2Train4 Customer: Traiana.

SLA: Oracle Database Administration
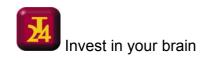
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2Train4

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1. 2Train4 Introduction

2Train4, founded in 2000, is an industry leader providing leading edge training and solutions for software development.

The company's main asset is its elite team of experts, which includes senior developers and consultants located both, in Israel and in the U.S.A. These experts specialize in Middleware, Server Side technologies, J2EE, .NET, DB technologies, Security and supporting technologies.

2. Overview

2Train4 was contracted by Traiana to provide it with an SLA (Service Level Agreement).

The following document details topics and actions that came up and should be performed within the monthly SLA time frame.

3. Work Plan

#	Topic	Topic Description
1.	Maintenance procedures	Developing a "platform" for running maintenance scripts and develop those procedures.
2.	HP-OpenView configurations	Configure the HP-OpenView to perform monitoring, notifications and maintenance.
3.	Database administration and configuration considerations	Brainstorm and discuss aspects of database administration and management such as storage considerations.
4.	Database version upgrade	Assist in planning and performing database upgrade procedure to 8.1.7.4 in the production environments.
5.	Backup procedure	Currently only logical backups (Exports) are being done. Overview methods for physical hot and cold backups.
6.	Disaster site	Determine the method to use for the disaster site: Standby DB, Veritas, etc.

4. Maintenance Procedures

4.1. Current checks

A.K.A "Sunday maintenance". Includes verification that the jobs of analyze and log deletion were run successfully, and also database and listener services restart. It also includes verifying the cluster functions properly.

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4.2. Additional required checks

4.2.1. General

Every section describe a monitor check that should be executed against the database. Per section, there is the name of the SQL script that should be executed using SQL*PLUS. Relevant wrappers scripts that connects to the databases using the write schema, were agreed to be tailored by Traiana. They also need to be maintained and edited whenever new database or host is added to the production environment.

Operating system monitors were agreed to be handled manually until the activation of HP-Openview.

4.2.2. For each machine running Oracle instance/s

4.2.2.1. Free disk space (operating system script)

Operating system monitors were agreed to be handled manually until the activation of HP-Openview.

4.2.3. For each Oracle instance

4.2.3.1. Tablespace free space

File name: ts.sql.

The script generates a report of all tablespaces in the database, with data about the tablespace size, the free space in the tablespace.

Column name	Meaning	Example
TABLESPACE_NAME	The name of the tablespace (M)	TS_DATA
TSSIZE	Total size of the tablespace (M)	100
FREE_TOTAL	Total free space in the tablespace (M)	30
FREE_LARGEST	The largest consecutive free space chunk (M)	10
PCT_FREE	The percent of the free space from the total (%)	30%

Alert: PCT_FREE under 15%.

4.2.3.2. Alert log checking (operating system script)

Operating system monitors were agreed to be handled manually until the activation of HP-Openview.

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4.2.4. For each schema holding Traiana data

4.2.4.1. Tables "Last Analyzed"

File name: last_analyzed.sql.

The script generates a report of dates of when tables were analyzed. For each date, there is the number of tables analyzed on that date.

Column name	Meaning	Example
DAY	The date of the tables' last analyze.	02-MAY-2004
COUNT(*)	Total size of the tablespace (M)	150

Alert: There are tables that were not analyzed in the passing 7 days.

4.2.4.2. Indexes that are in need of a rebuild

File name: check_index.sql.

The script generates a report of index utilization and fragmentation.

Column name	Meaning	Example
INDEX NAME	The name of the index	SYSTEM_ALERT_PK
TABLE NAME	The name of the table	SYSTEM_ALERT
#ROWS	Number of rows in the table	105
%DELETED	Percentage of the deleted index entries	97.7
HEIGHT	Height of the index's B*Tree	1
DISTINCTIVENESS	Values distinctiveness (Unique = 0)	0

Alert: An index is considered as candidate for rebuild when :

- When deleted entries represent 20% or more of the current entries
- When the index depth is more then 4 levels.(height starts counting from 1 so > 5)
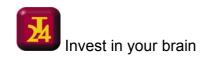
An Index is (possible) candidate for a bitmap index when :

- distinctiveness is more than 99%

4.2.4.3. Tables fragmentation including extents

File name: check_tbl_frag.sql.

The script generates a report tables space occupations and utilization.

Column name	Meaning	Example
TABLE_NAME	The name of the table	SYSTEM_ALERT
NUM_EXTENTS	Number of extents this table occupies	287

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NUM_ROWS	Number of rows in the table	105
Segment Size (k)	The size in K of the segment.	297480
Table Blocks HWM (k)	The size of occupied space in the table (High Water Mark), according to the latest analyze	296992
Net Used Space (k)	Net space used by table rows	210.41
Utilization	The percentage of the net space from the high water mark block space	0.07
Empty blocks space	Empty blocks space of the table	480
hwm/total blocks	The percentage of the HWM blocks space from the total segment space	99.84

Alert: The above is an example for a very bad case. The HWM is very high, while the net space used is very low. This is a result of deletions that left the table with very few rows, fragmented on a wide HWM space.

4.2.4.4. Migrated/Chained rows

File name: check_row_mig.sql.

The script generates a report of chained and migrated rows in tables.

Column name	Meaning	Example
TABLE_NAME	The name of the table	EMPLOYEES
NUM_ROWS	Total number of rows in the table	150
CHAIN_CNT	The number of chained/migrated rows	15
PCT_CHAINED	The percentage of migrated rows	10

Alert: There should not be any chained/migrated rows.

4.2.4.5. Disabled constraints

File name: Disabled_Constraints.sql.

The script generates a report of the disabled constraint in tables.

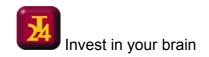| Column name	Meaning	Example
TABLE_NAME	The name of the table	EMPLOYEES
CONSTRAINT_NAME	Name of the disabled constraint	EMP_PK

Alert: There should not be any disabled constraints.

4.2.4.6. Disabled triggers

File name: Disabled_Triggers.sql.

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The script generates a report of the disabled triggers.

Column name	Meaning	Example
TABLE_NAME	The name of the table	EMPLOYEES
TRIGGER_NAME	Name of the disabled trigger	SECURE_EMPLOYEES

Alert: There should not be any disabled triggers.

4.3.   Implementation Options

Command line scripts. Located on the remote servers, or locally on Ofir's machine… Those scripts has to be manually run and their output should be manually compared to a "demo" output written in the document.

Package compiled inside the databases, under SYSTEM schema. A main procedure accepts the schema to check as a parameter, and prints out a report. In a later stage, results can be inserted into a repository for historical queries, etc.

Conclusion: Command-line scripts. Because this solution is temporary until the HP-OV is implemented, there is no use in putting time and effort in a complex solution.

5. Further work

As stated in section 3 above.