CERN

Effective Oracle Home Management with the New Release Model

Ludovico Caldara
Computing Engineer
IT Department, CERN
ludovico.caldara@cern.ch
@ludodba

Flora Barriele
Database Engineer
DSI, Etat de Vaud
flora.barriele@vd.ch
@floo_bar

About Ludovico Caldara

- 18+ Years DBA (Not Only Oracle)
- ITOUG co-founder
- OCP (11g, 12c, MySQL) & OCE
- Italian living in Switzerland

http://www.ludovicocaldara.net

@ludodba

ludovicocaldara

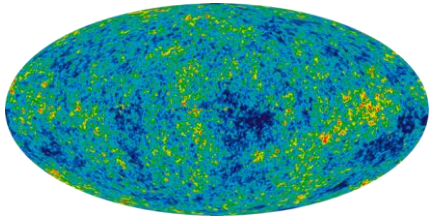
ORACLE ACE Director

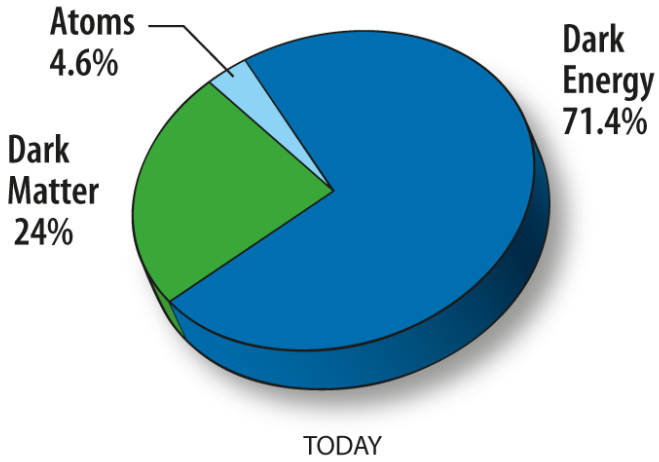
CERN

- CERN - European Laboratory for Particle Physics
- Founded in 1954 by 12 Countries for fundamental physics research in the post-war Europe
- Today 22 member states and world-wide collaborations
  - About ~1100 MCHF yearly budget
  - 2’300 CERN personnel
  - 10’000 users from 110 countries

Fundamental Research

- What is 95% of the Universe made of?
- Why do particles have mass?
- Why is there no antimatter left in the Universe?
- What was the Universe like, just after the "Big Bang"?





The Large Hadron Collider (LHC)

Largest machine in the world

27km, 6000+ superconducting magnets

Fastest racetrack on Earth

Protons circulate 11245 times/s (99.9999991% the speed of light)

Emptiest place in the solar system

High vacuum inside the magnets

Hottest spot in the galaxy

During Lead ion collisions create temperatures 100 000x hotter than the heart of the sun

“Patch soon, patch often” vs reality

Frequent patching?

- Patching is time consuming
- It is complex
- It introduces some risks
- It is not always really necessary
- It leads to human errors

How many bugs could you encounter?

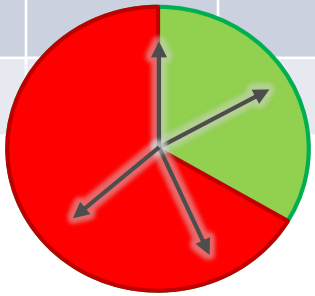
```
$ opatch lspatches
27923320;Database PSU 12.1.0.2.180717, Oracle JavaVM Component (JUL2018)
22243983;
27762253;OCW PATCH SET UPDATE 12.1.0.2.180717 (27762253)
27547374;Database Bundle Patch : 12.1.0.2.180717 (27547374)
OPatch succeeded.

$ cd $ORACLE_HOME/inventory
$ grep -r "bug description" * |  wc -l
2132
$ grep -r "bug description" * | grep -i "wrong result" | wc -l
66
```

Quick overview of the New Release Model

What does it change?

	Jan 18	Apr	Jul	Oct	Jan 19	Apr	Jul	Oct
RU	18.1.0	18.2.0	18.3.0	18.4.0	18.5.0	18.6.0	18.7.0	18.8.0
RUR1			18.2.1	18.3.1	18.4.1	18.5.1	18.6.1	18.7.1
RUR2				18.2.2	18.3.2	18.4.2	18.5.2	18.6.2
RU					19.1.0	19.2.0	19.3.0	19.4.0
RUR1							19.2.1	19.3.1
RUR2								19.2.2

2



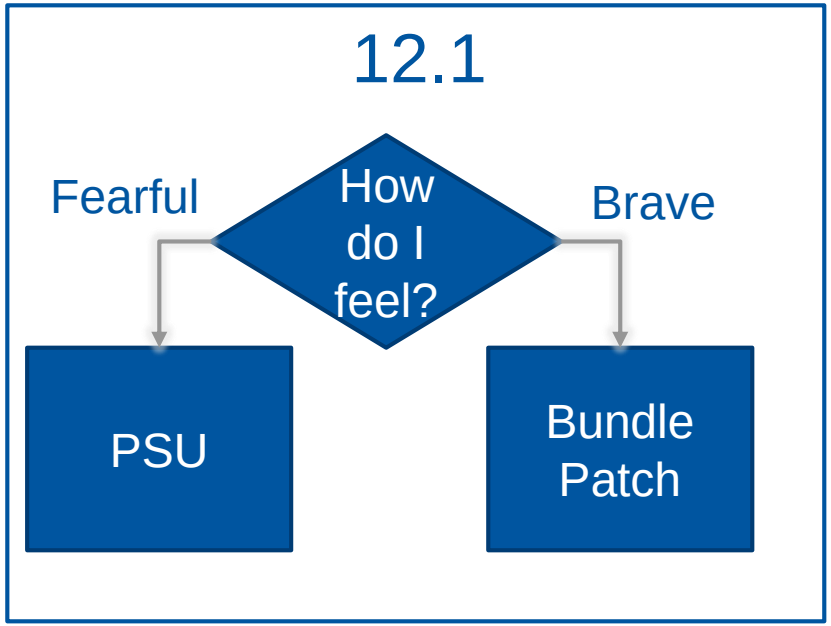
What does it change?

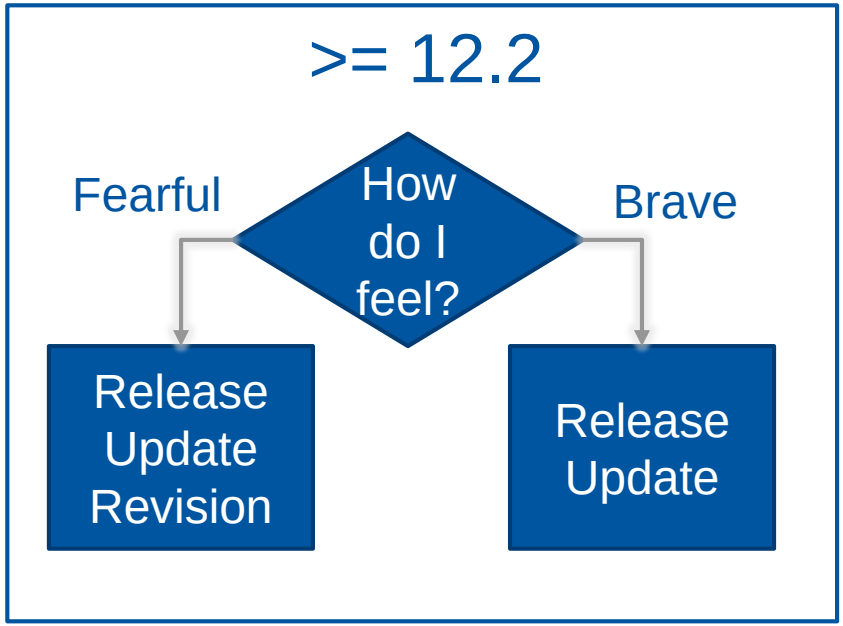
Short Development cycle

Frequent Upgrades And Updates

Which patches should I apply?

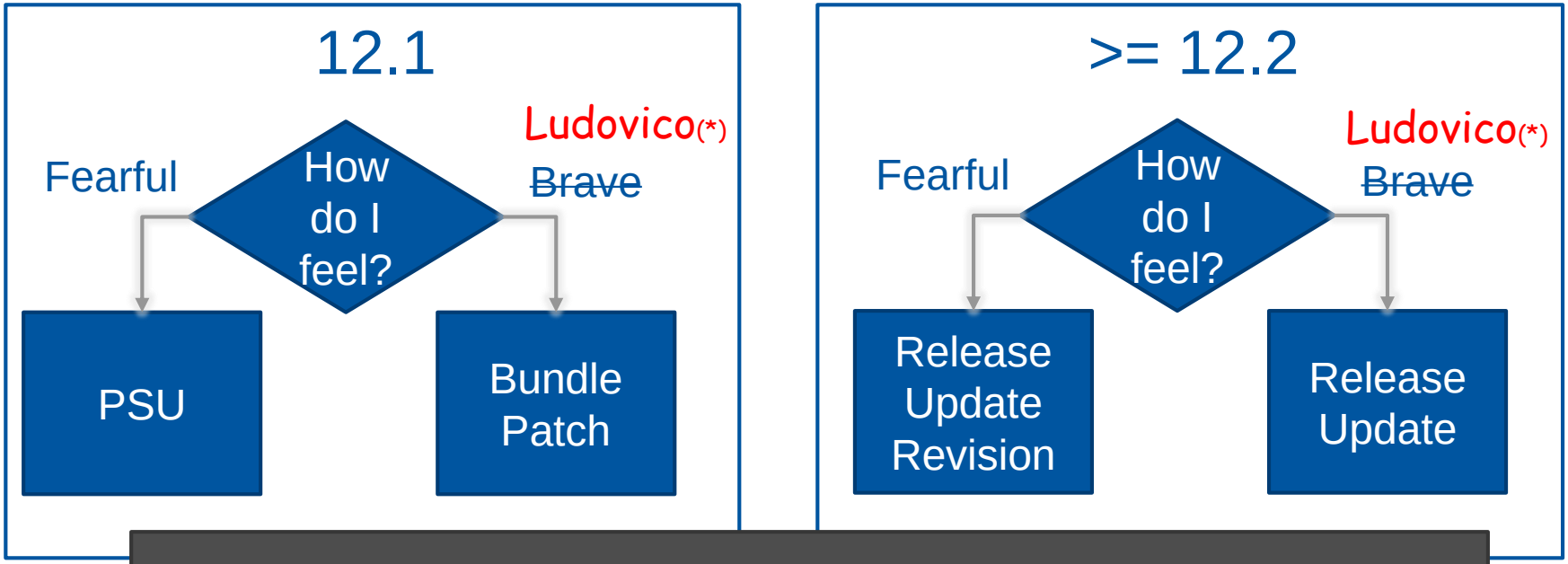
Brave vs Fearful





(*) yes, it's Comic Sans

Brave vs Fearful



https://mikedietrichde.com/2017/10/24/differences-psu-bp-ru-rur/

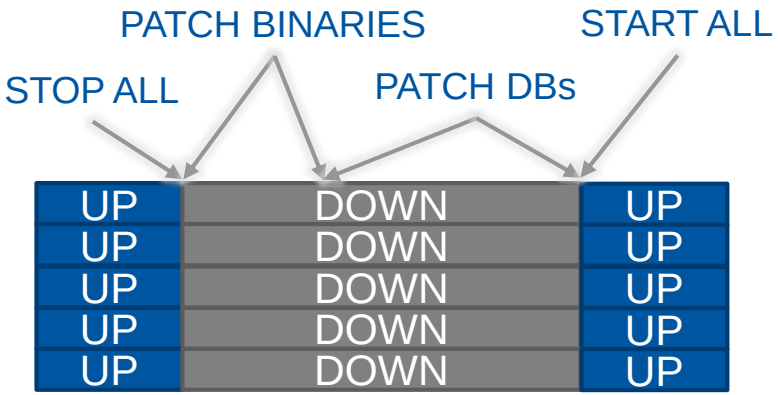
Common patching patterns

Common worst practices in maintaining homes

- Installing software by hand
- Different patch levels for Oracle Homes with the same path
- Not tracking the installed patches
- Oracle Home paths hard-coded in the operational scripts
- Not minding about naming conventions

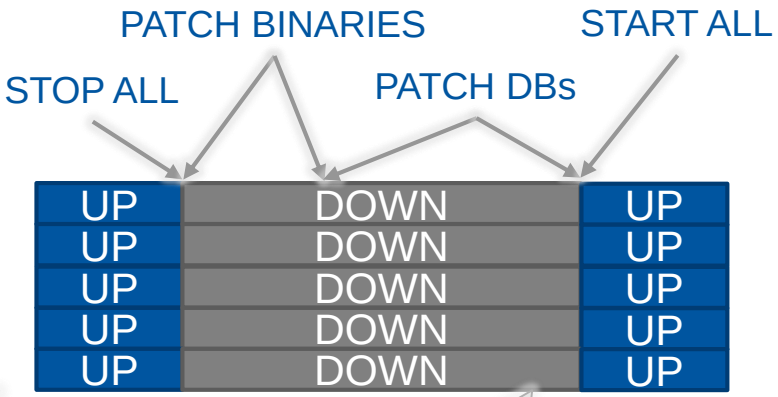
Worst approach (big bang)

1. Stop everything
2. In-place binaries patching
3. Database patching, all at once
4. Start everything



Worst approach (big bang)

1. Stop everything
2. In-place binaries patching
3. Database patching, all at once
4. Start everything



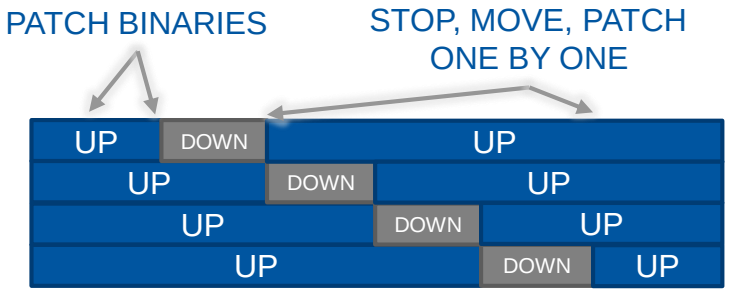
No easy rollback

Long downtime

Complex planning

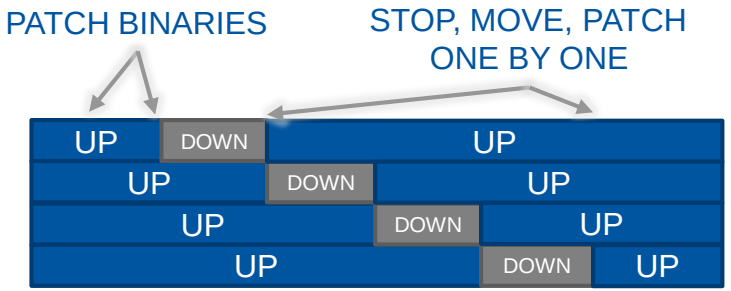
Different approach (still bad)

1. Install new binaries manually
2. Patch the new binaries
3. Stop, change OH, patch databases one by one
4. Decommission old binaries



Different approach (still bad)

1. Install new binaries manually
2. Patch the new binaries
3. Stop, change OH, patch databases one by one
4. Decommission old binaries

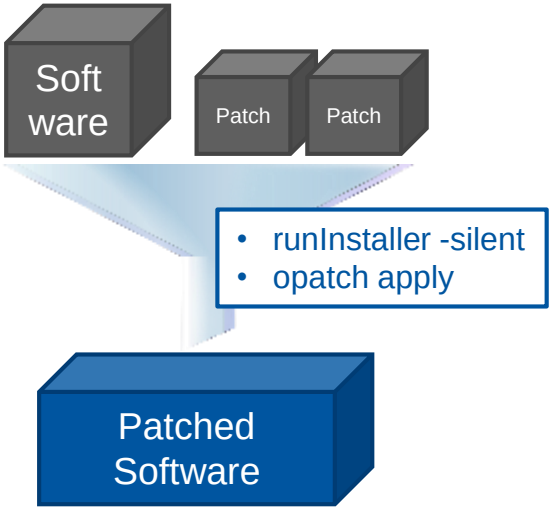


Complex to do manually

Repetitive task when many servers

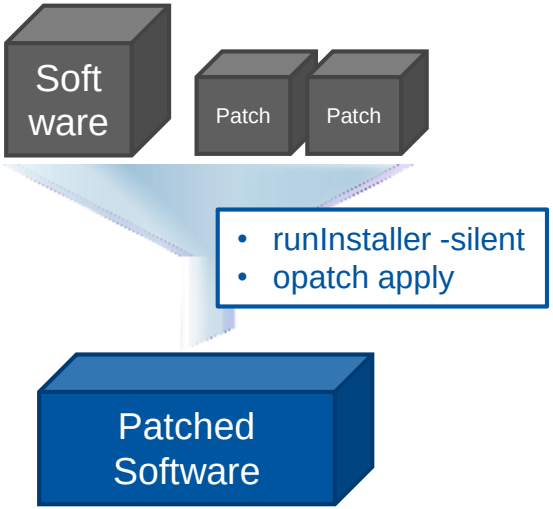
Automate the installation!

- Automated creation

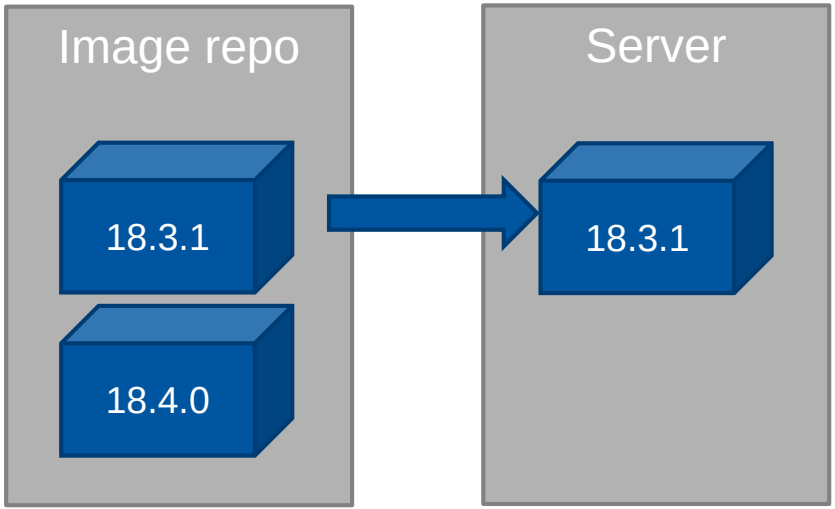


Automate the installation!

- Automated creation

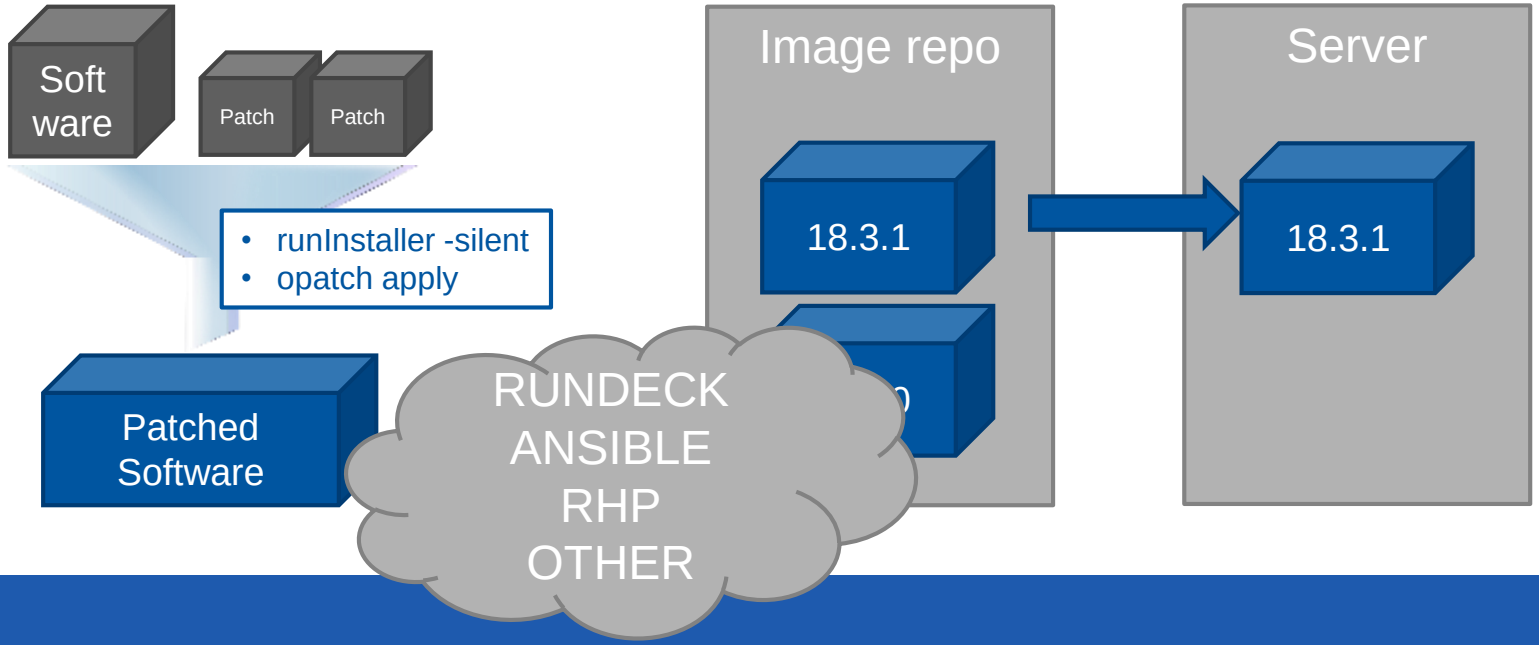


- Software cloning



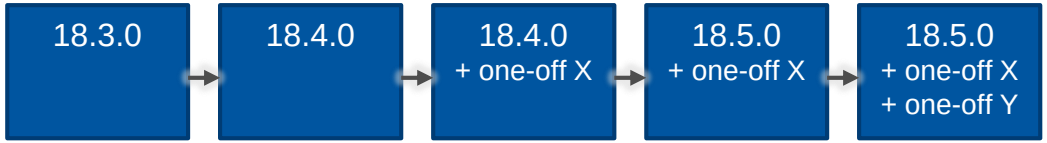
Automate the installation!

- Automated creation
- Software cloning

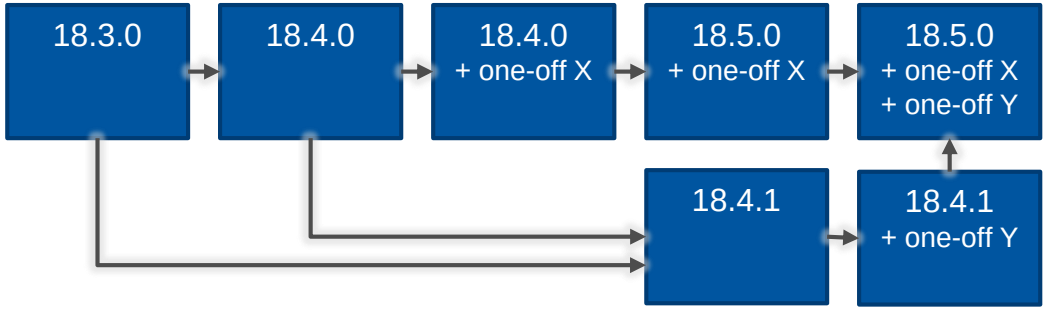


Less paths

GOOD:



BAD:



Workarounds vs one-offs

- Sometimes through underscore parameters
- Mitigate the number of one-offs
- Less merge requests

- Document it! (why, when, who)

```
alter system set "_px_groupby_pushdown"=off
  comment='Ludo, 03.05.16: W/A for bug 18499088'
scope=both sid='*';
```

Rapid Home provisioning

- It might be the perfect product…

- Requires Lifecycle Management Pack
- The technology stack is complex
  (Clusterware, ASM, ACFS, NFS, GNS…)

Custom approach

- Simple script
- Golden images
- Solid naming conventions
- I blogged about it!
  http://www.ludovicocaldara.net/dba/oh-mgmt-[1..7]/

Implementation at Etat de Vaud

Flora Barriele

About Flora Barriele

- 8 years in IT, 3 years DBA
- French living in Switzerland

@floo_bar

http://floobar0.wordpress.com

Geek Girls Carrots

co-organizer in Geneva

Naming Conventions

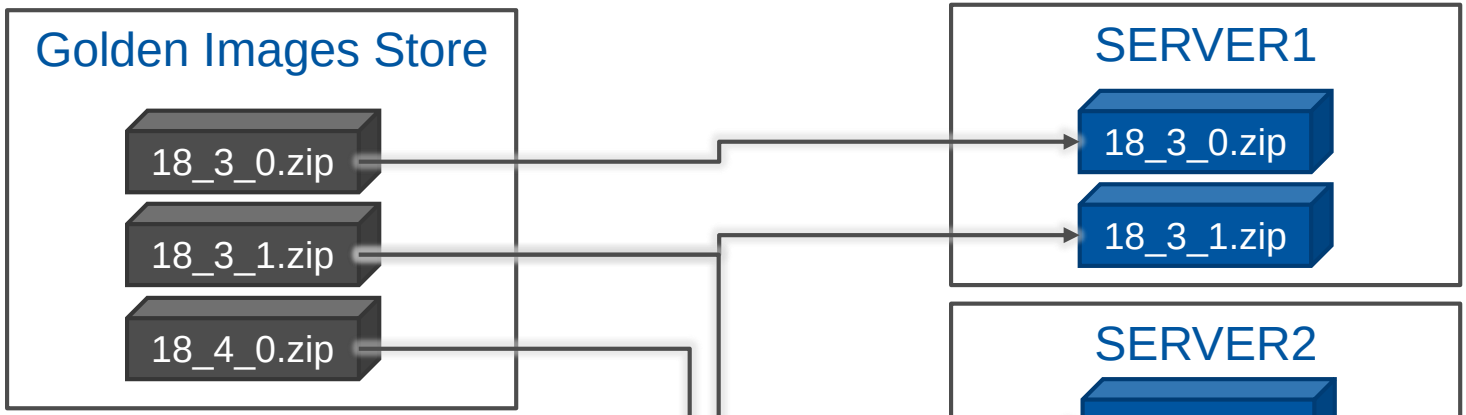
- Central Inventory contains OH name
- OH name matches OH location
- No dots (.) allowed (inventory limitation)

Central Inventory

```
<HOME NAME="18_3_0"
LOC="/u01/app/oracle/product/18_3_0"
TYPE="O" IDX="2">
```

- 1 to 1 mapping: easy to code
- 18c read-only OH uses the name as subdir in `orabasehome`: consistent naming!

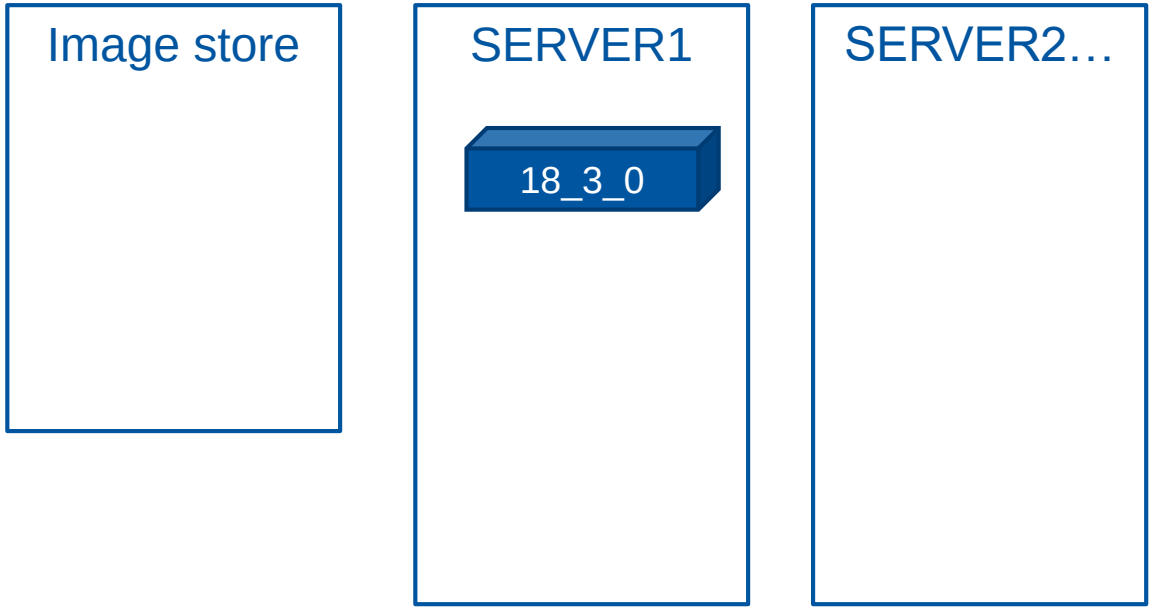
Golden images



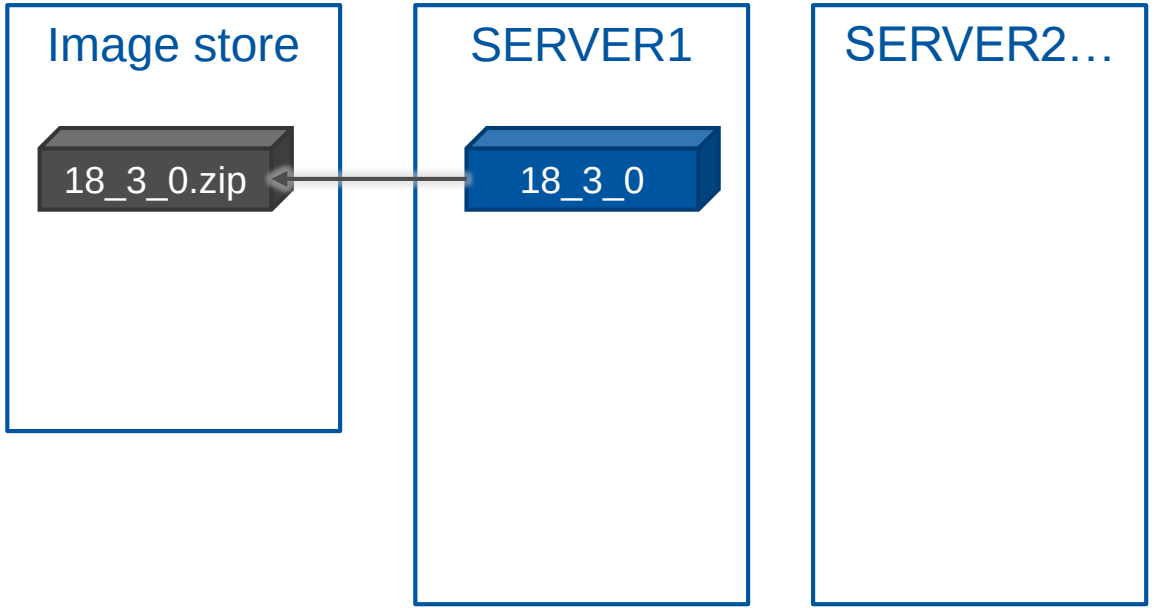
Golden Image Metadata

Name	Path
18_3_0	/store/18_3_0.zip
18_3_1	/store/18_3_1.zip
18_4_0	/store/18_4_0.zip

Typical workflow

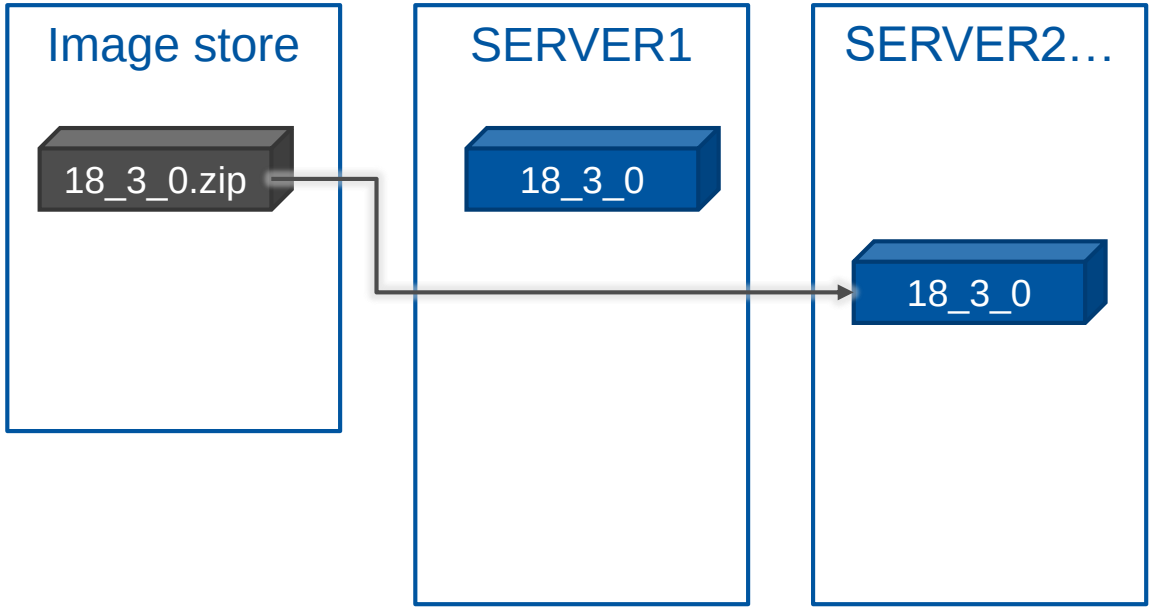


Typical workflow



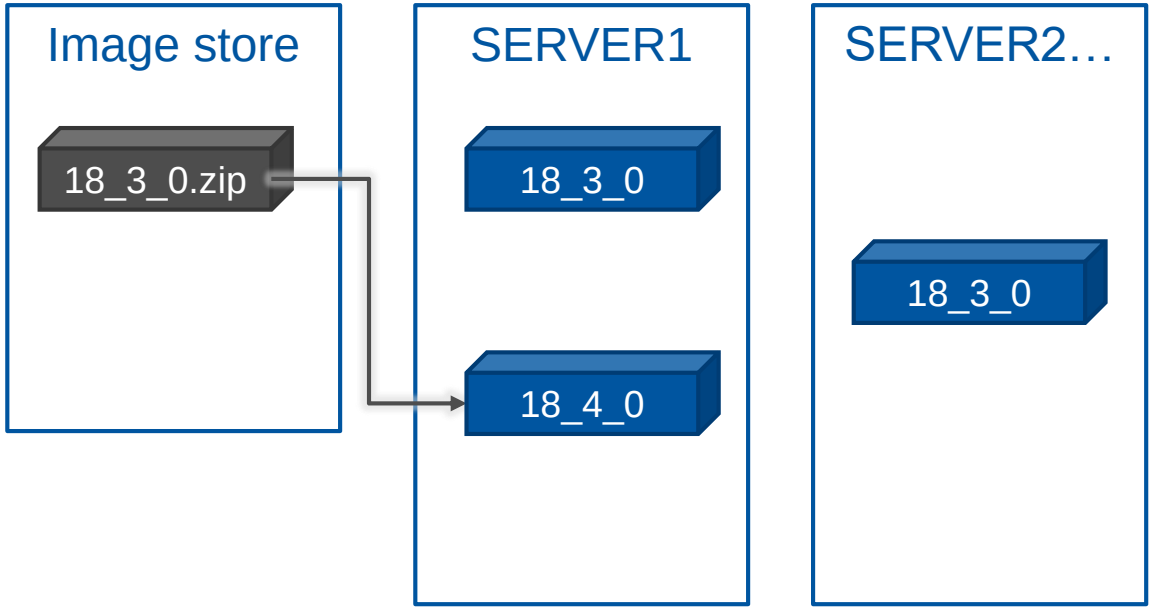
$ ohctl -c -n 18_3_0

Typical workflow



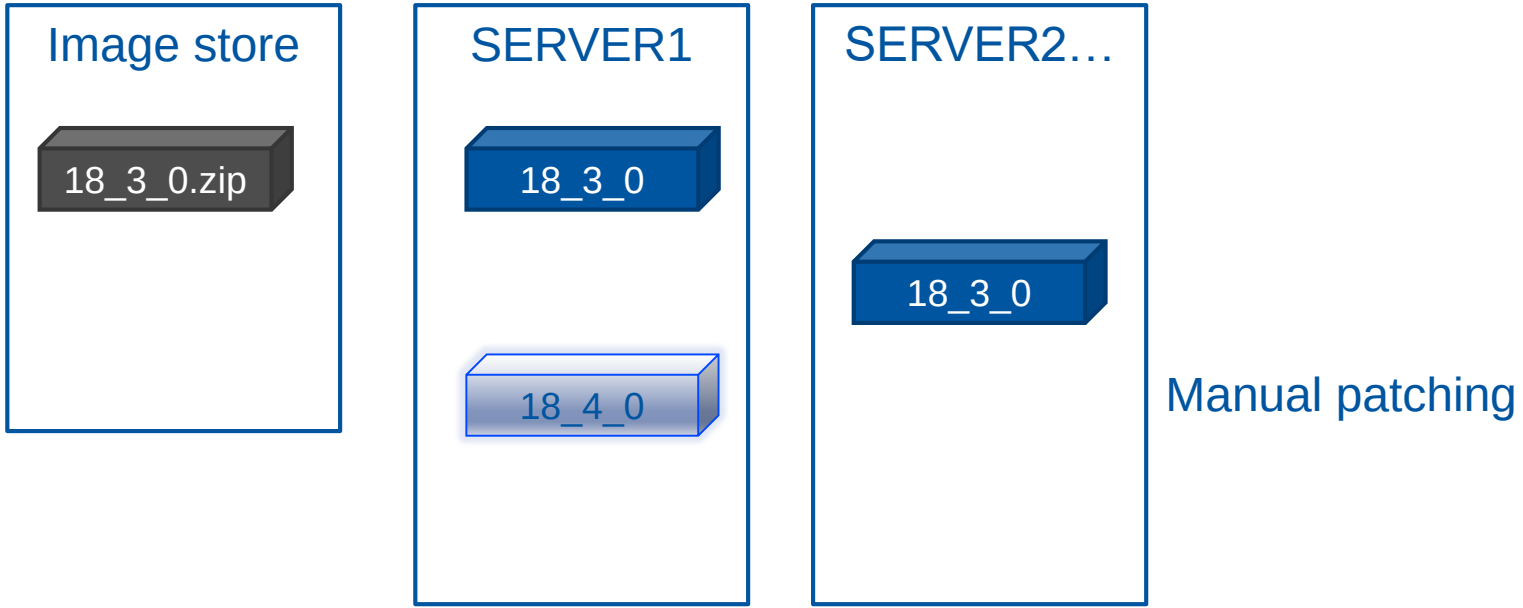
$ ohctl -i 18_3_0

Typical workflow

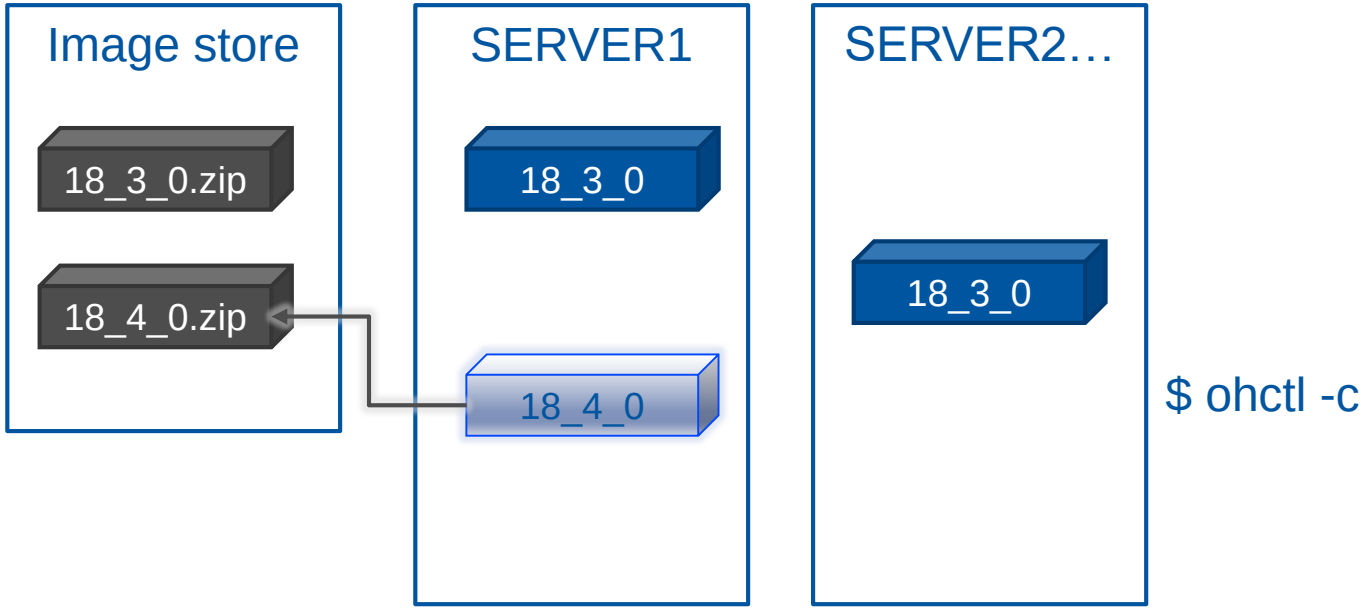


$ ohctl -i 18_3_0 -n 18_4_0

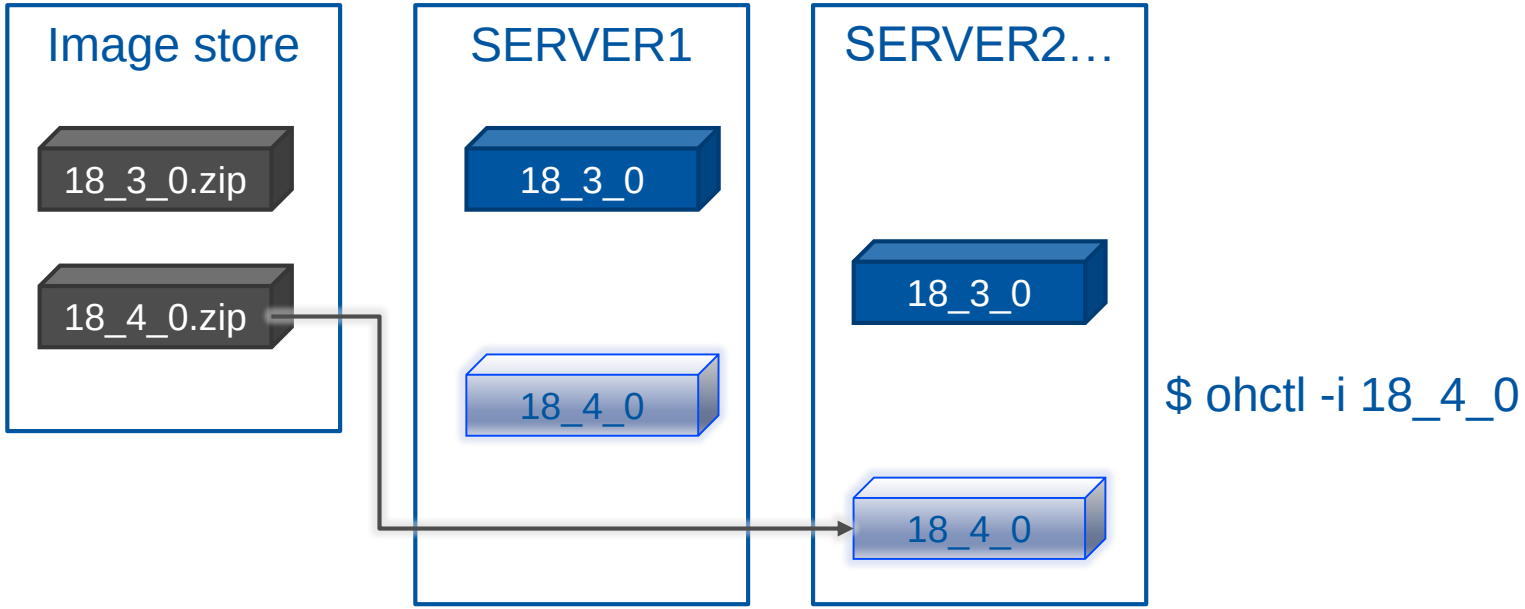
Typical workflow



Typical workflow



Typical workflow



What it actually does

Creation workflow

- Copy the Home
- Clean it up
- Create the zip
- Store the zip in the repo
- Store metadata

Installation workflow

- Security checks
- Create new path
- Unzip from the store
- Attach home
- Relink (opt. with RAC)
- Run setasmgid
- Other stuff (e.g. TNS)

DEMO
JLG LIFTLUX 153-12

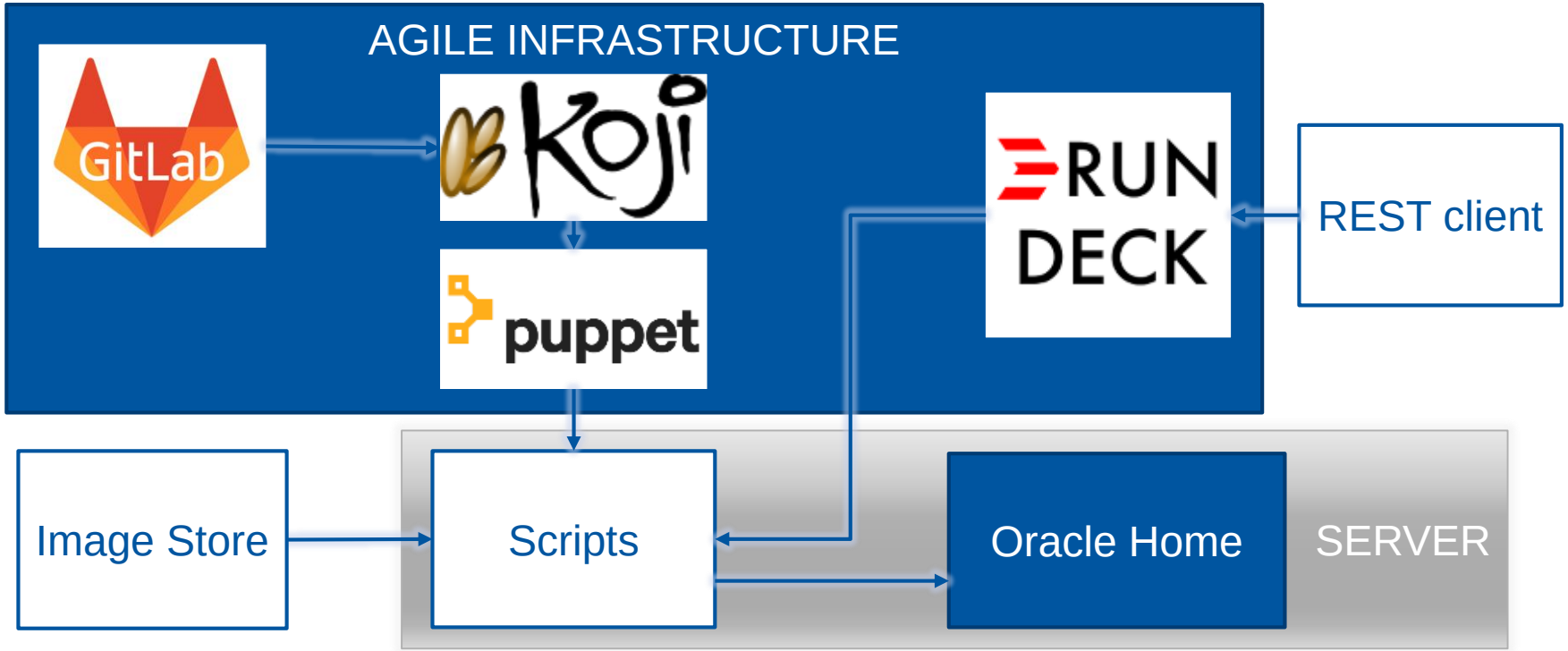
Further development at CERN

Ludovico Caldara

Read-only Oracle Home

```
$ roohctl -enable
Enabling Read-Only Oracle home.
Update orabasetab file to enable Read-Only Oracle home.
Orabasetab file has been updated successfully.
Create bootstrap directories for Read-Only Oracle home.
Bootstrap directories have been created successfully.
Bootstrap files have been processed successfully.
Read-Only Oracle home has been enabled successfully.
Check the log file /u01/app/oracle/cfgtoollogs/roohctl/roohctl-
180822AM102911.log.
```

Insertion in the Agile Infrastructure



Grid Infrastructure Installation

- Puppet + Rundeck for automatic GI install
- To be implemented:
  - Patched Grid Infrastructure versions beside the first one

    https://www.markusdba.net/?p=294
  - Automatic patching with 18c independent local-mode automaton

```
$ rhpctl move gihome –sourcehome Oracle_home_path -destinationhome Oracle_home_path
```

Back to the demo…

Flora Barriele

Questions?

Thank you!

Ludovico Caldara
Computing Engineer
IT Department, CERN
ludovico.caldara@cern.ch
@ludodba

Flora Barriele
Database Engineer
DSI, Etat de Vaud
flora.barriele@vd.ch
@floo_bar