



ORACLE

Patch Me If You Can Grid Infrastructure Edition


UKOUG 2023





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 dohdatabase

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 <https://dohdatabase.com>

Episode 1

Release and Patching Strategy

105 minutes – Feb 4, 2021



Episode 2

AutoUpgrade to Oracle Database 19c

115 minutes – Feb 20, 2021



Episode 3

Performance Stability, Tips and Tricks and Underscores

120 minutes – Mar 4, 2021



Episode 4

Migration to Oracle Multitenant

120 minutes – Mar 16, 2021



Episode 5

Migration Strategies – Insights, Tips and Secrets

120 minutes – Mar 25, 2021



Episode 6

Move to the Cloud – Not only for techies

115 minutes – Apr 8, 2021




Recorded Web Seminars

<https://MikeDietrichDE.com/videos>

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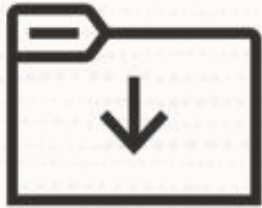




A young boy with a joyful expression, wearing a purple cap and a blue and white plaid shirt, is sitting on a wooden bench. He is holding an open book on his lap and laughing heartily. The background is a bright, blurred outdoor setting, possibly a park or a playground, with sunlight filtering through the trees.

My database is
not facing the internet

What Do I Need to Apply?



You always start with the base release

- Oracle Grid Infrastructure 19.3.0

Most Recent Release Update

Use the Patch Download Assistant [MOS Note: 2118136.2](#)

★ **Assistant: Download Reference for Oracle Database/GI Update, Revision, PSU, SPU(CPU), Bundle Patches, Patchsets and Base Releases (Doc ID 2118136.2)** To Bottom

Visibility: EXTERNAL (98)

Selection(s)

What would you like to download?

- Oracle Database Base Releases
- Oracle Database Patchsets
- Oracle Database Release Updates (RUs)**
- Oracle Database Release Update Revisions (RURs - discontinued since Apr 2023)
- Oracle Database PSU, SPU(CPU), Bundle Patches (Versions 12.1 & lower)
- OJVM Update/PSU/Bundle Patches
- Latest Available Microsoft Windows Patches
- Monthly Recommended Patches (MRPs)

Solution(s)

Possible Solutions will appear once you make your selection.

Most Important Patches

Oracle Database 19c Important Recommended One-off Patches (Doc ID [555.1](#))

Recommended Patches for 19.21 GI Home

Below is the list of important patches to consider applying on top of 19.21. In addition to the relevant patches listed below, you should also review patches in [Database PSU/BP/Update/Revision - Known Issues Primary Note\(Doc ID 1227443.1\)](#) and [Oracle Database Patches to Consider for 19c \(Doc ID 2781612.2\)](#) which contains patches to consider for specific areas such as Data Pump, Golden gate etc.

Only one OCW (Oracle Clusterware) patch should be applied to GI homes. Ensure you apply the patch starting with X8M if you are on an X8M system

Bug	Fixed in RU	Fixed in MRP	Description	Patches	NON ROLLING	Added
35739076		Not Applicable	[VOS] Linux: ORA-800 / Set Priority / DB Performance Merge Patch for 19.21 (Requires Root Access) - 34286265 34318125	[list-patches]		20-OCT-2023

Version GI 19.21_555.1: 35739076



If you don't apply a recent Release Update,
you will miss hundreds of fixes

Together or separately

... that's the question

Patching Oracle Grid Infrastructure and Oracle Database

Patching GI and DB together?

Option 1

TOGETHER

One maintenance window

Longer, single patching window

Several changes

When draining is a problem

Option 2

SEPARATELY

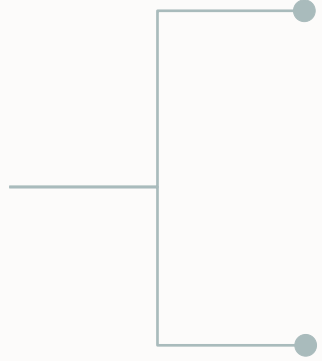
Two maintenance windows

Shorter window, but longer overall patching

One change at a time

For well-behaving applications

Grid Infrastructure Patching Methods



1

In-place

Replaces existing Oracle Home
Uses opatchauto

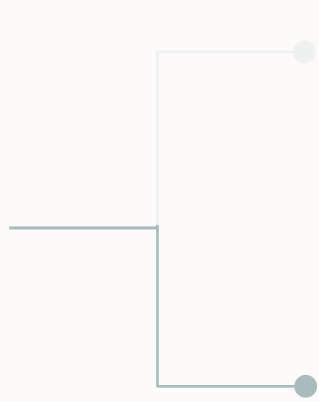
2

Out-of-place

Creates a new Oracle Home
Uses opatchauto or gridSetup



Grid Infrastructure Patching Methods



1

In-place

Replaces existing Oracle Home

Uses opatchauto

2

Out-of-place

Creates a new Oracle Home

Uses opatchauto or gridSetup



Tim Hall ∞ 🤖 +∞ 📄
@oraclebase



When patching your production Oracle GI/DB installations, which method do you use?

In-Place = Current ORACLE_HOME
Out-Of-Place = New ORACLE_HOME

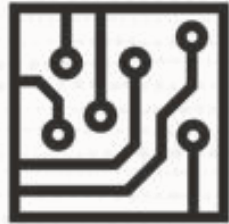
If you don't look after have production kit, then don't answer.





Use Out-Of-Place Patching

- Minimize downtime
- Minimize risk during outage
- Easier rollback



Use golden images

- [Blog post](#)

--Unzip base release and update OPatch

```
unzip -oq LINUX.X64_193000_db_home.zip
```

```
mv OPatch OPatch_old
```

```
unzip p6880880...zip
```

--Install the Oracle Home and apply Release Update and one-offs
--Specify multiple one-offs using comma-separated list

```
./gridSetup.sh -silent -applyRU <patch_dir> \  
-applyOneOffs <patch_dir> \  
...
```

```
--Always create your golden image from a "fresh" home  
--Never use a production home
```

```
./gridSetup.sh -createGoldImage \  
               -destinationLocation $GOLDIMAGEDIR \  
               -silent
```

--Deploy golden image throughout your environment
--Just unzip and attach on node 1, installer copies to other nodes

```
unzip -oq my_golden_image.zip  
./gridSetup.sh -silent \  
    oracle.install.db.CLUSTER_NODES=node1,node2 \  
    ...
```

Demo

Install GI home
Apply Release Update
Create golden image

Watch on [YouTube](#)

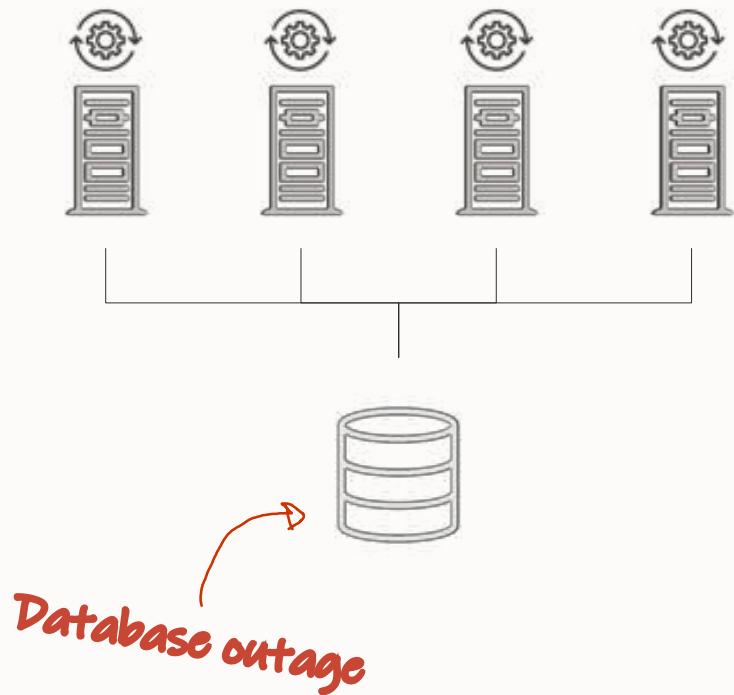
Grid Infrastructure Patching



Patching a cluster requires passwordless SSH connection between the nodes

- You can disable it after patching

Grid Infrastructure Patching Concepts

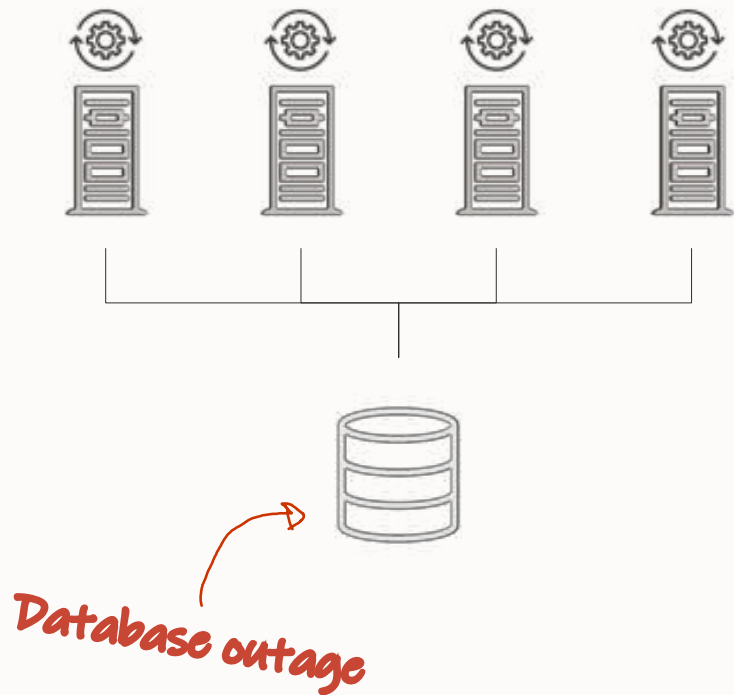


ALL NODE

- All nodes patched at one time
- One long database outage
- Works for all patches, including non-rolling
- Cluster at full capacity except for outage

Rolling Patch - OPatch Support for RAC (Doc ID 244241.1)

Grid Infrastructure Patching Concepts

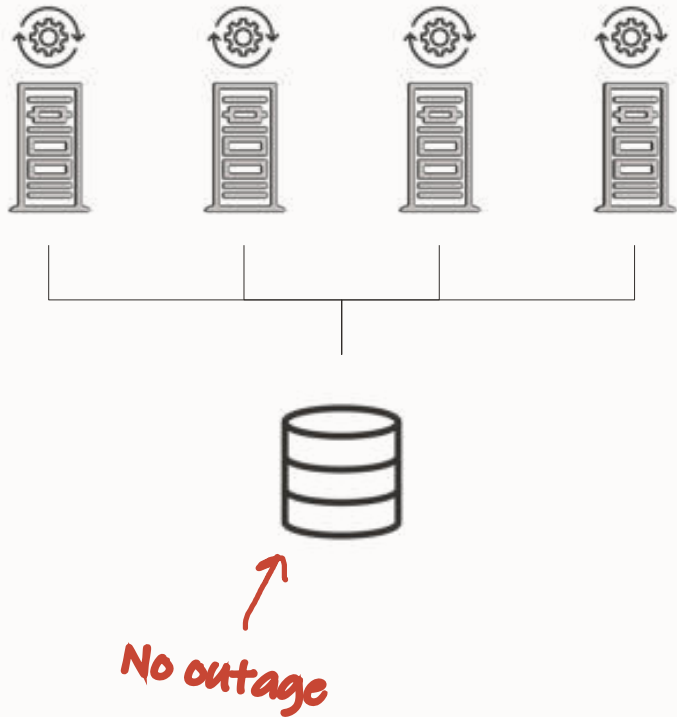


MINIMUM DOWNTIME

- Nodes patched in two batches
- One short database outage
- Works for all patches, including non-rolling
- Other nodes must handle workload while another batch is patched

Rolling Patch - OPatch Support for RAC (Doc ID 244241.1)

Grid Infrastructure Patching Concepts

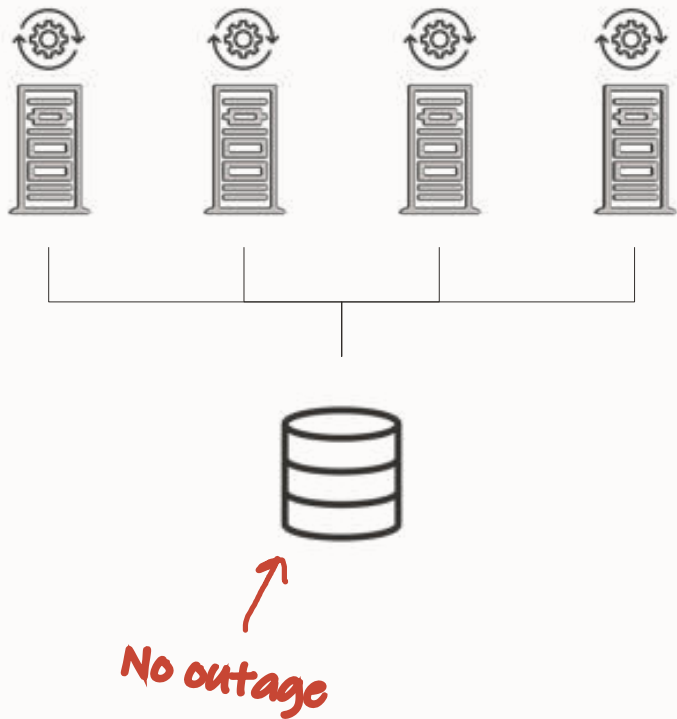


ROLLING

- Each node patched separately
- **No database outage**
- Patch must be RAC rolling installable
- Other nodes must handle workload while one node is patched

Rolling Patch - OPatch Support for RAC (Doc ID 244241.1)

Grid Infrastructure Patching Concepts

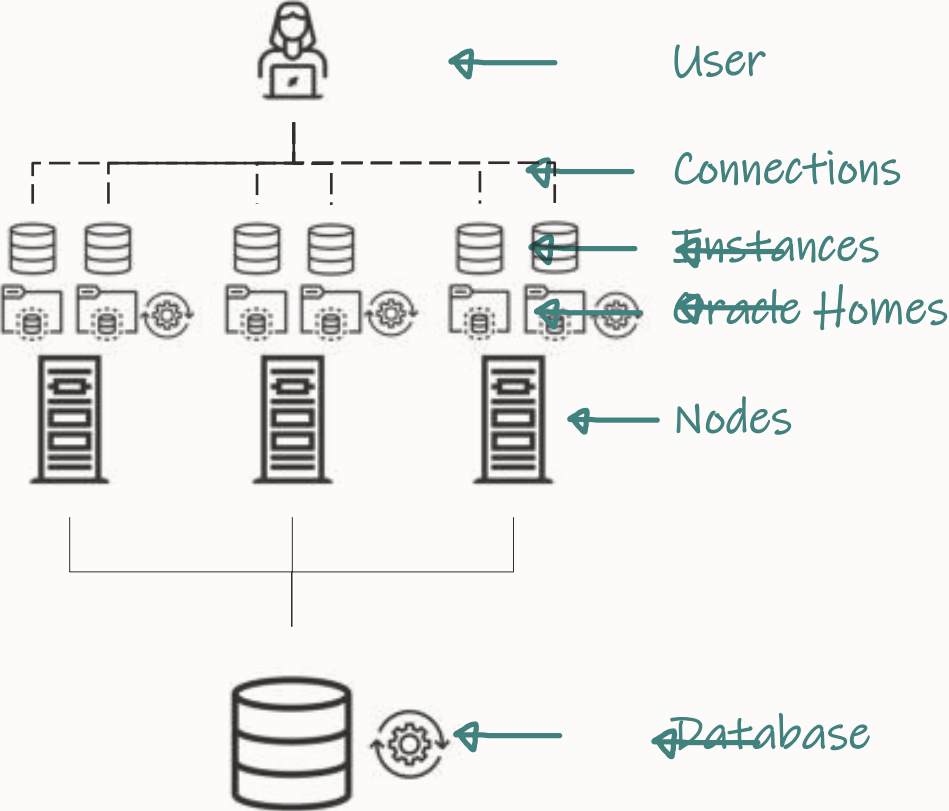


ROLLING IN GROUPS

- Patch a subset together
- Useful when draining is a problem
- **No** database outage
- Patch must be RAC rolling installable
- Other nodes must handle workload while one node is patched

Rolling Patch - OPatch Support for RAC (Doc ID 244241.1)

RAC Rolling Patching



- Clone Oracle Home
- Patch Oracle Home
- Move to new Oracle Home
- Execute datapatch



Demo

Patch a 2-node RAC system
GI and database

Watch on [YouTube](#)



Complete a rolling patching operation
always as **quickly as possible**

- [RAC: Frequently Asked Questions \(Doc ID 220970.1\)](#)

All patching operations should be completed on all Oracle Real Application Clusters (RAC) instances as quickly as possible.

...

ideally within 24 hours



RAC: Frequently Asked Questions (RAC FAQ) (Doc ID [220970.1](#))

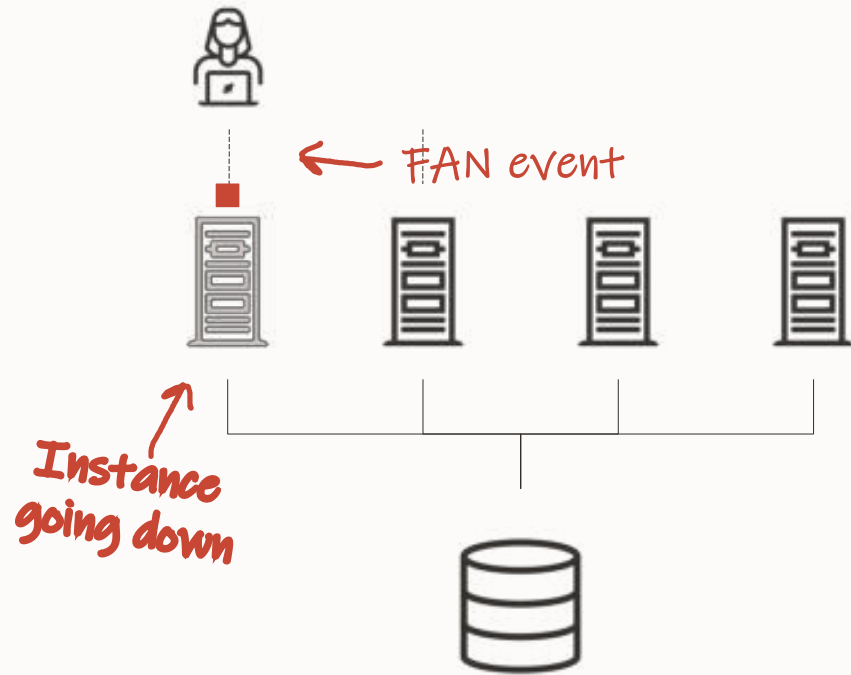




Rolling patching requires efficient draining

- Optionally, consider a *batched* approach

Draining Connections



DRAINING

- Allows users to finish their work and reconnect to another instance
- New sessions connect to other instances
- Sessions that don't drain in time are forcefully terminated
- Controlled by `drain_timeout` parameter in `srvctl` and `DBMS_SERVICE`

Drain Timeout



Setting `drain_timeout`
very **low**?

- This may cause login storms
- Be cautious on databases with many connections



Setting `drain_timeout`
very **high**?

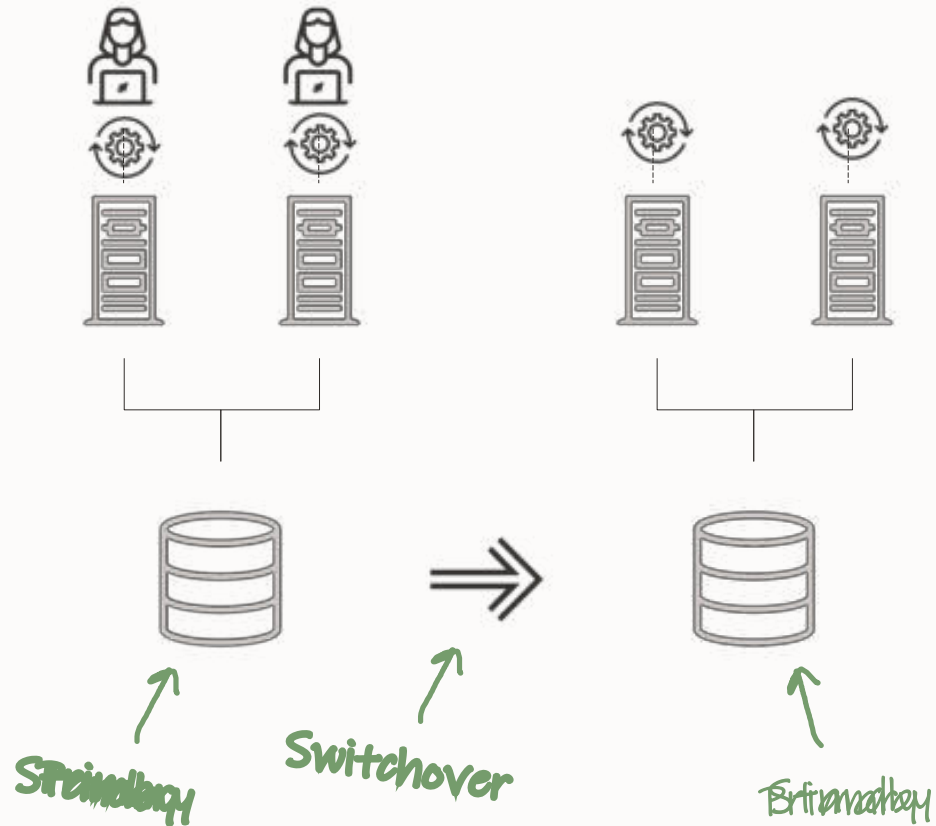
- Load is spread on fewer instances
- Cluster is in **rolling patch mode** for an extended period of time



Application should connect to database using a custom service

- Use [srvctl add service](#)
- Don't use the default service

Grid Infrastructure | Data Guard



ALTERNATIVE

- If draining is a problem
- Downtime limited to a switchover
- Test your Data Guard configuration



Data Guard | **Additional Information**



[INTERVIEW WITH LUDOVICO CALDERA](#)

Ludovico is Data Guard Product Manager and he shares his top tips for patching Oracle Grid Infrastructure and Data Guard



[PATCHING ORACLE GRID INFRASTRUCTURE AND ORACLE DATA GUARD](#)

Blog post with additional details plus instructions on how to patch GI and database at the same time when you have Data Guard



Safely test and verify patches with Standby-First Patch Apply

- [Data Guard Standby-First Patch Apply \(Doc ID 1265700.1\)](#)



Patch must Standby-First installable

- Check the patch readme



Execute datapatch on the primary database

- Only execute datapatch when all homes are on the new patch



Find additional restrictions in [Data Guard Standby-First Patch Apply \(Doc ID 1265700.1\)](#)



Comply with Maximum Availability Architecture (MAA) principles

- [Continuous Availability - MAA Checklist for Applications for the Oracle Database](#)

top tips

PATCHING SUCCESS

Cluster Verification Utility

Patch Level

Application Continuity

OPatch

Use CVU before and after patching

Preferably through EXAchk or ORAchk

Identifies potential issues

Light-weight, non-intrusive

Always use the latest version

```
$ cluvfy stage -pre patch
```

```
Performing following verification checks ...
```

```
cluster upgrade state ...PASSED
```

```
OLR Integrity ...PASSED
```

```
Hosts File ...PASSED
```

```
...
```

```
Check for parameter kernel.shmmni ...PASSED
```

```
/tmp directory free space ...PASSED
```

```
Check for parameter kernel.shmall ...PASSED
```

```
ORAchk checks ...PASSED
```

```
Pre-check for Patch Application was successful.
```

top tips

PATCHING SUCCESS

Cluster Verification Utility

Patch Level

Application Continuity

OPatch

Apply patches regularly

Apply recent Release Updates

Apply MRPs

Keep GI and DB patch levels in sync

top tips

PATCHING SUCCESS

Cluster Verification Utility

Patch Level

Application Continuity

OPatch

Completely hide interruptions from users

Hides planned and unplanned events

Comply with MAA guidelines

See also Transparent Application Continuity

top tips

PATCHING SUCCESS

Cluster Verification Utility

Patch Level

Application Continuity

OPatch

Always use the latest version of OPatch

Use in GI and DB homes



You don't need to apply
OJVM patches to GI Homes

- Details in [blog post](#)



Can you make it **even easier**
even faster
even smarter

```
[oracle@centos39-oracle817 oracle]$ █
```

Thank You

