Oracle® ORAchk and EXAchk

User's Guide

12*c* Release 1 (12.1)

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ORACLE

Oracle ORAchk and EXAchk User's Guide, 12*c* Release 1 (12.1)

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Preface

This guide explains how to use Oracle ORAchk and Oracle EXAchk diagnostic tools on Oracle Database Engineered Systems.

It also explains the prerequisites to install and configure Oracle ORAchk, Oracle EXAchk, and other diagnostic tools such as Cluster Health Monitor, Trace File Analyzer Collector, Cluster Health Advisor, Memory Guard, and Hang Manager.

Audience

Oracle® ORAchk and EXAchk User's Guide provides conceptual and usage information about the diagnostic tools for the database administrators.

This guide assumes that you are familiar with Oracle Database concepts.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's New in Oracle ORAchk and Oracle EXAchk 12.1.0.2.7

This chapter provides an overview of the new features available in Oracle ORAchk and Oracle EXAchk 12.1.0.2.7.

Simplified Enterprise-Wide Data Configuration and Maintenance

Now, it's easier to configure and maintain systems, users, and collection results.

Bulk Mapping Systems to Business Units

If you have a large number of systems, then you can quickly map those systems to business units in Oracle Health Check Collections Manager using an XML bulk upload.

See Also: Bulk Mapping Systems to Business Units (page 1-118) for more details about how to map systems to business units

---

Selectively Capturing Users During Login

By default, Oracle Health Check Collections Manager captures details of the users who log in using LDAP authentication, and assigns the DBA role.

However, you can disable automatic capture and re-enable it. If you disable automatic capture, then you must manually create users and assign them roles.

See Also: Selectively Capturing Users During Login (page 1-114) for more details about how to enable or disable automatic capture of user details

---

Configure Details for Upload of Collection Results

Configure Oracle ORAchk and Oracle EXAchk to automatically upload check results to the Oracle Health Check Collections Manager database.

Specify the connection string and the password to connect to the database and upload collection results. Oracle Health Check Collections Manager stores the connection details in an encrypted wallet.

See Also: Uploading Collections Automatically (page 1-129) for more details about how to upload check results to the Oracle Health Check Collections Manager database

---

Viewing and Reattempting Failed Uploads

Uploads might fail for unknown reasons. Find the failed uploads by running the `-checkfaileduploads` option, and then reattempt to upload using the `-uploadfailed all` option.

See Also: Viewing and Reattempting Failed Uploads (page 1-131) for more details about how to find the failed uploads and reattempt to upload failed uploads

---

Purging Old Collections

By default, Oracle Health Check Collections Manager purges collections older than three months.

See Also: Purging Old Collections (page 1-120) for more details about how to enable or disable purging of collections

---

Track Changes to the Attributes of Important Files

Track changes to the attributes of important files with the `-fileattr` option.

By default, setting this option searches all files within Oracle Grid Infrastructure and database homes. Configure the list of directories, subdirectories, and files to monitor that suits your requirements.

See Also: ORAchk and EXAchk Tracking File Attribute Changes (page 1-61) for more details about how to track file attribute changes

---

Quickly Find Health Checks that Require Privileged Users to Run

Use the **Privileged User** option in the Health Check Catalogs to quickly find health checks that need to be run by a specific privileged user, such as `root`.

See Also: Finding Which Checks Require Privileged Users (page 1-82) for more details about how to find health checks that require privileged users to run

---

Broader Stack Support

Health check support has been broadened to include Linux Operating System Health Checks (Oracle ORAchk only), External ZFS Storage Appliance health checks (Oracle EXAchk on Exalogic only) and Oracle Enterprise Manager Cloud Control 13.1.

See Also: Viewing Clusterwide Linux Operating system Health Check (VMPScan) (page 1-54) for more details about how to view VMPScan report.

Easier to Run Oracle EXAchk on Oracle Exadata Storage Servers

Run Oracle EXAchk from Oracle Exadata storage servers without SSH connectivity from the database server to the storage server.

To lock and unlock cells, use the `-unlockcells` and `-lockcells` options for Oracle Exadata, Oracle SuperCluster and Zero Data Loss Recovery Appliance.

```
./exachk -unlockcells all | -cells comma-delimited list of cell names or cell IPs

./exachk -lockcells all | -cells comma-delimited list of cell names or cell IPs
```

New Health Checks

New health checks for Oracle Exadata, Oracle SuperCluster, Oracle Exalogic, Oracle ZFS Storage, Linux, Oracle Solaris Cluster, Oracle Database and Grid Infrastructure, Oracle Enterprise Manager Cloud Control Oracle Management Service (OMS) and Repository.

See Also: Oracle ORAchk Health Check Catalog and Oracle EXAchk Health Check Catalog to download and view the list of health checks.

1

Oracle ORAchk and Oracle EXAchk Common Features and Tasks

Oracle ORAchk and Oracle EXAchk share a common health check framework and a large portion of their features and tasks are common.

This chapter describes Oracle ORAchk and Oracle EXAchk common features and tasks.

1.1 Quick Start Guide

This section explains how to install and configure Oracle ORAchk and Oracle EXAchk. Review other topics in this section for additional information.

1.1.1 Overview of Oracle ORAchk and Oracle EXAchk

Oracle ORAchk and Oracle EXAchk provide a lightweight and non-intrusive health check framework for the Oracle stack of software and hardware components.

If you have an engineered system other than Oracle Database Appliance, then use Oracle EXAchk. For all other systems, use Oracle ORAchk.

You have access to Oracle ORAchk and Oracle EXAchk as a value add-on to your existing support contract. There is no additional fee or license required to run Oracle ORAchk and Oracle EXAchk.

Features of Oracle ORAchk and Oracle EXAchk

- Automates risk identification and proactive notification before business is impacted
- Runs health checks based on critical and reoccurring problems

- Runs in your environment with no need to send anything to Oracle
- Enables you to schedule email health check reports
- Integrates the findings into other tools of your choice

1.1.2 Prerequisites

Review the checklist for Bash requirements, SSH connectivity, and required user privileges to run health checks.

1.1.2.1 Bash Requirements

Oracle ORAchk and Oracle EXAchk are written largely in Bash, and therefore Bash 3.2 or later is required to run Oracle ORAchk and Oracle EXAchk.

1.1.2.2 SSH Connectivity and Access

In a clustered database environment, Oracle ORAchk and Oracle EXAchk run health checks on a single node and remotely run on all other cluster nodes. Remotely running health checks on cluster nodes involves remotely copying files to and from the targets and running commands without providing the passwords.

Some commands might not run correctly if security restrictions block those commands. Develop alternate plans to run those commands.

To remotely run health checks on all other cluster nodes, from the database server, configure passwordless SSH equivalency for the same user on each cluster node that runs Oracle ORAchk and Oracle EXAchk on the database server. If you have not already configured passwordless SSH, then Oracle ORAchk and Oracle EXAchk automatically configures passwordless SSH. You can specify whether passwordless SSH is configured temporarily or permanently.

You cannot perform remote operations without passwordless SSH configuration in place. If it is not present, then you must run health checks on each database server in the cluster using the `-localonly` command line option, and then merge the results.

See Also: My Oracle Support Note 372795.1:

How to Configure SSH for User Equivalence to install the Grid Control Agent 10.1 to 10.2.0.4

Understanding and Managing Reports and Output (page 1-42)
Oracle ORAchk and Oracle EXAchk generate a detailed HTML report with findings and recommendations.

1.1.2.3 Handling of root Passwords

Handling of root passwords depends on whether you have installed the Expect utility. Expect is a tool for automating interactive applications such as telnet, ftp, passwd, fsck, rlogin, tip, and so on.

If you have installed the Expect utility, then specify the root password when you run the health checks for the first time. The Expect utility stores the password and uses the stored password for subsequent sessions. The Expect utility prompts you to check if the root password is same for all of the remote components such as databases, switches, and so on.

Specify the password only once if you have configured the same root password for all of the components. If the root password is not the same for all of the components, then the Expect utility prompts you to validate the root password every time you run the health checks.

If you enter the password incorrectly or the password is changed in between the time it is entered and used, then Oracle ORAchk and Oracle EXAchk notifies you and skips the relevant checks.

Run the health checks after resolving the issues. If any of the health checks are skipped, then Oracle ORAchk and Oracle EXAchk log the details about the skipped checks in the report output.

See Also: The Expect Home Page:

http://expect.sourceforge.net/

1.1.2.4 Deciding Which User Should Run Oracle ORAchk or Oracle EXAchk

You must have root access to run health checks. You can also run health checks as the Oracle Database home owner or the Oracle Grid Infrastructure home owner. Decide which user you want to use before you run health checks.

- **(recommended) Run as root:** Use `root` user credentials to run Oracle ORAchk and Oracle EXachk.

  The Oracle ORAchk and Oracle EXAchk processes that run as `root`, perform user lookups for the users who own the Oracle Database home and Oracle Grid Infrastructure home. When root access is not required, the Oracle ORAchk and Oracle EXAchk processes use the `su` command to run health checks as applicable Oracle Database home user or Oracle Grid Infrastructure home user. Accounts with lower privileges cannot have elevated access to run health checks that require root access.

  This approach has advantages in role-separated environments or environments with more restrictive security.

- **Run as Oracle Database home owner or Oracle Grid Infrastructure home owner:** Use Oracle Database home owner or Oracle Grid Infrastructure home owner credentials to run Oracle ORAchk and Oracle EXAchk.

  The user that runs Oracle ORAchk and Oracle EXAchk must have elevated access as `root` to run health checks that need root access.

  This approach requires multiple runs in role-separated environments. More restrictive security requirements do not permit this elevation.

  There are a number of options:

  – Skip the checks that require root access.

  – Specify the root user ID and password when prompted.

  – Configure sudo.

    If you're using sudo, then the temporary directory used by Oracle ORAchk and Oracle EXAchk that is, *$HOME*, must have an entry in the `/etc/sudoers` file corresponding to the user who is running the health checks, for example,

    ```
    user ALL=(root) NOPASSWD:/root/.orachk/root_orachk.sh
    ```

    Or

    ```
    user ALL=(root) NOPASSWD:/root/.exachk/root_exachk.sh
    ```

  – Pre-configure passwordless SSH connectivity.

A large number of the Oracle stack health checks do not require root access. However, a subset of Oracle stack health checks need to run with root privileges.

The script used to run these root privilege checks is `root_orachk.sh` or `root_exachk.sh` and it depends on the tool you are using.

This root script is created in the temporary directory used by Oracle ORAchk and Oracle EXAchk, which is `$HOME` by default. You can change the temporary directory by setting exporting `RAT_TMPDIR`.

There may be times when you want to place the root script in a different location from the temporary directory, for either security or convenience reasons.

You can choose to have the root script created outside of the standard temporary directory, in a custom directory you set through the `RAT_ROOT_SH_DIR` environment variable:

```
export RAT_ROOT_SH_DIR=/orahome/oradb/
```

You can use a specific location for `sudo` remote access as follows:

```
export RAT_ROOT_SH_DIR=/mylocation
```

Then an entry in the /etc/sudoers as follows:

```
oracle ALL=(root) NOPASSWD:/mylocation/root_orachk.sh
```

Note:

Entries in the `/etc/sudoers` file must contain full paths and do not use environment variables.

1.1.2.5 Prerequisites for Running Oracle ORAchk and Oracle EXAchk

Review Oracle ORAchk and Oracle EXAchk specific prerequisites.

For Oracle ORAchk specific prerequisites, see Oracle ORAchk Scope and Supported Environments (page 2-1)

1.1.2.6 Data Entry Terminal Considerations

Use any supported UNIX and Linux terminal type (character mode terminal, ILOM, VNC server) to run Oracle ORAchk and Oracle EXAchk. Respond to the prompts during the interactive run, or while configuring the daemon.

Each terminal type has advantages and disadvantages. The effect of a dropped network connection varies based on the terminal type used.

For example, in an interactive run using a character mode terminal, if all the prompts are answered prior to the network drop, then the running process completes successfully even if the network connection drops. If the network connection drops before all of the input prompts are answered, then all of the running processes hang. Clean up the hung processes manually when the network connection is restored.

Using a remote connection to a VNC server running on the database where Oracle ORAchk and Oracle EXAchk are running minimizes the network drop interruptions.

If you use accessibility software or devices that prevent the use of a VNC server, and cause network failures, then you must work with your network team and system administrator to determine the root cause and adjust the environment as required.

For example, an accessibility aid might insert a suspension and restart the interactive process that runs Oracle ORAchk or Oracle EXAchk. If this causes an operating system timeout due to terminal inactivity, then lengthen the inactivity timeouts of the environment before running the commands.

The timeout caused by an assistive tool at the operating system level due to terminal inactivity is not specific to Oracle ORAchk and Oracle EXAchk. The timeout could happen to any process that is managed by the assistive technology.

1.1.3 Installing Oracle ORAchk and Oracle EXAchk

Follow these procedures to install Oracle ORAchk and Oracle EXAchk.

Note:

If your Oracle Exadata Database Machine is enrolled in the Oracle Platinum Services: Exadata Exachk Automation Project, then there is a separate installation method described in My Oracle Support Note 2043991.1:

Oracle Platinum Services: Exadata Exachk Automation Project

1. Download the latest version of the health check tool zip file.

Note:

Oracle ORAchk is pre-installed with the database in the `$ORACLE_HOME/suptools/orachk` directory.

To update to the latest version, see "Updating to the Latest Version of Oracle ORAchk and Oracle EXAchk".

Updating to the Latest Version of Oracle ORAchk and Oracle EXAchk (page 1-17)

- For Oracle ORAchk, download `orachk.zip` or `orachk_idm.zip` for Oracle ORAchk with IAM support. Refer to My Oracle Support Note 1268927.2:

  ORAchk - Health Checks for the Oracle Stack

- For Oracle EXAchk, download `exachk.zip`. Refer to My Oracle Support Note 1070954.1:

  Oracle Exadata Database Machine exachk

2. Copy the zip file to the installation directory on the systems that you want to check.

Note: Oracle ORAchk and Oracle EXAchk are Oracle RAC database cluster aware. You only need to install Oracle ORAchk and Oracle EXAchk on one node of the cluster to check all nodes in the cluster.

3. As the oracle software install user, extract the zip file:

```
$ unzip orachk.zip

$ unzip exachk.zip
```

Note: Oracle ORAchk and Oracle EXAchk can be staged on a shared network drive if the performance is acceptable.

To run Oracle ORAchk and Oracle EXAchk on a read-only NFS server, modify the permissions of the `.cgrep` directory and the scripts within it at least to `555`.

```
chmod -R 555 .cgrep
```

1.1.4 Configuring the Daemon Mode

Use the daemon to configure automatic health check runs at scheduled intervals.

Note:

If you have an Oracle engineered system, then in addition to the following usage steps, follow the system-specific instructions:

1. Set the daemon properties.

   At a minimum, set `AUTORUN_SCHEDULE` and `NOTIFICATION_EMAIL`.

   For example, to set the tool to run at 3 AM every Sunday and email the results to `some.body@example.com`, run the following command:

   ```
   $ ./orachk -set "AUTORUN_SCHEDULE=3 * *
   0 ;NOTIFICATION_EMAIL=some.body@example.com"

   $ ./exachk -set "AUTORUN_SCHEDULE=3 * *
   0 ;NOTIFICATION_EMAIL=some.body@example.com"
   ```

2. Configure the health check daemon as described in "Automated Daemon Mode Operation".

3. Start the daemon as `root` (recommended) or as the Oracle Database or Oracle Grid Infrastructure home owner.

   ```
   # ./orachk -d start

   # ./exachk -d start
   ```

4. Answer the questions prompted during startup.

Deciding Which User Should Run Oracle ORAchk or Oracle EXAchk (page 1-4)
You must have root access to run health checks. You can also run health checks as the Oracle Database home owner or the Oracle Grid Infrastructure home owner. Decide which user you want to use before you run health checks.

Automating Daemon Mode Operations (page 1-19)
Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

1.1.5 Email Notification and Report Overview

The following sections provide a brief overview about email notifications, sections of the HTML report output, and ways to generate a diff report.

First Email Notification (page 1-9)
After completing health check runs, the daemon emails the report output as an attachment to all users that are specified in the NOTIFICATION_EMAIL list.

Health Check Report (page 1-9)
Health check reports contain the health status of each system grouped under different sections of the report.

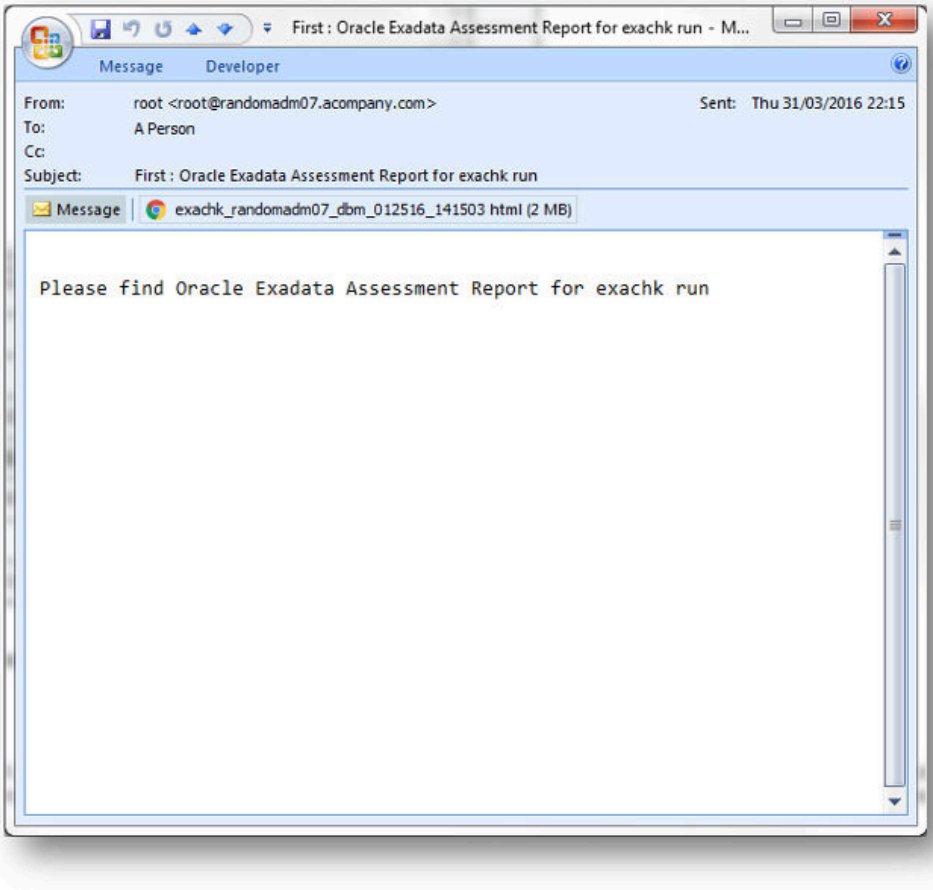
Subsequent Email Notification (page 1-14)
For the subsequent health check runs after the first email notification, the daemon emails the diff report of the current run and the immediate past run to all users that are specified in the NOTIFICATION_EMAIL list.

Diff Report (page 1-15)
The diff report attached to the email notification shows a summary of the differences between the most recent run and the immediate past one. This helps you quickly identify the changes since the last run.

1.1.5.1 First Email Notification

After completing health check runs, the daemon emails the report output as an attachment to all users that are specified in the NOTIFICATION_EMAIL list.

Figure 1-1 First Email Notification



1.1.5.2 Health Check Report

Health check reports contain the health status of each system grouped under different sections of the report.

The HTML report output contains the following:

- Health score
- Summary of health check run
- Table of contents
- Controls for report features
- Findings

- Recommendations

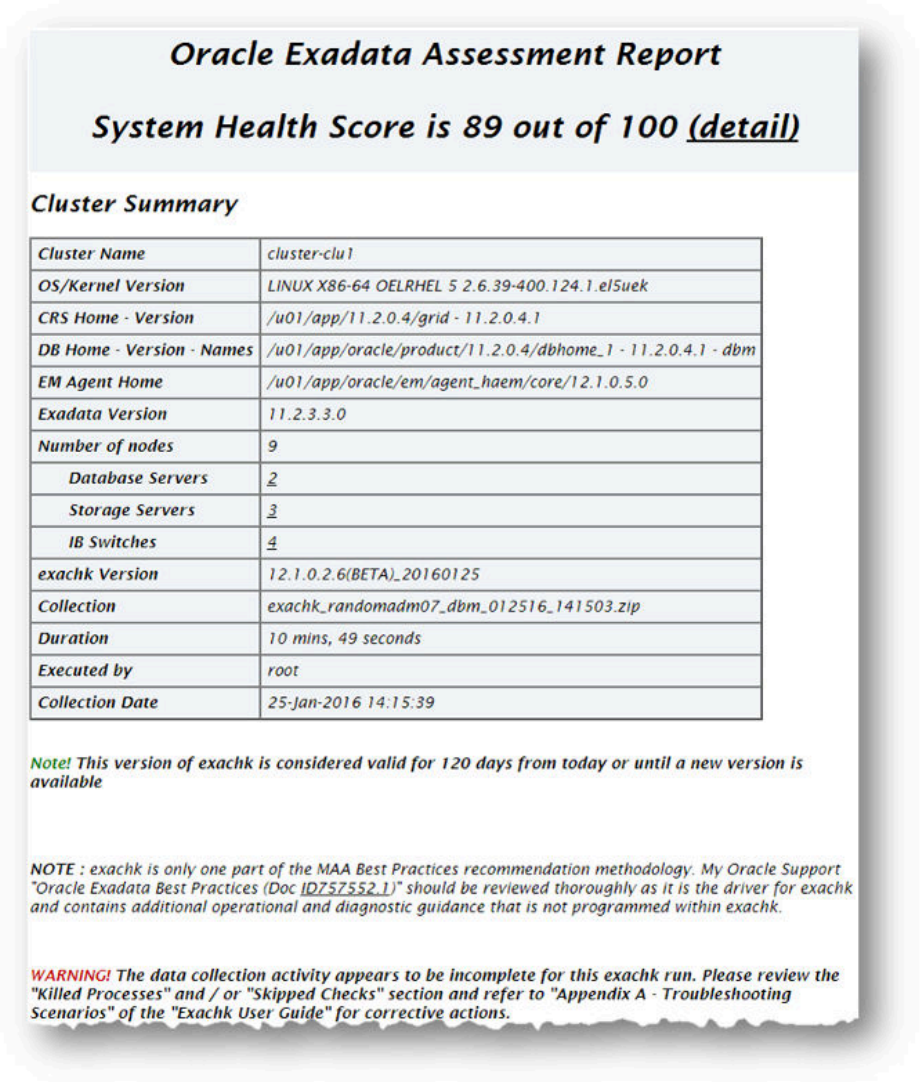
Details of the report output are different on each system. The report is dynamic, and therefore certain sections are displayed only if applicable.

System Health Score and Summary

System Health Score and Summary report provides:

- A high-level health score based on the number of checks that passed or failed.
- A summary of the health check run, such as where and when it was run, which version was used, duration, which user it was run as, and so forth.

Figure 1-2 System Health Score and Summary



Oracle Exadata Assessment Report

System Health Score is 89 out of 100 (detail)

Cluster Summary

Cluster Name	cluster-clu1
OS/Kernel Version	LINUX X86-64 OELRHEL 5 2.6.39-400.124.1.el5uek
CRS Home - Version	/u01/app/11.2.0.4/grid - 11.2.0.4.1
DB Home - Version - Names	/u01/app/oracle/product/11.2.0.4/dbhome_1 - 11.2.0.4.1 - dbm
EM Agent Home	/u01/app/oracle/em/agent_haem/core/12.1.0.5.0
Exadata Version	11.2.3.3.0
Number of nodes	9
Database Servers	2
Storage Servers	3
IB Switches	4
exachk Version	12.1.0.2.6(BETA)_20160125
Collection	exachk_randomadm07_dbm_012516_141503.zip
Duration	10 mins, 49 seconds
Executed by	root
Collection Date	25-Jan-2016 14:15:39

Note! This version of exachk is considered valid for 120 days from today or until a new version is available

NOTE : exachk is only one part of the MAA Best Practices recommendation methodology. My Oracle Support "Oracle Exadata Best Practices (Doc ID757552.1)" should be reviewed thoroughly as it is the driver for exachk and contains additional operational and diagnostic guidance that is not programmed within exachk.

WARNING! The data collection activity appears to be incomplete for this exachk run. Please review the "Killed Processes" and / or "Skipped Checks" section and refer to "Appendix A - Troubleshooting Scenarios" of the "Exachk User Guide" for corrective actions.

Table of Contents and Report Feature

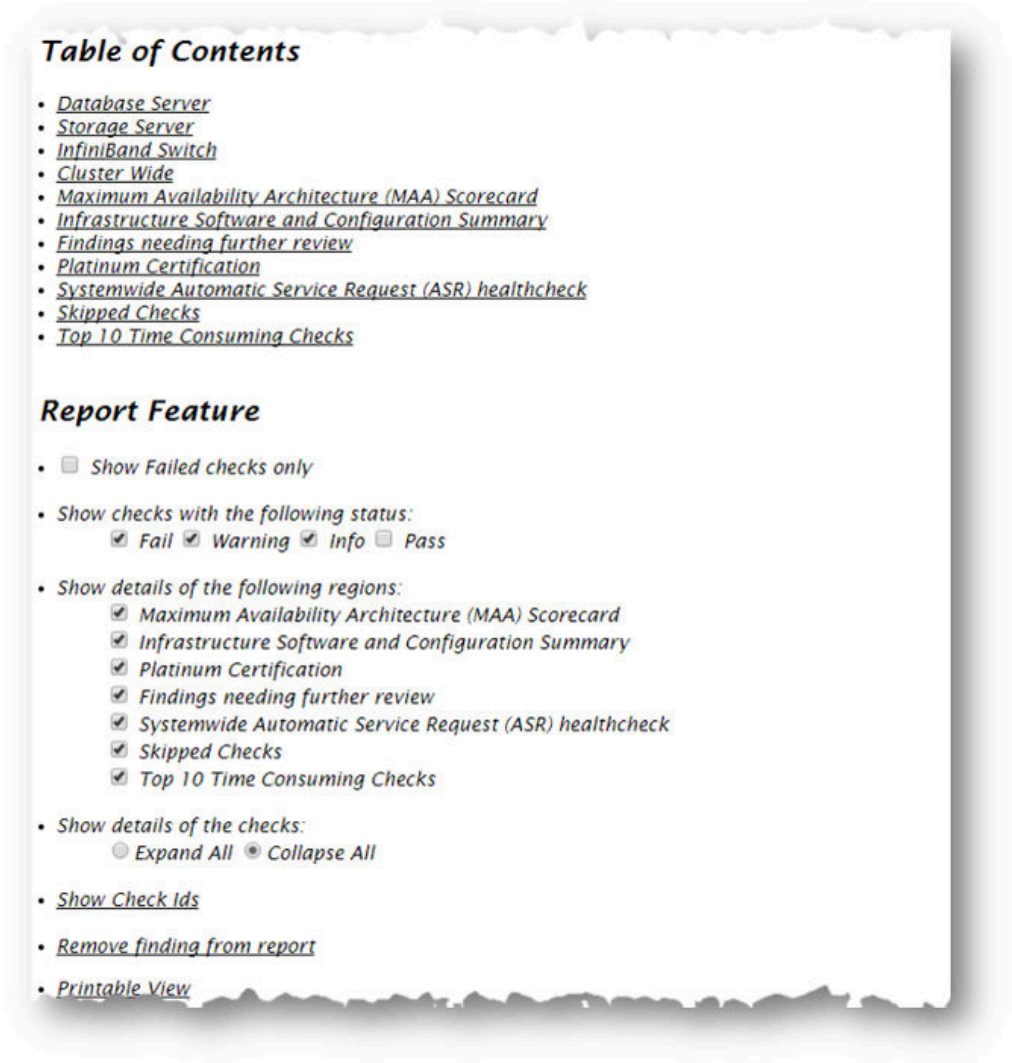
The **Table of Contents** section provides links to major sections in the report.

The **Report Feature** section enables you to:

- Filter checks based on their statuses

- Select the regions
- Expand or collapse all checks
- View check IDs
- Remove findings from the report
- Get a printable view

Figure 1-3 Table of Contents and Report Feature



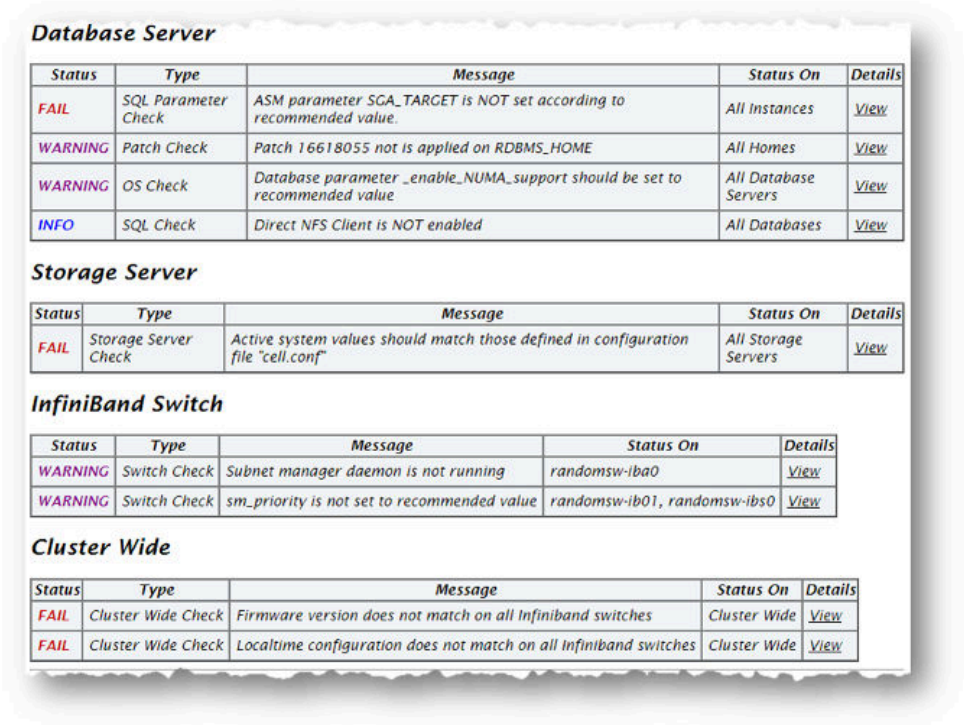
Report Findings

The **Report Findings** section displays the result of each health check. The results are grouped by technology components and shows a row for each health check run including:

- Check status (FAIL, WARNING, INFO or PASS)
- Type of check
- Check message

- Where the check was run
- Link to expand details for further findings and recommendation

Figure 1-4 Report Findings



Database Server

Status	Type	Message	Status On	Details
FAIL	SQL Parameter Check	ASM parameter SGA_TARGET is NOT set according to recommended value.	All Instances	View
WARNING	Patch Check	Patch 16618055 not is applied on RDBMS_HOME	All Homes	View
WARNING	OS Check	Database parameter _enable_NUMA_support should be set to recommended value	All Database Servers	View
INFO	SQL Check	Direct NFS Client is NOT enabled	All Databases	View

Storage Server

Status	Type	Message	Status On	Details
FAIL	Storage Server Check	Active system values should match those defined in configuration file "cell.conf"	All Storage Servers	View

InfiniBand Switch

Status	Type	Message	Status On	Details
WARNING	Switch Check	Subnet manager daemon is not running	randomsw-iba0	View
WARNING	Switch Check	sm_priority is not set to recommended value	randomsw-ib01, randomsw-ibs0	View

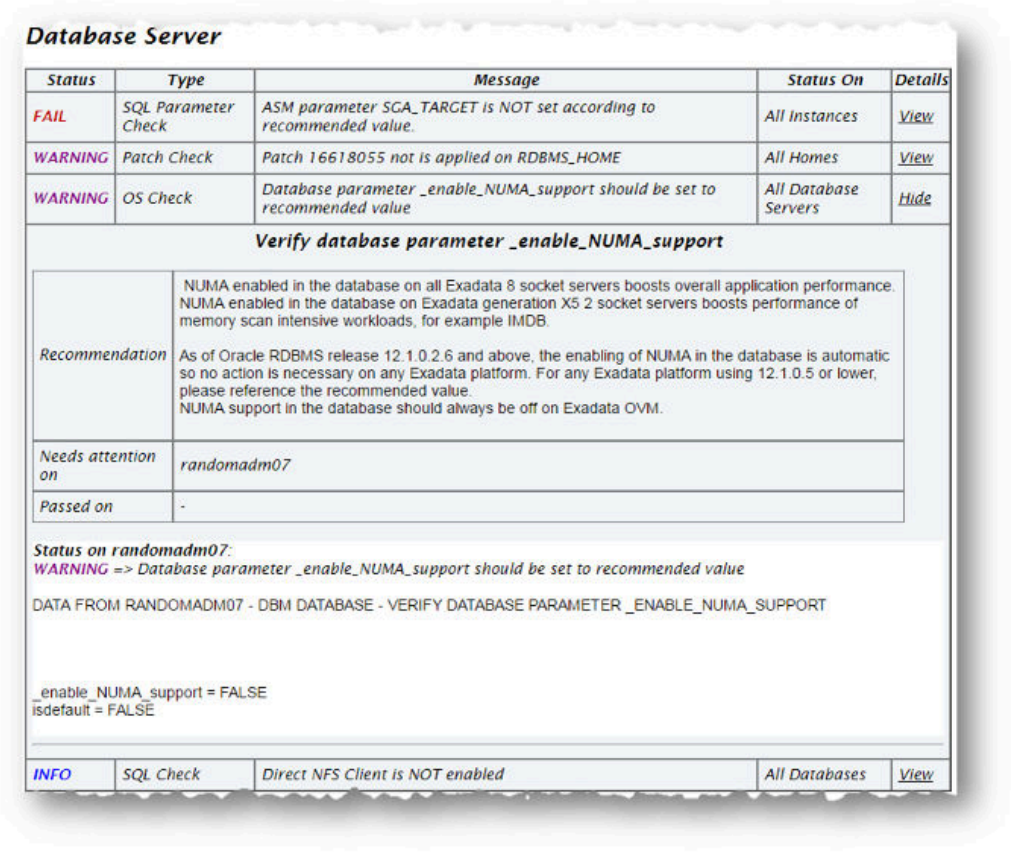
Cluster Wide

Status	Type	Message	Status On	Details
FAIL	Cluster Wide Check	Firmware version does not match on all Infiniband switches	Cluster Wide	View
FAIL	Cluster Wide Check	Localtime configuration does not match on all Infiniband switches	Cluster Wide	View

Click **View** for more information about the result of the health check and the recommendation.

- What to do to solve the problem
- Where the recommendation applies
- Where the problem does not apply
- Links to relevant documentation or My Oracle Support Notes
- Example of data the recommendation is based on

Figure 1-5 View Report Findings



Database Server

Status	Type	Message	Status On	Details
FAIL	SQL Parameter Check	ASM parameter SGA_TARGET is NOT set according to recommended value.	All Instances	View
WARNING	Patch Check	Patch 16618055 not is applied on RDBMS_HOME	All Homes	View
WARNING	OS Check	Database parameter _enable_NUMA_support should be set to recommended value	All Database Servers	Hide

Verify database parameter _enable_NUMA_support

Recommendation	NUMA enabled in the database on all Exadata 8 socket servers boosts overall application performance. NUMA enabled in the database on Exadata generation X5 2 socket servers boosts performance of memory scan intensive workloads, for example IMDB. As of Oracle RDBMS release 12.1.0.2.6 and above, the enabling of NUMA in the database is automatic so no action is necessary on any Exadata platform. For any Exadata platform using 12.1.0.5 or lower, please reference the recommended value. NUMA support in the database should always be off on Exadata OVM.
Needs attention on	randomadm07
Passed on	-

Status on randomadm07:
WARNING => Database parameter _enable_NUMA_support should be set to recommended value

DATA FROM RANDOMADM07 - DBM DATABASE - VERIFY DATABASE PARAMETER _ENABLE_NUMA_SUPPORT

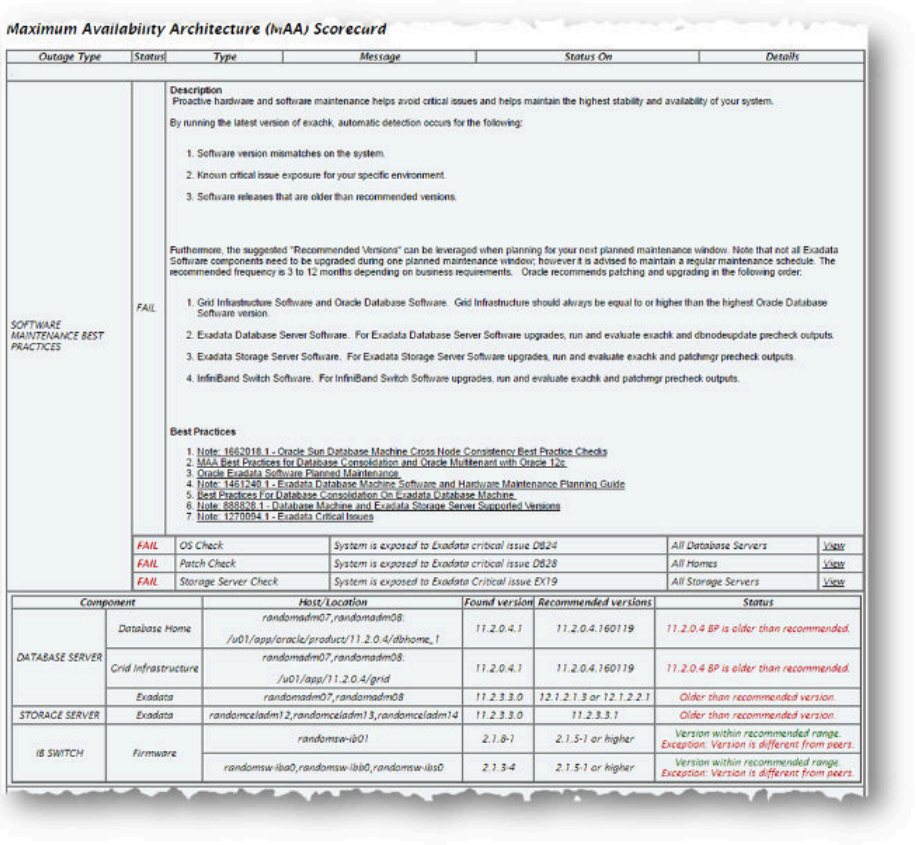
_enable_NUMA_support = FALSE
isdefault = FALSE

INFO	SQL Check	Direct NFS Client is NOT enabled	All Databases	View

Maximum Availability Architecture (MAA) Score Card

Maximum Availability Architecture (MAA) Score Card displays the recommendations for the software installed on your system.

Figure 1-6 Maximum Availability Architecture (MAA) Score Card



Maximum Availability Architecture (MAA) Scorecard

Outage Type	Status	Type	Message	Status On	Details

SOFTWARE MAINTENANCE BEST PRACTICES — FAIL

Description

Proactive hardware and software maintenance helps avoid critical issues and helps maintain the highest stability and availability of your system.

By running the latest version of exachk, automatic detection occurs for the following:

1. Software version mismatches on the system.
2. Known critical issue exposure for your specific environment.
3. Software releases that are older than recommended versions.

Furthermore, the suggested "Recommended Versions" can be leveraged when planning for your next planned maintenance window. Note that not all Exadata Software components need to be upgraded during one planned maintenance window; however it is advised to maintain a regular maintenance schedule. The recommended frequency is 3 to 12 months depending on business requirements. Oracle recommends patching and upgrading in the following order:

1. Grid Infrastructure Software and Oracle Database Software. Grid Infrastructure should always be equal to or higher than the highest Oracle Database Software version.
2. Exadata Database Server Software. For Exadata Database Server Software upgrades, run and evaluate exachk and dbnodeupdate precheck outputs.
3. Exadata Storage Server Software. For Exadata Storage Server Software upgrades, run and evaluate exachk and patchmgr precheck outputs.
4. InfiniBand Switch Software. For InfiniBand Switch Software upgrades, run and evaluate exachk and patchmgr precheck outputs.

Best Practices

1. Note: 1602018.1 - Oracle Sun Database Machine Cross Node Consistency Best Practice Checks
2. MAA Best Practices for Database Consolidation and Oracle Multitenant with Oracle 12c
3. Oracle Exadata Software Planned Maintenance
4. Note: 1461240.1 - Exadata Database Machine Software and Hardware Maintenance Planning Guide
5. Best Practices For Database Consolidation On Exadata Database Machine
6. Note: 888828.1 - Database Machine and Exadata Storage Server Supported Versions
7. Note: 1270094.1 - Exadata Critical Issues

FAIL	OS Check	System is exposed to Exadata critical issue DB24	All Database Servers	View
FAIL	Patch Check	System is exposed to Exadata critical issue DB28	All Homes	View
FAIL	Storage Server Check	System is exposed to Exadata Critical issue EX19	All Storage Servers	View

Component		Host/Location	Found version	Recommended versions	Status
DATABASE SERVER	Database Home	randomadm07,randomadm08: /u01/app/oracle/product/11.2.0.4/dbhome_1	11.2.0.4.1	11.2.0.4.160119	11.2.0.4 BP is older than recommended.
	Grid Infrastructure	randomadm07,randomadm08: /u01/app/11.2.0.4/grid	11.2.0.4.1	11.2.0.4.160119	11.2.0.4 BP is older than recommended.
	Exadata	randomadm07,randomadm08	11.2.3.3.0	12.1.2.1.3 or 12.1.2.2.1	Older than recommended version.
STORAGE SERVER	Exadata	randomceladm12,randomceladm13,randomceladm14	11.2.3.3.0	11.2.3.3.1	Older than recommended version.
IB SWITCH	Firmware	randomsw-ib01	2.1.8-1	2.1.5-1 or higher	Version within recommended range. Exception: Version is different from peers.
		randomsw-iba0,randomsw-ibb0,randomsw-ibs0	2.1.3-4	2.1.5-1 or higher	Version within recommended range. Exception: Version is different from peers.

Understanding and Managing Reports and Output (page 1-42)
Oracle ORAchk and Oracle EXAchk generate a detailed HTML report with findings and recommendations.

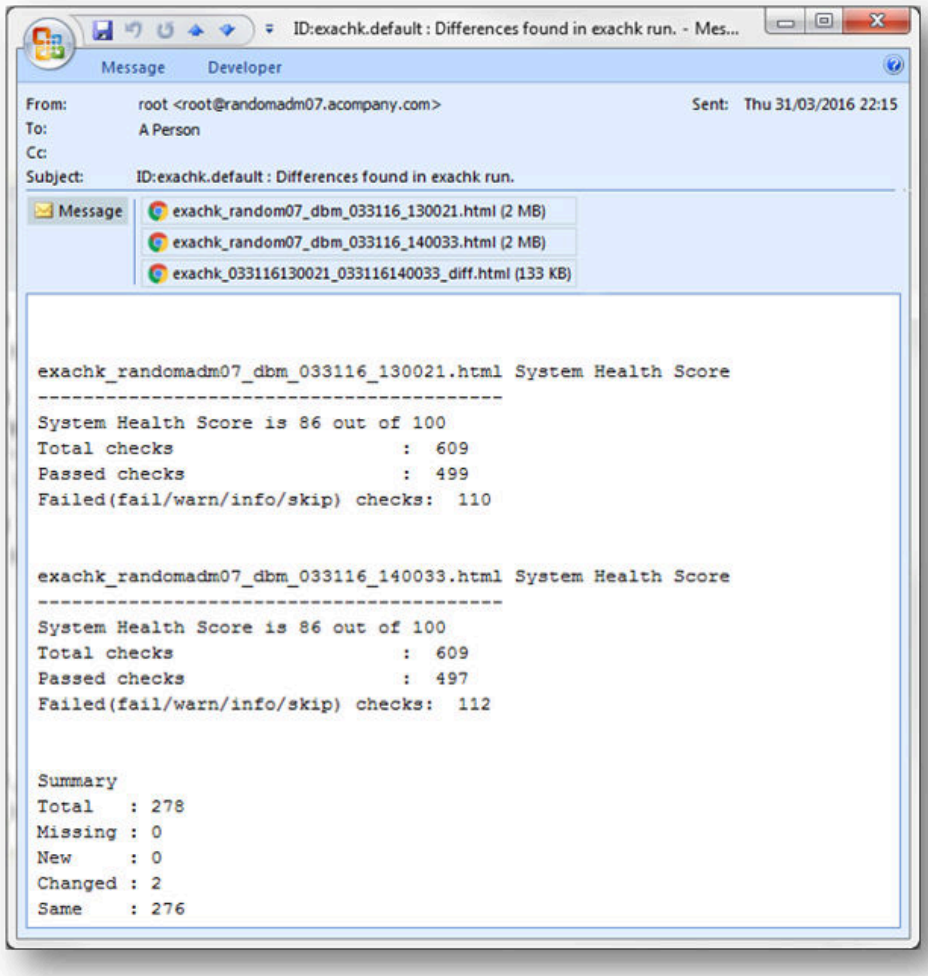
1.1.5.3 Subsequent Email Notification

For the subsequent health check runs after the first email notification, the daemon emails the diff report of the current run and the immediate past run to all users that are specified in the NOTIFICATION_EMAIL list.

The email notification contains:

- System Health Score of this run compared to previous
- Summary of number of checks run and the differences between runs
- Most recent report result as attachment
- Previous report result as attachment
- Diff report as attachment

Figure 1-7 Subsequent Email Notification



1.1.5.4 Diff Report

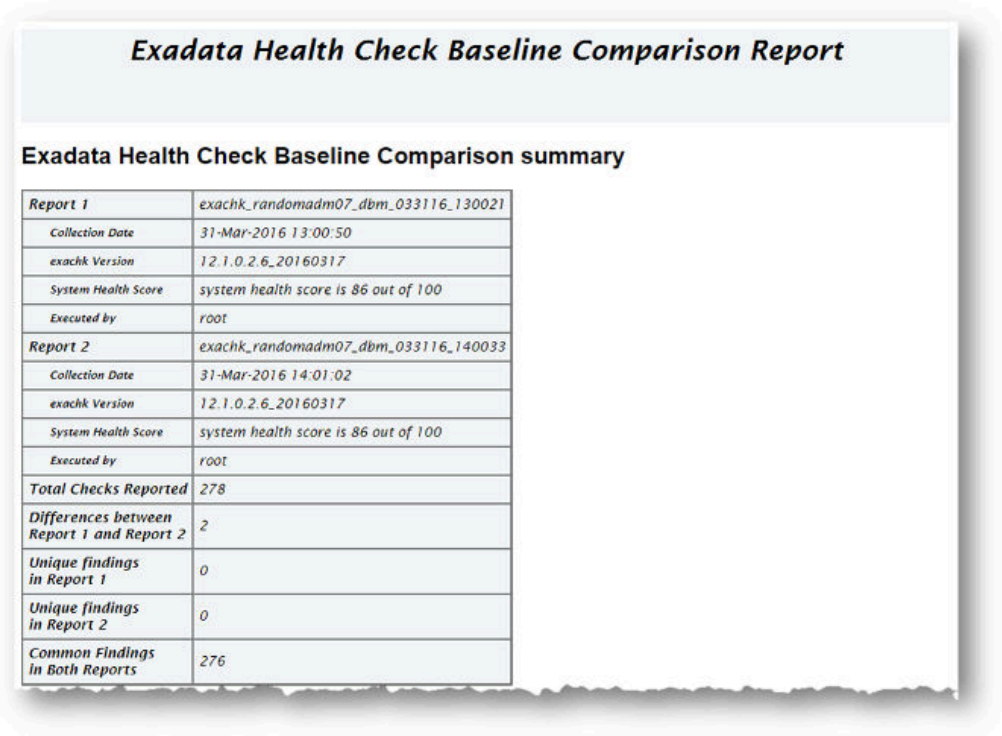
The diff report attached to the email notification shows a summary of the differences between the most recent run and the immediate past one. This helps you quickly identify the changes since the last run.

Generate a diff report using the following command option:

```
$ ./orachk -diff report_1 report_2
```

When you review the diff report, you will see a baseline comparison of the two reports, and then a list of differences.

Figure 1-8 Health Check Baseline Comparison Summary

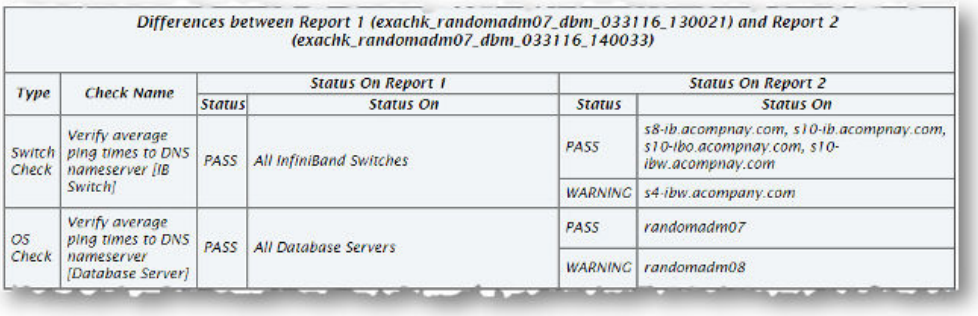


Exadata Health Check Baseline Comparison Report

Exadata Health Check Baseline Comparison summary

Report 1	exachk_randomadm07_dbm_033116_130021
Collection Date	31-Mar-2016 13:00:50
exachk Version	12.1.0.2.6_20160317
System Health Score	system health score is 86 out of 100
Executed by	root
Report 2	exachk_randomadm07_dbm_033116_140033
Collection Date	31-Mar-2016 14:01:02
exachk Version	12.1.0.2.6_20160317
System Health Score	system health score is 86 out of 100
Executed by	root
Total Checks Reported	278
Differences between Report 1 and Report 2	2
Unique findings in Report 1	0
Unique findings in Report 2	0
Common Findings in Both Reports	276

Figure 1-9 Diff Report



Differences between Report 1 (exachk_randomadm07_dbm_033116_130021) and Report 2 (exachk_randomadm07_dbm_033116_140033)

Type	Check Name	Status On Report 1		Status On Report 2	
		Status	Status On	Status	Status On
Switch Check	Verify average ping times to DNS nameserver [IB Switch]	PASS	All InfiniBand Switches	PASS	s8-ib.acompnay.com, s10-ib.acompnay.com, s10-ibo.acompnay.com, s10-ibw.acompnay.com
				WARNING	s4-ibw.acompany.com
OS Check	Verify average ping times to DNS nameserver [Database Server]	PASS	All Database Servers	PASS	randomadm07
				WARNING	randomadm08

Comparing Two Reports (page 1-64)
Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

Managing the Report Output (page 1-87)
Use the commands explained in this section to manage report output.

1.1.6 Recommended On-Demand Usage

Recommendations to run health checks on-demand.

Apart from scheduled health check runs, you can also run health checks on-demand by running the following commands:

```
$ ./orachk
```

```
$ ./exachk
```

Oracle recommends that you run health checks in the following on-demand scenarios:

- Pre or post-upgrades
- Machine moves from one subnet to another
- Hardware failure or repair
- Problem troubleshooting
- In addition to go-live testing

While running pre- or post-upgrade checks, Oracle ORAchk and Oracle EXAchk automatically detect all databases that are registered with Oracle Clusterware and presents the list of databases to check.

Run the pre-upgrade checks during the upgrade planning phase. Oracle ORAchk and Oracle EXAchk prompt you for the version to which you are planning to upgrade to:

```
$ ./orachk -u -o pre

$ ./exachk -u -o pre
```

After upgrading, you must run the post-upgrade checks:

```
$ ./orachk -u -o post

$ ./exachk -u -o post
```

Running Health Checks On Demand (page 1-35)
Usually, health checks run at scheduled intervals. However, Oracle recommends that you run health checks on-demand when needed.

1.1.7 Updating to the Latest Version of Oracle ORAchk and Oracle EXAchk

There are two methods for maintaining Oracle ORAchk and Oracle EXAchk.

Updating Oracle ORAchk and Oracle EXAchk in an Environment with an Internet Connection (page 1-17)
If your Oracle ORAchk or Oracle EXAchk version is older than 120 days, then the tool prompts you on startup to automatically download a newer version from My Oracle Support.

Updating Oracle ORAchk and Oracle EXAchk in an Environment without an Internet Connection (page 1-18)
If you do not have a direct connection to My Oracle Support, then download the latest versions of Oracle ORAchk and Oracle EXAchk from a machine that has an Internet connection. Transfer the downloaded files to a shared network staging location, and then set the environment variable `RAT_UPGRADE_LOC` to point to that staging location.

1.1.7.1 Updating Oracle ORAchk and Oracle EXAchk in an Environment with an Internet Connection

If your Oracle ORAchk or Oracle EXAchk version is older than 120 days, then the tool prompts you on startup to automatically download a newer version from My Oracle Support.

The script prompts for your My Oracle Support login details, and then checks if a later version is available for download and upgrade.

You can also download manually by running the `-download` option:

```
$ ./orachk -download

$ ./exachk -download

$ ./exachk -download
Enter your my oracle support username:- some.person@acompany.com
Enter your my oracle support password:-
Started downloading…..

exachk.zip successfully downloaded to /opt/oracle.suptools/exachk/
exachk_mybox_040116_043027
```

1.1.7.2 Updating Oracle ORAchk and Oracle EXAchk in an Environment without an Internet Connection

If you do not have a direct connection to My Oracle Support, then download the latest versions of Oracle ORAchk and Oracle EXAchk from a machine that has an Internet connection. Transfer the downloaded files to a shared network staging location, and then set the environment variable `RAT_UPGRADE_LOC` to point to that staging location.

The next time the Oracle ORAchk or Oracle EXAchk is started, the tool detects the latest version and prompts you to upgrade.

1. Download the appropriate health check tool zip file:
   - For Oracle ORAchk, download `orachk.zip`.
   - For Oracle EXAchk, download `exachk.zip`.
2. Transfer the zip file to a shared network staging directory.
3. On each machine with a version of the tool that you want to upgrade, set the environment variable `RAT_UPGRADE_LOC` to point to the network staging directory.

   ```
   $ export RAT_UPGRADE_LOC=PATH_TO_STAGING_DIRECTORY
   ```

The next time Oracle ORAchk or Oracle EXAchk is started, the tool searches the directory specified in the `RAT_UPGRADE_LOC` environment variable. If this directory contains the latest version of the `orachk.zip` or `exachk.zip` file, then Oracle ORAchk or Oracle EXAchk prompts you to allow it to upgrade.

```
$ ls /opt/oracle.SupportTools/exachk/latest
exachk.zip
$ export RAT_UPGRADE_LOC=/opt/oracle.SupportTools/exachk/latest
$ ./exachk
Latest version of exachk (EXACHK VERSION: 12.1.0.2.7_20160401) is available at /opt/
oracle.SupportTools/exachk/latest/

Do you want to upgrade to the latest version of exachk? [y/n][y]

exachk has been upgraded to EXACHKVERSION:12.1.0.2.7(DEV)_20160401

Running the latest version…
```

If you have set `RAT_UPGRADE_LOC` but do not want to upgrade, then you can still run Oracle ORAchk or Oracle EXAchk using the `-noupgrade` option:

```
$ ./orachk -noupgrade

$ ./exachk -noupgrade
```

Running Generic Oracle ORAchk and Oracle EXAchk Commands (page 1-85)
List of command options common to Oracle ORAchk and Oracle EXAchk.

1.2 Automating Daemon Mode Operations

Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

Configure the daemon to:

- Schedule recurring health checks at regular interval
- Send email notifications when the health check runs complete, clearly showing any differences since the last run
- Purge collection results after a pre-determined period
- Check and send email notification about stale passwords
- Store multiple profiles for automated health check runs
- Restart automatically if the *server* or *node* where it is running restarts

---

Note:

While running, the daemon answers all of the prompts required by subsequent on-demand health checks.

To run on-demand health checks, do not use the daemon process started by any other user. Run on-demand health checks within the same directory where you have started the daemon.

If you change the system configuration such as adding or removing *servers* or *nodes*, then restart the daemon.

Setting and Getting Options for the Daemon (page 1-20)
Set the daemon options before you start the daemon. Reset those options anytime after starting the daemon.

Starting and Stopping the Daemon (page 1-30)
Use these commands to start and stop the daemon, and to force the daemon to stop a health check run.

Querying the Status and Next Planned Daemon Run (page 1-31)
Query the status and next auto run schedule of the running daemon.

Configuring the Daemon for Auto Restart (page 1-33)
By default, you must manually restart the daemon if you restart the *server* or *node* on which it is running. However, if you use the auto restart option, the daemon restarts automatically after the *server* or *node* reboot.

Running Health Checks On Demand (page 1-35)
Usually, health checks run at scheduled intervals. However, Oracle recommends that you run health checks on-demand when needed.

1.2.1 Setting and Getting Options for the Daemon

Set the daemon options before you start the daemon. Reset those options anytime after starting the daemon.

Set the daemon options using the `-set` option.

Set an option as follows:

```
$ ./orachk -set "option_1=option_1_value"

$ ./exachk -set "option_1=option_1_value"
```

Set multiple options using the *`name=value`* format separated by semicolons as follows:

```
$ ./orachk -set
"option_1=option_1_value;option_2=option_2_value;option_n=option_n_value"

$ ./exachk -set
"option_1=option_1_value;option_2=option_2_value;option_n=option_n_value"
```

AUTORUN_SCHEDULE (page 1-21)
Schedule recurring health checks using the AUTORUN_SCHEDULE daemon option.

AUTORUN_FLAGS (page 1-21)
The AUTORUN_FLAGS daemon option determines how health checks are run.

NOTIFICATION_EMAIL (page 1-22)
Set the NOTIFICATION_EMAIL daemon option to send email notifications to the recipients you specify. The daemon notifies the recipients each time a health check run completes or when the daemon experiences a problem.

collection_retention (page 1-24)
Set the `collection_retention` daemon option to purge health check collection results that are older than a specified number of days.

PASSWORD_CHECK_INTERVAL (page 1-25)
The PASSWORD_CHECK_INTERVAL daemon option defines the frequency, in hours, for the daemon to validate the passwords entered when the daemon was started the first time. If an invalid password is found due to a password change, then the daemon stops, makes an entry in the daemon log, and then sends an email notification message to recipients specified in the NOTIFICATION_EMAIL option.

AUTORUN_INTERVAL (page 1-25)
The AUTORUN_INTERVAL daemon option provides an alternative method of regularly running health checks.

Setting Multiple Option Profiles for the Daemon (page 1-26)
Use only one daemon process for each server. Do not start a single daemon on multiple databases in a cluster, or multiple daemons on the

same database. The daemon does not start if it detects another Oracle ORAchk or Oracle EXAchk daemon process running locally.

Getting the Existing Options for the Daemon (page 1-27)
Query the values that you set for the daemon options.

Controlling the Behavior of the Daemon (page 1-89)
List of commands you can use to control the behavior of the daemon.

1.2.1.1 AUTORUN_SCHEDULE

Schedule recurring health checks using the AUTORUN_SCHEDULE daemon option.

Set the AUTORUN_SCHEDULE option, as follows:

```
AUTORUN_SCHEDULE=hour day month day_of_week
```

where:

- *hour* is 0 – 23
- *day* is 1 - 31
- *month* is 1 - 12
- *day_of_week* is 0 - 6, where 0=Sunday and 6=Saturday

Use the asterisk (*) as a wildcard to specify multiple values separated by commas.

Table 1-1 AUTORUN_SCHEDULE

Example	Result
`"AUTORUN_SCHEDULE= * * * *"`	Runs every hour.
`"AUTORUN_SCHEDULE= 3 * * 0"`	Runs at 3 AM every Sunday.
`"AUTORUN_SCHEDULE= 2 * * 1,3,5"`	Runs at 2 AM on Monday, Wednesday, and Friday.
`"AUTORUN_SCHEDULE= 4 1 * *"`	Runs at 4 AM on the first day of every month.
`"AUTORUN_SCHEDULE= 8,20 * * 1,2,3,4,5"`	Runs at 8 AM and 8 PM every Monday, Tuesday, Wednesday, Thursday, and Friday.

```
$ ./orachk -set "AUTORUN_SCHEDULE=3 * * 0"

$ ./exachk -set "AUTORUN_SCHEDULE=3 * * 0"
```

1.2.1.2 AUTORUN_FLAGS

The AUTORUN_FLAGS daemon option determines how health checks are run.

Set the AUTORUN_FLAGS option as follows: `AUTORUN_FLAGS=flags`, where *flags* can be any combination of valid command-line flags.

Table 1-2 AUTORUN_FLAGS

Example	Result
`"AUTORUN_FLAGS=-profile dba"`	Runs only the `dba` profile checks.
`"AUTORUN_FLAGS=-profile sysadmin –tag syadmin"`	Runs only the `dba` profile checks and tags the output with the value `sysadmin`.
`-excludeprofile ebs`	Runs all checks except those in the `ebs` profile.

```
$ ./orachk –set "AUTORUN_FLAGS=-profile sysadmin –tag sysadmin"

$ ./exachk –set "AUTORUN_FLAGS=-profile sysadmin –tag sysadmin"
```

1.2.1.3 NOTIFICATION_EMAIL

Set the NOTIFICATION_EMAIL daemon option to send email notifications to the recipients you specify. The daemon notifies the recipients each time a health check run completes or when the daemon experiences a problem.

Specify a comma-delimited list of email addresses, as follows:

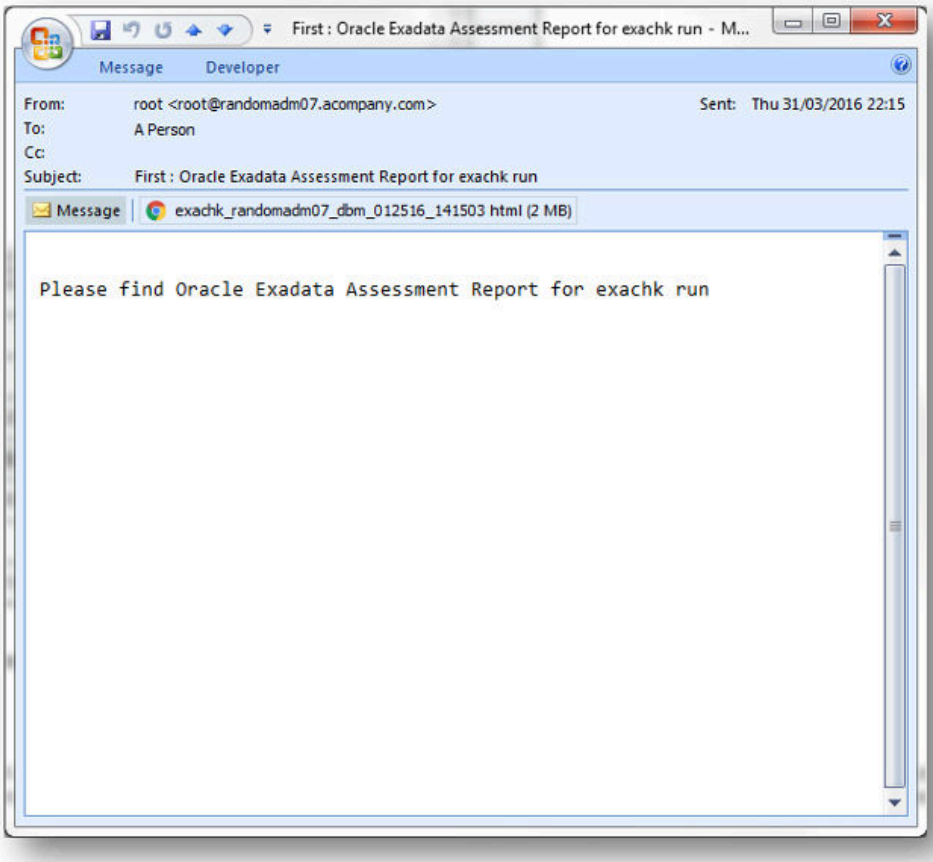
```
$ ./orachk –set
"NOTIFICATION_EMAIL=some.person@acompany.com,another.person@acompany.com"

$ ./exachk –set
"NOTIFICATION_EMAIL=some.person@acompany.com,another.person@acompany.com"
```

Test the email notification configuration using the `–testemail` option, as follows:

```
$ ./orachk -testemail all

$ ./exachk -testemail all
```

After the first health check run, the daemon notifies the recipients with report output attached.

Figure 1-10 First Email Notification

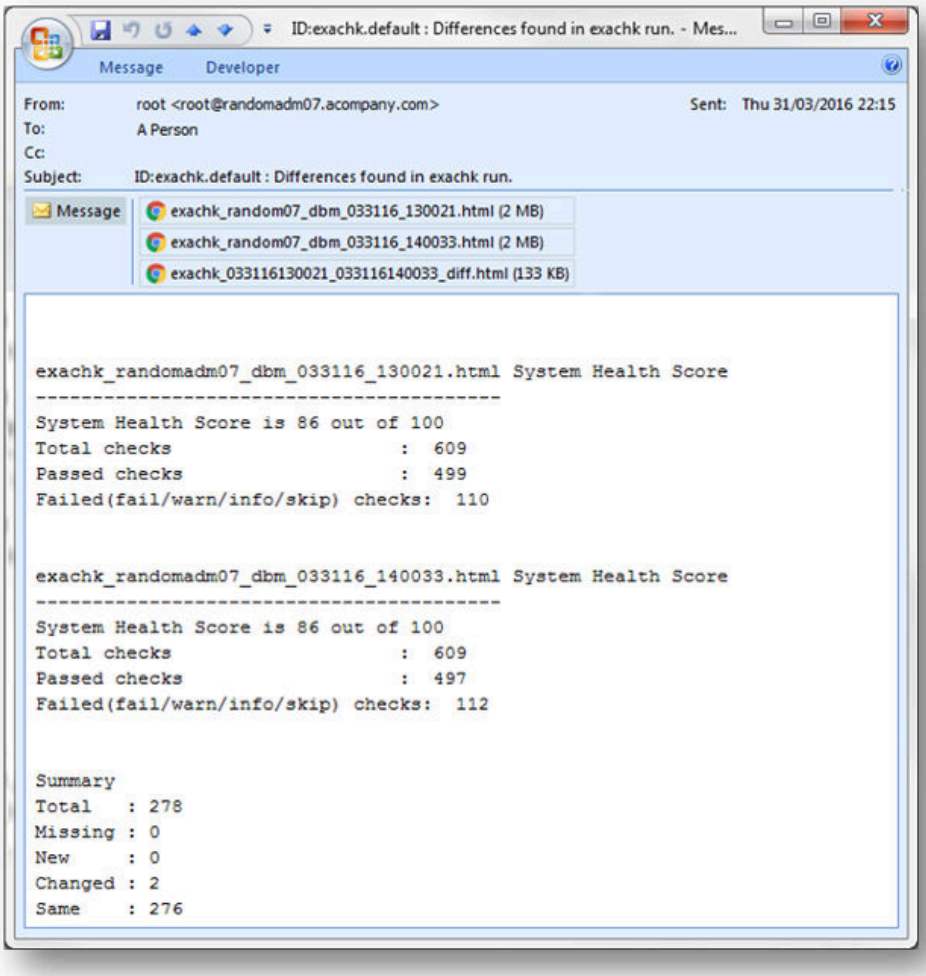


For the subsequent health check runs after the first email notification, the daemon emails the diff report of the current run and the immediate past run to all users specified in the NOTIFICATION_EMAIL list.

The email notification message contains:

- System Health Score of this run compared to previous
- Summary of number of checks run and differences between runs
- Most recent report result as attachment
- Previous report result as attachment
- Diff report as attachment

Figure 1-11 Subsequent Email Notification



PASSWORD_CHECK_INTERVAL (page 1-25)
The PASSWORD_CHECK_INTERVAL daemon option defines the frequency, in hours, for the daemon to validate the passwords entered when the daemon was started the first time. If an invalid password is found due to a password change, then the daemon stops, makes an entry in the daemon log, and then sends an email notification message to recipients specified in the NOTIFICATION_EMAIL option.

1.2.1.4 collection_retention

Set the `collection_retention` daemon option to purge health check collection results that are older than a specified number of days.

Set the `collection_retention` option, as follows:
`collection_retention=`*`number_of_days`*.

The daemon does not purge the stale collection if you do not set this option.

Set the `collection_retention` option to an appropriate number of days based on the frequency of your scheduled collections, size of the collection results, and the available disk space.

Note:

Specify the `collection_retention` option lower case.

Example 1-1 collection_retention

```
$ ./orachk -set "collection_retention=60"

$ ./exachk -set "collection_retention=60"
```

1.2.1.5 PASSWORD_CHECK_INTERVAL

The PASSWORD_CHECK_INTERVAL daemon option defines the frequency, in hours, for the daemon to validate the passwords entered when the daemon was started the first time. If an invalid password is found due to a password change, then the daemon stops, makes an entry in the daemon log, and then sends an email notification message to recipients specified in the NOTIFICATION_EMAIL option.

Set the PASSWORD_CHECK_INTERVAL option, as follows: `PASSWORD_CHECK_INTERVAL=`*`number_of_hours`*.

If you do not set the PASSWORD_CHECK_INTERVAL option, then the daemon can not actively check password validity and fails the next time it tries to run after a password change. Using the PASSWORD_CHECK_INTERVAL option enables you to take corrective action and restart the daemon with the correct password rather than having failed collections.

Set the PASSWORD_CHECK_INTERVAL option to an appropriate number of hours based on the frequency of your scheduled collections and password change policies.

Example 1-2 PASSWORD_CHECK_INTERVAL

```
$ ./orachk -set "PASSWORD_CHECK_INTERVAL=1"

$ ./exachk -set "PASSWORD_CHECK_INTERVAL=1"
```

NOTIFICATION_EMAIL (page 1-22)
Set the NOTIFICATION_EMAIL daemon option to send email notifications to the recipients you specify. The daemon notifies the recipients each time a health check run completes or when the daemon experiences a problem.

1.2.1.6 AUTORUN_INTERVAL

The AUTORUN_INTERVAL daemon option provides an alternative method of regularly running health checks.

Note:

The functionality of the AUTORUN_INTERVAL option has been superseded by the AUTORUN_SCHEDULE option and is only retained for backwards compatibility. Oracle recommends that you use the AUTORUN_SCHEDULE option.

Set the AUTORUN_INTERVAL option, as follows: `AUTORUN_INTERVAL=`*`n`* `[`*`d`* `|` *`h`*`]`, where:

- *n* is a number
- *d* is days
- *h* is hours

Table 1-3 AUTORUN_INTERVAL

Example	Result
`"AUTORUN_INTERVAL=1h"`	Runs every hour.
`"AUTORUN_INTERVAL=12h"`	Runs every 12 hours.
`"AUTORUN_INTERVAL=1d"`	Runs every day.
`"AUTORUN_INTERVAL=7d"`	Runs every week.

1.2.1.7 Setting Multiple Option Profiles for the Daemon

Use only one daemon process for each server. Do not start a single daemon on multiple databases in a cluster, or multiple daemons on the same database. The daemon does not start if it detects another Oracle ORAchk or Oracle EXAchk daemon process running locally.

You can define multiple different run profiles using the same daemon. This enables you to run multiple different health checks with different daemon options, such as different schedules, email notifications, and auto run flags. The daemon manages all profiles.

Define daemon option profiles using the `-id` *`id`* option before the `-set` option, where *`id`* is the name of the profile.

```
$ ./orachk -id id -set "option=value"

$ ./exachk -id id -set "option=value"
```

Example 1-3 Setting Multiple Option Profiles for the Daemon

For example, if database administrator wants to run checks within the `dba` profile and the system administrator wants to run checks in the `sysadmin` profile, then configure the daemon using the profiles option.

Define the database administrator profile as follows:

```
$ ./orachk -id dba -set "NOTIFICATION_EMAIL=dba@example.com;\
   AUTORUN_SCHEDULE=4,8,12,16,20 * * *;AUTORUN_FLAGS=-profile dba -tag dba;\
   collection_retention=30"

Created notification_email for ID[dba]
Created autorun_schedule for ID[dba]
Created autorun_flags for ID[dba]
Created collection_retention for ID[dba]

$ ./exachk -id dba -set "NOTIFICATION_EMAIL=dba@example.com;\
   AUTORUN_SCHEDULE=4,8,12,16,20 * * *; AUTORUN_FLAGS=-profile dba -tag dba;\
   collection_retention=30"
```

```
Created notification_email for ID[dba]
Created autorun_schedule for ID[dba]
Created autorun_flags for ID[dba]
Created collection_retention for ID[dba]
```

Define the system administrator profile as follows:

```
$ ./orachk -id sysadmin -set "NOTIFICATION_EMAIL=sysadmin@example.com;\
   AUTORUN_SCHEDULE=3 * * 1,3,5; AUTORUN_FLAGS=-profile sysadmin -tag sysadmin;\
   collection_retention=60"

Created notification_email for ID[sysadmin]
Created autorun_schedule for ID[sysadmin]
Created autorun_flags for ID[sysadmin]
Created collection_retention for ID[sysadmin]

$ ./exachk -id sysadmin -set "NOTIFICATION_EMAIL=sysadmin@example.com;\
   AUTORUN_SCHEDULE=3 * * 1,3,5; AUTORUN_FLAGS=-profile sysadmin -tag sysadmin;\
   collection_retention=60"

Created notification_email for ID[sysadmin]
Created autorun_schedule for ID[sysadmin]
Created autorun_flags for ID[sysadmin]
Created collection_retention for ID[sysadmin]
```

Controlling the Behavior of the Daemon (page 1-89)
List of commands you can use to control the behavior of the daemon.

1.2.1.8 Getting the Existing Options for the Daemon

Query the values that you set for the daemon options.

To query the values, use [-id *ID*] -get *option* | *all*, where

- *`ID`* is a daemon option profile
- *`option`* is a specific daemon option you want to retrieve
- *`all`* returns values of all options

To get a specific daemon option, use `-get` *`option`*.

Example 1-4 Getting Existing Options for the Daemon

```
$ ./orachk -get NOTIFICATION_EMAIL

ID: orachk.default
----------------------------------------
notification_email = some.body@example.com

$ ./exachk -get NOTIFICATION_EMAIL

ID: exachk.default
----------------------------------------
notification_email = some.body@example.com
```

To query multiple daemon option profiles, use the `-get` *`option`*`:` .

```
$ ./orachk -get NOTIFICATION_EMAIL

ID: orachk.default
----------------------------------------
notification_email = some.body@example.com
```

```
ID: dba
----------------------------------------
notification_email = dba@example.com


ID: sysadmin
----------------------------------------
notification_email = sysadmin@example.com

$ ./exachk -get NOTIFICATION_EMAIL

ID: exachk.default
----------------------------------------
notification_email = some.person@example.com

ID: dba
----------------------------------------
notification_email = dba@example.com


ID: sysadmin
----------------------------------------
notification_email = sysadmin@example.com
```

To limit the request to a specific daemon option profile, use the `-id` *`ID`* `-get` *`option`*.

To get the *NOTIFICATION_EMAIL* for a daemon profile called `dba`:

```
$ ./orachk -id dba -get NOTIFICATION_EMAIL

ID: dba
----------------------------------------
notification_email = dba@example.com

$ ./exachk -id dba -get NOTIFICATION_EMAIL

ID: dba
----------------------------------------
notification_email = dba@example.com
```

To get all options set use `-get` all

```
$ ./orachk -get all

ID: orachk.default
----------------------------------------
notification_email = some.body@example.com
autorun_schedule = 3 * * 0
collection_retention = 30
password_check_interval = 1

$ ./exachk -get all

ID: exachk.default
----------------------------------------
notification_email = some.body@example.com
autorun_schedule = 3 * * 0
collection_retention = 30
password_check_interval = 1
```

To query all daemon option profiles, use the `-get all` option.

```
$ ./orachk -get all

ID: orachk.default
----------------------------------------
notification_email = some.body@example.com
autorun_schedule = 3 * * 0
collection_retention = 30
password_check_interval = 12

ID: dba
----------------------------------------
notification_email = dba@example.com
autorun_schedule = 4,8,12,16,20 * * *
autorun_flags = -profile dba – tag dba
collection_retention = 30
password_check_interval = 1

ID: sysadmin
----------------------------------------
notification_email = sysadmin@example.com
autorun_schedule = 3 * * 1,3,5
autorun_flags = -profile sysadmin –tag sysadmin
collection_retension = 60
password_check_interval = 1

$ ./exachk -get all

ID: exachk.default
----------------------------------------
notification_email = some.body@example.com
autorun_schedule = 3 * * 0
collection_retention = 30
password_check_interval = 1

ID: dba
----------------------------------------
notification_email = dba@example.com
autorun_schedule = 4,8,12,16,20 * * *
autorun_flags = -profile dba – tag dba
collection_retention = 30
password_check_interval = 1

ID: sysadmin
----------------------------------------
notification_email = sysadmin@example.com
autorun_schedule = 3 * * 1,3,5
autorun_flags = -profile sysadmin –tag sysadmin
collection_retension = 60
password_check_interval = 1
```

To limit the request to a specific daemon option profile use, `-id` *`ID`* `-get all` option.

To get all the options set for a daemon profile called `dba`:

```
$ ./orachk -id dba -get all

ID: dba
----------------------------------------
notification_email = dba@example.com
```

```
autorun_schedule = 4,8,12,16,20 * * *
autorun_flags = -profile dba – tag dba
collection_retention = 30
password_check_interval = 1

$ ./exachk –id dba –get all

ID: dba
----------------------------------------
notification_email = dba@example.com
autorun_schedule = 4,8,12,16,20 * * *
autorun_flags = -profile dba – tag dba
collection_retention = 30
password_check_interval = 1
```

1.2.2 Starting and Stopping the Daemon

Use these commands to start and stop the daemon, and to force the daemon to stop a health check run.

1. To start the daemon, use the `–d start` option as follows:

   ```
   $ ./orachk –d start

   $ ./exachk –d start
   ```

   The tool prompts you to provide required information during startup.

   ```
   $ ./exachk -d start

   Checking ssh user equivalency settings on all nodes in cluster

   Node randomadm08 is configured for ssh user equivalency for root user

   Searching for running databases . . . . .

   . .
   List of running databases registered in OCR
   1. dbm
   2. None of above

   Select databases from list for checking best practices.
   For multiple databases, select 1 for All or comma separated number like 1,2 etc
   [1-2] [1].
   . . . .

   .
   Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

   . . . . . .
   ---------------------------------------------------------------------------------
   -----
                           Oracle Stack Status
   ---------------------------------------------------------------------------------
   -----
   Host Name   CRS Installed    RDBMS Installed    CRS UP    ASM Up    RDBMS UP
   Instance Name
   ---------------------------------------------------------------------------------
   -----
   randomadm07    Yes               Yes             Yes     Yes        Yes
   dbm1
   randomadm08    Yes               Yes             Yes     Yes
   ```

```
Yes            dbm2
--------------------------------------------------------------------------------
-----

. . . . . .

9 of the included audit checks require root privileged data collection on
INFINIBAND SWITCH .

1. Enter 1 if you will enter root password for each INFINIBAND SWITCH when
prompted

2. Enter 2 to exit and to arrange for root access and run the exachk later.

3. Enter 3 to skip checking best practices on INFINIBAND SWITCH

Please indicate your selection from one of the above options for INFINIBAND
SWITCH[1-3][1]:-

Is root password same on all INFINIBAND SWITCH ?[y/n][y]

Enter root password for INFINIBAND SWITCH :-

Verifying root password.

. . .

exachk daemon is started with PID : 69068
Daemon log file location is : /opt/oracle.SupportTools/exachk/20160318/exachk/
exachk_daemon.log
```

2. To stop the daemon, use the `-d stop` option as follows:

```
$ ./orachk -d stop

$ ./exachk -d stop
```

The daemon confirms when it stops.

```
$./exachk -d stop
Stopping exachk daemon..

Stopped.
```

If a health check run is progress when you run the stop command, then the daemon indicates so and continues running.

3. To force the daemon to stop a health check run, use the `-d stop_client` option:

```
$ ./orachk -d stop_client

$ ./exachk -d stop_client
```

The daemon stops the health check run and then confirms when it is done. If required, stop the daemon using the `-d stop` option.

1.2.3 Querying the Status and Next Planned Daemon Run

Query the status and next auto run schedule of the running daemon.

You can query the information about the running daemon using the following options:

```
-d status|info|nextautorun
```

- `-d status`: checks if the daemon is running.
- `-d info`: print information about running daemon.
- `-d nextautorun [-id ID]`: prints the next auto run time.

1. To check if the daemon is running, use `–d status`:

   ```
   $ ./orachk –d status

   $ ./exachk –d status
   ```

   If running, then he daemon confirms and displays the PID.

   ```
   $./exachk –d status

   exachk daemon is running. Daemon PID : 65550
   ```

2. To query more detailed information about the daemon, use `–d info`:

   ```
   $ ./orachk –d info

   $ ./exachk –d info
   ```

   The daemon responds with the following information:

   - install node
   - version
   - install location
   - time when it was started

   ```
   $  ./exachk -d info

   ------------------------------------------------------------
   exachk daemon information
   ------------------------------------------------------------

   install node = randomadm07

   exachk daemon version = 12.1.0.2.6_20160317

   Install location = /opt/oracle.SupportTools/exachk/20160318/exachk

   Started at = Thu Apr  7 08:21:57 PDT 2016
   ```

3. To query the next scheduled health check run, use `–d nextautorun`:

   ```
   $ ./orachk –d nextautorun

   $ ./exachk –d nextautorun
   ```

   The daemon responds with details of schedule. If you have configured multiple daemon option profiles, then the output shows whichever is scheduled to run next.

   ```
   $ ./exachk –d nextautorun

   ID: sysadmin
   ```

```
Next auto run starts on Apr 4, 2016 03:00:00
```

If you have configured multiple daemon option profiles, then query the next scheduled health check run of a specific profile using `-id ID -d nextautorun`:

```
$ ./orachk -d ID -d nextautorun

$ ./exachk -d ID -d nextautorun
```

The daemon responds with details of the schedule for the daemon options profile ID you have specified .

```
$ ./exachk -id dba -d nextautorun

ID: dba

Next auto run starts on Apr 4, 2016 04:00:00
```

1.2.4 Configuring the Daemon for Auto Restart

By default, you must manually restart the daemon if you restart the *server* or *node* on which it is running. However, if you use the auto restart option, the daemon restarts automatically after the *server* or *node* reboot.

Daemon auto restart requires passwordless SSH user equivalence to root for the user who is configuring the auto-start feature, for example, `root` or `oracle`. If passwordless SSH user equivalence is not in place, then Oracle ORAchk and Oracle EXAchk optionally configure for you.

The passwordless SSH user equivalence is retained as long as the daemon auto restart functionality is configured.

Deconfiguring the daemon auto restart feature will restore the SSH configuration to the state it was found before auto restart start was configured.

1. To setup daemon auto restart use, `-initsetup`:

   ```
   $ ./orachk -initsetup

   $ ./exachk -initsetup
   ```

   The tool prompts you to provide the required information during startup.

   ```
   $ ./exachk -initsetup

   Checking ssh user equivalency settings on all nodes in cluster

   Node randomadm08 is configured for ssh user equivalency for root user

   Checking ssh user equivalency between root and root user on COMPUTE nodes

   Node randomadm07 is configured for ssh user equivalency between root and root user

   Node randomadm08 is configured for ssh user equivalency between root and root user

   Checking ssh user equivalency between root and root user on STORAGE Servers

   192.0.0.1 is configured for ssh user equivalency for root user

   192.0.0.4 is configured for ssh user equivalency for root user
   ```

```
192.0.0.6 is configured for ssh user equivalency for root user

. . . . . .

Checking ssh user equivalency between root and root user on INFINIBAND SWITCH

s10sw-ib is not configured for ssh user equivalency for root user

Do you want to configured SSH for user root on s10sw-ib [y/n][y]

Is root password same on all IBSWITCHES?[y/n[y]
Enter root password :-

Verifying root password.

. .
.
s10sw-ib has been configured for ssh user equivalency for root user

Verifying root password

. .
.
s4sw-ib has been configured for ssh user equivalency for root user

Verifying root password

. .
.
sc8 has been configured for ssh user equivalency for root user

Verifying root password

. .
.

s10sw-ib has been configured for ssh user equivalency for root user

Verifying root password
. .
.

s10sw-ib0 has been configured for ssh user equivalency for root user

Setting up exachk auto restart functionality using inittab

Starting exachk daemon. . . . . .

exachk daemon started successfully
```

Note: If the daemon is already running, stop it before running `-initsetup` .

You can pre-configure root user equivalence for all `COMPUTE`, `STORAGE`, or `IBSWITCHES` using the `-initpresetup` option (root equivalency for `COMPUTE` nodes is mandatory for setting up the auto restart functionality):

```
$ ./orachk -initpresetup

$ ./exachk -initpresetup
```

2. To query the auto restart status of the daemon use, `-initcheck`:

```
$ ./orachk -initcheck

$ ./exachk -initcheck

$ ./exachk -initcheck

Auto restart functionality is configured.

exachk daemon is running. PID : 68230
```

To remove auto-restart configuration, use the `-initrmsetup` option:

```
$ ./orachk -initrmsetup

$ ./exachk -initrmsetup

$ ./exachk -initrmsetup
Shetting down exachk
Stopping exachk daemon..

Stopped.

Removed exachk from inittab
```

1.3 Running Health Checks On Demand

Usually, health checks run at scheduled intervals. However, Oracle recommends that you run health checks on-demand when needed.

Examples of when you must run health checks on-demand:

- In addition to go-live testing procedures
- Machine moves from one subnet to another
- Pre and post- database upgrades
- Hardware failure or repair
- Troubleshooting

To start on-demand health check runs, log in to the system as an appropriate user then run an appropriate tool. Specify the options to direct the type of run that you want.

```
$ ./orachk

$ ./exachk
```

Note:

To avoid problems when running the tool from terminal sessions on a network attached workstation or laptop, consider running the tool using VNC. If there is a network interruption, then the tool continues to process to completion. If the tool fails to run, then re-run the tool. The tool does not resume from the point of failure.

Output varies depending on your environment and options used:

- The tool starts discovering your environment
- If you have configured passwordless SSH user equivalency, then the tool does not prompt you for passwords
- If you have not configured passwordless SSH for a particular component at the required access level, then the tool prompts you for password
- If the daemon is running, then the commands are sent to the daemon process that answers all prompts, such as selecting the database and providing passwords
- If the daemon is not running, then the tool prompts you for required information, such as which database you want to run against, the required passwords, and so on
- The status of discovered components will be investigated

Note:

If you are prompted for passwords, then the utility runs when available. In this way, the passwords are gathered at the beginning, and Expect supplies the passwords when needed at the root password prompts. This enables the tool to continue without the need for further input. If you do not use Expect, then closely monitor the run and enter the passwords interactively as prompted.

Without Expect installed, you must enter passwords many times depending on the size of your environment. Therefore, Oracle recommends to use the Expect utility.

See Also:

The Expect Home Page, which is available at the following URL:

http://expect.sourceforge.net/

```
$ ./exachk -profile dba
Sending commands to daemon (mypid 57719) args : -profile dba

Checking ssh user equivalency settings on all nodes in cluster

Node srv08 is configured for ssh user equivalency for root user
Searching for running database . . . . . .

. .
List of running databases registered on OCR
1. db07
2. None of above

Select databases from list for checking best practices.
For multiple databases, select 1 for All or comma separated number
like 1,2 etc [1-2][1].
. . . .

.
Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

. . . . . .
```

```
------------------------------------------------------------
                 Oracle Stack Status
------------------------------------------------------------
Host Name  CRS       RDBMS     CRS  ASM  RDBMS  Instance
           Installed Installed UP   UP   UP     Name
------------------------------------------------------------
srv07      Yes       Yes       Yes  Yes  Yes    db071
srv08      Yes       Yes       Yes  Yes  Yes    db072
------------------------------------------------------------
. . . . . .
```

- The tool starts collecting information across all of the relevant components, including the remote nodes.

```
. . . .
*** Checking Best Practice Recommendations (PASS/WARNING/FAIL) ***
Collections and audit checks log file is
/opt/oracle.SupportTools/exachk/exachk_srv07_db07_041516_034032/log/exachk.log
Checking for prompts in /root/.bash_profile on srvr07 for root user....
Checking for prompts in /root/.bash_profile on srvr08 for root user....
Starting to run exachk in background on srvr08
. .
============================================================
                  Node name - srvr07
============================================================
. . . . .
Collecting - ASM Diskgroup Attributes
Collecting - ASM initialization parameters
Collecting - Database Parameters for db07 database
Collecting - RDBMS Feature Usage for db07 database
Collecting - Clusterware and RDBMS software version
Collecting - Patches for Grid Infrastructure
Collecting - Patches for RDBMS Home
Collecting - RDBMS patch inventory
Collecting - Exadata version on database server
Collecting - Verify TCP Segmentation Offload (TSO) is set to off

Starting to run root privileged commands in background
on STORAGE SERVER str12 (192.0.125.142)

Starting to run root privileged commands in background
on STORAGE SERVER str13 (192.0.125.144)

Starting to run root privileged commands in background
on STORAGE SERVER str14 (192.0.125.145)

Collections from STORAGE SERVER :
---------------------------------
. . . .
```

- The tool run the health checks against the collected data and displays the results.

```
. . . . .. . .

Data collections completed. Checking best practices on srv07.
------------------------------------------------------------------------------
------

FAIL => DB_UNIQUE_NAME on primary has not been modified from the default,
confirm that database name is unique across your Oracle enterprise. for db07
FAIL => Hidden database Initialization Parameter usage is not correct for db07
WARNING => ASM parameter AUDIT_SYS_OPERATIONS should be set to the recommended
```

```
value
WARNING => Database parameter_enable_NUMA_support should be set to recommended
value for db07
INFO => Direct NFS Client is NOT enabled for db07
INFO => One or more non=default AWR baselines should be created for db07
WARNING => All disk groups should have compatible.advm attribute set to
recommended value
FAIL => Database parameter DB_BLOCK_CHECKSUM is NOT set to recommended value on
db071 instance
FAIL => Database parameter Db_create_online_log_dest_n is NOT set to recommended
value on db071 instance
WARNING => Database parameter DB_BLOCK_CHECKING on PRIMARY is NOT set to
recommended value on db071 instance
FAIL => Flashback on PRIMARY is not configured for db07
INFO =>    Operational Best Practices
INFO =>    Database Consolidation Best Practices
INFO =>    Computer failure prevention best practices
INFO =>    Data corruption prevention best practices
INFO =>    Logical corruption prevention best practices
. . . .
```

- After completing the health check run, the tool points to the location of the detailed HTML report and the `.zip` file that contains additional output.

```
. . . .

Detailed report (html) -
/opt/oracle.SupportTools/exachk/exachk_srv07_db07_041516_034032/
exachk_srvr07_db07_041516_034032.html

UPLOAD(if required) - /opt/oracle.SupportTools/exachk/
exachk_srv07_db07_041516_034032.zip
```

Running On-Demand With or Without the Daemon (page 1-39)
When running on-demand, if the daemon is running all prompts, then the daemon answers where possible including passwords .

Sending Results by Email (page 1-39)
You can optionally email the HTML report to one or more recipients using the `-sendemail` option.

Handling of root Passwords (page 1-4)
Handling of root passwords depends on whether you have installed the Expect utility. Expect is a tool for automating interactive applications such as telnet, ftp, passwd, fsck, rlogin, tip, and so on.

Deciding Which User Should Run Oracle ORAchk or Oracle EXAchk (page 1-4)
You must have root access to run health checks. You can also run health checks as the Oracle Database home owner or the Oracle Grid Infrastructure home owner. Decide which user you want to use before you run health checks.

Automating Daemon Mode Operations (page 1-19)
Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

Upgrade Readiness Mode (Clusterware and Database Upgrade Checks) (page 1-74)
You can use Upgrade Readiness Mode to obtain an Upgrade Readiness Assessment.

1.3.1 Running On-Demand With or Without the Daemon

When running on-demand, if the daemon is running all prompts, then the daemon answers where possible including passwords .

To run health checks on-demand if the daemon is running, use the `-daemon` option:

```
$ ./orachk -daemon

$ ./exachk -daemon
```

To avoid connecting to the daemon process, meaning the tool to interactively prompt you as required, use the `-nodaemon` option:

```
$ ./orachk -nodaemon

$ ./exachk -nodaemon
```

Note:

If you are running database pre-upgrade checks (`-u -o pre`) and if the daemon is running, then you must use the `-nodaemon` option.

Upgrade Readiness Mode (Clusterware and Database Upgrade Checks) (page 1-74)

You can use Upgrade Readiness Mode to obtain an Upgrade Readiness Assessment.

1.3.2 Sending Results by Email

You can optionally email the HTML report to one or more recipients using the `-sendemail` option.

```
$ ./orachk -sendemail "NOTIFICATION_EMAIL=email_recipients"

$ ./exachk -sendemail "NOTIFICATION_EMAIL=email_recipients"
```

Where *email_recipients* is a comma-delimited list of email addresses.

Note:

Verify the email configuration settings using the `-testemail` option.

NOTIFICATION_EMAIL (page 1-22)

Set the NOTIFICATION_EMAIL daemon option to send email notifications to the recipients you specify. The daemon notifies the recipients each time a health check run completes or when the daemon experiences a problem.

1.4 Running Health Checks in Silent Mode

You can run health checks automatically by scheduling them with the Automated Daemon Mode operation.

Note:

Silent mode operation is maintained for backwards compatibility for the customers who were using it before the daemon mode was available. Silent mode is limited in the checks it runs and Oracle does not actively enhance it any further.

- Running health checks in silent mode using the `-s` option does not run any checks on the storage servers and switches.
- Running health checks in silent mode using the `-S` option excludes checks on database server that require root access, also does not run any checks on the storage servers and database servers.

To run health checks silently, configure passwordless SSH equivalency. It is not required to run remote checks, such as running against a single-instance database.

When health checks are run silently, output is similar to that described in On-Demand Mode Operation.

```
$ ./orachk -s


    Checking ssh user equivalency settings on all nodes in cluster

    Node dbserver1 is configured for ssh user equivalency for root user

    Node dbserver3 is configured for ssh user equivalency for root user


    Searching for running databases . . . . .

    . . . . . .
    List of running databases registered in OCR
    1. ordsdb
    2. rdb11204
    3. All of above
    4. None of above


    Searching out ORACLE_HOME for selected databases.

    . . . . . .

    .
    Checking Status of Oracle Software Stack - Clusterware, ASM, RDBMS

    . . . . . .. . . . . .
 . . . . . .

--------------------------------------------------------------------------------
-----------------
                        Oracle Stack Status

--------------------------------------------------------------------------------
-----------------
    Host Name  CRS Installed  RDBMS Installed  CRS UP    ASM UP    RDBMS UP  DB
Instance Name
```

```
--------------------------------------------------------------------------------
-----------------
    dbserver2  Yes             Yes             Yes        Yes      Yes
rdb112042
    dbserver1  Yes             Yes             Yes        Yes      Yes
rdb112041
    dbserver3  Yes             Yes             Yes        Yes      Yes      ordsdb_1
rdb112043

--------------------------------------------------------------------------------
-----------------
    . . . . . .


    *** Checking Best Practice Recommendations (PASS/WARNING/FAIL) ***
    . . . . . .
```

Note:

The tool does not perform storage server or InfiniBand switch checks if it is configured to run in silent mode operation on an Oracle engineered system.

Including Health Checks that Require root Access (page 1-41)
Run as `root` or configure `sudo` access to run health checks in silent mode and include checks that require root access.

Excluding Health Checks that Require root Access (page 1-42)
To run health checks in silent mode and exclude checks that require root access, use `-S` followed by other required options.

SSH Connectivity and Access (page 1-3)
In a clustered database environment, Oracle ORAchk and Oracle EXAchk run health checks on a single node and remotely run on all other cluster nodes. Remotely running health checks on cluster nodes involves remotely copying files to and from the targets and running commands without providing the passwords.

Automating Daemon Mode Operations (page 1-19)
Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

Running Health Checks On Demand (page 1-35)
Usually, health checks run at scheduled intervals. However, Oracle recommends that you run health checks on-demand when needed.

1.4.1 Including Health Checks that Require root Access

Run as `root` or configure `sudo` access to run health checks in silent mode and include checks that require root access.

To run health checks including checks that require root access, use the `-s` option followed by other required options:

```
$ ./orachk -s

$ ./exachk -s
```

Deciding Which User Should Run Oracle ORAchk or Oracle EXAchk (page 1-4)
You must have root access to run health checks. You can also run health checks as the Oracle Database home owner or the Oracle Grid Infrastructure home owner. Decide which user you want to use before you run health checks.

1.4.2 Excluding Health Checks that Require root Access

To run health checks in silent mode and exclude checks that require root access, use -S followed by other required options.

```
$ ./orachk -S

$ ./exachk -S
```

1.5 Understanding and Managing Reports and Output

Oracle ORAchk and Oracle EXAchk generate a detailed HTML report with findings and recommendations.

See Managing Oracle Health Check Collections Manager (page 1-91) and Integrating Health Check Results with Other Tools (page 1-143) for more details about other ways to consume those results.

Temporary Files and Directories (page 1-43)
While running health checks, Oracle ORAchk and Oracle EXAchk create temporary directories and files for the purposes of data collection and assessment, and then delete them upon completion of health check runs.

Output Files and Directories (page 1-43)
Oracle ORAchk and Oracle EXAchk create an output directory that contains various files for you to examine.

HTML Report Output (page 1-46)

Tagging Reports (page 1-60)
The health check HTML report is typically named: `orachk_hostname_database_date_timestamp.html` or `exachk_hostname_database_date_timestamp.html`. You can include other tags in the HTML report name to facilitate differentiation and identification.

ORAchk and EXAchk Tracking File Attribute Changes (page 1-61)
Track changes to the attributes of important files with the `-fileattr` option that looks at all files within Grid Infrastructure and Database homes by default. Configure the list of directories and their contents to monitor specific to your requirements.

Comparing Two Reports (page 1-64)
Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

Merging Reports (page 1-67)
Merging reports is useful in role-separated environments where different users are run different subsets of checks and then you want to view everything as a whole.

Output File Maintenance (page 1-69)
Oracle ORAchk and Oracle EXAchk create a number of temporary files and directories while running health checks.

Consuming Multiple Results in Other Tools (page 1-69)
Health check results can optionally be integrated into various other tools.

1.5.1 Temporary Files and Directories

While running health checks, Oracle ORAchk and Oracle EXAchk create temporary directories and files for the purposes of data collection and assessment, and then delete them upon completion of health check runs.

By default, Oracle ORAchk and Oracle EXAchk create these temporary files and directories is the *$HOME* directory of the user who runs the tool. Change this temporary working directory by setting the environment variable *RAT_TMPDIR=tmp_directory* prior to using the tools:

```
$ export RAT_TMPDIR=/tmp
$ ./orachk

$ export RAT_TMPDIR=/tmp
$ ./exachk
```

If you are using sudo access for root and you want to change the default temporary working directory location, then you must specify the alternate location in the `/etc/sudoers` file. The `/etc/sudoers` file on each server must contain the following line:

```
user ALL=(root) NOPASSWD:/tmp/.orachk/root_orachk.sh

user ALL=(root) NOPASSWD:/tmp/.exachk/root_exachk.sh
```

Note:

Any directory specified in *RAT_TMPDIR* must exist on the hosts for all cluster nodes.

1.5.2 Output Files and Directories

Oracle ORAchk and Oracle EXAchk create an output directory that contains various files for you to examine.

The name format of the output directory is:

utility_name host_name database date time_stamp

where,

- *utility* is either `orachk` or `exachk`
- *host_name* is the host name of the node on which Oracle ORAchk or Oracle EXAchk was run
- *database* is the name of the database or one of the databases against which health checks were performed, if applicable
- *date* is the date the health check was run

- *timestamp* is the time the health check was run

By default, Oracle ORAchk and Oracle EXAchk create output in the directory from where they are run. To change the location of the output directory, use the -output option as follows:

```
$ ./orachk -output output_dir

$ ./exachk -output output_dir
```

Alternatively, set the output directory using the RAT_OUTPUT environment variable as follows:

```
$ export RAT_OUTPUT=output_dir
$ ./orachk

$ export RAT_OUTPUT=output_dir
$ ./exachk
```

The contents of this directory is available in a zip file with the same name.

After completing the health checks, Oracle ORAchk and Oracle EXAchk report the location of this zip file and the HTML report file.

```
...
Detailed report (html) - /orahome/oradb/orachk/orachk_myhost_rdb11204_041816_055429/
orachk_myhost_rdb11204_041816_055429.html


UPLOAD(if required) - /orahome/oradb/orachk/orachk_myhost_rdb11204_041816_055429.zip


$ ls -la
total 61832
drwxr-xr-x  4 oradb oinstall     4096 Apr 18 05:55 .
drwx------ 34 oradb oinstall     4096 Apr 18 05:58 ..
drwxr--r--  3 oradb oinstall     4096 Mar 28 17:36 .cgrep
-rw-r--r--  1 oradb oinstall  4692868 Mar 28 17:35 CollectionManager_App.sql
-rw-r--r--  1 oradb oinstall 41498425 Apr 18 05:54 collections.dat
-rwxr-xr-x  1 oradb oinstall  2730651 Mar 28 17:35 orachk
drwxr-xr-x  7 oradb oinstall     4096 Apr 18 05:55
orachk_myhost_rdb11204_041816_055429
-rw-r--r--  1 oradb oinstall    36141 Apr 18 05:55
orachk_myhost_rdb11204_041816_055429.zip
-rw-r--r--  1 oradb oinstall  9380260 Mar 28 19:02 orachk.zip
-rw-r--r--  1 oradb oinstall     3869 Mar 28 17:36 readme.txt
-rw-r--r--  1 oradb oinstall  4877997 Apr 18 05:54 rules.dat
-rw-r--r--  1 oradb oinstall    40052 Mar 28 17:35 sample_user_defined_checks.xml
-rw-r--r--  1 oradb oinstall     2888 Mar 28 17:35 user_defined_checks.xsd
-rw-r--r--  1 oradb oinstall      425 Mar 28 17:36 UserGuide.txt
```

The output directory contains a number of other directories and the main HTML report file.

```
$ cd orachk_myhost_rdb11204_041816_055429
$ ls -la
total 60
drwxr-xr-x 7 oradb oinstall  4096 Apr 18 05:55 .
drwxr-xr-x 4 oradb oinstall  4096 Apr 18 05:55 ..
drwxr-xr-x 2 oradb oinstall  4096 Apr 18 05:55 log
-rw-r--r-- 1 oradb oinstall 30815 Apr 18 05:55
orachk_myhost_rdb11204_041816_055429.html
```

```
drwxr-xr-x 4 oradb oinstall  4096 Apr 18 05:55 outfiles
drwxr-xr-x 2 oradb oinstall  4096 Apr 18 05:55 reports
drwxr-xr-x 2 oradb oinstall  4096 Apr 18 05:55 scripts
drwxr-xr-x 2 oradb oinstall  4096 Apr 18 05:55 upload
```

Oracle ORAchk and Oracle EXAchk each creates an output directory containing the following information depending on which tool you use:

Table 1-4 Output Files and Directories

Output	Description
`log (directory)`	Contains a number of log files recording details about the health check, including: **Oracle ORAchk:** • `orachk.log`: Main log for the health check. • `orachk_error.log`: `std_error` log for the health check. • `orachk_debug_`*`date_time`*`.log`: Debug output when run with `-debug`, which is useful for troubleshooting. **Oracle EXAchk:** • `exachk.log`: Main log for the health check. • `exachk_error.log`: `std_error` log for the health check. • `exachk_debug_`*`date_time`*`.log`: Debug output when run with `-debug`, which is useful for troubleshooting.
`outfiles (directory)`	Contains a number of the collection results.
`reports (directory)`	Contains sub-reports used to build the main report.
`scripts (directory)`	Contains scripts used during collection.
`upload (directory)`	Contains files to upload collection results to a database for the Oracle Health Checks Collection Manager to consume, integrate the results into your own application, or integrate into other utilities.
`orachk_*.html`	**Oracle ORAchk:** Main HTML report output using the same name format as the output directory: `orachk_`*`host_name_database_date_timestamp`*`.html`.
`exachk_*.html`	**Oracle EXAchk:** Main HTML report output using the same name format as the output directory: `exachk_`*`host_name_database_date_timestamp`*`.html`.

Managing Oracle Health Check Collections Manager (page 1-91)
Oracle Health Check Collections Manager is a companion application to Oracle ORAchk and Oracle EXAchk that gives you an enterprise-wide view of your health check collection data.

Integrating Health Check Results with Other Tools (page 1-143)
You can integrate health check results from Oracle ORAchk and Oracle EXAchk into Enterprise Manager and other third-party tools.

How to Capture Debug Output (page 1-153)
Follow these procedures to capture debug information.

1.5.3 HTML Report Output

The Health Check HTML report contains the following:

- High level health score
- Summary of the run
- Table of contents that provides easy access to findings
- Findings and recommendations to resolve the issues

System Health Score and Summary (page 1-47)
Oracle ORAchk and Oracle EXAchk calculate a high level System Health Score based on the number of checks that passed or failed. A summary of the run shows, where and when it was run, which version was used, how long it took, which user it was run as, and so forth.

HTML Report Table of Contents and Features (page 1-49)
The **Table of Contents** provides links to each of the major sections within the HTML report.

HTML Report Findings (page 1-50)
Report findings are grouped by Oracle Stack component.

Maximum Availability Architecture (MAA) Scorecard (page 1-52)
The Maximum Availability Architecture (MAA) Scorecard is displayed after the Findings group.

Findings Needing Further Review (page 1-53)
Issues that health checks have only a partial view and need user reviews to determine if they are relevant are displayed in the **Findings needing further review** section.

Platinum Certification (page 1-54)
The **Platinum Certification** section shows a list of compliance status items for the Oracle Platinum service. For the existing Platinum customers it is a review. For customers not yet participating in Oracle Platinum, it is an indication of readiness to participate in Oracle Platinum.

Viewing Clusterwide Linux Operating system Health Check (VMPScan) (page 1-54)
A summary of the VMPScan report is shown in the **Clusterwide Linux Operating System Health Check (VMPScan)** section of the report.

"Systemwide Automatic Service Request (ASR) healthcheck" Section (page 1-55)
`asrexacheck` is designed to check and test ASR configurations to ensure that communication to the ASR Manager is possible. This is a non-invasive script that checks configurations only and does not write to any system or configuration files. The script checks for known

configuration issues and any previous hardware faults that may not have been reported by ASR due to a misconfiguration on the BDA.

File Attribute Changes (page 1-56)
The **File Attribute Changes** section is shown in the report only when Oracle ORAchk and Oracle EXAchk are run with the `-fileattr` option.

Skipped Checks (page 1-57)
Any checks that were not able to be run and skipped for some reason are shown in the **Skipped Checks** section.

Component Elapsed Times (page 1-57)
The **Component Elapsed Times** gives a breakdown of time required to check various components.

Top 10 Time Consuming Checks (page 1-57)
The **Top 10 Time Consuming Checks** section shows the slowest 10 checks that were run.

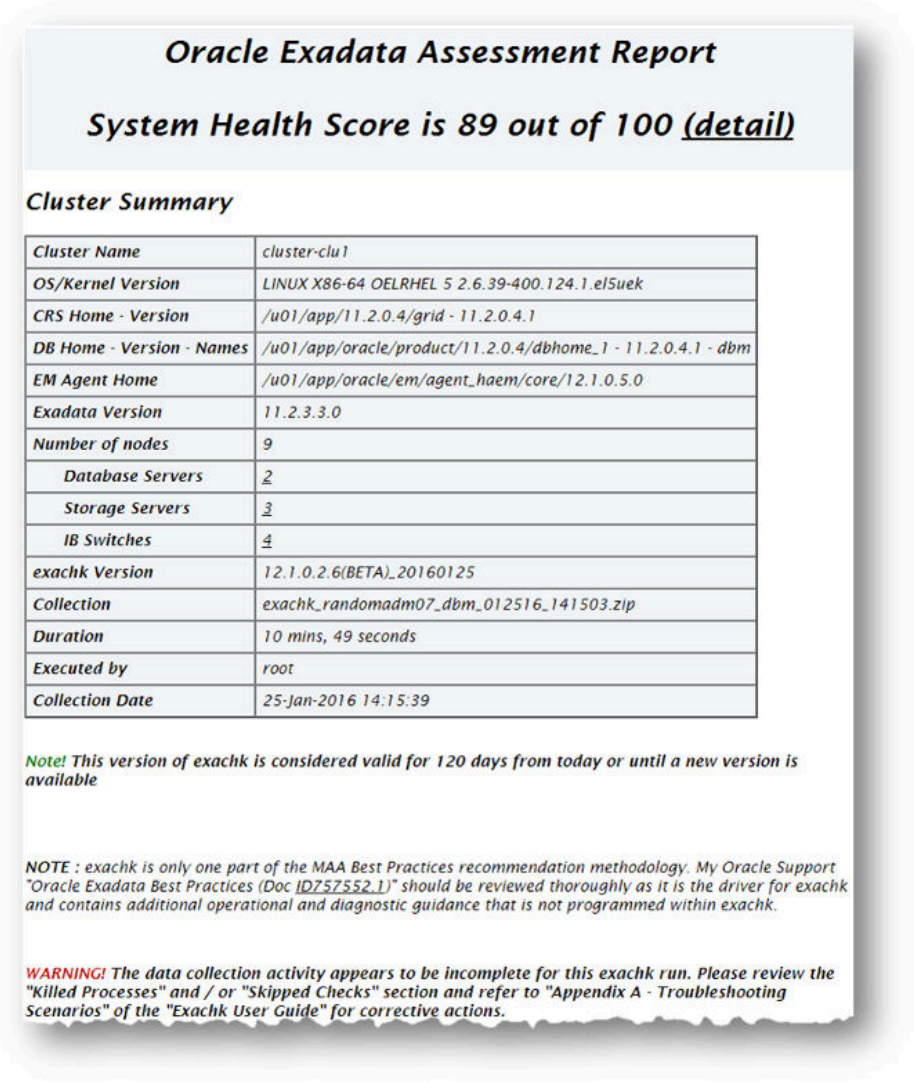
How to Find a Check ID (page 1-58)
Each health check has a unique 32 character ID.

How to Remove Checks from an Existing HTML Report (page 1-59)
Hide individual findings from the report using **Remove findings** .

1.5.3.1 System Health Score and Summary

Oracle ORAchk and Oracle EXAchk calculate a high level System Health Score based on the number of checks that passed or failed. A summary of the run shows, where and when it was run, which version was used, how long it took, which user it was run as, and so forth.

Figure 1-12 System Health Score and Summary



Oracle Exadata Assessment Report

System Health Score is 89 out of 100 (detail)

Cluster Summary

Cluster Name	cluster-clu1
OS/Kernel Version	LINUX X86-64 OELRHEL 5 2.6.39-400.124.1.el5uek
CRS Home - Version	/u01/app/11.2.0.4/grid - 11.2.0.4.1
DB Home - Version - Names	/u01/app/oracle/product/11.2.0.4/dbhome_1 - 11.2.0.4.1 - dbm
EM Agent Home	/u01/app/oracle/em/agent_haem/core/12.1.0.5.0
Exadata Version	11.2.3.3.0
Number of nodes	9
Database Servers	2
Storage Servers	3
IB Switches	4
exachk Version	12.1.0.2.6(BETA)_20160125
Collection	exachk_randomadm07_dbm_012516_141503.zip
Duration	10 mins, 49 seconds
Executed by	root
Collection Date	25-Jan-2016 14:15:39

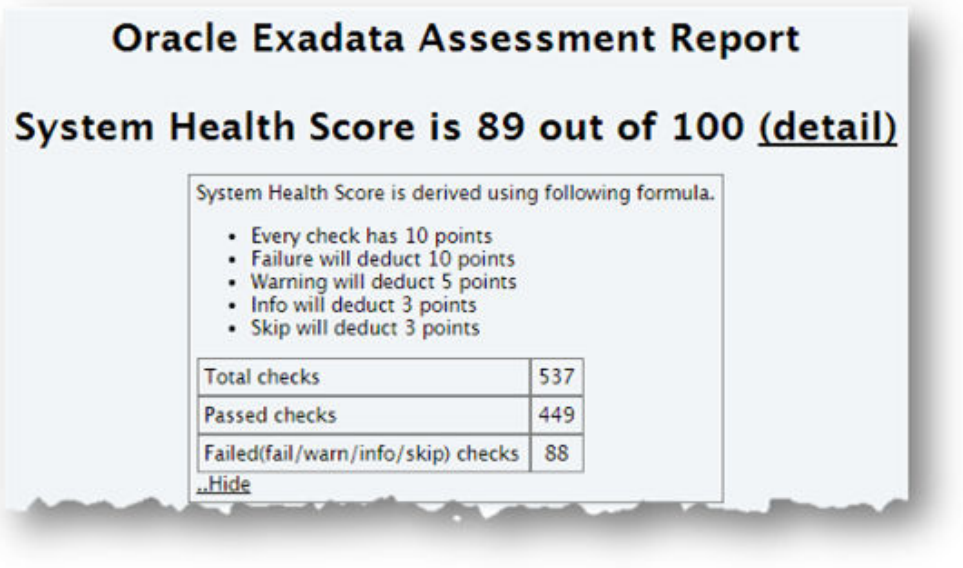
Note! This version of exachk is considered valid for 120 days from today or until a new version is available

NOTE : exachk is only one part of the MAA Best Practices recommendation methodology. My Oracle Support "Oracle Exadata Best Practices (Doc ID757552.1)" should be reviewed thoroughly as it is the driver for exachk and contains additional operational and diagnostic guidance that is not programmed within exachk.

WARNING! The data collection activity appears to be incomplete for this exachk run. Please review the "Killed Processes" and / or "Skipped Checks" section and refer to "Appendix A - Troubleshooting Scenarios" of the "Exachk User Guide" for corrective actions.

Click the **detail** link to expand the **System Health Score** section to view details of how this is calculated.

Figure 1-13 System Health Score Detail



To generate an HTML report without the **System Health Score** section, use the –`noscore` option:

```
$ ./orachk -noscore

$ ./exachk -noscore
```

Managing the Report Output (page 1-87)
Use the commands explained in this section to manage report output.

1.5.3.2 HTML Report Table of Contents and Features

The **Table of Contents** provides links to each of the major sections within the HTML report.

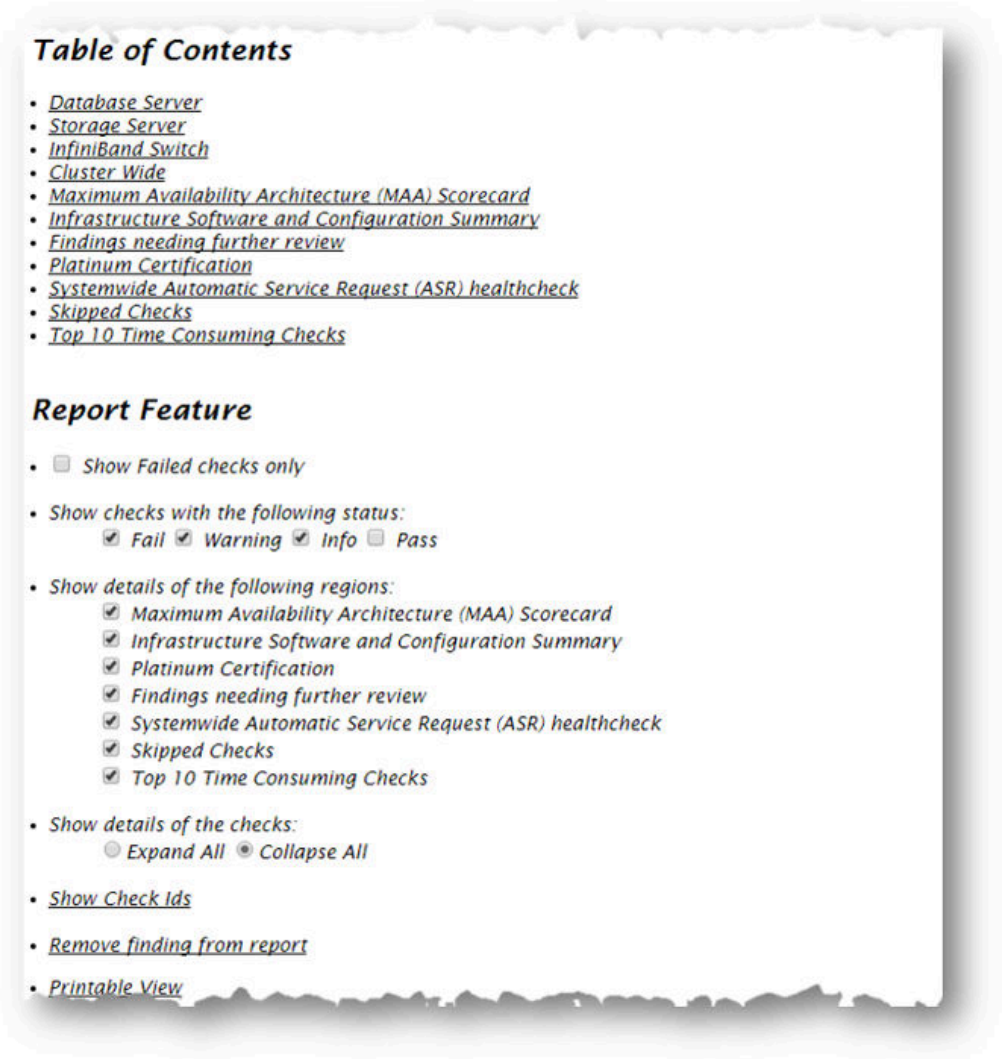
The next section in the HTML report after the summary is the **Table of Contents** and **Report Features**:

- The **Table of Contents** provides links to each of the major sections within the HTML report
  - What is shown in the Table of Contents will depend on the Oracle Stack components found during the health check run.
- The **Report Features** allow you to:
  - Filter checks based on their statuses.
  - Select the regions.
  - Expand or collapse all checks.
  - View check IDs.
  - Remove findings from the report.
  - Get a printable view.

By default, passed checks are hidden. To view, select the **Pass** checkbox under **Show Checks with the following status**. To exclude passed checks from the HTML report, use the `-nopass` option:

```
$ ./orachk -nopass

$ ./exachk -nopass
```

Figure 1-14 Report Table of Contents and Features



How to Find a Check ID (page 1-58)
Each health check has a unique 32 character ID.

How to Remove Checks from an Existing HTML Report (page 1-59)
Hide individual findings from the report using **Remove findings** .

Managing the Report Output (page 1-87)
Use the commands explained in this section to manage report output.

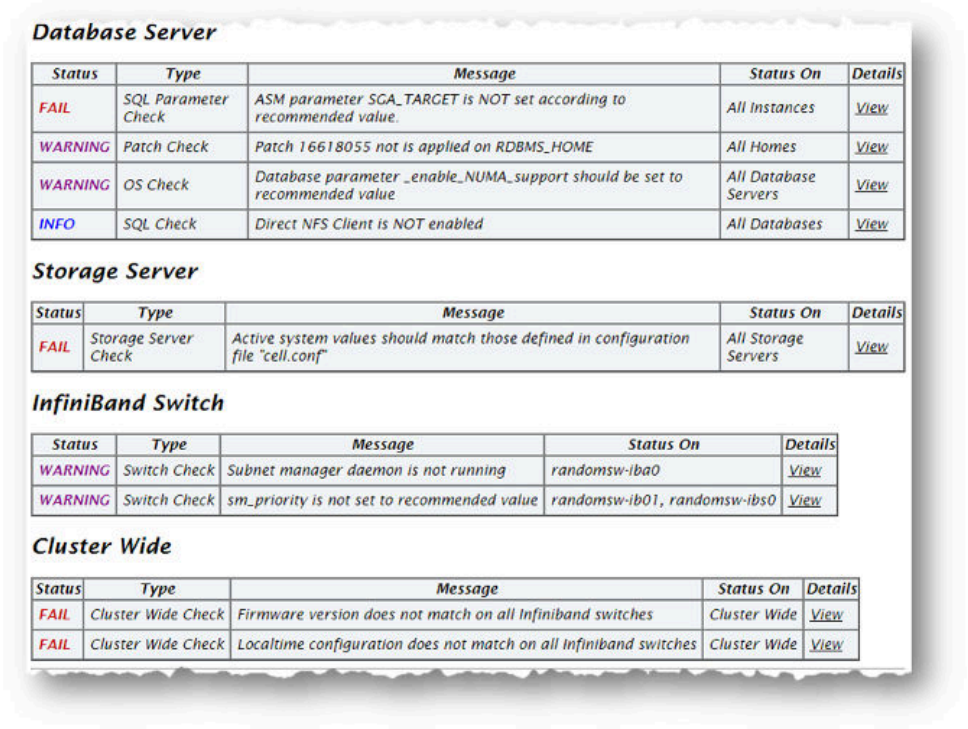
1.5.3.3 HTML Report Findings

Report findings are grouped by Oracle Stack component.

Findings include:

- Status of check (`FAIL`, `WARNING`, `INFO`, or `PASS`)
- Type of check
- Check message
- Location where the check was run
- Link to expand details for further findings and recommendations

Figure 1-15 Report Findings



Database Server

Status	Type	Message	Status On	Details
FAIL	SQL Parameter Check	ASM parameter SGA_TARGET is NOT set according to recommended value.	All Instances	View
WARNING	Patch Check	Patch 16618055 not is applied on RDBMS_HOME	All Homes	View
WARNING	OS Check	Database parameter _enable_NUMA_support should be set to recommended value	All Database Servers	View
INFO	SQL Check	Direct NFS Client is NOT enabled	All Databases	View

Storage Server

Status	Type	Message	Status On	Details
FAIL	Storage Server Check	Active system values should match those defined in configuration file "cell.conf"	All Storage Servers	View

InfiniBand Switch

Status	Type	Message	Status On	Details
WARNING	Switch Check	Subnet manager daemon is not running	randomsw-iba0	View
WARNING	Switch Check	sm_priority is not set to recommended value	randomsw-ib01, randomsw-ibs0	View

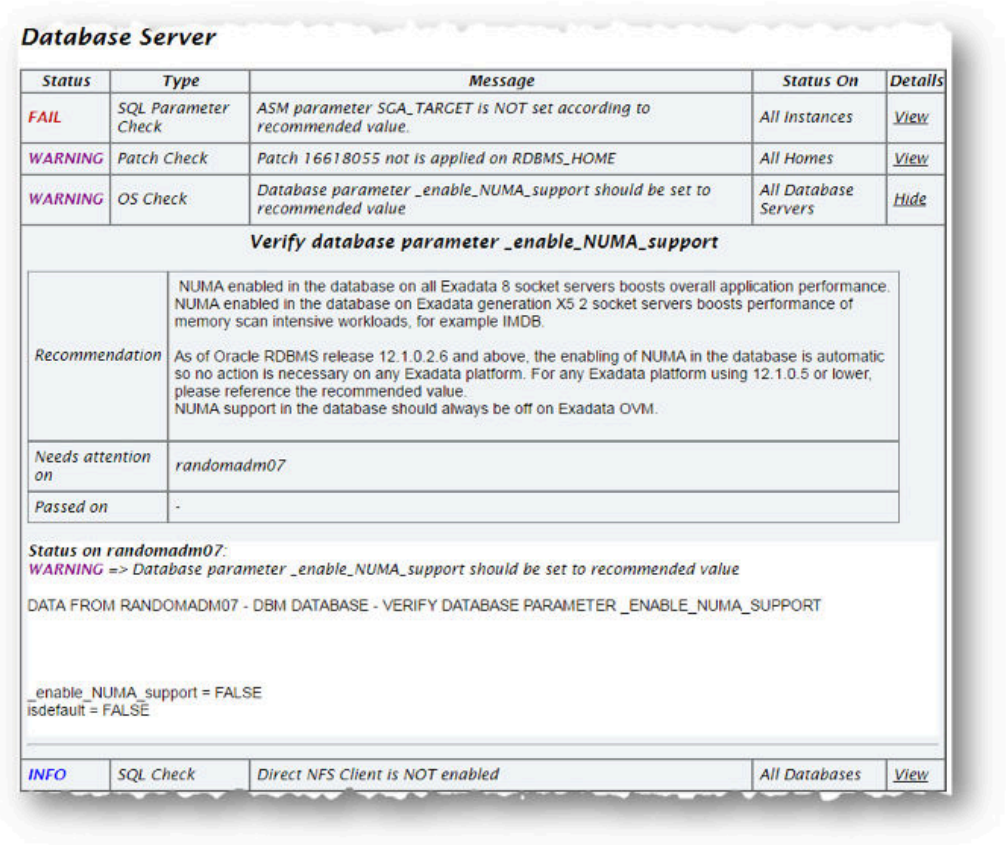
Cluster Wide

Status	Type	Message	Status On	Details
FAIL	Cluster Wide Check	Firmware version does not match on all Infiniband switches	Cluster Wide	View
FAIL	Cluster Wide Check	Localtime configuration does not match on all Infiniband switches	Cluster Wide	View

Click **view details** to view the findings and the recommendations.

- Solution to solve the problem
- Applicable recommendations
- Where the problem does not apply
- Links to relevant documentation or My Oracle Support Notes
- Example of data the recommendation is based on

Figure 1-16 View Report Findings



Database Server

Status	Type	Message	Status On	Details
FAIL	SQL Parameter Check	ASM parameter SGA_TARGET is NOT set according to recommended value.	All Instances	View
WARNING	Patch Check	Patch 16618055 not is applied on RDBMS_HOME	All Homes	View
WARNING	OS Check	Database parameter _enable_NUMA_support should be set to recommended value	All Database Servers	Hide

Verify database parameter _enable_NUMA_support

Recommendation	NUMA enabled in the database on all Exadata 8 socket servers boosts overall application performance. NUMA enabled in the database on Exadata generation X5 2 socket servers boosts performance of memory scan intensive workloads, for example IMDB. As of Oracle RDBMS release 12.1.0.2.6 and above, the enabling of NUMA in the database is automatic so no action is necessary on any Exadata platform. For any Exadata platform using 12.1.0.5 or lower, please reference the recommended value. NUMA support in the database should always be off on Exadata OVM.
Needs attention on	randomadm07
Passed on	-

Status on randomadm07:
WARNING => Database parameter _enable_NUMA_support should be set to recommended value

DATA FROM RANDOMADM07 - DBM DATABASE - VERIFY DATABASE PARAMETER _ENABLE_NUMA_SUPPORT

_enable_NUMA_support = FALSE
isdefault = FALSE

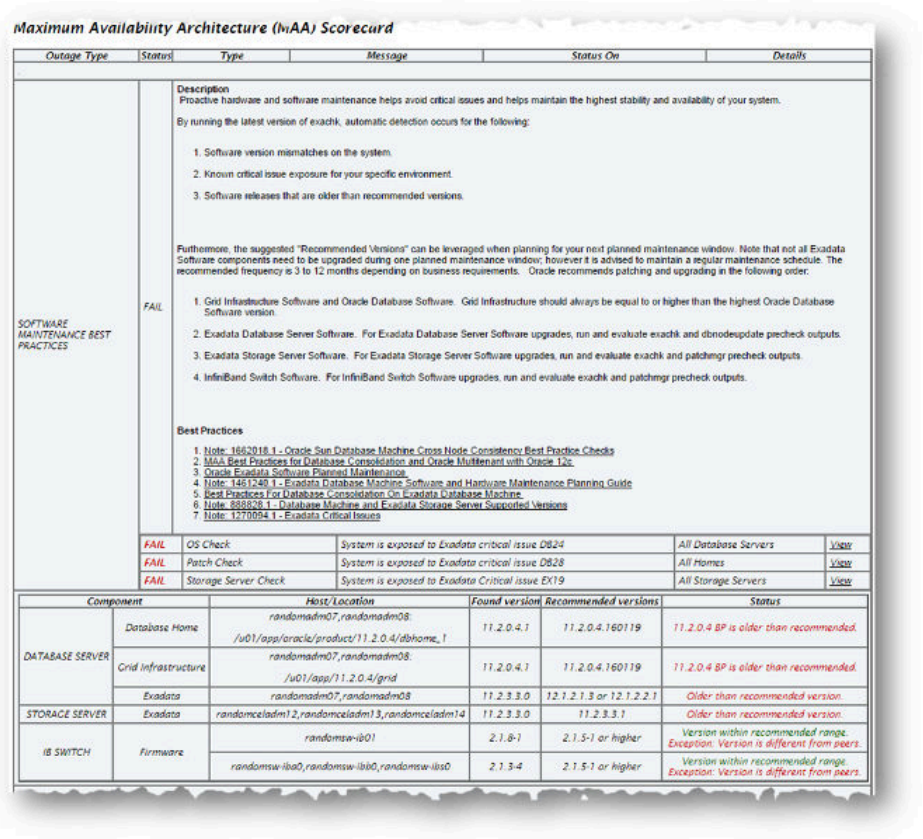
INFO	SQL Check	Direct NFS Client is NOT enabled	All Databases	View

1.5.3.4 Maximum Availability Architecture (MAA) Scorecard

The Maximum Availability Architecture (MAA) Scorecard is displayed after the Findings group.

The MAA Scorecard provides a set of best practices for maximum availability architecture. It also shows results related to maximum availability, such as the installed software versions checked for noncurrent software, and use of incompatible features.

Figure 1-17 Maximum Availability Architecture (MAA) Scorecard



Maximum Availability Architecture (MAA) Scorecard

Outage Type	Status	Type	Message	Status On	Details
SOFTWARE MAINTENANCE BEST PRACTICES	FAIL		**Description** Proactive hardware and software maintenance helps avoid critical issues and helps maintain the highest stability and availability of your system. By running the latest version of exachk, automatic detection occurs for the following: 1. Software version mismatches on the system. 2. Known critical issue exposure for your specific environment. 3. Software releases that are older than recommended versions. Furthermore, the suggested "Recommended Versions" can be leveraged when planning for your next planned maintenance window. Note that not all Exadata Software components need to be upgraded during one planned maintenance window; however it is advised to maintain a regular maintenance schedule. The recommended frequency is 3 to 12 months depending on business requirements. Oracle recommends patching and upgrading in the following order: 1. Grid Infrastructure Software and Oracle Database Software. Grid Infrastructure should always be equal to or higher than the highest Oracle Database Software version. 2. Exadata Database Server Software. For Exadata Database Server Software upgrades, run and evaluate exachk and dbnodeupdate precheck outputs. 3. Exadata Storage Server Software. For Exadata Storage Server Software upgrades, run and evaluate exachk and patchmgr precheck outputs. 4. InfiniBand Switch Software. For InfiniBand Switch Software upgrades, run and evaluate exachk and patchmgr precheck outputs. **Best Practices** 1. Note: 1662018.1 - Oracle Sun Database Machine Cross Node Consistency Best Practice Checks 2. MAA Best Practices for Database Consolidation and Oracle Multitenant with Oracle 12c 3. Oracle Exadata Software Planned Maintenance 4. Note: 1461240.1 - Exadata Database Machine Software and Hardware Maintenance Planning Guide 5. Best Practices For Database Consolidation On Exadata Database Machine 6. Note: 888828.1 - Database Machine and Exadata Storage Server Supported Versions 7. Note: 1270094.1 - Exadata Critical Issues		
	FAIL	OS Check	System is exposed to Exadata critical issue DB24	All Database Servers	View
	FAIL	Patch Check	System is exposed to Exadata critical issue DB28	All Homes	View
	FAIL	Storage Server Check	System is exposed to Exadata Critical issue EX19	All Storage Servers	View

Component		Host/Location	Found version	Recommended versions	Status
DATABASE SERVER	Database Home	randomadm07,randomadm08: /u01/app/oracle/product/11.2.0.4/dbhome_1	11.2.0.4.1	11.2.0.4.160119	11.2.0.4 BP is older than recommended.
	Grid Infrastructure	randomadm07,randomadm08: /u01/app/11.2.0.4/grid	11.2.0.4.1	11.2.0.4.160119	11.2.0.4 BP is older than recommended.
	Exadata	randomadm07,randomadm08	11.2.3.3.0	12.1.2.1.3 or 12.1.2.2.1	Older than recommended version.
STORAGE SERVER	Exadata	randomceladm12,randomceladm13,randomceladm14	11.2.3.3.0	11.2.3.3.1	Older than recommended version.
IB SWITCH	Firmware	randomsw-ib01	2.1.8-1	2.1.5-1 or higher	Version within recommended range. Exception: Version is different from peers.
		randomsw-iba0,randomsw-ibb0,randomsw-ibs0	2.1.3-4	2.1.5-1 or higher	Version within recommended range. Exception: Version is different from peers.

To generate an HTML report without the **MAA Scorecard** section, use the `-m` option:

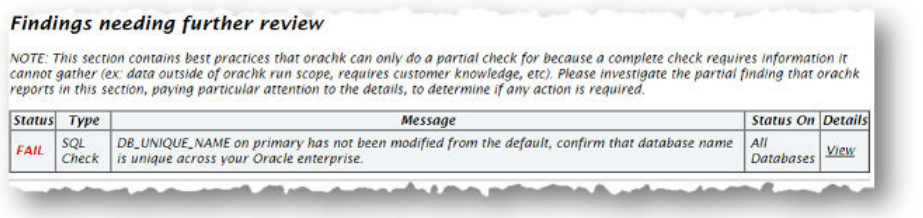
```
$ ./orachk -m

$ ./exachk -m
```

Controlling the Scope of Checks (page 1-86)
List of commands to control the scope of checks.

1.5.3.5 Findings Needing Further Review

Issues that health checks have only a partial view and need user reviews to determine if they are relevant are displayed in the **Findings needing further review** section.

Figure 1-18 Findings needing further review



Findings needing further review

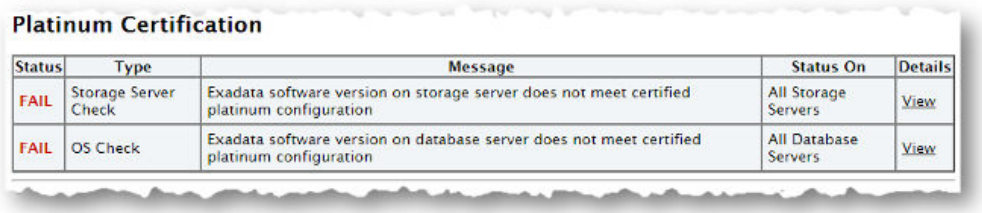
NOTE: This section contains best practices that orachk can only do a partial check for because a complete check requires information it cannot gather (ex: data outside of orachk run scope, requires customer knowledge, etc). Please investigate the partial finding that orachk reports in this section, paying particular attention to the details, to determine if any action is required.

Status	Type	Message	Status On	Details
FAIL	SQL Check	DB_UNIQUE_NAME on primary has not been modified from the default, confirm that database name is unique across your Oracle enterprise.	All Databases	View

1.5.3.6 Platinum Certification

The **Platinum Certification** section shows a list of compliance status items for the Oracle Platinum service. For the existing Platinum customers it is a review. For customers not yet participating in Oracle Platinum, it is an indication of readiness to participate in Oracle Platinum.

Figure 1-19 Platinum Certification



Platinum Certification

Status	Type	Message	Status On	Details
FAIL	Storage Server Check	Exadata software version on storage server does not meet certified platinum configuration	All Storage Servers	View
FAIL	OS Check	Exadata software version on database server does not meet certified platinum configuration	All Database Servers	View

Note:

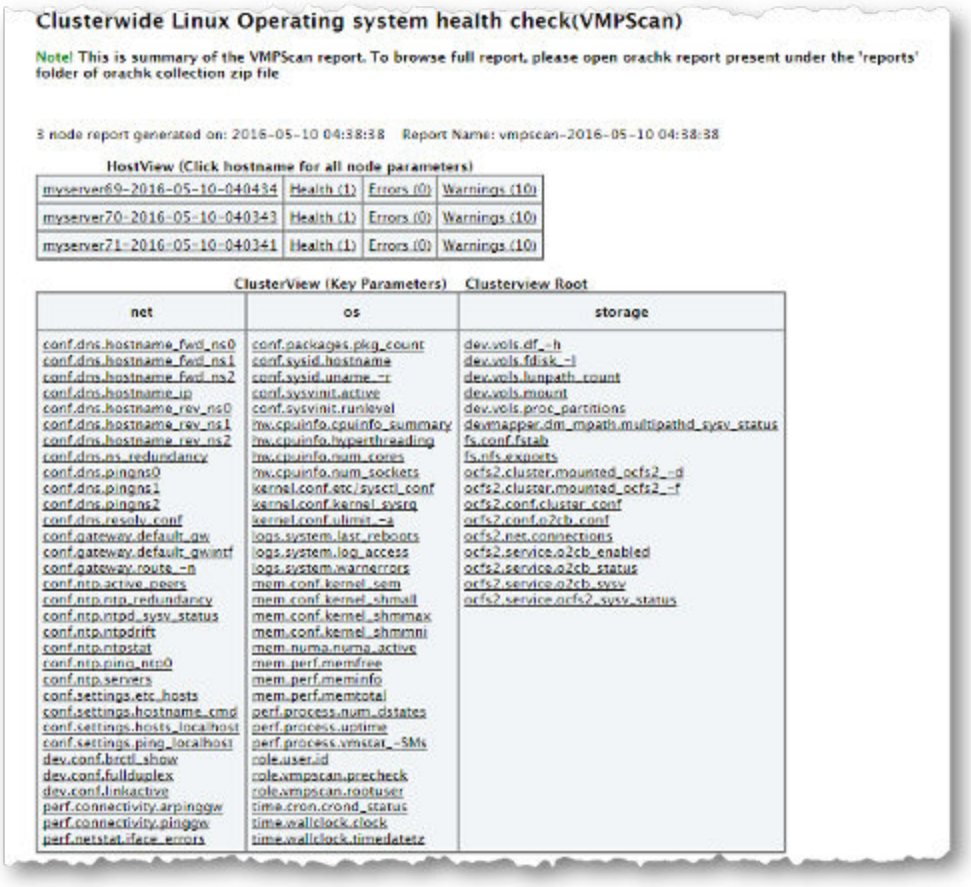
This section is seen when health checks are run on Oracle Engineered Systems.

1.5.3.7 Viewing Clusterwide Linux Operating system Health Check (VMPScan)

A summary of the VMPScan report is shown in the **Clusterwide Linux Operating System Health Check (VMPScan)** section of the report.

The full VMPScan report is also available within the *collection*/reports and *collection*/outfiles/vmpscan directory.

Figure 1-20 Clusterwide Linux Operating System Health Check (VMPScan)



Clusterwide Linux Operating system health check(VMPScan)

Note! This is summary of the VMPScan report. To browse full report, please open orachk report present under the 'reports' folder of orachk collection zip file

3 node report generated on: 2016-05-10 04:38:38 Report Name: vmpscan-2016-05-10 04:38:38

HostView (Click hostname for all node parameters)

myserver69-2016-05-10-040434	Health (1)	Errors (0)	Warnings (10)
myserver70-2016-05-10-040343	Health (1)	Errors (0)	Warnings (10)
myserver71-2016-05-10-040341	Health (1)	Errors (0)	Warnings (10)

ClusterView (Key Parameters) Clusterview Root

net	os	storage
conf.dns.hostname_fwd_ns0	conf.packages.pkg_count	dev.vols.df_-h
conf.dns.hostname_fwd_ns1	conf.sysid.hostname	dev.vols.fdisk_-l
conf.dns.hostname_fwd_ns2	conf.sysid.uname_-r	dev.vols.lunpath_count
conf.dns.hostname_ip	conf.sysvinit.active	dev.vols.mount
conf.dns.hostname_rev_ns0	conf.sysvinit.runlevel	dev.vols.proc_partitions
conf.dns.hostname_rev_ns1	hw.cpuinfo.cpuinfo_summary	devmapper.dm_mpath.multipathd_sysv_status
conf.dns.hostname_rev_ns2	hw.cpuinfo.hyperthreading	fs.conf.fstab
conf.dns.ns_redundancy	hw.cpuinfo.num_cores	fs.nfs.exports
conf.dns.pingns0	hw.cpuinfo.num_sockets	ocfs2.cluster.mounted_ocfs2_-d
conf.dns.pingns1	kernel.conf.etc/sysctl_conf	ocfs2.cluster.mounted_ocfs2_-f
conf.dns.pingns2	kernel.conf.kernel_sysrq	ocfs2.conf.cluster_conf
conf.dns.resolv_conf	kernel.conf.ulimit_-a	ocfs2.conf.o2cb_conf
conf.gateway.default_gw	logs.system.last_reboots	ocfs2.net.connections
conf.gateway.default_gwintf	logs.system.log_access	ocfs2.service.o2cb_enabled
conf.gateway.routs_-n	logs.system.warnerrors	ocfs2.service.o2cb_status
conf.ntp.active_peers	mem.conf.kernel_sem	ocfs2.service.o2cb_sysv
conf.ntp.ntp_redundancy	mem.conf.kernel_shmall	ocfs2.service.ocfs2_sysv_status
conf.ntp.ntpd_sysv_status	mem.conf.kernel_shmmax	
conf.ntp.ntpdrift	mem.conf.kernel_shmmni	
conf.ntp.ntpstat	mem.numa.numa_active	
conf.ntp.ping_ntp0	mem.perf.memfree	
conf.ntp.servers	mem.perf.meminfo	
conf.settings.etc_hosts	mem.perf.memtotal	
conf.settings.hostname_cmd	perf.process.num_dstates	
conf.settings.hosts_localhost	perf.process.uptime	
conf.settings.ping_localhost	perf.process.vmstat_-SMs	
dev.conf.brctl_show	role.user.id	
dev.conf.fullduplex	role.vmpscan.precheck	
dev.conf.linkactive	role.vmpscan.rootuser	
perf.connectivity.arpinggw	time.cron.crond_status	
perf.connectivity.pinggw	time.wallclock.clock	
perf.netstat.iface_errors	time.wallclock.timedatetz	

Note:

VMPScan report is included only when Oracle ORAchk is run on Linux systems.

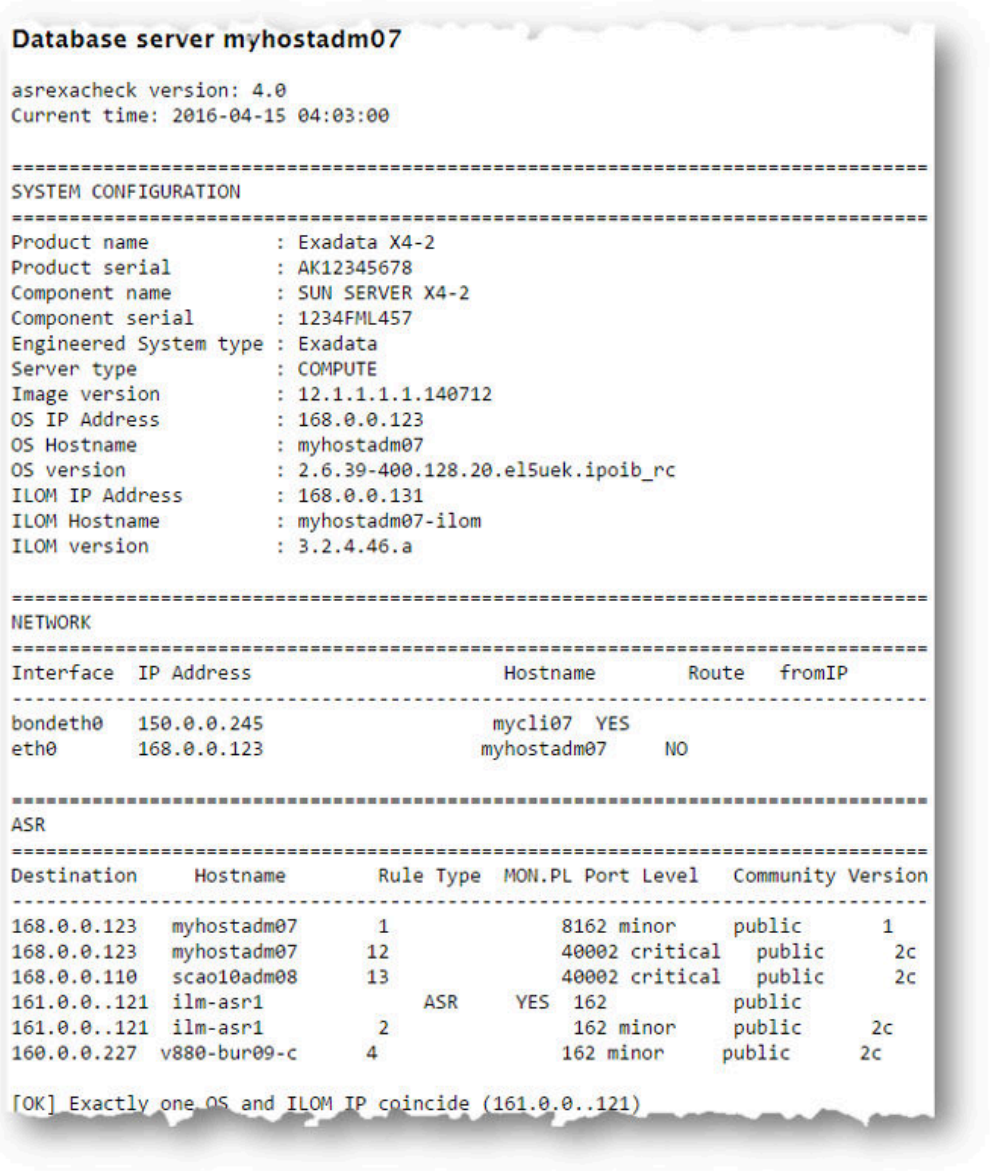
1.5.3.8 "Systemwide Automatic Service Request (ASR) healthcheck" Section

`asrexacheck` is designed to check and test ASR configurations to ensure that communication to the ASR Manager is possible. This is a non-invasive script that checks configurations only and does not write to any system or configuration files. The script checks for known configuration issues and any previous hardware faults that may not have been reported by ASR due to a misconfiguration on the BDA.

This section is included in the report only when health checks are run on Oracle Engineered Systems.

The following is a sample of the **Systemwide Automatic Service Request (ASR) healthcheck** section truncated for brevity:

Figure 1-21 Systemwide Automatic Service Request (ASR) healthcheck



Database server myhostadm07

```
asrexacheck version: 4.0
Current time: 2016-04-15 04:03:00

================================================================================
SYSTEM CONFIGURATION
================================================================================
Product name           : Exadata X4-2
Product serial         : AK12345678
Component name         : SUN SERVER X4-2
Component serial       : 1234FML457
Engineered System type : Exadata
Server type            : COMPUTE
Image version          : 12.1.1.1.1.140712
OS IP Address          : 168.0.0.123
OS Hostname            : myhostadm07
OS version             : 2.6.39-400.128.20.el5uek.ipoib_rc
ILOM IP Address        : 168.0.0.131
ILOM Hostname          : myhostadm07-ilom
ILOM version           : 3.2.4.46.a

================================================================================
NETWORK
================================================================================
Interface  IP Address                      Hostname        Route   fromIP
--------------------------------------------------------------------------------
bondeth0   150.0.0.245                     mycli07  YES
eth0       168.0.0.123                    myhostadm07     NO

================================================================================
ASR
================================================================================
Destination     Hostname        Rule Type  MON.PL Port Level   Community Version
--------------------------------------------------------------------------------
168.0.0.123   myhostadm07       1              8162 minor     public       1
168.0.0.123   myhostadm07      12              40002 critical   public      2c
168.0.0.110   scao10adm08      13              40002 critical   public      2c
161.0.0..121  ilm-asr1              ASR     YES  162           public
161.0.0..121  ilm-asr1           2               162 minor     public      2c
160.0.0.227  v880-bur09-c      4               162 minor     public      2c

[OK] Exactly one OS and ILOM IP coincide (161.0.0..121)
```

See Also:

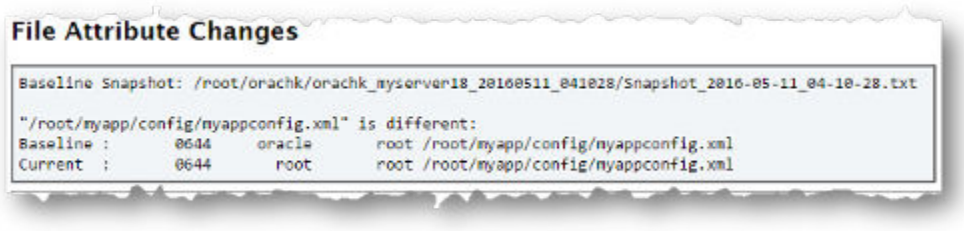
My Oracle Support Note 1450112.1:

Engineered Systems ASR Configuration Check through ASREXACHK

1.5.3.9 File Attribute Changes

The **File Attribute Changes** section is shown in the report only when Oracle ORAchk and Oracle EXAchk are run with the `-fileattr` option.

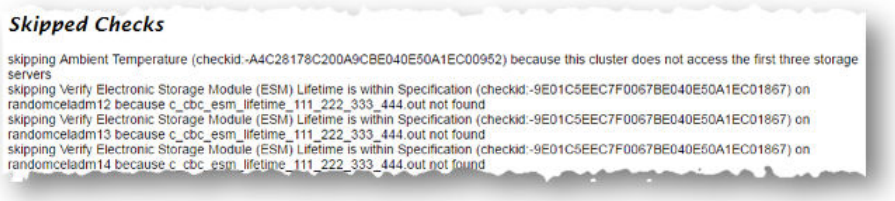
Figure 1-22 File Attribute Changes



1.5.3.10 Skipped Checks

Any checks that were not able to be run and skipped for some reason are shown in the **Skipped Checks** section.

Figure 1-23 Skipped Checks



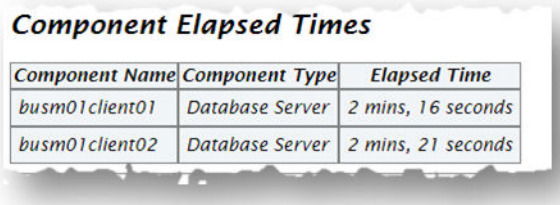
Slow Performance, Skipped Checks and Timeouts (page 1-163)
Follow these procedures to address slow performance and other issues.

1.5.3.11 Component Elapsed Times

The **Component Elapsed Times** gives a breakdown of time required to check various components.

This can be useful when diagnosing performance problems.

Figure 1-24 Component Elapsed Times



Component Elapsed Times

Component Name	Component Type	Elapsed Time
busm01client01	Database Server	2 mins, 16 seconds
busm01client02	Database Server	2 mins, 21 seconds

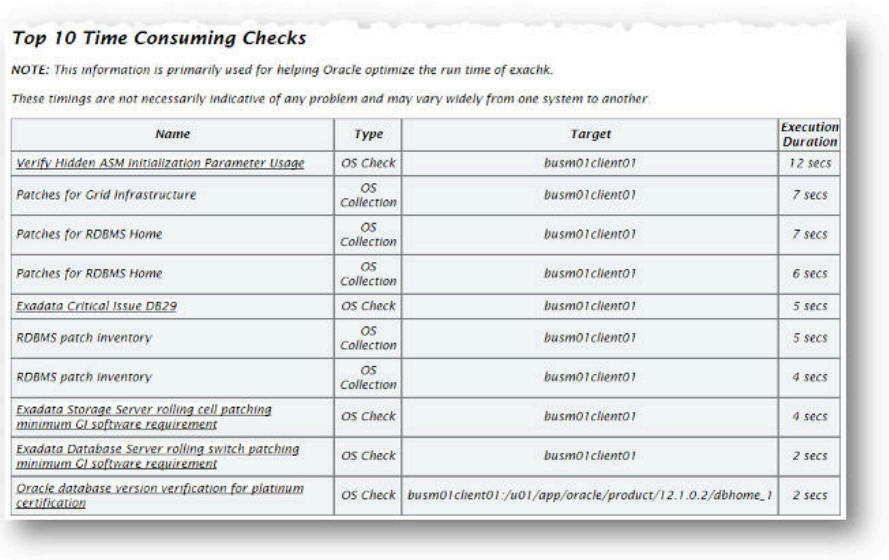
Slow Performance, Skipped Checks and Timeouts (page 1-163)
Follow these procedures to address slow performance and other issues.

1.5.3.12 Top 10 Time Consuming Checks

The **Top 10 Time Consuming Checks** section shows the slowest 10 checks that were run.

This can be useful when diagnosing performance problems.

Figure 1-25 Top 10 Time Consuming Checks



Top 10 Time Consuming Checks

NOTE: This information is primarily used for helping Oracle optimize the run time of exachk.

These timings are not necessarily indicative of any problem and may vary widely from one system to another.

Name	Type	Target	Execution Duration
Verify Hidden ASM Initialization Parameter Usage	OS Check	busm01client01	12 secs
Patches for Grid Infrastructure	OS Collection	busm01client01	7 secs
Patches for RDBMS Home	OS Collection	busm01client01	7 secs
Patches for RDBMS Home	OS Collection	busm01client01	6 secs
Exadata Critical Issue DB29	OS Check	busm01client01	5 secs
RDBMS patch inventory	OS Collection	busm01client01	5 secs
RDBMS patch inventory	OS Collection	busm01client01	4 secs
Exadata Storage Server rolling cell patching minimum CI software requirement	OS Check	busm01client01	4 secs
Exadata Database Server rolling switch patching minimum CI software requirement	OS Check	busm01client01	2 secs
Oracle database version verification for platinum certification	OS Check	busm01client01:/u01/app/oracle/product/12.1.0.2/dbhome_1	2 secs

For sample reports, see:

- Oracle ORAchk Sample Report
- Oracle EXAchk Sample Report

Slow Performance, Skipped Checks and Timeouts (page 1-163)
Follow these procedures to address slow performance and other issues.

1.5.3.13 How to Find a Check ID

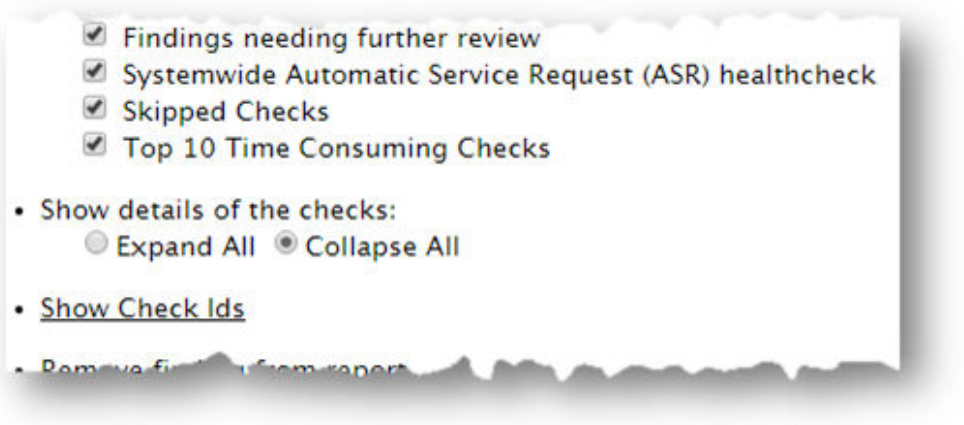
Each health check has a unique 32 character ID.

You may want to find a check id while:

- Communicating to Oracle or your own internal teams about a specific check
- Excluding or only running one or more checks

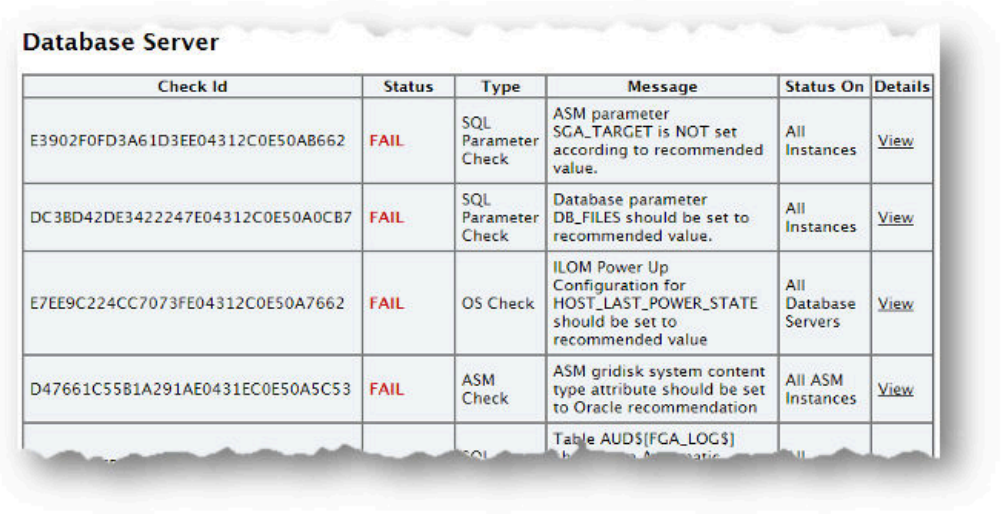
To find a particular check id using a generated report, click the **Show Check Ids** link.

Figure 1-26 Show Check Ids



The findings will then display an extra column to the left with the Check Id.

Figure 1-27 Show Check Ids



Database Server

Check Id	Status	Type	Message	Status On	Details
E3902F0FD3A61D3EE04312C0E50AB662	FAIL	SQL Parameter Check	ASM parameter SGA_TARGET is NOT set according to recommended value.	All Instances	View
DC3BD42DE3422247E04312C0E50A0CB7	FAIL	SQL Parameter Check	Database parameter DB_FILES should be set to recommended value.	All Instances	View
E7EE9C224CC7073FE04312C0E50A7662	FAIL	OS Check	ILOM Power Up Configuration for HOST_LAST_POWER_STATE should be set to recommended value	All Database Servers	View
D47661C55B1A291AE0431EC0E50A5C53	FAIL	ASM Check	ASM gridisk system content type attribute should be set to Oracle recommendation	All ASM Instances	View
			Table AUD$[FGA_LOG$]		

Health Check Catalog (page 1-69)
The Health Check Catalogs list the health checks that are included within Oracle ORAchk or Oracle EXAchk. Health Check Catalogs are HTML pages that require JavaScript. Enable JavaScript in your browser to view the Health Check Catalogs.

Running Subsets of Checks (page 1-73)
Where necessary, you can run a subset of health checks.

1.5.3.14 How to Remove Checks from an Existing HTML Report

Hide individual findings from the report using **Remove findings** .

Click **Remove finding from report**.

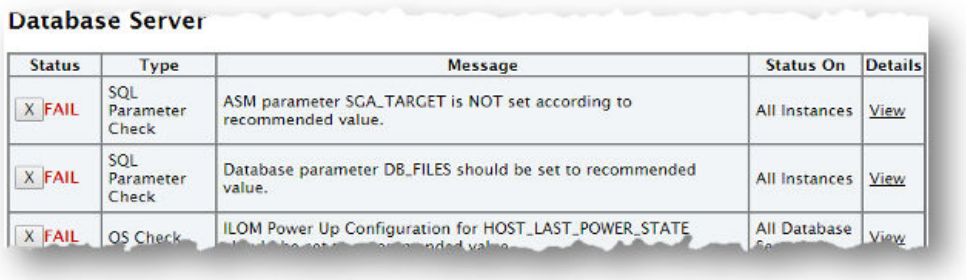
Figure 1-28 Remove Findings from Report

A button with an X appears next to each finding.

Click X to hide the finding. This does not remove the finding from the source of the HTML report it simply hides it. If the HTML report is reloaded the finding will appear again.

To permanently hide the finding use your browser's **Save Page** option to save the report once the finding is hidden.

Figure 1-29 Remove Findings from Report



If there are findings that you never want to see in the report, then they can be excluded altogether so the checks are never run in the first place.

Running Subsets of Checks (page 1-73)
Where necessary, you can run a subset of health checks.

1.5.4 Tagging Reports

The health check HTML report is typically named: `orachk_`*`hostname_database_date_timestamp`*`.html` or `exachk_`*`hostname_database_date_timestamp`*`.html`. You can include other tags in the HTML report name to facilitate differentiation and identification.

Include a custom tag in the HTML report name, as follows:

```
$ ./orachk -tag tag_name

$ ./exachk -tag tag_name
```

The resulting HTML report name is similar to the following: `orachk_`*`host_name_database_date_timestamp_tag_name`*`.html`, or `exachk_`*`host_name_database_date_timestamp_tag_name`*`.html`.

1.5.5 ORAchk and EXAchk Tracking File Attribute Changes

Track changes to the attributes of important files with the `-fileattr` option that looks at all files within Grid Infrastructure and Database homes by default. Configure the list of directories and their contents to monitor specific to your requirements.

Table 1-5 List of File Attribute Tracking Options

Option	Description
`-fileattr start`	Takes file-attribute snapshots of discovered directories and stores the snapshots in the output directory. By default, it takes snapshots of Oracle Grid Infrastructure homes and all of the installed database homes. If a user does not own a particular directory, then it does not take snapshots of the directory.
`-fileattr check`	Takes a recent snapshot of discovered directories to compare with the previous snapshot.
`-fileattr remove`	Removes file attribute snapshots and related files.

`-fileattr [start|check] -includedir` *`directories`*	You can specify a comma-delimited list of directories to check file attributes.
	For example:
	`./orachk -fileattr start -includedir "/root/home,/etc"`
	`./orachk -fileattr check -includedir "/root/home,/etc"`

`-fileattr [start|check] -excludediscovery`	Excludes the discovered directories. For example: `./orachk -fileattr start -includedir "/root/home,/etc" -excludediscovery`
`-fileattr check -baseline` *`baseline snapshot path`*	For example: `./orachk -fileattr check -baseline "/tmp/Snapshot"`
`-fileattr check –fileattronly`	This option performs only file attributes check and exits ORAchk. For example: `./orachk -fileattr check -fileattronly`

Note:

`-fileattr` requires Oracle Grid Infrastructure to be installed and running.

Tip:

To use with the daemon:

1. Start the daemon.

   ```
   ./orachk -d start
   ```

2. Start the client run with the `-fileattr` options as follows:

```
./orachk -fileattr start -includedir "/root/myapp,/etc/oratab" -
excludediscovery
./orachk -fileattr check -includedir "/root/myapp,/etc/oratab" -
excludediscovery
```

3. Specify the output directory to store snapshots with the `–output` option as follows:

```
./orachk -fileattr start -output "/tmp/mysnapshots"
```

Use `–tag` to help identify your snapshots:

```
./orachk -fileattr start -tag "BeforeXYZChange"
  Generated snapshot directory-
  orachk_myserver65_20160329_052056_ BeforeXYZChange
```

Oracle ORAchk and Oracle EXAchk –fileattr start

Use `–fileattr start` to start the first snapshot. Directories included in the snapshots, by default, are Oracle Grid Infrastructure homes and all installed Oracle Database homes.

```
./orachk –fileattr start

./exachk –fileattr start

$ ./orachk -fileattr start
CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME
to /u01/app/11.2.0.4/grid?[y/n][y]
Checking ssh user equivalency settings on all nodes in cluster
Node mysrv22 is configured for ssh user equivalency for oradb user
Node mysrv23 is configured for ssh user equivalency for oradb user

List of directories(recursive) for checking file attributes:
/u01/app/oradb/product/11.2.0/dbhome_11202
/u01/app/oradb/product/11.2.0/dbhome_11203
/u01/app/oradb/product/11.2.0/dbhome_11204
orachk has taken snapshot of file attributes for above directories at: /orahome/
oradb/orachk/orachk_mysrv21_20160504_041214
```

Oracle ORAchk and Oracle EXAchk –includedir

You can include other directories using the `–includedir` *`directories`* option, where *`directories`* is a comma-delimited list of directories to include, similar to the following:

```
./orachk -fileattr start -includedir "/home/oradb,/etc/oratab"

./exachk -fileattr start -includedir "/home/oradb,/etc/oratab"

$ ./orachk -fileattr start -includedir "/root/myapp/config/"
CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME
to /u01/app/12.2.0/grid?[y/n][y]
Checking for prompts on myserver18 for oragrid user...
Checking ssh user equivalency settings on all nodes in cluster
Node myserver17 is configured for ssh user equivalency for root user
List of directories(recursive) for checking file attributes:
/u01/app/12.2.0/grid
/u01/app/oradb/product/12.2.0/dbhome_1
/u01/app/oradb2/product/12.2.0/dbhome_1
/root/myapp/config/
```

```
orachk has taken snapshot of file attributes for above directories at: /root/orachk/
orachk_ myserver18_20160511_032034
```

Oracle ORAchk and Oracle EXAchk -excludediscovery

```
./orachk -fileattr start -excludediscovery

./exachk -fileattr start -excludediscovery

$ ./orachk -fileattr start -includedir "/root/myapp/config/" -excludediscovery
CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME
to /u01/app/12.2.0/grid?[y/n][y]
Checking for prompts on myserver18 for oragrid user...
Checking ssh user equivalency settings on all nodes in cluster
Node myserver17 is configured for ssh user equivalency for root user
List of directories(recursive) for checking file attributes:
/root/myapp/config/
orachk has taken snapshot of file attributes for above directories at: /root/orachk/
orachk_myserver18_20160511_032209
```

Oracle ORAchk and Oracle EXAchk –fileattr check

Use `–fileattr check` to take another snapshot and compare it to the previous snapshot, as well as run a normal health check collection.

```
./orachk –fileattr check

./exachk –fileattr check
```

Note:

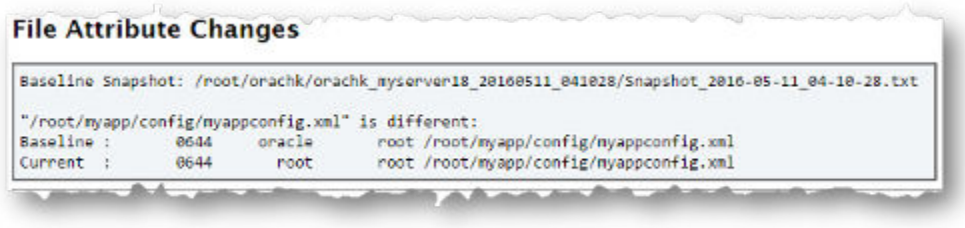
Use `–fileattr check` with the same options you used with `–fileattr start`.

For example, if you added `-includedir "/somedir" –excludediscovery` when you ran `–fileattr start`, then include the same options with `–fileattr check`.

```
$ ./orachk -fileattr check -includedir "/root/myapp/config" -excludediscovery
CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME
to /u01/app/12.2.0/grid?[y/n][y]
Checking for prompts on myserver18 for oragrid user...
Checking ssh user equivalency settings on all nodes in cluster
Node myserver17 is configured for ssh user equivalency for root user
 List of directories(recursive) for checking file attributes:
/root/myapp/config
Checking file attribute changes...
.
"/root/myapp/config/myappconfig.xml" is different:
Baseline :       0644     oracle       root /root/myapp/config/myappconfig.xml
Current  :       0644       root       root /root/myapp/config/myappconfig.xml
...
```

Results of the file attribute changes are reflected in the **File Attribute Changes** section of the HTML output report.

Figure 1-30 File Attribute Changes



Oracle ORAchk and Oracle EXAchk –baseline

If you have multiple different baselines that you want to check, then you can provide a specific baseline snapshot to compare against using the `-baseline` *`path_to_snapshot`* option.

```
./orachk -fileattr check -baseline path_to_snapshot

./exachk -fileattr check -baseline path_to_snapshot
```

Oracle ORAchk and Oracle EXAchk –fileattronly

By default, `-fileattr check` also performs a full health check run. To perform file attribute checking, only, and not proceed with other health checks, use the `-fileattronly` option.

```
./orachk -fileattr check -fileattronly

./exachk -fileattr check -fileattronly
```

Oracle ORAchk and Oracle EXAchk –fileattr remove

You can remove snapshots using the `-fileattr remove` option:

```
./orachk -fileattr remove

./exachk -fileattr remove

$ ./orachk -fileattr remove
CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME
to /u01/app/12.2.0/grid?[y/n][y]y
Checking for prompts on myserver18 for oragrid user...
Checking ssh user equivalency settings on all nodes in cluster
Node myserver17 is configured for ssh user equivalency for root user

List of directories(recursive) for checking file attributes:
/u01/app/12.2.0/grid
/u01/app/oradb/product/12.2.0/dbhome_1
/u01/app/oradb2/product/12.2.0/dbhome_1
Removing file attribute related files...
...
```

1.5.6 Comparing Two Reports

Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

To generate a diff HTML report, use the `-diff` option:

```
$ ./orachk -diff report_1 report_2
```

```
$ ./exachk -diff report_1 report_2
```

where, *report_1* and *report_2* are the path and name of any of the following:

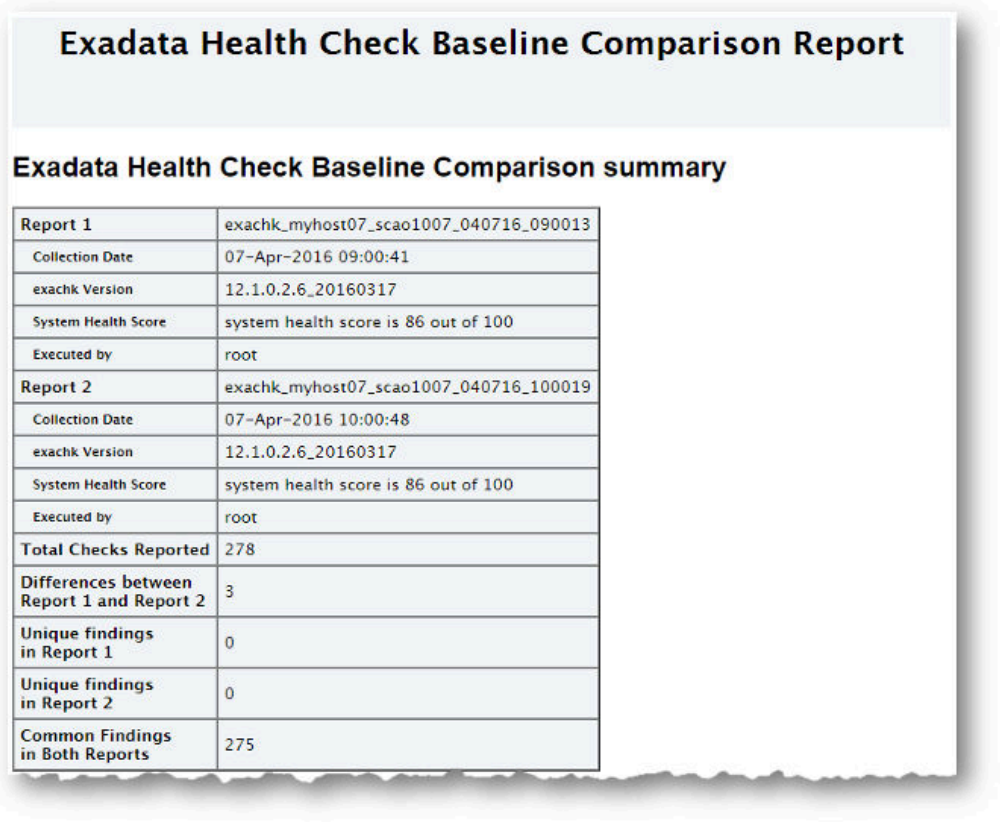
- HTML reports
- Output directories
- Output zip files

The diff output lists a summary of changes found and the location of the new diff HTML report.

```
$./exachk -diff exachk_myhost07_scao1007_040716_090013.zip
exachk_myhost07_scao1007_040716_100019.zip
Summary
Total   : 278
Missing : 0
New     : 0
Changed : 3
Same    : 275
Check comparison is complete. The comparison report can be viewed in: /opt/
oracle.SupportTools/exachk/exachk_040716090013_040716100019_diff.html
```

The diff HTML report shows a summary of both compared reports.

Figure 1-31 Health Check Baseline Comparison Report



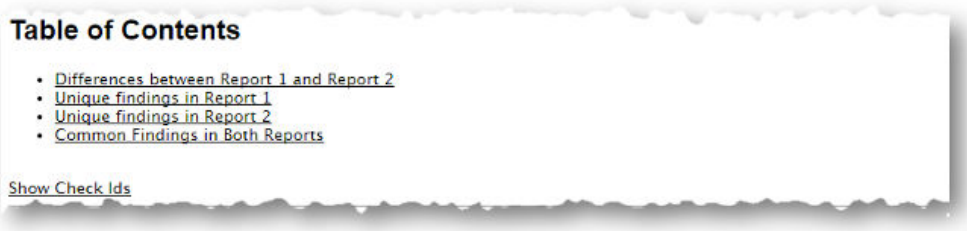
Exadata Health Check Baseline Comparison Report

Exadata Health Check Baseline Comparison summary

Report 1	exachk_myhost07_scao1007_040716_090013
Collection Date	07-Apr-2016 09:00:41
exachk Version	12.1.0.2.6_20160317
System Health Score	system health score is 86 out of 100
Executed by	root
Report 2	exachk_myhost07_scao1007_040716_100019
Collection Date	07-Apr-2016 10:00:48
exachk Version	12.1.0.2.6_20160317
System Health Score	system health score is 86 out of 100
Executed by	root
Total Checks Reported	278
Differences between Report 1 and Report 2	3
Unique findings in Report 1	0
Unique findings in Report 2	0
Common Findings in Both Reports	275

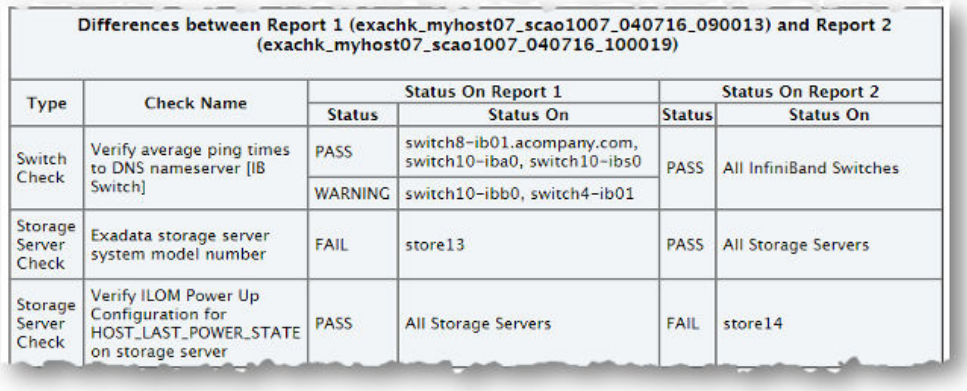
The **Table of Contents** provides quick access to the major sections in the report. You can also access various check Ids listed in the **Show Check Ids** section.

Figure 1-32 Table of Contents



The **Differences between Report 1 and Report 2** section shows what checks have different results.

Figure 1-33 Difference Between Reports

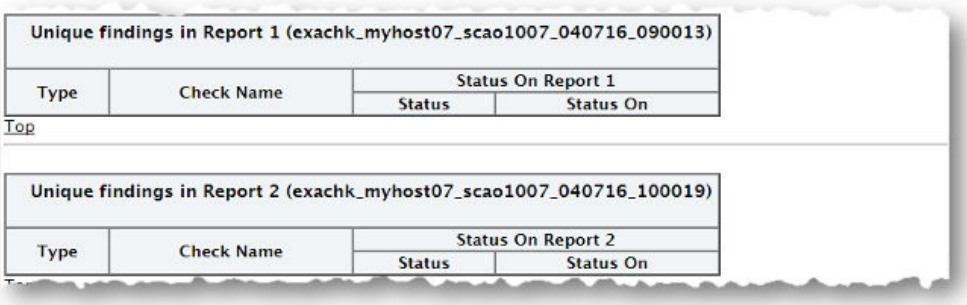


Differences between Report 1 (exachk_myhost07_scao1007_040716_090013) and Report 2 (exachk_myhost07_scao1007_040716_100019)

Type	Check Name	Status On Report 1		Status On Report 2	
		Status	Status On	Status	Status On
Switch Check	Verify average ping times to DNS nameserver [IB Switch]	PASS	switch8-ib01.acompany.com, switch10-iba0, switch10-ibs0	PASS	All InfiniBand Switches
		WARNING	switch10-ibb0, switch4-ib01		
Storage Server Check	Exadata storage server system model number	FAIL	store13	PASS	All Storage Servers
Storage Server Check	Verify ILOM Power Up Configuration for HOST_LAST_POWER_STATE on storage server	PASS	All Storage Servers	FAIL	store14

The **Unique findings** section shows any check findings that were unique to either of the reports

Figure 1-34 Unique Findings



Unique findings in Report 1 (exachk_myhost07_scao1007_040716_090013)

Type	Check Name	Status On Report 1	
		Status	Status On

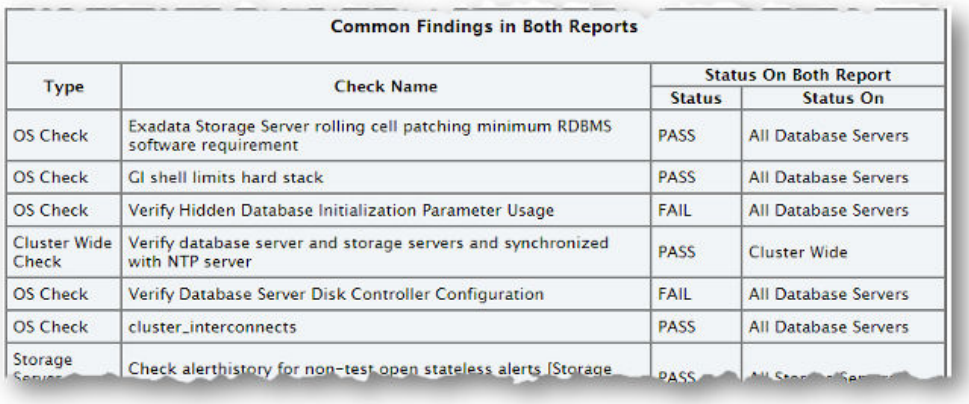
Top

Unique findings in Report 2 (exachk_myhost07_scao1007_040716_100019)

Type	Check Name	Status On Report 2	
		Status	Status On

The **Common Findings in Both Reports** section shows all the check results that had the same results in both the reports.

Figure 1-35 Common Findings in Both Reports



Common Findings in Both Reports			
Type	Check Name	Status On Both Report	
		Status	Status On
OS Check	Exadata Storage Server rolling cell patching minimum RDBMS software requirement	PASS	All Database Servers
OS Check	GI shell limits hard stack	PASS	All Database Servers
OS Check	Verify Hidden Database Initialization Parameter Usage	FAIL	All Database Servers
Cluster Wide Check	Verify database server and storage servers and synchronized with NTP server	PASS	Cluster Wide
OS Check	Verify Database Server Disk Controller Configuration	FAIL	All Database Servers
OS Check	cluster_interconnects	PASS	All Database Servers
Storage	Check alerthistory for non-test open stateless alerts [Storage	PASS	

1.5.7 Merging Reports

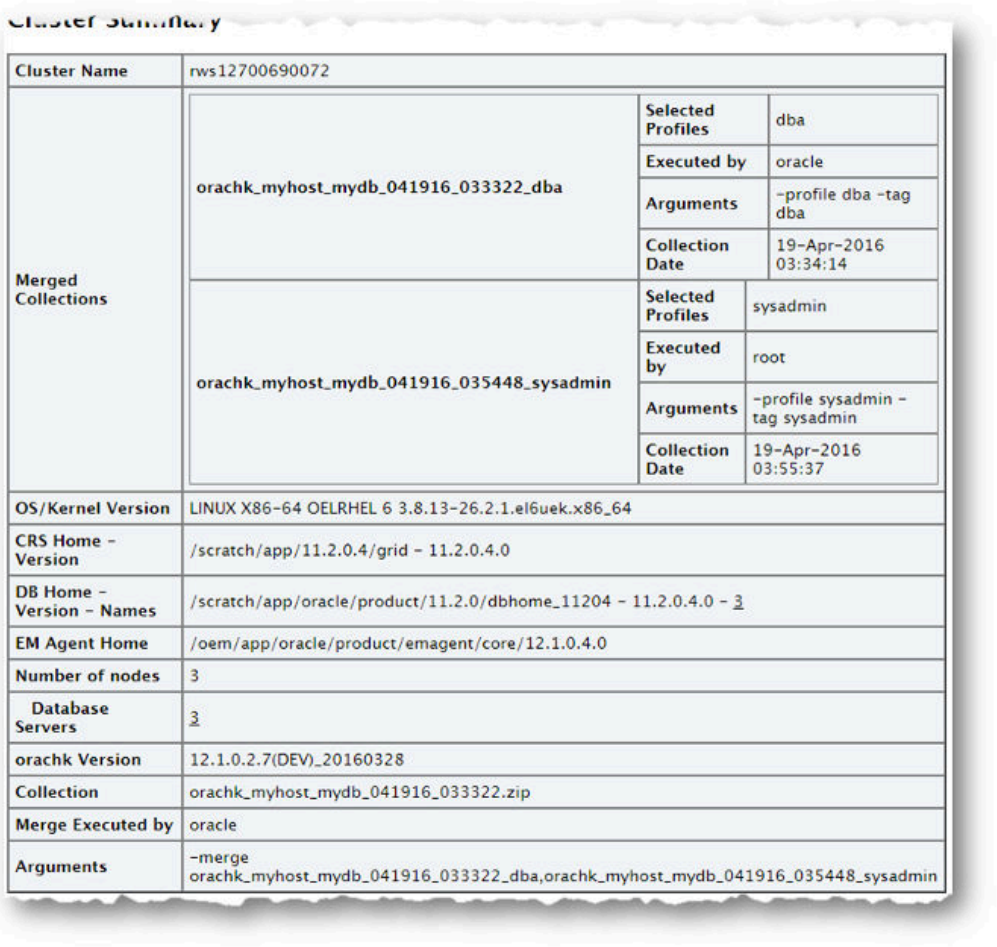
Merging reports is useful in role-separated environments where different users are run different subsets of checks and then you want to view everything as a whole.

To merge reports use the `-merge` option, followed by a comma--delimited list of reports, directories or zip files:

```
$ ./orachk -merge report_1, report_2

$ ./exachk -merge report_1, report_2

$./orachk -merge orachk_myhost_mydb_041916_033322_dba,
orachk_myhost_mydb_041916_035448_sysadmin

Merging following collections:

  orachk_myhost_mydb_041916_033322_dba
  orachk_myhost_mydb_041916_035448_sysadmin
. . . . .

Started merging orachk_myhost_mydb_041916_033322_dba
  ..................................................................................
Started merging orachk_myhost_mydb_041916_035448_sysadmin
  ..................................................................................
--------------------------------------------------------------------------------

Detailed report (html) - /oracle/orachk/orachk_myhost_mydb_041916_033322_dba_merge/
orachk_myhost_mydb_041916_033322_dba_merge.html

UPLOAD(if required) - /orahome/oradb/orachk/
orachk_myhost_mydb_041916_033322_dba_merge.zip
```

The resulting merged HTML report summary will show the collections it was merged from.

Figure 1-36 Merged Report Summary

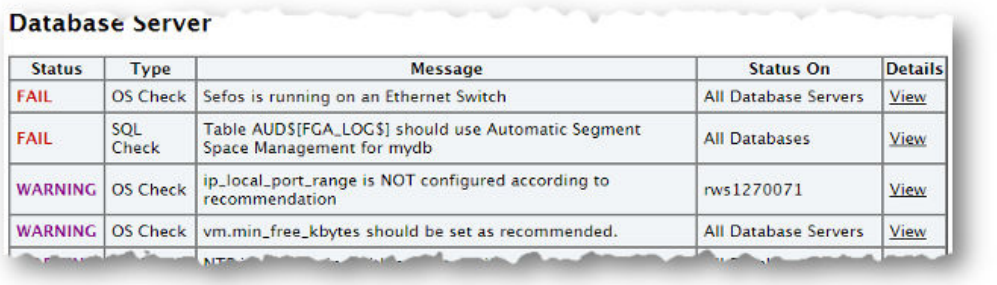


Cluster Summary

Cluster Name	rws12700690072		
Merged Collections	orachk_myhost_mydb_041916_033322_dba	Selected Profiles	dba
		Executed by	oracle
		Arguments	-profile dba -tag dba
		Collection Date	19-Apr-2016 03:34:14
	orachk_myhost_mydb_041916_035448_sysadmin	Selected Profiles	sysadmin
		Executed by	root
		Arguments	-profile sysadmin -tag sysadmin
		Collection Date	19-Apr-2016 03:55:37
OS/Kernel Version	LINUX X86-64 OELRHEL 6 3.8.13-26.2.1.el6uek.x86_64		
CRS Home - Version	/scratch/app/11.2.0.4/grid - 11.2.0.4.0		
DB Home - Version - Names	/scratch/app/oracle/product/11.2.0/dbhome_11204 - 11.2.0.4.0 - 3		
EM Agent Home	/oem/app/oracle/product/emagent/core/12.1.0.4.0		
Number of nodes	3		
Database Servers	3		
orachk Version	12.1.0.2.7(DEV)_20160328		
Collection	orachk_myhost_mydb_041916_033322.zip		
Merge Executed by	oracle		
Arguments	-merge orachk_myhost_mydb_041916_033322_dba,orachk_myhost_mydb_041916_035448_sysadmin		

The merged findings appear together.

Figure 1-37 Merged Report Findings



Database Server

Status	Type	Message	Status On	Details
FAIL	OS Check	Sefos is running on an Ethernet Switch	All Database Servers	View
FAIL	SQL Check	Table AUD$[FGA_LOG$] should use Automatic Segment Space Management for mydb	All Databases	View
WARNING	OS Check	ip_local_port_range is NOT configured according to recommendation	rws1270071	View
WARNING	OS Check	vm.min_free_kbytes should be set as recommended.	All Database Servers	View

Note:

For Oracle EXAchk, use the `-force` option to force merge collections from `dom0` and `domu`, or `global` and `local` zones.

1.5.8 Output File Maintenance

Oracle ORAchk and Oracle EXAchk create a number of temporary files and directories while running health checks.

Oracle ORAchk and Oracle EXAchk create an output directory that contains various files for you to examine. The total size of the output directory and .zip file is under 5 MB. However, the size depends on the number of Oracle Stack Components evaluated.

If you are running health checks in automated daemon Mode, then set the `collection_retention` duration to purge old collections.

If you are running health checks on-demand or in silent mode, then it is your responsibility to implement processes and procedures to purge result output.

Automating Daemon Mode Operations (page 1-19)
Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

Running Health Checks On Demand (page 1-35)
Usually, health checks run at scheduled intervals. However, Oracle recommends that you run health checks on-demand when needed.

Running Health Checks in Silent Mode (page 1-39)
You can run health checks automatically by scheduling them with the Automated Daemon Mode operation.

Temporary Files and Directories (page 1-43)
While running health checks, Oracle ORAchk and Oracle EXAchk create temporary directories and files for the purposes of data collection and assessment, and then delete them upon completion of health check runs.

Output Files and Directories (page 1-43)
Oracle ORAchk and Oracle EXAchk create an output directory that contains various files for you to examine.

1.5.9 Consuming Multiple Results in Other Tools

Health check results can optionally be integrated into various other tools.

For more information, see:

- Managing Oracle Health Check Collections Manager (page 1-91)
- Integrating Health Check Results with Other Tools (page 1-143)

1.6 Health Check Catalog

The Health Check Catalogs list the health checks that are included within Oracle ORAchk or Oracle EXAchk. Health Check Catalogs are HTML pages that require JavaScript. Enable JavaScript in your browser to view the Health Check Catalogs.

See Also:

Each tool has its own Health Check Catalog. Refer to My Oracle Support Note 1268927.2, which is available at the following URL:

- Oracle ORAchk Health Check Catalog

- Oracle EXAchk Health Check Catalog

As well as being available at the above links, Health Check Catalogs are also available in the download install zip (`orachk.zip`, `orachk_idm.zip`, or `exachk.zip`) file to view them offline in environments with no Internet connection.

Each of the respective Health Check Catalogs is called:

- `ORAchk_Health_Check_Catalog.html`
- `EXAchk_Health_Check_Catalog.html`

For each check, the Health Check Catalogs display:

- Name of the check
- Benefit and impact of the check
- Alert level of the check
- Links to any My Oracle Support Notes or other documentation linked from the check

Checks can be filtered by various attributes:

Table 1-6 Health Check Filters

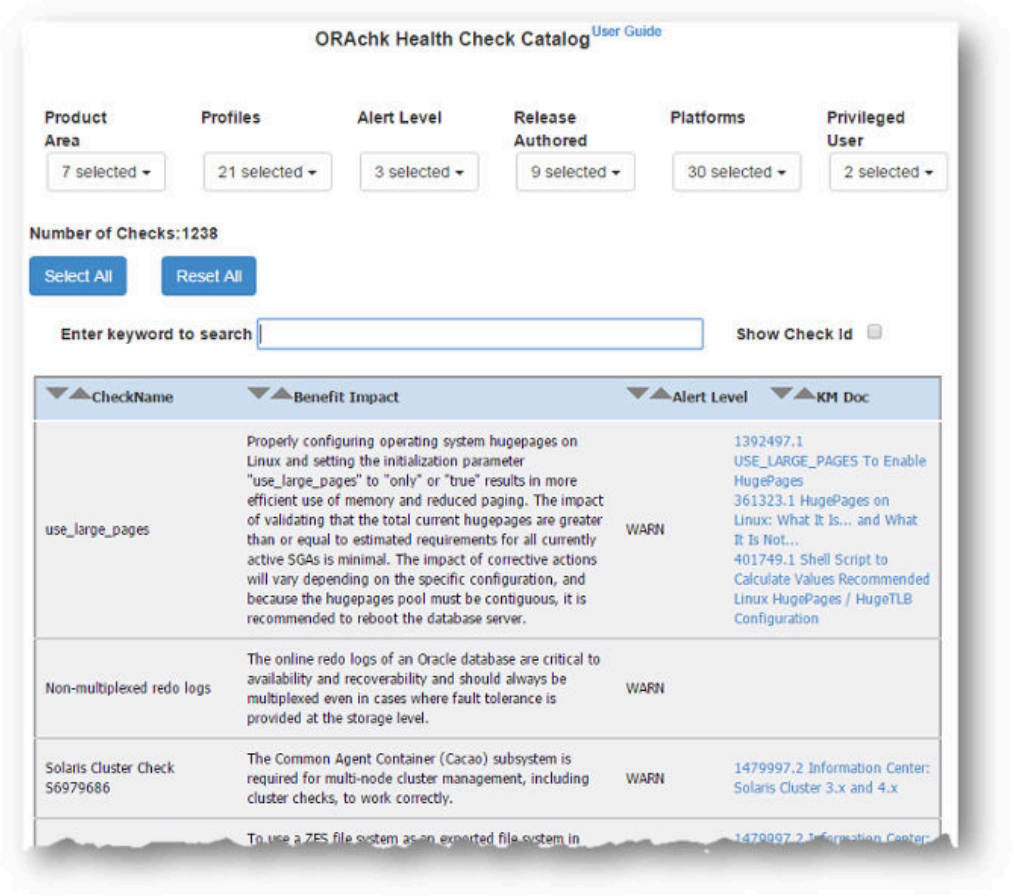
Filter	Description
`Product Area`	**Oracle ORAchk Only**: Filters checks by the product area to which they apply.
`Engineered System`	**Oracle EXAchk Only**: Filters checks by the engineered system to which they apply.
`Profiles`	Filters checks by the profile to which they apply.
`Alert Level`	Filters checks by the Alert Level of the check, `FAIL`, `WARN`, and `INFO`.
`Release Authored`	Filters checks by the Oracle ORAchk or Oracle EXAchk release in which they first published.
`Platforms`	Filters checks by platform.
`Privileged User`	Filters checks that require specific privileged user roles, such as root.

You can also filter checks based on searching for checks containing particular text.

Example 1-5 Health Check Catalog

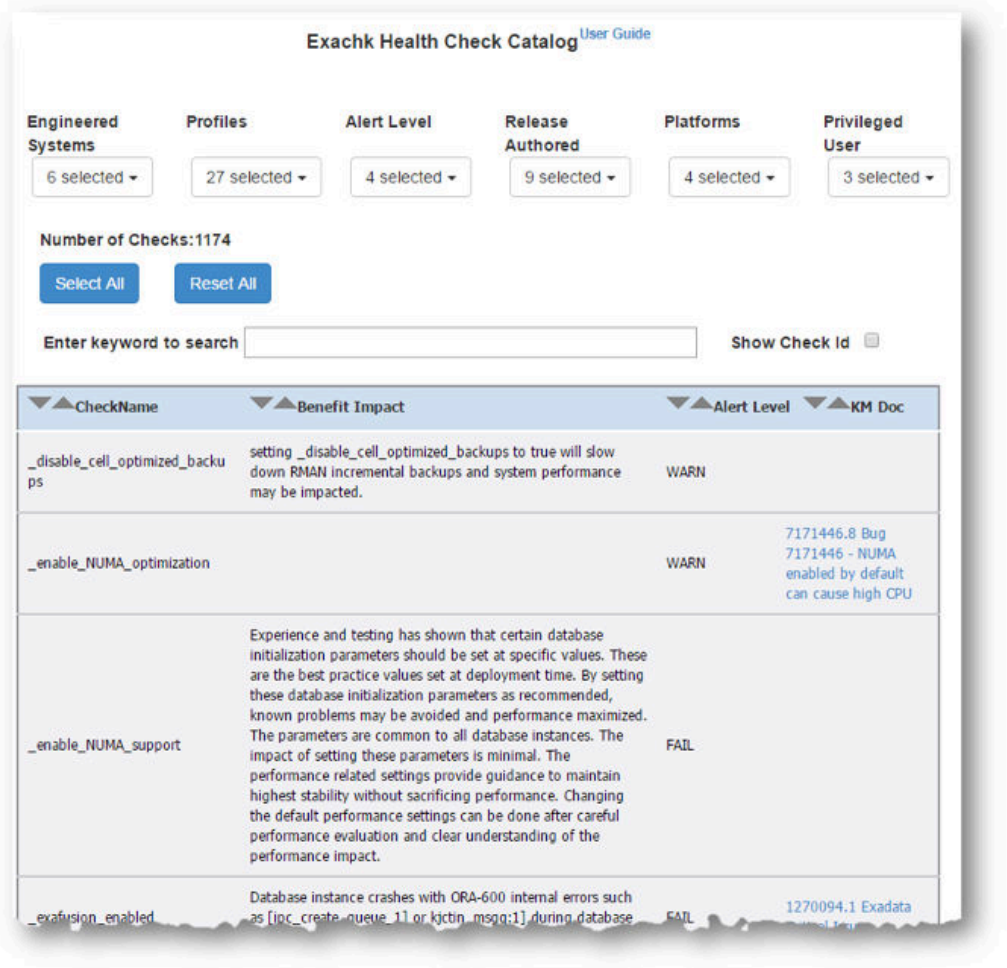
Oracle ORAchk Health Check Catalog:

Figure 1-38 Oracle ORAchk Health Check Catalog



Oracle EXAchk Health Check Catalog:

Figure 1-39 Oracle EXAchk Health Check Catalog

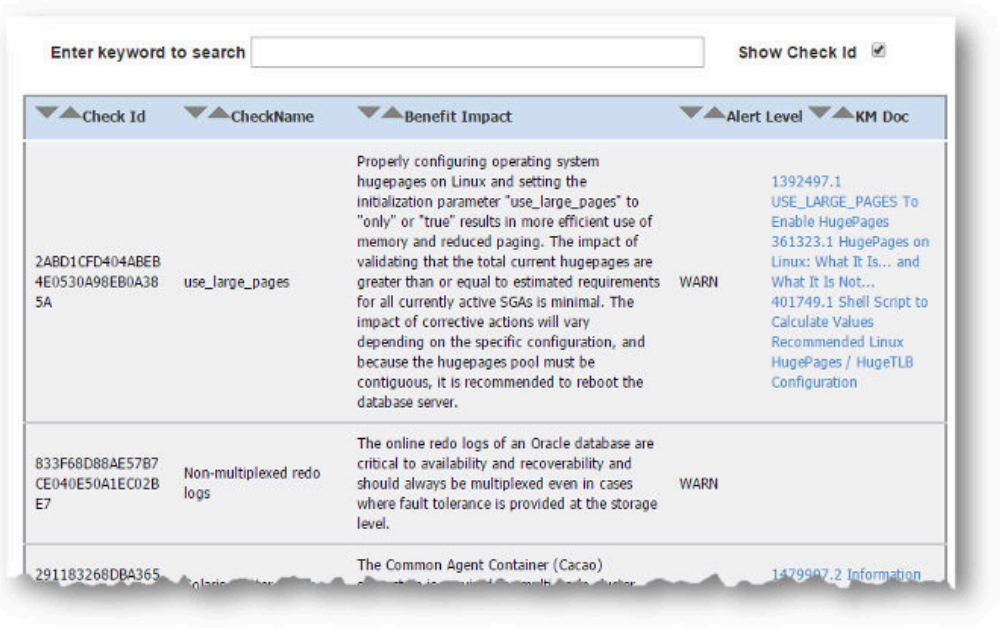


Using the Health Check Catalog, you can find the Check Id for a particular check without running a health check report

To view the check Id, select the **Show Check Id** checkbox

The catalog displays the **Check Id** field to the left of each the checks

Figure 1-40 Show Check Id



1.7 Running Subsets of Checks

Where necessary, you can run a subset of health checks.

These subsets can be a logical grouping determined by Oracle ORAchk and Oracle EXAchk based on what the check is about.

You can also determine the subsets at an individual check level where you want to exclude or run only specific checks.

Upgrade Readiness Mode (Clusterware and Database Upgrade Checks) (page 1-74)
You can use Upgrade Readiness Mode to obtain an Upgrade Readiness Assessment.

Running Checks on Subsets of the Oracle Stack (page 1-76)
Run checks on subsets of Oracle stack such as, database, cell, switch, and so forth.

Using Profiles with Oracle ORAchk and Oracle EXAchk (page 1-78)
Profiles are logical groupings of related checks. These related checks are grouped by a particular role, a task, or a technology.

Excluding Individual Checks (page 1-80)
Excluding checks is recommended in situations where you have reviewed all check output and determined a particular check is not relevant for some particular business reason. This allows the health check HTML report to be streamlined to show only the problems you need to fix.

Running Individual Checks (page 1-82)
There are times when you may want to run only specific checks.

Finding Which Checks Require Privileged Users (page 1-82)
The Health Check Catalogs have a filter for **Privileged User**, that allows you to quickly find health checks that need to be run by a specific privileged user, such as root.

1.7.1 Upgrade Readiness Mode (Clusterware and Database Upgrade Checks)

You can use Upgrade Readiness Mode to obtain an Upgrade Readiness Assessment.

Upgrade Readiness Mode helps you plan the upgrade process for Oracle Cluster and Oracle RAC Database by automating many of the manual pre-checks and post-checks listed in the upgrade documentation.

There are two Upgrade Readiness modes:

- **Pre-upgrade check:** Run this check during the planning phase of the upgrade process. Running this check helps you ensure that you have enough time to correct potential issues before the upgrade.
- **Post-upgrade check:** Run this check after the upgrade to help you ensure the health of Oracle Grid Infrastructure and Oracle Database upgrades.

The Upgrade Readiness report provides the following information:

- The target Clusterware and database versions. The report can only provide information for releases later than 11.2.0.3.
- In pre-upgrade mode, the tool automatically detects all databases that are registered with Oracle Clusterware. It displays a list of these databases on which you can perform pre-upgrade checks.
- In post-upgrade mode, the tool detects all databases registered with Oracle Clusterware. It displays a list of databases on which you can perform post-upgrade checks. If you select any release 11.2.0.3 or earlier releases, then the tool does not perform post-upgrade checks on these databases.
- In both the modes, the tool checks the Clusterware stack and the operating system.

After the tool completes running, you are referred to the report. The report contains the upgrade readiness report and links where you can obtain additional information.

Clusterware and Database Pre-Upgrade Checks (page 1-74)
During your pre-upgrade planning phase, run Oracle ORAchk and Oracle EXAchk in pre-upgrade mode as the Oracle Database owner or as root.

Clusterware and Database Post Upgrade Checks (page 1-75)
After performing the upgrade, you can run in post-upgrade mode as the Oracle Database software owner or root to see further recommendations.

1.7.1.1 Clusterware and Database Pre-Upgrade Checks

During your pre-upgrade planning phase, run Oracle ORAchk and Oracle EXAchk in pre-upgrade mode as the Oracle Database owner or as root.

To start pre-upgrade checking, use the `-u -o pre` option:

```
$ ./orachk -u -o pre

$ ./exachk -u -o pre
```

The tool prompts you to specify the version that you are planning to upgrade to, and then runs all of the applicable checks for that specific version.

```
$ ./orachk -u -o pre
Enter upgrade target version (valid versions are 11.2.0.3.0, 11.2.0.4.0, 12.1.0.1.0,
12.1.0.2.0 and 12.2.0.1.0):- 12.1.0.2.0

CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME to /
scratch/app/11.2.0.4/grid?[y/n][y]

Checking ssh user equivalency settings on all nodes in cluster

Node myhost69 is configured for ssh user equivalency for oradb user

Node myhost71 is configured for ssh user equivalency for oradb user


Searching for running databases . . . . .

. . . . . .
List of running databases registered in OCR
1. ordsdb
2. mydb
3. All of above
4. None of above

Select databases from list for checking best practices. For multiple databases,
select 3 for All or comma separated number like 1,2 etc [1-4][3].

. . . . . .
--------------------------------------------------------------------------------
                     CLUSTERWIDE CHECKS
--------------------------------------------------------------------------------


Detailed report (html) - /oracle/orachk/orachk_myhost70_mydb_041916_215655/
orachk_myhost70_mydb_041916_215655.html


UPLOAD(if required) - /oracle/orachk/orachk_myhost70_mydb_041916_215655.zip
```

Output is similar to a standard HTML report output. However, the report shows checks that are relevant to upgrading Oracle Clusterware and Oracle Database to the version that you have specified.

1.7.1.2 Clusterware and Database Post Upgrade Checks

After performing the upgrade, you can run in post-upgrade mode as the Oracle Database software owner or root to see further recommendations.

To start post-upgrade checks, use the `-u -o post` option:

```
$ ./orachk -u -o post

$ ./exachk -u -o post

$ ./orachk -u -o post

CRS stack is running and CRS_HOME is not set. Do you want to set CRS_HOME
to /u01/app/12.2.0/grid?[y/n][y]

Checking ssh user equivalency settings on all nodes in cluster
```

```
Node myhost69 is configured for ssh user equivalency for oradb user

Node myhost71 is configured for ssh user equivalency for oradb user


Searching for running databases . . . . .

. . . . . .
List of running databases registered in OCR
1. ordsdb
2. mydb
3. All of above
4. None of above

Select databases from list for checking best practices. For multiple databases,
select 3 for All or comma separated number like 1,2 etc [1-4][3].

. . . . . .

--------------------------------------------------------------------------------
                     CLUSTERWIDE CHECKS
--------------------------------------------------------------------------------


Detailed report (html) - /oracle/orachk/orachk_myhost70_mydb_042316_154355/
orachk_myhost70_mydb_042316_154355.html


UPLOAD(if required) - /oracle/orachk/orachk_myhost70_mydb_042316_154355.zip
```

Output is similar to a standard but shows only the checks that are relevant after upgrading the Clusterware and database.

HTML Report Output (page 1-46)

1.7.2 Running Checks on Subsets of the Oracle Stack

Run checks on subsets of Oracle stack such as, database, cell, switch, and so forth.

Running Database Checks (page 1-77)
During Oracle ORAchk and Oracle EXAchk system checks, all Oracle database logins are performed by using local connections. The user running the tool must have operating system authenticated system privileges in the databases where you are running the tool.

Running Cell Checks (page 1-78)
Limit the scope of health checks to a subset of storage servers by using the `-cell` *`cell`* option.

Running Switch Checks (page 1-78)
Limit the scope of health checks to a subset of switches by using the `-ibswitches` *`switch`* option.

Running Checks on Other Elements of the Oracle Stack (page 1-78)
Health checks are available for large parts of the Oracle software and hardware stack. Health check coverage is expanding with each new release.

1.7.2.1 Running Database Checks

During Oracle ORAchk and Oracle EXAchk system checks, all Oracle database logins are performed by using local connections. The user running the tool must have operating system authenticated system privileges in the databases where you are running the tool.

Oracle software is installed by using an Oracle software installation owner, which is commonly referred to in Oracle documentation as the Oracle user. Your system can contain multiple Oracle database homes all owned by the same Oracle user, for example, `oracle`. Your system can also contain multiple database homes owned by different Oracle users, for example, `oracle1`, `oracle2`, `oracle3`. If you have multiple Oracle database homes configured, and these homes are owned by different Oracle users, then you must either run the tool as `root` user, or you must log in as the Oracle user for each Oracle database that you want to check. Use that Oracle user to run the tool on the Oracle database instance on which the user is the software installation owner.

By default, Oracle ORAchk and Oracle EXAchk present a list of running databases that are registered with Oracle Grid Infrastructure. You can run the tools on one database, run the tools on all databases, or run the tool with a comma-delimited list of numbers that designate the databases listed. When you check multiple nodes running on the cluster, you do not need to stage the tool on the other nodes in the cluster to check the database instances running on those nodes.

- To prevent prompting for which database to run against and check all databases, use the `-dball` option.

  ```
  $ ./orachk -dball

  $ ./exachk -dball
  ```

- To prevent prompting and skip all database checks, use the `-dbnone` option.

  ```
  $ ./orachk -dbnone

  $ ./exachk -dbnone
  ```

- To run checks against a subset of databases, use the `-dbnames` *`database_name`* option. You can check multiple database instances by listing them in a comma-delimited list.

  ```
  $ ./orachk -dbnames db1,db2,db3

  $ ./exachk -dbnames db1,db2,db3
  ```

  By default, Oracle ORAchk and Oracle EXAchk run checks on all database nodes in the cluster.

- To run checks against a subset of cluster nodes, use the `-clusternodes` *`node`* option. You can check multiple cluster nodes by listing them in a comma-delimited list.

  ```
  $ ./orachk -clusternodes node1,node2,node3

  $ ./exachk -clusternodes node1,node2,node3
  ```

  To run checks against the local node, use the `-localonly` option.

  ```
  $ ./orachk -localonly
  ```

```
$ ./exachk -localonly
```

1.7.2.2 Running Cell Checks

Limit the scope of health checks to a subset of storage servers by using the `-cell` *`cell`* option.

To limit the scope to one cell, use the `orachk -cell` or `exachk -cell` option.

To limit the check to a set of cells, use a comma-delimited list of cells.

```
$ ./orachk -cell cell1,cell2,cell3

$ ./exachk -cell cell1,cell2,cell3
```

1.7.2.3 Running Switch Checks

Limit the scope of health checks to a subset of switches by using the `-ibswitches` *`switch`* option.

To limit the scope to one switch, use the `orachk -cell` or `exachk -cell` option.

To limit the check to a set of switches use a comma-delimited list of switches.

```
$ ./orachk -ibswitches switch1,switch2

$ ./exachk -ibswitches switch1,switch2
```

1.7.2.4 Running Checks on Other Elements of the Oracle Stack

Health checks are available for large parts of the Oracle software and hardware stack. Health check coverage is expanding with each new release.

Health checks are organized into logical groupings, which are called *profiles*. You can run subsets of checks for different areas of the Oracle stack by the applicable profile.

Refer to the Using Profiles section for a list of available profiles.

1.7.3 Using Profiles with Oracle ORAchk and Oracle EXAchk

Profiles are logical groupings of related checks. These related checks are grouped by a particular role, a task, or a technology.

The following table describes the profiles that you can use:

Table 1-7 List of Available Profiles for Oracle ORAchk and Oracle EXAchk Checks

Profile	Description
`asm`	Oracle Automatic Storage Management checks.
`avdf`	Oracle Audit Vault configuration checks.
`bi_middleware`	Oracle Business Intelligence checks.
`clusterware`	Oracle Clusterware checks.
`compute_node`	Compute Node checks (Oracle Exalogic only).
`control_VM`	Checks only for Oracle Virtual Machine Control VM (`ec1-vm`, `ovmm`, `db`, `pc1`, `pc2`). No cross-node checks.

Table 1-7 (Cont.) List of Available Profiles for Oracle ORAchk and Oracle EXAchk Checks

Profile	Description
`corroborate`	Oracle Exadata checks, which you must review to determine pass or fail.
`dba`	Database Administrator (DBA) Checks.
`ebs`	Oracle E-Business Suite checks.
`eci_healthchecks`	Enterprise Cloud Infrastructure Healthchecks.
`ecs_healthchecks`	Enterprise Cloud System Healthchecks.
`el_extensive`	Extensive EL checks.
`el_lite`	Exalogic-Lite Checks(Oracle Exalogic Only).
`el_rackcompare`	Data Collection for Exalogic Rack Comparison Tool (Oracle Exalogic Only).
`emagent`	Oracle Enterprise Manager Cloud Control agent checks.
`emoms`	Oracle Enterprise Manager Cloud Control management server.
`em`	Oracle Enterprise Manager Cloud Control checks.
`goldengate`	Oracle GoldenGate checks.
`hardware`	Hardware-specific checks for Oracle Engineered systems.
`maa`	Maximum Availability Architecture Checks.
`nimbula`	Nimbula checks for Oracle Exalogic.
`oam`	Oracle Access Manager checks.
`obiee`	OBIEE Checks (Oracle Exalytics Only)
`oim`	Oracle Identity Manager checks.
`oud`	Oracle Unified Directory server checks.
`ovn`	Oracle Virtual Networking.
`peoplesoft`	Peoplesoft best practices.
`platinum`	Platinum certification checks.
`preinstall`	Preinstallation checks.
`prepatch`	Checks to complete before patching.
`security`	Security checks.
`siebel`	Siebel Checks.
`solaris_cluster`	Oracle Solaris Cluster Checks.

Table 1-7 (Cont.) List of Available Profiles for Oracle ORAchk and Oracle EXAchk Checks

Profile	Description
`storage`	Oracle Storage Server Checks.
`switch`	InfiniBand switch checks.
`sysadmin`	System administrator checks.
`timesten`	Oracle TimesTen checks (Oracle Exalytics Only).
`user_defined_checks`	Run user-defined checks from `user_defined_checks.xml`.
`virtual_infra`	Oracle VM Server (OVS), Control VM, network time protocol (NTP), and stale virtual network interface cards (VNICs) check (Oracle Exalogic Only).
`zfs`	Oracle ZFS Storage Appliances checks (Oracle Exalogic Only).

You can run the command with an inclusion list, so that it runs only the checks in particular profiles. Run the command with the option `-profile` *`profile_name`*. You can run multiple profiles by running the command with a comma-delimited inclusion list. The inclusion list contains only the profiles that you want to run.

```
$ ./orachk -profile dba,clusterware

$ ./exachk -profile dba,clusterware
```

The output of inclusion list profile checks is similar to the standard HTML Report Output format. However, profile inclusion check reports show only output of checks that are in the specific profiles that you specify in the check.

You can also run the command with exclusion list. Run the command with the option `-excludeprofile profile_name`. When you run the command with an exclusion list, all profile checks are performed except for the checks in the profile that you list. You can list multiple profiles to exclude by running the command with a comma-delimited exclusion list.

```
$ ./orachk -excludeprofile dba,clusterware,ebs

$ ./exachk -excludeprofile dba,clusterware,ebs
```

The output of exclusion list profile checks is similar to the standard HTML Report Output format. However, profile exclusion check reports show only the checks that are not in the profiles that you specify to exclude in the check.

HTML Report Output (page 1-46)

1.7.4 Excluding Individual Checks

Excluding checks is recommended in situations where you have reviewed all check output and determined a particular check is not relevant for some particular business reason. This allows the health check HTML report to be streamlined to show only the problems you need to fix.

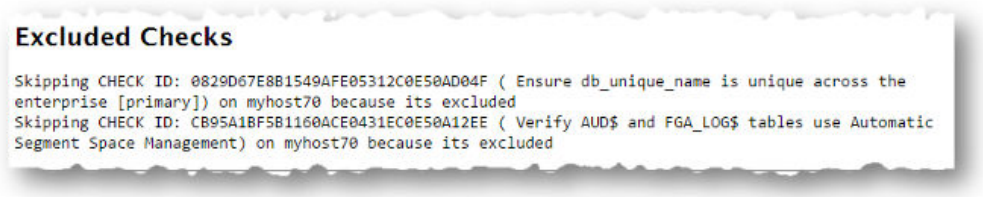
You can exclude checks in two different ways. Both the methods require you to find the check Ids.

The first method is to use the `-excludecheck` *`check_id`* option. To exclude multiple check ids, use the comma-delimited list of check ids:

```
$ ./orachk -excludecheck
0829D67E8B1549AFE05312C0E50AD04F,CB95A1BF5B1160ACE0431EC0E50A12EE

$ ./exachk - excludecheck
0829D67E8B1549AFE05312C0E50AD04F,CB95A1BF5B1160ACE0431EC0E50A12EE
```

All excluded files are shown in the **Excluded Checks** section of the report.

Figure 1-41 Excluding Checks - Method I



The second method of excluding individual checks is as follows:

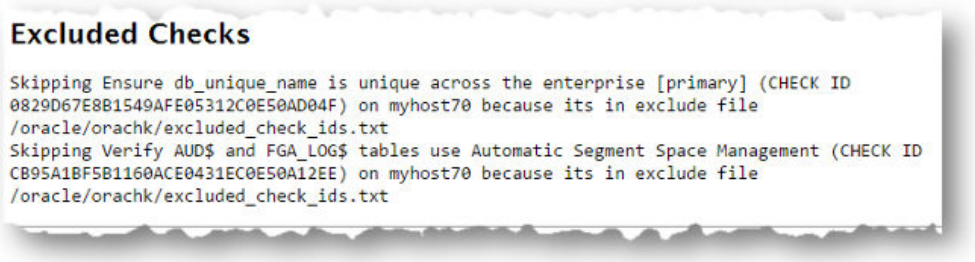
1. List all check ids in a file, one check id per line.
2. Save the file as `excluded_check_ids.txt` in the same directory where the tool is installed

```
$ ls -la
total 67616
drwxr-xr-x 3 oradb oinstall     4096 Apr 28 06:27 .
drwxr-xr-x 7 oradb oinstall     4096 Apr 28 06:22 ..
-rw-r--r-- 1 oradb oinstall  2077055 Feb  8 09:13 ORAchk_Health_Check_Catlog.html
drwxr--r-- 3 oradb oinstall     4096 Feb  7 21:31 .cgrep
-rw-r--r-- 1 oradb oinstall  4690680 Feb  7 21:30 CollectionManager_App.sql
-rw-r--r-- 1 oradb oinstall 44243042 Feb  7 21:31 collections.dat
-rw-r--r-- 1 oradb oinstall       66 Apr 28 06:27 excluded_check_ids.txt
-rwxr-xr-x 1 oradb oinstall  2653265 Feb  7 21:30 orachk
-rw-r--r-- 1 oradb oinstall  9860069 Apr 25 11:17 orachk.zip
-rw-r--r-- 1 oradb oinstall     3869 Feb  7 21:31 readme.txt
-rw-r--r-- 1 oradb oinstall  5613338 Feb  7 21:31 rules.dat
-rw-r--r-- 1 oradb oinstall    40052 Feb  7 21:30 sample_user_defined_checks.xml
-rw-r--r-- 1 oradb oinstall     2888 Feb  7 21:30 user_defined_checks.xsd
-rw-r--r-- 1 oradb oinstall      425 Feb  7 21:31 UserGuide.txt

$ cat excluded_check_ids.txt
0829D67E8b1549AFE05312C0E50AD04F
CB95A1BF5B1160ACE0431EC0E50A12EE

$
```

The `excluded_check_ids.txt` file remains in this directory. Each time the tool is run, all applicable health checks are run except those specified in the file.

All excluded files are shown in the **Excluded Checks** section of the report.

Figure 1-42 Excluded Checks



1.7.5 Running Individual Checks

There are times when you may want to run only specific checks.

Running individual check can particularly be useful in situations such as:

- Quickly verify if a particular issue has been fixed
- Troubleshoot performance or run specific checks
- Develop and test user-defined checks

Find the check ids before you run individual checks.

To run only specific checks use the `-check` *`check_id`* option.

To run multiple check ids, use the comma-delimited list of check ids:

```
$ ./orachk -check 0829D67E8B1549AFE05312C0E50AD04F,CB95A1BF5B1160ACE0431EC0E50A12EE

$ ./exachk -check 0829D67E8B1549AFE05312C0E50AD04F,CB95A1BF5B1160ACE0431EC0E50A12EE
```

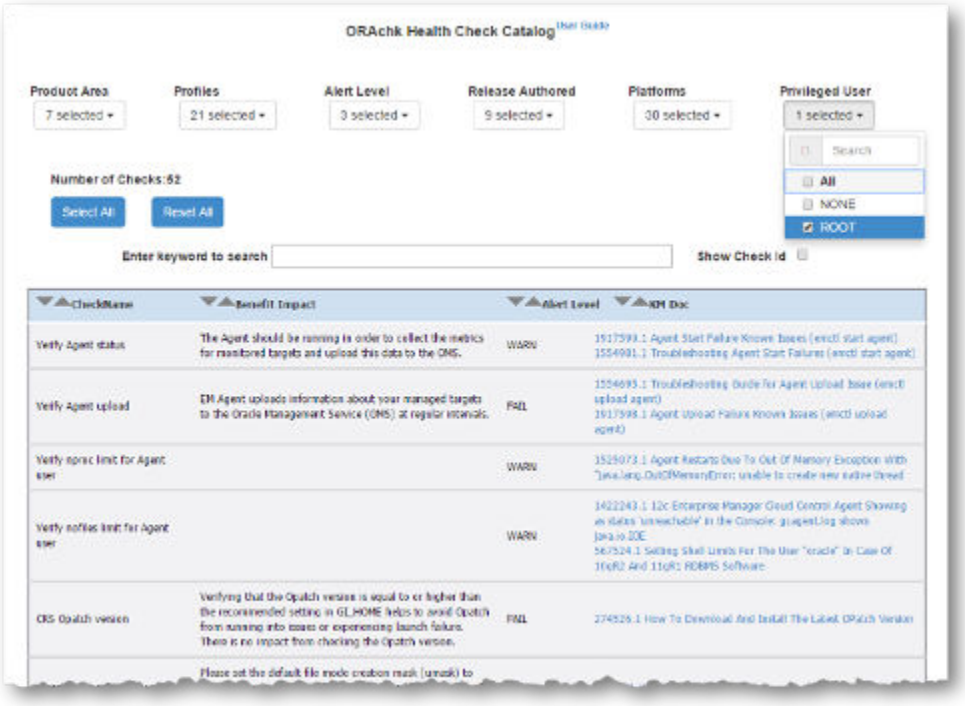
How to Find a Check ID (page 1-58)
Each health check has a unique 32 character ID.

1.7.6 Finding Which Checks Require Privileged Users

The Health Check Catalogs have a filter for **Privileged User**, that allows you to quickly find health checks that need to be run by a specific privileged user, such as root.

Example Oracle ORAchk Health Check Catalog:

Figure 1-43 Oracle ORAchk - Privileged User



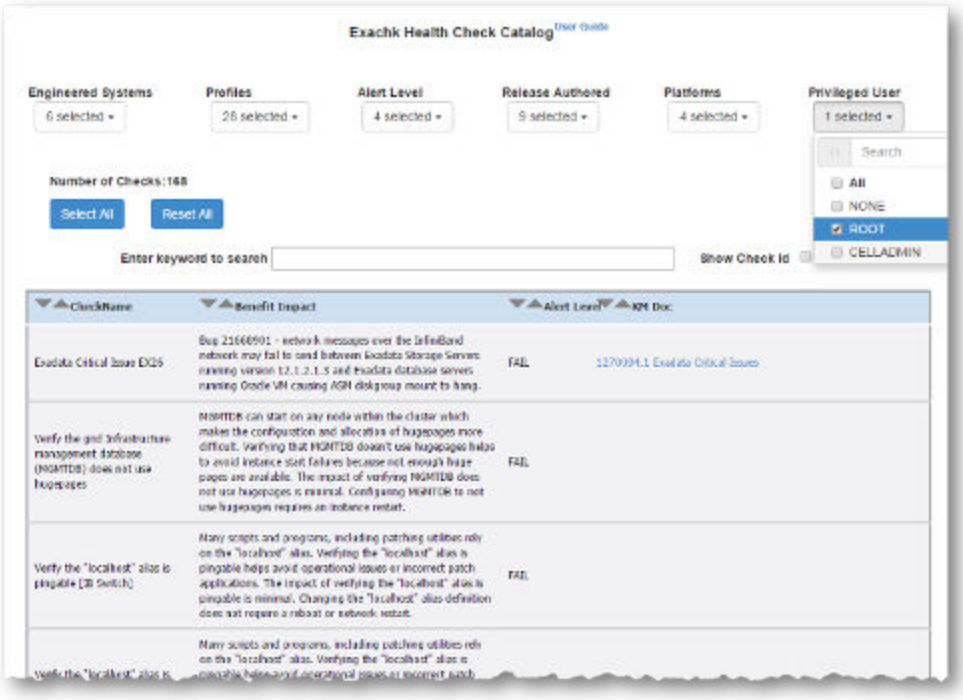
See Also:

Example Oracle ORAchk Health Check Catalog:

Oracle ORAchk Health Check Catalog

Example Oracle EXAchk Health Check Catalog:

Figure 1-44 Oracle EXAchk - Privileged User



See Also:

Example Oracle EXAchk Health Check Catalog:

Oracle EXAchk Health Check Catalog

1.8 Oracle ORAchk and Oracle EXAchk Command Line Options

Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

```
$ ./orachk options
```

```
$ ./exachk options
```

Running Generic Oracle ORAchk and Oracle EXAchk Commands (page 1-85)
List of command options common to Oracle ORAchk and Oracle EXAchk.

Controlling the Scope of Checks (page 1-86)
List of commands to control the scope of checks.

Managing the Report Output (page 1-87)
Use the commands explained in this section to manage report output.

Uploading Results to Database (page 1-88)
List of commands to upload results to database.

Controlling the Behavior of the Daemon (page 1-89)
List of commands you can use to control the behavior of the daemon.

Tracking File Attribute Differences (page 1-90)
List of commands to find file attribute differences.

1.8.1 Running Generic Oracle ORAchk and Oracle EXAchk Commands

List of command options common to Oracle ORAchk and Oracle EXAchk.

Table 1-8 Generic Commands

Option	Description
`-a`	Performs all checks, including best practice checks and recommended patch check. This is the default option, if no options are specified.
`-v`	Shows version.
`-debug`	Runs in debug mode. The generated `.zip` file contains a debug log and further files useful for Oracle Support.
`-daemon`	Runs only if the daemon is running.
`-nodaemon`	Does not send commands to the daemon, usage is interactive.
`-f`	Runs Offline. Checks are performed on data already collected from the system.
`-upgrade`	Forces an upgrade of the version of being run.
`-noupgrade`	Does not prompt for an upgrade even if a later version is available under the location specified by *RAT_UPGRADE_LOC*.
`-testemail all | "NOTIFICATION_EMAIL=`*`email addresses separated by comma`*`"`	Sends a test email to validate email configuration. Use – `testemail all` to validate daemon email configuration.
`-sendemail "NOTIFICATION_EMAIL=`*`email_address`*`"`	Emails the generated HTML report on completion. The `email_address` is a comma-delimited list of email addresses used for sending HTML report.
`-dbserial`	Runs `SQL`, `SQL_COLLECT`, and `OS` Checks in serial.
`-dbparallel [n]`	Runs `SQL`, `SQL_COLLECT`, and `OS` Checks in parallel, using `n` number of Child processes. Default is 25% of CPUs.
`-dbparallelmax`	Runs `SQL`, `SQL_COLLECT`, and `OS` Checks in parallel, using the maximum number of child processes.

Updating to the Latest Version of Oracle ORAchk and Oracle EXAchk (page 1-17)
There are two methods for maintaining Oracle ORAchk and Oracle EXAchk.

NOTIFICATION_EMAIL (page 1-22)
Set the NOTIFICATION_EMAIL daemon option to send email notifications to the recipients you specify. The daemon notifies the recipients each time a health check run completes or when the daemon experiences a problem.

Running On-Demand With or Without the Daemon (page 1-39)
When running on-demand, if the daemon is running all prompts, then the daemon answers where possible including passwords .

How to Capture Debug Output (page 1-153)
Follow these procedures to capture debug information.

1.8.2 Controlling the Scope of Checks

List of commands to control the scope of checks.

Table 1-9 Scope of Checks

Command	Description
`-b`	Runs only the best practice checks. Does not run recommended patch checks.
`-p`	Runs only the patch checks.
`-m`	Excludes checks for Maximum Availability Architecture (MAA) scorecards.
`-u -o pre`	Runs pre-upgrade checks for Clusterware and Database.
`-u -o post`	Runs post-upgrade checks for Clusterware and Database.
`-clusternodes` *`nodes`*	Pass comma-delimited node names to run only on the subset of nodes.
`-dbnames` *`db_names`*	Passes comma-delimited database names to run only on the subset of databases.
`-dbnone`	Does not prompt database selection, and skips all the database related checks.
`-dball`	Does not prompt database selection, and runs the database related checks on all databases discovered on system.
`-localonly`	Runs only on the local node.
`-cells` *`cells`*	Passes comma-delimited storage server names to run only on the selected storage servers.
`-ibswitches` *`switches`*	Passes comma-delimited InfiniBand switch names to run only on the selected InfiniBand switches.
`-profile` *`profile`*	Runs only the checks in specified profiles, profile is comma-delimited list of profiles.
`-excludeprofile` *`profile`*	Excludes checks in the specified profiles, profile is comma-delimited list of profiles
`-check` *`check_id`*	Runs only the checks specified, `check_id` is comma-delimited list
`-excludecheck` *`check_id`*	Does not run the checks specified, `check_id` is comma-delimited list
`-skip_usr_def_checks`	Does not run the checks present in user defined `xml` file.

Clusterware and Database Pre-Upgrade Checks (page 1-74)
During your pre-upgrade planning phase, run Oracle ORAchk and Oracle EXAchk in pre-upgrade mode as the Oracle Database owner or as root.

Clusterware and Database Post Upgrade Checks (page 1-75)
After performing the upgrade, you can run in post-upgrade mode as the Oracle Database software owner or root to see further recommendations.

Running Database Checks (page 1-77)
During Oracle ORAchk and Oracle EXAchk system checks, all Oracle database logins are performed by using local connections. The user running the tool must have operating system authenticated system privileges in the databases where you are running the tool.

Running Switch Checks (page 1-78)
Limit the scope of health checks to a subset of switches by using the `-ibswitches switch` option.

Running Cell Checks (page 1-78)
Limit the scope of health checks to a subset of storage servers by using the `-cell cell` option.

Using Profiles with Oracle ORAchk and Oracle EXAchk (page 1-78)
Profiles are logical groupings of related checks. These related checks are grouped by a particular role, a task, or a technology.

Excluding Individual Checks (page 1-80)
Excluding checks is recommended in situations where you have reviewed all check output and determined a particular check is not relevant for some particular business reason. This allows the health check HTML report to be streamlined to show only the problems you need to fix.

Running Individual Checks (page 1-82)
There are times when you may want to run only specific checks.

Authoring User-Defined Checks (page 1-134)
User-defined checks are checks written, tested, verified and maintained by you that are specific to your environment.

1.8.3 Managing the Report Output

Use the commands explained in this section to manage report output.

Table 1-10 Managing Output

Option	Description
`-syslog`	Write JSON results to syslog.
`-tag tagname`	Append *tagname* to output report name. The *tagname* must contain only alphanumeric characters.
`-o`	Argument to an option. If `-o` is followed by `v`, (or verbose, and neither option is case sensitive), then it prints checks that pass on the screen. If the `-o` option is not specified, then it prints only the failures on the screen.

Table 1-10 (Cont.) Managing Output

Option	Description
`-nopass`	Do not show passed checks in generated output.
`-noscore`	Do not print health score in HTML report.
`-diff old_report new_report [-outfile output_HTML]`	Report the difference between two HTML reports. Pass a directory name or a ZIP file or an HTML report file as *old_report* and *new_report*.
`-merge [-force] collections`	Comma-delimited collection names to merge collections and prepare single report.

Tagging Reports (page 1-60)
The health check HTML report is typically named: `orachk_hostname_database_date_timestamp.html` or `exachk_hostname_database_date_timestamp.html`. You can include other tags in the HTML report name to facilitate differentiation and identification.

Comparing Two Reports (page 1-64)
Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

Merging Reports (page 1-67)
Merging reports is useful in role-separated environments where different users are run different subsets of checks and then you want to view everything as a whole.

Integrating Health Check Results with Third-Party Tool (page 1-145)
Integrate health check results from Oracle ORAchk and Oracle EXAchk into various third-party log monitoring and analytics tools, such as Elasticsearch and Kibana by using Oracle ORAchk and Oracle EXAchk JSON output results.

1.8.4 Uploading Results to Database

List of commands to upload results to database.

Table 1-11 Uploading Results to Database

Option	Description
`-setdbupload all|variable_names`	Sets the values in the wallet to upload health check run results to the database. `all`: Sets all the variables in the wallet. *variable_names* are comma-delimited list of variables to set.
`-unsetdbupload all|variable_names`	Unsets the values in the wallet to upload health check run results to the database. `all`: Unsets all the variables in the wallet. *variable_names* are comma-delimited list of variables to unset.

Table 1-11 (Cont.) Uploading Results to Database

Option	Description
`-checkdbupload`	Checks the status if variables are set correctly for uploading health check run results to the database.
`-getdbupload`	Prints the variables with their values from wallet for uploading health check run result to the database.
`-checkfaileduploads`	Reports any failed collection uploads.
`-uploadfailed all| *list of failed collections*`	Reattempts upload of one or more failed collection uploads, specifying either all to upload all or a comma-delimited list of collections.

Integrating Health Check Results with Custom Application (page 1-146)
Oracle ORAchk and Oracle EXAchk are capable of uploading collection results from multiple instances into a single database for easier consumption of check results across your enterprise.

1.8.5 Controlling the Behavior of the Daemon

List of commands you can use to control the behavior of the daemon.

Table 1-12 Daemon Options

Option	Description
`[-id *id*] –set *daemon_option*`	Optionally use `id` with the set command to set specific daemon usage profiles.
`[-id *id*] -unset *daemon_option* | all`	Unsets the parameter. Use with `–id *id*` to set a daemon profile-specific value.
`[-id *id*] -get *parameter* | all`	Displays the value of the specified parameter or all of the parameters. Use with `–id *id*` to set a daemon profile-specific value.
`-d start`	Starts the daemon.
`-d start_debug`	Starts the daemon in debug mode.
`-d stop`	Stops the daemon.
`-d stop_client`	Forces a running daemon client to stop.
`-d status`	Checks the current status of the daemon.
`-d info`	Displays details about the daemon, installation and when started.
`[-id *id*] -d nextautorun`	Displays details about when the next scheduled auto run will occur. Use with `–id *id*` to specify the next auto run be daemon profile-specific.
`-initsetup`	Sets the daemon auto restart function that starts the daemon when the node starts.

Table 1-12 (Cont.) Daemon Options

Option	Description
`-initrmsetup`	Removes auto restart functionality.
`-initcheck`	Checks if auto restart functionality is set up.
`-initpresetup`	Sets root user equivalency for `COMPUTE`, `STORAGE`, and `IBSWITCHES` (root equivalency for `COMPUTE` nodes is mandatory for setting up auto restart functionality).

Automating Daemon Mode Operations (page 1-19)
Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

1.8.6 Tracking File Attribute Differences

List of commands to find file attribute differences.

Table 1-13 File Attribute Differences

Option	Description
`-fileattr start`	Takes file attributes snapshot of discovered directories and stores the snapshot in the output directory. By default, it takes snapshot of Oracle Grid Infrastructure Home and all the installed database homes. If the user doesn't own a particular directory then it does not take snapshot of the directory
`-fileattr check`	Takes a recent snapshot of discovered directories and compares with the previous snapshot
`-fileattr remove`	Removes file attribute snapshots and related files.

`-fileattr [start|check] -includedir` *`directories`*	Includes directories given by user at command-line to check file attributes.
	For example:
	`./orachk -fileattr start -includedir "/root/home,/etc"`
	`./orachk -fileattr check -includedir "/root/home,/etc"`

`-fileattr [start|check] -excludediscovery`	Excludes the discovered directories. `./orachk -fileattr start -includedir "/root/home,/etc" -excludediscovery`
`-fileattr check -baseline` *`baseline snapshot path`*	For example: `./orachk -fileattr check -baseline "/tmp/Snapshot"`
`-fileattr -check -fileattronly`	Performs file attributes check and exits ORAchk. `./orachk -fileattr check -fileattronly`

1.9 Managing Oracle Health Check Collections Manager

Oracle Health Check Collections Manager is a companion application to Oracle ORAchk and Oracle EXAchk that gives you an enterprise-wide view of your health check collection data.

1.9.1 Scope and Supported Platforms

Review the support matrix for Oracle Health Check Collections Manager.

It is difficult to run health checks and maintain collection data when you have many systems to manage. Oracle Health Check Collections Manager is a companion application to Oracle ORAchk and Oracle EXAchk that gives you an enterprise-wide view of your health check collection data.

Oracle Health Check Collections Manager:

- Provides a dashboard to track your collection data in one easy-to-use interface
- Displays collection data based on Business Units and time
- Serves as an enterprise-wide repository of all collections
- Uploads collection automatically

Oracle Health Check Collections Manager is fully supported through Oracle Support Services on all Editions (SE1, SE, and EE) of the Oracle database 11.1.0.7 or later with a valid Oracle Database Technical Support agreement.

Use Oracle Application Express 4.2 with Oracle Database 11*g* R1, 11*g* R2 and 12*c* R1. Express Edition (XE) is supported only through the Oracle Technology Network (OTN) discussion forums and not through Oracle Support Services.

1.9.2 Prerequisites

Review the list of Oracle Health Check Collections Manager prerequisites.

- Oracle Database 11.1.0.7.0 or later.
- Oracle Application Express 4.2.0 or later.

1.9.3 Installation

Follow the installation procedures sequentially to successfully install Oracle Health Check Collections Manager.

Configuring Oracle Application Express and Creating a Workspace (page 1-92)
Follow these procedures to configure Oracle Application Express and create a workspace.

Install Oracle Health Check Collections Manager Application (page 1-99)
Follow these procedures to install Oracle Health Check Collections Manager.

Log in to Oracle Health Check Collections Manager Application (page 1-103)
Follow these procedures to log in to Oracle Health Check Collections Manager.

1.9.3.1 Configuring Oracle Application Express and Creating a Workspace

Follow these procedures to configure Oracle Application Express and create a workspace.

If the Oracle Application Express 4.2 component is already installed and configured on your database, then skip to Install Collection Manager Application (page 1-99).

1. Download the latest version of Oracle Application Express, which is available at the following URL:

   Oracle Application Express Downloads

2. To install and configure Oracle Application Express, refer to the Application Express Installation Guide, which is available at the following URL:

   Application Express Installation Guide

3. Create a workspace.

   a. Log in to Oracle Application Express administration services.

Note:

The URLs used for accessing the Oracle Health Check Collections Manager application depend on how Oracle Application Express was deployed initially.

- If you have configured Oracle Application Express using the Oracle HTTP Server with `mod_plsql`, then specify the URL as follows:

  ```
  http://host:port/pls/apex/apex_admin
  ```

- If you have configured Oracle Application Express the Oracle XML DB HTTP listener with the embedded PL/SQL gateway, then specify the URL as follows:

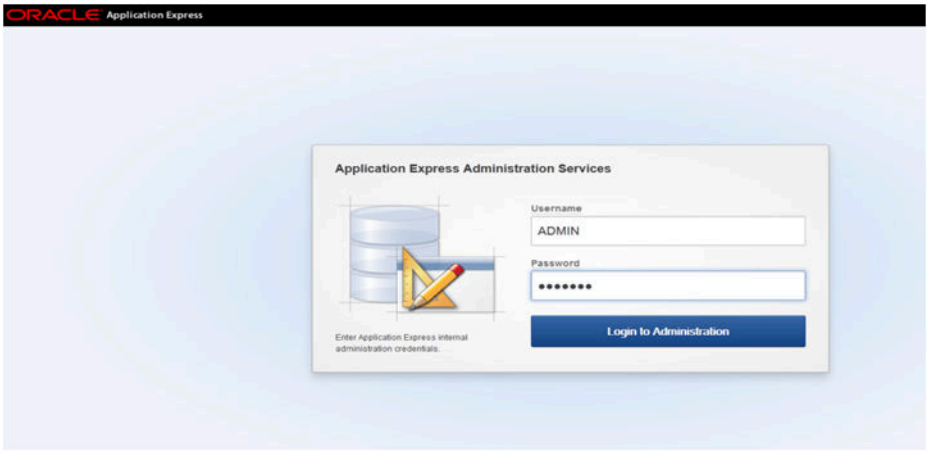
  ```
  http://host:port/apex/apex_admin
  ```

  For example:

  ```
  http://dbserver.domain.com:8080/apex/apex_admin
  ```

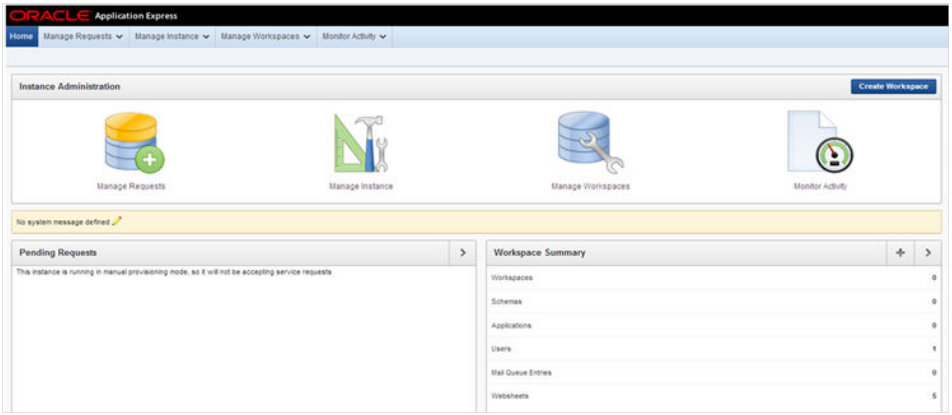
- The default schema user for Oracle Application Express administration services in the Oracle Database is `ADMIN`.
- The password is the one you gave at the time of configuring the Oracle Application Express component in the Oracle Database.

Figure 1-45 Administration Services Login



b. In the Oracle Application Express Admin home page, click **Manage Workspaces**.

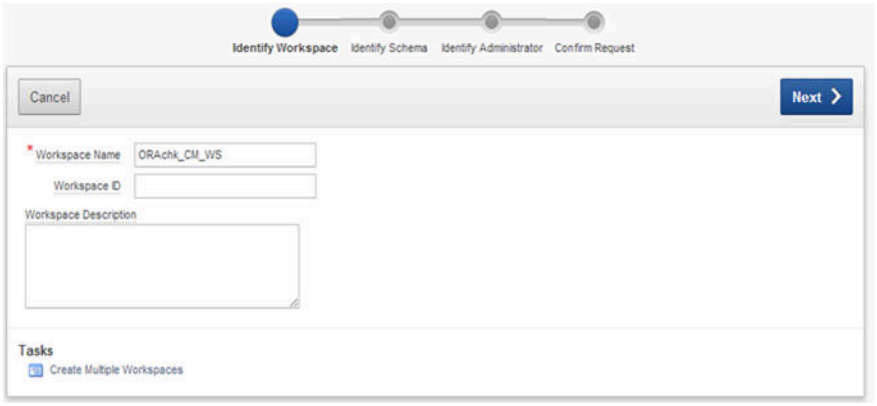
Figure 1-46 Manage Workspaces



c. Under **Workspace Actions**, click **Create Workspace**.

The Create Workspace Wizard appears.

Figure 1-47 Identify Workspace



- **Identify Workspace:**

  i. **Workspace Name**: Enter a unique workspace name, for example, `ORAchk_CM_WS`.

  ii. **Workspace ID**: Leave Workspace ID blank to have the new Workspace ID automatically generated.

  Workspace ID must be a positive integer greater than 100000.

  iii. **Workspace Description**: Enter workspace description.

  iv. Click **Next**.

Note:

A workspace needs to be associated with a database schema.

- **Identify Schema:**

  i. Specify whether you are re-using an existing schema or creating a new one. This depends on whether or not you already have Oracle ORAchk

and Oracle EXAchk configured to upload data to a schema in the database. If you do, then specify the existing schema. If not, then the name of the schema you create must be the one you intend to use for uploading the Oracle ORAchk data once configured.

ii. If you choose an existing schema in the database, then it should not be an Oracle Application Express administration schema (admin).

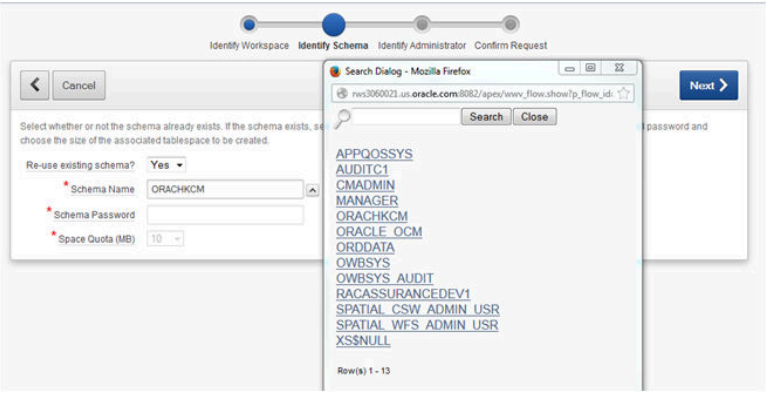
– If you are using an existing schema:

i. For **Re-use existing schema**, select **YES**.

ii. Select a schema from the list.

iii. Click **Next**.

Figure 1-48 Identify Schema - Reuse Schema



– If you are creating a new schema:

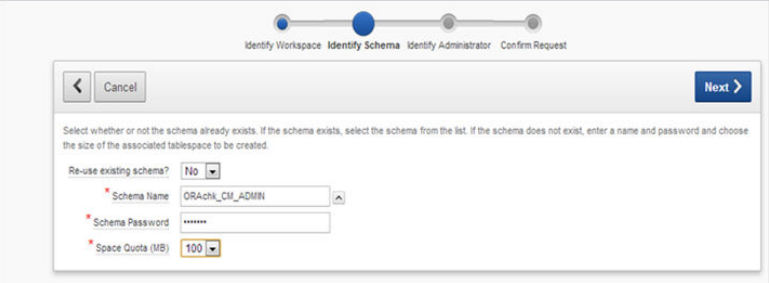
i. For **Re-use existing schema**, select **NO**.

ii. Enter the schema name and password, for example, ORAchk_admin, and so on.

iii. Specify the space quota.

iv. Click **Next**.

Figure 1-49 Identify Schema - New Schema



Note:

Minimum Space Quota should not be less than 100 MB to prevent application import failures.

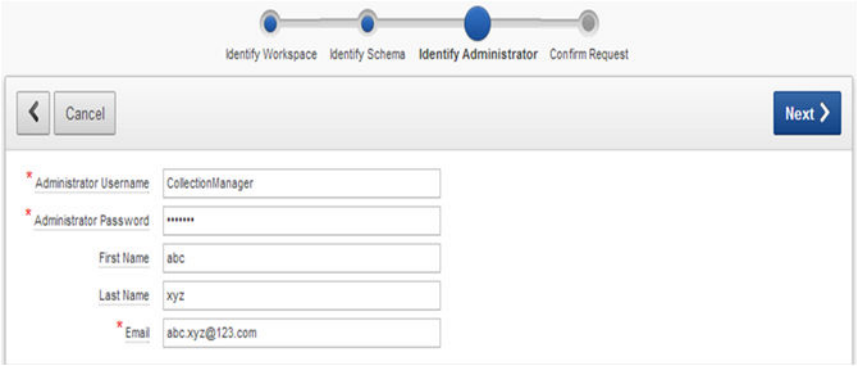
- **Identify Administrator:**

  i. Enter administrator user name and password.

  ii. Enter Personal details.

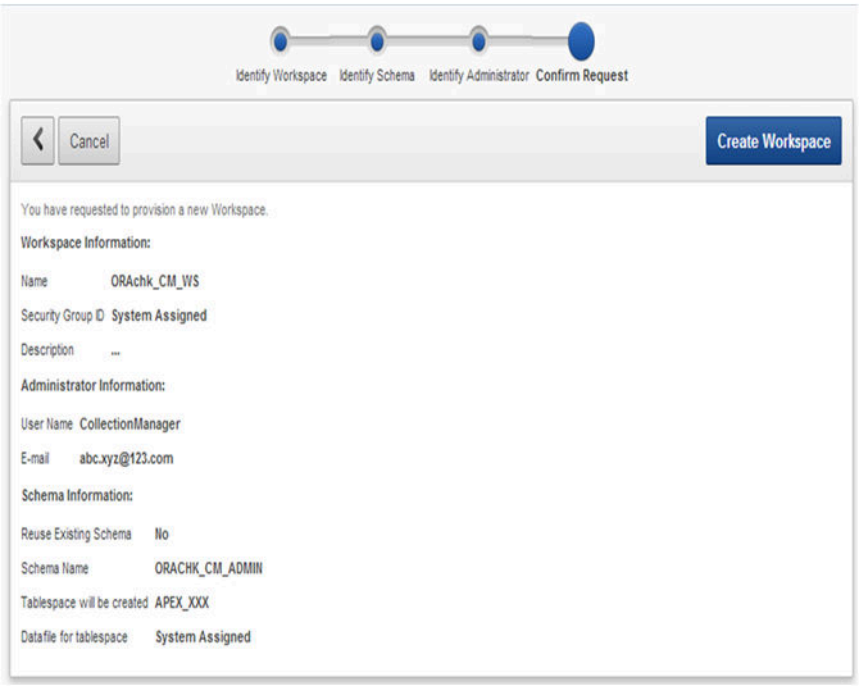
  iii. Click **Next**.

Figure 1-50 Identify Administrator



- Confirm your selections and then click **Create Workspace**.

Figure 1-51 Create Workspace - Confirm Request

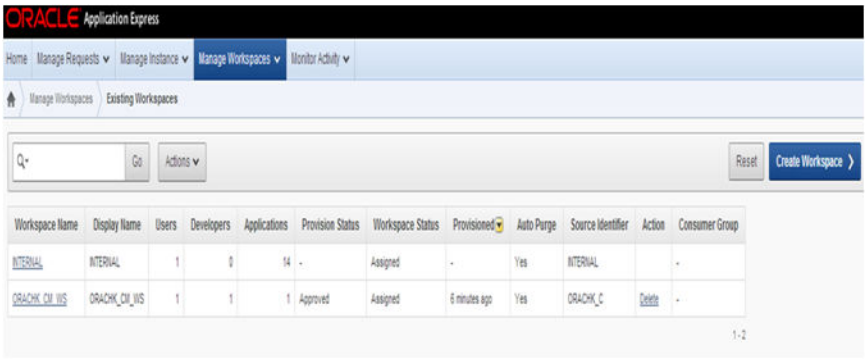


Your workspace is created.

4. Click **Manage Workspaces**.

   - Under **Workspace Reports**, click **Existing Workspaces**.

Figure 1-52 Manage Workspaces - Existing Workspaces



- To edit Workspace information, click the workspace name, edit any necessary details, and then click **Apply Changes**.
- Logout from Oracle Application Express Administration services.

Log in to the Workspace (page 1-97)
Follow these procedures to log in to Application Express admin user workspace.

Application Express User Accounts (page 1-98)
Application Express provides three types of users, namely, workspace administrators, developers, and end users.

1.9.3.1.1 Log in to the Workspace

Follow these procedures to log in to Application Express admin user workspace.

1. Log in to Oracle Application Express Admin User Workspace.

Note:

The URLs used for accessing the Oracle Health Check Collections Manager application depends on how Oracle Application Express was deployed initially.

- If you have configured Oracle Application Express the Oracle HTTP Server with `mod_plsql`, then specify the URL as follows:

  ```
  http://host:port/pls/apex/apex_admin
  ```

- If you have configured Oracle Application Express using the Oracle XML DB HTTP listener with the embedded PL/SQL gateway, then specify the URL as follows:

  ```
  http://host:port/apex/apex_admin
  ```

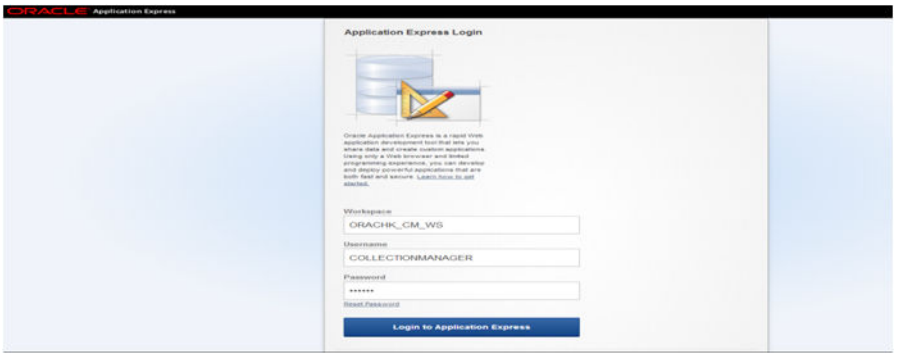
  For example:

  ```
  http://dbserver.domain.com:8080/apex/apex_admin
  ```

---

2. Enter the workspace name, workspace user name and password details to login.

Figure 1-53 Log into the Workspace



3. For the first time login, Application Express prompts you to change the password.
4. Log in again using the new password.

1.9.3.1.2 Application Express User Accounts

Application Express provides three types of users, namely, workspace administrators, developers, and end users.

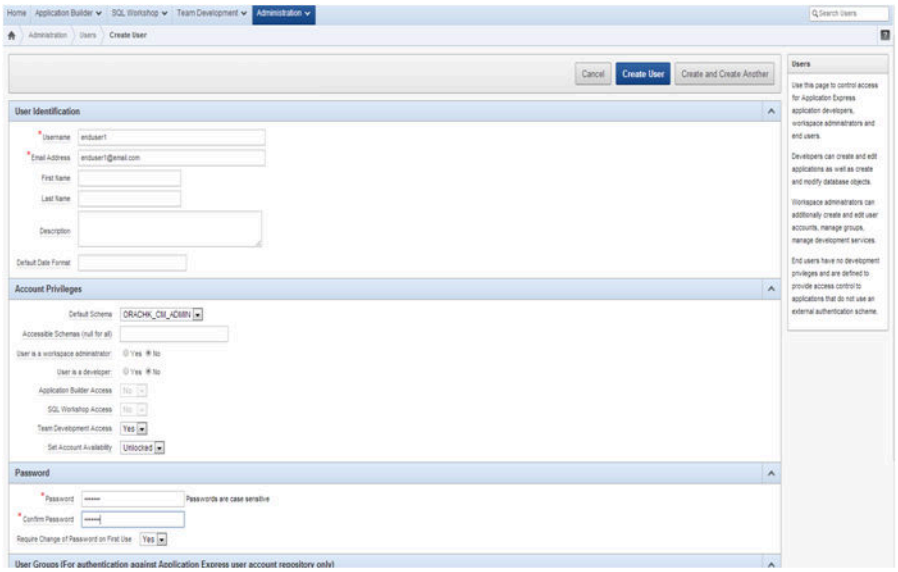
Table 1-14 Application Express Types of Users

Type of User	Description
Workspace administrators	Workspace administrators can additionally create and edit user accounts, manage groups, and manage development services.
Developers	Developers can create and modify applications and database objects.
End users	End users are non-administrative who have no development privileges and can only access applications that do not use an external authentication scheme. For the Oracle Health Check Collections Manager Application, almost all of the users fall into this category. A special role within the Oracle Health Check Collections Manager Application, DBA Managers and the DBAs manage all application users.

To grant access to the Oracle Health Check Collections Manager Application for non-administrative users (End users), you must login to the Workspace as an Admin user.

1. Log in to Oracle Application Express admin user workspace.
2. Click the **Administration** tab.
3. Click **Manage Users and Groups**.
4. Click **Create User**.
   - These users are application admin user(s), DBA Managers and DBAs. These users can authenticate to the application and manage their collections.
5. Fill in the user details.
   - Follow a consistent naming convention and specify unique user names. A reasonable naming convention might be `firstname.lastname`.

Figure 1-54 Application Express User Accounts



- For non-admin users use the default, **No** for **User is a developer** and **User is a Workspace Administrator** options.

6. Assign a temporary password for each user and communicate that password to the end user. Application Express prompts them to change this password the first time they log in.

7. Click **Create User**.

1.9.3.2 Install Oracle Health Check Collections Manager Application

Follow these procedures to install Oracle Health Check Collections Manager.

1. Verify if the workspace admin schema owner and the owner of the schema used for import of the Oracle Health Check Collections Manager Application have grants for `Create Job` and execute on the database packages `DBMS_RLS` and `UTL_SMTP` owned by the `SYS` user.

   The Oracle Health Check Collections Manager Application is distributed as an SQL script. Stage the script on the workstation that is used to install the application.

   Execute privilege on the database package `UTL_SMTP` is required only if you use Oracle Health Check Collections Manager Email Notification System Feature. Oracle Health Check Collections Manager uses `UTL_SMTP` package on one of the objects `RAC13_EMAIL`. so it may created with compilation error if you fail to grant `EXECUTE ON UTL_SMTP` privilege to workspace owner. You can see this information in the **Installation Summary**. Ignore this information, if you are not using the Oracle Health Check Collections Manager Email Notification System feature.

2. Verify if you have required privileges by running the SQL query as follows:

```
select GRANTEE,TABLE_NAME,PRIVILEGE  from USER_TAB_PRIVS;
GRANTEE       TABLE_NAME    PRIVILEGE
CM_USER      DBMS_RLS        EXECUTE
CM_USER      UTL_SMTP        EXECUTE

select USERNAME,PRIVILEGE from USER_SYS_PRIVS;
```

```
USERNAME     PRIVILEGE
CM_USER      CREATE JOB
```

3. Log in to the Oracle Application Express workspace administration services.
4. Click **Application Builder** on the**Home** page.

Figure 1-55 Home Page

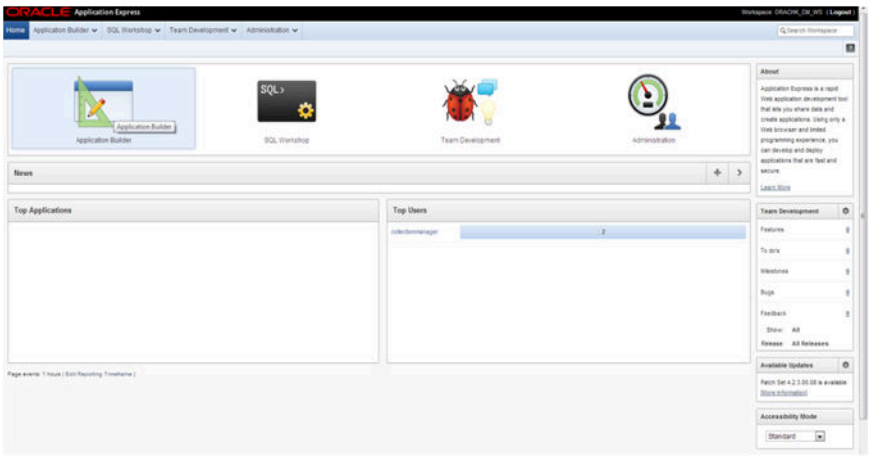
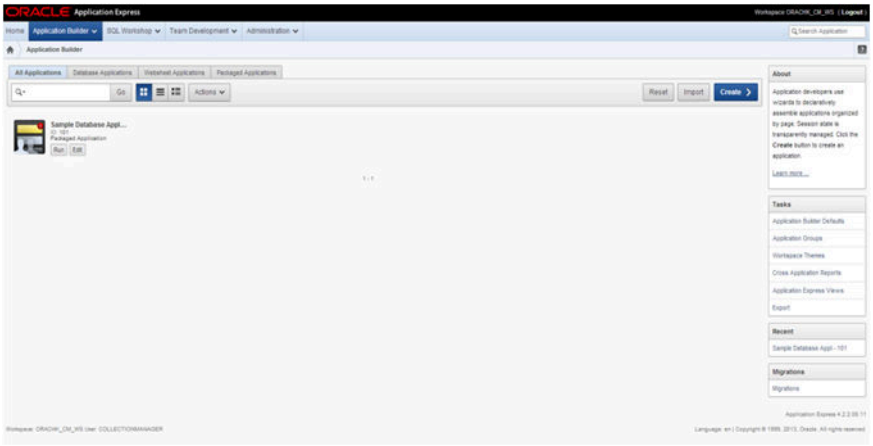
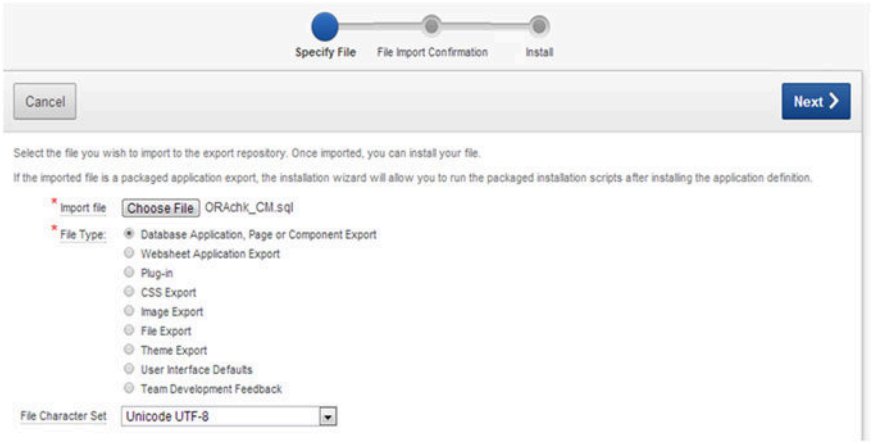


Figure 1-56 Application Builder



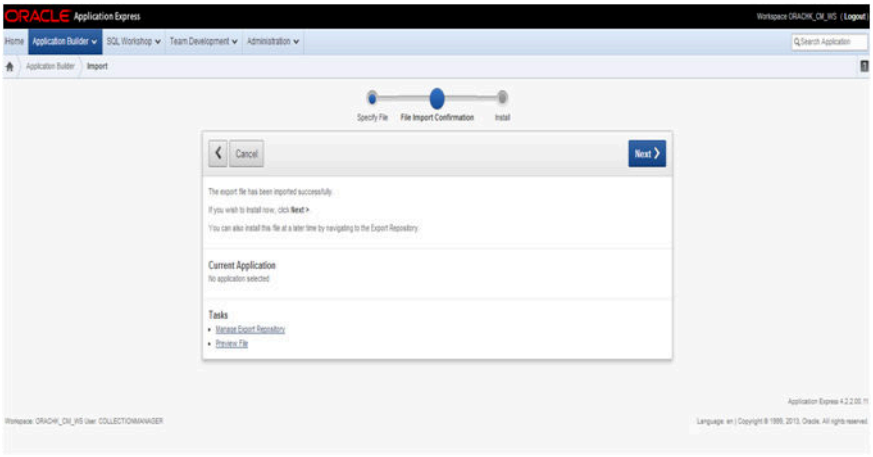
5. Click **Import** .
6. Click **Choose import file**, select the Oracle Health Check Collections Manager Application SQL script from the location where it was staged.
7. **File type**: select the default option **Database Application**, or **Component Export**.
8. **File Character Set**: select the default option **Unicode UTF-8**.
9. Click **Next**.

Figure 1-57 Specify File



10. Click **Install Application**.

Figure 1-58 File Import Confirmation



11. Click **Next**.

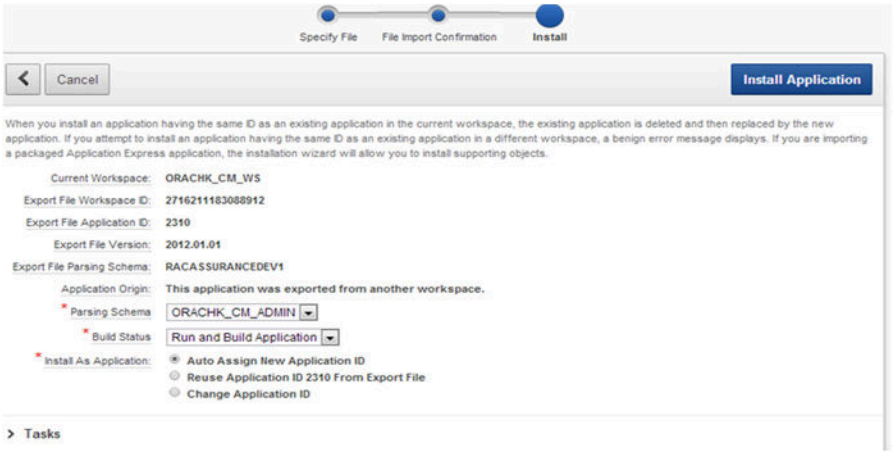
Note:

As mentioned earlier, ensure that the execute privilege on `DBMS_RLS` and `UTL_SMTP` packages and `create job` sys privilege are granted to parsing schema owner before starting the import of the application. This prevents database support object creation failures that prevents the proper installation of the application.

- For Parsing Schema, select the schema specified for the workspace.
- **Build Status**: select default option **Run and Build Application**.
- Install As Application.
- Select any one option based on your requirement or if possible use the same application id as it is easy to upgrade the application in future. However, the application Id must be unique. The application Id should not be used by any

other application and any other workspaces admins within Oracle Application Express Administration Server.

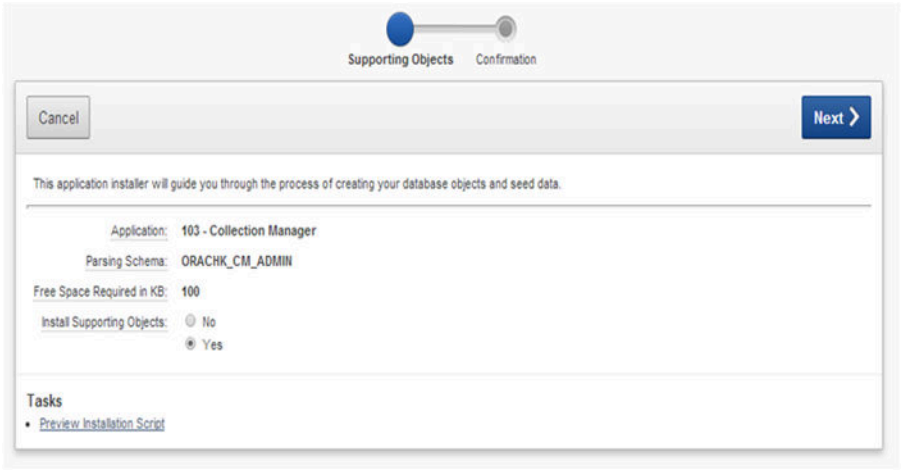
Figure 1-59 Install Application



12. Click **Install Application**.

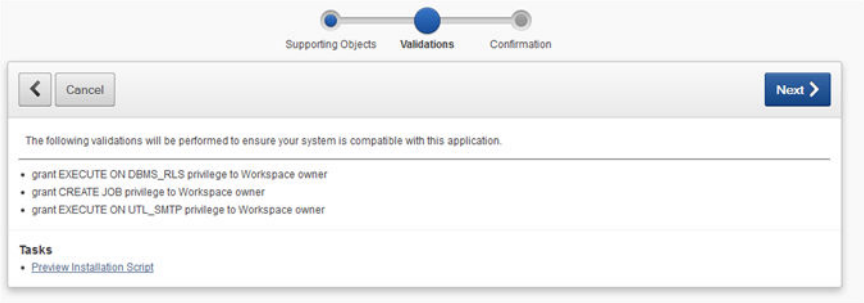
- Installing Application will take some time, please wait.
- Verify the application name and parsing schema, free space allocated for the application. Install supporting Objects, should always be **Yes**.

Figure 1-60 Supporting Objects



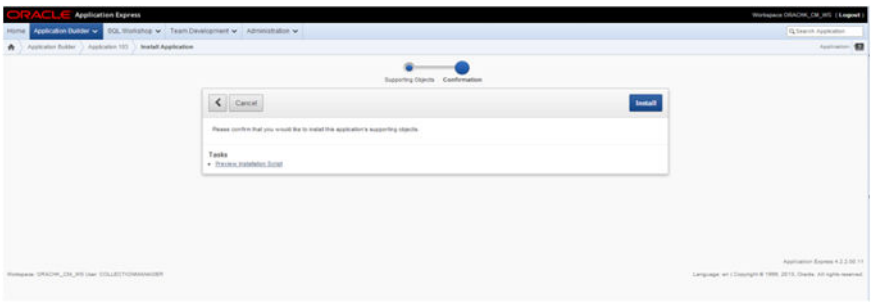
- Grant the required privileges to the workspace owner.

Figure 1-61 Validations



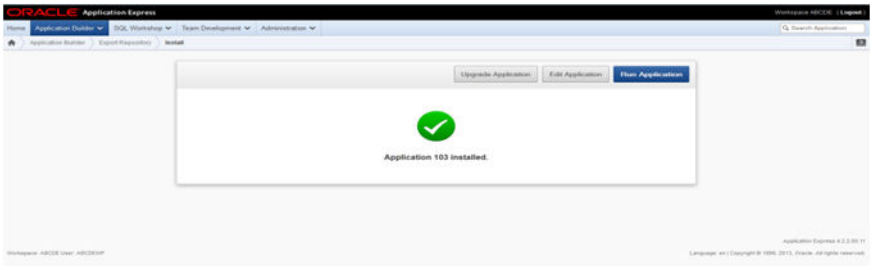
13. Click **Next**.

Figure 1-62 Install Applications Supporting Objects



14. Click **Install**.

Figure 1-63 Application Installed Successfully



15. Review the **Installation summary** for any errors or installation of database objects and seed data has failures

16. Capture the application ID generated for the application from the dialog upon successful installation of the application.

    This application ID is used in the URLs for accessing the application and you'll want to distribute the correct URL to the eventual users of the application

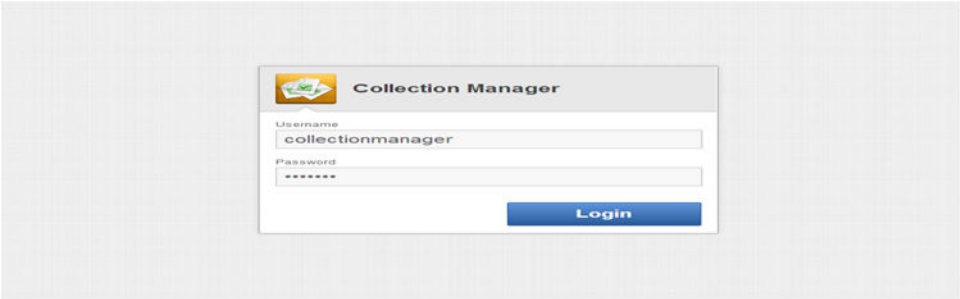
17. Click **Run Application**.

1.9.3.3 Log in to Oracle Health Check Collections Manager Application

Follow these procedures to log in to Oracle Health Check Collections Manager.

1. Enter user name and password details to login to the Oracle Health Check Collections Manager Application, click **Login**.

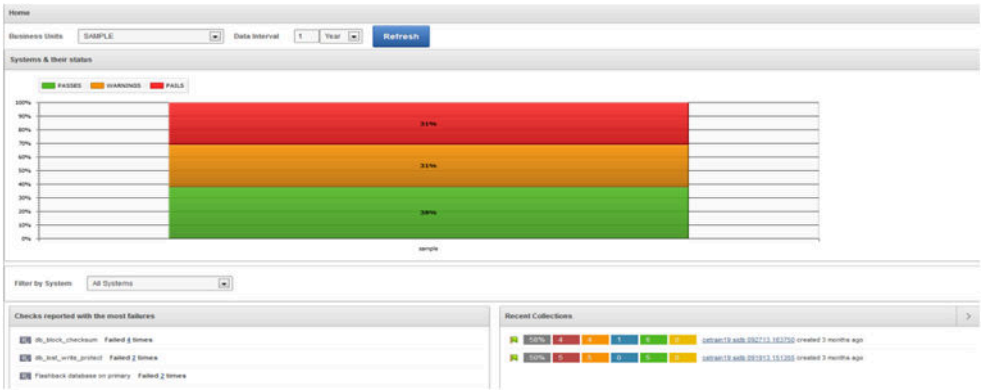
Figure 1-64 Log in to Oracle Health Check Collections Manager Application



After successful login, you are all set to use Oracle Health Check Collections Manager Application and its features.

By default, the Oracle Health Check Collections Manager Application is deployed with some default sample data for the purpose of acclimating new users to the application. Oracle Health Check Collections Manager displays the sample data In the **Home** page. Sample data is hidden automatically once your own data starts streaming into the application as you establish the automation and upload functionality of the tool as described in the ORAchk User Guide. If you are already using the upload functionality and have your audit check results data in the database tables, and that data replaces the sample data.

Figure 1-65 Oracle Health Check Collections Manager Default View



2. Log in to Oracle Health Check Collections Manager Application as End user:

   - The end user is not an administrator. The end users have only limited access to the application. Non-administrator users cannot do any administrative access unless administrator or developer privileges are granted.
   - The **End User** accounts must exist in the workspace where the application is installed.
   - To log in to the application, end user needs an application URL and login credentials.

     Provide the end users with one of the following URLs (they are interchangeable) and the temporary password that was assigned for them.

     ```
     http://hostname:port/apex/f?p=ApplicationID

     http://hostname:port/pls/apex/f?p=ApplicationID
     ```

     For example:

```
http://dbserver.domain.com:8080/apex/f?p=103
```

1.9.4 Upgrading Oracle Health Check Collections Manager Application

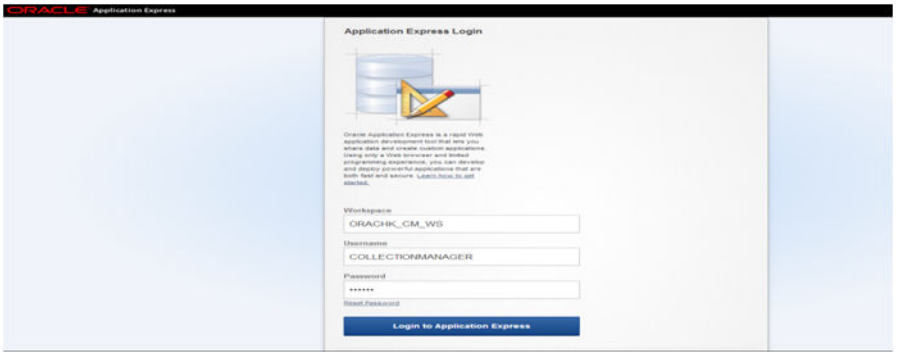
Upgrading the Oracle Health Check Collections Manager Application is as simple as a fresh application installation.

1. Download the latest version of Oracle ORAchk or Oracle EXAchk that contains the Oracle Health Check Collections Manager script.

   The same SQL script is used for fresh application installation or upgrading the existing application.

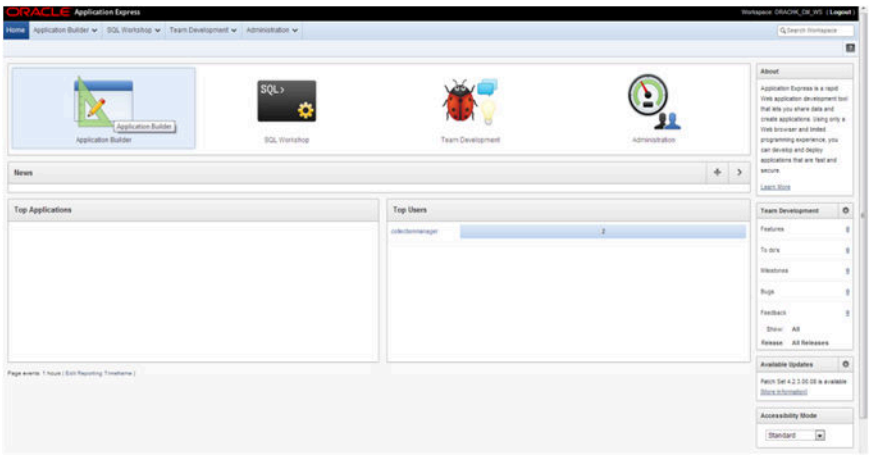
2. Log in to Application Express workspace where the Oracle Health Check Collections Manager Application is installed.

Figure 1-66 Log in to Application Express Workspace



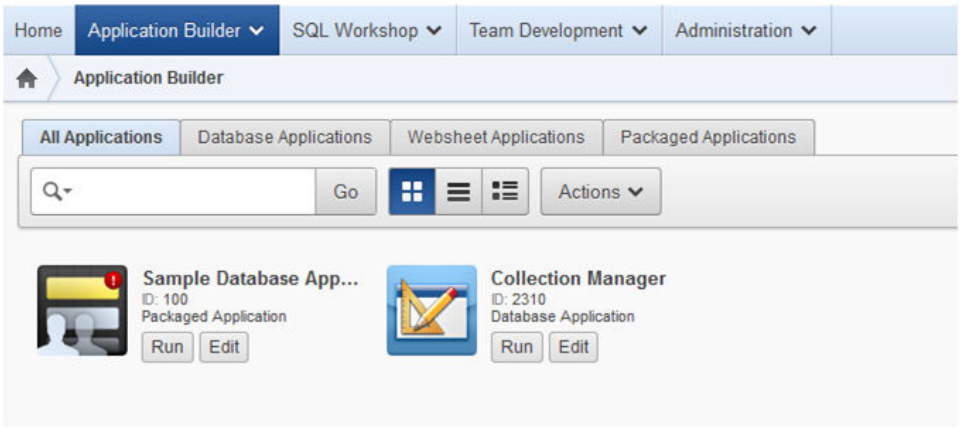
3. Click **Application Builder**.

Figure 1-67 Application Builder



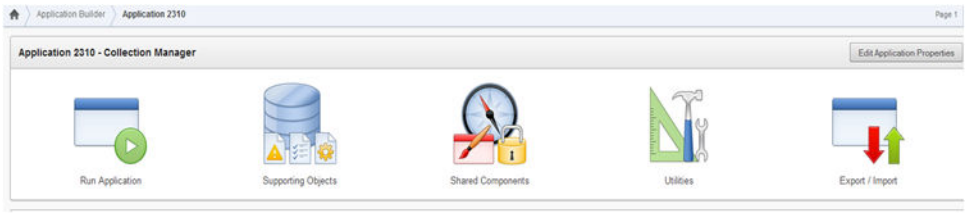
4. Click **Collection Manager**, **Edit**, and then note down the **Application ID**.

Figure 1-68 Application Builder - Edit



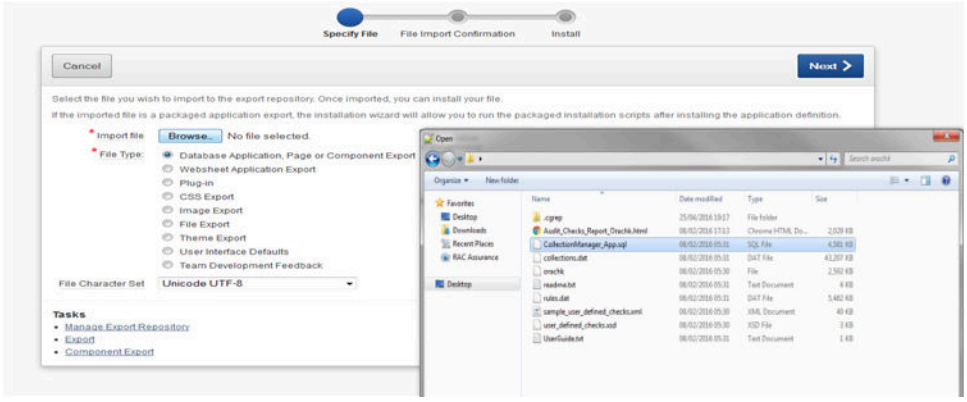
5. Click **Export/Import**.

Figure 1-69 Application Builder - Export or Import



6. Click **Import**.
7. Click **Choose import file** and select the downloaded new Oracle Health Check Collections Manager Application SQL script from the location where it was staged.
   - **File type**: select the default value, **Database Application** or **Component Export**.
   - **File Character Set**: select the default value, **Unicode UTF-8**.
8. Click **Next**.

Figure 1-70 Application Builder - File Import wizard



9. Click **Next**.
   - For Parsing Schema, select the schema specified for the workspace.

- **Build Status**: select the default value, **Run and Build Application**.
- **Install As Application**: select **Change Application ID**, if your existing Application ID is not 2310, else select **Reuse Application ID 2310**.
- **New Application ID**: enter your existing Oracle Health Check Collections Manager Application ID as noted earlier. Ensure that you have entered the same number that your Application is running.

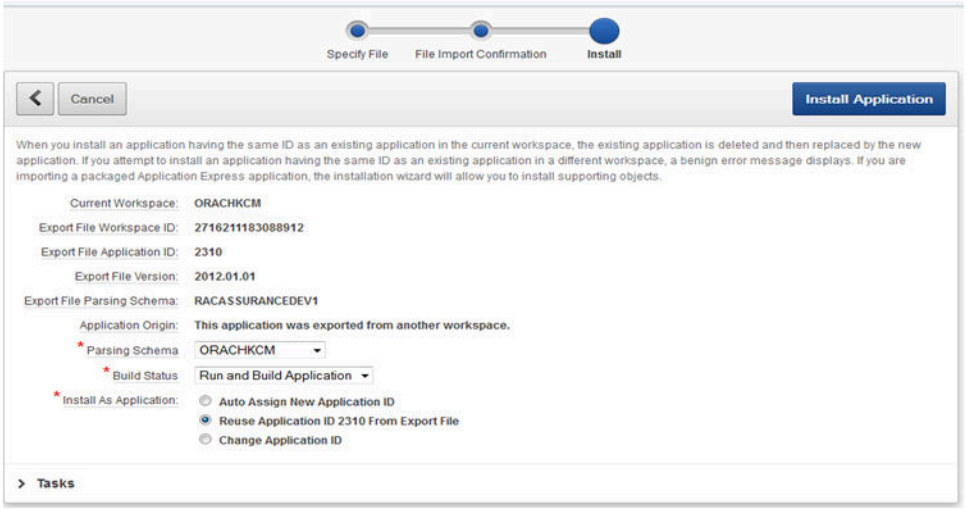
- **Note:**

  Oracle releases Oracle Health Check Collections Manager Application with Application ID 2310. Oracle recommends to use the same Application ID at the time of fresh install. It also makes it easier to upgrade the application in the future. If you have used different Application Id, then enter the same ID number as New Application ID.

---

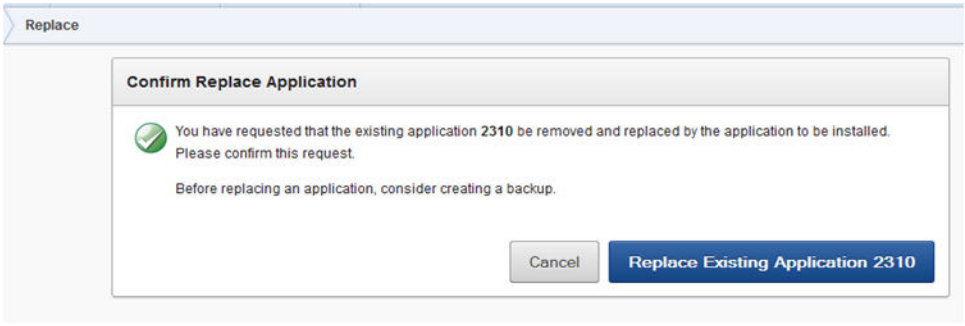
10. Click **Install Application**.

Figure 1-71 Application Builder - Install Application



11. If you have used same Application ID, then click **Replace Existing Application <application id>**.

Figure 1-72 Application Builder - Confirm Replace Application

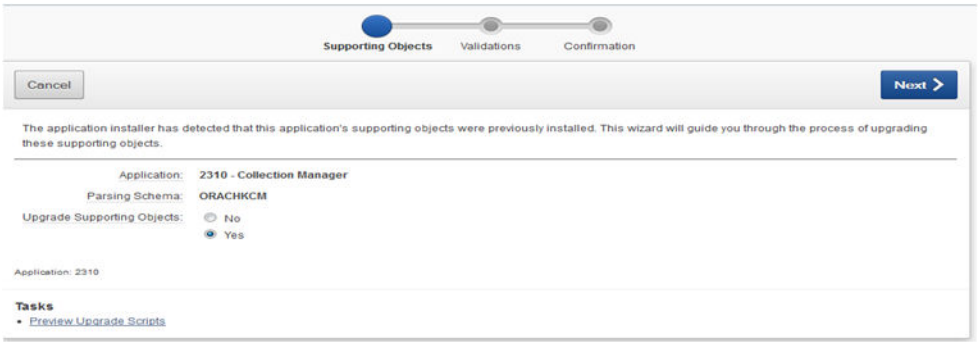


Note:

Backup before replacing an application.

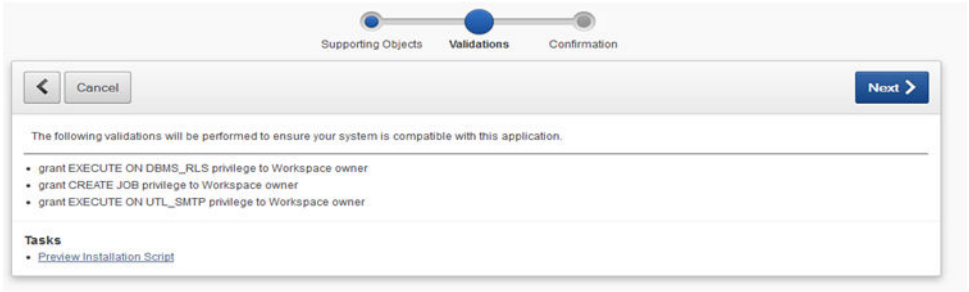
12. Verify the name of the application, parsing schema, free space allocated for application, and **Install supporting Objects** is set to**Yes**, and then click **Next**.

Figure 1-73 Application Builder - Supporting Objects



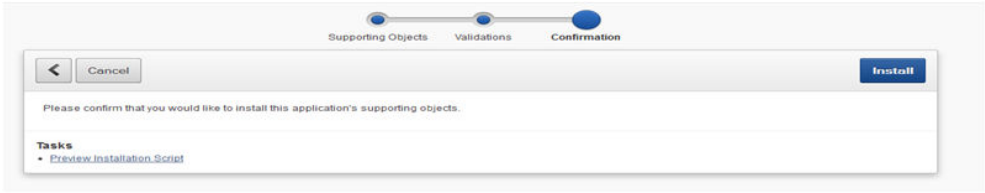
13. Grant the required privileges to the workspace owner.

Figure 1-74 Application Builder - Validations



14. Click **Install**.

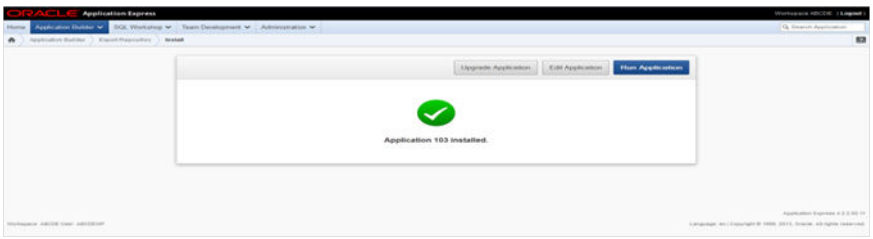
Figure 1-75 Application Builder - Confirmation



You must see `Application installed successfully` message.

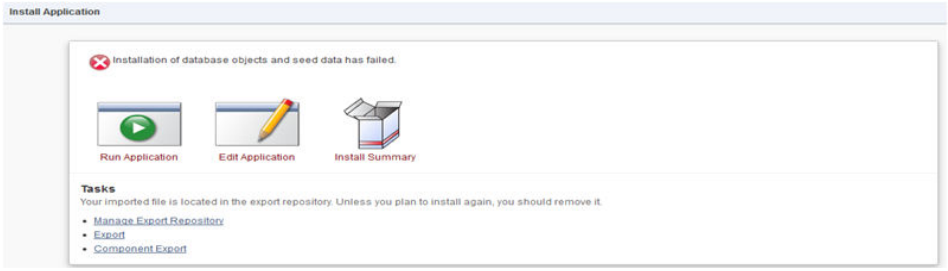
15. Click **Run Application**.

Figure 1-76 Application Builder - Application installed successfully



- If installation fails, examine the installation summary for any errors or if installation of database objects and seed data have failed.

Figure 1-77 Application Builder - Failed Installation



- Resolve the issues and rerun the failed SQL statements manually by connecting to the database from an SQL Prompt.
- Capture the application ID generated for the application, for example, 2310 from the dialog upon successful installation of the application. This application ID is used in the URLs for accessing the application. Distribute the correct URL to the users of the application.

16. Click **Run Application**.

1.9.5 Getting Started

Familiarize yourself with the Oracle Health Check Collections Manager Application.

Incident Ticket System Lookup Lists and Seed Data (page 1-110)
The Oracle Health Check Collections Manager Application provides a basic Incident Ticket system and is deployed with seed data for the lookup lists used for data entry for incident tickets:

Access Control System (page 1-110)
Limit and control access based on functional roles.

Oracle Health Check Collections Manager Application Administration (page 1-110)
Grant sufficient privileges to different roles to restrict authorized users alone to access the application.

Selectively Capturing Users During Login (page 1-114)
By default, Oracle Health Check Collections Manager captures details of the users logging in using LDAP authentication, and assigns them DBA role. However, you can disable automatic capture and re-enable anytime later. If you disable, then you must manually create users and assign them roles.

Configuring Email Notification System (page 1-115)
The Oracle Health Check Collections Manager Application provides an email notification system that users can subscribe to.

Bulk Mapping Systems to Business Units (page 1-118)
If you have a large number of systems, then you can quickly map those systems to business units in Oracle Health Check Collections Manager using an XML bulk upload.

Purging Old Collections (page 1-120)
By default, Oracle Health Check Collections Manager purges collections older than three months.

1.9.5.1 Incident Ticket System Lookup Lists and Seed Data

The Oracle Health Check Collections Manager Application provides a basic Incident Ticket system and is deployed with seed data for the lookup lists used for data entry for incident tickets:

- Products
- Category
- Customer Contacts
- Notifications
- Status Codes
- Incident Severity
- Incident Urgency

The seed data is values that are commonly used. Add or change the seed data provided with the application. However, you need to have admin privileges to manage the seed data through the **Administration** tab. Click the "gear" icon at the upper-right corner to access the **Administration** tab.

1.9.5.2 Access Control System

Limit and control access based on functional roles.

By default, the Access Control system is disabled. If Access Control is disabled, then all authenticates users are granted admin user privileges and can access all application features. Manage the Access Controls through the **Administration** tab to assign one or more roles to the end users. You can enable the following three functional roles available in the Oracle Health Check Collections Manager.

- **Admin:** Admin role user may or may not be a Workspace Administrator for the application and it depends on your functional roles requirements.
- **DBA Manager**
- **DBA**

Assign role to the users after configuring the Access Control system.

1.9.5.3 Oracle Health Check Collections Manager Application Administration

Grant sufficient privileges to different roles to restrict authorized users alone to access the application.

Admin

Any end user who is granted an admin role by the workspace administrator will have an admin user privileges within the Collection Manager application.

Log in to Oracle Health Check Collections Manager Application using a URL as follows:

```
http://hostname:port/apex/f?p=ApplicationID
http://hostname:port/pls/apex/f?p=ApplicationID)
```

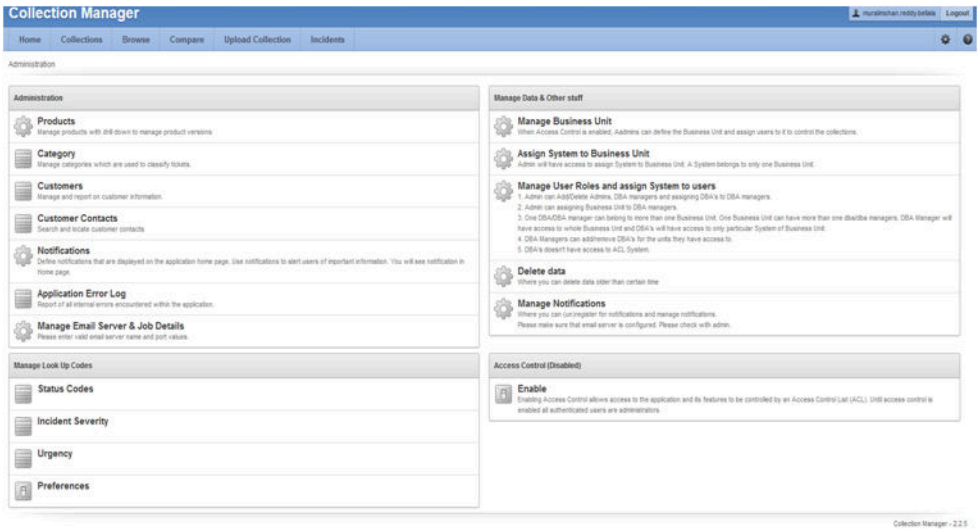
For example:

```
http://dbserver.domain.com:8080/apex/f?p=103
```

As an admin user, you must see the Administration menu (gear icon) at the upper-right corner. Click this icon to go to the Administration page.

- Following are the admin user privileges:
  - Add or revoke admin privileges
  - Define Business Units (BU)
  - Assign DBA Manager role to users
  - Assign DBA Managers to one or more BUs
  - Assign systems to BUs (a system can belong to one BU)
  - Assign DBAs to DBA Managers
  - Assign systems to DBAs
  - Ignore any check on a collection, BU or system
  - Create and assign incidents to any user
  - Manage all incidents

Figure 1-78 Oracle Health Check Collections Manager - Administration



- Only Admin role can edit any section under the **Administration** menu.
- The admin users need to configure data based on their requirements under the administration menu to prepare for the wider usage of the application. This is a one-time activity, however, change the configuration over time to suit your needs.

  Examples of the configuration data that you need set up are:
  - Products
  - Customers (internal designations for workgroups)

- Categories
- Notifications
- Status codes
- Manage Email Server and Job details
- Manage Notifications
- Incident Severity
- Urgency
- Manage User Roles and Assign systems to users
- Business Units (BUs)
- Assign systems to BUs

DBA Manager

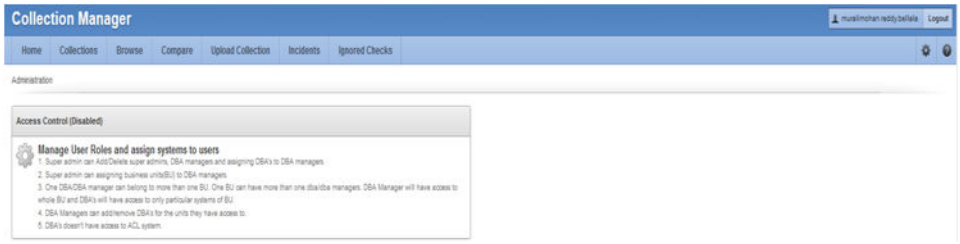
Any user who is granted the DBA Manager role.

Log in to Oracle Health Check Collections Manager Application using a URL as follows:

```
http://hostname:port/apex/f?p=ApplicationID
http://hostname:port/pls/apex/f?p=ApplicationID)
```

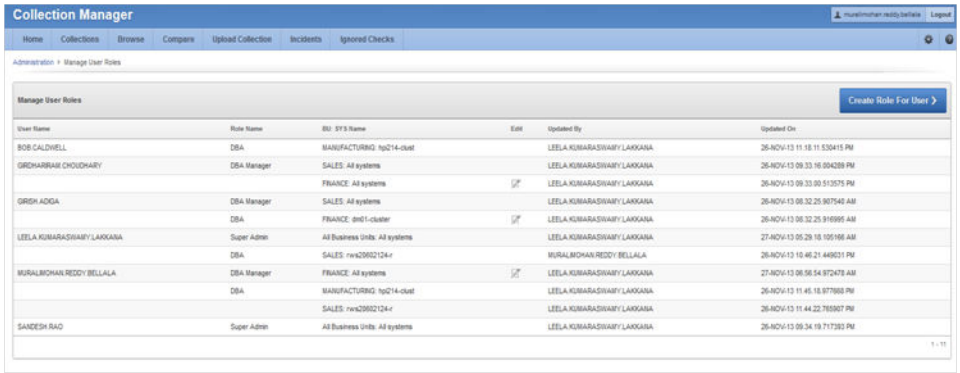
The DBA Managers must see an Administration menu (gear icon) at the upper-right corner of the application.

Figure 1-79 Oracle Health Check Collections Manager - DBA Manager Administration



Click **Manage User Roles**.

Figure 1-80 Oracle Health Check Collections Manager - DBA Manager - Manage User Roles



In above sample screen, user Murali has a DBA Manager role to the Finance BU. The DBA Manager can edit user roles or assign systems to other users in his or her BU. The scope of a DBA Manager is an entire BU, or multiple BUs.

Following are the DBA manager privileges:

- Assign DBAs to BUs the manager manages
- Assign DBAs to one or more systems
- Ignore any check on a collection, BU or system
- Create incidents for any system
- Assign incidents to DBAs that manage the systems in their BUs
- Manage any incidents for systems within their assigned BUs

DBA

Any user who is granted the DBA role.

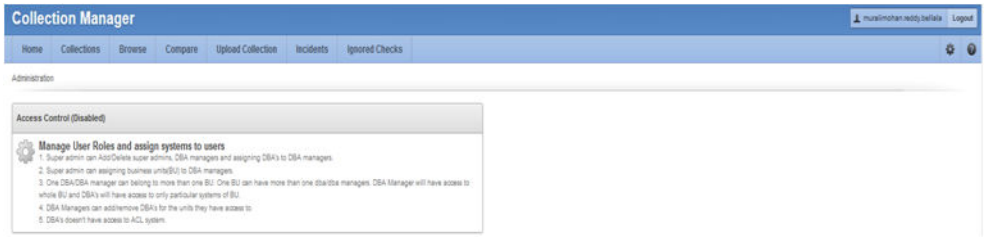
Log in to Oracle Health Check Collections Manager Application using a URL as follows:

```
http://hostname:port/apex/f?p=ApplicationID
http://hostname:port/pls/apex/f?p=ApplicationID)
```

The DBA must see the Administration menu (gear icon) at the upper-right corner of the application.

Any end user granted an admin role by the workspace administrator will have an admin user privileges within the Collection Manager application.

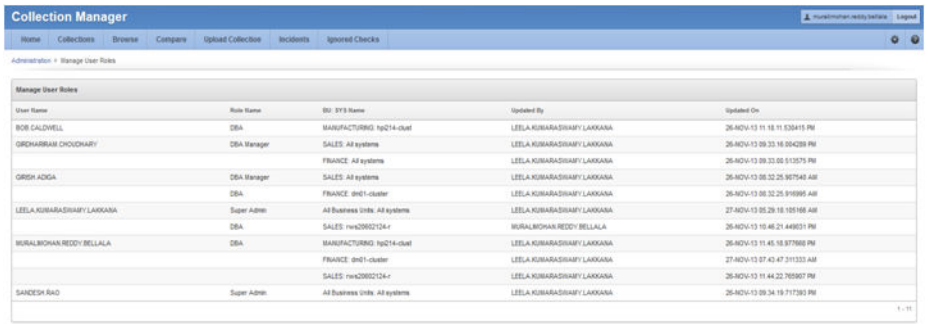
Figure 1-81 Oracle Health Check Collections Manager - DBA Administration



Click **Manage User Roles**.

DBA user has read-only access.

Figure 1-82 Oracle Health Check Collections Manager - DBA - Manage User Roles



In above sample screen, user Murali has a DBA Role to *hpi214-clust* system under the Manufacturing BU. However, he cannot edit user roles and assign system to other users.

Following are the DBA privileges:

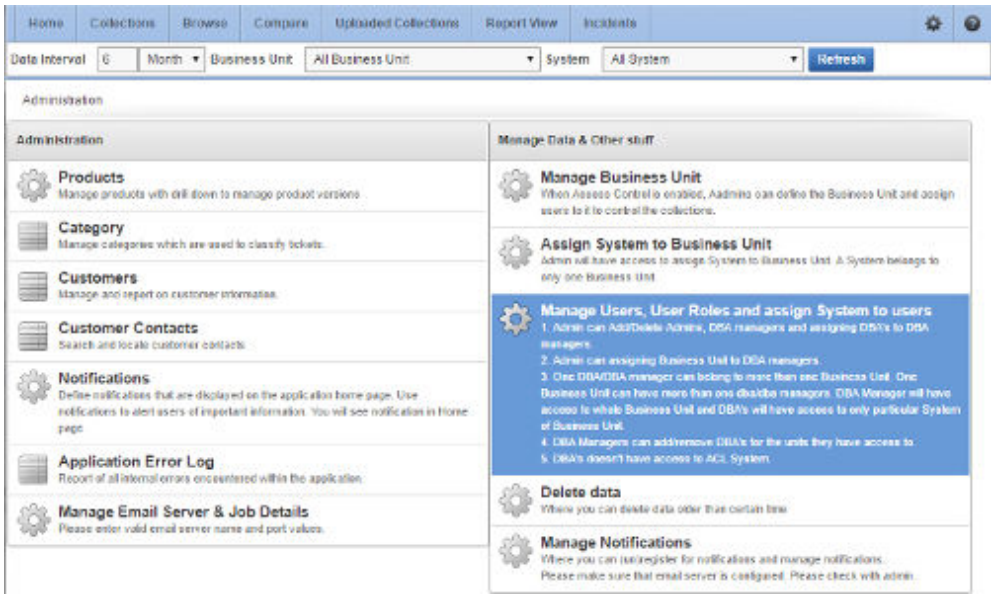
- Cannot manage Access Control List
- Manage systems within one or more BUs, if the DBA Managers of those BUs assigns them
- Ignore any check on a collection or system they manage
- Manage any incidents assigned to them

1.9.5.4 Selectively Capturing Users During Login

By default, Oracle Health Check Collections Manager captures details of the users logging in using LDAP authentication, and assigns them DBA role. However, you can disable automatic capture and re-enable anytime later. If you disable, then you must manually create users and assign them roles.

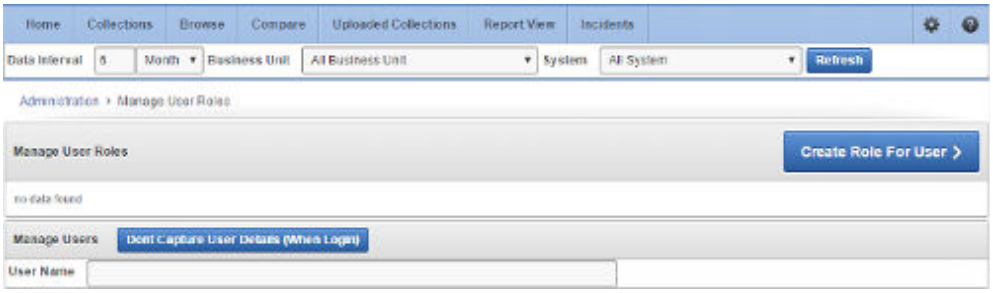
1. Click **Administration**, and then select **Manage Users, User Roles and assign System to users**.

Figure 1-83 Manage Users, User Roles and assign System to users



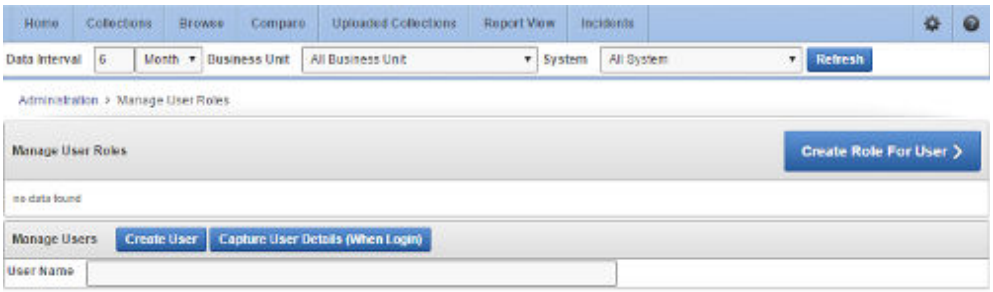
2. To disable automatic capture of users details, click **Don't Capture User Details (When Login)**.

Figure 1-84 Don't Capture User Details (When Login)



3. To re-enable automatic capture of user details, click **Capture User Details (When Login)**.

Figure 1-85 Capture User Details (When Login)



1.9.5.5 Configuring Email Notification System

The Oracle Health Check Collections Manager Application provides an email notification system that users can subscribe to.

The setup involves:

- Configuring the email server, port, and the frequency of email notifications.
- Registering the email address

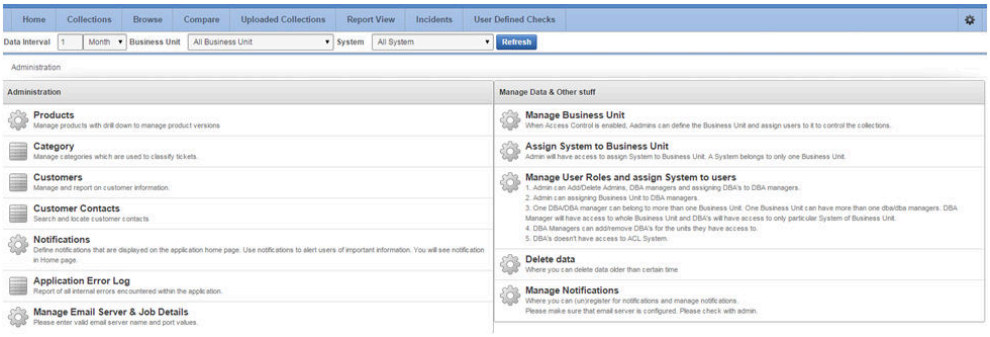
Note:

Only Admin role users has the privilege to manage **Email Notification Server and Job details**.

---

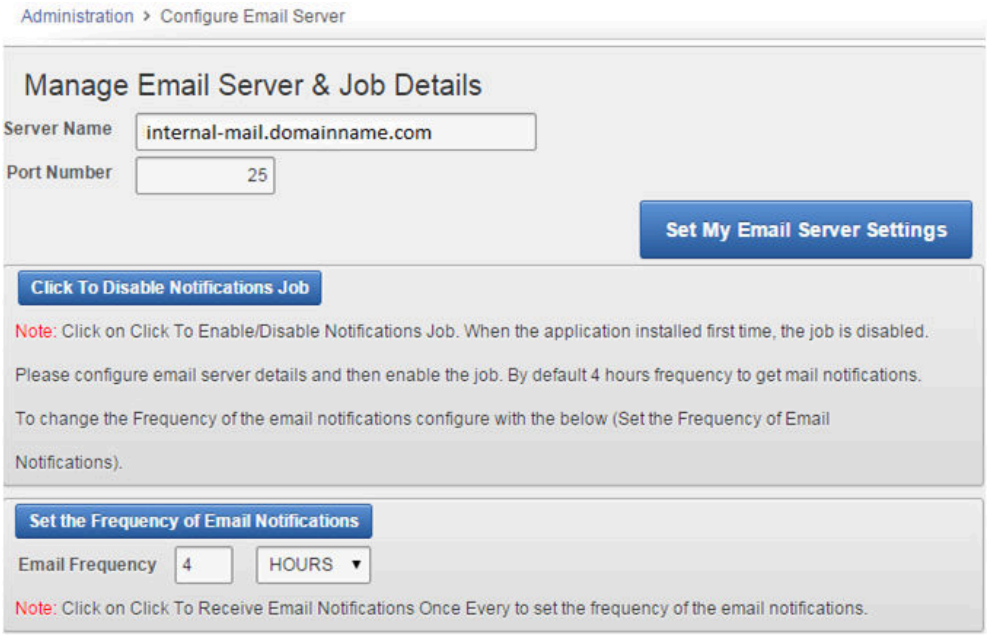
1. Log in to Oracle Health Check Collections Manager, and then click **Administration** at the upper-right corner.

Figure 1-86 Oracle Health Check Collections Manager - Administration



2. Under **Administration**, click **Manage Email Server & Job Details**.

Figure 1-87 Oracle Health Check Collections Manager - Configure Email Server

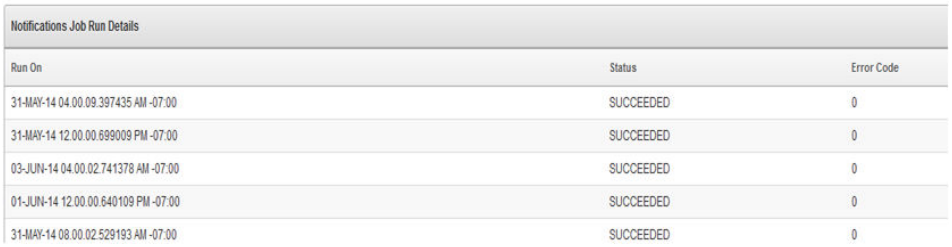


a. Specify a valid **Email Server Name**, **Port Number**, and then click **Set My Email Server Settings**.

b. Set **Email Notification Frequency** as per your needs.

See the **Notification Job Run Details** on the same page.

Figure 1-88 Oracle Health Check Collections Manager - Notification Job Run status details

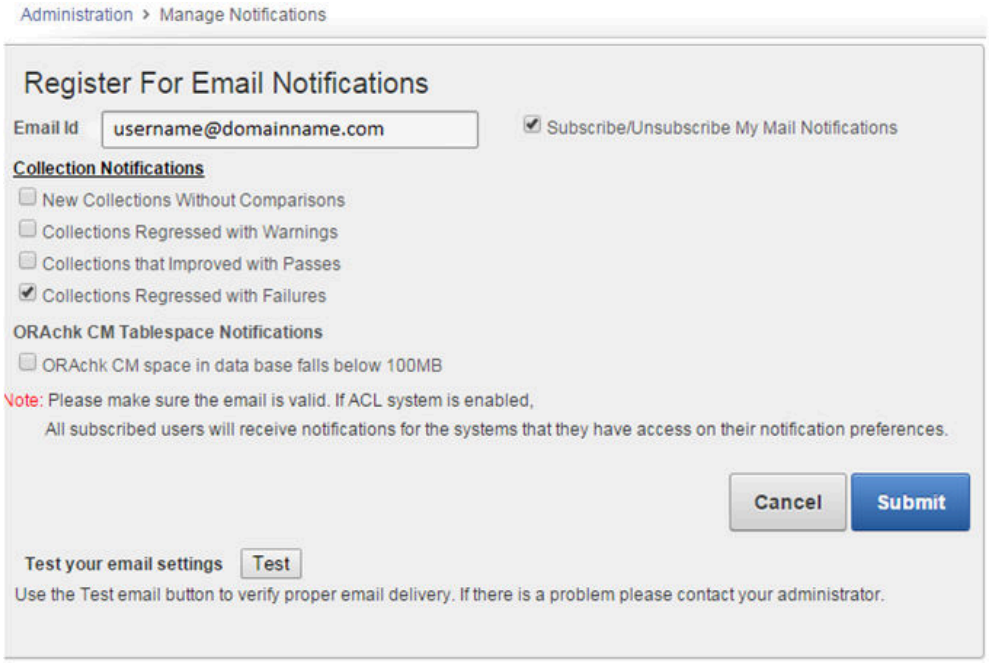


Notifications Job Run Details

Run On	Status	Error Code
31-MAY-14 04.00.09.397435 AM -07:00	SUCCEEDED	0
31-MAY-14 12.00.00.699009 PM -07:00	SUCCEEDED	0
03-JUN-14 04.00.02.741378 AM -07:00	SUCCEEDED	0
01-JUN-14 12.00.00.640109 PM -07:00	SUCCEEDED	0
31-MAY-14 08.00.02.529193 AM -07:00	SUCCEEDED	0

3. Go back to the **Administration** page, and click **Manage Notifications**.

Figure 1-89 Oracle Health Check Collections Manager - Manage Notifications



a. If this is the first time, then enter your email address.

Subsequent access to **Manage Notifications** page shows your email address automatically.

b. By default, **Subscribe/Unsubscribe My Mail Notifications** is checked. Leave as is.

c. Under **Collection Notifications**, choose the type of collections for which you want to receive notifications.

d. Select to receive notification when the available space in ORAchk CM Tablespace falls below 100 MB.

e. Validate the notification delivery by clicking **Test** under **Test your email settings**.

If the configuration is correct, you must receive an email. If you do not receive an email, check with your admin.

Following is the sample notification:

```
From: username@domainname.com
Sent: Thursday, January 28, 2016 12:21 PM
To: username@domainname.com
Subject: Test Mail From Collection Manager

Testing Collection Manager Email Notification System
```

f. Click **Submit**.

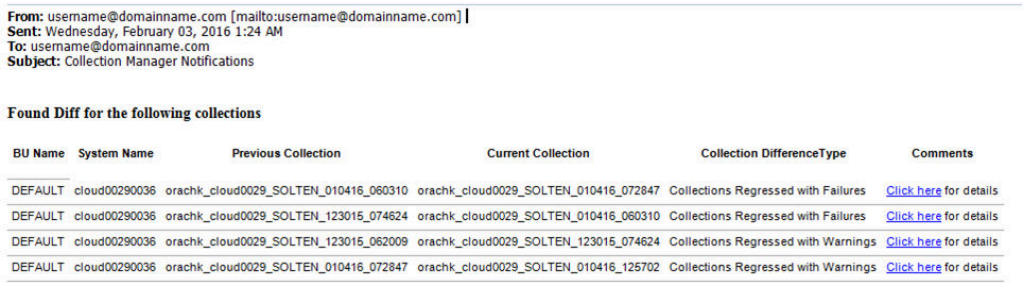
Note:

Manage Notifications section under the Administration menu is available for all users irrespective of the role.

If the ACL system is enabled, then the registered users receive notifications for the systems that they have access to. If the ACL system is not configured, then all registered users receive all notifications.

Depending on the selection(s) you made under **Collection Notifications** section, you receive an email with `Subject: Collection Manager Notifications` containing application URL with results.

Figure 1-90 Oracle Health Check Collections Manager - Sample Email Notification



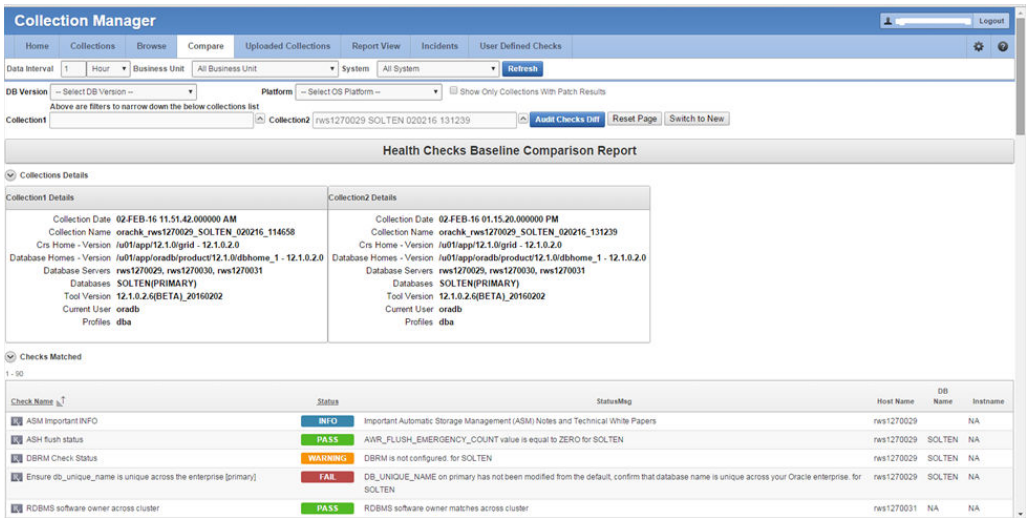
From: username@domainname.com [mailto:username@domainname.com]
Sent: Wednesday, February 03, 2016 1:24 AM
To: username@domainname.com
Subject: Collection Manager Notifications

Found Diff for the following collections

BU Name	System Name	Previous Collection	Current Collection	Collection DifferenceType	Comments
DEFAULT	cloud00290036	orachk_cloud0029_SOLTEN_010416_060310	orachk_cloud0029_SOLTEN_010416_072847	Collections Regressed with Failures	Click here for details
DEFAULT	cloud00290036	orachk_cloud0029_SOLTEN_123015_074624	orachk_cloud0029_SOLTEN_010416_060310	Collections Regressed with Failures	Click here for details
DEFAULT	cloud00290036	orachk_cloud0029_SOLTEN_123015_062009	orachk_cloud0029_SOLTEN_123015_074624	Collections Regressed with Warnings	Click here for details
DEFAULT	cloud00290036	orachk_cloud0029_SOLTEN_010416_072847	orachk_cloud0029_SOLTEN_010416_125702	Collections Regressed with Warnings	Click here for details

Under **Comments** column, click the **Click here** links for details. Click the respective URLs, authenticate and then view respective comparison report.

Figure 1-91 Oracle Health Check Collections Manager - Sample Diff Report

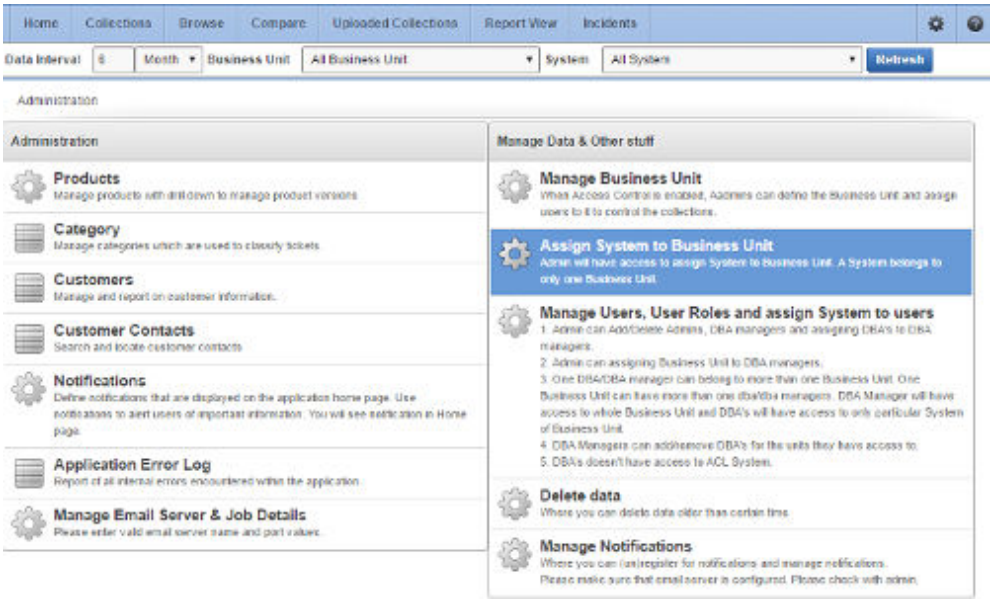


1.9.5.6 Bulk Mapping Systems to Business Units

If you have a large number of systems, then you can quickly map those systems to business units in Oracle Health Check Collections Manager using an XML bulk upload.

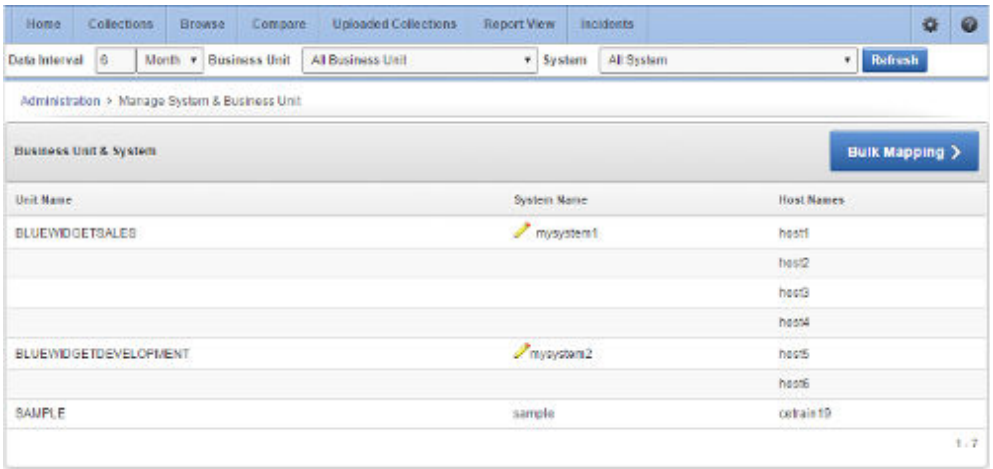
1. Click **Administration**, then select **Assign System to Business Unit**.

Figure 1-92 Assign System to Business Unit



2. Click **Bulk Mapping**.

Figure 1-93 Bulk Mapping

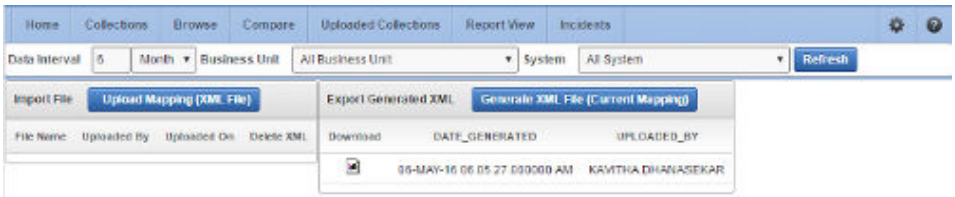


3. Upload a mapping XML.

   a. Click **Generate XML File (Current Mapping)**.

   b. Download the resulting XML file that contains your current system to business unit mappings.

Figure 1-94 Upload a mapping XML



c. Amend the XML to show mappings you want.

d. Upload new Mapping XML through **Upload Mapping (XML File)**.

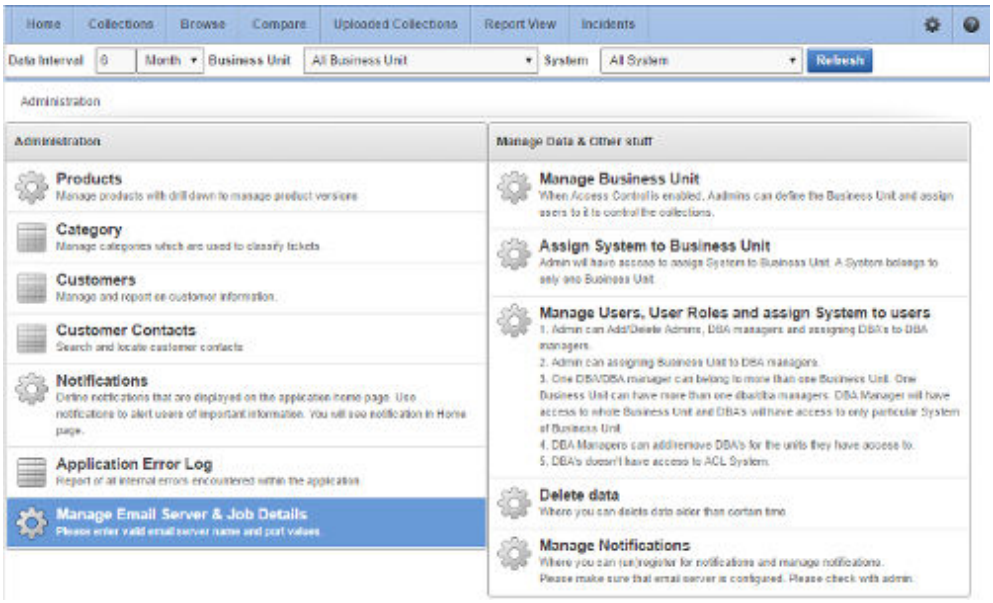
1.9.5.7 Purging Old Collections

By default, Oracle Health Check Collections Manager purges collections older than three months.

To adjust or disable the collection purging frequency:

1. Click **Administration**, then select **Manage Email Server & Job Details**.

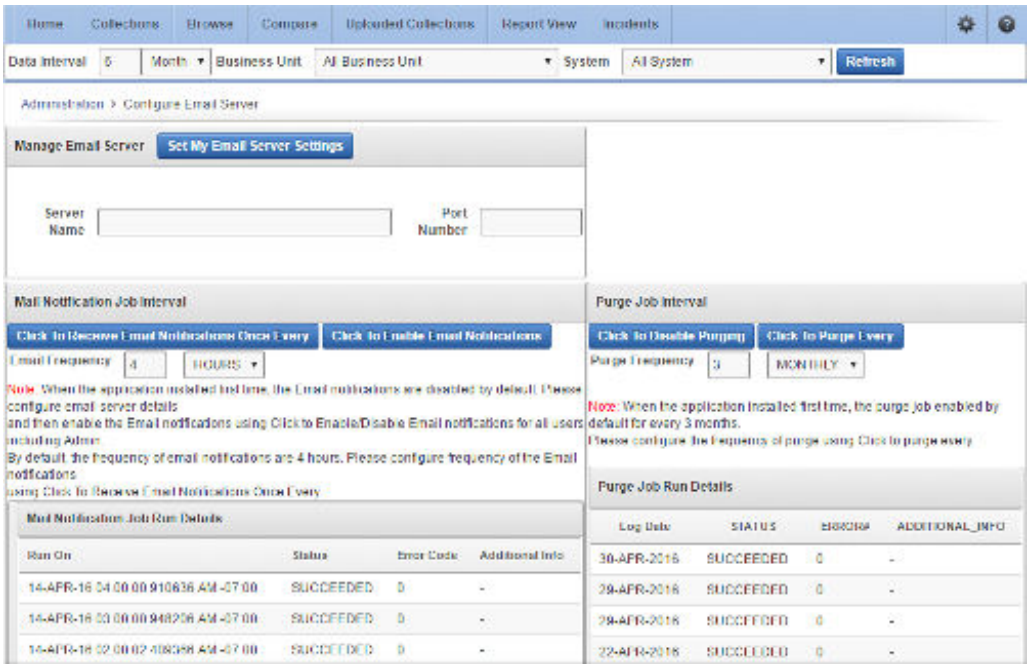
Figure 1-95 Manage Email Server & Job Details



2. Select an appropriate option:

- Change the frequency of purges by setting different values in **Purge Frequency** , and then click **Click To Purge Every**.
- To disable purging, click **Click To Disable Purging**.
- To re-enable purging, click **Click To Enable Purging**.

Figure 1-96 Configure Purging



1.9.6 Oracle Health Check Collections Manager Application Features

Familiarize yourself with the features of Oracle Health Check Collections Manager Application.

Global Select Lists (page 1-122)
Collection Manager Application has an option to display the data based on select lists like Business Units, Systems and Data for last periods of time.

Home Tab (page 1-122)
Displays systems and their statuses, and recent activities of all users who has permission to access the application.

Collections Tab (page 1-123)
Displays incidence information for each collection, and collection score for failed, warning, and failed checks.

Browse Tab (page 1-124)
Allows you to list individual checks based on filters set.

Compare Tab (page 1-126)
Helps you compare audit check results and patch results.

Report View Tab (page 1-128)
Provides a graphical representation of database checks, instance checks, home path checks, and system health checks.

Upload Collections Tab (page 1-128)
Provides an interface to manually upload a collection into Oracle Health Check Collections Manager Application and provides a list of uploaded collections and file details.

Uploading Collections Automatically (page 1-129)
Configure Oracle ORAchk and Oracle EXAchk to automatically upload check results to the Oracle Health Check Collections Manager database. Specify the connection string and the password to connect to the database and upload collection results. Oracle Health Check Collections Manager stores the connection details in an encrypted wallet.

Viewing and Reattempting Failed Uploads (page 1-131)
Use these procedures to view and reattempt to upload the failed uploads.

Tracking Support Incidents (page 1-132)
The **Incidents** tab gives you a complete system for tracking support incidents.

Authoring User-Defined Checks (page 1-134)
User-defined checks are checks written, tested, verified and maintained by you that are specific to your environment.

1.9.6.1 Global Select Lists

Collection Manager Application has an option to display the data based on select lists like Business Units, Systems and Data for last periods of time.

All these select lists are global within the application and options available on starting of each tab.

- Business Unit
- System
- Data interval

1.9.6.2 Home Tab

Displays systems and their statuses, and recent activities of all users who has permission to access the application.

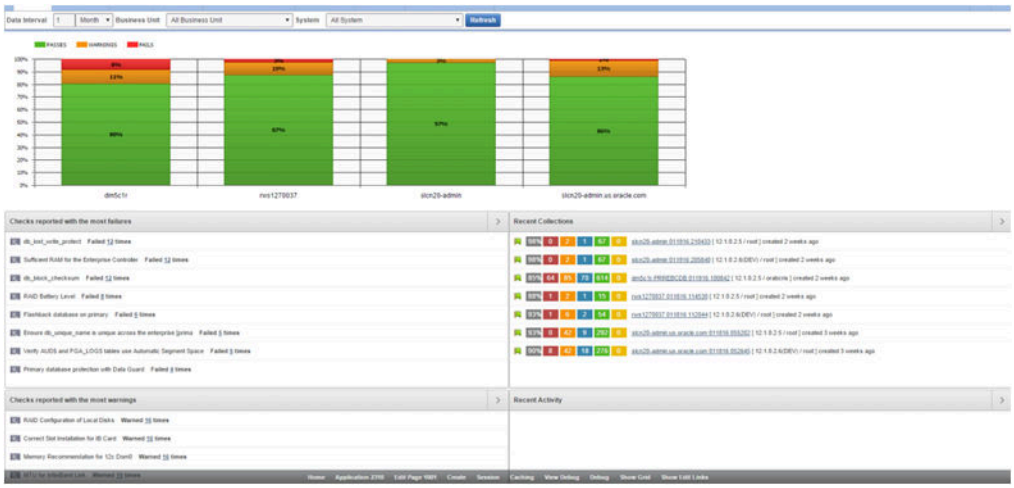
- Displays systems and their statuses in graphs with color coded green, orange, and red based on check results (passed, warning, and failed).
- The **Home** tab has an option to display the data based on select lists like Business Units and Data for last periods of time. There is also an option to filter the most failed/warned checks and recent collections based on system name.
- The **Most Failed Checks** region displays information for the most frequently failed checks for all collections for the time period, Business Unit or System selected, and displays the check name, fail count. There is a similar region for most warned checks .
- The **Recent Collections** region displays brief information about recently uploaded collections based on time frame, Overall score with Fail, Warning, and Pass counts and a Status flag. Recent collections are automatically compared to the last collection from the same system, whenever it occurred, if there is one.

  Status Flags are color-coded green, orange or red based on the comparison between the recent collection and the last collection, if any.

  - GREEN: There is no difference at all between the two collections or one or more findings from the last collection improved from WARNING or FAIL to PASS or there was no earlier collection to compare with.
  - ORANGE: There were one or more regressions between the last collection and the most recent on a given system. In other words some findings transitioned in a negative way, for example, PASS to WARNING.
  - RED: There were one or more regressions between the last collection and the most recent on a given system. In other words some findings transitioned in a negative way, for example, PASS to FAIL.

- Recent Activity in **User Range** shows recent activities by all users across all collections specific to the access role granted the user.
  - DBA role user able to see everything within his/her systems which he or she assigned.
  - DBA Manager role user able to see everything within his or her Business Unit and Systems which he or she assigned.
  - Admin role user can see everything when you have a collection data uploaded in to the application.

Figure 1-97 Home Tab



1.9.6.3 Collections Tab

Displays incidence information for each collection, and collection score for failed, warning, and failed checks.

- Displays all collections and allows you to filter the list of collections based on Business units and System. You can also filter based on Status flag. The list is also inherently filtered to those collections the user has access to, based on their assigned role.
- Displays incident information for each collection indicated by Delta (Δ) color coded red, blue, and green based on ticket status. Click the delta symbol to raise a new ticket or alter the ticket for an entire collection.
  - **RED (No Incident ticket exists)**: Click to create a new incident ticket for the collection or individual checks.

  - **BLUE (An open Incident ticket exists)**: Click to open the incident ticket for editing.
  - **GREEN (A closed Incident ticket exists)**: Click opens the closed incident ticket for viewing.

- Collection Score is calculated based on failed, warning, and passed checks.

  If a user raised a ticket for the collection, resolved the issues and the ticket is closed signifying the issues have all been resolved, then Oracle Health Check Collections Manager changes the collection score to 100%.

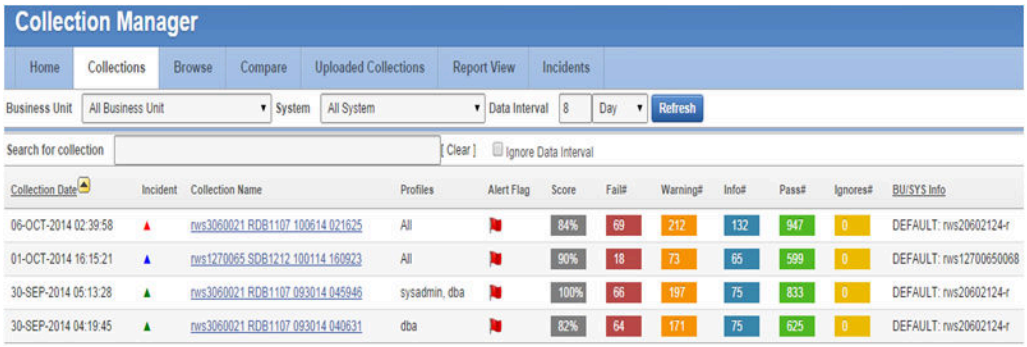
  If a user raised a ticket for an individual check and if it is closed signifying that the finding has been resolved, then Oracle Health Check Collections Manager changes the status of the check as PASS and recalculates the collection score.

  Collection Score is derived using following formula.

  - Every check has 10 points.
  - Failure deducts 10 points.
  - Warning deducts 5 points.
  - Info deducts 3 points.

- A **More Info** link next to a collection indicates the collection was manually uploaded into the application.
- Click the linked collection name in the list to load the collection in the **Browse** tab.

Figure 1-98 Collections Tab



1.9.6.4 Browse Tab

Allows you to list individual checks based on filters set.

- Set filters once the list of checks is created.
- Create and alter incident tickets for individual audit check findings similar to as described in the **Collections** tab.
- Select checks to ignore and to undo previously ignored checks. Select the checkbox beside the audit check and click **Ignore Selected**. Collection Manager marks them as **FAIL-IGNORED**, indicating that the check had failed but is ignored.

  Oracle Health Check Collections Manager ignores the checks for the entire level based on the level selected for ignoring.

To ignore selected failed checks, you must choose the ignore type from the following list:

- ignore from collection
- ignore from system
- ignore from a business unit
- ignore from all business units

Note:

The domain for ignoring checks is within the role assigned to the user.

All Ignored checks are listed under the **Ignored Checks** tab, if needed undo ignore.

To undo the selected Ignored checks, consider the type from the following list:

- undo ignore from collection
- undo ignore from system
- undo ignore from business unit
- undo ignore from all business units

Note:

The domain for undoing ignored checks is within the role assigned to the user.

Figure 1-99 Browse Tab

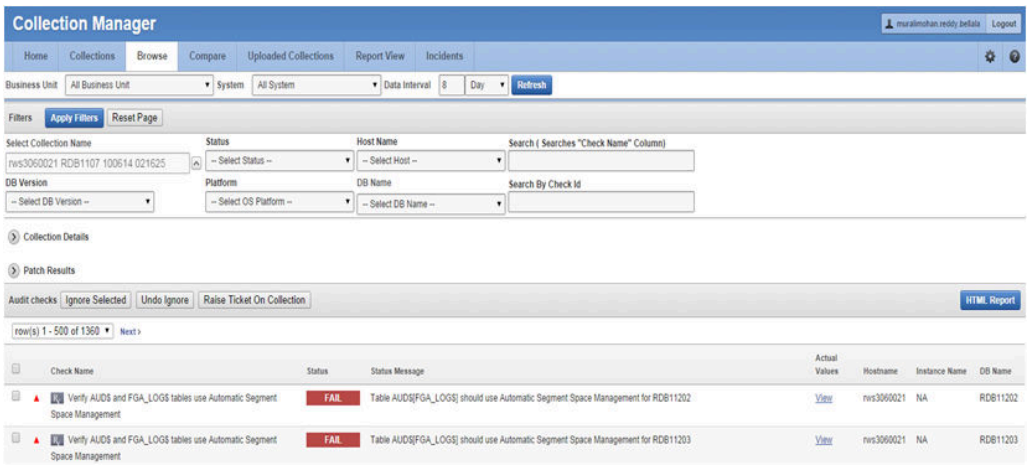


Figure 1-100 Ignored Checks

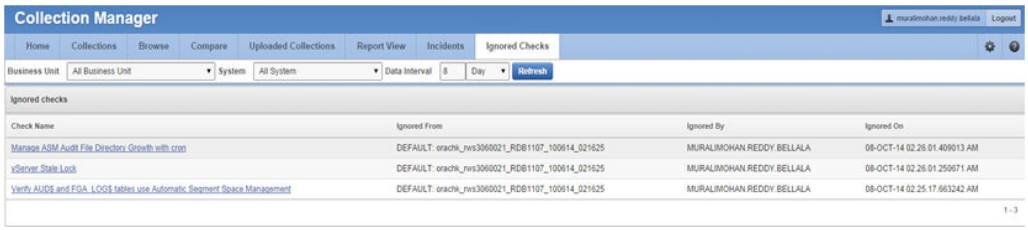


Figure 1-101 Browse Tab - Apply Filters

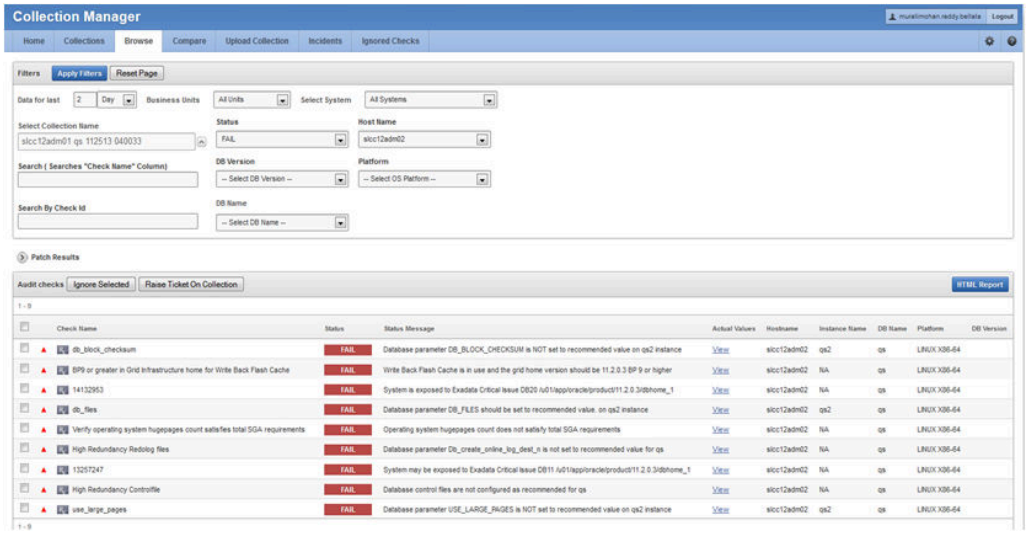
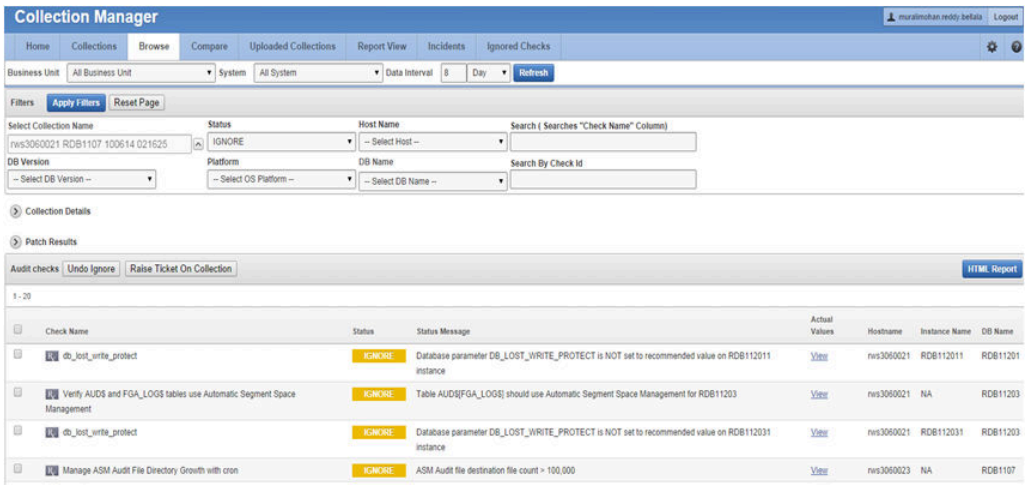


Figure 1-102 Browse Tab - Apply Filters - Ignored Checks



1.9.6.5 Compare Tab

Helps you compare audit check results and patch results.

- **Compare Audit check Results**
  - Compare the audit check findings from two different collections based on Business Unit, System, DB Version and Platform. The collections available for comparison are limited to filters set.

  - Compare collections from the same or different systems.

- **Compare Patch Results**

  - Compare installed Oracle patches from two different collections. The comparison displays the difference between the two collections based on patch results.

Figure 1-103 Compare Tab

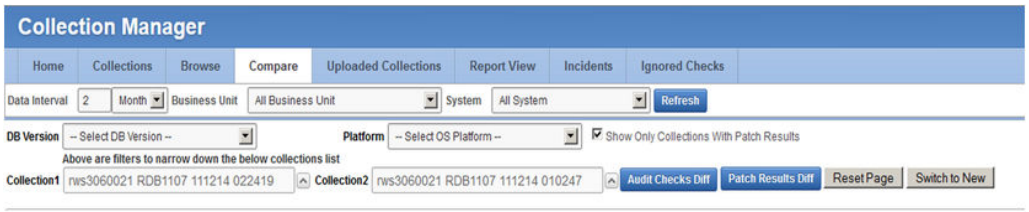


Figure 1-104 Compare Tab - Audit Checks Diff

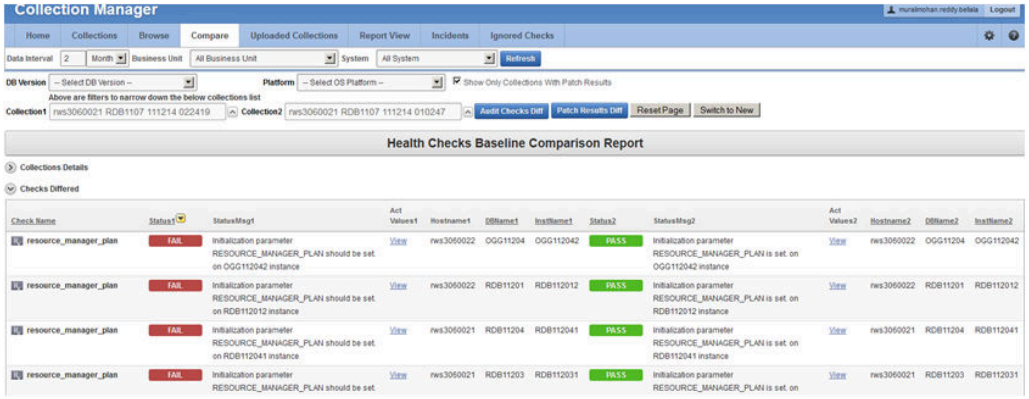
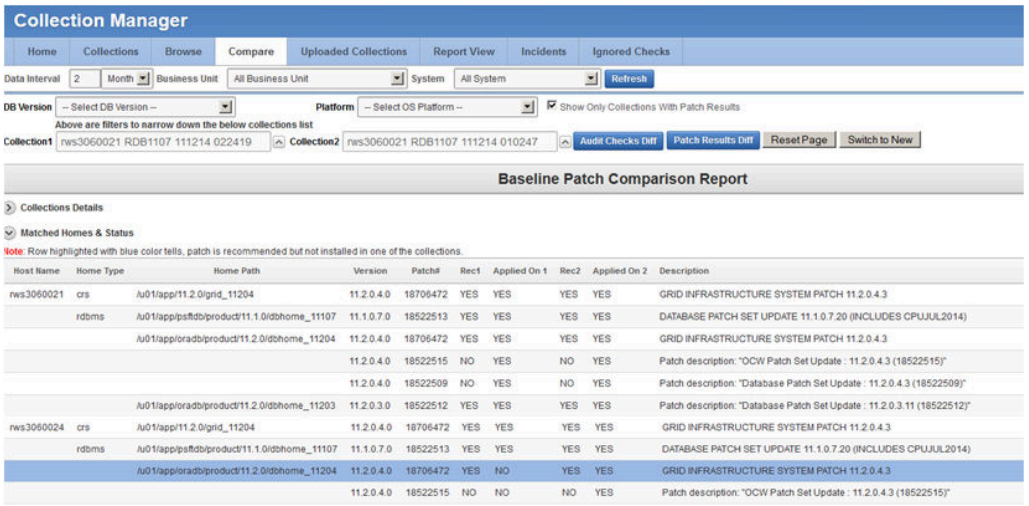


Figure 1-105 Compare Tab - Patch Results Diff



Note:

Row highlighted with blue color that the patch is recommended, but it is not installed in one of the collections.

1.9.6.6 Report View Tab

Provides a graphical representation of database checks, instance checks, home path checks, and system health checks.

- Provides a printable view option to print the graphical summary of system collection
- Displays separate graphical summary view for database checks, instance checks and home path checks breakup based on check type and check status in collection
- Displays system health check details based on status and check type in collection

Figure 1-106 Report View Tab - Summary

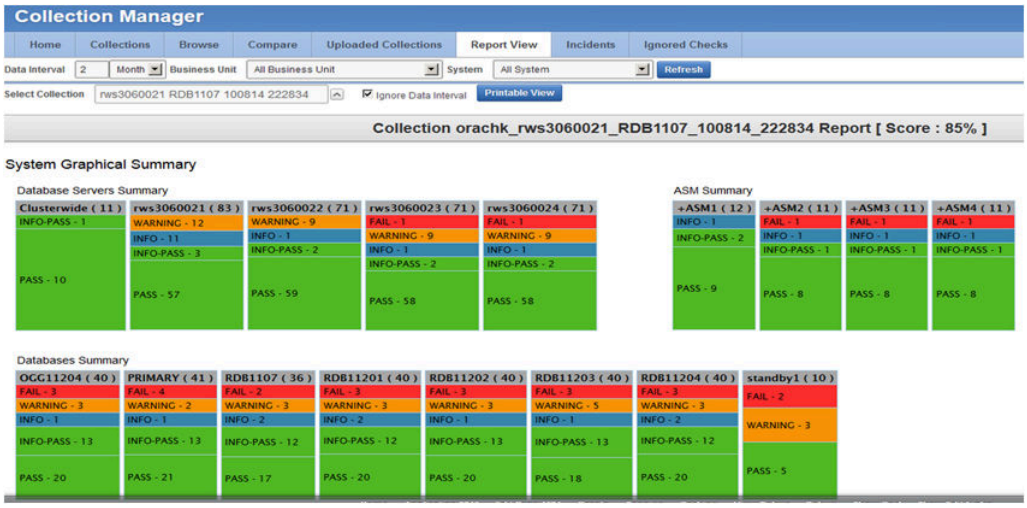
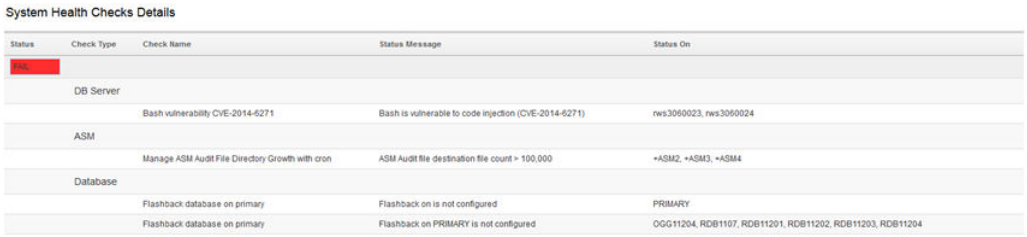


Figure 1-107 Report View Tab - Details



1.9.6.7 Upload Collections Tab

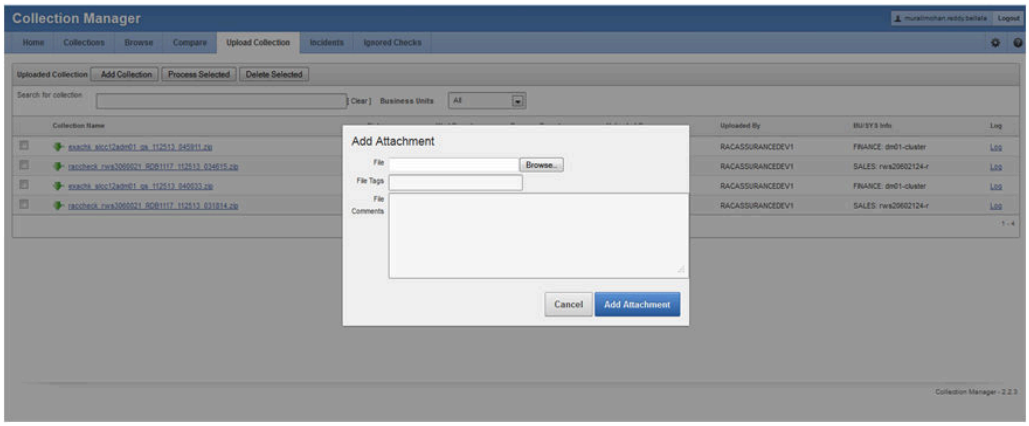
Provides an interface to manually upload a collection into Oracle Health Check Collections Manager Application and provides a list of uploaded collections and file details.

These manually uploaded collections are unzipped and their data imported into the framework just as if they had been uploaded at runtime when the tool was run. Therefore, even if the tool is not configured for automatic upload into the Oracle Health Check Collections Manager Application, you can always upload collections manually.

Note:

Using a combination of tables and environment variables, you can automate the process of uploading collections into the database hosting the Collection Manager Application at runtime.

Figure 1-108 Upload Collections Tab



1.9.6.8 Uploading Collections Automatically

Configure Oracle ORAchk and Oracle EXAchk to automatically upload check results to the Oracle Health Check Collections Manager database. Specify the connection string and the password to connect to the database and upload collection results. Oracle Health Check Collections Manager stores the connection details in an encrypted wallet.

Oracle ORAchk and Oracle EXAchk –setdbupload all

Specify the connection details using the `-setdbupload` option. For default options, use `-setdbupload all`.

```
./orachk -setdbupload all

./exachk -setdbupload all
```

Oracle Health Check Collections Manager prompts you to enter the values for the connection string and password. Oracle Health Check Collections Manager stores these values in an encrypted wallet file.

Oracle ORAchk and Oracle EXAchk –getdbupload all

To see the values set in the wallet, use the `-getdbupload` option.

```
$ ./orachk -getdbupload

$ ./exachk -getdbupload
```

Oracle ORAchk and Oracle EXAchk can automatically use the default values set in the *RAT_UPLOAD_USER* and *RAT_ZIP_UPLOAD_TABLE* environment variables.

Oracle ORAchk and Oracle EXAchk –checkdbupload all

Verify if Oracle ORAchk and Oracle EXAchk makes successful connection to the database using the **–checkdbupload** option.

```
$ ./orachk -checkdbupload

$ ./exachk -checkdbupload
```

Example 1-6 Oracle ORAchk and Oracle EXAchk –setdbupload all

```
$ ./orachk -setdbupload all

Enter value for RAT_UPLOAD_CONNECT_STRING:(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myserver44.acompany.com)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)
(SERVICE_NAME=orachkcm.acompany.com)))

Enter value for RAT_UPLOAD_PASSWORD:******

Database upload parameters successfully stored in orachk_wallet. orachk run will
keep uploading the collections in database until it is unset using ./orachk -
unsetdbupload all/env <variable name>
```

Note:

Use the fully qualified address (as in the example above) for the connect string rather than an alias from the `tnsnames.ora` file so that it is not necessary to rely on `tnsnames.ora` file name resolution on all the servers where the tool might be run.

Example 1-7 Oracle ORAchk and Oracle EXAchk –getdbupload all

```
$ ./orachk -getdbupload

RAT_UPLOAD_CONNECT_STRING = (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myserver44.acompany.com)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)
(SERVICE_NAME=orachkcm.acompany.com)))

RAT_UPLOAD_PASSWORD = ******

RAT_UPLOAD_USER = ORACHKCM

RAT_ZIP_UPLOAD_TABLE = RCA13_DOCS
```

Example 1-8 Oracle ORAchk and Oracle EXAchk –checkdbupload all

```
$ ./orachk -checkdbupload

Configuration is good to upload result to database.
```

At the end of health check collection, Oracle ORAchk and Oracle EXAchk check if the required connection details are set (in the wallet or the environment variables). If the connection details are set properly, then Oracle ORAchk and Oracle EXAchk upload the collection results.

Tip:

To configure many Oracle ORAchk and Oracle EXAchk instances:

1. Create the wallet once with the `-setdbupload all` option, then enter the values when prompted.
2. Copy the resulting wallet directory to each Oracle ORAchk and Oracle EXAchk instance directories.

You can also set the environment variable *RAT_WALLET_LOC* to point to the location of the wallet directory.

Other configurable upload values are:

- *RAT_UPLOAD_USER*: controls which user to connect as (default is ORACHKCM).
- *RAT_UPLOAD_TABLE*: controls the table name to store non-zipped collection results in (not used by default).
- *RAT_PATCH_UPLOAD_TABLE*: controls the table name to store non-zipped patch results in (not used by default).
- *RAT_UPLOAD_ORACLE_HOME*: controls *ORACLE_HOME* used while establishing connection and uploading.

  By default, *ORACLE_HOME* is set to Oracle Grid InfrastructureHOME discovered by Oracle ORAchk and Oracle EXAchk.

RCA13_DOCS: is not configurable to use Oracle Health Check Collections Manager as this is the table Oracle Health Check Collections Manager looks for.

RAT_UPLOAD_TABLE and *RAT_PATCH_UPLOAD_TABLE*: are not used by default because the zipped collection details are stored in *RCA13_DOCS*.

You only need to configure *RAT_UPLOAD_TABLE* and *RAT_PATCH_UPLOAD_TABLE* variable if you are using your own custom application to view collection results.

You can also set these values in the wallet, as follows:

```
$ ./orachk -setdbupload all

$ ./exachk -setdbupload all
```

This will prompt you for and set the *RAT_UPLOAD_CONNECT_STRING* and *RAT_UPLOAD_PASSWORD*, then use

```
$ ./orachk -setdbupload RAT_PATCH_UPLOAD_TABLE,RAT_PATCH_UPLOAD_TABLE

$ ./exachk -setdbupload RAT_PATCH_UPLOAD_TABLE,RAT_PATCH_UPLOAD_TABLE
```

Note:

Alternatively, you can set all values set in the wallet using the environment variables. If you're setting the values using *RAT_UPLOAD_CONNECT_STRING* environment variable, then enclose the values in double quotes as follows:

```
export RAT_UPLOAD_CONNECT_STRING="(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myserver.acompnay.com)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)
(SERVICE_NAME=myservice.acompany.com)))"
```

1.9.6.9 Viewing and Reattempting Failed Uploads

Use these procedures to view and reattempt to upload the failed uploads.

Values are stored in *collection_dir*/outfiles/check_env.out to record if the previous database upload was successful or not.

For example, this shows database upload has been setup, but the last upload was unsuccessful:

```
DATABASE_UPLOAD_SETUP=1
DATABASE_UPLOAD_STATUS=0
```

Oracle ORAchk and Oracle EXAchk -checkfaileduploads

To see failed collections, use the `-checkfaileduploads` option:

```
./orachk -checkfaileduploads

./exachk -checkfaileduploads

$ ./orachk -checkfaileduploads

List of failed upload collections
/home/oracle/orachk_myserver_042016_232011.zip
/home/oracle/orachk_myserver_042016_231732.zip
/home/oracle/orachk_myserver_042016_230811.zip
/home/oracle/orachk_myserver_042016_222227.zip
/home/oracle/orachk_myserver_042016_222043.zip
```

Oracle ORAchk and Oracle EXAchk -uploadfailed

To reattempt collection upload you can use the `-uploadfailed` option, specifying either all to upload all or a comma-delimited list of collections:

```
./orachk -uploadfailed all|list of failed collections

./exachk -uploadfailed all|list of failed collections

./orachk -uploadfailed "/home/oracle/orachk_myserver_042016_232011.zip, /home/
oracle/orachk_myserver_042016_231732.zip"
```

Note:

You can not upload previously uploaded collections because of the SQL unique constraint.

1.9.6.10 Tracking Support Incidents

The **Incidents** tab gives you a complete system for tracking support incidents.

- Enter customers and multiple contacts for each customer, specify products and categories, and set up values to limit status codes, severity, and urgency attributes for an incident.
- Raise a new ticket by clicking the Delta (Δ) symbol. Oracle Health Check Collections Manager displays this symbol only in the **Collections** and **Browse** tabs.
- The **Browse** tab allows the user to create a new ticket on individual checks.
- The **Collections** tab allows the user to create a single ticket for entire the collection.
- Delta (Δ) symbol is color coded red, blue, and green based on the ticket status.
  - **RED (No Incident ticket exists)**: initiates the process to create a new incident ticket for the collection or individual checks.
  - **BLUE (An open Incident ticket exists)**: opens the incident ticket for editing.

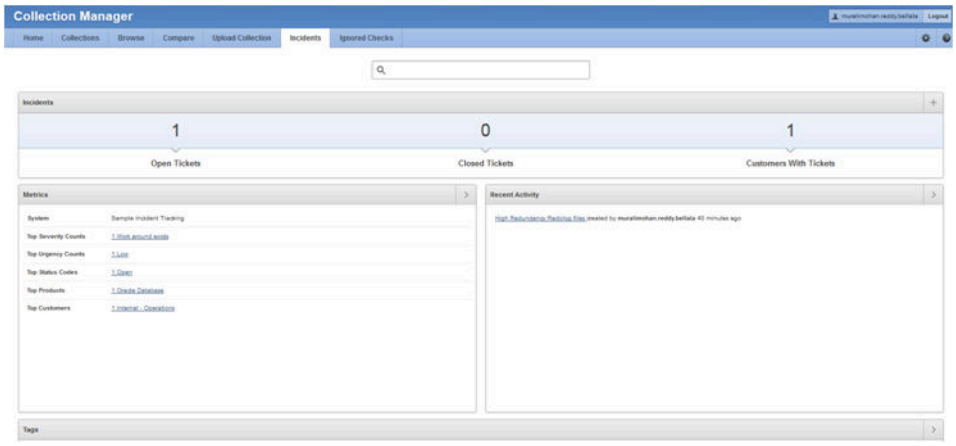
  - **GREEN (A closed Incident ticket exists)**: opens the closed incident ticket for viewing.

- Once a ticket is entered into the system, you can track the progress of the ticket in an update area of the ticket, or add attachments and links to the incident. You can also use tags to further classify incidents and use the resulting tag cloud in your reports.
- Incident access and management can happen only within user's access control range.

Note:

Incident Tracking feature of Oracle Health Check Collections Manager Application is a basic stand-alone system and is not designed for integration with other commercial enterprise level trouble ticketing systems.

Figure 1-109 Incidents Tab



Incident Tracking Features

- Search options
- Track and analyze incident tickets
- Flexible and updateable incident status
- Robust reporting
- Link, Note, and File Attachments
- Flexible Access Control (reader, contributor, administrator model)

Incidents Tab (page 1-133)
Create or edit incident tickets for individual checks or for an entire collection. The statuses of each ticket is represented by icons with different colors. You can act upon by clicking those icons.

1.9.6.10.1 Incidents Tab

Create or edit incident tickets for individual checks or for an entire collection. The statuses of each ticket is represented by icons with different colors. You can act upon by clicking those icons.

Creating Incident Tickets (page 1-134)
Follow these procedures to create incident tickets.

Editing Incident Tickets (page 1-134)
Follow these procedures to edit incident tickets.

1.9.6.10.1.1 Creating Incident Tickets

Follow these procedures to create incident tickets.

1. Click the **Delta (Δ)** symbol colored RED.
2. Add your ticket details.
3. Click **Next.**
4. Select the **Product** and **Product Version**.
5. Click **Next**.
6. Select the `Urgency` of the ticket.
7. Select the **Severity** of the ticket.
8. Select the **Status** of the ticket.
9. Select the **Category** of the ticket.
10. Enter a summary and description of the incident.
11. Click **Create Ticket**.

Editing Incident Tickets

Follow these procedures to edit incident tickets.

1. Click the **Incident** tab.
2. Click **Open Tickets**.
3. Click the ticket.
4. Click **Edit Ticket**.
5. Alter required details, click **Apply Changes**.

> **Note:** Click the delta symbol colored GREEN in the **Collections** or **Browse** tabs to edit incident tickets.

1.9.6.11 Authoring User-Defined Checks

User-defined checks are checks written, tested, verified and maintained by you that are specific to your environment.

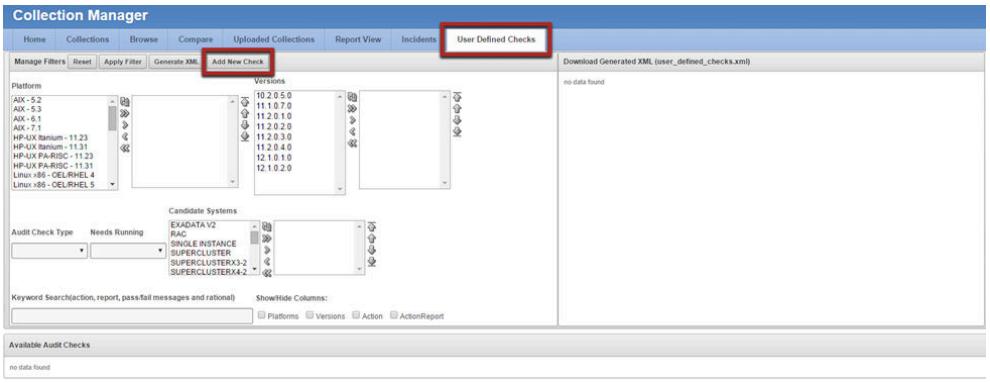
Oracle supports the framework for the creating and running user-defined checks, but not the logic of the checks. It is your responsibility to test, verify, author, maintain and support these checks. The checks are run at runtime by the Oracle ORAchk and Oracle EXAchk script and displays the results of the user-defined checks in the **User Defined Checks** section of the HTML report.

The user-defined checks are stored in the Oracle Health Check Collections Manager schema and output to an XML file, which is co-located with the ORAchk script. When

ORAchk 12.1.0.2.5 and later run on your system, it checks for the presence of this XML file and if it finds one, then by default it will run the checks contained therein and include the results in the standard HTML report.

1. Click the **User Defined Checks** tab, then select **Add New Check**.

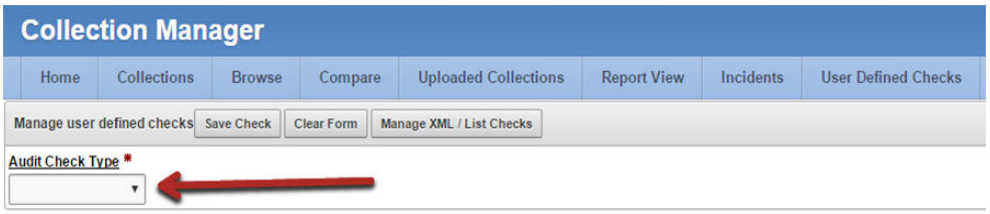
Figure 1-110 User Defined Checks Tab



2. Select **OS Check** or **SQL Check** as **Audit Check Type**.

   This choice decides how your check logic is coded. Operation System checks use a system command to determine the check status. SQL checks run an SQL statement to determine the check status.

Figure 1-111 User Defined Checks Tab - Audit Check Type

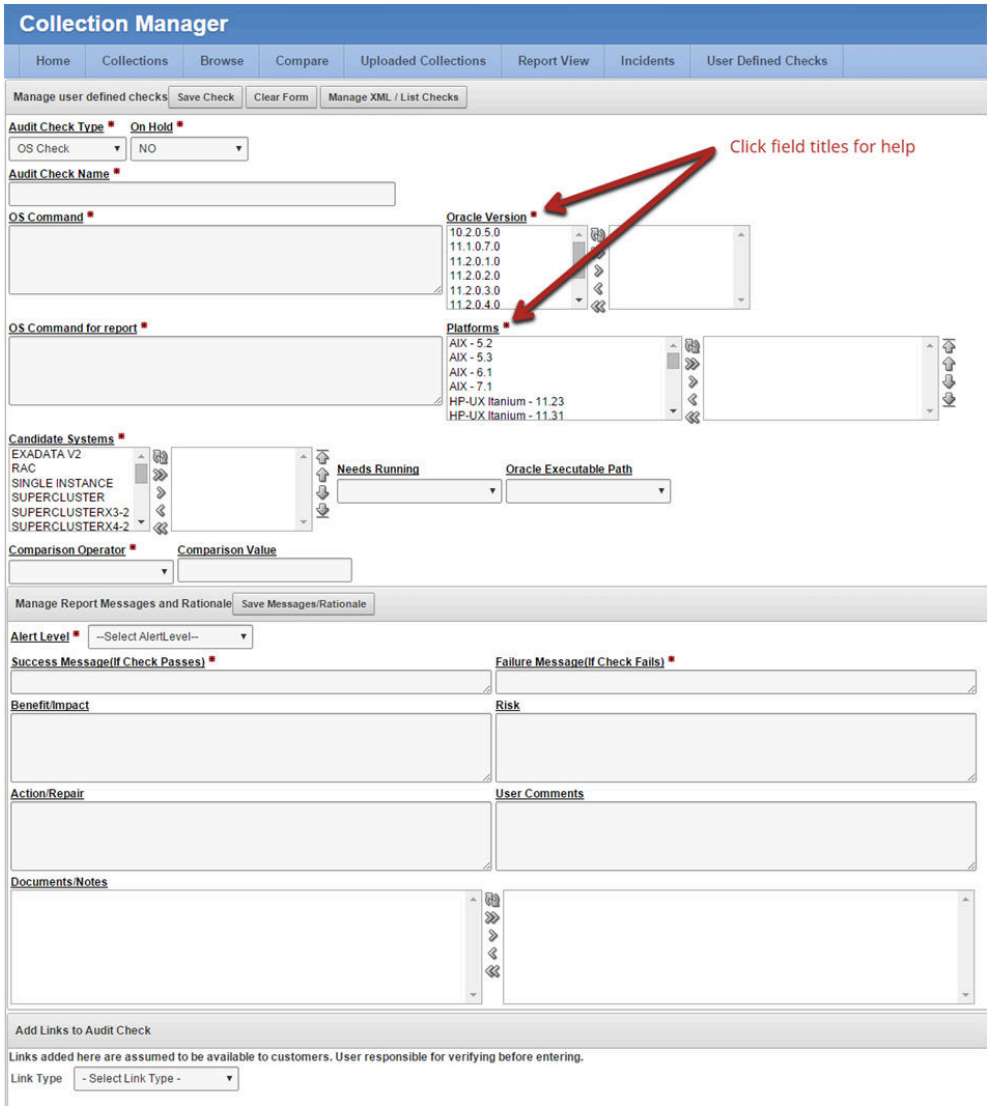


   Once you have selected an Audit Check Type, Oracle Health Check Collections Manager updates the applicable fields.

   Any time during authoring, click the title of a field to see help documentation specific to that field.

   OS and SQL commands are supported. Running user defined checks as root is NOT supported.

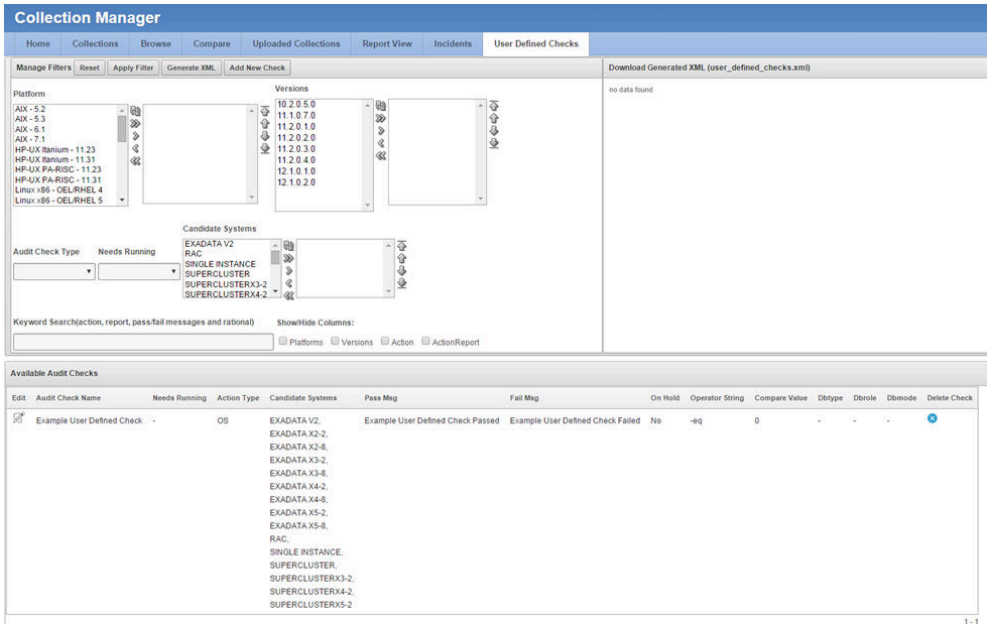
Figure 1-112 User Defined Checks Tab - Audit Check Type - OS Check



Once a check is created it is listed in the **Available Audit Checks** section.

You can create checks and each can be filtered using the filters on this page.

Figure 1-113 User Defined Checks Tab - Available Audit Checks



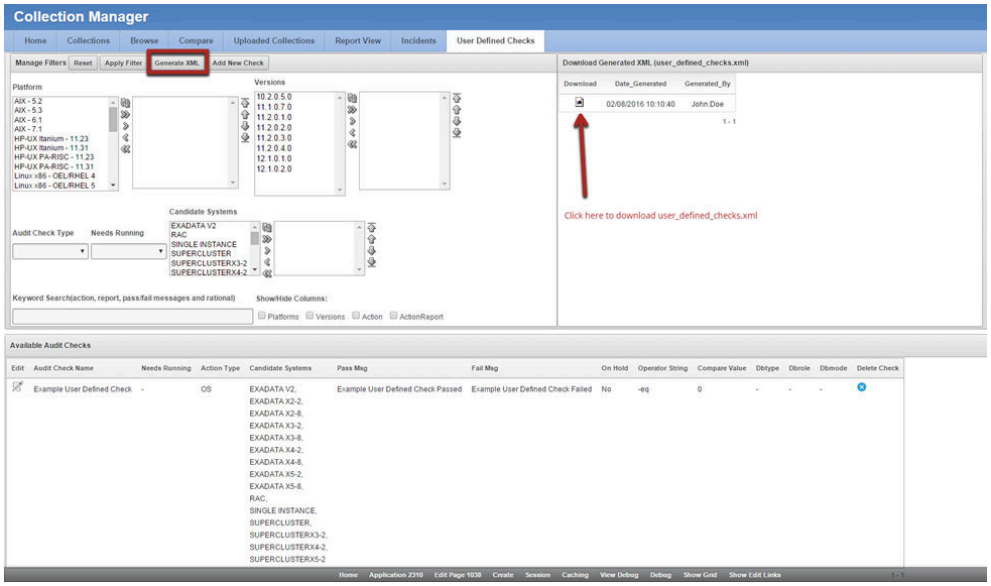
3. Click the **Generate XML**.

   On the right, find a link to download the generated `user_defined_checks.xml` file.

   All the checks that have been authored and have not been placed on hold are included in the XML file when generated. Placing checks on hold is equivalent to a logical delete. If a problem is discovered with a check or the logic has not been perfected it can be placed on hold to keep it from being included in the XML file until such time that it is production ready and the hold can be removed to include it in the XML file next time it is generated.

   Download the `user_defined_checks.xml` file and save it into the same directory as the Oracle ORAchk and Oracle EXAchk tool. Oracle ORAchk and Oracle EXAchk run the user-defined checks the next time they run.

Figure 1-114 User Defined Checks Tab - Download User Defined Checks



Alternatively, to run only the user-defined checks use the profile `user_defined_checks`. When this option is used then the user-defined checks are the only checks run and the**User Defined Checks** section is the only one with results displayed in the report.

```
./orachk -profile user_defined_checks

./exachk -profile user_defined_checks
```

To omit the user defined checks at runtime, use the `-excludeprofile`option.

```
./orachk -excludeprofile user_defined_checks

./exachk -excludeprofile user_defined_checks
```

Running Subsets of Checks (page 1-73)
Where necessary, you can run a subset of health checks.

1.9.7 Oracle Health Check Collections Manager Application Uninstallation

Anytime you can decommission Oracle Health Check Collections Manager Application setup. Follow these steps sequentially to gracefully uninstall the application leaving no residual files.

Deleting Oracle Health Check Collections Manager Application (page 1-139)
You need administrative privileges to uninstall Oracle Health Check Collections Manager Application. After successful uninstallation, application definition and the supporting objects are deleted from the hosting database.

Deleting Workspace Admin (page 1-140)
You need administrative privileges to delete a workspace. There may exist one or more workspaces so be cautious while deleting workspaces.

1.9.7.1 Deleting Oracle Health Check Collections Manager Application

You need administrative privileges to uninstall Oracle Health Check Collections Manager Application. After successful uninstallation, application definition and the supporting objects are deleted from the hosting database.

1. Log in to Oracle Health Check Collections Manager Application.

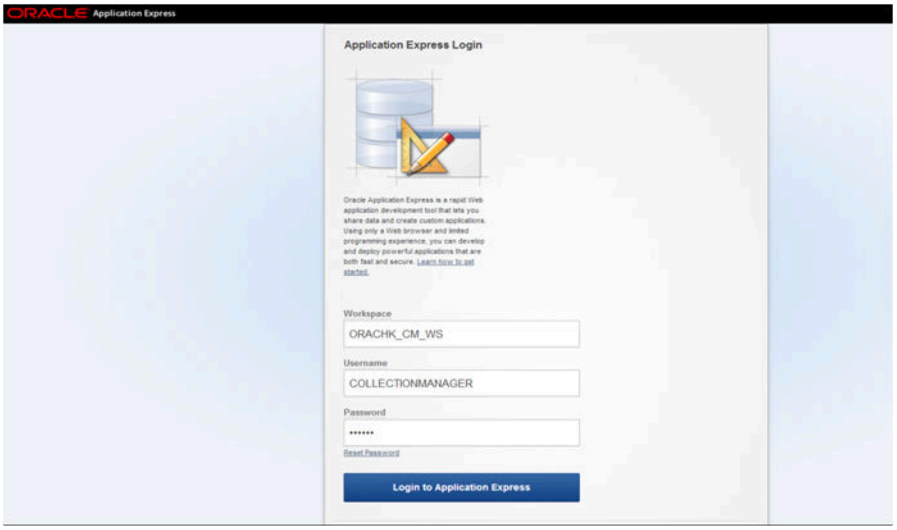
   ```
   http://hostname:port/apex
   http://hostname:port/pls/apex/
   ```

   For example:

   ```
   http://dbserver.domain.com:8080/apex/
   ```

2. Specify the **Workspace Name**, **Workspace Username**, and **Password**, and then click **Login**.

   Figure 1-115 Application Express Login

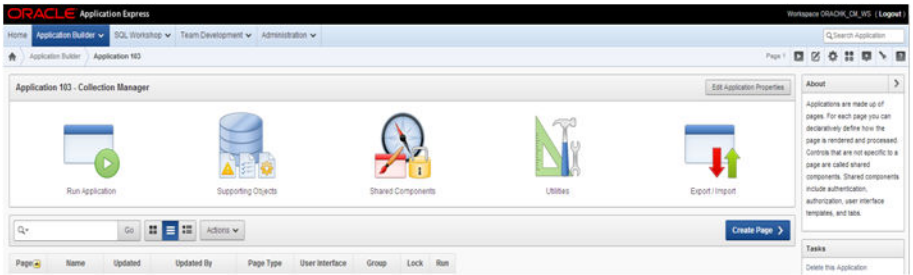
   

3. Click **Application Builder**.

4. Select **Collection Manager Application**, then click **Edit**.

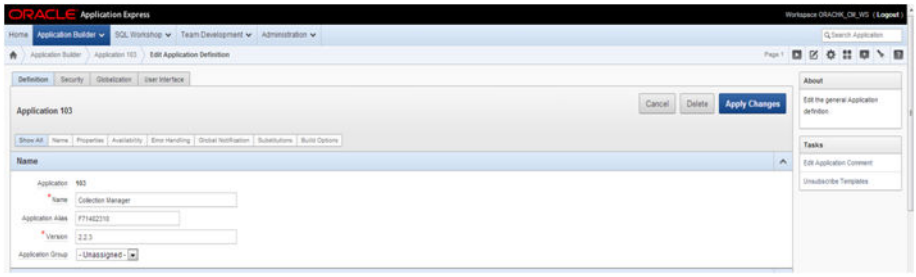
5. Click **Edit Application Page**.

   Figure 1-116 Application Express - Edit Application

6. Click **Delete**.

Figure 1-117 Application Express - Delete



7. Choose **Deinstallation Options**.

   - Select the **Remove Application Definition** & **Deinstall Supporting Objects** Deinstallation Options.
   - Click **Deinstall**.

Figure 1-118 Application Express - Deinstall

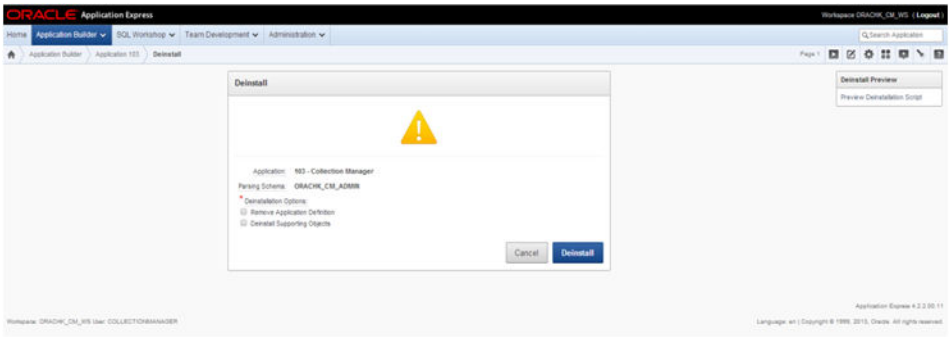
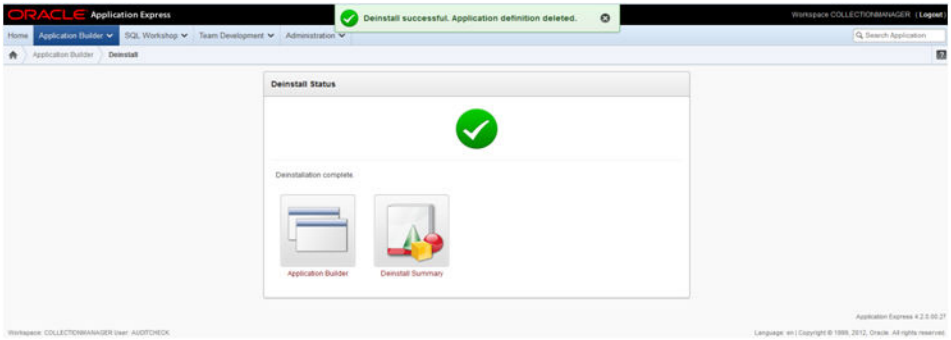


Figure 1-119 Application Express - Deinstall Summary

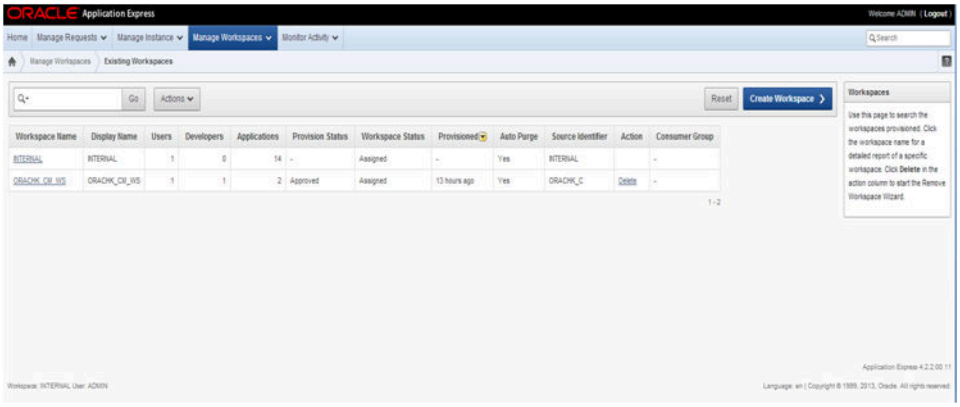


1.9.7.2 Deleting Workspace Admin

You need administrative privileges to delete a workspace. There may exist one or more workspaces so be cautious while deleting workspaces.

1. Log in to Oracle Application Express.
2. Click **Manage Workspaces**.
3. Under **Workspace Reports**, click **Existing Workspaces**, and check the **Workspace** name.

Figure 1-120 Application Express - Manage Workspaces



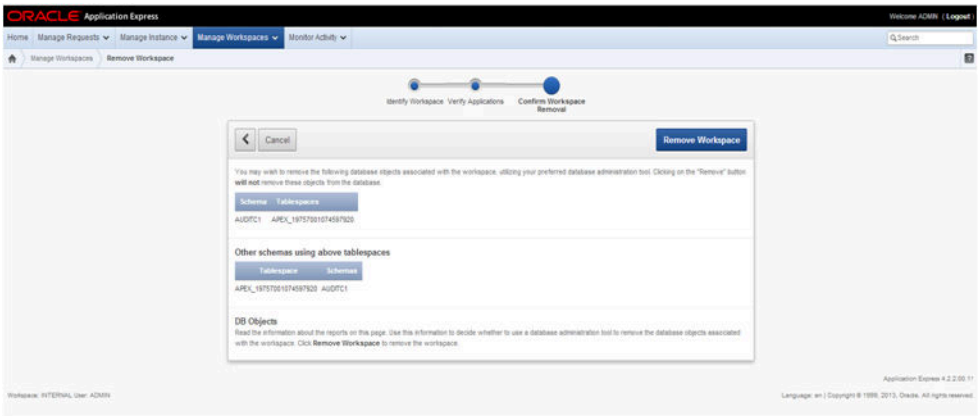
4. Under **Action**, click **Delete**.

5. Select the checkbox to confirm that you want to proceed with the removal and then click **Next**.

Figure 1-121 Application Express - Confirm Delete

6. Click **Remove Workspace**.

Figure 1-122 Application Express - Remove Workspace



The install process displays the `Workspace has been successfully removed` message.

See Also:

Oracle Application Express Installation Guide for more details about uninstallation:

Oracle Application Express Installation Guide

1.9.8 Troubleshooting Oracle Health Check Collections Manager

This topic describes how to troubleshoot Oracle Health Check Collections Manager.

- If you see any error like, `error at line 13: PLS-00201: identifier 'UTL_SMTP' must be declared` in the **Installation Summary**, then grant execute on `UTL_SMTP` privilege to the parsing schema or workspace owner.
- If there is a requirement to download files from within the Oracle Health Check Collections Manager, then two additional steps are required. Note that these steps are NOT required to upload files into Oracle Health Check Collections Manager.

  Prior to installing the Oracle Health Check Collections Manager, run the DDL mentioned below to re-create the Application Express built-in function `WWV_FLOW_EPG_INCLUDE_MOD_LOCAL` in the `APEX_XXXXX` or `FLOW_XXXXXX` schema whichever is appropriate to your environment. After re-creating the function ensure that it is in VALID state.

  ```
  CREATE OR replace FUNCTION Wwv_flow_epg_include_mod_local(
  procedure_name IN VARCHAR2)
  RETURN BOOLEAN
  IS
  BEGIN
      RETURN TRUE; ----- It should be always “RETURN TRUE”
      IF Upper(procedure_name) IN ( '' ) THEN
          RETURN TRUE;
      ELSE
          RETURN FALSE;
      END IF;
  END Wwv_flow_epg_include_mod_local;
  ```

  Once the Oracle Health Check Collections Manager is installed, run `RCA13_GET_DOC` to enable file downloads:

  ```
  SQL> grant execute on RCA13_GET_DOC to public;
  ```

- Ensure that Oracle Application Express is installed successfully. If you have revoked any default system privileges from default Application Express users, then grant them again.
- Ensure that all of the Oracle Application Express related users are not locked and expired.

  ```
  alter user ANONYMOUS account unlock;
  alter user XDB account unlock;
  alter user APEX_PUBLIC_USER account unlock;
  alter user FLOWS_FILES account unlock;
  ```

- If you see any issues in setting up email notifications, then cross verify your ACL permissions and privileges to the application schema on the SMTP mail server.

  For example, to create ACL system and grant privileges to Application schema, do as follows:

```
BEGIN
    DBMS_NETWORK_ACL_ADMIN.CREATE_ACL(acl => 'apex1.xml',
        description => 'APEX ACL',
        principal => 'ORACHK CM USERNAME',
        is_grant => true,
        privilege => 'connect');
    DBMS_NETWORK_ACL_ADMIN.ADD_PRIVILEGE(acl => 'apex1.xml',
        principal => 'ORACHK CM USERNAME',
        is_grant => true,
        privilege => 'resolve');
    DBMS_NETWORK_ACL_ADMIN.ASSIGN_ACL(acl => 'apex1.xml',
        host => 'mailservername.com',lower_port=>10,upper_port=>1000);
END;
/
COMMIT;
```

- If you see any uploaded collection processing is not started or collection status is NEW for long time, then verify database scheduler jobs (`RCA13_PROCESS_DATA` and `RCA13_COLLECTION_3718`) status and ensure that the jobs are enabled and running fine.

  ```
  select * from user_scheduler_jobs where job_name like 'RCA13_13%';
  select * from user_scheduler_running_jobs where job_name like 'RCA13_%'
  select * from user_scheduler_job_run_details where job_name like 'RCA13_%' order
  by log_date desc;
  ```

- If you see collection process is failed due to lack of space in Oracle Application Express tablespace and application schema tablespace, then increase the tablespace sizes as much as needed.

1.10 Integrating Health Check Results with Other Tools

You can integrate health check results from Oracle ORAchk and Oracle EXAchk into Enterprise Manager and other third-party tools.

Integrating Health Check Results with Enterprise Manager (page 1-143)
Integrate health check results from Oracle ORAchk and Oracle EXAchk into Enterprise Manager.

Integrating Health Check Results with Third-Party Tool (page 1-145)
Integrate health check results from Oracle ORAchk and Oracle EXAchk into various third-party log monitoring and analytics tools, such as Elasticsearch and Kibana by using Oracle ORAchk and Oracle EXAchk JSON output results.

Integrating Health Check Results with Custom Application (page 1-146)
Oracle ORAchk and Oracle EXAchk are capable of uploading collection results from multiple instances into a single database for easier consumption of check results across your enterprise.

1.10.1 Integrating Health Check Results with Enterprise Manager

Integrate health check results from Oracle ORAchk and Oracle EXAchk into Enterprise Manager.

See Also:

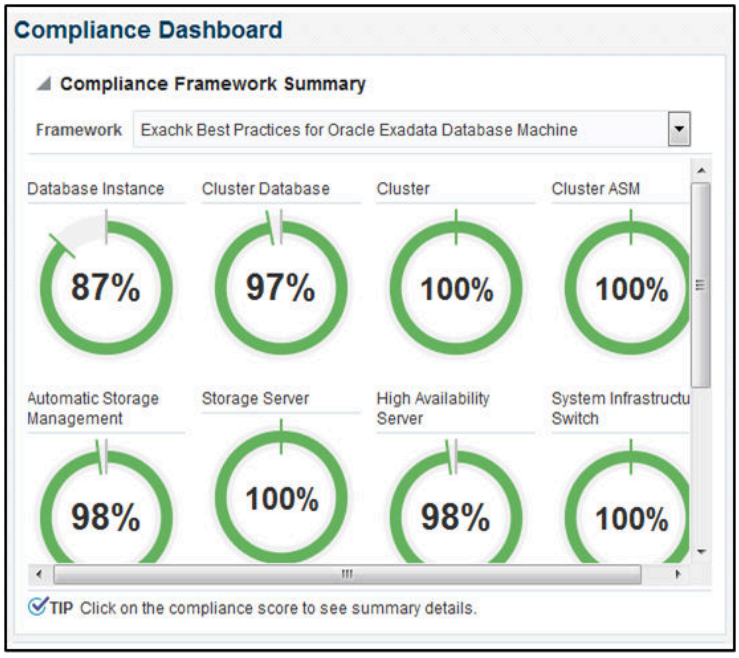
Enterprise Manager versions that support integration are:

- Enterprise Manager System Monitoring Plug-In Installation Guide for Oracle Engineered System Healthchecks
- Enterprise Manager ORAchk Healthchecks Plug-in User's Guide

With Oracle Enterprise Manager Cloud Control 13.1, Oracle ORAchk and Oracle EXAchk check results are also integrated into the compliance framework allowing you to display Compliance Framework Dashboards and browse checks by compliance standards.

- Integrate check results into Enterprise Manager compliance framework.
- View health check results in native Enterprise Manager compliance dashboards.

Figure 1-123 Compliance Dashboard



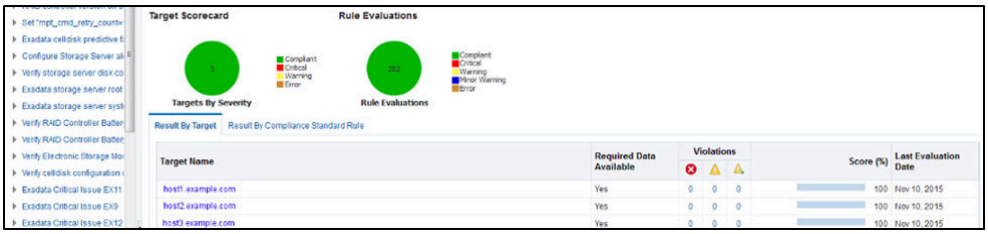
- Related checks are grouped into compliance standards where you can view targets checked, violations, and average score.

Figure 1-124 Compliance Standards

Compliance Standards	Applicable To	Compliance Standard State	Target Evaluations			Violations			Average Score (%)
Exachk Cluster ASM Best Practices For Oracle Exadata Database Machine	Cluster ASM	Production	0	0	1	0	0	0	100
Exachk Oracle Exadata Storage Server Best Practices For Oracle Exadata Database Machine	Oracle Exadata Storage Server	Production	0	0	3	0	0	0	100
Exachk Systems Infrastructure Switch Best Practices For Oracle Exadata Database Machine	Systems Infrastructure Switch	Production	0	0	3	0	0	0	100
Exachk Cluster Best Practices For Oracle Exadata Database Machine	Cluster	Production	0	0	1	0	0	0	100
Exachk Host Best Practices For Oracle Exadata Database Machine	Host	Production	0	0	2	2	2	13	99
Exachk Automatic Storage Management Best Practices For Oracle Exadata Database Machine	Automatic Storage Management	Production	0	0	2	2	1	0	97
Exachk Cluster Database Best Practices For Oracle Exadata Database Machine	Cluster Database	Production	0	0	1	5	3	1	97
Exachk Oracle High Availability Service Best Practices For Oracle Exadata Database Machine	Oracle High Availability Service	Production	0	0	2	2	0	0	98
Exachk Database Instance Best Practices For Oracle Exadata Database Machine	Database Instance	Production	0	0	2	32	8	0	87

- From within a compliance standard, you can drill-down to see individual check results and break the results by targets.

Figure 1-125 Compliance Standards Drill Down



See Also:

Although Oracle ORAchk and Oracle EXAchk do not require additional licenses, you require applicable Oracle Enterprise Manager licenses.

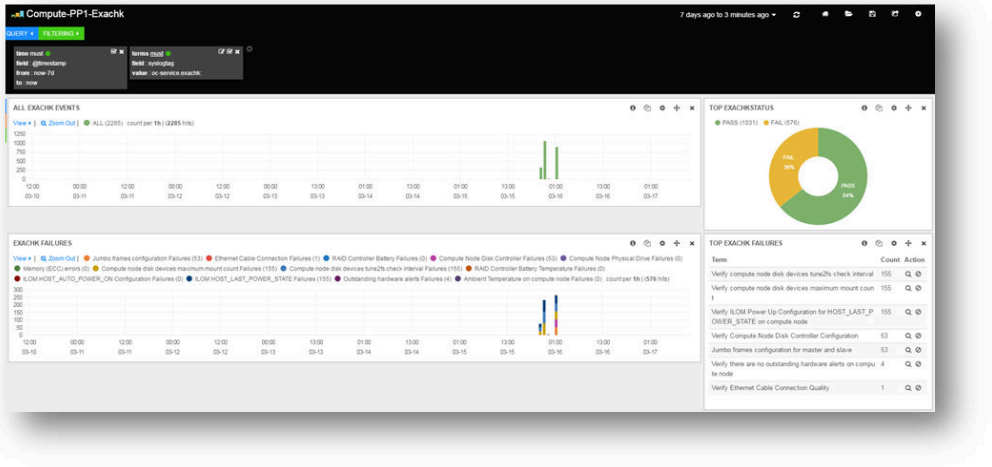
Enterprise Manager Licensing Information User Manual for more details.

1.10.2 Integrating Health Check Results with Third-Party Tool

Integrate health check results from Oracle ORAchk and Oracle EXAchk into various third-party log monitoring and analytics tools, such as Elasticsearch and Kibana by using Oracle ORAchk and Oracle EXAchk JSON output results.

- See Elasticsearch for more details
- See Kibana for more details

Figure 1-126 Third-Party Tool Integration



Oracle ORAchk and Oracle EXAchk create JSON output results in the output upload directory, for example:

```
Report_Output_Dir/upload/mymachine_orachk_results.json
Report_Output_Dir/upload/mymachine_orachk_exceptions.json

Report_Output_Dir/upload/mymachine_exachk_results.json
Report_Output_Dir/upload/mymachine_exachk_exceptions.json
```

Run the `-syslog` option to write JSON results to the syslog daemon, for example:

```
./orachk -syslog
```

```
./exachk -syslog
```

Note:

See Logging Alerts to the syslogd Daemon for more details about configure the types of messages to log and their output location.

Oracle ORAchk and Oracle EXAchk use the message levels: `CRIT`, `ERR`, `WARN`, and `INFO`.

Verify the syslog configuration by running the following commands:

```
$  logger -p user.crit crit_message
$  logger -p user.err err_message
$  logger -p user.warn warn_message
$  logger -p user.info info_message
```

Verify in your configured message location, for example, `/var/adm/messages` that each test message is written.

1.10.3 Integrating Health Check Results with Custom Application

Oracle ORAchk and Oracle EXAchk are capable of uploading collection results from multiple instances into a single database for easier consumption of check results across your enterprise.

You can either use Oracle Health Check Collections Manager or alternatively, use your own custom application to consume the results.

Upload the collection results into the following tables at the end of a collection:

Table 1-15 Uploading Collection Results into a Database

Table	What Get's Uploaded
`rca13_docs`	Full zipped collection results.
`auditcheck_result`	Health check results.
`auditcheck_patch_result`	Patch check results.

If you install Oracle Health Check Collections Manager, the these tables are created by the install script. If the tables are not created, use the following DDL statements:

- **DDL for the RCA13_DOCS table**

```
CREATE TABLE RCA13_DOCS   (
    DOC_ID        NUMBER DEFAULT
to_number(sys_guid(),'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX') NOT NULL ENABLE,
    COLLECTION_ID VARCHAR2(40 BYTE),
    FILENAME      VARCHAR2(1000 BYTE) NOT NULL ENABLE,
    FILE_MIMETYPE VARCHAR2(512 BYTE),
    FILE_CHARSET  VARCHAR2(512 BYTE),
    FILE_BLOB BLOB NOT NULL ENABLE,
    FILE_COMMENTS VARCHAR2(4000 BYTE),
    TAGS          VARCHAR2(4000 BYTE),
    ATTR1         VARCHAR2(200 BYTE),
    UPLOADED_BY   VARCHAR2(200 BYTE) DEFAULT USER,
    UPLOADED_ON TIMESTAMP (6) DEFAULT systimestamp,
```

```
    SR_BUG_NUM    VARCHAR2(20 BYTE),
    CONSTRAINT RCA13_DOCS_PK PRIMARY KEY (DOC_ID),
    CONSTRAINT RCA13_DOCS_UK1 UNIQUE (FILENAME)
  );
```

- **DDL for the auditcheck_result table**

```
create table
auditcheck_result
(
     COLLECTION_DATE TIMESTAMP NOT NULL ENABLE,
     CHECK_NAME VARCHAR2(256),
     PARAM_NAME VARCHAR2(256),
     STATUS VARCHAR2(256),
     STATUS_MESSAGE VARCHAR2(256),
     ACTUAL_VALUE VARCHAR2(256),
     RECOMMENDED_VALUE VARCHAR2(256),
     COMPARISON_OPERATOR VARCHAR2(256),
     HOSTNAME VARCHAR2(256),
     INSTANCE_NAME VARCHAR2(256),
     CHECK_TYPE VARCHAR2(256),
     DB_PLATFORM VARCHAR2(256),
     OS_DISTRO VARCHAR2(256),
     OS_KERNEL VARCHAR2(256),
     OS_VERSION NUMBER,
     DB_VERSION VARCHAR2(256),
     CLUSTER_NAME VARCHAR2(256),
     DB_NAME VARCHAR2(256),
     ERROR_TEXT VARCHAR2(256),
     CHECK_ID VARCHAR2(40),
     NEEDS_RUNNING VARCHAR2(100),
     MODULES VARCHAR2(4000),
     DATABASE_ROLE VARCHAR2(100),
     CLUSTERWARE_VERSION VARCHAR2(100),
     GLOBAL_NAME VARCHAR2(256),
     UPLOAD_COLLECTION_NAME VARCHAR2(256) NOT NULL ENABLE,
     AUDITCHECK_RESULT_ID VARCHAR2(256) DEFAULT sys_guid() NOT NULL ENABLE,
     COLLECTION_ID  VARCHAR2(40),
     TARGET_TYPE    VARCHAR2(128),
     TARGET_VALUE   VARCHAR2(256),
     CONSTRAINT "AUDITCHECK_RESULT_PK" PRIMARY KEY ("AUDITCHECK_RESULT_ID")
);
```

- **DDL for the auditcheck_patch_result table**

```
create table
  auditcheck_patch_result
       ( COLLECTION_DATE     TIMESTAMP(6) NOT NULL,
          HOSTNAME            VARCHAR2(256),
          ORACLE_HOME_TYPE    VARCHAR2(256),
          ORACLE_HOME_PATH    VARCHAR2(256),
          ORACLE_HOME_VERSION VARCHAR2(256),
          PATCH_NUMBER NUMBER,
         CLUSTER_NAME VARCHAR2(256),
         DESCRIPTION         VARCHAR2(256),
         PATCH_TYPE VARCHAR2(128),
         APPLIED NUMBER,
         UPLOAD_COLLECTION_NAME VARCHAR2(256),
         RECOMMENDED NUMBER
         );
```

Store the connection details in an encrypted wallet using the `-setdbupload` option.

Oracle ORAchk and Oracle EXAchk –setdbupload all

Oracle Health Check Collections Manager upload configuration requires the connection string and the password to connect to the database where the collection results are uploaded.

Specify the connection details using the `–setdbupload` option. For default options, use `–setdbupload all`.

```
./orachk -setdbupload all

./exachk -setdbupload all
```

Oracle Health Check Collections Manager prompts you to enter the values for the connection string and password. Collection Manager stores these values in an encrypted wallet file.

Oracle ORAchk and Oracle EXAchk –getdbupload all

To see the values set in the wallet, use the `–getdbupload` option.

```
$ ./orachk –getdbupload

$ ./exachk –getdbupload
```

Oracle ORAchk and Oracle EXAchk can automatically use the default values set in the *RAT_UPLOAD_USER* and *RAT_ZIP_UPLOAD_TABLE* environment variables.

Oracle ORAchk and Oracle EXAchk –checkdbupload all

Verify if Oracle ORAchk and Oracle EXAchk makes successful connection to the database using the **–checkdbupload** option.

```
$ ./orachk –checkdbupload

$ ./exachk –checkdbupload
```

Example 1-9 Oracle ORAchk and Oracle EXAchk –setdbupload all

```
$ ./orachk -setdbupload all

Enter value for RAT_UPLOAD_CONNECT_STRING:(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myserver44.acompany.com)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)
(SERVICE_NAME=orachkcm.acompany.com)))

Enter value for RAT_UPLOAD_PASSWORD:******

Database upload parameters successfully stored in orachk_wallet. orachk run will
keep uploading the collections in database until it is unset using ./orachk -
unsetdbupload all/env <variable name>
```

Note:

Use the fully qualified address (as in the example above) for the connect string rather than an alias from the `tnsnames.ora` file so that it is not necessary to rely on `tnsnames.ora` file name resolution on all the servers where the tool might be run.

Example 1-10 Oracle ORAchk and Oracle EXAchk –getdbupload all

```
$ ./orachk -getdbupload

RAT_UPLOAD_CONNECT_STRING = (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myserver44.acompany.com)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)
(SERVICE_NAME=orachkcm.acompany.com)))

RAT_UPLOAD_PASSWORD = ******

RAT_UPLOAD_USER = ORACHKCM

RAT_ZIP_UPLOAD_TABLE = RCA13_DOCS
```

Example 1-11 Oracle ORAchk and Oracle EXAchk –checkdbupload all

```
$ ./orachk -checkdbupload

Configuration is good to upload result to database.
```

At the end of health check collection, Oracle ORAchk and Oracle EXAchk check if the required connection details are set (in the wallet or the environment variables). If the connection details are set properly, then Oracle ORAchk and Oracle EXAchk upload the collection results.

Tip:

To configure many Oracle ORAchk and Oracle EXAhk instances:

1. Create the wallet once with the `-setdbupload all` option, then enter the values when prompted.
2. Copy the resulting wallet directory to each Oracle ORAchk and Oracle EXAchk instance directories.

You can also set the environment variable *RAT_WALLET_LOC* to point to the location of the wallet directory.

Other configurable upload values are:

- *RAT_UPLOAD_USER*: controls which user to connect as (default is `ORACHKCM`).
- *RAT_UPLOAD_TABLE*: controls the table name to store non-zipped collection results in (not used by default).
- *RAT_PATCH_UPLOAD_TABLE*: controls the table name to store non-zipped patch results in (not used by default).
- *RAT_UPLOAD_ORACLE_HOME*: controls *ORACLE_HOME* used while establishing connection and uploading.

  By default, *ORACLE_HOME* is set to `GI HOME` discovered by Oracle ORAchk and Oracle EXAchk.

RCA13_DOCS: is not configurable to use Oracle Health Check Collections Manager as this is the table Oracle Health Check Collections Manager looks for.

RAT_UPLOAD_TABLE and *RAT_PATCH_UPLOAD_TABLE*: are not used by default because the zipped collection details are stored in *RCA13_DOCS*.

You only need to configure *RAT_UPLOAD_TABLE* and *RAT_PATCH_UPLOAD_TABLE* variable if you are using your own custom application to view collection results.

You can also set these values in the wallet, as follows:

```
$ ./orachk -setdbupload all

$ ./exachk -setdbupload all
```

This will prompt you for and set the *RAT_UPLOAD_CONNECT_STRING* and *RAT_UPLOAD_PASSWORD*, then use

```
$ ./orachk -setdbupload RAT_PATCH_UPLOAD_TABLE,RAT_PATCH_UPLOAD_TABLE

$ ./exachk -setdbupload RAT_PATCH_UPLOAD_TABLE,RAT_PATCH_UPLOAD_TABLE
```

Note:

Alternatively, you can set all values set in the wallet using the environment variables. If you're setting the values using *RAT_UPLOAD_CONNECT_STRING* environment variable, then enclose the values in double quotes as follows:

```
export RAT_UPLOAD_CONNECT_STRING="(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=myserver.acompnay.com)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)
(SERVICE_NAME=myservice.acompany.com)))"
```

Viewing and Reattempting Failed Uploads (page 1-150)
Use these procedures to view and reattempt to upload the failed uploads.

1.10.3.1 Viewing and Reattempting Failed Uploads

Use these procedures to view and reattempt to upload the failed uploads.

Values are stored in *`collection_dir`*`/outfiles/check_env.out` to record if the previous database upload was successful or not.

For example, this shows database upload has been setup, but the last upload was unsuccessful:

```
DATABASE_UPLOAD_SETUP=1
DATABASE_UPLOAD_STATUS=0
```

Oracle ORAchk and Oracle EXAchk -checkfaileduploads

To see failed collections, use the `-checkfaileduploads` option:

```
./orachk -checkfaileduploads

./exachk -checkfaileduploads

$ ./orachk -checkfaileduploads

List of failed upload collections
/home/oracle/orachk_myserver_042016_232011.zip
/home/oracle/orachk_myserver_042016_231732.zip
/home/oracle/orachk_myserver_042016_230811.zip
```

```
/home/oracle/orachk_myserver_042016_222227.zip
/home/oracle/orachk_myserver_042016_222043.zip
```

Oracle ORAchk and Oracle EXAchk -uploadfailed

To reattempt collection upload you can use the `-uploadfailed` option, specifying either all to upload all or a comma-delimited list of collections:

```
./orachk -uploadfailed all|list of failed collections

./exachk -uploadfailed all|list of failed collections

./orachk -uploadfailed "/home/oracle/orachk_myserver_042016_232011.zip, /home/
oracle/orachk_myserver_042016_231732.zip"
```

Note:

You can not upload previously uploaded collections because of the SQL unique constraint.

1.11 Troubleshooting Oracle ORAchk and Oracle EXAchk

Follow the steps explained in this section to troubleshoot and fix Oracle ORAchk and Oracle EXAchk related issues.

1.11.1 How to Troubleshoot Oracle ORAchk and Oracle EXAchk Issues

Follow these steps to fix Oracle ORAchk and Oracle EXAchk related issues.

1. Ensure that you are using the correct tool.

If you have an Oracle Engineered System other than ODA, then use Oracle EXAchk. For all other systems, use Oracle ORAchk.

2. Ensure that you are using the latest versions of Oracle ORAchk and Oracle EXAchk.

   New versions are released every three months.

   a. Check the version using the *–v* option:

      ```
      $ ./orachk -v

      $ ./exachk -v
      ```

   b. Compare your version with the latest version available here:

      i. For Oracle ORAchk, refer to My Oracle Support Note 1268927.2, which is available at the following URL:

         ORAchk Health Checks For The Oracle Stack

      ii. For Oracle EXAchk, refer to My Oracle Support Note 1070954.1, which is available at the following URL:

         Oracle Exadata Database Machine exachk or HealthCheck

3. Check the **FAQ** for similar problems in My Oracle Support Note 1070954.1.

4. Review files within the `log` directory.

   - Check applicable `error.log` files for relevant errors.

     This file contains `stderr` output captured during the run, not everything you see in here will mean you have a problem, but if you have a problem this may give more information.

     – *output_dir*`/log/orachk _error.log`

     – *output_dir*`/log/exachk _error.log`

   - Check applicable log for other relevant information.

     – *output_dir*`/log/orachk.log`

     – *output_dir*`/log/exachk.log`

5. Review My Oracle Support Notes for similar problems.

6. For Oracle ORAchk issues, check My Oracle Support Community (MOSC), which is available at the following URL:

   ORAchk (MOSC)

7. If necessary capture debug output, log a new SR and attach the resulting `zip` file.

Output Files and Directories (page 1-43)
Oracle ORAchk and Oracle EXAchk create an output directory that contains various files for you to examine.

How to Capture Debug Output (page 1-153)
Follow these procedures to capture debug information.

1.11.2 How to Capture Debug Output

Follow these procedures to capture debug information.

To capture debug output, use the following process:

1. Before enabling debug, reproduce the problem with the least run necessary.

   - Debug captures a lot, the resulting `zip` file can be large so try to narrow down the amount of run necessary to reproduce the problem.

     Use relevant command line options to limit the scope of checks.

2. Enable debug.

   If you are running the tool in on-demand mode, use the `-debug` option:

```
$ ./orachk -debug

$ ./exachk -debug

$ ./orachk -debug
+ PS4='$(date "+ $LINENO: + ")'
 36276: + [[ -z 1 ]]
  36302: + sed 's/[\.\/]//g'
   36302: + basename /global/u01/app/oracle/arch03/ORACLE_CHECK/ORACLE_SR/orachk
  36302: + echo orachk
 36302: + program_name=orachk
  36303: + which bash
  36303: + echo 0
 36303: + bash_found=0
 36304: + SSH_PASS_STATUS=0
 36307: + set +u
 36309: + '[' 0 -ne 0 ']'
 36315: + raccheck_deprecate_msg='RACcheck has been deprecated.  ORAchk provides
the same functionality.  Please switch to using ORAchk from same directory.\n
\nRACcheck will not be available after this (12.1.0.2.3) release.\n\nSee MOS
Note "RACcheck Configuration Audit Tool Statement of Direction - name change to
ORAchk (Doc ID 1591208.1)".\n'
 36316: + '[' orachk = raccheck ']'
 36325: + export LC_ALL=C
 36325: + LC_ALL=C
 36326: + NO_WRITE_PASS=0
 36327: + ECHO=:
 36328: + DEBUG=:
 36329: + AUDITTAB=db_audit
 36379: + supported_modules='PREUPGR
 . . . . . .
 . . . . . .
```

   When debug is enabled, Oracle ORAchk and Oracle EXAchk create a new debug log file in:

   - *output_dir*`/log/orachk _debug_`*date_stamp_time_stamp*`.log`
   - *output_dir*`/log/exachk _debug_`*date_stamp_time_stamp*`.log`

   This will contain:

   - `bash -x` of program on local node

- `bash -x` of program on all remote nodes
- `bash -x` of all dynamically generated and called scripts
  - The *`output_dir`* directory retains a number of other temporary files used during health checks.
  - If you run health checks using the daemon, then restart the daemon with the `-d start_debug` option.

    Running this command generates both debug for daemon and include debug in all client runs:

    ```
    $ ./orachk -d start_debug

    $ ./exachk -d start_debug
    ```

When debug is run with the daemon, Oracle ORAchk and Oracle EXAchk create a daemon debug log file in the directory the daemon was started:

```
orachk_daemon_debug.log

exachk_daemon_debug.log
```

3. Collect the resulting output `zip` file, and the daemon debug log file if applicable.

Controlling the Scope of Checks (page 1-86)
List of commands to control the scope of checks.

1.11.3 Error Messages or Unexpected Output

Troubleshoot and fix error messages and unexpected output.

Data Entry Terminal Considerations (page 1-155)
Use any supported UNIX and Linux terminal type (character mode terminal, ILOM, VNC server) to run Oracle ORAchk and Oracle EXAchk. Respond to the prompts during interactive run, or while configuring the daemon.

Tool Runs without Producing Files (page 1-155)
Oracle ORAchk and Oracle EXAchk create temporary files and directories at runtime, as well as output files for data collection.

Messages similar to “line ****: **** Killed $perl_cmd 2>> $ERRFIL?” (page 1-156)
Oracle ORAchk and Oracle EXAchk has a built-in `watchdog` process that monitors and kills commands that exceed default timeouts to prevent hangs.

Messages similar to “RC-001- Unable to read driver files” (page 1-156)
There are a number of possible causes related to not having a supported platform or not being able to read or write into temporary, working or installation directories.

Messages similar to “There are prompts in user profile on [hostname] which will cause issues in [tool] successful execution” (page 1-156)
Oracle ORAchk and Oracle EXAchk sources the user environment file on all nodes and if those contain prompts, for example, `read -p`, or other commands that pause the running commands, then the commands timeout because there is no way to respond to the messages when its being called.

Messages similar to "Syntax error near unexpected token $tag" (page 1-157)
This error is caused if you have not installed the correct version of Bash.

Problems Related to Remote Login (page 1-157)
Troubleshoot and fix issues related to remote logins.

Messages similar to "Another instance of orachk/exachk is running" (page 1-157)
This error occurs if the previous session was abruptly terminated. Abruptly ending a session leaves the process ID lock file in the temporary folder.

Other Error Messages in orachk_error.log or exachk_error.log (page 1-158)
When examining the `orachk_error.log` , some errors should appear. Some errors are expected errors and are not indicative of problems. These errors are redirected and absorbed into the `error.log` to keep them from being reported on the screen. You do not need to report these types of errors to Oracle Support.

1.11.3.1 Data Entry Terminal Considerations

Use any supported UNIX and Linux terminal type (character mode terminal, ILOM, VNC server) to run Oracle ORAchk and Oracle EXAchk. Respond to the prompts during interactive run, or while configuring the daemon.

Each terminal type has advantages and disadvantages. The impact of a dropped network connection varies based on the terminal type used.

For example, in an interactive run using a character mode terminal, if all the prompts are answered prior to the network drop and the update messages are scrolling by, then the running process completes successfully even if the network connection drops. If the network connection drops before all of the input prompts are answered, then all of the running processes hang. Clean up the hung processes manually when the network connection is restored.

Using a remote connection to a VNC server running on the database where Oracle ORAchk and Oracle EXAchk are running minimizes the network drop interruptions.

If you use accessibility software or devices that prevents the use of a VNC server, and experience network drops, then you must work with your network team and system administrator to determine the root cause and adjust the environment as required.

For example, if an accessibility aid inserts suspensions and restarts the interactive process running Oracle ORAchk and Oracle EXAchk leads to an operating system timeout due to terminal inactivity. Lengthen the inactivity timeouts of the environment before running the commands.

The timeout caused by an assistive tool at the operating system level due to terminal inactivity is not specific to Oracle ORAchk and Oracle EXAchk. The timeout could happen to any process managed by the assistive technology.

1.11.3.2 Tool Runs without Producing Files

Oracle ORAchk and Oracle EXAchk create temporary files and directories at runtime, as well as output files for data collection.

If you cancel Oracle ORAchk using control-C or if Oracle ORAchk fails due to an error, then it cleans up files that it created while running.

If Oracle ORAchk or Oracle EXAchk complete health check runs but did not generate output files, then there is an error probably near the end of the run that caused an

ungraceful exit. If the problem persists, then run the tool again in debug mode and examine the output. If necessary contact Oracle Support for assistance.

How to Capture Debug Output (page 1-153)
Follow these procedures to capture debug information.

1.11.3.3 Messages similar to "line ****: **** Killed $perl_cmd 2>> $ERRFIL?"

Oracle ORAchk and Oracle EXAchk has a built-in `watchdog` process that monitors and kills commands that exceed default timeouts to prevent hangs.

The error message is a result of a killed command.

Slow Performance, Skipped Checks and Timeouts (page 1-163)
Follow these procedures to address slow performance and other issues.

1.11.3.4 Messages similar to "RC-001- Unable to read driver files"

There are a number of possible causes related to not having a supported platform or not being able to read or write into temporary, working or installation directories.

Oracle ORAchk and Oracle EXAchk display the same error message also as, `RC-002-Unable to read driver files`

Troubleshooting Process

1. Verify that you are running on a supported platform, see:
2. Verify that there is sufficient diskspace available in the temporary or output directory. If necessary increase disk space or direct temporary and output files elsewhere.
3. Verify the hidden subdirectory `.cgrep` exits within the install location. This directory contains various support files some of which are platform-specific.
4. Verify that you are able to write into and read out of the temporary and working directory location.

Output Files and Directories (page 1-43)
Oracle ORAchk and Oracle EXAchk create an output directory that contains various files for you to examine.

Permission Problems (page 1-163)
You need to have necessary directory permissions to run Oracle ORAchk and Oracle EXAchk.

1.11.3.5 Messages similar to "There are prompts in user profile on [hostname] which will cause issues in [tool] successful execution"

Oracle ORAchk and Oracle EXAchk sources the user environment file on all nodes and if those contain prompts, for example, `read -p`, or other commands that pause the running commands, then the commands timeout because there is no way to respond to the messages when its being called.

If Oracle ORAchk or Oracle EXAchk detects prompts in the user profile, then it displays the referenced message and exits.

All such commands may not be detected in the environment, but those that are might lead to this message.

Troubleshooting Process

Comment all such prompts from the user profile file (at least temporarily) and test run again.

1.11.3.6 Messages similar to “Syntax error near unexpected token $tag”

This error is caused if you have not installed the correct version of Bash.

When you run Oracle ORAchk and Oracle EXAchk, you may get an error similar to this:

```
./orachk: line 21817: syntax error near unexpected token `"$tag"'   ./orachk: line
21817: `     ?*) path+=("$tag") ;;'
```

Troubleshooting Process

Install Bash 3.2 or later.

1.11.3.7 Problems Related to Remote Login

Troubleshoot and fix issues related to remote logins.

Messages similar to "-bash: /usr/bin/ssh -q: No such file or directory”

See Remote Login Problems (page 1-161) for more details.

Messages similar to ”/usr/bin/scp -q: No such file or directory “

See Remote Login Problems (page 1-161) for more details.

1.11.3.8 Messages similar to “Another instance of orachk/exachk is running”

This error occurs if the previous session was abruptly terminated. Abruptly ending a session leaves the process ID lock file in the temporary folder.

The following text appears when you attempt to run Oracle ORAchk and Oracle EXAchk:

```
Another instance of orachk is running on myhost. Please allow it to finish on myhost
before you run it on another node.
```

Troubleshooting Process

1. Verify that the previous process is terminated, using the command as follows::

   ```
   $ ps -ef | grep orachk

   $ ps -ef | grep exachk
   ```

2. Terminate the process if it is still running, using the command as follows:

   ```
   $ kill pid
   ```

3. Verify if the temporary directory generated by Oracle ORAchk during the previous run is deleted. If the directory still exists, delete it.

   - By default the temporary directory is, `$HOME/.orachk` or `$HOME/.exachk`.
   - You can override the default temporary directory using the environment variable `RAT_TMPDIR`.

1.11.3.9 Other Error Messages in orachk_error.log or exachk_error.log

When examining the `orachk_error.log` , some errors should appear. Some errors are expected errors and are not indicative of problems. These errors are redirected and absorbed into the `error.log` to keep them from being reported on the screen. You do not need to report these types of errors to Oracle Support.

For example, an error similar to the following may be reported numerous times, once for each Oracle software home for each node:

```
/bin/sh: /u01/app/11.2.0/grid/OPatch/opatch: Permission denied
chmod: changing permissions of `/u01/app/oracle_ebs/product/11.2.0.2/
VIS_RAC/.patch_storage': Operation not permitted
OPatch could not open log file, logging will not be possible
Inventory load failed... OPatch cannot load inventory for the given Oracle Home.
```

These types of errors occur in role-separated environments when the tool is run as the Oracle Database software owner attempts to list the patch inventories of homes that are owned by other users (GRID or other database home owners) using `Opatch`. When you run `Opatch` to list the patch inventories for those other users, it fails because the current user does not have permissions on the other homes. In these cases, the `Opatch` error is ignored and the patch inventories for those homes are gathered by other means. This is an example of why it is recommended to run as root in role-separated environments.

Additionally, ignore the errors similar to the following:

```
./orachk: line [N]: [: : integer expression expected
```

The line number may change over time but this error just means that the tool was expecting an integer return value and no value was found, That is, the value was null so the shell returns this error when attempting to make the comparison. This error might be repeated many times for the same command, once for each node.

1.11.4 Operating System Is Not Discovered Correctly

If Oracle ORAchk and Oracle EXAchk is not able to detect the platform, then they will prompt stating that the data needed for the derived platform could not be found to improperly detecting an unsupported platform.

Set *RAT_OS* to the correct operating system:

```
$ export RAT_OS=platform
```

1.11.5 Clusterware or Database is not Detected or Connected Issues

Troubleshoot and fix Clusterware or database related issues.

Clusterware Software is Installed, but Cannot be Found (page 1-159)
Oracle ORAchk discovers the location of the Clusterware home from the `oraInst.loc` and `oraInventory` files.

Database Software Is Installed, but Cannot Be Found (page 1-159)
If the database software is installed, but Oracle ORAchk and Oracle EXAchk cannot find it, then set the *RAT_ORACLE_HOME* environment variable to the applicable `ORACLE_HOME` directory.

Database Software Is Installed, but Version cannot Be Found (page 1-160)
If the Database software is installed, but Oracle ORAchk and Oracle EXAchk cannot find the correct version, then set the *RAT_DB* environment variable to the applicable version.

ASM Software is Installed, but Cannot be Found (page 1-160)
If the ASM software is installed, but Oracle ORAchk and Oracle EXAchk cannot find it, then set the *RAT_ASM_HOME* environment variable to the applicable home directory.

Database Discovery Issues on RAC Systems (page 1-160)
On RAC systems, Oracle ORAchk discovers the database resources registered in the Oracle Cluster Registry. The *ORACLE_HOME* for the database resources is derived from the profile of the database resources.

Database Login Problems (page 1-161)
If you run Oracle ORAchk and Oracle EXAchk as a user other than the database software installation owner, `root` or `grid`, and if you experience problems connecting to the database, then perform the following steps:

1.11.5.1 Clusterware Software is Installed, but Cannot be Found

Oracle ORAchk discovers the location of the Clusterware home from the `oraInst.loc` and `oraInventory` files.

Clusterware discovery can fail due to:

- Problems discovering those files.
- Problems with the files themselves.
- One or more paths in those files are incorrect.

Troubleshooting Process

1. Ensure that the `oraInst.loc` file is located correctly and is properly formed.

   If it is not in the default location, then set the *RAT_INV_LOC* environment variable to point to the `oraInventory` directory:

   ```
   $ export RAT_INV_LOC=oraInventory directory
   ```

2. If necessary set the *RAT_CRS_HOME* environment variable to point to the location of the Clusterware home:

   ```
   $ export RAT_CRS_HOME=CRS_HOME
   ```

1.11.5.2 Database Software Is Installed, but Cannot Be Found

If the database software is installed, but Oracle ORAchk and Oracle EXAchk cannot find it, then set the *RAT_ORACLE_HOME* environment variable to the applicable `ORACLE_HOME` directory.

```
$ export RAT_ORACLE_HOME=ORACLE_HOME
```

Oracle ORAchk and Oracle EXAchk perform best practice and recommended patch checks for all the databases running from the home specified in the *RAT_ORACLE_HOME* environment variable.

1.11.5.3 Database Software Is Installed, but Version cannot Be Found

If the Database software is installed, but Oracle ORAchk and Oracle EXAchk cannot find the correct version, then set the *RAT_DB* environment variable to the applicable version.

```
$ export RAT_DB=11.2.0.3.0
```

.

1.11.5.4 ASM Software is Installed, but Cannot be Found

If the ASM software is installed, but Oracle ORAchk and Oracle EXAchk cannot find it, then set the *RAT_ASM_HOME* environment variable to the applicable home directory.

```
$ export RAT_ASM_HOME=ASM_HOME
```

1.11.5.5 Database Discovery Issues on RAC Systems

On RAC systems, Oracle ORAchk discovers the database resources registered in the Oracle Cluster Registry. The *ORACLE_HOME* for the database resources is derived from the profile of the database resources.

If there is a problem with any of that, then Oracle ORAchk may not be able to recognize or connect to one or more databases. If this occurs the problems should be found and addressed. However, use the `-dbnames` option temporarily to workaround this problem. Specify the names of the database in a comma-delimited list as follows:

```
$ ./orachk -dbnames ORCL,ORADB
```

Alternatively, you can use the space-delimited environment variable *RAT_DBNAMES*:

```
$ export RAT_DBNAMES="ORCL ORADB"
```

Use double quotes if you are specifying more than one database.

Note:

If you configure *RAT_DBNAMES* as a subset of databases registered in the Clusterware, and you want the patch inventories of ALL databases found registered in the Clusterware to have their patch inventories checked for recommended patches then you must also configure *RAT_DBHOMES*.

By default, the recommended patch analysis is limited to the homes for the list of databases specified in the *RAT_DBNAMES* environment variable.

To perform the recommended patch analysis for additional database homes than just those specified in the *RAT_DBNAMES* environment variable, set space-delimited list of all database names in the *RAT_DBHOMES* environment variable.

For example:

```
export RAT_DBNAMES="ORCL ORADB"

export RAT_DBHOMES="ORCL ORADB PROD"
```

Best practice checks are applied to `ORACL` and `ORADB`.

Recommended patch checks are applied to `ORACL`, `ORADB` and `PROD`.

1.11.5.6 Database Login Problems

If you run Oracle ORAchk and Oracle EXAchk as a user other than the database software installation owner, `root` or `grid`, and if you experience problems connecting to the database, then perform the following steps:

1. Login as `grid` (operating system) user on the system.
2. Run `export ORACLE_HOME=`*`path of Oracle database home`*
3. Run `export ORACLE_SID=`*`database SID`*
4. Run `export PATH=$ORACLE_HOME/bin:$ORACLE_HOME/lib:$PATH`
5. Add alias in the `$ORACLE_HOME/network/admin/tnsnames.ora` file for*`database SID`*.
6. Connect to the database using `$ORACLE_HOME/bin/sqlplus "sys@`*`SID`*` as sysdba"`, and enter the password.
7. Ensure that you have a successful connection.

If this method of connecting to the database does not work, then Oracle ORAchk and Oracle EXAchk do not connect either.

- If you have multiple homes owned by different users and you are not able to login to the target database as the user running Oracle ORAchk independently in SQL*Plus, then Oracle ORAchk does not login either.
- If the operating system authentication is not set up, then it should still prompt you for user name and password.

1.11.6 Remote Connections

Troubleshoot and fix remote connections issues.

Remote Login Problems (page 1-161)
If Oracle ORAChk and Oracle EXAchk have problem locating and running SSH or SCP, then the tools cannot run any remote checks.

1.11.6.1 Remote Login Problems

If Oracle ORAChk and Oracle EXAchk have problem locating and running SSH or SCP, then the tools cannot run any remote checks.

Additionally, if passwordless remote root login is not permitted over SSH or Expect is not able to pass the root password, then the root privileged commands do not work

1. Verify that the SSH and SCP commands can be found.
   - If SSH commands return the error, `-bash: /usr/bin/ssh -q: No such file or directory`, then it may be because SSH is not located where expected.

     Set the *RAT_SSHELL* environment variable pointing to the location of SSH:

     ```
     $ export RAT_SSHELL=path to ssh
     ```

- If SCP commands return the error, `/usr/bin/scp -q: No such file or directory`, then it may be because SCP is not located where expected.

  Set the *RAT_SCOPY* environment variable pointing to the location of SCP:

  ```
  $ export RAT_SCOPY=path to scp
  ```

2. Verify that the user you are running as can run the following command manually from where you are running Oracle ORAchk and Oracle EXAchk to whichever remote node is failing.

   ```
   $ ssh root@remotehostname "id"
   root@remotehostname's password:
   uid=0(root) gid=0(root) groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),
   10(wheel)
   ```

   - If this fails, then engage the systems administrators to correct this if only temporarily for running the tool.
   - Oracle ORAchk and Oracle EXAchk search for the prompts or traps in remote user profiles. However, the tools may miss some. If you have prompts in remote profiles comment them out at least temporarily and test run again.
   - If the passwordless remote root login can be configured, edit the `/etc/ssh/sshd_config` file as follows:

     ```
     n to yes
     ```

     Now, run the following command as root on all nodes of the cluster:

     ```
     hd restart
     ```

3. Enable Expect debugging.

   - Oracle ORAchk uses the Expect utility when available to answer password prompts to connect to remote nodes for password validation as well as running root collections, without logging the actual connection process by default.
   - Set environment variables to help debug remote target connection issues.
     - ***RAT_EXPECT_DEBUG***: If this variable is set to `-d` , then the Expect command tracing is activated. The trace information is written to the standard output.

       For example:

       ```
       export RAT_EXPECT_DEBUG=-d
       ```

     - ***RAT_EXPECT_STRACE_DEBUG***: If this variable is set to `strace`, `strace` calls the Expect command. The trace information is written to the standard output.

       For example:

       ```
       export RAT_EXPECT_STRACE_DEBUG=strace
       ```

   - By varying the combinations of these two variables, you can get three levels of Expect connection trace information.

     Note:

These two variables should only be set at the direction of Oracle support or development. They are typically used in combination with other variables and user interface options to restrict the amount of data collected during the tracing, and the "script" command to capture standard output. They should not be set for a full Oracle ORAchk run as that will generate a large amount of data, and if the "script" command is not used, the trace data will simply scroll by on the screen and be lost!

As a temporary workaround while you resolve remote problems you can run reports local on each node then merge them together later.

On each node, run:

```
./orachk -local

./exachk -local
```

Then merge the collections to obtain a single report.

```
./orachk –merge zipfile 1  zip file 2 > zip file 3 > zip file ...

./exachk –merge zipfile 1  zip file 2 > zip file 3 > zip file ...
```

1.11.7 Permission Problems

You need to have necessary directory permissions to run Oracle ORAchk and Oracle EXAchk.

1. Verify that the permissions on the tools scripts `orachk` and `exachk` are set to `755 (-rwxr-xr-x)`.

   If the permissions are not currently set to 755, then set the permissions as follows:

   ```
   $ chmod 755 orachk

   $ chmod 755 exachk
   ```

2. If Oracle ORAchk and Oracle EXAchk were installed by root and you are running as a different user, then you may not have the necessary directory permissions.

   ```
   [root@randomdb01 exachk]# ls -la
   total 14072
   drwxr-xr-x  3 root root    4096 Jun  7 08:25 .
   drwxrwxrwt 12 root root    4096 Jun  7 09:27 ..
   drwxrwxr-x  2 root root    4096 May 24 16:50 .cgrep
   -rw-rw-r--  1 root root 9099005 May 24 16:50 collections.dat
   -rwxr-xr-x  1 root root  807865 May 24 16:50 exachk
   -rw-r--r--  1 root root 1646483 Jun  7 08:24 exachk.zip
   -rw-r--r--  1 root root    2591 May 24 16:50 readme.txt
   -rw-rw-r--  1 root root 2799973 May 24 16:50 rules.dat
   -rw-r--r--  1 root root     297 May 24 16:50 UserGuide.txt
   ```

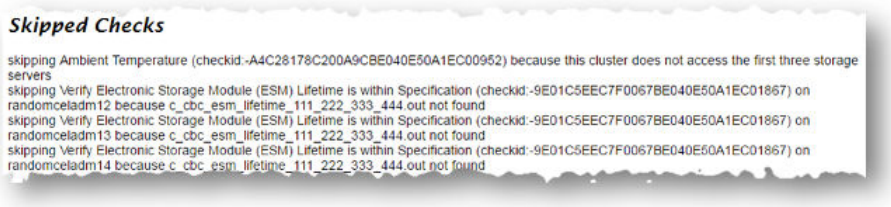
In which case, you need to run as root or unzip again as the Oracle software install user.

1.11.8 Slow Performance, Skipped Checks and Timeouts

Follow these procedures to address slow performance and other issues.

When Oracle ORAchk and Oracle EXAchk run commands, a child process is spawned to run the command and a watchdog daemon monitors the child process. If the child process is slow or hung, then the watchdog kills the child process and the check is registered as skipped:

Figure 1-127 Skipped Checks



The `watchdog.log` file also contains entries similar to **killing stuck command**.

Depending on the cause of the problem you may not see skipped checks.

1. Determine if there is a pattern to what is causing the problem.

   - EBS checks, for example, depend on the amount of data present and may take longer than the default timeout.
   - Remote checks may timeout and be killed and skipped, if there are prompts in the remote profile. Oracle ORAchk and Oracle EXAchk search for prompts or traps in the remote user profiles. If you have prompts in remote profiles, then comment them out at least temporarily and test run again.

2. Increase the default timeout.

   - You override the default timeoute by setting the environment variables.

   Table 1-16 Timeout Controlling

Timeout Controlling	Default Value (seconds)	Environment Variable
Checks not run by root (most).	90	*RAT_TIMEOUT*
Collection of all root checks.	300	*RAT_ROOT_TIMEOUT*
SSH login DNS handshake.	1	*RAT_PASSWORDCHECK_TIMEOUT*

   - The default timeouts are designed to be lengthy enough for the vast majority of cases. If it is not long enough, then it is possible you are experiencing a system performance problem that should be corrected. Many timeouts can be indicative of a non Oracle ORAchk and Oracle EXAchk problem in the environment.

3. If it is not acceptable to increase the timeout to the point where nothing fails, then try excluding problematic checks running separately with a large enough timeout and then merging the reports back together.

   - See "Using Profiles with Oracle ORAchk and Oracle EXAchk" for more details about excluding all checks in a profile and only run checks in a specific profile.

For example: `-excludeprofile ebs` and `–profile ebs`.

- See "Excluding Individual Checks" if this is just a few checks.
- See "Merging Reports" for more details.

4. If the problem does not appear to be down to slow or skipped checks but you have a large cluster, then try increasing the number of slave processes user for parallel database run.

   - Database collections are run in parallel. The default number of slave processes used for parallel database run is calculated automatically. This default number can be changed using the options: `-dbparallel` *`slave processes`*, or `–dbparallelmax`

Note:

The higher the parallelism the more resources are consumed. However, the elapsed time is reduced.

You can raise or lower the number of parallel slaves beyond the default value.

After the entire system is brought up after maintenance, but before the users are permitted on the system, use a higher number of parallel slaves to finish a run as quickly as possible.

On a busy production system, use a number less than the default value yet more than running in serial mode to get a run more quickly with less impact on the running system.

Turn off the parallel database run using the `-dbserial` option.

2

Oracle ORAchk Specific Features and Tasks

This chapter describes the specific features of Oracle ORAchk and the tasks that you can perform using Oracle ORAchk.

2.1 Oracle ORAchk Scope and Supported Environments

Review the scope and supported environments for Oracle ORAchk.

2.1.1 Oracle ORAchk Scope of Oracle Stack Supported

Oracle ORAchk performs health checks for the entire range of Oracle products from hardware, to Oracle Database, middleware, and applications. Oracle ORAchk proactively scans for top known problems (based on prioritization of reported issues) within an Oracle system.

The scope of Oracle ORAchk increases with new releases. Review the following list for the current scope of ORAchk.

Oracle Database

- Single-instance Oracle Database
- Oracle Grid Infrastructure and Oracle RAC
- Maximum Availability Architecture (MAA) validation
- Upgrade Readiness validation
- Oracle GoldenGate
- Application Continuity

Enterprise Manager Cloud Control (12*c* only)

- Management Repository
- Management Agents
- Oracle Management Service (OMS), version 12.1.0.1 and later on Linux only

E-Business Suite

- Oracle Payables (R12 only)
- Oracle Workflow
- Oracle Purchasing (R12 only)
- Oracle Order Management (R12 only)
- Oracle Process Manufacturing (R12 only)
- Oracle Fixed Assets (R12 only)
- Oracle Human Resources (R12 only)
- Oracle Receivables (R12 only)
- Oracle Customer Relationship Management
- Oracle Project Billing

Oracle Identity and Access Management

- Oracle Identity Manager (11.1.2.2.x and 11.1.2.3.x)
- Oracle Access Manager (11.1.2.2.x and 11.1.2.3.x)
- Oracle Unified Directory (11.1.2.2.x and 11.1.2.3.x)

Oracle Hardware Systems

- Oracle Solaris
- Oracle Solaris Cluster
- Oracle Systems configuration for Oracle Middleware and Oracle Applications
- Oracle ZFS Storage Appliance
- Oracle Virtual Networking

Oracle Siebel

- Oracle Siebel verification of the database configuration for stability, best practices and performance optimization (Siebel 8.1.1.11 connecting to Oracle Database 11.2.0.4.)

Oracle PeopleSoft

- Oracle PeopleSoft verification of database best practices

2.1.2 Oracle ORAchk Supported Platforms

Review the list of Oracle ORAchk supported platforms.

Oracle ORAchk is supported on the following platforms:

- Intel Linux* (Oracle Linux/RedHat 5, 6, 7 and SuSE 9,10, 11, 12)
- Linux on System Z (RedHat 6, 7 and SuSE 12)
- Oracle Solaris SPARC (Solaris 10 and 11)
- Oracle Solaris x86-64 (Solaris 10 and 11)
- AIX **
- HPUX**
- Microsoft Windows (2008 and 2012)***

Note:

*No planned support for Linux Itanium.

*Only 32-bit platforms are supported for 32-bit EBS environments using the command `./orachk -ebs32bit`

** Requires BASH Shell 3.2 or later to be installed on the systems

*** Requires Cygwin to be installed.

Cygwin Requirements (page 2-4)
Install Cygwin to use Oracle ORAchk on Microsoft Windows operating system.

2.1.3 Oracle ORAchk Supported Database Releases

Review the list of supported database releases for Oracle ORAchk.

Oracle ORAchk is supported on the following database releases:

- Oracle Database 10*g* Release 2 or later
- Oracle Database 11*g* Release 1 or later
- Oracle Database 11*g* Release 2 or later
- Oracle Database 12*c* Release 1 or later

2.1.4 Cygwin Requirements

Install Cygwin to use Oracle ORAchk on Microsoft Windows operating system.

Cygwin is a free utility that provides a POSIX compliant Linux-like environment on a Microsoft Windows host. Technically, it is a DLL (`cygwin1.dll`) that acts as a Linux API layer providing substantial Linux API functionality.

Cygwin provides a bash scripting shell environment that is compatible with Oracle ORAchk. After installing Cygwin, configure the SSH daemon on the host. SSH daemon is needed only for Oracle RAC installations.

Oracle ORAchk includes hundreds of database and application checks that run on Microsoft Windows.

How to Install Cygwin on Microsoft Windows Hosts (page 2-4)
To use Oracle ORAchk on Microsoft Windows, you must install Cygwin on the Microsoft Windows servers.

Configuring SSH (page 2-5)
Configure SSH and test your Cygwin setup.

2.1.4.1 How to Install Cygwin on Microsoft Windows Hosts

To use Oracle ORAchk on Microsoft Windows, you must install Cygwin on the Microsoft Windows servers.

1. Download the latest version of Cygwin, which is available at the following URL:

   https://cygwin.com/

2. During Cygwin installation you are prompted to select the packages to install. Select at least the following:

   - Perl/*
   - Tcl/expect
   - Archive/unzip
   - Archive/zip

Note:

Some Cygwin mirror download sites do not include all the packages. If you find the necessary packages are not available, then try a different mirror site.

Note:

SSH configuration is required for cluster-wide runs, and required for single-instance Oracle Database and Oracle Restart environments.

2.1.4.2 Configuring SSH

Configure SSH and test your Cygwin setup.

Note:

- SSH Configuration is needed only for cluster-wide runs and required for single-instance Oracle Database and Oracle Restart environments.
- While configuring SSH, run `cygwin.bat` as an Administrator user on Microsoft Windows Server 2012 or later release, or Windows 7 or later release.
- If MKSNT is installed and running, then remove the path of `mksnt` from the environment and stop the SSH server.

1. Go to the `C:\cygwin` directory, open the `Cygwin.bat` file in edit mode using any editor, and add the following line before running the bash shell.

   ```
   set CYGWIN=binmode ntsec
   ```

   For example, here are the contents for the `Cygwin.bat` file after adding the above line:

   ```
   @echo off
   C:
   chdir C:\cygwin\bin
   set CYGWIN=binmode ntsec
   bash --login -i
   ```

2. Save and close the `Cygwin.bat` file.
3. Right-click the `Cygwin.bat` file and select **Run as administrator**.
4. Verify that Cygwin (`cygrunsrv`) is installed properly.
   a. Run `C:\cygwin\Cygwin.bat`, and then run the `cygsrvrun -h` command:

      If Cygwin is installed properly, then all the help options for Cygwin are displayed on the screen. If this command returns an error message, then reinstall Cygwin.

      ```
      $ cygrunsrv -h
      Usage: cygrunsrv [OPTION]...

      Main options: Exactly one is required.

        -I, --install <svc_name>  Installes a new service named <svc_name>.
        -R, --remove <svc_name>   Removes a service named <svc_name>.
        -S, --start <svc_name>    Starts a service named <svc_name>.
        -E, --stop <svc_name>     Stops a service named <svc_name>.
        -Q, --query <svc_name>    Queries a service named <svc_name>.
        -L, --list [server]       Lists services that have been installed
                                  with cygrunsrv.
      <svc_name> can be a local service or "server/svc_name" or "server\svc_name".
      ```

```
---more---

Report bugs to <cygwin@cygwin.com>.
```

5. To configure the SSHD service, run `C:\cygwin\Cygwin.bat`, and then run the following command:

   ```
   $ ssh-host-config
   ```

   - Cygwin prompts you to answer the following questions:

     ```
     *** Query: Should privilege separation be used? <yes/no>: yes
     *** Query: New local account 'sshd'? <yes/no>: yes
     *** Query: Do you want to install sshd as a service?
     *** Query: <Say "no" if it is already installed as a service> <yes/no>: yes
     *** Query: Enter the value of CYGWIN for the daemon: [] binmode ntsec
     *** Query: Do you want to use a different name? <yes/no>: no
     ```

   - At this point, if you want to use the same name, that is, `cyg_server`, enter **no**. You are then prompted the following questions:

     ```
     *** Query: Create new privileged user account 'cyg_server'? (yes/no) yes
     *** Query: Please enter the password:
     *** Query: Reenter:
     ```

   - If the configuration is successful, then Cygwin displays the following message:

     ```
     Host configuration finished. Have fun!
     ```

6. Backup the `passwd` file. Make a copy of this file before editing it.

7. Edit the `passwd` file. Use any editor to open the `passwd` file in edit mode. Remove only those entries of the user that you use to connect to the host on which you plan to run Oracle ORAchk.

8. Create a `/etc/passwd` file.

   - **For a local user:** Run `C:\cygwin\Cygwin.bat`, and then run the following command:

     ```
     /bin/mkpasswd -l –u USER >> /etc/passwd
     ```

     For example:

     ```
     /bin/mkpassword -l –u pjohn >> /etc/passwd
     ```

   - **For a domain user:** Run `C:\cygwin\Cygwin.bat`, and then run the following commands:

     ```
     /bin/mkpasswd –d –u USER >> /etc/passwd
     ```

     For example:

     ```
     /bin/mkpasswod –d –u pjohn >> /etc/passwd

     mkdir –p /home/USER
     ```

     For example:

     ```
     mkdir –p /home/pjohn

     chown USER /home/USER
     ```

For example:

```
chown pjohn /home/pjohn
```

9. (Domain user only) Start the SSH daemon in an Oracle RAC environment. SSH is not necessary for single-instance Oracle Database or Oracle Restart environments.

   a. Right-click **My Computer**, and select **Manage**.

   b. In the **Computer Management** dialog box, go to **Services and Applications**, and select **CYGWIN sshd**.

   c. Right-click **CYGWIN sshd** and select **Properties**.

   d. In the **Properties** window, go to the **Log On** tab.

   e. Specify the fully qualified domain user name and password, for example, EXAMPLE\USER1, and then click **Apply**.

   f. Run `C:\cygwin\Cygwin.bat`, and run the following:

```
chown USERNAME /var/log/sshd.log
chown –R USERNAME /var/empty
chown USERNAME /etc/ssh*
chmod 755 /var/empty
chmod 644 /var/log/sshd.log
```

Note: If `/var/log/sshd.log` does not exist, you do not have to run the following commands:

```
chown USERNAME /var/log/sshd.log
chmod 644 /var/log/sshd.log
```

---

10. Complete one of the following steps to start the SSH daemon for the first time, and verify the SSH daemon status whenever the server reboots.

    Run `C:/cygwin/Cygwin.bat`, and run the following command:

```
/usr/sbin/sshd
```

    Or

    Run `C:/cygwin/Cygwin.bat`, and run the following command:

```
cygrunsrv -S sshd
```

    Or

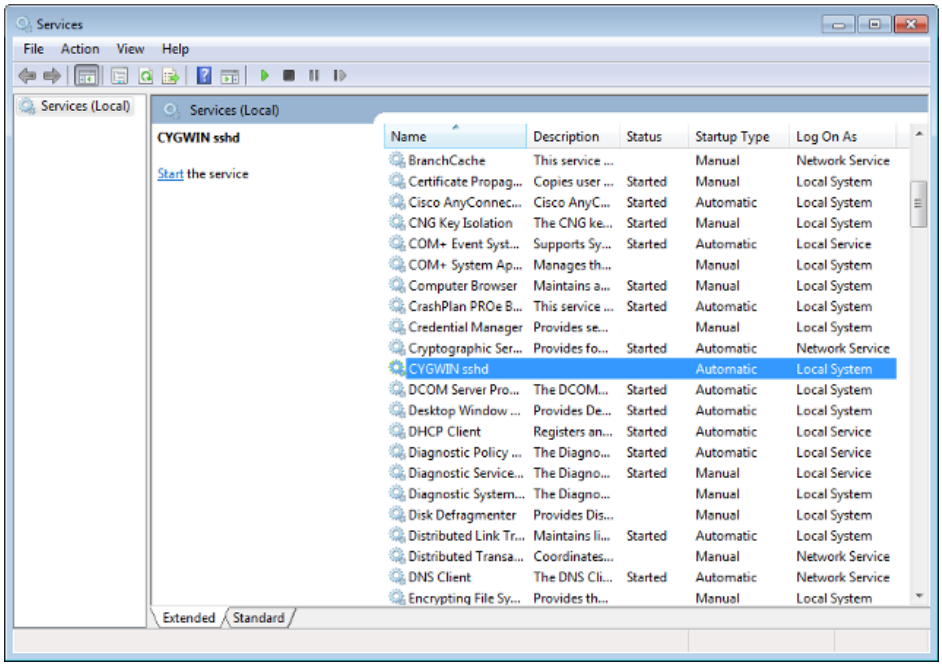
    Perform these steps:

    a. Right-click **My Computer**, and select **Manage**.

    b. In the **Computer Management** dialog box that appears, go to **Services and Applications**, and select **CYGWIN sshd**.

    c. Click **CYGWIN sshd**, and then click **Start**.

Figure 2-1 Cygwin - sshd



Note:

Run the following:

```
chown -R USERNAME /var/empty
chown USERNAME /etc/ssh*
chmod 755 /var/empty
```

If the `/var/log/sshd.log` file exists, then also run these commands:

```
chown USERNAME /var/log/sshd.log
chmod 644 /var/log/sshd.log
```

---

11. Test your Cygwin setup.

Run the following command on the local node and remote nodes:

```
ssh -l USERNAME localhost 'date'
```

Or

```
ssh -l USERNAME this node 'date'
```

For example:

```
ssh -l phohn example.com 'date'
```

This command prompts you to specify the password. When you specify the correct password, the command returns the accurate date.

See Also:

- Cygwin FAQ, if you experience a process fork failure, memory leak error, or a file access error after configuring SSH, which is available at the following URL:

  http://cygwin.com/faq.html

- Cygwin community, if you are unable to find a workaround for your problem, which available at the following URL:

  http://cygwin.com/problems.html

2.2 Using Oracle ORAchk to Confirm System Readiness for Implementing Application Continuity

Application Continuity Checking for Application Continuity allows you to deploy Application Continuity easily and transparently in most cases.

Overview of Application Continuity (page 2-9)

Checks for Application Continuity (page 2-9)

2.2.1 Overview of Application Continuity

Oracle ORAchk identifies any references to deprecated JDNVC concrete classes that need to be changed.

Oracle ORAchk analyzes the database operations in the application and reports the level of protection, and where applications are not protected. In places where applications are not protected, Oracle ORAchk reports why.

Together, these checks can help ensure that your application workload is covered by Oracle Application Continuity.

See Also:

Ensuring Application Continuity

Oracle White paper, Application Continuity with Oracle Database 12*c*, which is available at the following URL:

Application Continuity with Oracle Database 12*c*

Examples of using the newer Oracle JDBC types in place of the older Oracle concrete types, which is available at the following URL:

Using API Extensions for Oracle JDBC Types

2.2.2 Checks for Application Continuity

Application Continuity Checking for Concrete Classes

For Java applications only, determine whether the application uses deprecated Oracle JDBC concrete classes.

To use Application Continuity with Java, replace the deprecated Oracle JDBC concrete classes. For information about the deprecation of concrete classes including actions to take if an application uses them, see My Oracle Support Note 1364193.1:

New Jdbc Interfaces for Oracle types

To know if the application is using concrete classes, use Application Continuity checking (called `acchk` in Oracle ORAchk). There is no need to use 12*c* driver or database, or to have source code for concrete class checks. The application can be verified in advance while planning for high availability for your application.

Application Continuity is unable to replay transactions that use `oracle.sql` deprecated concrete classes of the form `ARRAY`, `BFILE`, `BLOB`, `CLOB`, `NCLOB`, `OPAQUE`, `REF`, or `STRUCT` as a variable type, a cast, the return type of a method, or calling a constructor.

Modify them for Application Continuity to work with the application.

There are three values that control the Application Continuity checking for Oracle concrete classes. Set these values either on the command line or through shell environment variables (or mixed). The values are as follows:

Table 2-1 Application Continuity Checking for Concrete Classes

Command Line Argument	Shell Environment Variable	Usage
`–asmhome jarfilename`	*RAT_AC_ASMJAR*	This must point to a version of `asm-all-5.0.3.jar` that you download from http://asm.ow2.org/
`-javahome JDK8dirname`	*RAT_JAVA_HOME*	This must point to the `JAVA_HOME` directory for a JDK8 installation.
`-appjar dirname`	*RAT_AC_JARDIR*	To analyze the application code for references to Oracle concrete classes, this must point to the parent directory name for the code. The program analyzes `.class` files, and recursively `.jar` files and directories.

Example

The following command checks the Application Continuity checking for Oracle concrete classes.

```
$ ./orachk -asmhome /tmp/asm-all-5.0.3.jar -javahome /tmp/jdk1.8.0_40 -appjar /tmp/
appdir

Outage Type             Status  Message

Concrete class checks   Total : 19845 Passed : 19610 Warning : 0
                        Failed : 235
                        (Failed check count is one per file)

                        FAILED    [oracle/jdbc/driver/ArrayDataResultSet]
                                [[CAST]desc= oracle/sql/STRUCT method
                                name=getObject, lineno=1477]

                        FAILED    [oracle/jdbc/driver/ArrayDataResultSet]
                                [[CAST]desc= oracle/sql/NCLOB method
                                name=getNClob, lineno=1776]

                        FAILED    [oracle/jdbc/driver/BfileAccessor]
                                [[Method]name=getBFILE,
```

```
        desc=(I)Loracle/sql/BFILE;,
        lineno=99]

FAILED    [oracle/jdbc/driver/BlobAccessor]
        [[Method]name=getBLOB,
        desc=(I)Loracle/sql/BLOB;,
        lineno=129]

FAILED    [oracle/jdbc/driver/ClobAccessor]
        [[Method]name=getCLOB_,
        desc=(I[B)Loracle/sql/CLOB;,
        lineno=230]

FAILED    [oracle/jdbc/driver/ClobAccessor]
        [[Method] name=getCLOB,
        desc=(I)Loracle/sql/CLOB;,
        lineno=226]
```

Application Continuity Checking for the Protection Level Application Continuity is Providing Your Application

Measure Coverage

Destructive testing is a good thing to do and definitely should be run. However, introducing failures is non-deterministic. The application can failover beautifully in all the tests, and then in production a failure occurs elsewhere and unexpectedly some requests do not failover.

Using AC Check Coverage Analysis averts this situation by reporting in advance the percentage of requests that are fully protected by Application Continuity, and for those are not fully protected, which they are and where. Use the coverage check in advance of deployment, and the after application changes. Developers and management will know how well protected an application release is from failures of the underlying infrastructure. If there is a problem it can be fixed before the application is released or waived knowing the level of coverage.

Executing the coverage check is rather like using `SQL_TRACE`. First run the application in a representative test environment with Application Continuity trace turned on at the server side. The trace is collected in the standard database user trace directory in user trace files. Then, pass this directory as input to Oracle ORAchk to report the coverage for the application functions that were run. As this check uses Application Continuity, the database and client must be using 12*c*. The application does not have to be released with Application Continuity. The check is to help you to release.

The following is a summary of the coverage analysis.

- If a round-trip is made to the database server and returns while Application Continuity' capture is enabled during capture phase, then it is counted as a protected call.
- If a round-trip is made to the database server while Application Continuity' capture is disabled (not in a request, or following a restricted call or a disable replay API was called), it is counted as an unprotected.
- Round trips that are ignored for the purpose of capture and replay are ignored in the protection-level statistics.

  At the end of processing each trace file, a level of protection for the calls sent to the database is computed.

For each trace: `PASS (>= 75)`, `WARNING (25 <= value <75)`, and `FAIL (< 25)`

Running the Coverage Report

1. Turn on tracing at either a session level or database level

   To enable for a single application function, run as follows (put this in the callback or before `beginRequest` so replay is not disabled by setting events):

   ```
   alter session set events 'trace [progint_appcont_rdbms]';
   ```

   To enable for all sessions, run as follows:

   ```
   alter system set event='trace[progint_appcont_rdbms]' scope = spfile;
   ```

2. Run through the application functions. To report on an application function, it needs to have executed. The more application functions run, the better the information that the coverage analysis provides.

3. Use Oracle ORAchk to analyze the collected database traces and report the level of protection, and where not protected, reports why a request is not protected.

   Set the following four values through command line or shell environment variables (or mixed) to control the Application Continuity checking for coverage:

Table 2-2 Using Application Continuity Checking for Protection Level

Command Line Argument	Shell Environment Variable	Usage
`-asmhome jarfilename`	*RAT_AC_ASMJAR*	This must point to a version of `asm-all-5.0.3.jar` that you download from http://asm.ow2.org/
`-javahome JDK8dirname`	*RAT_JAVA_HOME*	This must point to the `JAVA_HOME` directory for a JDK8 installation.
`-apptrc dirname`	*RAT_AC_TRCDIR*	To analyze the coverage, specify a directory name that contains one or more database server trace files. The trace directory is generally, `$ORACLE_BASE/diag/rdbms/{DB_UNIQUE_NAME}/$ORACLE_SID/trace`
NONE	*RAT_ACTRACEFILE_WINDOW*	When scanning the trace directory, this optional value limits the analysis to scanning to files created in the most recent specified number of days

Example

```
$ ./orachk -asmhome /tmp/asm-all-5.0.3.jar -javahome /tmp/jdk1.8.0_40 -apptrc
$ORACLE_BASE/diag/rdbms/$ORACLE_SID/trace 3
```

Reading the Coverage Report

The coverage check produces a directory named `orachk_`*`uname_date_time`*. This report summaries coverage and lists trace files that have WARNINGS or FAIL status.

Also check in the PASS report (`acchk_scorecard_pass.html`) in the reports directory to ensure all requests PASS (Coverage(%) = 100). To see all of the details, look for `reports/acchk_scorecard_pass.html` under the `outfile` subdirectory.

The output includes the database service name, the module name (from `v $session.program`, which can be set on the client side using the connection property on Java for example, `oracle.jdbc.v$session.program`), the `ACTION` and `CLIENT_ID`, which can be set using `setClientInfo` with `OCSID.ACTION` and `OCSID.CLIENTID` respectively.

Example output: found in `orachk_.....html#acchk_scorecard`

```
Outage Type Status/Message

Coverage
checks      Total : 19845 Passed : 19610 Warning : 0
            Failed : 235
            (Failed check count is one per file)

            [FAIL] Trace file name = SAMPLE_ora_1234.trc
            Row number = 2222
            SERVICE NAME = (SAMPLE_WEB_SERVICE.OCS.QA)
            MODULE NAME = (DEBIT)
            ACTION NAME = null
            CLIENT ID = null
            Coverage(%) = 50
            ProtectedCalls = 4
            UnProtectedCalls = 4

            [FAIL] Trace file name = SAMPLE_ora_5678.trc
            Row number = 7653
            SERVICE NAME = (SAMPLE_WEB_SERVICE.OCS.QA)
            MODULE NAME = (PAYMENTS)
            ACTION NAME = null
            CLIENT ID = null
            Coverage(%) = 20
            ProtectedCalls = 1
            UnProtectedCalls = 4

            [FAIL] Trace file name = SAMPLE_ora_90123.trc
            Row number = 15099
            SERVICE NAME = (SAMPLE_WEB_SERVICE.OCS.QA)
            MODULE NAME = (PAYMENTS)
            ACTION NAME = null
            CLIENT ID = null
            Coverage(%) = 60
            ProtectedCalls = 3
            UnProtectedCalls = 2

            [FAIL] Trace file name = SAMPLE_ora_4747.trc
            Row number = 789
            SERVICE NAME = (SAMPLE_WEB_SERVICE.OCS.QA)
            MODULE NAME = (ACCOUNT)
            ACTION NAME = null
            CLIENT ID = null
            Coverage(%) = 50
            ProtectedCalls = 2
            UnProtectedCalls = 2
```

Application Continuity Command Line Options (page 2-23)
List of Application Continuity command line options.

2.3 Oracle Identity and Access Management Health Checks

Oracle Identity and Access Management (IAM) health check tool is a single health check solution for IAM customers to proactively identify areas where preventive and actions can be taken to keep a system healthy on an ongoing basis.

IAM health check tool includes checks that cover the entire deployment stack from application tier to database tier providing a very simplistic, value-added, and easy-to-use solution.

Supported Platforms and Databases (page 2-14)
Review the platforms and databases requirements for deploying IAM health check tool.

Supported Components and Topologies (page 2-14)
Review the following for supported components and topologies.

Introduction to IAM Health Checks (page 2-15)
Oracle IAM health checks inspect the entire deployment stack from application tier to database tier providing a very simplistic, value-added, and easy-to-use solution. Run IAM health checks before and after installing the product, and while running the product.

Running IAM Heath Checks (page 2-18)
Crosscheck the prerequisites before you install Oracle ORAchk for IAM. Provide the information that is required while running the Discovery tool for the first time.

2.3.1 Supported Platforms and Databases

Review the platforms and databases requirements for deploying IAM health check tool.

Only Linux is currently supported and in these combinations:

Table 2-3 Operating System and Database Requirements for IAM Healthcheck Tool

Operating System	Database
Linux(Oracle Enterprise Linux/RedHat 5, 6, 7 and SuSE 9,10, 11, 12)	10*g* R1
Linux on System Z (RedHat 6, 7 and SuSE 12)	11*g* R1 11*g* R2 12*c* 12*c* R2

2.3.2 Supported Components and Topologies

Review the following for supported components and topologies.

Oracle IAM health checks support the following components:

- Oracle Identity Manager (11.1.2.2.x and 11.1.2.3.x)

- Oracle Access Manager (11.1.2.2.x and 11.1.2.3.x)
- Oracle Unified Directory (11.1.2.2.x and 11.1.2.3.x)

Based on the above components, the supported topologies are as follows:

- Oracle Identity Manager in single node as well as in multi-node setups
- Oracle Access Manager + (Any directory)* in single node as well as in multi-node setups

  IAM health checks run on Oracle Unified Directory (OUD) only. If other directories are there as well, then Oracle IAM health checks skips those directories and performs health checks on Oracle Access Manager. Also, Oracle Access Manager configured in embedded LDAP mode is not supported.
- Oracle Identity Manager + Oracle Access Manager + (Any directory)** in single node as well as in multi-node setups

  IAM health checks run on Oracle Unified Directory (OUD) only. If other directories are there as well, then Oracle IAM health checks skips those directories and performs health checks on Oracle Access Manager. Also, Oracle Access Manager configured in embedded LDAP mode is not supported.

2.3.3 Introduction to IAM Health Checks

Oracle IAM health checks inspect the entire deployment stack from application tier to database tier providing a very simplistic, value-added, and easy-to-use solution. Run IAM health checks before and after installing the product, and while running the product.

Table 2-4 IAM Healthckeck Tool Use Cases

Use Cases	Description
Post-install health checks	Includes checks that are run just after a product is installed. These are mostly product focused checks, for example, for Oracle Identity Manager, Oracle Access Manager, and Oracle Unified Directory respective post-install checks.
Runtime health checks	Show the health of the system on a regular basis and helps you take proactive corrective actions.

Use Cases for IAM Healthcheck Tool (page 2-15)
Review the use cases covered in the IAM Healthcheck tool.

Features of IAM Healthcheck Tool (page 2-15)
Health checks are run both at product install time as well as runtime.

Auto-discovery of Oracle IAM Environment (page 2-17)
Oracle ORAchk framework automatically runs the Discovery tool while running IAM health checks.

2.3.3.1 Use Cases for IAM Healthcheck Tool

Review the use cases covered in the IAM Healthcheck tool.

2.3.3.2 Features of IAM Healthcheck Tool

Health checks are run both at product install time as well as runtime.

Product install time checks cover the following areas:

- System Resources
- System Configuration
- Software Configuration
- Database Configuration

Runtime checks for Oracle Identity Manager cover the following areas:

- OIM Modules
  - Access Request and Catalog
  - Certification Engine
  - UI Category
  - Provisioning Engine
  - Reconciliation Engine
  - IT Admin (User/Role/Org)
  - Connector Framework
  - Identify Audit Engine
  - Identify Analytics Engine
  - Role Engine
- Common Services
  - Audit and Reports/Embedded BIP
  - Scheduler
  - Policy/Rule Engine
  - Workflow Engine (SOA/BPEL)
  - Authorization Layer
  - Notification Engine
- Data Tier
  - Database
- General
  - Overall Performance
  - Application Readiness

Runtime checks for `OAM` cover the following areas:

- OAM Modules

  - UI Category
  - Federation (Single Sign On) Engine
  - Authentication Engine
  - Admin Console
  - Policy Engine
  - oAuth
  - Token Processing
  - Session Management
  - Config Services
  - Authorization Services
  - Oracle Platform Security Services
  - Webgates
- Data Tier
  - Database
- General
  - Overall Performance
  - Application Readiness

Runtime checks for OUD cover the following areas:

- OUD Modules
  - Basic Sanity
  - OUD Replication
  - Performance

2.3.3.3 Auto-discovery of Oracle IAM Environment

Oracle ORAchk framework automatically runs the Discovery tool while running IAM health checks.

Auto-discovery process includes the following:

1. Discovery tool Identifies the host name of the following:
   a. OIM Admin server
   b. OAM Admin server
   c. One OUD host from user ID store and system ID store OUD clusters. If both ID stores are same, then pick one OUD host.
2. Discovery tool stores the discovered information in a topology file and the user credentials in a wallet file.

3. Oracle ORAchk copies the discovery executables to the target machine and runs the Discovery tool on all required machines.
4. Discovery tool runs serially on all the required machines.
5. Oracle ORAchk passes the same `topology.xml` and `cwallet` files to the Discovery tool on all IAM machines.

   That is, if Oracle ORAchk runs the Discovery tool on the first machine, then the Discovery tool creates the`topology.xml` and `cwallet.sso` files. Oracle ORAchk copies the same `xml` and `wallet` while running the Discovery tool on other IAM machines.
6. At the end of the discovery, the topology file contains the complete information of the entire environment and the wallet file contains the encrypted user credentials.
7. Oracle ORAchk uses the topology file and the wallet file to run the health checks on multiple nodes.
8. The Discovery tool validates the user credentials that it collected. If the credentials are not valid, then the tool prompts the user to enter the details again. After three unsuccessful attempts, the discovery process exits.

2.3.4 Running IAM Heath Checks

Crosscheck the prerequisites before you install Oracle ORAchk for IAM. Provide the information that is required while running the Discovery tool for the first time.

Download Oracle ORAchk for IAM (page 2-18)
Oracle ORAchk for IAM uses a different distribution than standard Oracle ORAchk.

Prerequisites for Installing Oracle ORAchk for Oracle Identity and Access Management (page 2-18)
Review the list of prerequisites for running Oracle Identity and Access Management (IAM) health checks.

Inputs Required by Discovery Tool (First Time Only) (page 2-19)
The first time your run the Discovery tool you are prompted to answer a series of questions about your configuration.

IAM Health Checks (page 2-20)
Run IAM health checks as root or the user who owns the IAM setup.

2.3.4.1 Download Oracle ORAchk for IAM

Oracle ORAchk for IAM uses a different distribution than standard Oracle ORAchk.

Download `orachk_idm.zip` for Oracle ORAchk with IAM support, which is available from My Oracle Support:

ORAchk - Health Checks for the Oracle Stack (Doc ID 1268927.2)

2.3.4.2 Prerequisites for Installing Oracle ORAchk for Oracle Identity and Access Management

Review the list of prerequisites for running Oracle Identity and Access Management (IAM) health checks.

1. Ensure that JDK 6 or later is set in the system path. If it is not set, then set the environment variable `RAT_JAVA_HOME` to the correct Java home location.
2. You must run Oracle ORAchk on the machine where the WebLogic admin server for IAM is installed.
3. Oracle ORAchk uses *$HOME* directory as the temporary destination.

   Oracle recommends to set the environment variable `RAT_TMPDIR`, for example, `export RAT_TMPDIR=/scratch`, if Oracle ORAchk picks the root location and enough space is not available, then errors can occur.
4. If the `oraInst.loc` file is not in the default directory, for example, `/u01/app/oraInventory`, then specify the exact location of the `oraInventory` directory using the `RAC_INV_LOCAL` environment variable. For example:

   ```
   export RAT_INV_LOC=/scratch/shared/oracle/oraInventory
   ```
5. You must run Oracle ORAchk as the same user that installed the IAM software components.
6. Each server that is part of the IAM topology must have secure shell (SSH) enabled. If SSH is disabled, then Oracle ORAchk cannot remotely run checks on those servers. On servers without SSH enabled you must run Oracle ORAchk individually and then combine the results.
7. Oracle ORAchk can only detect local database installations. It cannot detect databases that are installed on remote machines. In such cases, run Oracle ORAchk explicitly on the database machine and combine the results.

2.3.4.3 Inputs Required by Discovery Tool (First Time Only)

The first time your run the Discovery tool you are prompted to answer a series of questions about your configuration.

Table 2-5 Inputs Required by Directory Tool (First Time Only)

Input	Description
Is this a Single Node Identity Management System (idm) [Y|N] [N] :	Checks whether your IDM environment is a single node or multi-node setup.
How many Oracle Unified Directory (OUD) clusters present[0] :1	Checks for the number of OUD clusters present.
Enter one of the Oracle Unified Directory (OUD) Host in cluster 1	Specify one OUD host name.
Enter Oracle Identity Manager(OIM) Host (Press just ENTER to skip)	Specify one OIM admin server host name.
Enter Oracle Access Manager (OAM) Host (Press just ENTER to skip) :	Specify one OAM admin server host name.

Table 2-5 (Cont.) Inputs Required by Directory Tool (First Time Only)

Input	Description
Enter `JAVA_HOME`:	The Discovery tool does not prompts this question, if you have set the *RAT_JAVA_HOME* environment variable.
Enter `WLS` Admin user name for domain `IAMGovernanceDomain`:	Specify WebLogic admin user name.
Enter password	Specify the password for WebLogic admin user name.
Enter Oracle Identity Manager (OIM) admin user (xelsysadm) password :	Specify the password for `xelsysadm`.
Enter Oracle Identity Manager (OIM) LDAP Admin user DN:	Specify the entire DN for OIM LDAP admin user, for example,`cn=oimLDAP,cn=SystemIDs,dc=us,dc=oracle,dc=com`.
Enter password for admin user DN	Specify the password for OIM LDAP DN.
Enter password for schema `<OIM Schema>`:	Specify the password for OIM schema.
Enter OUD Admin password for `cn=oudadmin`:	Specify the OUD admin password.
Enter OUD Admin password for `cn=oudmanager,cn=Administrators, cn=admin` data:	Specify the OUD manager password.
Enter WLS Admin Username for domain `IAMAccessDomain`:	Specify the OAM admin user name.
Enter password:	Specify the OAM Admin user password.
Enter Oracle Access Manager (OAM) Admin user	Specify the OAM LDAP admin user name.
Enter password for admin user:	Specify the OAM LDAP admin password.
Enter password for schema `<OAM Schema>`:	Specify the password for OAM schema.
Database Oracle home location	If Oracle database is on the local machine, then the Discovery tool prompts you to specify the Oracle home location.

2.3.4.4 IAM Health Checks

Run IAM health checks as root or the user who owns the IAM setup.

1. Create a new folder on a location on one of the WebLogic admin machine, for example, `healthcheck IAM`.

2. Set the environment variable to run the health checks based on a specific deployment size.

   Oracle ORAchk supports four deployment sizes:

   Table 2-6 Deployment Size

Deployment Size	Directory User Size
small	Close to 100 K
medium	Close to 1 million
large	Close to 15 million
extralarge	Close to 250 million

   To specify a deployment size, before running Oracle ORAchk, set the environment variable *RAT_IDM_DEPLOYMENT_SIZE*.

```
$ export RAT_IDM_DEPLOYMENT_SIZE=small
```

   If *RAT_IDM_DEPLOYMENT_SIZE* is not set, then Oracle ORAchk uses the default deployment size `small` .

3. Change directories to the new directory you created in Step 1 and run Oracle ORAchk.

   Oracle ORAchk prompts the discovery questions as described in "Inputs Required by Discovery Tool (First Time Only)".

   If the database is running on the same machine where the core IAM components are installed, then the database checks are run as well.

4. If database is running on a remote server, then the database checks need to be run manually:

   a. Copy the same `orachk_IAM.zip` to the remote srver, and unzip it.

   b. Run `./orachk -idmdbruntime` either as root or the user who owns the Oracle IAM installation.

      This command generates a new Oracle ORAchk collection, for example, `orachk_den00etd_orcl_100915_061616.zip`.

   Oracle ORAchk runs checks on all servers that are part of the IAM topology and generates a single report. However, in the following cases Oracle ORAchk cannot generate a single report:

   a. IAM install is multi-node setup and SSH is disabled on machines involved. In such case Oracle ORAchk run on each node and then merge the reports.

   b. Oracle ORAchk is run on machine where Weblogic Admin server is running. If this machine doesn't have the database installed, then Oracle ORAchk does not run the database checks.. In such case run Oracle ORAchk on the database node additionally and then merge the reports.

See Also:

My Oracle Support Note 2070073.1 for the latest known issues specific to Oracle Identity and Access Management (IAM) health checks:

Oracle Identity and Access Management Healthcheck Guide (ORAchk for IDM)

Auto-discovery of Oracle IAM Environment (page 2-17)
Oracle ORAchk framework automatically runs the Discovery tool while running IAM health checks.

Inputs Required by Discovery Tool (First Time Only) (page 2-19)
The first time your run the Discovery tool you are prompted to answer a series of questions about your configuration.

IAM Command Line Options (page 2-23)
List of Oracle Identity and Access Management (IAM) command line options.

Merging Reports (page 1-67)
Merging reports is useful in role-separated environments where different users are run different subsets of checks and then you want to view everything as a whole.

Understanding and Managing Reports and Output (page 1-42)
Oracle ORAchk and Oracle EXAchk generate a detailed HTML report with findings and recommendations.

Health Check Catalog (page 1-69)
The Health Check Catalogs list the health checks that are included within Oracle ORAchk or Oracle EXAchk. Health Check Catalogs are HTML pages that require JavaScript. Enable JavaScript in your browser to view the Health Check Catalogs.

2.4 Oracle ZFS Storage Appliance Health Checks

Oracle ORAchk supports health checks for Oracle ZFS Storage Appliances.

To run Oracle ORAchk on one Oracle ZFS appliance, use the `-zfssa` option.

To run Oracle ORAchk on multiple Oracle ZFS appliances, specify a comma-delimited list of Oracle ZFS Storage Appliances:

```
./orachk -zfssa node1,node2
```

2.5 Oracle ORAchk Specific Command Line Options

List of command line options specific to Oracle ORAchk.

Application Continuity Command Line Options (page 2-23)
List of Application Continuity command line options.

IAM Command Line Options (page 2-23)
List of Oracle Identity and Access Management (IAM) command line options.

ZFS Storage Appliance Options (page 2-24)
List of ZFS Storage Appliance options.

2.5.1 Application Continuity Command Line Options

List of Application Continuity command line options.

Table 2-7 Application Continuity Command-Line Options

Command Line Argument	Shell Environment Variable	Usage
`-asmhome jarfilename`	*RAT_AC_ASMJAR*	This must point to a version of `asm-all-5.0.3.jar` that you download from http://asm.ow2.org/
`-javahome JDK8dirname`	*RAT_JAVA_HOME*	This must point to the `JAVA_HOME` directory for a JDK8 installation.
`-appjar dirname`	*RAT_AC_JARDIR*	To analyze the application code for references to Oracle concrete classes, this must point to the parent directory name for the code. The program analyzes `.class` files, and recursively `.jar` files and directories. To analyze the coverage, specify a directory name that contains one or more database server trace files. The trace directory is generally, `$ORACLE_BASE/diag/rdbms/$ORACLE_UNQNAME/$ORACLE_SID/trace`
NONE	*RAT_ACTRACEFILE_WINDOW*	When scanning the trace directory, this optional value limits the analysis to scanning to files created in the most recent specified number of days

Example 2-1 Application Continuity Command Line Options

```
$ ./orachk -asmhome /tmp/asm-all-5.0.3.jar -javahome /tmp/jdk1.8.0_40 -apptrc
$ORACLE_BASE/diag/rdbms/$ORACLE_SID/trace 3
```

2.5.2 IAM Command Line Options

List of Oracle Identity and Access Management (IAM) command line options.

Table 2-8 Identity Management Options

Option	Description
`-idm –h`	Displays IDM help.
`-idmpreinstall`	Runs all pre-install checks on Identity Management System.
`-idmpostinstall`	Runs all post-install checks on Identity Management System.
`-idmruntime`	Runs all runtime checks on Identity Management System.
`-idmdbpreinstall`	Runs pre-install database checks on Identity Management System.
`-idmpdbostinstall`	Runs post-install database checks on Identity Management System.

Table 2-8 (Cont.) Identity Management Options

Option	Description
`-idmdbruntime`	Runs runtime database checks on Identity Management System.
`-idm_config`	Passes `OAM`, `OIM`, and one of the `OUD` host from clusters.
`-Idmdiscargs`	Passes arguments to Identity Management Discovery Tool.
`-idmhcargs`	Passes arguments to Identity Management Healthcheck Tool.

IAM Health Check Scenarios

Table 2-9 IAM Health Check Scenarios

Scenario	Command
Run pre-install checks.	`./orachk -idmpreinstall -idm_config "OUD_HOST=h1,h2;OIM_HOST=h3,h4;OAM_HOST=h5,h6,h7; OHS_HOST=h8,h9"`
Run pre-install database checks.	`./orachk –idmdbpreinstall`
Run post-install checks on single node Identity Management setup.	`./orachk -idmpostinstall –idm_config "singlenode"`
Run runtime checks on multi-mode Identity Management setup.	`./orachk -idmruntime -idm_config "OUD_HOST=host1,host2;OAM_HOST=host3;OIM_HOST=host4"`
Run OIM runtime checks on multi-mode Identity Management setup.	`./orachk -idmruntime -idm_config "OUD_HOST=host1,host2;OAM_HOST=host3;OIM_HOST=host4" -profile "OIM"`
Run OIM and OAM post-install checks on single node Identity Management setup.	`./orachk -idmpostinstall -idm_config "singlenode" -profile "OIM,OAM"`
Run runtime checks with log level specified for Identity Management.	`./orachk -idmruntime -idmdiscargs "-DlogLevel=FINEST" -idmhcargs "-DlogLevel=FINEST"`
Discovery and Healthcheck tool Run checks directly passing `topology.xml` and `credconfig` location.	`./orachk - idmpreinstall | idmpostinstall | idmruntime -topology topology.xml -credconfig credconfig`

2.5.3 ZFS Storage Appliance Options

List of ZFS Storage Appliance options.

Table 2-10 ZFS Storage Appliance Options

Option	Decsription
`-zfssa` *node*	Runs Oracle ORAchk only on selected ZFS appliance nodes, where *node* is a comma-delimited list of ZFS Storage Appliance names. For example: `./orachk -zfssa node1,node2`

Oracle ZFS Storage Appliance Health Checks (page 2-22)
Oracle ORAchk supports health checks for Oracle ZFS Storage Appliances.

2.6 Troubleshooting Oracle ORAchk Specific Problems

Troubleshoot and fix Oracle ORAchk specific problems.

Troubleshooting Cygwin (page 2-25)
Troubleshoot and fix Cygwin setup issues.

Troubleshooting Oracle Identity and Access Management (IAM) Health Checks (page 2-26)
My Oracle Support has the most current information about troubleshooting Oracle ORAchk for IAM.

2.6.1 Troubleshooting Cygwin

Troubleshoot and fix Cygwin setup issues.

See Also:

Cygwin FAQ, if you experience a process fork failure, memory leak error, or a file access error after configuring SSH, which is available at the following URL:

Cygwin FAQ

Cygwin community, to report your problem if you are unable to find a workaround for your problem, which is available at the following URL:

Cygwin problems

SSH Daemon does not Start (page 2-25)
Workaround to fix if the SSH daemon fails to start.

Other Cygwin Issues (page 2-26)
Workaround to fix common Cygwin issues.

2.6.1.1 SSH Daemon does not Start

Workaround to fix if the SSH daemon fails to start.

1. View the `c:\cygwin\var\log\sshd.log` file for information on why the SSH daemon failed to start.

2. Run the following commands to test SSH connectivity between the local node and the remove nodes.

   ```
   ssh -l username localhost 'date'
   ```

   ```
   ssh -l varname this node  'date'
   ```

   For example:

   ```
   ssh -l pjohn node1.example.com 'date'
   ```

   This command prompts you to specify the password. When you specify the correct password, the command returns the accurate date.

2.6.1.2 Other Cygwin Issues

Workaround to fix common Cygwin issues.

Permission Issue

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@                @@@@@@@@@@@@@@@@@@@
                @         WARNING: UNPROTECTED PRIVATE KEY FILE!          @
                @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@@@@@@@@@@@@@@@@@@@
                Permissions 0644 for '/etc/ssh_host_ed25519_key' are too open.
                It is required that your private key files are NOT accessible by
others.
                This private key will be ignored.
                bad permissions: ignore key: /etc/ssh_host_ed25519_key
                Could not load host key: /etc/ssh_host_ed25519_key
                Disabling protocol version 2. Could not load host key
                sshd: no hostkeys available -- exiting.
```

1. Run the `chmod 600 /etc/ssh*` command to fix permission issues.
2. To fix the `privilege separation user sshd does not exist` error, remove sandbox from the `/etc/sshd_config` file.

   ```
   UsePrivilegeSeparation sandbox   # Default for new installations.
   ```

   to

   ```
   UsePrivilegeSeparation no        # Default for new installations.
   ```

3. Stop MKSNT SSH servers in Windows Services, if MKSNT is running sshd.
4. Oracle ORAchk fails on SuSE Linux with the error as follows: `-bash: ./orachk: /bin/env: bad interpreter: No such file or directory`
   a. Create a softlink from `/usr/bin/env` to `/bin/env` on all nodes:

      ```
      ln -s /bin/env /usr/bin/env
      ```

2.6.2 Troubleshooting Oracle Identity and Access Management (IAM) Health Checks

My Oracle Support has the most current information about troubleshooting Oracle ORAchk for IAM.

See Also:

My Oracle Support Note 2070073.1:

Oracle Identity and Access Management Healthcheck Guide (ORAchk for IDM)

3

Oracle EXAchk Specific Features and Tasks

Review this information for the features of Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance, Oracle Exalogic, Oracle SuperCluster, Oracle Exalytics, and Big Data.

> **See Also:** Oracle ORAchk and Oracle EXAchk Common Features and Tasks (page 1-1)

3.1 Oracle Exadata and Zero Data Loss Recovery Appliance

Understand the features and tasks specific to Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance.

> **See Also:** Oracle ORAchk and Oracle EXAchk Common Features and Tasks (page 1-1)

3.1.1 Supported Platforms

Oracle EXAchk supports all supported hardware types, operating systems, firmware versions, and Oracle versions for the following Oracle engineered systems.

- Oracle Big Data Appliance
- Oracle Exadata Database Machine (Exadata) (V2 and above, HP hardware based V1 systems are not covered)
- Oracle Exalogic
- Oracle Exalytics
- Oracle SuperCluster
- Zero Data Loss Recovery Appliance

See Also:

My Oracle Support Note 1070954.1 for the latest supported platforms and releases, which is available at the following URL:

Oracle Exadata Database Machine exachk or HealthCheck

3.1.2 Prerequisites for Running Oracle EXAchk on Oracle Exadata

Review the list of additional prerequisites for running Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance.

Storage Servers

On the database, if you configure passwordless SSH equivalency for the user that launched Oracle EXAchk to the `root` user id on each storage server, then Oracle EXAchk uses SSH equivalency credentials to complete the storage server checks.

You can run Oracle EXAchk from the Oracle Exadata storage server, if there is no SSH connectivity from the database to the storage server.

To lock and unlock cells, use the `-unlockcells` and `-lockcells` options for Oracle Exadata, Oracle SuperCluster and Zero Data Loss Recovery Appliance.

```
./exachk -unlockcells <all | -cells [comma-delimited list of cell names or cell IPs]>

./exachk -lockcells <all | -cells [comma-delimited list of cell names or cell IPs]>
```

InfiniBand Switches

On the database, if you configure passwordless SSH equivalency for the user that launched Oracle EXAchk to the `nm2user` user on each InfiniBand switch, then Oracle EXAchk uses SSH equivalency credentials to complete the InfiniBand switch checks.

If you have not configured passwordless SSH equivalency, then Oracle EXAchk prompts you for the `nm2user` user password on each of the InfiniBand switches.

Prerequisites (page 1-3)
Review the checklist for Bash requirements, SSH connectivity, and required user privileges to run health checks.

3.1.3 Installation Requirements

Understand the requirements for installing Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance, either on your local database or on a remote device that is connected to a database.

Shared Remote Versus Local Installation

If the environment contains only one Oracle Exadata Database machine or one Oracle Real Application Clusters (Oracle RAC) database, then the entire Oracle EXAchk installation must be local to one of the databases. Do not install Oracle EXAchk on every database.

When an environment consists of more than one Oracle Exadata Database machine or Oracle RAC database, consider installing Oracle EXAchk on a remote device that is connected to a database on each Oracle Exadata Database machine or Oracle RAC cluster.

The advantage is that you can install Oracle EXAchk in one location, validate it, and then run it where required within your environment. This saves time and errors. Because Oracle EXAchk is frequently updated, Oracle recommends that you always use the latest version available.

See Also:

My Oracle Support Note 1070954.1, which is available at the following URL:

Oracle Exadata Database Machine exachk or HealthCheck

Use the remote location for running Oracle EXAchk only. All working directories and output files are written to the local databases using the *RAT_OUTPUT* environment variable. The location you choose for `RAT_OUTPUT` must have read, write, and delete privileges for the user running Oracle EXAchk. Typically, *RAT_OUTPUT* is set to the local `/opt/oracle.SupportTools/exachk` directory.

For example, to install Oracle EXAchk in the `/remotely_mounted_dev/exachk/12.1.0.2.6` directory, and then run Oracle EXAchk on the local node as the Oracle Database home owner `oracle`, use the command:

```
oracle $ export RAT_OUTPUT=/opt/oracle.SupportTools/exachk
oracle $ /remotely_mounted_dev/exachk/12.1.0.2.6/exachk
```

Note:

To use the remote device for Oracle EXAchk output, consider the following:

1. Ensure that the remote device can handle the I/O load. The performance of Oracle EXAchk is adversely affected when the remote device cannot manage the I/O load. The effect varies from excessively long run times to unpredictable check timeouts leading to hard-to-diagnose skipped checks.
2. Do not write I/O from multiple Oracle Exadata Database machines or Oracle RAC clusters into the same output directory. Using the same output directory for multiple devices can cause remote locking or access issues on the remote device. At a minimum, store the output for each unique Oracle Exadata Database Machine or Oracle RAC cluster to its own directory structure using the *RAT_OUTPUT* environment variable.

Recommended Local Installation Directory and Owner User Id

If the installation is local, then install Oracle EXAchk in `/opt/oracle.SupportTools/exachk` owned by the `grid` home owner for the relevant cluster. The permissions on the directory must be `775`. For example, in a role-separated environment where the grid home is owned by `user1` belonging to the `install1` group, the installation directory is as follows:

```
# ls -lt /opt/oracle.SupportTools | grep exachk
drwxrwxr-x 2 user1 install1   4096 Jan 23 08:31 exachk
```

As `user1`, copy and unzip the `exachk.zip` file as follows:

```
# ls -la
total 55912
drwxrwxr-x 5 user1 install1     4096 Jan 23 10:27 .
drwxr-xr-x 8 root root         4096 Jan 23 08:31 ..
drwxrwxr-x 3 user1 install1     4096 Jan 22 16:00 .cgrep
-rw-r--r-- 1 user1 install1  8041431 Jan 22 16:34 exachk.zip
-rw-r--r-- 1 user1 install1  4580698 Jan 22 16:00 rules.dat
-rw-r--r-- 1 user1 install1 36866945 Jan 22 16:00 collections.dat
-rw-r--r-- 1 user1 install1      291 Jan 22 15:59 UserGuide.txt
-rw-r--r-- 1 user1 install1     2533 Jan 22 15:58 readme.txt
-rw-r--r-- 1 user1 install1  4114714 Jan 22 15:55 CollectionManager_App.sql
-rwxr-xr-x 1 user1 install1  1973350 Jan 22 15:55 exachk
```

This configuration permits the root user and the users in the `install1` group to run Oracle EXAchk from the installation directory.

Recommended Oracle EXAchk Run Location

By default, Oracle EXAchk stores the output in the directory from where you run it. Any user that runs Oracle EXAchk must first change the working directory to the Oracle EXAchk installation directory.

For example:

```
[user1]$ cd /opt/oracle.SupportTools/exachk
[user1]$ ./exachk -nodaemon -profile clusterware
```

This method maintains the output files in one location, even though the file owner user IDs are different.

For example:

```
[user1]$ ls -lt | grep exachk_
-rw-r--r-- 1 user2 install1  1462155 Jan 23 12:25
exachk_randomdb04_V1201_012315_121443.zip
drwxr-xr-x 8 user2 install1    61440 Jan 23 12:25
exachk_randomdb04_V1201_012315_121443
-rw-r--r-- 1 user1 install1   295994 Jan 23 12:12
exachk_randomdb04_V1201_012315_120457.zip
drwxr-xr-x 8 user1 install1    28672 Jan 23 12:12
exachk_randomdb04_V1201_012315_120457
drwxr-xr-x 8 root  root        69632 Jan 23 10:27 exachk_randomdb04_012315_101719
-rw-r--r-- 1 root  root      1405449 Jan 23 10:27 exachk_randomdb04_012315_101719.zip
```

If you do not want the output files in this location, then use either the *RAT_OUTPUT* environment variable or the `-output` command line option to direct the output to another location. By default, Oracle EXAchk maintains temporary working files in the home directory of the user that runs Oracle EXAchk, and deletes the files at the end of the run.

Installing Oracle ORAchk and Oracle EXAchk (page 1-6)
Follow these procedures to install Oracle ORAchk and Oracle EXAchk.

Understanding and Managing Reports and Output (page 1-42)
Oracle ORAchk and Oracle EXAchk generate a detailed HTML report with findings and recommendations.

3.1.4 Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance Usage

Usage of Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance depends on other considerations such as virtualization, parallel run, and so forth.

Database Default Access on the Client Interface (page 3-6)
If you use the client interface as the default access for your database, then use the `-clusternodes` command line option to instruct Oracle EXAchk to communicate over the management interface.

Virtualization Considerations (page 3-6)
Oracle EXAchk supports virtualization on Exadata.

Parallel Run (page 3-7)
By default, Oracle EXAchk runs parallel data collection for the storage servers and InfiniBand switches and databases.

Multiple Asymmetric Database Home Examples (page 3-7)
If the database homes are not symmetric, then install Oracle EXAchk onto multiple databases in the cluster so that there is one installation for each Oracle Database home on a subset of databases.

Using the root User ID in Asymmetric and Role Separated Environments (page 3-9)
Run Oracle EXAchk as root to simplify the work required in asymmetric or role separated environments.

Environment Variables for Specifying a Different User Than root (page 3-10)
Review the list of environment variables for specifying a different user than root.

Oracle ORAchk and Oracle EXAchk Common Features and Tasks (page 1-1)

3.1.4.1 Database Default Access on the Client Interface

If you use the client interface as the default access for your database, then use the `-clusternodes` command line option to instruct Oracle EXAchk to communicate over the management interface.

For example, if a cluster is configured as follows:

Table 3-1 Example Cluster Configuration

Interface	Database Host names
Management	`dbadm01`, `dbadm02`, `dbadm03`, `dbadm04`
Client	`dbclnt01`, `dbclnt02`, `dbclnt03`, `dbclnt04`

Then the command must include:

```
-clusternodes dbadm01,dbadm02,dbadm03,dbadm04
```

Note: When using the `-clusternodes` option, start Oracle EXAchk on the first database in the list.

3.1.4.2 Virtualization Considerations

Oracle EXAchk supports virtualization on Exadata.

To run hardware and operating system level checks for database, storage servers, InfiniBand fabric, and InfiniBand switches, install Oracle EXAchk into the management domain also referred to as `DOM0` and run Oracle EXAchk as `root` .

When you run Oracle EXAchk from `DOM0`, it discovers all compute nodes, storage servers, and InfiniBand switches in the entire InfiniBand fabric and runs on all those components. To run Oracle EXAchk on a subset of nodes when Oracle EXAchk is run in the management domain, use the command line options `-clusternodes` to designate databases, `-cells` to designate storage servers, and `-ibswitches` to designate InfiniBand switches.

For example, for a full rack where only the first quarter rack is configured for virtualization but all components are on the same InfiniBand fabric, run the following command as root on the database `randomadm01` :

```
./exachk -clusternodes randomadm01,randomadm02 \
       -cells randomceladm01,randomceladm02,randomceladm03 \
    -ibswitches randomsw-ibs0,randomsw-iba0,randomsw-ibb0
```

Run Oracle EXAchk separately for each cluster in a user domain also referred to as DOMUs. For example, consider 2 clusters and 4 user domains in each cluster. Although there are a total of 8 user domains, Oracle EXAchk runs only twice. Once on the first node of the first cluster running in the first user domain and once on the first node of second cluster running in the second user domain. The user domain runs do not include hardware or operating system level checks on the database, storage servers, or InfiniBand switches.

Note:

Run Oracle EXAchk as `root` in the management domain and the user domains.

3.1.4.3 Parallel Run

By default, Oracle EXAchk runs parallel data collection for the storage servers and InfiniBand switches and databases.

You can also configure Oracle EXAchk to run serial data collection.

To run serial data collection for the storage server, database, and InfiniBand switches, set the following environment variables:

- *RAT_COMPUTE_RUNMODE*:

  To collect database server data in serial, do the following:

  ```
  export RAT_COMPUTE_RUNMODE=serial
  ```

- *RAT_CELL_RUNMODE*:

  To collect storage server data in serial, do the following:

  ```
  export RAT_CELL_RUNMODE=serial
  ```

- *RAT_IBSWITCH_RUNMODE*:

  To collect InfiniBand switch data in serial, do the following:

  ```
  export RAT_IBSWITCH_RUNMODE=serial
  ```

Slow Performance, Skipped Checks and Timeouts (page 1-163)
Follow these procedures to address slow performance and other issues.

3.1.4.4 Multiple Asymmetric Database Home Examples

If the database homes are not symmetric, then install Oracle EXAchk onto multiple databases in the cluster so that there is one installation for each Oracle Database home on a subset of databases.

Multiple Asymmetric Database Homes Owned by the Same or Different Users

The following table is an example of a distribution in the same cluster, with role separation between `userid1` and `userid2` such that neither can access the other's database home or database:

Table 3-2 Multiple Asymmetric Database Homes Owned by the Same or Different Users

Owner User	Database Home	Installed on	Databases
`userid1`	`/path1/dbhome_1`	`db01`, `db02`, `db03`, `db04`	`dbm-a`
`userid2`	`/path2/dbhome_2`	`db05`, `db06`, `db07`, `db08`	`dbm-b`, `dbm-c`

Do the following:

1. As `userid1`, install Oracle EXAchk in `/home/exachk/userid1` on `db01`.

2. As `userid2`, install Oracle EXAchk in `/home/exachk/userid2` on `db05`.
3. As `userid1`, on `db01`, run the following command to collect the storage server, root level database checks, and InfiniBand switch checks:

```
cd /home/exachk/userid1
./exachk -profile sysadmin
```

4. As `userid1`, on `db01` , collect the database checks for `dbm-a`:

```
cd  /home/exachk/userid1
./exachk -profile dba -clusternodes db01,db02,db03,db04
```

5. As `userid2`, on `db05`:

```
cd /home/exachk/userid2
./exachk -profile dba -clusternodes db05,db06,db07,db08.
```

   Choose `dbm-b` and `dbm-c` from the database selection list to collect the database checks for `dbm-b` and `dbm-c`.

6. Optionally, use the `-merge` option to merge the reports.

Multiple Asymmetric Database Homes Owned by the Same or Different Users, Grid User, and SYSADMIN/DBA Role Isolation

For this example, assume the following configuration in the same cluster:

Table 3-3 Multiple Asymmetric Database Homes Owned by the Same or Different Users, Grid User, and SYSADMIN/DBA Role Isolation

Owner User ID	Database Home	Installed on	Database(s)
`userid1`	`/path1/dbhome_1`	`db01`, `db02`, `db03`, `db04`	`dbm-a`
`userid2`	`/path2/dbhome_2`	`db05`, `db06`, `db07`, `db08`	`dbm-b`, `dbm-c`
`grid`	`/path3/grid`	`db01`, `db02`, `db03`, `db04`, `db05`, `db06`, `db07`, `db08`	`+ASM`

Further, there is role separation between `userid1` and `userid2` and `grid` such that none can access the database structure of others and a company policy to isolate the system administrators from the database administrators.

Do the following:

1. As `userid1`, install Oracle EXAchk in `/home/exachk/userid1` on `db01`.
2. As `userid2`, install Oracle EXAchk in `/home/exachk/userid2` on `db05`.
3. As the `grid` user, run Oracle Clusterware checks:

```
mkdir /home/grid/exachk_reports
cd /home/grid/exachk_reports
/home/exachk/userid1/exachk -profile clusterware
```

The working directory and zip file are stored in the `/home/grid/exachk_reports` directory.

4. As `root`, run the `sysadmin` checks to collect from the storage server, root level database, and InfiniBand switch checks:

```
mkdir /root/exachk_reports
cd /root/exachk_reports
/home/exachk/userid1/exachk -profile sysadmin
```

The working directory and zip file are stored in the `/root/exachk_reports` directory.

5. As `userid1` on `db01`, run the command:

```
cd /home/exachk/userid1
./exachk -profile dba -clusternodes db01,db02,db03,db04
```

Choose `dbm-a` from the database selection list to collect the database checks for `dbm-a`.

6. As `userid2` on `db05`, run the command:

```
cd /home/exachk/userid2
./exachk -profile dba -clusternodes db05,db06,db07,db08
```

Choose `dbm-b` and `dbm-c` from the database selection list to collect the database checks for `dbm-b` and `dbm-c`.

7. Optionally, use the `-merge` command line option to merge the reports.

3.1.4.5 Using the root User ID in Asymmetric and Role Separated Environments

Run Oracle EXAchk as root to simplify the work required in asymmetric or role separated environments.

If database homes are not symmetric, then install Oracle EXAchk on multiple databases in the cluster, such that there is one installation for each Oracle Database home located on a subset of databases.

For this example, assume the following configuration in the same cluster:

Table 3-4 Using root User ID in Asymmetric and Role Separated Environments

Owner User ID	Database Home	Installed on	Database(s)
userid1	/path1/dbhome_1	db01, db02, db03, db04	dbm-a
userid2	/path2/dbhome_2	db05, db06, db07, db08	dbm-b, dbm-c
grid	/path3/grid	db01, db02, db03, db04, db05, db06, db07, db08	+ASM

Further, there is role separation between `userid1` and `userid2` and GRID, such that none can access the database structure of the others. You can also enforce company policy to isolate the system administrators from the database administrators.

Do the following:

1. As `root`, install Oracle EXAchk in the `/tmp/exachk/121026` directory on `db01` .
2. As `root`, install Oracle EXAchk the `/tmp/exachk/121026` directory on `db05`.
3. As `root` , on `db01`:

   ```
   cd /tmp/exachk/121026
   ./exachk -clusternodes db01,db02,db03,db04
   ```

   Choose `dbm-a` from the database selection list to collect the database checks for `dbm-a`.
4. As `root` on `db05`:

   ```
   cd /tmp/exachk/121026
   ./exachk -excludeprofiles storage,switch -clusternodes db05,db06,db07,db08
   ```

   Choose `dbm-b` and `dbm-c` from the database selection list to collect the database checks for `dbm-b` and `dbm-c`.
5. If desired, use the `-merge` command line option to merge the reports.

3.1.4.6 Environment Variables for Specifying a Different User Than root

Review the list of environment variables for specifying a different user than root.

- *RAT_CELL_SSH_USER*

  By default, Oracle EXAchk runs as`root` to run checks on an Exadata storage server.

  If security policies do not permit connection to a storage server as `root` over SSH, then you can specify a different user by setting this environment variable:

  ```
  export RAT_CELL_SSH_USER=celladmin
  ```

  Note:

  If you specify *RAT_CELL_SSH_USER*, then a subset of checks is run, based upon the privileges of the alternate user you specify.

- *RAT_IBSWITCH_USER*

  By default, Oracle EXAchk runs as`root` to run checks on the InfiniBand switches, when you run Oracle EXAchk on a database as root. By default, when Oracle EXAchk is run as a user other than root on a database, the `nm2user` is used to run checks on the InfiniBand switches.

  If security policies do not permit connection to an InfiniBand switch as either the root or `nm2user` user over SSH, then specify a different user by setting this environment variable:

  ```
  export RAT_IBSWITCH_USER=ilom-admin
  ```

  Note:

If you specify *RAT_IBSWITCH_USER* , then a subset of checks is run, based upon the privileges of the alternate user you specify.

3.1.5 Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance Command Line Options

List of command line options specific to Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance.

Table 3-5 Oracle EXAchk on Exadata and Zero Data Loss Recovery Appliance Command Line Options

Option	Description

`-cells` *`cells`*	Pass comma-delimited list of storage server names to limit to subset of storage servers.
	Alternatively, set the *RAT_CELLS* environment variable to space-delimited list of cells:
	For example:
	`export RAT_CELLS="randomcel01 randomcel06"`
	Or
	`export RAT_CELLS=randomcel01`

`-ibswitches` *`switches`*	Pass comma-delimited list of InfiniBand switch names to limit to subset of InfiniBand switches.
	Alternatively, set *RAT_IBSWITCHES* environment variable to space-delimited list of switches:
	For example:
	`export RAT_IBSWITCHES="randomsw-ib1 randomsw-ib3"`
	Or
	`export RAT_CELLS=randomsw-ib2`

To lock and unlock the cell, use the `–unlockcells` and `–lockcells` options:

```
./exachk -unlockcells all | -cells comma-delimited list of names or IP addresses of cells

./exachk -lockcells all | -cells comma-delimited list of names or IP addresses of cells
```

Oracle ORAchk and Oracle EXAchk Command Line Options (page 1-84)
Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

3.1.6 Troubleshooting Oracle EXAchk on Exadata and Zero Data Loss Recovery Appliance

Troubleshoot and fix issues related to Oracle EXAchk on Oracle Exadata and Zero Data Loss Recovery Appliance.

See Also:

My Oracle Support Note 1070954.1 for the latest known issues specific to Oracle EXAchk on Oracle Exadata, which is available at the following URL:

Oracle Exadata Database Machine exachk or HealthCheck

Error RC-003 - No Audit Checks Were Found

In the process of identifying the environment characteristics, Oracle EXAchk constructs some environment variables that it then compares to the Oracle EXAchk rules database to determine what checks to run. If one of these environment variables does not match a known profile in the rules database, then Oracle EXAchk displays an error that starts with `error RC-003 - no audit checks were found`... and exits.

The most common case occurs when an older version of Oracle EXAchk is used in an Oracle Exadata Database Machine environment with recently released components. This may occur because of a delay between the release of a new component or version and when Oracle EXAchk incorporates support for it.

For example, when Oracle EXAchk earlier than 2.1.3_20111212 were run on an Oracle Exadata Database Machine where Oracle Database release 11.2.0.3.0 was deployed, EXAchk exited with the following message:

```
Error RC-003 - No audit checks were found for LINUXX8664OELRHEL5_112030-. Please
refer to the section for this error code in "Appendix A - Troubleshooting Scenarios"
of the "Exachk User Guide".
```

In this example, `_112030` indicates that Oracle Database release 11.2.0.3.0 was installed on the system. Since the version of Oracle EXAchk used did not support 11.2.0.3.0, Oracle EXAchk could not find a known match in the Oracle EXAchk rules database.

How Long Should It Take to Run Oracle EXAchk?

The time it takes to run the tool varies based on the number of nodes in a cluster, CPU load, network latency, and so on. Normally the entire process takes only a few minutes per node, that is, less than 5 minutes per node. This is just a general guideline but if it takes substantially more time than this then there may be some other problem, then investigate.

With the introduction of parallelized database collection in 2.2.5, elapsed time for systems with many databases is significantly reduced. Experience in the field is that, it normally takes about 10 minutes for a quarter rack X2-2 system with one database. On an internal X3-2 half rack with 20 storage servers, 9 InfiniBand switches, and 44 databases, the elapsed time was 44 minutes.

Oracle ORAchk and Oracle EXAchk Command Line Options (page 1-84)
Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

3.2 Oracle Exalogic

This section explains features and tasks specific to Oracle EXAchk on Oracle Exalogic.

See Also:

3.2.1 Scope and Supported Platforms

Oracle EXAchk is a health check tool that is designed to audit important configuration settings in an Oracle Exalogic Elastic Cloud machine.

Oracle EXAchk examines the following components:

- Compute nodes
- Storage appliance
- InfiniBand fabric
- Ethernet network
- Exalogic Control vServers, relevant only in virtual configurations
- Guest vServers, relevant only in virtual configurations

Oracle EXAchk audits the following configuration settings:

- Hardware and firmware
- Operating system kernel parameters
- Operating system packages

You must run Oracle EXAchk for Exalogic in the following conditions:

- After deploying the machine.
- Before and after patching or upgrading the infrastructure.
- Before and after making any changes in the system configuration.
- Before and after any planned maintenance activity.

See Also:

My Oracle Support Note 1449226.1 for the latest scope and supported platforms specific to Oracle EXAchk on Oracle Exalogic, which is available at the following URL:

Exachk Health-Check Tool for Exalogic

3.2.2 Prerequisites for Running Oracle EXAchk on Oracle Exalogic

Review the list of prerequisites.

Oracle recommends that you install Oracle EXAchk on the pre-existing share `/export/common/general` on the ZFS storage appliance on the Exalogic machine. You can then run Oracle EXAchk and access the Oracle EXAchk generated HTML reports from a compute node on which the `/export/common/general` share is mounted.

For Exalogic machines in a virtual configuration, Oracle recommends that you mount the `/export/common/general share` on the vServer that hosts the Enterprise Controller component of the Exalogic control stack, and run Oracle EXAchk from that vServer.

To install Oracle EXAchk on the `/export/common/general` share, you must complete the following steps:

1. Enable NFS on the `/export/common/general` share.
2. Mount the `/export/common/general` share.

Enable NFS on the /export/common/general Share (page 3-14)
Before installing Oracle EXAchk on the pre-existing share `export/common/general`, enable NFS share mode on the share.

Mount the /export/common/general Share (page 3-16)
In this section, compute node `el01cn01` is used as the example of the host on which the `/export/common/general` share is mounted.

3.2.2.1 Enable NFS on the /export/common/general Share

Before installing Oracle EXAchk on the pre-existing share `export/common/general`, enable NFS share mode on the share.

1. In a web browser, enter the IP address or host name of the storage node as follows:

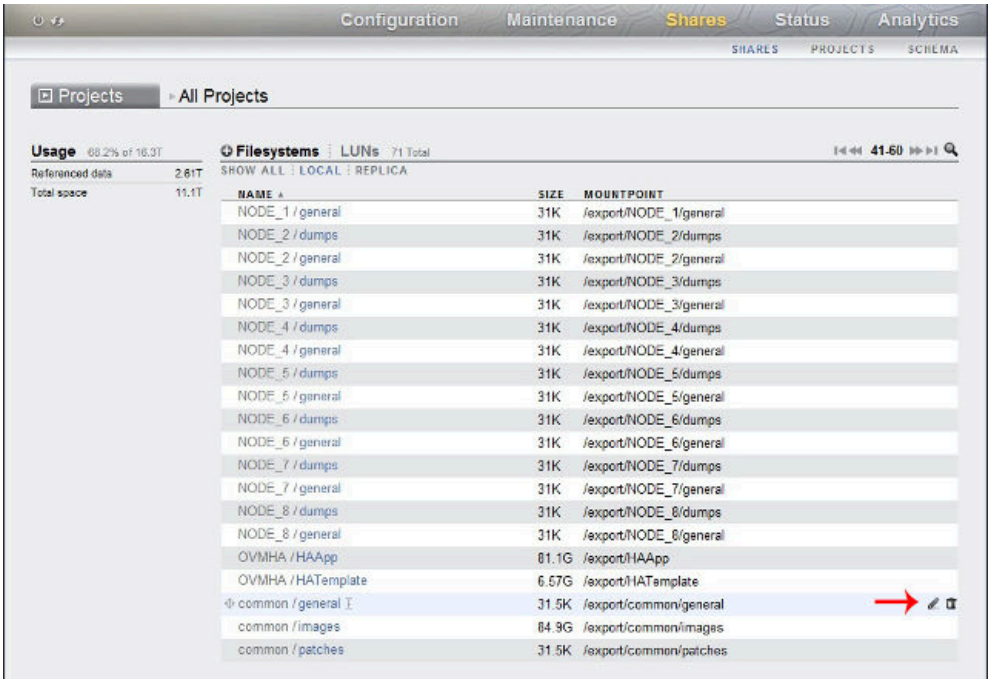
```
https://ipaddress:215
```

Or

```
https://hostname:215
```

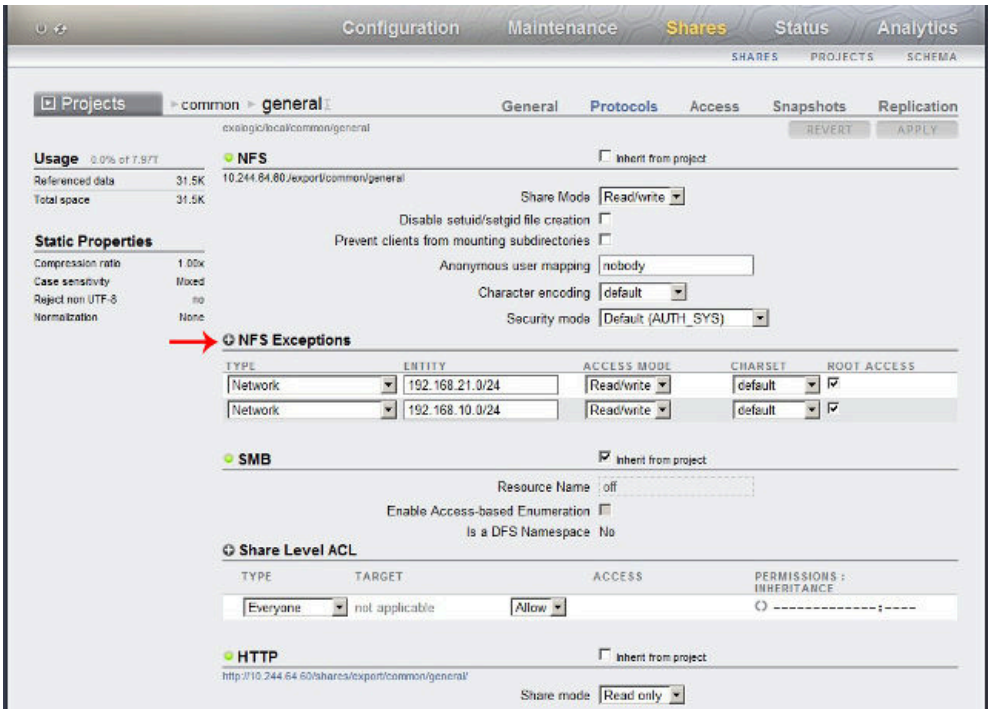
2. Log in as `root`.
3. Click **Shares** in the top navigation pane.
4. Place your cursor over the row corresponding to the share `/export/common/general`.
5. Click the **Edit entry**.

Figure 3-1 Exalogic - Shares



6. On the resulting page, select **Protocols** in the top navigation pane.
7. In the **NFS** section, deselect **Inherit from project**, and click plus (+) located next to **NFS Exceptions**.

Figure 3-2 Exalogic - Edit Protocols



8. Edit the following in the **NFS Exceptions** section:

Table 3-6 NFS Exceptions

Element	Action/Description
TYPE	Select **Network**.
ENTITY	Enter the IP address of the host that gains access to the share. For example: `192.168.10.0/24`
ACCESS MODE	Select **Read/write**.
CHARSET	Keep the default setting.
ROOT ACCESS	Select the checkbox.

9. Click **Apply**.

10. Log out.

3.2.2.2 Mount the /export/common/general Share

In this section, compute node `el01cn01` is used as the example of the host on which the `/export/common/general` share is mounted.

Note:

- For an Exalogic machine in a virtual configuration running EECS 2.0.6, mount the `export/common/general` share on the vServer that hosts the

Enterprise Controller component of the Exalogic Control stack. Substitute the compute node `el01cn01` in this procedure with the host name or IP address of that vServer.

For an Exalogic machine running EECS 2.0.4 (virtual), if traffic from the `eth-admin` network cannot be routed to the `EoIB-external-mgmt` network, when you run Oracle EXAchk from the Enterprise Controller vServer, then health checks are not performed for the switches and the storage appliance. On such racks, to perform health checks on the physical components, you must mount the `export/common/general` share on a compute node as well.

- In a virtual configuration, if you run Oracle EXAchk from a compute node, Oracle EXAchk does not perform health checks for the Exalogic Control components.

---

1. Check if the `/export/common/general` share is already mounted at the `/u01/common/general` directory on compute node `el01cn01`.

   You can do this by logging in to `el01cn01` as root and running the following command:

   ```
   # mount
   ```

   If the `/export/common/general` share is already mounted on the compute node, then the output of the mount command contains a entry like the following:

   ```
   192.168.10.97:/export/common/general on /u01/common/general ...
   ```

   In this example, `192.168.10.97` is the IP address of the storage node `el01sn01`.

   If you see the previous line in the output of the mount command, then skip step 2.

   If the output of mount command does not contain the previous line, perform step 2.

2. Mount the `/export/common/general` share at a directory on compute node `el01cn01`.

   a. Create the directory `/u01/common/general` to serve as the mount point on `el01cn01` as follows:

      ```
      # mkdir -p /u01/common/general
      ```

   b. Depending on the operating system running on the host on which you want to mount the `/export/common/general` share, complete the following steps:

      Oracle Linux

      Edit the `/etc/fstab` file by using a text editor like `vi`, and add the following entry for the mount point that you just created:

      ```
      el01sn01-priv:/export/common/general /u01/common/general nfs4
      rw,bg,hard,nointr,rsize=131072,wsize=131072,proto=tcp
      ```

      Oracle Solaris

      Edit the `/etc/vfstab` file by using a text editor like vi, and add the following entry for the mount point that you just created:

```
el01sn01-priv:/export/common/general - /u01/common/general nfs - yes
rw,bg,hard,nointr,rsize=131072,wsize=131072,proto=tcp
```

c. Save and close the file.

d. Mount the volumes by running the following command:

```
# mount -a
```

3.2.3 Oracle Exalogic Prerequisite for Viewing

Review the prerequisite for viewing Oracle EXAchk HTML Report in a web browser.

Enable access to the `/export/common/general` share through the HTTP/WebDAV Protocol

To enable access to a share through the HTTP/WebDAV protocol, complete the following steps:

1. In a web browser, enter the IP address or host name of the storage node as follows:

   ```
   https://ipaddress:215
   ```

   Or

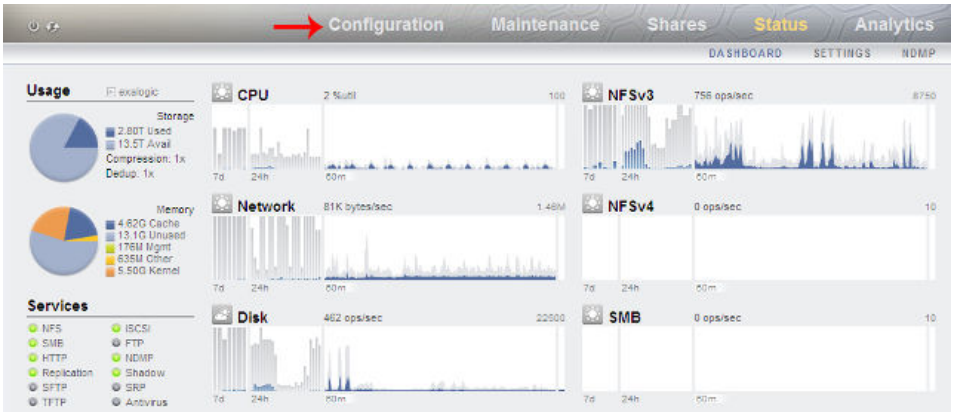
   ```
   https://hostname:215
   ```

2. Log in as root.

3. Enable the HTTP service on the appliance, by doing the following:

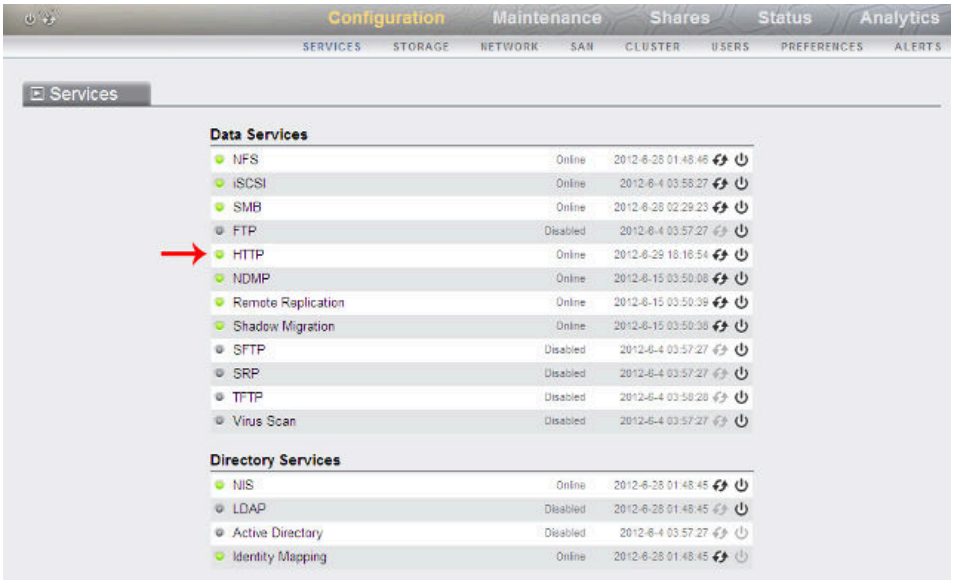
   a. Click **Configuration** in the top navigation pane.

   Figure 3-3 Exalogic - Configuration

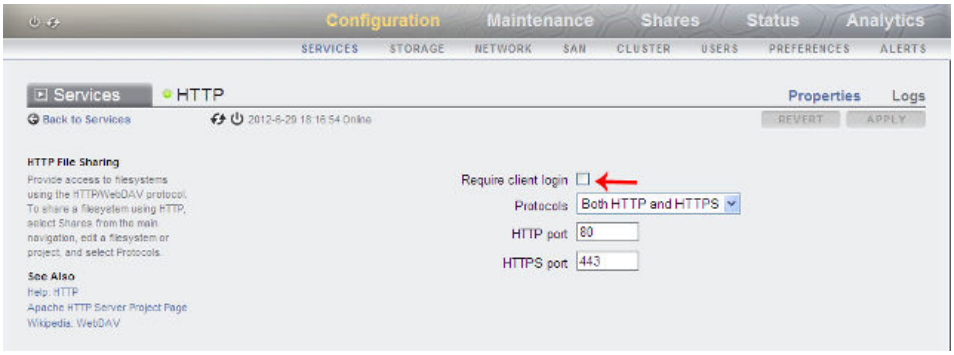
   b. Click **HTTP** under **Data Services**.

Figure 3-4 Exalogic - Data Services



c. Ensure that the **Require client login** checkbox is not selected.

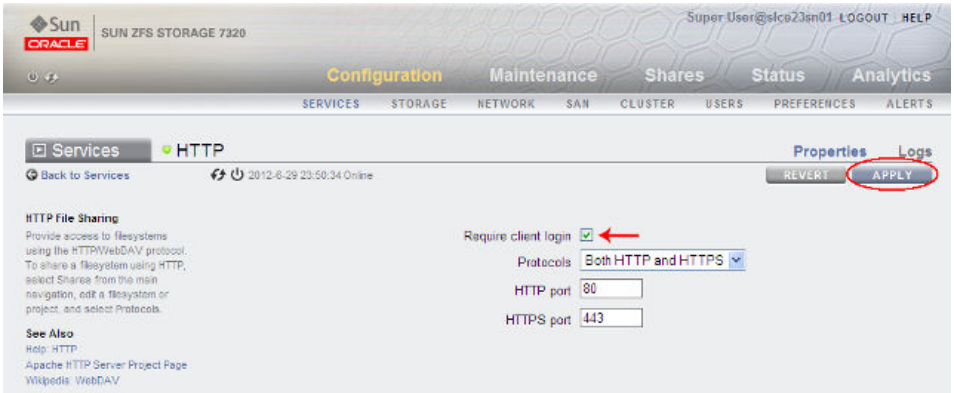
Figure 3-5 Exalogic - Client Login



d. Click **Apply**.

If the button is disabled, select and deselect the **Require client login** checkbox.

Figure 3-6 Exalogic - Client Login



4. Enable read-only HTTP access to the `/export/common/general` share by doing the following:

   a. Click **Shares** in the top navigation pane.

   b. Place your cursor over the row corresponding to the `/export/common/general` share.

   c. Click the **Edit entry** button (pencil icon) near the right edge of the row.

   d. On the resulting page, click **Protocols** in the navigation pane.

   e. Scroll down to the **HTTP** section.

   f. Deselect the **Inherit from project** check box.

   g. In the **Share mode** field, select **Read only**.

   Figure 3-7 Exalogic - Share Mode

   h. Click **APPLY** .

5. Log out.

3.2.4 Installation and Upgrade

Follow these instructions to install and upgrade Oracle EXAchk on Oracle Exalogic.

Install Oracle EXAchk on a Physical Oracle Exalogic Machine (page 3-21)
Follow these instructions to install Oracle EXAchk on a physical Oracle Exalogic machine.

Install Oracle EXAchk on a Virtual Oracle Exalogic Machine (page 3-21)
Follow these instructions to install Oracle EXAchk on a virtual Oracle Exalogic machine.

Upgrade Oracle EXAchk (page 3-22)
Follow these instructions to upgrade Oracle EXAchk on Oracle Exalogic.

3.2.4.1 Install Oracle EXAchk on a Physical Oracle Exalogic Machine

Follow these instructions to install Oracle EXAchk on a physical Oracle Exalogic machine.

See Also:

Mount the /export/common/general Share share section in the Exalogic Elastic Cloud Exachk User's Guide, for more details.

Install Oracle EXAchk in the `/export/common/general` share by completing the following steps:

1. Ensure that `/export/common/general` share is mounted on the compute node `el01cn01`.
2. SSH to the compute node `el01cn01`.
3. Create a sub-directory named `exachk` in the `/u01/common/general/` directory to hold the Oracle EXAchk binaries:

   ```
   # mkdir /u01/common/general/exachk
   ```

4. Go to the `/u01/common/general/exachk` directory.
5. Download the `exachk.zip` file.
6. Extract the contents of the `exachk.zip` file.

   ```
   # unzip exachk.zip
   ```

   The Oracle EXAchk tool is now available at the following location on compute node `el01cn01`:

   ```
   /u01/common/general/exachk/exachk
   ```

3.2.4.2 Install Oracle EXAchk on a Virtual Oracle Exalogic Machine

Follow these instructions to install Oracle EXAchk on a virtual Oracle Exalogic machine.

See Also:

Mount the /export/common/general Share share section in the Exalogic Elastic Cloud Exachk User's Guide, for more details.

Install Oracle EXAchk in the `/export/common/general` share by completing the following steps:

1. Ensure that `/export/common/general` share is mounted on the vServer that hosts the Enterprise Controller.

   Note:

   For an Exalogic machine running EECS 2.0.4 (virtual), if traffic from the `eth-admin` network cannot be routed to the `EoIB-external-mgmt` network, when you run Oracle EXAchk from the Enterprise Controller vServer, health checks will not be performed for the switches and the storage appliance. On such racks, to perform health checks on the physical components, you must mount the `export/common/general`share on a compute node as well.

2. SSH to the vServer.

3. Create a subdirectory named `exachk` in `/u01/common/general/` to hold the EXAchk binaries:

   ```
   # mkdir /u01/common/general/exachk
   ```

   Note: If the vServer is down or otherwise inaccessible, then you can run Oracle EXAchk from a compute node. However, in this case, the health checks are performed for the Exalogic Control components.

4. Go to the `/u01/common/general/exachk` directory.

5. Download the `exachk.zip` file.

6. Extract the contents of the `exachk.zip` file.

   ```
   # unzip exachk.zip
   ```

   The Oracle EXAchk tool is now available at the following location on compute node `el01cn01`:

   ```
   /u01/common/general/exachk/exachk
   ```

3.2.4.3 Upgrade Oracle EXAchk

Follow these instructions to upgrade Oracle EXAchk on Oracle Exalogic.

See Also:

My Oracle Support Note 1449226.1 for the latest release of Oracle EXAchk, which is available at the following URL:

Exachk Health-Check Tool for Exalogic

1. Back up the directory containing the existing Oracle EXAchk binaries by moving it to a new location.

   For example, if the Oracle EXAchk binaries are currently in the directory `/u01/common/general/exachk`, then move them to a directory named `exachk_05302012` by running the following commands:

   ```
   # cd /u01/common/general
   # mv exachk exachk_05302012
   ```

In this example, the date when Oracle EXAchk is upgraded (05302012) is used to uniquely identify the backup directory. Pick any unique naming format, like a combination of the backup date and the release number and use it consistently.

2. Create the `exachk` directory afresh.

```
$ mkdir /u01/common/general/exachk
```

3. Install the latest version of Oracle EXAchk.

3.2.5 Oracle EXAchk on Oracle Exalogic Usage

For optimum performance of the Oracle EXAchk tool, Oracle recommends that you complete the following steps.

- Oracle EXAchk is a minimal impact tool. However, Oracle recommends that you run Oracle EXAchk when the load on the system is low. The runtime of Oracle EXAchk depends on the number of nodes to check, CPU load, network latency, and so on.
- Do not run the scripts in the Oracle EXAchk directory unless specifically documented.
- To avoid problems while running the tool from terminal sessions on a workstation or laptop, connect to the Exalogic machine and then run Oracle EXAchk by using VNC. Even if a network interruption occurs, Oracle EXAchk continues to run.
- Run Oracle EXAchk as `root`.

  Whenever the tool requires root user privileges, it displays a message as follows:

```
7 of the included audit checks require root privileged data collection.  If sudo
is not configured or the root password is not available, audit checks which
require root privileged data collection can be skipped.

1. Enter 1 if you will enter root password for each host when prompted (once for
each node of the cluster)
2. Enter 2 if you have sudo configured for oracle user to execute /tmp/
root_exachk.sh script
3. Enter 3 to skip the root privileged collections
4. Enter 4 to exit and work with the SA to configure sudo or arrange for root
access and run tool later

Please indicate your selection from one of the above options:-
```

  If you select 1, then the tool prompts you to enter the `root` password for each node. Enter the `root` password once for each node.

  If you select 2, and if you have `sudo` configured on your system, then the tool performs the `root` privileged collection by using the `sudo` credentials.

  If you select 3, then the tool skips all of the root privileged collections and audit checks. Perform those checks manually.

Performing Health Checks for the Exalogic Infrastructure (page 3-24)
Perform health checks in a virtual or physical racks.

Performing Health Checks for Guest vServers (page 3-26)
Run Oracle EXAchk to perform health checks for guest vServers.

3.2.5.1 Performing Health Checks for the Exalogic Infrastructure

Perform health checks in a virtual or physical racks.

Prerequisites

The term infrastructure is used here to indicate the compute nodes, switches, storage appliance, and, additionally, the Exalogic Control stack in the case of a machine in a virtual configuration.

Before running Oracle EXAchk for the Exalogic infrastructure components, ensure to meet the following prerequisites:

- Ensure that Oracle EXAchk is installed as described in Installing EXAchk.
- Before running Oracle EXAchk for the first time, make a note of the short names of the storage nodes and switches: `el01sn01`, `el01sw-ib01`, and so on. Oracle EXAchk prompts you for these names at the start of the health check process. This is a one time prompt. Oracle EXAchk stores the names you provide, and uses the stored names for subsequent runs.

Running Oracle EXAchk for Physical Racks

To perform health checks for all the infrastructure components in an Exalogic machine in a physical Linux or Solaris configuration, complete the following steps:

1. SSH as `root` to the compute node on which you installed Oracle EXAchk.
2. Go to the directory where you have installed Oracle EXAchk.

   ```
   # cd /u01/common/general/exachk
   ```

3. Run the following command:

```
# ./exachk
```

When running Oracle EXAchk for the first time, the tool detects the size of the Exalogic rack and prompts for the host name or IP address of the switch and storage node. For information about overriding the IP addresses and host names set during the first run.

Running Oracle EXAchk for Virtual Racks

To perform health checks for all the infrastructure components in an Exalogic machine in a virtual configuration, complete the following steps:

1. SSH as root to the vServer that hosts the Enterprise Controller.
2. Go to the directory where you have installed Oracle EXAchk.

   ```
   # cd /u01/common/general/exachk
   ```

3. Run the following command:

   ```
   # ./exachk
   ```

   Oracle EXAchk automatically discovers the IP addresses or host names of all the components in the machine, and starts performing the health checks.

See Also:

Section 4.4, "Overriding Discovered Component Addresses" in the Oracle Exalogic Elastic Cloud EXAchk User's Guide, for more details.

Note:

For an Exalogic machine running EECS 2.0.4 (virtual), if traffic from the `eth-admin` network is not routed to the `EoIB-external-mgmt` network when you run Oracle EXAchk from the Enterprise Controller vServer, Oracle EXAchk does not run health checks for the switches and storage heads. On such racks, do the following to perform health checks on all the components:

1. Perform health checks for the Exalogic Control components:
   a. SSH as `root` to the Enterprise Controller vServer.
   b. Go to the directory where you have installed Oracle EXAchk.

      ```
      # cd /u01/common/general/exachk
      ```

   c. Run the following command:

      ```
      # ./exachk -profile control_VM
      ```

   d. Oracle EXAchk reports that all the checks on the compute nodes passed. However, this command did not perform any health checks on the compute nodes, the storage appliance, and the switches.
2. Perform health checks for the physical components, such as compute nodes, storage appliance, and switches:
   a. SSH as `root` to the compute node on which you installed Oracle EXAchk.

b. Ensure that passwordless SSH to the Oracle VM Manager CLI shell is enabled.

c. Go to the directory where you have installed Oracle EXAchk.

```
# cd /u01/common/general/exachk
```

d. Run the following command:

```
# ./exachk -profile el_extensive
```

Running Oracle EXAchk for Hybrid Racks

To perform health checks for all the infrastructure components in an Exalogic machine in a hybrid configuration, that is, a machine on which half the nodes are running Oracle VM Server and the other half are on Oracle Linux, complete the following steps:

1. SSH as `root` to the vServer that hosts the Enterprise Controller component of the Exalogic Control stack.

2. Go to the directory where you have installed Oracle EXAchk.

```
# cd /u01/common/general/exachk
```

3. Run the following command:

```
./exachk -hybrid -phy physical_node_1[,physical_node_2,...]
```

In this command, `physical_node_1`, `physical_node_2`, and so on are the `eth-admin` IP addresses of the compute nodes running Oracle Linux.

The `-phy physical_node_1[,physical_node_2,...]` must be specified only the first time you run Oracle EXAchk with the `-hybrid` option. Oracle EXAchk stores the host names in the `exachk_exalogic.conf` file. For subsequent runs, you can run Oracle EXAchk without specifying the `-phy` option. Oracle EXAchk uses the host names stored in the`exachk_exalogic.conf` file.

Overriding Discovered Component Addresses (page 3-34)
In a physical environment, the component IP addresses or host names are determined in the first run based on user input. In a virtual environment, Oracle EXAchk has an in-built mechanism to automatically discover the IP addresses or host names of all the components. These features are designed to minimize the need for end-user input.

Oracle ORAchk and Oracle EXAchk Command Line Options (page 1-84)
Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

Oracle EXAchk on Oracle Exalogic Output (page 3-37)
Identify the checks that you need to act immediately to remediate, or investigate further to assess the checks that might cause performance or stability issues.

3.2.5.2 Performing Health Checks for Guest vServers

Run Oracle EXAchk to perform health checks for guest vServers.

Prerequisites

This section describes the prerequisites that you must complete before running Oracle EXAchk for all guest vServers.

- Install Oracle EXAchk as described in Installing Oracle EXAchk.
- Install IaaS CLI and API on the vServer that hosts the Enterprise Controller. Note that the IaaS CLI and API are pre-installed on the Enterprise Controller vServer in EECS 2.0.4.

To verify this prerequisite, check whether the `/opt/oracle/iaas/cli` and `/opt/oracle/iaas/api` directories exist on the vServer. If the directories exist, then the IaaS CLI and API are installed.

To install the IaaS CLI and API, complete the following steps:

1. Go to https://edelivery.oracle.com.

   Sign in by using your Oracle account.

2. Read and accept the Oracle Software Delivery Cloud Trial License Agreement and the Export Restrictions. Click **Continue**.

3. In the **Select a Product Pack** field, select **Oracle Fusion Middleware**.

   In the **Platform** field, select **Linux x86-64**.

   Click **Go**.

4. In the results displayed, select **Oracle Exalogic Elastic Cloud Software 11g Media Pack**, and click **Continue**.

5. Look for Oracle Exalogic <version> IaaS Client for Exalogic Linux x86-64 (64–bit), and download the appropriate version – 2.0.4.0.0, 2.0.6.0.0, or 2.0.6.0.1 depending on the EECS release installed on the Exalogic machine.

6. Unzip the downloaded file.

7. Install both the RPMs by running the following command in the directory in which you unzipped the RPMs:

   ```
   rpm -i *.rpm
   ```

Additional Prerequisites for STIG-hardened vServers

You can harden guest vServers using the STIGfix tool. The STIGfix tool is packaged as part of the Exalogic Lifecycle Toolkit.

Download the toolkit installer and tar bundle.

See Also:

My Oracle Support Note 1586312, which is available at the following URL:

Master Note - Exalogic Lifecycle Toolkit Releases

Refer to My Oracle Support Note for toolkit install instructions.

To run Oracle EXAchk on STIG-hardened vServers, you must perform the following prerequisites:

- Run Oracle EXAchk on STIG-hardened vServers separately from other guest vServers.
- The vServer that hosts the Enterprise Controller and the STIG-hardened guest vServers must have the same user with `sudo` privileges. You can create these users by doing the following.

Create the account on the vServer hosting Enterprise Controller as follows:

1. Log in to the vServer hosting Enterprise Controller as root.
2. Run the following scripts to create the account ELAdmin:

```
# useradd -d /home/ELAdmin -s /bin/bash -m ELAdmin
# echo "ELAdmin:<password>"|chpasswd
# echo "PATH=$PATH.:/usr/kerberos/sbin:/usr/kerberos/bin:/usr/local/sbin:/usr/
local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/root/bin" >>/home/ELAdmin/.bashrc
# usermod -a -G oinstall ELAdmin
```

   Replace *`password`* with a password of your choice.

3. Run the `visudo` command.
4. Under **## Allows people in group wheel to run all commands**, add the following line:

```
%ELAdmin ALL=(ALL) ALL
```

5. Under **## Same thing without a password**, add the following line:

```
%ELAdmin ALL=(ALL) NOPASSWD: ALL
```

6. Save the file.

Create the ELAdmin account that you created on the Enterprise Controller, on the guest vServer that is STIG-hardened as follows:

1. Log in to the vServer that is STIG-hardened.
2. Switch to the root user by running the following command:

```
su root
```

3. Run the following scripts to create the account ELAdmin:

```
# useradd -d /home/ELAdmin -s /bin/bash -m ELAdmin
# echo "ELAdmin:<password>"|chpasswd
# echo "PATH=$PATH.:/usr/kerberos/sbin:/usr/kerberos/bin:/usr/local/sbin:/usr/
local/bin:/sbin:/bin:/usr/sbin:/usr/bin:/root/bin" >>/home/ELAdmin/.bashrc
```

   Replace *`password`* with a password of your choice.

4. Run the `visudo` command.
5. Under **## Allows people in group wheel to run all commands**, add the following line:

```
%ELAdmin ALL=(ALL) ALL
```

6. Under ## Same thing without a password, add the following line:

```
%ELAdmin ALL=(ALL) NOPASSWD: ALL
```

7. Save the file.

Running Oracle EXAchk for vServers that are not STIG-hardened

To perform health checks for all the guest vServers that are not STIG-hardened, in a vDC on an Exalogic machine, complete the following steps:

1. SSH as `root` to the vServer that hosts the Enterprise Controller.
2. Go to the directory in which you installed Oracle EXAchk.

   ```
   # cd /u01/common/general/exachk
   ```

3. Discover the IP addresses of all the guest vServers, by running the following script:

   ```
   # ./generate_guests_list.sh
   ```

   Note:

   If the IaaS CLI and API are not installed on the vServer, the following error message is displayed:

   ```
   IaaS API is not installed. Please consult with user guide for more
   information on IaaS API installation.
   ```

   If this error occurs, install the IaaS CLI and API, as described above and then perform this procedure from step 1.

4. When prompted, enter the `root` password.

   Note:

   At times, particularly right after installing the IaaS CLI and API, when you enter the root password, the `generate_guests_list.sh` script may hang.

   If this error occurs, complete the following steps:

   a. Set the *IAAS_HOME* and *JAVA_HOME* environment variables, by running the following commands:

      ```
      # export IAAS_HOME="/opt/oracle/iaas/cli"
      # export JAVA_HOME="/usr/java/latest/"
      ```

   b. Run the following command:

      ```
      # /opt/oracle/iaas/cli/bin/akm-describe-accounts --base-url https://
      localhost/ --user root
      ```

   c. At the prompt to accept the trust certificate, enter `yes`.

   d. Run `generate_guests_list.sh` again.

      The script generates a set of .out files, one for each Cloud User. The files are named `guest_vm_ip_user.out`, where user is a Cloud User. Each `.out` file contains the IP addresses of the guest vServers created by a Cloud User.

5. Run Oracle EXAchk with the `-vmguest` option, and specify one or more `guest_vm_ip_user.out` files as arguments, depending on the users for which you want to perform health checks for guest vServers:

```
# ./exachk -vmguest guest_vm_ip_user-1.out[,guest_vm_ip_user-1.out,...]
```

Running Oracle EXAchk for STIG-hardened vServers

Run Oracle EXAchk for STIG-hardened vServers by doing the following:

1. Log in as root on the vServer that hosts the Enterprise Controller.
2. Switch to the `ELAdmin` user by running the following command:

   ```
   su - ELAdmin
   ```

   Note:

   When running Oracle EXAchk on STIG-hardened vServers, Oracle recommends using only the ELAdmin user which you created above.

   Create the `guest_vm_ip_user.out` manually. The `guest_vm_ip_user.out` has the following format:

   ```
   ip_address_of_stig_hardened_guest_vserver1
   ip_address_of_stig_hardened_guest_vserver2
   ip_address_of_stig_hardened_guest_vserver3
   ```

3. Run Oracle EXAchk with the `-vmguest` option, and specify one or more `guest_vm_ip_user.out` files as arguments, depending on the users for which you want to perform health checks for guest vServers:

   ```
   # ./exachk -vmguest guest_vm_ip_user-1.out[,guest_vm_ip_user-1.out,...]
   ```

3.2.5.3 About the Oracle EXAchk Health Check Process

Review the Oracle EXAchk start up sequence of events.

1. At the start of the health check process, Oracle EXAchk prompts you for the names of the storage nodes and switches. At the prompt, enter the names or IP addresses of the storage nodes and switches. This is a one time process. Oracle EXAchk remembers these values and uses them for the consequent health checks.

   ```
   $ ./exachk

   Could not find infiniband gateway switch names from env or configuration file.
   Please enter the first gateway infiniband switch name : el01sw-ib02
   Could not find storage node names from env or configuration file. Please enter
   the first storage server : el01sn01

   Checking ssh user equivalency settings on all nodes in cluster

   Node el01cn02 is configured for ssh user equivalency for root user

   Node el01cn03 is configured for ssh user equivalency for root user

   Node el01cn04 is configured for ssh user equivalency for root user

   Node el01cn05 is configured for ssh user equivalency for root user

   Node el01cn06 is configured for ssh user equivalency for root user
   ```

   Note:

Enter the host names or IP addresses for the nodes, in the sequence in which they are arranged on the machine.

2. The health check tool checks the SSH user equivalency settings on all of the nodes in the cluster.

   Oracle EXAchk is a non-intrusive health check tool. Therefore, it does not change anything in the environment. The tool verifies the SSH user equivalency settings, assuming that it is configured on all of the compute nodes on the system:

   - If the tool determines that the user equivalence is not established on the nodes, it provides you an option to set the SSH user equivalency either temporarily or permanently.
   - If you choose to set SSH user equivalence temporarily, then EXAchk does this for the duration of the health check. However, after the completion of the health check, Oracle EXAchk returns the system to the state in which it found.

   When Oracle EXAchk prompts you to specify your preference. Enter the password for the nodes for which you are prompted. The default preference, 1, allows you to enter the root password once for all of the nodes on each host of the Exalogic machine.

```
Using cached file /root/exachk/o_ibswitches.out for gateway infiniband switches
list ....

Using cached file /root/exachk/o_storage.out for storage nodes list ....

Checking ssh user equivalency settings on all nodes in cluster

Node 0 is configured for ssh user equivalency for root user

Node 0 is configured for ssh user equivalency for root user

root user equivalence is not setup between 2 and STORAGE SERVER.

1. Enter 1 if you will enter root password for each STORAGE SERVER when prompted.

2. Enter 2 to exit and configure root user equivalence manually and re-run
exachk.

3. Enter 3 to skip checking best practices on STORAGE SERVER.

Please indicate your selection from one of the above options[1-3][1]:- 1-3

Is root password same on all STORAGE SERVER?[y/n][y]
```

   On confirming the option and entering the credentials to proceed, Oracle EXAchk creates a number of output files, log files, and collection files for collecting the data required for the health check.

```
Preparing to run root privileged commands on INFINIBAND SWITCH el01sw-ib04.

root@el01sw-ib04's password:
Collecting -  Environment Test
Collecting -  Ethernet over infiniband data and control SL
Collecting -  Free Memory
Collecting -  Gateway Configuration
Collecting -  Infiniband status
Collecting -  List Link Up
```

```
Collecting -  Localhost Configuration in /etc/hosts
Collecting -  VNICS
Collecting -  Version
Collecting -  configvalid
Collecting -  opensm

Preparing to run root privileged commands on INFINIBAND SWITCH el01sw-ib05.

root@el01sw-ib05's password:
Collecting -  Environment Test
Collecting -  Ethernet over infiniband data and control SL
Collecting -  Free Memory
Collecting -  Gateway Configuration
Collecting -  Infiniband status
Collecting -  List Link Up
Collecting -  Localhost Configuration in /etc/hosts
Collecting -  VNICS
Collecting -  Version
Collecting -  configvalid
Collecting -  opensm
```

3. Oracle EXAchk checks the status of the components of the Exalogic stack, such as compute nodes, storage nodes, and InfiniBand switches. Depending on the status of each component, the tool runs the appropriate collections and audit checks.

```
================================================================
                    Node name - 0
================================================================
    WARNING =>     NTP is not synchronized correctly.
    INFO =>     One or more NFS Mount Points don't sue the current recommended
NFSv4.
    WARNING =>     One or more NFS Mount Points uses incorrect rsize or wsize.
    WARNING =>     Virtual Memory is not tuned to the recommended configuration.
    WARNING =>     Ypbind is not configured correctly.
    WARNING =>     DNS service is not configured correctly.
    WARNING =>     IP Configuration for eth0 and bond0 are not configured
correctly.
    INFO =>        EoIB Setup is not set up.
    INFO =>        Please verify BIOS Setting. See the Action / Repair section
for instructions.
    WARNING =>     Lock Daemon Configuration is not configured correctly.
================================================================
                    Node name - 0
================================================================
    WARNING =>     NTP is not synchronized correctly.
    INFO =>     One or more NFS Mount Points don't sue the current recommended
NFSv4.
    WARNING =>     One or more NFS Mount Points uses incorrect rsize or wsize.
    WARNING =>     Virtual Memory is not tuned to the recommended configuration.
    WARNING =>     Ypbind is not configured correctly.
    WARNING =>     DNS service is not configured correctly.
    WARNING =>     IP Configuration for eth0 and bond0 are not configured
correctly.
    INFO =>        EoIB Setup is not set up.
    INFO =>        Please verify BIOS Setting. See the Action / Repair section
for instructions.
    WARNING =>     Lock Daemon Configuration is not configured correctly.
```

4. Oracle EXAchk runs in the background monitoring the progress of the command run. If any of the commands times out, Oracle EXAchk either skips or terminates

that command so that the process continues. Oracle EXAchk logs such cases in the log files.

If Oracle EXAchk stops running for any reason, it cannot resume or restart automatically. You must start Oracle EXAchk afresh. However, before running Oracle EXAchk again, complete the following steps:

- Verify whether the previous Oracle EXAchk process has been terminated, by running the following command:

  ```
  # ps -ef | grep exachk
  ```

  If the Oracle EXAchk process is still running, terminate it by running the following command:

  ```
  # kill pid
  ```

  In this command `pid` is the process ID of the Oracle EXAchk process that you want to terminate.

- Verify if `/tmp/.exachk/`, the temporary directory generated by Oracle EXAchk during the previous run is deleted. If the directory still exists, delete it.

5. When Oracle EXAchk completes the health check, it produces an HTML report and a zip file.

3.2.5.4 Running Oracle EXAchk in Silent Mode

Follow these procedures to run Oracle EXAchk in silent mode. When you run Oracle EXAchk in silent mode, it does not perform health checks for storage nodes and InfiniBand switches.

Ensure that the following prerequisites are met before running Oracle EXAchk in silent mode:

1. Configure SSH user equivalence for the root user from the compute node on which Oracle EXAchk is staged to all the other computer nodes on which you plan to run the health check tool.

   To verify SSH user equivalence, log in by using the oracle software owner credentials and run the SSH command, as shown in the following example:

   ```
   $ ssh -o NumberOfPasswordPrompts=0 -o StrictHostKeyChecking=no -l oracle el01cn01
   "echo \"oracle user equivalence is setup correctly\""
   ```

   In this example, `oracle` is the oracle software owner, and `el01cn01` is the compute node host name.

   If the SSH user is not properly configured on the compute nodes, the displays the following message:

   ```
   Permission denied (publickey,gssapi-with-mic,password)
   ```

See Also:

Upgrading Multiple Nodes Simultaneously section in My Oracle Support Note 1446396.1, for more information about configuring passwordless login:

Upgrade Advisor: Engineered Systems Exalogic Elastic Cloud Software (EECS) from 1.x to 2.x

---

2. (required only for the `-s` option) Add the following line to the `sudoers` file on each compute node by using the `visudo` command:

```
oracle ALL=(root) NOPASSWD:/tmp/root_exachk.sh
```

Running Health Checks in Silent Mode (page 1-39)
You can run health checks automatically by scheduling them with the Automated Daemon Mode operation.

3.2.5.5 Overriding Discovered Component Addresses

In a physical environment, the component IP addresses or host names are determined in the first run based on user input. In a virtual environment, Oracle EXAchk has an in-built mechanism to automatically discover the IP addresses or host names of all the components. These features are designed to minimize the need for end-user input.

However, if the components were entered incorrectly during the first run or the auto-discovery mechanism fails to identify the components correctly, then do the following to override the values:

- If you are running Oracle EXAchk from a compute node, then do the following:
  - To override the names of the I switches, edit or create the file `o_ibswitches.out` in the directory that contains the `exachk` binary. The file should contain a list of host names of the NM2-GW switches, each on a separate line.
  - To override the names of the storage components, edit or create the file `o_storage.out` in the directory that contains the `exachk` binary. The file should contain a list of host names of the storage heads, each on a separate line.
  - To override the names of the compute nodes, add the environment variable named *RAT_CLUSTERNODES*, and specify a list of the host names separated by a space, as the value of the variable.

    ```
    export RAT_CLUSTERNODES="el01cn01 el01cn02 el01cn03 el01cn04"
    ```

- If you are running Oracle EXAchk from the vServer that hosts the Enterprise Controller component of the Exalogic Control stack, you must use a file named `exachk_exalogic.conf` to define the names of the components.

  The `exachk.zip` contains the following templates for `exachk_exalogic.conf` in the templates subdirectory:

  - `exachk_exalogic.conf.tmpl_full`
  - `exachk_exalogic.conf.tmpl_half`
  - `exachk_exalogic.conf.tmpl_quarter`
  - `exachk_exalogic.conf.tmpl_eight`

  Copy the template that corresponds to the size of your Exalogic machine to the directory that contains the `exachk` binary, and rename the template file to `exachk_exalogic.conf`.

  Modify `exachk_exalogic.conf` to match your IP address schema.

Note:

Oracle recommends that you create a copy of the `exachk_exalogic.conf` file that Oracle EXAchk generates the first time when the system is fully populated and functional, so that you can use the file later.

3.2.5.6 Setting Environment Variables for Local Issues

Oracle EXAchk attempts to derive all the data it needs from the environment in which it is run. However, at times, the tool does not work as expected due to local system variations. In such cases, you can use local environment variables to override the default behavior of Oracle EXAchk.

Table 3-7 Oracle EXAchk Environment Variables

Environment Variables	Description	Example

RAT_OS	Enables the utility to verify the platform information.	For a 64 bit Oracle Enterprise Linux 5 machine, with x86 architecture, use the following command to set the *RAT_OS* variable:
		`export RAT_OS=LINUXX8664OELRHEL5`
		For a 64 bit Oracle Solaris 11 machine, with x86 architecture, use the following command to set the *RAT_OS* variable:
		`export RAT_OS=SOLARISX866411`

RAT_SSHELL	Redirects Oracle EXAchk to the default secure shell location.	`export RAT_SSHELL="/usr/bin/ssh -q"`
RAT_SCOPY	Redirects Oracle EXAchk to the default secure copy (scp) location.	`export RAT_SCOPY="/usr/bin/scp -q"`
RAT_LOCALONLY	If set to 1, then directs Oracle EXAchk to perform health checks on only the compute node from which Oracle EXAchk is run; that is, Oracle EXAchk skips the checks for the storage nodes, the switches, and all the compute nodes other than one from which it is run.	To direct Oracle EXAchk to perform health checks on only the compute node from which Oracle EXAchk is run, use the following command: `export RAT_LOCALONLY=1`

Table 3-7 (Cont.) Oracle EXAchk Environment Variables

Environment Variables	Description	Example
RAT_CELLS	Directs Oracle EXAchk to run checks on one of the two storage nodes. If the names of the storage nodes are non-standard, then edit the `theo_storage.out` file that is located in the same directory where Oracle EXAchk is installed, and specify the name of the storage node.	To direct Oracle EXAchk to run checks on the second storage node, use the following command: `export RAT_CELLS="el01sn02"`
RAT_SWITCHES	Directs Oracle EXAchk to run checks on sub-sets of the InfiniBand switches, in addition to the default checks on the InfiniBand switches. If the names of the switches are non-standard, then edit the `theo_ibswitches.out` file that is located in the same directory where Oracle EXAchk is installed, and specify the names of the switches.	To direct Exact to run on the InfiniBand switch `el01sw-ib02` and its subsets, use the following command: `export RAT_IBSWITCHES="el01sw-ib02"`
RAT_CLUSTERNODES	Directs Oracle EXAchk to run checks on specific nodes.	On a quarter rack, which has eight compute nodes, use the following command to list the compute nodes on which the health check needs to be performed: `export RAT_CLUSTERNODES="el01cn01 el01cn02 el01cn03 el01cn04 el01cn05 el01cn06 el01cn07 el01cn08"`

Table 3-7 (Cont.) Oracle EXAchk Environment Variables

Environment Variables	Description	Example
RAT_ELRACKTYPE	Indicates whether the machine is an eighth rack (0), quarter rack (1), half rack (2), or full rack (3).	To specify that the system is a full rack, use the following command: `export RAT_ELRACKTYPE="3"`

Note:

In a virtual configuration, when running Oracle EXAchk from the vServer that hosts the Enterprise Controller component of the Exalogic Control stack, do not use the *RAT_CELLS*, *RAT_SWITCHES*, and *RAT_CLUSTERNODES* variables to override the storage node, switches, and compute nodes for which Oracle EXAchk should perform health checks. Instead, use the `exachk_exalogic.conf` file.

Overriding Discovered Component Addresses (page 3-34)
In a physical environment, the component IP addresses or host names are determined in the first run based on user input. In a virtual environment, Oracle EXAchk has an in-built mechanism to automatically discover the IP addresses or host names of all the components. These features are designed to minimize the need for end-user input.

3.2.5.7 External ZFS Storage Appliance

For Exalogic systems, support has been added to run health checks on External ZFS Storage appliances. The results of these checks are displayed in the **External ZFS Storage Appliance** of the report.

Figure 3-8 External ZFS Storage Appliance


External ZFS Storage Appliance

Status	Type	Message	Status On	Details
WARNING	External ZFS Storage Appliance Check	L2ARC Header Size exceeds the recommended 12.5% of the total memory limit.	myserver3, myserver4	View
WARNING	External ZFS Storage Appliance Check	Datasets Check failed.	myserver3	View
WARNING	External ZFS Storage Appliance Check	NFS v4 Delegation is enabled	myserver3, myserver4	View

3.2.6 Oracle EXAchk on Oracle Exalogic Output

Identify the checks that you need to act immediately to remediate, or investigate further to assess the checks that might cause performance or stability issues.

Reading and Interpreting the Oracle EXAchk HTML Report

You can view the Oracle EXAchk HTML report in a browser by using an HTTP URL as shown in the following example:

```
http://el01sn01/export/common/general/exachk/exachk_el01cn01_053112_101705/
exachk_el01cn01_053112_101705.html
```

In this example, `el01sn01` is the name of the storage node, `el01cn01` is the name of the compute node on which the share is mounted, and `053112_101705` is the date-and-time stamp for the report.

See Also:

"Enable Access to the /export/common/general Share Through the HTTP/WebDAV Protocol", for more details about enabling access to a share through the HTTP/WebDAV protocol.

The following is specific to Oracle EXAchk on Exalogic:

Table 3-8 Oracle EXAchk on Exalogic Message Definitions

Message Status	Description or Possible Impact	Action to be Taken
FAIL	Shows checks that did not pass due to issues.	Address the issue immediately.
WARNING	Shows checks that might cause performance or stability issues if not addressed.	Investigate the issue further.
ERROR	Shows errors in system components.	Take corrective measures, and restart Oracle EXAchk.
INFO	Indicates information about the system.	Read the information displayed in these checks, and follow the instructions provided, if any.

System-Wide Firmware and Software Versions

This section lists the firmware and software versions of all the components for which the health check was performed.

Skipped Nodes

This section lists components for which Oracle EXAchk did not perform any health check. Skipped components are those that, typically, Oracle EXAchk cannot access.

The following table lists the typical situations when Oracle EXAchk skips a component and the solutions for each situation:

Table 3-9 Oracle EXAchk on Exalogic Skipped Nodes

Situation	Solution
The IP address of the component is incorrect or the host name cannot be resolved.	Update `exachk_exalogic.conf` or the `o*.out` files, as appropriate, with the correct IP addresses, and run Oracle EXAchk again.
The component is not running.	Ping or SSH to the component. If the ping or SSH command fails, ensure that the component is started. Then, run Oracle EXAchk again.
The network is congested and very slow, causing an SSH time-out.	Try increasing the value of the environment variable, *RAT_TIMEOUT*, and run Oracle EXAchk again.
The component is overloaded and low on memory, causing a password time-out.	Try increasing the value of the environment variable, *RAT_PASSWORDCHECK_TIMEOUT*, and run Oracle EXAchk again.

Comparing Component Versions in Two Oracle EXAchk Collections

You can use the `-exadiff` option of Oracle EXAchk to compare two Oracle EXAchk collections. When you use this option, Oracle EXAchk generates a comparison report in HTML format, highlighting the differences in the versions of the infrastructure components, hardware, firmware, and software between the two reports. The two Oracle EXAchk reports can be for different Exalogic racks or at different points in time for the same rack, such as before and after upgrading the rack.

To compare two Oracle EXAchk collections, complete the following steps:

1. Identify the two Oracle EXAchk collections, zip files that you want to compare.
2. If the collections do not already exist on the host, compute node or vServer on which you are running Oracle EXAchk, then copy the collections to the host.
3. Run the following command:

   ```
   ./exachk -exadiff collection_1 collection_2
   ```

   In this command, `collection_1` and `collection_2` are the full paths and names of the two collections that you want to compare. You can specify either the collection zip file or the directory in which the zip file has been extracted.
4. Wait for the command to finish running.

   After comparing the two collections, Oracle EXAchk saves the results of the comparison in an HTML file named `rack_comparison_date_time.html`, for example, `rack_comparison_131219_213435.html`.

You can view the HTML report in a browser by using an HTTP URL as shown in the following example:

Example 3-1 Comparing Component Versions in Two Oracle EXAchk Collections

```
http://el01sn01/export/common/general/exachk/rack_comparison_131219_213435.html
```

In this example, `el01sn01` is the name of the active storage node, `/common/general` is the share in which the Oracle EXAchk reports are stored, and `131219_213435` is the date-and-time stamp for the report.

How to Remove Checks from an Existing HTML Report (page 1-59)
Hide individual findings from the report using **Remove findings** .

Comparing Two Reports (page 1-64)
Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

HTML Report Output (page 1-46)

Setting Environment Variables for Local Issues (page 3-35)
Oracle EXAchk attempts to derive all the data it needs from the environment in which it is run. However, at times, the tool does not work as expected due to local system variations. In such cases, you can use local environment variables to override the default behavior of Oracle EXAchk.

3.2.7 Oracle EXAchk on Oracle Exalogic Command Line Options

List of command line options applicable to Exalogic.

Command Options Applicable to Exalogic

Table 3-10 Command Options Applicable to Exalogic

Option	Purpose and Syntax
`-clusternodes`	Performs checks on only the specified compute nodes and all the other components, and exclude the unspecified compute nodes. Syntax: `./exachk -clusternodes cn_1[,cn_2,...]`
`-diff`	Compares two Oracle EXAchk HTML reports and generate an HTML report showing the changes in the health of the Exalogic rack between Oracle EXAchk runs. Syntax: `# ./exachk -diff report1 report2 [-outfile compared_report.html]` See Section 5.3, "Comparing Health-Check Results in Two EXAchk HTML Reports" in the Exalogic Elastic Cloud EXAchk User's Guide, for more details.

Table 3-10 (Cont.) Command Options Applicable to Exalogic

Option	Purpose and Syntax
`-exadiff`	Compares two Oracle EXAchk zip collections and generate an HTML report showing the differences in the versions of the infrastructure components, hardware, firmware, and software between the two reports. The two Oracle EXAchk reports can be for different Exalogic racks or at different points in time for the same rack, such as before and after upgrading the rack. Syntax: `./exachk -exadiff exachk_collection_zip_1 exachk_collection_zip_2` See Section 5.5, "Comparing Component Versions in Two EXAchk Collections" in the Exalogic Elastic Cloud EXAchk User's Guide, for more details.
`-f`	Performs checks on already collected data. Syntax: `./exachk -f report_name`
`-vmguest`	Performs checks for guest vServers as well. Syntax: `./exachk -vmguest conf_file_1[,conf_file_2,...]` See Section 3.3, "Performing Health Checks for Guest vServers" in the Exalogic Elastic Cloud EXAchk User's Guide, for more details.
`-hybrid`	Performs checks on physical nodes as well in a hybrid rack. Syntax: `./exachk -hybrid` See Section 3.2.4, "Running EXAchk for Hybrid Racks" in the Exalogic Elastic Cloud EXAchk User's Guide, for more details.
`-localonly`	Perform checks for only the host on which Oracle EXAchk is running. Syntax: `./exachk -localonly`
`-nopass`	Excludes passed checks from the HTML report. Syntax: `./exachk -nopass`

Table 3-10 (Cont.) Command Options Applicable to Exalogic

Option	Purpose and Syntax
`-o v`	Displays results for all checks, including those that passed. Syntax: `./exachk -o v`
`-phy`	Use this option along with `-hybrid`, to specify the physical nodes in a hybrid rack. Syntax: `./exachk -hybrid -phy node_1[,node_2,...]` See Section 3.2.4, "Running EXAchk for Hybrid Racks" in the Exalogic Elastic Cloud EXAchk User's Guide, for more details.
`-profile`	Performs specific checks or checks for specific components. Syntax: `./exachk -profile profile_name` See Supported Profiles for the -profile option, for more details.
`-s or -S`	Runs Oracle EXAchk in silent mode. Syntax: `./exachk -s` See Section 4.3, "Running EXAchk in Silent Mode" in the Exalogic Elastic Cloud EXAchk User's Guide, for more details.
`-v`	Displays the version of the tool. Syntax: `./exachk -v`

Supported Profiles for the -profile Option

Table 3-11 Supported Profiles for the -profile option

Profile	Description
`control_VM`	Runs health checks for only the Exalogic Control components.

Table 3-11 (Cont.) Supported Profiles for the -profile option

Profile	Description
`el_extensive`	In addition to the standard set of checks, run the following checks that are useful for a freshly installed or upgraded machine: • Verify whether the BIOS on the compute nodes is configured correctly. • Verify whether PCI 64-bit resource allocation setting on the compute nodes is disabled. • In Oracle VM Manager, for each server pool name, verify whether VM Start Policy is set to Start on current server. **Note:** Before running Oracle EXAchk with the `el_extensive` profile, verify whether passwordless SSH has been enabled for the CLI shell of Oracle VM Manager.
`switch`	Runs checks for the switches.
`virtual_infra`	Runs checks for the Exalogic virtual infrastructure. This check is applicable to only Exalogic machines in a virtual configuration.
`zfs`	Runs checks for the storage appliance.

Verifying and Enabling Passwordless SSH to the Oracle VM Manager CLI (page 3-43)
Before running Oracle EXAchk with the `el_extensive` profile, you must verify whether passwordless SSH is enabled for the CLI shell of Oracle VM Manager.

3.2.7.1 Verifying and Enabling Passwordless SSH to the Oracle VM Manager CLI

Before running Oracle EXAchk with the `el_extensive` profile, you must verify whether passwordless SSH is enabled for the CLI shell of Oracle VM Manager.

To do this, try logging in through SSH to the Oracle VM Manager CLI shell by running the following command on the host running the Oracle VM Manager vServer:

```
# ssh -l admin host_name_of_localhost -p 10000
```

`host_name_of_localhost` is the host name of the localhost.

If you can log in without having to enter a password, that is, if the `OVM>` prompt is displayed, then passwordless SSH is enabled.

If a password prompt is displayed, do the following:

1. Enter the password for the admin user, default is `welcome1`.
2. Log out from the `OVM>` shell, and try logging in again through SSH. If the password prompt continues to display, then passwordless SSH is not enabled. To enable passwordless SSH to the Oracle VM Manager CLI, complete the following steps:

a. SSH as root to the vServer that hosts the Oracle VM Manager.

b. Ensure that the `ssh` agent is running:

```
# eval 'ssh-agent'
```

The output is similar to following example: `Agent pid 18529`

c. Generate a public/private key pair:

```
# ssh-keygen -t rsa -f ~/.ssh/admin
```

If the ssh agent is not running, the following error message is displayed: `Could not open a connection to your authentication agent.`

When prompted for a pass phrase, press **Enter**.

The keys are generated and stored in the `~/.ssh/` directory. The `admin` file contains the private key and the `admin.pub` file contains the public key.

d. Add the private key to the authentication agent:

```
# ssh-add ~/.ssh/admin
Identity added: /home/user/.ssh/admin (/home/user/.ssh/admin)
```

Copy the public key to the `.ssh` directory in the oracle user's home directory:

```
# cp ~/.ssh/admin.pub /home/oracle/.ssh/
```

e. Append the file containing the public key, that is, `admin.pub` to the `ovmcli_authorized_keys` file:

```
# cd /home/oracle/.ssh/# cat admin.pub >> ovmcli_authorized_keys
```

f. SSH as the admin user to the Oracle VM Manager CLI:

```
# ssh -l admin localhost -p 10000
```

At the prompt to continue connecting, enter **yes**.

At the prompt for the password, enter the admin user's password.

The following shell is displayed: `OVM>`

For subsequent logins, the newly established passwordless SSH channel is used.

3.2.8 Troubleshooting Oracle EXAchk on Exalogic

Troubleshoot and fix Oracle EXAchk on Exalogic issues.

See Also:

My Oracle Support Note 1478378.1 for the latest known issues specific to Oracle EXAchk on Oracle Exalytics, which is available at the following URL:

Exalogic Exachk Health-Check Tool Known Issues

Issues with the Local Environment Settings

See Setting Environment Variables (page 3-33) for more details.

Contacting Support with Oracle EXAchk Report

1. Run Oracle EXAchk with the `-profile el_extensive` option to include a larger set of health checks in the generated HTML report:

   ```
   ./exachk -profile el_extensive
   ```

   Contact Support with Oracle EXAchk result bundle as needed for further assistance.

2. To get assistance from Oracle Support on problems related to running Oracle EXAchk or issues related to generating complete Oracle EXAchk report, run the Oracle EXAchk command with `-debug` option as shown below:

   ```
   ./exachk -debug
   ```

   Contact Support with the resulting output zip file.

Oracle ORAchk and Oracle EXAchk Command Line Options (page 1-84)
Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

Troubleshooting Oracle ORAchk and Oracle EXAchk (page 1-151)
Follow the steps explained in this section to troubleshoot and fix Oracle ORAchk and Oracle EXAchk related issues.

3.3 Oracle SuperCluster

This section explains features and tasks specific to Oracle EXAchk on Oracle SuperCluster.

See Also:

Oracle ORAchk and Oracle EXAchk Common Features and Tasks (page 1-1)

Scope and Supported Platforms (page 3-46)
Oracle EXAchk is an invaluable aid in keeping your system up-to-date and recording changes, as well as providing baselines for support analysis in the event such data is required to resolve a Service Request.

Installation and Deployment (page 3-46)
Follow these procedures to install and deploy Oracle EXAchk on Oracle SuperCluster.

Oracle EXAchk on Oracle SuperCluster Usage (page 3-48)
Perform health checks from GZ / primary LDOM, or NGZ.

Oracle EXAchk on Oracle SuperCluster Command Line Options (page 3-51)
List of command line options specific to Oracle EXAchk on SuperCluster.

Troubleshooting Oracle EXAchk on SuperCluster (page 3-51)
Troubleshoot and fix issues related to Oracle EXAchk on Oracle SuperCluster.

3.3.1 Scope and Supported Platforms

Oracle EXAchk is an invaluable aid in keeping your system up-to-date and recording changes, as well as providing baselines for support analysis in the event such data is required to resolve a Service Request.

See Also:

My Oracle Support Note 2053185.1 for the latest scope and supported platforms specific to Oracle EXAchk on Oracle SuperCluster, which is available at the following URL:

SuperCluster: Best Practices for Using EXAchk

3.3.2 Installation and Deployment

Follow these procedures to install and deploy Oracle EXAchk on Oracle SuperCluster.

Installation

- Run Oracle EXAchk from the primary `ldom` as `root` . Oracle EXAchk discovers all Oracle RAC and database instances, compute nodes, storage servers, and InfiniBand switches in the fabric.
- Run Oracle EXAchk in a database zone or virtualized environment. Oracle EXAchk collects data from one or all database instances and Oracle RAC nodes.

Notes and considerations

If you install and run Oracle EXAchk as `root`, it collects connectivity data from the GZ to the storage cells and other nodes. However, Oracle EXAchk collects only collect database and Oracle RAC data if run as `root` from within the nodes or zones on which the database and Oracle RAC software is installed.

By default, there should be no need to set environment variables or run as any other user than root. However, there may be exceptions when one is asked to run it in some debug or extraordinary fashion by an Oracle Support Analyst.

By default, the output destination is `/opt/oracle.SupportTools/exachk` . Set the environment variable *RAT_OUTPUT* to change this, for example,

```
export RAT_OUTPUT=/opt/oracle.SupportTools/exachk/output
```

Merge multiple collections into one file for ease of uploading to My Oracle Support for analysis.

Note:

In zones, there is currently an issue with discovery and you must explicitly set the *RAT_ORACLE_HOME* and *RAT_GRID_HOME* environment variables in some remote cases.

Deployment

1. Download the latest version of Oracle EXAchk into `/opt/oracle.SupportTools` directory on the primary `node/LDOM` of the SuperCluster.

   a. Backup or remove if you have already installed Oracle EXAchk.

   b. Download the latest version of the Oracle EXAchk on SuperCluster deployment script `deploy_exachk.sh`.

      Refer to the My Oracle Support Note 2053185.1, which is available at the following URL:

      SuperCluster: Best Practices for Using EXAchk

   c. Move the downloaded file into the `/opt/oracle.SupportTools` directory.

2. Use the `deploy_exachk.sh` script to deploy and install Oracle EXAchk into the `/opt/oracle.SupportTools/exachk` directory in the primary `ldom` and in each zone.

   Note:

   Repeat this action for each of the other LDOMs.

   Example of what a zone's `/opt/oracle.SupportTools` looks like when this is finished:

```
total 68
drwxr-xr-x   7 root     root          10 Oct 14 19:27 .
drwxr-xr-x   8 root     sys            8 Oct  7 22:06 ..
drwxr-xr-x   3 root     root          21 Oct 14 19:27 Exachk.old
drwxr-xr-x   3 root     root          23 Oct 14 19:06 Exachk
drwxr-xr-x   2 root     root           7 Oct  5 20:52 em
lrwxrwxrwx   1 root     root          14 Oct 14 19:27 exachk -> Exachk
drwxr-xr-x   2 root     root           6 Oct  7 20:43 onecommand
-rw-r--r--   1 root     root       40830 Oct  7 20:30 resourcecontrol
```

3. Manual or standalone installation.

   Manually install Oracle EXAchk on each host or LDOM or zone as follows:

```
root@abc5db01:/opt/oracle.SupportTools# mv exachk Exachk.old
root@abc5db01:/opt/oracle.SupportTools# mkdir exachk
root@abc5db01:/opt/oracle.SupportTools# unzip exachk_121024_bundle.zip -d exachk
root@abc5db01:/opt/oracle.SupportTools# unzip exachk/exachk.zip -d exachk
```

4. Check the version.

```
# /opt/oracle.SupportTools/exachk/exachk -v

Note if root RSA keys are set up for ssh, then this is an example of an easy way
to check all zones in a given LDOM:

root@abc5db01:/opt/oracle.SupportTools# zoneadm list | grep -v global > zone_list
root@abc5db01:/opt/oracle.SupportTools# hostname >> zone_list
root@abc5db01:/opt/oracle.SupportTools# /opt/oracle.supercluster/bin/dcli -g
zone_list -l root /opt/*Tools/exachk/exachk -v
abc5db01z1:
abc5db01z1: EXACHK  VERSION: 12.1.0.2.6_20160208
```

```
abc5db01z2:
abc5db01z2: EXACHK  VERSION: 12.1.0.2.6_20160208
abc5db01z3:
abc5db01z3: EXACHK  VERSION: 12.1.0.2.6_20160208
abc5db01z4:
abc5db01z4: EXACHK  VERSION: 12.1.0.2.6_20160208
abc5db01:
abc5db01: EXACHK  VERSION: 12.1.0.2.6_20160208
```

Installing Oracle ORAchk and Oracle EXAchk (page 1-6)
Follow these procedures to install Oracle ORAchk and Oracle EXAchk.

Merging Reports (page 1-67)
Merging reports is useful in role-separated environments where different users are run different subsets of checks and then you want to view everything as a whole.

3.3.3 Oracle EXAchk on Oracle SuperCluster Usage

Perform health checks from GZ / primary LDOM, or NGZ.

Performing Health Checks from GZ / Primary LDOM

```
root@abc5db01:/opt/oracle.SupportTools/exachk# ./exachk
exachk did not find the inventory location on abc5db01 from environment.Does
abc5db01 have Oracle software installed [y/n][n]?n

Checking ssh user equivalency settings on all nodes in cluster

Node abc5db02 is configured for ssh user equivalency for root user

Node abc5db03 is configured for ssh user equivalency for root user

Node abc5db04 is configured for ssh user equivalency for root user
<snip>
```

Performing Health Checks from non-GZ local zone, aka NGZ

```
root@abc4db01:/opt/oracle.SupportTools/exachk# zlogin abc4db01z2
[Connected to zone 'abc4db01z2' pts/10]
Oracle Corporation      SunOS 5.11      11.1    April 2014
root@abc4db01z2:~# cd /opt/*Tools
root@abc4db01z2:/opt/oracle.SupportTools# cd exachk
root@abc4db01z2:/opt/oracle.SupportTools/exachk# ./exachk


Checking ssh user equivalency settings on all nodes in cluster
<snip>
```

Merging Collections (page 3-48)
Merge multiple collections into one file and upload it to an SR through `curl`.

Automated Daemon Mode Operation (page 3-50)
Follow these specific advanced setup instructions when using Oracle EXAchk on SuperCluster.

3.3.3.1 Merging Collections

Merge multiple collections into one file and upload it to an SR through `curl`.

Note:

Specify the `-force` option after the comma-delimited file list.

```
root@abc4db01:/opt/oracle.SupportTools/exachk# ./exachk -
mergeexachk_abc4db01_090715_214648.zip,/zoneHome/abc4db01z1/root/opt/
oracle.SupportTools/exachk/exachk_abc4db01z1_abc4z1_090415_183027.zip,/zoneHome/
abc4db01z2/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z2_abc4z2_090715_211212.zip,/zoneHome/abc4db01z3/root/opt/
oracle.SupportTools/exachk/exachk_abc4db01z3_dbm01_031015_212416.zip -force

Merging following collections:

  exachk_abc4db01_090715_214648.zip
  /zoneHome/abc4db01z1/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z1_abc4z1_090415_183027.zip
  /zoneHome/abc4db01z2/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z2_abc4z2_090715_211212.zip
  /zoneHome/abc4db01z3/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z3_dbm01_031015_212416.zip


Started merging exachk_orlt4db01_090715_214648.zip
  ..................................................................................
.....

Started merging /zoneHome/abc4db01z1/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z1_abc4z1_090415_183027.zip
  ..................................................................................
..................................................................................
...................

Started merging /zoneHome/abc4db01z2/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z2_abc4z2_090715_211212.zip
  ..................................................................................
..................................................................................
...................

Started merging /zoneHome/abc4db01z3/root/opt/oracle.SupportTools/exachk/
exachk_abc4db01z3_dbm01_031015_212416.zip
  ..................................................................................
..................................................................................
...................
<snip>
Detailed report (html) - /opt/oracle.SupportTools/exachk/
exachk_abc4db01_090715_214648_merge/exachk_abc4db01_090715_214648_merge.html

UPLOAD(if required) - /opt/oracle.SupportTools/exachk/
exachk_abc4db01_090715_214648_merge.zip


root@abc4db01:/opt/oracle.SupportTools/exachk#
```

Merging Reports (page 1-67)
Merging reports is useful in role-separated environments where different users are run different subsets of checks and then you want to view everything as a whole.

3.3.3.2 Automated Daemon Mode Operation

Follow these specific advanced setup instructions when using Oracle EXAchk on SuperCluster.

Before you schedule automated health check runs, set the following environment variables as follows:

```
export RAT_TIMEOUT=120
export RAT_ROOT_TIMEOUT=600
export RAT_PASSWORDCHECK_TIMEOUT=30
export RAT_OUTPUT=/opt/oracle.SupportTools/exachk/output
export RAT_COPY_EM_XML_FILES=1
```

Note:

Create a file with these commands because they are required to be set anytime you restart the daemon.

---

1. Set the AUTORUN_SCHEDULE environment variable as follows:

```
AUTORUN_SCHEDULE * * * * :- Automatic run at specific time
                 - - - -
                 ¦ ¦ ¦ ¦
                 ¦ ¦ ¦ +----- day of week (0 - 6) (0 to 6 are
                 ¦ ¦ ¦       Sunday to Saturday)
                 ¦ ¦ +---------- month (1 - 12)
                 ¦ +--------------- day of month (1 - 31)
                 +------------------- hour (0 - 23)
```

   For example, to run on 5th of every month at 2 AM:

```
./exachk -set "AUTORUN_SCHEDULE=2 5 * *"
```

2. Check the results.

```
./exachk -get all
```

3. Run the pre-setup tasks to set the required SSH equivalences.

```
./exachk -initpresetup
```

4. Set the daemon and `inittab`.

```
./exachk -initsetup
```

Note:

If the preceding action produces an error, then wait for one or two minutes before running the next command to give `init` time to respawn the process.

---

5. Check if the daemon is running.

```
./exachk -d nextautorun
```

Automating Daemon Mode Operations (page 1-19)
Oracle recommends that you use the daemon process to schedule recurring health checks at regular intervals.

3.3.4 Oracle EXAchk on Oracle SuperCluster Command Line Options

List of command line options specific to Oracle EXAchk on SuperCluster.

Table 3-12 Oracle SuperCluster Command Line Options

Option	Description

`-cells` *`cells`*	Pass comma-delimited list of storage server names to limit to subset of storage servers.
	Alternatively, set the *RAT_CELLS* environment variable with a space-delimited list of cells:
	For example:
	`export RAT_CELLS="randomcel01 randomcel06"`
	Or
	`export RAT_CELLS=randomcel01`

`-ibswitches` *`switches`*	Pass comma-delimited list of InfiniBand switch names to limit to subset of InfiniBand switches.
	Alternatively, set the *RAT_IBSWITCHES* environment variable with a space-delimited list of switches:
	For example:
	`export RAT_IBSWITCHES="randomsw-ib1 randomsw-ib3"`
	Or
	`export RAT_CELLS=randomsw-ib2`

To lock and unlock the cell, use the `-unlockcells` and `-lockcells` options:

```
./exachk -unlockcells all | -cells comma-delimited list of names or IP addresses of cells

./exachk -lockcells all | -cells comma-delimited list of names or IP addresses of cells
```

3.3.5 Troubleshooting Oracle EXAchk on SuperCluster

Troubleshoot and fix issues related to Oracle EXAchk on Oracle SuperCluster.

See Also:

My Oracle Support Note 2053185.1 for the latest known issues specific to Oracle EXAchk on Oracle SuperCluster, which is available at the following URL:

SuperCluster: Best Practices for Using Exachk

Troubleshooting Oracle ORAchk and Oracle EXAchk (page 1-151)
Follow the steps explained in this section to troubleshoot and fix Oracle ORAchk and Oracle EXAchk related issues.

3.4 Oracle Exalytics

This section explains features and tasks specific to Oracle EXAchk on Oracle Exalytics.

See Also:

Oracle ORAchk and Oracle EXAchk Common Features and Tasks (page 1-1)

3.4.1 Scope and Supported Platforms

Oracle EXAchk for Exalytics is a health check tool that audits important configuration settings within an Oracle Exalytics machine.

Oracle EXAchk examines the following components:

- Server
- Operating System, Firmware, BIOS
- Ethernet network, InfiniBand switches
- RAM, hard disks
- Software installed on the machine - OBIEE and TimesTen

Run Oracle EXAchk in the following conditions:

- Before and after deploying an Oracle Exalytics machine
- As part of the monthly maintenance program for an Oracle Exalytics machine

- Before and after making any changes in the system configuration
- Before and after any planned maintenance activity
- For troubleshooting hardware or software failures
- For troubleshooting performance degradation

Supported Platforms

- **Machine**: Oracle Exalytics In-Memory Machine
- **Operating systems**: Oracle Exalytics Base Image 1.0.0.5.0 and later

> **Note:** Virtualization is not supported for Oracle EXAchk on Exalytics.

3.4.2 Prerequisites for Running Oracle EXAchk on Oracle Exalytics

Review the list of prerequisites.

If OBIEE was not installed by Domain Management Utility (DOMU), then you must set the following environment variable before running Oracle EXAchk:

```
$ export RAT_BI_HOMES=location of BI Middleware homes
```

Specify multiple BI homes installed on the machine in a space-delimited list as follows:

```
$ export RAT_BI_HOMES=/u01/app/oracle/product/fmw /u02/app/oracle/product/fmw
```

> **Note:** The *RAT_BI_HOMES* environment variable is not needed if you run Oracle EXAchk using the `TimesTen` profile.

To view Oracle EXAchk related environment variables that are already configured on the system, run the following command:

```
$ env | grep RAT
```

3.4.3 Installation

Follow these procedures to install Oracle EXAchk on Oracle Exalytics.

1. Log in to the machine as the root user.
2. Create a directory to hold the Oracle EXAchk binaries.

   For example:

   ```
   $ mkdir /opt/exalytics/exachk
   ```

3. Go to the `/opt/exalytics/exachk` directory.
4. Download the `exachk.zip` file to the `/opt/exalytics/exachk` directory.
5. Extract the contents of the `exachk.zip` file.

   ```
   $ unzip exachk.zip
   ```

Installing Oracle ORAchk and Oracle EXAchk (page 1-6)
Follow these procedures to install Oracle ORAchk and Oracle EXAchk.

3.4.4 Oracle EXAchk on Oracle Exalytics Usage

Oracle EXAchk runs the appropriate collections and audit checks based on the status of the components.

1. Log in to the machine as the root user.
2. Go to the directory in which you installed Oracle EXAchk, for example,

   ```
   $ cd /opt/exalytics/exachk
   ```

3. Start Oracle EXAchk by running the following command:

   ```
   $ ./exachk
   ```

Oracle EXAchk checks the status of the components of the Exalytics machine. Depending on the status of each component, the tool runs the appropriate collections and audit checks. When Oracle EXAchk completes the health check, it produces an HTML report and a zip file. You can use the zip file to log a service request with My Oracle Support.

Note:

Do not rename any of the Oracle EXAchk output report files or folders.

Oracle ORAchk and Oracle EXAchk Command Line Options (page 1-84)
Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

3.4.5 Oracle EXAchk on Oracle Exalytics Output

Identify the checks that you need to act immediately to remediate, or investigate further to assess the checks that might cause performance or stability issues.

The following is specific to Oracle EXAchk on Exalytics:

Oracle EXAchk Summary

This section of the report summarizes the key data collected from the Oracle EXAchk environment:

- Operating system and Kernel version
- System identifier
- Base image version
- Compute node name
- Version of Oracle EXAchk
- Version of TimesTen
- Collection folder
- Date when the check was run

Oracle EXAchk on Exalytics Message Definitions

Table 3-13 Oracle EXAchk on Exalytics Message Definitions

Message Status	Description or Possible Impact	Action to be Taken
FAIL	Shows checks that did not pass due to issues.	Address the issue immediately.
WARNING	Shows checks that might cause performance or stability issues if not addressed.	Investigate the issue further.
INFO	Indicates information about the system.	Read the information displayed in these checks and follow the instructions provided, if any.

How to Remove Checks from an Existing HTML Report (page 1-59)
Hide individual findings from the report using **Remove findings** .

Understanding and Managing Reports and Output (page 1-42)
Oracle ORAchk and Oracle EXAchk generate a detailed HTML report with findings and recommendations.

HTML Report Output (page 1-46)

Comparing Two Reports (page 1-64)
Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

3.4.6 Running Subsets of Checks

You can run Oracle EXAchk using a specific profile. A profile contains selective sets of checks pertaining to specific components.

To run Oracle EXAchk using a profile, run the following command:

```
$ ./exachk -profile profile_name
```

Oracle supports the following profiles for Oracle EXAchk on Exalytics:

Table 3-14 Profiles Supported for Oracle EXAchk on Exalytics

Profile	Description
`obiee`	Using this profile, you can run Oracle EXAchk to do a selective check of the OBIEE software component.
`timesten`	Using this profile, you can run Oracle EXAchk to do a selective check of the TimesTen software component.

Running Subsets of Checks (page 1-73)
Where necessary, you can run a subset of health checks.

3.4.7 Troubleshooting Oracle EXAchk on Exalytics

Troubleshoot and fix issues related to Oracle EXAchk on Oracle Exalytics.

See Also:

My Oracle Support Note 1566134.1 for the latest known issues specific to Oracle EXAchk on Oracle Exalytics, which is available at the following URL:

Oracle Exalytics Exachk Health-Check Tool (for Exalytics PatchSet 3 and Higher)

Runtime Command Timeouts

During the health check process, if a particular compute node, storage server, or switch does not respond to the health check command within a pre-defined duration, Oracle EXAchk terminates that command.

To prevent the program from freezing, Oracle EXAchk automatically terminates commands that exceed default timeouts. On a busy system, Oracle EXAchk terminates commands when the target of the check does not respond within the default timeout.

Note:

To avoid runtime command timeouts from occurring during health checks, ensure that you run the tool when there is least load on the system.

Getting Support for the Tool

You might see some errors in the `exachk_error.log` file. Most of these errors do not indicate any serious problems with Oracle EXAchk or the system. To prevent these errors from appearing on the screen and cluttering the display, Oracle EXAchk directs them to the `exachk_error.log` file. You need not report any of these errors to Oracle Support.

See Also:

My Oracle Support for support on any problems that you might encounter while using Oracle EXAchk:

My Oracle Support

Oracle ORAchk and Oracle EXAchk Command Line Options (page 1-84)
Most command line options apply to both Oracle ORAchk and Oracle EXAchk.

Troubleshooting Oracle ORAchk and Oracle EXAchk (page 1-151)
Follow the steps explained in this section to troubleshoot and fix Oracle ORAchk and Oracle EXAchk related issues.

3.5 Oracle Big Data

This section explains features and tasks specific to Oracle EXAchk on Oracle Big Data.

See Also:

Oracle ORAchk and Oracle EXAchk Common Features and Tasks (page 1-1)

Scope and Supported Platforms (page 3-57)
Oracle EXAchk for Big Data Appliance supports all BDA versions later than 2.0.1.

Installation (page 3-58)
Follow these procedures to install Oracle EXAchk on the BDA.

Oracle EXAchk on Oracle Big Data Usage (page 3-58)
Run the `exachk -h` command to view the list of options supported for Big Data Appliance.

Oracle EXAchk on Oracle Big Data Output (page 3-62)
Identify the checks that you need to act immediately to remediate, or investigate further to assess the checks that might cause performance or stability issues.

Troubleshooting Oracle EXAchk on Oracle BigData Appliance (page 3-63)
In addition to the base Troubleshooting, the following are also applicable to Oracle EXAchk on Oracle BigData.

3.5.1 Scope and Supported Platforms

Oracle EXAchk for Big Data Appliance supports all BDA versions later than 2.0.1.

Oracle EXAchk for Big Data Appliance audits important configuration settings within a Big Data Appliance. Oracle EXAchk examines the following components:

- CPU
- Hardware, firmware, and BIOS
- Operating System kernel parameters, system packages
- Ethernet network, InfiniBand switches
- RAM, hard disks
- Software Installed

Goals for Big Data Appliance Health Checks

1. Provide a mechanism to check the complete health of a Big Data Appliance on a proactive and reactive basis.
2. Provide a "recommendation engine" for best practices and tips to fix Big Data Appliance known issues.

Recommended Validation Frequency

Oracle recommends to validate Big Data Appliance immediately after initial deployment, before and after any change, and at least once a quarter as part of planned maintenance operations. The runtime duration of Oracle EXAchk depends on the number of nodes to check, CPU load, network latency, and so forth.

Note:

Plan to run Oracle EXAchk when there is less load on the a Big Data Appliance. This helps you avoid runtime timeouts during health checks.

3.5.2 Installation

Follow these procedures to install Oracle EXAchk on the BDA.

1. Download the `exachk.zip` file to a directory on the a Big Data Appliance, as `root` user.
2. Extract the contents of `exachk.zip`.

   ```
   $ unzip exachk.zip
   ```

3. (recommended) Add the location of the `exachk` executable to the `/root/.bash_profile` file so that you can run Oracle EXAchk from anywhere.

   For example:

   From:

   ```
   # User specific environment and startup programs
   PATH=$PATH:$HOME/bin
   ```

   To:

   ```
   # User specific environment and startup programs
   PATH=$PATH:$HOME/bin: path to exachk
   ```

   If `exachk` is installed in `/root/exachk_home`, then update the `/root/.bash_profile` file as follows:

   ```
   PATH=$PATH:$HOME/bin:/root/exachk_home
   ```

3.5.3 Oracle EXAchk on Oracle Big Data Usage

Run the `exachk -h` command to view the list of options supported for Big Data Appliance.

Note:

Run Oracle EXAchk as root from *node1* of the BDA cluster.

Most data collection options require password for each InfiniBand switch. This is required, if there is no SSH user equivalency from running compute node to switch.

1. To view the command options, run the following command as root or non-root user:

   ```
   ./exachk -h

   Usage : ./exachk [-abvhpfmsuSo:c:t:]
           -a      All (Perform best practice check and recommended patch check)
           -b      Best Practice check only. No recommended patch check
           -h      Show usage
           -v      Show version
            ...
   ```

List of Oracle EXAchk options supported for BDA:

```
        -a      (Perform best practice check and recommended patch check.  This is
the default option.  If no options are specified exachk runs with -a)
        -b      Best Practice check only. No recommended patch check
        -h      Show usage
        -v      Show version
        -m      exclude checks for Maximum Availability Architecture (MAA)
scorecards(see user guide for more details)
        -o      Argument to an option. if -o is followed by v,V,Verbose,VERBOSE or
Verbose, it will print checks which     passes on the screen
                 if -o option is not specified,it will print only failures on
screen. for eg: exachk -a -o v
        -clusternodes
                Pass comma separated node names to run exachk only on subset of
nodes.
        -localonly
                Run exachk only on local node.

        -debug  Run exachk in debug mode. Debug log will be generated.
                eg:- ./exachk -debug
                Output goes to stdout as well as generated log files

        -nopasd  Skip PASS'ed check to print in exachk report and upload to
database.

        -noscore  Do not print healthscore in HTML report.
        -diff <Old Report> <New Report> [-outfile <Output HTML>]
                Diff two exachk reports. Pass directory name or zip file or html
report file as <Old Report> & <New Report>
        -<initsetup|initrmsetup|initcheck|initpresetup>
                initsetup       : Setup auto restart. Auto restart functionality
automatically brings up exachk daemon when node starts
                initrmsetup   : Remove auto restart functionality
                initcheck       : Check if auto restart functionality is setup or not
                initpresetup  : Sets root user equivalency for COMPUTE, STORAGE and
IBSWITCHES.(root equivalency for COMPUTE nodes is mandatory for setting up auto
restart   functionality)
        -d <start|start_debug|stop|status|info|stop_client|nextautorun>
                start           : Start the exachk daemon
                start_debug     : Start the exachk daemon in debug mode
                stop            : Stop the exachk daemon
                status          : Check if the exachk daemon is running
        -daemon
                run exachk only if daemon is running

       -nodaemon
                Dont use daemon to run exachk

       -set
                configure exachk daemon parameter like
"param1=value1;param2=value2... "

                 Supported parameters are:-

                 AUTORUN_INTERVAL <n[d|h]> :- Automatic rerun interval in daemon
mode.Set it zero to disable automatic rerun which is zero.

                 AUTORUN_SCHEDULE * * * *       :- Automatic run at specific time in
daemon mode.
                                  - - - -
```

```
                                    ¦ ¦ ¦ ¦
                                    ¦ ¦ ¦ +----- day of week (0 - 6) (0 to 6 are
Sunday to Saturday)
                                    ¦ ¦ +---------- month (1 - 12)
                                    ¦ +--------------- day of month (1 - 31)
                                    +-------------------- hour (0 - 23)

                        example: exachk -set "AUTORUN_SCHEDULE=8,20 * * 2,5" will
schedule runs on tuesday and friday at 8 and 20 hour.

                    AUTORUN_FLAGS <flags> : exachk flags to use for auto runs.

                        example: exachk -set "AUTORUN_INTERVAL=12h;AUTORUN_FLAGS=-
profile sysadmin" to run sysadmin profile every 12 hours

                                exachk -set "AUTORUN_INTERVAL=2d;AUTORUN_FLAGS=-
profile dba" to run dba profile once every 2 days.

                    NOTIFICATION_EMAIL : Comma separated list of email addresses used
for notifications by daemon if mail server is configured.

                    PASSWORD_CHECK_INTERVAL <number of hours> : Interval to verify
passwords in daemon mode

                    collection_retention <number of days> : Purge exachk collection
directories and zip files older than specified days.
       -unset <parameter>
                    unset the parameter
                      example: exachk -unset "AUTORUN_SCHEDULE"

       -get parameter | all
                    Print the value of parameter
        -excludeprofile
                    Pass specific profile.
                    List of supported profiles is same as for -profile.

       -merge
                    Pass comma separated collection names(directory or zip files) to
merge collections and prepare single report.
                    eg:- ./exachk -merge
exachk_hostname1_db1_120213_163405.zip,exachk_hostname2_db2_120213_164826.zip
       -profile Pass specific profile.
                     List of supported profiles for BDA:
                     switch          Infiniband switch checks
                     sysadmin     sysadmin checks

       -ibswitches
                    Pass comma separated infiniband switch names to run exachk only on
selected infiniband switches.
```

Note:

Oracle EXAchk returns an error as follows if run any other profiles that are not listed above:

```
<profile_name> is not supported component. EXAchk will run generic checks
for components identified from environment
```

For example, to perform all checks including best practice checks and recommendations, run:

```
# ./exachk -a
```

Note:

By default, Oracle EXAchk runs with the `-a` option, if you do not provide any options.

Output looks similar to the following:

```
Checking ssh user equivalency settings on all nodes in cluster

Node <BDANode01> is configured for ssh user equivalency for root user
...

Node <BDANode0n> is configured for ssh user equivalency for root user

Copying plug-ins
. . . . . .
. . . . . .


9 of the included audit checks require root privileged data collection on INFINIBAND
SWITCH .

1. Enter 1 if you will enter root password for each INFINIBAND SWITCH when prompted

2. Enter 2 to exit and to arrange for root access and run the exachk later.

3. Enter 3 to skip checking best practices on INFINIBAND SWITCH

Please indicate your selection from one of the above options for INFINIBAND
SWITCH[1-3][1]:- 1

Is root password same on all INFINIBAND SWITCH ?[y/n][y]y

Enter root password for INFINIBAND SWITCH :-

Verifying root password.
. . .

*** Checking Best Practice Recommendations (PASS/WARNING/FAIL) ***

Collections and audit checks log file is
/<dir>/exachk_<BDANode0x_040414_091246/log/exachk.log
Starting to run exachk in background on <BDANode01>
...
Starting to run exachk in background on <BDANode0n>

============================================================
                    Node name - <BDANode01>
============================================================

Collecting - Verify ASR configuration check via ASREXACHECK

Starting to run root privileged commands in background on INFINIBAND SWITCH
<RackName>sw-ib1.
```

```
Starting to run root privileged commands in background on INFINIBAND SWITCH
<RackName>sw-ib2.

Starting to run root privileged commands in background on INFINIBAND SWITCH
<RackName>sw-ib3.

Collections from INFINIBAND SWITCH:
-----------------------------------
Collecting - Infiniband Switch NTP configuration
Collecting - Infiniband switch HOSTNAME configuration
Data collections completed. Checking best practices on BDANode01>
------------------------------------------------------------------------------------
-
 ...

Copying results from <BDANode02> and generating report. This might take a while. Be
patient.

============================================================
                    Node name - <BDANode02>
============================================================

Collecting - Verify ASR configuration check via ASREXACHECK

Data collections completed. Checking best practices on BDANode02>
------------------------------------------------------------------------------------
-
...
------------------------------------------------------------------------------

Detailed report (html) - /<dir>/exachk_<BDANode01>_040414_091246/
exachk_<BDANode01>_040414_091246.html


UPLOAD(if required) - /<dir>/exachk_<BDANode01>_040414_091246.zip
```

3.5.4 Oracle EXAchk on Oracle Big Data Output

Identify the checks that you need to act immediately to remediate, or investigate further to assess the checks that might cause performance or stability issues.

The following message statuses are specific to Oracle EXAchk on Oracle Big Data:

Oracle EXAchk on Oracle Big Data Message Definitions

Table 3-15 Oracle EXAchk on Oracle Big Data Message Definitions

Message Status	Description or Possible Impact	Action to be Taken
FAIL	Shows checks that did not pass due to issues.	Address the issue immediately.
WARNING	Shows checks that might cause performance or stability issues if not addressed.	Investigate the issue further.

Table 3-15 (Cont.) Oracle EXAchk on Oracle Big Data Message Definitions

Message Status	Description or Possible Impact	Action to be Taken
INFO	Indicates information about the system.	Read the information displayed in these checks and follow the instructions provided, if any.

How to Remove Checks from an Existing HTML Report (page 1-59)
Hide individual findings from the report using **Remove findings** .

HTML Report Output (page 1-46)

Comparing Two Reports (page 1-64)
Oracle ORAchk and Oracle EXAchk automatically compare the two most recent HTML reports and generate a third diff report, when run in automated daemon mode.

Health Check Catalog (page 1-69)
The Health Check Catalogs list the health checks that are included within Oracle ORAchk or Oracle EXAchk. Health Check Catalogs are HTML pages that require JavaScript. Enable JavaScript in your browser to view the Health Check Catalogs.

3.5.5 Troubleshooting Oracle EXAchk on Oracle BigData Appliance

In addition to the base Troubleshooting, the following are also applicable to Oracle EXAchk on Oracle BigData.

Create a service request through My Oracle Support, if you face any problems running EXAchk.

See Also:

My Oracle Support Note 1643715.1 for the latest known issues specific to Oracle EXAchk on Oracle BigData Appliance, which is available at the following URL:

Oracle Big Data Appliance EXAchk Health-Check Tool

Runtime Command Timeouts

During the health check process, if a particular node or switch does not respond to the health check command within a pre-defined duration, Oracle EXAchk terminates that command. To prevent the program from freezing, Oracle EXAchk automatically terminates commands that exceed default timeouts. On a busy system, Oracle EXAchk terminates commands when the target of the check does not respond within the default timeout.

Note:

To avoid runtime command timeouts from occurring during health checks, ensure that you run the tool when there is least load on the system.

Timeouts Checking Switches

In the case of a slow SSH on a given switch, Oracle EXAchk throws an error as follows:

```
Starting to run root privileged commands in background on INFINIBAND SWITCH
<cluster>sw-ib1.

Timed out
Unable to create temp directory on <cluster>sw-ib1

Skipping root privileged commands on INFINIBAND SWITCH <cluster> sw-ib1 is
available but SSH is blocked.
```

To resolve, increase the SSH timeout using Oracle EXAchk environment variable.:

1. Reset the environment variable RAT_PASSWORDCHECK_TIMEOUT :

   ```
   # set RAT_PASSWORDCHECK_TIMEOUT=40
   ```

2. Rerun Oracle EXAchk as follows:

   ```
   # ./exachk -a
   ```

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