The three investigators

An Introduction to OraChk, TFA and DBSAT

Markus Flechtner

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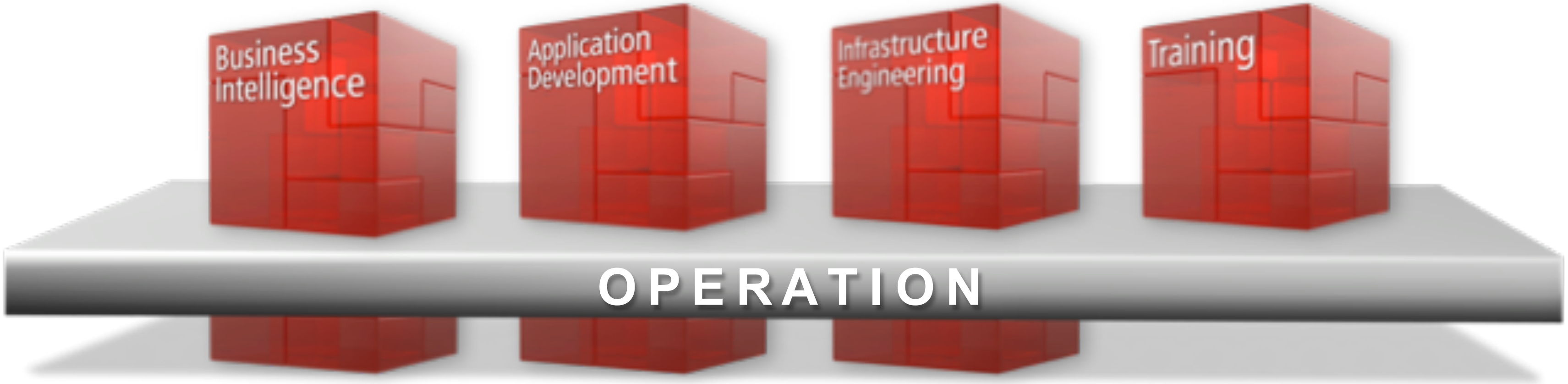

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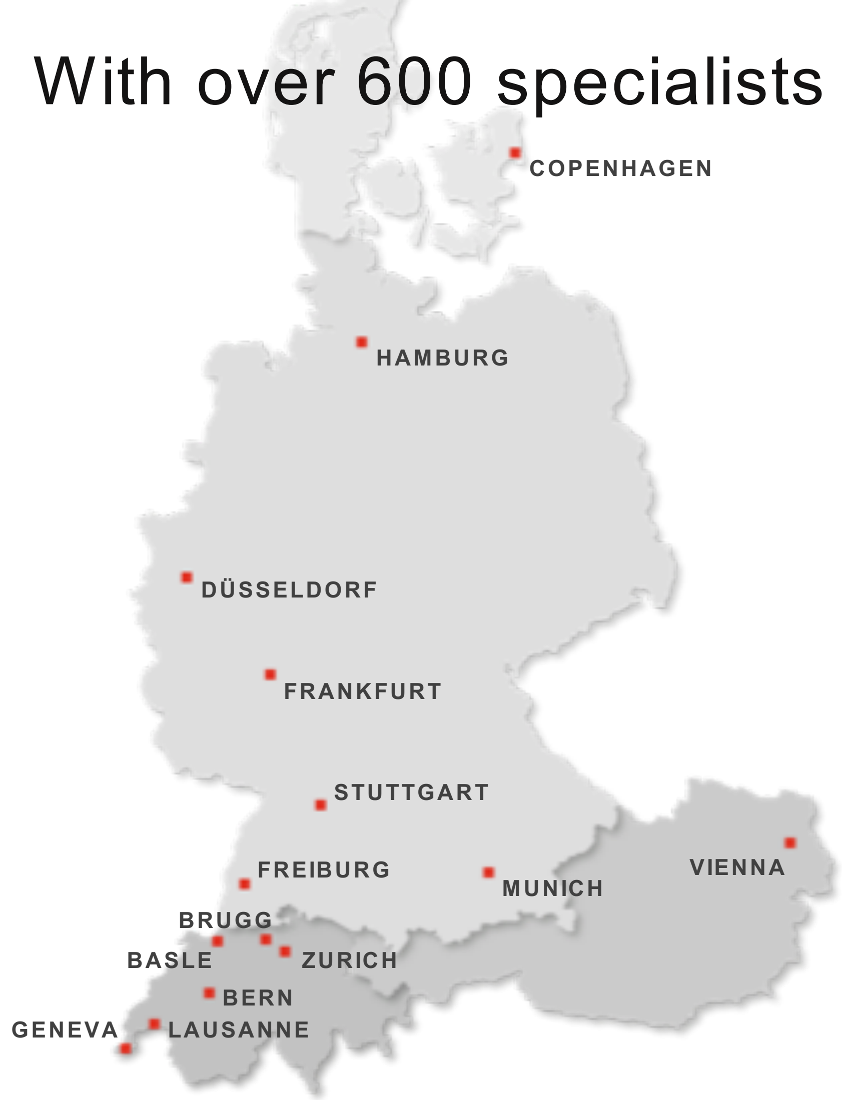

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About Markus Flechtner

- Principal Consultant, Trivadis, Duesseldorf/Germany, since April 2008
- Discipline Manager Infrastructure Database @Trivadis
- Working with Oracle since the 1990's
  - Development (Forms, Reports, PL/SQL)
  - Support
  - Database Administration
- Focus
  - Oracle Real Application Clusters
  - Database Upgrade and Migration Projects
- Teacher
  - O-RAC – Oracle Real Application Clusters
  - O-NF12CDBA – Oracle 12c New Features for the DBA

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Agenda

1. Overview
2. OraChk
3. TFA
4. DBSAT
5. Summary

Overview

Oracle database tools ..

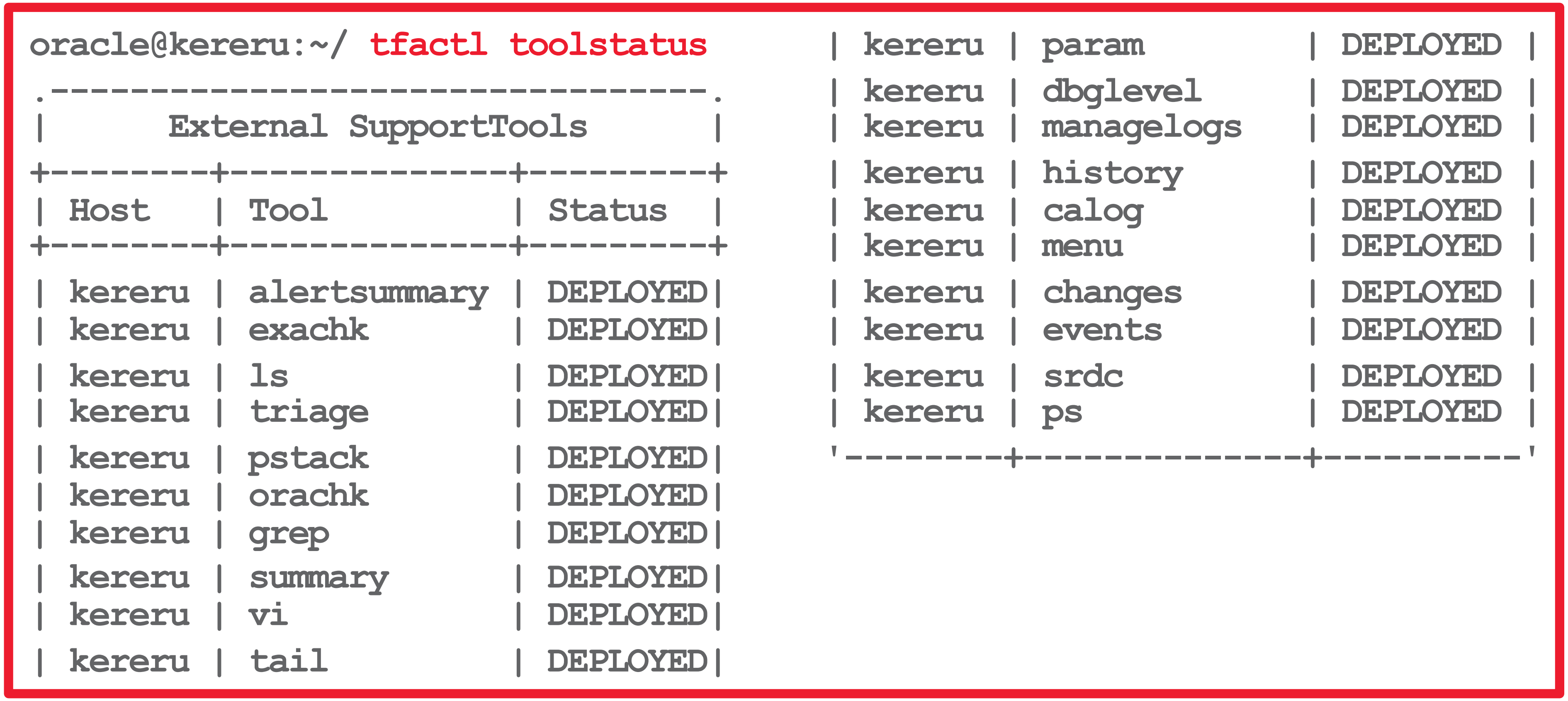
- During the last years, Oracle has released a number of additional database tools, like:

- **OraChk (Current version 18.2)**
  - Checks an Oracle installation against Oracle best practices
- **TFA (Trace File Analyzer Collector, current version 18.2)**
  - Originally: collecting log and trace files
  - Now: Central tool of the "Oracle Support Tools Bundle"
  - Included in Grid Infrastructure 11.2.0.4+12.1.0.2 and higher and RDBMS 12.2.0.1
- **DBSAT (Current version 2.1)**
  - Database Security Assessment Tool

Oracle Support Tools Bundle (1)

- Collection of database and RAC support tools
- Includes
  - ORAchk
  - ExaChk – like OraChk, but for Engineered Systems
  - OSWatcher
  - ProcWatcher – tool to examine and monitor Oracle database and/or clusterware processes
  - ORATOP - near real-time monitoring of databases
  - SQLT – helps in tuning SQL statements
  - DARDA - Diagnostic Assistant - interface for other diagnostic tools
  - .. And many more
- Integrated in TFA collector since release 12.1.2.3.0

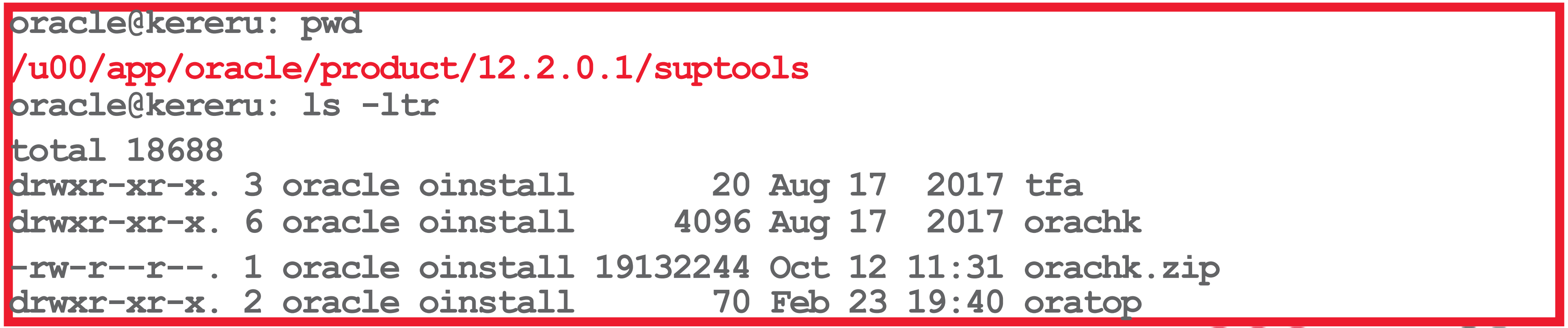
Oracle Support Tools Bundle (2)



```
oracle@kereru:~/ tfactl toolstatus
.--------------------------------.
|      External SupportTools     |
+--------+-------------+---------+
| Host   | Tool        | Status  |
+--------+-------------+---------+
| kereru | alertsummary | DEPLOYED|
| kereru | exachk      | DEPLOYED|
| kereru | ls          | DEPLOYED|
| kereru | triage      | DEPLOYED|
| kereru | pstack      | DEPLOYED|
| kereru | orachk      | DEPLOYED|
| kereru | grep        | DEPLOYED|
| kereru | summary     | DEPLOYED|
| kereru | vi          | DEPLOYED|
| kereru | tail        | DEPLOYED|
| kereru | param       | DEPLOYED |
| kereru | dbglevel    | DEPLOYED |
| kereru | managelogs  | DEPLOYED |
| kereru | history     | DEPLOYED |
| kereru | calog       | DEPLOYED |
| kereru | menu        | DEPLOYED |
| kereru | changes     | DEPLOYED |
| kereru | events      | DEPLOYED |
| kereru | srdc        | DEPLOYED |
| kereru | ps          | DEPLOYED |
'--------+-------------+----------'
```

Tool integration in RDBMS packages (1)

- Some tools are integrated in the Oracle RDMS packages or patch packages
  - 12.2.0.1 (Base Release)
  - 11.2.0.4.5 (Jan 2015) Database Patch Set Update (DB PSU)
  - 11.2.0.4 Bundle Patch 15 for Exadata Database (Jan 2015)
  - 11.2.0.4 Patch 12 on Windows Platforms



```
oracle@kereru: pwd
/u00/app/oracle/product/12.2.0.1/suptools
oracle@kereru: ls -ltr
total 18688
drwxr-xr-x. 3 oracle oinstall       20 Aug 17  2017 tfa
drwxr-xr-x. 6 oracle oinstall     4096 Aug 17  2017 orachk
-rw-r--r--. 1 oracle oinstall 19132244 Oct 12 11:31 orachk.zip
drwxr-xr-x. 2 oracle oinstall       70 Feb 23 19:40 oratop
```

OraChk

ORAchk – Purpose & History

- Available since July 2011
- Current version 12.2.0.1.4
- Formerly known as "RACCheck"
- Supported on Unix, Linux and Windows
- **Checks your installation against more than 1.000 Oracle Best Practices**
  - Audit_Checks_Report_Orachk.html contains a list of all checks
  - Additional user defined checks are possible
- ExaChk is a similar tool for Exadata
- Prompts for an upgrade when you are running a version older than 120 days

ORAchk – Not a RAC or database tool only

- ORAchk includes checks for
  - **Oracle Database (Single Instance + RAC)**
  - **MAA Validation**
  - **Upgrade Readiness**
  - Golden Gate
  - Enterprise Manager Cloud Control
  - Peoplesoft
  - Siebel
  - Oracle Sun Server
  - ..

ORAchk – Interfaces

- CLI tool
  - Daemon possible
- HTML- and ZIP-output
- Results can be stored in a database
  - → "configuration management lite"
- GUI
  - Collection Manager (APEX)
  - Enterprise Manager Plugin

ORAchk - Installation

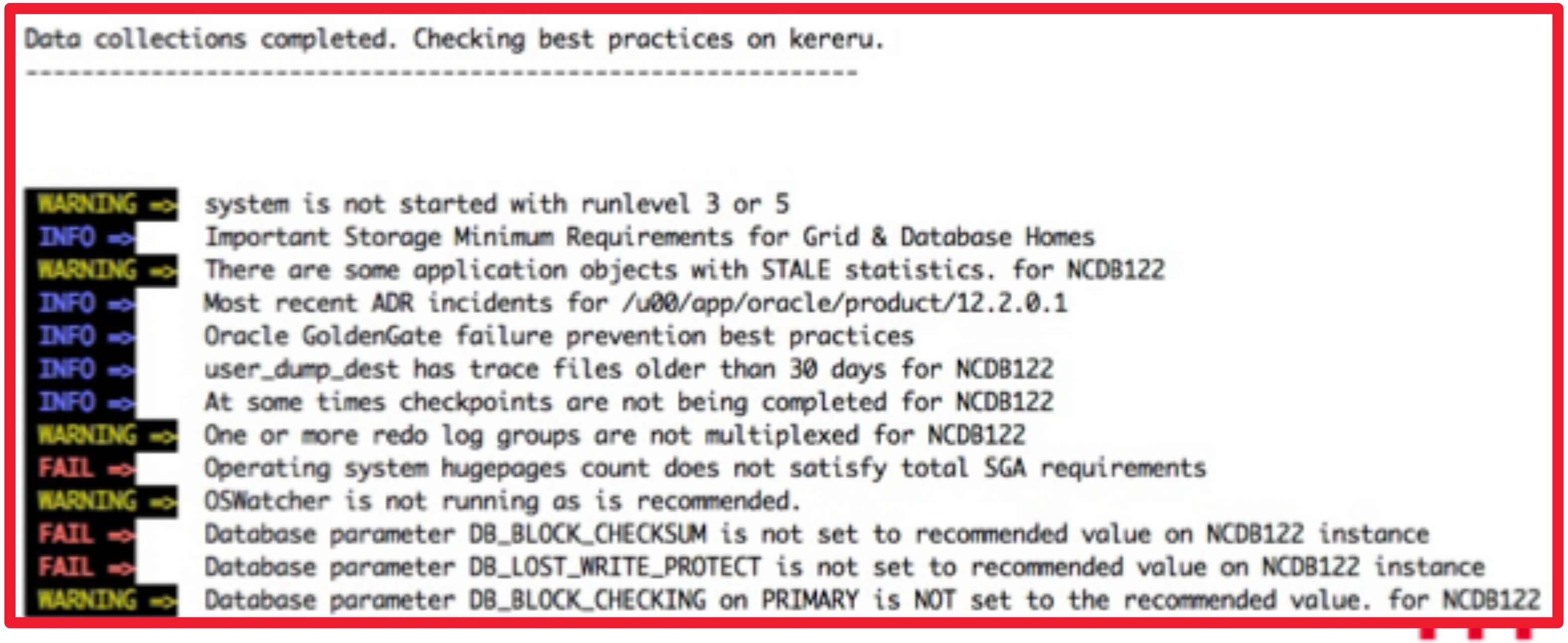
- Clusterware 11.2.0.4 and 12.1.0.2 and RDBMS 12.2.0.1
  - Installed with the software (into $ORACLE_HOME/suptools/orachk)
- For older versions
  - Install the current version of TFA Collector
  - Download the OraChk standalone package (MOS note 1268927.2)

ORAchk – Basic Command Line Options

Option	Meaning
-a	Run all Checks
-b	Best Practice Check only
-p	Patch Check Only
-u –o pre|post	Pre or Post Upgrade Checks
-dbnames	run for a subset of databases only
-clusternodes	run for a subset of nodes only
-h	Help on all available parameters (long list)

ORAchk – Sample Output (1)

- ORAchk checks O/S, clusterware and databases on all nodes of a cluster
- Result: ZIP-File and HTML-Report



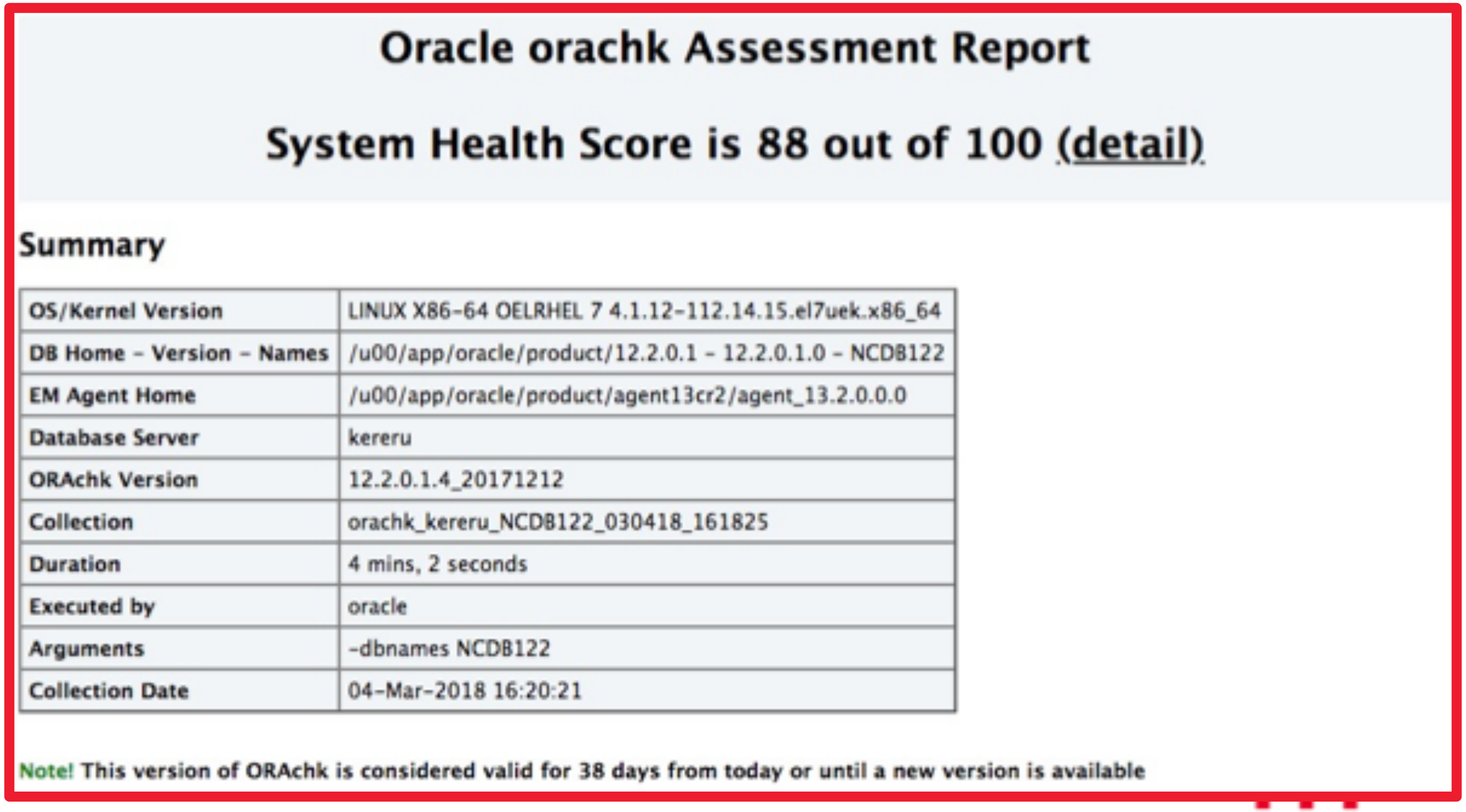
```
Data collections completed. Checking best practices on kereru.
------------------------------------------------------------



WARNING =>  system is not started with runlevel 3 or 5
INFO =>     Important Storage Minimum Requirements for Grid & Database Homes
WARNING =>  There are some application objects with STALE statistics. for NCDB122
INFO =>     Most recent ADR incidents for /u00/app/oracle/product/12.2.0.1
INFO =>     Oracle GoldenGate failure prevention best practices
INFO =>     user_dump_dest has trace files older than 30 days for NCDB122
INFO =>     At some times checkpoints are not being completed for NCDB122
WARNING =>  One or more redo log groups are not multiplexed for NCDB122
FAIL =>     Operating system hugepages count does not satisfy total SGA requirements
WARNING =>  OSWatcher is not running as is recommended.
FAIL =>     Database parameter DB_BLOCK_CHECKSUM is not set to recommended value on NCDB122 instance
FAIL =>     Database parameter DB_LOST_WRITE_PROTECT is not set to recommended value on NCDB122 instance
WARNING =>  Database parameter DB_BLOCK_CHECKING on PRIMARY is NOT set to the recommended value. for NCDB122
```

Example - Report

Health Check Catalog

OraChk - Results

ORAchk – Sample Output (2) – HTML-File Header



Oracle orachk Assessment Report

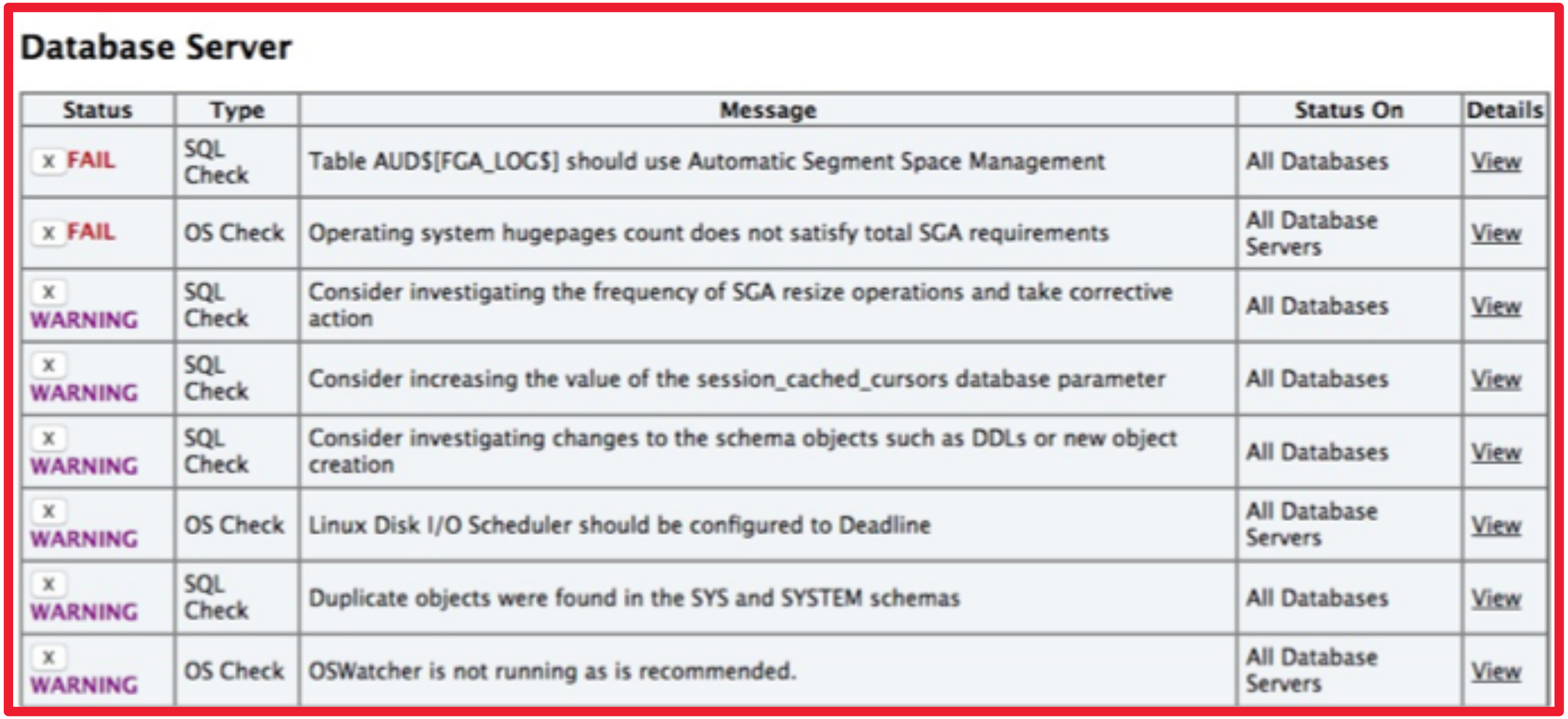
System Health Score is 88 out of 100 (detail)

Summary

OS/Kernel Version	LINUX X86-64 OELRHEL 7 4.1.12-112.14.15.el7uek.x86_64
DB Home - Version - Names	/u00/app/oracle/product/12.2.0.1 - 12.2.0.1.0 - NCDB122
EM Agent Home	/u00/app/oracle/product/agent13cr2/agent_13.2.0.0.0
Database Server	kereru
ORAchk Version	12.2.0.1.4_20171212
Collection	orachk_kereru_NCDB122_030418_161825
Duration	4 mins, 2 seconds
Executed by	oracle
Arguments	-dbnames NCDB122
Collection Date	04-Mar-2018 16:20:21

Note! This version of ORAchk is considered valid for 38 days from today or until a new version is available

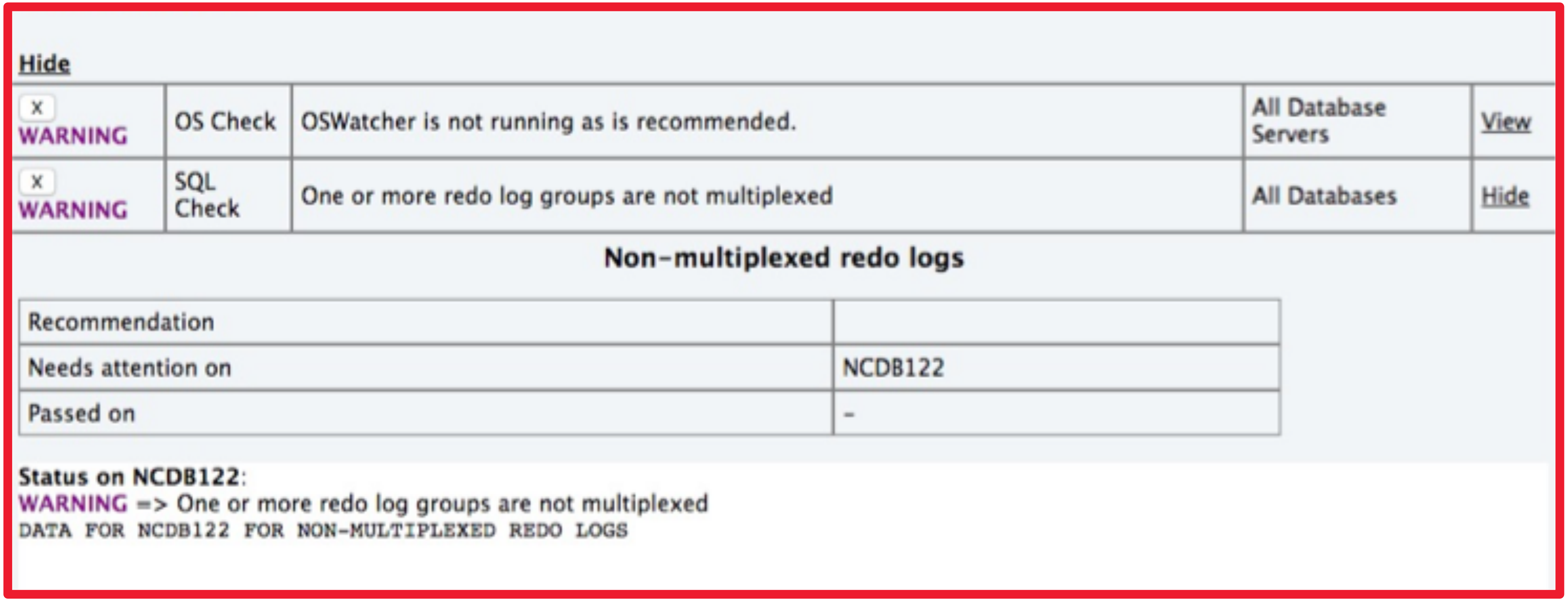
ORAchk – Sample Output (3) – Overview



Database Server

Status	Type	Message	Status On	Details
x FAIL	SQL Check	Table AUD$[FGA_LOG$] should use Automatic Segment Space Management	All Databases	View
x FAIL	OS Check	Operating system hugepages count does not satisfy total SGA requirements	All Database Servers	View
x WARNING	SQL Check	Consider investigating the frequency of SGA resize operations and take corrective action	All Databases	View
x WARNING	SQL Check	Consider increasing the value of the session_cached_cursors database parameter	All Databases	View
x WARNING	SQL Check	Consider investigating changes to the schema objects such as DDLs or new object creation	All Databases	View
x WARNING	OS Check	Linux Disk I/O Scheduler should be configured to Deadline	All Database Servers	View
x WARNING	SQL Check	Duplicate objects were found in the SYS and SYSTEM schemas	All Databases	View
x WARNING	OS Check	OSWatcher is not running as is recommended.	All Database Servers	View

ORAchk – Sample Output (4) – Details



Hide

x WARNING	OS Check	OSWatcher is not running as is recommended.	All Database Servers	View
x WARNING	SQL Check	One or more redo log groups are not multiplexed	All Databases	Hide

Non-multiplexed redo logs

Recommendation	
Needs attention on	NCDB122
Passed on	-

Status on NCDB122:
WARNING => One or more redo log groups are not multiplexed

```
DATA FOR NCDB122 FOR NON-MULTIPLEXED REDO LOGS
```

ORAchk – Advanced Command Line Options

Option	Meaning
-diff	Compare 2 reports
-d	Manage ORAchk daemon
-profile	Run for specific components or applications like: • ASM • Clusterware • EBS • MAA • Goldengate • Enterprise Manager Cloud Control • ..

ORAchk – Collection Manager (1)

- ORAchk results can be stored in a repository database
- Collection Manager is a GUI for the repository database
- APEX application
  - Installation script is delivered with ORAchk software (e.g. Apex5_CollectionManager_App.sql)
- Installation
  - Create database user for ORAchk
  - Install APEX application
  - The required tables are created when installing the application

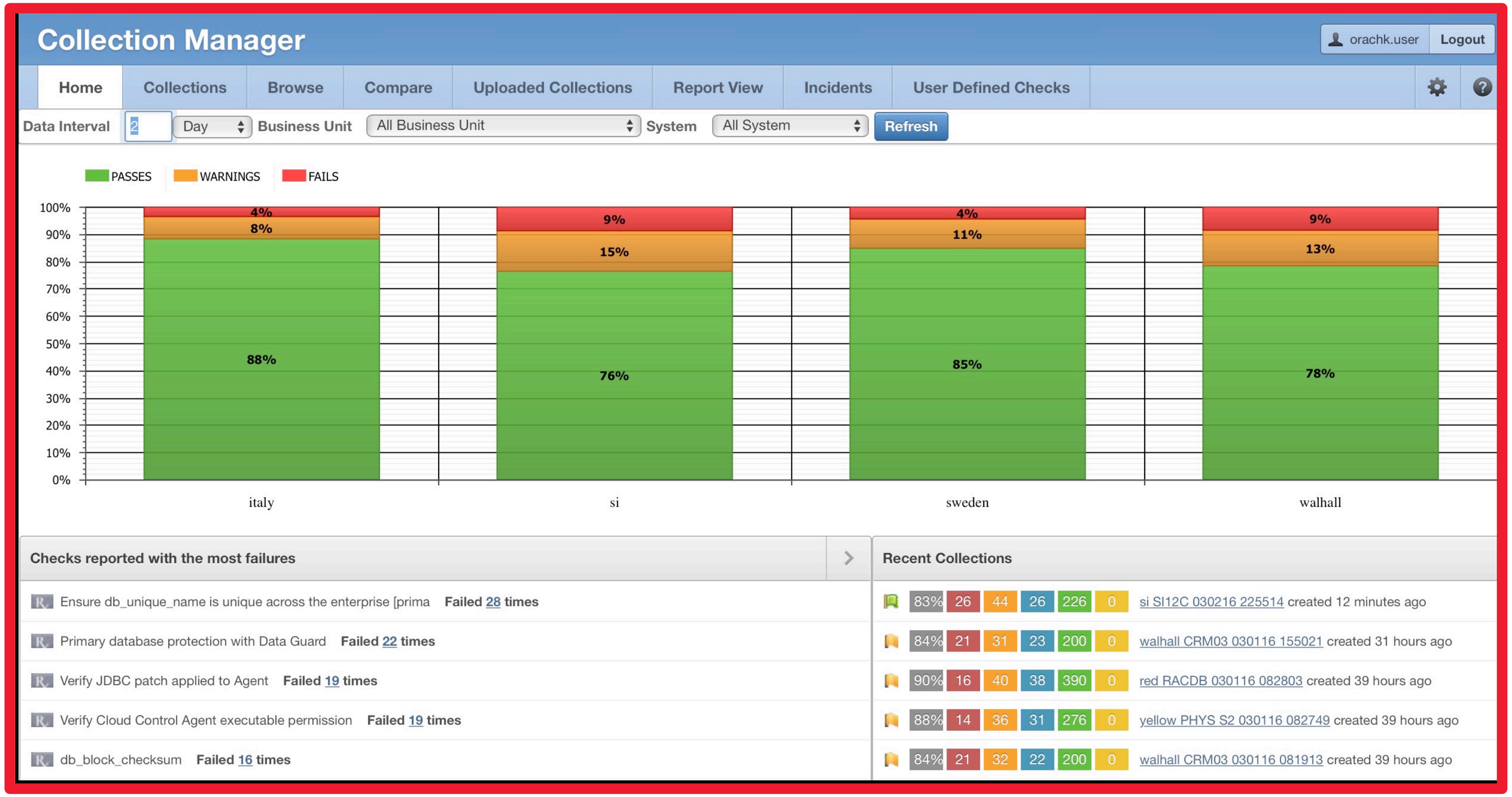
ORAchk – Collection Manager (2)

- Set environment

```
export RAT_UPLOAD_USER=orachkcm
export RAT_UPLOAD_PASSWORD=orachkcm
export RAT_ZIP_UPLOAD_TABLE=RCA13_DOCS
export
RAT_UPLOAD_CONNECT_STRING="(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=kea.m
arkusdba.net)(PORT=1521))(CONNECT_DATA=(SERVER=DEDICATED)(SERVICE_NAME=XE)
))"
```

  - Parameters can be passed to OraChk, too.
  - OraChk stores the connection data in a wallet
- Run ORAchk
  - If the environment is set, then the data will be inserted into the repository database

ORAchk – Collection Manager (3) – some screenshots

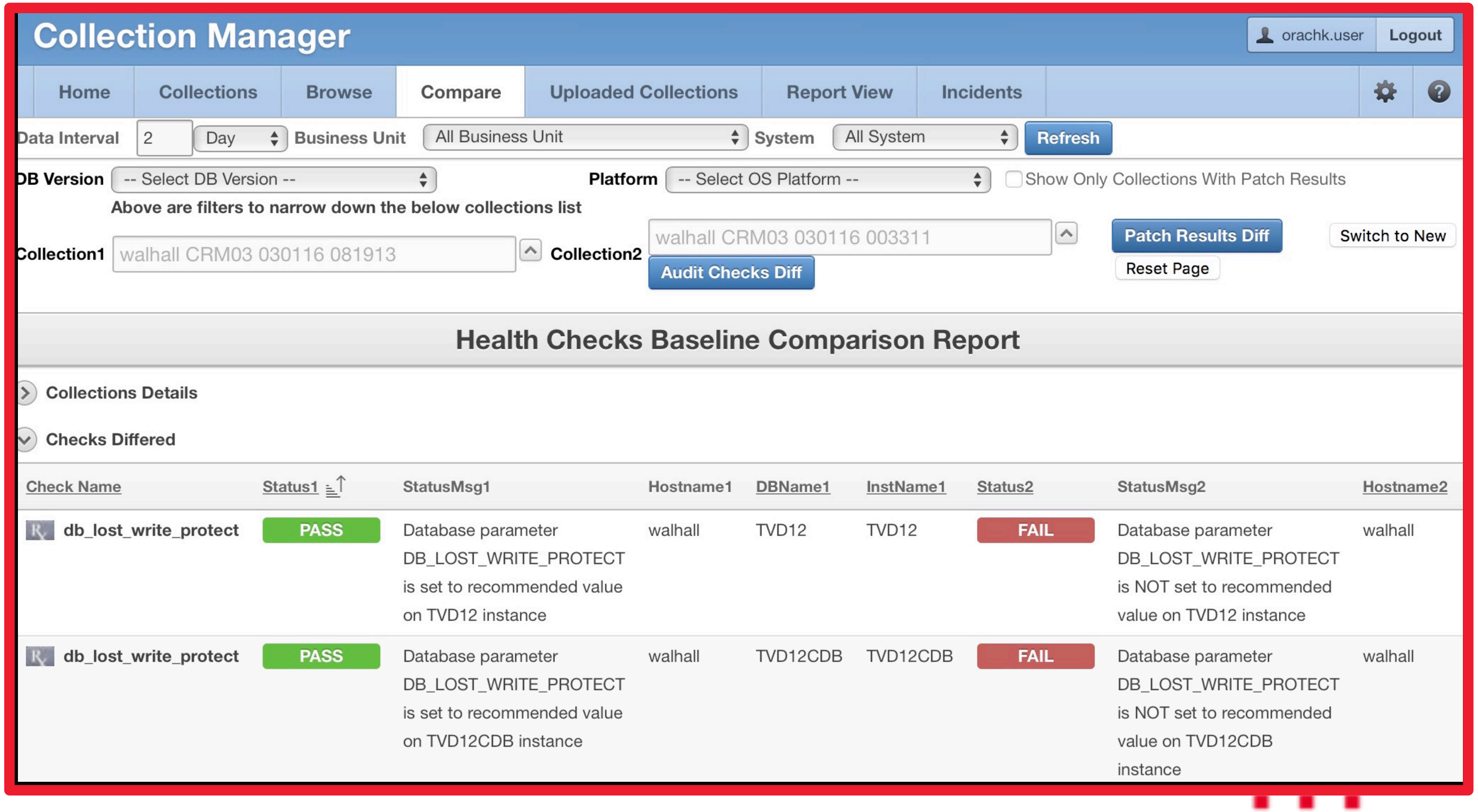


Data Interval 2 Day Business Unit All Business Unit System All System

Checks reported with the most failures
Ensure db_unique_name is unique across the enterprise [prima **Failed 28 times**
Primary database protection with Data Guard **Failed 22 times**
Verify JDBC patch applied to Agent **Failed 19 times**
Verify Cloud Control Agent executable permission **Failed 19 times**
db_block_checksum **Failed 16 times**

Recent Collections						
83%	26	44	26	226	0	si SI12C 030216 225514 created 12 minutes ago
84%	21	31	23	200	0	walhall CRM03 030116 155021 created 31 hours ago
90%	16	40	38	390	0	red RACDB 030116 082803 created 39 hours ago
88%	14	36	31	276	0	yellow PHYS S2 030116 082749 created 39 hours ago
84%	21	32	22	200	0	walhall CRM03 030116 081913 created 39 hours ago

ORAchk – Collection Manager (4) – some screenshots



Data Interval 2 Day Business Unit All Business Unit System All System

DB Version -- Select DB Version -- Platform -- Select OS Platform -- □ Show Only Collections With Patch Results

Above are filters to narrow down the below collections list

Collection1 walhall CRM03 030116 081913 Collection2 walhall CRM03 030116 003311

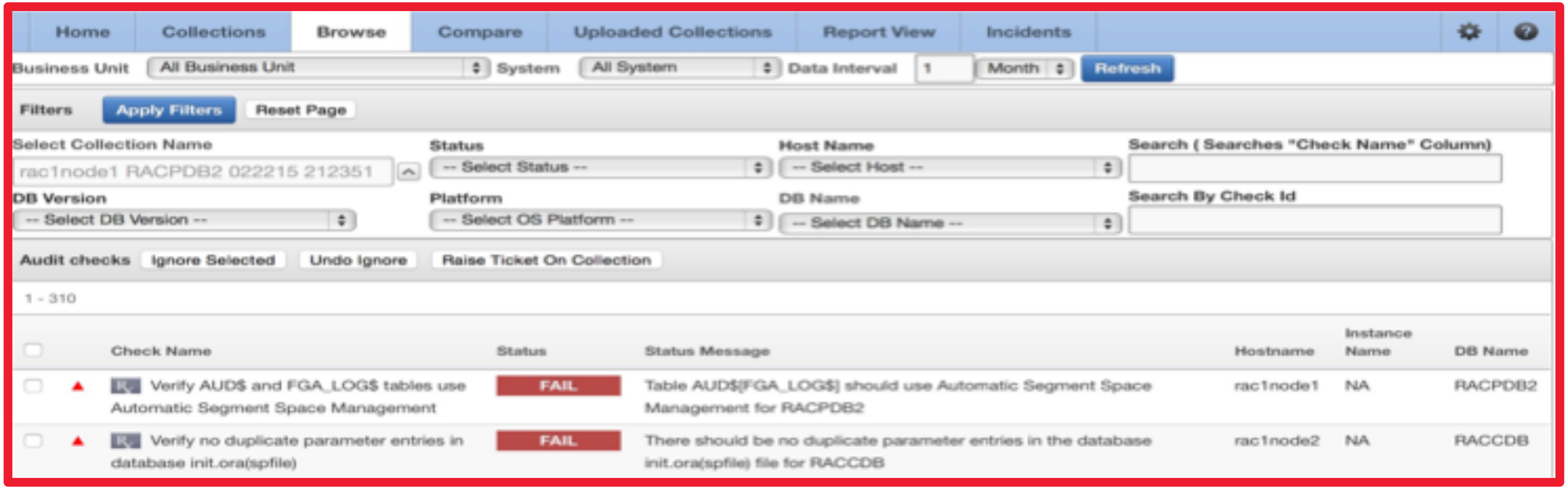
Health Checks Baseline Comparison Report

Collections Details

Checks Differed

Check Name	Status1	StatusMsg1	Hostname1	DBName1	InstName1	Status2	StatusMsg2	Hostname2
db_lost_write_protect	PASS	Database parameter DB_LOST_WRITE_PROTECT is set to recommended value on TVD12 instance	walhall	TVD12	TVD12	FAIL	Database parameter DB_LOST_WRITE_PROTECT is NOT set to recommended value on TVD12 instance	walhall
db_lost_write_protect	PASS	Database parameter DB_LOST_WRITE_PROTECT is set to recommended value on TVD12CDB instance	walhall	TVD12CDB	TVD12CDB	FAIL	Database parameter DB_LOST_WRITE_PROTECT is NOT set to recommended value on TVD12CDB instance	walhall

ORAchk – Collection Manager (5) – some screenshots



Business Unit: All Business Unit | System: All System | Data Interval: 1 Month

Filters

Select Collection Name: rac1node1 RACPDB2 022215 212351

Status: -- Select Status --

Host Name: -- Select Host --

Search (Searches "Check Name" Column):

DB Version: -- Select DB Version --

Platform: -- Select OS Platform --

DB Name: -- Select DB Name --

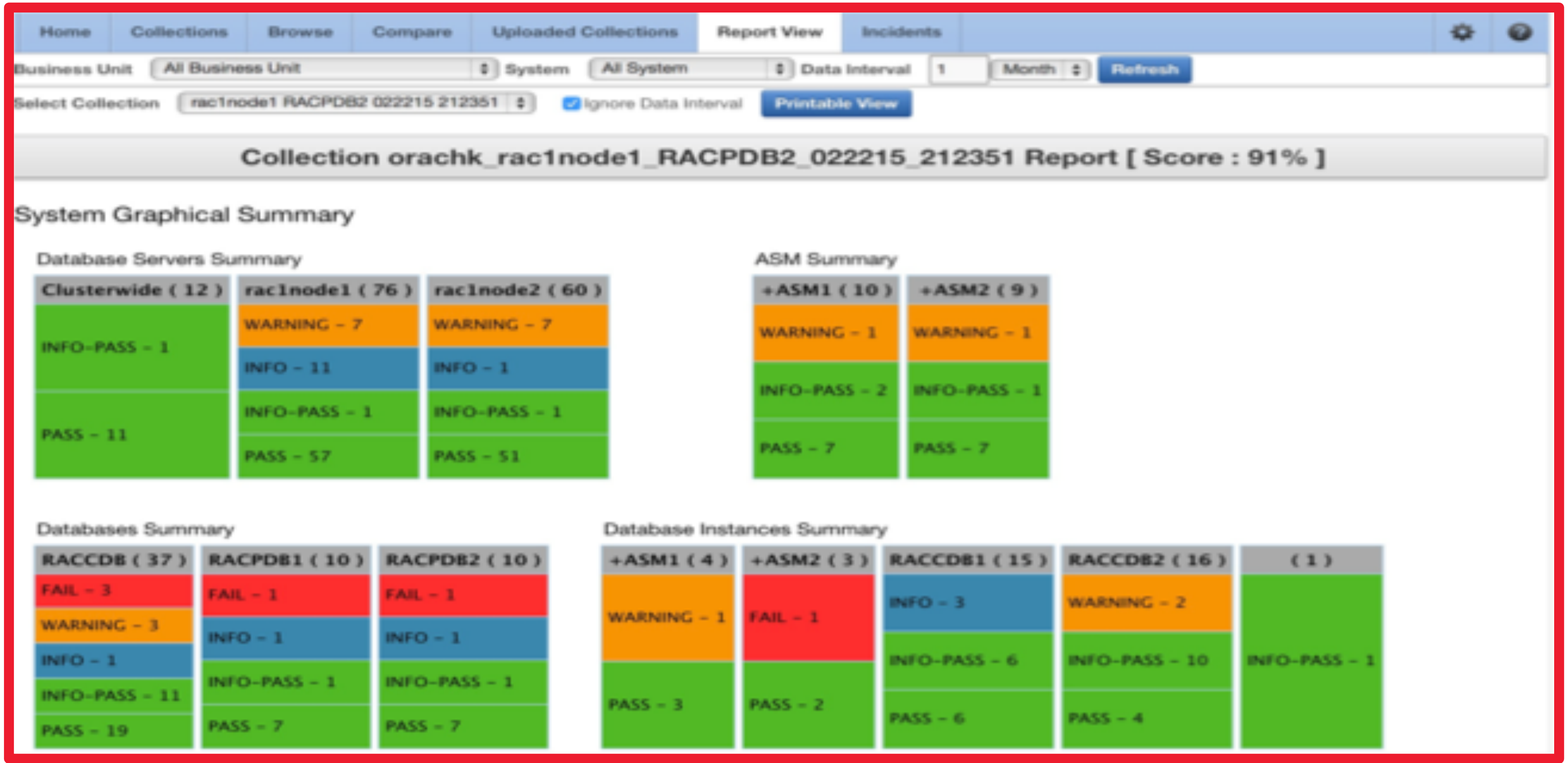
Search By Check Id:

Audit checks

1 - 310

□		Check Name	Status	Status Message	Hostname	Instance Name	DB Name
□	▲	Verify AUD$ and FGA_LOG$ tables use Automatic Segment Space Management	FAIL	Table AUD$[FGA_LOG$] should use Automatic Segment Space Management for RACPDB2	rac1node1	NA	RACPDB2
□	▲	Verify no duplicate parameter entries in database init.ora(spfile)	FAIL	There should be no duplicate parameter entries in the database init.ora(spfile) file for RACCDB	rac1node2	NA	RACCDB

ORAchk – Collection Manager (6) – some screenshots



Business Unit: All Business Unit | System: All System | Data Interval: 1 Month

Select Collection: rac1node1 RACPDB2 022215 212351 | ☑ Ignore Data Interval

Collection orachk_rac1node1_RACPDB2_022215_212351 Report [Score : 91%]

System Graphical Summary

Database Servers Summary

Clusterwide (12)	rac1node1 (76)	rac1node2 (60)
INFO-PASS – 1	WARNING – 7	WARNING – 7
PASS – 11	INFO – 11	INFO – 1
	INFO-PASS – 1	INFO-PASS – 1
	PASS – 57	PASS – 51

ASM Summary

+ASM1 (10)	+ASM2 (9)
WARNING – 1	WARNING – 1
INFO-PASS – 2	INFO-PASS – 1
PASS – 7	PASS – 7

Databases Summary

RACCDB (37)	RACPDB1 (10)	RACPDB2 (10)
FAIL – 3	FAIL – 1	FAIL – 1
WARNING – 3	INFO – 1	INFO – 1
INFO – 1	INFO-PASS – 1	INFO-PASS – 1
INFO-PASS – 11	PASS – 7	PASS – 7
PASS – 19		

Database Instances Summary

+ASM1 (4)	+ASM2 (3)	RACCDB1 (15)	RACCDB2 (16)	(1)
WARNING – 1	FAIL – 1	INFO – 3	WARNING – 2	INFO-PASS – 1
PASS – 3	PASS – 2	INFO-PASS – 6	INFO-PASS – 10	
		PASS – 6	PASS – 4	

TFA

Real life experience ..

- 26 node cluster
  - 5 databases
- Strange ASM issue
- Oracle Support requested
  - Clusterware logs
  - ASM alert.logs
  - Database alert.logs

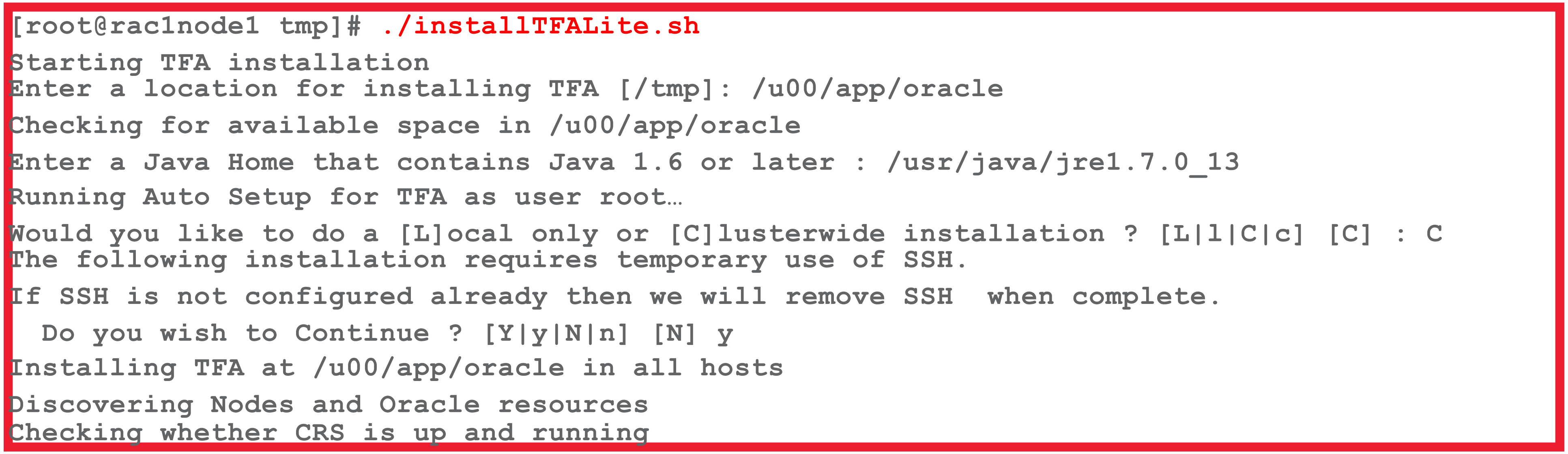
For **each** of the **26 servers!!**

Trace File Analyzer Collector

- Initial release in January 2013, current version 18.1.1 (January 2018)
- **Collects trace and log files and system information from all nodes into a cluster with a single command initiated on one cluster node**
- **Integrates a lot of other tools with one single CLI**
- Centralized output
- **Real-time scanning** for specific error messages possible ➔ Automatic Collection
- Included in Clusterware since 11.2.0.4 and 12.1.0.2 and with the database 12.2
- For other versions (10.2 or higher):
  - Download from MOS: 1513912.1
  - RAC and DB Support Tools Bundle is included in current TFA package

TFA Collector – Installation

- For Clusterware 11.2.0.4 and 12.1.0.2 and RDBMS 12.2: No additional installation required
- For older versions:



```
[root@rac1node1 tmp]# ./installTFALite.sh
Starting TFA installation
Enter a location for installing TFA [/tmp]: /u00/app/oracle
Checking for available space in /u00/app/oracle
Enter a Java Home that contains Java 1.6 or later : /usr/java/jre1.7.0_13
Running Auto Setup for TFA as user root…
Would you like to do a [L]ocal only or [C]lusterwide installation ? [L|l|C|c] [C] : C
The following installation requires temporary use of SSH.
If SSH is not configured already then we will remove SSH  when complete.
  Do you wish to Continue ? [Y|y|N|n] [N] y
Installing TFA at /u00/app/oracle in all hosts
Discovering Nodes and Oracle resources
Checking whether CRS is up and running
..
```

TFA Collector – Update

- TFA updates are not part of the PSUs/RUs
  - ➔ TFA installed with Oracle software is not updated automatically
- Manual updates
  - Running TFA is detected automatically
  - TFA is updated in the correct directory

TFA Collector – Architecture

- JAVA-based tool
- TFA-daemon “TFAMain” running on all cluster nodes

```
oracle@rac1node1:~/ [rdbms12102] ps -ef |grep tfa |grep -v grep
root   2325      1  0 10:14 ?   00:00:03 /bin/sh /etc/init.d/init.tfa run
root   3631      1  0 10:16 ?   00:05:10 /u00/app/grid/product/12.1.0.2/jdk/jre/bin/java -
[..]   oracle.rat.tfa.TFAMain /u00/app/grid/product/12.1.0.2/tfa/rac1node1/tfa_home
```

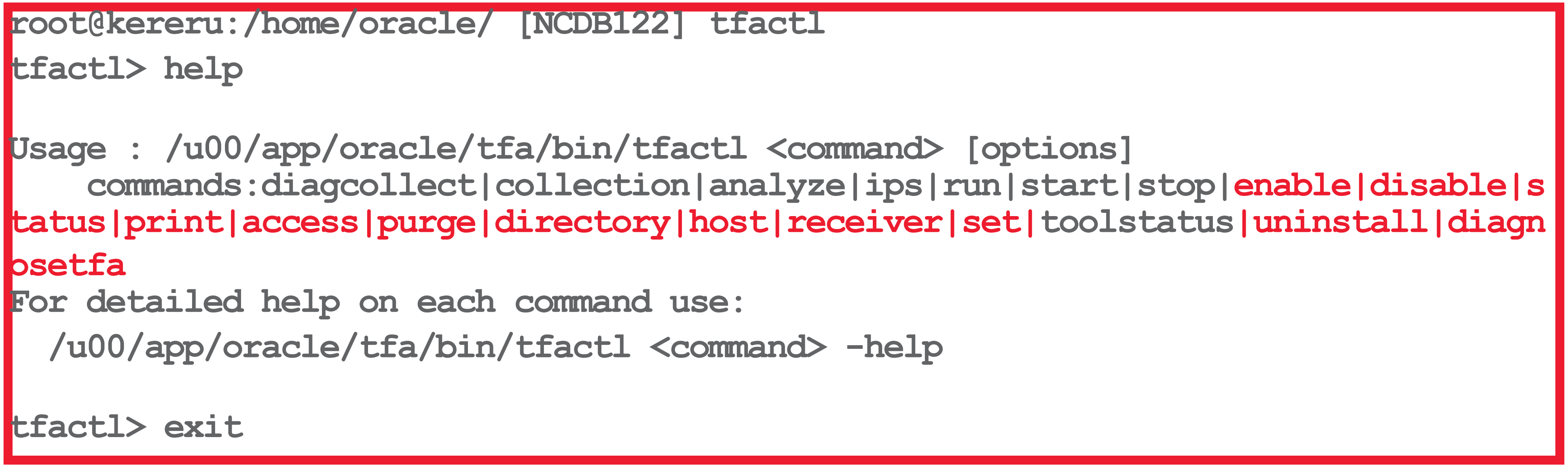
- Data Storage
  - File-Repository for Diagnostic Information
  - Berkeley Database for metadata, file inventory, event history, etc.
- Command Line Interface
  - tfactl (perl)
  - Communication with daemon using secure sockets

TFA Collector – Commands (1) – Command Overview

```
oracle@kereru:~/ [NCDB122] tfactl
tfactl> help

Usage : /u00/app/oracle/tfa/bin/tfactl <command> [options]
    commands:diagcollect|collection|analyze|ips|run|start|stop|print|directory|
toolstatus
For detailed help on each command use:
  /u00/app/oracle/tfa/bin/tfactl <command> -help

tfactl> exit
```

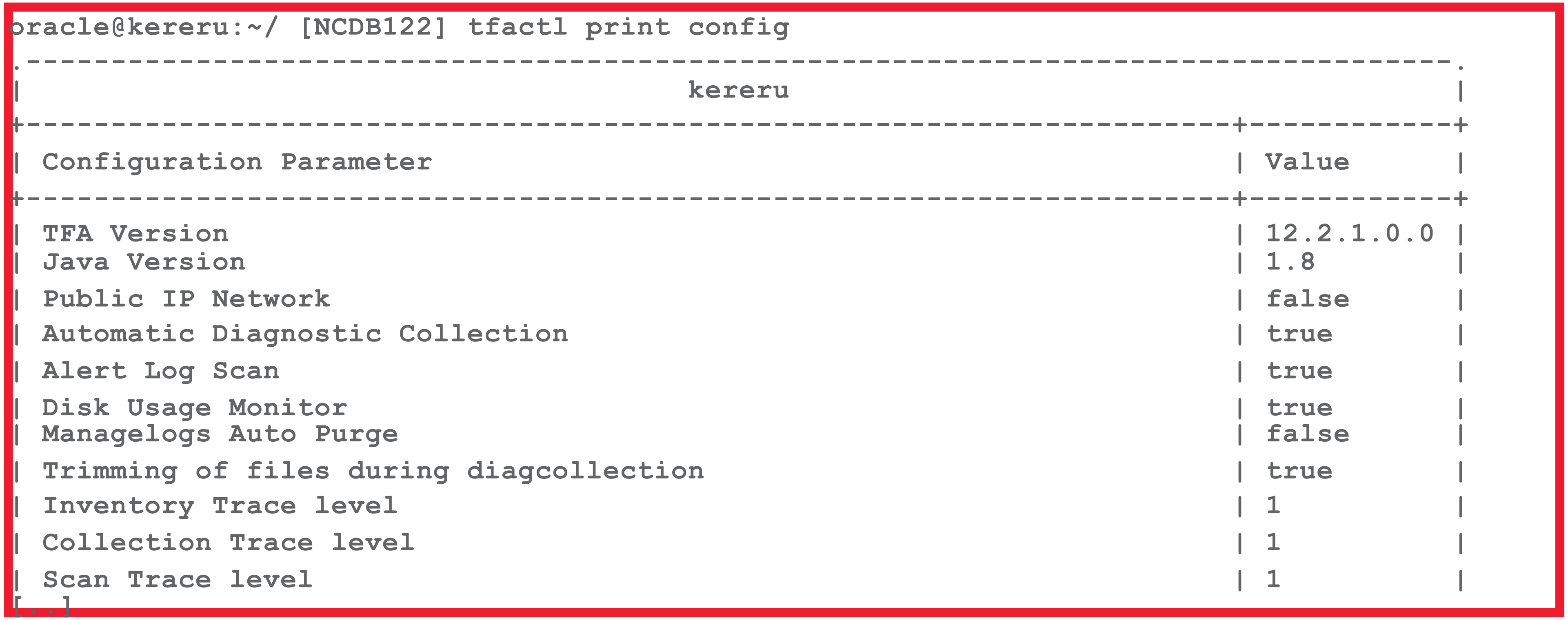
TFA Collector – Commands (2) – commands for root

- Configuration tasks must be done by root
- Additional commands are available via "tfactl":



```
root@kereru:/home/oracle/ [NCDB122] tfactl
tfactl> help

Usage : /u00/app/oracle/tfa/bin/tfactl <command> [options]
    commands:diagcollect|collection|analyze|ips|run|start|stop|enable|disable|s
tatus|print|access|purge|directory|host|receiver|set|toolstatus|uninstall|diagn
osetfa
For detailed help on each command use:
  /u00/app/oracle/tfa/bin/tfactl <command> -help

tfactl> exit
```

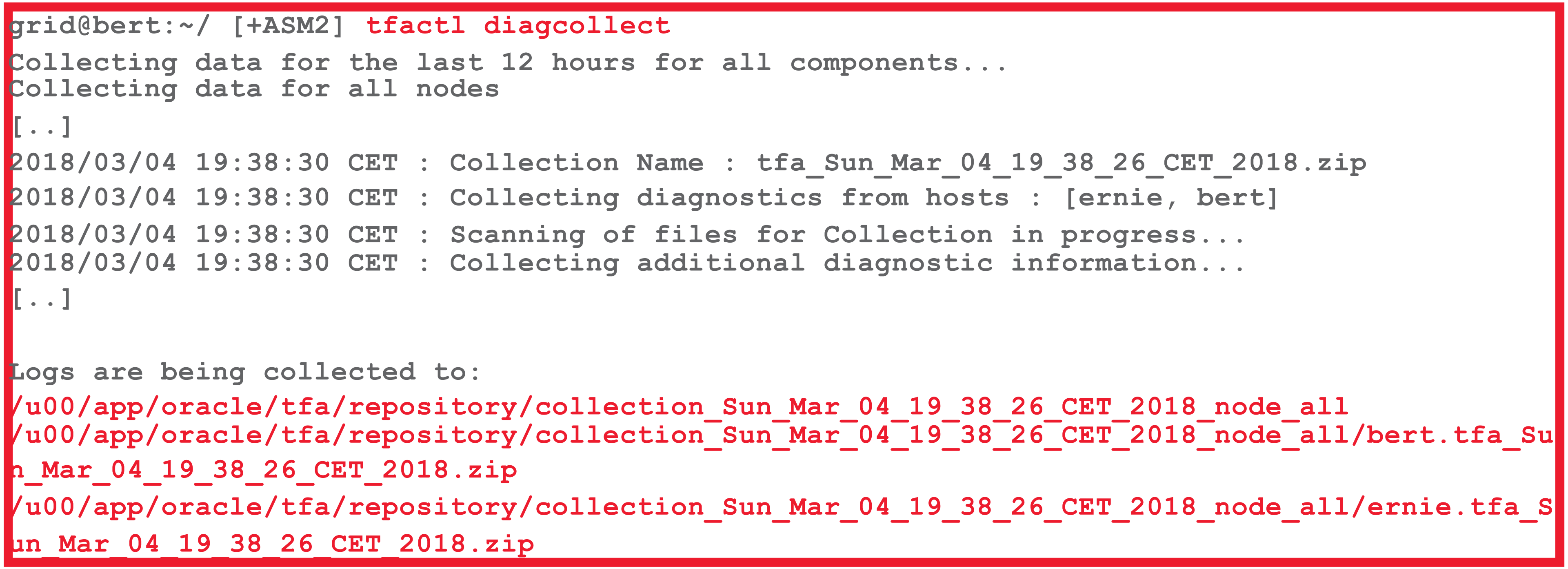
TFA Collector – Commands (3) – print config



```
oracle@kereru:~/ [NCDB122] tfactl print config
.-------------------------------------------------------------------------------------.
|                                       kereru                                        |
+------------------------------------------------------------------------+-------------+
| Configuration Parameter                                                | Value       |
+------------------------------------------------------------------------+-------------+
| TFA Version                                                            | 12.2.1.0.0  |
| Java Version                                                           | 1.8         |
| Public IP Network                                                      | false       |
| Automatic Diagnostic Collection                                        | true        |
| Alert Log Scan                                                         | true        |
| Disk Usage Monitor                                                     | true        |
| Managelogs Auto Purge                                                  | false       |
| Trimming of files during diagcollection                                | true        |
| Inventory Trace level                                                  | 1           |
| Collection Trace level                                                 | 1           |
| Scan Trace level                                                       | 1           |
[...]
```

TFA Collector – Commands (4) – diagcollect (1)

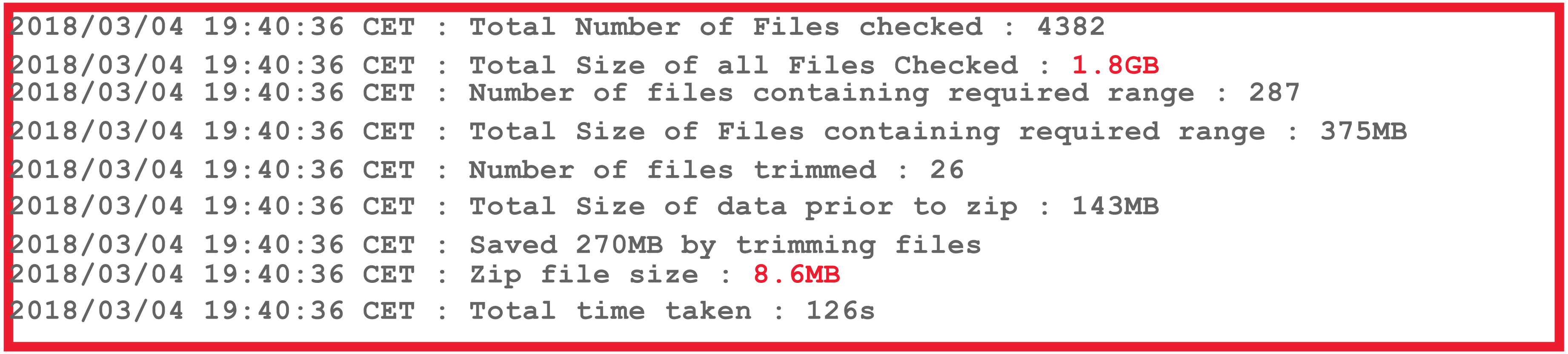
- Collects trace and log files from the cluster nodes



```
grid@bert:~/ [+ASM2] tfactl diagcollect
Collecting data for the last 12 hours for all components...
Collecting data for all nodes
[..]
2018/03/04 19:38:30 CET : Collection Name : tfa_Sun_Mar_04_19_38_26_CET_2018.zip
2018/03/04 19:38:30 CET : Collecting diagnostics from hosts : [ernie, bert]
2018/03/04 19:38:30 CET : Scanning of files for Collection in progress...
2018/03/04 19:38:30 CET : Collecting additional diagnostic information...
[..]

Logs are being collected to:
/u00/app/oracle/tfa/repository/collection_Sun_Mar_04_19_38_26_CET_2018_node_all
/u00/app/oracle/tfa/repository/collection_Sun_Mar_04_19_38_26_CET_2018_node_all/bert.tfa_Su
n_Mar_04_19_38_26_CET_2018.zip
/u00/app/oracle/tfa/repository/collection_Sun_Mar_04_19_38_26_CET_2018_node_all/ernie.tfa_S
un_Mar_04_19_38_26_CET_2018.zip
```

TFA Collector – Commands (5) – diagcollect (2)

- Which data is collected by default?
  - alert.log from all databases
  - ASM log files
  - listener.log files
  - Patch Information
  - CHM information
  - Clusterware logs
  - OS information
- Data is "trimmed" to the relevant time window



```
2018/03/04 19:40:36 CET : Total Number of Files checked : 4382
2018/03/04 19:40:36 CET : Total Size of all Files Checked : 1.8GB
2018/03/04 19:40:36 CET : Number of files containing required range : 287
2018/03/04 19:40:36 CET : Total Size of Files containing required range : 375MB
2018/03/04 19:40:36 CET : Number of files trimmed : 26
2018/03/04 19:40:36 CET : Total Size of data prior to zip : 143MB
2018/03/04 19:40:36 CET : Saved 270MB by trimming files
2018/03/04 19:40:36 CET : Zip file size : 8.6MB
2018/03/04 19:40:36 CET : Total time taken : 126s
```

TFA Collector – Commands (6) – autodiagcollect

- Enable Automatic diagnostic collection

```
root@rac1node1:~/ tfactl set autodiagcollect=<ON|OFF> [-c]
```

  - Tfa will scan the alert.log files and runs "diagcollect" automatically
  - Collection triggered by ORA-600, ORA-7445, ORA-4031, ..
  - Trimming interval +/- 600 seconds

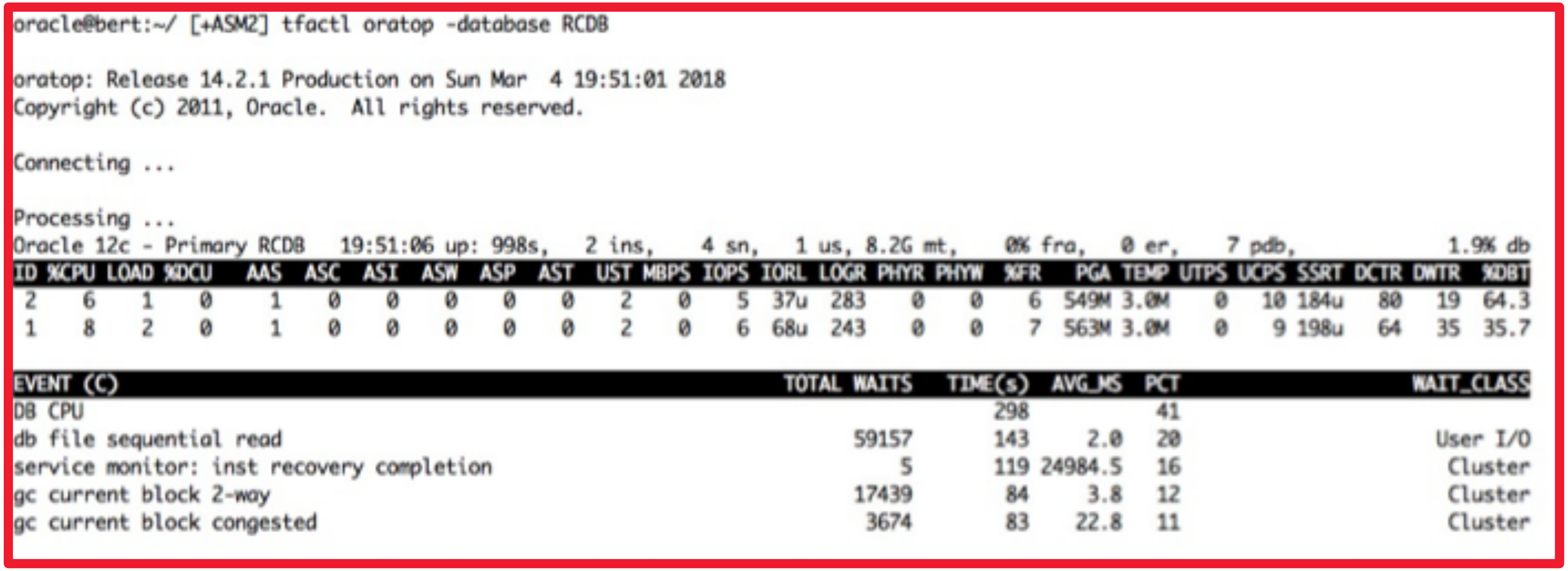
TFA Collector – other tools (1)

(partial) list of the tools which are integrated in TFA (incl. "Support Tools Bundle"):

Command in TFACTL	Explanation
Alertsummary	Event summary from all alert.log files
Changes	Lists changes of OS and instance configuration
Oratop	"top" for Oracle Databases, Linux client required
Events	List important events
Pstack	Stack trace for a process (across the cluster)
Darda	Diagnostic assistant, , common interface for various tools
Prw (ProcWatcher)	Capture diagnostic output for perfomance issues and session hangs

Please see TFA documentation for a complete list incl. documentation for each tool

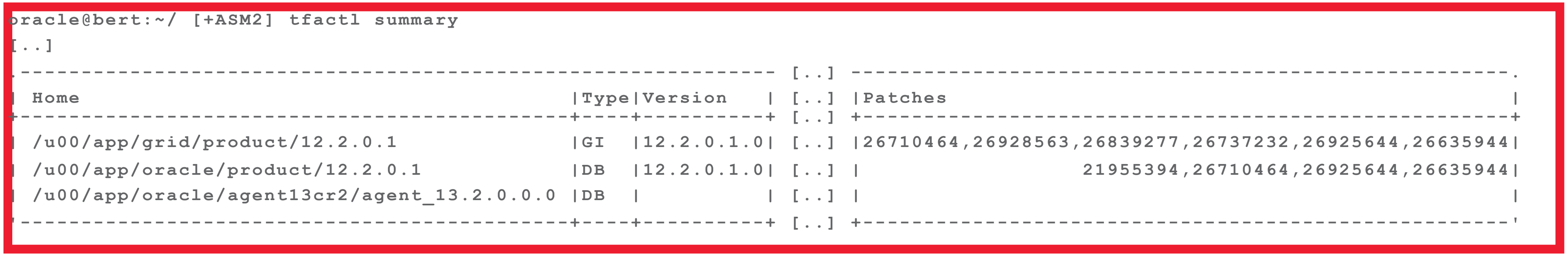
TFA Collector – oratop



```
oracle@bert:~/ [+ASM2] tfactl oratop -database RCDB

oratop: Release 14.2.1 Production on Sun Mar  4 19:51:01 2018
Copyright (c) 2011, Oracle.  All rights reserved.

Connecting ...

Processing ...
Oracle 12c - Primary RCDB   19:51:06 up: 998s,   2 ins,    4 sn,   1 us, 8.2G mt,    0% fra,   0 er,    7 pdb,             1.9% db
ID %CPU LOAD %DCU   AAS  ASC  ASI  ASW  ASP  AST  UST MBPS IOPS IORL LOGR PHYR PHYW  %FR   PGA TEMP UTPS UCPS SSRT DCTR DWTR  %DBT
 2    6    1    0     1    0    0    0    0    0    2    0    5  37u  283    0    0    6  549M 3.0M    0   10 184u   80   19  64.3
 1    8    2    0     1    0    0    0    0    0    2    0    6  68u  243    0    0    7  563M 3.0M    0    9 198u   64   35  35.7

EVENT (C)                                                         TOTAL WAITS   TIME(s)  AVG_MS  PCT                    WAIT_CLASS
DB CPU                                                                              298           41
db file sequential read                                                 59157       143     2.0   20                      User I/O
service monitor: inst recovery completion                                   5       119 24984.5   16                       Cluster
gc current block 2-way                                                  17439        84     3.8   12                       Cluster
gc current block congested                                               3674        83    22.8   11                       Cluster
```

TFA Collector – "summary"

- Displays a summary for all Oracle-home-directories
  - Path
  - Version
  - Component
  - Databases + Instances
  - Installed Patches



```
oracle@bert:~/ [+ASM2] tfactl summary
[..]
.------------------------------------------------------------- [..] ------------------------------------------------------.
| Home                                        |Type|Version   | [..] |Patches                                              |
+---------------------------------------------+----+----------+ [..] +-----------------------------------------------------+
| /u00/app/grid/product/12.2.0.1              |GI  |12.2.0.1.0| [..] |26710464,26928563,26839277,26737232,26925644,26635944|
| /u00/app/oracle/product/12.2.0.1            |DB  |12.2.0.1.0| [..] |                  21955394,26710464,26925644,26635944|
| /u00/app/oracle/agent13cr2/agent_13.2.0.0.0 |DB  |          | [..] |                                                     |
'---------------------------------------------+----+----------+ [..] +-----------------------------------------------------'
```

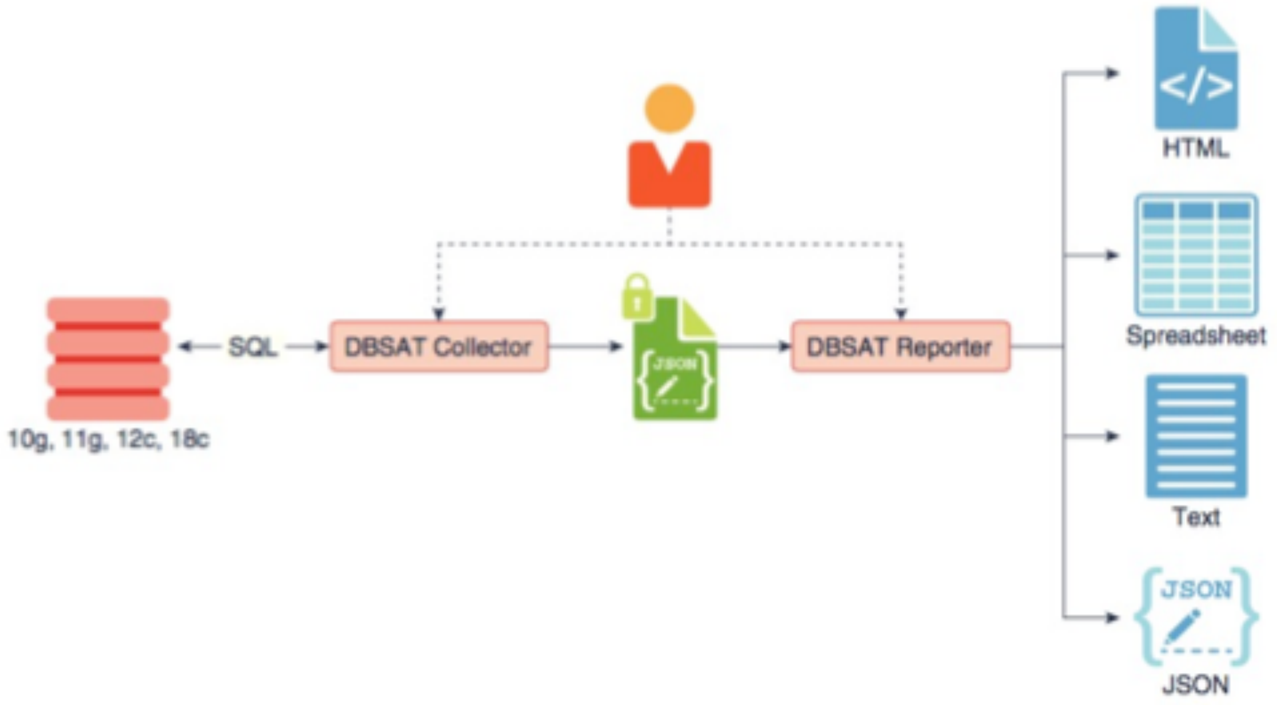
DBSAT

DBSAT - Introduction

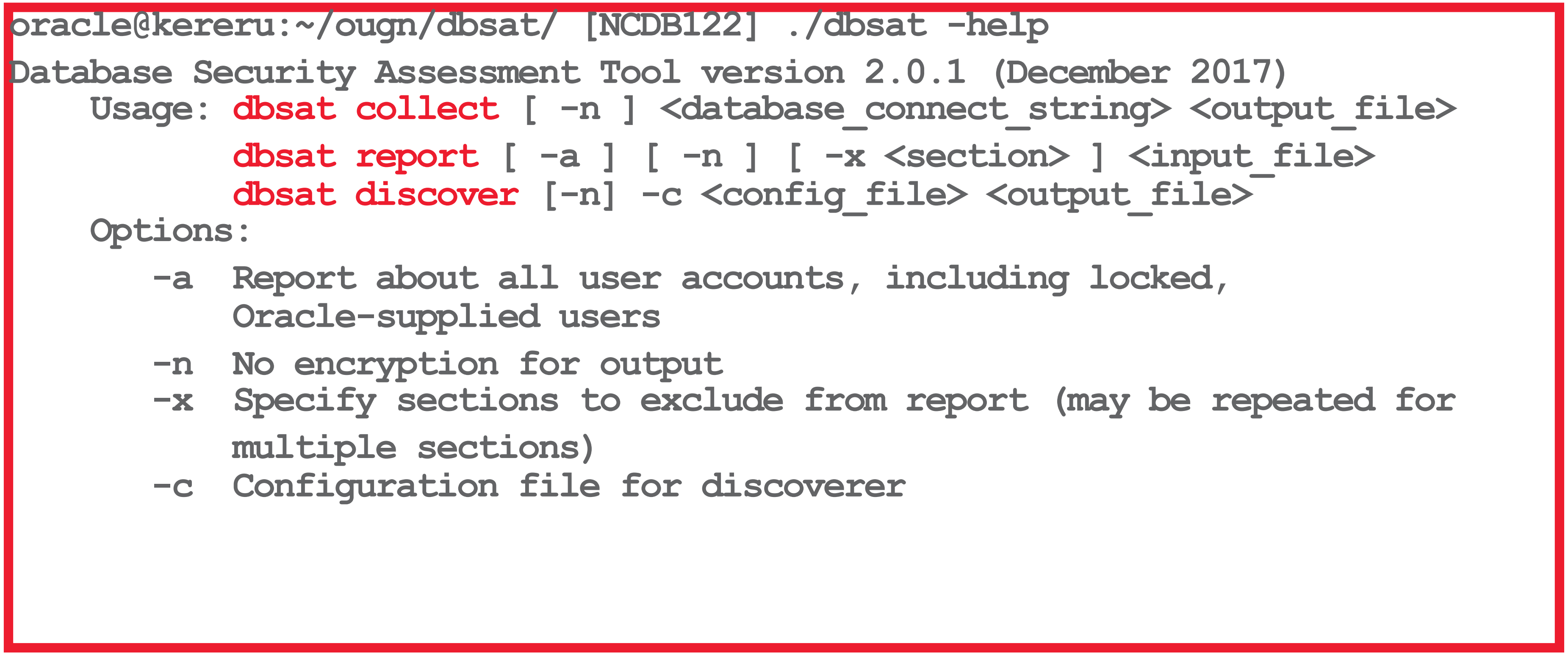
- Database Security Assesment Tool
  - Checks database configuration for security issues
  - Can find sensitve data
  - Result: security recommendation report
- Available since June 2016
- Current version: 2.0.1 (December 2017)
- Download from MOS- note 2138254.1

DBSAT - Architecture

- Components
  - Collector
  - Reporter
  - Discoverer (Standalone-Tool)



DBSAT – CLI



```
oracle@kereru:~/ougn/dbsat/ [NCDB122] ./dbsat -help
Database Security Assessment Tool version 2.0.1 (December 2017)
    Usage: dbsat collect [ -n ] <database_connect_string> <output_file>
           dbsat report [ -a ] [ -n ] [ -x <section> ] <input_file>
           dbsat discover [-n] -c <config_file> <output_file>
    Options:
       -a  Report about all user accounts, including locked,
           Oracle-supplied users
       -n  No encryption for output
       -x  Specify sections to exclude from report (may be repeated for
           multiple sections)
       -c  Configuration file for discoverer
```

DBSAT – Create a security report

- Collect information from the database

```
./dbsat collect "/ as sysdba" dbsat_demo_ncdb122
```

  - Result is an (encrypted) JSON-file

- Create a HTML report from the JSON file

```
./dbsat report dbsat_demo_ncdb122
```

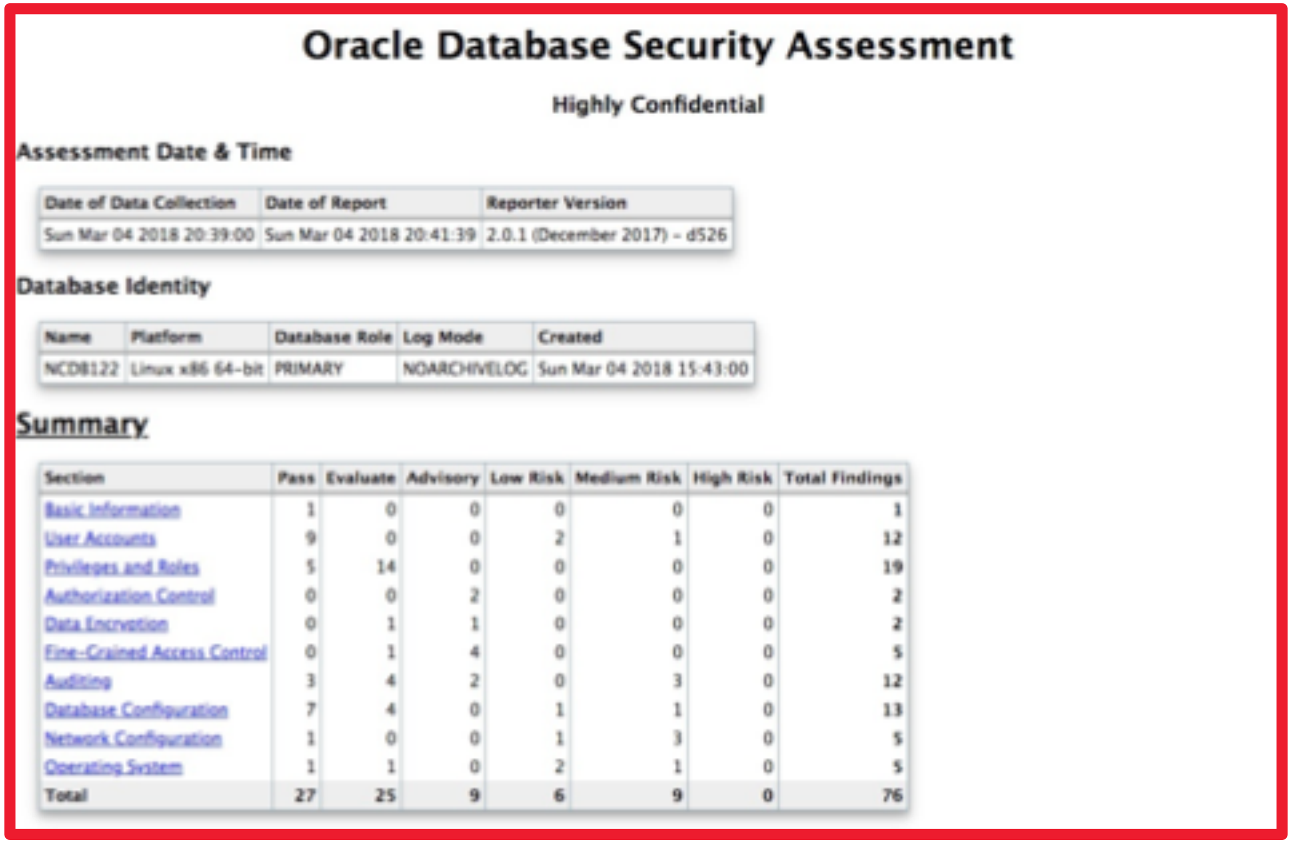
  - Result is a password protected ZIP-file

Example - Report

Oracle Database Security Assessment

Oracle Database Sensitive Data Assessment

DBSAT-Report



Oracle Database Security Assessment

Highly Confidential

Assessment Date & Time

Date of Data Collection	Date of Report	Reporter Version
Sun Mar 04 2018 20:39:00	Sun Mar 04 2018 20:41:39	2.0.1 (December 2017) - d526

Database Identity

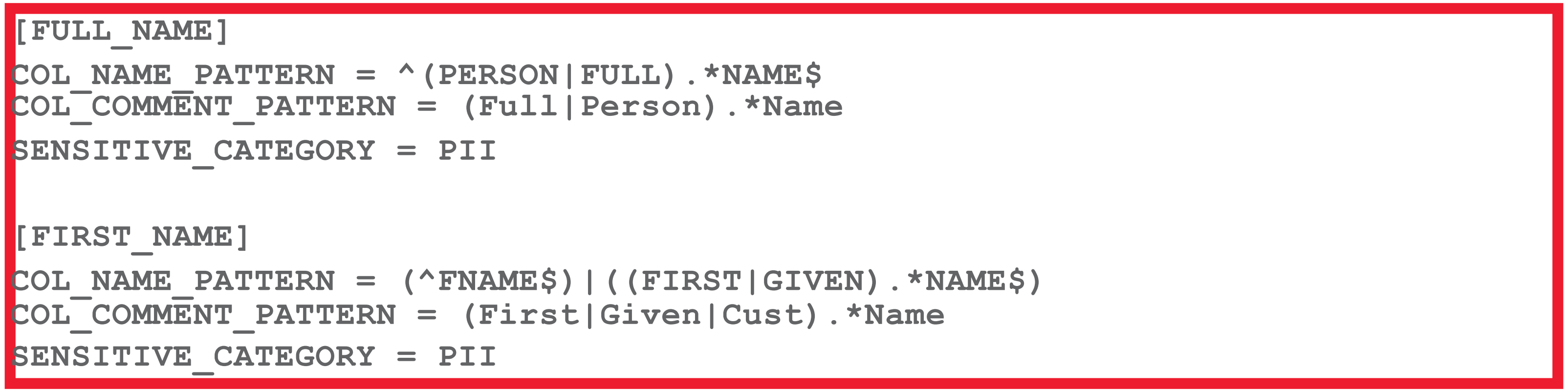
Name	Platform	Database Role	Log Mode	Created
NCDB122	Linux x86 64-bit	PRIMARY	NOARCHIVELOG	Sun Mar 04 2018 15:43:00

Summary

Section	Pass	Evaluate	Advisory	Low Risk	Medium Risk	High Risk	Total Findings
Basic Information	1	0	0	0	0	0	1
User Accounts	9	0	0	2	1	0	12
Privileges and Roles	5	14	0	0	0	0	19
Authorization Control	0	0	2	0	0	0	2
Data Encryption	0	1	1	0	0	0	2
Fine-Grained Access Control	0	1	4	0	0	0	5
Auditing	3	4	2	0	3	0	12
Database Configuration	7	4	0	1	1	0	13
Network Configuration	1	0	0	1	3	0	5
Operating System	1	1	0	2	1	0	5
Total	27	25	9	6	9	0	76

DBSAT – find sensitive data

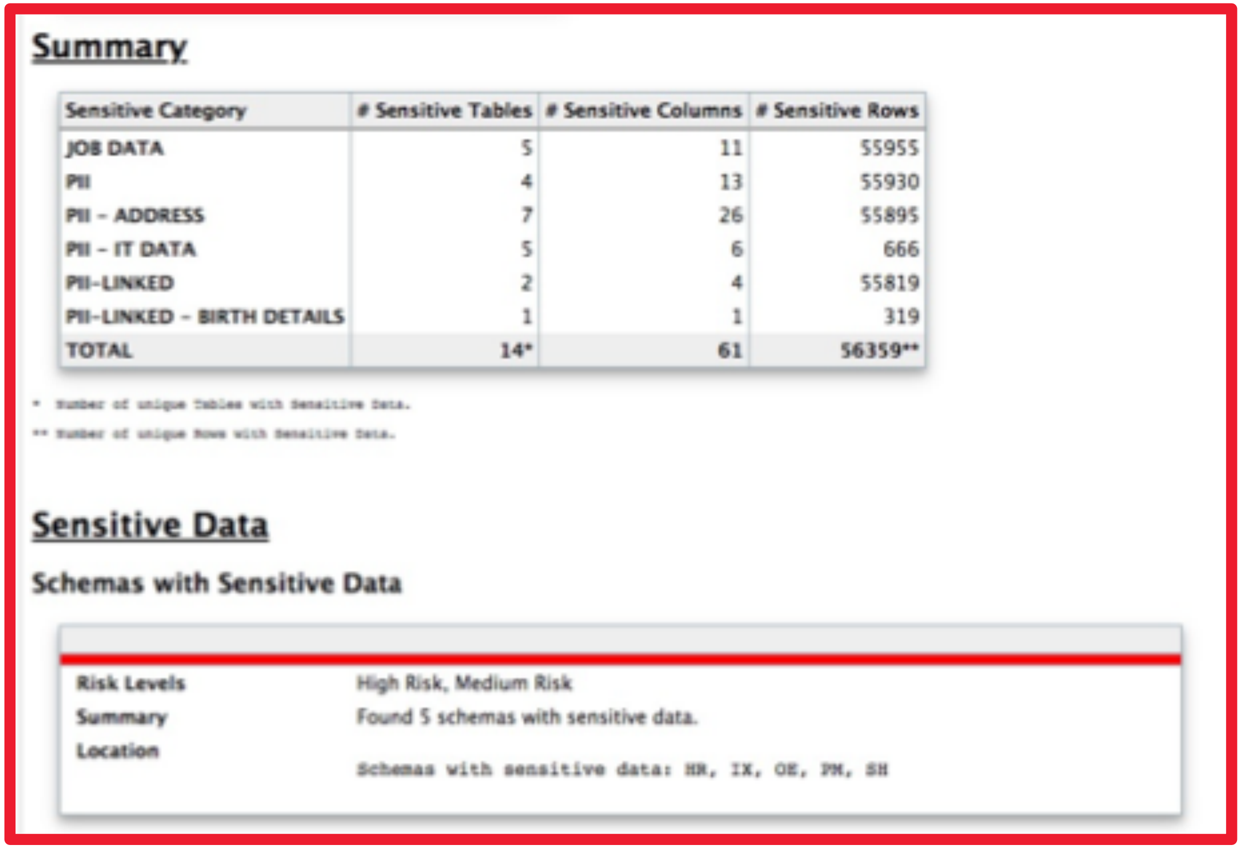
- Helpful when preparing for GDPR
- DBSAT checks the data dictionary against a list of column names
- Excerpt:



```
[FULL_NAME]
COL_NAME_PATTERN = ^(PERSON|FULL).*NAME$
COL_COMMENT_PATTERN = (Full|Person).*Name
SENSITIVE_CATEGORY = PII

[FIRST_NAME]
COL_NAME_PATTERN = (^FNAME$)|((FIRST|GIVEN).*NAME$)
COL_COMMENT_PATTERN = (First|Given|Cust).*Name
SENSITIVE_CATEGORY = PII
```

- You can create your own file with column names

DBSAT – Sensitive Data Report



Summary

Sensitive Category	# Sensitive Tables	# Sensitive Columns	# Sensitive Rows
JOB DATA	5	11	55955
PII	4	13	55930
PII – ADDRESS	7	26	55895
PII – IT DATA	5	6	666
PII-LINKED	2	4	55819
PII-LINKED – BIRTH DETAILS	1	1	319
TOTAL	14*	61	56359**

* Number of unique Tables with Sensitive Data.

** Number of unique Rows with Sensitive Data.

Sensitive Data

Schemas with Sensitive Data

Risk Levels	High Risk, Medium Risk
Summary	Found 5 schemas with sensitive data.
Location	Schemas with sensitive data: HR, IX, OE, PM, SH

Summary

Summary

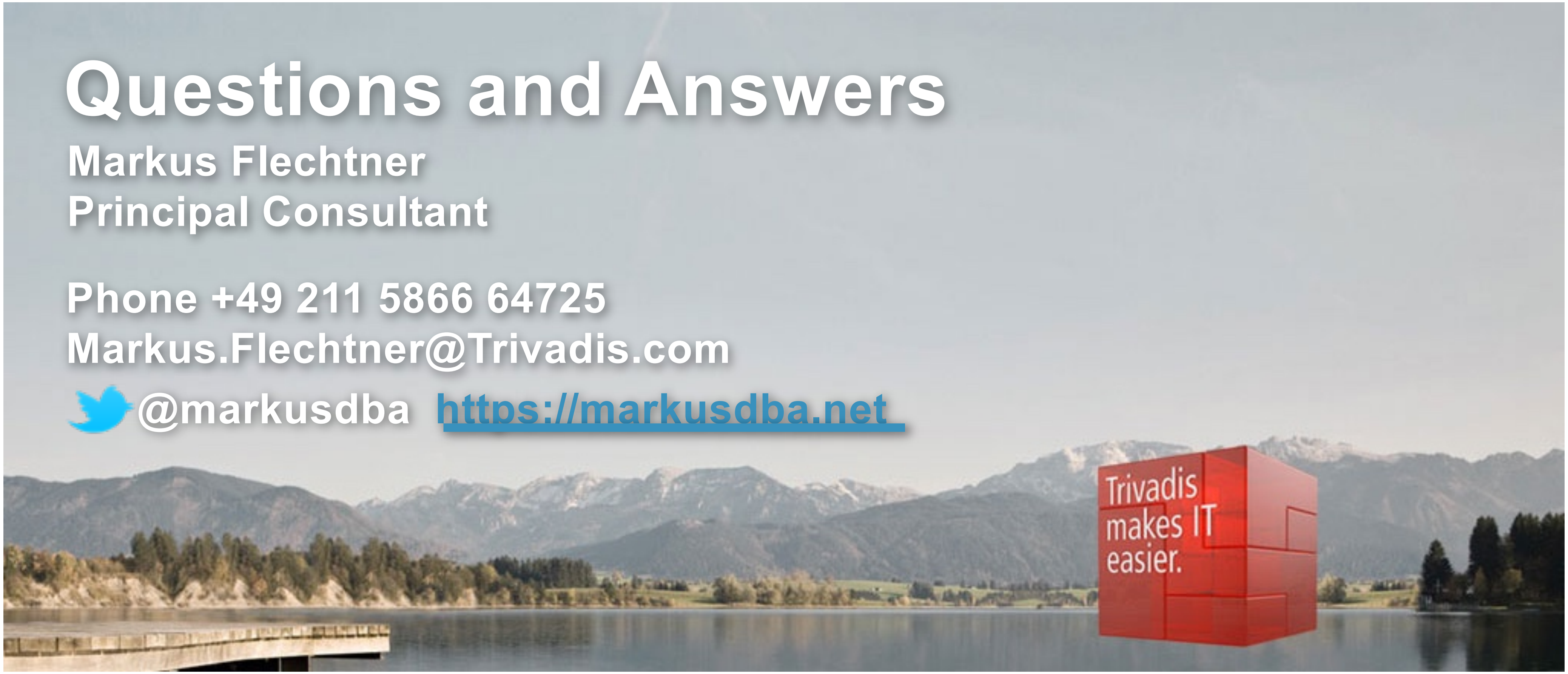
- Oracle provides a lot of tools to keep a database in a healthy state
- DBSAT is very helpful when preparing your systems for GDPR
- TFA is very helpful when dealing with Oracle support
- Unfortunately, there are multiple sources for the same tool; tracking the versions can be an issue

Further Information

MOS-Notes:

- Oracle Database Security Assessment Tool (DBSAT)(Doc ID 2138254.1)
- Security Checklist: 10 Basic Steps to Make Your Database Secure from Attacks(Doc ID 1545816.1)
- TFA Collector - TFA with Database Support Tools Bundle(Doc ID 1513912.1)
- ORAchk - Health Checks for the Oracle Stack(Doc ID 1268927.2)
- ORAchk Upgrade Readiness Assessment(Doc ID 1457357.1

Identify sensitive data with DBSAT - http://christian-gohmann.de/2018/01/26/identify-sensitive-data-with-dbsat/



Questions and Answers

Markus Flechtner
Principal Consultant

Phone +49 211 5866 64725
Markus.Flechtner@Trivadis.com
@markusdba https://markusdba.net

Download the slides from https://www.slideshare.net/markusflechtner

Please don‘t forget the session evaluation – Thank you!