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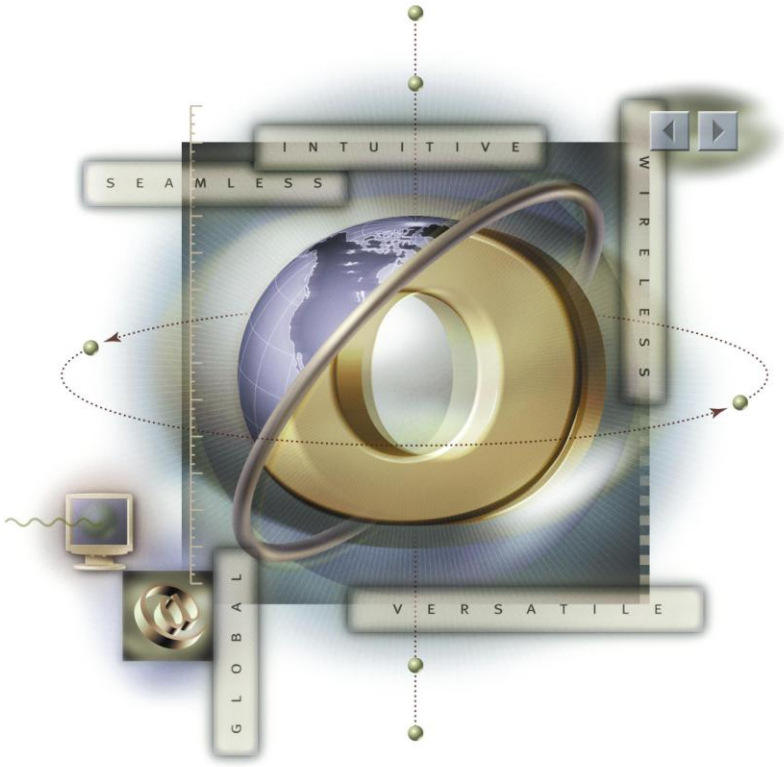

Opera Hotel Edition

MIS Support Guide for Opera

Version 4.0.4.1

May 2007

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Change Log

V1.0	15th November 2002	Initial Draft
V1.1	20th November 2002	Added Night Audit Reporting/Exports
V1.2	4th December 2002	Corrected formatting
V1.3	7th January 2003	Minor Corrections
V1.4	10th March 2003	Technical changes/additions
V2.5	9th September 2003	Updated for V2.5 Technical Changes
V2.5.1	27th November 2003	Added Report Queue Manager to Printer Section
V2.5.1.1	15th December 2003	Corrected Oracle 9i Version Page 7
V2.5.2	20th February 2004	Typographical corrections. Added OXI synonym schema to schema list Added Oracle 9i shutdown sequence.
V2.5.3	26TH February 2004	Added Oracle 9i Listener to DB Services Added Oracle 9i DB Drive Partition Options
V2.6.1	16th August 2004	Removed references to thick client workstations. Removed references to Oracle 8i Added additional printer configuration information
V2.6.2	14th October 2004	Added multiple application servers and support of common /export/ virtual path
V2.6.3	17th November 2004	Added XP SP2 client requirements
V3.0	20th May 2005	Added introduction and server configuration options. Updated for Opera V3.0 technical changes Reformatted document sections
V4.0	20th June 2006	Updated for V4.0 release / Oracle 10G Added Oracle Data Guard V4 new queue processors
V4.0.1	19th July	Updated Oracle section for rollback segments and UNDO tablespace. Corrected REDO log size. Added IFC78 to fo_act processor
V4.0.3.1	30th August 2006	Updated for 10gR2 application server. Updated services section
V4.0.4.1	4th May 2007	Added OSC Cluster Solution and XML Publisher Requirements. Removed IFC7/Equinox reference for WAN environments – not required for IFC8. Updated server topology section to include graphical representation for each

Disclaimer

This document is a guide for systems operations of Opera V4.0.4.1+
It is accurate as of the release date of the document.

This document may not apply to future versions of Opera, due to functionality changes in the software and database.

Introduction

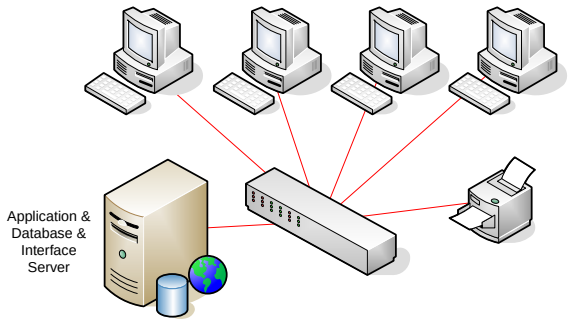
Congratulations on your installation of or upgrade to Opera Hotel Edition or Opera Reservation System V4.0.

Opera has been created using Oracle development tools and operates on an Oracle Relational Database Management System. Although designed to require little maintenance, this document is aimed at providing the knowledge necessary to assist with understanding the environment required for Opera and the various maintenance tasks needed to ensure minimal downtime and to ensure the best performance from your system.

Server Configuration

Depending on the number of concurrent users, the server requirements for Opera vary considerably.

Single Server (Small)



Single server can support up to 40 concurrent users on appropriately sized hardware. The one server is installed with all software components required to run Opera Hotel Edition.

Database Server
(Oracle 10g RDMBS)

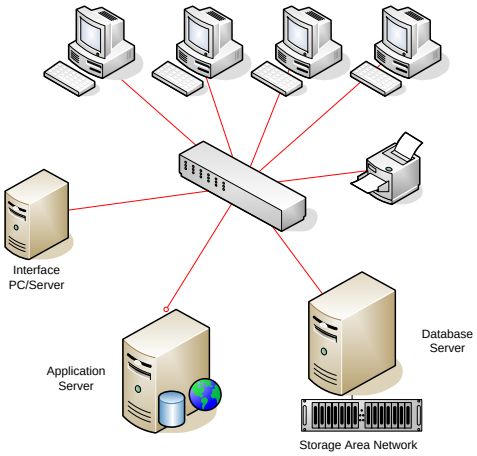
Application Server
(Oracle 10g/R2 Internet Application Server)

Opera runtimes

Opera Interface Server

For the long term training needs of any hotel, it is highly recommended to install suitable hardware with *Single Server*. This server is then isolated from the production environment and can be upgraded independently, to the latest version, so that testing and training of new product features can be done ahead of upgrading the production environment.

Separate Database and Application Servers (Medium)

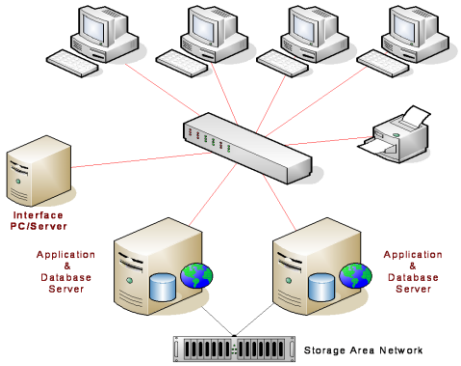


With more than 40 concurrent connections, the Oracle database software must be installed on a separate server to the Oracle Internet Application Server software; thus separating the two tasks onto different equipment.

Each application server can support 80 concurrent connections. Additional application servers can be configured as required.

A separate workstation/server is also used for the Opera interfaces, using serial and/or IP communication to external systems such as POS, Call Accounting, Door Locking, Pay Movies.

Opera Cluster Solution (OSC)

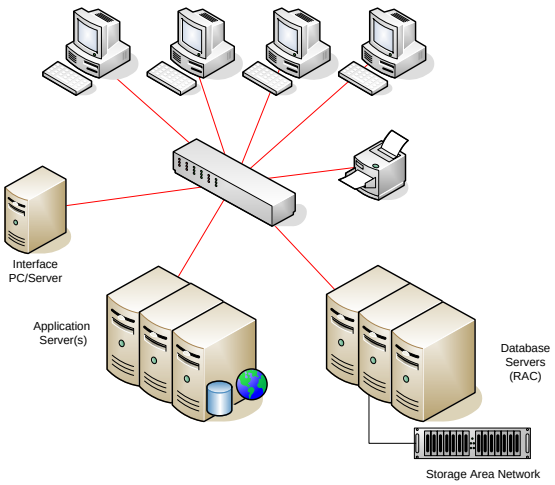


OSC consists of 2 servers both installed with Oracle database and application/web software. Each has the ability to failover to the other and continues operating as a *single server* in the event of 1 server failing.

This provides continued operation of Opera for a limited number of users until the second server can be repaired.

OSC is limited to 2 servers and therefore can only be implemented for small sites with less than 80 users.

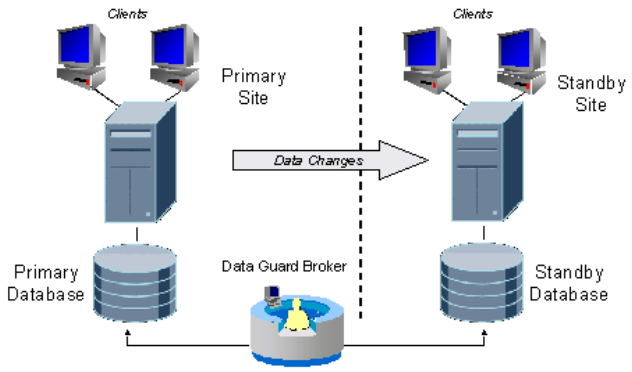
10g RAC Database Server (Large)



With more than 160 concurrent connections to the database, multiple database nodes can be used in parallel. Oracle 10g RAC (Real Application Cluster) software support clustering of database servers to provide scalability beyond a single node limit (based on operating system and server memory limitations).

Multiple application servers would also be required with 10g RAC installations, according to the concurrent user count.

Oracle Data Guard (Stand-by Server)



An up-to-date stand-by database server can be implemented using Oracle Data Guard technology. Data Guard maintains a standby database as a transactionally consistent copy of the production database. A standby database can be located at remote disaster recovery sites thousands of miles away from the production data center, or they may be located in the same city or even in the same building. If the production database becomes unavailable because of a planned or an unplanned outage, Data Guard can switch any standby database to become the production role, thus minimizing the downtime associated with the outage, and preventing any data loss[1].

Data Guard can be used in combination with Real Application Clusters (RAC) to provide a very high level of data protection and data availability that is unprecedented in the industry.

Local Area Network Installation

The most common installation of Opera in a single property environment is for all hardware to exist on the local area network.

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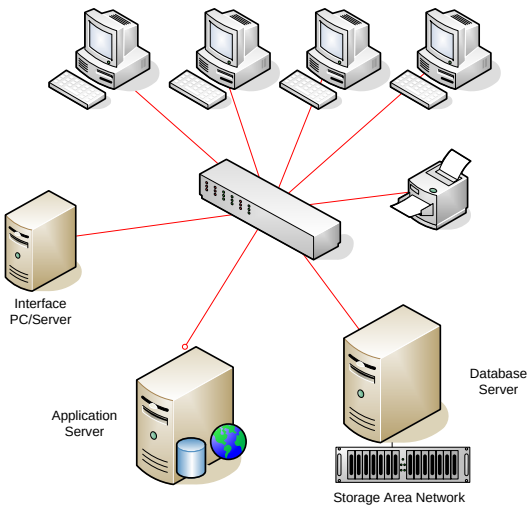
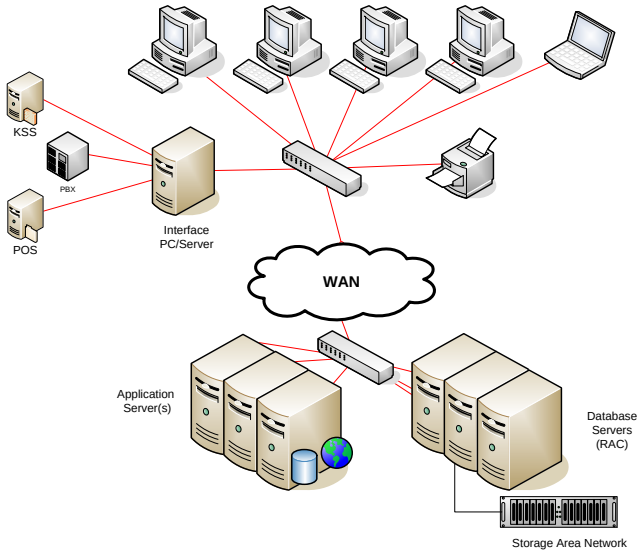


[1] ***Excerpt - http://www.oracle.com/technology/deploy/availability/htdocs/DataGuardOverview.html***

Wide Area Network Installation

Database and application servers can be housed in a data centre or other remote location from the property (example: multi-property).

WAN communication requires 15kb per database connection (user) with <120ms latency. Public internet is not supported due to a lack of Quality of Service (QoS) guarantees.



Server Installation Media and Server Imaging

Single server, Oracle database and Oracle Internet Application Server software installation media is available from your local MICROS-Fidelio office or dealer.

Server imaging software is highly recommended for rapid recovery of server environments, in the event of disaster, hardware failure or damage; examples of this software are such as Norton Ghost and Altiris. Servers should be re-imaged after every major upgrade of Opera/Oracle.

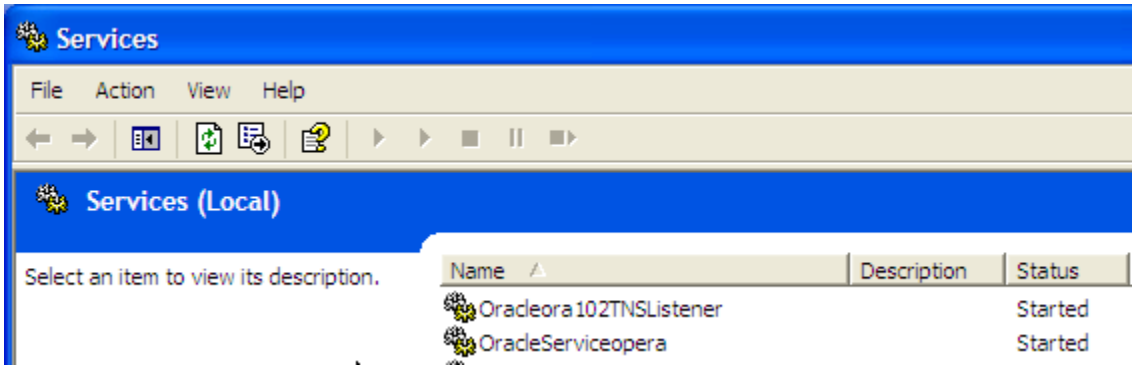
Database Server

Opera V4.0 requires Oracle Enterprise 10.2.0.2 (10g) software to be installed on the database server(s).

On completion of the Oracle software installation 2 services are created for Oracle

- OracleServiceOpera
- Oracleora102TNSListener

These services are set to automatic start on reboot of the server.



Database Schemas

The Opera database instance is configured with three primary schemas. Each schema contains various database objects, such as tables, indexes, views, packages and triggers, required for the application to function.

Schema	Usage
OPERA	Production schema for Opera Hotel Edition
OPERA_TRAIN	Training schema for Opera Hotel Edition **
OXI	Opera Exchange Interface

** During installation, the OPERA_TRAIN schema will be created based on a copy (export) of the primary OPERA production schema, following completion of hotel configuration. [2]

It is highly recommended that separate hardware/server be used for the ongoing training/testing environment. This can then be upgraded independently of production.

[2] See section on Schema Management Tool

Database Data Files

The Opera Hotel Edition V4.0 database instance is installed and created using the database installation wizard. The V4.0 installation wizard provides 5 installation options for logical drive allocation. The minimum is to only have a C and D drive and maximum is 7 drive configuration: C,D,G,H,I,J,K drives. With the E and F drives reserved for the CD-ROM.

1. C(4GB), D(4GB), G(4GB), H(4GB), I(4GB), J(4GB), K(4GB)

2. C(4GB), D(4GB), G(4GB), H(8GB), I(8GB)

3. C(4GB), D(8GB), G(8GB), H(8GB)

4. C(4GB), D(12GB), G(12GB)

5. C(4GB), D(24GB)

Using option 1 – the following structure would then exist.

Drive	Usage
D:	NT Paging File Oracle Redo Log Files Other Oracle Log Files Tools Oracle Tablespace
G:	Oracle Binaries Oracle Tablespace: system, rbs, and temp. Archived redo logs
H:	Oracle Tablespace: namedata, quickdata, ratedata, resvdata
I:	Oracle Tablespaces: findata, logdata, opera_data
J:	Oracle Tablespace: opera_indx, finindx, logindx
K:	Oracle Tablespace: nameindx, quickindx, rateindx, resvindx

Note: Available space must be maintained on each of these drives, to allow for future growth of the database over time. Additional drives/partitions can be added later, as required by database growth rate.

10g RAC

Oracle 10g RAC provides user scalability by allowing multiple server nodes to manage a single database instance.

Installation of Oracle 10g on multiple servers requires manual installation of the Oracle 10g RAC (Real Application Clusters) software and creation of the Opera database. A Storage Area Network (SAN) is then used to store the Oracle database data files. The drive allocations for a

SAN are custom to the installation and do not follow the convention detailed above for standard installations.

Oracle Archive Mode

Oracle redo logs store each transaction that was committed to the database. Within Oracle, each transaction is assigned a system change number for the purposes of tracking the change in the rollback segment and the redo log. Once committed, Oracle stores the SCN in both places, along with a message saying this transaction is committed. The redo logs are an ongoing list of system change numbers and database changes. Once full, the online redo logs are archived to another location in the database.

With access to archived redo logs, the options for database recovery are increased because the data changes recorded by redo logs can then be applied to the most recent backup to allow for all the committed changes that have been made since that backup to "roll forward." A roll-forward is when Oracle applies all the changes that are stored in the redo logs to the database. Once this step is complete, Oracle then rolls back to eliminate the uncommitted changes from the database.

For Opera the G: drive is the default location defined for the storage of archived redo logs generated by Oracle. In the event of the need to restore/recover the database, these archive logs are essential and therefore must be safely backed up to tape for easy restore and recovery.

Archive logs are written to the G:\oracle\admin\opera\archive folder as ARC files as specified by the parameter *LOG_ARCHIVE_DEST* in the *INITOPERA.ORA* file.

Sufficient drive space should be assigned to the G: partition to allow for creation of archive logs throughout the day – the number of archive logs created each day will differ greatly depending on the transaction volume of the database, based on the size and number of concurrent users at the property. It is not uncommon for 1.5GB of archive logs to be created daily. MICROS-Fidelio recommends maintaining 6GB of available storage on the G: partition for archive logs storage[3].

Archive mode is not active by default and must be configured by the Micros installer/technician.

Archive Pruning

In order to prevent the G: drive filling to capacity and causing the Oracle database to cease function, the archive logs should be deleted after successful backup to tape. To free the space on the G: drive is known as archive pruning.

Depending on the backup solution implemented, archive pruning can be automated or executed using a batch command to delete these files on completion of the backup job. Most commonly, pruning occurs nightly after successful backup of these files to tape.

Failure to prune archive logs will result in eventual saturation of the G: drive causing the Oracle database to cease function until space is made available. Please ensure you perform a regular check of available drive space on the database server.

Note: Deleting archive logs created after the last successful full backup will not allow recovery past the time of the deleted archive log.

[3] Per property, in a multi property environment, due to increase in transaction volume

Database Backup

Backup of the Oracle database is the responsibility of the hotel, based on initial installation and guidelines provided by MICROS-Fidelio. Regular monitoring (by the hotel) of the successful completion of the backup is essential, in the event of the need for disaster recovery. Backup failures will need to be identified and resolved with some urgency.

Archive Mode

With archive mode active, an online *hot-backup* should be scheduled to occur nightly; both Veritas and Arcserve have the ability to automate the backup routine at schedule times. An Oracle agent is required in order to be able to backup the Oracle tablespace datafiles while in use by the Oracle services running on the database server.

It is strongly recommended that an offline *cold-backup* of the database be scheduled every 6 months and also prior to any primary version upgrade to Opera Hotel Edition. A cold backup must include the entire contents of all drives used for the storage of the Oracle database files (as listed above), plus any custom drive configuration used by Oracle.[4]

The inability to restore the Oracle database datafiles, control files or archived redo logs will result in an inability to recover/restore the database.

It is the responsibility of the site to ensure that the nightly online backup of the database has been successful and completed without error.

Recovery of a database is a DBA skill and would require assistance from a Micros-Fidelio office or dealer.

Non Archive Mode

Non archive mode backup requires that the database is shutdown each night for the period of time taken to copy the contents of the database folder *<drive>:\oracle\oradata\opera* to the backup folder *\oracle\oradata\opera\backup.*

The available tape backup solution should be configured to copy the contents of the *\oracle\oradata\opera\backup* folder each night.

Recovery of the database is achieved by restoring files to the \backup folder (from tape) local DBA assistance to recreate the Oracle database instance.

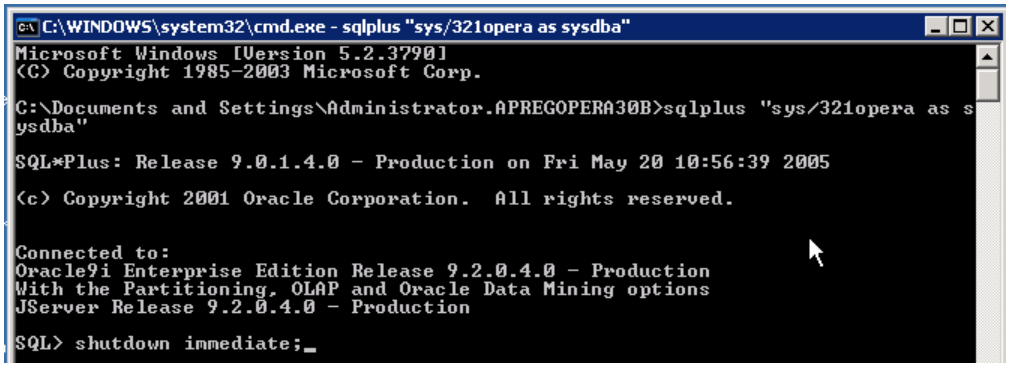
Database Shutdown

In order to be able to perform an offline *cold* backup of the database it is necessary to close (shutdown) the database. This will require scheduled downtime.

- Start a DOS window (cmd.exe) on the database server
- At the command line, type
- At the command line, type *SQLPLUS "sys/<syspassword> as sysdba"*
- Once connected, shutdown the database by typing *shutdown immediate; [enter]*
- This may take a few minutes. After it completes, exit by typing: *exit*
- Close the DOS window
- Stop the service *Oracleserviceopera* in the Control Panel Services window.

The database is now completely shutdown and prepared for a cold backup.

[4] Additional tablespace can be added to drives L: - Z: if required for database growth, and must be included in any backup strategy implemented



Once the backup is complete, the database can be restarted by simply starting the service *Oracleserviceopera* in Control Panel Services window.

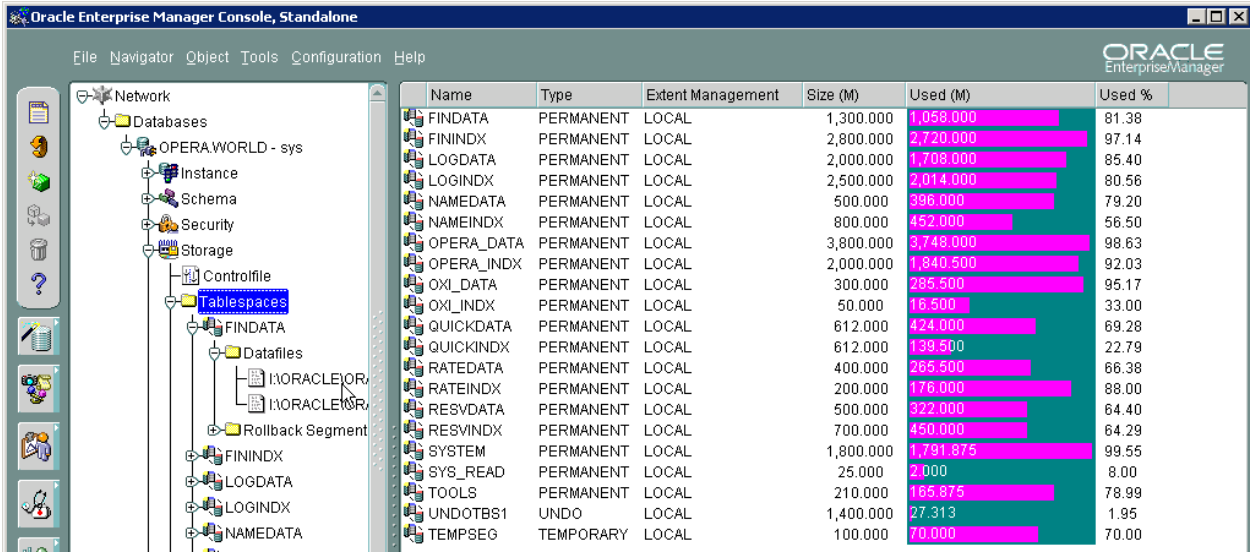
Database Tablespace

The Oracle database is sized to allow for 2 years of growth before requiring attention. The various tablespace data files, used by the Oracle database, are also set to allow auto extent of their size when needed. By default, the Opera instance has 18GB of reserved space at time of installation. 50% of this space will be used during installation, configuration and creation of the OPERA_TRAIN schema.

As the various tablespace files auto-extend, available space on each drive will be reduced. By default each datafile is preset to auto-extend to a maximum size of 2GB. In the event that a tablespace or physical disk drive fills to capacity, additional tablespace files can be created on a custom drive after installation of new hard drives; allowing the Opera database to grow indefinitely.

Opera's Health Check Report can be added to the night audit report sequence and will alert you to any critical consumption of tablespace allocation and the requirement for additional tablespace data file creation. Available drive space should be monitored to ensure drives do not fill to capacity.

Oracle provides a Windows based application – Oracle Enterprise Manager – for this purpose. This software is installed on the database and application server and is accessible via a shortcut on the start menu.



With OEM - Storage Manager, you can perform administrative tasks associated with managing database storage. These tasks include managing tablespaces and adding datafiles.

You can also launch other database tools and utilities from the application. Storage Manager displays a tree listing and multi-column lists to allow you to manipulate and view objects.

A single tablespace datafile must not exceed 2GB. To increase an Oracle tablespace beyond 2GB, one ore more additional tablespace datafiles can be created/added to the tablespace. Adjustments to the tablespace allocation and creation of new tablespace datafiles must be performed with the assistance and instruction from MICROS-Fidelio DBA support personnel.

Application Server

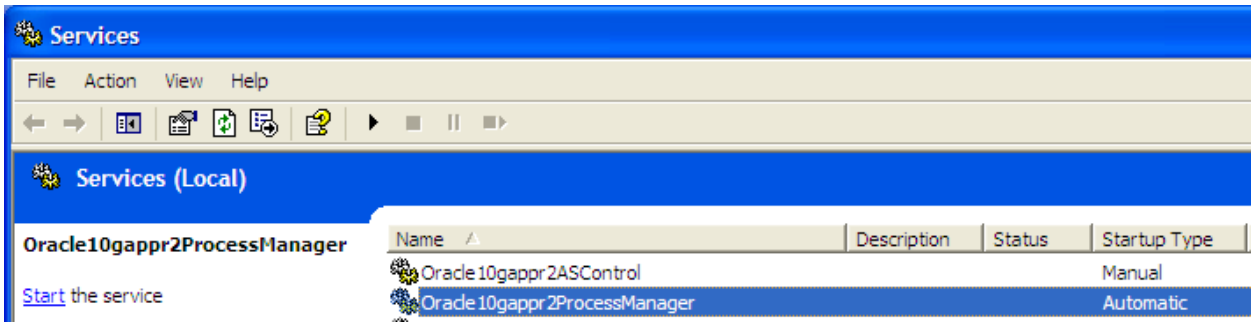
Opera is delivered as a Java application to a user workstation launched from the Opera Web Page. This is hosted from 1 or more application servers. The Opera application server is installed with various Oracle software components

- Oracle Client Software
- Internet Application Server (iAS) (web server)
- Opera runtimes

Depending on the CPU and memory available each application server can support up to 80 concurrent users. Additional application servers can be installed and configured as required.

Being a web-based application it is important that workstations are configured correctly to resolve the hostname of the application server(s) within DNS. Incorrect configuration for name resolution will result in issues with application performance response.

On completion of the Oracle software installation a number of services are created for Oracle.



Oracle10gappR2AScontrol

This service is used to give access to remote administration of the app server via a web browser interface on port 1810. While this service is running, you can point a browser to the URL http://[appserver]:1810 and you will be asked to log in. The default login and password for that connection are 'ias_admin' and 'opera321'. This service is set to autostart by default but is optional.

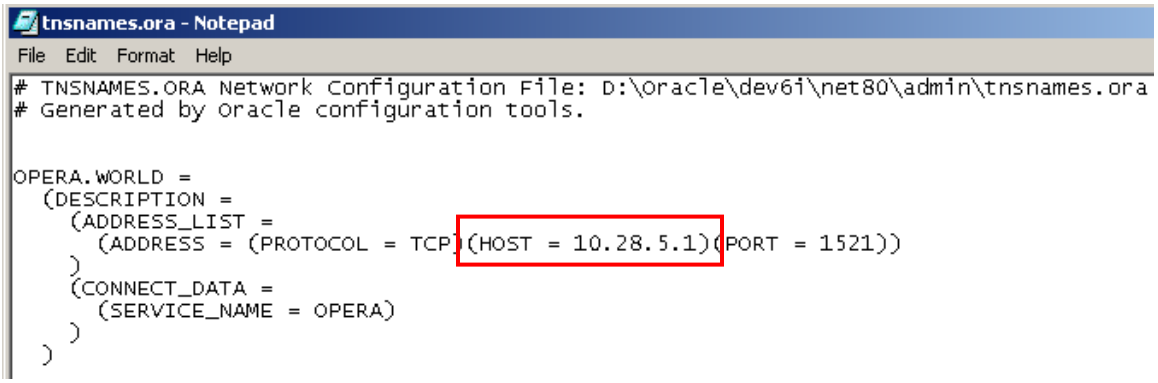
Oracle10gappR2ProcessManager

This is the master service that controls all the other services needed by the application server. This service is more of a shell for the other services such as the HTTP_Listener, the OC4J servers, etc. To monitor what this service is actually running, you use the 'opmnctl' utility from the command line.

Database Connection

In order for the application server(s) to communicate to the Oracle database server, a database alias must be configured for Oracle.

The file \ORACLE\10gappr2\NETWORK\ADMIN\tnsnames.ora contains the following entry.



The HOST= value should identify the IP address of the database server.

The SERVICE_NAME identifies the instance of Oracle and should equal OPERA

Changes to TNS configuration for each application server must be done using the Micros OAPPCFGED.EXE utility

Application Server Configuration Utility - OAppCfgEd.exe

An application server configuration utility is available to assist with configuration of the database connection, schema selection and report service creation.

This utility resided in the \micros\opera\tools directory.

The purpose of this utility is to maintain and configure the connections that the application server will use.

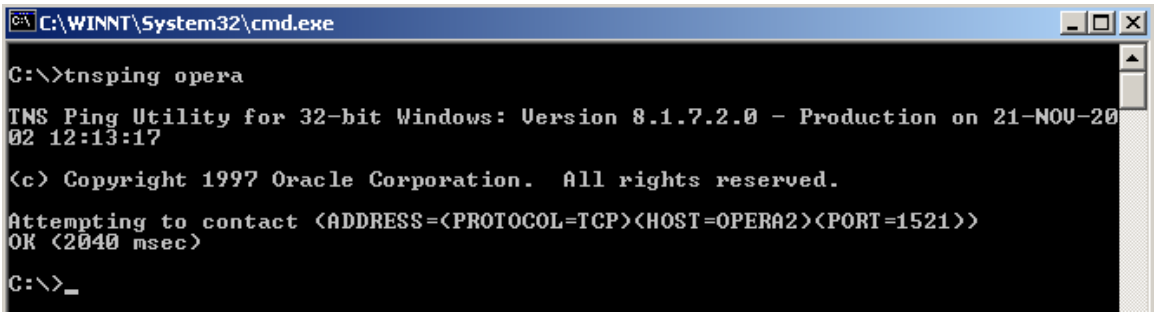
This utility is auto-updating via the micros FTP server – if FTP access is blocked on the network the software will not be able to update when new versions are released.

It should not be necessary to alter the Oracle configuration after installation; configuration changes should only be made by qualified Micros-Fidelio personnel.

Testing Database Connection

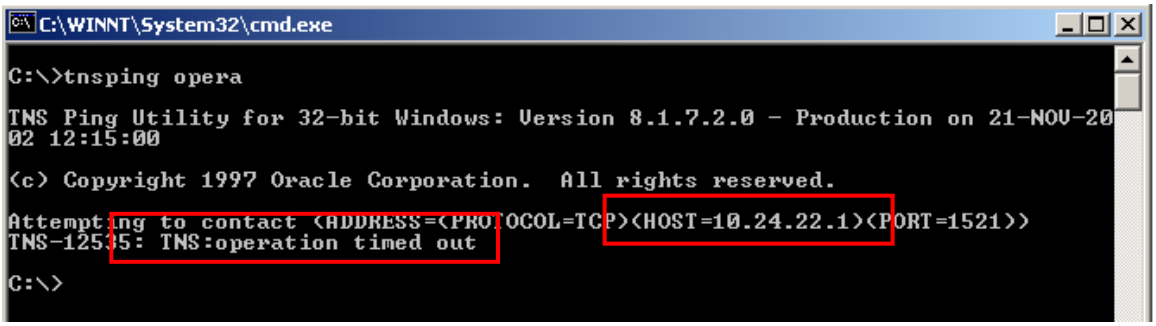
To verify that an application server can successfully connect to the Opera database server, it is possible to test using a DOS utility.

TNSPING <ALIAS>



A successful configuration of TNSNAMES.ORA will result in an 'OK' result.

If the TNSNAMES.ORA file is incorrectly configured, the Oracle client will not be able to connect to the database and will time out or return an error.

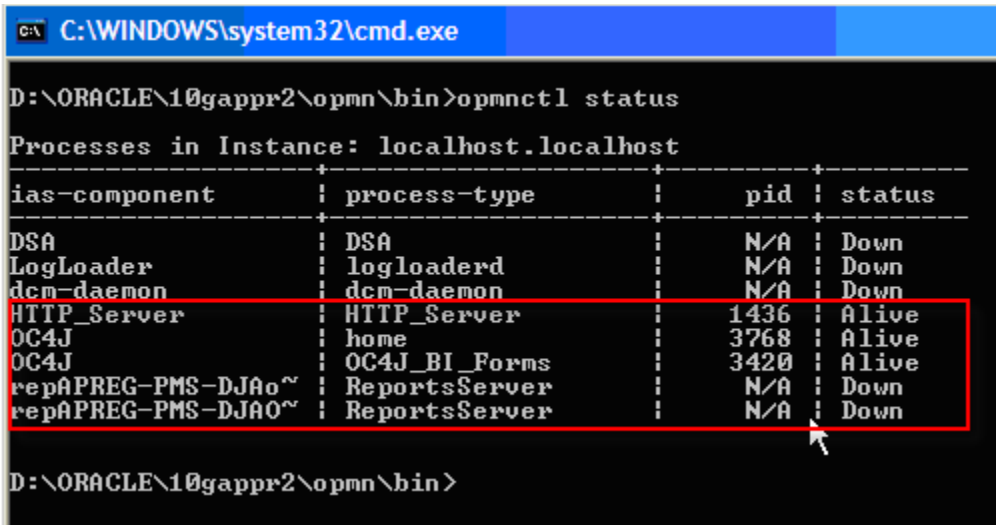


OPMNCTL Utility

The opmnctl utility is located on the application server in the \oracle\10gappr2\opmn\bin directory. This utility can be used to view what processes are currently being managed by the **Oracle10gappr2ProcessManager** service. The benefit of a managed process is that if for some reason one of the managed processes crashes, this service will restart it automatically.

The following screenshot shows the use of the utility with the 'status' option. The two OC4J, HTTP_Server and reportserverrprocesses are all ones that should always be running (alive).

The DSA, dcmdaemon and LogLoader processes are currently not in use by Opera.



The other commands that may be useful with this utility are; 'opmnctl shutdown' for stopping all the processes, and 'opmnctl startall' for restarting all the processes. In general, there shouldn't be any need to manually run these commands. Stopping and restarting the **Oracle10gappr2ProcessManager** service will accomplish the same thing.

Opera Runtimes

Opera Hotel Edition uses Oracle Forms 10g technology to deliver the application user interface and reporting. Opera Hotel Edition is not a standard Windows compiled executable, but rather an interpreted forms/report application.

All runtime files required for Opera Hotel Edition are located in the *\micros\opera\production* folder and subfolders. "Runtimes" consist of forms (screens), reports, compiled procedures, graphic files and online help content.

Key runtime forms, used for application entry (logon) include:

PMS.FMX	Opera Front Desk
FCONFIG.FMX	Configuration
SC.FMX	Sales and Catering
UTILITIES.FMX	Utilities
CRIS.FMX	OXI

Opera is delivered as a Java application, launched from the Opera Home Page.

Night Audit Report and Export Files

Various files are generated on the application server during night audit.

Night audit reports and export files generated by Opera are written to the \micros\opera\export\<schema>\<resort>\<date> folder on the application server.

Multiple Application Servers

By default, the night audit and export files will be created on the local disk of the application server. If more than one application server is installed onsite then Distributed File System (DFS) can be used to ensure the contents of the /export/ folder are synchronised on all servers.

An alternative method is to map a logic drive on all application servers to a shared location on the network. Export and night audit files would then be stored at this location and accessible from all application servers.

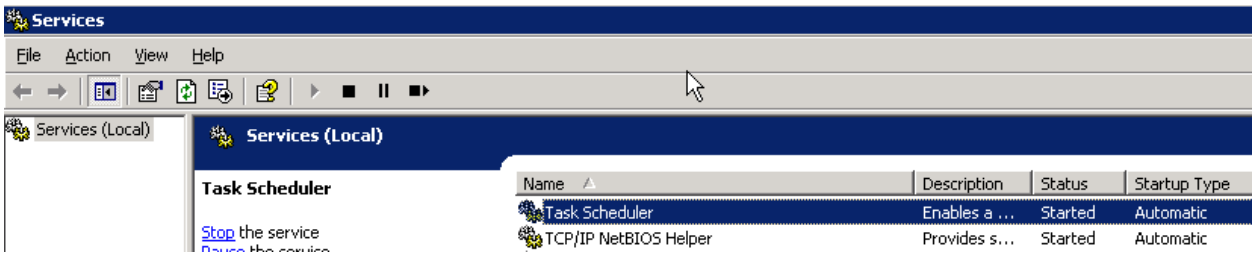
It is essential that the contents of the /export/ folder are included as part of the nightly backup of the Opera database. Alternatively, files can be copied or archived to CDROM

Temporary Files (and cleanup)

Various temp files are written to the application server as a result of user activity from the various Opera sessions. These files are written to the [localdrive:] \micros\opera\operais\webtemp\ folder.

The night audit routine will create a scheduled task to cleanup the files within webtemp, this task will call various batch files resident in the [localdrive:]\micros\opera\tools folder to delete contents of this folder.

This process requires the Task Scheduler service to be running (started) on the application server(s).

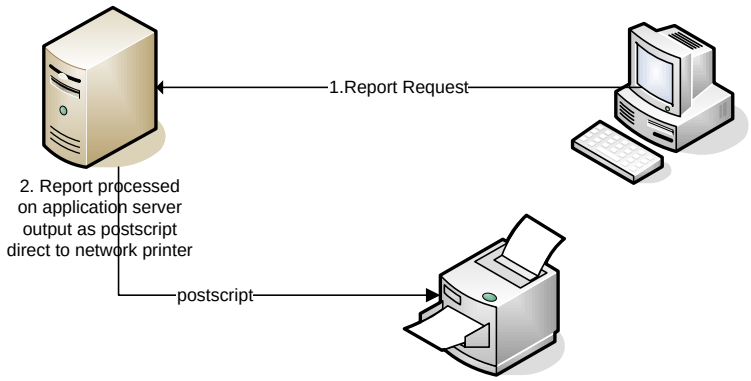


Printer Configuration

Direct Printing

Direct printing is only possible in a LAN environment; where the application server(s) and network printers are on the same subnet. All reports will be generated by the application server and PCL/postscript data sent directly to the printer – this can be 3-4MB per page.

Direct printing requires that the printer drivers for each network printer be installed on the application server. The printer name defined on the application server is then referenced within the Opera application.



Direct printing cannot be used generation of stationery reports defined using Microsoft Word/ XML Publisher. XML Publisher can only output to PDF, HTML, RTF and requires client-side printing to be implemented.

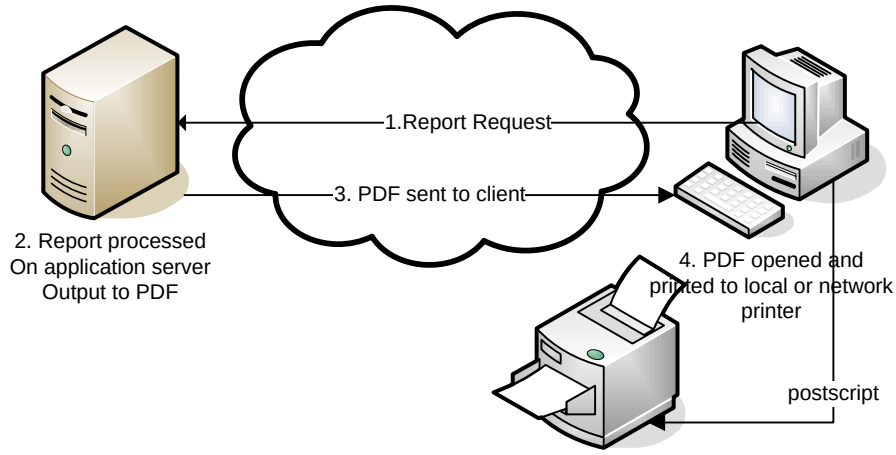
Client Side Printing

Client side printing is required under various circumstances

- For printers in a wide area network environment (multi property or data centre environment); where the client workstations and printers are not located on the same subnet as the application server.
- For sites using stationery defined using Microsoft Word / XML Publisher
- For local (LPT or USB) printers not connected / shared to the network.

All reporting from Opera will be processed/generated on the application server as either a PDF (bitmap) or TXT (character) files and then transmitted to the client (via HTTP) for printing by the client; using locally installed printer drivers. The PDF file is opened on the client workstation using Acrobat Reader V4 and printed on the local subnet.

PDF is essentially compressed postscript – each page is less than 300kb in size.



Postscript Driver Requirements

For best results, postscript drivers should be installed for all HP printers used by Opera.

The HP PCL5e and PCL6 drivers have 2 known problems with Oracle and Acrobat Reader:

- Memory leaks that will eventually crash application servers or clients
- Incorrect font translations from PDF files, especially when system is busy or large PDF Report

The postscript driver must be installed on the Network Print Server, from where the printers are shared and on the application server for direct printing.

If other hotel applications require PCL Drivers, they can be installed on the Print Server as well. However, they must have a different name than the postscript drivers to prevent conflict.

Varying versions of a printer driver can result in slightly different output formats due to variations in the translation of the data received. If output is different when printed from a different workstation or to a different printer, please check the driver version being used on the application server (direct) or workstation (client-side)

Oracle Report Server Process

On every application server, the Oracle Report Server process is responsible for the generation of all report requests. These requests are made via records in the Report Queue (rw_server_queue) table.

The report server process is managed by the **Oracle10gappR2ProcessManager** service

Report Failure

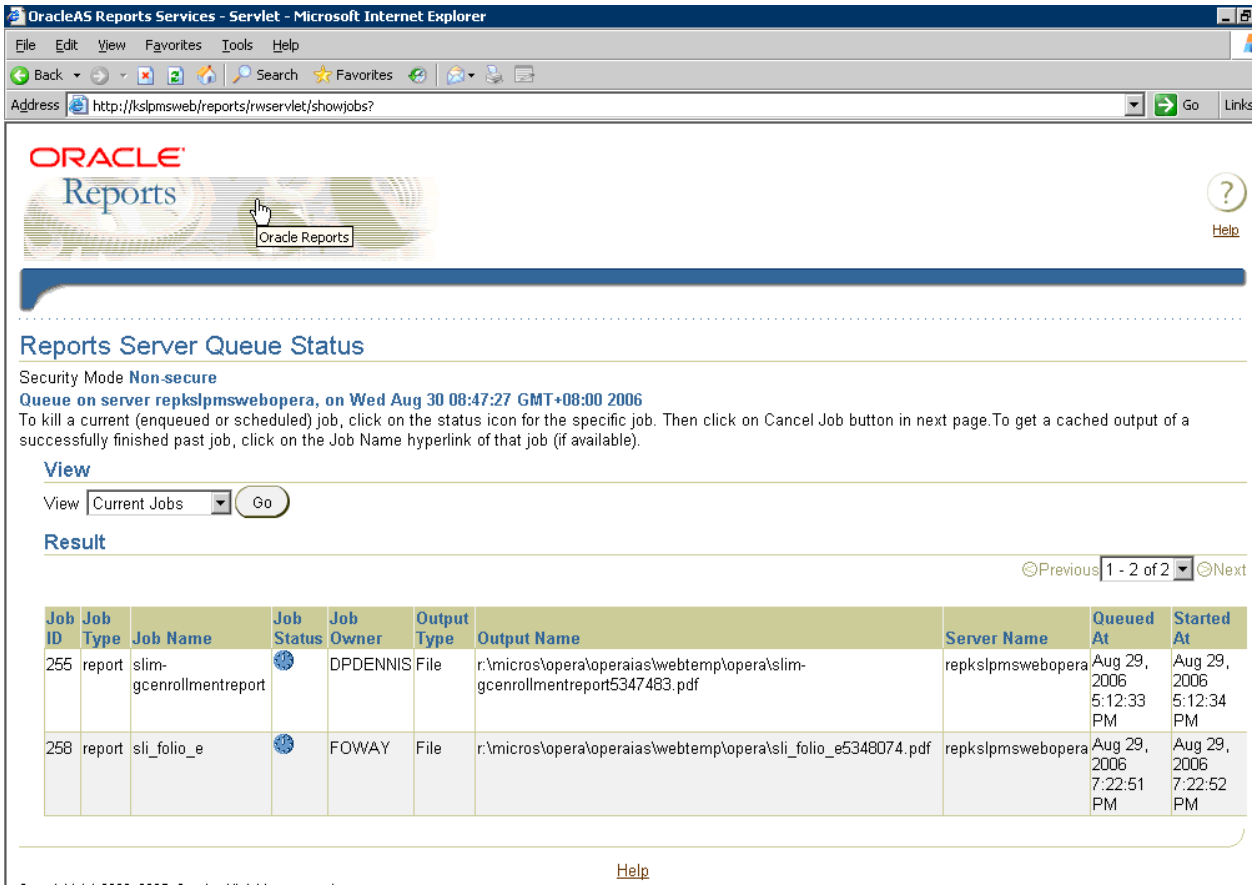
This error indicates that the report process is not running on the application server

Report Queue Manager

All print jobs processed from thin-client sessions can be managed using the Oracle Report Queue Manager utility. From any workstation access the URL -

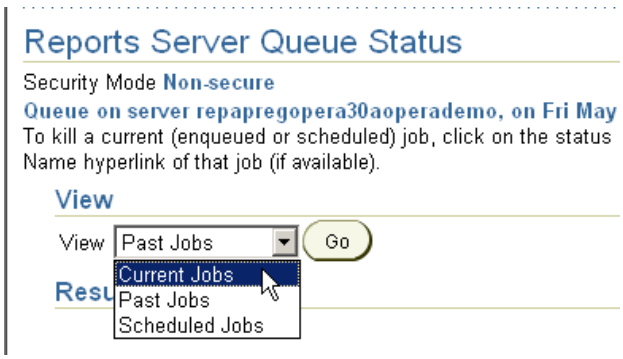
http:///[appserver]/reports/rwservlet/showjobs?server=rep[appserver]opera - for production

http:///[appserver]/reports/rwservlet/showjobs?server=rep[appserver]opera_train - for training



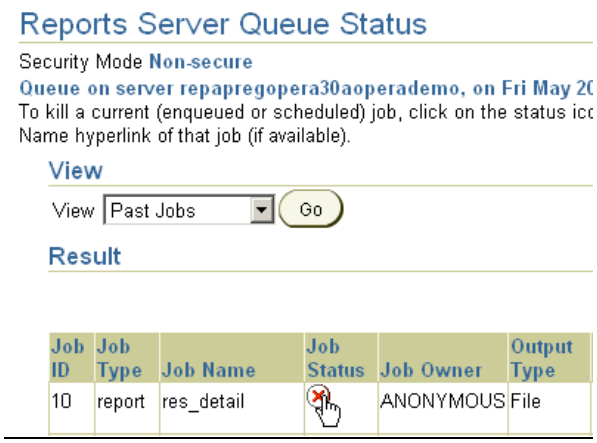
Cancel Report Request

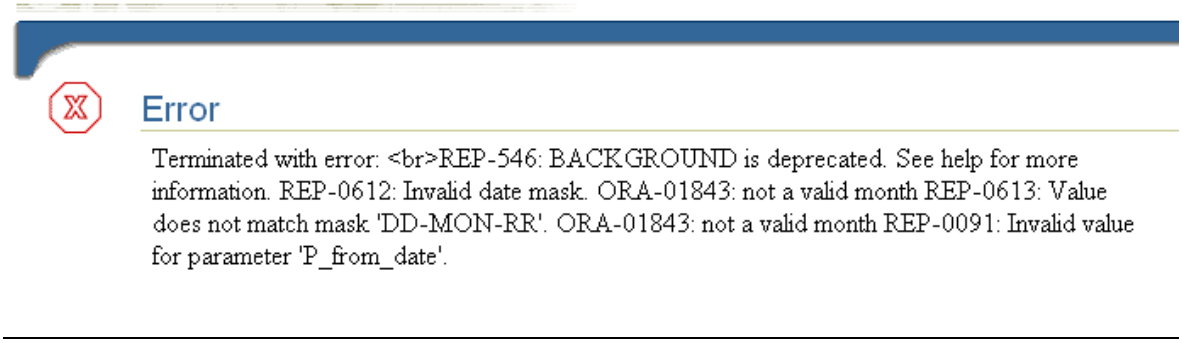
To cancel a currently running or queued report, select 'Current Jobs' from the list of values and select GO



View Report Error (Job Status)

Report failures can be seen within the report queue past jobs. Select the {x} on the job status to display the error message. Copy and paste this text when escalating a support case to Micros support.





Network and Local Printers

Both network and local printers are supported by Opera.

Network Printers

Network shared printers will require a separate print server for the Windows queue management.

Ideally, TCP/IP printing should be implemented for all local area network printers. By adding the TCP/IP port on the application server(s) and installing the printer as a 'local printer'. Output from Oracle is sent directly to the IP port, bypassing the need for a print server/queue manager.

For Wide Area Network installations, client side printing must be used. TCP/IP ports can be defined on each workstation for a single printer or a network shared printer configured.

Local Printers

Local printers, attached directly to workstations must be configured for client-side printing. Opera will generate all report output to PDF for client-side printers. The PDF file will be printed by the client (workstation) using locally installed printer drivers to the local serial or USB port.

Workstation Requirements

Opera is delivered as a web (Java) application via Internet Explorer V6.0 on workstations.

When launching Opera from a workstation for the first time, 4 applications are installed on the workstation in order for Opera to function correctly.

- Oracle J-Initiator (Java)
- Opera Terminal Registration (unique terminal ID)
- Abode Acrobat Reader V4.0x
- MF Print Utility

This one-time installation procedure requires local administrator privileges.

If policies are in use – the user requires permissions to update the registry and install local applications.

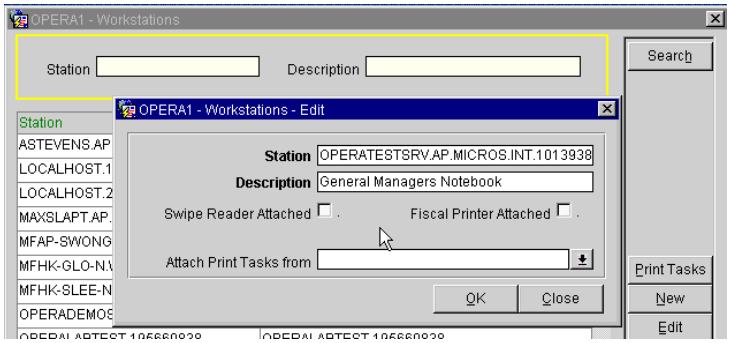
Subsequent launches of Opera do not require any software installation nor administrator privileges.

First time launch of the Opera screen painting wizard will also force a download of the applet to the client. This application installation will also require local administration privileges.

Terminal Registration

A default terminal ID will be assigned to any new workstation that launches the Opera application from within Internet Explorer. This ID is displayed lower left of the Single Sign On (SSO) homepage.

Within Opera Hotel, it is necessary to add the same terminal name to the list of workstations.



Thin client workstations are identified by the entry within the file TERMREG.INI in the %WINDIR% folder.

In a multi-property environment the same %computername% could be used on different subnets; therefore the terminal registration program will assign a unique ID based on Julian date and time.

Adobe Acrobat Reader V4.0

Opera uses Acrobat Reader for report preview and printing. Version 4 of the reader is required, as this version supports background printing – avoiding the launch of the splash screen on execution. This feature was removed from later versions of Acrobat Reader, making it incompatible with Opera.

Acrobat reader can be manually installed on a workstation by launching the install wizard from the Opera Single Sign On homepage [Get Acrobat Reader].

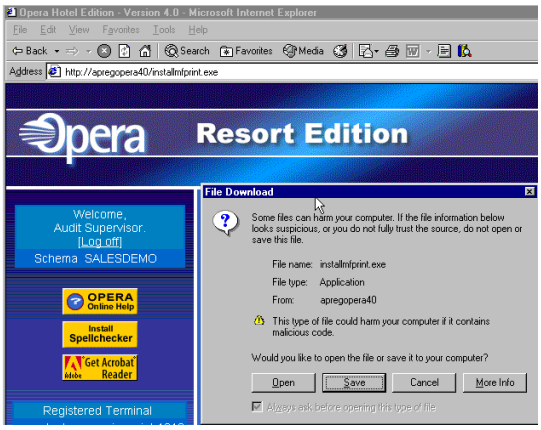
Select to 'run this program from its current location' and installation of Acrobat Reader will commence.

Later versions of Acrobat Reader can be installed in addition to Acrobat Reader V4.0, for use with other generic PDF files. Please ensure Acrobat Reader V4 is installed first and registered with MF Print Utility before installing Acrobat V6/V7

MF Print Utility

The MF print utility is used for background printing of PDF files. MF Print will call Acrobat Reader V4.0 to open the PDF file and print the document to the specified printer.

MF Print Utility can be manually installed by launching the installation wizard via HTTP from the client web browser – http://<appserver>/installmfprint.exe (select open or run)



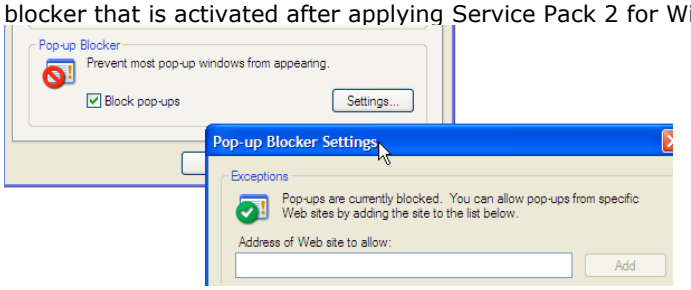
Oracle J-Initiator

Oracle J-Initiator can be manually installed from the web page

//<appserver>/opera_jinit_1012_25.exe (select open or run)

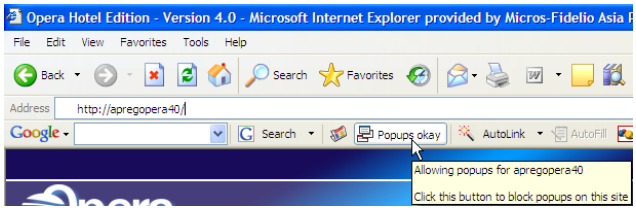
Internet Explorer Pop-Up Blocker

Many areas of Opera make use of pop up windows (eg online help) which will be affected by the blocker that is activated after applying Service Pack 2 for Windows XP.



All thin client workstations installed with SP2 will need to add the address of the application server(s) as a trusted site, thus allowing pop-ups from this address. (Tools > Internet Options > Privacy)

The application server address must also be flagged as OK within the Google or Yahoo toolbar bar plug-in's for IE if installed.



Microsoft Word Stationery Editor

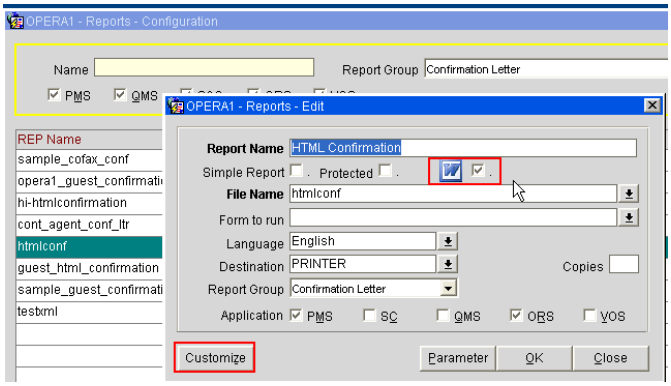
Hotel stationery may be defined using the XML Publisher desktop plug-in for Microsoft Word.

In order to create stationery templates using Microsoft Word, the Oracle XML Publisher software must be installed on the user's workstation. Please contact your local Micros support office for a copy of the XML Publisher installation media. (This software does not need to be installed to execute the stationery/report)

Once installed to a workstation stationery can be created/ updated via Opera.

Configuration > Login > Setup > Report Setup > Reports > Select Report Group

New or Edit



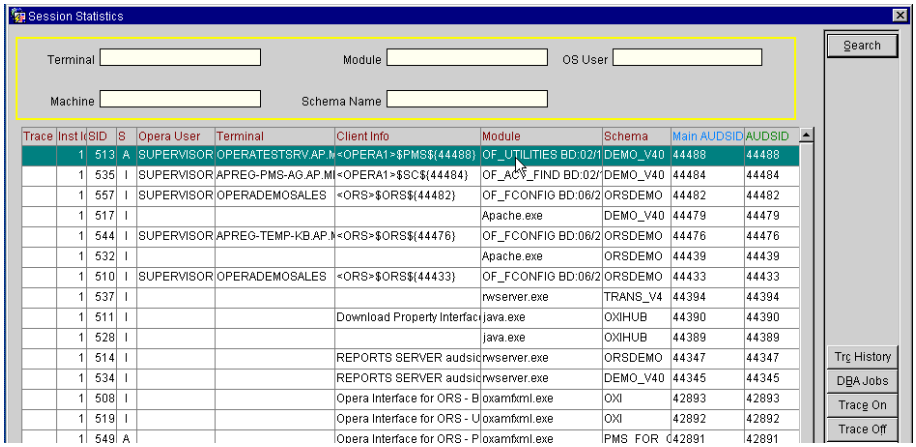
Please refer to the *MS Word Stationery Editor - User Guide* and online help for further information on using this stationery editor.

Opera Utilities

Utilities can also be accessed from the main Opera web page.
Application permissions are required to access Utility options

Session Statistics

Tools | Session Statistics



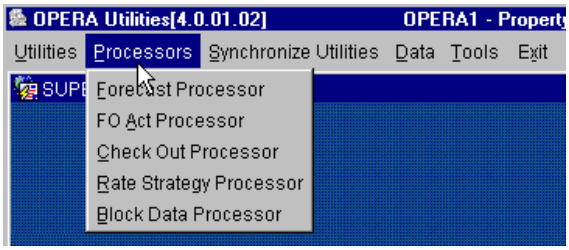
Trace	Inst Id	SID	S	Opera User	Terminal	Client Info	Module	Schema	Main AUDSID	AUDSID
	1	513	A	SUPERVISOR	OPERATESTSRV.AP.M	<OPERA1>PMS{44488}	OF_UTILITIES BD:02/1	DEMO_V40	44488	44488
	1	535	I	SUPERVISOR	APREG-PMS-AG.AP.MI	<OPERA1>SC{44484}	OF_ACV_FIND BD:02/	DEMO_V40	44484	44484
	1	557	I	SUPERVISOR	OPERADEMOSALES	<ORS>ORS{44482}	OF_FCONFIG BD:06/2	ORSDEMO	44482	44482
	1	517	I				Apache.exe	DEMO_V40	44479	44479
	1	544	I	SUPERVISOR	APREG-TEMP-KB.AP.M	<ORS>ORS{44476}	OF_FCONFIG BD:06/2	ORSDEMO	44476	44476
	1	532	I				Apache.exe	ORSDEMO	44439	44439
	1	510	I	SUPERVISOR	OPERADEMOSALES	<ORS>ORS{44433}	OF_FCONFIG BD:06/2	ORSDEMO	44433	44433
	1	537	I				rwserver.exe	TRANS_V4	44394	44394
	1	511	I			Download Property Interfac	java.exe	OXIHUB	44390	44390
	1	528	I				java.exe	OXIHUB	44389	44389
	1	514	I			REPORTS SERVER audsic	rwserver.exe	ORSDEMO	44347	44347
	1	534	I			REPORTS SERVER audsic	rwserver.exe	DEMO_V40	44345	44345
	1	508	I			Opera Interface for ORS - B	oxamfxml.exe	OXI	42893	42893
	1	519	I			Opera Interface for ORS - U	oxamfxml.exe	OXI	42892	42892
	1	549	A			Opera Interface for ORS - P	oxamfxml.exe	PMS_FOR_O	42891	42891

Session statistics allows you to view and manage to the various connections to the Oracle database. When downtime is required, session statistics can help determine who is still connected and running Opera Hotel. Sessions can be terminated by highlighting the entry in the grid and selecting the [KILL Sess.] button.

Session Statistics can also be used to perform a database trace, in the event on a performance issue within the application. Trace files help determine inefficient code, that can be corrected to improve transaction performance

Queue Processors

Opera Hotel Edition uses up to three background jobs for low priority queue based processing of data. These processors would always be running. Processors are stopped for application upgrade only.



Forecast Processor

The forecast processor is responsible for all availability updates. Creation and update to reservations and blocks triggers a record to be added to the forecast processor queue[5]. This queue is then processed sequentially and the availability updated accordingly. If this processor is stopped, no availability update will occur

FO ACT Processor

FO ACT processor is used with IFC7w.EXE, for the processing of interface postings and activities. If stopped, no update to guest balances will occur for postings received from third party interfaces. (IFC8 does not require the FO ACT processor).

Scheduled Checkout Processor

The checkout processor is used for scheduled checkout functionality. Any scheduled checkouts will be placed into a job queue and handled through this processor.

Rate Strategy Processor

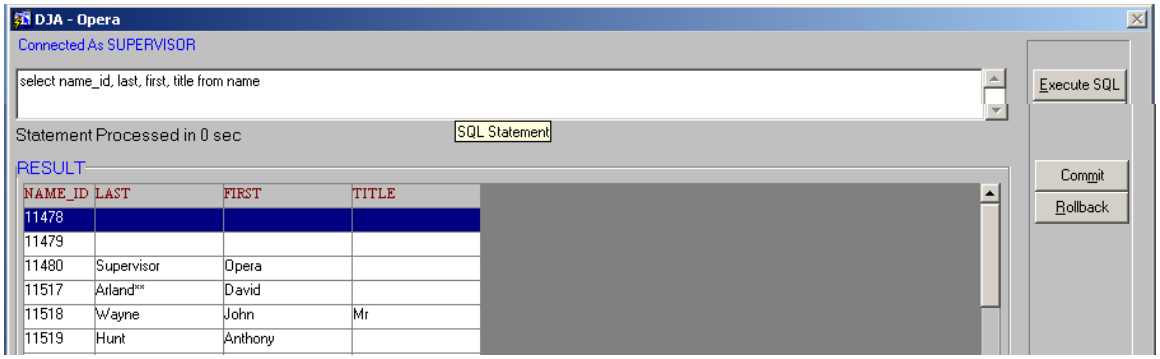
The rate strategy processor is responsible for the processing of any rate controls defined through the rate strategy module. Rates will be opened and closed accordingly based on current occupancy levels.

Opera SQL

Tools | Opera SQL

Opera Utilities has a built in SQL utility to view the data held within the opera schema. As this utility operates in an Oracle Forms environment it will function from any thin-client, without the need for Oracle client software to be installed on the workstation; the connection is made from the application server.

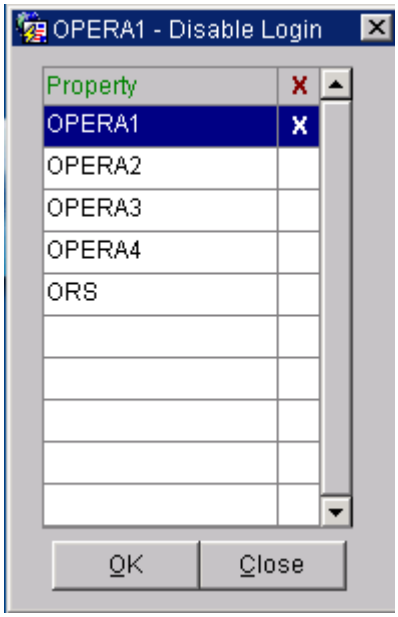
[5] Queue: FIFO – First in First out



Disable Property Login

This option prohibits login to a selected property. This option is useful whenever you wish to restrict users from logging in to Opera for a specific resort.

Property Configuration | Disable Property Login



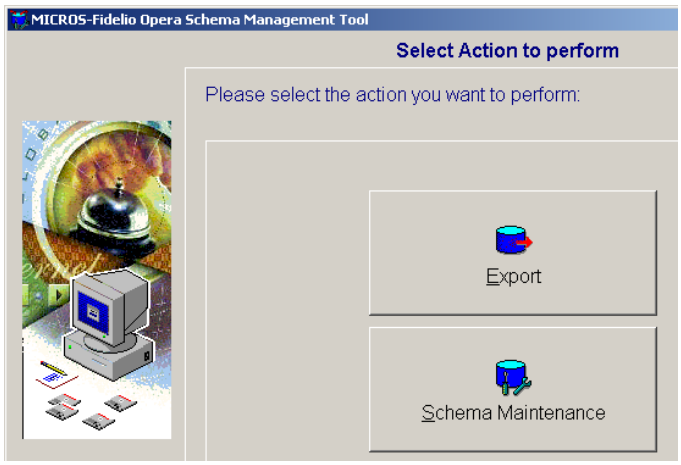
To restrict access, check the column next to the resort ID and select [OK]
To allow user access, simply uncheck the column next to the resort ID and select [OK]

Schema Management Tool

The Opera development team has created an Oracle schema management tool for easy maintenance of schemas and associated tasks. This is a MICROS installer/support utility.

OPERA_SMT.EXE is installed on application server in the \micros\opera\tools folder.

This utility is auto-updating via the micros FTP server – if FTP access is blocked on the network the software will not be able to update when new versions are released.



Export
SMT provides an option to automate the export of a schema to a self-executing file that allows for the transportation of a schema from one database instance to another.

SMT also allows for the automated creation of a training schema.

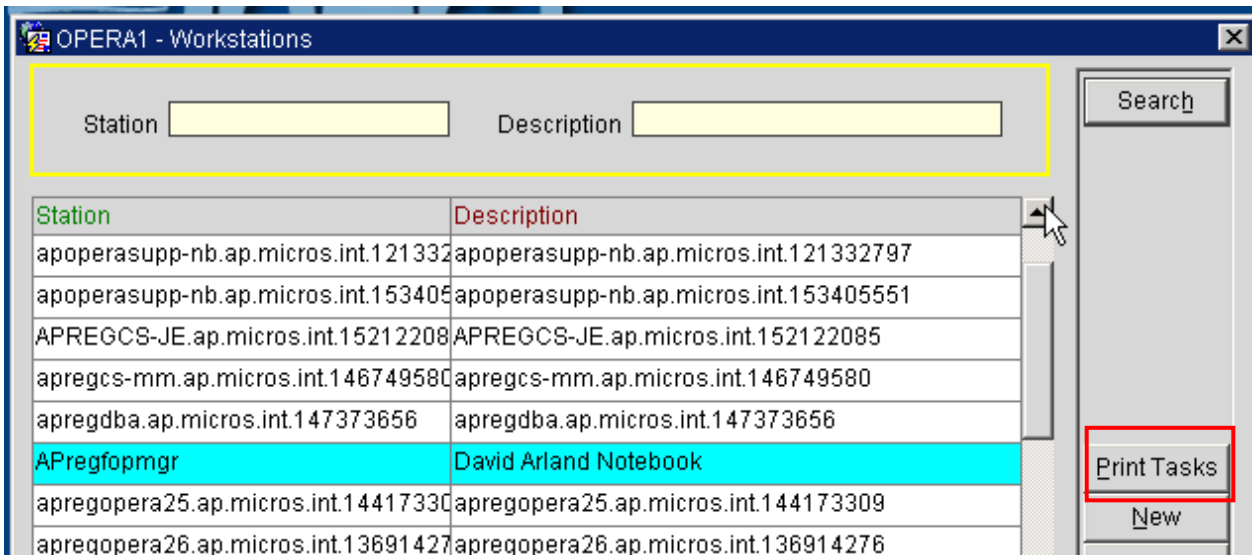
Schema Maintenance
SMT also provides maintenance tools for the implementation of e-patch scripts and associated schema object tasks.

Please refer to OPERA_SMT.PDF located in the \micros\opera\tools folder for detailed documentation on this utility.

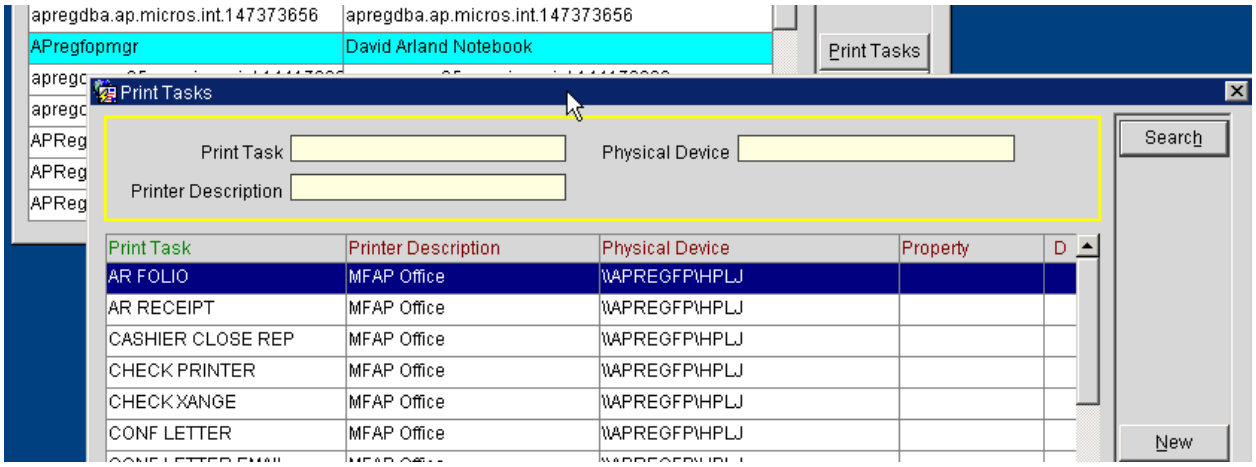
Workstation Print Tasks

In order for Opera to know where to print the various stationery and reporting items for a particular workstation, it is necessary to define print tasks per workstations.

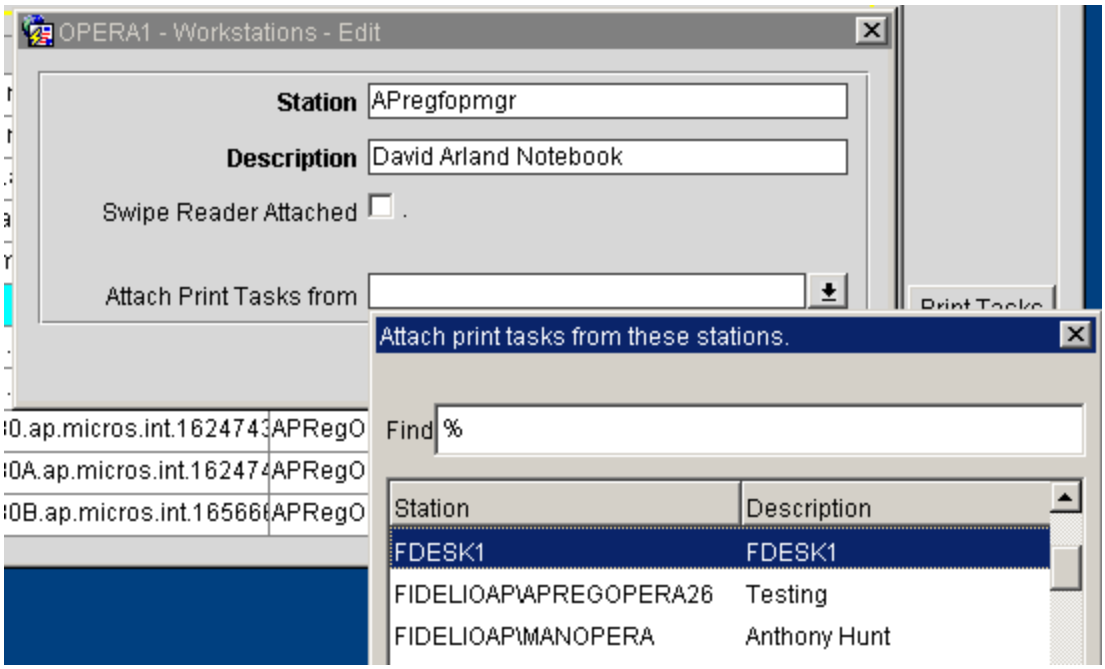
It is also possible for one or more workstations to reference the print task of another workstation; in the event that all print tasks need to be the same. For example, all reservation PC's requiring the same print tasks; after setting the print tasks on the reservation managers PC, the other workstations can be configured to reference the reservation manager for their print tasks.



Highlight the workstation and select [PRINT TASKS] to define the settings required for this workstation.



Select [NEW] then select the printer and one or more print tasks to be sent to this printer.



Attach print tasks from – allows a workstation to inherit the task of another workstation.

License Codes

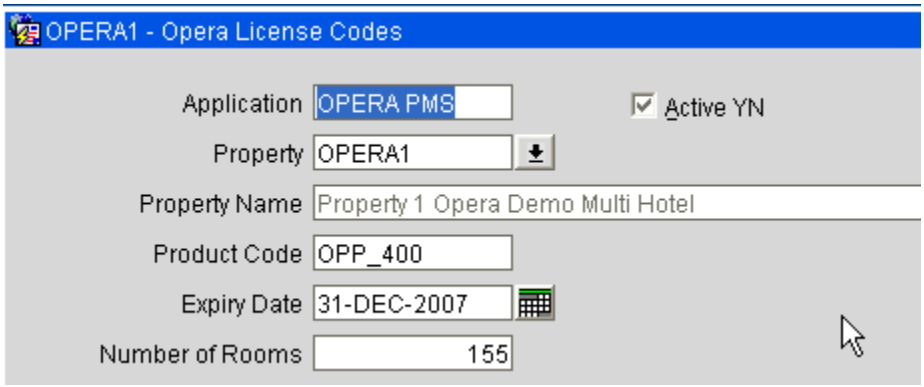
Opera Hotel Edition license codes are generated based on the hotel name and number of rooms configured within the resort. License codes are resort-specific in a multi property environment.

The primary OPP, OPQ and OPS codes also have an expiry date and change with each product version. New license codes will be issued by the local Micros-Fidelio office close to the time of pending expiry (or upgrade) and sent to you for update within Opera.

Opera's add-on licenses are not date or version specific.

License information is updated via Hotel Configuration.

Setup > License Codes > <product>

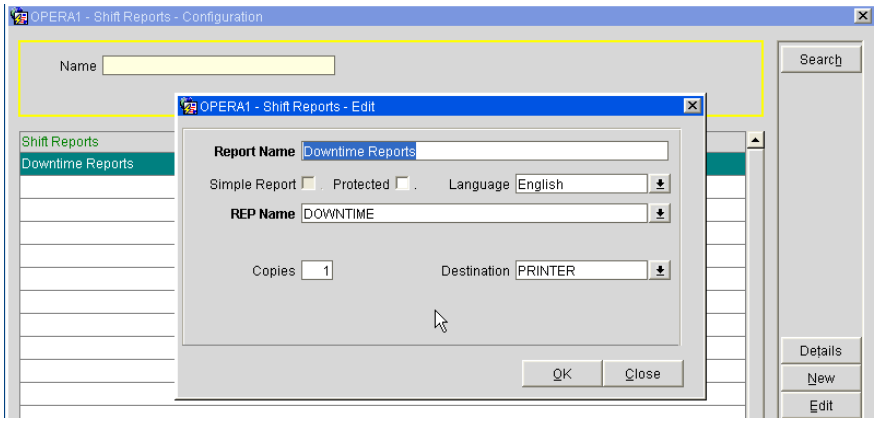


Shift Reports

Shift Reports enable the execution of several report jobs from a single report selection within Opera.

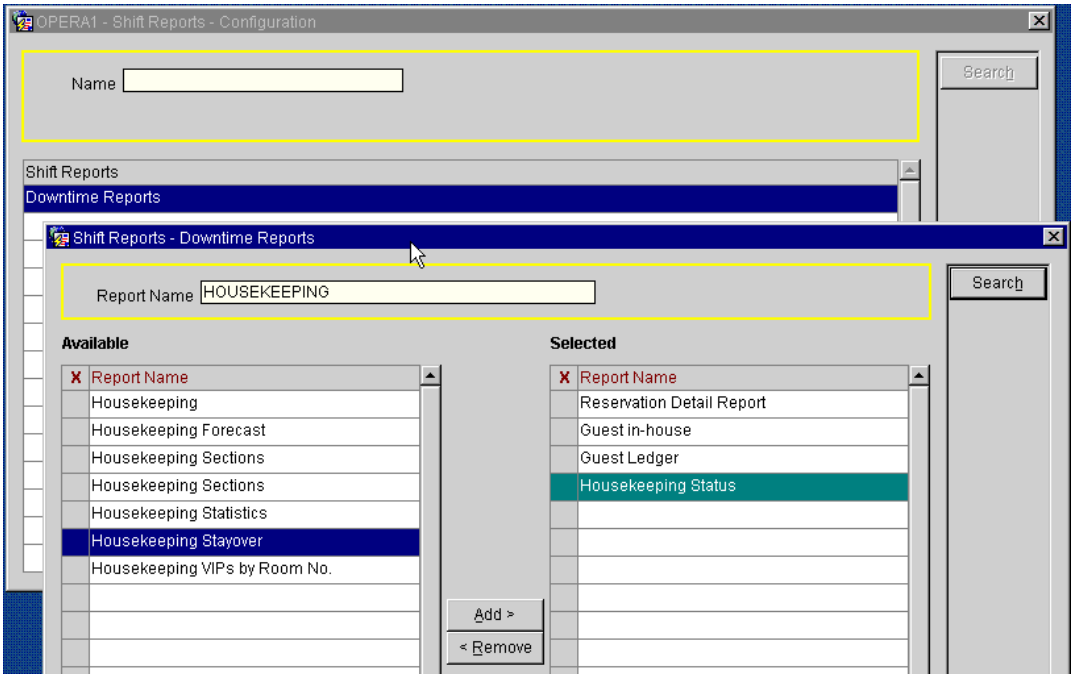
Create New Shift Report

Setup | Report Setup | Shift Report



Select [NEW] to create a new report set; [OK] to save

Select [DETAILS] to add various reports to the shift report set.



Oracle Database Essentials

MICROS-Fidelio bears no responsibility for the execution of any of the commands listed in this chapter or herewith if the reader is not professionally qualified as an Oracle Database Administrator. The reader of this document must be aware that commands listed in this chapter require sufficient technical expertise to understand and execute.

This information builds on topics previously addressed in this document. There are more detailed commands and file locations to further assist maintaining the Opera Oracle environment.

What is an Oracle database

Oracle Database is used to store vast amounts of information. Oracle Databases are Relational databases, so if used in the correct manner, data from many tables can be collected into one large query.

Opera uses Oracle Databases to store not only information, but the program code as well.

Oracle System Files

The database is composed of many files at the Operating System.
The files that make up a database are listed below:

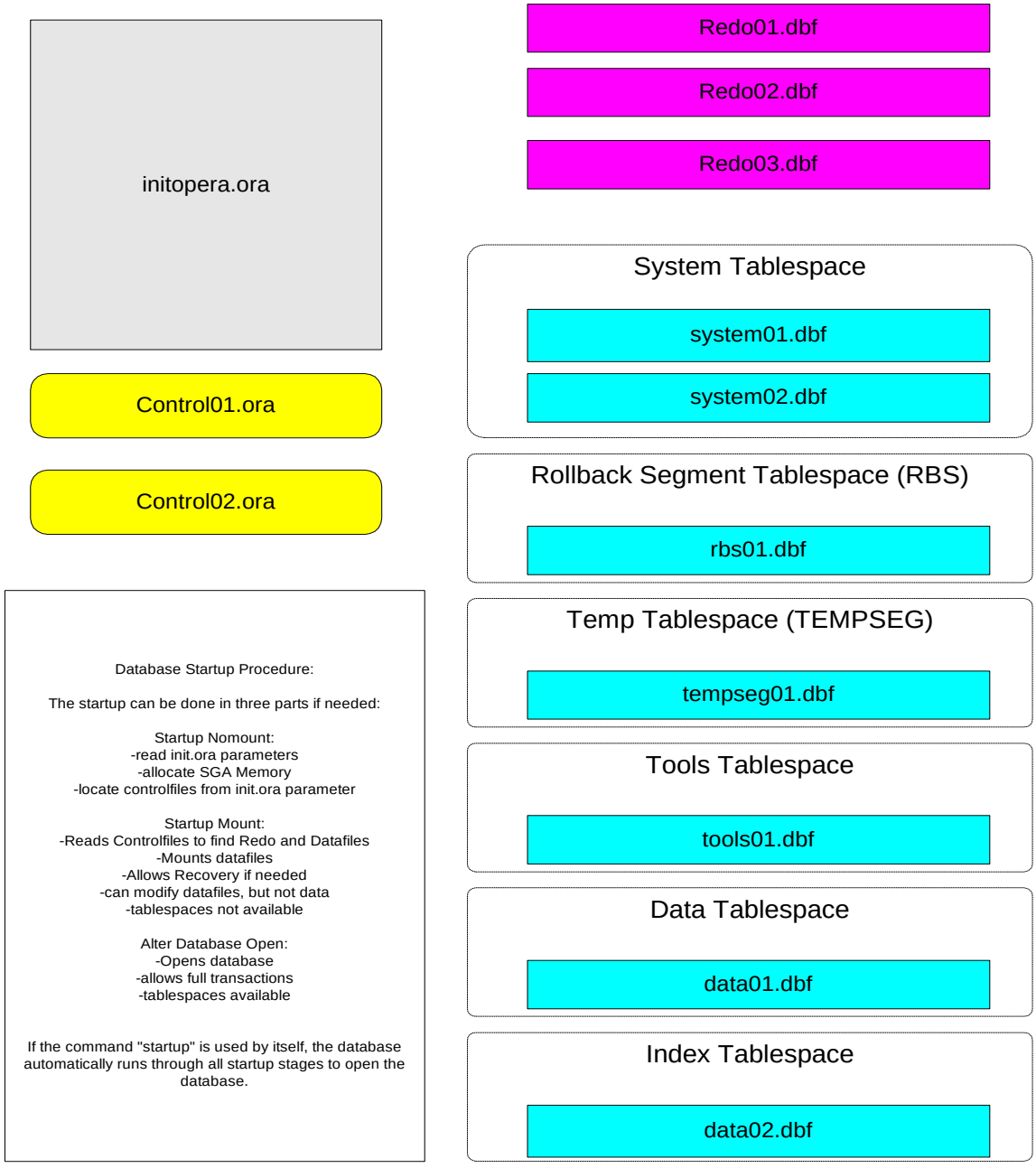
- Datafiles (required)
- Control Files (required)
- Initialization files (initopera.ora) (required)
- Redo Logs (required)
- Archive Logs (Optional)
- Trace Files

Oracle Memory Requirements

The database will allocate memory when running. The base amount of memory is controlled by settings in the initialization file, and will is detailed in the Maintaining Oracle Database section.

Each user that connects to the database via Opera or an Oracle utility will create a process on the database server. Each process requires memory meaning that the more users on the system the more memory used on the Database Server.

Database File Structure



This diagram shows the basic components of a database. The tablespaces are shown in dotted lines because they do not actually exist as a file – they are logical groupings of datafiles.

Starting Oracle Database

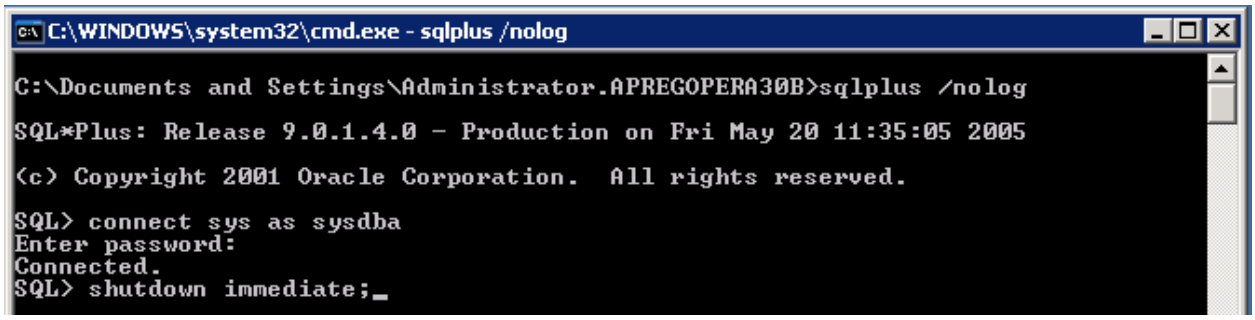
By default, an Oracle database installed for Opera will automatically start up when the database server is started or rebooted.

To start the database manually

- Start a DOS window (cmd.exe) on the database server
- At the command line, type *SQLPLUS /NOLOG*
- At SQL> prompt type *connect sys as sysdba [enter]*
- Password *<syspassword>*
- Once connected startup the database by typing *startup; [enter]*
- This may take a few minutes.
- After start up completes exit SQLPLUS by typing: *exit [enter]*
- Close the DOS window

Stopping Oracle Database

- Start a DOS window (cmd.exe) on the database server
- At the command line, type *SQLPLUS /nolog*
- At SQL> prompt, type *connect sys as sysdba [enter]*
- Password *<syspassword>*
- Once connected, shutdown the database by typing *shutdown immediate; [enter]*
- This may take a few minutes. After it completes, exit by typing: *exit*
- Close the DOS window
- Stop the service *OracleServiceOpera* in the Control Panel Services window.



Tablespace and Datafiles

The largest files in the database are always the datafiles. Datafiles make up the various tablespaces. By default, an Opera Database has the following tablespaces:

- SYSTEM
- RBS
- TEMPSEG
- TOOLS
- OPERA_DATA
- OPERA_INDX
- FINDATA
- FININDX

- LOGDATA
- LOGINDX
- RATEDATA
- RATEINDX
- RESVDATA
- RESVINDX
- QUICKDATA
- QUICKINDX
- NAMEDATA
- NAMEINDX

Here are some more details on tablespaces and datafiles:

- A tablespace has at least one datafile.
- A datafile can only belong to one Tablespace
- One tablespace can have multiple datafiles
- The maximum datafile size for an Opera datafiles is 1900MB. This limit is imposed because of issues with 2GB and larger files on some platforms, and files larger than 2GB are very difficult to manage or move.
- When a tablespace fills, either a new datafile needs to be added, or current datafiles need to be resized up to 1900MB.

UNDO Tablespace

UNDO tablespace is used for data integrity. If a transaction fails or a user cancels the transaction before it is committed, then the data is reverted back to the original value by the rollback segment.

For example, if a reservation agent is on the phone with a customer and making a reservation in Opera, and the person on the phone changes their mind; consequently the reservation agent will cancel out of the transaction. The data that was inserted or changed is rolled back to the original value by using data stored in the rollback segment.

UNDO tablespace is used for data consistency. For example - when selecting every record from the financial transactions table, to ensure the data remains accurate from the time when the query started - while data modification is occurring on the table- the query will read from the rollback segment to keep all data consistent with the time the query started.

- By default, Opera uses UNDO tablespace.
- Before a transaction is committed the data is stored in the UNDO tablesapce.
- There is one rollback segment called "SYSTEM". This rollback segment can only be used for objects in the SYSTEM tablespace, and is meant for use by Oracle Background Processes only. Sizing it or taking it online or offline is not needed only if AUTO UNDO equals manual.

- UNDO tablespace in the default Opera database is optimally sized. It does not require maintenance from the end user or support. If a transaction continually causes a UNDO tablespace to fill then this needs to be reviewed by development.

Redo Logs

Redo Logs are used for database recovery. The redo logs ensure that all transactions are logged and are recoverable in case of a database failure or a disk crash. They are used only for database recovery if needed.

Opera has 10 redo logs of 100MB each. Oracle writes all transactions to the redo logs as they happen. When a redo log is filled, Oracle switches to the next to use it. When the 10th log is filled, Oracle will go back and use the 1st redo log.

If Archive mode is enabled, then Oracle will create a copy of redo logs as they are completed. When a redo log is filled and Oracle switches it is then copies the file to the archive destination. If the redo log doesn't get archived by the time the database comes back around to it, then the database will not be able to use that redo log. The database will hang until that problem is cleared and the redo log is archived. Most of the time, this is caused by the 'Archive Destination' filling to capacity. Solutions to this problem are listed in the Maintaining an Oracle Database section.

Despite it's name, the Redo log is not a logfile that can be read. It is binary, and illegible if opened in an editor. There is an Oracle Utility called Logminer that can read these files if needed, but the need for this is very rare and it is a tedious job to read the redo logs with logminer.

Backup and Recovery Basics

There are a few ways to backup Oracle databases. There are Cold Backups, Hot Backups and Exports. Each type of backup is listed below, with pros and cons:

Cold Backup

Cold Backups, also known as Offline Backups, must be taken when the database is completely shutdown. The Controlfiles, Redo Logs, and Datafiles must be backed up to tape for the backup to be successful. It is recommended to also backup the initopera.ora.

Hot Backup

Hot Backups, also known as Online Backups, are taken while the database is running. A third party utility (Backup Exec, RMAN) is generally required to handle these backups. However, the backup can be done manually although it is time consuming. Only the datafiles get backed up in this mode, as the controlfiles are locked and redo logs change. The database must be in Archive Log mode for a hot backup to work. The redo logs don't need to be backed up because they are captured in the archive logs, and the controlfile has to be copied to a different location by using an "alter database…" statement inside Oracle.

Export

Although not officially a backup method, an export is a good way to obtain an image of a database or schema quickly. An export is taken when the database is open. Exports are used to copy Opera configuration shells to new sites and to also create training schemas. If the primary backup is failing for any reason, it is highly recommended to run an export of the Opera schema as an alternative backup method.

	PROS	CONS
COLD BACKUP	Quickly restored Can apply Archive logs after restore (if available) Simple to copy data files, no fancy scripts required Database doesn't have to be in archivemode	Database shutdown, downtime required.
HOT BACKUP	Quickly restored. Can apply archive logs after restore Users continue inside database, unaware of backup occurring	Requires Backup Exec, Arcserve or other software Requires Oracle Agent Requires Archive mode
EXPORTS	Quickly created/exported Easily transportable to other sites Doesn't require downtime	No guarantee of data integrity No way to apply archive logs Not recommended if site requires no data loss in crash scenario

Archive Logs

Archive logs store all transaction information so the database can be recovered if a crash occurs. Here is an example:

One disk on the Database Server crashed. All data on the this disk is lost. The datafiles this disk contained are Opera_data01.dbf and Logdata01.dbf.

There are hot backups of the database. To recover this problem, only the two datafiles that were lost need to be restored from tape. All Archive logs from the time of the backup until the current time have to be available in the Archive Destination. Once the datafiles are restored, they can be recovered by using recover commands in SQLPLUS. The recover command will read all archive logs and bring each of the restored datafiles up to date with the rest of the database.

If there is an Archive log missing from this recovery, then there is a serious problem. The two datafiles can only be recovered up until that gap, and the database will not function. So, the rest of the database must be restored from tape and recovered up until that gap in the Archive logs.

Database Maintenance

There are many aspects to maintaining an Oracle Database. The database generally needs to be tuned over time, the log files need to be monitored for error messages, and the tablespace sizing needs to be monitored and adjusted to prevent the files from filling.

Log Files

When installed from the Released CDs, Opera will store all database trace files on the D: drive of the database server. The directory will be:

D:\oracle\admin\opera\

In that folder, there is a udump, bdump, and other directories.

If the trace files are not in the default location, then run the following query in SQLPlus to show the Dump (trace) destinations:

```
Select name, value from v$parameter where name like '%dump%';
```

The files of particular interest are:

D:\oracle\admin\opera\bdump\operaalrt.log

This is the Alert Log. The Alert log has information about errors the database has received. If there is a space issue or archiving issue, or any other major issue with the database, it will be logged to this file. Reviewing this file is a good first step in troubleshooting a database issue.

Below is an excerpt from an Alert Log:

```
Thread 1 advanced to log sequence 22167

  Current log# 17 seq# 22167 mem# 0: /u06/ORACLE8/opera/log17opera.dbf

Wed Mar  6 03:05:31 2002

ARC0: Beginning to archive log# 16 seq# 22166
```

```
ARC0: Completed archiving log# 16 seq# 22166

Wed Mar  6 03:17:44 2002

Thread 1 advanced to log sequence 22168

  Current log# 19 seq# 22168 mem# 0: /u06/ORACLE8/opera/log19opera.dbf

Wed Mar  6 03:17:44 2002

ARC0: Beginning to archive log# 17 seq# 22167

Wed Mar  6 03:17:54 2002

ARC0: Completed archiving log# 17 seq# 22167

Wed Mar  6 03:18:10 2002

Errors in file /u00/home/dba/oracle8/product/8.1.6/rdbms/log/ora_58264_opera.trc:

ORA-00600: internal error code, arguments: [12333], [0], [44], [38], [], [], [],
[]

Wed Mar  6 03:23:55 2002

Thread 1 advanced to log sequence 22169

  Current log# 20 seq# 22169 mem# 0: /u06/ORACLE8/opera/log20opera.dbf

Wed Mar  6 03:23:55 2002

ARC0: Beginning to archive log# 19 seq# 22168

ARC0: Completed archiving log# 19 seq# 22168

Wed Mar  6 03:27:49 2002
```

The error message highlighted in Red is a normal occurrence in Opera databases.

ORA-600 [12333] is due to the Night Audit process killing user sessions to roll the business date. It is an Oracle bug that does not affect performance or data.

Errors in the alert log will generally start with ORA-xxxx

D:\oracle\admin\opera\bdump\listener.log

The listener.log will track all connections to the database. If users are getting errors when trying to connect to the database, the listener.log will show errors if it is failing at that point.

Datafile Allocation

When a tablespace runs out of available space for the storage of new table records, then Opera will fail.

Error messages beginning with:

ORA-0165x are the most common sign of a tablespace issue in the database. The error message will display which tablespace has run out of space.

Space can be added to a tablespace in two ways: by resizing the datafile to make it larger, or by adding a new datafile.

By default, all datafiles in Opera are set to autoextend to a maximum size of 1.9GB. Once full, a new datafile must be created. **Datafiles must not be (manually) extended beyond 1.9GB limit.**

The following queries will assist in determining what datafiles exist, how large they are, and their location. The queries need to be run as user 'System', 'SYS', or 'Internal' in SQLPlus:

For the examples, tablespace SYSTEM will be used

```
select bytes,  file_name from dba_data_files where tablespace_name='SYSTEM';
```

This query will return the current size of files in the 'SYSTEM' tablespace. If the files are below 1900MB, then the datafile can be resized to 1900MB with the following command. Be sure to use the datafile name that came from the previous query:

```
alter database datafile 'g:\oracle\oradata\opera\system01.dbf' resize 1900M;
```

If the datafiles are already at 1900MB, then a new datafile needs to be added to the tablespace:

```
alter tablespace system add datafile
'g:\oracle\oradata\opera\system02.dbf' size 512M
autoextend on next 50M maxsize 1900M;
```

Before adding the datafile, verify that the operating system has enough free space on the target disk (G: in the example above). The syntax in the add datafile statement has autoextend enabled. The autoextend feature will let the datafile grow up to 1900MB as needed .

A simple query to find out how much free space is available in all tablespaces on the system is below:

```
Select sum(bytes), tablespace_name
From dba_free_space
Group by tablespace_name;
```

The DBA Studio tool provided with the database will have more detailed results and allows datafile resize as well.

Performance Tuning

Starting with V2, Opera's default database install includes the Oracle Database performance-monitoring tool called Statspack.

Statspack will take a snapshot of the database during the day and record the statistics. Using the Statspack tools inside the database, a performance report can be generated to cover a period of time.

For assistance with Oracle database issues with Opera, please contact your local MICROS Support centre.