

# Exadata Upgrade to 12.2

Upgrade with Challenges

# Agenda

- 1 **About Us**
- 2 Architecture
- 3 Choosing Patchrelease
- 4 Patch-Plan
- 5 Pretasks
- 6 Patchday
- 7 Conclusion

# As an Employer – What makes us different

## Our Profile – nationwide

- One of the largest IT service providers in Germany with a current headcount of 4,445 at five locations
- A full-service service provider: the competence center for bank-related IT solutions and business processes
- Part of the Cooperative Financial Network: we hold the balance between bank and IT
- A wide range of technologies and possibilities: from app development to mainframes, from consulting to migration projects.



## Diverse Target Markets

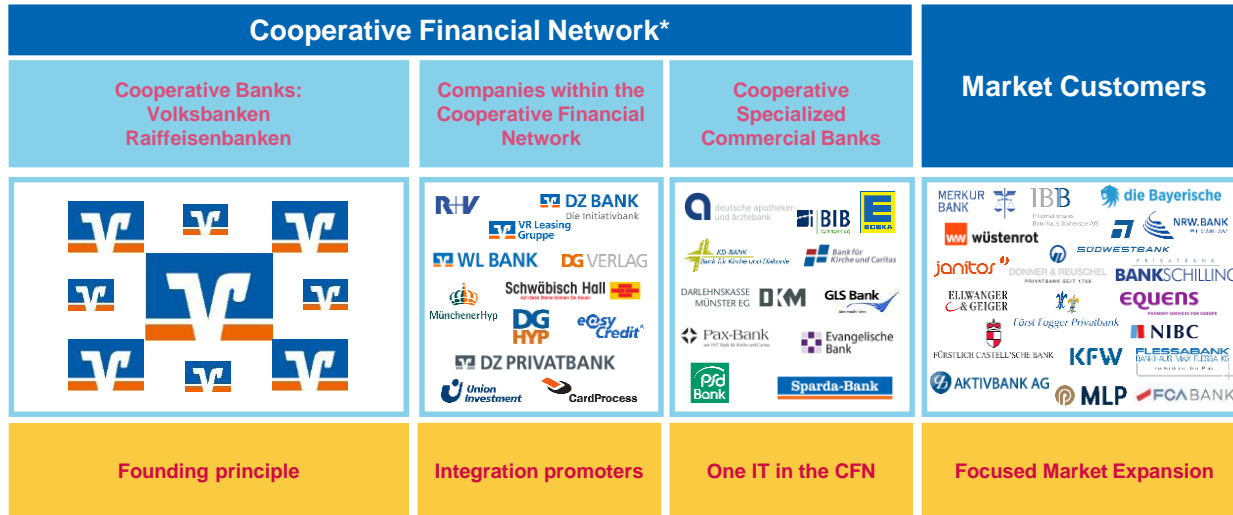
More than 1,200 customers and owners in four target markets are the basis of our successful business strategy.



Status: 31 Dec. 2016

# Focusing on customers in 4 target markets

We provide services to customers in four target markets – Our focus is on our owners in cooperative banking - Volksbanken und Raiffeisenbanken



\* Volksbanken Raiffeisenbanken Cooperative Financial Network  
(Genossenschaftliche FinanzGruppe Volksbanken Raiffeisenbanken)

# Our Corporate Group

The Group companies offer a wide range of IT services.

- Systems and services for HR departments
- Specialized and process IT consulting for private and special banks, planning of bank-specific solutions
- Software solutions for risk management and controlling
- On-site technical infrastructure services
- Consulting, project management, software development, quality assurance
- Product management for cooperation-related business and service providers
- Outsourcing solutions for back office, inbound and outbound as well as 24h service for banking customers

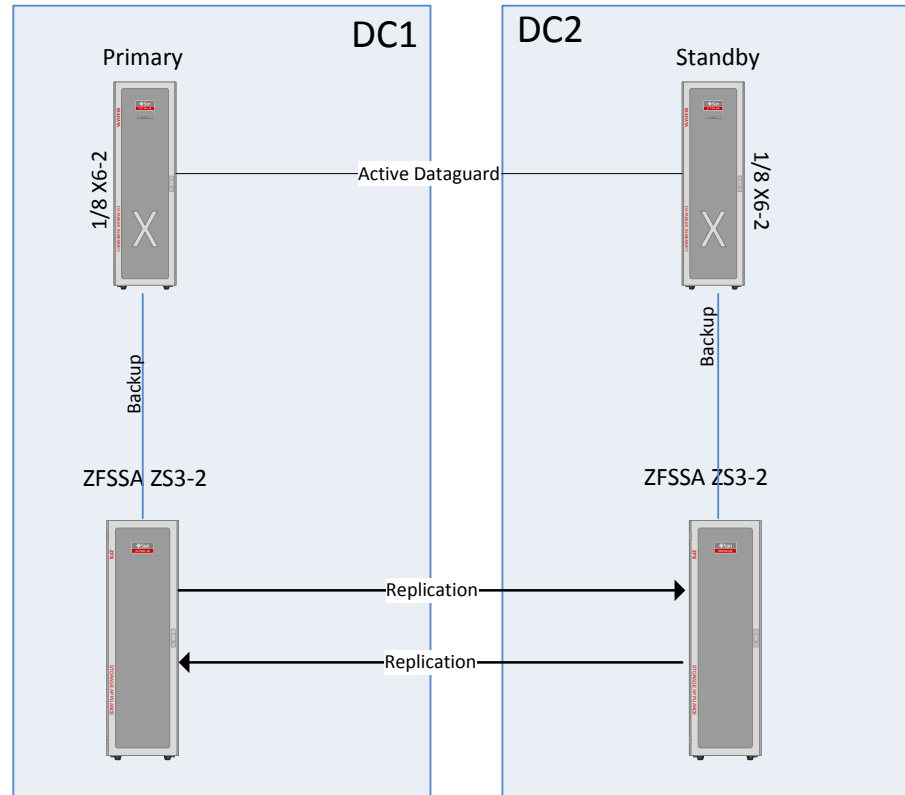


# Agenda

- 1 About Us
- 2 Architecture**
- 3 Choosing Patchrelease
- 4 Patch-Plan
- 5 Pretasks
- 6 Patchday
- 7 Conclusion

# Architecture

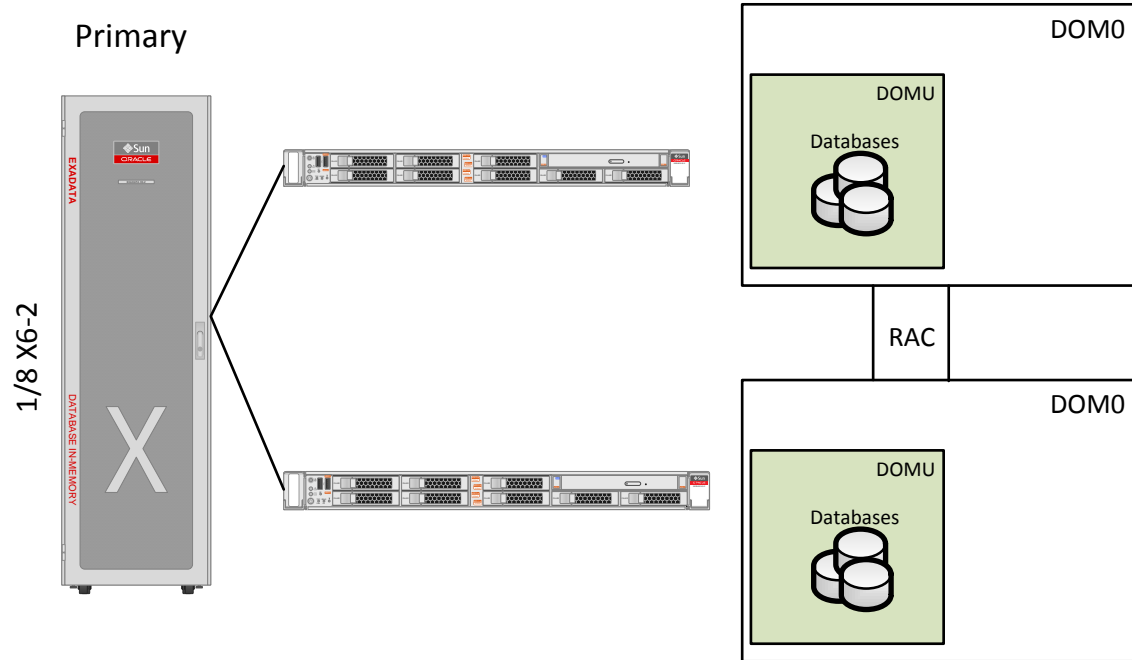
## Overview I





# Architecture

## Overview II



# Architecture


## Current Setup

- Patchrelease Exadata: 12.1.2.3.2.160721
- GridInfrastructure & DB: BP 12.1.0.2.160721
- Infiniband Firmware: 2.1.8-1
- Virtualized Exadata (currently 1 VM per Node)
- 2-Node Policy Managed RAC
- 2 Exadatas configured with Active Dataguard
- Database Backup performend on Standby Site to ZFSSA
- Backups replicated „Backup“-ZFSSA

# Agenda

- 1 About Us
- 2 Architecture
- 3 Choosing Patchrelease**
- 4 Patch-Plan
- 5 Pretasks
- 6 Patchday
- 7 Conclusion

# Choosing Patchrelease

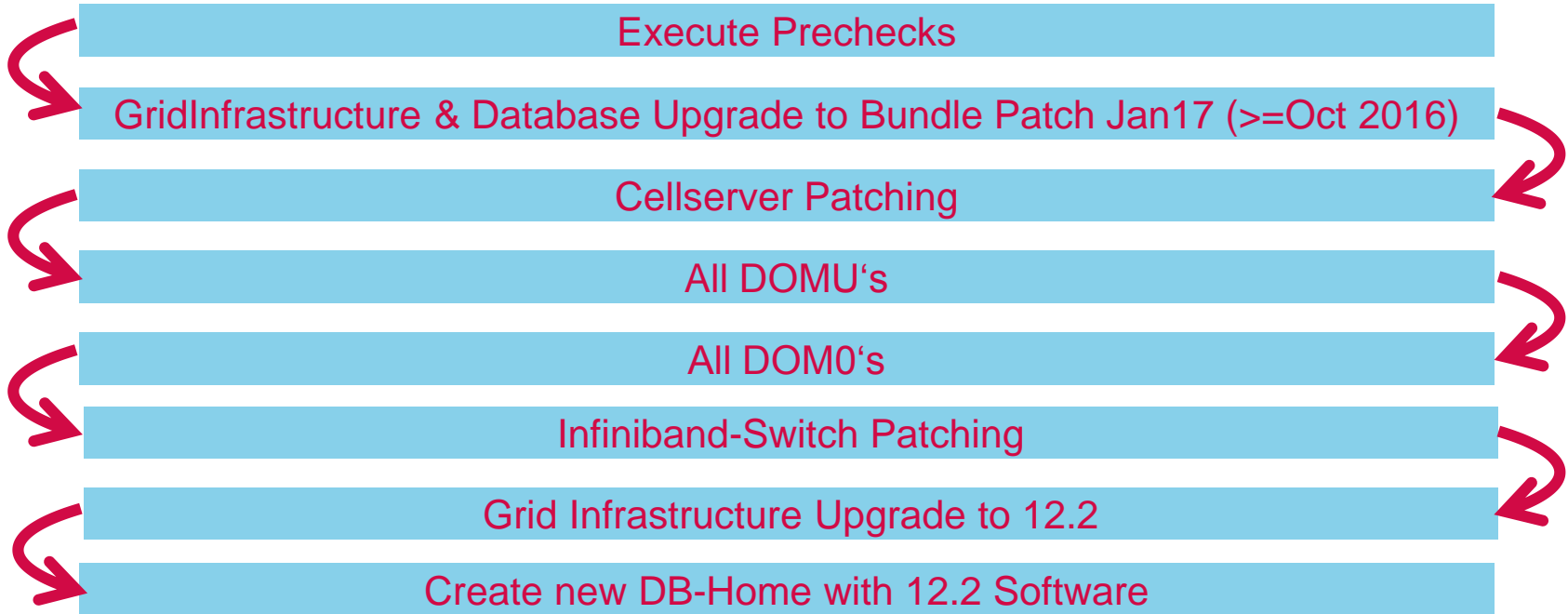
- Patchplaning: Start in January 2017
  - Patching with support of Oracle ACS
  - Finding available patching date
  - Available Exa-Releases:
    - 12.1 (latest release)
    - 12.2 (first release)
  - Rolling- / Non-Rolling Upgrade
- 
- Patching Date: March 2017
  - Patchrelease: 12.2 (12.2.1.1.0.170126.2)
  - Non-Rolling

# Agenda

- 1 About Us
- 2 Architecture
- 3 Choosing Patchrelease
- 4 Patch-Plan**
- 5 Pretasks
- 6 Patchday
- 7 Conclusion

# Patch-Plan

The way to success 😊



# Agenda

- 1 About Us
- 2 Architecture
- 3 Choosing Patchrelease
- 4 Patch-Plan
- 5 Pretasks**
- 6 Patchday
- 7 Conclusion

## exachks

- latest exachk
- for all dom0 (run from first node)
- for all domU (run from first node)

## patchmgr

- copy all patches to each dom0 -> /EXAVMIMAGES/patches/...
- execute precheck runs from dom0 for all dom0/domU/cells/ib

## additional checks

- own scripts with additional checks



## exachk findings I – Database Servers

Status	Type	Message	Status On	Details
FAIL	OS Check	Oracle Enterprise Linux 5 rpms are installed on Oracle Enterprise Linux 6	All Database Servers	<a href="#">View</a>
FAIL	OS Check	Downdelay attribute is not set to recommended value on bonded client interface	All Database Servers	<a href="#">View</a>

- Finding 1: ignore
- Finding 2: investigate

```
The expected output should be:  
Down delay correctly set to 2000 for all bonded interface  
Example of a failure:  
Down delay not set to 2000 for the bonded interface bondeth0  
If failures are reported, as the root userid on the database server which has the failure,  
execute the following command followed by a reboot:  
sed -i 's/downdelay=5000/downdelay=2000/' /etc/sysconfig/network-scripts/ifcfg-bondeth0  
NOTE: It is possible to temporarily set the value in the active kernel as the root userid  
using this command:  
echo 2000 > /sys/class/net/<bonded interface name>/bonding/downdelay  
However, this will not survive a reboot. The "sed" command followed by a reboot is the  
preferred method.
```

→ correct value on each dom0 for bonded interface bondeth0

## exachk findings II - Storage

Status	Type	Message	Status On	Details
FAIL	Storage Server Check	Storage Server alerts are not configured to be sent via email	All Storage Servers	<a href="#">View</a>
FAIL	Storage Server Check	Active system values should match those defined in configuration file "cell.conf"	All Storage Servers	<a href="#">View</a>

- Finding 1: ignore
- Finding 2: investigate

```
IPCONF_RAW_OUTPUT=$(/opt/oracle.cellos/ipconf -verify -semantic -at-runtime -check-  
consistency -verbose 2>/dev/null);  
IPCONF_RESULT=$(echo "$IPCONF_RAW_OUTPUT" | egrep "Consistency check PASSED" | wc -  
l);  
IPCONF_SUMMARY=$(echo "$IPCONF_RAW_OUTPUT" | tail -1);  
if [ $IPCONF_RESULT = "1" ]  
then  
    echo -e "SUCCESS: $IPCONF_SUMMARY"  
else  
    echo -e "FAILURE: $IPCONF_SUMMARY\n"  
    echo -e "`echo -e \"$IPCONF_RAW_OUTPUT\" | grep FAILED`"  
fi;  
  
The expected output is:  
  
SUCCESS: [Info]: Consistency check PASSED
```

# Pretasks

## exachk findings II - Storage

- check /opt/oracle.cellos/cell.conf
  - describes the cellserver configuration
  - dns/ntp/hostnames/interfaces/gateway/etc.
- run commands one by one to narrow the problem

→ problem didn't show up again, as of now we ignore the warning

## patchmgr checks – dom0

```
cd /EXAVMIMAGES/patches/YUM/dbserver_patch_5.170214/
```

```
./patchmgr -dbnodes ~/all_dom0_except_firstnode -precheck -nomodify_at_prereq -log_dir auto -target_version  
12.2.1.1.0.170126.2 -iso_repo /EXAVMIMAGES/patches/YUM/p25463019_122110_Linux-x86-64.zip
```

```
...  
2017-07-04 14:00:56 +0200 :ERROR : dbnodeupdate.sh precheck failed on one or more nodes
```

```
SUMMARY OF WARNINGS AND ERRORS FOR dba01:
```

```
dba01: # The following file lists the commands that would have been executed for removing rpms when specifying -M  
flag. #
```

```
dba01: ERROR: There are DOMU images not yet upgraded to a UEK4 kernel image. You must upgrade all DOMU images to a  
UEK4 kernel image prior to upgrading DOM0.
```

```
dba01: Warning: This Exadata update includes an Oracle Linux 5 to Oracle Linux 6 update.
```

```
dba01: Warning: Although the system was analyzed for custom rpms, any other custom installed software (such as  
tar-balls) cannot be detected.
```

```
dba01: The following known issues will be checked for but require manual follow-up:
```

```
2017-07-04 14:00:58 +0200 :ERROR : DONE: dbnodeupdate.sh precheck on dba01
```

```
2017-07-04 14:01:09 +0200 :INFO : SUMMARY FOR ALL NODES:
```

```
2017-07-04 14:01:09 +0200 :ERROR : dba01 has state: FAILED
```

## patchmgr checks – domU

```
cd /EXAVMIMAGES/patches/YUM/dbserver_patch_5.170214/
```

```
./patchmgr -dbnodes ~/all_node_vm -precheck -nomodify_at_prereq -log_dir auto -target_version  
12.2.1.1.0.170126.2 -iso_repo /EXAVMIMAGES/patches/YUM/p25463013_122110_Linux-x86-64.zip
```

```
...  
2017-07-04 14:25:08 +0200 :ERROR : dbnodeupdate.sh precheck failed on one or more nodes
```

```
SUMMARY OF WARNINGS AND ERRORS FOR exa01vm01:
```

```
exavm01: # The following file lists the commands that would have been executed for removing rpms when  
specifying -M flag.
```

```
exavm01: Warning: Active network mounts found on this DB node.
```

```
exavm01: ERROR: Oracle Grid Infrastructure home must be running release 12.1.0.2.161018 (Oct 2016) Proactive  
Bundle Patch or later before updating to Exadata 12.2.1.1.0 or later.
```

```
exavm01: ERROR: Preventive abort of update due to dependency issues or a missing package that will fail the  
update
```

```
exa01vm01: The following known issues will be checked for but require
```

```
manual follow-up:
```

```
2017-07-04 14:25:11 +0200 :ERROR : DONE: dbnodeupdate.sh precheck on exavm01
```

```
2017-07-04 14:25:21 +0200 :INFO : SUMMARY FOR ALL NODES:
```

```
2017-07-04 14:25:21 +0200 :ERROR : exavm01 has state: FAILED
```

```
...
```

# Pretasks

## patchmgr checks – Cellserver

```
cd /EXAVMIMAGES/patches/YUM/dbserver_patch_5.170214/  
  
./patchmgr -cells all_cells -cleanup  
  
./patchmgr -cells all_cells -patch_check_prereq
```

→ no problems

# Pretasks

## patchmgr checks – Infiniband

```
cd /EXAVMIMAGES/patches/YUM/dbserver_patch_5.170214/  
./patchmgr -ibswitches ibswitches.lst -upgrade -ibswitch_precheck
```

→ no problems

# Pretasks

## Results

- all errors and warnings reviewed and resolved



**Ready for Patching**



# Agenda

- 1 About Us
- 2 Architecture
- 3 Choosing Patchrelease
- 4 Patch-Plan
- 5 Pretasks
- 6 Patchday**
- 7 Conclusion

# Patchday

## patching progress



Execute Prechecks

GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)

Cellserver Patching

All DOMU's

All DOM0's

Infiniband-Switch Patching

Grid Infrastructure Upgrade to 12.2

Create new DB-Home with 12.2 Software

## GI and Database Patch to Januar 2017

- switch primary database to standby site
- stop Grid Infrastructure Services `'crsctl stop cluster -all'`
- patch Grid Infrastructure

```
dcli -l oracle -g ~/all_vm '/u01/app/12.1.0.2/grid/OPatch/patch napply -oh /u01/app/12.1.0.2/grid -local -silent /u01/patches/BP/24968615/24732088'
```

```
dcli -l oracle -g ~/all_vm '/u01/app/12.1.0.2/grid/OPatch/patch napply -oh /u01/app/12.1.0.2/grid -local -silent /u01/patches/BP/24968615/21436941'
```

```
dcli -l oracle -g ~/all_vm '/u01/app/12.1.0.2/grid/OPatch/patch napply -oh /u01/app/12.1.0.2/grid -local -silent /u01/patches/BP/24968615/24828643'
```

## GI and Database Patch to Januar 2017

- patch result

```
dcli -l oracle -g ~/all_vm '/u01/app/12.1.0.2/grid/OPatch/opatch lspatches'
```

```
24828643;ACFS Patch Set Update : 12.1.0.2.170117 (24828643)
```

```
25101514;OCW Interim patch for 2510151424
```

```
732088;DATABASE BUNDLE PATCH: 12.1.0.2.170117 (24732088)
```

```
21436941;WLM Patch Set Update: 12.1.0.2.5 (21436941)
```

## GI and Database Patch to Januar 2017

- patch database home

```
dcli -l oracle -g ~/all_vm '/u01/app/oracle/product/12.1.0.2/dbhome_1/OPatch/opatch napply -oh /u01/app/oracle/product/12.1.0.2/dbhome_1 -local -silent /u01/patches/BP/24968615/24732088'
```

```
dcli -l oracle -g ~/all_vm '/u01/app/oracle/product/12.1.0.2/dbhome_1/OPatch/opatch napply -oh /u01/app/oracle/product/12.1.0.2/dbhome_1 -local -silent /u01/patches/BP/24968615/25101514'
```

```
dcli -l oracle -g ~/all_vm '/u01/app/oracle/product/12.1.0.2/dbhome_1/OPatch/opatch apply -oh /u01/app/oracle/product/12.1.0.2/dbhome_1 -local -silent /u01/patches/ONEOFF/24917972'
```

- patch result

```
opatch lspatches
```

```
25101514;OCW Interim patch for 25101514  
24732088;DATABASE BUNDLE PATCH: 12.1.0.2.170117 (24732088)  
24732088;DATABASE BUNDLE PATCH: 12.1.0.2.170117 (24732088)  
21923026;
```

## GI and Database Patch to Januar 2017

- execute postpatch actions

```
dcli -l root -g ~/all_vm '/u01/app/12.1.0.2/grid/rdbms/install/rootadd_rdbms.sh'
```

```
dcli -l root -g ~/all_vm '/u01/app/12.1.0.2/grid/crs/install/rootcrs.pl  
-postpatch -nonrolling'
```



all components patched

# Patchday

## patching progress



Execute Prechecks



GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)



Cellserver Patching

All DOMU's

All DOM0's

Infiniband-Switch Patching

Grid Infrastructure Upgrade to 12.2

Create new DB-Home with 12.2 Software

# Patchday

## Cellserver Patching I

- reboot all cells
- clear all open alerts from alerthistory with cellcli
- do precheck run again



„ERROR: Patch prerequisite checks failed



## Cellserver Patching I

- review of patchmgr logfile shows problems with one of the configured NTP-Server
- remove problematic NTP-Server via ‚ipconf‘ from all cells
- rerun precheck again → success
- now start with the patching process

```
nohup ./patchmgr -cells ~/all_cells -patch &
```

## Cellserver Patching I

- The real problem while probing NTP-Servers:

```
script: dostep.sh.tpl
# Check NTP servers.
...
# Exclude local clock
if [ "$ntp_server" != '127.127.1.0' ]; then
  ((ntp_servers_cnt++))
  # It takes about 20 seconds with -t 5 if ntp server is not responding
  echo "Check NTP server: ntpdate -t 5 -q -d $ntp_server"
  ntpdate -t 5 -q -d $ntp_server
  if [ $? -ne 0 ]; then
    echo "[ERROR] NTP server $ntp_server is not responding"
    ret_code=$((ret_code | 1 ))
  fi
fi
done
fi
if [ $ntp_servers_cnt -eq 0 ]; then
  echo "[WARNING] No NTP server(s) found in /etc/ntp.conf"
fi
...
```

## Cellserver Patching II

- next issue: patchrun on the 3rd cellserver is stuck and don't continue (seen while monitoring the patchmgr logfile)

```
pstree -a 335709
```

```
patchmgr ./patchmgr -cells /root/all_cells -patch  
+-ssh -o BatchMode=yes -o ConnectionAttempts=1 -o ConnectTimeout=60 -q -l root exacel03 hostname
```

```
ps -axwww |grep 352637
```

```
352637 pts/2    S          0:00 ssh -o BatchMode=yes -o ConnectionAttempts=1 -o ConnectTimeout=60 -q -l root exacel03  
hostname
```

```
kill 352637
```

# Patchday

## patching progress

- ✓ Execute Prechecks
- ✓ GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)
- ✓ Cellserver Patching
- ▶ All DOMU's
- All DOM0's
- Infiniband-Switch Patching
- Grid Infrastructure Upgrade to 12.2
- Create new DB-Home with 12.2 Software

## DOMU

- precheck run:

```
./patchmgr -dbnodes ~/other_node_vm -precheck -nomodify_at_prereq -log_dir auto -target_version 12.2.1.1.0.170126.2 -iso_repo /EXAVMIMAGES/patches/YUM/p25463013_122110_Linux-x86-64.zip
```

- backup vm:

```
./patchmgr -dbnodes ~/other_node_vm -backup -iso_repo /EXAVMIMAGES/patches/YUM/p25463013_122110_Linux-x86-64.zip -target_version 12.2.1.1.0.170126.2 -allow_active_network_mounts
```

- patch vm:

```
./patchmgr -dbnodes ~/all_node_vm -upgrade -log_dir auto -target_version 12.2.1.1.0.170126.2 -iso_repo /EXAVMIMAGES/patches/YUM/p25463013_122110_Linux-x86-64.zip -nobackup
```

→ completed without problems !!!

# Patchday

## patching progress

- ✓ Execute Prechecks
- ✓ GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)
- ✓ Cellserver Patching
- ✓ All DOMU's
- ▶ All DOM0's
- Infiniband-Switch Patching
- Grid Infrastructure Upgrade to 12.2
- Create new DB-Home with 12.2 Software

## DOM0 I

- `./patchmgr -dbnodes ~/all_dom0_except_firstnode -upgrade -log_dir auto -target_version 12.2.1.1.0.170126.2 -iso_repo /EXAVMIMAGES/patches/YUM/p25463019_122110_Linux-x86-64.zip -nobackup`

- completed without errors, but ...
- no Infiniband available in domU's after successful patching
- GridInfrastructure is down !!!

another troubleshooting round begins ...

## DOM0 II

- Problem tracked down to the fact the „rdma“-service is not running (was implemented in previous release via modprobe.conf)
- `chkconfig --list | grep -i rdma`  
  
rdma            0:off 1:off 2:off 3:off 4:off 5:off 6:off
- Workaround: Edit `/etc/exadata/security/pset.xml` and switch ‚rdma-Service‘ to ‚on‘
- **WARNING:** not recommended by Oracle Support

```
...  
<system_service name="rdma">  
<value>on</value>  
</system_service>  
...
```



## DOM0 III

- supported way to change this value:
  - enable rdma service with „chkconfig rdma on“
  - run „/opt/oracle.cellos/host\_access\_control get-runtime“ to update “pset.xml” file
  - reboot node to check if everything works as expected

# Patchday

## patching progress

- ✓ Execute Prechecks
- ✓ GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)
- ✓ Cellserver Patching
- ✓ All DOMU's
- ✓ All DOM0's
- ▶ Infiniband-Switch Patching
- Grid Infrastructure Upgrade to 12.2
- Create new DB-Home with 12.2 Software

## Infiniband-Switch Patching

- Precheck `./patchmgr -ibswitches ibswitches.lst -upgrade -ibswitch_precheck`  
– everything OK
- `./patchmgr -ibswitches ibswitches.lst -upgrade &`
- after waiting 45 minutes, first IB-Switch is dead and switch has to be replaced afterwards
- continue in patch plan without patching the second IB-Switch

# Patchday

## patching progress

- ✓ Execute Prechecks
- ✓ GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)
- ✓ Cellserver Patching
- ✓ All DOMU's
- ✓ All DOM0's
- ✗ Infiniband-Switch Patching
- ▶ Grid Infrastructure Upgrade to 12.2
- Create new DB-Home with 12.2 Software

## GridInfrastructure Patching I

- add GridInfrastructure 12.2 GoldImages to domU's

based on „2 Maintaining Database Servers of Oracle Exadata Database Machine”

→ 2.9.10.1 Adding a New LVM Disk to a User Domain\*

→ add Disk to Mountpoint: /u01/app/12.2.0.1/grid (on all VM's)

- run upgrade precheck:

```
unset ORACLE_HOME ORACLE_BASE ORACLE_SID
/u01/app/12.2.0.1/grid/runcluvfy.sh stage -pre crsinst -upgrade -rolling \-src_crshome
/u01/app/12.1.0.2/grid \-dest_crshome /u01/app/12.2.0.1/grid \-dest_version 12.2.0.1.0 -fixupnoexec -
verbose
```

\*[https://docs.oracle.com/cd/E80920\\_01/DBMMN/maintaining-exadata-database-servers.htm#GUID-1691A67E-BE50-4BE4-AE88-C5958D7EACD1](https://docs.oracle.com/cd/E80920_01/DBMMN/maintaining-exadata-database-servers.htm#GUID-1691A67E-BE50-4BE4-AE88-C5958D7EACD1)

## GridInfrastructure Patching II

- run fixup task → increase ‚Soft Limit: maximum stack size‘ to 10240 (/etc/security/limits.conf)

```
dcli -l root -g ~/all_vm /tmp/CVU_12.2.0.1.0_oracle/runfixup.sh
```

- validate memory settings for ASM-Instances
  - minimum value 3G for sga\_target and sga\_max\_size
  - hugepages minimum 1500
- **start upgrade routine:** `cd /u01/app/12.2.0.1/grid && ./gridSetup.sh -skipRemoteCopy`

## GridInfrastructure Patching III

- `run: /u01/app/12.2.0.1/grid/rootupgrade.sh`
- **ERROR: config.o not found**

```
## make.log /u01/app/12.2.0.1/grid/install/make.log
...
/u01/app/12.2.0.1/grid/rdbms/lib/config.o: file not
recognized: File truncatedmake: *** [/u01/app/12.2.0.1/grid/rdbms/lib/oracle] Error 1

cd /u01/app/12.2.0.1/grid/rdbms/lib
mv -n config.o config.o.$(date +%y%m%d)
export ORACLE_HOME=/u01/app/12.2.0.1/grid
cd /u01/app/12.2.0.1/grid/rdbms/lib
make -f ins_rdbms.mk config.o
make -f ins_rdbms.mk config.o

ls -la config.o      -rw-r--r-- 1 oracle oinstall 1512 Mar 16 12:35 config.o
```

## GridInfrastructure Patching IV

- again run: `/u01/app/12.2.0.1/grid/rootupgrade.sh`
- ERROR:

```
/u01/app/12.2.0.1/grid/install/root_extladm01vm01.noc.fiducia.de_2017-03-16_12-36-51-532629615.log
...
2017/03/16 12:41:37 CLSRSC-595: Executing upgrade step 15 of 19: 'InstallACFS'.
CRS-2791: Starting shutdown of Oracle High Availability Services-managed resources on 'extladm01vm01'
CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'extladm01vm01' has completed
CRS-4133: Oracle High Availability Services has been stopped.      CRS-4123: Oracle High Availability
Services has been started.
2017/03/16 12:41:56 CLSRSC-196: ACFS driver install actions failed      The command
'/u01/app/12.2.0.1/grid/perl/bin/perl -I/u01/app/12.2.0.1/grid/perl/lib -
I/u01/app/12.2.0.1/grid/crs/install /u01/app/12.2.0.1/grid/crs/install/rootcrs.pl -upgrade' execution
failed
```

- Solution: add groups: `asmadmin` and `asmdba` → make 'oracle' user member of these groups



## GridInfrastructure Patching V

- now first node finished successfully
- on second node run: `/u01/app/12.2.0.1/grid/rootupgrade.sh`
- create missing directories:

```
mkdir -p /u01/app/grid/diag
mkdir -p /u01/app/grid/crsdata/ext1adm02vm01/output
mkdir -p /u01/app/grid/crsdata/ext1adm02vm01/cvu
```
- CLSRSC-325: Configure Oracle Grid Infrastructure for a Cluster ... succeeded

## GridInfrastructure Patching VI

- RAC is upgrade to 12.2 and up and running, but ....
  - ORACLE\_BASE is set to wrong location (/u01/app/grid/)
  - 'asmadmin' and 'asmdba' groups had to be created
  - Solution for these problems will be investigated with Oracle SR
  - will take quite long to get a solution in the end

# Patchday

## patching progress

- ✓ Execute Prechecks
- ✓ GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)
- ✓ Cellserver Patching
- ✓ All DOMU's
- ✓ All DOM0's
- ✗ Infiniband-Switch Patching
- ! Grid Infrastructure Upgrade to 12.2
- ▶ Create new DB-Home with 12.2 Software

# Patchday

## Install additional 12.2 RDBMS Home

- startup 12.2 runInstaller and do a software only installation
- step completed without any issues

# Patchday

## patching progress

- ✓ Execute Prechecks
- ✓ GridInfrastructure & Database Upgrade to Bundle Patch Jan17 (>=Oct 2016)
- ✓ Cellserver Patching
- ✓ All DOMU's
- ✓ All DOM0's
- ✗ Infiniband-Switch Patching
- ! Grid Infrastructure Upgrade to 12.2
- ✓ Create new DB-Home with 12.2 Software

# Agenda

- 1 About Us
- 2 Architecture
- 3 Choosing Patchrelease
- 4 Patch-Plan
- 5 Pretasks
- 6 Patchday
- 7 Conclusion**

# Conclusion

- going to the latest release as an early adaptor is challenging
- there are still bugs in the patching process / patched components
- create proactive Service Request before patching to get immediate Oracle Support
- be prepared to have a strategy for doing a fallback
- always review MOS Note 888828.1

# Conclusion

- no better way to get insides about the Exadata Platform
- now you now what to do for your disaster recovery strategy
- you are best prepared for regular patching within the same release and what to expect when going to the latest 😊



# Thank You!