ignore	Ignore columns are columns for any new counters that you know have been added since the validation report was created, but are not interested in, and want to exclude from the file. To add an ignore column, click the Add Ignore column button, type the name of the column and then click OK.

3.9.4.7 Saving the Configuration

Once you have configured the loader report, you must save the configuration information to the loader database configuration.

To do this:

- 1 Click Apply from any of the Configure Report Tabs.
- 2 In the Confirm dialog box, click OK to create an INI configuration file locally. The file is created in the location specified in the Loader report configuration.



 If you are loading on a Unix platform, then the INI file must be transferred to the AIRCOM OPTIMA Unix platform and passed as a parameter to the Loader.

- 3 In the next Confirm dialog box, click OK. This creates Oracle directory objects in the database that the Loader uses during processing.



3.9.5 Maintenance of the Loader

In usual operation, the Loader application should not need any special maintenance. During installation, the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However, AIRCOM International recommends the following basic maintenance checks are carried out for the Loader:

Check The	When	Why
Input directory for a backlog of files	Weekly	Files older than the scheduling interval should not be in the input directory. A backlog indicates a problem with the program.
Error directory for files	Weekly	Files should not be rejected. If there are files in the error directory analyse them to identify why they have been rejected.
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

3.9.5.1 Checking the Loader Error Log Tables

If you selected the Enable Error Tables option when you configured the database and processing settings for the loader, you can view loader error information in two places within the database:

- The LOADER_LOG table provides a brief description of the number of errors for a particular file (using the pre-batched filename) and the cause of the error. This picture shows an example, as seen in TOAD:

LOADER_LOG: Created: 16/07/2009 12:08:41 Last DDL: 22/07/2009 13:05:41					
Columns	Indexes	Constraints	Triggers	Data	Script
				<input type="checkbox"/> Sort by Primary Key <input type="checkbox"/> Desc	<input checked="" type="checkbox"/> Read Only
PRID	DATETIME	SEVERITY	MESSAGE_TYPE	MESSAGE	
000110001	17/08/2009 15:29:13.706000	1	1225	DEBUG: LOAD_DATA END	
000110001	17/08/2009 15:29:13.706000	1	131	End Error report	
000110001	17/08/2009 15:29:13.658000	2	132	For the file 'FN4' 1 error(s) found of type 'ORA-12899: value too large for column "M13". "M0\$RAW", "BSC"	
000110001	17/08/2009 15:29:13.658000	2	132	For the file 'FN4' 1 error(s) found of type 'ORA-12899: value too large for column "M03". "M0\$RAW", "BSC"	
000110001	17/08/2009 15:29:13.658000	2	132	For the file 'FN4' 2 error(s) found of type 'ORA-12899: value too large for column "M03". "M0\$RAW", "BSC"	
000110001	17/08/2009 15:29:13.658000	2	132	For the file 'FN3' 2 error(s) found of type 'ORA-12899: value too large for column "M13". "M0\$RAW", "BSC"	
000110001	17/08/2009 15:29:13.593000	1	131	Begin Error report	
000110001	17/08/2009 15:29:13.593000	2	115	loading time: start: 17-08-2009 15:29:13 end: 17-08-2009 15:29:13 load time: 00:00:00 load type: 12	



The filename will only be given in the LOADER_LOG table if the INPUT_FILE_NAME has been defined as one of the aliases in the external table settings (Loader File Mappings and Loader Table Mappings).

- The ERROR_LOG table (called ERR_PRID, where PRID is the Program ID) gives a detailed description of the load failures for each offending row. This picture shows an example, as seen in TOAD:

ERR_000110001: Created: 17/08/2009 15:25:46 Last DDL: 17/08/2009 15:29:13

ORA_ERR_NUMBER\$	ORA_ERR_MESSAGE\$	ORA_ERR_ROWID\$	ORA_ERR_OPTYPE\$	O...	DATETIME	BSC
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC1
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC1
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC2
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC3
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC3
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC3
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC3
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC3
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC3
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC4
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC4
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC5
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC5
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC6
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC7
1	ORA-00001: unique constraint (MJS.MJSRAW_PK) violated		I		01-JUL-09	BSC8
12899	ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 50, maximum: 30)		I		01-JUL-09	this-column-
12899	ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 55, maximum: 30)		I		01-JUL-09	this-column-
12899	ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 58, maximum: 30)		I		01-JUL-09	this-column-
12899	ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 50, maximum: 30)		I		01-JUL-09	this-column-

3.9.5.2 Checking the Version of the Loader

If you need to contact AIRCOM International support regarding any problems with the Loader, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_LOD_GEN_110_10g.exe -v
- or -
opx_LOD_GEN_110_11g.exe -v
```

In Unix:

```
opx_LOD_GEN_110_10g -v
- or -
opx_LOD_GEN_110_11g -v
```

For more information about obtaining version details, see About Versioning on page 22.

3.9.5.3 Checking Loader is Running

The AIRCOM OPTIMA Process Monitor allows the status of all AIRCOM OPTIMA backend processes to be determined. Once launched, the Loader should have an entry in the process table for a given program instance. For more information, see the AIRCOM OPTIMA User Reference Guide.

To ensure a program is running, the Process Monitor will examine the PIDs directory for a PID file matching the program identifier or PRID. If the PRID file exists, the PID is tested to check that it exists in the process table. If it does not, the PID is removed and the next scheduled Loader invocation should restart the Loader process. The Process Monitor can also be configured to periodically terminate the Loader instance to ensure that a zombie process does run unchecked for an extended period of time.

The Process Monitor functionality can also be performed at the command line using standard Unix commands, for example:

- To identify the PID of the running opx_LOD_GEN_110, go into the PIDs directory:

```
cd $OPTDIR/pids
```

- To display the file contents:

```
cat <hostname>_opx_LOD_GEN_110_00000001.pid
```

This should display the following information:

```
[PID]
```

```
PID = 9191
```

- To identify the PID in the process table:

```
ps -ef | grep 9191
```

If the process cannot be found in the process table, the program has terminated. The PID file should be removed from the monitor directory as other attempts to invoke the Loader will fail whilst the PID file exists.



For more information, see About Program IDs on page 17.

3.9.6 Troubleshooting

Loader Configuration Utility

Symptom	Possible Cause	Solution
Cannot save configuration (INI) file.	User has insufficient privileges on configuration (INI) file or directory. The file is read only or is being used by another application.	Enable permissions. Make file writable Close the Loader application to release the configuration (INI) file.
New configuration settings are not being used by the Loader.	Settings are not saved to the configuration (INI) file. INI file not moved to the correct directory on the Unix machine. Loader has not restarted to pick up the new settings.	Check settings and location of file. Restart the Loader application.
DB External Table Creation Error or 3120 Error	External table not created properly.	Check if an external (.ext) file exists on the DB machine in the external table directory. If not try and manually copy a file on the Parser Loader machine to this directory and check the directory paths and permissions. If a file does exist then check that the external file has the same number of columns as the external table definition and the same data types. Try defaulting the external table columns to VARCHAR2 (500) and loading all data types as a VARCHAR2 into the external table. Check if the external table exists inside TOAD (or similar program), and if not then run the external table script which is contained within the Loader Parameters table for this report. Try doing a <code>select * from the external table</code> if it does exist. Check in the external file for bad end of line characters and make sure that the correct file end of line format (Unix or Windows) is selected in the GUI. Check that the Oracle external table directory exists by using the following SQL: <code>select * from dba_directories</code>

Loader Application

Symptom	Possible Cause	Solution
Application not processing input files.	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings.	Use Process Monitor to check last run status. Check crontab settings. Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The process monitor will do this automatically.
Application exits immediately.	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.
Files in Error Directory.	Incorrect configuration settings. Invalid input files.	Check log file for more information on the problems. Check error file format.

3.9.7 Example Loader Configuration (INI) File

 Environment variables can be used within the directory specification, except for the External Table Directory - ExtTblDir.

 The direct modification of the GUI generated configuration file is not recommended.

```
[LoaderConfiguration]
Database=OPTPROD62
UserName=AIRCOM
Password=l\mlofhY
InterfaceId=001
ProgramId=110
InstanceId=009
PRID=001110009
TimeInterval=10
ExeName=opx_LOD_GEN_110
ReportName=CSV_NA_swFCPort_DC
ExtFileName=opx_LOD_GEN_110_001110009.ext
FileMask=*.csv
ErrThreshold=100
LogSeverity=2
DoBackup=0
DoCpyToErr=1
NumberOfHeaderLines=1
InputThresHold=0

InputDir=${OPTDIR}\Interfaces\BROCADE\IT\CSV\NA\parser\out\swFC
Port\
BackupDir=${OPTDIR}\Interfaces\BROCADE\IT\CSV\NA\loader\backup\
swFCPort\
ErrDir=${OPTDIR}\Interfaces\BROCADE\IT\CSV\NA\loader\error\swFC
Port\
LogDir=${OPTDIR}\log\
TempDir=${OPTDIR}\Interfaces\BROCADE\IT\CSV\NA\loader\tmp\swFCP
ort\
PIDFileDir=C:\OPTIMA\prids
ExtTblDir=C:\OPTIMA\extdir
ValidateInputFile=1

[VALIDATECONFIGURATION]
TrimHeader=1
TrimData=0
SeparatorIn=,
separatorOut=,
HeaderLineNumber=1
MissingValue=
RemoveHeader=0
ColumnsCaseSensitive=0
SafeMode=1
```

```

[SAFE]
SafeDir=C:\Development\Test\opx_LOD_GEN_110\newCounters
IgnoreColumns=0
PrimaryColumns=1
PrimaryColumn1=DateTime

[REPORTS]
Number=1
Report1=VALIDATION_REPORT

[VALIDATION_REPORT]
ColumnNumber=34
Column1=DateTime
Column2=IPADDRESS
Column3=PORT
Column4=Index
Column5=swFCPortCapacity
Column6=swFCPortIndex
Column7=swFCPortTxWords
Column8=swFCPortRxWords
Column9=swFCPortTxFrames
Column10=swFCPortRxFrames
Column11=swFCPortTxC2Frames
Column12=swFCPortRxC3Frames
Column13=swFCPortRxLCs
Column14=swFCPortRxMcasts
Column15=swFCPortTooManyRdys
Column16=swFCPortType
Column17=swFCPortNoTxCredits
Column18=swFCPortRxEncInFrs
Column19=swFCPortRxCrcs
Column20=swFCPortRxTruncs
Column21=swFCPortRxTooLongs
Column22=swFCPortRxBadEofs
Column23=swFCPortRxEncOutFrs
Column24=swFCPortRxBadOs
Column25=swFCPortC3Discards
Column26=swFCPortMcastTimedOuts
Column27=swFCPortPhyState
Column28=swFCPortTxMcasts
Column29=swFCPortLipIns
Column30=swFCPortLipOuts
Column31=swFCPortOpStatus
Column32=swFCPortAdmStatus
Column33=swFCPortLinkState
Column34=swFCPortTxType

```

This table describes the entries found in the [Loader Configuration] section of the ETL GUI generated INI configuration file:

Parameter	Description
Database	The database name as defined on the Loader server.
Username	The username for the specified database.
Password	The encrypted password for the Loader configuration instance.
Interface ID	The three-digit interface identifier (mandatory).
Program ID	The three-digit program identifier (mandatory).
Instance ID	The three-character program instance identifier (mandatory).
PRID	<p>The Program Identifier consisting of the concatenation of the Interface ID (3 numbers), Program ID (3 numbers) and Instance ID (3 characters, which can be a combination of letters and numbers).</p> <p>For more information, see About Program IDs on page 17.</p>
Time Interval	The pause (in seconds) between the executions of the main loop when running continuously.
ExeName	The name of the Loader Executable.
ReportName	An instance-unique report name.
ExtFileName	The external table file name.
FileMask	The file mask that the loader will match when selecting files to process.
ErrThreshold	The error threshold.
LogSeverity	Sets the level of information required in the log file. The available options are: 1-Debug 2-Information (Default) 3-Warning 4-Minor 5-Major 6-Critical
DoBackup	Indicates whether a copy of the input file will be copied to the backup directory (1) or not (0).
DoCpyToErr	Indicates whether the input file will be moved to the error folder when the load fails (1) or not (0).
NumberOfHeaderLines	The number of header lines to skip.
InputThresHold	<p>The input threshold in bytes.</p> <p>The loader can load several CSV files at once, by combining them into a single external file. The input threshold is the maximum size of the single external file.</p>
InputDir	The location of the input directory from where the raw data files will be processed.
BackupDir	The location of the raw file backup directory.
ErrDir	The location of the error directory.
LogDir	The location of the directory where log files will be stored.
TempDir	The location of the directory where temporary files will be stored.
PIDFileDir	The location of the directory where PID files will be created.

Parameter	Description
ExtTblDir	The location of the directory where the data file will be copied to. This will usually be a mapped drive pointing to a directory specified in the External Table Directory (DB) field. If the loader client is running on the database server, then this location will be the same as the External Table Directory (DB) location.
ValidateInputFile	Indicates whether the loader is also configured to perform the data validation (1) or not (0).

This table describes the entries found in the [VALIDATECONFIGURATION] section:

Parameter	Description
TrimHeader	If this is set to 1, any spaces found around the header columns will be removed. 0 indicates that these spaces will not be removed.
TrimData	If this is set to 1, any spaces found around the data values will be removed. 0 indicates that these spaces will not be removed.
SeparatorIn	Separator character for input files. The possible characters are: Comma "," Pipe " " Tab "TAB" Spaces "SPACE"
SeparatorOut	Separator character for output files. The possible characters are: Comma "," Semicolon ";" Pipe " " Tab "TAB" Spaces "SPACE"
HeaderLineNumber	The number of lines that need to be skipped in order to process the data.
MissingValue	The value used for any columns that are not in the file and are to be added to the database.
RemoveHeader	If this is set to 1, it does not include the header in the output file. 0 indicates that the header will be included.
ColumnCaseSensitive	If this is set to 1, the header columns are compared to ensure that they are the same case. 0 indicates that they will not be compared.
SafeMode	Indicates whether the Safe Mode option has been selected (1) or not (0).

This table describes the entries found in the [SAFE] section, which is only produced if the SafeMode option is selected on the Validator Options tab of the Loader:

Parameter	Description
SafeDir	The location of the directory of the new counter report generated in safe mode.
IgnoreColumns	The total number of ignore columns, which are columns for any new counters that you know have been added since the validation report.
IgnoreColumn n	The name of each ignore column, where n is the column number.
PrimaryColumns	The total number of primary columns, which are those which will be needed to load the new counter report.
PrimaryColumn n	The name of each primary column, where n is the column number.

This table describes the entries found in the [REPORTS] section:

Parameter	Description
Number	The total number of validation reports.
Report n	The name of each report, where n is the report number.

Each validation report will have its own section, containing the following entries:

Parameter	Description
ColumnNumber	The total number of columns (new counters) in the report.
Column n	The name of each column (new counter), where n is the column number.

3.10 Session Summary Checklist

This checklist has been provided as a self-assessment of the objectives stated at the beginning of the session.

Please tick all objectives covered in this session.

- Data Acquisition Tools
- Parser
- Combiner
- Validator (Splitter)
- Loader



Additional Notes:

4 ETL Supporting Components

4.1 Objectives of this Session

During this session you will learn about:

- Process Monitor
- Opxlog
- Directory maintenance

4.2 About the Process Monitor

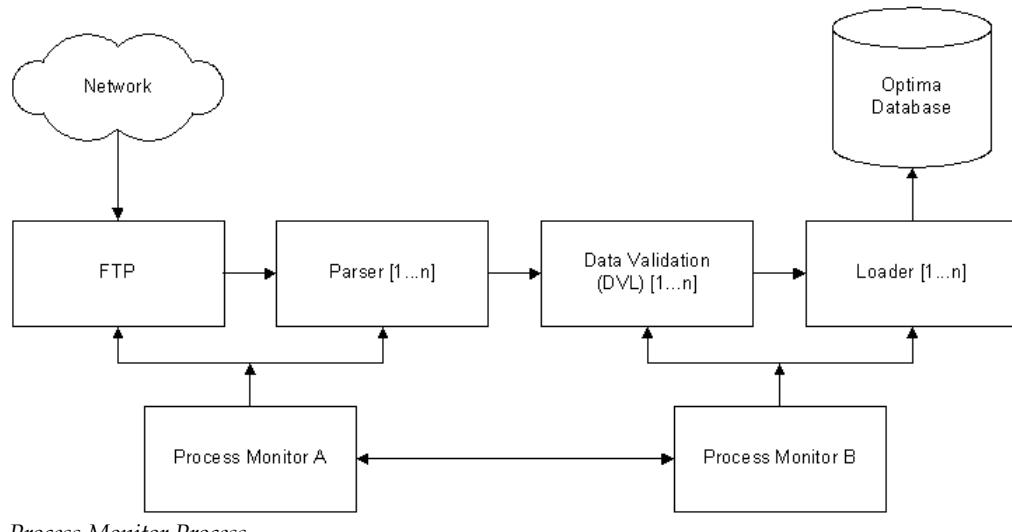
The Process Monitor continuously checks the running of AIRCOM OPTIMA backend applications on a particular machine to ensure that they have not crashed, run away or hung.

Each backend application creates a monitor file, which is used by the Process Monitor to identify and check the health of these applications. If a process crashes, runs away or hangs, the Process Monitor will remove that instance of the application to ensure the smooth running of the data loading process.

The Process Monitor uses a configuration file (INI) to store its settings. The configuration file can be edited using a suitable text editor.

The Process Monitor uses global settings to monitor applications but you can also specify monitoring requirements for individual applications by defining reports. For more information about reports, see Defining Monitoring Settings for an Application on page 149.

This diagram shows the Process Monitor process:



Process Monitor Process

If the configuration (INI) file is modified while the Process Monitor application is running, the backend application has to be restarted for the changes to come to effect.

The Process Monitor program supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application. For more information, see About Program IDs on page 17.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

4.2.1 The Process Monitor Process

The Process Monitor program is used to monitor all current running backend programs to detect crashes and program hangs. The Process Monitor clears monitor (PRID) files and rogue processes to allow the scheduled backend program to run again.



Important :

- An instance of the Process Monitor will need to be created for each distinct Interface ID used. However, you do not need to create an instance for each distinct machine that you are using, as the Process Monitor reads the `hostname`, which is the environment variable that identifies the machine on which the backend application is running. This enables the Process Monitor to monitor applications running on a separate machine, without having to manually update the INI file each time the application is moved to a different machine.

- Because the Process Monitor needs to read the `hostname` environment variable, this must be defined in the `.profile` (or equivalent) running the backend application.



To check that the `hostname` environment variable has been defined:

- Run the `hostname` command on any console (WIN/UNIX) and a value should be returned (for example, `server1`).
- On UNIX check the `.profile` and/or `.bash_profile` file(s) for the `HOSTNAME` environment variable (shown in capital letters, unlike the command). This should be equal to the value returned by the command, for example `HOSTNAME=server1`.

On start up, the Process Monitor application loads all the configuration settings from the INI file into memory. The settings contain information on all the backend processes to be monitored.

The monitor files, created by each backend application, uniquely identify the application instance using the PRID contained in its filename and the `hostname`. The Operating System process identifier (PID), which identifies the unique process ID of a backend application, is also written to the file. Each backend application regularly updates the timestamp of the monitor file. This provides a heartbeat function.

The Process Monitor regularly checks all monitor files in the common monitor directory to ensure the timestamp has not passed the grace period you have specified for each application. Then:

- If the grace period has expired, then the associated process is removed from the current process list and the monitor file is removed.
- If the grace period has not expired, the Process Monitor checks that the PID in each file is still in the current OS process list. If not, this means that the associated program has crashed, in which case the Process Monitor program removes the monitor file.

Because a program cannot easily stop processes on another machine, the Process Monitor uses the `hostname` to filter the monitor directory, to only monitor instances running on the same machine.

4.2.2 Installing the Process Monitor

Before you can use the Process Monitor, install the following file in the backend binary directory:

- `opx_MON_GEN_510.exe` (Windows)
- `opx_MON_GEN_510` (UNIX)



It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

4.2.3 Starting the Process Monitor

To start the Process Monitor, type in the executable file name and the configuration (INI) file name into the command prompt:

In Windows:

```
opx_MON_GEN_510.exe opx_MON_GEN_510.ini
```

In Unix:

```
opx_MON_GEN_510 opx_MON_GEN_510.ini
```

 In usual operation within the data loading architecture, all applications are scheduled. In usual circumstances, you should not need to start the program. For more information, see Starting and Stopping the Data Loading Process on page 23.

4.2.4 Configuring the Process Monitor

The Process Monitor is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The Process Monitor configuration (INI) file is divided into different sections.

The following table describes the parameters in the [DIR] section:

Parameter	Description
LogDir	The location of the directory where log files will be stored.
TempDir	The location of the directory where temporary files will be stored.
PIDFileDir	The location of the directory where monitor (PID) files will be created.

The following table describes the parameters in the [MAIN] section:

Parameter	Description
LogGranularity	Defines the frequency of logging. The options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily
LogSeverity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical
PollingTime	The pause (in seconds) between the execution of the main loop when running continuously.
RunContinuously	0 - Have the data validation application run once. 1 - Have the data validation application continuously monitor for input files.

Parameter	Description
StandAlone	0 – Run the Process Monitor without a monitor file. Do not select StandAlone if the Process Monitor is scheduled. 1 – Run the Process Monitor with a monitor file.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
Iterations	This parameter is used when the application does not run in continuous mode so that it will be able to check for input files in the input folder for the number of required iterations before an exit. Integer values are allowed, like 1,2,3,4...

The following table describes the parameters in the [OPTIONS] section:

Parameter	Description
TimeScale	The time scale for the GlobalTimeout parameter. The available options are: SEC - seconds MIN - minutes HOUR - hours DAY - days MONTH - months YEAR - years
GlobalTimeout	Type the maximum time the Process Monitor should take to do its job. This is known as the grace period. The Process Monitor checks the grace period against the timestamp of the monitor file. If the monitor file has not been updated within the grace period, that instance of the application is removed.

4.2.5 Defining Monitoring Settings for an Application

You can override the global monitoring settings defined in the [OPTIONS] section of the configuration (INI) file by defining reports to monitor individual applications. For example, if the Process Monitor is set to check all monitor files every 60 minutes but you want to check the Parser every 30 minutes, you can define a report to do this.

You define reports by editing parameters in the configuration (INI) file with a suitable text editor. The following table describes the parameters in the [REPORTS] section:

Parameter	Description
Number	Type the number of reports to be combined.
Reportn	Type the unique name of the report, where n is the execution order position of the report, for example, Report1 will be executed before Report2.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
EXEName	Type the executable name of the application to be monitored.
Comments	Add any comments about the application that is being monitored.
Monitor	0 - Do not monitor the application. 1 - Monitor the application.
MaximumRunningTime	Type the maximum time the application should take to do its job.

Parameter	Description
Timescale	The time scale for the MaximumRunningTime parameter. The available options are: SEC - seconds MIN - minutes HOUR - hours DAY - days MONTH - months YEAR - years

The following example shows the definitions for two reports called XMLParser and CellStat:

```
[Reports]
NoOfReports=2
Report1=XMLParser
Report2=CellStat

[XMLParser]
InterfaceID=000
ProgramID=711
InstanceID=001
EXEname=opxNorXML
Comments=XML parser
Monitor=1
MaximumRunningTime=10
TimeScale=SEC

[CellStat]
InterfaceID=001
ProgramID=110
InstanceID=001
EXEname=CellStat
Comments=CellStat loader
Monitor=1
MaximumRunningTime=20
TimeScale=SEC
```

For more information, see Example Process Monitor Configuration (INI) File on page 152.

4.2.6 Maintenance

In usual operation the Process Monitor should not need any special maintenance. During installation the AIRCOM OPTIMA Process Monitor will be configured to maintain the backup and log directories automatically.

However AIRCOM International recommends the following basic maintenance check to be carried out for Process Monitor:

Check The	When	Why
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

4.2.6.1 Stopping the Process Monitor

If the Process Monitor application is scheduled, then the application will terminate once it has finished monitoring the working of all the programs which are scheduled to be monitored.

If run continuously, then the Process Monitor process will monitor the working of all the programs continuously. In this case, the application can be terminated. For more information, see Starting and Stopping the Data Loading Process on page 23.

4.2.6.2 Checking the Version of the Process Monitor

If you need to contact AIRCOM International support regarding any problems with the Process Monitor, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_MON_GEN_510.exe -v
```

In Unix:

```
opx_MON_GEN_510 -v
```

For more information about obtaining version details, see About Versioning on page 22.

4.2.6.3 Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

4.2.7 Troubleshooting

The following table shows troubleshooting tips for the Process Monitor:

Symptom	Possible Cause	Solution
Cannot save configuration (INI) file.	The user has insufficient privileges on configuration (INI) file or directory. The file is read only or is being used by another application.	Enable permissions. Make file writable. Close the Process Monitor to release the configuration (INI) file.
Process Monitor does not use new settings.	Settings are not saved to the configuration (INI) file. File created in the wrong location Process Monitor has not restarted to pick up the new settings.	Check settings in file and (INI) file location. Restart the Process Monitor backend application.
Application not monitoring programs.	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings.	Use Process Monitor to check last run status. Check crontab settings. Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The process monitor will do this automatically.
Application exits immediately.	Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.

4.2.8 Example Process Monitor Configuration (INI) File

```
[DIR]
PIFileDir=C:\ProcessMonitor\Pids
LogDir= C:\ProcessMonitor\PMLog
TempDIR=C:\ProcessMonitor\PMTemp

[MAIN]
InterfaceID=001
ProgramID=510
InstanceID=001
PollingTime=5
LogGranularity=3
LogSeverity=1
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000
StandAlone=0
RunContinuously=0

[OPTIONS]
TimeScale=SEC
GlobalTimeOut=60
```

```
[Reports]
NoOfReports=3
Report1=NortelXMLParser
Report2=CellStat
Report3=EricssonParser

[NortelXMLParser]
InterfaceID=000
ProgramID=711
InstanceID=001
EXEname=opxNorXML
Comments=nortel XML parser
Monitor=1
MaximumRunningTime=10
TimeScale=SEC

[CellStat]
InterfaceID=001
ProgramID=110
InstanceID=001
EXEname=CellStat
Comments=CellStat loader
Monitor=1
MaximumRunningTime=20
TimeScale=SEC

[EricssonParser]
InterfaceID=001
ProgramID=712
InstanceID=001
EXEname=EricssonParser
Comments=Ericsson Parser
Monitor=1
MaximumRunningTime=40
TimeScale=SEC
```

4.3 Opxlog Utility

The opxlog utility is provided with the AIRCOM OPTIMA backend to combine, filter or search external program log files. Use the utility to perform ad-hoc searches for specific problem analysis or schedule it to run on a regular basis to create concatenated filtered files of log messages for loading into the database. The output will show all matched log messages. By default all output is printed to the terminal.

You run the opxlog utility from the command prompt. You can specify various options either as command line switches or in a separate INI file. For more information about these options, see [Opxlog Utility Command Options on page 154](#).

To run the utility with command line switch options, type the following into the command prompt:

```
opxlog [options]
```



Command [options] are specified on one line, in any order.

To run the utility with an INI file, type the following into the command prompt:

```
opxlog -ini=[inifilename]
```

For more information about the INI file, see [Example Opxlog Utility Configuration \(INI\) File on page 156](#).

4.3.1 Opxlog Utility Command Options

The opxlog utility command options are described in the following table:

Command Option	Description
-source=[dir]	<p>The top level of the directory tree to search for log messages.</p> <p>If unspecified, this will be set to the common log file directory. However, the option should be used if messages from log files in other locations are required for example an archive directory.</p>
-ds=n	<p>Day start. Number of days back from today which you want to include messages for.</p> <p>1 = yesterday.</p> <p>0 = Default, today only.</p> <p>If -de is not specified then all messages up to latest are returned.</p>
-de=n	<p>Day end. Used in conjunction with -ds.</p> <p>Number of days back from today to stop including messages.</p>
-hs=n	<p>Hour start. Number of hours back from the current time to include messages for, based on whole hours.</p> <p>1 = previous hour.</p> <p>23 = Maximum value.</p> <p>For example, if it is now 12:30 -hs=1 would return messages from 11:00 to 12:30. If -he is not specified then all messages up to the latest are returned.</p> <p> The settings for -ds and -de are ignored if -hs is specified.</p>
-he=n	Hour End. Used in conjunction with -hs.
-rec	Search all directories (recursively) under the top level for log files (default).
-norec	Include only log files in the specified source directory.

Command Option	Description
-sev=n	Only include messages with a severity level greater than or equal to n. 0 = Default, all messages. For example, 3 would result in Minor, Major and Critical messages only. For a description of severities, see About Log Files on page 21.
-prid	Only output messages for a specific program identified by the PRID.
-pridf=[filename]	Only output messages for a specific set of programs identified by a list of PRIDs in the specified file. Specify PRIDs one per line.
-outf=[filename]	Append output to specified file. Default is to print to the screen.
-txtsev	Output severity values as text (default).
-notxtsev	Output severity values as an enumerated value. Use this option if the output file is to be loaded into the database.
-v	Print the script version details.

4.3.2 Example Uses for the Opxlog Utility

This table gives some example uses for the utility:

Use This Command	To Do This
opxlog	Print to screen all log messages, for today, from files under /var/optima/log.
opxlog -source=/optima/archive/log	Print all log messages under /optima/archive/log.
opxlog -ds=1	Print all log messages from midnight yesterday to now.
opxlog -ds=7	Print all log messages for the past week.
opxlog -ds=1 -de=1	Print all log messages from yesterday only (midnight to midnight).
opxlog -ds=1 -de=1 -sev=3	Print all Minor, Major and Critical messages from yesterday.
opxlog -hs=1	Print all messages from the previous hour to now. Based on whole hours. For example, if now is 12:30 then it would print all messages from 11.00 to 12:30.
opxlog -hs=1 -he=1	Print all messages from the previous hour. For example, if now is 12:30 then it would print all messages from 11.00 to 12:00.
opxlog -hs=1 -he=1 -prid=000010001	Print all messages from the previous hour for PRID 000010001 only.
opxlog -hs=1 -he=1 -outf=my.log	Append all messages from the previous hour to file my.log in local directory.
opxlog grep mytext	Print all log messages for today containing the text mytext to screen. This is useful for finding messages with a particular error codes or string – Unix only.
opxlog grep mytext > myfile.log	Create file myfile.log containing all log messages containing the text mytext to screen – Unix only.
opxlog sort -k2	Print all log messages sorted in date/time order to screen – Unix only.

4.3.3 Example Opxlog Utility Configuration (INI) File

```
source=C:\commonfiles\Log
outdir=C:\commonfiles\Loader\Loaderin
mondir=C:\commonfiles\pids
tempdir=C:\OptimaPrograms\LogLoaderscript\temp
ds=0
de=0
hs=1
he=1
sev=1
rec=0
prid=12345634
pridf=myfile
outf=commonlog
newf=commonlog
quote=1
txtsev=0
myprid=001123001
```

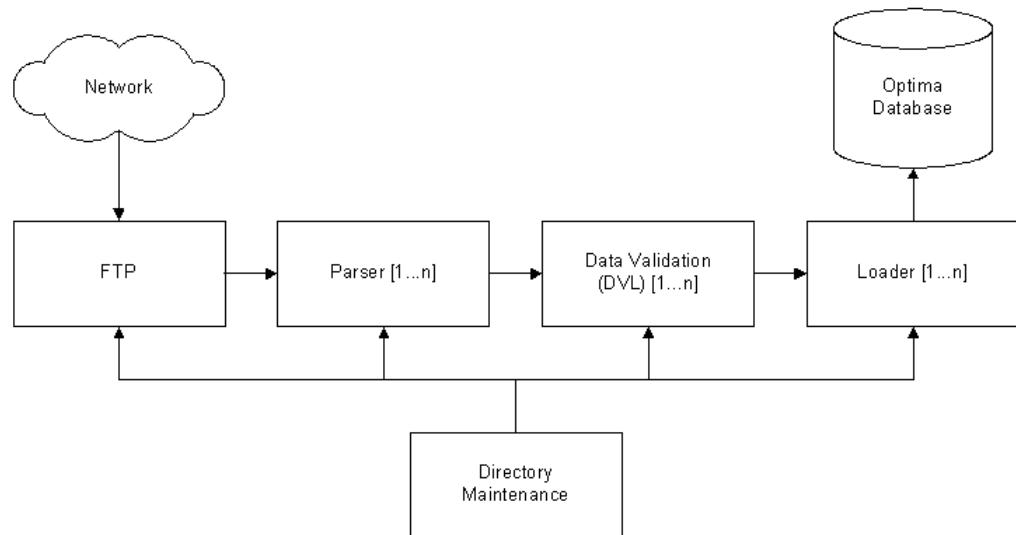
4.4 About the Directory Maintenance Application

During the data extraction and loading process, a large number of directories are used for various purposes. These directories need maintenance on a regular basis to ensure smooth running and good performance for the whole system.

The Directory Maintenance application reports on and maintains user-specified directories based on user-defined maintenance parameters.

The Directory Maintenance application uses a configuration file (INI) to store information about the maintenance parameters. The configuration file can be edited using a suitable text editor.

This diagram shows the Directory Maintenance process:



Directory Maintenance Process

The Directory Maintenance application supports these common functions:

Function	Action
Logging	Status and error messages are recorded in a daily log file.
Monitor Files	The application runs in a scheduled mode. A monitor (PID) file, created each time the application is started, ensures that multiple instances of the application cannot be run. The PID file is also used by the AIRCOM OPTIMA Process Monitor to ensure that the application is operating normally.
PRID	The PRID uniquely identifies each instance of the application.

For more details on these common functions, see the AIRCOM OPTIMA Operations and Maintenance Guide.

4.4.1 The Directory Maintenance Process

On start up, the Directory Maintenance application loads all the configuration settings from the INI file into memory. The settings contain information on all the directories to be maintained.

The application polls each configured directory at user-defined polling interval to check if the files have met the maintenance criteria, which includes maintenance by age and by file count. If a file mask is specified in the settings, only those types of files are considered in the maintenance process. Sub directories are also maintained if that particular option is chosen.

If the selected criterion is age then the files are maintained by age. Files older than the age specified will be deleted or archived depending on the selected option.

If the selected criterion is file count, the number of files in the particular directory is considered for maintaining the directory. If the file count is greater than the value specified, the excess files will be archived or deleted according to the selected option.

The Directory Maintenance application displays the results of maintenance in a maintenance report.

4.4.2 Installing the Directory Maintenance Application

Before you can use the Directory Maintenance application, install the following file in the backend binary directory:

- `opx_MNT_GEN_610.exe` (Windows)
- `opx_MNT_GEN_610` (Unix)

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

4.4.3 Starting the Directory Maintenance Application

To start the Directory Maintenance application, type in the executable file name and the configuration (INI) file name into the command prompt:

In Windows:

```
opx_MNT_GEN_610.exe opx_MNT_GEN_610.ini
```

In Unix:

```
opx_MNT_GEN_610 opx_MNT_GEN_610.ini
```

 In usual operation within the data loading architecture, all applications are scheduled. In usual circumstances you should not need to start the program. For more information, see Starting and Stopping the Data Loading Process on page 23.

4.4.4 Configuring the Directory Maintenance Application

The Directory Maintenance application is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The Directory Maintenance configuration (INI) file is divided into different sections.

The following table describes the parameters in the [DIR] section:

Parameter	Description
RootDir	Type the root of the directory tree that the Directory Maintenance application will report on and maintain.
ReportDir	Type the location where Directory Maintenance report will be stored.
DefaultArchiveRootDir	<p>Type the default root of the archive directory tree. Maintained directories will be backed up here if the archive option is on for these directories.</p> <p>The Directory Maintenance application uses the tree structure of the directory maintained. For example, if RootDir=/dev/optima/, the folder /dev/optima/parser is archived to DefaultArchiveRootDir/optima/parser.</p> <p> Notes :</p> <ul style="list-style-type: none"> • The Directory Maintenance application will not maintain any folder matching path mask DefaultArchiveRootDir/* • The program will append a path separator to end of directory path if missing. • The folder must be created before the application runs. • This parameter is required if NumberOfDir is not zero.
LogDir	Type the name of the directory in which log files will be created.
TempDir	Type the name of the directory in which temporary files will be created. The temporary file is deleted once directory is maintained.
PIDFileDir	Type the name of the directory in which the program monitor file will be created.

The following table describes the parameters in the [MAIN] section:

Parameter	Description
LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily (default)
LogSeverity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information (default) 3 - Warning 4 - Minor 5 - Major 6 - Critical
RefreshTime	The pause (in seconds) between executions of the main loop when running continuously.
RunContinuously	0 - Have the Directory Maintenance application run once. 1 - Have the Directory Maintenance application continuously monitor for input files.

Parameter	Description
PollingTime	If you have selected to run the Directory Maintenance application continuously, type the number seconds that must pass between each check for input files.
StandAlone	0 – Run the Directory Maintenance application without a monitor file. Do not select StandAlone if the Process Monitor is scheduled. 1 – Run the Directory Maintenance application with a monitor file.
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0). The default value is 0 ('OFF').
FolderFileLimit	The maximum number of output files that can be created in each output (sub) folder. The default value is 10,000. There is a limit of 100,000 on Windows and 500,000 on UNIX/Sun.  Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.
minimumFolderFileLimit	The minimum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be less than this, the application will not run. This is set as a read-only value of 100.
maximumFolderFileLimit	The maximum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be more than this, the application will not run. This is set as a read-only value of 100,000.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
Iterations	This parameter is used when the application does not run in continuous mode so that it will be able to check for input files in the input folder for the number of required iterations before an exit. Integer values are allowed, like 1,2,3,4...

The following table describes the parameters in the [OPTIONS] section:

Parameter	Description
DoNotProcessPathMasks	<p>Type a comma-separated list of path masks you do not want the application to report on or maintain. Any sub directories of the root folder which match any of these path masks will not be reported or maintained.</p> <p>For example:</p> <pre>RootDir=/dev/optima DoNotProcessPathMasks=bin/*</pre> <p>The program will ignore the /dev/optima/bin/ directory and all its sub folders.</p> <pre>RootDir=/dev/optima DoNotProcessPathMasks=bin</pre> <p>The program will ignore just the /dev/optima/bin/ directory.</p> <p> Notes :</p> <ul style="list-style-type: none"> • The program will ignore blank fields in the comma separated list. • The program will append a path separator to start of field if missing. • The program will append a path separator to end of the field if the field does not end with a path separator or *.
DefaultFileMask	Type the file mask of files to be reported on and maintained. For example, DefaultFileMask=*.csv, will report and maintain all CSV files.
DefaultArchive	<p>The default value for the Archive parameter in maintained directory sections. The available options are:</p> <p>0 - Archiving off 1 - Archiving on</p> <p> This parameter is required when NumberOfDir is not zero.</p>
DefaultMaxFilesToKeep	<p>The maximum number of files to keep in a directory. This is the default value for the MaxFilesToKeep parameter in maintained directory sections.</p> <p> This parameter is required when NumberOfDir is not zero.</p>
DefaultMaxFileAgeToKeep	<p>The maximum age of files to keep in a directory. This is the default value for the MaxFileAgeToKeep parameter in maintained directory sections.</p> <p> This parameter is required when NumberOfDir is not zero.</p>
DefaultMaxFileAgeTimeScale	<p>The timescale of the maximum age of files to keep in a directory. This is the default value for the MaxFileAgeTimeScale parameter in maintained directory sections. The available options are:</p> <p>0 - Seconds 1 - Minutes 2 - Hours 3 - Days 4 - Weeks</p> <p> This parameter is required when NumberOfDir is not zero.</p>
DefaultMaxThreadRunningSeconds	<p>The maximum time in seconds a reported or maintained directory should take to finish. This is the default value for the MaxThreadRunningTimeSeconds parameter in maintained directory sections.</p> <p>If a directory being reported or maintained takes longer than this value then thread processing that directory will be killed.</p>

Parameter	Description
MaxNumberOfThreads	The maximum number of threads the application can use while running.  On UNIX this cannot be greater than 255 threads. On Windows the maximum is slightly higher.
MainThreadSleepMilliseconds	The time in milliseconds the main thread of the application will sleep for in its main logic loop.
ThreadScope	0 - PTHREAD_SCOPE_PROCESS. The system scheduling attributes of a thread created with PTHREAD_SCOPE_PROCESS scheduling contention scope are the implementation-defined mapping into system attribute space of the scheduling attributes with which the thread was created. Threads created with PTHREAD_SCOPE_PROCESS scheduling contention scope contend directly with other threads within their process that were created with PTHREAD_SCOPE_PROCESS scheduling contention scope. The contention is resolved based on the threads' scheduling attributes and policies. It is unspecified how such threads are scheduled relative to threads in other processes or threads with PTHREAD_SCOPE_SYSTEM scheduling contention scope.  PTHREAD_SCOPE_PROCESS is less resource intensive. 1 - PTHREAD_SCOPE_SYSTEM. A thread created with PTHREAD_SCOPE_SYSTEM scheduling contention scope contends for resources with all other threads in the same scheduling allocation domain relative to their system scheduling attributes. The system scheduling attributes of a thread created with PTHREAD_SCOPE_SYSTEM scheduling contention scope are the scheduling attributes with which the thread was created.
NumberOfDir	The number of directory maintenance sections defined in the INI file. If not zero then there must be parameter in format Dir1=SectionName Dir2=SectionName And so on. If zero then the Directory Maintenance application will only report on all directories found and perform no maintenance.
FileMask	Type the file mask for this maintenance section.

Parameter	Description
PathMask	<p>This parameter specifies the path mask for this maintenance section.</p> <p>The program will append a path separator to the start of the field if missing.</p> <p>The program will append a path separator to the end of the field if the field does not end with a path separator or *.</p> <p>Example 1:</p> <pre>RootDir=/dev/optima PathMask=parser/abc/*</pre> <p>Any directory matching path mask /dev/optima/parser/abc/* will be maintained using these settings.</p> <p>Example 2:</p> <pre>RootDir=/dev/optima PathMask=parser/abc</pre> <p>Any directory matching path mask /dev/optima/parser/abc/ will be maintained using these settings.</p> <p>Example 3:</p> <pre>RootDir=/dev/optima PathMask=/*</pre> <p>Any directory matching path mask /dev/optima/* will be maintained using these settings. Every directory found will use these settings if the directory does match a path mask in another section.</p> <p>If a directory matches more than one section path mask then the least general path mask will be used. For example:</p> <pre>[Section1] RootDir=/dev/optima PathMask=/parser/*</pre> <pre>[Section2] RootDir=/dev/optima PathMask=/parser/tmp/</pre> <p>In this case, directory /dev/optima/parser/tmp/a/ will use Section 2 settings.</p>
ExcludePathMasks	<p>Type a comma-separated list of path masks to use to exclude directories which match the PathMask parameter and also match ExcludePathMasks.</p> <p> Notes :</p> <p>The program will ignore blank fields in the comma separated list.</p> <p>The program will append a path separator to start of field if missing.</p> <p>The program will append a path separator to end of the field if the field does not end with a path separator or *.</p>
Archive	<p>0 - Archiving Off 1 - Archiving On</p>

Parameter	Description
MaintenanceType	<p>0 - Report only</p> <p> AIRCOM International recommends using this setting when running the Directory Maintenance application with a newly created configuration (INI) file. This allows you to run the application to check that the correct directories in your directory tree are matching the correct path masks without having any files deleted from the directories.</p> <p>1 - Maintain directory by maximum number of files</p> <p>2 - Maintain directory by maximum file age</p>
MaxFilesToKeep	The maximum number of files to keep in the directory.
MaxFileAgeToKeep	The maximum age of files to keep in the directory.
MaxFileAgeTimeScale	<p>The timescale of the maximum age of files to keep in a directory. The available options are:</p> <p>0 - Seconds</p> <p>1 - Minutes</p> <p>2 - Hours</p> <p>3 - Days</p> <p>4 - Weeks</p>
MaxThreadRunningTimeSeconds	<p>The maximum time in seconds a reported or maintained directory should take to finish.</p> <p>If a directory being reported or maintained takes longer than this value then thread processing that directory will be killed.</p>

4.4.5 Maintenance

In usual operation, the Directory Maintenance application should not need any special maintenance. During installation the OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However AIRCOM International recommends the following basic maintenance checks are carried out for Directory Maintenance application:

Check The	When	Why
Input directory for a backlog of files meeting the maintenance criteria.	Weekly	Files meeting the maintenance criteria should not be in the input directory. A backlog indicates a problem with the program.
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

4.4.5.1 Stopping the Directory Maintenance Application

If the Directory Maintenance application is scheduled, then it will terminate when all the maintenance work for directories is finished.

If run continuously, then the Directory Maintenance application will monitor the directories continuously. In this case, the application can be terminated. For more information, see Starting and Stopping the Data Loading Process on page 23.

4.4.5.2 Checking the Version of the Directory Maintenance Application

If you need to contact AIRCOM International support regarding any problems with the Directory Maintenance application, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_MNT_GEN_610.exe -v
```

In Unix:

```
opx_MNT_GEN_610 -v
```

For more information about obtaining version details, see About Versioning on page 22.

4.4.5.3 Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

4.4.6 Troubleshooting

The following table shows troubleshooting tips for the Directory Maintenance application:

Symptom	Possible Cause	Solution
Cannot save configuration (INI) file.	User has insufficient privileges on configuration (INI) file or directory. The file is read only or is being used by another application.	Enable permissions. Make file writable Close the application to release the configuration (INI) file.
New configuration settings are not being used by the application.	Settings are not saved to the configuration (INI) file. File created in the wrong location. Application has not restarted to pick up the new settings.	Check settings and location of file. Restart the application.
Application not maintaining directories.	Application has not been scheduled. Crontab entry removed. Application has crashed and Process Monitor is not configured. Incorrect configuration settings.	Use Process Monitor to check last run status. Check crontab settings. Check configuration settings. Check process list and monitor file. If there is a monitor file and no corresponding process with that PID, then remove the monitor file.  The Process Monitor will do this automatically.
Application exits immediately.	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.

4.4.7 Example Directory Maintenance Configuration (INI) File - Report Only

```
[DIR]
RootDir=c:\ 
ReportDir=c:\Report
LogDir=c:\Log
TempDir=c:\Temp
PIDFileDir=c:\PID

[MAIN]
InterfaceID=001
ProgramID=610
InstanceID=001
PollingTime=5
StandAlone=1
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000
RunContinuous=0
LogGranularity=3
LogSeverity=2

[OPTIONS]
DefaultFileMask=*
MainThreadSleepMilliSeconds=500
MaxNumberOfThreads=50
ThreadScope=0
DefaultMaxThreadRunningSeconds=300
```

4.4.8 Example Directory Maintenance Configuration (INI) File - Report and Maintenance

```
[DIR]
#Compulsory parameters
RootDir=C:\TEST_NEW\Directory_Maintenance\test
ReportDir=C:\TEST_NEW\Directory_Maintenance
DefaultArchiveRootDir=C:\TEST_NEW\Directory_Maintenance\archive
LogDir=C:\TEST_NEW\Directory_Maintenance
TempDir=C:\TEST_NEW\Directory_Maintenance\temp
PIDFileDir=C:\TEST_NEW\Directory_Maintenance\pid

[MAIN]
InterfaceID=001
ProgramID=610
InstanceID=001
LogSeverity=1
UseFolderFileLimit=0
FolderFileLimit=10000
minimumFolderFileLimit=100
maximumFolderFileLimit=100000

[OPTIONS]
#Compulsory parameters
DefaultFileMask=*
```

```
#Optional parameters
MainThreadSleepMilliseconds=200
MaxNumberOfThreads=200
ThreadScope=0
DefaultMaxThreadRunningSeconds=600
DoNotProcessPathMasks=\bin\*
DoNotProcessPathMasks=\R000_FABRIC\*

#Compulsory parameters if NumberOfDir NOT 0
DefaultMaxFilesToKeep=10
DefaultMaxFileAgeToKeep=60
DefaultMaxFileAgeTimeScale=4
DefaultArchive=0

NumberOfDir=2
Dir1=A
Dir2=B

[A]
FileMask=*.paul
PathMask=\*
ExcludePathMasks=*\\level_1_dir_1\*
MaintenanceType=0
MaxFileAgeToKeep=2000
MaxFileAgeTimeScale=4
MaxThreadRunningTimeSeconds=480

[B]
FileMask=*.paull
PathMask=\opx*\out\*
ExcludePathMasks=*\\loaders,,ftp\\tmp\*
MaintenanceType=0
MaxFilesToKeep=100000;
MaxThreadRunningTimeSeconds=480
```

4.5 Session Summary Checklist

This checklist has been provided as a self-assessment of the objectives stated at the beginning of the session.

Please tick all objectives covered in this session.

- Process Monitor
- Opxlog
- Directory maintenance



Additional Notes:

5 Database Components

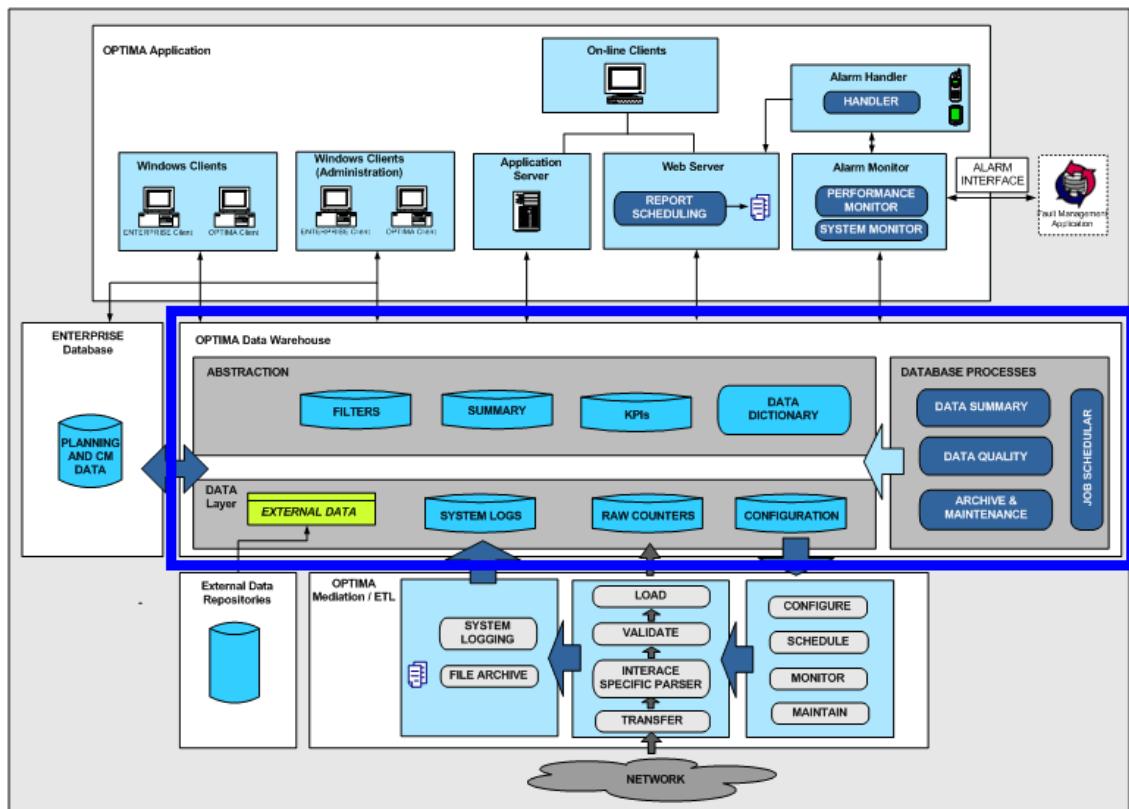
5.1 Objectives of this Session

During this session you will learn about:

- OSS maintenance
- Summary
- Data Quality
- Scheduling programs
- Resource management

5.2 Architecture Overview - Database Components

This picture shows an overview of the entire AIRCOM OPTIMA architecture, with the database components highlighted:



AIRCOM OPTIMA Architecture - Database Components

5.3 About the OSS Maintenance Package

The OSS Maintenance package enables you to maintain your database. You can use the package to:

- Maintain partitions
- Maintain indexes
- Maintain tablespaces
- Gather statistics

5.3.1 Installing the OSS Maintenance Package

 Before installing the OSS Maintenance package, ensure you have correctly installed the OSS_LOGGING package and the COMMON_LOGS table.

To install the OSS Maintenance package:

- 1 Run the following script to install the DD_LUNS, MAINTAIN_TABLE and MAINTAIN_TABLESPACE tables:
`OSS_MAINTAIN_RUN_FIRST.sql`
 These tables are normally installed in the AIRCOM schema.
- 2 Run the OSS_MAINTENANCE.pks script to install the OSS Maintenance package header.
- 3 Run the OSS_MAINTENANCE.plb to install the OSS Maintenance package body.

 It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

5.3.2 Maintaining Table Partitions

AIRCOM recommends partitioning the majority of the tables in the database, including vendor raw data tables, summary tables and tables used to store log messages. The size of the partitions will vary, depending upon the size and quantity of the data that is loaded into the tables. For example, raw data tables storing hourly data could be partitioned into daily partitions, daily summary tables could be partitioned into weekly partitions and monthly summary tables could be partitioned into monthly or yearly partitions. The OSS Maintenance package enables you to maintain the table partitions in your database.

Partition maintenance is implemented in the following ways:

- New partitions are created ready for when they are required. As the number of future partitions that can be created during the installation is limited by available disk space, new partitions must be automatically generated.
- Old partitions are dropped when they are no longer required. As data is only needed for a certain amount of time, for example 1 year, partitions that contain obsolete data need to be removed.

 To use partition maintenance, tables must be created with a single old partition using the naming format YYYYMMDD, for example P20010101.

5.3.2.1 Configuring Partition Maintenance

You configure partition maintenance by editing the MAINTAIN_TABLE table with a suitable SQL Editor, for example TOAD.

 Before configuring partition maintenance, ensure that the COMMON_LOGS table is added to the MAINTAIN_TABLE table.

The following table describes the configuration options:

Column	Description	Example Value
SCHEMA	The schema (user) of the table to maintain.	AIRCOM
TABLE_NAME	The name of the table to maintain.	CELLSTATS
PARTRETENTION	The number of partitions before the current date to retain. Earlier partitions will be deleted.	14
PARTADVANCE	The number of partitions after the current date to create. AIRCOM recommends creating several future partitions to avoid any loss of data if the OSS Maintenance package should fail to run.	7
PARTTYPE	The type of partitions to create. The available options are: 1 = Daily 2 = Weekly 3 = Monthly 4 = Yearly	1
LASTRUNDATE	The date when the table partition maintenance last ran. This column is updated automatically by the OSS Maintenance package.	28/06/2009 11:31:00
NEXTRUNDATE	The date when the table partition maintenance should next run. This column is updated automatically by the OSS Maintenance package.	29/06/2009 00:00:00

Column	Description	Example Value
SCHEDULEPERIOD	Updates the NEXTRUNDATE with the correct date after the partition maintenance has processed the table. The available options are: 1 = Daily (NEXTRUNDATE is midnight the following day) 2 = Weekly (NEXTRUNDATE is Monday the following week) 3 = Monthly (NEXTRUNDATE is in 1 months time) 4 = Yearly (NEXTRUNDATE is in 1 years time)	1
PRIORITY	The priority in which the tables are maintained. The COMMON_LOGS table is always partitioned first, then the tables are partitioned in order of priority, in ascending order.	1

5.3.2.2 Scheduling Partition Maintenance

To schedule partition maintenance:

Create an Oracle job to run the following:

```
AIRCOM.OSS_MAINTENANCE.MAINTAIN_TABLE_PARTITIONS;
```



Notes :

- This is normally done inside the AIRCOM schema
- No parameters are passed to the procedure

For more information about Oracle jobs, see the AIRCOM OPTIMA Operations and Maintenance Guide.

5.3.3 Rebuilding Indexes

The indexes in the database can become invalid. If this happens, they need to be rebuilt. The OSS Maintenance package enables you to rebuild the majority of indexes in the database. Rebuilding indexes can also increase performance, as queries run on the underlying tables can run faster when they use a good index.

5.3.3.1 Configuring Index Maintenance

In a standard database set up, index maintenance does not require any configuration. However, the index maintenance procedure does require that the GLOBAL.VENDORS table is populated with all of the vendor schemas in the database. This enables the index maintenance procedure to rebuild all indexes for the schemas in the GLOBAL.VENDORS table.



Notes :

- The index maintenance procedure does not process indexes in the AIRCOM and GLOBAL schemas.
- The index maintenance procedure processes both non-partitioned and partitioned indexes. For partitioned indexes only recent partitions are rebuilt.

5.3.3.2 Scheduling Index Maintenance

To schedule index maintenance:

Create an Oracle job to run the following:

```
AIRCOM.OSS_MAINTENANCE.REBUILD_ALL_INDEXES;
```



Notes :

- This is normally done inside the AIRCOM schema
- No parameters are passed to the procedure

For more information about Oracle jobs, see the AIRCOM OPTIMA Operations and Maintenance Guide.

5.3.4 Maintaining Tablespaces

You can use the OSS Maintenance package to maintain the database's tablespaces.

The tablespace maintenance procedures add new datafiles to tablespaces whose space is running out. Datafiles are created using the following parameters:

```
SIZE 100M AUTOEXTEND ON NEXT 100M MAXSIZE 2000M
```

This means that datafiles are created with an initial size of 100 MB and extend by 100 MB at a time to a maximum size of 2000 MB. New datafiles are added before the maximum datafile size of 2000 MB is reached. The location of the directories where the datafiles are added is stored in a DD_LUNS table.

There are four different tablespace maintenance procedures, which are described in the following table:

Procedure	Description
Maintain_Tablespaces_AllLUNS	Adds a datafile for every LUN defined when a tablespace is running out of space (Oracle striping).
Maintain_Tablespaces_By_Size	Adds one new datafile on the least occupied LUN of the correct type.
Maintain_Tablespaces_SingleLUN	Creates one datafile at a time on a single LUN. Future datafiles for the tablespace will remain on the same LUN.
Maintain_Tablespaces	Processes all tablespaces using the method configured for each tablespace. The above three procedures are then called within this procedure.

5.3.4.1 Configuring Tablespace Maintenance

You configure tablespace maintenance by manually populating the DD_LUNS and MAINTAIN_TABLESPACE tables with a suitable SQL Editor, for example TOAD.

Configuring the DD_LUNS Table

The following table describes the DD_LUNS table configuration options:

 Type one row per location on disk where a tablespace can be created.

In This Column	Do This	For Example
LUN_TYPE	Type the type of data which the LUN will store. The available LUN types are described in a separate table below.	D
LUN_PATH	Type the path (normally a location on disk) where the datafiles will be put.  Ensure the last character in the path is the directory separator, that is, "\" in Windows and "/" in UNIX.	C:\optima_data\lun1\
FULL	This column is reserved for future use. Type "N" for this column.	N
CAPACITY_MB	Type the available space (in MB) on the LUN disk location which is available to be used by datafiles.  Notes : <ul style="list-style-type: none">• Do not include the entire disk space.• Ensure that the specified amount of disk space will be available and will not be used by other processes.  As datafiles have a maximum size of 2000 MB, AIRCOM recommends defining this capacity as a multiple of 2000.	8000

The following LUN types are available:

LUN_TYPE	Description	Maintain Tablespaces?
S	System tablespaces	N
D	Data tablespaces	Y
I	Index tablespaces	Y
T	Temporary tablespaces	N



Only LUN types D and I are maintained by the OSS Maintenance package.

Configuring the MAINTAIN_TABLESPACE Table

The following table describes the MAINTAIN_TABLESPACE table configuration options:



Type one row per tablespace in the database.

In This Column	Do This	Example Value
TABLESPACE_NAME	Type the tablespace name. The tablespace name must end with the letter of its LUN_TYPE, that is, "D" for data tablespaces and "I" for index tablespaces.	ERI_CELLSTATS_I
MAINTENANCE_TYPE	Type a maintenance option for each tablespace. The available values are: 0 = Do not maintain this tablespace 1 = Maintain by adding a datafile on the LUN of the correct LUN_TYPE with the most space remaining when the tablespace needs extending. 2 = Maintain tablespace on a single LUN, all data files will be in the LUN defined in the SINGLE_LUN column. 3 = Maintain tablespace by adding a data file to all the LUNs available when the tablespace is running out of space. Only LUNS that have the same LUN_TYPE as the tablespace will be included.	1
SINGLE_LUN	Type the LUN that is always used to add datafiles to the tablespace. This column is only used when MAINTENANCE_TYPE is set to 2 (SINGLE_LUN).	C:\optima_data\lun1\



You can use the following query to populate the TABLESPACE_NAME column from the data dictionary:

```
INSERT INTO MAINTAIN_TABLESPACE (TABLESPACE_NAME) SELECT
TABLESPACE_NAME FROM DBA_TABLESPACES WHERE TABLESPACE_NAME NOT
IN ('SYSTEM', 'RBS', 'USR', 'TEMP');
COMMIT;
```

AIRCOM recommends that system and temporary tablespaces are not included in the MAINTAIN_TABLESPACE table and that their rows are deleted after they have been populated.

5.3.4.2 Scheduling Tablespace Maintenance

AIRCOM recommends scheduling the `Maintain_Tablespace` procedure to run regularly and frequently, for example, at hourly intervals. This is because if a tablespace becomes full, then no data for any tables within that tablespace can be inserted.

To schedule tablespace maintenance:

Create an Oracle job to run the following:

```
AIRCOM.OSS_MAINTENANCE.MAINTAIN_TABLESPACES;
```



Notes :

- This is normally done inside the AIRCOM schema
- No parameters are passed to the procedure

For more information about Oracle jobs, see the AIRCOM OPTIMA Operations and Maintenance Guide.

5.3.5 Gathering Statistics

Gathering schema statistics in the database is important in ensuring that queries run quickly and efficiently. Statistics are gathered using Oracle's `DBMS_STATS.GATHER_SCHEMA_STATS` procedure. The following options are used when using this procedure:

Option	Value
ESTIMATE_PERCENT	15
METHOD_OPT	FOR ALL INDEXED COLUMNS SIZE 254
DEGREE	2
CASCADE	TRUE
OPTIONS	GATHER AUTO

Two statistics procedures are included in the OSS Maintenance package, these are `GATHER_ALL_STATS` and `GATHER_SCHEMA_STATS`. The `GATHER_ALL_STATS` procedure gathers statistics for all schemas in the database that are configured inside the `GLOBAL.VENDORS` table and also processes the AIRCOM and GLOBAL schemas. The `GATHER_SCHEMA_STATS` procedure gathers statistics for the schema that is passed as a parameter to the procedure.

5.3.5.1 Configuring Statistics Gathering

In a standard database set up, statistics gathering does not require any configuration.

The `GATHER_ALL_STATS` procedure requires that the `GLOBAL.VENDORS` table is populated with all the Vendor schemas in the database. It will then gather statistics for the schemas in the `GLOBAL.VENDORS` table as well as the AIRCOM and GLOBAL schemas.

The `GATHER_SCHEMA_STATS` procedure requires no configuration, you just need to pass the schema name whose statistics are required to be gathered.

5.3.5.2 Scheduling Statistics Gathering

Scheduling the GATHER_ALL_STATS Procedure

To schedule GATHER_ALL_STATS:

Create an Oracle job to run the following:

```
AIRCOM.OSS_MAINTENANCE.GATHER_ALL_STATS;
```



Notes :

- This is normally done inside the AIRCOM schema
- No parameters are passed to the procedure

Scheduling the GATHER_SCHEMA_STATS Procedure

To schedule GATHER_SCHEMA_STATS:

Create an Oracle job to run the following:

```
AIRCOM.OSS_MAINTENANCE.GATHER_SCHEMA_STATS ('AIRCOM');
```



Notes :

- This is normally done inside the schema whose statistics are to be gathered
- No parameters are passed to the procedure

For more information about Oracle jobs, see the AIRCOM OPTIMA Operations and Maintenance Guide.

5.3.6 Maintenance

AIRCOM International recommends the following basic maintenance checks are carried out to ensure the OSS Maintenance package is functioning correctly:

Check	When	Why
For broken / failed OSS Maintenance package jobs.	Daily	Checking jobs are executing correctly ensures that maintenance is processing and that partitions and tablespaces are allowing new data to be inserted.
The COMMON_LOGS tables for errors. You can use the following query to retrieve all important (Warning level and above) messages logged in the last week: select * from common_logs where severity>2 and PRID='000827001' and datetime > sysdate-7 order by datetime desc	Daily / Weekly	Any errors in the COMMON_LOGS table relating to the OSS Maintenance package (PRID 000827001) must be investigated.

Check	When	Why
The Loader and summary loading for tablespace and partition errors and check partitions are available for tables.	Weekly	If partitions or tablespaces are not maintained, errors will be found in the Loader and AIRCOM OPTIMA Summary when data is inserted into the database. Check that there are partitions available and that the tablespace has space remaining. Check for any "Unable to extend tablespace/datafile" errors in the loading / summarising which indicate that tablespace maintenance is not working correctly. Checking the max dates of raw and summary tables ensures that the tables are still loading.
That the LAST_ANALYSED date for tables and indexes is recent and that table statistics have been gathered. If you are using TOAD, you can find this information in the Schema Browser for Tables/Indexes on the Stats/Size tab.	Monthly	Checking that statistics have been recently generated ensures that queries on the tables are optimized correctly.

5.3.7 Troubleshooting

The following table shows troubleshooting tips for the OSS Maintenance package:

Symptom	Possible Cause	Solution
OSS Maintenance procedures not running.	Oracle job not running scheduled jobs. COMMON_LOGS and OSS_LOGGING package not installed correctly. DD_LUNS, MAINTAIN_TABLESPACE and MAINTAIN_TABLE tables not installed or configured correctly.	Check Oracle job is configured correctly and has not broken. Check COMMON_LOGS has a public synonym. Check OSS_LOGGING package is installed (this is a requirement for the OSS Maintenance package.) Check tables contain the correct configuration.
COMMON_LOGS table log entries contain error messages.	Numerous possible causes, check error messages for information about the cause of the problem.	If you are unable to resolve the problem from the information in the error message, please contact AIRCOM International Support.
Raw or Summary tables fail to insert data with "ORA-14400: inserted partition key does not map to any partition" error.	Partition maintenance not creating new partitions correctly	Check if partitions exist for the table. Check if table is included in MAINTAIN_TABLE table. Check job for MAINTAIN_TABLE_PARTITIONS is running correctly.
Raw or Summary tables fail to insert data with "Unable to extend tablespace/ data file" error.	Tablespace maintenance not creating new datafiles correctly	Check if tablespace is full. Check if tablespace is configured correctly in the MAINTAIN_TABLESPACE table. Check job for Maintain_Tablespace procedure is running correctly.

5.4 About the AIRCOM OPTIMA Summary Application

The AIRCOM OPTIMA Summary application summarises data within the AIRCOM OPTIMA database.

The AIRCOM OPTIMA Summary application is a database-based program that runs within the Oracle server. It uses configuration tables in the database to store information about aggregating data. These can be modified using the configuration utility.

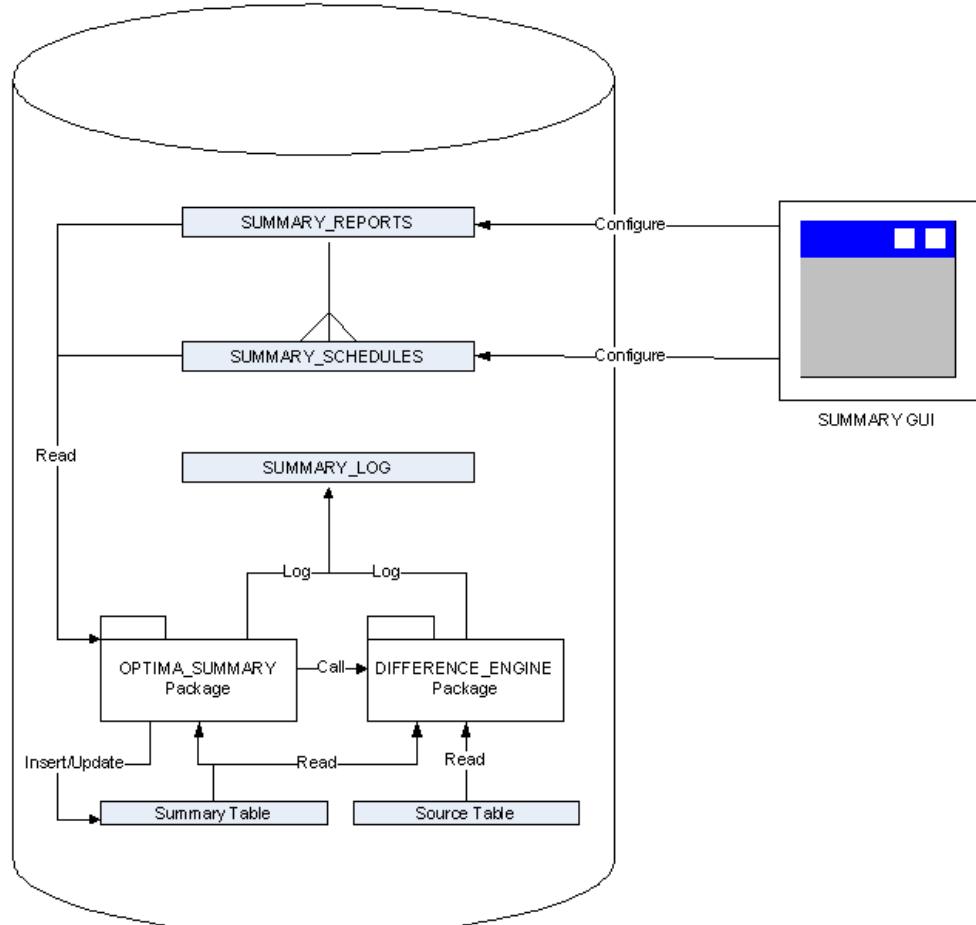


In this document, each configuration is referred to as a report.

The AIRCOM OPTIMA Summary process can be used for the following:

For This Functionality	The Summary Process
Time and Element Aggregation	Aggregates data from a primary table over time and element and inserts this data into a secondary table.
Busy Hour Calculation	Calculates a busy hour from data in a primary table and stores it in a secondary table.
Busy Hour Summarisation	Populates the busy hour summary tables using the data in the busy hour tables and a specified raw table.

This picture shows an overview of the AIRCOM OPTIMA Summary:



The OPTIMA_SUMMARY package reads its configuration from the SUMMARY_REPORTS and the SUMMARY_SCHEDULES tables. It then calls the DIFFERENCE_ENGINE package to compare the source table with the destination table. The OPTIMA_SUMMARY package then inserts and updates the summary table with the new data from the DIFFERENCE_ENGINE comparison.

The packages log their messages to the SUMMARY_LOG table. The SUMMARY GUI is a Windows application which is used to configure the SUMMARY_REPORTS and SUMMARY_SCHEDULES tables and monitor the processing of the OPTIMA_SUMMARY package.

5.4.1 Supported Summary Types

This table indicates all the summary types that are supported:

Summary Type	Summarisation (Insert Only)	Resummarisation (Insert and Update/Date Insert with Delete)
Time Aggregation - Hourly	✓	✓ Insert and Update/Date Insert with Delete
Time Aggregation - Daily	✓	✓ Insert and Update/Date Insert with Delete
Time Aggregation - Weekly	✓	✓ Insert and Update/Date Insert with Delete
Time Aggregation - Monthly	✓	✓ Insert and Update/Date Insert with Delete
Time Aggregation with Time Filter For example, Working Week	✓	✓ Insert and Update/Date Insert with Delete
Element Aggregation With Time Aggregation	✓	✓ Insert and Update/Date Insert with Delete
Element Aggregation Without Time Aggregation	✓	✓ Insert and Update/Date Insert with Delete
Time/Element with Element Filter	✓	✓ Insert and Update/Date Insert with Delete
Basic Busy Hour	✓	✓ Insert and Update/Date Insert with Delete
Busy Hour with Multi Rank For example, Top 3 BH	✓	✗
Rolling Busy Hour	✓	✓ Insert and Update/Date Insert with Delete
Busy Hour Summary Standard	✓	✓ Date Insert with Delete
Busy Hour Summary Rolling	✓	✓ Date Insert with Delete
RollUp Busy Hour	✓	✓ Date Insert with Delete
Rolling Rollup Busy Hour	✓	✓ Date Insert with Delete
Rollup Rolling Busy Hour Summary	✓	✗

5.4.2 Installing the AIRCOM OPTIMA Summary

To install the AIRCOM OPTIMA Summary:

- 1 Double-click AIRCOM OPTIMA Backend.msi.
- 2 Follow the on-screen instructions to install the products and options that you require including:
 - Entering your user name and company name
 - Choosing the Setup Type you require

Complete: If you choose Complete setup, then the installer will install the following:

- AIRCOM OPTIMA Installation Tool
- AIRCOM OPTIMA Summary Application
- Mediation Device Binaries

Custom: If you choose Custom setup, then you will have the option to select which application you would like to install



- 3 When the InstallShield Wizard Completed dialog box appears, click Finish.

 After you have installed the AIRCOM OPTIMA Summary, you may need to run the Create_Optima_Summary.sql script using SQL*Plus to create the database objects if these do not already exist. This script can be found at the following location, or from the path within the folder that you selected during installation:

C:\Program Files\AIRCOM International\AIRCOM Optima Backend\Scripts\Summary

After you have finished installing the AIRCOM OPTIMA Summary application, you will need to connect to the database to get it running.

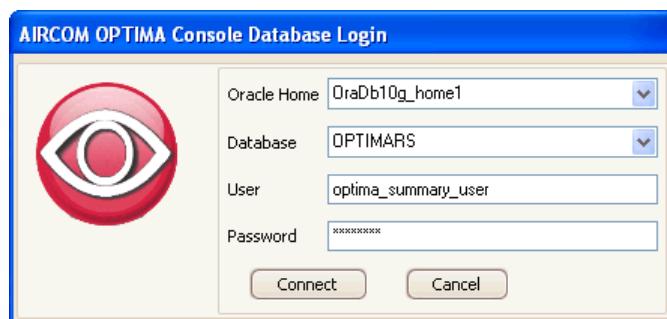
5.4.3 Connecting to the AIRCOM OPTIMA Database

When you open the AIRCOM OPTIMA Summary, you must connect to the database.

To connect to a database:

- 1 From the Start menu, point to Programs, select AIRCOM International, AIRCOM OPTIMA Backend, AIRCOM OPTIMA Summary.
- 2 In the Database Login dialog box:
 - From the Oracle Home drop-down list, select the appropriate Oracle version
 - From the Database drop-down list, select the required database
 - Type the user name and password

This picture shows an example:



- 3 Click Connect. If there is any error, you will need to ensure that the major, minor, and interim version numbers for the tool and packages are the same. For more information, see About AIRCOM OPTIMA Summary Version on page 186.
- 4 In the dialog box that appears, from the Tools menu, click Summary.

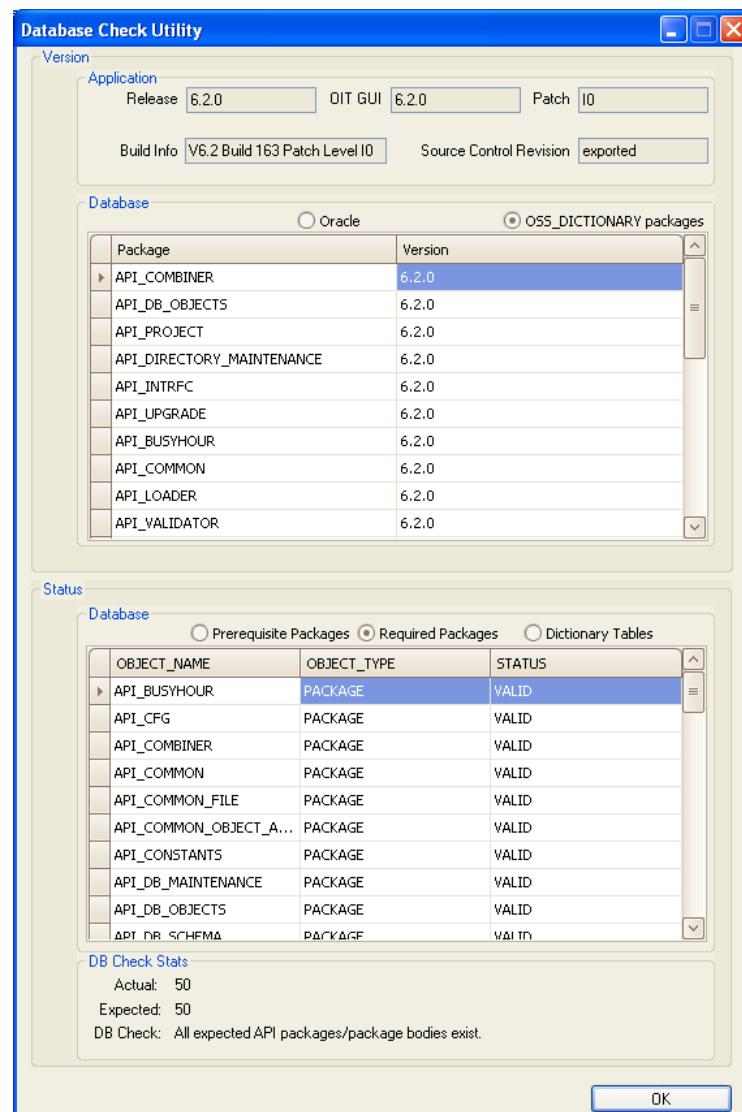
The AIRCOM OPTIMA Summary Configuration dialog box appears, in which you can configure the AIRCOM OPTIMA Summary process.

5.4.3.1 About AIRCOM OPTIMA Summary Version

A basic compatibility check is made to check whether the tool and packages in the relevant schemas have the same major, minor and interim version numbers.

The modules involved in the compatibility check are:

- Application (Summary)
- All PL/SQL packages relevant to the summary process



5.4.4 Configuring the AIRCOM OPTIMA Summary

Configuration of the AIRCOM OPTIMA Summary process consists of the following steps:

- 1 **Create Raw and Summary Tables.**

Ensure that raw and summary tables are created with correct partitions. You can do this manually or by using the AIRCOM OPTIMA Installation Tool (OIT).

- 2 **Configure the Report.**

After the raw and summary tables have been created, configure the report by setting the parameters for Source and Summary tables. For more information, see The Report Configuration Tab on page 192.

- 3 **Create Schedule(s).**

After configuring a report, schedules are created by default. These schedules decide when a particular report will run. You can edit these schedules to change the run time parameters. For more information, see Editing Report Schedules on page 210.

As well as these default report schedules, you can also create your own to correspond to different time zones, for example. For more information, see Adding Report Schedules on page 207.

- 4 **Enable the Report and Schedule(s).**

Ensure that the report and schedules are enabled. A schedule or a report will not run if it is not enabled.

- 5 **Create an Oracle Job.**

An Oracle job decides which schedule to run depending on the priority. If it does not already exist, then create an Oracle Job that calls the OPTIMA_Summary.DO_WORK() procedure which in turn run a query on the SUMMARY_SCHEDULES to find the most urgent schedule to process.

You can create an Oracle job to run the following:

```
begin  
aircom.optima_summary.do_work();  
end;
```

It should run every minute. The interval for this job should be set to SYSDATE+ (1/24 / (60*60)). It is recommended that you create a number of jobs equal to 4*CPU_Count.CPU_Count is an ORACLE parameter.

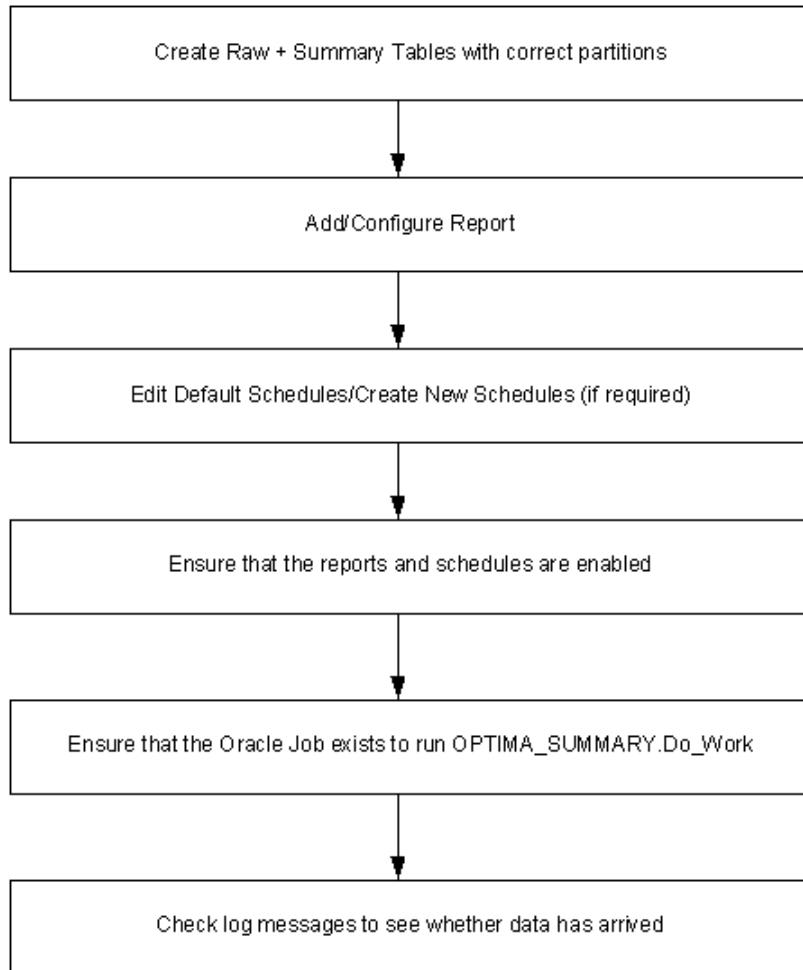


The recommended tool to create the Oracle jobs is TOAD.

- 6 **Check the Log Message.**

When a report is run, log messages are generated. You can check the log messages to make sure that the data has arrived.

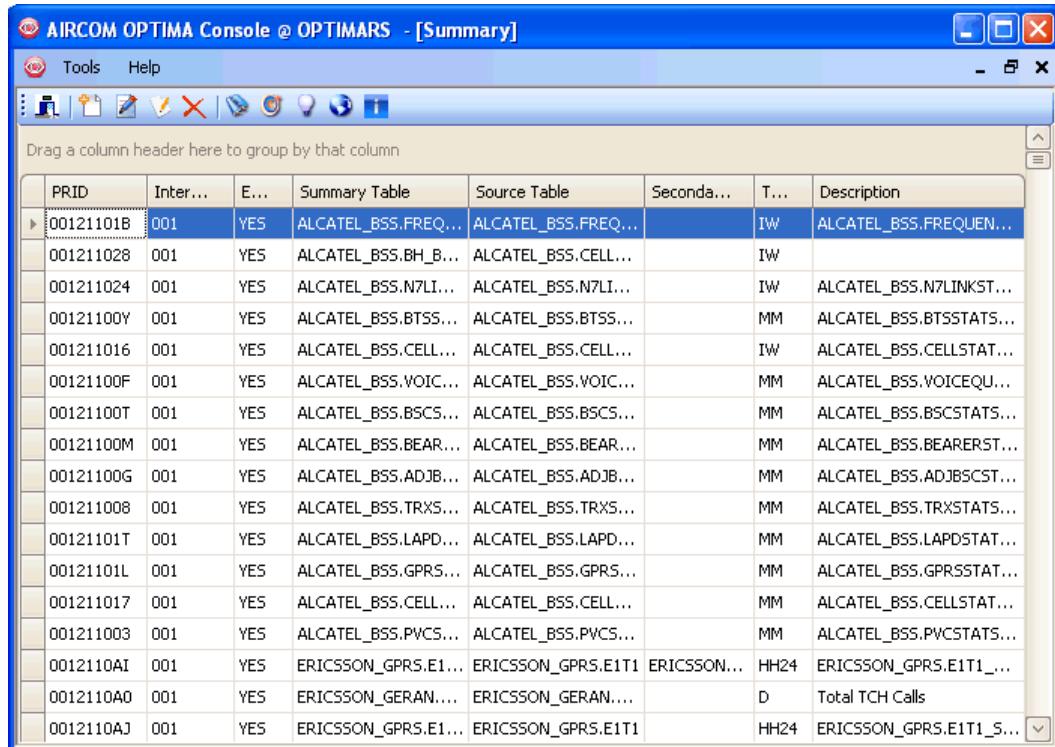
This flowchart explains the AIRCOM OPTIMA Summary Process:



Flowchart of the AIRCOM OPTIMA Summary Process

5.4.5 About the AIRCOM OPTIMA Summary Configuration Dialog Box

This picture shows the AIRCOM OPTIMA Summary Configuration dialog box:



AIRCOM OPTIMA Summary Configuration dialog box

This table describes the parameters that are displayed:

Parameter	Description
PRID	Program ID for the summary. For more information, see About Program IDs on page 17.
Interface	Interface ID for the summary
Enabled	Indicates whether the report is enabled
Summary Table	Table to store the aggregated data
Source Table	Source table for the summary
Secondary Source Table	Secondary Source Table for the summary
Time Agg	Time truncation for aggregates
Description	Description for the summary report

From the AIRCOM OPTIMA Summary Configuration toolbar, you can select these options:



Summary Configuration toolbar

This table describes the various toolbar options:

Button	Toolbar Option	Enables You To
	Exit	Close the application and exit.
	New Summary Report	Create a new summary report. For more information, see Adding a New Summary Report on page 190.
	Edit Report	Make changes to the configuration of a single report. For more information, see Editing and Deleting a Summary Report on page 214.
	Edit Multiple Reports	Make changes to a number of reports simultaneously. For more information, see Editing Multiple Reports on page 214.
	Delete Report	Delete an existing report. For more information, see Editing and Deleting a Summary Report on page 214.
	Log Viewer	View the list of log messages. For more information, see Viewing Log Messages on page 217.
	Schedule Explorer	View and edit the list of report schedules. For more information, see Viewing and Editing Report Schedules on page 210.
	Job Explorer	View the list of Oracle jobs. For more information, see Viewing Oracle Jobs on page 218.
	Migrate from Generic Summary	Migrate Generic Summary Reports to AIRCOM OPTIMA Summary Reports. For more information, see Migrating Generic Summary Reports on page 221.
	About Summary	View version information of the AIRCOM OPTIMA Summary Process. For more information, see About AIRCOM OPTIMA Summary Version on page 186.

5.4.6 Adding a New Summary Report

Adding a new summary report consists of the following prerequisites:

- Ensure that you have created the Source Tables and the Destination tables
- Ensure that a `SELECT` grant on the source table to AIRCOM user and `SELECT`, `INSERT`, and `UPDATE` grants on the destination table to AIRCOM user exist:

```
GRANT SELECT ON
SCHEMA.SRC_TABLE
TO AIRCOM
```

```
GRANT SELECT, INSERT, UPDATE ON
SCHEMA.DST_TABLE
TO AIRCOM
```

- The following tables must have a valid partition for the current day:
 - `Summary_Log`
 - Destination Table

 It is important for all summary tables to have an `ENTRIES` column to enable resummarisation.

To add a new summary report in the AIRCOM OPTIMA Summary Configuration dialog box:

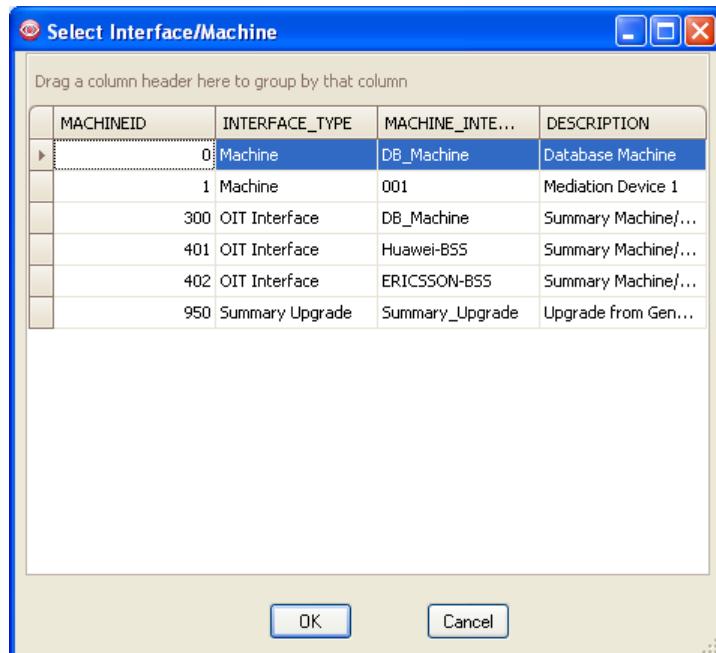
- 1 Click the New Summary Report button .

-or-

Right-click in the AIRCOM OPTIMA Summary Configuration dialog box and from the menu that appears, click New Report.

- 2 In the dialog box that appears, click a particular column to select the machine/interface to be used in the PRID for the new report.

This picture shows an example:



 For more information on PRIDs, see About Program IDs on page 17.

- 3 Click OK. The Create New Summary Report dialog box appears.

You can configure your report across a number of tabs:

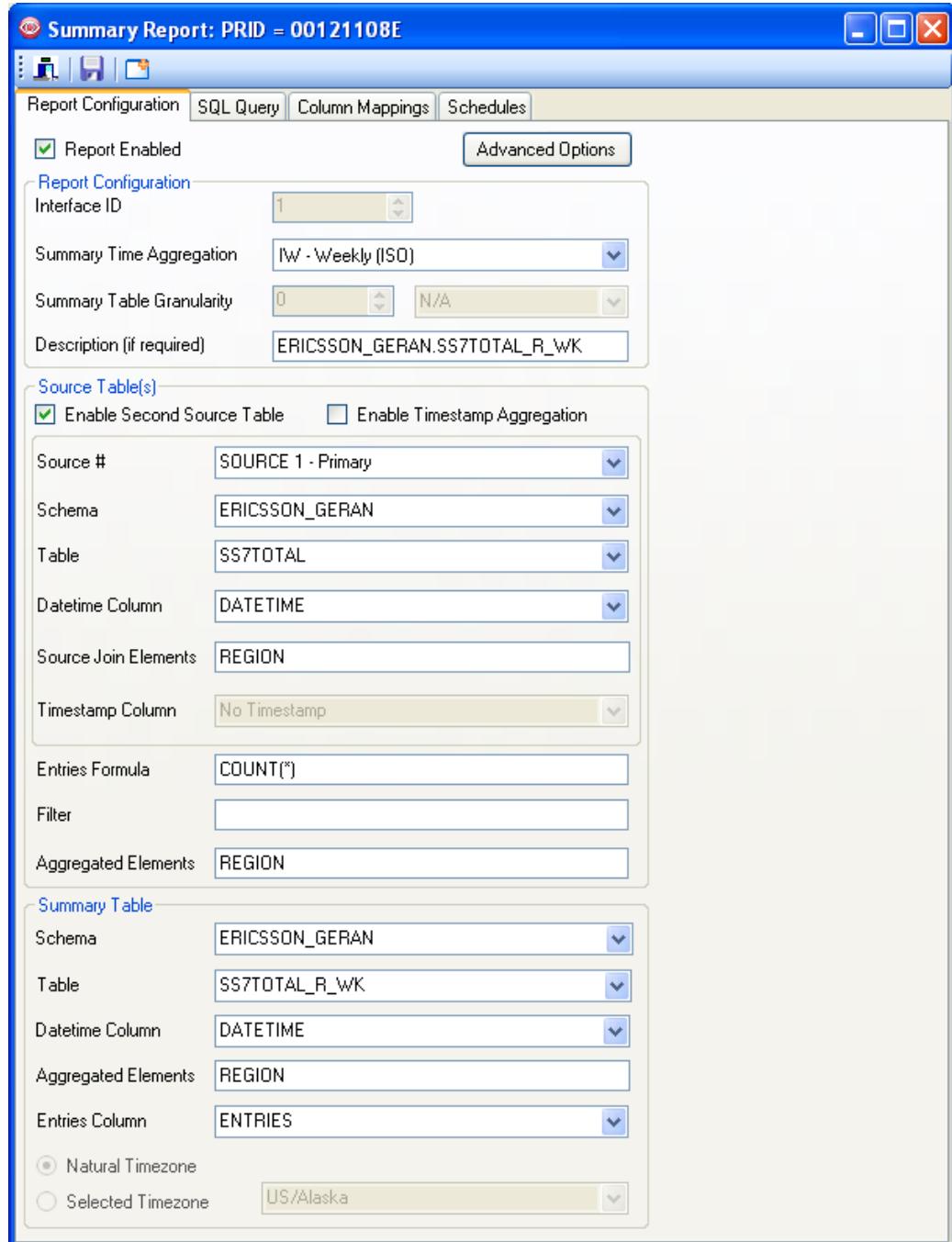
This Tab	Enables you to
Report Configuration	Configure the report, source table and summary table.
SQL Query	Type the SQL Query.
Column Mappings	Map the columns in the SQL query to the columns in the summary table.
Schedules	Create/Edit schedules.

5.4.6.1 The Report Configuration Tab

The Report Configuration tab of the Summary Report dialog box enables you to configure:

- General summary report information
- Information on the source table(s) to be summarised
- Information on the summary table that will be used

This picture shows an example of the Report Configuration tab:



The Report Configuration Tab

Report Configuration

To configure the report:

- 1 If you want the report to be run by the AIRCOM OPTIMA Summary processing package, select the Report Enabled option.
- 2 In the Report Configuration pane, from the Summary Time Aggregation drop-down list, select the aggregation type. This will be applied to the PK date column in the source table to aggregate the data to the granularity of the summary table. This means that the granularity of the summary table will be based on the value in the Summary Time Aggregation field.

For example, if you select Daily, then the summary table will have data for each day from the source table.



Notes:

- If you select Element Aggregation value, then the granularity of the source table will be same as the granularity of the summary table. Granularity is required for element aggregation to ensure that the scheduling is configured correctly.
- If you select Element Aggregation Only, then you will need to specifically select the Summary Table Granularity.

For example, to aggregate CELLSTATS with primary key (DATETIME, BSC, CELL) to a BSC level, you would enter BSC whereas for CELLSTATS hourly summary without element aggregation, you would enter BSC, CELL.

- 3 If you have selected Element Aggregation as the aggregation type, in the Summary Table Granularity field, define the granularity of the summary table in terms of minutes, hours, days or weeks.

For example, if the granularity is specified as 1 day, then the summary table will have data for each day.

- 4 In the Description text box, type a text description for the report for identification purposes.

Source Table Configuration

To configure the source table, in the Source Table pane:

- 1 If the summary has two source tables, select the Enable Second Source Table option.

For example, you may require a join of two raw tables, or a raw table with a busy hour definition table. The two tables will be joined by the AIRCOM OPTIMA Summary PL/SQL package.

If you select this option, then you will have to set the configuration for two source tables:

- Source 1 - Primary
- Source 2 - Secondary

If you do not select this option, then you will only have to set the configuration for the primary source table.

- 2 From the Source # drop-down list, select which source table you want to configure - either primary or (if you have selected the Enable Second Source Table option) secondary.
- 3 From the Schema drop-down list, select the schema in which the source table exists.
- 4 From the Table drop-down list, select the source table for the summary report.
- 5 From the Datetime Column drop-down list, select the Oracle date column that is used as the primary key of the source table.



If your secondary source is a CFG table with no date field in the primary key, then this can be left empty.

- 6 If you are generating summaries across multiple time zones, and want to aggregate the correct data using timestamp aggregation:
 - Select the Enable Timestamp Aggregation option.
 - From the Timestamp Column drop-down list, select the source table's timestamp column name. This will be the column that is read across all of the raw tables in order to ensure time zone consistency.



Important :

- When configuring the summary table, you should ensure that you choose the correct time zone option, either Natural or Selected. For a description of these options, see Summary Table Configuration below.
- If you select the Enable Timestamp Aggregation option as well as the Enable Second Source Table option, you must use the 'Override SQL' option in the Advanced Options to specify the SQL that will be used to join the tables. For more information, see Setting Advanced Options on page 197.

- 7 In the Source Join Elements box, use comma-separated values to define which common elements join the two source tables.

The first column in the primary list should match the first column in the secondary list, and so on.

For example, BSC in the primary source table may correspond to BSC_NAME in the secondary source table, CELL may correspond to CELL_NAME and so on.

- 8 In the Entries Formula box, specify the formula used for the CRC check.

The Entries Formula is used to load the ENTRIES column, whose column name is specified in the Summary Table Configuration. In normal usage for daily, weekly, and monthly summaries, you need to specify COUNT(*)�.

When the table is loaded from multiple count groups, each counter group in the raw table can be checked by selecting a column from each counter group. For example, NVL(Col A,0) + NVL(Col B,0) + NVL(Col C,0) where Col A, Col B and Col C are single columns from each counter group.

If the source table for the summary is a summary table in another report, for example, a daily summary can be a source for a weekly summary, then the ENTRIES formula should be SUM (ENTRIES), where ENTRIES is the ENTRIES column in the daily summary report.



If you are defining two source tables, the entries formula will be defined once for both. You should differentiate any columns that have the same name in the primary source and secondary source by using the appropriate prefix, either 's1' or 's2' respectively.

- 9 In the Filter box, type the filter. This filter applies to the source table selected in the Source# drop-down list. The filter enables you to restrict the number of rows in the source table to be summarised.

This field can have either a date filter or an element filter or both.

An example of the Element filter is BSC = 'BSC1'. In this example, only BSC1 will be summarised.

An example of the Time filter is a working week. A working week will summarise only the working days and not Sunday.

To test a working week, you can type the following filter:

```
TO_CHAR(DATETIME, 'D') IN (1,2,3,4,5,6)
```

where:

DATETIME is the date PK column name and (1,6) means Monday-Saturday, that is, exclude Sunday. If you want to exclude Saturday as well, you will need (1,5).



If you are defining two source tables, the filter will be defined once for both. You should differentiate any columns that have the same name in the primary source and secondary source by using the appropriate prefix, either 's1' or 's2' respectively.

- 10 In the Aggregated Elements box, specify the remaining non-date part of the logical primary key of the data in the SQL query:

- If element aggregation is not being used, this is the primary key of the source table minus the date column.
- or -
- If element aggregation is being used, this is the primary key of the source table query minus the date column and any columns which are at a lower level to the aggregated level.

If you want to use element aggregation by CFG table, these columns do not have to be the same as the Source Join Elements.



If you are defining two source tables, the aggregated elements will be defined once for both. You should differentiate any columns that have the same name in the primary source and secondary source by using the appropriate prefix, either 's1' or 's2' respectively.

Summary Table Configuration

This picture shows an example of the Summary Table Configuration:

The screenshot shows a configuration dialog titled "Summary Table". It contains the following fields:

Schema	ERICSSON_GERAN
Table	SS7TOTAL_R_WK
Datetime Column	DATETIME
Aggregated Elements	REGION
Entries Column	ENTRIES
<input checked="" type="radio"/> Natural Timezone	
<input type="radio"/> Selected Timezone	US/Alaska

An example of Summary Table Configuration

To configure the summary table:

- 1 From the Schema drop-down list, select the schema in which the summary table exists.
- 2 From the Table drop-down list, select the summary table. When you select a summary table, the Datetime Column, Aggregated Elements, and the Entries Formula fields acquire default values:

Field	Description
Datetime	The Oracle Date column in the Summary Table that is used in the Primary Key.
Aggregated Elements	The Summary Table's primary key minus the date column.  The Aggregated Elements column names should be specified as a comma separated list.
Entries Column	The column used to store the Entries Formula value.

- 3 If you have chosen to enable timestamp aggregation, select the required time zone option. This table describes these options:

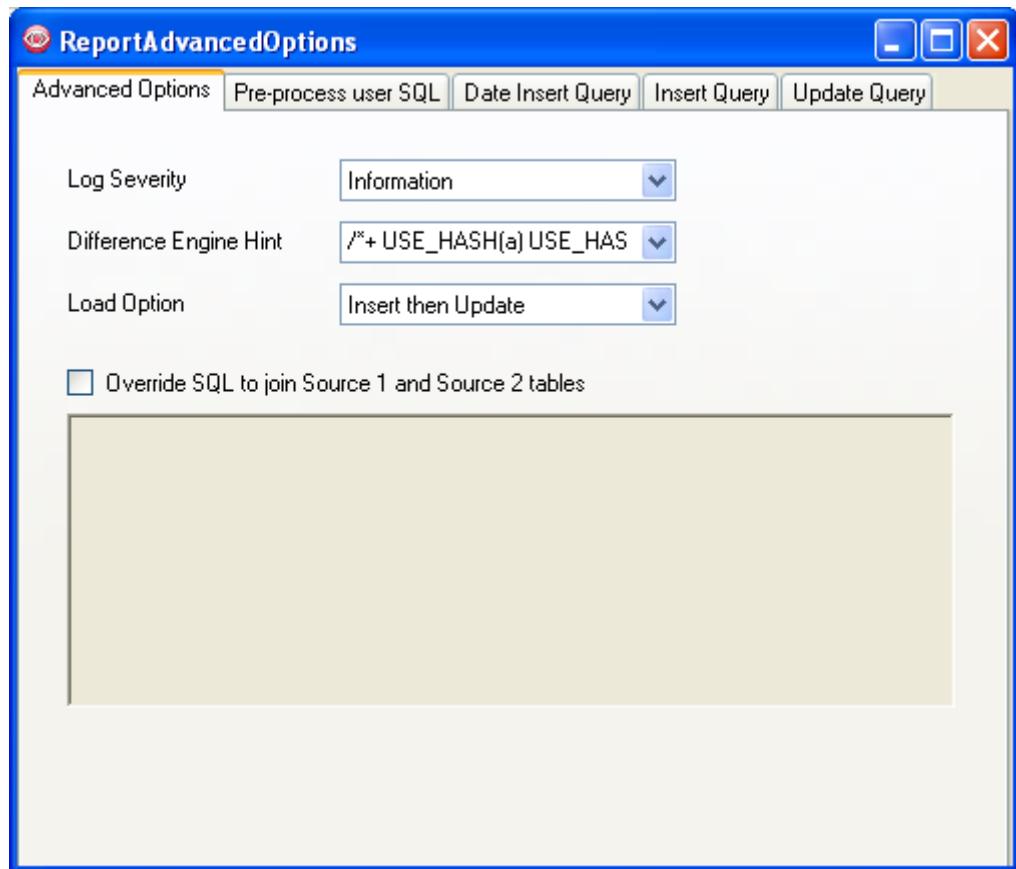
Item	Description
Natural Timezone	If you select this option (the default), the time zone value will be ignored - in other words, 10:00 in time zone 1 will be the same as 10:00 in time zone 2, time zone 3 and so on. The timestamp is returned as a date with the time zone information ignored, and the data is then aggregated to daily, weekly, monthly and so on based on this.
Selected Timezone	If you select this option (and then select a time zone from the drop-down list), the time zone value will be used to aggregate the data at the correct time across multiple time zones. For example, you have three time zones: West (-1 hour), Central (the meridian) and East (+1 hour). If you choose Central as the Selected Timezone, then a summary report configured to summarise the data across all 3 time zones at 10:00 Central time will aggregate the 09:00 data from West, 10:00 data from Central and 11:00 data from East.

Setting Advanced Options

The Advanced Options dialog box enables you to tune your summary report configuration further, across a number of tabs.

Advanced Options Tab

This picture shows an example of the Advanced Options tab:



Advanced Options Tab

This table describes the options:

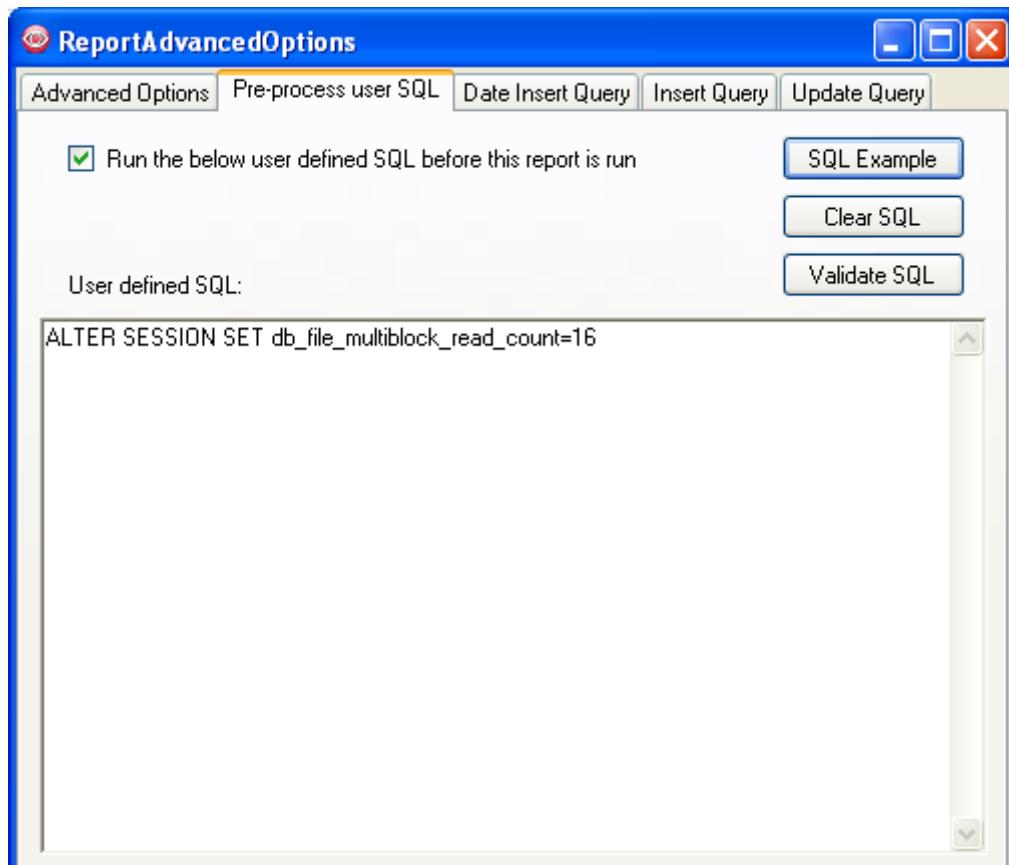
Option	Enables you to
Log Severity	<p>Set the severity of the log message that will be logged by the AIRCOM OPTIMA Summary package.</p> <p>The various log severity levels are:</p> <ul style="list-style-type: none">• Debug• Information• Warning• Minor• Major• Critical
Difference Engine Hint	<p>Use hint for the difference engine.</p> <p> It is recommended to use the Hash hint.</p>

Option	Enables you to
Load Option	<p>Select one of the following load options:</p> <ul style="list-style-type: none"> • Insert with Delete: This option inserts new summary periods and if resummary is required, then it deletes the entire period and inserts again. • Insert then Update: This option inserts date of new periods. If resummary is required, then it inserts for missing rows and updates for incomplete or incorrect rows using the primary key. <p> Insert then Update is the default option.</p> <ul style="list-style-type: none"> • Insert Only: This option just inserts new data. This means that there is no resummary. • Update Only: This option just updates the primary keys that have changed. • Date Insert Only: This option inserts new periods and does not insert or update or delete the data once it has been inserted.
Override SQL to join Source 1 and Source 2 tables	<p>Select this option if:</p> <ul style="list-style-type: none"> • You are configuring a report for CFG Historical tables, and want to join dates within a day of each other • You have selected to use timestamp aggregation with two source tables <p>You must define the SQL that will be used to join the tables.</p> <p> In the SQL, specify any columns that have the same name in both source tables by using 's1' (for source table 1) or 's2' (for source table 2) as appropriate.</p>

Pre-process user SQL Tab:

Before running a particular report, it is possible for the package to run a user defined SQL to tune the database session before running the main SQL Query in the SQL Query tab.

This picture shows an example of the Pre-process user SQL tab:



To tune the database session:

- 1 Select the checkbox.
- 2 Click SQL Example to insert a sample SQL
-or-

In the User-defined SQL text box, enter the SQL that should be executed before the report is run. You can enter SQL to change a database parameter for the session. This will only apply to the current report and the session will close after the report has run. Hence, any changes to session parameters will be reset.

The following gives an example of this:

```
ALTER SESSION SET db_file_multiblock_read_count=16
```

It is also possible to call a PL/SQL procedure before the report is run. For example, to call a SUMMARY_EXAMPLE procedure passing the parameter 100, type the following:

```
begin
    aircom.summary_example(100);
end;
```

- 3 Click Validate SQL to check whether the specified SQL is correct.

 If you need to clear the SQL, you can use the Clear SQL button Clear SQL.

Date Insert Query/Insert Query /Update Query Tabs:

These tabs show the query that will be run. This is dependent on the option selected in the Load Options drop-down list in the Advanced Options tab.

5.4.6.2 The SQL Query Tab

The SQL Query tab enables you to write a SQL query to define what you want to summarise.

This picture shows an example:

```
SELECT TRUNC(DATETIME, 'DD') DATETIME, BSC, CELL,  
SUM(COL1) COL1,  
SUM(COL2) COL2,  
SUM(COL3) COL3,  
SUM(COL4) COL4,  
SUM(COL5) COL5,  
COUNT(1) ENTRIES  
FROM SUMTEST_CELLSTATS  
WHERE DATETIME BETWEEN :STARTDATE AND :ENDDATE  
GROUP BY TRUNC(DATETIME, 'DD'), BSC, CELL
```

An example of the SQL Query tab of the Report Configuration dialog box

This example SQL query does not use time zones. To view a query that includes time zones, see Example SLQ Query Using Time Zones on page 202.

On the Report Configuration tab, you can choose a filter to apply to the source table selected in the Source# drop-down list. These filters enable you to restrict the number of rows in the source table to be summarised.

To use these filters, click the appropriate filter button. For example, click Source1 Filter to retrieve the value for the Element filter that has been set for Source 1.

To retrieve Date filter, click Source1 Date Filter.

When you click on anyone of these buttons, placeholders are inserted and values are picked based on the ones that you have specified in the Report Configuration tab.

It is important to type AND or Where in the SQL statement where it is applicable as per SQL rules.

To write the SQL:

- 1 Click the SQL Query tab.
- 2 Type the SQL to select the data to summarise from the Source Table.

You need to keep in mind the following rules for the Select query:

- It must include the clause Where %DATE1 AND/OR %DATE2 BETWEEN :STARTDATE AND :ENDDATE.
 - Click Source1 Date Filter to insert the %DATE1 placeholder.
 - Click Source2 Date Filter to insert the %DATE2 placeholder.
- Query must give alias for date column to itself if there is a date truncation applied. For example, SELECT TRUNC(DATETIME, 'DD') DATETIME
 - 💡 If the date column is to have a different name in the summary table, it must still have the alias for the date column name in the source table (it will still be mapped by position to the correct column)
- An alias should not be applied to the columns in the aggregated elements PK list. Only the date column should be aliased in the Primary Key.
- An alias should be given to the remainder of columns (counters).
- The query should not have :GROUPELEMENT bind variable. The only bind variables in the query should be :STARTDATE and :ENDDATE.

The following is an example of a sample SQL:

```
SELECT TRUNC(DATETIME, 'DD') DATETIME, BSC, CELL,  
SUM(COL1) COL1,  
SUM(COL2) COL2,  
SUM(COL3) COL3,  
SUM(COL4) COL4,  
SUM(COL5) COL5,  
COUNT(1) ENTRIES  
FROM SUMTEST.CELLSTATS  
WHERE DATETIME BETWEEN :STARTDATE AND :ENDDATE  
GROUP BY TRUNC(DATETIME, 'DD'), BSC, CELL
```

- 3 Click Validate to validate the SQL query.

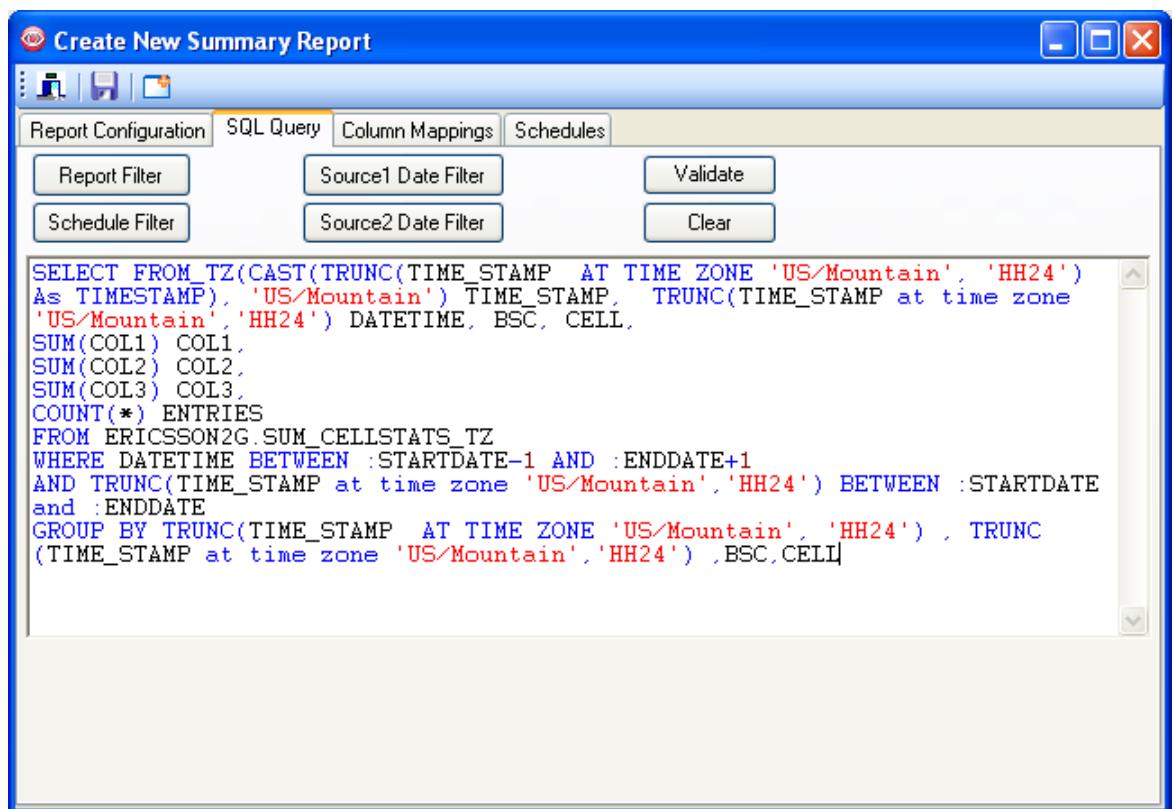
💡 You can click Clear to delete the SQL query.

Example SQL Query Using Time Zones

Here is an example SQL for an hourly summary, where the source timestamp column is converted to be at timezone 'US/Mountain'.

```
SELECT FROM_TZ(CAST(TRUNC(TIME_STAMP AT TIME ZONE
'US/Mountain', 'HH24') AS TIMESTAMP), 'US/Mountain')
TIME_STAMP, TRUNC(TIME_STAMP at time zone
'US/Mountain','HH24') DATETIME, BSC, CELL,
SUM(COL1) COL1,
SUM(COL2) COL2,
SUM(COL3) COL3,
COUNT(*) ENTRIES
FROM ERICSSON2G.SUM_CELLSTATS_TZ
WHERE DATETIME BETWEEN :STARTDATE-1 AND :ENDDATE+1
AND TRUNC(TIME_STAMP at time zone 'US/Mountain','HH24') BETWEEN
:STARTDATE and :ENDDATE
GROUP BY TRUNC(TIME_STAMP AT TIME ZONE 'US/Mountain', 'HH24')
, TRUNC(TIME_STAMP at time zone 'US/Mountain','HH24') ,BSC,CELL
```

This picture shows this SQL query on the SQL Query tab of the Report Advanced Options dialog box:

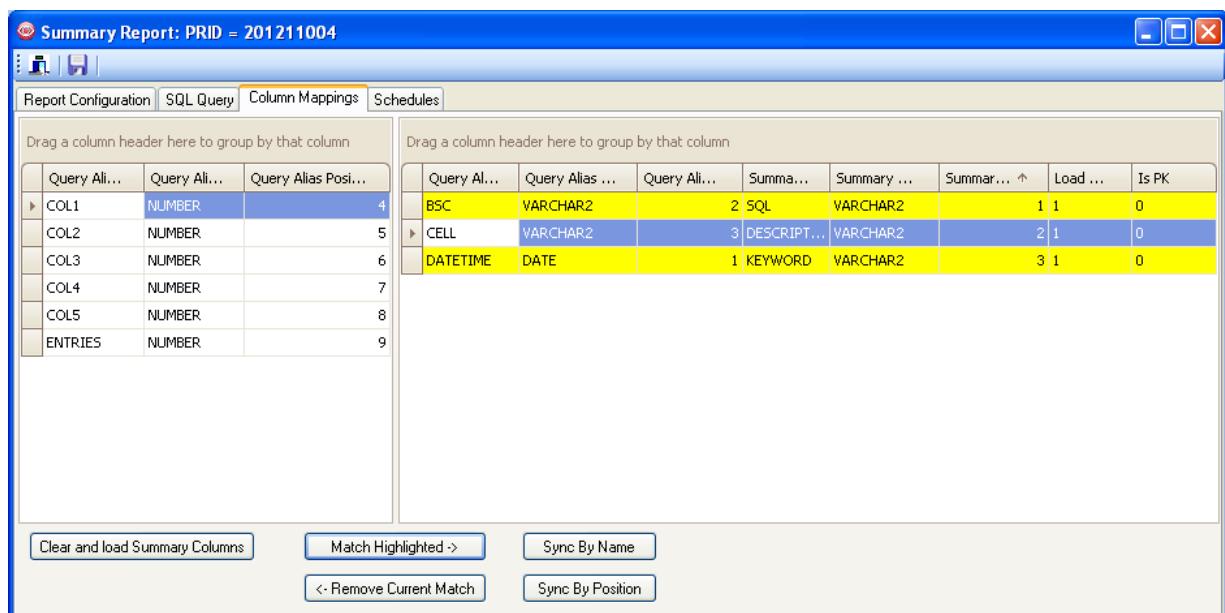


SQL Query including time zones

5.4.6.3 The Column Mappings Tab

The Column Mappings tab enables you to map the columns in the SQL query to the columns in the summary table.

This picture shows an example:



An example of the Column Mappings Tab of the Report Configuration dialog box

The Column Mappings tab is divided into two panes:

- Left-hand pane: Indicates the following details of the SQL query:

Field Name	Description
Query Alias Name	Name of the column in the SQL query
Query Alias Data Type	Data Type of the column in the SQL query
Query Alias Position	Position of the columns in the SQL query

- Right-hand pane: Indicates the following details of the summary table:

Field Name	Description
Query Alias Name	Name of the column in the SQL query. This field is empty at first. It is populated later with the SQL query column that matches the corresponding summary table column.
Query Alias Data Type	Data Type of the column in the SQL query. This field is empty at first. It is populated later with the SQL query column that matches the corresponding summary table column.
Query Alias Position	Position of the column in the SQL query. This field is empty at first. It is populated later with the SQL query column that matches the corresponding summary table column.
Summary Col Name	Name of the column in the summary table.
Summary Col Data Type	Data Type of the column in the summary table.
Summary Col Position	Position of the column in the summary table.

Field Name	Description
Load Column	Indicates whether a particular column of the SQL query is mapped to the corresponding column of the summary table. It takes the value 1 to indicate that the column is mapped, else its value is 0.
Is PK	Indicates whether the column is a primary key of the summary table.

To map the columns of the SQL query and summary table:

- 1 Click the Column Mappings tab. You will see that the left hand side pane has the values for the SQL query columns and the right hand side has the values for the summary table columns. The first three columns will be empty.
- 2 Select a particular row on the right hand side and click Match Highlighted->. The system will map a column from the left hand side to the selected column on the right hand side, delete the column from the left hand side and populate the row on the right hand side. After you click Match Highlighted, the value of Load Column changes to 1 as the column has been mapped.



Colour of the selected row on the right hand side indicates the following:

- No Colour: The SQL query column is correctly mapped to the summary table column.
- Green: There is no mapping between the SQL query column and the summary table column.
- Yellow: The SQL query column is mapped to summary table column but the Name/Data Type/Position is different between the SQL query column and summary table column. However, as the column is not a primary key of the summary table, the summary will work fine despite the mismatch.
- Red: This means that the Summary application will not work and it will result in an error due to any one of the following reasons:

First, an SQL query column is mapped to a summary table column but the Query Alias Name of the SQL query column is different from the Query Alias Name of the summary table column and this column forms part of the Primary Key of the summary table. To rectify this error, ensure that the query alias name of the summary table column is same as the query alias name of the SQL query column for the primary key.

Second, the Query Alias Name is not displayed in the 'Datetime Column' or 'Aggregated Elements' fields in the source table configuration in the Report Configuration tab and the field forms part of the Primary Key of the summary table. To rectify this error, ensure that the Query Alias Name is displayed in the 'Datetime Column' or 'Aggregated Elements' fields.

- 3 Click Clear and Load Summary Columns to remove all the mappings, reload the column list from the summary table and repopulate the query columns in the left hand grid.

- or -

Select a particular row and click Remove Current Match to remove the mapping for that row.

 **Tips:**

- Click Sync By Name to map the columns with the same name.
- Click Sync By Position to map the columns with the same position.

5.4.6.4 The Schedules Tab

The Schedules tab for a report lists the schedules that specify when the report will be run.

When you click the Schedules tab, two default schedules for that report are automatically created. These are:

- **Recent Schedule:**

A recent report checks the recent periods. The date period for a recent schedule is between SYSDATE-RECENT and SYSDATE.

The following table lists the recent periods for various granularity levels:

Granularity	Recent Period
Hourly	1-0
Daily	3-0
Weekly	7-0
Monthly	31-0

For example, when it is 3-0, it means that the summary schedule will calculate the date period between SYSDATE-3 and SYSDATE-0. That will account for the data for the last three days from today.

- **Historic Schedule:**

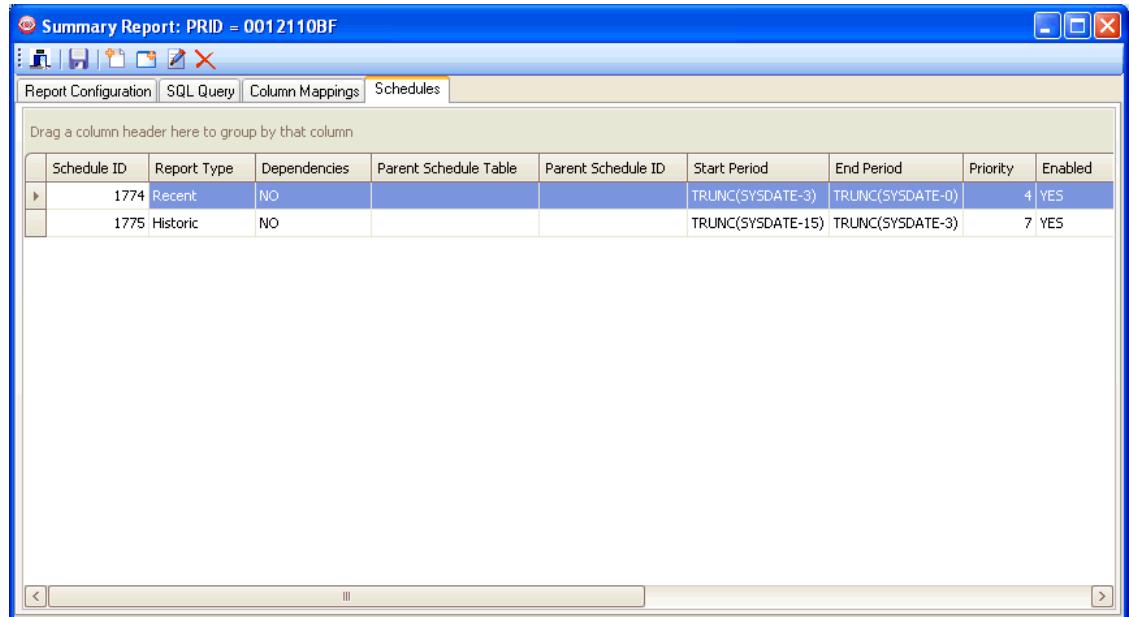
A historic report will also process 5 years of data when it first runs, to ensure that the table has all historic data. The date period for a historic schedule is between SYSDATE-HISTORIC and SYSDATE-RECENT.

The following table lists the historic periods for various granularity levels:

Granularity	Historic Period
Hourly	15-1
Daily	15-3
Weekly	31-7
Monthly	60-31

For example, when it is 15-3, it means that the summary schedule will calculate the date period between SYSDATE-15 and SYSDATE-3. For more information on how a period of a schedule is processed, see Processing of a Period by a Schedule on page 212.

This picture shows an example of the Schedules Tab:



To configure the default schedules for the report:

- 1 Click the Schedules tab.
- 2 Click Yes in the confirmation dialog box that appears.

The schedule for a report consists of the following parameters:

Option	Description
Schedule_ID	The identifier of the schedule.
Report_Type	Indicates whether a report has a recent or historic schedule.
Dependencies	<p>Indicates whether this schedule is dependent on a parent schedule. Being dependent on a parent schedule means that a child schedule can run only after it has received data from the parent schedule.</p> <p>For example, a daily schedule will be dependent on an hourly schedule as it will be executed only after data for all the hours in a day has come in after executing an hourly schedule.</p> <p>When the parent schedule has processed, and if the current schedule should be run, then the NEXT_RUN_DATE of the current schedule is set to SYSDATE where SYSDATE is the current date.</p> <p>For more information on how dependencies are executed, see About Dependencies on page 213.</p>
Parent_Schedule_Report	This is used in case there are dependencies. It is the schedule which if updated, will require the current schedule to run. A historic schedule is normally the parent of another historic schedule while a recent schedule is normally the parent of another recent schedule.
Parent_Schedule_ID	<p>Indicates the ID of the schedule which if updated will require the current schedule to be run.</p> <p> A historic schedule will normally be the parent schedule of another historic schedule and a recent schedule will be the parent schedule of another recent schedule.</p>

Option	Description
Start_Period	The start date of the period. This is relative to the current date, also known as the SYSDATE and is shown as (as SYSDATE - x) where x is in days. For example, if it is specified as (SYSDATE-1), it means that the start period for the data will be from yesterday as SYSDATE is the current date.
End_Period	The end date of the period. This is also relative to the current date and is specified as (SYSDATE - x) where x is in days.  A second is always subtracted from the end date. So, in order to process a daily summary of the 24th, you should pass start date as 24/11/2008 00:00:00 and end date as 25/11/2008 00:00:00 which is then converted to process the 24th. For example, if the end period is specified as (SYSDATE-0), then only the data till today will be picked up. Hence, if start period is (SYSDATE-1) and end period is (SYSDATE-0), then the data will be processed only for yesterday.
Priority	The priority of the schedule. The most urgent schedule should be given a 1, while a lower priority schedule should be given a higher number. The Oracle job will process a higher priority schedule before the lower priority schedule.  More than one schedule can have the same priority number.
Enabled	Indicates whether the schedule will run.
Current_Process_Start_Date	Indicates the date and time when the current schedule started processing.
Next_Run_Date	Indicates the date when the schedule is next scheduled to run.
Last_Run_Date	Indicates the date when the schedule was last run.
Next_Schedule_Date_Formula	An ORACLE formula that is used to calculate when the schedule should next be run after it has finished processing. For example, a value of SYSDATE + (15/24/60) will mean the schedule will run 15 minutes after it has completed processing and a value of TRUNC(SYSDATE+1) +(20/24) will run the next day at 8pm.

- 3 Click the Close button .
 - 4 In the Close Report dialog box that appears, click Yes to save the report.
-  You also have the option to edit these schedules. For more information, see [Editing Report Schedules on page 210](#).

As well as the two default schedules, you can create your own additional recent report schedules. This is particularly useful if your network spans multiple timezones, because it means that you can create separate schedules for each timezone. For more information, see [Adding Extra Report Schedules on page 207](#).

Adding Report Schedules

As well as the two default schedules on page 205, on the Schedules tab you can create your own additional report schedules, both historic and recent.

This is particularly useful if your network spans multiple timezones, because it means that you can create separate recent schedules for each timezone. Different timezones need to be processed at different times, based on when the data has loaded into the raw table - for example, based on your own location, each other time zone used will have a different 00:00, which could be before or after your own, and therefore the point at which a day's worth of data is collected will be different as well. Different schedules will be needed to compensate for this.

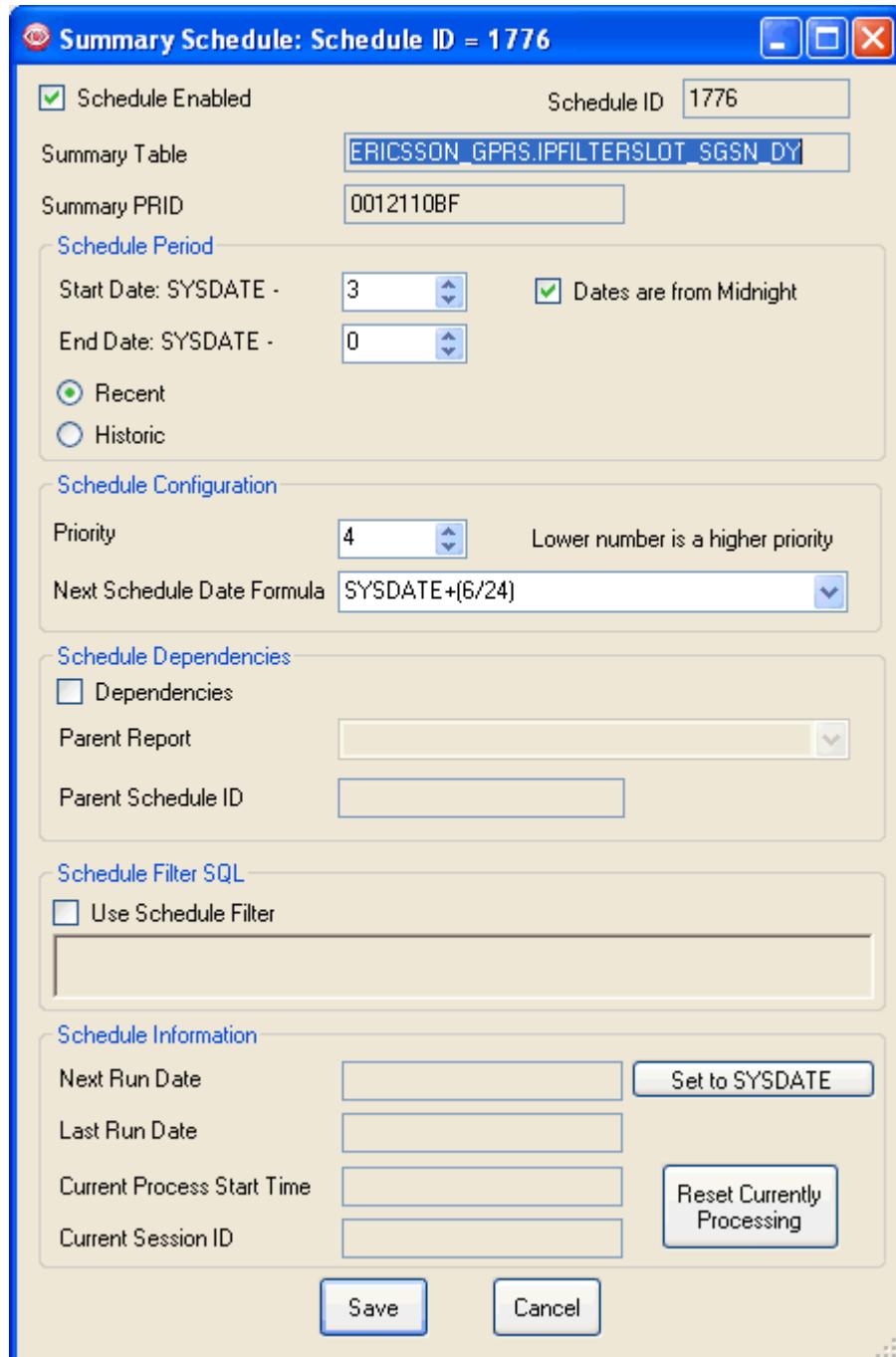
To create a new report schedule:

- 1 On the Schedules tab, click the Add Recent Schedule button  or Add Historic Schedule button as appropriate.

- or -

Right-click in the Schedules pane, and from the menu that appears, click either Add Recent Schedule or Add Historic Schedule as appropriate.

The Summary Schedule dialog box appears. This picture shows an example recent schedule:



- 2 To enable the schedule to run, select the Schedule Enabled option.

- 3 Define the details for the new schedule, as described in the following table:

In This Pane	Do This
Schedule Period	<p>Change the Start Date and the End Date of the schedule. It is calculated as SYSDATE-X, when you can type in X or use the up and down arrows to get the correct values.</p> <p>Ensure that the Dates are from Midnight checkbox is enabled, if you want the start date and the end date to be calculated by truncating to the midnight of the day that has been selected.</p>
Schedule Configuration	<p>Set the priority of the schedule. A lower number indicates higher priority.</p> <p>From the Next Schedule Date Formula drop-down list, select the Oracle formula that will be used to calculate when the schedule should next be run after it has finished processing.</p>
Schedule Dependencies	<p>Select the Dependencies checkbox if you want the schedule to be dependent on a parent schedule. This means that after the parent schedule has run, and if it is determined that the current schedule can be run, then the Next_RUN_DATE of the current schedule is set to the current date.</p> <p>From the Parent Schedule ID drop-down list, select the schedule ID for this schedule.</p> <p> You can select a summary report which populates either the source1 table or the source2 table in the Report Configuration tab. If the source tables are not populated by the summary, then dependencies cannot be used for the current schedule.</p> <p>The Parent Schedule ID is automatically set by the Summary GUI. If the current schedule is a recent schedule, then the recent schedule for the parent report is selected as the Parent Schedule ID. If the current schedule is a historic schedule, then the historic schedule for the parent report is selected as the Parent Schedule ID.</p>
Schedule Filter SQL	<p>Select the Schedule Filter option, and then define the SQL query that you want to use to filter the data.</p> <p>For example, if you are creating separate schedules for each timezone within your network, you should use this to filter on timezone, in order to filter out data that has not been completely loaded yet because it is in a different timezone that begins loading later than the other timezones.</p> <p> This filter is used in addition to the report-level filter.</p>
Schedule Information	<p>Click the Set to SYSDATE button to set the Next_RUN_DATE to the current date. In this case, the schedule will run immediately.</p> <p>Click Reset Currently Processing to reset the data.</p>

- 4 Click Save.

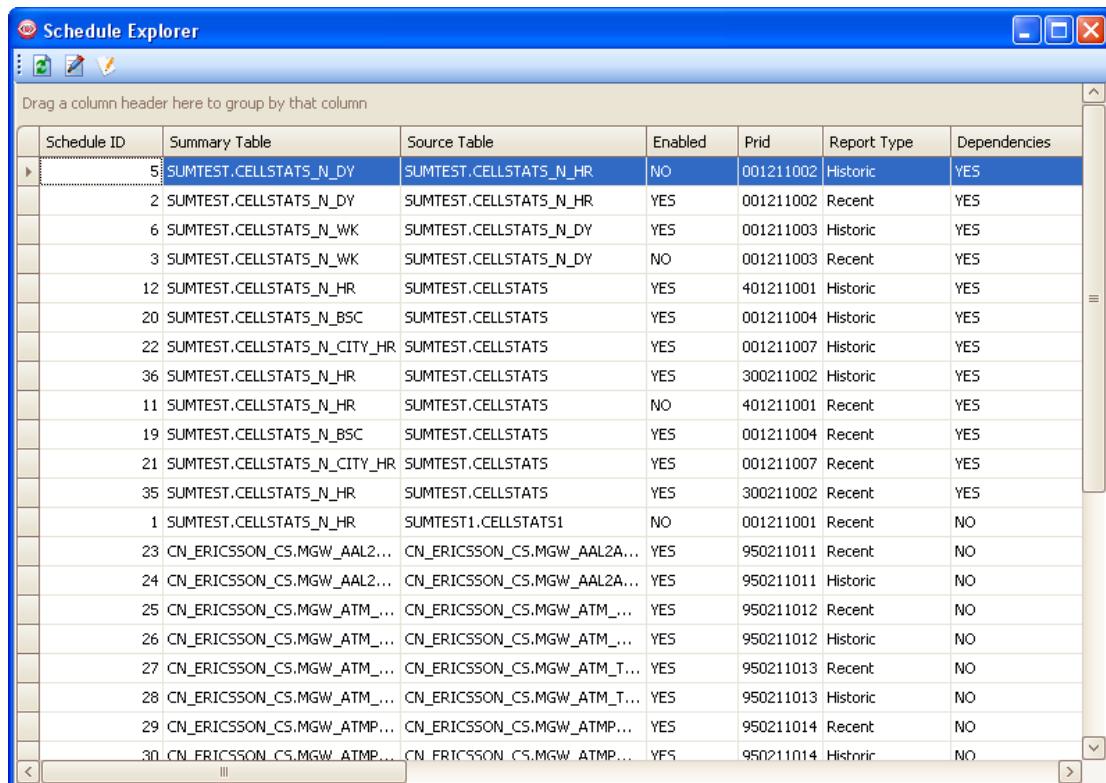
Viewing and Editing Report Schedules

To view report schedules that have been created:

- 1 In the AIRCOM OPTIMA Summary Configuration dialog box, click the Schedule Explorer button .

The Schedule Explorer appears, displaying the report schedules for all the reports.

This picture shows an example of the Schedule Explorer:



The Schedule Explorer dialog box displays a grid of report schedules. The columns are: Schedule ID, Summary Table, Source Table, Enabled, Prid, Report Type, and Dependencies. The data includes various report names like SUMTEST.CELLSTATS_N_DY, SUMTEST.CELLSTATS_N_HR, and CN_ERICSSON_CS.MGW_ATM_T... along with their corresponding parameters such as Enabled (NO/YES), Prid (e.g., 001211002, 401211001), Report Type (Historic/Recent), and Dependencies (YES/NO).

Schedule ID	Summary Table	Source Table	Enabled	Prid	Report Type	Dependencies
5	SUMTEST.CELLSTATS_N_DY	SUMTEST.CELLSTATS_N_HR	NO	001211002	Historic	YES
2	SUMTEST.CELLSTATS_N_DY	SUMTEST.CELLSTATS_N_HR	YES	001211002	Recent	YES
6	SUMTEST.CELLSTATS_N_WK	SUMTEST.CELLSTATS_N_DY	YES	001211003	Historic	YES
3	SUMTEST.CELLSTATS_N_WK	SUMTEST.CELLSTATS_N_DY	NO	001211003	Recent	YES
12	SUMTEST.CELLSTATS_N_HR	SUMTEST.CELLSTATS	YES	401211001	Historic	YES
20	SUMTEST.CELLSTATS_N_BSC	SUMTEST.CELLSTATS	YES	001211004	Historic	YES
22	SUMTEST.CELLSTATS_N_CITY_HR	SUMTEST.CELLSTATS	YES	001211007	Historic	YES
36	SUMTEST.CELLSTATS_N_HR	SUMTEST.CELLSTATS	YES	300211002	Historic	YES
11	SUMTEST.CELLSTATS_N_HR	SUMTEST.CELLSTATS	NO	401211001	Recent	YES
19	SUMTEST.CELLSTATS_N_BSC	SUMTEST.CELLSTATS	YES	001211004	Recent	YES
21	SUMTEST.CELLSTATS_N_CITY_HR	SUMTEST.CELLSTATS	YES	001211007	Recent	YES
35	SUMTEST.CELLSTATS_N_HR	SUMTEST.CELLSTATS	YES	300211002	Recent	YES
1	SUMTEST.CELLSTATS_N_HR	SUMTEST1.CELLSTATS1	NO	001211001	Recent	NO
23	CN_ERICSSON_CS.MGW_AAL2...	CN_ERICSSON_CS.MGW_AAL2...	YES	950211011	Recent	NO
24	CN_ERICSSON_CS.MGW_AAL2...	CN_ERICSSON_CS.MGW_AAL2...	YES	950211011	Historic	NO
25	CN_ERICSSON_CS.MGW_ATM...	CN_ERICSSON_CS.MGW_ATM...	YES	950211012	Recent	NO
26	CN_ERICSSON_CS.MGW_ATM...	CN_ERICSSON_CS.MGW_ATM...	YES	950211012	Historic	NO
27	CN_ERICSSON_CS.MGW_ATM...	CN_ERICSSON_CS.MGW_ATM_T...	YES	950211013	Recent	NO
28	CN_ERICSSON_CS.MGW_ATM...	CN_ERICSSON_CS.MGW_ATM_T...	YES	950211013	Historic	NO
29	CN_ERICSSON_CS.MGW_ATMP...	CN_ERICSSON_CS.MGW_ATMP...	YES	950211014	Recent	NO
30	CN_ERICSSON_CS.MGW_ATMP...	CN_ERICSSON_CS.MGW_ATMP...	YES	950211014	Historic	NO

This dialog box explains all the schedule parameters. For more information on schedule parameters, see The Schedules Tab on page 205.

You can edit individual report schedules, or a group of schedules simultaneously.

To edit a single report schedule:

- 1 Double-click a schedule that you want to edit.

- or -

While creating a report, in the Schedules tab of the AIRCOM OPTIMA Summary Configuration dialog box, double-click a schedule.

- or -

Select the required schedule, and then click the Edit Single Schedule button .

The Summary Schedule dialog box appears.

- 2 Edit the schedule details as required. For more information on these, see Adding Report Schedules on page 207.
- 3 Click Save.



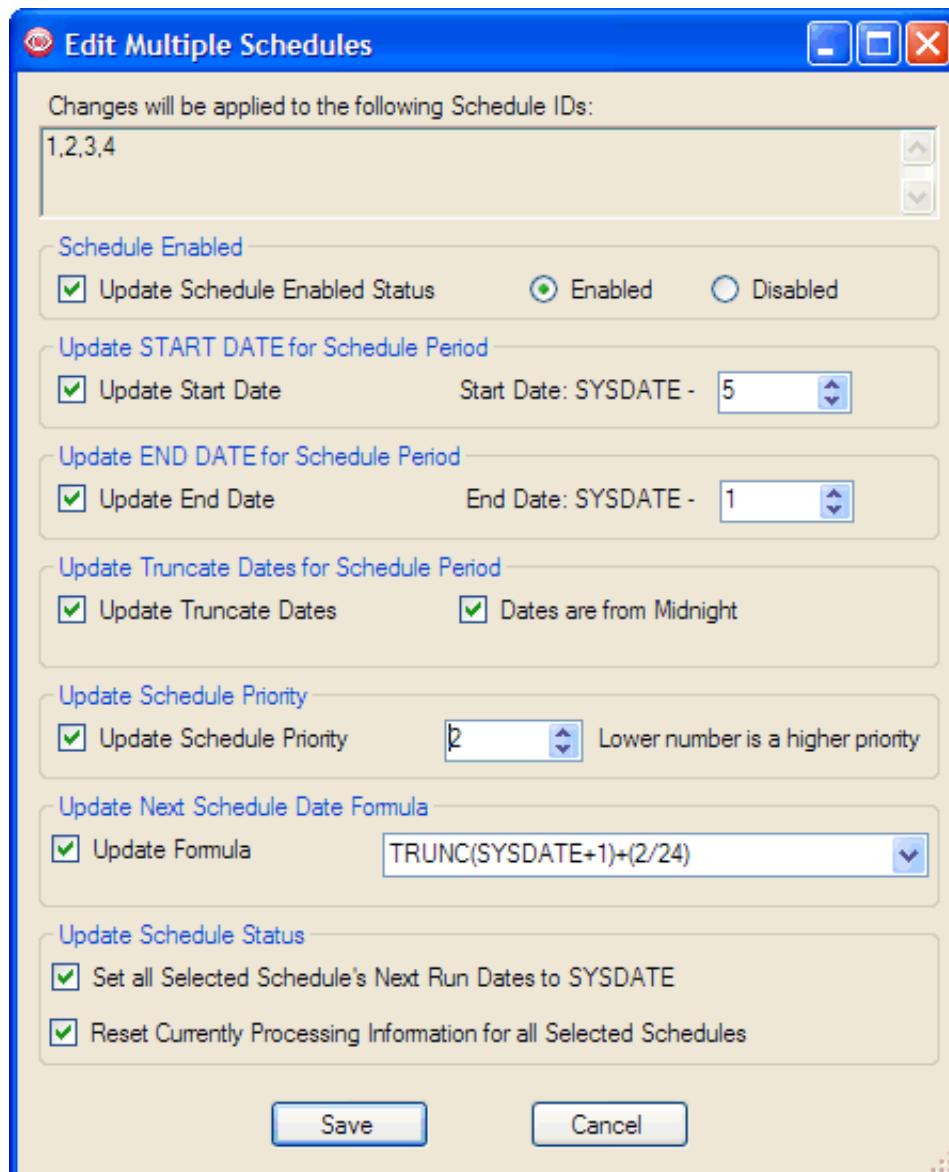
For information on how to edit several schedules at once, see [Editing Multiple Report Schedules](#) on page 211.

Editing Multiple Report Schedules

As well as editing individual report schedules, you can also edit multiple report schedules simultaneously. To do this:

- 1 Select the report schedules that you want to edit.
- 2 Click the Edit Multiple Schedules button

The Edit Multiple Schedules dialog box appears:

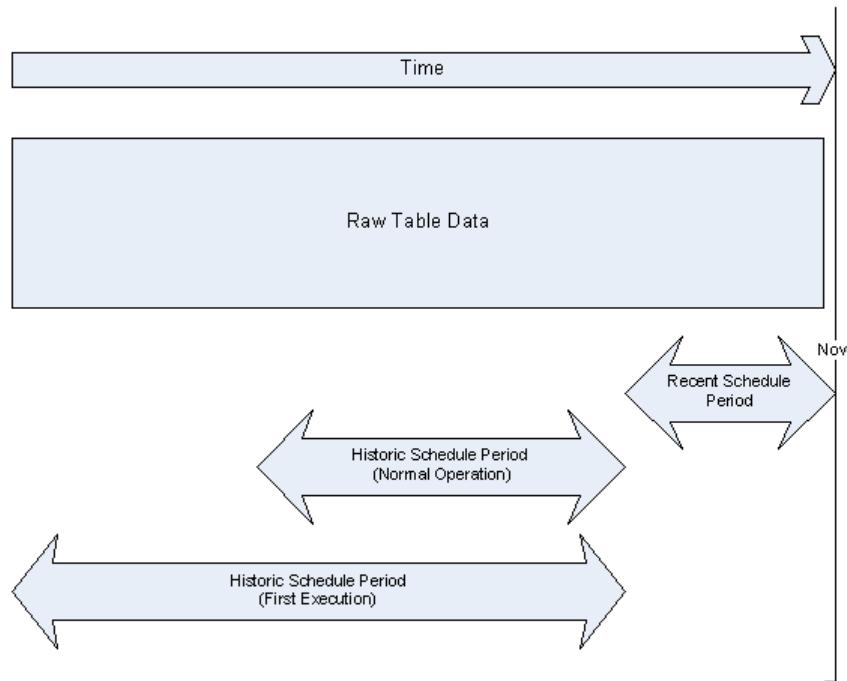


- 3 Change the details of the schedules as required. The parameters are the same as those for individual schedules, although a few have slightly different names; for example, the 'Set all Selected Schedule's Next Run Dates to SYSDATE' option is a checkbox rather than a 'Set To SYSDATE' button.

- When you have made the required changes, click Save.

Processing of a Period by a Schedule

This picture shows an example of the periods that a schedule processes:



An example of a period of a schedule is processed

Processing of a period of a schedule consists of the following steps:

- When a summary table is configured by the AIRCOM OPTIMA Summary, a report is created which will have a PRID. The AIRCOM OPTIMA Summary Process will then generate the following two schedules for the report:
 - Recent Schedule
 - Historic Schedule
- For more information on PRIDs, see [About Program IDs on page 17](#).
- The recent schedule will summarise and resummarise the recent data in the raw table, for example, from SYSDATE-3 to SYSDATE.
- The historic schedule will run less often and will resummarise any late data that has loaded into the raw table. The historic schedule will therefore process an older period, for example, from SYSDATE-15 to SYSDATE-3.

The end period of the historic schedule should match the start period of the recent schedule, the summary will subtract one second from the end period so the data queried will not overlap. When the historic schedule executes for the first time, it will process a much longer period to allow all the data in the raw table to be summarised.

About Dependencies

A dependency is a situation when one schedule depends on data to arrive from another schedule before it executes. Hence, dependencies have parent and child schedules. The schedule that is dependent is the child schedule while the one for which the child schedule waits is the parent schedule. A child schedule will execute only after the parent schedule has executed and data from the parent schedule has arrived.

For example, a daily schedule will be dependent on an hourly schedule as it will be executed only after data for all the hours in a day has come in after executing an hourly schedule. In this case, the daily schedule is the child schedule and the hourly schedule is the parent schedule.

There are two types of dependency that exist:

- Dependencies for Historic Schedules
- Dependencies for Recent Schedules

The two types are processed differently. The Schedule_Type column determines the type of dependency:

Recent with dependencies	1
Historic with dependencies	2
Recent no dependencies	3
Historic no dependencies	4

If the schedule type is 3 or 4, it means that such schedules do not have any dependent schedules.

Dependencies for Recent Schedules

If the schedule type is 1, then any child schedules will be scheduled to process immediately if the summary process has processed the last period in the parent schedule.

For example, if the 11pm data is processed, then a daily (child) recent schedule is set to run immediately. If a daily summary schedule is running, then if it has processed the last day of the month, then the monthly schedule will be set.

To improve efficiency, before a schedule processes a set of periods, it will generate a list of child schedule IDs together with the date and time that must be processed to cause the child schedule to be set. Every time it has completed processing a period, it will check the date and time of the period with the list and if it finds any matches it will set the NEXT_RUN_DATE of the child schedule to SYSDATE.

Dependencies for Historic Schedules

If the schedule type is 2, and any data - even row 1 - changes in the parent schedule, then the child historic is set to run immediately. There is no check on the date period being processed, and the assumption is that the processing period of the child schedule is the same as the parent schedule.

The dependencies check is therefore done when a schedule has finished processing a period. If any rows have been updated or inserted then all child schedules with PARENT_SCHEDULE_ID equal to the current SCHEDULE_ID are set to run immediately (NEXT_RUN_DATE is set to SYSDATE).

5.4.7 Editing and Deleting a Summary Report

To edit a summary report in the AIRCOM OPTIMA Summary Configuration dialog box:

- 1 Select the report that you want to edit and click the Edit Report button .

-or-

Right-click and from the menu that appears, click Edit Report.

- 2 In the dialog box that appears, make changes to the report.

- 3 Click the Close button .

- 4 In the dialog box that appears, click Yes to save your changes.

To delete a summary report in the AIRCOM OPTIMA Summary Configuration dialog box:

- 1 Select the report that you want to delete and click the Delete Report button .

-or-

Right-click and from the menu that appears, click Delete Report.

- 2 In the dialog box that appears, click Yes to delete the report. The selected report is removed from the summary reports table.

5.4.7.1 Editing Multiple Reports

The AIRCOM OPTIMA Summary Application enables you to edit the following attributes of multiple reports at the same time:

- Report Enabled Status
- Entries Formula for Source1 Table, Source2 Table, and Destination Table
- Load Option
- Log Severity

To do this:

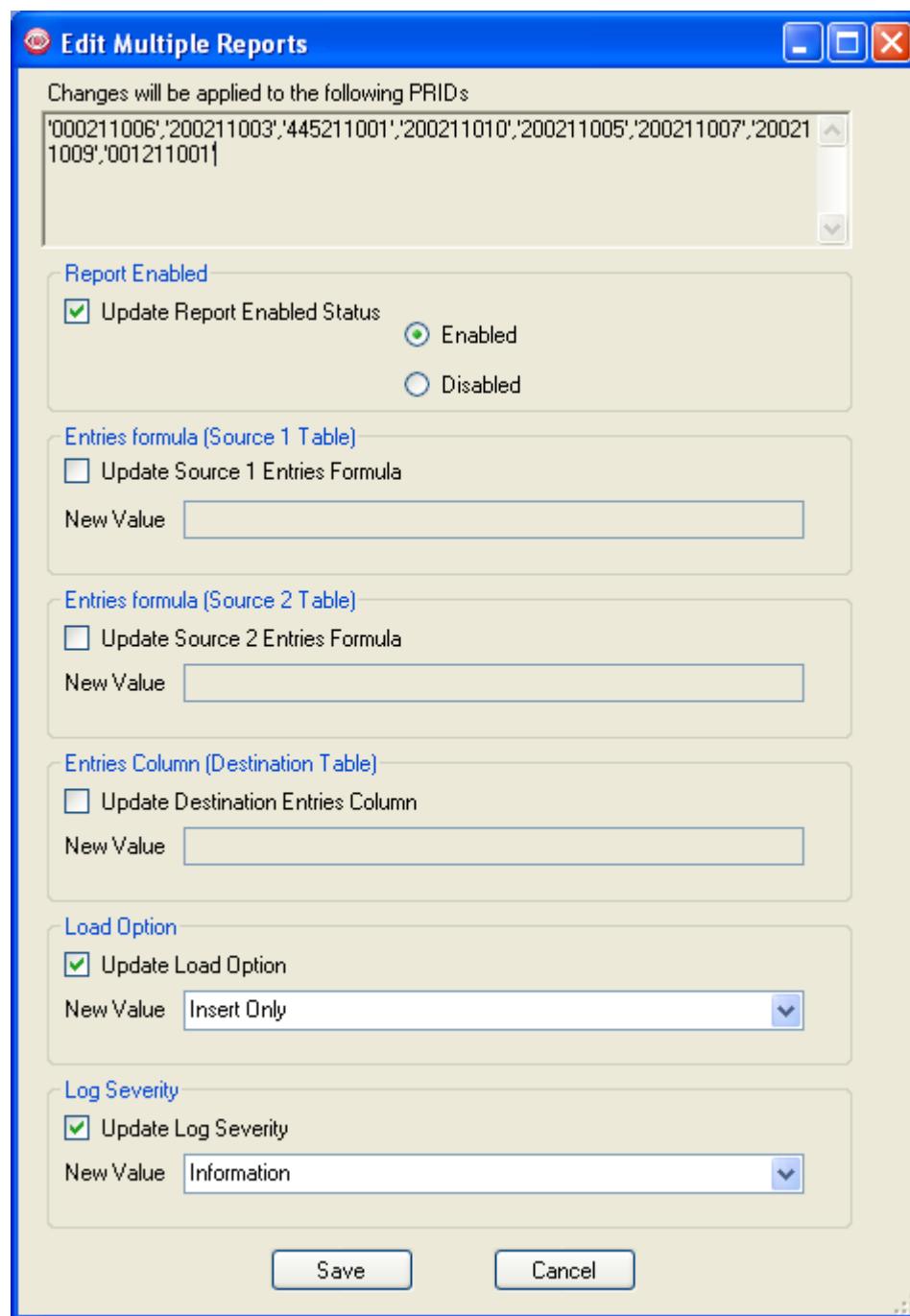
- 1 In the AIRCOM OPTIMA Summary Configuration dialog box, select multiple reports that you want to edit.
- 2 Click the Edit Multiple Reports button .

- or -

Right-click and from the menu that appears, click Edit Multiple Reports.

- 3 The Edit Multiple Reports dialog box opens.

This picture shows an example of the Edit Multiple Reports dialog box:



The different PRIDs that will be affected with your changes are displayed in the first pane. These PRIDs are of the different reports that you have selected.

This table shows the different options:

In This Pane	Do This
Report Enabled	Click Update Report Enabled Status to activate the Enabled/Disabled options. Select the desired option depending on whether you want to enable or disable the selected reports.
Entries Formula (Source 1 Table)	Select the Update Source 1 Entries Formula checkbox to activate the New Value text box. In the New Value text box, type the new entries formula for Source 1 table.
Entries Formula (Source 2 Table)	Select the Update Source 2 Entries Formula checkbox to activate the New Value text box. In the New Value text box, type the new entries formula for Source 2 table.
Entries Formula (Destination Table)	Select the Update Destination Entries Column checkbox to activate the New Value text box. In the New Value text box, type the new entries formula for the Destination table.
Load Option	Click the Update Load Option checkbox to activate the New Value drop-down list. From the New Value drop-down list, select the new load option.
Log Severity	Click the Update Log Severity option to activate the New Value drop-down list. From the New Value drop-down list, select the new log severity.

- 4 Click Save to apply these changes to all the selected reports.

5.4.8 Viewing Log Messages

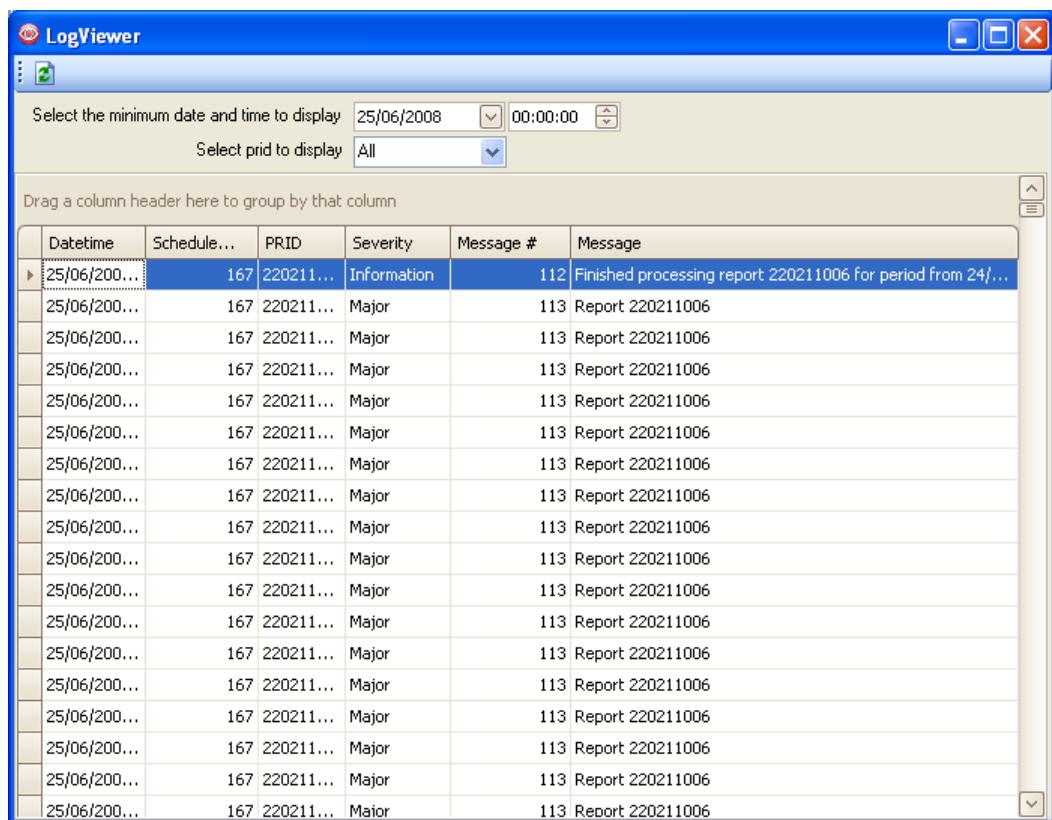
The Log Viewer enables you to view the log messages.

 It is essential that the Summary_Log table is partitioned for the current date and time for the log messages to appear in the Log Viewer.

To view the log messages in the AIRCOM OPTIMA Summary Configuration dialog box:

- 1 Click the Log Viewer button .

This picture shows an example of the Log Viewer:



- 2 From the date and time drop-down options, select the date and time after which you want to view the log messages.

 The log messages that will be displayed will be for the time period between the selected date and time and the present.

- 3 From the PRID drop-down list, select a particular PRID for which the log messages will be displayed.

 The default value is midnight till now.

- 4 Click the Refresh button  to get the list of log messages.

The Log Viewer dialog box displays the log messages.

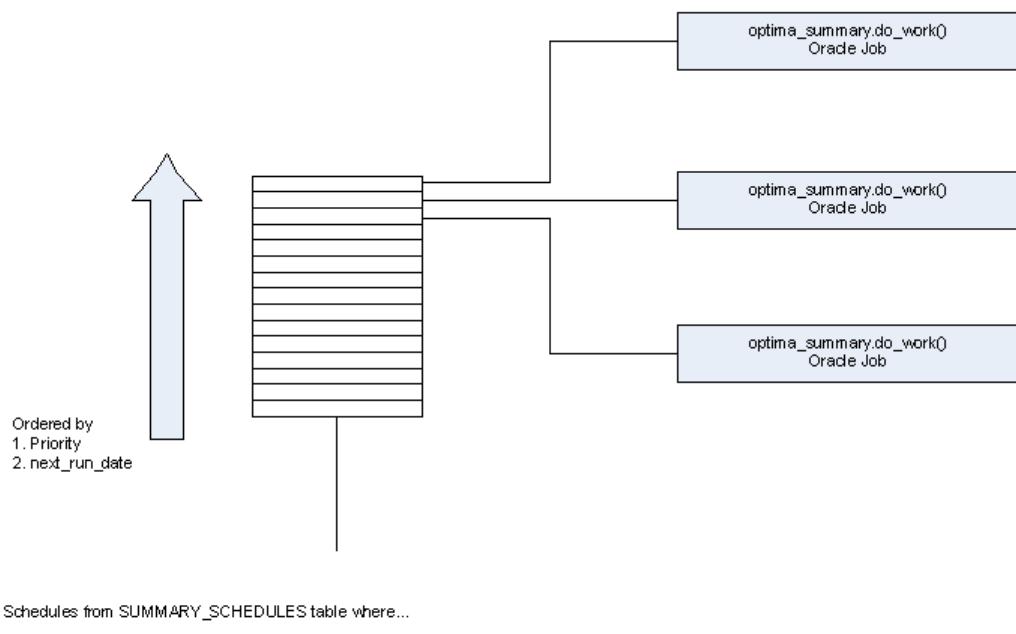
The following table lists the information that you can view for log messages:

This Parameter	Indicates
Datetime	Date and time of the log message
Schedule ID	Identifier of the schedule
PRID	Program ID for the summary report
Severity	Severity level of the log message
Message #	Identifier for the message
Message	Log message details from the PL/SQL package

5.4.9 About Oracle Jobs

An Oracle job decides which schedule to run depending on the priority.

This picture shows an example of how schedules are executed:



Execution of a schedule

Execution of a schedule consists of the following steps:

- 1 Oracle Jobs are set up within the database to run every minute and call `OPTIMA_SUMMARY.DO_WORK()`.
- 2 The schedules are selected from the list in the `SUMMARY_SCHEDULES` table based on the following criteria:
 - Schedule's next run date is before the current date (`NEXT_RUN_DATE < SYSDATE`)
 - Schedule is not currently processing (`current_process_start_date IS NULL OR (current_process_start_date < SYSDATE - 1 AND current_session_id NOT IN (SELECT sid FROM v$session))`)

- Schedule is enabled (ENABLED=1)
- 3 The schedule list is then ordered by
- PRIORITY (lowest number first)
 - NEXT_RUN_DATE (oldest date first)
- 4 The job will process the highest priority schedule and then terminate. If there are more schedules to process, they will be picked up by the next available job.

Each job therefore represents a concurrent execution of the summary. If there are five jobs, then the five schedules can be processed at the same time.

 The recommended number of jobs is 4*CPU_Count. CPU_Count is an ORACLE parameter.

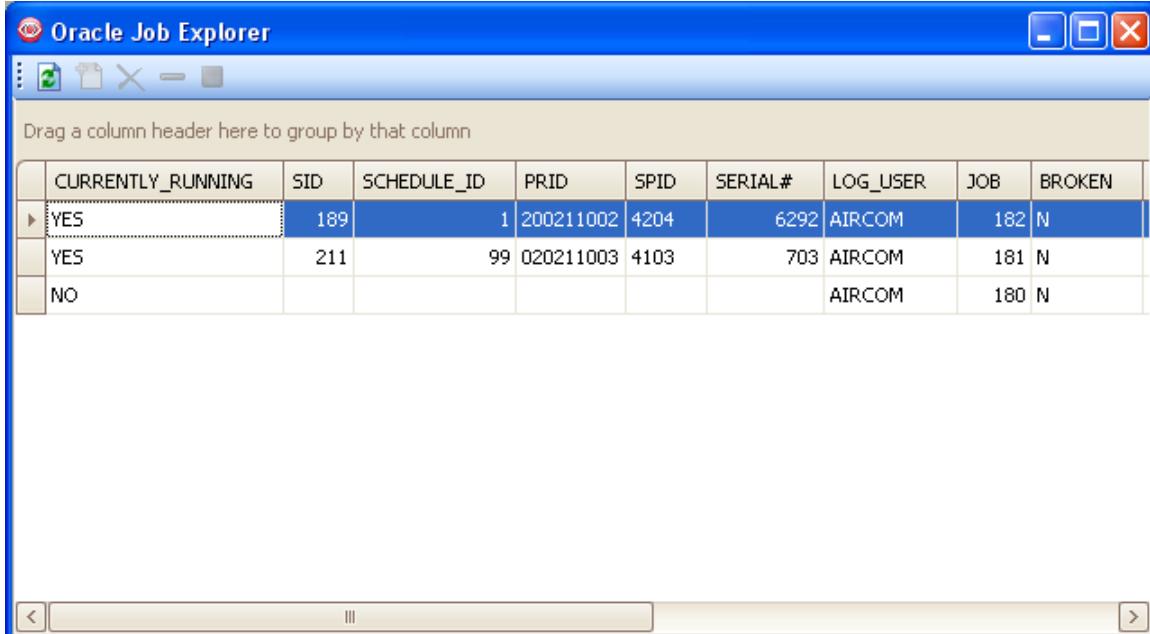
5.4.9.1 Viewing Oracle Jobs

The Oracle Job Explorer enables you to view all the Oracle jobs that have been configured to run the AIRCOM OPTIMA Summary PL/SQL processing package. It contains information about whether the job is running currently and if so, which schedule it is running.

To view Oracle jobs:

- 1 In the AIRCOM OPTIMA Summary Configuration dialog box, click the Job Explorer button .

The Oracle Job Explorer appears. This picture shows an example:



The screenshot shows the Oracle Job Explorer application window. The title bar reads "Oracle Job Explorer". The main area is a grid table with the following columns: CURRENTLY_RUNNING, SID, SCHEDULE_ID, PRID, SPID, SERIAL#, LOG_USER, JOB, and BROKEN. There are three rows of data:

CURRENTLY_RUNNING	SID	SCHEDULE_ID	PRID	SPID	SERIAL#	LOG_USER	JOB	BROKEN
YES	189	1	200211002	4204	6292	AIRCOM	182	N
YES	211	99	020211003	4103	703	AIRCOM	181	N
NO						AIRCOM	180	N

The following table lists the various parameters of Oracle jobs:

This Parameter	Indicates
Currently_Running	Whether the job is executing at that current time.
SID	Oracle Session ID.
Schedule_ID	Identifier of the schedule for which the job is currently running.
PRID	Identifier of the report.  For more information, see About Program IDs on page 17.
SPID	System Process ID.
Serial #	Internal Oracle ID for the session.
Log_User	User that executes the job.
Job	Job ID.
Broken	Whether the job has broken. If Yes, then the job will not run. In this scenario, you will need to find the reason why the job has broken and enable it again.
Failures	Number of times the job has failed.
Last_Date	Last date the job had run.
This_Date	Date when the job started running.
Next_Date	Date when the job is scheduled to run next.
Interval	How often the job runs.

5.4.10 Migrating Generic Summary Reports

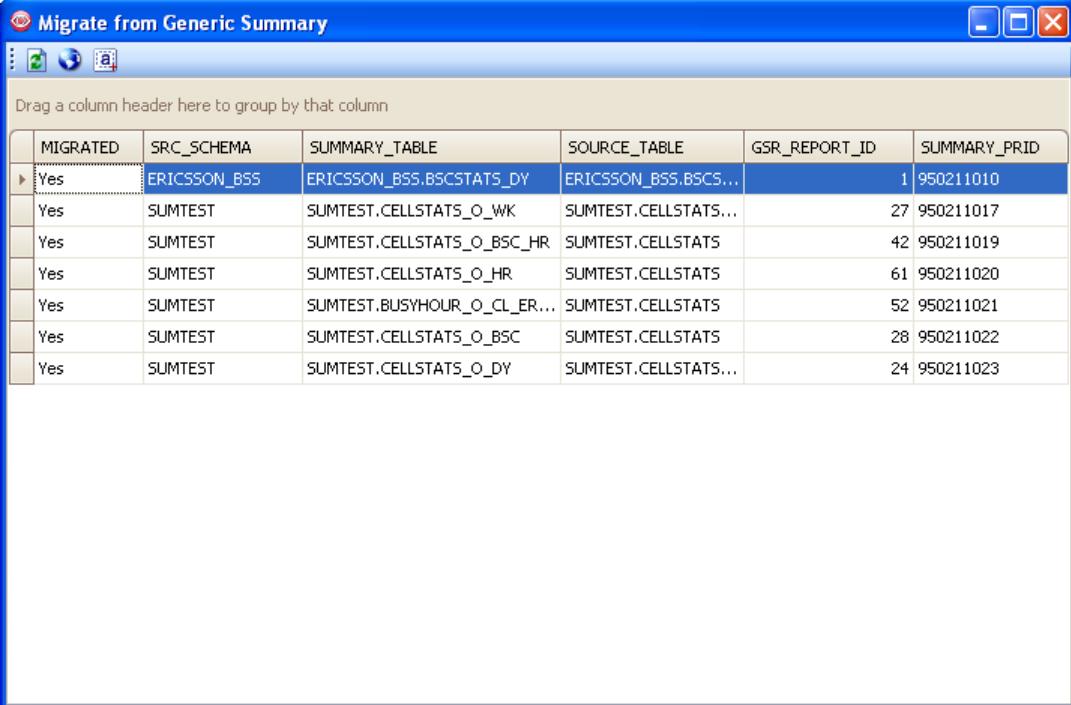
The AIRCOM OPTIMA Summary application has replaced the Generic Summary application. However, if you still have old generic summary reports, you can migrate them into AIRCOM OPTIMA summary reports.

 To migrate Generic Summary reports successfully, the Summary table must exist, because the Generic Summary column mappings data will be migrated to the new AIRCOM OPTIMA Summary columns table.

To migrate a generic summary report:

- 1 In the AIRCOM OPTIMA Summary Configuration dialog box, click the Migrate from Generic Summary button .

The Migrate from Generic Summary dialog box appears. This picture shows an example:



Drag a column header here to group by that column						
MIGRATED	SRC_SCHEMA	SUMMARY_TABLE	SOURCE_TABLE	GSR_REPORT_ID	SUMMARY_PRID	
Yes	ERICSSON_BSS	ERICSSON_BSS.BSCSTATS_DY	ERICSSON_BSS.BSCS...	1	950211010	
Yes	SUMTEST	SUMTEST.CELLSTATS_O_WK	SUMTEST.CELLSTATS...	27	950211017	
Yes	SUMTEST	SUMTEST.CELLSTATS_O_BSC_HR	SUMTEST.CELLSTATS	42	950211019	
Yes	SUMTEST	SUMTEST.CELLSTATS_O_HR	SUMTEST.CELLSTATS	61	950211020	
Yes	SUMTEST	SUMTEST.BUSY HOUR_O_CL_ER...	SUMTEST.CELLSTATS	52	950211021	
Yes	SUMTEST	SUMTEST.CELLSTATS_O_BSC	SUMTEST.CELLSTATS	28	950211022	
Yes	SUMTEST	SUMTEST.CELLSTATS_O_DY	SUMTEST.CELLSTATS...	24	950211023	

 It is only possible to migrate those reports which have not yet been migrated. The MIGRATED column indicates whether a report has been migrated.

- 2 Click the Select All Not Migrated button  All the reports that have not been migrated are selected.

-or-

Alternatively, you can also select a single report that has not yet been migrated, and click the Migrate Selected Summary Reports button  All the selected generic summary reports will get migrated to AIRCOM OPTIMA summary reports.

After the selected generic summary reports have been migrated, a log message dialog box appears showing the log files for the migration. This includes the new PRID for the migrated report and any errors in processing.



These log messages are not stored in the SUMMARY_LOG table.

When a report is migrated, the Entries Formula and column will be set to 1. This will allow the summaries to work immediately.

5.4.11 Using the Summary for Direct Database Loading

As well as using the AIRCOM OPTIMA Summary application to summarise data within the AIRCOM OPTIMA database, you can also use it to load data from any other third-party database directly into AIRCOM OPTIMA over a direct database link.

To do this:

- 1 Create a database link that enables you to access the source database from AIRCOM OPTIMA using the login details for the source database. A database link is a schema object in one database that enables you to access objects on another database.

For more information on how to create database links, see <http://otn.oracle.com>.

You can run the following script within TOAD to create the database link while logged into AIRCOM OPTIMA as the DBA.

An example database link could be:

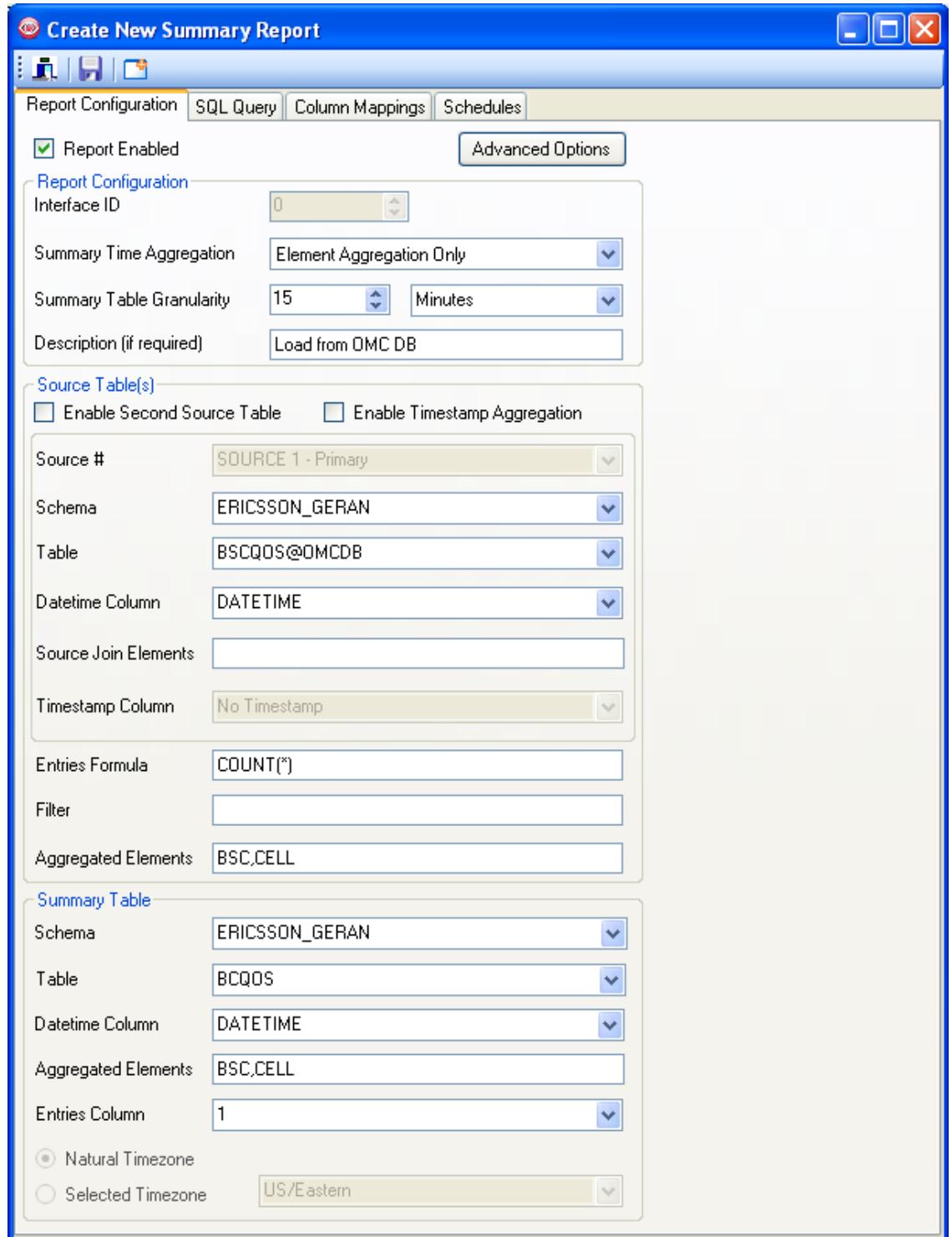
```
CREATE PUBLIC DATABASE LINK OMCDLINK  
    CONNECT TO OMC_USER IDENTIFIED BY password  
    USING 'OMCDB';
```

Where:

- OMCDLINK is the name of the link you want to create
- OMC_USER is the name of the user on the source database (OMCDB)
- password is the password string
- OMCDB is the name of the source database from where the data is to be loaded into AIRCOM OPTIMA.

- 2 In the AIRCOM OPTIMA database, define your summary report configuration in the usual way, using the following guidelines:
 - The Summary Time Aggregation option should be set as 'Element Aggregation Only'
 - The Summary Table Granularity should match the granularity of the raw and destination tables
 - For the Source Table, the schema should be the one in the source database that you want to load, and the table should be written as 'tablename@database link name'
 - The Entries Formula should be COUNT(*) and the Entries Column should be 1 in order to ensure a 1:1 mapping of primary key records
 - The Summary Table that you define should be the table in the destination database into which you want to load the data

This picture shows an example:



- 3 Define the corresponding query on the SQL Query tab.

An example query could be:

```
SELECT * ALL FROM ERICSSON_GERAN.BSCQOS@OMCDB  
WHERE %DATE1
```

This query will load all rows from the BSCQOS table in the ERICSSON_GERAN schema of the source database referenced by the OMCDB database link.



The query should not have a 'group by' clause, as it will be comparing individual rows rather than groups.

- 4 Define the column mappings and schedules as normal.
- 5 Resummarise, using 'Insert and Update'.

5.5 About the Data Quality Package

The Data Quality package enables you to configure reports on the quality of data, for example, data that is incomplete or missing.

5.5.1 Installing the Data Quality Package

Before you can use the Data Quality package, install the following files to a local directory:

- opx_DAQ_WIN_420.exe
- OSSFrameWork.dll
- OSSDataQuality.dll



It is strongly recommended that you install the backend components using the AIRCOM OPTIMA combined backend package, which will install the required components quickly and easily. For more information on how to use this, see the AIRCOM OPTIMA Operations and Maintenance Guide.

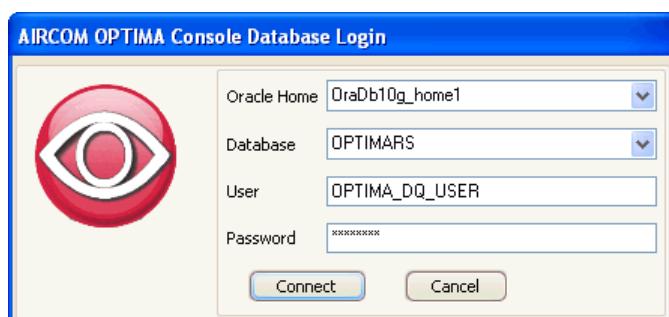
5.5.2 Using the Data Quality Console

You use the Data Quality Console to configure the Data Quality package. When you start the Data Quality Console, you must connect to the database.

To start the Data Quality Console:

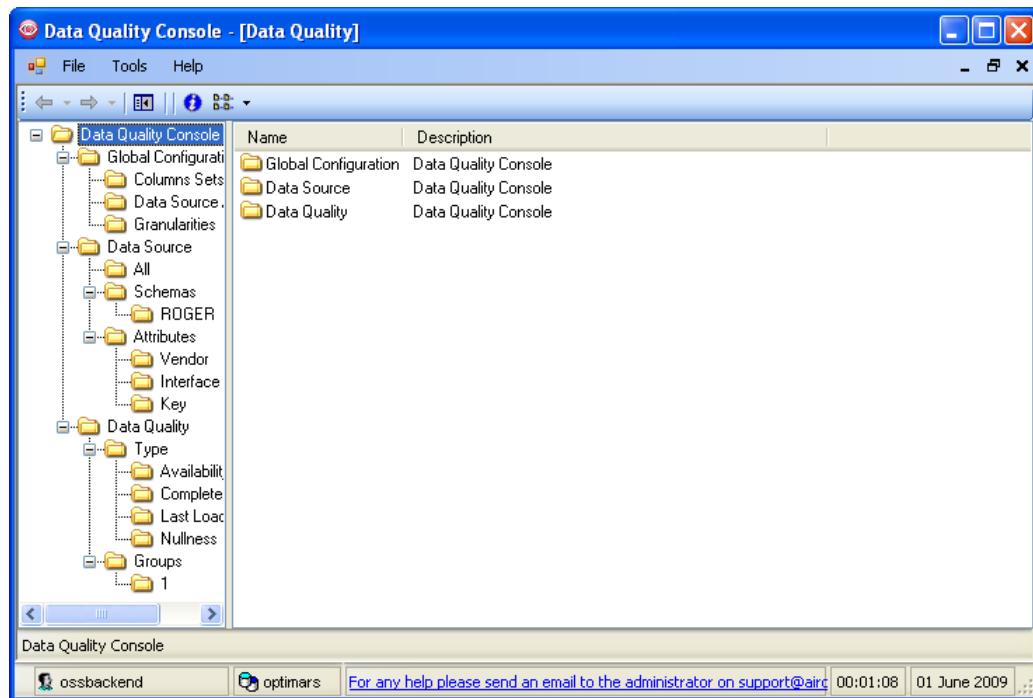
- 1 Double-click the opx_DAQ_WIN_420.exe.
- 2 In the Login dialog box:
 - From the Oracle Home drop-down list, select the appropriate Oracle version
 - From the Database drop-down list, select the required database
 - Type the user name and password

This picture shows an example:



- Click Connect.

The Data Quality Console appears. This picture shows an example:



5.5.3 Configuring the Data Quality Package

You configure the Data Quality package in three stages, these are:

- 1 Global Configuration - this includes column set configuration, data source attribute configuration and granularity configuration. For more information, see [About Global Configuration on page 226](#).
- 2 Data Source - this involves adding and configuring the data sources for the Data Quality package. For more information, see [About Data Source Configuration on page 236](#).
- 3 Data Quality - this determines the processes and groups with which the Data Quality package will run. For more information, see [About Data Quality Configuration on page 248](#).

Each of these configurations corresponds to a folder in first level of the Data Quality Console tree.



Data Quality Console Tree

5.5.3.1 About Global Configuration

To complete the Global Configuration, you need to configure:

- Column Sets - for more information, see Configuring Column Sets on page 226
- Data Source Attributes - for more information, see Configuring Data Source Attributes on page 230
- Granularities - for more information, see Configuring Granularities on page 233

Each of these configurations corresponds to a folder in the Global Configuration tree:



Configuring Column Sets

You use the Column Sets configuration to set the levels that the Data Quality package will process. By default, you can run the Data Quality package on the following column set levels:

Level	Description
Table	Refers to the table as a whole. For example, a last load report on the table level will find the maximum date of the whole table.
Managed Element	Refers to the parent element for the table, that is, the element that generates the data for this table which is then loaded into AIRCOM OPTIMA. For example, for GSM cell data, the managed element will normally be the BSC. Reporting on this level allows you to see files that have not loaded and obtain information which is much more aggregated than the Reported Element level.
Reported Element	Refers to the level that the data is reported on, for example, for cell data, the cell level. The whole element hierarchy is included, so a cell data table may be BSC + CELL. It is automatically defined as the primary key minus the date column but its contents can be changed. Reported Element Data Quality processing: <ul style="list-style-type: none">• Takes the longest time to run• Returns large amounts of data• Is normally only viewed by drilling down from the Managed Element level for a particular managed element

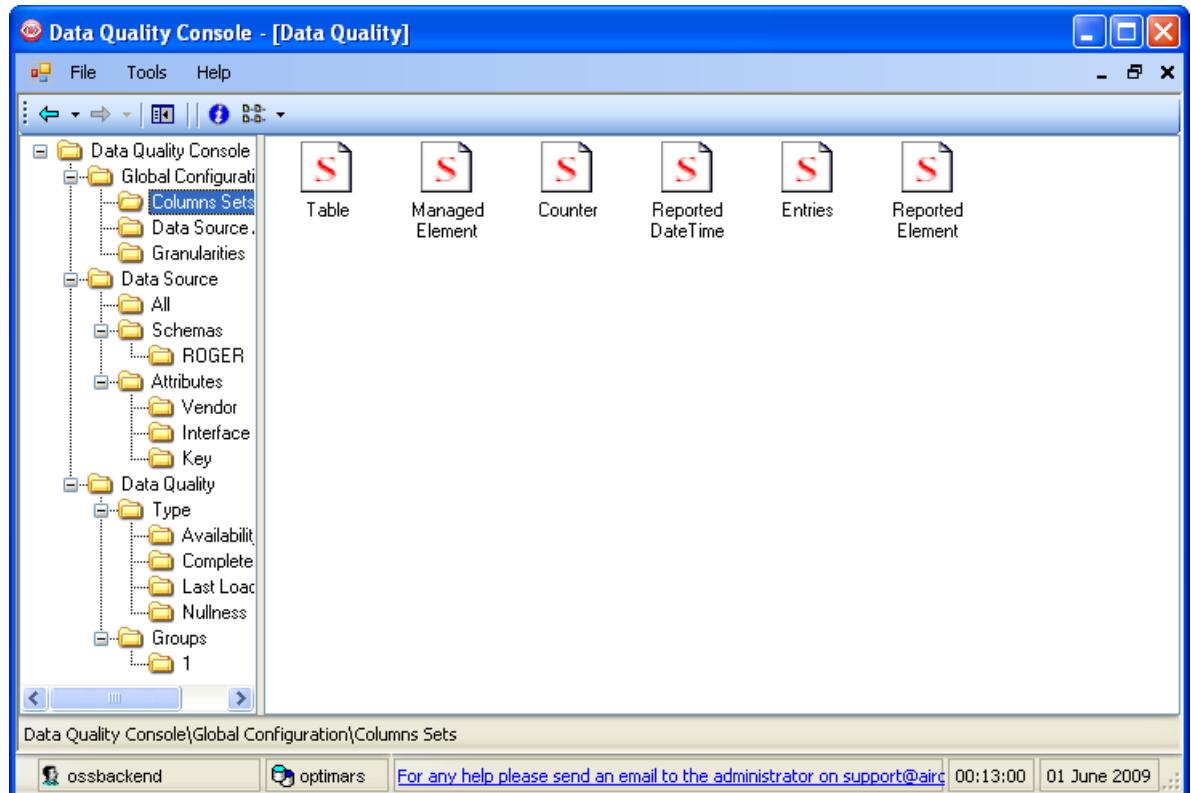
AIRCOM International recommends you run the Data Quality package only on the Table and Managed Element column set levels. The Data Quality package should not be run on the Reported Element level, in the majority of circumstances, as this causes too much of a load on the AIRCOM OPTIMA database.

There are also other system column sets which help you describe the data. For example, you must use the Reported DateTime column set to store the table's DATE field. The DATE field contains the date of the data, for example, the DATETIME column.

You can also define your own user-defined (non-system) column sets. This enables you to check for data quality on user-defined levels, for example, for regions of a country. For information about how to create column sets, see Creating Column Sets on page 227.

Creating Column Sets

As part of the Column Sets configuration, you can also create user-defined column sets:

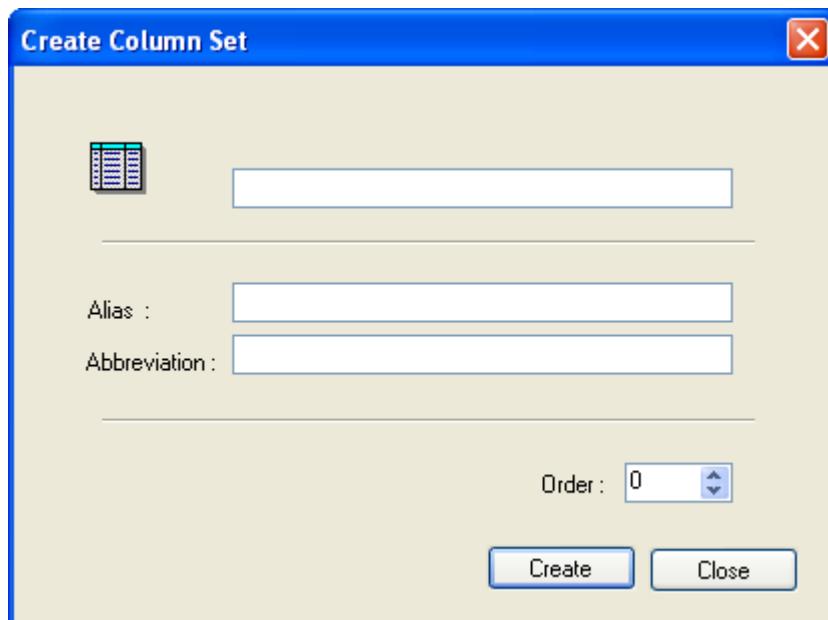


Column sets defined in the Data Quality Console

To do this:

- 1 In the Data Quality Console, in the tree view, select the Column Sets folder.
- 2 In the right hand pane, right-click and, from the menu that appears, click Create Column Set.

The Create Column Set dialog box appears:

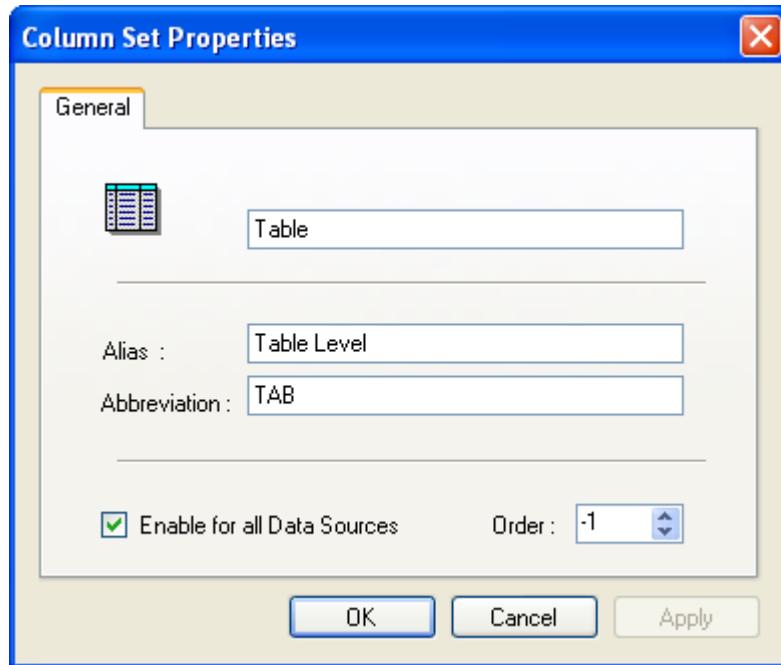


- 3 In the dialog box that appears, complete the following information:

In this field	Do this
Name	Type a name for the column set.
Alias	Type an alias for the column set.
Abbreviation	Type an abbreviation for the column set
Enable for all Data Sources	Select this option if you want to enable the column set for all data sources.
Order	Set the order for the column set.

- When you have finished, click Create.

This picture shows an example of a completed column set:



Editing and Deleting Column Sets

To edit a column set:

- In the Data Quality Console, in the right hand pane:

Right-click the column set you want to edit and, from the menu that appears, click Properties.

- or -

Double-click the column set you want to edit.

- In the Column Set Properties dialog box that appears, make the required changes.

- Click Apply to save your changes.

- Click OK to close the Column Set Properties dialog box and return to the Data Quality Console.

To delete a column set:

- In the Data Quality Console, in the right hand pane, select the column set you want to delete.

- Right-click and, from the menu that appears, click Delete.

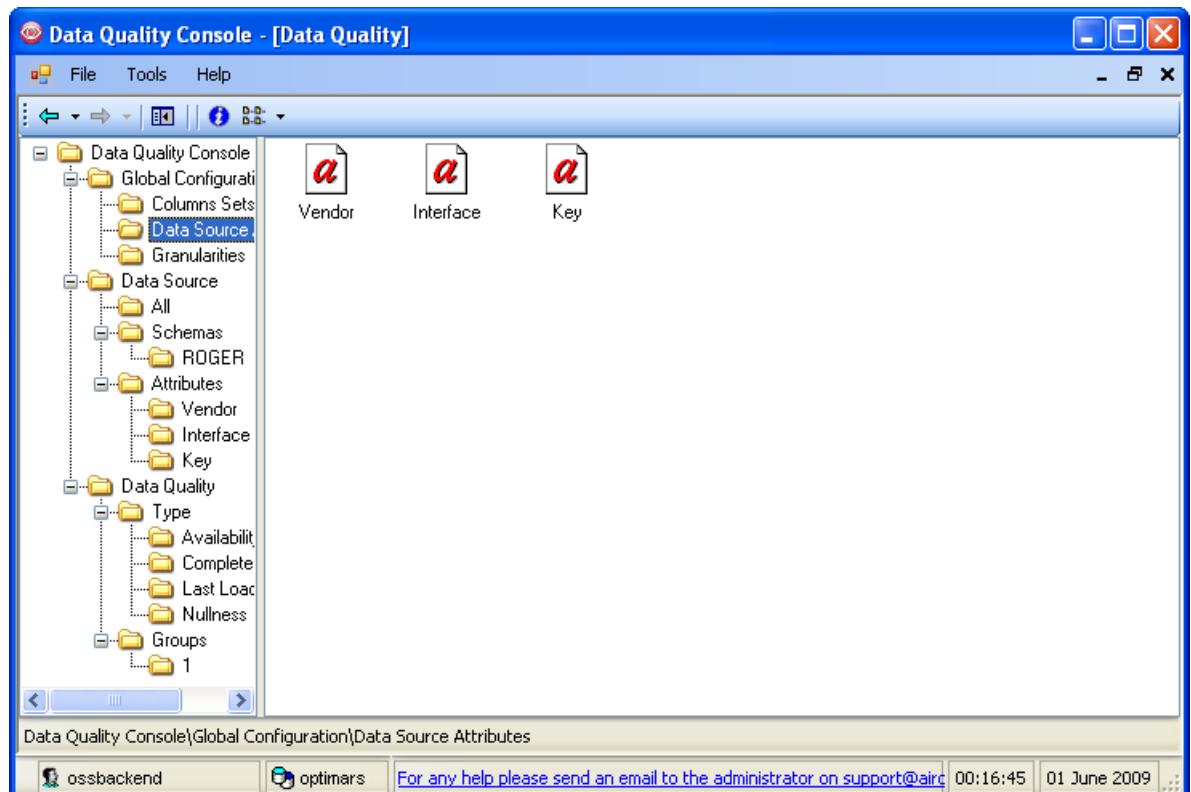
- or -

Click the Delete button .

- In the message box that appears, click Yes to confirm.

Configuring Data Source Attributes

You can assign attributes and attribute values to each data source. An attribute for a data source could be, for example, the Vendor the table represents, with assigned values such as Ericsson or Nortel. This configuration option is included solely for the purpose of reporting and enables you to show different attributes with the Data Quality data.



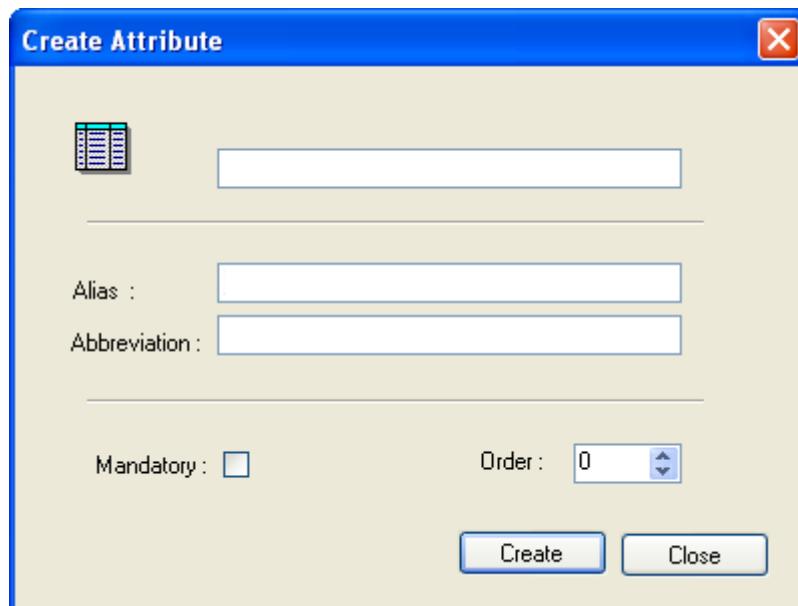
Data Source Attributes defined in the Data Quality Console

Creating Attributes

To create an attribute for a data source:

- 1 In the Data Quality Console, in the tree view, select the Data Source Attributes folder.
- 2 In the right hand pane, right-click and, from the menu that appears, click Create New Attribute.

The Create Attribute dialog box appears:

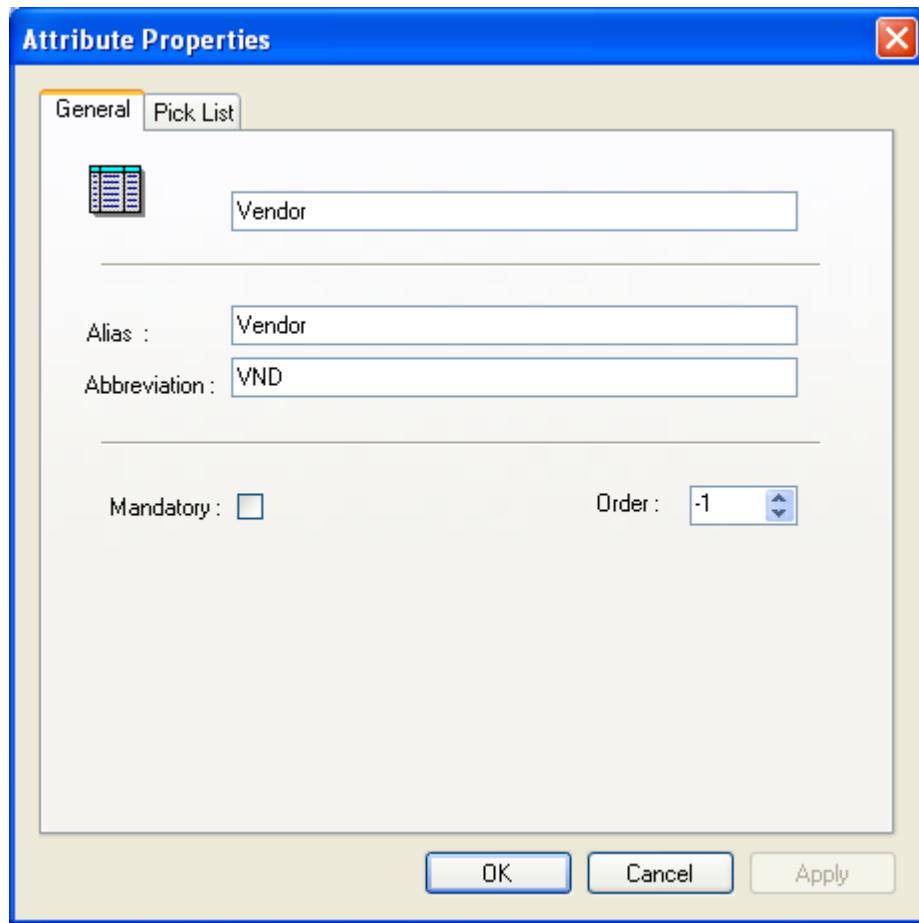


- 3 In the dialog box that appears, complete the following information:

In this field	Do this
Name	Type a name for the attribute.
Alias	Type an alias for the attribute.
Abbreviation	Type an abbreviation for the attribute.
Mandatory	Select this option if you want this attribute to be mandatory.
Order	Set the order for the attribute.

- When you have finished, click Create.

The picture shows an example of a completed attribute:



Editing and Deleting Attributes

To edit an attribute:

- In the Data Quality Console, in the right hand pane:

Right-click the attribute you want to edit and, from the menu that appears, click Properties.

- or -

Double-click the attribute you want to edit.

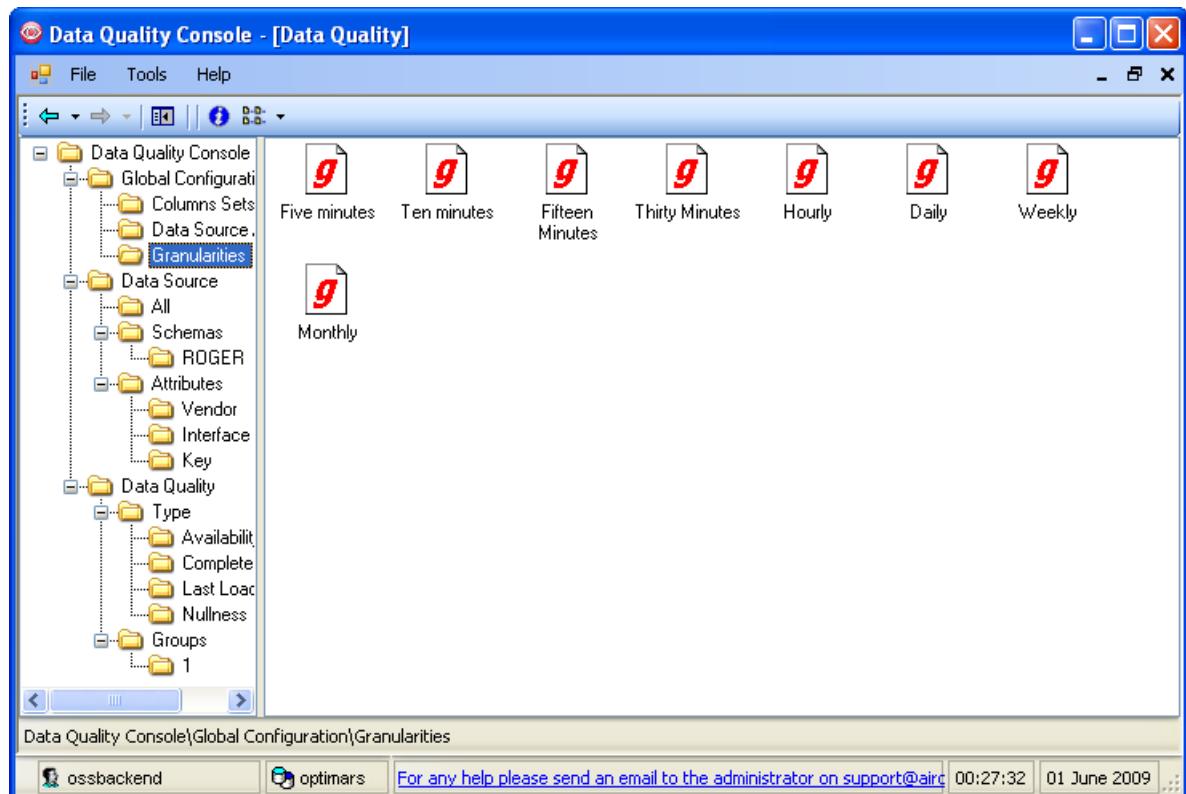
- In the Attribute Properties dialog box that appears, on the General tab, make the required changes.
- On the Pick List tab, you can type the range of values the attribute can have. For example, the System Key attribute has the values Yes and No to determine if the column is a key field.
- Click Apply to save your changes.
- Click OK to close the Attribute Properties dialog box and return to the Data Quality Console.

To delete an attribute:

- 1 In the Data Quality Console, in the right hand pane, select the attribute you want to delete.
- 2 Right-click and, from the menu that appears, click Delete.
- or -
Click the Delete button .
- 3 In the message box that appears, click Yes to confirm.

Configuring Granularities

AIRCOM OPTIMA performance tables have different granularities of data. For example, raw data tables often have hourly data, whereas summary tables often have daily or weekly data. There are a large number of system granularities which come pre-configured with the Data Quality package, for example, 15 minutes, daily or weekly.



Granularities defined in the Data Quality Console

You can also create new granularities as required. For more information, see Creating Granularities on page 234.

Creating Granularities

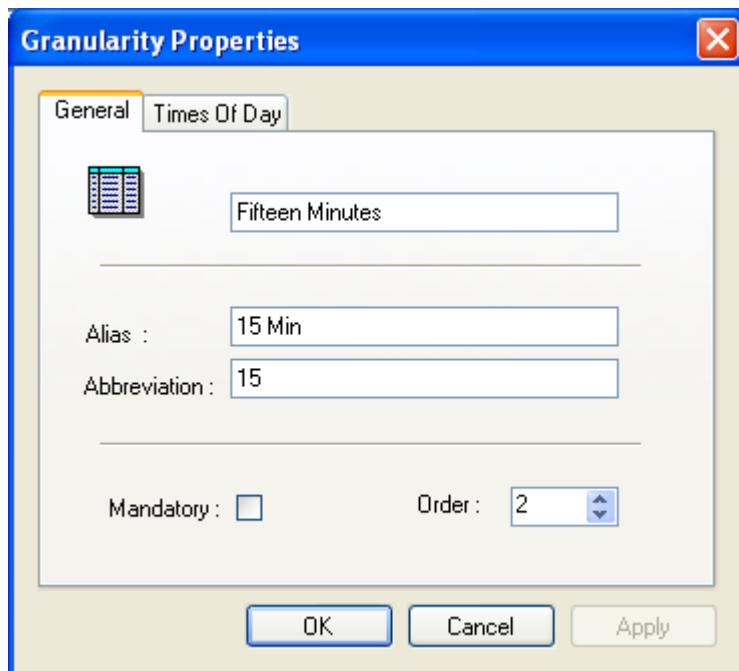
To create a new granularity:

- 1 In the Data Quality Console, in the tree view, select the Granularities folder.
- 2 In the right hand pane, right-click and, from the menu that appears, click Create New Granularity.
- 3 In the dialog box that appears, complete the following information:

In this field	Do this
Name	Type a name for the granularity.
Alias	Type an alias for the granularity.
Abbreviation	Type an abbreviation for the granularity.
Mandatory	Select this option if you want this granularity to be mandatory.
Order	Set the order for the granularity.

- 4 When you have finished, click Create.
- 5 To set the times of day that the granularity appears, you must edit the granularity. For information about how to do this, see Editing and Deleting Granularities on page 235.

This picture shows an example granularity:



Editing and Deleting Granularities

To edit a granularity:

- 1 In the Data Quality Console, in the right hand pane:

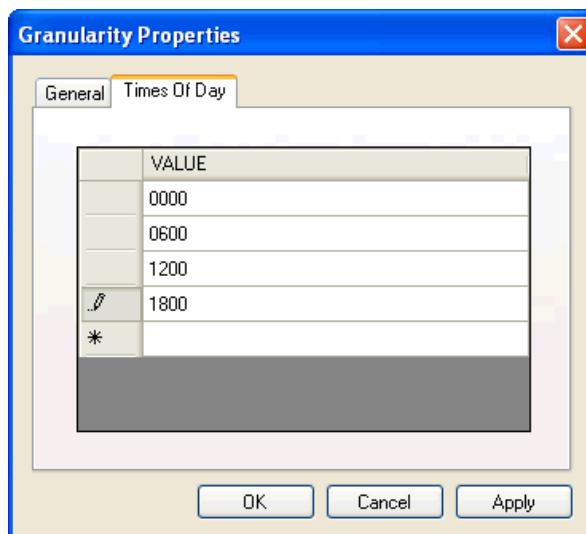
Right-click the granularity set you want to edit and, from the menu that appears, click Properties.

- or -

Double-click the granularity you want to edit.

- 2 In the Granularity Properties dialog box that appears, on the General tab, make the required changes.
- 3 On the Times of Day tab, type the times of day that the Granularity occurs. This setting is used to check that data is present at the specified times.

 Times must be entered in HH24MI format as a 4 digit 24 hour time with no punctuation. For example, for a 6 hour granularity you would type: 0000, 0600, 1200, 1800. For granularities of 1 day and less, simply type 0000 or the time of day of the data when is present. This picture shows an example:



- 4 Click Apply to save your changes.
- 5 Click OK to close the Granularity Properties dialog box and return to the Data Quality Console.

To delete a granularity:

- 1 In the Data Quality Console, in the right hand pane, select the granularity you want to delete.

 You cannot delete system granularities.

- 2 Right-click and, from the menu that appears, click Delete.

- or -

Click the Delete button .

- 3 In the message box that appears, click Yes to confirm.

5.5.3.2 About Data Source Configuration

Once you have completed the Global Configuration, you need to add the data sources. The data sources you add are tables inside the database.

You can add any of the following tables as data sources:

- Raw data performance tables loaded by the ETL Loader
- Summary tables summarised by the AIRCOM OPTIMA Summary
- CFG tables containing lists of elements, for example, CELLCFG or BSCCFG

You cannot add the following tables as data sources:

- External tables created and used by the ETL Loader
- Tables used to configure the AIRCOM OPTIMA front end or back end

 You should not generally add the AIRCOM, GLOBAL, and OSSBACKEND schema tables used for configuring AIRCOM OPTIMA as data sources.

The data sources you configure for Data Quality can be viewed in the Data Source tree in the Data Quality Console. This picture shows an example:



You can view the data sources in three different categories:

Category	Description
All	Shows a list of all data sources added to the Data Quality package.
Schemas	Shows the data sources by the schema they are in. Each schema appears as a sub-item.
Attributes	Shows the data sources by attribute. Each different attribute appears as sub-item.

 By default, when you first install the Data Quality package, no data sources are configured.

Adding Data Sources

To add a data source:

- 1 In the Data Quality Console, in the tree view, select the All folder.
- 2 In the right hand pane, right-click and, from the menu that appears, click Add Data Source.

The Add Data Source Wizard appears.

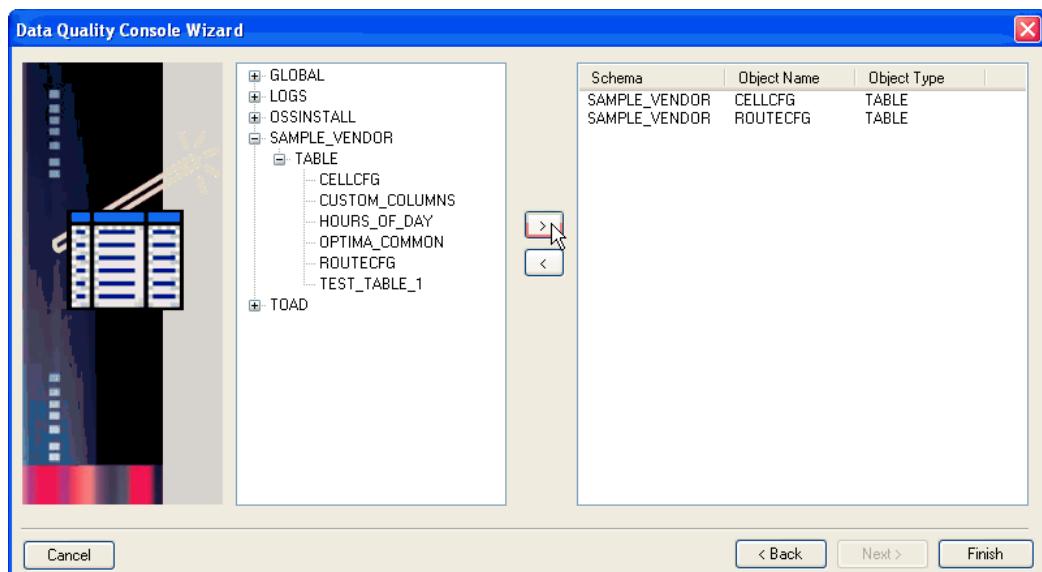
- 3 On the first page of the Wizard, choose a method to generate a list of available data sources. The options are described in the following table:

Select this option	To
Oracle Data Dictionary	Search the Oracle Data Dictionary tables for all schemas in the database with the exception of the AIRCOM, SYS and SYSTEM schemas. This allows you to add tables that have not been configured before for any AIRCOM OPTIMA application.
OSS Data Dictionary	Generate a list of tables used in the AIRCOM OPTIMA Data Dictionary which is populated by the AIRCOM OPTIMA Interface Template. If the AIRCOM OPTIMA Interface Template has been used to install the database, then this will provide a quick method to select only tables relevant to Data Quality.
Configuration Tables	Search for tables configured in AIRCOM OPTIMA backend applications such as the AIRCOM OPTIMA Summary and the ETL Loader. This may be the best option when the Summary and Loader have been configured and Data Quality is needed for the tables used by these applications.

- 4 Click Next.
- 5 On the next page of the Wizard, in the right hand pane, select the data sources you want to add and use the right arrow button to move them to the left hand pane.

You can add schemas, tables and / or views.

This picture shows an example:



- 6 When you have finished, click Finish.

The selected data sources are added to the Data Source tree in the Data Quality Console.

Once you have added the data sources, you can configure them by either setting their properties or by using the Add Columns Wizard. For more information, see Setting Data Source Properties on page 238 and Configuring the Data Quality Package Using the Add Columns Wizard on page 245.

Setting Data Source Properties

You can further configure a data source by setting its properties. You can set properties for a single data source or globally for multiple data sources.

 Not all properties are available when setting data source properties globally.

To set data source properties:

- 1 In the Data Quality Console, in the right hand pane, select the data source(s) whose properties you want to set.

 Use the Shift and Ctrl keys to select more than one data source at a time.

- 2 Right-click and, from the menu that appears, click Properties.

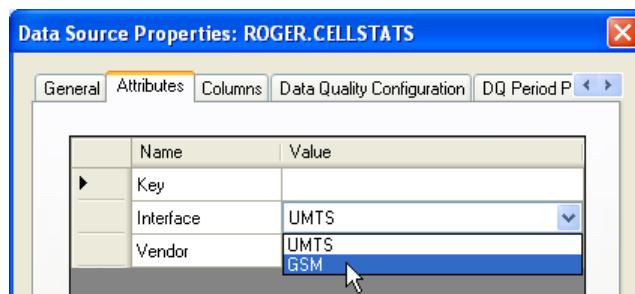
The Data Source Properties dialog box appears.

- 3 On the General tab, complete the following information:

In this field	Do this
Loading Type	Select the type of data the data source contains from the drop-down list, either raw or summary data.
Granularity	Select the granularity of the data source from the drop-down list, for example, 15 minute data.
Use Topology Table	Select this option if you want the Data Quality package to obtain a list of elements which should be present at each granularity from a topology configuration (CFG) table. If you enable this option, you must also select the Owner (schema) and Name of the topology table you want to use from the drop-down lists.

- 4 On the Attributes tab, you set values for any attributes created during Data Source Attributes configuration. For more information, see Configuring Data Source Attributes on page 230.

To set an attribute value, click the Value field you want to set and select the value from the drop-down list:



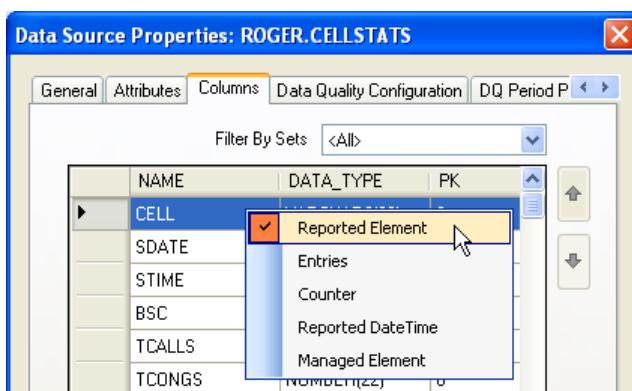


The attributes are used only for reporting purposes and are not required by the Data Quality package.

- 5 On the Columns tab, you can view the column sets created during Column Sets configuration by selecting a column set from the drop-down list. For more information, see Configuring Column Sets on page 226.

To add a column to a column set:

- Select All from the Filter By Sets drop-down list.
- Select the column you want to add.
- Right-click and, from the menu that appears, select the column set.
The default values for the system column sets are then populated by the Data Source Wizard.

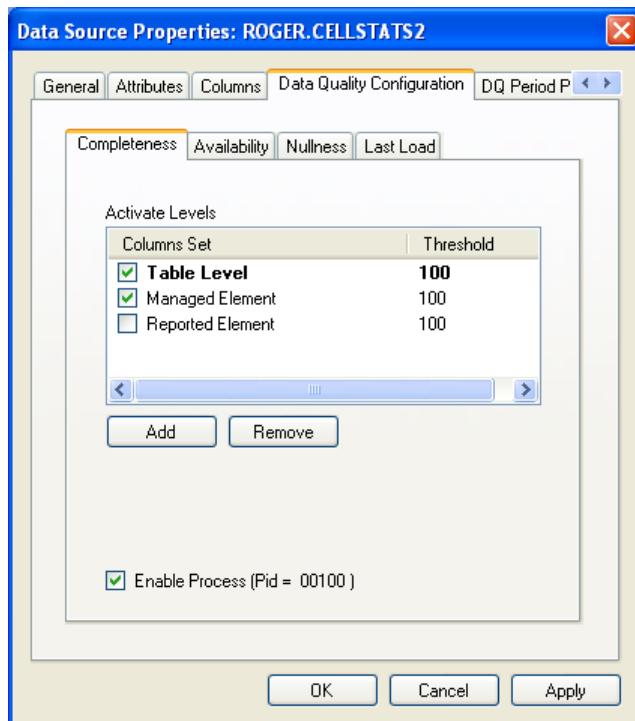


If you are setting properties for multiple data sources, the Columns tab is disabled.

- 6 On the Data Quality Configuration tab, you configure the Data Quality processes. For more information about Data Quality processes, see About Data Quality Configuration on page 248. The following table describes the options:

On this sub-tab	Do this
Completeness	<p>Select the column set(s) you want the Data Quality package to process for Completeness. Completeness is the percentage of available data for the period loaded.</p> <p>To change a threshold value for a column set:</p> <ul style="list-style-type: none"> Right-click the column set and, from the menu that appears, click Change Threshold. In the dialog box that appears, set the required threshold and click OK. <p>To view the column details for a column set, right-click the column set and, from the menu that appears, click Column Details.</p> <p>To add a column set:</p> <ul style="list-style-type: none"> Click the Add button. In the dialog box that appears, select the column set from the drop-down list, set a threshold value and click OK. <p> You can only add column sets that contain one or more columns.</p> <p>To remove a column set, select the column set and click Remove.</p> <p>To enable Completeness processing for the data source, ensure that the Enable Process option is selected.</p> <p> If you are setting properties for multiple data sources, then only the Enable Process option is available.</p>
Availability	<p>Select the column set(s) you want the Data Quality package to process for Availability. Availability is the percentage of elements which are completely missing for a day.</p> <p>The options for Availability are the same as those on the Completeness sub-tab, as described above.</p>
Nullness	<p>Select the column set(s) you want the Data Quality package to process for Nullness. Nullness is the number of null entries in the table for a day for a specified list of columns.</p> <p>The options for Nullness are the same as those on the Completeness sub-tab, as described above.</p> <p>In addition, you can choose which columns in the data source to check for null values. To do this:</p> <ul style="list-style-type: none"> Click the Choose Columns button. In the dialog box that appears, select the column(s) you require in the list and click OK.
Last Load	<p>Select the column set(s) you want the Data Quality package to process for Last Load. Last Load is the last date a table loaded, that is, the maximum date of the table.</p> <p>The options for Last Load are the same as those on the Completeness sub-tab, as described above.</p>

This picture shows an example of the Completeness sub-tab:

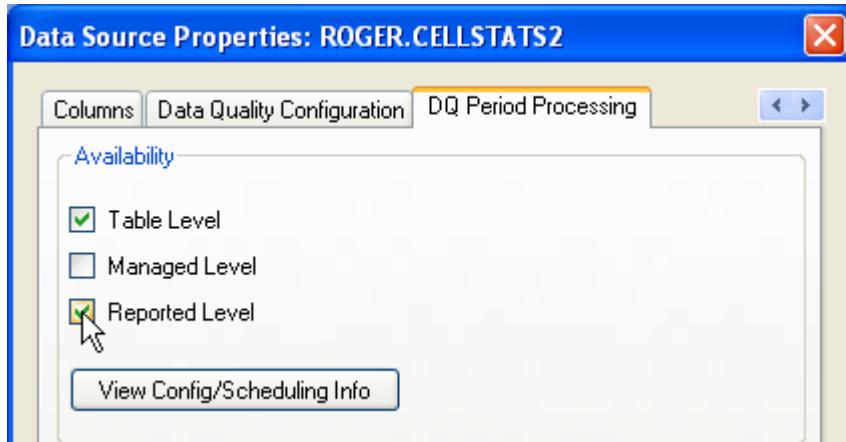


- 7 On the DQ Period Processing tab, you can configure the period processing options.

For more information on how period processing works, see Configuring Period Processing on page 244.

To configure period processing for Availability:

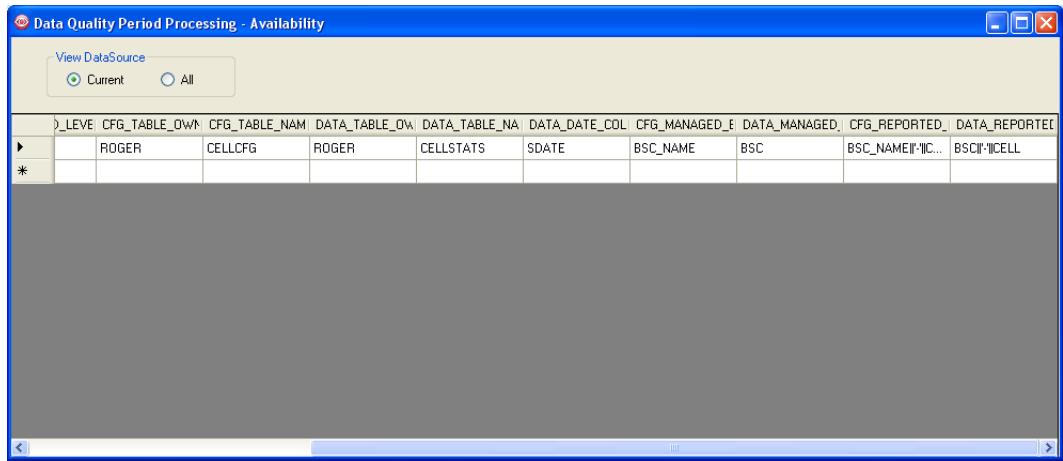
- Select the required processing levels:



For more information on these, see Configuring Column Sets on page 226.

- Click the View Config/Scheduling Info button to check that the tables are configured correctly.

The following dialog box appears:



Click the Current button to see the information for the current datasource, or click the All button to see the information for all datasources.

To use Availability reporting, the following conditions must apply:

A CFG table is configured, with the Managed and Reported columns set for the CFG table as well as the raw table

The data in the CFG columns must match the data in the raw table columns

The order of the CFG columns must match that of the raw table columns

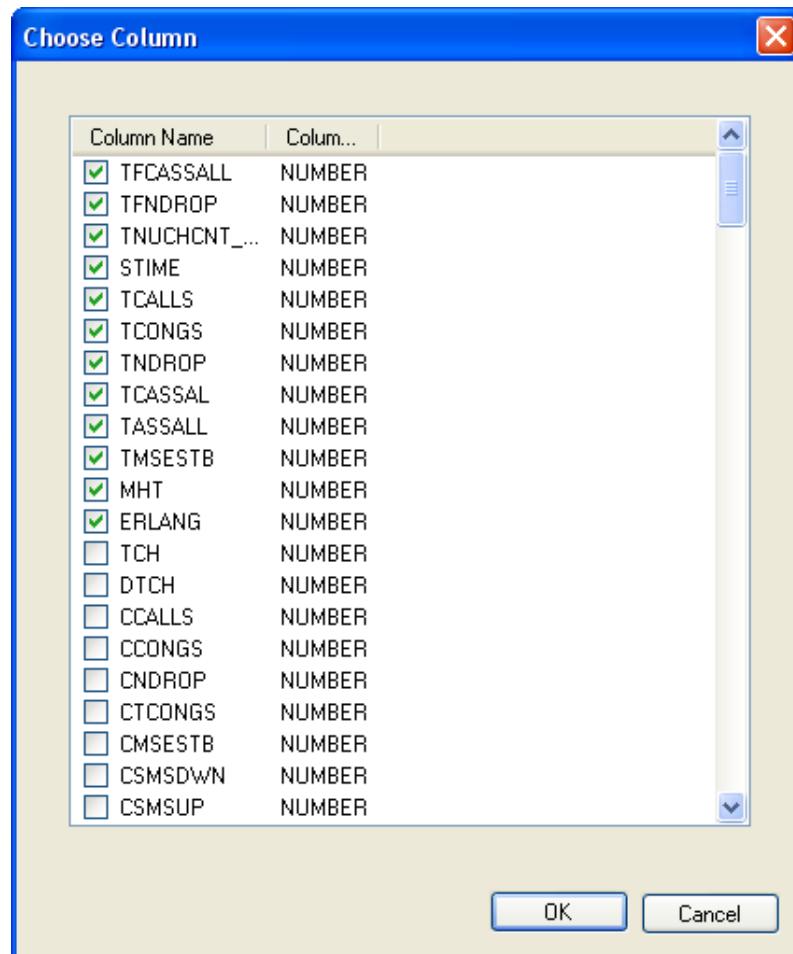
You cannot directly edit the data displayed in this dialog box; instead, you must edit the data on the other tabs of the Data Source Properties dialog box.

To configure period processing for Nullness:

- Select the required processing levels:



- To choose the columns that you want to report on, click the Choose Columns button, and in the dialog box that appears, select the required columns:



The available columns for period processing are the same as those available for daily processing.

- Click OK.
- 8 Click Apply to save your changes.
 - 9 Click OK to close the Data Source Properties dialog box and return to the Data Quality Console.

Configuring Period Processing

By default, all of the data quality reports produce daily results. This means that although the granularity of the raw data may be based on a period of minutes (for example, 10 minutes or 30 minutes), the data quality reports show the results for a whole day.

This can cause limitations, depending on your requirements, for example:

- You cannot see the current day's quality results until after midnight, when the day has finished
- If you run the reports for a three-day period, then you will just get three separate reports, one for each day

However, if you require the daily quality reports to be processed for a different period, for example hourly, you can do this as well. There are two stages to this:

- 1 On the DQ Period Processing tab of the Data Source Properties dialog box:
 - Specify the levels that you want to process
 - Check that the tables are configured correctly.
- 2 When you run the DQ_PERIOD_PROCESSING package, set the PERIOD_START and PERIOD_END to be the required period.

 A second is subtracted from the end date when you run the package in a job or script. So, for example, to process Report 5 for 02/07/2009 for the 6pm hour, run the package with following parameters:

```
(5,  
to_date('020720091800','ddmmyyyyhh24mi'),to_date('0207200919  
00','ddmmyyyyhh24mi'))
```

 You can only configure period processing for availability and nullness reporting. This is because:

- Completeness reporting uses a variable number of loading periods - it may report based on a single period, or on a number of periods
- For last load reporting, the maximum date of the data in the table cannot be applied to sub-periods

 Period processing reports on the period **as a whole**. For example, if you run the availability report for 3 hours and 1 hour has a missing cell, then this will not be picked up. However, if you run each hour individually, the missing cell will be detected. Similarly, the nullness report reports on the total rows and null rows for the period it is run as a whole.

Editing and Deleting Data Sources

To edit a data source:

- 1 In the Data Quality Console, in the right hand pane:

Right-click the data source you want to edit and, from the menu that appears, click Properties.

- or -

Double-click the data source you want to edit.

- 2 In the Data Source Properties dialog box that appears, make the required changes. For more information, see Setting Data Source Properties on page 238.
- 3 Click Apply to save your changes.
- 4 Click OK to close the Data Source Properties dialog box and return to the Data Quality Console.

To delete a data source:

- 1 In the Data Quality Console, in the right hand pane, select the data source(s) you want to delete.



Use the Shift and Ctrl keys to select more than one data source at a time.

- 2 Right-click and, from the menu that appears, click Delete.

- or -

Click the Delete button .

- 3 In the message box that appears, click Yes to confirm.

Configuring the Data Quality Package Using the Add Columns Wizard

You can use the Add Columns Wizard as an alternative method of configuring the Data Quality package. The main benefit of using the Add Columns Wizard is that it reduces the time taken to configure columns contained in the column sets of each data source.



Before using the Add Columns Wizard, first ensure you have:

- Added the data sources. For more information, see Adding Data Sources on page 237.
- Configured the column sets. For more information, see Configuring Column Sets on page 226.

To configure the Data Quality package using the Add Columns Wizard:

- 1 In the Data Quality Console, in the right hand pane, right-click and, from the menu that appears, click Add Columns.

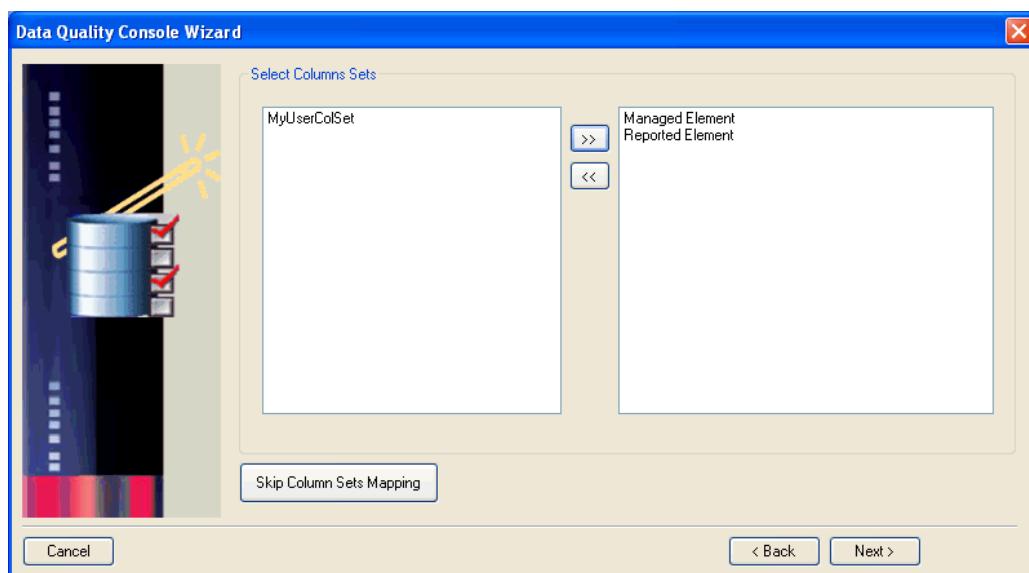
The Add Columns Wizard appears.

- 2 On the first page of the Wizard, select the data source(s) you want to configure and use the double right arrow button  to move them to the left hand pane.

 Use the Shift and Ctrl keys to select more than one data source at a time.

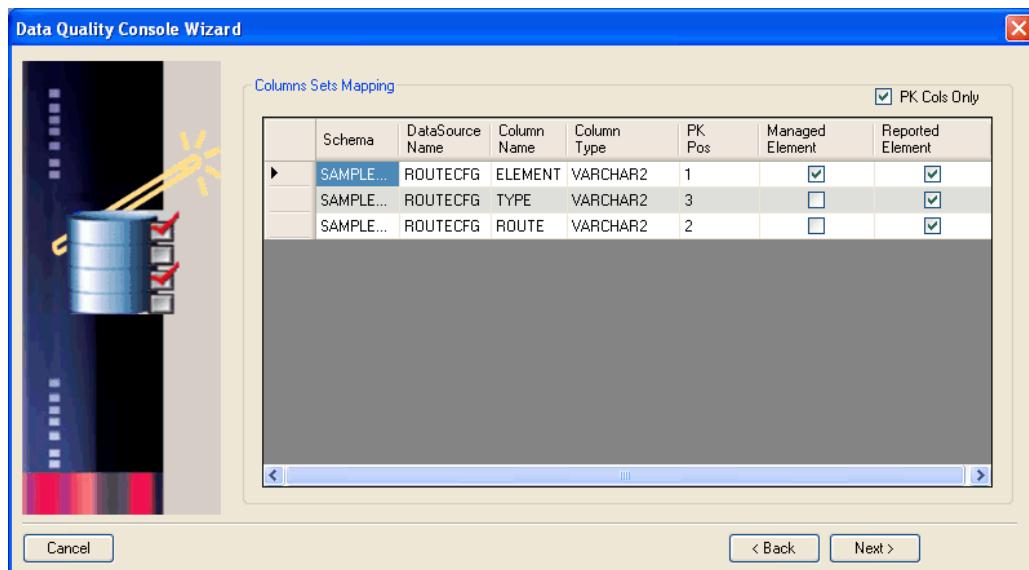
- 3 Click Next.
- 4 On the next page of the Wizard, select the column set(s) you want to configure and use the double right arrow button  to move them to the left hand pane.

 If you do not need to select the columns for each column set and only need to be able to enable and disable levels, click Skip Column Sets Mapping and proceed to step 10.

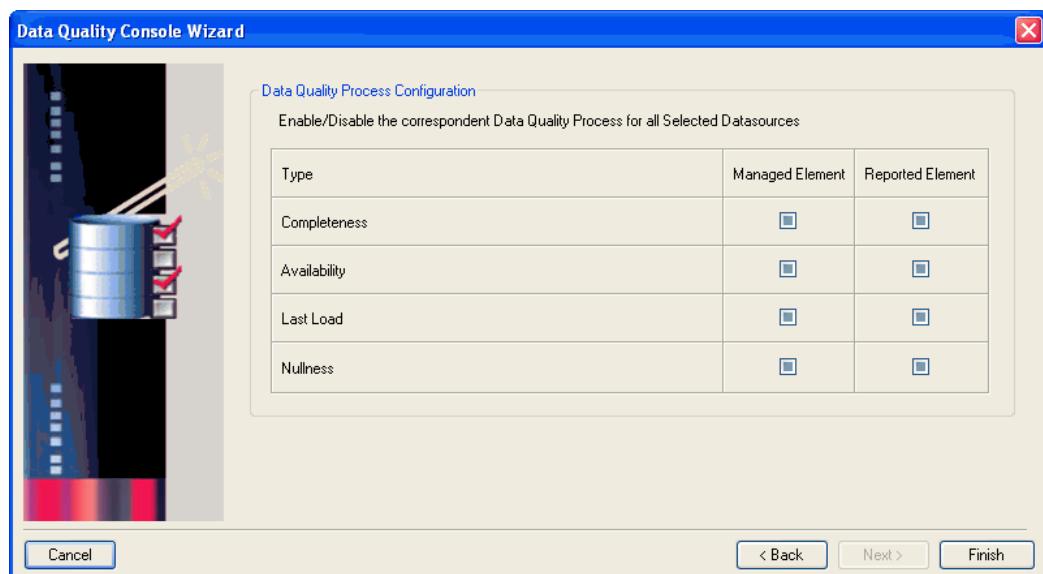


- 5 Click Next.
- 6 On the next page of the Wizard, select the columns to include in the column sets. If you only want to include columns that form the primary key of the data source, select the PK Cols Only option.

 You can change the sort order for each column alphabetically by clicking the column headings.



- 7 Click Next.
 - 8 On the next page of the Wizard, set the order of the columns in the column set by selecting columns and using the Up and Down buttons to position them.
-  The column order you set applies to all column sets and all data sources selected. You should choose an order for all columns, for example, the BSC column always above the Cell column, the MSC column always above the BSC column.
- 9 Click Next.
 - 10 On the last page of the Wizard, select the Data Quality processes that you want to be enabled for the column sets that you selected in step 4. For a detailed description of the processes, see About Data Quality Configuration on page 248.



- 11 Click Finish to save your configuration.

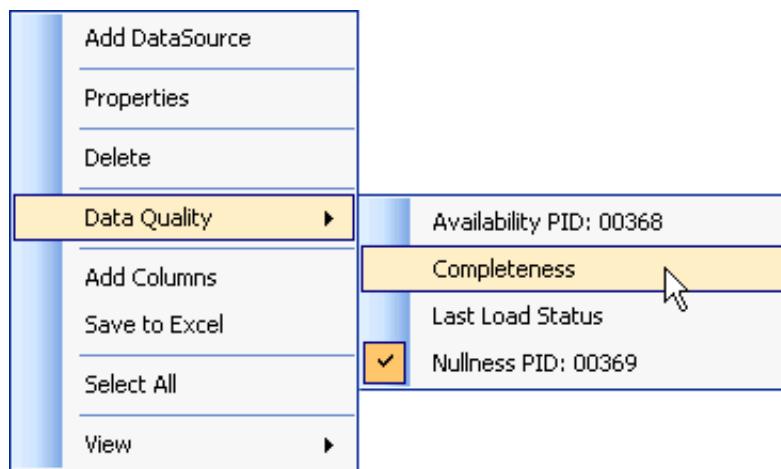
Quickly Enabling Processing Types

You can quickly enable processing types for a data source using the popup menu. For more information about processing types, see [About Data Quality Configuration](#) on page 248.

To enable a processing type:

In the Data Quality Console, in the right hand pane, right-click the data source for which you want to enable processing and, from the menu that appears, point to Data Quality and then click the processing type you require.

Any processes that are already enabled are shown with a selected checkbox. This picture shows an example:

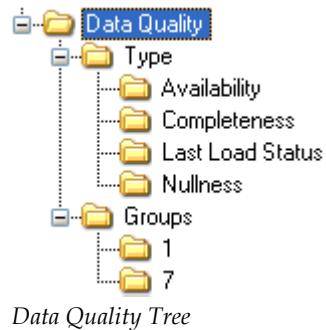


5.5.3.3 About Data Quality Configuration

Data Quality configuration enables you to further configure the Data Quality processes configured during Data Source configuration. For more information about configuring Data Quality processes, see [Setting Data Source Properties](#) on page 238 and [Quickly Enabling Processing Types](#) on page 248.

You can also create new processes after you have completed Data Source configuration. For information about how to do this, see [Creating Processes](#) on page 249.

In the Data Quality Console, in the Data Quality tree, you can view the Data Quality processes by type and by group:



The Type folder contains the different processing types, these are:

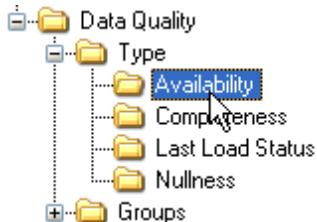
Processing Type	Description
Availability	<p>The percentage of elements which are completely missing for a period.</p> <p>This type shows which elements are missing in the defined period, and also any new elements that have appeared, with statistics for this.</p> <p>For more information, see About the Data Quality Reports on page 254.</p>
Completeness	<p>The percentage of available data for the period loaded. This does not include data which is not present at all.</p> <p>For data that is present, Completeness gives an idea of missing entries each day.</p>
Last Load Status	The last date a table loaded, that is, the maximum date of the table.
Nullness	<p>The number of null entries in the table for a specified list of columns, for a period.</p> <p>For more information, see About the Data Quality Reports on page 254.</p>

The Groups folder contains the processing groups. For more information about processing groups, see [Scheduling Data Quality with Process Groups on page 253](#).

Creating Processes

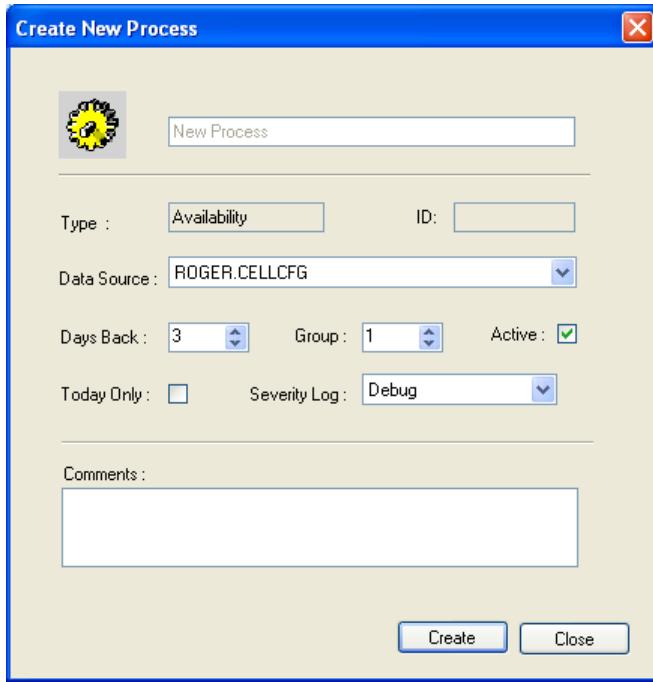
To create a new process:

- 1 In the Data Quality Console, in the tree view, select the folder for the type of process you want to create:



- 2 In the right hand pane, right-click and, from the menu that appears, click Create Process.

The Create New Process dialog box appears. This picture shows an example:



- 3 In the Create New Process dialog box, complete the following information:

In this field	Do this
Data Source	Select the data source for this process from the drop-down list.
Days Back	Set the number of days back to go for processing this process. For example, if the Data Quality package runs daily and Days Back is set to 3, then it will process 3 days of data each day. 💡 Alternatively, if you just want to process this package for today's data only, select the Today Only checkbox.
Group	Set the number of the processing group that this process runs under. This must be a value between 1 and 50. For more information about processing groups, see Scheduling Data Quality with Process Groups on page 253.
Active	Enable the process by selecting the Active option. If the process is enabled, it will run if it is scheduled.
Severity Log	Indicates the information level of the messages that will be sent to the log file. Anything below the selected level will not be reported - for example, if Minor is selected then only Minor, Major and Critical logging will occur.
Comments	Type any comments you want to add for the process. This option is for information only and is not used in processing. 📝 This option is not available if you are setting properties for multiple processes.

- 4 When you have finished, click Create.

Setting Process Properties

You can further configure a process by setting its properties. You can set properties for a single process or globally for multiple processes.

 Not all properties are available when setting process properties globally.

To set process properties:

- 1 In the Data Quality Console, in the right hand pane, select the process(es) whose properties you want to set.

 Use the Shift and Ctrl keys to select more than one process at a time.

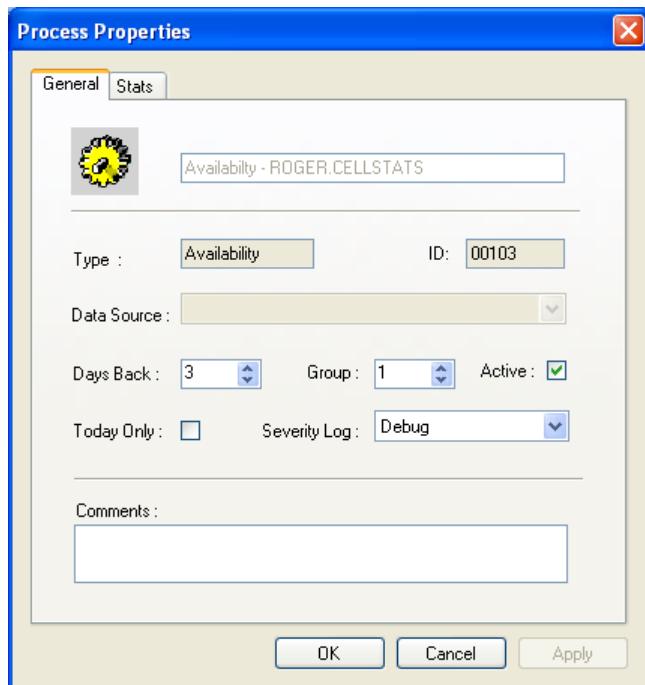
- 2 Right-click and, from the menu that appears, click Properties.

The Process Properties dialog box appears.

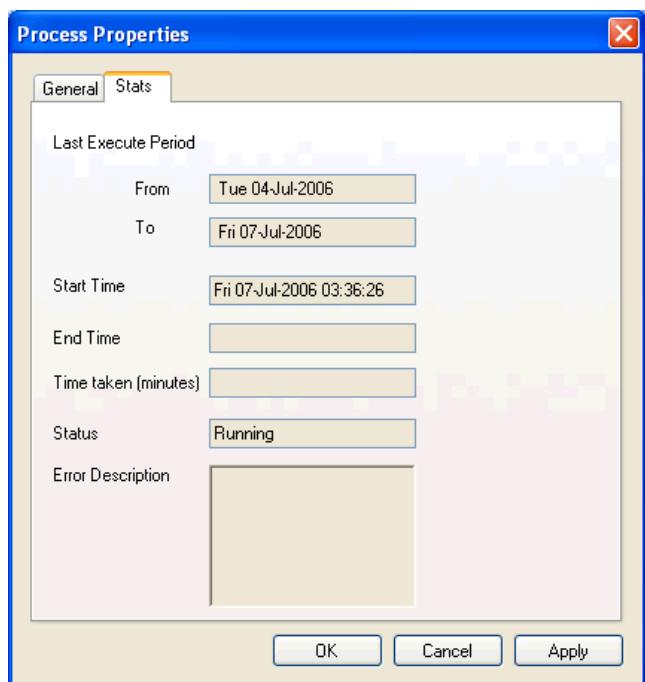
- 3 On the General tab, complete the following information:

In this field	Do this
Data Source	Select the data source for this process from the drop-down list.
Days Back	<p>Set the number of days back to go for processing this process. For example, if the Data Quality package runs daily and Days Back is set to 3, then it will process 3 days of data each day.</p> <p> Alternatively, if you just want to process this package for today's data only, select the Today Only checkbox.</p>
Group	<p>Set the number of the processing group that this process runs under. This must be a value between 1 and 50. For more information about processing groups, see Scheduling Data Quality with Process Groups on page 253.</p>
Active	Enable the process by selecting the Active option. If the process is enabled, it will run if it is scheduled.
Severity Log	<p>Indicates the information level of the messages that will be sent to the log file.</p> <p>Anything below the selected level will not be reported - for example, if Minor is selected then only Minor, Major and Critical logging will occur.</p>
Comments	<p>Type any comments you want to add for the process. This option is for information only and is not used in processing.</p> <p> This option is not available if you are setting properties for multiple processes.</p>

This picture shows an example:



- 4 On the Stats tab, you can view information about the running of the process:



- 5 Click Apply to save your changes.
- 6 Click OK to close the Process Properties dialog box and return to the Data Quality Console.

Editing and Deleting Processes

To edit a process:

- 1 In the Data Quality Console, in the right hand pane:

Right-click the process you want to edit and, from the menu that appears, click Properties.

- or -

Double-click the process you want to edit.

- 2 In the Process Properties dialog box that appears, on the General tab, make the required changes. For more information, see Setting Process Properties on page 251.
- 3 Click Apply to save your changes.
- 4 Click OK to close the Process Properties dialog box and return to the Data Quality Console.

To delete a process:

- 1 In the Data Quality Console, in the right hand pane, select the process(es) you want to delete.



Use the Shift and Ctrl keys to select more than one process at a time.

- 2 Right-click and, from the menu that appears, click Delete.

- or -

Click the Delete button .

- 3 In the message box that appears, click Yes to confirm.

Scheduling Data Quality with Process Groups

To run the Data Quality package, you need to put the Data Quality processes into groups. Each process is automatically assigned to group 1. However, you should divide processes into a number of groups, for example, by type, schema or time taken to run.

You set group numbers in the Process Properties dialog box. The Group option can be configured for multiple processes at once. For more information, see Setting Process Properties on page 251.

In order to run a process group, you need to create an Oracle job to run the following SQL:

```
OSSBACKEND.DQ_PROCESSING.RUN_PROCESS_GROUP (n);
```

Where n is the number of the process group to execute.



Notes :

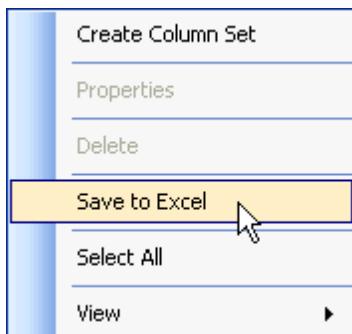
- If you have installed the Data Quality package in a schema other than OSSBACKEND, then substitute the schema name in the example above.

For more information about Oracle jobs, see the AIRCOM OPTIMA Operations and Maintenance Guide.

5.5.4 Saving Configuration Information to Microsoft Excel

In the Data Quality Console, you can save your configuration information to an Excel file. To do this:

- 1 In the Data Quality Console, in the tree view, select the folder that contains the configuration information that you want to save to Excel.
- 2 In the left-hand pane, right-click and, from the menu that appears, click Save to Excel.



- 3 In the Save As dialog box that appears, browse to the appropriate folder, type a name, and click Save.

The information is saved as an Excel file.

5.5.5 About the Data Quality Reports

This section describes the reports that are produced for the different types of data quality reporting.

Availability

There are two reports for availability:

Report name	Database table	Description
Statistics	DQP_AVAIL_STATS	Provides overall statistics related to availability; for example, the number of new data elements (in other words, in the raw table but not in the cfg table).
Elements	DQP_AVAIL_ELEMENT	Describes each missing or new element.

The Statistics report provides the following information:

Database Field	Description
DQP_CONFIG_ID	The configuration ID, corresponding to the DQP_CONFIG table or the DQP_AVAILABILITY_CONFIG view (also available in the GUI).
LEVEL_CITM	The data level - table, managed or reported.
DATETIME_INS	The date and time of the report.
PERIOD_START	The start of the processing period, defined by the user when they called the package.
PERIOD_END	The end of the processing period, defined by the user when they called the package.
TOTAL_CFG_ELEMENTS	The total number of elements at this level in the CFG table.
TOTAL_DATA_ELEMENTS	The total number of elements at this level in the raw table.
CFG_ELEMENTS_NOT_IN_DATA	The total number of missing elements - in other words, the number of elements defined in the CFG table that were not found in the raw table.

Database Field	Description
DATA_ELEMENTS_NOT_IN_CFG	The total number of new elements - in other words, the number of elements found in the raw table that were not defined in the CFG table.

The Elements report provides the following information:

Database Field	Description
DQP_CONFIG_ID	The configuration ID, corresponding to the DQP_CONFIG table or the DQP_AVAILABILITY_CONFIG view (also available in the GUI).
LEVEL_CITM	The data level - table, managed or reported.
DATETIME_INS	The date and time of the report.
ELEMENT_NAME	The name of the element.
PERIOD_START	The start of the processing period, defined by the user when they called the package.
PERIOD_END	The end of the processing period, defined by the user when they called the package.
ELEMENT_TYPE	Indicates whether the element is missing (M) or new (N).

Nullness

There is a single report for nullness, which corresponds to the DQP_NULL_STATS database table, and reports on the total number of rows and the number of null rows, per table, per level and per column.

Database Field	Description
DQIP_CONFIG_ID	The configuration ID, corresponding to the DQP_CONFIG table or the DQP_AVAILABILITY_CONFIG view (also available in the GUI).
LEVEL_CITM	The data level - table, managed or reported.
PERIOD_START	The start of the processing period, defined by the user when they called the package.
PERIOD_END	The end of the processing period, defined by the user when they called the package.
COLUMN_NAME	The name of the column being reported on.
ELEMENT_NAME	The name of the element being reported on. If this consists of more than one element (depending on the level that is being reported), the ELEMENT_NAME will be in the format BSC1-CELL1.
TOTAL_ROWS	The total number of rows being reported on.
NULL_ROWS	The total number of null rows found.
DATETIME_INS	The date and time of the report.

5.5.6 Example Workflow for Using the Availability Package

This topic describes the suggested steps that you could follow to use the Availability package. In this example, period (sub-daily) processing is used, rather than the default daily processing.

The rest of this section describes these steps, and the rest of the Data Quality package, in more detail.

 These instructions are also available as a text file ('How to use DQP_Availability.txt') in the Data Quality\Help folder of your backend installation.

- 1 Ensure that the following OSS Oracle scripts are installed:

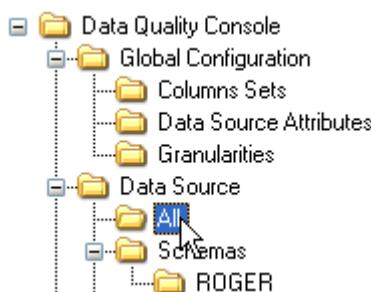
- OSS_BACKEND_SYS_SCRIPT.sql
- Install_ossbackend_schema.sql
- AIRCOM_grants.sql

If these are not installed, install these using the instructions in the ReadMe.txt file in the Data Quality folder of your backend installation.

- 2 Check log file for errors and ensure that all package bodies in the OSSBACKEND schema are compiled correctly
- 3 Run the following package function to create the partitions and check afterwards they have been created:

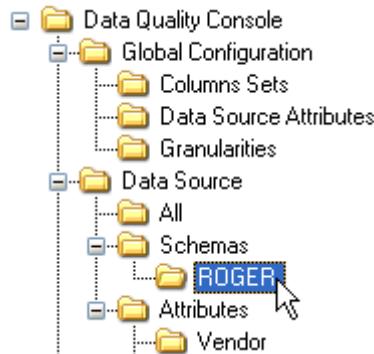
AIRCOM.OSS_MAINTENANCE.MAINTAIN_TABLE_PARTITIONS

- 4 Run the opx_DAQ_WIN_420.exe.
- 5 Log in using the username 'OPTIMA_DQ_USER' and the password.
- 6 In the Data Quality Console dialog box, select the Data Source folder, and then the All folder:



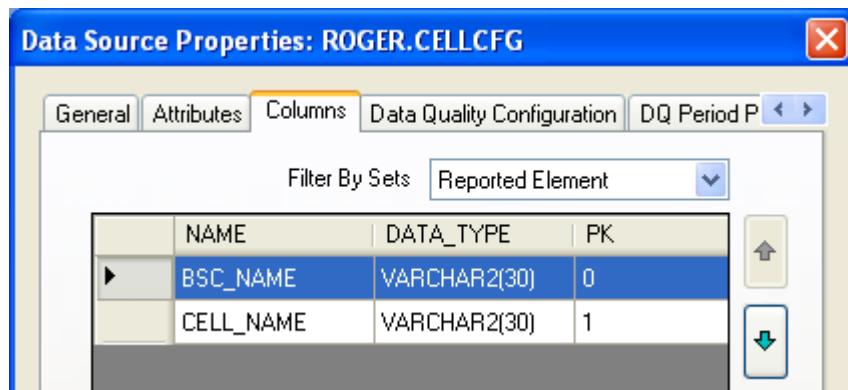
- 7 In the right-hand pane, right click, and from the menu that appears, click Add DataSource.
- 8 In the Data Quality Console Wizard:
 - Select the Oracle Data Dictionary and click Next
 - Select the required data tables and CFG tables, and add them to the right-hand pane using the right arrow button
 - Click Finish

- 9 In the Data Quality Console dialog box, select the Schemas folder, and then the folder corresponding to the schema name:



- 10 In the right-hand pane, right-click the CFG table that you want to use for data quality processing, and from the menu that appears, click Properties.
- 11 In the dialog box that appears, click the Columns tab and configure the Managed Element and Reported Element columns correctly.
- 12 In the Filter By Sets drop-down list, select Reported Element.

Ensure the column order is the same as will be defined for the raw table:



Use the Up and Down arrows to re-order the columns.

- 13 From the Filter By Sets drop-down list, select Managed Element, and ensure the column order is the same as will be defined for the raw table.
- 14 Click Apply and then click OK.
- 15 Right click the raw table, and from the menu that appears, click Properties.
- 16 In the dialog box that appears, on the General tab, set the loading type and granularity.
- 17 Select the Use Topology Table option, and select the CFG table that you have chosen to use for data quality processing:



- 18 On the Columns tab, configure the Managed Element, Reported Element and Reported Datetime columns correctly.
- 19 In the Filter By Sets drop-down list, select each of the three groups in turn, and ensure the column order matches that used in the CFG table for the same level.
- 20 On the DQ Period Processing tab, in the Availability pane, select the levels on which you want to report.
- 21 Click the View Config/Scheduling info button to check the configuration and retrieve the DQP_CONFIG_ID.
- 22 Click Apply to save the configuration, and then click OK.
- 23 On all datasources (CFG and data/raw) grant the select privilege to ossbackend:

```
grant select on <schema>.<table> to ossbackend
```
- 24 Check that the data quality tables DQP_AVAIL_ELEMENT and DQP_AVAIL_STATS have partitions for the startdate of the period you wish to check.
- 25 In an SQL script run Data Quality Period Processing for availability using the following script as the ossbackend user:

```
execute OSSBACKEND.DQ_PERIOD_PROCESSING.PROCESS_AVAIL (
:DQP_CONFIG_ID, :PERIOD_START, :PERIOD_END );
```

Where

DQP_CONFIG_ID is the configuration ID, specifying the data source configuration that you are using (as defined in the Data Source Properties dialog box)

PERIOD_START and PERIOD_END define the range of the time period you want to report on.

5.6 Scheduling Programs

All AIRCOM OPTIMA external programs are run in scheduled mode using the Unix scheduler, cron tab. For example, a parser may be scheduled to run on a periodic basis of every five minutes, in which case, every five minutes the parser will:

- Be started by cron tab
- Process any input files that are available at that instance
- Exit

If a program instance does not complete before the next time it is scheduled, then multiple instances of that program will occur. This is avoided by the use of a monitor file.

Before a program starts an instance, it checks if an associated monitor file exists. If one does exist, then this indicates that an instance is already running and so the program immediately exits. If a monitor file does not exist, the program starts and creates a monitor file. This file is uniquely associated to the program instance using the PRID and the hostname environment variable in a common directory (the default is \$OPTIMA/PIDS). When the program has run, it removes the monitor file.

The Process Monitor ensures that monitor files are removed if programs crash or hang.

Multiple programs may be scheduled from a single cron entry by using a batch file. The programs may be scheduled to run sequentially or concurrently, the latter achieved by running the program in background mode (&) in the batch file.

5.7 Managing Resources Through Consumer Groups

In order to enable you to effectively manage database memory allocation, AIRCOM OPTIMA supports the use of Oracle consumer groups and resource plans. An Oracle resource consumer group is a collection of users with similar requirements for resource consumption. For more information on Oracle consumer groups, see your Oracle documentation.

The AIRCOM OPTIMA consumer groups are defined as follows:

- For the AIRCOM OPTIMA front end, the consumer groups are based on the user type:

User Type	Consumer Group
OPTIMA_ADMINISTRATOR	OPTIMA_ADMINISTRATORS(CG)
OPTIMA_ADVANCED_USER	OPTIMA_ADVANCED_USERS(CG)
OPTIMA_USER	OPTIMA_USERS(CG)
OPTIMA_USER_ADMINISTRATOR	OPTIMA_USER_ADMINISTRATORS(CG)
OPTIMA_ALARM_ADMINISTRATOR	OPTIMA_ALARM_ADMINISTRATORS(CG)

This means that when a new user is created and assigned to a particular user type, they will be assigned to the corresponding consumer group at the same time.

- For the AIRCOM OPTIMA back end, the consumer groups are based on the backend application:

Application	Consumer Group
Report Scheduler	OPTIMA_REPSCH_PROCS(CG)
Loader	OPTIMA_LOADER_PROCS(CG)
Loader GUI	OPTIMA_LOADER_USERS(CG)
Summary GUI	OPTIMA_SUMMARY_USERS(CG)
Data Quality GUI	OPTIMA_DQ_USERS(CG)
Alarms Processor	OPTIMA_ALARM_PROCS(CG)
Alarm Handler	OPTIMA_ALARMHANDLER_PROCS(CG)
SNMP Agent	OPTIMA_SNMPAGENT_PROCS(CG)
SNMP Poller	OPTIMA_SNMPOLLER_USERS(CG)

This means that when a user logs into a particular application, they will be assigned to the corresponding consumer group at the same time. For example, when OPTIMA_LOADER_PROCS logs into the Loader, they will automatically be assigned to the OPTIMA_LOADER_PROCS(CG) consumer group, and receive the specified allocation of database memory for a member of that group.

These resource groups must be used in conjunction with resource plans, which define how resources are balanced across the system (in terms of % share) according to business rules.

 This percentage share will only be enforced when resource consumption has reached capacity (in other words, 100%).

As a simple example, a 'DAYTIME' plan may distribute the resources in one way, while another 'NIGHTTIME' plan distributes them in another way:

Consumer Group	Plan 1 - 'DAYTIME' (% Share)	Plan 2 - 'NIGHTTIME' (% Share)
OPTIMA_ADMINISTRATORS(CG)	20	50
OPTIMA_ADVANCED_USERS(CG)	10	10
OPTIMA_USERS(CG)	60	20
OPTIMA_USER_ADMINISTRATORS(CG)	5	10
OPTIMA_ALARM_ADMINISTRATORS(CG)	5	10

AIRCOM OPTIMA has a default resource plan, which is assigned at the start of the deployment of AIRCOM OPTIMA. This contains a number of subplans associated to the consumer groups for the different components of AIRCOM OPTIMA - for example, Loader, SNMP, Summary and so on.

5.8 Session Summary Checklist

This checklist has been provided as a self-assessment of the objectives stated at the beginning of the session.

Please tick all objectives covered in this session.

- OSS Maintenance
- Summary
- Data Quality
- Alarms
- Scheduling Process
- Resource Management



Additional Notes:

6 Application Components

6.1 Objectives of this Session

During this session you will learn about:

- Report Scheduler
- Alarms module
- Administration reports

6.2 Scheduling Processes

The Report Scheduler enables the Administrator to configure the AIRCOM OPTIMA Report Scheduling System. The Report Scheduler comprises a configuration utility and an executable application (Windows NT service or stand-alone.)

Using the configuration utility, Administrators can:

- Choose how configuration settings are stored
- Configure the database connection for the Report Scheduler
- Indicate whether time zones are being used
- Configure the email connection for reports
- Configure settings for debugging
- Configure log file settings
- Enable and disable the scheduling of reports

6.2.1 Installing the Report Scheduler

Before you can use the Report Scheduler:

- 1 Install the Report Scheduler configuration utility (OptimaReportSchedulerConfig.exe) to the backend binary directory.
- 2 Install **one** of the following Report Scheduler applications to the backend binary directory:
 - Windows NT service application (OptimaReportScheduler.exe)
 - or -
 - Stand-alone application (OptimaReportSchedulerGUI.exe)

 AIRCOM International recommends using the Report Scheduler as a stand-alone executable application, for the following reasons:

- It is more memory and CPU efficient
- It is easier to set-up
- It has error logging, file maintenance and crash-monitor functionality
- It is less erroneous as it does not interfere with Windows services

6.2.2 Configuring the Report Scheduler

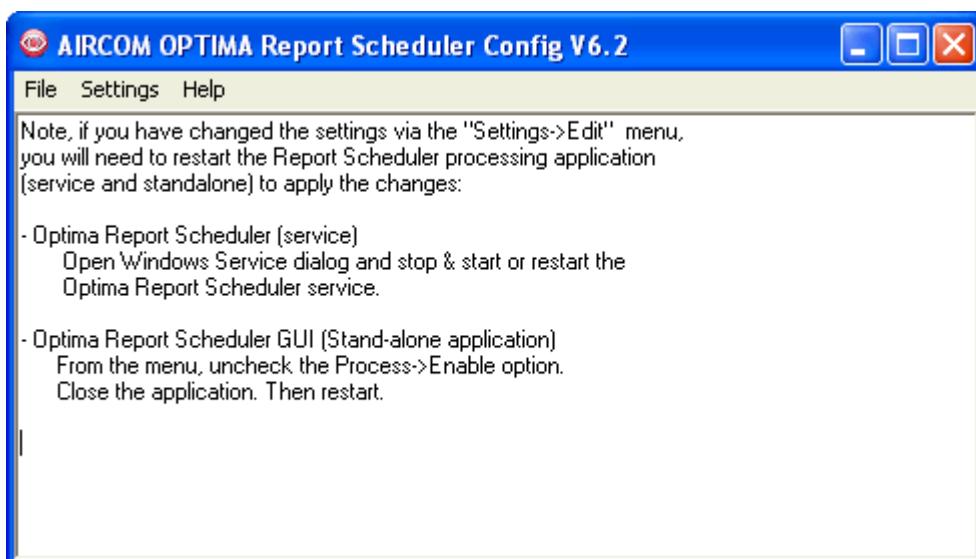
Before you can use the Report Scheduler, you must configure the application using the configuration utility.

To configure the Report Scheduler:

- 1 Type the executable filename into the command prompt:

OptimaReportSchedulerConfig.exe

The Report Scheduler configuration utility appears. This picture shows an example:



- 2 From the Settings menu, click Edit.

- 3 On the Storage Type page that appears, choose the storage type you require by selecting the appropriate radio button, and then click Next.
- 4 On the Database page, add the following details:

In This Box:	Do This:
Username	Type the username the Report Scheduler will use to connect to the database.
Password	Type the password the Report Scheduler will use to connect to the database.
Service	Type the name of the database.
Use Time Zone	<p>If your network is spread across more than one time zone, time zone support is required in order to manage the difference between the User Time Zone where the scheduler is located and the Universal Time Zone where the database is located:</p> <ul style="list-style-type: none"> • Select the Use Time Zone option • From the list of available time zones that appears, select the one that represents the time zone for the scheduler. The run time of the reports on the remote database is adjusted accordingly. <p>For more information on time zones, see the AIRCOM OPTIMA Operations and Maintenance Guide.</p> <p>For more information on how the Report Scheduler uses time zones, see Scheduling Reports Across Different Time Zones on page 266.</p>

-  Click Test Connection, to test the database connection before proceeding.
- 5 Click Next.
 - 6 On the Email page, add the following details:

In This Field:	Do This:
Allow Export to email	Select this checkbox if you want to export reports to email.
SMTP Server	Type the name of the SMTP Server.
Port Number	Type the port number of the SMTP Server.
SMTP authentication required	Select this checkbox if the SMTP Server that you have defined requires authentication.
SMTP User Name/Password	If you have selected the 'SMTP authentication' option, type the SMTP username and password.
Report "From" address field	Type the email address of the report sender.

-  Click Test Connection, to test the email connection before proceeding.
- 7 Click Next.
 - 8 On the Debug page:
- | Select The: | To Do This: |
|-----------------------------------|--|
| Event Log checkbox | <p>If you want debug level information to be included in the Event Viewer Application log.</p> <p> This option only applies if you are running the Report Scheduler Windows NT service application.</p> |
| Backup Email Attachments checkbox | If you want to backup email attachments in a separate directory. Select the location of the backup directory in the Debug Directory field. |
- 9 Click Next.

- 10 If you want the Report Scheduler to run continuously, select the Run Continuous checkbox. Otherwise, you will need to schedule the Report Scheduler in the Windows scheduler.
- 11 Click Next.
- 12 On the PID Settings page, click the PID File Settings button to configure PID File settings. For more information, see Configuring PID File Settings on page 268.
- 13 Click Next.
- 14 On the Log Settings page, click the Log Settings button to configure log file settings. For more information, see Configuring Log File Settings on page 269.
- 15 Click Finish to save your configuration.

6.2.2.1 Scheduling Reports Across Different Time Zones

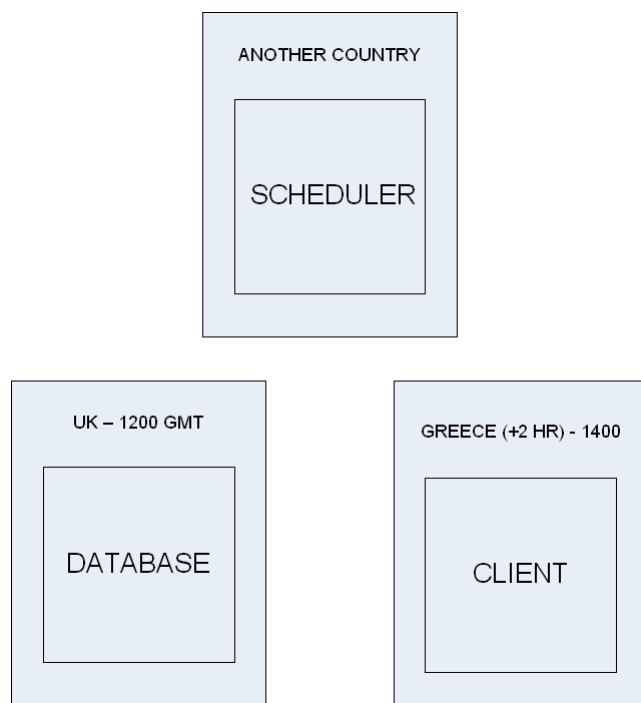
The Report Scheduler works differently depending on whether or not you have configured the Report Scheduler to use a specific time zone.

The Report Scheduler Uses a Time Zone

If your network spans across multiple time zones, and you have configured the Report Scheduler to use a specific time zone, when the scheduler is started, it will search for and run:

- All report schedules set on the same time zone as the Report Scheduler, where the next run date is equal to or less than the database local time (for example, the Oracle SYSDATE) adjusted by the time zone
- Any other schedules without a specified time zone, where the next run date is equal to or less than the database local time (SYSDATE)

Consider the following network example:



A network across multiple time zones

The example network is spread across different time zones:

- The database is in the UK
- The client is in Greece
- The report scheduler is in a third country

The following report schedules have been created:

Schedule Number	Time Zone	Next Run Time
1	GREECE	14:00
2	GREECE	12:00
3	GMT	15:00
4	None Set	12:00

The Report Scheduler has been configured to use the GREECE time zone.

If the Report Scheduler is set running, then the database time (SYSDATE) is converted according to the GREECE timezone, giving an actual runtime of 14:00. Therefore, the Scheduler will run:

- All report schedules set on the GREECE time zone, where the next run date is equal to or less than 14:00
- Any other schedules without a specified time zone, where the next run date is equal to or less than 12:00

This means that it deals with each example schedule record as follows:

Schedule Record	Runs?	Reason Why
1	Y	Next run time = 1400, SYSDATE + GREECE TIME ZONE = 1400
2	Y	Next run time = 1200, SYSDATE + GREECE TIME ZONE = 1400
3	N	Has a different time zone set, and so is ignored
4	Y	Next run time = 1200, SYSDATE = 1200

The Report Scheduler Does Not Use A Time Zone

If your network spans across multiple time zones, and you have configured the Report Scheduler to use a specific time zone, when the scheduler is started, it will search for and run all report schedules where the next run date is equal to or less than the database local time (for example, the Oracle SYSDATE) adjusted by the specific time zone for each schedule.

 If no time zone has been set for a schedule, it will just compare the database local time with the next run time.

Take an example network, when the following report schedules have been created:

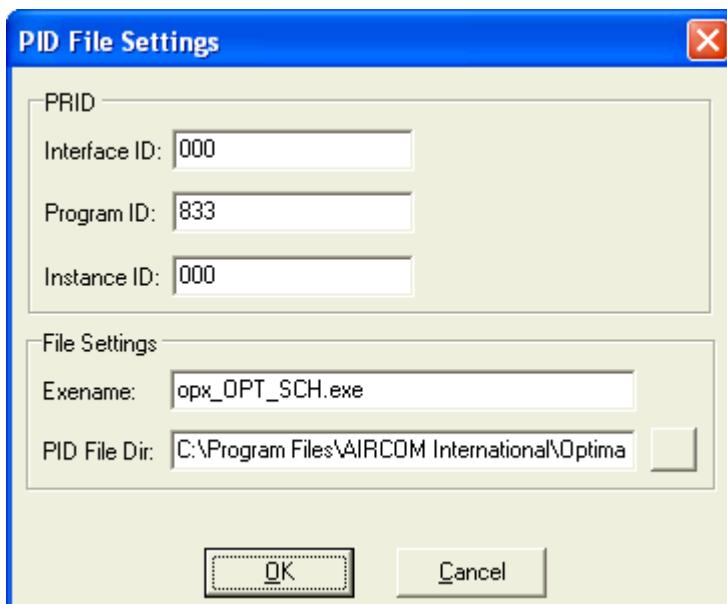
Schedule Number	Time Zone	Next Run Time
1	GREECE	14:00
2	GREECE	12:00
3	GMT	15:00
4	None Set	12:00

If the Report Scheduler is set running, then it will treat each schedule record as follows:

Schedule Number	Time Zone	Next Run Time	SYSDATE	Adjusted SYSDATE	Run?
1	GREECE	14:00	12:00	14:00	Y
2	GREECE	12:00	12:00	14:00	Y
3	GMT	15:00	12:00	12:00	N
4	None Set	12:00	12:00	12:00	Y

6.2.2.2 Configuring PID File Settings

When you click the PID File Settings button on the PID Settings page in the AIRCOM OPTIMA Report Scheduler configuration utility, the PID File Settings dialog box appears. This picture shows an example:



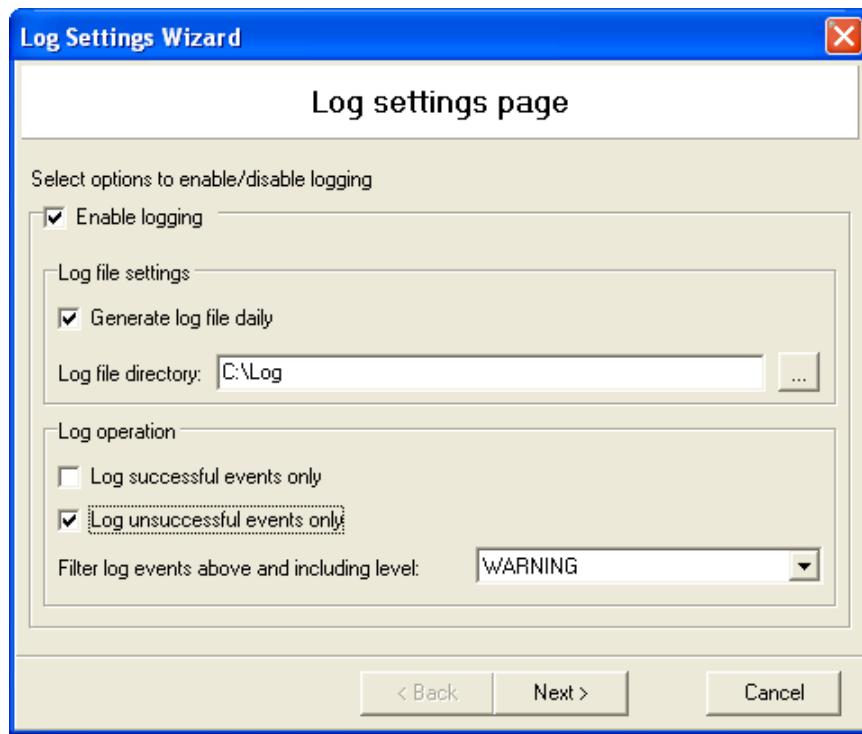
PID File Settings dialog box

This table describes the information to complete the PID File Settings dialog box:

In This Field:	Do This:
Interface ID	Type the three-digit interface identifier.
Program ID	Type the three-digit program identifier.
Instance ID	Type the three-character instance identifier.
Exename	Type the name of the executable file.
PID File Dir	Select the location of the PID File directory.

6.2.2.3 Configuring Log File Settings

When you click the Log Settings button on the Log Settings page in the AIRCOM OPTIMA Report Scheduler configuration utility, the Log Settings Wizard appears. This picture shows an example:



Log Settings Wizard

To configure log file settings:

- 1 On the Log Settings page, add the following details:

In This Field:	Do This:
Enable Logging checkbox	Select this checkbox to enable logging.
Generate Log File Daily checkbox	Select this checkbox if you want to generate log files on a daily basis.
Log File Directory	Select the location of the Log File directory.
Log Successful Events Only checkbox	Select this checkbox if you only want to add operation successful messages to the log file.
Log Unsuccessful Events Only checkbox	Select this checkbox if you only want to add operation unsuccessful messages to the log file.
Filter Log Events Above and Including Level drop-down list	Select the level of information required in the log file. The available options are: Debug, Information, Warning, Minor, Major, Critical.

- 2 Click Next.
- 3 On the Completing the Wizard page, check your settings in the Settings Summary pane.
 - 💡 Click the More Info button, to view Program information.
- 4 Click Finish to save your settings and close the Log Settings Wizard.

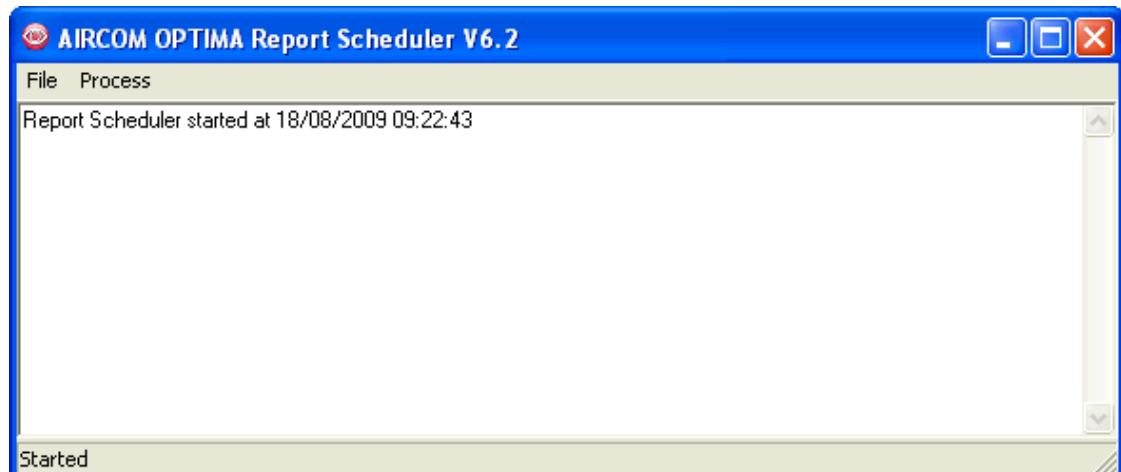
6.2.3 Starting the Report Scheduler GUI

The Report Scheduler GUI is a standalone application that can be launched from anywhere on a client machine. Before you can start the Report Scheduler, you must ensure you have a valid configuration file and a database correctly configured and accessible. For more information, see Configuring the Report Scheduler on page 264.

To start the Report Scheduler GUI, type the executable filename into the command prompt:

```
OptimaReportSchedulerGUI.exe
```

The Report Scheduler window appears:



Report Scheduler window

This table describes the Report Scheduler window menu options:

Menu:	Option:	Description:
File	Exit	Closes the Report Scheduler.
Process	Enable	Enables the processing of report schedules.

6.2.4 Running Multiple Instances of the Report Scheduler

The Report Scheduler processes one report at a time. If you need to process a lot of reports by a certain time, for example overnight, you can achieve this by running multiple Report Scheduler instances.

If you want to run multiple instances on the same machine, then you must ensure that each instance uses different INI files, PID files and log files, otherwise the PID file will prevent any other instance from running.

To run multiple instances on the same machine:

- 1 Assign each INI file a different name (or place them in different directories).
- 2 Pass each INI file as a parameter to the Report Scheduler. For example, if the path and filename of the INI file is

C:\OptimaBackend\ReportScheduler\OptRepSchedulerConfig1.ini, type the following into the command prompt:

```
OptimaReportSchedulerGUI.exe  
INI="C:\OptimaBackend\ReportScheduler\OptRepSchedulerConfig1.ini"
```

 If you don't pass the INI file as a parameter, the Report Scheduler will use the OptRepSchedulerConfig.ini file in the directory specified in the Report Scheduler configuration utility.

6.2.5 Maintenance of the Report Scheduler

In usual operation, the Report Scheduler should not need any special maintenance. During installation the AIRCOM OPTIMA Directory Maintenance application will be configured to maintain the backup and log directories automatically.

However AIRCOM International recommends the following basic maintenance checks are carried out for the Report Scheduler:

Check The	When	Why
Log messages for error messages	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

6.2.5.1 Checking a Log File Message

The log file for the Report Scheduler is stored in the directory as defined in the Log Settings Wizard. For more information, see Configuring Log File Settings on page 269.

You can choose to create a new log file every day. The information level required in the log file is also defined in the Log Settings Wizard and will be one of the following:

- Debug
- Information
- Warning
- Minor
- Major
- Critical

These levels help the user to restrict low level severity logging if required. For example, if Minor is selected then only Minor, Major and Critical logging will occur.

 Utilities are provided for searching and filtering log messages and also for loading the messages into the database. For more information, see Checking Log Files on page 24.

6.2.5.2 Stopping the Report Scheduler Application

If the Report Scheduler application is scheduled, then it will terminate when all outstanding schedules have been processed.

If the application is run continuously, then it will monitor continuously for schedules. In this case, the application can be terminated.

6.2.5.3 Checking the Report Scheduler is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

6.2.6 Troubleshooting

The following table shows troubleshooting tips for the Report Scheduler:

Problem	Cause	Solution
Application exits immediately.	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.
New configuration settings are not being used by the application.	Settings are not saved to the configuration (INI) file. File created in the wrong location. Report Scheduler processing (service and standalone) applications have not been restarted to pick up the new settings.	Check settings and location of file. Restart the Report Scheduler processing (service and standalone) applications.
Error emailing reports: 10053: Software caused connection abort.	Anti-virus software is running.	Deactivate anti-virus software.
SMTP Authentication Error	Invalid SMTP Username setting. Port 25 is being blocked.	Use the configuration utility to delete the SMTP Username setting on the Email page of the configuration. For information about how to do this, see Configuring the Report Scheduler on page 264. If the problem persists, for example users outside the domain are still unable to receive emails, then request that the customer's IT department enable relaying without authentication for the AIRCOM OPTIMA Server. Check that no anti-virus software is blocking port 25.

Problem	Cause	Solution
Failure to export report to email address due to the following error: 421 4.3.5 Unable to create data file: Input/Output error (Processing time is...)	User has insufficient privileges on Debug Directory or Debug Directory doesn't exist.	Enable permissions. Create Debug Directory.
Printer is unavailable.	Default or specified printer has not been installed on the Report Scheduler server.	Assign user a logon account for the Report Scheduler service and then add the assigned user to the printer. To assign a logon account: 1. In the Services window, right-click the Report Scheduler service and, from the menu that appears, click Properties. 2. In the Report Scheduler Properties dialog box, click the Log On tab and select the This Account radio button. 3. Complete the user account and password fields. 4. Click Apply and then close the Services window. To add a user for an installed printer: 1. In the Printers and Faxes window, select the printer that you want to use to send reports. 2. In the Printer Tasks list, click Share This Printer. 3. In the Printer Properties dialog box, select the Security tab and click Add. 4. In the Select Users, Computers or Groups dialog box, type the username and click OK. 5. Click Apply and then close the Printer Properties dialog box.

6.2.6.1 Troubleshooting Exporting to Email

The following list contains tips for helping you if you are experiencing problems exporting to email with the Report Scheduler. For example, if you are receiving an "Unable to export to email address" error message. In this case, you should check:

- If the IP address of the Report Scheduler machine needs to be registered to access the mail server machine. The Report Scheduler normally connects to the mail server on port 25. You can test this by typing the following command at the command prompt:

```
telnet <ip_address_of_mailserver> 25
```

You specify the port number using the Report Scheduler configuration utility. For more information, see Configuring the Report Scheduler on page 264.

- If an authenticated SMTP username and password are required for the Report Scheduler to be able to send email.

If you are having problems, try typing a valid username into the Report Scheduler configuration utility or try leaving it blank. If "SMTP Authentication Error" occurs, it means the Report Scheduler is using an invalid username. In this case, you should use the configuration utility to either remove the SMTP username or add a valid one. For more information, see Configuring the Report Scheduler on page 264.



If you remove the username, users outside the domain may not be able to receive the emails. In this case, request that the Customer's IT department enable relaying without authentication for the AIRCOM OPTIMA server.

- That the email From address you are using is a valid email address

If "Invalid email address..." appears in the schedule history in the Schedule Explorer, it can mean that the From email address (rather than the email address of the user to whom the email is sent) is invalid. Ensure that you use a valid form of email address, for example, ReportScheduler@aircominternational.com.

- For additional security restrictions on the mail server. For example, an error message of "Connection closed gracefully" when using the `telnet` command indicates that the mail server is closing the connection. Contact the customer's IT department for more information about security restrictions on the mail server.
- If the Report Scheduler machine is able to send an email from a client such as Outlook Express by connecting to the customer mail server. Normally, if Outlook Express can send an email, then the Report Scheduler can too.
- If the Alarm Notifier is able to send an email. For more information, see About the Alarm Notifier on page 280.
- That all anti-virus software has been disabled on the Report Scheduler machine.

If "10053: Software caused connection abort" occurs, it means anti-virus software is blocking port 25. Normally, you only need to stop virus checking for port 25 but it can be useful to disable all anti-virus software when testing the Report Scheduler.



If reports are to be emailed externally, you may need to ask the customer's IT department to open port 25 on the firewall for the Report Scheduler application.

- The log files in the common log directory for additional error messages. To receive more detailed log messages, set the severity level of the log file to Debug. AIRCOM International recommends reducing the logging level again, once the Report Scheduler is working correctly.
- If the Report Scheduler is able to export a report to file on a shared directory. This confirms that the Report Scheduler is working and confirms that you only have a problem with sending email.
 - ☞ You need to run the Report Scheduler with a network user so it can access all network file locations and the customer's email server.
- That the version numbers of the Report Scheduler configuration utility and GUI are compatible.
- You are using the Report Scheduler stand-alone executable application and not the older Windows NT service application.

You can check this in the Windows Services window. If the service is installed, uninstall it by typing the following at the command prompt:

```
OptimaReportScheduler /uninstall
```

- That the Report Scheduler GUI is scheduled, for example, at 10 minute intervals, in the Windows Task Scheduler.

Ensure the Report Scheduler is not set to run in continuous mode. The Report Scheduler should be launched from the Windows Scheduler. In this way, it will connect to the database, process the reports, then close down until re-launched by the Windows Scheduler.

- That the PID file and log file settings are correctly set.

To test the Process Monitor, kill the Report Scheduler during testing and check that the Process Monitor removes the PID after the specified time.

To receive more detailed log messages (for testing purposes), set the severity level of the log file to Debug.

- That the database user can connect to the database.
- Which storage type you are using. AIRCOM recommends using the configuration (INI) file rather than saving to registry.

6.2.7 Example AIRCOM OPTIMA Report Scheduler Configuration (INI) File

```
[PIDCompIniSection]
InterfaceId=789
ProgramId=456
InstanceId=123
Exename=opx_OPT_SCH.exe
PIDFileDir=C:\Report Scheduler

[LogCompIniSection]
LogMaint_SuccessFul=0
LogMaint_UnSuccessFul=1
LogMaint_LogSize=512
LogMaint_OverrideEventsAuto=0
LogMaint_ClearManually=0
LogMaint_ClearLogbySize=1
LogMaint_Days=7
EnableLogMaintenance=0
LogMaint_TimeInterval=60
GenerateDailyLogs=1
PRID=789456123
LogLevel=WARNING
EnableLogging=1
LogDir=C:\Log

[Database]
UserName=test1
Password=Gev\wPrn
DBService=TEST

[Email]
SMTPServer=test.server
SMTPUserName=test.user
PortNumber=25
EmailFrom=test.user@aircom.co.uk
AllowExportToEmail=1

[Debug]
EnableDebugInEventViewer=1
EnableAttachmentDir=1
AttachmentDir=C:\Debug

[StandAlone]
RunContinuous=1

[LogSettings]
LogDirectory=C:\Log
```

```

[TIMEZONE]
UseTimeZone=1
OptimaAbbrev=opt_1014
TimeZoneName=Australia/NSW
TimeZoneAbbrev=LMT
OptimaDescription=Test
SystemBias=0
SystemStandardName=GMT Standard Time
SystemStandardBias=0
SystemDaylightName=GMT Standard Time
SystemDaylightBias=-60

```

6.3 About AIRCOM OPTIMA Alarms

The alarms defined in the AIRCOM OPTIMA front end are processed by two backend programs:

- The Alarms Processor checks the next schedule date of each alarm and then processes and updates any alarm whose schedule date is due. For more information, see [About the Alarms Processor on page 277](#).
- The Alarm Notifier polls the database for recently raised alarms and sends alarm notifications via email or SMS. For more information, see [About the Alarm Notifier on page 280](#).
- The SNMP Agent provides an outgoing interface for alarms through SNMP protocols. SNMP clients can request information from the SNMP Agent about alarms in the database. The SNMP Agent can also send SNMP traps to these SNMP clients.

6.3.1 About the Alarms Processor

The Alarms Processor (opx_ALM-GEN-817.exe) connects to the database and polls the alarms at a specified polling interval. It checks the next schedule date of each alarm and then processes and updates any alarm whose schedule date is due.

6.3.1.1 Starting the Alarms Processor

Before you can use the Alarms Processor, install the following file in the backend binary directory:

- opx_ALM_GEN_817.exe (Windows)
- opx_ALM_GEN_817 (UNIX)

To start the Alarms Processor:

In Windows, type:

```
opx_ALM_GEN_817.exe opx_ALM_GEN_817.ini
```

In Unix, type:

```
opx_ALM_GEN_817.exe opx_ALM_GEN_817.ini
```



All applications are scheduled in a usual operation within the data loading architecture.

6.3.1.2 Configuring the Alarms Processor

The Alarms Processor is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The Alarms Processor configuration (INI) file is divided into different sections.

The following table describes the parameters in the [DIR] section:

Parameter	Description
LogDir	The location of the directory where log files will be stored.
TempDir	The location of the directory where temporary files will be stored.
MonFilePath	The location of the directory where monitor (PID) files will be created.

The following table describes the parameters in the [MAIN] section:

Parameter	Description
LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily
LogSeverity	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical
RefreshTime	The pause (in seconds) between executions of the main loop when running continuously.
RunContinuous	0 - Have the data validation application run once. 1 - Have the data validation application continuously monitor for input files.
StandAlone	0 – Run the Process Monitor without a monitor file. Do not select StandAlone if the Process Monitor is scheduled. 1 – Run the Process Monitor with a monitor file.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
Verbose	0 - Run silently. 1 - Print status messages to the screen.

The following table describes the parameters in the [OPTIONS] section:

Parameter	Description
Database	Oracle database TNS name
UserName	User name
Password	Password

This is an example of an Alarms Processor configuration INI file:

```
[DIR]
LogDir=C:\Development\Test\opx_ALM_GEN_817\log\
TempDir=C:\Development\Test\opx_ALM_GEN_817\temp\
MonFilePath=C:\Development\Test\opx_ALM_GEN_817\prid\

[MAIN]
LogGranularity=3
LogLevel=1
RefreshTime=0
RunContinuous=0
StandAlone=0
MachineID=000
ProgramID=817
InstanceID=001
Verbose=1

[OPTIONS]
Database=OPTRAC_VM
UserName=OPTIMA_ALARM_PROC
Password=l\mlofhY
```

6.3.2 About the Alarm Notifier

The Alarm Notifier is a standalone application that polls the Alarms table in the database for recently raised alarms and sends alarm notifications via email or SMS to users or groups of users.

6.3.2.1 Installing the Alarm Notifier

Before you can use the Alarm Notifier, install the following file to the backend binary directory:

OptimaAlarmsNotifier.msi

To install the Alarm Notifier:

Double-click the Alarm Notifier installer (OptimaAlarmsNotifier.msi).

6.3.2.2 Starting the Alarm Notifier

To start using the Alarm Notifier:

- 1 Double-click the Alarm Notifier application (AlarmNotifier.exe).

The application is started, with the Alarm Notifier dialog box minimised.

- 2 Double-click the Alarm Notifier icon  in your system tray.

- or -

Right-click the Alarm Notifier icon  in your system tray and, from the menu that appears, click Show.

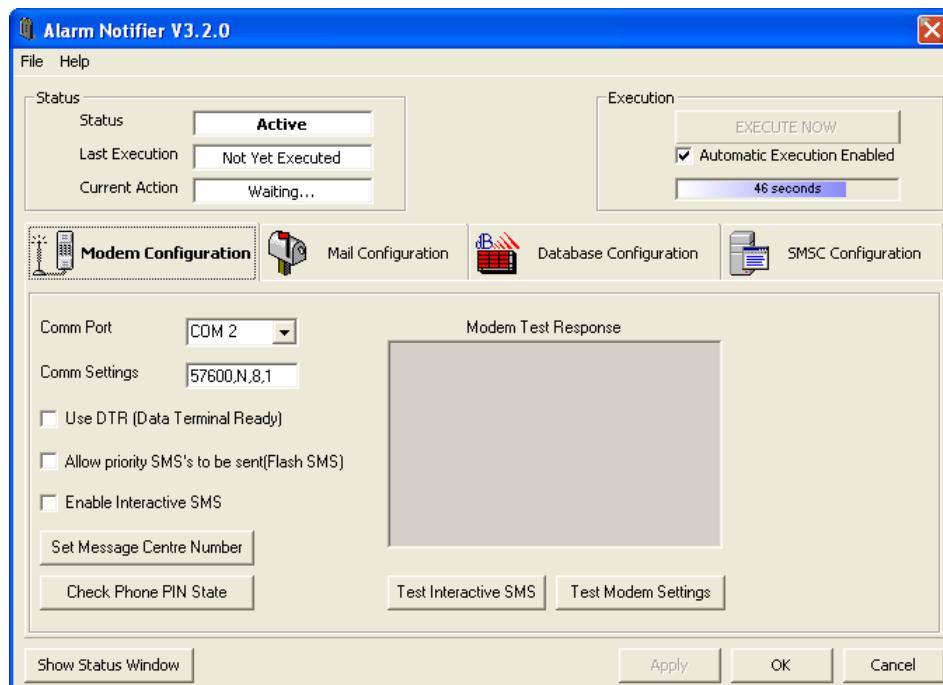
The Alarm Notifier dialog box appears.

6.3.2.3 About the Alarm Notifier Dialog Box

In the Alarm Notifier dialog box, you can:

- View the Alarm Notifier's current status
- Control how the Alarm Notifier is executed
- Configure modem, email, database and SMSC settings

This picture shows an example of the Alarm Notifier dialog box:



Alarm Notifier dialog box

Viewing the Status of the Alarm Notifier

In the Status pane of the Alarm Notifier dialog box, you can view the Alarm Notifier's current status. The following table describes the information shown in the Status pane:

This field:	Shows this information:
Status	Whether the Alarm Notifier is active or disabled. When the Alarm Notifier is disabled, the Disabled Alarm Notifier icon  is displayed in your system tray.
Last Execution	The date and time that the processing of alarms was last completed.
Current Action	The action that is currently being performing. The possible actions are: <ul style="list-style-type: none">• Waiting• Executing• Updating Log• Error

This picture shows an example:

Status	
Status	Active
Last Execution	Not Yet Executed
Current Action	Waiting...

Status pane

Executing the Alarm Notifier

You control the automatic execution of the Alarm Notifier in the Execution pane of the Alarm Notifier dialog box. The following table describes the Execution pane:

In this field:	Do this:
EXECUTE NOW	Click this button to force an immediate execution of the Alarm Notifier.  The EXECUTE NOW button is disabled when the Automatic Execution Enabled checkbox is selected.
Automatic Execution Enabled	Select this checkbox if you want the Alarm Notifier to automatically execute at a specified polling interval. You set the polling interval on the Database tab. See Configuring Database Settings on page 287 for more information. When Automatic Execution is enabled, the time remaining (in seconds) until the next scheduled execution is shown in a progress bar.

This picture shows an example:

Execution	
<input type="button" value="EXECUTE NOW"/>	
<input checked="" type="checkbox"/> Automatic Execution Enabled	
46 seconds	

Execution pane

Configuring Modem Settings

On the Modem configuration tab, you configure the settings for using the Alarm Notifier with an attached GSM modem or handset. Modems are usually connected to the host machine via an RS232 COM port or a COM port emulator such as a USB or PCI device. The Alarm Notifier has been tested successfully with several types of mobile handset and should work with any handset that supports Protocol Description Unit (PDU) format SMS. For more information about supported handsets, please contact AIRCOM International Support.

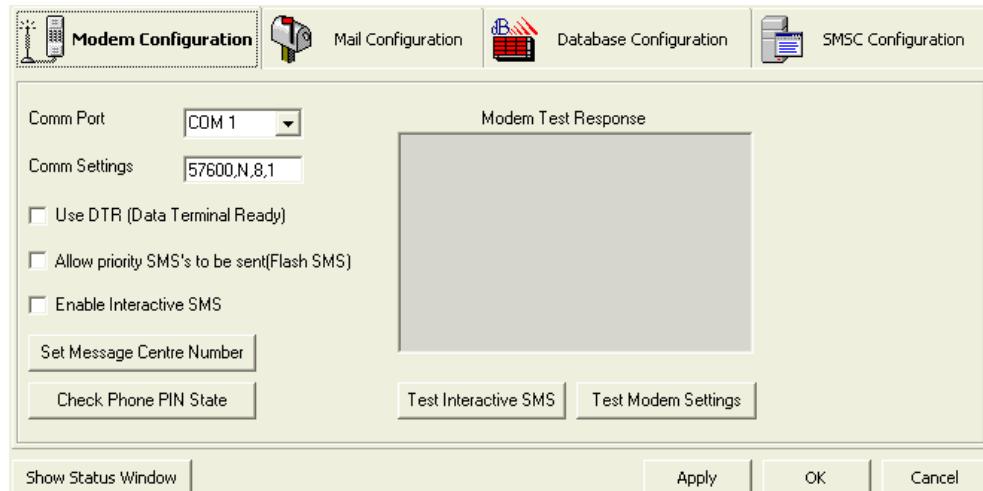
To configure modem settings:

- 1 In the Alarm Notifier dialog box, on the Modem Configuration tab, complete the following information:

In this field:	Do this:
Comm Port	Select the port number on the host machine that the handset is connected to, from the drop-down list.
Comm Settings	This field displays the default baud rate, parity, data bit, and stop bit settings for the majority of handsets.  For newer handsets, you may be able to improve performance by increasing the baud rate.  AIRCOM recommends that you: <ul style="list-style-type: none">• Do not change the Comm settings if the Alarm Notifier is working correctly• Consult the modem manufacturer for advice if you do need to change the Comm settings
Use DTR (Data Terminal Ready)	Select this checkbox if you are using a modem that is configured to use DTR.  Try using this option if your Comm port is set correctly but your modem is not responding correctly.  This option is not supported by all handsets.
Allow Priority SMS's to be sent (Flash SMS)	Select this checkbox if you want to send alarm notifications as 16-bit text messages of class 0 (Flash SMS). On phones that support this feature, alarm notifications will appear as Flash SMS (also called blinking SMS or alert SMS) messages.
Enable Interactive SMS	Select this checkbox if you want to use interactive SMS. Enabling interactive SMS means that the Alarm Notifier can perform certain actions, such as returning information, by responding to specified keywords received via SMS. For information about using interactive SMS, please contact AIRCOM International Support.
Set Message Centre Number	Click this button to set the Short Message Service Centre (SMSC) number on the attached modem or handset. In the dialog box that appears, type the Message Service Centre number and click OK. Your network operator can provide you with this information.  The maximum length of the Message Centre Number can be only 11 digits.
Check Phone PIN State	Click this button to check if a phone has a pin code set and unlock its SIM card for use.

In this field:	Do this:
Test Interactive SMS	Click this button if you have configured interactive SMS and you want to test the response without having to send the modem an SMS message. The results of the test are displayed in the Modem Test Response window.
Test Modem Settings	Click this button to test that you have correctly configured your modem settings. The results of the test are displayed in the Modem Test Response window.

This picture shows an example:



- 2 Click Apply to save your changes.
- 3 Click OK to minimise the Alarm Notifier dialog box.

Configuring Email Settings

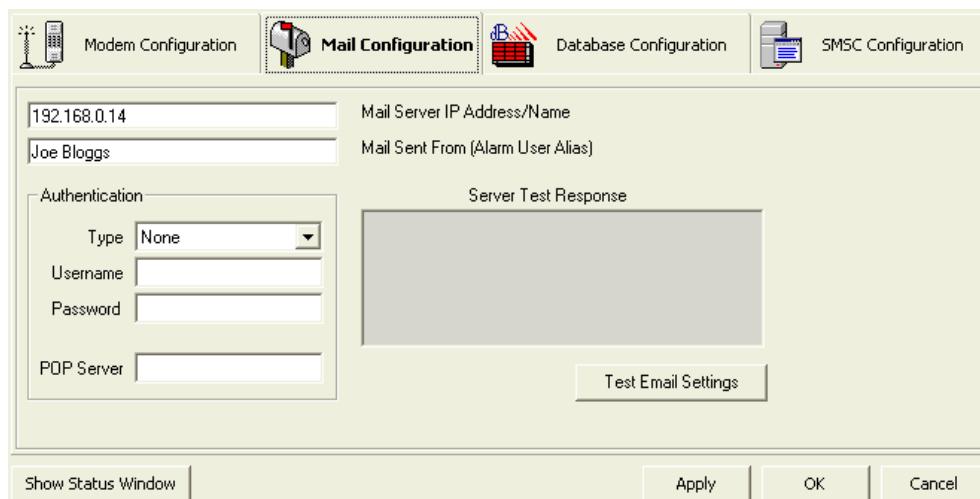
On the Mail Configuration tab, you set the required parameters to allow the Alarm Notifier to send emails.

To configure email settings:

- 1 In the Alarm Notifier dialog box, on the Mail Configuration tab, complete the following information:

In this field:	Do this:
Mail Server IP Address / Name	Type the hostname or IP address of the mail server to connect to.
Mail Sent From (Alarm User Alias)	Type the sender's name that will appear in the From field of received email notifications.  This field is not used for authentication and can be set to anything.
Type	Select the type of authentication required from the drop-down list. The available options are: <ul style="list-style-type: none">• None• POP• Login• Plain Contact the customer's mail server administrator for information about the type of authentication required.
Username	Type the username required to connect to the mail server.  This field is only required if the authentication type is set to something other than None.
Password	Type the password required by the mail server for the specified username.  This field is only required if the authentication type is set to something other than None.
POP Server	Type the hostname or IP address of the POP server.  This field is only required when the POP authentication type is selected.
Test Email Settings	Click this button to test that the Alarm Notifier can successfully send email notifications. In the dialog box that appears, type the required email address and click OK. The results of the test are displayed in the Server Test Response window.

This picture shows an example:



- 2 Click Apply to save your changes.
- 3 Click OK to minimise the Alarm Notifier dialog box.

Configuring Database Settings

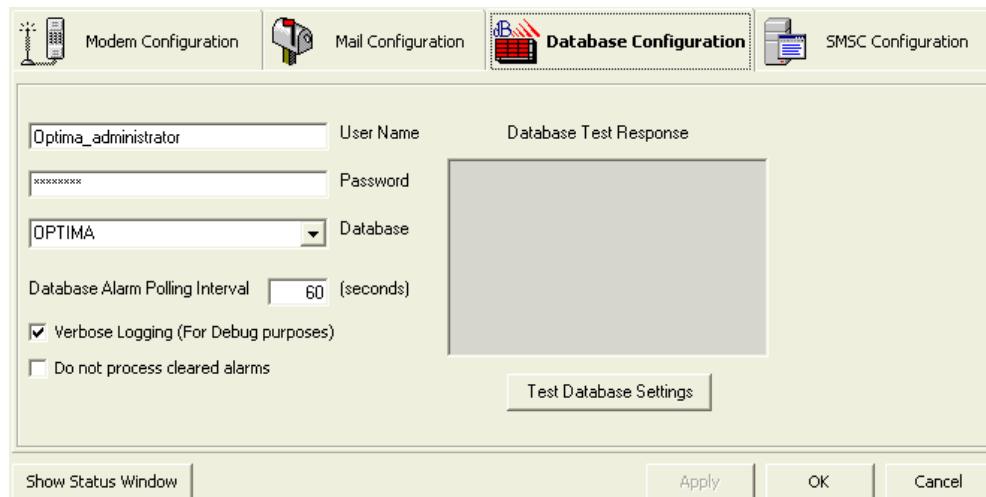
On the Database Configuration tab, you set the database, polling and logging options for the Alarm Notifier.

To configure database settings:

- 1 In the Alarm Notifier dialog box, on the Database Configuration tab, complete the following information:

In this field:	Do this:
User Name	Type the user name you want to use to connect to the database.
Password	Type the password required to connect to the database.
Database	Select the SID that identifies the database to connect to, from the drop-down list. 💡 You can find the SID listed in the Oracle tnsnames.ora file.
Database Alarm Polling Interval	Type the interval (in seconds) that the program will wait before checking for new alarms when in automatic execution mode. See Executing the Alarm Notifier on page 282 for more information.
Verbose Logging (For Debug Purposes)	Select this checkbox if you want to show more detailed information about actions performed and errors encountered in the Current Actions window. See About the Current Actions Window on page 291 for more information.
Do not process cleared alarms	Select this checkbox if you do not want the Alarm Notifier to send notifications for cleared alarms.
Test Database Settings	Click this button to test that the Alarm Notifier can successfully connect to the database with the parameters you have set. The results of the test are displayed in the Database Test Response window.

This picture shows an example:



- 2 Click Apply to save your changes.
- 3 Click OK to minimise the Alarm Notifier dialog box.

Configuring SMSC Settings

On the SMSC configuration tab, you set the parameters that allow the Alarm Notifier to connect directly to an operator's Short Message Service Centre (SMSC) via Short Message Peer to Peer protocol (SMPP).

To configure SMSC Settings:

- 1 In the Alarm Notifier dialog box, on the SMSC Configuration tab, complete the following information:

In this field:	Do this:
Address	Type the socket network address of the SMSC (either TCP/IP or X.25), for example, 192.168.88.1 for TCP/IP connections.
Port	Type the port which is used for TCP/IP connections only.
Single port connectivity only	Select this checkbox if you are using single port connectivity. Normally, an SMPP connection requires two socket connections: one for transmitting and one for receiving SMS messages. However, some SMSC operators only provide a port for transmitting messages or handle both operations on a single socket connection.  Only change this setting if instructed to by your network operator.
System ID	Type the System ID provided by your network operator. This setting is used to identify you or your application.
System Type	Type the System Type provided by your network operator.  Notes : <ul style="list-style-type: none">• This setting is used as additional information to identify your application.• This setting is optional.
Password	Type the password required to connect to the SMSC.
TON	Type the short value representing the Type of Number (TON) of the address for your application, for example, this could be a TCP/IP address. If you have not been provided with this information, type 1 in this field.
NPI	Type the short value representing the Numbering Plan of the address for your application, for example this could be a TCP/IP address. If you have not been provided with this information, type 1 in this field.
SMPP Version	Type the long value representing the SMPP Interface version that your application supports.  Notes : <ul style="list-style-type: none">• Some older SMSC implementations require a one digit value, for example, 3, whereas more recent implementations expect a two-digit value, for example, 33 or 34.• The SMPP Interface version must be sent in hexadecimal format. If you are using the 3.4 version, a hexadecimal 0x34 value must be sent. To achieve this, set the SMPP Interface version to 52, which corresponds to the required 0x34 hexadecimal value. You do not need to do this if you are using a 3.3 or lower version, as hexadecimal values from 0x0 to 0x33 are allowed.

In this field:	Do this:
Transceiver	<p>Select this checkbox if the transmitting and receiving of SMS messages is to be handled via a single port.</p> <p> Notes :</p> <ul style="list-style-type: none"> When using this option, ensure you also select the Single port connectivity only checkbox. This option is not required for standard SMPP links. <p> Only change this setting if instructed to by your network operator.</p>
Send from	<p>Type the sender information which is shown when the message arrives at the mobile. Usually this is a mobile number in international format or a short number identifier. Request this information from your network operator, if you are unsure.</p> <p> This setting can be an alphanumeric string but AIRCOM recommends testing whether your SMSC operator supports alphanumeric senders.</p>
Dest TON	<p>Type the short value representing the TON for the bstrDestination value. If you have not been provided with this information, type 1 in this field.</p>
Dest NPI	<p>Type the short value representing the NPI for the bstrDestination value. If you have not been provided with this information, type 1 in this field.</p>
Validity(hr)	<p>Type the long value containing the validity period of the SMS message in hours. The validity period determines how long a message is stored by the SMSC and how long it tries to deliver it to the mobile if the mobile is not reachable. The maximum Validity value depends on the SMSC operator but the range is between 48 and 72 hours.</p> <p> If your SMSC does not support this setting, type 0 in this field.</p>
Source TON	<p>Type the short value representing the TON for the bstrOriginator value. If you have not been provided with this information, type 1 in this field.</p>
Source NPI	<p>Type the short value representing the NPI for the bstrOriginator value. If you have not been provided with this information, type 1 in this field.</p>
Option	<p>Type the long value representing the SMS message option. The following options are available:</p> <p>0 - Normal SMS messages 2 - Delivery notification 4 - Direct display messages 8 - 8bit encoded messages 16 - User Data Header (logo or ringing tone) 32 - Virtual SMSC 64 - Unicode messages 128: EMS messages</p> <p> Do not change this setting unless instructed to by your network operator. Incorrect use of this option can cause the Alarm Notifier to fail when attempting to send alarm notifications.</p>
Use SMSC as primary send mechanism	<p>Select this checkbox if you want notifications to be sent via the SMSC. The Alarm Notifier will first attempt to send a notification via the SMSC. If this fails, it will then attempt to send the notification via an attached modem or handset. This method provides a backup send mechanism in the event of a LAN failure.</p>

In this field:	Do this:
Use SMSC Keep Alives	Select this checkbox if you want an Enquire Link request to be sent to the SMSC every thirty seconds to ensure that the connection to the SMSC does not time out during periods of inactivity. 💡 Try using this option if errors occur after periods of inactivity but the connection worked correctly initially. 📝 This setting is not required by all SMSCs.
Test SMSC Settings	Click this button to test that your SMSC configuration is set up correctly. The results of the test are displayed in the Server Test Response window.

This picture shows an example:

- 2 Click Apply to save your changes.
- 3 Click OK to minimise the Alarm Notifier dialog box.

6.3.2.4 About the Current Actions Window

The Current Actions window enables you to view information about:

- What actions the Alarm Notifier is currently performing
- Any errors that the Alarm Notifier has encountered

 You can display more detailed information in the Current Actions window by selecting the Verbose Logging checkbox on the Database Configuration tab. For more information, see Configuring Database Settings on page 287.

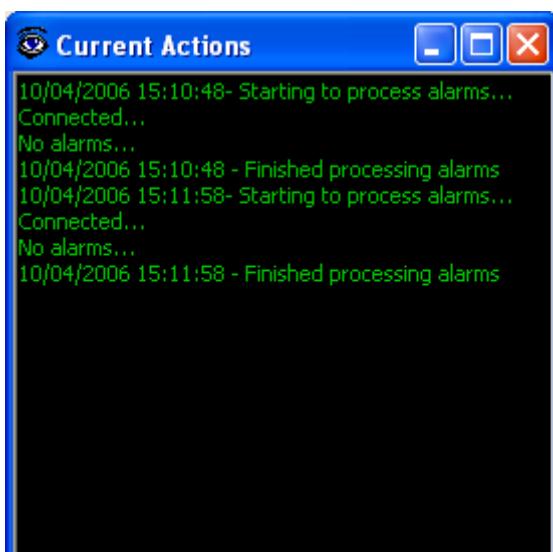
To open the Current Actions window:

Right-click the Alarm Notifier icon  in your system tray and, from the menu that appears, click Show Status Window.

- or -

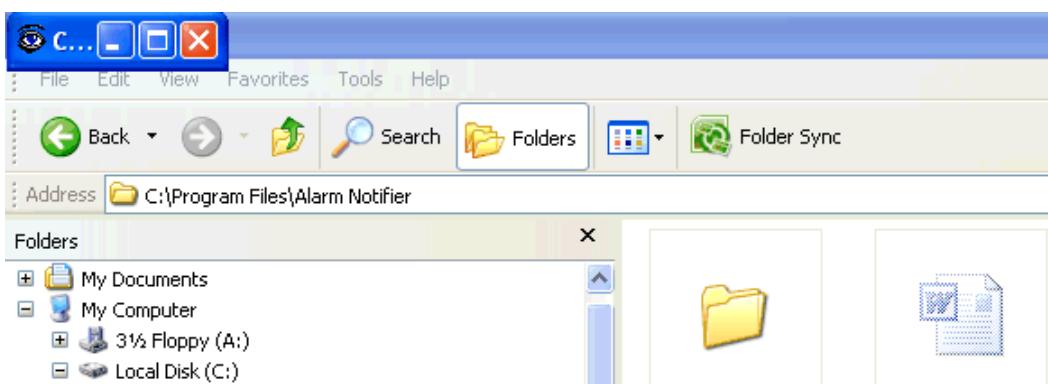
In the Alarm Notifier dialog box, click the Show Status Window button .

This picture shows an example of the Current Actions window:



Current Actions window

 When you open the Current Actions window for the first time, it appears minimised in the top left-hand corner of your screen:



Current Actions window

You should locate and resize the Current Actions window as you require, and it will then open with same location and dimensions in the future.

6.3.2.5 Troubleshooting the Alarm Notifier

The following table shows troubleshooting tips for the Alarm Notifier:

Symptom	Possible Causes	Solution
When trying to test email settings using the Alarm Notifier, the following message is received: "Authenticated message sent. SMTP session closed", However, the tested email address is not receiving the email.	If the notifier says the mail has been sent, then there can be a problem with the SMTP server or the client receiving the mail. Can be a problem with the 'From' email address Check if there is a 'space' in the email address you have provided in the 'Mail Sent From' data. If there is space it will not work Check if there is an '@' symbol in the 'Mail Sent From' data. It will not work without it.	You would have to trace the event through the SMTP server logs. Make sure that there is no 'space' in the 'Mail Sent From' data Make sure your from address include a @ symbol. The relay servers require an email address with the symbol and will not forward the mail without it. For example, make the from address optima_alarms@aircominternational.com or something similar.
Email sent by the notifier does not reach the recipient	The Exchange Server might block the emails for different reasons. If there is 3rd party anti-spam software installed on the Exchange server, it might scan the contents of every mail and delete the mail if it is recognized as a spam mail.	Talk to the IT department and make sure that the emails sent from Notifier are not blocked. Ensure that you get the anti-spam software to exclude AIRCOM OPTIMA emails from being blocked.
When running Alarms Notifier, an error message pops up 'NOTIFIED invalid identifier. No further processing will be done'	Database not upgraded properly/ Alarms table doesn't have all the columns used by the Alarms Notifier	Make sure that the Database is upgraded properly and that the Alarms table contains all the necessary columns for Alarms Notifier
User doesn't want a user login on any of their servers. They don't want to have an open session of Windows NT server	Not using the appropriate Login option.	Alarms Notifier provides different Authentication types like None, Pop, Login, Plain etc (Mail Configuration tab- Authentication type). If the user chooses the 'None' option they don't need to provide a username and password.
Only 'set' Alarms are notified. No notification made for clear alarms.	Option to send notification for Clear Alarms not selected when configuring the handler. The Version of Alarm Notifier used might not have this feature. Only from Alarm Notifier V3.2 the notification is made for Clear Alarms	Make sure that in the Alarm Handler definition the 'Apply Handler on Clear Alarms' option is checked. Make sure that the 'Do not process cleared alarms' checkbox on the Database Configuration tab in the Alarms Notifier is cleared. Install Alarms Notifier version 3.2.
Once the option "Use SMSC Keep Alives" is selected; the SMS notifier will disconnect another application developed by the customer that is also connecting to the SMSC server. Both applications are using same account to connect to the SMSC.	The reason that multiple programs cannot use the same account is because the Alarms Notifier keeps its session to the SMSC open permanently.	You should configure a dedicated account for AIRCOM OPTIMA.

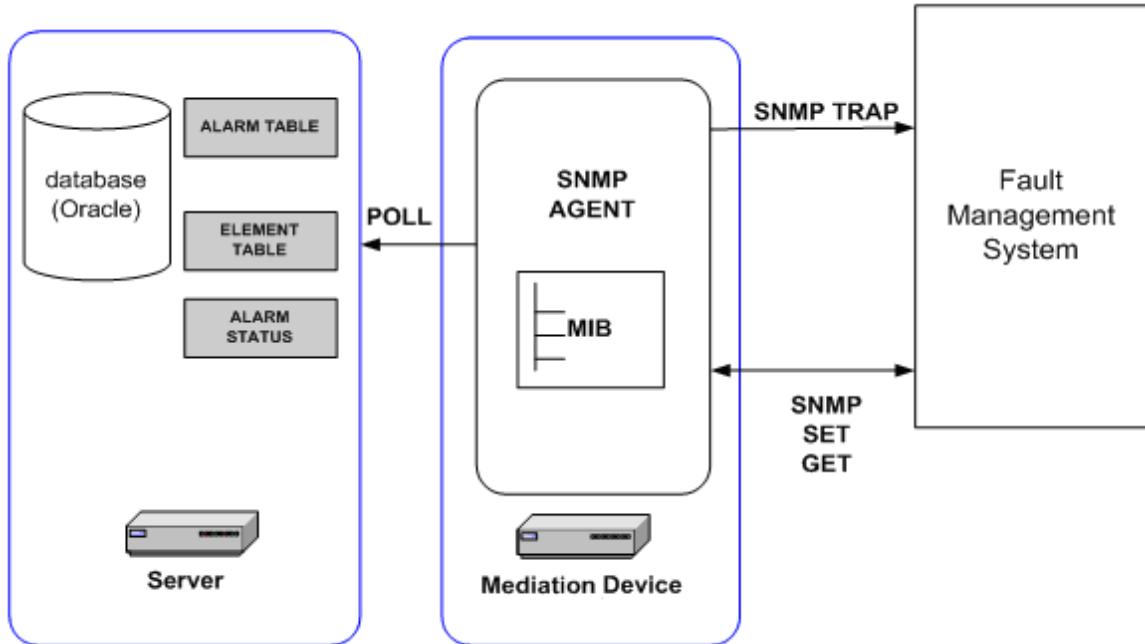
Symptom	Possible Causes	Solution
Delay in receiving SMS notification	<p>The Alarms and Log tables may have grown too large, which cause a delay in the processing of the alarms.</p> <p>In this case, the Notifier may:</p> <ul style="list-style-type: none"> • Send the SMS late. • Send the SMS on time, but with a delay in the SMSC before the notification is delivered 	<p>Implement some jobs to clean up the log and the alarms tables for older events.</p> <p>Investigation needs to be done by the operator to resolve the delays in the SMSC</p>
The error 'Send via SMSC failed: CIMD2 Error Code {11}' appears.	This is a standard status SMSC error, which means 'Teleservice not provisioned'.	<p>Check the Send From mobile phone number and clarify it is numeric.</p> <p> This can be alphabetic although you must check with your SMSC.</p>
The Alarms Notifier is sending the total backlog for alarms, not just the latest.	The Alarms Notifier queries all alarms where the NOTIFIED field in the ALARMS table is either NULL, 0 or 2, and then sends the notification accordingly.	If you want to stop this you will have to manually update the ALARMS table by setting the NOTIFIED field value to 1.

6.3.3 About the SNMP Agent

AIRCOM OPTIMA uses the SNMP Agent to provide an outgoing interface for alarms compliant with X733 through SNMP protocols. SNMP clients can request information from the SNMP Agent about alarms in the database. The SNMP Agent can also send SNMP traps to these SNMP clients.

6.3.3.1 The SNMP Interface

This diagram shows the functionality of the SNMP interface:



SNMP Interface Functionality

Fault management systems can integrate with AIRCOM OPTIMA's SNMP interface which provides SNMP trap forwarding to named IP addresses and an SNMP Agent for more granular interaction by the FM system.

The SNMP Interface supports the following functionality:

- The SNMP Agent has the ability to accept and respond to SNMP GET, GETNEXT, GETBULK, WALK, SET commands from the Fault Management System (FMS) based on the MIB.
- Generation of an alarm TRAP for both SET and CLEAR events in the alarm module. The generation of TRAPS can be set on an individual alarm definition. The TRAP format is based on the MIB. For more information about alarms, see the AIRCOM OPTIMA User Reference Guide.
- The ability to generate a heartbeat TRAP. The format of the heartbeat TRAP is configurable. Heartbeat TRAPS are sent at an interval defined by the heartbeat interval parameter in the SNMP Agent. This is writable in the MIB via an SNMP SET command and so can be set by the FMS. For more information about configuring heartbeat TRAPS, see Configuring the SNMP Agent on page 295.
- A coldstart trap is sent to the FMS when the system is first initialised to notify the FMS that the Agent is active.

- The ability to perform a FMS initiated re-synchronisation. The FMS can set a writable re-synchronisation flag in the MIB via an SNMP SET command. During this time no TRAP is sent but is stored until the re-synchronisation flag is reset.

6.3.3.2 Installing the SNMP Agent

Before you can use the SNMP Agent, install the following file to the backend binary directory:

- opx_ALM_GEN_820.exe (Windows)
- opx_ALM_GEN_820 (Unix)

6.3.3.3 Starting the SNMP Agent

To start the SNMP Agent, type the executable name and a configuration file name into the command prompt. If you are creating a new configuration file, this is when you choose the file name.

In Windows type:

```
opx_ALM_GEN_820.exe opx_ALM_GEN_820.ini
```

In Unix type:

```
opx_ALM_GEN_820 opx_ALM_GEN_820.ini
```



The SNMP Agent should be run continuously.

6.3.3.4 Configuring the SNMP Agent

The SNMP Agent is configured using a configuration (INI) file. Configuration changes are made by editing the parameters in the configuration (INI) file with a suitable text editor. The SNMP Agent configuration (INI) file is divided into seven sections.

The following table describes the parameters in the [DIR] section:

Parameter	Description
TempDir	The location of temporary files created while the SNMP Agent is running.
LogDir	The location of the log files.
PidFilePath	The location of the monitor files.
EXEName	The executable name.
PersistentPath	The location of persistent files.

The following table describes the parameters in the [MAIN] section:

Parameter	Description
LogGranularity	Defines the frequency of logging, the options are: 0 - Continuous 1 - Monthly 2 - Weekly 3 - Daily
LogLevel	Sets the level of information required in the log file. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical
LogOptions	0 - Do not generate a log file. 1 - Generate a log file to the specified directory.
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0). The default value is 0 ('OFF').
FolderFileLimit	The maximum number of output files that can be created in each output (sub) folder. The default value is 10,000. There is a limit of 100,000 on Windows and 500,000 on UNIX/Sun.  Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.
minimumFolderFileLimit	The minimum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be less than this, the application will not run. This is set as a read-only value of 100.
maximumFolderFileLimit	The maximum number of output files per folder that will be accepted. If the user sets the FolderFileLimit to be more than this, the application will not run. This is set as a read-only value of 100,000.
InterfaceID	The three-digit interface identifier (mandatory).
ProgramID	The three-digit program identifier (mandatory).
InstanceID	The three-character program instance identifier (mandatory).
Verbose	0 - Do not send output to the console. 1 - Send output to the console.

The following table describes the parameters in the [SNMP-AGENT] section:

Parameter	Description
Port	The port number the SNMP Agent listens for incoming requests.
ReadCommunity	The community string used in the GET, GETNEXT request.
WriteCommunity	The community string used in the SET request.
ResyncType	The resynchronisation type: 0 - Agent 1 - Manager.
DbPollInterval	The database polling interval in minutes.
HeartbeatTrapInterval	The time in minutes between sending the heartbeat trap.
EnterpriseOid	The Enterprise OID used in the MIB.
ExtEnterpriseOid	The Enterprise OID used when sending traps.
AlarmTableView	The database view to query when populating the Alarm table in the MIB. For more information, see Configuring Views on page 303.
ObjectTableView	The database view to query when populating the Object table in the MIB. For more information, see Configuring Views on page 303.
TrapView	The database view to query when sending alarm traps. For more information, see Configuring Views on page 303.
ResyncTable	The database view to query when sending alarm traps due to a resynchronisation. For more information, see Configuring Views on page 303.
WaitForRequestTimeoutSeconds	The time in seconds to wait for incoming requests.
SysName	The name of the SNMP Agent. The default setting for this parameter is OPTIMA SNMP Agent.
SysLocation	The location where the SNMP Agent is running, for example, a physical location or a machine name.
SendEndOfResyncTrap	0 - Do not send an end of resynchronisation trap. 1 - Send an end of resynchronisation trap.
TrapGuardPeriod	The delay time (in milliseconds) after each trap is sent, for example, TrapGuardPeriod=1000 means a 1 second delay after each trap is sent.

The following table describes the parameters in the [DATABASE] section:

Parameter	Description
Database	The database name.
UserName	The user name to connect to the database.
Password	The password required to connect to the database.

The following table describes the parameters in the [TRAP-LISTENER] section:

Parameter	Description
IPAddress	The IP address to send traps to.
Port	The port number used in sending traps.
Community	The community string to use when sending traps.
ResyncTraps	1 - The MANAGER at the specified IP address wants to be sent resync traps and is allowed to change the resyncFlag value using a SET message. 0 - The MANGER at the given IP address does not want to be sent resync traps and is not allowed to change the resyncFlag value using a SET message.

The following table describes the parameters in the [HEARTBEAT_TRAP] section:

Parameter	Description
NotificationID	The default value for this trap value is 99999.
PerceivedSeverity	The default value for this trap value is 4.
FirstOccurrence	This trap value is optional.
Occurrence	This trap value is optional.
ObjectId	This trap value is optional.
ProbableCauseID	The default value for this trap value is 0.
EventTypeID	The default value for this trap value is 2.
SpecificProblem	This trap value is optional.
ProposedRepairAction	This trap value is optional.
AdditionalText	The default value for this trap value is HEARTBEAT_TRAP.
TrendIndicator	This trap value is optional.

The following table describes the parameters in the [END_OF_RESYNC] section:

Parameter	Description
NotificationID	The default value for this trap value is 99998.
PerceivedSeverity	The default value for this trap value is 4.
FirstOccurrence	This trap value is optional.
Occurrence	This trap value is optional.
ObjectId	This trap value is optional.
ProbableCauseID	The default value for this trap value is 0.
EventTypeID	The default value for this trap value is 2.
SpecificProblem	This trap value is optional.
ProposedRepairAction	This trap value is optional.
AdditionalText	The default value for this trap value is END_OF_RESYNC.
TrendIndicator	This trap value is optional.

The following table describes the parameters in the [OPTIMA-SEVERITY-MAPPING] section:

Parameter	Description
Intermediate	The mapping from OPTIMA Severity to MIB perceivedSeverity value. The available options are: 0 - Indeterminate 1 - Critical 2 - Major 3 - Minor 4 - Warning 5 - Cleared
Warning	See above for parameter description.
Minor	See above for parameter description.
Clear	See above for parameter description.
Major	See above for parameter description.
Critical	See above for parameter description.
Information_only	See above for parameter description.
Admin_clear	See above for parameter description.

SNMP Agent Modes

This section describes the SNMP agent behaviour for the following ResyncType modes:

- Agent
- Manager

When ResyncType = Agent :

The SNMP agent reads the INI file, creates the SNMP session, connects to the database, creates the log file, creates the PRID file, and builds the MIB in memory. The agent then queries the AlarmTableView database view and populates the alarmsTable MIB table in the agent memory based on the result set returned from the database.

The agent sets the following MIB scalars in memory:

- resyncFlag to 0
- trapSequenceNumber to 0 or its last value when the agent was cleanly shut down
- pollHeartBeat to HeartbeatTrapInterval or its last value when agent was cleanly shut down

The agent then enters into a main loop and performs the following steps:

- 1 The agent listens on Port for a PDU request for a period of WaitForRequestTimeoutSeconds
- 2 The agent responds to a PDU GET message by searching for the value of the OID in the MIB message stored in memory. The following are the options:
 - The agent responds to a PDU GETNEXT message by returning the next OID after OID received in the message
 - The agent will respond to a PDU SET message by setting the OID value from the message in the MIB memory
 - No database connections are made when responding to these requests

Once the agent finishes responding to a request or waits for a request to be over, it performs the following actions:

- 1 The agent checks to see if a Heartbeat trap should be sent by comparing the pollHeartBeat value and the last time a Heartbeat trap was sent. When it is ready to send the heartbeat trap, the agent builds the heartbeat trap PDU using the values listed in the HEARTBEAT_TRAP section of the INI file. For more information on the Heartbeat_Trap section, see Configuring the SNMP Agent on page 295. It then sleeps for period TrapGuardPeriod milliseconds if the trap was sent without error and then reset the last heartbeat time.
- 2 The agent checks to see if the resyncFlag value is 1. If yes, it performs the following actions:
 - Queries the ResyncActiveAlarms database view
 - For each row in the result set, the agent builds the trap PDU for alarm reading the 11 column values in the row, sends the alarm trap, sleeps for TrapGuardPeriod milliseconds period if the trap was sent without error, and then insert a row into the SNMP_UPDATE database table
 - Once it finishes processing the result set, the agent calls SNMP_PKG.SET_FWD_IN_ALL_ALARMS_TBL database procedure which updates the ALARM table fields related to the SNMP AGENT, resets the resyncFlag to 0, and if SendEndOfResyncTrap is set, the agent sends a EndOfResyncTrap
- 3 The agent then checks the database polling time and sends any new alarms traps. The agent compares the last database polling time to the DbPollInterval:
 - When database polling is due, the agent queries the database view TrapView
 - For each row in the result set, the agent builds the trap PDU for alarm reading the 11 column values in the row, sends the alarm trap, sleeps for TrapGuardPeriod milliseconds period if the trap was sent without error, and inserts a row into database table SNMP_UPDATE

- 4 Once it finishes processing the result set, the agent calls the SNMP_PKG.SET_FWD_IN_ALLALARMS_TBL database procedure which updates the ALARM table fields related to the SNMP AGENT. If the TrapView database view is not empty:
 - Clears the current MIB tables alarmsTable and objectsTable
 - Queries the AlarmTableView database view and populates the alarmsTable MIB table in the agent memory
 - Queries the ObjectTableView database view and populates the objectsTable MIB table in the agent memory
 - Resets the last db polling time

When ResyncType = Manager :

The SNMP agent reads the INI file, creates the SNMP session, connects to the database, creates the log file, creates the PRID file and then builds the MIB in memory. The agent then queries the AlarmTableView database view and populates the alarmsTable MIB table in the agent memory based on the result set returned from the database.

The agent queries the ObjectTableView database view and populates the objectsTable MIB table in the agent memory based on the result set that is returned from the database.

The agent sets the following MIB scalars in memory:

- resyncFlag to 0,
- trapSequenceNumber to 0 or its last value when the agent was cleanly shut down
- pollHeartBeat to HeartbeatTrapInterval or its last value when agent was cleanly shut down

The agent then enters into a main loop and performs the following steps:

- 1 The agent listens on Port for a PDU request for a period of WaitForRequestTimeoutSeconds
- 2 The agent responds to a PDU GET message by searching for the value for the OID in the MIB message stored in memory. The following are the options:
 - The agent responds to a PDU GETNEXT message by returning the next OID after OID received in the message
 - The agent responds to a PDU SET message by setting the OID value from the message in the MIB memory
 - No database connections are made when responding to these requests

Once the agent is finished responding to a request or waits for a request to be over, it performs the following actions:

- 1 The agent checks to see if a Heartbeat trap should be sent by comparing the pollHeartBeat value and the last time a Heartbeat trap was sent
- 2 When it is time to send a heart beat:
 - When resyncFlag = 1, no heartbeat trap is sent
 - When resyncFlag = 0, a heartbeat trap is sent
- 3 The Agent builds the heartbeat trap PDU using the values listed under the HEARTBEAT_TRAP section of the INI file. For more information on the Heartbeat_Trap section, see Configuring the SNMP Agent on page 295. It then sleeps for a period of TrapGuardPeriod milliseconds if the trap was sent without error and then reset the last heartbeat time.
- 4 The agent then checks the database polling time and sends any new alarms traps. The agent compares the last database polling time to the DbPollInterval:
 - When database polling is due, the agent sends traps if resyncFlag value = 0
 - The agent queries the TrapView database view
 - For each row in the result set, the agent builds the trap PDU for alarm reading the 11 column values in the row, sends the alarm trap, sleeps for period TrapGuardPeriod milliseconds if the trap was sent without error, and inserts a row into database table SNMP_UPDATE
- 5 Once it finishes processing the result set, the agent calls the SNMP_PKG.SET_FWD_IN_ALL_ALARMS_TBL database procedure which updates the ALARM table fields related to the SNMP AGENT. If the TrapView database view was not empty and traps were sent, the agent:
 - Clears the current alarmsTable and objectsTable MIB tables
 - Queries the AlarmTableView database view and populates the alarmsTable MIB table in the agent memory
 - Queries the ObjectTableView database view and populates the objectsTable MIB table in the agent memory
 - Resets the last db polling time

Configuring Views

In the [SNMP-AGENT] section of the configuration (INI) file, there are some parameters that query views in the database. You can configure these views to control the behaviour of the SNMP Agent.

The following table describes how to configure the views:

This view	Is used for	Uses these columns	And must have this header
Alarm Table	Active events, that is, SET events that have no corresponding CLEAR event.	X735 alarm columns	CREATE OR REPLACE FORCE VIEW AIRCOM.SNMP_ALARM_MIB_<ALARM TYPE> (NOTIFICATIONID, ALARM_DATETIME, PERCIEVEDSEVERITY, FIRSTOCCURENCE, OCCURENCE, DEFINITION_ID, ELEMENT_ID, MANAGEDOBJECT, IDEVENTTYPE, IDPROBABLECAUSE, SPECIFICPROBLEM, PROPOSEDREPAIRACTION, ADDITIONALTEXT, TRENDINDICATOR)
Object Table	Objects for which alarms are valid.	Object columns	CREATE OR REPLACE FORCE VIEW AIRCOM.SNMP_OBJECTS_<ALARM TYPE> (DEFINITION_ID, ELEMENT_ID, ELEMENT_NAME)
Trap	Unforwarded events, that is, events that have not been forwarded by the SNMP Agent.	X735 alarm columns	CREATE OR REPLACE FORCE VIEW AIRCOM.SNMP_TRAP_MIB_<ALARM TYPE> (NOTIFICATIONID, ALARM_DATETIME, PERCIEVEDSEVERITY, FIRSTOCCURENCE, OCCURENCE, DEFINITION_ID, ELEMENT_ID, MANAGEDOBJECT, IDEVENTTYPE, IDPROBABLECAUSE, SPECIFICPROBLEM, PROPOSEDREPAIRACTION, ADDITIONALTEXT, TRENDINDICATOR)

There are now 3 different alarm types, and this must be specified at the end of the view name, as follows:

- For performance alarms, use PERFORMANCE
- For system alarms, use SYSTEM
- For TCAs, use TCA

For example, the Alarm Table view for a system alarm is AIRCOM.SNMP_ALARM_MIB_SYSTEM, and the Trap view for a TCA is AIRCOM.SNMP_TRAP_MIB_TCA.

6.3.3.5 Maintenance

In usual operation, the SNMP Agent should not need any special maintenance. However, AIRCOM International recommends the following basic maintenance checks are carried out for the SNMP Poller:

Check The	When	Why
Log file for error messages.	Weekly	In particular any Warning, Minor, Major and Critical messages should be investigated.

Stopping the SNMP Agent

The SNMP Agent is run continuously. You can stop the SNMP Agent by pressing CRTL-C or by closing the console window.

Checking the Version of the SNMP Agent

If you need to contact AIRCOM International support regarding any problems with the SNMP Agent, you must provide the version details.

You can either obtain the version details from the log file or you can print the information by typing the following command at the command prompt:

In Windows:

```
opx_ALM_GEN_820.exe -v
```

In Unix:

```
opx_ALM_GEN_820 -v
```

For more information about versioning, see About Versioning on page 22.

Checking the Application is Running

To check that the application is running, check that there is a PRID file in the application's PRID folder. For more information about PRIDs, see About Program IDs on page 17.

6.3.3.6 Troubleshooting

The following table shows troubleshooting tips for the SNMP Agent:

Problem	Cause	Solution
Cannot save configuration (INI) file.	User has insufficient privileges on configuration (INI) file or directory. The file is read only or is being used by another application.	Enable permissions. Make file writable. Close the Parser to release the configuration (INI) file.
Application exits immediately.	Another instance is running. Invalid or corrupt (INI) file.	Use Process Monitor to check instances running.
SNMP session not created	Network problem	Report to system administrator.

6.3.3.7 Example SNMP Agent Configuration (INI) File

```
[DIR]
TempDir=c:\SNMPAgent\Temp
LogDir=c:\SNMPAgent\Log
PidFilePath=c:\SNMPAgent
EXEName=opx_ALM_GEN_820
PersistentPath=c:\SNMPAgent\

[MAIN]
LogGranularity=0
LogLevel=1
LogOptions=1
TrapsOnly=0
FileFolderLimit=0
InterfaceID=001
ProgramID=002
InstanceID=003
Verbose=0

[SNMP-AGENT]
TrapsOnly=0
Port=161
ReadCommunity=billy
WriteCommunity=billy
ResyncTable=SNMP_ALARM_MIB_TCA
ResyncType=MANAGER
DbPollInterval=1
HeartbeatTrapInterval=1
EnterpriseOid=20000
ExtEnterpriseOid=20000.3
AlarmTableView=SNMP_ALARM_MIB_TCA
ObjectTableView=SNMP_OBJECTS_TCA
TrapView=SNMP_TRAP_MIB_TCA
WaitForRequestTimeoutSeconds=4

[DATABASE]
Database=OPT502
UserName=aircom
Password=l\mlofhY

[TRAP-LISTENERS]
IPAddress=127.0.0.1
Port=162
Community=public

[HEARTBEAT_TRAP]
NotificationID=99999
PerceivedSeverity=4
ProbableCauseID=0
EventTypeID=2
AdditionalText=HEARTBEAT_TRAP
```

```
[END_OF_RESYNC]
NotificationID=99999
PerceivedSeverity=4
ProbableCauseID=0
EventTypeID=2
AdditionalText=END_OF_RESYNC

[OPTIMA-SEVERITY-MAPPING]
Intermediate=1
Warning=4
Minor=3
Clear=5
Major=2
Critical=1
Information_only=0
Admin_Clear=5
```

6.4 Session Summary Checklist

This checklist has been provided as a self-assessment of the objectives stated at the beginning of the session.

Please tick all objectives covered in this session.

- Report Scheduler
- Alarms module
- Administration reports



Additional Notes:

7 Application Administration

7.1 Objectives of this Session

During this session you will learn about:

- User administration
- Alarms
- Application database configuration
- Data dictionary
- Holiday entry
- Sandbox administration
- Data retention
- General options

7.2 User Administration

In AIRCOM OPTIMA, there are two ways to configure security. These are:

- At user level by assigning roles, for example, you can choose to give a user read-only access by making them an OPTIMA_User
- At object level using groups, for example, you can choose to allow a group of users access to certain reports in the Schedule Explorer

You must:

- Create groups before you can restrict access to specific objects
 - Assign users to each group, they will inherit the permissions of the group
-  OPTIMA_Administrators have write-access to all features and objects.



Important :

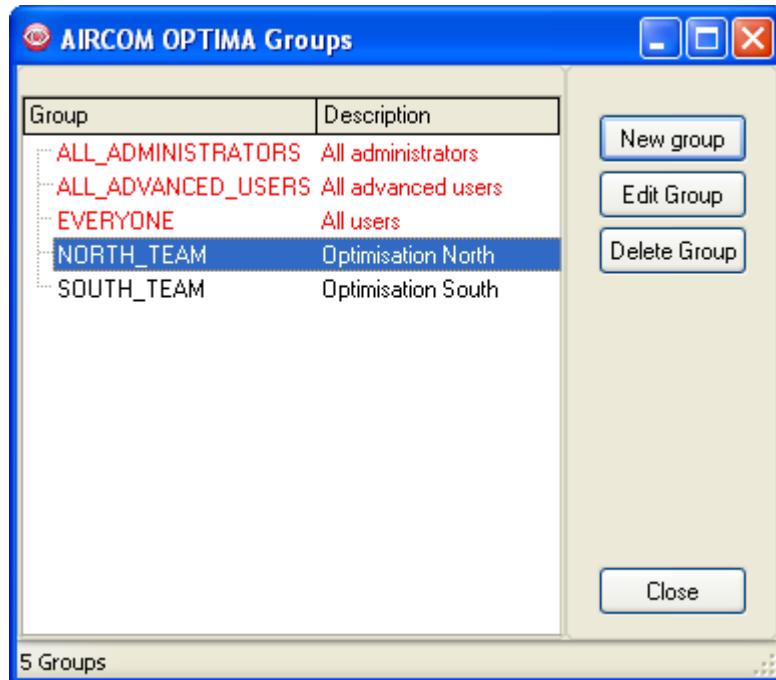
- Only OPTIMA_Administrators and OPTIMA_User_Administrators can create, edit and delete groups and users
- User Administrators can only create, edit and delete OPTIMA_Advanced_Users and OPTIMA_Users

[Click here](#) for an example of using groups and users to configure security.

7.2.1 Example of Using Groups and Users to Configure Security

First, you create these **groups**:

- North_Team
- South_Team

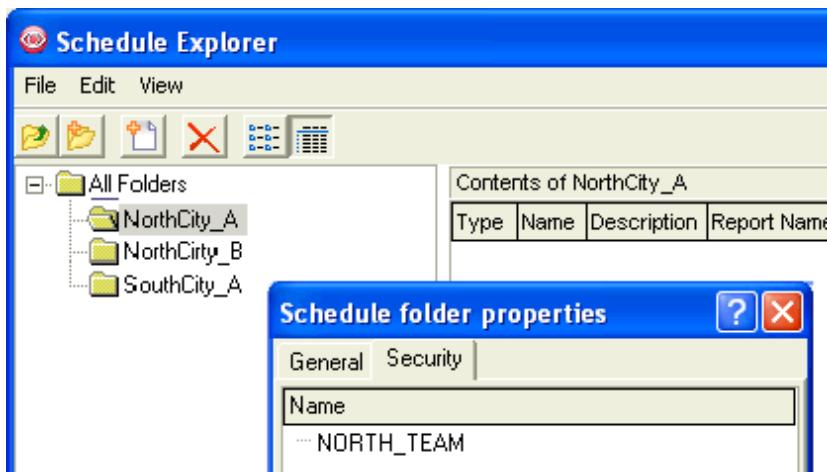


AIRCOM OPTIMA Groups dialog box

Then you create these **users**:

User	Member Of	Role
John	North_Team Everyone	OPTIMA_Advanced_User
Pierre	North_Team Everyone	OPTIMA_User
Emma	South_Team Everyone	OPTIMA_Advanced_User

You can then use these groups to limit access to the folders in the Schedule Explorer, as shown here:



The results are:

- John can view and run schedules in the NorthCity_A folder and, as he is an OPTIMA_Advanced_User, he can also create schedules in this folder. John cannot view or create schedules in the SouthCity_A folder.
- Pierre can view and run schedules in the NorthCity_A folder, but as he is a OPTIMA_User, he cannot create schedules. Pierre cannot view schedules in the SouthCity_A folder.
- Emma can view and run schedules in the SouthCity_A folder and, as she is an OPTIMA_Advanced_User, she can also create schedules in this folder. Emma cannot view or create schedules in the NorthCity_A folder.

7.2.2 Creating Groups

In AIRCOM OPTIMA, you can create groups and then use these groups to give access to objects. The group Everyone is automatically created and includes all users. You cannot edit the Everyone group.

To create a group:

- 1 From the Administrator menu, point to Security and click Groups.
- 2 In the dialog box that appears, click New Group.
- 3 In the New AIRCOM OPTIMA Group dialog box, type a name and description for the group.



You can only use letters, numbers and the symbols \$ _ and # in the group name. You cannot use spaces and you must use a letter or number for the first and last characters.

- 4 If you have already created the users that you want to become members of this group, click Add User. If you have not created any users, see Creating Users on page 315.
- 5 Select the users you want to add to this group and use the > button to move them to the Destination List.
 A small icon of a lit lightbulb.
- 6 When you have finished adding users to the Destination List, click OK.

The users who are members of this group are listed in the Members pane of the New AIRCOM OPTIMA Group dialog box.

- 7 Click Close to save the new group.

You can now assign this group to the different objects, enabling the members of this group to use those objects. For more information, see Using Groups to Assign Access on page 314.

7.2.3 Editing and Deleting Groups

To add users to and remove users from a group:

- 1 From the Administrator menu, point to Security and click Groups.
The AIRCOM OPTIMA Groups dialog box appears.
- 2 Double-click the required group.
- or -
Select the group and click the Edit Group button.
- 3 To add a user:
 - Click Add Users.
 - In the Select Users dialog box, select the users you want to add to this group and use the > button to move them to the Destination List.
 Use the Shift and Ctrl keys to select more than one user at a time and use the >> button to add all the users to the Destination List.
 - When you have finished adding users to the Destination List, click OK.
- 4 To remove a user:
 - Select the user and click the Remove User button.
- 5 Click Close to save the changes.

To delete a group:

- 1 From the Administrator menu, point to Security and click Groups.
The AIRCOM OPTIMA Groups dialog box displays.
- 2 Select the group and click the Delete Group button.
- 3 Click Yes to confirm.
- 4 If no objects are owned by the group, the group is deleted. However, if there are objects still owned by the group, then the Change AIRCOM OPTIMA Group dialog box appears.
- 5 To select a new owning group for the objects:
 - Select a group from the Group list and click the right arrow button.
-or -
 - Double-click a group in the Group list.
 If you click Cancel, the group will not be deleted.
- 6 Click OK.
- 7 Click Close.

7.2.4 Using Groups to Assign Access

You can use groups to restrict access to objects and information held in AIRCOM OPTIMA. Groups can be assigned to objects in the following windows:

- Module Explorer
- Combination Explorer
- Report Explorer
- Schedule Explorer

For example, in the Schedule Explorer, you may have a folder that contains schedules that only one group of users will work with. This may be a regional group, for example, such as the South Team. You can make sure that only the South Team can access those schedules by assigning the South Team group to the folder.

You must create groups before you can assign them. For more information, see [Creating Groups on page 312](#).

To assign a group to an object:

- 1 Open the appropriate explorer window from the menu or toolbar.
- 2 Browse to the folder to which you wish to assign access and right-click the folder name. From the menu that appears, click Properties.
- 3 In the dialog box that appears, click the Security tab and then click Add. A list of available groups appears.
- 4 Select the group(s) you want to have access to this folder and use the > button to move them to the Destination List.

 Use the Shift and Ctrl keys to select more than one group at a time and use the >> button to add all the groups to the Destination List.

- 5 Click OK.
- 6 Select how you want the group permission to be applied:

Select	To Assign Access To
Do not cascade permissions	The selected folder level and its objects only. Users of the group will not be able to access any subfolders unless they are a member of a group with access to those folders.
Cascade permission changes to child folders	The selected folder and its subfolders. This option will not overwrite any existing groups that have already been assigned to the folder or subfolders.
Cascade all permission to child folders	The selected folder and its subfolders. This option overwrites existing groups that have already been assigned to the folder or subfolders.

- 7 Click OK to apply the group permissions to the folder.

7.2.5 Creating Users

To create a user:

- 1 From the Administrator menu, point to Security and click Users.
- 2 In the dialog box that appears, click New User.
- 3 On the General tab of the New AIRCOM OPTIMA User dialog box, add the following details:

In This Box	Do This
Username	Type a name for the user, this is the name they will use to log in.  You can only use letters, numbers and the symbols \$ _ and # in the username. You cannot use spaces and you must use a letter or number for the first and last characters.
Full Name	Type the full name of the user.
Description	Type a description of the user's account if necessary. This field is not mandatory.
Department	Type the name of the user's department if necessary. This field is not mandatory.
Region	Type the name of the user's region - this could be actual location or the part of the country they work deals with, for example, a cell planner covering the North. This field is not mandatory.
Password, Verify Password	Type the password for the user, this is the password they will use to log in.
User Access	Select a role for the user. For more information about roles, see About AIRCOM OPTIMA User Roles on page 316.  User Administrators can only create OPTIMA_Advanced_Users and OPTIMA_Users.

- 4 To assign groups to this user, click the Group Membership tab.

The user is automatically a member of the group Everyone and this group is listed in the Group(s) pane.

- 5 On the Group Membership tab, click Add.
- 6 In the dialog box that appears, select the groups you want this user to be a member of and use the > button to move them to the Destination List.

 Use the Shift and Ctrl keys to select more than one group at a time and use the >> button to add all the groups to the Destination List.

- 7 When you have finished adding groups to the Destination List, click OK.

The group(s) that this user is a member of are listed in the Group(s) pane of the New AIRCOM OPTIMA User dialog box.

- 8 If you want to assign contact information to the user:
 - Click Assign Contact Info.
 - Select the contact name and click Assign Contact.
 - In the dialog box that appears, click OK
 - Click Close to return to the AIRCOM OPTIMA Users dialog box.
- For more information about contacts, see the AIRCOM OPTIMA User Reference Guide.

- Click Close to add the new user.

7.2.6 About AIRCOM OPTIMA User Roles

There are a number of default roles for users in AIRCOM OPTIMA. They are created during installation and determine the level of system access for a user. You can further define a user's access by assigning groups. For more information about groups, see the AIRCOM OPTIMA User Reference Guide.

The default roles are:

Object/Role	Administrator	User Administrator	Alarm Administrator	Advanced User	User
Administrator Menu	Full access	Security > Users : View Add Edit Delete (Advanced Users and Users only) Security > Groups : View Add Edit Delete	No access	No access	No access
Alarms	Performance Alarms and System Alarms : View Add Edit Delete	No access	Performance Alarms : View Add Edit Delete	Performance Alarms : View	Performance Alarms : View
Alarm Handlers	Performance Alarms, System Alarms and TCAs : View Add Edit Delete	No access	Performance Alarms : View Add Edit Delete	No access	No access

Object/Role	Administrator	User Administrator	Alarm Administrator	Advanced User	User
Combination Windows	View Add Edit Delete Restrict editing Restrict access Import Export Add to Favourites	No access	View Add Edit* Delete* Restrict editing** Import Export Add to Favourites * If granted object access ** If granted group object ownership	View Add Edit* Delete* Restrict editing** Import Export Add to Favourites * If granted object access ** If granted group object ownership	View* Add Edit* Delete* Restrict editing** Import Export Add to Favourites * If granted object access ** If granted group object ownership
Combination Folders	View Add Edit Delete Restrict editing and access Import Export	No access	View Add Edit* Delete* Import* Export * If granted object access	View Add Edit* Delete* Import* Export * If granted object access	View* Add Edit* Delete* Import* Export * If granted object access
Contacts	View Add Edit Delete	No access	View (for scheduling purposes)	View (for scheduling purposes)	No access
Counters	View Add Edit Delete	No access	View	View	View
Categories (Table Properties dialog box)	View Add Edit Delete	No access	No access	No access	No access
Element Hierarchies	View all types (personal, group, system) Add Edit Delete	No access	View personal, system and group* Add personal and group* Edit personal and group* Delete personal * If granted group object ownership	View personal, system and group* Add personal and group* Edit personal and group* Delete personal * If granted group object ownership	View system and group (if granted group object ownership)

Object/Role	Administrator	User Administrator	Alarm Administrator	Advanced User	User
Filters	View all types (personal, group, system) Add all types Edit all types Delete all types Restrict access	No access	View personal, system and group* Add static and dynamic filters Add personal, system and group* Edit personal and group* Delete personal * If granted group object ownership	View personal, system and group* Add static and dynamic filters Add personal, system and group* Edit personal and group* Delete personal * If granted group object ownership	View personal, system and group (if granted group object ownership) Add static personal filters Edit static personal filters Delete static personal filters
KPIs	View all types (personal, group, admin) Add all types Edit all types Delete all types Import Export Restrict access Create KPI views	No access	View personal, admin and group* Add personal and group Edit personal and group* Delete personal Import as public (EVERYONE group) and personal Export * If granted group object ownership	View personal, admin and group* Add personal and group Edit personal and group* Delete personal Import as public (EVERYONE group) and personal Export * If granted group object ownership	View personal, admin and group (if granted group object ownership) Add personal Edit personal Delete personal Import as personal Export
Global KPIs	View Add Edit Delete	No access	No access	No access	No access
Modules	View Add Edit Delete Restrict editing Import Export Restrict access	No access	View Add Edit Delete Restrict editing (if granted group object ownership) Import Export	View Add Edit Delete Restrict editing (if granted group object ownership) Import Export	View

Object/Role	Administrator	User Administrator	Alarm Administrator	Advanced User	User
Module Folders	View Add Edit Delete Restrict access Import Export	No access	View Add* Edit* Delete* Rename Import ** Export <small>* If granted access to the parent folder ** If granted access to the destination folder</small>	View Add* Edit* Delete* Rename Import ** Export <small>* If granted access to the parent folder ** If granted access to the destination folder</small>	View
Reports	View Add Edit Delete Restrict access and editing Import Export report definition and reports in any format Add to Favourites Restrict access Schedule	No access	View Add Edit Delete Restrict editing Import Export report definition and reports in any format Add to Favourites Schedule	View Add Edit Delete Restrict editing Import Export report definition and reports in any format Add to Favourites Schedule	View Add to Favourites Export reports in current format
Report Folders	View Add Edit Delete Import Export Restrict access	No access	View* Add* Edit* Delete* Import* Export <small>* If granted access to the parent folder</small>	View* Add* Edit* Delete* Import* Export <small>* If granted access to the parent folder</small>	View

Object/Role	Administrator	User Administrator	Alarm Administrator	Advanced User	User
Sandbox Views	View all types Add all types Edit all types Delete all types Create index Delete index (that the user has created) Create sandbox views (if the user has a quota)	No access	View (if granted object access) Add personal and group Edit personal and group* Delete personal and group* Create index Delete index* Create sandbox views (if the user has a quota) <small>* That the user has created</small>	View (if granted object access) Add personal and group Edit personal and group* Delete personal and group* Create index Delete index* Create sandbox views (if the user has a quota) <small>* That the user has created</small>	View (if granted object access)
Schedules	View Add Edit Delete Delete history Restrict access and editing	No access	View Add Edit Delete Delete history Restrict editing	View Add Edit Delete Delete history Restrict editing	View View history
Schedule Folders	View Add Edit Delete Import Export Restrict access	No access	View* Add* Edit* Delete* <small>* if granted access to the parent folder</small>	View* Add* Edit* Delete* <small>* if granted access to the parent folder</small>	View
User Views	View all types (personal, group, system) Add all types Edit all types Delete all types Add to the Data Model	No access	View (if granted object access) Add personal and group Edit personal and own group Delete personal and own group	View (if granted object access) Add personal and group Edit personal and own group Delete personal and own group	View (if granted object access) Add personal Edit personal Delete personal

 Editing includes:

- Renaming objects
- Adding objects to folders, if the folders exist
- Copying and pasting objects, where the user has access to the folder to which they are pasting

7.2.7 Editing and Deleting Users

To edit user details and permissions:

- 1 From the Administrator menu, point to Security and click Users.

The AIRCOM OPTIMA Users dialog box appears.

- 2 Double-click the user that you want to edit.

- or -

Select the user and click Edit User.



You can change the password or the user group details. If you want to change the user name, you will have to recreate the user.

To delete a user:



If you delete a user, all of the information and objects owned by the user will be deleted (for example, any materialized views that they have created).

- 1 From the Administrator menu, point to Security and click Users.

The AIRCOM OPTIMA Users dialog box appears.

- 2 Select the user and click Delete User.

- 3 Click Yes to confirm the deletion.

The user is deleted.



User Administrators can only edit and delete OPTIMA_Advanced_Users and OPTIMA_Users.

7.2.8 Changing Passwords

When a user logs into AIRCOM OPTIMA, they can choose to change their password. For more information, see the AIRCOM OPTIMA User Reference Guide.

If a user forgets their password, and therefore cannot access AIRCOM OPTIMA, you can assign a new password to that user.

To do this:

- 1 From the Administrator menu, point to Security and click Users.

The AIRCOM OPTIMA Users dialog box appears.

- 2 Select the user and click Edit User.

- 3 Type and then verify the password.

- 4 Click OK to save the changes.

7.3 Administering Alarms

In AIRCOM OPTIMA, there are a number of types of alarm:

Alarm Type	Description
Performance	<p>Performance alarms enable you to set network counter thresholds or key performance indicators (KPIs) and then receive alerts whenever network conditions are not met. Network data is processed, at user defined intervals, by AIRCOM OPTIMA. This data is stored in database tables in the form of counters. Ripple counts are used to define the threshold conditions for setting or clearing alarms.</p> <p>The information from these alarms can be:</p> <ul style="list-style-type: none">• Queries in modules and reports• Viewed in the Alarms Explorer• Passed on to a fault management system
System	System alarms are alarms raised on AIRCOM OPTIMA events, not performance data events.
Threshold Crossing Alert (TCA)	<p>TCA are loader-specific alarms, which are raised as data is loaded into the AIRCOM OPTIMA database using the Loader. They indicate a discrepancy between the expected values according to the defined thresholds and the data loaded into the database after any modification during the loading process.</p> <p>A potential standard use may be to report on NULL values being inserted at load for faster reporting. This needs evaluation against Data Quality Nullness reports.</p>

As well as alarms, AIRCOM OPTIMA also enables you to create alarm handlers, which define how an alarm is 'handled'. Alarm handlers specify:

- Which contacts are notified when an alarm is raised
- How the alarm is sent, either by email, SMS (text message) or both

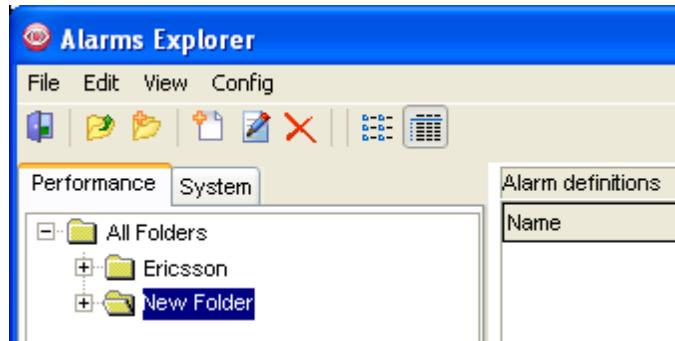


Important :

- OPTIMA_Administrators can configure and view performance and system alarms, and TCA handlers
- OPTIMA_Alarm_Administrators can only configure and view performance alarms
- OPTIMA_Advanced_Users and OPTIMA_Users can only view performance alarms

This chapter will describe the configuration of performance and system alarms; for more information about configuring TCAs, see the AIRCOM OPTIMA Operations and Maintenance Guide.

In the Alarms Explorer, the two types of alarm configured in the Explorer - Performance and System - are shown on separate tabs:



Performance and System tabs in the Alarms Explorer

In the Alarms Handler Explorer, all types of alarm handler are shown on separate tabs:



Performance, System and TCA tabs in the Alarm Handler Explorer

7.3.1 About Alarm Settings

Before you can define and use an alarm, you must configure a number of components that will make up the alarm definition:

- Vendors
- Technologies
- Element types (performance alarms only)
- Problem text (not mandatory - you can define your own problem text when defining the alarm, but configuring it here beforehand can save time)
- Maintenance parameters

You define these settings from menus in the Alarms Explorer. To open the Alarms Explorer:

From the Alarms menu, click Alarms.

Once defined, these settings can be added to an alarm on the Settings tab of the Alarm Definition dialog box. The settings provide an easy way to sort information in the Alarm Log Viewer.

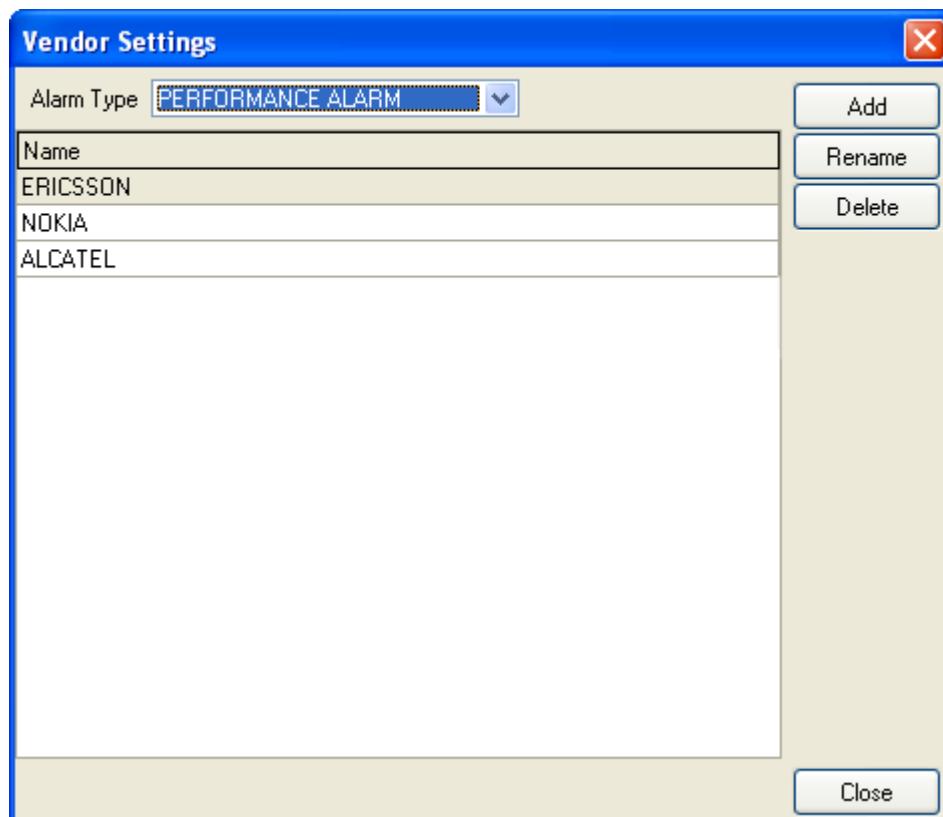
7.3.1.1 Configuring Vendors

In the Vendor Settings dialog box you can create a list of vendors that you can then choose from when you are creating an alarm.

To add a vendor:

- 1 In the Alarms Explorer, from the Config menu, click Vendor.

The Vendor Settings dialog box appears:



- 2 From the Alarm Type drop-down list, select the alarm type for which you want to define vendors.
- 3 Click Add.
- 4 In the Add Vendor dialog box, type the name of the vendor and click OK.

To edit a vendor name:

- 1 In the Alarms Explorer, from the Config menu, click Vendor.
- 2 Select the vendor that you want to edit and click Rename.
- or -
Double-click the vendor name.
- 3 Type in the new name for the vendor.

To delete a vendor:

- 1 In the Alarms Explorer, from the Config menu, click Vendor.
- 2 Select the required vendor and click Delete.
- 3 Click Yes to confirm.

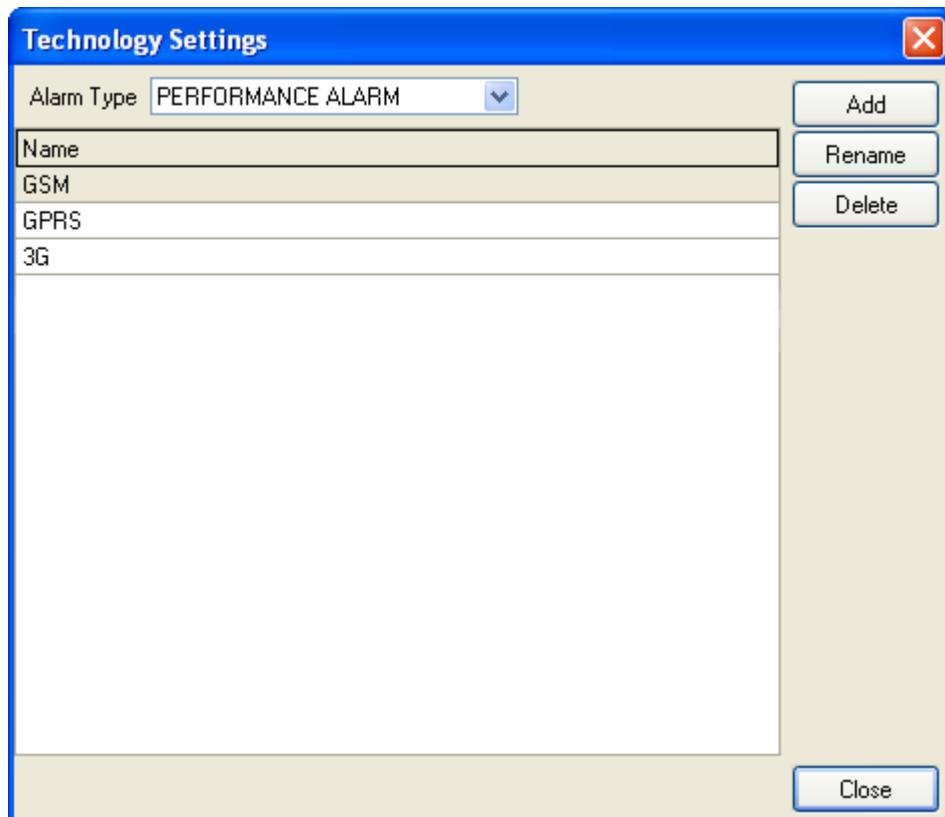
7.3.1.2 Configuring Technologies

In the Technology Settings dialog box you can create a list of technologies that you can then choose from when you are creating an alarm.

To add a technology:

- 1 In the Alarms Explorer, from the Config menu, click Technology.

The Technology Settings dialog box appears:



- 2 From the Alarm Type drop-down list, select the alarm type for which you want to define the technology.
- 3 Click Add.
- 4 In the Add Technology dialog box, type the name of the technology and click OK.

To edit a technology name:

- 1 In the Alarms Explorer, from the Config menu, click Technology.
- 2 Select the technology that you want to edit and click Rename
 - or -
 - Double-click the technology name.
- 3 Type in the new name for the technology.

To delete a technology:

- 1 In the Alarms Explorer, from the Config menu, click Technology.
- 2 Select the required technology and click Delete.
- 3 Click Yes to confirm.

7.3.1.3 Configuring Element Types

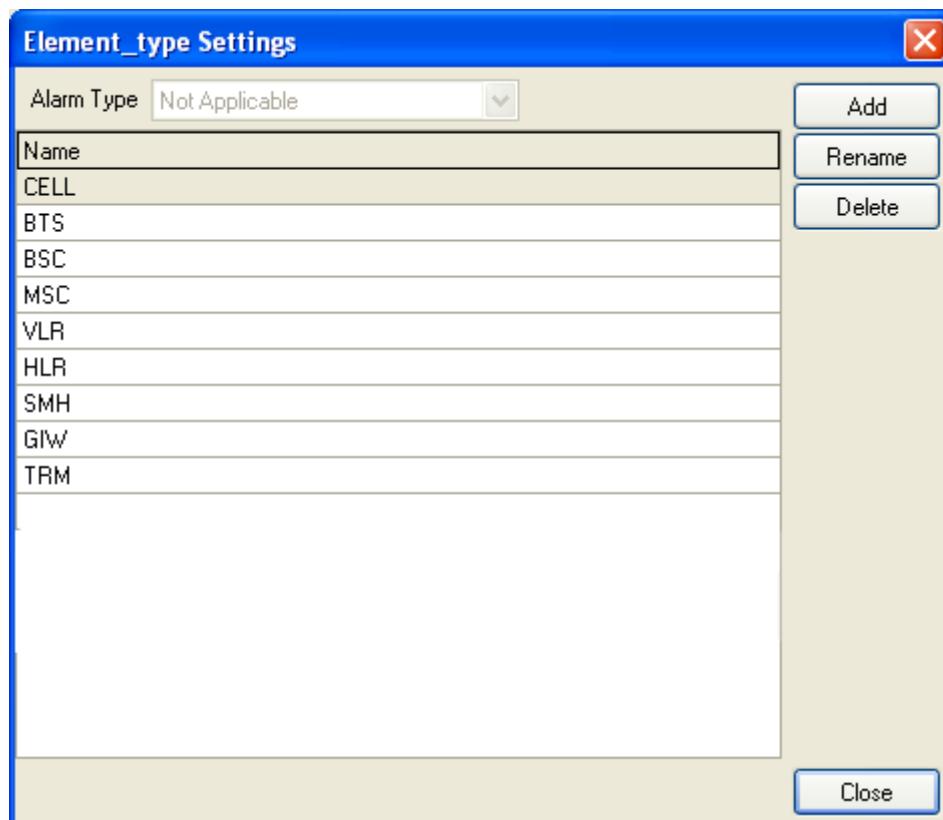
In the Element Type Settings dialog box you can create a list of element types that you can then choose from when you are creating an alarm.

 Because system alarms are raised on AIRCOM OPTIMA events, rather than performance events, you do not need to define element types for them.

To add an element type:

- 1 In the Alarms Explorer, from the Config menu, click Element Type.

The Element Type Settings dialog box appears:



- 2 Click Add.

- 3 Type the name of the element type and click OK.

To edit an element type:

- 1 In the Alarms Explorer, from the Config menu, click Element Type.
- 2 Select the element type that you want to edit and click Rename.

- or -

Double-click the element type name.

- 3 Type in the new name for the element type.

To delete an element type:

- 1 In the Alarms Explorer, from the Config menu, click Element Type.
- 2 Select the element type and click Delete.
- 3 Click Yes to confirm.

7.3.1.4 Configuring Problem Texts

In the Problem Text dialog box, you can create a list of problem text definitions that you can then choose from when you are creating an alarm.

 You can also choose to create the problem text when creating the rest of the alarm, rather than choosing a pre-defined option.

To add a problem text:

- 1 In the Alarms Explorer, from the Config menu, click Problem Text.
- 2 In the dialog box that appears, click Add.
- 3 In the Name column, type the name of the problem text.
- 4 In the Definition column, click the empty row.
- 5 In the text box that appears, click Edit.
- 6 In the dialog box that appears, type in your definition, either as an SQL query or simple text.

If you are using SQL query, check the Override SQL checkbox so that the system knows that the written text is SQL.

 You can double-click any of the items in the list of tables and columns, Oracle keywords and functions in the Database pane on the right-hand side to help you write the problem text.

- 7 To test that the code works correctly, click Test SQL. If your code is correct, results appear in the bottom pane of the dialog box.
- 8 Click Save.

Here is a problem text example for Route congestion alarm:

Set Problem Text:

```
FDN:%ELEMENTID  
DATETIME:%DATE  
CONGESTION:%LAST(%CONGESTION)  
OG CALLS:%LAST(%NCALLSO)  
OG TRAF:%LAST(%OG_TRAF)  
RIPPLE:%COUNT(%CONGESTION)
```

Result of Set Problem Text:

```
FDN:MSC:MRG05;ROUTE:BRSI-BRSO  
DATETIME:26-03-2007 12:00:00  
CONGESTION:1,09  
OG CALLS:2475  
OG TRAF:74  
RIPPLE:1
```

Clear Problem Text:

```
%ELEMENTID CLEARED
```

To delete a problem text:

- 1 In the Alarms Explorer, from the Config menu, click Problem Text.
- 2 Select the problem text that you want to delete and click Delete.
- 3 Click Yes to confirm.

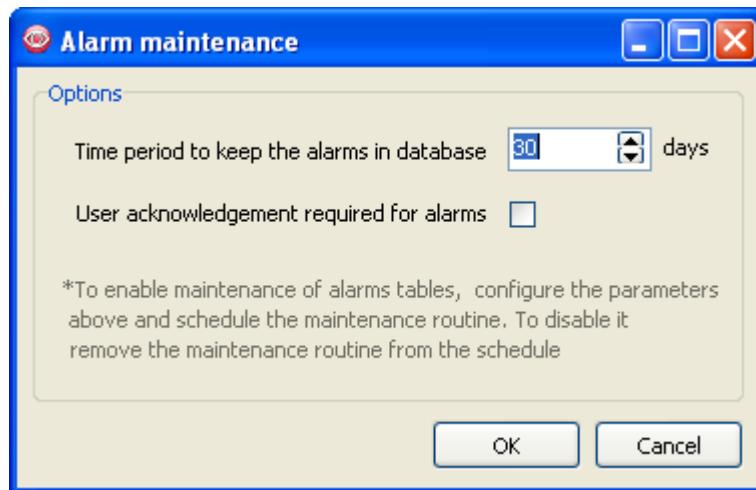
7.3.1.5 Configuring Alarm Maintenance Parameters

In the Alarm maintenance dialog box, you can configure the parameters that will make up the alarm maintenance routine. This routine can then be scheduled to run periodically.

To configure alarm maintenance parameters:

- 1 In the Alarms Explorer, from the Config menu, click Maintenance.

The Alarm maintenance dialog box appears:



- 2 Select the number of days that you want to keep the alarms in the database. The default is 30 days.
- 3 Select the 'User acknowledgement required for alarms' option if you want the user to acknowledge an alarm before it is removed from the system.

 The user will only be able to acknowledge an alarm on the AIRCOM OPTIMA web interface. Therefore, you should only select this option only if the web interface is installed on the user's system.

- 4 Click OK.

7.3.2 Defining an Alarm

Before defining an alarm, ensure you have configured the alarm settings. For more information, see About Alarm Settings on page 323.

You can define an alarm in one of the following two ways:

- Define an alarm using a wizard (performance alarms only)
- Define an alarm using an editor

7.3.2.1 Defining Performance Alarms Using the Alarms Wizard

To define a performance alarm using the Alarms Wizard:

 You can only define performance alarms using the Alarms Wizard. If you want to define a system alarm, you must use the Alarms Editor. For more information, see Defining Alarms Using the Alarms Editor on page 335.

- 1 From the Alarms menu, click Alarms.
- 2 In the Alarms Explorer, click the Create New Alarm Definition button .
- or -
In the Alarm Definitions pane, right-click and from the menu that appears, click Add Definition.
- 3 In the dialog box that appears, select the Create Performance Alarm with Wizard option, and then click OK.
- 4 In the dialog box that appears, type the name and description of the alarm.
- 5 Click Next.

- 6 In the dialog box that appears:

Item	Description
Schema, Table, Element Column, Date Column	Select the schema, table, element column, and date column that the alarm will monitor.
Date Period to be scanned back	This determines how far back the data is monitored and is required if any of the following conditions arise: <ul style="list-style-type: none"> • There has been a delay in loading the data into the database • The alarm service has not been running.
Element Selection	By default, the alarm will monitor all the network elements of the type selected in the element column. However, you can change the selection to apply the alarm only to a subset of elements. To do so: <ol style="list-style-type: none"> 1. Select the Filter Elements checkbox. 2. Click Select. The Selection dialog box appears. 3. You can select the elements monitored by the alarm in any one of the following three ways: <ul style="list-style-type: none"> • Element Hierarchy: You can select elements from only one element hierarchy level. Click the Select Hierarchy button  to select the element hierarchy. For more information on element hierarchy, see the AIRCOM OPTIMA User Reference Guide. • Filters: You can apply filters on element hierarchy and select the elements. Click the 'Use filter on element hierarchy' button  to select the elements using the filters. For more information on filters, see the AIRCOM OPTIMA User Reference Guide. • Manual Input: You can manually type element values. Click the Add to Manual Input button  to specify the elements manually.

- 7 Click Next.

- 8 On the next page of the wizard, define the threshold that the alarm will use:

Option	Description
Severity	This defines the severity of the alarm, if it is raised. Click <Select> to get the Severity drop-down list. You have the following options: <ul style="list-style-type: none"> • Minor • Major • Critical • Information_Only • Intermediate • Warning

Parameter Name and Expression	<p>To add the parameters and expression:</p> <p>Click the AddParameter button to add the parameters and expression for the alarm threshold. The Parameter Editor dialog box opens.</p> <p> You can also click  in the Parameter Name column to add a parameter.</p> <p>In the Parameter Editor dialog box:</p> <ol style="list-style-type: none"> 1. In the Name text box, type the name of the parameter. 2. From the Data Type drop-down list, select the data type of the parameter. 3. From the Functions pane, select the number, string, date, and custom values for the parameter. 4. From the Operators pane, select the operator. 5. Click OK. <p> You can also right-click in the Threshold dialog box to add or delete a parameter.</p>
Operator and Value	<p>Set the operator and value for this threshold:</p> <ol style="list-style-type: none"> 1. Click the Set value button to set the operator and value for the parameters. The Selection dialog box appears. <p> You can also click  in the Operator and Value columns to set operator values.</p> <ol style="list-style-type: none"> 2. From the Operator drop-down list, select the operator for each parameter. 3. In the Values column, type the value for the parameter. 4. Select the Apply to all queries checkbox to apply all the parameters to the queries in the Queries pane on the left-hand side. 5. Click OK. <p> You can also right-click in the Threshold dialog box to set the value.</p>
Override the parameters for Clear	<p>If this option is not checked, the system automatically adds an identical clear parameter for every set parameter that you create.</p> <p>Select this checkbox if you want to create a separate clear parameter for the set parameters that you create.</p> <p>If this option is selected, then you have the option to click  to edit the operator value for the clear parameter. After setting a different value for the clear parameter, if you uncheck this option, a warning message is displayed that the clear parameter will be synchronized with the set parameter. Click Yes to continue.</p> <p> It is mandatory to have at least one set and clear parameter.</p>

9 Click Next.

10 In the dialog box that appears:

In This Pane	Do This
Alarm Process Mode	<p>Select the alarm process mode from any one of the following options:</p> <ul style="list-style-type: none">Normal: If you select this option, the system raises an alarm for the first time when the SET condition is met. Then it checks for the CLEAR condition. If the CLEAR condition is not met, it keeps checking for the CLEAR condition until it is met. After the CLEAR condition is met, it again checks the SET condition. That means that there is always a pattern – SET-CLEAR, SET-CLEAR.Monitor active alarms: If you select this option, the system raises an alarm when the SET condition is met and then checks for the CLEAR condition. If the CLEAR condition is not met, it checks for the SET condition again. If the SET condition is met, it raises a SET alarm. This means that the pattern need not be SET-CLEAR,SET-CLEAR as in the normal mode and several SET alarms can be raised before a CLEAR alarm is raised. <p> The option Monitor set on granularity is selected automatically when you select the Monitor active alarms process mode.</p>
Select Problem Text	<p>You can select an existing problem text from the drop-down list or you can add a new problem text.</p> <p>To add a new problem text:</p> <ol style="list-style-type: none">Click Add. The Problem Text dialog box appears.Click Add.In the Name column, type the name of the problem text.In the Definition column, click the empty row.In the text box that appears, click Edit.In the dialog box that appears, type in the SQL code or simple text. <p> If you type simple text, double-click any of the items in the list of tables and columns, Oracle keywords and functions in the Database pane on the right-hand side. If you type the actual code, check the Override SQL checkbox so that the system knows that the written text is SQL.</p> <ol style="list-style-type: none">To test that the code works correctly, click Test SQL. If your code is correct, results appear in the bottom pane of the dialog box.Click Save.
Vendor, Technology, Element Type	<p>Select a vendor, technology, and element type.</p> <p>To add a new vendor, technology, and element type, click the Add button  corresponding to the correct row. For more information, see About Alarm Settings on page 323.</p>

11 Click Next.

12 In the dialog box that appears:

In This Pane	Do This
Alarm Polling	<p>Set the rate at which information from the network is tested against the alarm thresholds. To do this:</p> <ol style="list-style-type: none">From the Next Polling Date Time menus, select a date and a time from which to run the alarm.From the Alarm Polling Interval menu, select the polling interval frequency and time duration.

13 Click Next.

14 In the dialog box that appears:

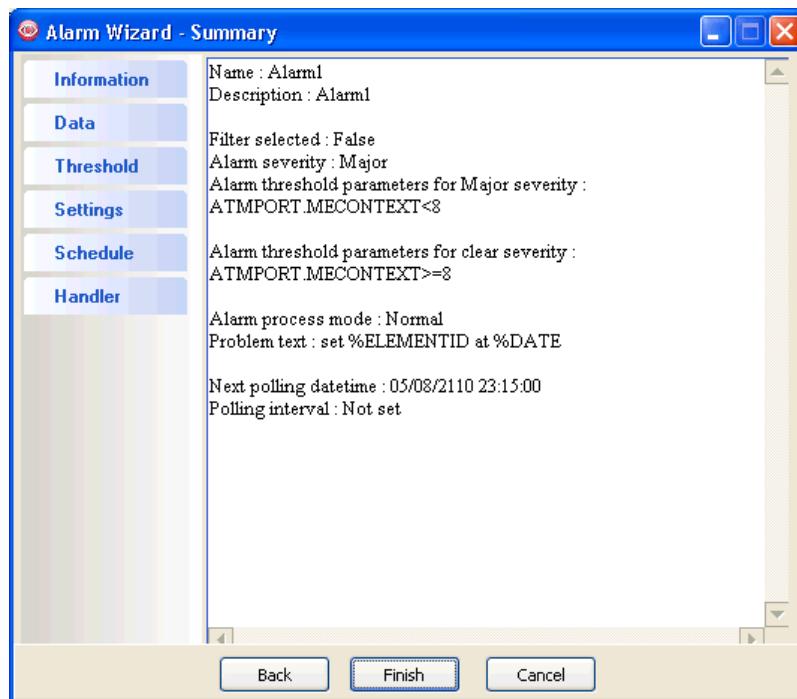
In This Pane	Do This
Handler Type	Select the method via which you want to send the alarm notifications. It can be any of the following methods: <ul style="list-style-type: none">• Email: Alarm notification is sent by email.• SMS: Alarm notification is sent by sms.• SNMP: Alarm notification is sent by SNMP.
Handler Location	Click the Select button to specify a location to save the alarm handler.
Select Contacts	To select contacts: <ol style="list-style-type: none">1. Click the Add button to select a contact from the address book. You can search users, groups, and contacts to select your contact.2. Click OK.3. Select the Send multiple notifications per email and/or SMS checkbox if you want to send multiple alarm notifications.4. Select the Apply handler on 'Clear' alarms checkbox if you want to send the notifications for cleared alarms also.
SNMP	This pane is active only if you have select SNMP as your handler type. Select the type of event and probable cause for your alarm from the available lists.

15 Click Next.

The Alarm Wizard - Summary dialog box lists all the details of the alarm.

 You can click any right-hand side menu items to edit your alarm information. As a minimum, you have to specify the Information, Data and Threshold details.

This picture shows an example of the Alarm Wizard - Summary dialog box:



16 Click Finish. A new alarm definition is created.

17 When you have defined an alarm, you can activate it. For more information, see Activating an Alarm on page 340.

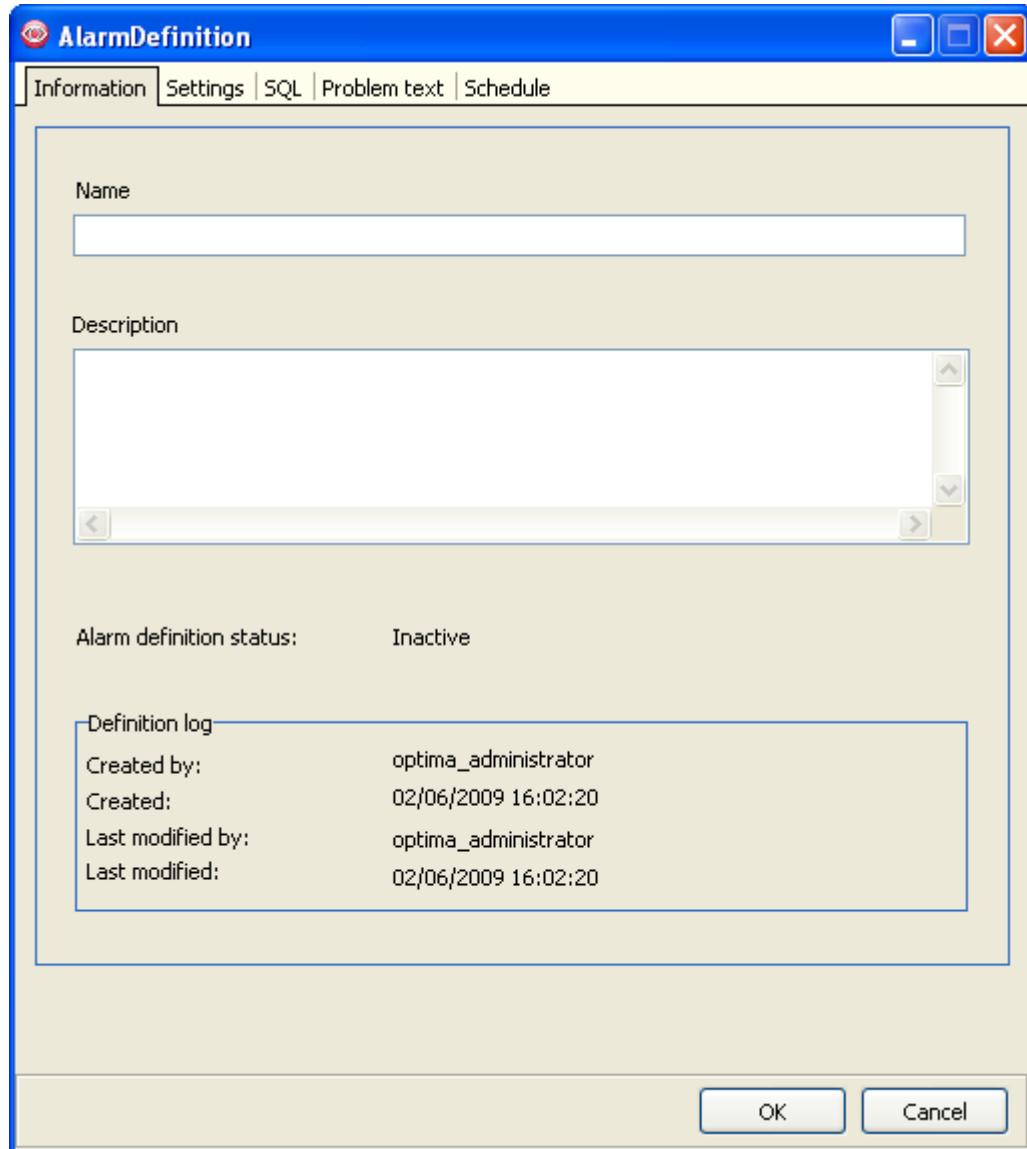
7.3.2.2 Defining Alarms Using the Alarms Editor

You can use the Alarms Editor to define two types of alarm - performance and system.

To define either of these:

- 1 From the Alarms menu, click Alarms.
- 2 In the Alarms Explorer, click the Create New Alarm Definition button  .
 - or -
- 3 In the Alarm Definitions pane, right-click and from the menu that appears, click Add Definition.
- 4 Click OK.

The Alarm Definition dialog box appears:



- 5 On the Information tab, type the alarm name and add a description.
- 6 On the Settings tab:

In This Pane	Do This
Alarm Process Mode	<p>Select the alarm process mode:</p> <ul style="list-style-type: none">• Normal: If you select the Process Mode for the defined Alarm as Normal, the system raises an alarm for the first time when the SET condition is met. Then it checks for the CLEAR condition. If the CLEAR condition is not met, it keeps checking for the CLEAR condition until it is met. After the CLEAR condition is met, it again checks the SET condition. That means, there is always a pattern – SET-CLEAR, SET-CLEAR.• Monitor active alarms: If you select the Process Mode for the defined Alarm as Monitor active alarms, the system raises an alarm when the SET condition is met and then checks for the CLEAR condition. If the CLEAR condition is not met, it checks for the SET condition again. If the SET condition is met, it raises a SET alarm. This means that the pattern need not be SET-CLEAR,SET-CLEAR as in the normal mode and several SET alarms can be raised before a CLEAR alarm is raised. <p> The Monitor set on granularity option is selected automatically when you select the Monitor active alarms process mode, as it is part of this option.</p>

In This Pane	Do This
Ripple Counts	Select the ripple counts that will define the thresholds. For more information, see About Ripple Counts on page 341.
Alarm Severity	Select the severity level for your alarm from the list available. If the alarm is triggered, then this is the severity level value that will be stored in the database for the event.
Vendor, Technology, Element type	<p>Select a vendor, technology and element type.</p> <p>The available options are based on the items defined in the Alarms Settings dialog boxes, and may be different depending on the type of alarm you are defining. For more information, see About Alarm Settings on page 323.</p> <p>For system alarms, you can also select the required AIRCOM OPTIMA module, for example, the ETL Loader.</p> <p> You cannot define an Element type for a system alarm, as this option is not applicable for AIRCOM OPTIMA events.</p>
SNMP	<p>Select the Forward SNMP traps option to send alarm notifications by SNMP to a third-party fault management system.</p> <p>Select the event type and probable cause that will describe the alarm when it is triggered.</p>

7 On the SQL tab:

In This Pane	Do This
SQL	
SET Alarm SQL/ CLEAR Alarm SQL	<p>To define the Set Alarm SQL:</p> <ol style="list-style-type: none"> 1. In the Set Alarm pane, click Set SQL. The Data Explorer launches. 2. Define the SQL query to set an alarm. For more information, see the AIRCOM OPTIMA User Reference Guide. <p>Based on the SQL query, the Element ID and Date Time drop-down lists are populated with values.</p> <ol style="list-style-type: none"> 3. From the Element ID drop-down list, select a value. 4. From the Date Time drop-down list, select a value. 5. Select the counters that you want to include in the problem text. 6. If you are defining a system alarm, select the Process ID that will be used in the SQL query to define the PRID. If you have defined the technology as Oracle or RAC, for example, which have no Process ID, select the Use Technology as Process ID option. <p>To define the Clear Alarm SQL:</p> <ol style="list-style-type: none"> 1. In the Clear Alarm pane, click Clear SQL. The Data Explorer launches. 2. Define the SQL query to clear an alarm. For more information, see the AIRCOM OPTIMA User Reference Guide. <p>Based on the SQL query, the Element ID and Date Time drop-down lists are populated with values.</p> <ol style="list-style-type: none"> 3. From the Element ID drop-down list, select a value. 4. From the Date Time drop-down list, select a value.

In This Pane	Do This
Element Selection	<p>The alarm monitors these elements. By default, this selection includes all the network elements of the type selected in the element column.</p> <p>You can change the selection to apply the alarm only to a subset of elements. To do so:</p> <ol style="list-style-type: none"> Select the Filter elements checkbox. Click Select. The Selection dialog box appears. You can select the elements monitored by the alarm in any one of the following three ways: <ul style="list-style-type: none"> Element Hierarchy: You can select elements from only one element hierarchy level. Click the Select Hierarchy button  to select the element hierarchy. For more information on element hierarchy, see the AIRCOM OPTIMA User Reference Guide. Filters: You can apply filters on element hierarchy and select the elements. Click the 'Use filter on element hierarchy' button  to select the elements using the filters. For more information on filters, see the AIRCOM OPTIMA User Reference Guide. Manual Selection: You can manually enter element values. Click the Add to Manual Input button  to specify the elements manually.
Threshold	
Severity	<p>This defines the severity of the alarm threshold.</p> <p>From the Severity drop-down list, select a severity for the threshold.</p> <p> You can click <Select> to get the Severity drop-down list.</p>
Operator and Value	<p>To set the operator and value:</p> <ol style="list-style-type: none"> Click the Set value button to set the operator and value for the parameters. The Selection dialog box appears. From the Operator drop-down list, select the operator for each parameter. In the Values column, type the value for the parameter. Select the Apply to all queries checkbox to apply all the parameters to the queries in the Queries pane on the left-hand side. Click OK. <p> You can also right-click in the Threshold dialog box to add or delete a parameter.</p>

8 On the Problem Text tab:

In This Pane	Do This
Problem Text for SET/CLEARED Alarm	<p>Define the problem text that will be received when an alarm is raised.</p> <p>You can define the problem text from a predefined list or by creating your own.</p> <p>To define own problem text:</p> <ol style="list-style-type: none"> Select the Define own problem text checkbox. Click Define. The Problem Text dialog box appears. Type in the text that you want to be sent when an alarm is raised. <p>-or-</p> <p>Select the Override SQL checkbox if you want to include an SQL statement and in the SQL pane, type the code for the problem text.</p> <p> If you type SQL code, double-click any of the items in the list of tables and columns, Oracle keywords and functions in the Database pane on the right-hand side. If you type the actual code, check the Override SQL checkbox so that the system knows that the written text is SQL.</p> <ol style="list-style-type: none"> To test the code works correctly, click Test SQL. If your code is correct, results appear in the bottom pane of the dialog box. When you have defined the problem text, click Save and then click Yes to confirm. <p>To select problem text from a predefined list:</p> <p>From the drop-down list, select a predefined problem text.</p> <p>-or-</p> <p>To add a new problem text:</p> <ol style="list-style-type: none"> Click Add. The Problem Text dialog box appears. Click Add. In the new row, type the name of the problem text. In the Definition column, click the empty row. In the text box that appears, click Edit. In the dialog box that appears, type in the SQL code or simple text. Close the window to exit.

9 On the Schedule tab:

In This Pane	Do This
Alarm Polling	<p>Set the rate at which information from the network is tested against the alarm thresholds. To do this:</p> <ol style="list-style-type: none"> From the Next Polling Date Time menus, select a date and a time from which to run the alarm. From the Alarm Polling Interval menu, select the polling interval frequency and time duration.

10 When you have finished defining your alarm, click Apply. A new alarm definition is created in the system.

 As a minimum, you must specify the Information, Data and Threshold details.

11 When you have defined both SET and CLEARED alarms, you can activate the alarm. For more information, see Activating an Alarm on page 340.

7.3.2.3 Activating an Alarm

After you have created an alarm, you must activate it to start monitoring the network. You can have as many active alarms as needed at any one time.

To do this:

- 1 From the Alarms menu, click Alarms.
- 2 In the Alarm Definition pane, select the Active checkbox for each alarm you wish to activate.



You cannot activate an alarm whose definition is incomplete. It is coloured grey indicating that the alarm definition is incomplete.

7.3.2.4 Editing and Deleting an Alarm

To edit an alarm:

- 1 In the Alarms Explorer, select the alarm you want to edit.
- 2 Double-click the alarm.
- or -

Click the Edit Alarm Definition button .

- or -

Right-click the alarm name and from the menu that appears, click Edit Alarm Definition.

- 3 Edit the alarm as necessary and click OK to save the changes.

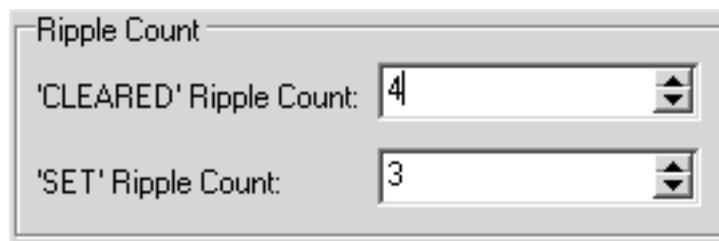
To delete an alarm:

- 1 In the Alarms Explorer, select the alarm you want to delete.
 - 2 If the alarm is active, clear the Active checkbox.
 - 3 Click the Delete Alarm Definition button .
- or -
- Right-click your alarm definition and from the menu that appears, click Delete.
- 4 In the Confirm dialog box, click Yes to delete the alarm.

7.3.3 About Ripple Counts

Ripple counts are used to define the threshold conditions for setting or clearing alarms. These conditions need to be met continually until the threshold is reached and an alarm is raised. If, at any point the condition is not met, the ripple count is reset and the conditions will have to be met again to raise an alarm.

On the Settings tab in the Alarm Definition dialog box, you can define the ripple counts using the up and down arrows. This picture shows an example.



Ripple Count pane

The following is an example of using ripple counts:

For a SET alarm query returning **5** or greater Erlangs and a CLEARED alarm query returning **4** or less Erlangs, you specify a SET ripple count of **3** and a CLEARED ripple count of **4**. This means that:

- For a SET alarm to be raised for a particular element in a filter, the element should have an Erlang factor of **5** or more for the next three polling intervals
- For a CLEARED alarm to be raised for a particular element in a filter, the element should have an Erlang factor of **4** or less for the next four subsequent data granularity periods

For information about granularity periods, see Setting the Granularity Period for a Single Table on page 361.

This applies to all cells in the filter and with any order of values. So:

- 1 If the three values **6, 9** and **8** are received, then the SET alarm will be activated on receiving the third value (8). The ripple process will now wait for a CLEARED alarm.
- 2 If the four values **2, 4, 1** and **3** are received, then the CLEARED alarm will be activated on receiving the fourth value (3). The ripple process will now wait for a SET alarm.

7.3.4 Assigning Alarms to Contacts

After you have created an alarm, you should define an alarm handler for it, which specifies:

- Which contacts are notified when an alarm is raised
- How the alarm is sent, either by email, SMS (text message) or both

 You can assign multiple alarms to a contact or a group of contacts, and you can also use the same alarm in multiple alarm handlers.

Before you can assign an alarm to a contact, the contact must be defined. Only OPTIMA_Administrators can define contacts using the Address Book. For more information, see the AIRCOM OPTIMA User Reference Guide.

7.3.4.1 Creating an Alarm Handler

To create an alarm handler:

- 1 From the Alarms menu, click Alarm Handlers.
- 2 In the Alarms Handler Explorer, click the Create New Alarm Handler button  .
- or -
In the Alarm Handler pane (for any tab), right-click and from the menu that appears, click New Alarm Handler.
- 3 In the dialog box that appears, select the alarm handler type that you want to create, and then click OK:



The Alarms Handler dialog box appears.

- 4 On the Information tab, type the handler name and add a description.

- 5 On the Settings tab:

In This Pane	Do This
Alarm Handler	Choose which alarm(s) you want a contact to be notified about. For more information on how to do this, see Selecting the Alarms for an Alarm Handler on page 344.
Notification Type	Select how you want the contact to be notified when the alarm is raised. If you want the contact to receive an alert for each element within the alarm, select the Send Multiple Notifications Per Email and/or SMS checkbox.  You should only use this option if the alarm is monitoring a small number of elements.
Amend Alarm Type	Select the Apply Handler on CLEAR Alarms checkbox if you want the contact to be notified when an alarm is cleared. The contact will also be notified if the alarm is cleared by the OPTIMA_Administrator.

- 6 On the Contacts tab, click Assign.
7 In the dialog box that appears, select a contact and click Add.

The contacts who will receive notification when this alarm is raised are shown in the right-hand pane of this dialog box.

 To remove a contact from the list, select the name and click Remove. You view detail for a contact or activate a contact so they can receive alarm notifications by selecting their name in the Assign Users dialog box and clicking Properties.

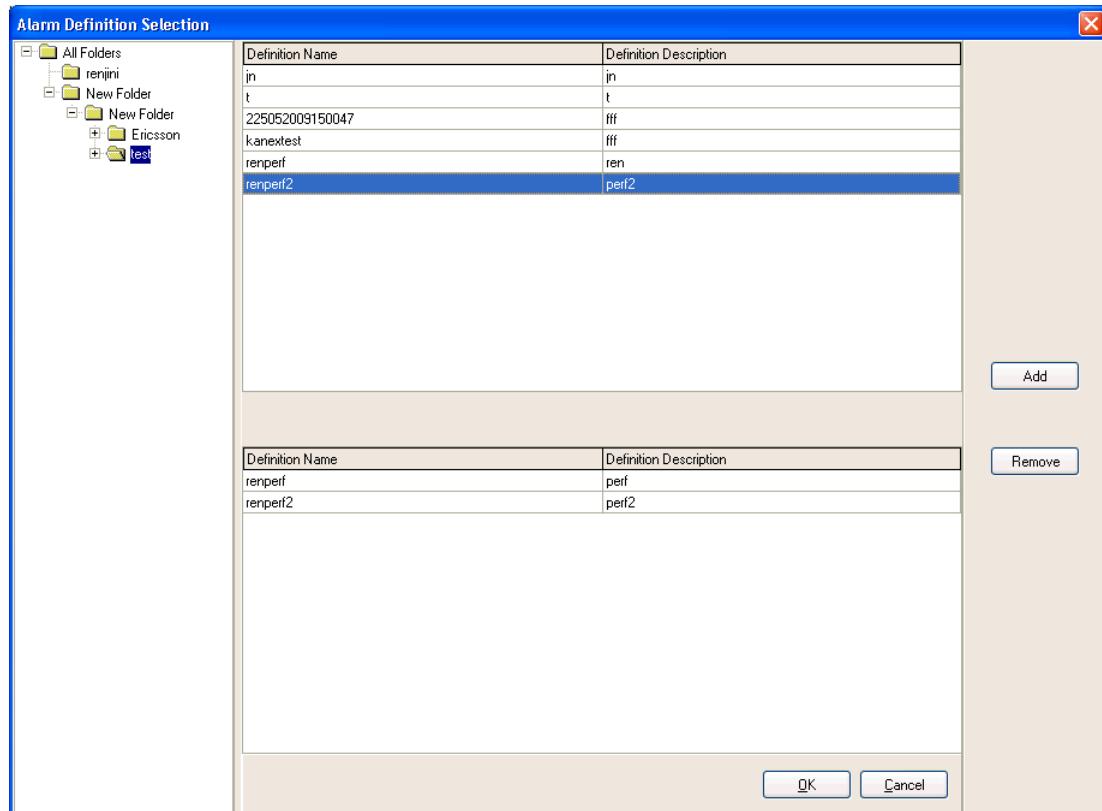
- 8 You can now activate the alarm handler so the contact receives the notifications.

Selecting the Alarms for an Alarm Handler

When you are creating an alarm handler, you must select which alarm(s) will use it. The method for this can differ slightly, depending on the type of alarm handler that you are creating.

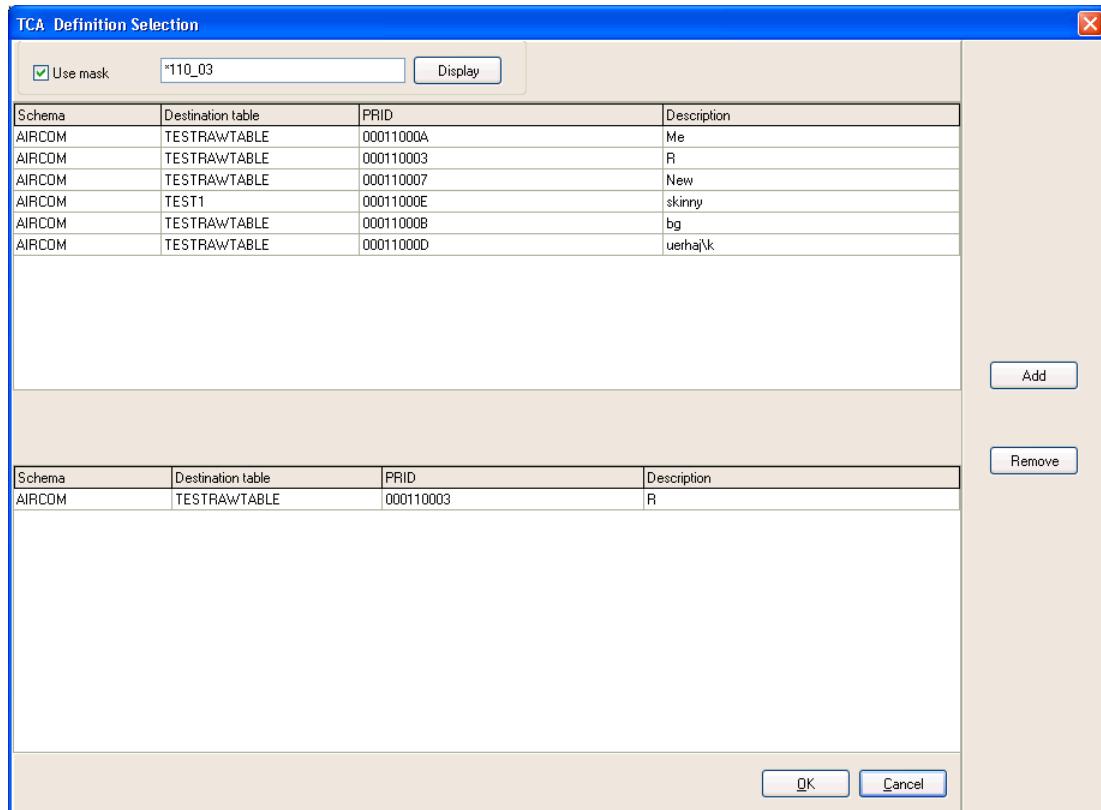
To select the alarms for the handler:

- 1 In the Alarm Handler pane, click the Select button.
- 2 If you are creating a performance or system alarm handler, the Alarm Definition Selection dialog box appears:



This shows a list of all of the alarms that have been defined on the appropriate tab, either Performance or System.

If you are creating a TCA handler, the TCA Definition Selection dialog box appears:



This shows a list of all of the TCAs defined in the backend Loader GUI.

- 3 For all three alarm types, you can select the specific alarms that you want to include in the handler. To do this, in the top pane, select the alarms that you want to add to this handler and then either click the Add button or drag and drop them into the lower pane.

 You can browse the folder structure on the left-hand side to find the required alarm.

- or -

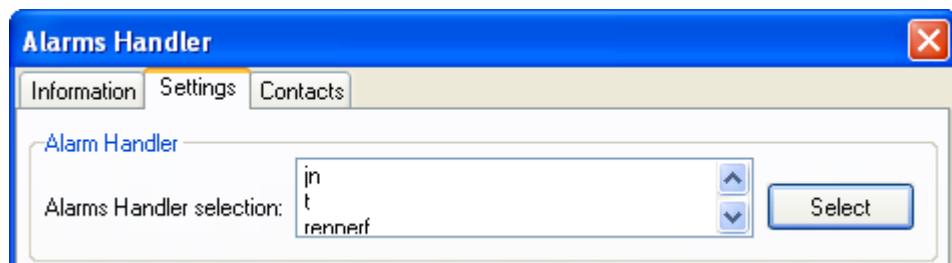
For TCAs, you can define a mask, and any TCAs that match that mask (for example, all of the TCAs for a particular interface) will be assigned to this handler. This is particularly useful when you know that new TCAs will be added in the future, as any new ones that match the mask will be included automatically without modifying the handler definition.

To define a mask:

- Select the 'Use mask' option
 - Type the required mask based on the PRIDs (in the alarm definition) that you want to include
-  The only regular expressions that you can use are * or %. Any other character will be treated as part of the PRID and therefore be invalid.
- Click Display. A list of alarms that currently match the mask and will be included in the handler are shown in the lower pane.

4 Click OK.

The chosen alarms are listed in the Alarm Handler pane:



7.3.4.2 Activating an Alarm Handler

Before a contact can receive alarm notifications, you must activate the alarm handler.

To do this:

- 1 Ensure the alarm in each alarm handler is active. For information about activating alarms, see Activating an Alarm on page 340.
- 2 From the Alarms menu, click Alarm Handlers.
- 3 In the Alarm Handler pane, select the Active checkbox for each alarm handler you wish to activate.

7.3.4.3 Enabling Contacts to Receive Alerts

If a contact is not active, they will not receive alerts. OPTIMA_Administrators can activate contacts using the Address Book. For more information, see the AIRCOM OPTIMA User Reference Guide.

If you are not an OPTIMA_Administrator, you can activate a contact from the Alarm Handler Explorer.

To do this:

- 1 From the Alarms menu, click Alarm Handlers.
- 2 In the dialog box that appears, from the Tools menu, click Contacts.
- 3 In the Address Book that appears, select the contact you want to activate and click the Edit button .
- 4 In the Properties dialog box that appears, select the Active checkbox.
- 5 Click OK and then click Yes to confirm.



To activate or deactivate all contacts, right-click the Address Book and from the menu that appears select Activate All or Deactivate All.

7.3.5 Viewing, Clearing and Resetting Alarms

In the Alarms Explorer Viewer pane, on the Alarms tab, you can view the alarms which are not acknowledged by a third party Fault Management System (FMS). This picture shows an example of the Alarms tab:

DEFINITION_ID	DEFINITION_DESCRIPTION	ALARM_ID	ELEMENT_ID	ELEMENT_TYPE	STATUS	ALARM_DATETIME	SQL_DATETIME	VENDOR	TE
1722	perf	784	MSC1	MSC	0	18/06/2009 19:43:37	18/06/2009 19:43:37	ERICSSON GS	
1722	perf	805	MSC10	MSC	1	10/06/2009 15:05:33	10/06/2009 15:05:00	ERICSSON GS	
1722	perf	805	MSC10	MSC	0	10/06/2009 15:13:36	10/06/2009 15:10:00	ERICSSON GS	
1722	perf	784	MSC2	MSC	0	18/06/2009 19:43:38	18/06/2009 19:43:38	ERICSSON GS	
1722	perf	801	MSC3	MSC	1	10/06/2009 15:05:33	10/06/2009 15:05:00	ERICSSON GS	
1722	perf	784	MSC3	MSC	0	18/06/2009 19:43:38	18/06/2009 19:43:38	ERICSSON GS	
1722	perf	802	MSC4	MSC	1	10/06/2009 15:05:33	10/06/2009 15:05:00	ERICSSON GS	
1722	perf	802	MSC4	MSC	0	10/06/2009 15:13:36	10/06/2009 15:10:00	ERICSSON GS	
1722	perf	803	MSC5	MSC	1	10/06/2009 15:05:33	10/06/2009 15:05:00	ERICSSON GS	
1722	perf	803	MSC5	MSC	0	10/06/2009 15:13:36	10/06/2009 15:10:00	ERICSSON GS	

Alarms Tab

Viewing Alarms

The information shown on the Alarms tab includes the following details:

- Description of the alarm.
- Element ID.
- Element type, for example Cell.
- Alarm Date Time, this is when the data was queried by the alarms program.
- SQL Date Time, this is the date and time of the data that generated the alarm.
- Vendor, Technology and Severity as selected when the alarm was defined.
- Problem Text.
- Forwarded value. The following table describes the two possible Forwarded values:

Forwarded Value:	Description:
0	Alarm has not been forwarded to the FMS by the SNMP program.
1	Alarm has been forwarded to the FMS by the SNMP program.



You can customise the way alarm information is displayed by using the tools menu. For more information, see Customising Alarm Information on page 353.

Clearing SNMP Forwarded Alarms

If an alarm has been raised and it has been forwarded to the FMS, you can choose to clear that alarm. You can only clear the alarms whose Forwarded value has been set to 1. To do this:

- 1 In the Alarms tab, select the alarm(s) you want to clear.
 -  Use the Shift and Ctrl keys to highlight more than one alarm at a time.
 - 2 Right-click and then, from the menu that appears, click Delete Forwarded Alarms. You can choose to delete all or delete by alarm ID or definition ID.
- Cleared alarms can be viewed in the Alarms Historical Log tab.

Resetting SNMP Forwarded Alarms

If an alarm has been raised and it has been forwarded to the FMS, you can choose to reset that alarm. Resetting an alarm sets its Forwarded value back to 0. You might want to do this if there was a problem sending SNMP notifications, for example, during SNMP synchronisation. To do this:

- 1 In the Alarms tab, select the alarm(s) you want to reset.
 -  Use the Shift and Ctrl keys to highlight more than one alarm at a time.
- 2 Right-click and then, from the menu that appears, click Reset Forwarded Alarms. You can choose to reset all or reset by alarm ID or definition ID.

7.3.6 Viewing and Clearing Alarm Definitions

In the Alarms Explorer Viewer pane, on the Definition Log tab, you can view information about the changes made to alarm definitions. The Definition log tab has two subtabs which are described in the following table:

Sub-Tab	Description
Definition log	Shows the log for alarm definitions.
Redundant Definition log	Shows the log for deleted and/or non-existing alarm definitions. You can choose to view either all results or results by definition, by selecting the appropriate option from the View Data drop-down list.

This picture shows an example of the Definition log tab:

DEFINITION_ID	DESCRIPTION	USER	DATETIME	ACTION
1722	perf	optima_administrator	09/06/2009 10:58:43	Edited
1722	perf	optima_administrator	09/06/2009 11:48:11	Activated
1722	perf	optima_administrator	09/06/2009 15:22:17	Deactivated
1722	perf	optima_administrator	10/06/2009 08:59:01	Activated
1722	perf	optima_administrator	10/06/2009 13:56:11	Deactivated
1722	perf	optima_administrator	10/06/2009 13:56:14	Activated
1722	perf	optima_administrator	18/06/2009 19:43:37	Deactivated

Definition log tab

Viewing Alarm Definitions

The following information is shown in both subtabs on the Definition log tab:

- A description of the definition
- The user who made the change to the definition
- The date and time when the change was made to the definition
- The action that was performed on the definition

 You can customise the way alarm definition information is displayed by using the tools menu. For more information, see Customising Alarm Information on page 353.

Clearing Alarm Definitions

To clear alarm definitions in the Definition log subtab:

- 1 In the Definition Log subtab, select the alarm definition(s) you want to clear.
 - 💡 Use the Shift and Ctrl keys to highlight more than one alarm at a time.
- 2 Right-click and, from the menu that appears, click Clear Items. You can choose to clear one item or all of the items.

To clear alarm definitions in the Redundant definition log subtab:

- 1 In the Redundant definition log subtab, select the alarm definition(s) you want to clear.
 - 💡 Use the Shift and Ctrl keys to highlight more than one alarm at a time.
- 2 Right-click and then, from the menu that appears, click Clear Items. You can choose to clear one item or all of the items.

7.3.7 Viewing and Clearing Alarms History

In the Alarms Explorer Viewer pane, on the Alarms historical log tab, you can view all historical alarms. The Alarms historical log tab has the following two subtabs:

- Historical alarms which shows the historical log for all generated alarms
- Redundant alarms log which shows the alarms for deleted and/or non-existing definitions

This picture shows an example of the Alarms historical log tab:

The screenshot shows a software interface for viewing historical alarms. At the top, there is a navigation bar with tabs: 'Alarms', 'Definition log', 'Alarms historical log' (which is highlighted in yellow), and 'Run history'. Below the navigation bar, there are two sub-tabs: 'Historical alarms' (which is selected and highlighted in blue) and 'Redundant alarms log'. Underneath these tabs is a toolbar with various icons for filtering and sorting data. The main area is a data grid table with the following columns: DEFINITION_ID, DEFINITION_DESCRIPTION, ALARM_ID, ELEMENT_ID, ELEMENT_TYPE, STATUS, ALARM_DATETIME, SQL_DATETIME, and VENDOR. The table contains several rows of data, each representing a historical alarm entry. The data includes fields like 'perf' for DEFINITION_DESCRIPTION, '505' for ALARM_ID, 'MSC1' for ELEMENT_ID, 'MSC' for ELEMENT_TYPE, and various dates/times for ALARM_DATETIME and SQL_DATETIME.

DEFINITION_ID	DEFINITION_DESCRIPTION	ALARM_ID	ELEMENT_ID	ELEMENT_TYPE	STATUS	ALARM_DATETIME	SQL_DATETIME	VENDOR
1722	perf	505	MSC1	MSC	1	09/06/2009 14:55:25	09/06/2009 14:50:00	ERICSSON
1722	perf	505	MSC1	MSC	0	09/06/2009 15:22:18	09/06/2009 15:22:18	ERICSSON
1722	perf	646	MSC1	MSC	1	10/06/2009 09:08:36	10/06/2009 09:00:00	ERICSSON
1722	perf	646	MSC1	MSC	0	10/06/2009 09:43:36	10/06/2009 09:35:00	ERICSSON
1722	perf	701	MSC1	MSC	1	10/06/2009 09:48:36	10/06/2009 09:40:00	ERICSSON
1722	perf	701	MSC1	MSC	0	10/06/2009 13:56:11	10/06/2009 13:56:11	ERICSSON
1722	perf	784	MSC1	MSC	1	10/06/2009 14:28:36	10/06/2009 14:20:00	ERICSSON
1722	perf	784	MSC1	MSC	0	18/06/2009 19:43:38	18/06/2009 19:43:38	ERICSSON
1722	perf	600	MSC10	MSC	1	none/none 14:55:25	none/none 14:50:00	ERICSSON

Alarms historical log tab

Viewing Alarms History

The following information is shown in both tabs of the Alarms historical log tab:

- Description of the alarm
- Element ID
- Element type, for example Cell
- Alarm Date Time, this is when the data was queried by the alarms program
- SQL Date Time, this is the date and time of the data that generated the alarm
- Vendor, Technology and Severity as selected when the alarm was defined
- Problem Text

 You can customise the way alarm history information is displayed by using the tools menu. For more information, see Customising Alarm Information on page 353.

Clearing Alarms History

To clear alarms history in the Historical alarms subtab:

- 1 In the Historical alarms subtab, select the alarm(s) you want to clear.
 Use the Shift and Ctrl keys to highlight more than one alarm at a time.
- 2 Right-click and then, from the menu that appears, point to one of the options described in the following table:

Point to:	To:
Clear Items	Clear one or all items.
Send ADMIN_CLEAR	Manually clear alarms which have been raised and not cleared, for example, if an alarm is in a setting state and its clear conditions have not been met after a long period of time, and the user has acknowledged this and is prepared to close the alarm.

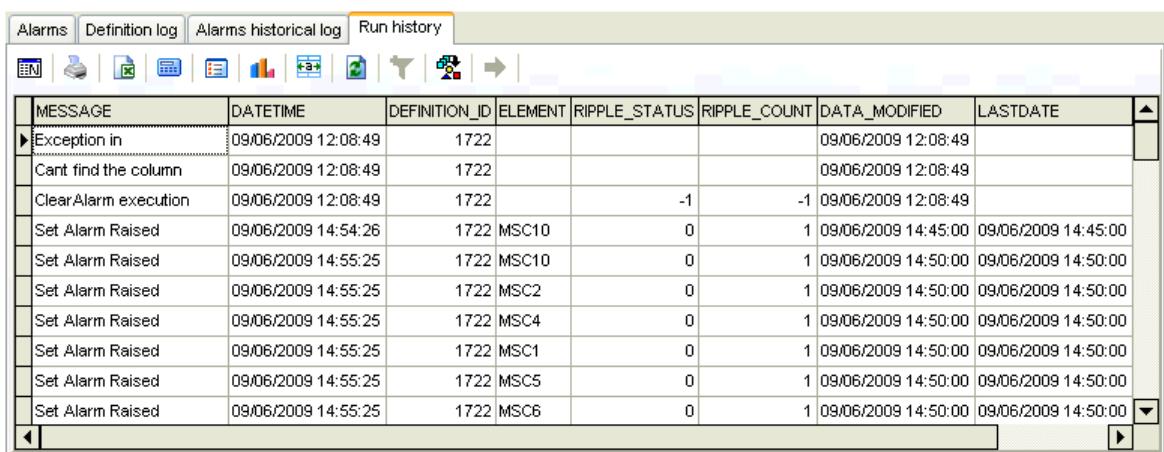
To clear alarms history in the Redundant alarms log subtab:

- 1 In the Redundant alarms log subtab, select the alarm(s) you want to clear.
 Use the Shift and Ctrl keys to highlight more than one alarm at a time.
- 2 Right-click and then, from the menu that appears, point to Clear Items. You can choose to clear one item or all of the items.

7.3.8 Viewing Alarms Run History

In the Alarms Explorer Viewer pane, on the Run History tab, you can view alarm processing messages for the alarms that you have selected in the Alarm Definitions pane.

This picture shows an example of the Run History tab for the alarms:



The screenshot shows a software interface titled 'Alarms Explorer Viewer'. At the top, there are tabs: 'Alarms' (selected), 'Definition log', 'Alarms historical log', and 'Run history'. Below the tabs is a toolbar with various icons. The main area is a grid table with the following columns: MESSAGE, DATETIME, DEFINITION_ID, ELEMENT, RIPPLE_STATUS, RIPPLE_COUNT, DATA_MODIFIED, and LASTDATE. The data in the table is as follows:

MESSAGE	DATETIME	DEFINITION_ID	ELEMENT	RIPPLE_STATUS	RIPPLE_COUNT	DATA_MODIFIED	LASTDATE
Exception in	09/06/2009 12:08:49	1722				09/06/2009 12:08:49	
Cant find the column	09/06/2009 12:08:49	1722				09/06/2009 12:08:49	
ClearAlarm execution	09/06/2009 12:08:49	1722		-1	-1	09/06/2009 12:08:49	
Set Alarm Raised	09/06/2009 14:54:26	1722	MSC10	0	1	09/06/2009 14:45:00	09/06/2009 14:45:00
Set Alarm Raised	09/06/2009 14:55:25	1722	MSC10	0	1	09/06/2009 14:50:00	09/06/2009 14:50:00
Set Alarm Raised	09/06/2009 14:55:25	1722	MSC2	0	1	09/06/2009 14:50:00	09/06/2009 14:50:00
Set Alarm Raised	09/06/2009 14:55:25	1722	MSC4	0	1	09/06/2009 14:50:00	09/06/2009 14:50:00
Set Alarm Raised	09/06/2009 14:55:25	1722	MSC1	0	1	09/06/2009 14:50:00	09/06/2009 14:50:00
Set Alarm Raised	09/06/2009 14:55:25	1722	MSC5	0	1	09/06/2009 14:50:00	09/06/2009 14:50:00
Set Alarm Raised	09/06/2009 14:55:25	1722	MSC6	0	1	09/06/2009 14:50:00	09/06/2009 14:50:00

Run history tab

The following table shows the various parameters and their description:

Parameter	Description
Message	Message for the alarm
Date and Time	Date and Time at which the alarm was created
Definition ID	Definition ID of the alarm
Element	Element for which the alarm is raised
Ripple Status Number	Indicates whether the alarm is set or clear: 0 = clear, 1 = set
Ripple Count Number	Indicates the ripple counts for the alarm
Data Modified Date	Date at which the alarm was created
Last Date	Last date when the input table was updated in the database
Message Severity Number	Indicates the level of severity of the message. The available options are: 1 - Debug 2 - Information 3 - Warning 4 - Minor 5 - Major 6 - Critical

7.3.9 Customising Alarm Information

In the Alarms Explorer Viewer pane, information is displayed in grid format. You can customise the way this information is displayed by using the tools menu. For more information, see the AIRCOM OPTIMA User Reference Guide.

7.3.9.1 Sorting Alarm Information by Column

To sort alarm information using the column headings:

Click the heading for the column by which you wish to sort the data.

 If you want to sort by more than one column, hold down the Shift key and click the heading for each column by which you want to sort the data.

To see by which column data in the grid is sorted, look for the arrow in the column heading. An up arrow indicates data is in ascending order and a down arrow indicates data is in descending order.

To change the position of a column:

Select the column and drag it to the desired location.

7.3.10 About the Alarms Backend Applications

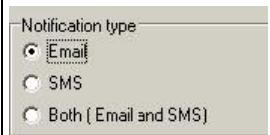
The alarms you define in AIRCOM OPTIMA are processed by two backend applications:

- The Alarms Service checks the next schedule date of each alarm and then processes and updates any alarm whose schedule date is due
- The Alarm Notifier polls the database for recently raised alarms and sends alarm notifications via email or SMS

You can find detailed information about installing and configuring the alarms backend applications in the AIRCOM OPTIMA Operations and Maintenance (O&M) Guide. Please contact AIRCOM International Support to obtain the latest version of the O&M Guide.

7.3.11 Troubleshooting

The following table shows troubleshooting tips for AIRCOM OPTIMA alarms:

Symptom	Possible Causes	Solution
When trying to edit an alarm definition, the severity, vendor and technology combo boxes are empty.	Synonym, Grant missing for the tables : 'ALARM_VENDORS', 'ALARM TECHNOLOGY', 'ALARM_ELEMENT_TYPE', 'PROBABLE_CAUSE' Rows deleted from these tables.	Make sure that these tables have proper synonyms, grants and also they have all the rows from the original installation.
Does not receive Alarms SMS but receive Alarms email	Wrong option selected in Alarm Handler GUI	Make sure that the right option is selected in Alarm Handler definition 
'Insufficient privileges' error message in the log when opening Alarm Handler Explorer	Insufficient privileges/ Not enough access rights on the tables	Check the table access privileges. Run the necessary scripts. If the database is installed from a production template this should not happen. Check the file and see which query has failed. This might give a clue as to which table has the grants missing
The ALARM definition is shown as "active" but in the Alarm definition window, the Alarm status is "inactive"	Expected behaviour.	Expected behaviour. A definition is made inactive when it is opened for editing and cannot be edited when the alarm is being processed.
The ALARM definition. is shown as "active" but no alarm is triggered and the "Next Schedule Date" is not updated	This can be a problem with the SET SQL query. The SQL with double quoted ALIAS works fine through the TEST SQL button but gives Oracle error 'Missing Expression' in the trace file.	Remove the double quoted alias from the 'SET' SQL. Will be providing a better solution soon.
Right-click Alarm Explorer window and select either delete or reset forwarded alarms. It generates the following error message: PLS-00201: identifier 'SNMP_PKG.DEL_FWD_ALARMS_ALL' must be declared.	Synonym missing for SNMP package	CREATE PUBLIC SYNONYM SNMP_PKG FOR AIRCOM.SNMP_PKG;
Keeps on repeating same alarm and inbox is filled with same SMS alarm issue	The wrong option for Process Mode might be selected. If the Process Mode for the defined Alarm is set to be 'Continuous' the alarm will be raised whenever the SET condition is met , even if the clear condition is not met after a set.	Select the 'Normal mode' if that serves the purpose. If the Process Mode for the defined Alarm is set to be 'Normal', the program raises an alarm (once) when the 'Set' condition is met and the alarm will not be raised again until the Clear condition is met for that alarm. Check if the Process Mode is set to 'Normal'.(This is in the Alarm definition – Settings tab 

Symptom	Possible Causes	Solution
Alarms not being generated and receiving Oracle error- 911 in the alarmservice trace file when using '%' sign in the alias in Set SQL definition.	The problem was not using the '%' in double quoted alias in the SET SQL. After defining the SET SQL, when you map the counters brought back by the SQL, if the values list contains the alias with %, this was not handled properly by the Alarms package.	Install the latest version of AIRCOM OPTIMA Alarms package
Problem text not working when using the Override SQL option. Blank results in the problem text column.		User was using the %Date placeholder in the where clause of the SQL statement. Need to have a to_date conversion in front of it as the user was comparing it with a date column.

7.4 Application Database Configuration

The Database Config Settings include the following:

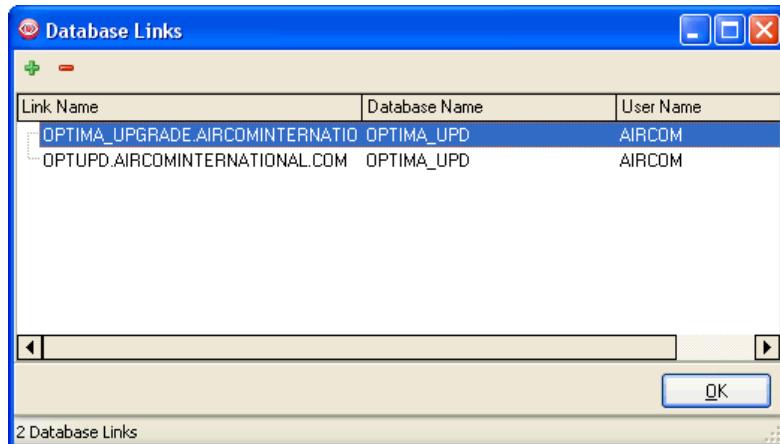
- Database Links
- Regional Settings

7.4.1 About Database Links

In AIRCOM OPTIMA, you can create a Database Link. A Database Link is the way in which Oracle allows you to connect from one database to another.

To create a Database Link:

- 1 From the Administrator menu, point to Database Config and click Database Links. This dialog box appears:



- 2 Click . The Create Database Link dialog box appears:



- 3 In this dialog box, specify the following details:
 - In the Link Name text box, type the name of the link.
 - In the Database to connect to text box, type the name of the database with which you want to create a link.

 You can get the name of the database that you want to link to from the `tnsnames.ora` file on your computer.

- In the User name and Password for connection text boxes, provide the user name and password that you have set for that database.

- 4 Click OK. The new link will appear in the Database Links dialog box.

Once you have created a Database Link, you can use it in the SQL tab in the Data Explorer to get data from another database in the following way:

Suppose you have created a database link OPT_620_LINK as shown above. Now in the SQL tab of the Data Explorer, type the following SQL statement:

```
Select * from CellStats@OPT_620_LINK
```

where:

- CELLSTATS is the name of the table in the OPT_DEV_620 database
- OPT_620_LINK is the name of the database link

 It is important to write the SQL query in the following syntax:

```
Select * from TableName@DatabaseLinkName
```

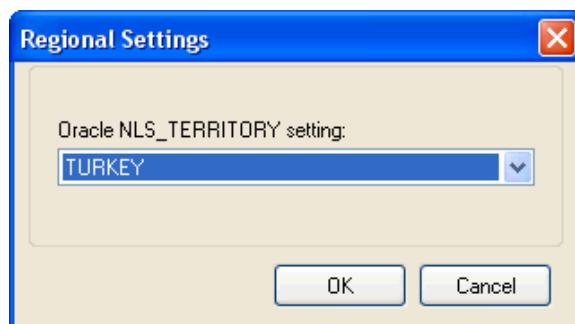
Now, when you click  , the information will be retrieved from the OPT_DEV_620 database and displayed.

7.4.2 About Regional Settings

The Regional Settings dialog box enables you to change the country settings for AIRCOM OPTIMA.

To do so:

- 1 From the Administrator menu, point to Database Config and click Regional Settings. The Regional Settings dialog box appears:



- 2 From the drop-down list, select the country where you are currently.
- 3 Click OK to save your changes.

7.5 Administering the Data Dictionary

The AIRCOM OPTIMA Administrator can use table and field information settings to:

- Allow groups of users access to certain tables
- Set the granularity period for tables
- Set the table period for tables
- Assign tables to specific categories
- Assign summary tables to tables
- Add comments to tables and table columns

You configure table and field information settings in the Table and Field Info dialog box. Tables can be configured individually or all at the same time using the Settings Wizard.

To open the Table and Field Info dialog box:

From the Administrator menu, point to Data Dictionary and click Table and Field Info.

This picture shows an example of the Table and Field Info dialog box.

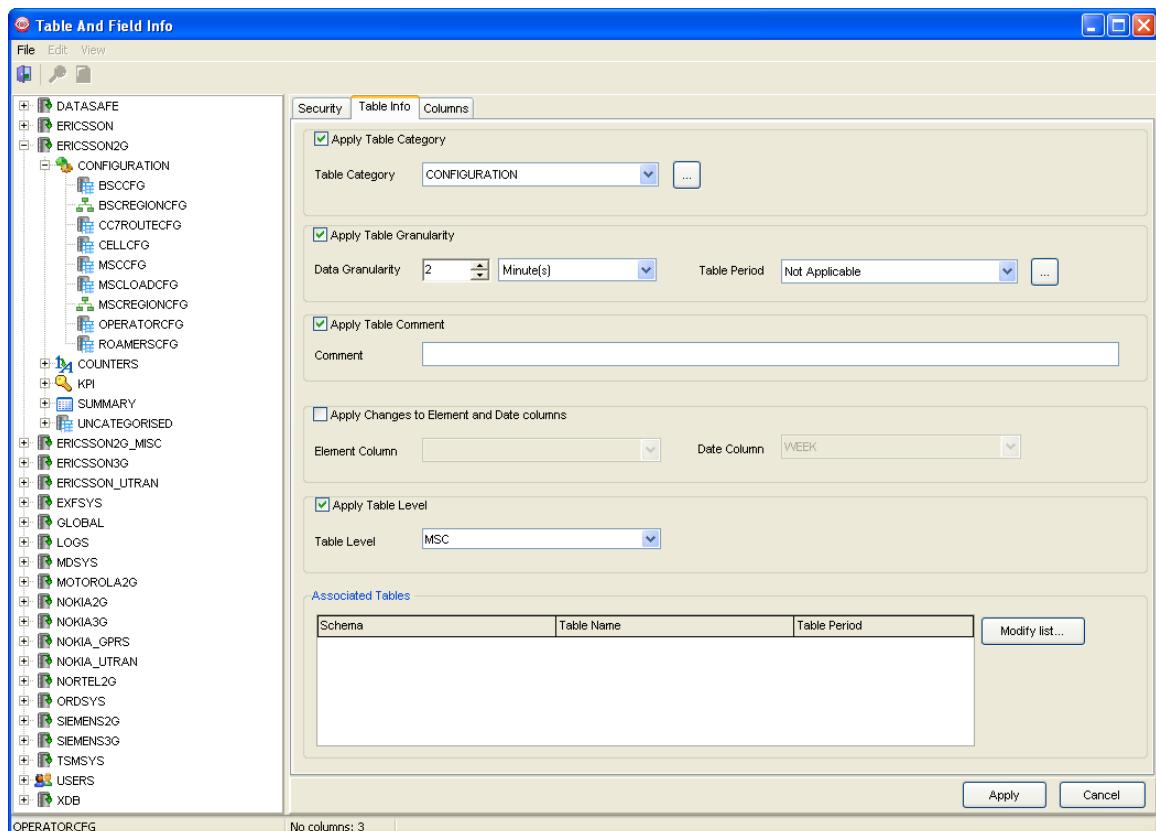


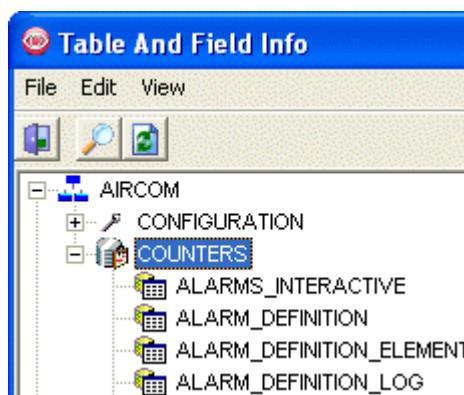
Table and Field Info dialog box.

7.5.1 Setting All Table and Field Information Settings Using the Settings Wizard

The Settings Wizard enables you to change permission, category and granularity period settings for one or more tables at the same time, rather than changing them individually.

To set table and field information settings:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select a table, category or schema:



This selection determines which tables will be available to configure in the Settings Wizard. For example, if you select a category or schema, then all of the underlying tables will be available.

- 3 From the Edit menu, click Change Settings.

- or -

Right-click the schema, category or table you selected and then, from the menu that appears, click Change Settings.

- 4 On the first page of the Settings Wizard, select the tables you want to use and then click Next.

If you want to select more than one table, hold down the Shift key and click the tables you want to select.

You cannot apply permissions to tables marked in red as these are internal tables. If your selection includes internal tables, you must unselect them otherwise you will not be able to apply permissions. You can still apply category and granularity period settings to internal tables.

- 5 On the Table Permission page, select:

- The group you want to apply permissions to
- Whether the permissions are to be reset, updated or removed

For more information about table permissions, see Setting Table Security on page 360.

- 6 Click Next.
- 7 On the Table Info Settings page, select:
 - The granularity period to be applied to all selected tables. For more information about granularity periods, see Setting the Granularity Period for a Single Table on page 361.
 - The category to be applied to all selected tables. For more information about categories, see Assigning a Category to a Table on page 361.
- 8 Click Next.
- 9 Click Finish to apply your settings and close the Settings Wizard.

7.5.2 Setting Table Security

In AIRCOM OPTIMA, you can configure security at the table level by using groups. For example, you can choose to allow a group of users access to certain tables.



You must create groups before you can assign them. For more information, see Creating Groups on page 312.

To set security for a table:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the table and click the Modify Groups button.

A list of available groups appears.



You cannot apply permissions to internal tables (marked in red). If you select an internal table, the Modify Groups button will be disabled.

- 3 Select the group(s) you want to have access to this table and use the > button to move them all to the Destination List at the same time.



Use the Shift and Ctrl keys to select more than one group at a time and use the >> button to add all the groups to the Destination List.

- 4 Click OK.
- 5 Click Apply to apply the group permissions to the table.
- 6 Click Yes to confirm.

7.5.3 Setting the Granularity Period for a Single Table

The granularity period is used by the Map View window to determine which is the nearest time stamp and therefore what data is returned. This means that you do not have to select the exact time stamp. For example, if you set the granularity period to 15 minutes, data for 13.00 will be displayed if you select 13.15.

You can set the granularity period for a single table or use the Settings Wizard to set the granularity period for all the tables in a category or schema. This is usually done once during the initial set-up.

To set the granularity period for a single table:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the table you want to set the granularity period for.
- 3 Click the Table Info tab.
- 4 Click the Apply Table Granularity checkbox and in the Period column, use the up and down arrows to select the number of periods.
- 5 Select a period type from the drop-down list.
- 6 If you want to assign a table period, select the table period you require from the drop-down list.
 - 💡 If you want to create a new table period, you can open the Table Properties dialog box by clicking the button  . For more information, see Creating and Editing Table Periods on page 370.
- 7 Click Apply.
- 8 Click Yes to confirm.

7.5.4 Assigning a Category to a Table

All database tables must be assigned a category to appear in the Data Explorer list of tables. When you create a new database table, a category is automatically assigned when you repopulate the Table and Field Info dialog box. For more information about repopulating tables, see Repopulating Data on page 365.

However, you can also manually assign a category to a table. To do this:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the table you want to set the category for.
- 3 Click the Table Info tab.
- 4 Click the Apply Table Category checkbox and select a category from the drop-down list.

 If you want to create a new category, you can open the Table Properties dialog box by clicking the button  . For more information, see Creating and Editing Categories on page 368.

- 5 Click Apply.
- 6 Click Yes to confirm.

For more information on categories, see About Categories on page 368.

7.5.5 Defining an Association for a Table

Associated tables associate a summary table/view with its source raw table and vice versa, and are used for:

- Synchronising table KPIs. For more information, see the AIRCOM OPTIMA User Reference Guide.
- Time aggregation. For more information, see the AIRCOM OPTIMA User Reference Guide.

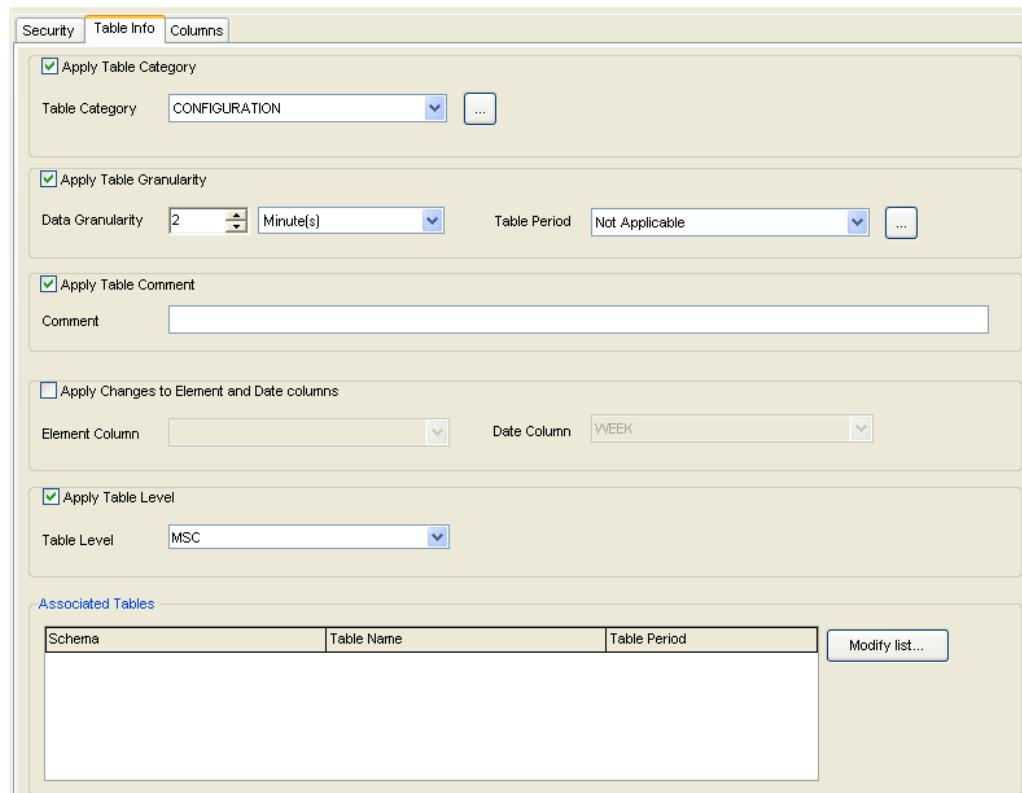
In AIRCOM OPTIMA, you can define associated tables in a number of ways:

- Generate associated tables when repopulating AIRCOM OPTIMA's data dictionary. For more information, see Generating Associated Tables Automatically on page 366.
- Manually define your own associations for a single table

To define associations manually:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the table to which you want to assign an associated table.
- 3 Click the Table Info tab.

This picture shows an example of the Table Info tab:



- 4 In the Associated Tables pane, click the Modify list button.
- 5 In the Table Selection dialog box that appears, select a schema from the Schema drop-down list.
- 6 Select the associated table(s) you want to assign to the selected table and use the > button to move them all to the Destination List at the same time.
 - Use the Shift and Ctrl keys to highlight more than one associated table at a time or use the >> button to add all the associated tables to the Destination List.
 - To add associated tables from more than one schema, repeat steps 5 and 6.
- 7 Click OK.
- 8 If you want to assign a table period for an associated table, click in the table's row and select the table period you require from the drop-down list. This picture shows an example:

Schema	Table Name	Table Period
ERICSSON2G	XXCELLSTATS24	Daily
ERICSSON2G	XXCELLSTATSBH24	15-Minutes
ERICSSON2G	XXCELLSTATSBHMO	30-Minutes
ERICSSON2G	XXCELLSTATSBHWK	Hourly
ERICSSON2G	XXCELLSTATSMO	Daily
ERICSSON2G	XXCELLSTATSWK	Weekly

- 9 Click Apply to save your changes.
- 10 Click Yes to confirm.

7.5.6 Adding a Comment to a Table

To add a comment to a table:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the table you want to add a comment to.
- 3 Click the Table Info tab.
- 4 Click the Apply Table Comment checkbox and type a comment in the Comment box.
- 5 Click Apply.
- 6 Click Yes to confirm.

7.5.7 Applying Changes to Element and Date Columns

To set the element and date columns at the table level:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the required table.
- 3 Click the Table Info tab.
- 4 Select the Apply Changes to Element and Date columns option.
- 5 From the Element Column drop-down list, select the element level for the selected table.

This will be used as the element level for that table throughout AIRCOM OPTIMA.

- 6 From the Date Column drop-down list, select the date level for the selected table.
This will be used as the date level for that table throughout AIRCOM OPTIMA.
- 7 Click Apply.
- 8 Click Yes to confirm.

7.5.8 Setting Table Level

To set the table level:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the required table.
- 3 Click the Table Info tab.
- 4 Select the Apply Table Level checkbox.
- 5 From the Table Level drop-down list, select the level of the selected table.
- 6 Click Apply.

- 7 Click Yes to confirm.



The KPIs of the table will only be displayed on the 2D Map View if you set the table to a CELL level.

7.5.9 Adding a Comment to a Column

To add a comment to a column in a table:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- 2 In the tree view of the Table and Field Info dialog box, select the table which contains the column you want to add a comment to.
- 3 Click the Column tab.
- 4 Find the relevant column in the list and click its Comments cell.
- 5 Type the comment you want to add and click Apply.
- 6 Click Yes to confirm.

7.5.10 Finding a Counter in the Table and Field Info Dialog Box

You can search the database tables for counters in the Table and Field Info dialog box in the same way you can in the Data Explorer. For information about how to do this, see the AIRCOM OPTIMA User Reference Guide.

7.5.11 Repopulating Data

In the Table and Field Info dialog box, you should repopulate data when tables or columns have been created or removed in the database, and you want to view these changes in the Table and Field Info dialog box and the Data Explorer.

To do this:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
- The Table and Field Info dialog box appears.
- 2 From the View menu, click Regenerate Table Info.
 - 3 From the dialog box that appears, choose to regenerate all table information or only the table information that has changed in the database by clicking the appropriate radio button.



If you choose to regenerate all table information, then the category and granularity period settings for all tables will be reset to the default values.

- 4 Click the Regenerate button.
- 5 Click Yes to confirm.

When you repopulate the Table and Field Info dialog box with new tables, category names are automatically assigned according to the naming convention for the table.

The following table describes the naming conventions:

Category	Convention
KPI	Tables beginning with V.
Summary	Tables beginning with XX.
Configuration	Hard-coded configuration tables.
Counters	All other tables.

For more information about categories, see [About Categories on page 368](#).

7.5.12 Generating Associated Tables Automatically

In AIRCOM OPTIMA, you can automatically create table associations based on the summary configuration tables in the database.



To do this, the summary configuration tables must be configured correctly

To generate associated tables automatically:

- 1 From the Administrator menu, point to Data Dictionary and click Table and Field Info.
The Table and Field Info dialog box appears.
- 2 From the View menu, click Regenerate Table Info.
- 3 From the dialog box that appears, choose to regenerate all table information or only the table information that has changed in the database by clicking the appropriate radio button.



If you choose to regenerate all table information, then the category and granularity period settings for all tables will be reset to the default values.

- 4 Click the Regenerate button.
- 5 Click Yes to confirm.



For more information on how the associated tables are created, see [How AIRCOM OPTIMA Generates Associated Tables on page 367](#).

7.5.12.1 How AIRCOM OPTIMA Generates Associated Tables

If you create associated tables using the Regenerate Table Info option in the Table and Field Info dialog box, the associated tables are generated as follows:

- An associated table is created for each pair of source and destination tables defined within the summary report.

For example, the (subhourly) raw table ERICSSON_GERAN.CELLSTATS will have the following associated tables generated:

- ERICSSON_GERAN.CELLSTATS_HR
- ERICSSON_GERAN.CELLSTATS_DY (this could be derived from the ERICSSON_GERAN.CELLSTATS_HR)
- ERICSSON_GERAN.CELLSTATS.BHDY
- Associated tables are also created for all of the other relationships within the hierarchy. This means that for the ERICSSON_GERAN.CELLSTATS example, the entire list of associations would be as follows (totalling 12 in all):

TABLE_NAME	ASSOCIATED_TABLE_NAME
ERICSSON_GERAN.CELLSTATS	ERICSSON_GERAN.CELLSTATS_HR
ERICSSON_GERAN.CELLSTATS	ERICSSON_GERAN.CELLSTATS_DY
ERICSSON_GERAN.CELLSTATS	ERICSSON_GERAN.CELLSTATS_BHDY
ERICSSON_GERAN.CELLSTATS_HR	ERICSSON_GERAN.CELLSTATS
ERICSSON_GERAN.CELLSTATS_HR	ERICSSON_GERAN.CELLSTATS_DY
ERICSSON_GERAN.CELLSTATS_HR	ERICSSON_GERAN.CELLSTATS_BHDY
ERICSSON_GERAN.CELLSTATS_DY	ERICSSON_GERAN.CELLSTATS
ERICSSON_GERAN.CELLSTATS_DY	ERICSSON_GERAN.CELLSTATS_HR
ERICSSON_GERAN.CELLSTATS_DY	ERICSSON_GERAN.CELLSTATS_BHDY
ERICSSON_GERAN.CELLSTATS_BHDY	ERICSSON_GERAN.CELLSTATS
ERICSSON_GERAN.CELLSTATS_BHDY	ERICSSON_GERAN.CELLSTATS_HR
ERICSSON_GERAN.CELLSTATS_BHDY	ERICSSON_GERAN.CELLSTATS_DY

7.5.13 About Categories

All the tables in the database are assigned a category. Categories are used to group tables in the Data Explorer. If a table does not have a category assigned to it, then it will not appear in the Data Explorer list of tables.

The categories can be manually assigned or automatically assigned when you repopulate the Table and Field Info dialog box. For more information about repopulating tables, see Repopulating Data on page 365.

AIRCOM OPTIMA has four default categories, which cannot be changed or deleted:

- Configuration
- Counters
- KPI
- Summary

However, if you are an OPTIMA_Administrator, you can create additional user-defined categories and then associate them with database tables.

7.5.13.1 Creating and Editing Categories

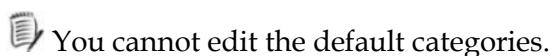
If you are an OPTIMA_Administrator, you can create additional user-defined categories and then associate them with database tables.

To create a category:

- 1 From the Administrator menu, point to Data Dictionary and then click Table Properties.
The Table Properties dialog box appears.
- 2 On the Table Categories tab, click Add.
- 3 In the Add Category dialog box, type a name and description for the category.
- 4 Click OK.
- 5 In the Table Properties dialog box, click Close.

To edit a user-defined category:

- 1 In the Table Properties dialog box, on the Table Categories tab:
 - Double-click the category that you want to edit.
- or -
 - Highlight the category that you want to edit, and then click Edit.
- 2 Edit the name and description as required.
- 3 Click OK.
- 4 In the Table Properties dialog box, click Close.



When you delete a category, you must reassign other categories to all the tables that were in the category you have deleted. If you do not assign other categories, the tables will not appear in the Data Explorer.

To delete a user-defined category:

- 1 In the Table Properties dialog box, on the Table Categories tab, highlight the category you want to delete.
 You cannot delete the default categories.
- 2 Click Remove.
- 3 Click OK to confirm the deletion.
- 4 In the Table Properties dialog box, click Close.

7.5.14 About Table Periods

All the tables in the database must be assigned a table period. For information about assigning time periods, see Setting the Granularity Period for a Single Table on page 361.

Table periods are used when running data queries with time aggregation. If a table does not have a period assigned to it, then it cannot be used for time aggregation. For more information about time aggregation, see the AIRCOM OPTIMA User Reference Guide.

AIRCOM OPTIMA comes pre-configured with several default table periods, for example, Hourly and Daily, and also a Not Applicable period for tables such as configuration tables that do not contain time-related data.

 The Not Applicable period cannot be changed or deleted.

OPTIMA_Administrators can use the Table Properties dialog box to add, edit and remove table periods. For more information, see Creating and Editing Table Periods on page 370.

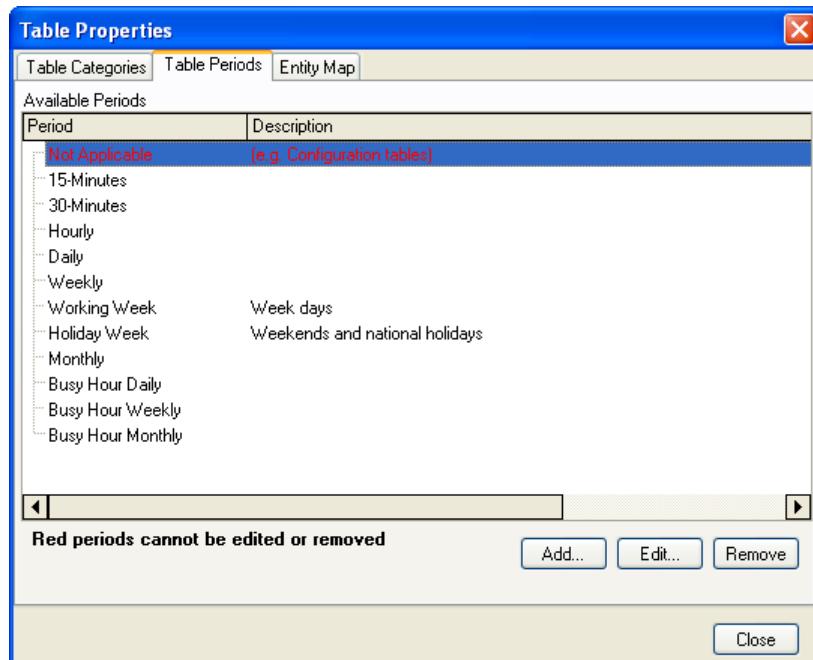
OPTIMA_Administrators can use the Table Properties dialog box to add, edit and remove entities. For more information, see Creating and Editing Entities on page 371.

To open the Table Properties dialog box:

- 1 From the Administrator menu, point to Data Dictionary and click Table Properties.

The Table Properties dialog box appears.

- 2 Click the Table Periods tab. This picture shows an example:



7.5.14.1 Creating and Editing Table Periods

If you are an OPTIMA_Administrator, you can create user-defined table periods and then assign those periods to database tables. For more information, see Setting the Granularity Period for a Single Table on page 361.

Creating a Table Period

To create a table period:

- 1 From the Administrator menu, point to Data Dictionary and then click Table Properties.
- The Table Properties dialog box appears.
- 2 On the Table Periods tab, click Add.
 - 3 In the Add Table Period dialog box, type a name and description for the table period.
 - 4 Click OK.
 - 5 In the Table Properties dialog box, click Close.

Editing a Table Period

To edit a user-defined table period:

- 1 In the Table Properties dialog box, on the Table Periods tab:
 - Double-click the table period.
 - or -
 - Highlight the table period you want to edit, and then click Edit.
- 2 Modify the name and description as required.
- 3 Click OK.
- 4 In the Table Properties dialog box, click Close.

Deleting a Table Period

To delete a user-defined table period:

- 1 In the Table Properties dialog box, on the Table Periods tab, highlight the table period you want to delete.
- 2 Click Remove.
- 3 Click OK to confirm the deletion.
- 4 In the Table Properties dialog box, click Close.

7.5.14.2 Creating and Editing Entities

The Entity Map tab of the Table Properties dialog box lists all the element types and their properties.

The following table describes the entity properties:

Property	Description
Entity Name	Name of the entity
Display Name	Display Name of the entity
Comment	Information about the entity
Physical	Indicates whether it is a physical or logical entity. 1: Logical 0: Physical
Priority	Priority of the entity in the network
Custom_K	Indicates if it is an AIRCOM created entity which cannot be edited or deleted 1: AIRCOM 0: User

To create an entity:

- 1 From the Administrator menu, point to Data Dictionary and then click Table Properties.

The Table Properties dialog box appears.

- 2 Click the Entity Map tab.

- 3 Click Add.

The Add entity dialog box appears.

- 4 In the Entity Name text box, type the name of the entity.

- 5 In the Display Name text box, type the display name for the entity.

- 6 Select the Entity Type as logical or physical.

- 7 In the Comment text box, type a comment for the entity.

When you add details of this new entity, it automatically appears in the Current Network Priority pane.

- 8 In the Current Network Priority pane, drag and drop the new entity at the level at which you want it to be used in the network.

- 9 Click Save.

This new entity is now visible in the list of entities and it is located at the same level at which you placed it in the Current Network Priority pane.

To edit an entity:

- 1 From the Administrator menu, point to Data Dictionary and then click Table Properties.

The Table Properties dialog box appears.

- 2 Click the Entity Map tab.

- 3 Double-click the entity that you want to edit.

- or -

Select the entity that you want to edit and click Edit.

- 4 In the dialog box that appears, make changes to the entity.

- 5 Click Save.

 You cannot edit or delete the entities which are shown in Red, as these have been created by AIRCOM.

To delete an entity:

- 1 From the Administrator menu, point to Data Dictionary and then click Table Properties.

The Table Properties dialog box appears.

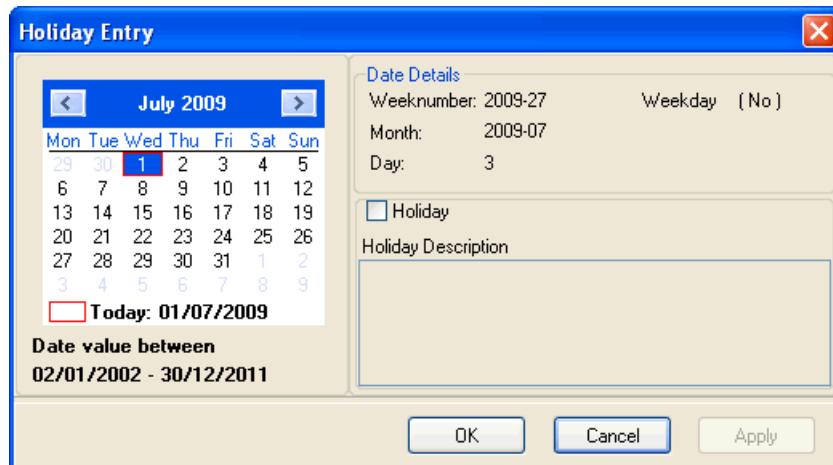
- 2 Click the Entity Map tab.

- 3 Select the entity that you want to delete and click Remove.

- 4 Click Yes to delete the entity.

7.6 Holiday Entry

AIRCOM OPTIMA enables you to exclude particular days, for example holidays, from reports. These days are specified in the Holiday Entry dialog box.



Holiday Entry dialog box

To add a day that you want to exclude from reports:

- 1 From the Administrator menu, point to Editors and click Holiday Entry.
- 2 In the dialog box that appears, select the date you wish to make a holiday.
- 3 Select the Holiday checkbox.
- 4 Type a description in the Holiday Description window then click Apply.
- 5 Click Yes if you want this holiday date to reoccur every year.
- 6 Click OK to close the dialog box.

7.6.1 Editing and Deleting Holidays

To edit a holiday:

- 1 From the Administrator menu, point to Editors and click Holiday Entry.
- 2 In the Holiday Entry dialog box, select the date.
- 3 Amend the information.
- 4 Click Apply.
- 5 Click OK to close the Holiday Entry dialog box and save the changes.

To delete a holiday:

- 1 In the Holiday Entry dialog box, select the date.
- 2 Clear the Holiday checkbox.
- 3 Click Apply and then click Yes to confirm.
- 4 Click OK to close the Holiday Entry dialog box and save the changes.

7.7 Setting Administrator Options

If you are an OPTIMA_Administrator, you can set the following global settings (which are not specific to a particular user):

Option Type	Description
General	Enables you to: <ul style="list-style-type: none">Choose to show Cancel dialog boxesSet the maximum tree size for a module hierarchyChoose to prompt users to save combination templates when closing a combinationChoose to select all elements for the selected counter in combination graphsSet AIRCOM OPTIMA client settingsDefine the WEBWIZARD URL from which users will access WEBWIZARD
Sandbox	Enables you to allocate individual quotas for your users to use space in the 'sandbox' environment, so that they can create sandbox views in the Data Explorer.
Partition Maintenance	Enables you to set retention periods (partition maintenance) for the partitioned tables in the database.

7.7.1 Setting General Administrator Options

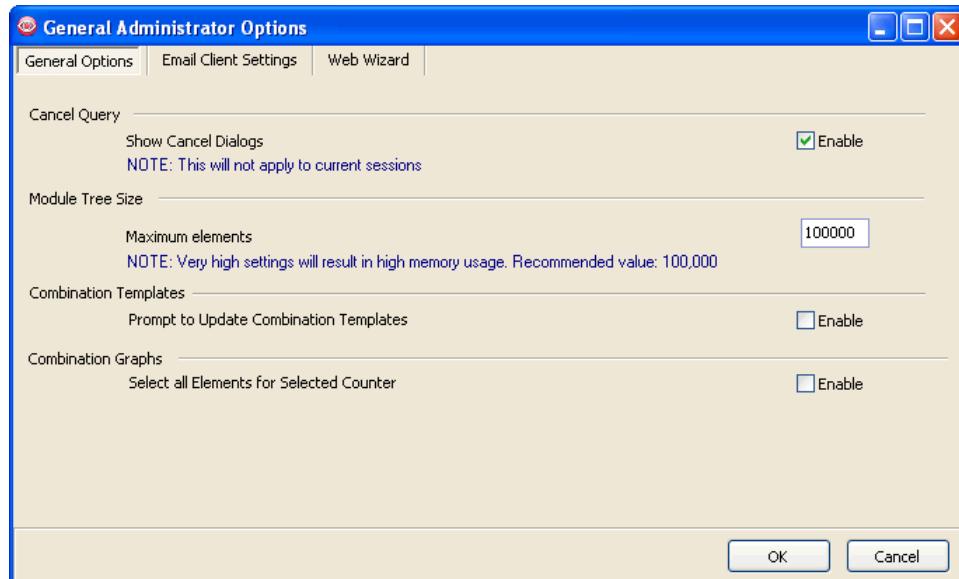
The General Administrator Options dialog box contains a number of the settings that an OPTIMA_Administrator can configure globally for users. These include:

- The connection details for the AIRCOM OPTIMA email client
- The URL for accessing WEBWIZARD
- Miscellaneous options, such as choosing to show Cancel dialog boxes when executing queries and setting a maximum number of nodes a module can display

To set general administrator options:

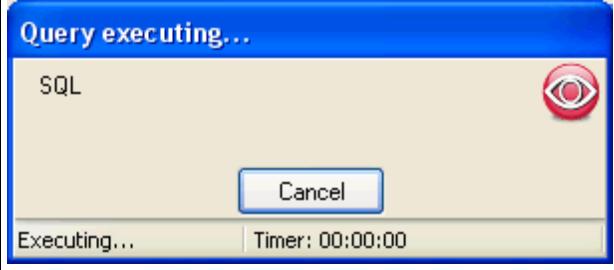
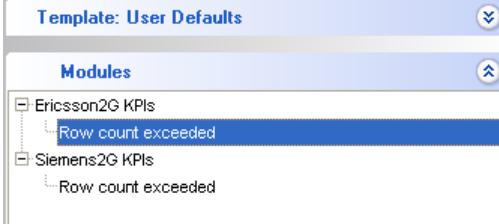
- From the Administrator menu, click General Options.

The General Administrator Options dialog box appears. This picture shows an example:



- Click the General Options tab.

- 3 On this tab, you can set the following options:

Item	Description
Cancel Query	<p>If you want to provide a Cancel dialog box to users when they execute a query, ensure that the Enable checkbox is selected.</p> <p>This picture shows an example Cancel dialog box:</p>  <p> It is recommended that you select this option.</p>
Module Tree Size	<p>In order to protect memory consumption, set the maximum number of nodes that a module can display. The higher the value, the larger the module size allowed, and therefore the larger the amount of memory that may be needed to run the module.</p> <p>If this number is exceeded, then the module tree will not load within a combination, and an error message is shown:</p>  <p> The recommended value is 100,000.</p>
Combination Templates	If you want to prompt users to update the combination template when they close a combination, select this option.
Combination Graphs	If you want to select all of the elements for a selected counter when showing combination graphs, select this option.

- 4 Click OK to save these settings.

For more information on how to set the connection details for the AIRCOM OPTIMA email client, see Setting Email Client Options on page 376.

For more information on defining the URL that will be used to access WEBWIZARD, see Setting WEBWIZARD Options on page 378.

7.7.2 Setting Email Client Options

In the General Administrator Options dialog box, on the Email Client Settings tab, you can define the email client.

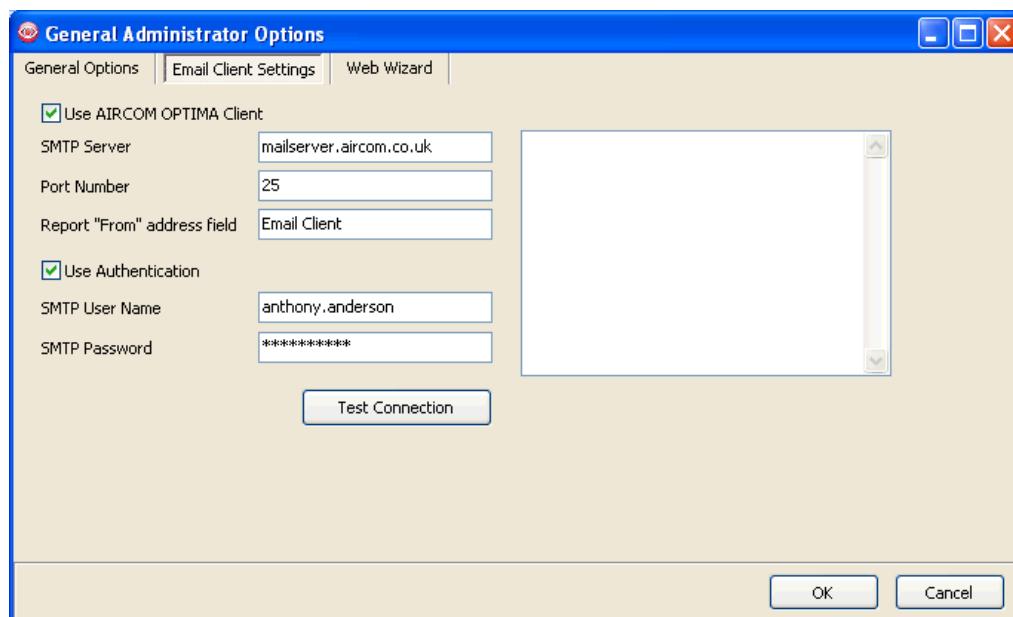
When you set this option, the client overrides your system's default mail client to use the email client settings when emailing reports.

 The Email Client Settings check will not run if the virus check on your system is blocking emails. Ensure that you turn off the virus check before you set the email client options.

To set the email client options:

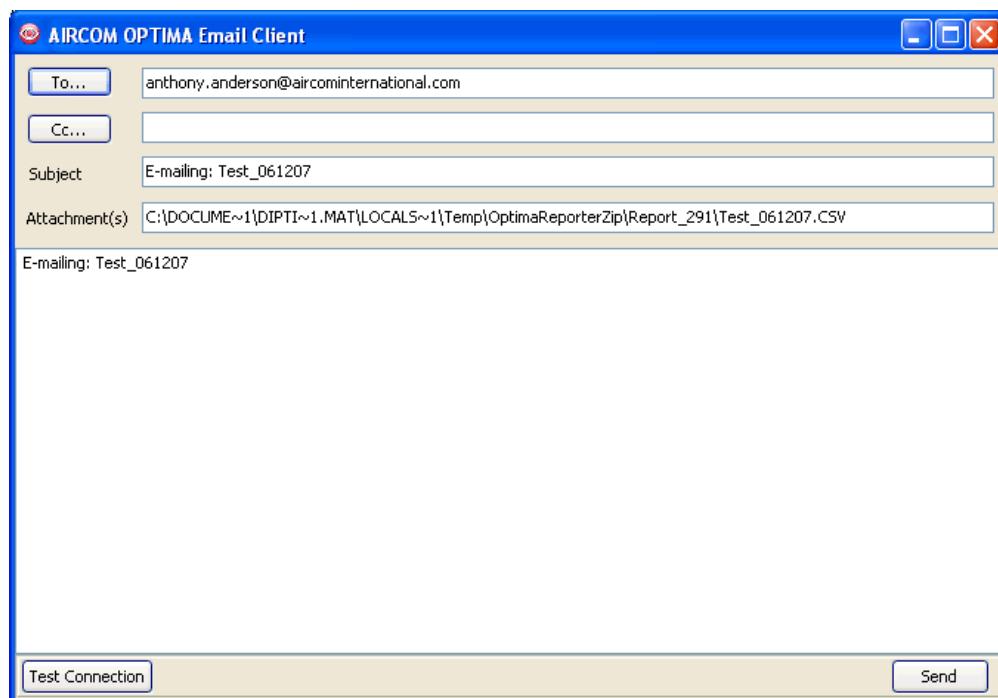
- 1 From the Administrator menu, click General Options.
- 2 In the General Administrator Options dialog box, click the Email Client Settings tab.

This picture shows an example:



- 3 Select the Use AIRCOM OPTIMA Client checkbox.
- 4 In the SMTP Server box, type the name of the SMTP server.
- 5 In the Port Number box, type the port number.
- 6 In the Report "From" address field box, type the name of the user from whose email ID the email will be sent.
- 7 If you want to use authentication, select this option, and then type the SMTP user name and password.
 -  If you want to check the connection to the email client, click Test Connection.
- 8 Click OK.

After you have set these options, this email client is displayed when you export a report to email:



Example of displayed email client



Tips:

- You can click To or Cc to open the Address Book to retrieve the email addresses.
- Once you have set your email address, click Test Connection to check your connection. When this succeeds, click Send to export the report via email.

7.7.3 Setting WEBWIZARD Options

In the General Administrator Options dialog box, on the Web Wizard tab, you can specify the URL from which users can access WEBWIZARD.

This bypasses the WEBWIZARD login, and automatically authenticates the user based on their AIRCOM OPTIMA login details. The URL must contain a number of components:

Item	Description
loginuser	The user name with which you want to log in. This user must already exist in WEBWIZARD.
password	The password associated with the loginuser. If you choose to encrypt the password, by setting the EncryptPW to 'true', it will be shown as a set of encrypted characters in the URL displayed in WEBWIZARD.
EncryptPW	Indicates whether the password is encrypted ('true') or not ('false').
favLink	The first instance is the name of the favourite that will be loaded. The second instance should be set to 'true'.
region	The name (and location) of the region that will be launched when WEBWIZARD is opened.
minEast	Define the initial extent of the region.
maxEast	 These parameters are optional. If they are not set, then WEBWIZARD loads the favourite with the extents that were defined when it was created.
minNorth	
maxNorth	
date	The date that will be applied to the GIS.
filter	The name of the filter that will be applied to the GIS.
layersOn	Indicates which layers are initially switched on, specified as a comma-separated list.
zoomFeatureId	The identity of a feature (for example, a cell) that will be zoomed into when the region is launched.
zoomLayerName	The name of the layer to which the zoomed-in feature belongs.
zoomFactor	Indicates by how much the feature will be zoomed into.
ShowExplorer	Indicates whether to show the WEBWIZARD Explorer tree ('true') or not ('false') when the region is launched.
GISMode	Indicates whether to launch the region in standard WEBWIZARD mode ('WW') or Virtual Earth mode ('VE').

This shows an example URL:

```
http://localhost/webwizard/logon.aspx?loginuser=demouser&password=d`feg&EncryptPW=true&favLink=select  
region.aspx^region=C:\Inetpub\wwwroot\WW62DEV\WebWizard\Published\UK  
LatLonVE\LYRX_UK.jpg|favLink=true|date=1/1/1-  
12:0:0|filter=All|layersOn=LYR2_UK_UMTSCells|zoomFeatureId=Cell1a|zoomLayerName=LYR2_UK_UMTSCells|ShowExplorer=false|zoomFactor=5|GISMode=VE
```

This URL would automatically login to WEBWIZARD as 'demouser', and launch the 'UK' region in Virtual Earth mode, zoomed into the feature 'Cell1a' (which is part of the 'UMTSCells' layer). The feature will also be highlighted.

7.7.4 Setting Sandbox Options

In the Sandbox Options dialog box, you can allocate individual space quotas for your users to use in the 'sandbox' environment, where they can create sandbox views in the Data Explorer. For more information, see the AIRCOM OPTIMA User Reference Guide.

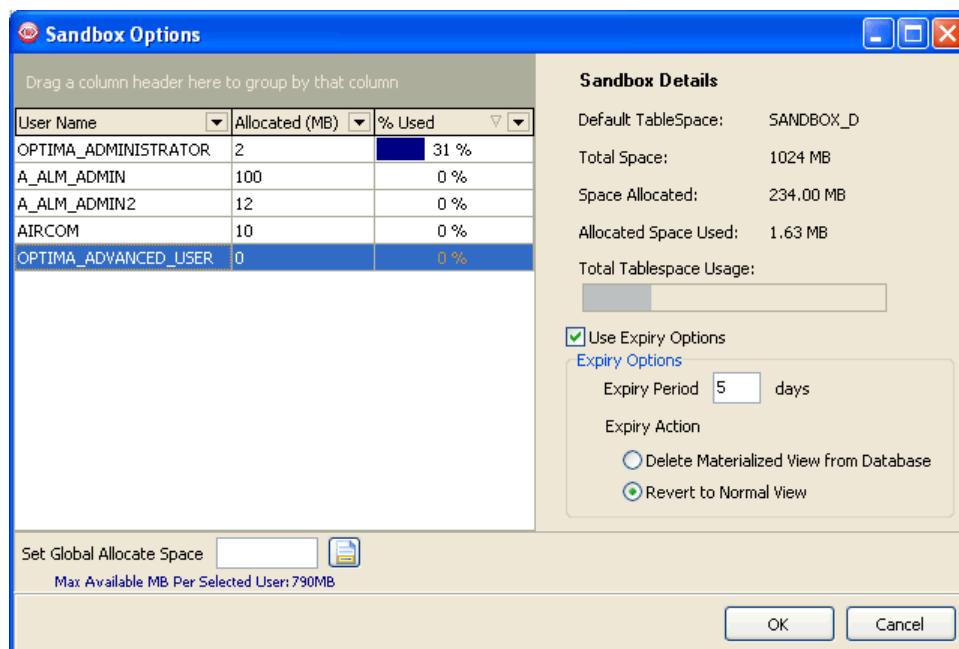
The Sandbox Options dialog box contains information on:

- Individual users' allocations and what percentage is used
- The sandbox as a whole, for example the total space available for all users

To view this information and define quotas for users:

- 1 From the Administrator menu, click Sandbox Options.

The Sandbox Options dialog box appears. This picture shows an example:

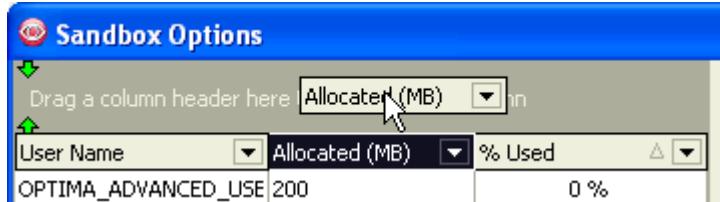


- 2 You can sort the user data in a number of different ways:
 - To sort the values in a particular column, click the column heading
 - To filter the values in a particular column, click the drop-down arrow in the column heading, and from the list that appears, select the required value:

The screenshot shows the 'Allocated (MB)' column header with a dropdown arrow. A context menu is open, listing options: '(All)', '(Custom...)', '0', '2', '10', '12', and '100'. The '10' option is currently selected.

User Name	Allocated (MB)	% Used
OPTIMA_ADMINISTRATOR	(All)	31 %
A_ALM_ADMIN	(Custom...)	0 %
A_ALM_ADMIN2	0	0 %
AIRCOM	2	0 %
OPTIMA_ADVANCED_USER	10	0 %
	12	0 %
	100	0 %

- To group the values by a particular column, drag the column heading into the grey area above the table:



- To re-order the columns, drag the column into the required position
- 3 To edit the space allocation for a particular user:
- In the left hand User Data grid, select the user.
 - Click in the corresponding Allocated (MB) column, type the new value, and then press Enter.

The % Used bar for that user is updated, along with the Sandbox Details pane. The Total Tablespace Usage bar of the Sandbox Details pane shows the total space allocated to users (marked in grey) and the amount of space actually used (marked in green).

This picture shows an example:



- If you want to set the same space allocation for more than one user:

- Click each user while holding down the Ctrl key
- In the Set Global Allocate Space box type the required allocation (up to the specified maximum value)
- Click the Apply button

- 4 If you want to set an expiry period for sandbox views, select the Use Expiry Options checkbox, and in the Expiry Period box, type the required number of days.
- 5 If you have chosen to set an expiry period, choose which action you want to take at the end of the expiry period:
- Delete the sandbox view from the database
 - Revert the sandbox view into a normal user view
- 6 Click OK to save these settings.

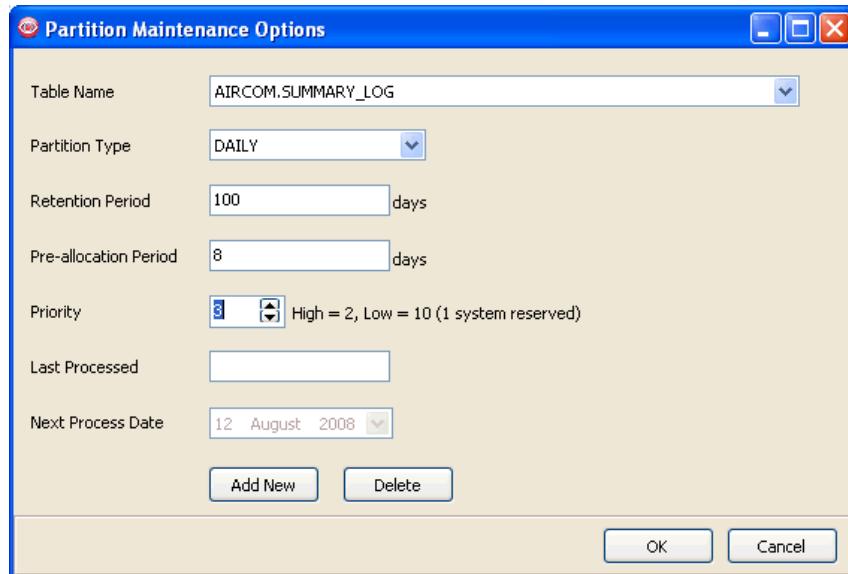
7.7.5 Setting Partition Maintenance Options

In the Partition Maintenance Options dialog box, you can set retention periods (partition maintenance) for the partitioned tables in the database.

To do this:

- 1 From the Administrator menu, click Partition Maintenance.

The Partition Maintenance Options dialog box appears. This picture shows an example:



To set a new retention period for a table:

- 1 Click the Add New button.
- 2 In the dialog box that appears, select the required table from the list, and click OK.
(Only tables which do not already have retention periods appear in this list.)
- 3 Set the Partition Type (Daily, Weekly and so on).
- 4 Set the Retention Period, that is, the number of partitions (backwards in time) that you want to save.
- 5 Set the Pre-allocation Period, that is, the number of partitions you want to plan ahead for.
- 6 Set the Priority number (2 is the highest, 10 is the lowest) which sets the partition maintenance priority.
- 7 If required, specify the Next Process Date.
- 8 Click OK.

To edit or view existing retention periods:

- 1 In the Table Name drop-down list of available partitioned tables, select the appropriate table.
- 2 Edit or view the values as required.
- 3 Click OK.

7.8 Session Summary Checklist

This checklist has been provided as a self-assessment of the objectives stated at the beginning of the session.

Please tick all objectives covered in this session.

- User administration
- Alarms
- Application database configuration
- Data dictionary
- Holiday entry
- Sandbox administration
- Data retention
- General options



Additional Notes:

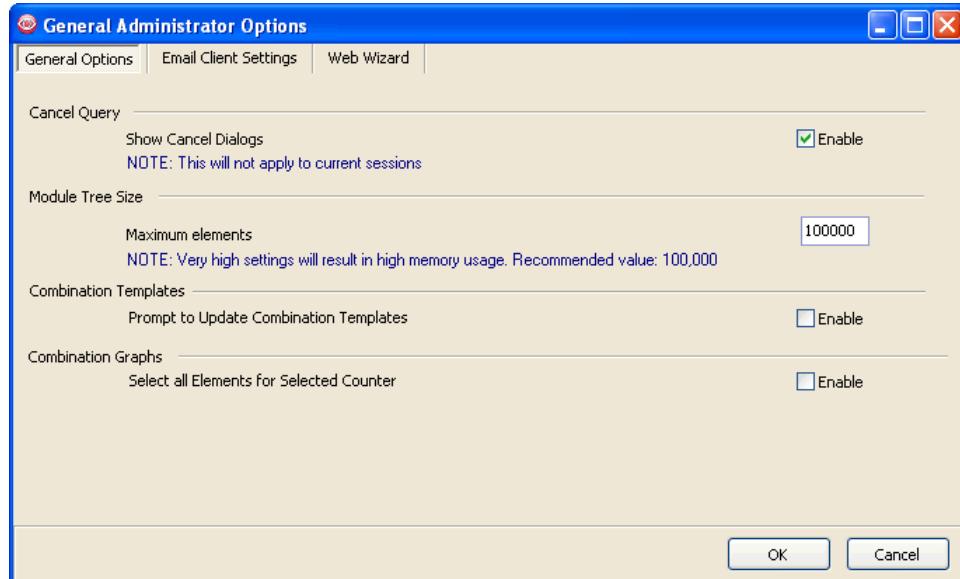
8 What's New in AIRCOM OPTIMA 6.2 for Administrators?

8.1 Reorganisation of Administrator Options

For version 6.2, the Administrator options have been reorganised into three different groups, which can all be accessed from the Administrator menu.

General Administrator Options

The General Options, Email Client Settings and Web Wizard tabs have all been moved onto the General Administrator Options dialog box:



To open the General Administrator Options dialog box, from the Administrator menu, click General Options.

If you are an OPTIMA_Administrator, you can set the following global settings (which are not specific to a particular user):

Option Type	Description
General	Enables you to: <ul style="list-style-type: none">• Choose to show Cancel dialog boxes• Set the maximum tree size for a module hierarchy• Choose to prompt users to save combination templates when closing a combination• Choose to select all elements for the selected counter in combination graphs• Set AIRCOM OPTIMA client settings• Define the WEBWIZARD URL from which users will access WEBWIZARD
Sandbox	Enables you to allocate individual quotas for your users to use space in the 'sandbox' environment, so that they can create sandbox views in the Data Explorer.
Partition Maintenance	Enables you to set retention periods (partition maintenance) for the partitioned tables in the database.

Sandbox Options

In the Sandbox Options dialog box, you can allocate individual space quotas for your users to use in the 'sandbox' environment, where they can create sandbox views in the Data Explorer. For more information, see Saving a Query as a Custom View in the Sandbox.

The Sandbox Options dialog box contains information on:

- Individual users' allocations and what percentage is used
- The sandbox as a whole, for example the total space available for all users

To open the Sandbox Options dialog box:

From the Administrator menu, click Sandbox Options.

Partition Maintenance Options

In the Partition Maintenance Options dialog box, you can set retention periods (partition maintenance) for the partitioned tables in the database.

To open the Partition Maintenance dialog box:

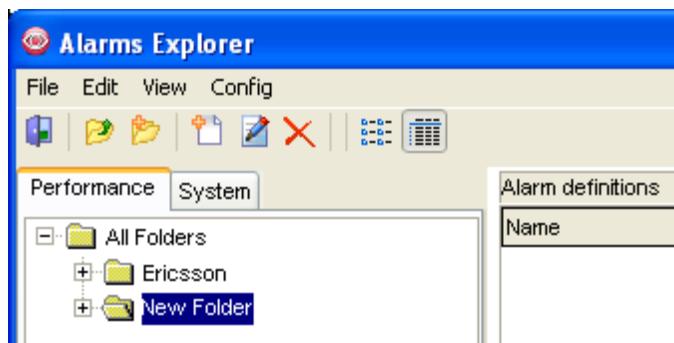
From the Administrator menu, click Partition Maintenance.

8.2 Alarms Enhancements

In AIRCOM OPTIMA, the alarms capabilities have been enhanced so that you can now use three different types of alarm:

Alarm Type	Description
Performance	<p>Performance alarms enable you to set network counter thresholds or key performance indicators (KPIs) and then receive alerts whenever network conditions are not met. Network data is processed, at user defined intervals, by AIRCOM OPTIMA. This data is stored in database tables in the form of counters. Ripple counts are used to define the threshold conditions for setting or clearing alarms.</p> <p>The information from these alarms can be:</p> <ul style="list-style-type: none">• Queries in modules and reports• Viewed in the Alarms Explorer• Passed on to a fault management system
System	System alarms are alarms raised on AIRCOM OPTIMA events, not performance data events.
Threshold Crossing Alert (TCA)	TCAs are loader-specific alarms, which are raised as data is loaded into the AIRCOM OPTIMA database using the Loader. They indicate a discrepancy between the expected values according to the defined thresholds and the data loaded into the database after any modification during the loading process.

In the Alarms Explorer, you can define performance and system alarms:



Performance and System tabs in the Alarms Explorer

You can define performance alarms using the Alarms Wizard, and you can define performance and system alarms using the Alarms Editor.

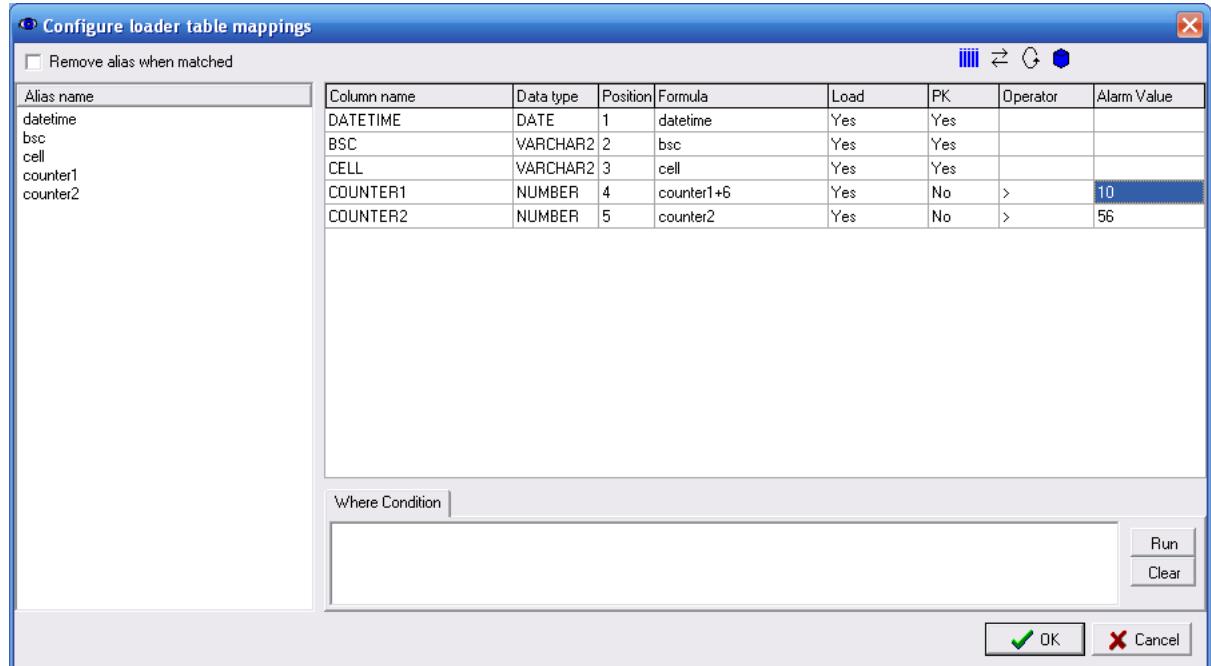
In the Alarm Handler Explorer, you can define handlers for performance alarms, system alarms, and TCAs:



Performance alarms, system alarms and TCAs in the Alarms Handler Explorer

You can define TCAs when you configure the Loader in the AIRCOM OPTIMA back end.

In the Configure loader table mappings dialog box (which you can open from the the Table Settings tab of the loader report), you can define the TCAs to monitor the value of particular columns, and signal if the loaded values are incorrect:



Defining TCAs in the Loader Table Mappings dialog box

In this example, TCAs have been set to trigger if the loaded value of COUNTER1 is greater than 10, and/or the value of COUNTER2 is greater than 56.

On the Table Settings tab of the loader report, you can select to enable any TCAs that have been created, choose at what severity they should be raised, and choose to send TCA notifications by SNMP:

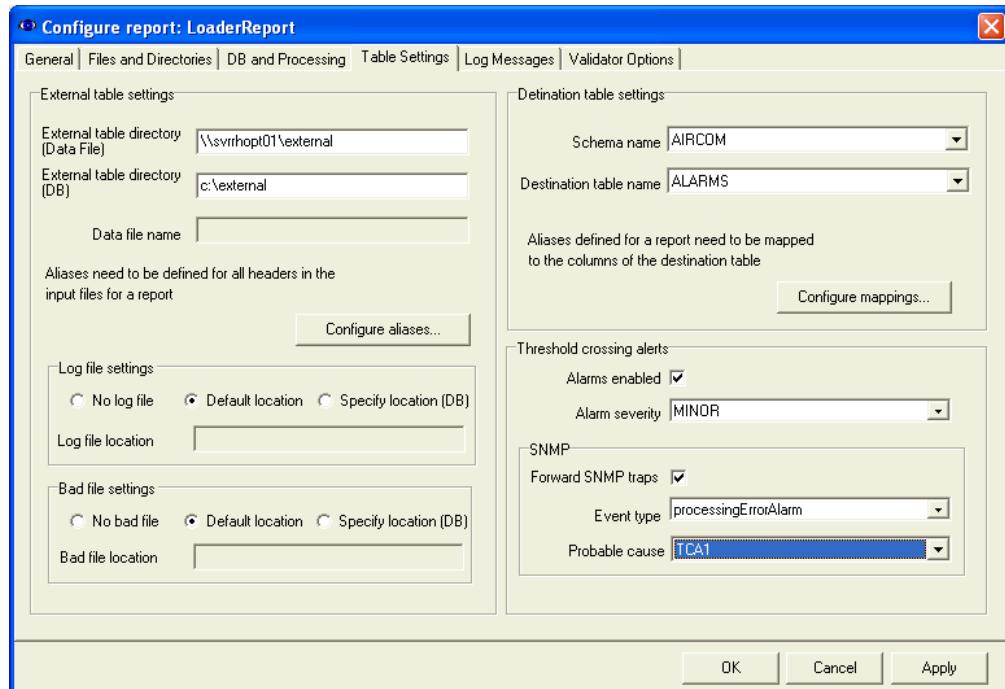


Table Settings options for TCAs

8.3 Additional Roles for AIRCOM OPTIMA Users

A number of additional roles have been defined for AIRCOM OPTIMA users, which provides you with greater control over the activities of users who are logged into AIRCOM OPTIMA.

Two new roles have been created, in addition to the current OPTIMA_Administrator, OPTIMA_Advanced_User and OPTIMA_User:

Role	Description
User_Administrator	User_Administrators can add, edit and delete new OPTIMA_Advanced_Users, OPTIMA_Users and groups. User_Administrators have no other permissions.
Alarm_Administrator	Alarm_Administrators can add, edit and delete performance alarms and performance alarm handlers. Otherwise, all permissions are identical to those of an OPTIMA_Advanced_User.

8.4 AIRCOM OPTIMA Back End Enhancements

This section describes the improvements to the AIRCOM OPTIMA back end that have been made for 6.2.

8.4.1 Password Encryption

Password encryption has been added for all programs that have the password stored in the ini file. Previously, passwords were not encrypted in any way and were stored in plain text form within the ini file.

The AIRCOM OPTIMA Installation Tool (OIT) and Loader GUI now automatically create ini files with encrypted passwords.

For existing/legacy ini files, or those that are created manually, the command line executable 'OPXCRYPT' can now be used to encrypt the passwords.

The command syntax for 'OPXCRYPT' is:

```
OPXCRYPT.exe [[[ -f File] or [-d Path]] [-r Recursive] [-t Tag]]  
or [-v]
```

Where

-f File	Is a single, defined file containing the password to be encrypted. The filename defined can be a wildcard (for Windows) or a regular expression (for UNIX) - for example, *.ini.
-d Path	Is the directory containing the *.ini files containing the passwords to be encrypted. If the directory is not defined, then the current directory will be used by default.
-r Recursive	Is an optional tag, indicating that opxcrypt should also look for ini files in all sub-directories of the defined directory.
-t Tag	Is an optional parameter, used to locate the password in the file. You should only use this if the password parameter is called something other than 'Password' - for example, 'remotePass'.
-v	Is the print version string. This overrides all other command line parameters.

 The syntax supports comma-separated values, for cases where there are multiple IP addresses/passwords. During encryption, the comma is only ever used as a separator - it is excluded from the character set available for encoding purposes in order to avoid erroneously splitting whole passwords.

'OPXCRYPT' is available on a number of supported AIRCOM OPTIMA Mediation Server platforms, including Windows XP (32-bit), HP-UX Titanium and Linux Redhat Enterprise Server 4.

 It is not currently available for Sun Solaris 8.

This table shows the full list of supported applications:

Application Name	Encrypted Element in the INI File	Manual Encryption Required?	Configuration UI Name
Alarms Notifier	Password, SMSC_Password	No	Alarms Notifier
Alarms Processor	Password	Yes	N/A
FTP	remotePass	Yes	N/A
Loader	Password	No	Loader GUI, OIT
Report Scheduler	Password	No	Report configuration tool
SNMP Poller	CommunityRead	No	SNMP Poller configuration tool
WEBWIZARD	Password	No	AIRCOM OPTIMA frontend

For those applications where manual encryption is required, you need to use OPXCRYPT to encrypt the listed element.

The OIT encrypts the Oracle connection to the OSS_DICTIONARY and AIRCOM in the project file. If you update the two passwords in the Database Connection section of the Project Parameters form, they will be encrypted automatically when Loader ini files are created.

 Password encryption for WEBWIZARD works slightly differently. It is invoked in the AIRCOM OPTIMA frontend, and passes a Hex encryption of the password as part of the WEBWIZARD URL.

AIRCOM OPTIMA will perform internal decryption at the latest point possible prior to connection, in order to maximise security and ensure that the decrypted password is not available for any longer than it needs to be.

8.4.2 PRID Limit and Interface Support

PRID Limit

PRIDs (Program IDs) have had their upper limit extended, by making the INSTID component alphanumeric, rather than just numeric.

This means that it can support more than 999 instances in a backend application.

If you are upgrading from a version older than 6.2, any existing INSTIDs will not be updated but any new INSTIDs will be calculated by using the next available alphanumeric ID.

PRID Interface Support

The PRID definition has now changed. Rather than representing the Machine ID, the first three numbers of the PRID represent the Interface ID, and are a unique identifier for the particular interface. This means that the same process can be run on different machines, without changing the configuration each time.

The Machine ID is now stored separately, as the host name. The host name is read by AIRCOM OPTIMA and used in a number of places:

- A number of file names have been modified to include the host name:

File Type	New Name
Log	<hostname>_<exename>_<PRID>_<date>.log
Monitor	<hostname>_<exename>_<PRID>.pid
Temporary	<hostname>_<exename>_<PRIDn>.tmp

- The host name and PRID are both written to log file messages
- The host name environment variable and PRID are used in monitor files to associate it to a program instance



The functionality to read the hostname environment variable rather than the MachineID in the PRID is not backwards compatible. Therefore if you have a 6.2 version of the Process Monitor, you must ensure that all of the applications that you are monitoring have been upgraded to version 6.2 as well. However, if you are still using a pre-6.2 version of the Process Monitor, you do not have to (but can) upgrade the backend applications that you are monitoring to 6.2.

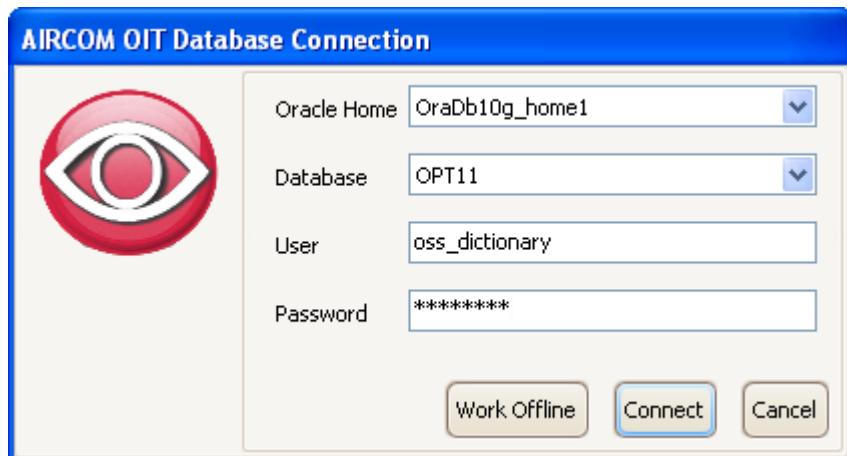
8.4.3 Improved AIRCOM OPTIMA Installation Tool

An enhanced version of the AIRCOM OPTIMA Installation Tool has been developed, containing the following new features.

8.4.3.1 Multiple User Support/Deployment Ease

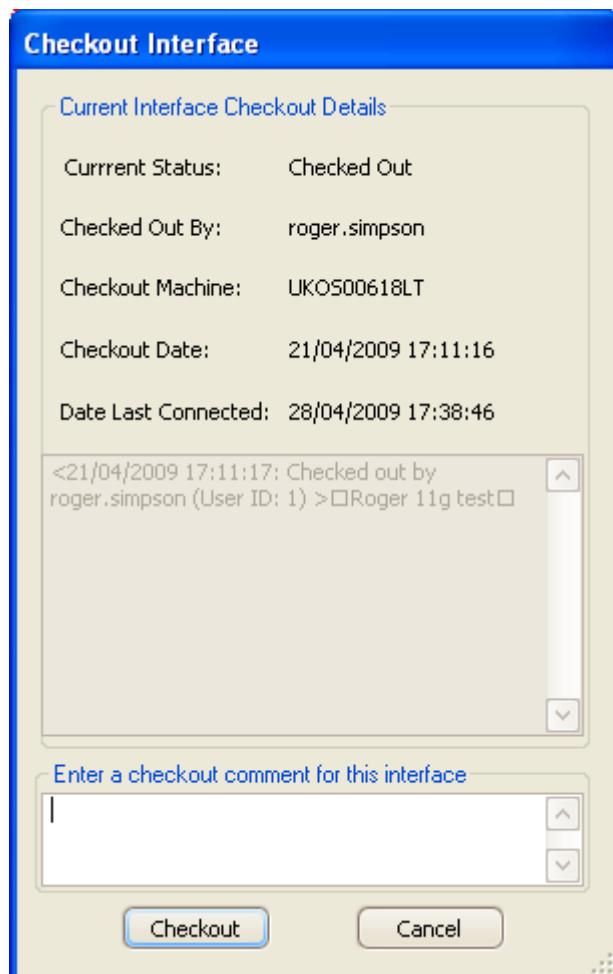
In order to make deployment easier, the AIRCOM OPTIMA Installation Tool now supports multiple users in a number of ways:

- There is no longer a single project file, and instead multiple users can connect to the OSS_DICTIONARY schema, and upload and activate interface templates at the same time.



- Multiple users can now upload and activate multiple interfaces into one AIRCOM OPTIMA system. Each interface can be uploaded from different locations by different users at the same time.
- Users can check-out templates in order to implement changes. The interface to which the template belongs is assigned to a particular user and marked as 'checked out':
 - Interfaces are marked as green if they are checked out to you:
A screenshot of a tree view labeled 'Interfaces'. A folder named 'ERICSSON_UTRAN_UMTS_GENERIC_PM(jonathan.buckmaster@UKDC247DT)' is highlighted in green.
 - Red if they are checked out to another user:
A screenshot of a tree view labeled 'Interfaces'. A folder named 'ERICSSON_UTRAN_UMTS_GENERIC_PM(clive.gregory@UKSW00389DT)' is highlighted in red.
 - Black if no-one has them checked out:
A screenshot of a tree view labeled 'Interfaces'. A folder named 'ERICSSON_UTRAN_UMTS_GENERIC_PM' is highlighted in black.

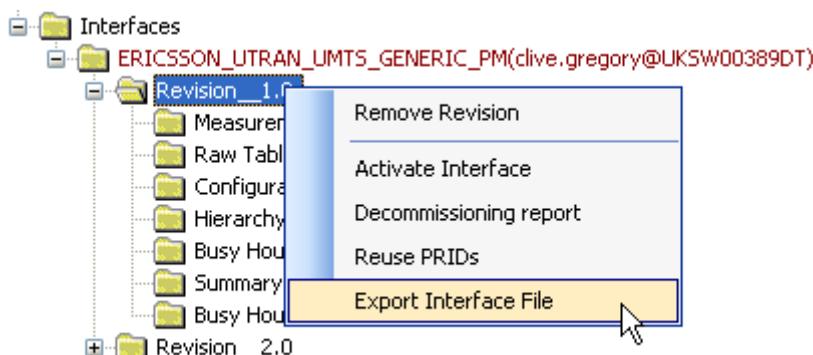
If another user wants to activate or change that template, they must 'check out' the interface to themselves, using the Checkout Interface dialog box:



Users can also check templates back in, so that they can be made available to other users, by right-clicking and selecting Check in.

8.4.3.2 Exporting Revisions of Excel Templates

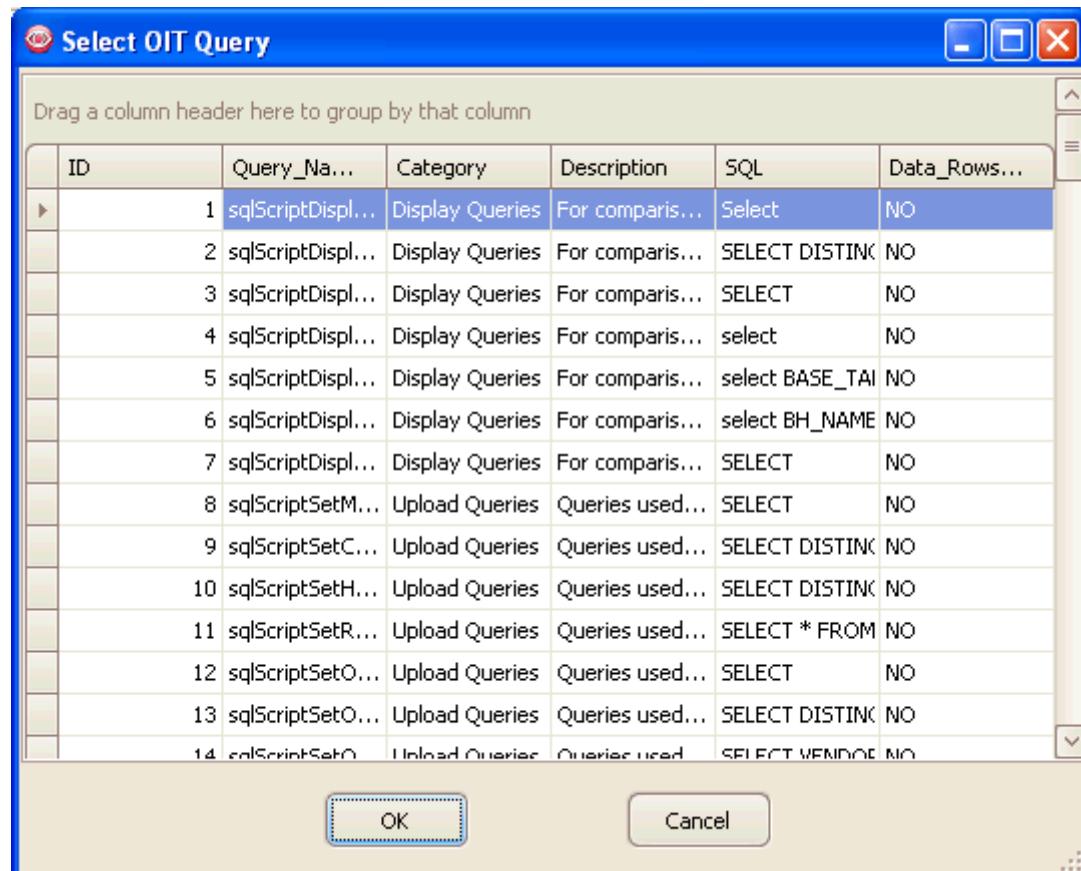
All revisions of Excel templates are stored, and copies of these can be exported out of the OIT for viewing and editing locally elsewhere for subsequent upload and activation.



Exporting a revision of an Excel template

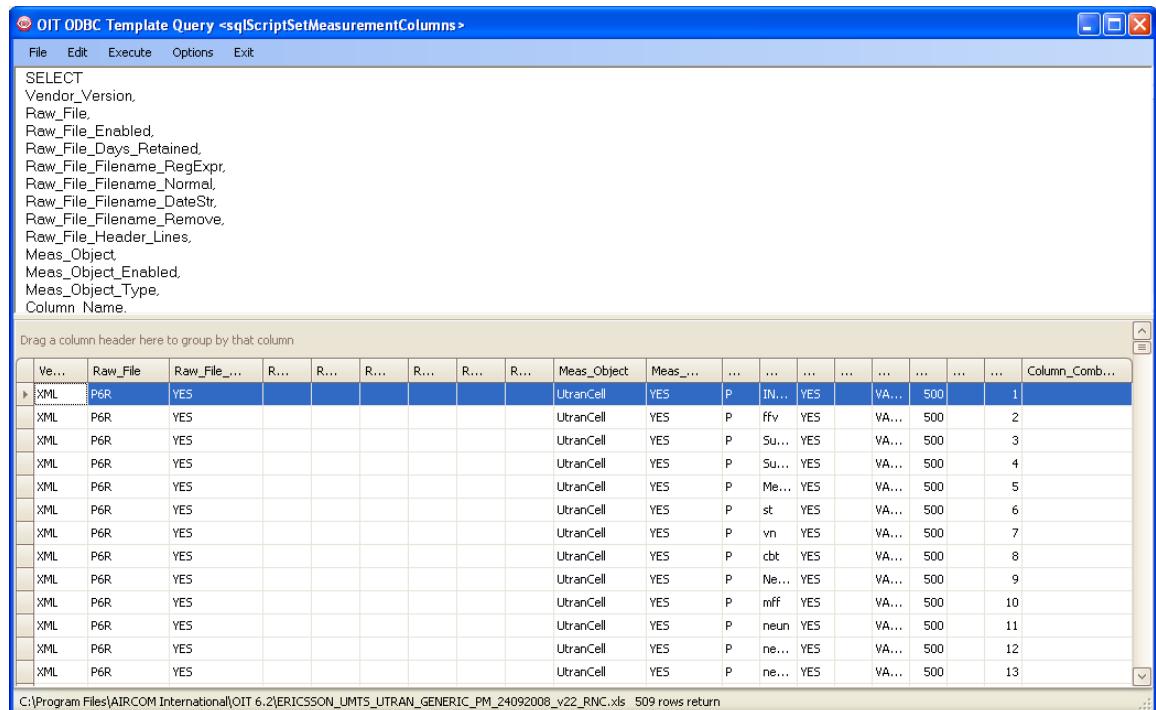
8.4.3.3 Querying Templates

As well as validating templates, which checks for any syntax/code errors in the template, you can now query templates as well.



Selecting an OIT query within a template to test

Querying a template effectively creates a simulated version of the activated template in the production environment. When the template is queried, the returned results are displayed:



The screenshot shows the 'OIT ODBC Template Query <sqlScriptSetMeasurementColumns>' window. The top menu bar includes File, Edit, Execute, Options, and Exit. The main area contains a SQL query and a data grid.

```
SELECT
Vendor_Version,
Raw_File,
Raw_File_Enabled,
Raw_File_Days_Retained,
Raw_File_Filename_RegExpr,
Raw_File_Filename_Normal,
Raw_File_Filename_DateStr,
Raw_File_Filename_Remove,
Raw_File_Header_Lines,
Meas_Object,
Meas_Object_Enabled,
Meas_Object_Type,
Column_Name.
```

The data grid has columns: Ve..., Raw_File, Raw_File_..., R..., R..., R..., R..., Meas_Object, Meas_..., ... (repeated 10 times), Column_Comb... . The first row is highlighted in blue. The bottom status bar shows the path C:\Program Files\AIRCOM International\OIT 6.2\ERICSSON_UMTS_UTRAN_GENERIC_PM_24092008_v22_RNC.xls and the message 509 rows return.

Results from querying a template

 If you are testing a validation query, results will only be returned where there are errors. If data is validated correctly, then nothing will appear in the bottom pane.

If there are any errors, you can modify the query in the top pane, and then re-run the query.

8.4.3.4 Interface Naming Convention

The interface naming convention has changed slightly. It is now:

vendor_domain_sub-domain_portal_technology

(The vendor schema naming convention is vendor_technology).

8.4.3.5 Performance Enhancements

Performance has improved; for example, the activation tree displays information more quickly than in previous versions.

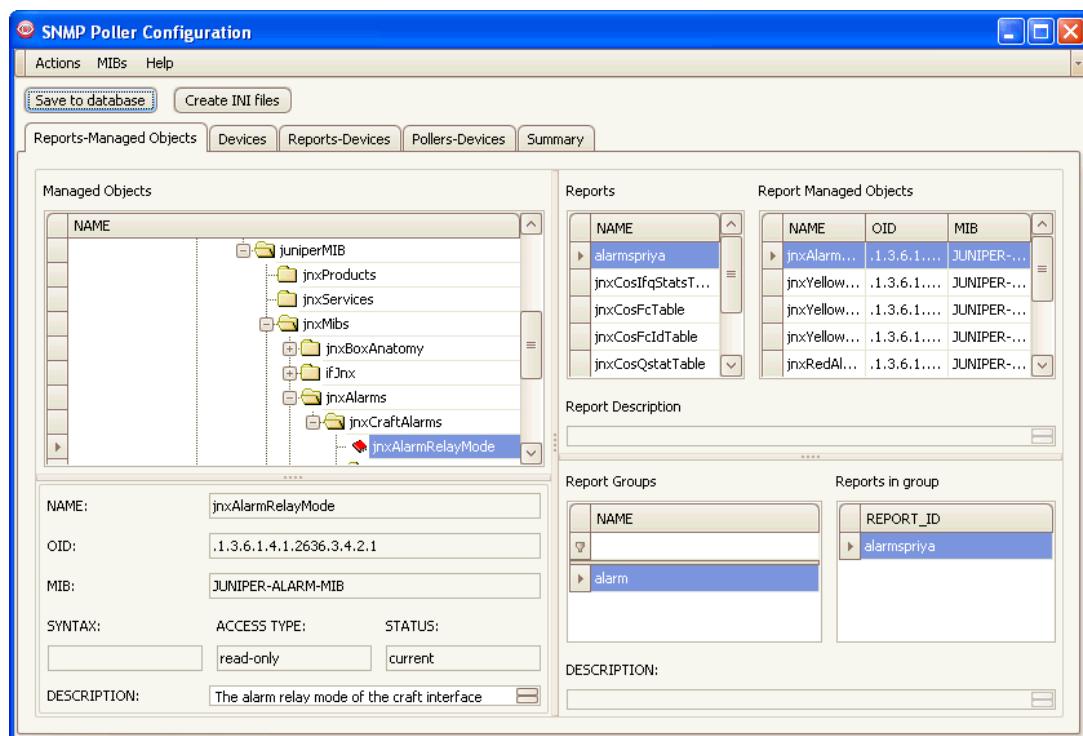
8.4.4 Data Quality - Performance Improvements and Sub-Daily Processing

As part of the requirements to improve the performance of data quality, the 'Availability', 'Completeness', 'Last Load' and 'Nullness' queries need to be tuned:

- The 'Availability' query calculates the percentage of elements which are completely missing for a day.
- The 'Completeness' query calculates the percentage of available data for the period loaded. This does not include data which is not present at all. For data that is present it gives an idea of missing entries each day.
- The 'Last Load' query provides the last date that a table was loaded (in other words, the maximum date of the table).
- The 'Nullness' query calculates the number of null entries in the table for a day, for a specified list of columns.

8.4.5 New SNMP Poller GUI

A new user interface has been developed, which enables you to configure the SNMP Poller quickly and easily:



SNMP Poller Configuration dialog box

You can use the Configuration GUI to perform a number of tasks:

- Load managed objects, and create reports that define which managed objects will be reported on
- Define the devices (agents) that will be polled - by either defining them manually, or searching for existing devices and loading their details into the SNMP Poller GUI
- Choose which devices will be reported on in each report
- Assign the devices to particular machines from which you want to poll the data
- Generate an ini file of these settings

8.4.6 Directory File Limit

A large number of the backend components have been enhanced to limit the number of output files created in each output (sub) folder.

The file limit is configurable in the ini file, using a series of new parameters:

Parameter	Description
UseFolderFileLimit	Indicates whether the folder file limit should be used (1) or not (0).
FolderFileLimit	The maximum number of output files that will be created in each output folder. This is set at 10,000 by default.
minimumFolderFileLimit	The minimum number of output files per folder that will be accepted. If the user sets the <code>FolderFileLimit</code> to be less than this, the application will not run. This is set as a read-only value of 100.
maximumFolderFileLimit	The maximum number of output files per folder that will be accepted. If the user sets the <code>FolderFileLimit</code> to be more than this, the application will not run. This is set as a read-only value of 100,000.

 Depending on the number of files that you are processing, the lower the file limit, the more output sub-folders that will be created. This can have a significant impact on performance, so you should ensure that if you do need to change the default, you do not set the number too low.

These parameters are stored in a different section of the ini file depending on the backend component:

- For the FTP, they are in the FILENAME PARAMETERS section
- For the CMB, they are in the GENERAL section
- For all other affected components, they are the MAIN section

 The limit can be set to a maximum of 100,000 on Windows and 500,000 on UNIX/Sun.

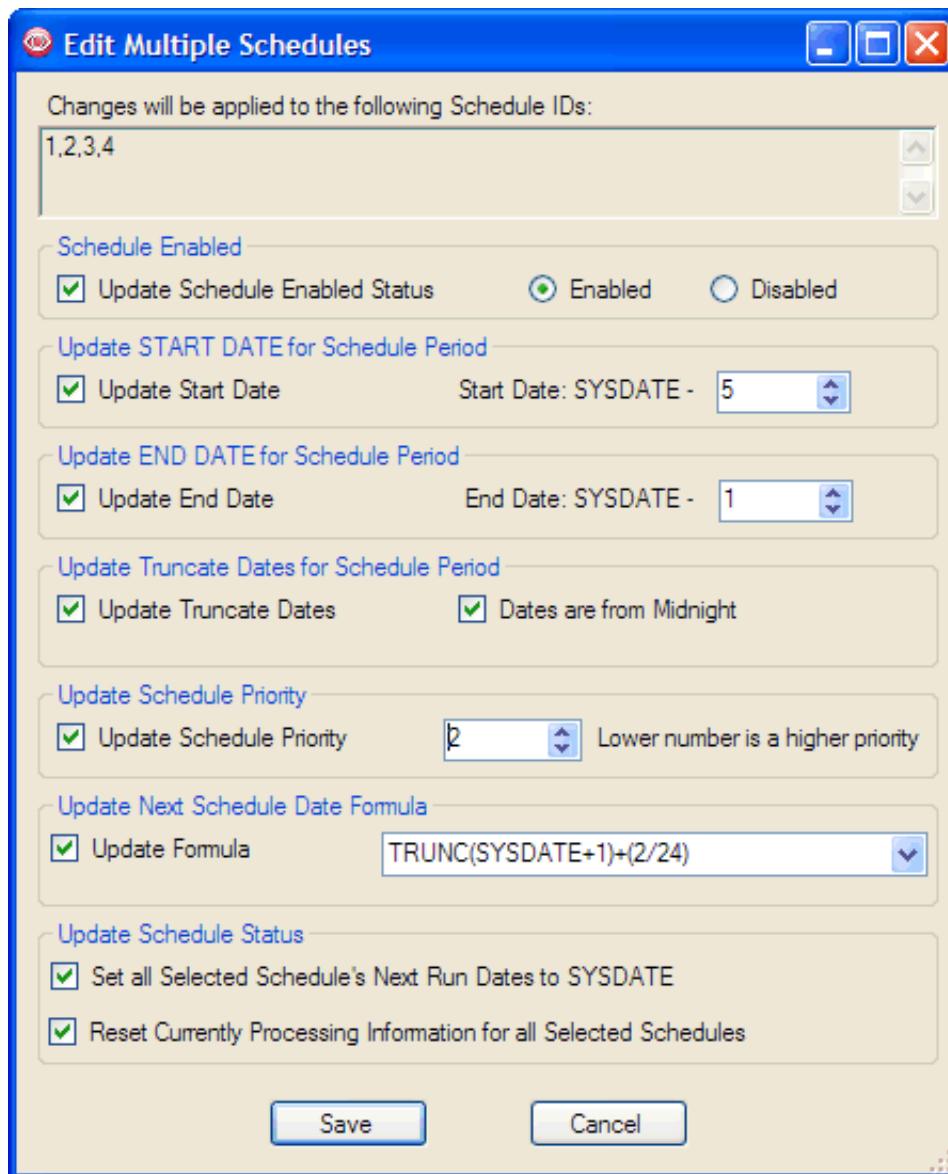
The files are loaded in availability order, in other words, a file available 10 minutes ago will be loaded before a file available 5 minutes ago.

8.4.7 Editing Multiple Report Schedules in the Summary GUI

As well as editing individual report schedules, you can also edit multiple report schedules simultaneously. To do this:

- 4 Select the report schedules that you want to edit.
- 5 Click the Edit Multiple Schedules button .

The Edit Multiple Schedules dialog box appears:



- 6 Change the details of the schedules as required. The parameters are the same as those for individual schedules, although a few have slightly different names; for example, the 'Set all Selected Schedule's Next Run Dates to SYSDATE' option is a checkbox rather than a 'Set To SYSDATE' button.
- 7 When you have made the required changes, click Save.

8.4.8 Using AIRCOM OPTIMA Across Multiple Time Zones

If your network is spread across more than one time zone, the associated time zone difference can cause discrepancies in any AIRCOM OPTIMA application which handles data - particularly, report scheduling and summary.

For example, you may be running a daily network summary that covers a network across multiple time zones. If the last hour of data from the farthest part of the network is 5 hours behind the rest of the network, there will be a delay of 5 hours on the summary. This in turn will affect the schedule.

If time zone support is not used and the client and database machines are in different time zones, there could be ambiguity in scheduled time.

You may also have network elements that have child nodes that span time zones - for example, MSCs with BSCs in regions that have different time zones. If time zone support is not used, this could cause problems because there would be data from two different time zones coming in - for example, 9am ET (Eastern Time) is 8am CT (Central Time). This means that if the BH is summarised at 9am, it would not be truly representative of the elements in both time zones.

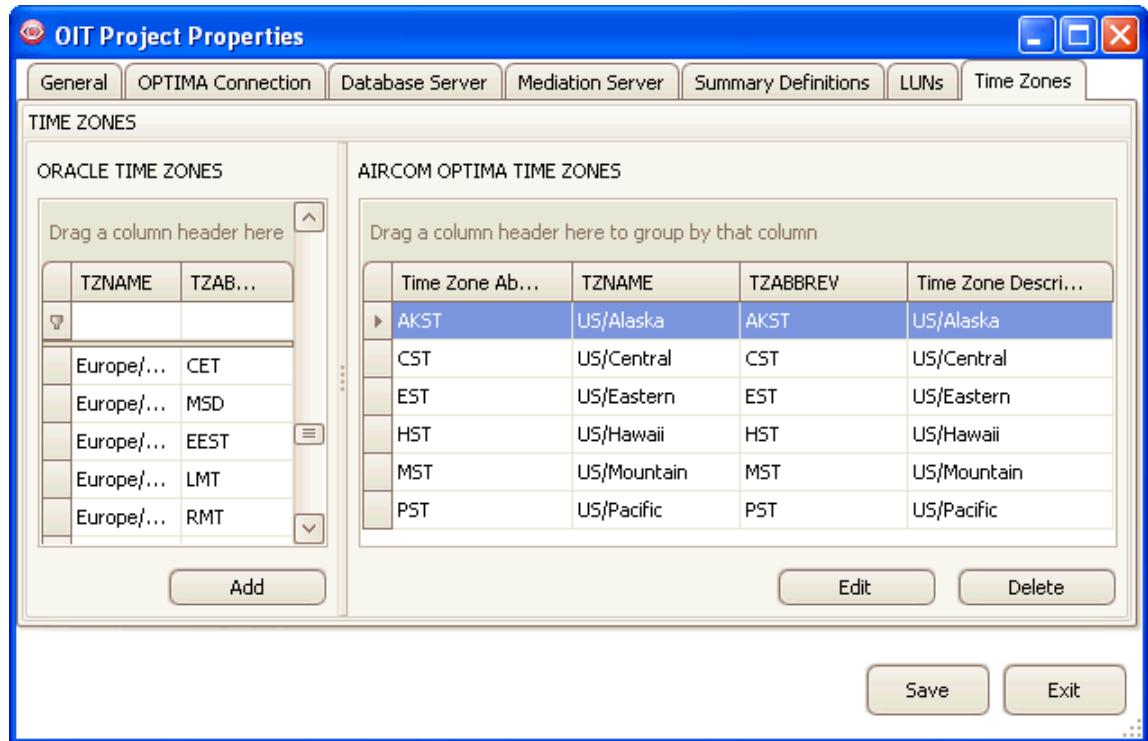
In order to mitigate this, AIRCOM OPTIMA now supports the use of multiple time zones, at a number of different levels.



Currently, time zone support for alarm forwarding is not available.

Defining Time Zones

In the AIRCOM OPTIMA Installation Tool, when defining the project properties, you can specify which time zones are used in the project:



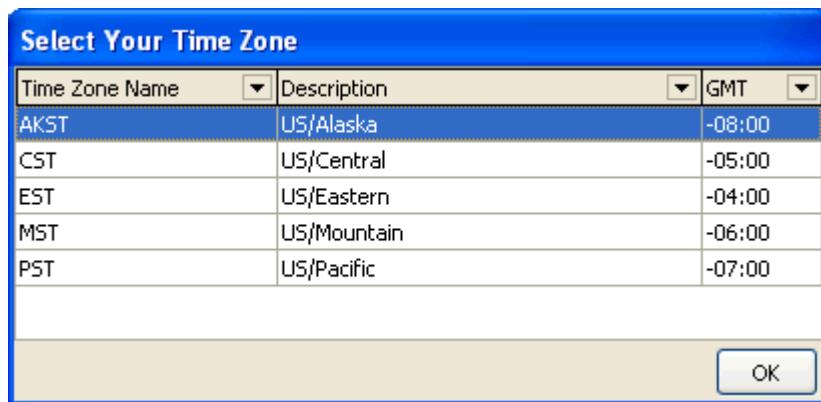
Time Zones tab

Also within the AIRCOM OPTIMA Installation Tool, when setting up the interface workbook, two additional types have been added to the Type field to enable you to specify time-related information:

Type	Description
TS	Timestamp. This corresponds to the TIMESTAMP data type, which extends the DATE data type to include fractional seconds.
TZ	Timestamp with Time Zone. Similar to the TS type but with an explicit time zone attached to it. This corresponds to the Oracle TIMESTAMP WITH TIMEZONE data type.

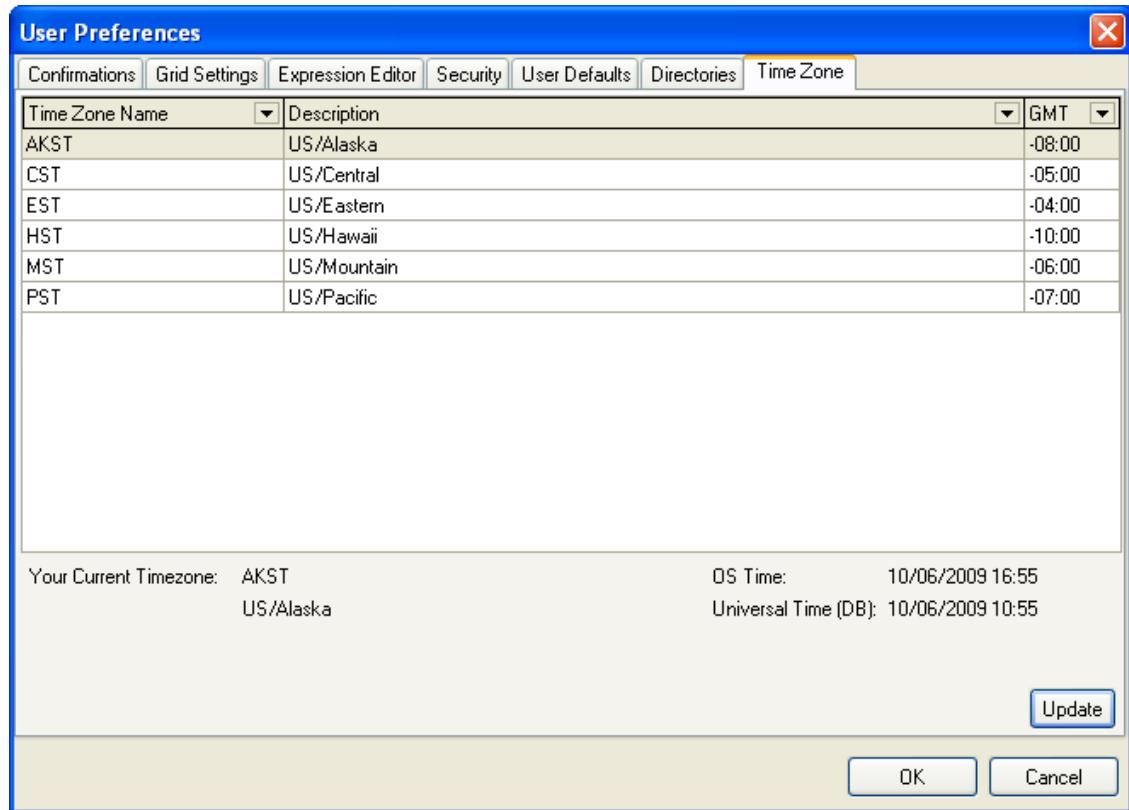
Selecting Your Time Zone When Logging In

When a user logs into the project for the first time, they must choose their time zone from the defined list of AIRCOM OPTIMA time zones:



Selecting the time zone

After this has been done for the first time, it can be changed at any time using the Time Zone tab of the User Preferences dialog box:



User Preferences dialog box

Configuring Summaries

When creating summary reports, you can choose to aggregate data using timestamp aggregation.

If you choose the Enable Timestamp Aggregation option, you can then select the source table's timestamp column name, which will be read across all of the raw tables in order to ensure time zone consistency:

The screenshot shows the 'Source Table(s)' configuration dialog. It includes checkboxes for 'Enable Second Source Table' and 'Enable Timestamp Aggregation'. The following fields are set:

Source #	SOURCE 1 - Primary
Schema	ERICSSON_GERAN
Table	SS7TOTAL
Datetime Column	DATETIME
Source Join Elements	REGION
Timestamp Column	No Timestamp

Specifying the timestamp column

When configuring the summary table, you can select the timezone that will be used to aggregate the data at the correct time across all of the time zones in your network:

Summary Table	
Schema	ERICSSON_GERAN
Table	SS7TOTAL_R_WK
Datetime Column	DATETIME
Aggregated Elements	REGION
Entries Column	ENTRIES
<input checked="" type="radio"/> Natural Timezone	
<input type="radio"/> Selected Timezone	US/Alaska

Selecting the time zone

Scheduling Reports

When creating report schedules, you can now set the recurrence to run against a specific time zone, rather than against the database's local time.

Similarly, when configuring the Report Scheduler, you can define the time zone in which the scheduler is located, so that AIRCOM OPTIMA can manage the difference between this time zone and the time zone where the database is located.

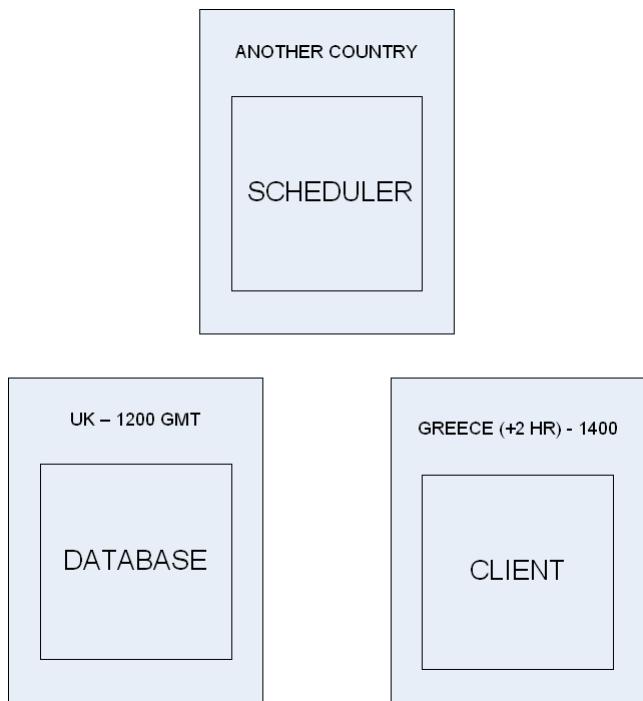
The Report Scheduler works differently depending on whether or not you have configured the Report Scheduler to use a specific time zone.

The Report Scheduler Uses a Time Zone

If your network spans across multiple time zones, and you have configured the Report Scheduler to use a specific time zone, when the scheduler is started, it will search for and run:

- All report schedules set on the same time zone as the Report Scheduler, where the next run date is equal to or less than the database local time (for example, the Oracle SYSDATE) adjusted by the time zone
- Any other schedules without a specified time zone, where the next run date is equal to or less than the database local time (SYSDATE)

Consider the following network example:



A network across multiple time zones

The example network is spread across different time zones:

- The database is in the UK
- The client is in Greece
- The report scheduler is in a third country

The following report schedules have been created:

Schedule Number	Time Zone	Next Run Time
1	GREECE	14:00
2	GREECE	12:00
3	GMT	15:00
4	None Set	12:00

The Report Scheduler has been configured to use the GREECE time zone.

If the Report Scheduler is set running, then the database time (SYSDATE) is converted according to the GREECE timezone, giving an actual runtime of 14:00. Therefore, the Scheduler will run:

- All report schedules set on the GREECE time zone, where the next run date is equal to or less than 14:00
- Any other schedules without a specified time zone, where the next run date is equal to or less than 12:00

This means that it deals with each example schedule record as follows:

Schedule Record	Runs?	Reason Why
1	Y	Next run time = 1400, SYSDATE + GREECE TIME ZONE = 1400
2	Y	Next run time = 1200, SYSDATE + GREECE TIME ZONE = 1400
3	N	Has a different time zone set, and so is ignored
4	Y	Next run time = 1200, SYSDATE = 1200

The Report Scheduler Does Not Use A Time Zone

If your network spans across multiple time zones, and you have configured the Report Scheduler to use a specific time zone, when the scheduler is started, it will search for and run all report schedules where the next run date is equal to or less than the database local time (for example, the Oracle SYSDATE) adjusted by the specific time zone for each schedule.

 If no time zone has been set for a schedule, it will just compare the database local time with the next run time.

Take an example network, when the following report schedules have been created:

Schedule Number	Time Zone	Next Run Time
1	GREECE	14:00
2	GREECE	12:00
3	GMT	15:00
4	None Set	12:00

If the Report Scheduler is set running, then it will treat each schedule record as follows:

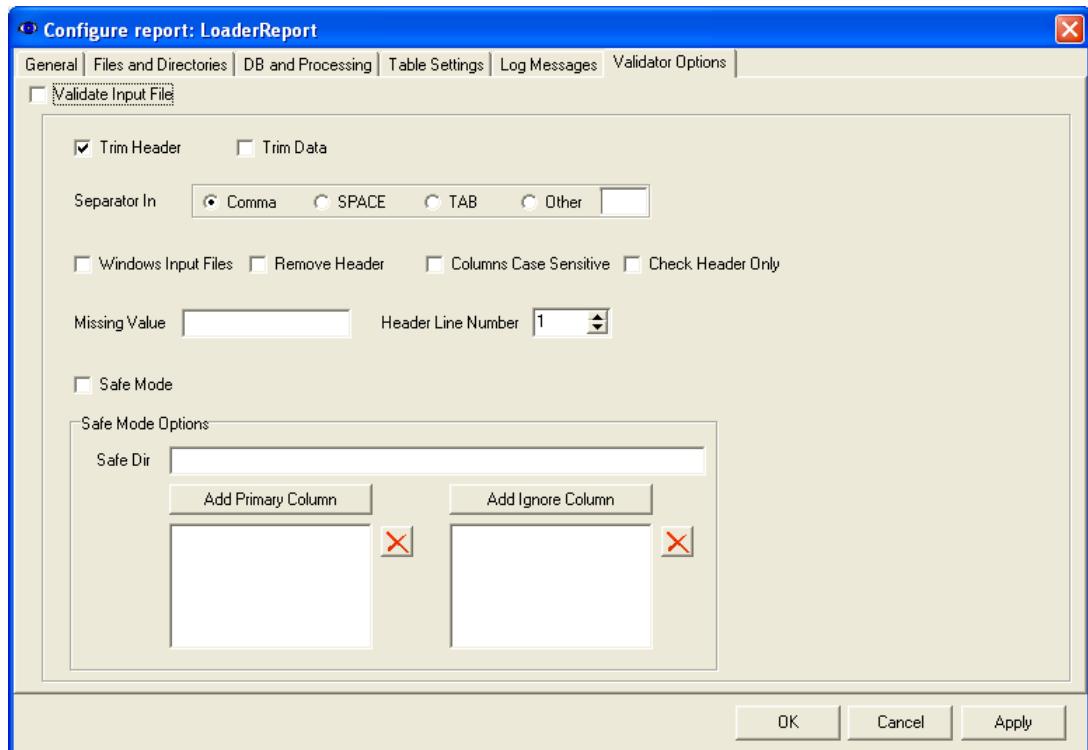
Schedule Number	Time Zone	Next Run Time	SYSDATE	Adjusted SYSDATE	Run?
1	GREECE	14:00	12:00	14:00	Y
2	GREECE	12:00	12:00	14:00	Y
3	GMT	15:00	12:00	12:00	N
4	None Set	12:00	12:00	12:00	Y

8.4.9 Validator Options for the Loader

The Loader Configuration dialog box now contains an additional Validator Options tab.

You can use the Validator Options tab to configure the Loader to perform the validation of the data before it is loaded.

This picture shows an example:



Example Validator Options tab

To configure the validation options:

- 8 Select the Validate Input File option.
- 9 Choose any trimming options that you want to use when validating the data. This table describes the options:

Option	Description
Trim Header	Removes any spaces found around the header columns.
Trim Data	Removes any spaces found around the data values.

- 10 Select the required separator for input files - comma, SPACE, TAB or another character.

- 11 Choose any additional options that you want to use when validating the data. This table describes these options:

Option	Description
Windows Input Files	Select this option if the files that are to be loaded/validated are in Windows format (where the lines end with \r\n).
Remove Header	Does not include the header in the output file.
Columns Case Sensitive	Compares the header columns to ensure that they are the same case.
Check Header Only	Only checks that the header is valid, not the entire file.

- 12 In the Missing Value box, type the value to be used for any columns which are not in the file and are to be added to the database.
- 13 In the Header Line Number box, specify the number of lines that need to be skipped in order to process the data.
- 14 You can choose to use Safe Mode.

Safe Mode enables you to generate a file containing the data for any new counters (or columns in the parser file header) that the parser outputs but were not expected based the configuration of the original report.

If you want to use Safe Mode:

- Select the Safe Mode option
- Define an appropriate directory for the generated new counter file to be stored.
- Select the primary and ignore columns for the new counter file:

Column	Description
Primary	Primary columns are those which will be needed to load the new counter file. To add a primary column, click the Add Primary column button, type the name of the column and then click OK.
Ignore	Ignore columns are columns for any new counters that you know have been added since the validation report was created, but are not interested in, and want to exclude from the file. To add an ignore column, click the Add Ignore column button, type the name of the column and then click OK.

8.4.10 Managing Resources Through Consumer Groups

In AIRCOM OPTIMA, you can now use Oracle consumer groups to manage database memory allocation between users.

- For the AIRCOM OPTIMA front end, the consumer groups are based on the user type:

User Type	Consumer Group
OPTIMA_ADMINISTRATOR	OPTIMA_ADMINISTRATORS(CG)
OPTIMA_ADVANCED_USER	OPTIMA_ADVANCED_USERS(CG)
OPTIMA_USER	OPTIMA_USERS(CG)
OPTIMA_USER_ADMINISTRATOR	OPTIMA_USER_ADMINISTRATORS(CG)
OPTIMA_ALARM_ADMINISTRATOR	OPTIMA_ALARM_ADMINISTRATORS(CG)

This means that when a new user is created and assigned to a particular user type, they will be assigned to the corresponding consumer group at the same time.

- For the AIRCOM OPTIMA back end, the consumer groups are based on the backend application:

Application	Consumer Group
Report Scheduler	OPTIMA_REPSCH_PROCS(CG)
Loader	OPTIMA_LOADER_PROCS(CG)
Loader GUI	OPTIMA_LOADER_USERS(CG)
Summary GUI	OPTIMA_SUMMARY_USERS(CG)
Data Quality GUI	OPTIMA_DQ_USERS(CG)
Alarms Processor	OPTIMA_ALARM_PROCS(CG)
Alarm Handler	OPTIMA_ALARMHANDLER_PROCS(CG)
SNMP Agent	OPTIMA_SNMPAGENT_PROCS(CG)
SNMP Poller	OPTIMA_SNMPOLLER_USERS(CG)

This means that when a user logs into a particular application, they will be assigned to the corresponding consumer group at the same time. For example, when OPTIMA_LOADER_PROCS logs into the Loader, they will automatically be assigned to the OPTIMA_LOADER_PROCS(CG) consumer group, and receive the specified allocation of database memory for a member of that group.

These resource groups are used in conjunction with resource plans, which define how resources are balanced across the system (in terms of % share) according to business rules.

AIRCOM OPTIMA has a default resource plan, which is assigned at the start of the deployment of AIRCOM OPTIMA. This contains a number of subplans associated to the consumer groups for the different components of AIRCOM OPTIMA - for example, Loader, SNMP, Summary and so on.

8.4.11 Accessing the AIRCOM OPTIMA Database

Users can now access AIRCOM OPTIMA's data and configuration tables from outside AIRCOM OPTIMA - for example, using SQLPLUS or TOAD with read-only access - for example, they cannot edit or delete any data or tables.

 A special 'power user', the DBACCESS user, can access the database to create new objects.

To manage access when using the AIRCOM OPTIMA front end and backend applications, a number of dedicated Oracle roles have been created.

In the front end, these are based on user type, and are assigned to users when they are created in AIRCOM OPTIMA:

User Type	Role
OPTIMA_ADMINISTRATOR	OPTIMA_ADMINISTRATORS
OPTIMA_ADVANCED_USER	OPTIMA_ADVANCED_USERS
OPTIMA_USER	OPTIMA_USERS
OPTIMA_USER_ADMINISTRATOR	OPTIMA_USER_ADMINISTRATORS
OPTIMA_ALARM_ADMINISTRATOR	OPTIMA_ALARM_ADMINISTRATORS

For the AIRCOM OPTIMA back end, a separate, dedicated role exists for each application:

Application	Role
Report Scheduler	OPTIMA_REPSCH_PROCS
Loader	OPTIMA_LOADER_PROCS
Loader GUI	OPTIMA_LOADER_USERS
Summary GUI	OPTIMA_SUMMARY_USERS
Data Quality GUI	OPTIMA_DQ_USERS
Alarms Processor	OPTIMA_ALARM_PROCS
Alarm Handler	OPTIMA_ALARMHANDLER_PROCS
SNMP Agent	OPTIMA_SNMPAGENT_PROCS
SNMP Poller	OPTIMA_SNMPOLLER_USERS

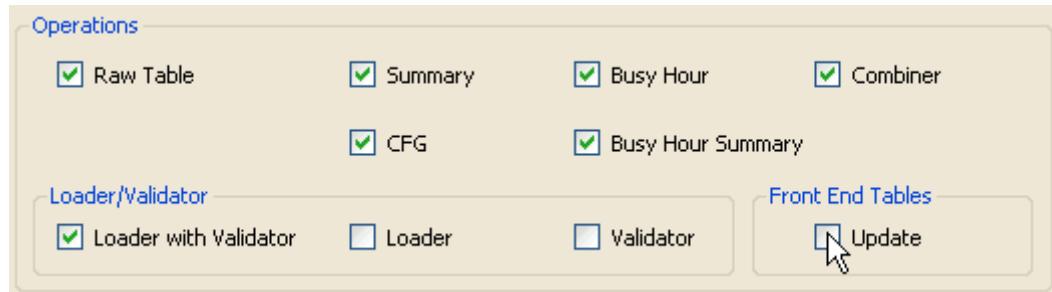
These application roles are session-based, and only activated when the user logs into the appropriate application - if the same user tries to use an application outside AIRCOM OPTIMA to access the data and configuration tables (for example, SQLPLUS or TOAD) they will only have read-only access again.

8.4.12 Generating Associated Tables Automatically

As well as defining associations for a table manually, you can now generate them automatically. You can do this in two ways.

When Activating an Interface in the AIRCOM OPTIMA Installation Tool

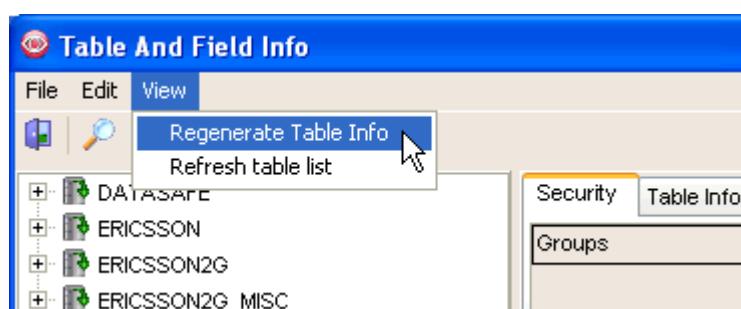
In the Activate Interface dialog box, there is now an option to update front end tables:



If you select this option, when the interface is activated, the DATA DICTIONARY and ASSOCIATED TABLES table are updated with any summaries that are included in the activated interface. The associated tables are created and this data is populated in the Table and Field Info dialog box.

When Repopulating AIRCOM OPTIMA's Data Dictionary

In the Table and Field Info dialog box, you can automatically create table associations based on the summary configuration tables in the database, by using the Regenerate Table Info option:



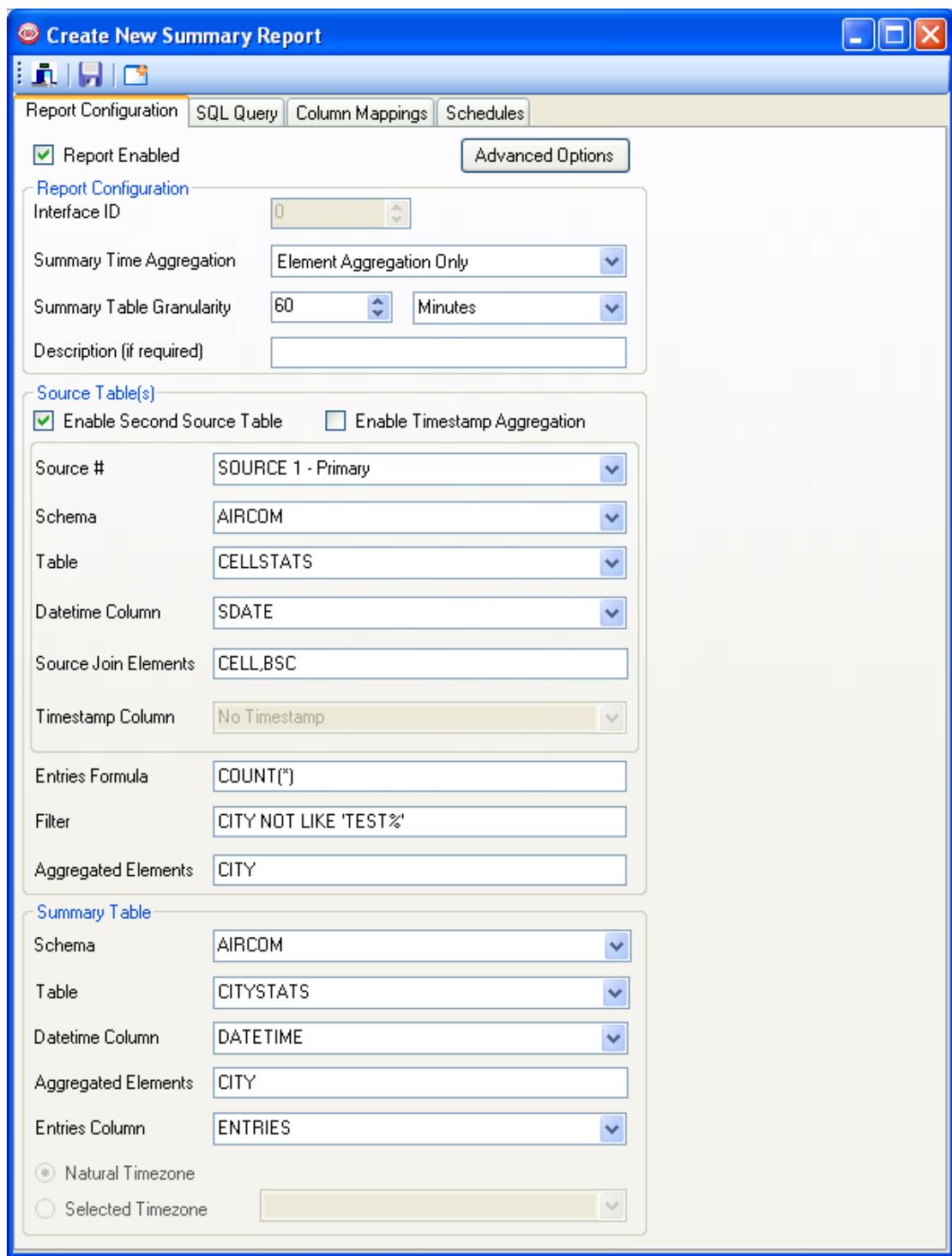
An associated table is created for each pair of source and destination tables defined within the summary report, and also for all of the other relationships within the hierarchy.

8.4.13 Summary Element Aggregation by CFG Table

AIRCOM OPTIMA now supports summary element aggregation by CFG table.

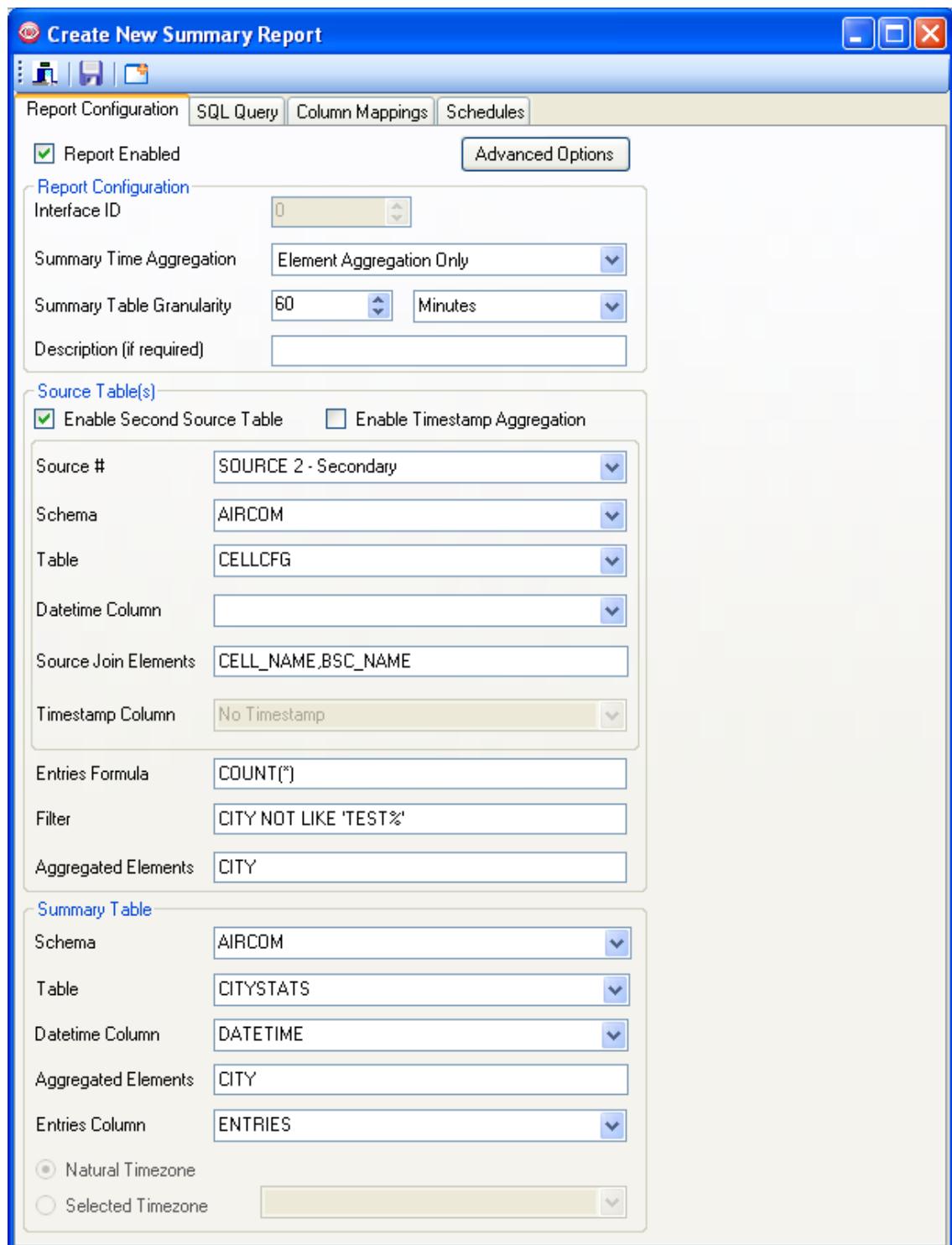
This means that when defining summary reports, you can join a raw table with a CFG table (for example BSC,CELL) and then aggregate and join with a summary table (for example, CFG.CITY).

These pictures show how this would be configured in the Summary Report dialog box. The first shows the configuration of Source Table 1:



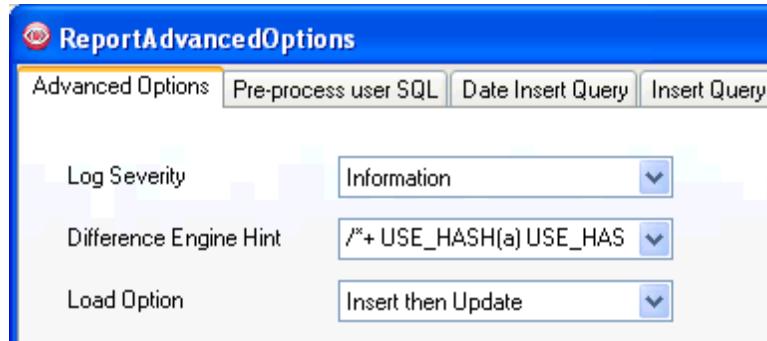
First source table

The second shows the configuration of Source Table 2:



Second source table

Then, in the Advanced Options for the summary report, if you choose the 'Insert then Update' load option, re-summarization will be supported.



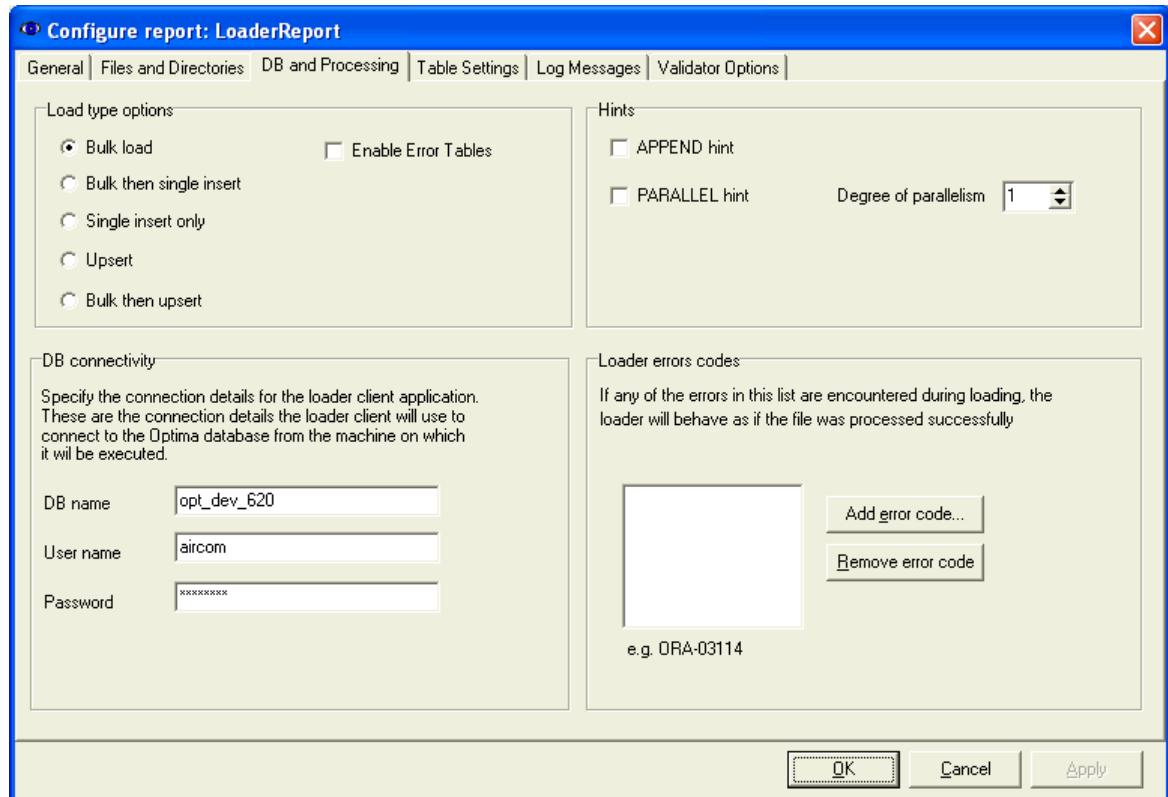
Choosing the Insert then Update load option

This configuration should be supported by an appropriate query, defined on the SQL Query tab of the Summary Report dialog box:

```
SELECT cfg.CITY, SDATE,
       SUM(TCALLS) TCALLS,
       SUM(TCONGS) TCONGS,
       SUM(TNDROP) TNDROP,
       .... and so on
       SUM(TFMSESTB) TFMSESTB,
       SUM(CMSESTAB) CMSESTAB,
       SUM(TFCASSALL) TFCASSALL,
       SUM(TFNDROP) TFNDROP,
       SUM(TNUCHCNT_SCAN) TNUCHCNT_SCAN,
       count(*) ENTRIES
  FROM AIRCOM.CELLSTATS, AIRCOM.CELLCFG cfg
 WHERE SDATE BETWEEN :STARTDATE AND :ENDDATE
   AND %FILTER
  AND AIRCOM.CELLSTATS.CELL = cfg.CELL_NAME
 GROUP BY SDATE, cfg.CITY
```

8.4.14 Loader Error Tables

When defining the Database and Processing Settings for the Loader, there is now an option to enable Error tables.



This option is only available if you are using the 'Bulk Load' or 'Bulk then Upsert' Load Type options, and enables you to create an error log table, and store details of loading errors.

This option is particularly useful if there is a reasonable chance that the data you want to load will produce 'primary key violation' errors, because if you use it in conjunction with the 'bulk then upsert' option, when the bulk load fails, the Loader will use the information logged in the error table to try to rectify the incorrect rows by updating or inserting new ones.

You can view this loader error information in two places within the database:

- The LOADER_LOG table provides a brief description of the number of errors for a particular file (using the pre-batched filename) and the cause of the error. This picture shows an example, as seen in TOAD:

LOADER_LOG: Created: 16/07/2009 12:08:41 Last DDL: 22/07/2009 13:05:41					
Columns	Indexes	Constraints	Triggers	Data	Script Grants Synonyms Partitions Subpartitions Stats/Size Referential Used By Policies Auditing
					<input type="checkbox"/> Sort by Primary Key <input type="checkbox"/> Desc <input checked="" type="checkbox"/> Read Only
PRID	DATETIME	SEVERITY	MESSAGE_TYPE	MESSAGE	
000110001	17/08/2009 15:29:13.706000	1	1225 DEBUG: LOAD_DATA END		
000110001	17/08/2009 15:29:13.706000	1	131 End Error report		
000110001	17/08/2009 15:29:13.658000	2	132 For the file FN4' 1 error(s) found of type 'ORA-12899: value too large for column "MJS"."MJSRAW"."BSC"		
000110001	17/08/2009 15:29:13.658000	2	132 For the file FN4' 1 error(s) found of type 'ORA-12899: value too large for column "MJS"."MJSRAW"."BSC"		
000110001	17/08/2009 15:29:13.658000	2	132 For the file FN4' 2 error(s) found of type 'ORA-12899: value too large for column "MJS"."MJSRAW"."BSC"		
000110001	17/08/2009 15:29:13.658000	2	132 For the file FN3' 2 error(s) found of type 'ORA-12899: value too large for column "MJS"."MJSRAW"."BSC"		
000110001	17/08/2009 15:29:13.593000	1	131 Begin Error report		
000110001	17/08/2009 15:29:13.593000	2	115 loading time: start: 17-08-2009 15:29:13 end: 17-08-2009 15:29:13 load time: 00:00:00 load type: 12		

 The filename will only be given in the LOADER_LOG table if the INPUT_FILE_NAME has been defined as one of the aliases in the external table settings (Loader File Mappings and Loader Table Mappings).

- The ERROR_LOG table (called ERR_PRID, where PRID is the Program ID) gives a detailed description of the load failures for each offending row. This picture shows an example, as seen in TOAD:

ERR_000110001: Created: 17/08/2009 15:25:46 Last DDL: 17/08/2009 15:29:13					
Columns	Indexes	Constraints	Triggers	Data	Script Grants Synonyms Partitions Subpartitions Stats/Size Referential Used By Policies Auditing
					<input type="checkbox"/> Sort by Primary Key <input type="checkbox"/> Desc <input checked="" type="checkbox"/> Read Only
ORA_ERR_NUMBER\$	ORA_ERR_MSG\$			ORA_ERR_ROWID\$	ORA_ERR_OPTYP\$ O... DATETIME BSC
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC1
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC1
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC2
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC2
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC2
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC2
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC2
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC2
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC3
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC3
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC3
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC3
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC4
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC4
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC5
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC5
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC6
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC7
	1 ORA-00001: unique constraint (MJS.MJSRAW_PK) violated			I	01-JUL-09 BSC8
	12899 ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 50, maximum: 30)			I	01-JUL-09 this-column-
	12899 ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 55, maximum: 30)			I	01-JUL-09 this-column-
	12899 ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 58, maximum: 30)			I	01-JUL-09 this-column-
	12899 ORA-12899: value too large for column "MJS"."MJSRAW"."BSC" (actual: 50, maximum: 30)			I	01-JUL-09 this-column-

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