

Don't Worry be Happy!

Automate Your Environment with Ease

Noelle Stimely, University of California at Berkeley

nstimely@berkeley.edu



Who am I?

- Senior Oracle Database Administrator for 20 years**
- Past Senior Performance Test Engineer**
- Past Oracle Instructor**
- Past Lead Database Administrator**
- Oracle Certified Professional (OCP) – 8, 8i, 9i,10g**
- Hewlett Packard AIS – LoadRunner v11 Certified**

University of California - Berkeley

The **University of California, Berkeley**, (also referred to as **Berkeley**, **UC Berkeley**, and **Cal**) is a public research university located in Berkeley, California. Founded in 1868, Berkeley is the oldest of the ten research universities affiliated with the University of California system, and is often cited as the top public university in the United States and around the world

Berkeley faculty, alumni, and researchers have won 92 Nobel prizes (including 32 Nobel laureates), 9 Wolf prizes, 13 Field medals (including 3 alumni medalists) 22 Turing Awards (including 11 alumni awardees), 45 MacArthur Fellowships, 20 Academy Awards, 14 Pulitzer Prizes and 117 Olympic gold medals (51 silver and 39 bronze).

Students – 38,204 (Fall 2015)

Undergraduates – 27,496 (Fall 2015)

Postgraduates – 10,708 (Fall 2015)



Why Automate?

“ ☒ *Saves Time*

☒ *Limits errors which may occur from manually running*

☒ *Manage the environment instead of it managing you*

“

⊠ *Planning for future issues*

⊠ *Standardization*

⊠ *Reduces downtime*

⊠ *Work smarter*



What to Automate

- Performance Monitoring**
- Establish a baseline – What is normal?**
- What aspects of system to monitor?**
- How to monitor?**
- Scripts/crontab/OEM**
- Frequency**

Database Backups





BACKUPS

- Backups**
- What type of backups need to be performed?**
 - ☒ Full/incremental/exports/hot/cold
- RMAN backup scripting**
- Automating backups with ease**
 - ☒ Third-party tool
 - ☒ Cron/scheduler
- How does it all fit together**



AUTOMATING RESTORES

- Making restoring backups a “no-brainer”**
- What needs to be restored?**
 - Database**
 - Tables**
 - Schema(s)**
 - Other database structures (controlfiles/logs/tablespaces, etc)**
- Script automatic restores to test backups**
- How to plan for the unthinkable**



DATABASE REFRESHES

- When do refreshes need to be performed?**
- Application testing/development
- Database patching/upgrades
- Types of refreshes**
- Database
- Schema
- Table



PERFORMING THE REFRESH

- How to perform refreshes**
- 3rd Party tool
- Script

A person with short dark hair, wearing a grey and black striped sweater, is seen from behind, looking at a wall covered in various design sketches, photos, and documents. The wall is filled with creative work, including wireframes, hand-drawn diagrams, and photographs of people and objects. A large white arrow points from the top left towards the center of the image. The text "Environmental Considerations" is overlaid in the center in a bold, white, sans-serif font.

Environmental Considerations



ENVIRONMENT

What type of environment?

Linux/Unix

- Bourne/Korn Shell
- Crontab
- Global variables

Profile

Windows

- Powershell
- Bat Files
- Windows Scheduler



PREPARING ENVIRONMENT FOR AUTOMATION

- Accounts to be used (Oracle/Service account/individual)**
- Security consideration**
- Global environment/account settings**
- Alias configuration**
- How large is the environment?**



PREPARING FOR AUTOMATION CONT'D

- Number of databases**
- Number of servers/network**
- Notification**
- Sendmail**
- Outlook**



NOTIFICATIONS

- Decide on space notification percentage**
- Beware of too many notifications and levels of notification**
- Know pattern of usage/growth**
- Who/when to notify**
- What level to send notification**



DISK SPACE MONITORING

- Windows Disk Space Monitoring**
- Powershell**
- Nagios**
- Linux/Unix Disk Space Monitoring**
- Is ASM being used?**
- How to create a script to monitor disk space**
- Scheduling cron jobs**
- Creating “fix-it” tickets via script**

Disk Space Monitoring
Using Shell Script





ORACLE HOUSEKEEPING ACTIVITIES

- Checking Oracle alert log for errors**
- Other error checks**
- Remediating errors**
- Process**
- Rotating logs**
- Audit logs**
- Listener log, etc.**



ORACLE HOUSEKEEPING ACTIVITIES

- Keeping your System Administrator Happy**
- Check/remove core dumps**
- Remove old install files**
- Remove old, unneeded exports/backups**
- Monitor/remove old archives**



ORACLE HOUSEKEEPING ACTIVITIES

- Monitoring for Errors/Issues**
- Which errors?**
- What level for notification?**
- Automated fixing/ticket creation**



How to script refreshes in one line or less in Linux/Unix

- Type of Refresh Needed**
- Copy Schema**
- How does the environment need to be configured to conduct refresh?**
- Global variables**
- Copy Table(s)**
- Refresh Database**



HOW TO SCRIPT REFRESHES IN ONE LINE OR LESS IN LINUX/UNIX

Create shell script needed for refresh

What to refresh

Schema

Table

Database

How to do it?

Many ways to accomplish

Shell Script

Tool



HOW TO SCRIPT REFRESHES IN ONE LINE OR LESS IN LINUX/UNIX

Elements of Shell Script

Data Pump
ExpDP
ImpDP
Shell script
How it works

Global/Local Profile to set environment

Variables

edp.sh – Exports database using Data Pump

idp.sh – Imports database using Data Pump



HOW TO SCRIPT REFRESHES IN ONE LINE OR LESS IN LINUX/UNIX

Type of Refresh Needed
Copy Schema

- How does the environment need to be configured to conduct refresh?**
- Crontab**
- Global variables**
- Profile**



HOW TO SCRIPT REFRESHES IN ONE LINE OR LESS IN WINDOWS

Windows

- PowerShell**
- Bat Files**
- Windows Scheduler**



REFRESH SCHEMA

Process

Script will execute the following steps to refresh a schema:

- If the target is a production instance, assert that the schema(s) are empty, otherwise abort.**
- Check source schema(s) for any LONG or LONG RAW columns. If present, abort. LONGs cannot be queried over db link.**
- Scrub the schemas, excluding tables in exclusion file**



REFRESH SCHEMA

- Creating the schema user itself**
- Role and system grants to the user**
- Private database links (Scrub also excludes database links since it uses all_objects as driver)**
- EXCEPTION: user will be created if doing a single schema import and user does not exist. In that case, the system and role grants to the user will be executed. The user will have the same password as the source.**
- Compile invalid objects in target schema(s)**
- Call cronsql.sh to process a post-refresh sql script**



SCRIPT USAGE

Refresh target with copy of schemas from source

```
$ $HOME/dp_refresh_schema.sh targetdb sourcedb schema1[,schema2,schemaN]
```

Refresh with remapping of schemas

```
$ $HOME/dp_refresh_schema.sh targetdb sourcedb schema1,schema2:schema3  
-- will import schema1 as itself, schema2 into schema3
```

Refresh with exclusions

Create a exclusions file in `$HOME/oracle/etc` named `refresh_<targetdb>_<schema>_exclusions.lst`. The file should contain each table to be excluded on a separate line. If you also specify the `"-a <app>"` option, the exclusions file must be located in `$HOME/oracle/<app>/etc`.



DUPLICATE/CLONE DATABASE

- Rman duplicate database**
- Preparation for cloning**
- Check file system space for backup of source that will be copied**
- Source database must be in archive log mode or there must be a cold backup available**
- Scripts to use for cloning activity**
- Create functions in database for reusability**
- How functions work together for success**
- Creating a new database on server from backup**



DUPLICATE/CLONE DATABASE

- What to check?**
- How to prepare**
- Issuing the one-line command**
- What is the source? What is the target?**
- Does the database need to be recovered to a specific time?**
- Can I restart if there are errors?**
- Where to check for errors**



DEMO



THANKS!

Any questions?

You can find me at
@eastbay_oracle
nstimely@berkeley.edu