Oracle DB PowerPack Version 1.5.0

ScienceLogic

Contents

Summary

The Oracle DB PowerPack supports configuration, status and performance monitoring of Oracle databases running on Linux and Microsoft Windows operating systems.

The PowerPack uses SQL client connectivity for core database monitoring functionality. The dynamic applications used for this are identical whether connecting to a Windows or Linux database.

The PowerPack also includes optional operating system specific dynamic applications for monitoring the Oracle alert log via an ssh connection (Linux) or WinRM/Powershell connection (Windows). There are two further Linux dynamic applications for collecting additional listener and database information, these are most useful on Linux systems with more than one database instance deployed.

Supported Versions

This version 1.2.1 PowerPack has been developed and tested using the following systems:
- Oracle 12c running on Microsoft Windows 2008 R2
- Oracle 11gr2 running on Oracle Linux 6.7 (equivalent to RedHat EL 6.7)

There are no known limitations which would prevent this PowerPack from operating with other database / Windows, Linux operating system combinations currently supported by Oracle, Microsoft and RedHat.

Deployment

Connectivity requires a credential for Oracle database access and a credential for operating system access on the target server. The operating system credential (Linux or Windows) must have at least read access to the Oracle alert_xx.log file.

For consistent and time-efficient deployment, a device template should be used to align the required dynamic applications and credentials to the target server. Example Linux and Windows device templates are included in the PowerPack.

Alert Log Monitoring

Multiple methods are included for alert log monitoring to suit the needs of different environments:

Method	Dynamic Application	Advantage	Disadvantage
Direct operating system access to the alert log	Oracle DB: Linux Alert Log Oracle DB: Windows Alert Log	• Usually fast • Works when the database is inaccessible • No impact on database performance • Supports databases earlier than 11g	• Requires separate operating system credential • Requires alert log to be rotated before use to avoid lots of events for old alerts
SQL access referencing standard view V$DIAG_ALERT_EXT	Oracle DB: Alert Log *(default behavior)*	• Standard view, will work successfully on all recent databases	• Slow to return results on some databases
SQL access referencing custom view V$ALERT_LOG	Oracle DB: Alert Log *(enabled with custom credential)*	• Performs well • No special privileges required	• Requires custom view to be created before use
SQL access referencing table X$DBGALERTTEXT	Oracle DB: Alert Log *(enabled with custom credential)*	• Performs well • Built-in to all recent databases	• Access to the table requires SYS privilege, lab use only

You should select only one alert log monitoring method per database, based on which matches your environment. Further details of each method are provided in the PowerPack section below.

Oracle DB PowerPack Details

Database Status

Under normal circumstances the tables on the Configuration tab for this dynamic application will be empty. In the case of a blocking session, invalid object, unusable index or unusable index partition being detected, a major event will be generated and the problem element will appear in the relevant table on the Database Status configuration table.

For testing purposes the snippet which performs these checks has two sets of queries: one for production use and one to test events and recording of status information. Testing can be enabled by setting PRODUCTION=False at the top of the oracle_status snippet.

Additional status checks can be added in future by adding check queries to the production and non-production "collections" dictionary and corresponding collection object, alert and event definition:

```
if PRODUCTION:
    collections = {
        'blocking': """SELECT s.username ||'@'||s.machine ||'(sid='||s.sid||') is blocking '||ss.username||'@'||ss.machine||' (sid=' ||ss.sid||')' AS blocking_status FROM v$l
        'invalid_objects': """SELECT owner, object_type, object_name FROM dba_objects WHERE status != 'VALID'""",
        'unusable_indexes': """SELECT owner, index_name, tablespace_name FROM dba_indexes WHERE status = 'UNUSABLE'""",
        'unusable_index_partitions': """SELECT index_owner, index_name, partition_name, tablespace_name FROM dba_ind_PARTITIONS WHERE status = 'UNUSABLE'"""
    }
else:
    collections = {
        'blocking': """SELECT s.username ||'@'||s.machine ||'(sid='||s.sid||') is blocking '||ss.username||'@'||ss.machine||' (sid=' ||ss.sid||')' AS blocking_status FROM v$se
        'invalid_objects': """SELECT owner, object_type, object_name FROM dba_objects WHERE status = 'VALID' AND ROWNUM <= 3""",
        'unusable_indexes': """SELECT owner, index_name, tablespace_name FROM dba_indexes WHERE status != 'UNUSABLE' AND ROWNUM <= 3""",
        'unusable_index_partitions': """SELECT index_owner, index_name, partition_name, tablespace_name FROM dba_ind_PARTITIONS WHERE status != 'UNUSABLE' AND ROWNUM <= 3"""
    }
```

Configuration Report	Oracle DB: Database Status		Actions	Reset	Guide

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Blocking Sessions

Blocking Sessions

Invalid Objects

Invalid Objects

Unusable Indexes

Unusable Indexes

Unusable Index Partitions

Unusable Index Partitions

Version Details

The Version Details dynamic application shows a quick view of versions for each of the database components.

This dynamic application also serves as a reference for:

- Alert log location
- Database SID
- Operating system

| Configuration Report | Oracle DB: Version Details | Actions | Reset | Guide |

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Oracle Version

Oracle Version

1. Oracle Database 11g Release 11.2.0.1.0 - 64bit Production
2. PL/SQL Release 11.2.0.1.0 - Production
3. CORE 11.2.0.1.0 Production
4. TNS for Linux: Version 11.2.0.1.0 - Production
5. NLSRTL Version 11.2.0.1.0 - Production

Alert Log Location

Alert Log Location

1. /u01/app/oracle/diag/rdbms/db01/db01/trace/alert_db01.log

SID

SID

1. db01

Operating System

Operating System

1. x86_64/Linux 2.4.xx

Datafile Configuration

Shows a tabular view of datafile location, size and status.

| Configuration Report | Oracle DB: Datafile Configuration | Actions | Reset | Guide |

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Datafile Status

	Name	Size (MB)	Status
1.	/u01/app/oracle/oradata/db01/system01.dbf	860	SYSTEM
2.	/u01/app/oracle/oradata/db01/sysaux01.dbf	630	ONLINE
3.	/u01/app/oracle/oradata/db01/undotbs01.dbf	180	ONLINE
4.	/u01/app/oracle/oradata/db01/users01.dbf	5	ONLINE
5.	/u01/app/oracle/oradata/db01/example01.dbf	100	ONLINE
6.	/u01/app/oracle/oradata/db01/testdf987.dbf	5	ONLINE
7.	/u01/app/oracle/oradata/db01/testdf099.dbf	5	ONLINE
8.	/u01/app/oracle/product/11.2.0/db01/dbs/tbs_f2.dbf	40	ONLINE
9.	/u01/app/oracle/product/11.2.0/db01/dbs/UndoTEST01.dbf	20	ONLINE
10.	/u01/app/oracle/product/11.2.0/db01/dbs/tbs_f0081.dbf	5	OFFLINE
11.	/u01/app/oracle/product/11.2.0/db01/dbs/TBS_db100081	5	ONLINE

A major event will be generated for any datafile whose status is not "ONLINE" or "SYSTEM". An example event message is shown below:

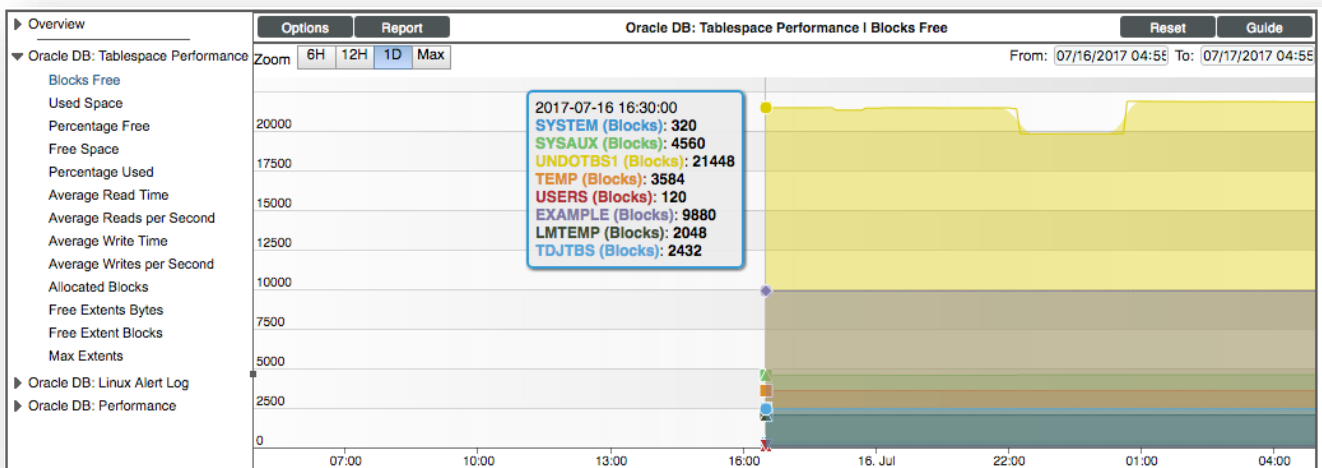Oracle datafile /u01/app/oracle/product/11.2.0/db01/dbs/tbs_f0081.dbf is in state OFFLINE

Tablespace Configuration

Shows a tabular view of all tablespace information in the database, including number of datafiles, online status and total space.

Configuration Report	Oracle DB: Tablespace Configuration			Actions	Reset	Guide

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Tablespace Information

	Name	Number of Datafiles	Status	Total Space (MB)
1.	UNDOTBS1	1	ONLINE	180
2.	TBS_01	1	ONLINE	40
3.	TBS_081	1	OFFLINE	--
4.	EXAMPLE	1	ONLINE	100
5.	TDJTBS	1	ONLINE	20
6.	LMTEMP	1	ONLINE	20
7.	USERS	1	ONLINE	5
8.	UNDOTEST01	1	ONLINE	20
9.	TEMP	1	ONLINE	29
10.	TESTTB987	2	ONLINE	10
11.	SYSTEM	1	ONLINE	860
12.	TBS_DB181T	1	ONLINE	5
13.	SYSAUX	1	ONLINE	630

Tablespace Performance

Shows detailed performance information and trend for each tablespace on the system. Includes events for warning and critical utilization levels, and free extents below threshold.

▶ Overview	Options	Report	Oracle DB: Tablespace Performance I Blocks Free	Reset	Guide

▼ Oracle DB: Tablespace Performance   Zoom | 6H | 12H | 1D | Max   From: 07/16/2017 04:55 To: 07/17/2017 04:55

- Blocks Free
- Used Space
- Percentage Free
- Free Space
- Percentage Used
- Average Read Time
- Average Reads per Second
- Average Write Time
- Average Writes per Second
- Allocated Blocks
- Free Extents Bytes
- Free Extent Blocks
- Max Extents

▶ Oracle DB: Linux Alert Log
▶ Oracle DB: Performance

2017-07-16 16:30:00
SYSTEM (Blocks): 320
SYSAUX (Blocks): 4560
UNDOTBS1 (Blocks): 21448
TEMP (Blocks): 3584
USERS (Blocks): 120
EXAMPLE (Blocks): 9880
LMTEMP (Blocks): 2048
TDJTBS (Blocks): 2432

20000
17500
15000
12500
10000
7500
5000
2500
0

07:00   10:00   13:00   16:00   16. Jul   22:00   01:00   04:00

Example events for this dynamic application:

| Oracle tablespace SYSTEM utilization now 99.71%, above the tablespace utilization critical threshold 97% |
| Oracle tablespace TBS_081 free extents now 0% has fallen below the minimum threshold 10%. |

Note:
Tablespace utilization alerts are **disabled** by default in this release. Common practice is to configure Oracle datafiles as `autoextend on maxsize unlimited`. With this configuration, tablespace utilization will typically be very high but Oracle will automatically extend the underlying file size as needed. It is very important to monitor the filesystem utilization in this case.

If you want to use tablespace utilization alerts, enable them under: System > Manage > Applications > Oracle DB: Tablespace Performance > Alerts

Alert Log

This dynamic application is used to monitor the Oracle alert log by reference to a view or table mapped into the text log file. By default the dynamic application refers to the *V$DIAG_ALERT_EXT* view, which should suit most environments.

Warning:
A known bug in some versions of Oracle can result in unhandled exceptions in dbgrlrReadAlertMsg when this dynamic application is used.
 Only use the Alert Log dynamic application if one of the following is true:

- You are running 12.1 or later
- You have applied patch set 11.2.0.4
- You have applied Patch 13598167 if it is available for your platform and version

See Oracle support document ID 1433214.1 for further details.
The Linux Alert Log and Windows Alert Log dynamic applications below provide alternative methods for monitoring the Oracle alert log.

Alternative Data Sources
There are two alternative data sources available with this dynamic application which can be enabled through the use of a custom credential. Refer to the *Alert Log* section of this document for further details on selecting alert log monitoring methods :

*X$DBGALERTEXT Data Source – for lab use only, requires sys privileges*

V$ALERT_LOG Data Source – custom view which must be created before use

Commands to be executed by the SYS user to create the V$ALERT_LOG custom view for use with this dynamic application:

```
create view v_$alert_log as select * from x$dbgalertext;
create public synonym v$alert_log for sys.v_$alert_log;
grant select on v$alert_log to em7admin;
```

Replace "em7admin" in the above command with the Oracle user to be used for monitoring.

To use one of the alternative data sources, include the required table or view name after a vertical bar '|' at the end of the credential name used with this dynamic application. For example to use the V$ALERT_LOG view:
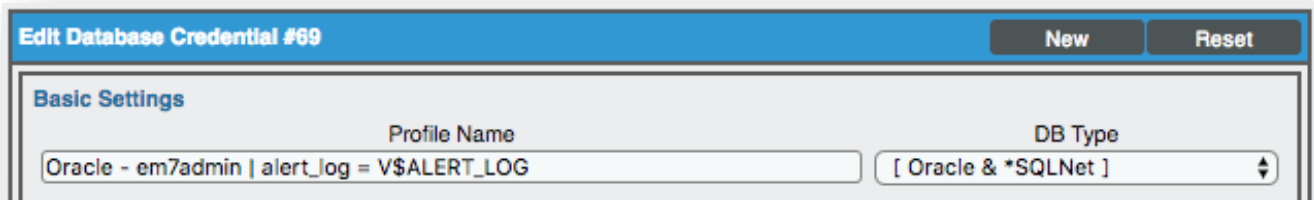
No matter which source is used, all log entries in the tables containing the "ORA-" prefix will result in generated EM7 events. The log file location and last read position are cached so that only new "ORA-" entries result in events on each execution of the dynamic application.

Linux Alert Log

The purpose of this dynamic app is to monitor the text log file for the installed Oracle database on a Linux server. It watches for log entries matching a certain prefix (ORA -) and promotes them to alerts and then events so that the administrator can handle them.

The first time this dynamic application runs it performs a look-up to find the Oracle alert log. In order for this look up to be successful, the ORACLE_SID environment variable must be set for the Linux account used for login after the local .profile or .bash_profile environment files are executed.

Once the alert log file has been located all log entries containing the "ORA-" prefix will result in generated EM7 events.

The log file location and last read position are cached so that only new "ORA-" entries result in events on each execution of the dynamic application. Example EM7 device log entries from the alert log are shown below:

The Oracle database alert file may contain a long history of issues, so to avoid generating a large number of events when first run, it is recommended to backup and empty the alert log before the dynamic application is aligned.

Windows Alert Log

The purpose of this dynamic app is to monitor the text log file for the installed Oracle database on a Windows server. It watches for log entries matching a certain prefix (ORA-) and promotes them to alerts and then events so that the administrator can handle them.

Prerequisites

The first time this dynamic application runs it performs a look-up to find the Oracle alert log. For this lookup to be successful, the alert log location must already have been collected and cached on the EM7 collector. Specifically:

- The *Oracle DB: Version Details* dynamic application must be aligned to the device from which alert logs are to be collected
- At least one successful scheduled collection of the *Oracle DB: Version Details* dynamic application (see above for details of this dynamic application).

Once the alert log file has been located, all log entries containing the "ORA-" prefix will result in generated EM7 events.

The log file location and last read position are cached so that only new "ORA-" entries result in events on each execution of the dynamic application. Example EM7 device log entries from the alert log are shown below:

The Oracle database alert file may contain a long history of issues, so to avoid generating a large number of events when first run, it is recommended to backup and empty the alert log before the dynamic application is aligned.

Alert Log Events

By default most ORA- alerts will result in major EM7 events. Alerts which start with ORA-125 or ORA-126 indicate problems connecting to the database and these will result in critical EM7 events:

The event policy "weight" feature in EM7 allows additional event policies to be added in future when more specific handling is needed.

Linux Listener Configuration

This is an optional Linux-only dynamic application which provides configuration information about the Linux database listener.

| Configuration Report | Oracle DB: Linux Listener Configuration | | | | | Actions | Reset | Guide |

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Listener Settings

	Alias	Security	SNMP	Start Date	Trace Level	Version
1.	LISTENER	ON: Local OS Authentication	OFF	08-FEB-2017 21:58:29	off	TNSLSNR for Linux: Version 11.2.0.1.0 - Production

Service Summary

|	Service Name	Listener Status	Database Instance Name
1.	db01.qa.sciencelogic.local	READY	db01
2.	db01XDB.qa.sciencelogic.local	READY	db01
3.	dev.qa.sciencelogic.local	READY	dev
4.	devXDB.qa.sciencelogic.local	READY	dev

Linux Database Configuration

This is an optional Linux-only dynamic application which provides configuration information about the Linux database configuration. This can be useful on Linux hosts with multiple Oracle instances running on them.

| Configuration Report | Oracle DB: Linux Database Configuration | | | Actions | Reset | Guide |

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Databases

	Database Name	Database Status	Database Open Mode
1.	DB01	ACTIVE	READ WRITE

Database Instances

	Database Instance Name	Database Instance Status
1.	db01	OPEN

Performance Ratios

This dynamic application provides a key set of performance ratios which are commonly helpful to DBAs in tuning database configuration as well as providing guidance to application developers. It includes adjustable thresholds for each of the metrics and corresponding high-water events and low-water clears.
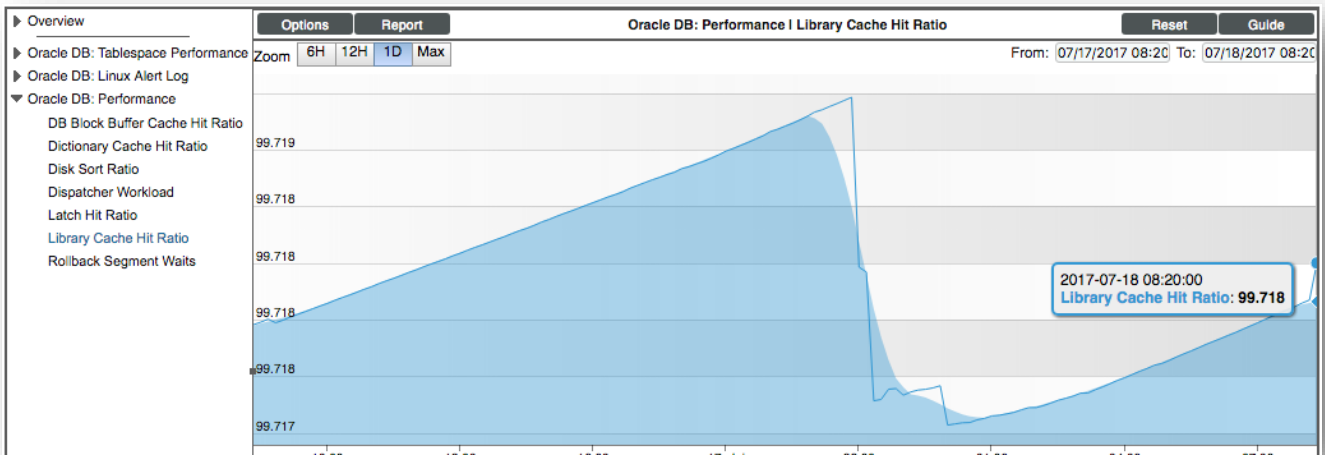
Dataguard Status (alpha)

The Dataguard status dynamic application monitors the Oracle v$dataguard_status table and generates events for any records for which the CALLOUT field is set to 'YES'.

ScienceLogic events will begin with the text 'Oracle Dataguard' followed by the message severity, message text, error code, destination ID, facility and message number. The Dataguard message severity is mapped onto ScienceLogic standard severities. The last message ID is stored between database polls so that only one event is generated for each status message.

This dynamic application is currently in alpha status and requires validation against a Dataguard system. The Dataguard status dynamic application is disabled by default.

Oracle Database Credential

An example Oracle database credential record is also included in the PowerPack for reference as shown below.

Credential Editor [72]

Edit Database Credential #72   New   Reset

Basic Settings

Profile Name	DB Type
Oracle DB - Example	[Oracle & *SQLNet]

DB Name	DB User	Password
DATABASE NAME	USERNAME	••••••••

Hostname/IP	Port
%D	1521

Oracle Settings

Oracle Connect Type	SID (if required)
[Oracle System Identifier (SID)]	EXAMPLE SID

Save   Save As

Device Templates

The PowerPack contains three device templates, one for each of the supported operating systems and one general purpose template when no direct database access is required:

- Oracle DB: Linux Server
- Oracle DB: Windows Server
- Oracle DB: Server (No OS credential)

The device templates include the required dynamic application for alignment to each of the operating systems as appropriate. Prior to use, the specific local credentials should be added to these templates.

The alpha Dataguard status dynamic application is not included in device templates.

Referenced Views and Tables

The following SQL can be used to create a user named *silo* with access to the required views and tables are referenced by this PowerPack:

```
CREATE USER silo IDENTIFIED BY password123
DEFAULT TABLESPACE USERS
TEMPORARY TABLESPACE TEMP
PROFILE DEFAULT
ACCOUNT UNLOCK;

GRANT CONNECT TO silo;
GRANT SELECT ON  v_$version TO silo;
```

```
GRANT SELECT ON  v_$lock TO silo;
GRANT SELECT ON  v_$session TO silo;
GRANT SELECT ON  v_$sysstat TO silo;
GRANT SELECT ON  v_$rowcache TO silo;
GRANT SELECT ON  v_$dispatcher TO silo;
GRANT SELECT ON  v_$latch TO silo;
GRANT SELECT ON  v_$librarycache TO silo;
GRANT SELECT ON  v_$rollstat TO silo;
GRANT SELECT ON  v_$parameter TO silo;
GRANT SELECT ON  v_$tablespace TO silo;
GRANT SELECT ON  v_$diag_alert_ext TO silo;
GRANT SELECT ON  v_$tempfile TO silo;
GRANT SELECT ON  v_$open_cursor TO silo;

GRANT SELECT ON  dual TO silo;
GRANT SELECT ON  dba_objects TO silo;
GRANT SELECT ON  dba_indexes TO silo;
GRANT SELECT ON  dba_ind_partitions TO silo;
GRANT SELECT ON  dba_tablespaces TO silo;
GRANT SELECT ON  dba_free_space TO silo;
GRANT SELECT ON  dba_temp_free_space TO silo;
GRANT SELECT ON  dba_temp_files TO silo;
GRANT SELECT ON  dba_data_files TO silo;
GRANT SELECT ON  dba_hist_filestatxs TO silo;
GRANT SELECT ON  dba_hist_snapshot TO silo;
```

Note: Oracle synonyms in format V$VIEWNAME are used in the PowerPack for views named V_$VIEWNAME. The above SQL grants read access on the V_$ name rather than the synonym.