

Oracle 19c Server auf Oracle Linux 7

Vorbemerkung

Oracle Linux (OL, früher bekannt als Oracle Enterprise Linux) ist eine Linux-Distribution, die von Oracle gepackt und frei vertrieben wird. Es wurde aus dem RHEL-Quellcode (Red Hat Enterprise Linux) kompiliert und ersetzt das Red Hat-Branding durch das von Oracle. Benutzer können Oracle Linux kostenlos über den E-Delivery-Service von Oracle (Oracle Software Delivery Cloud) oder von verschiedenen Mirror-Sites herunterladen und kostenlos bereitstellen und verteilen.

Oracle Database 19c ist die langfristige Support-Version der Oracle Database 12c- und 18c-Produktfamilie und bietet Kunden Premier- und Extended Support bis März 2023 bzw. März 2026. In diesem Tutorial wird die Enterprise Edition installiert, aber auch die Standard Edition funktioniert.

In diesem Tutorial werden Linux und Oracle in einer virtuellen Maschine unter Proxmox installiert. Andere Virtualisierungslösungen wie VMware oder VirtualBox gehen natürlich genauso gut.

Installation

Linux ISO herunterladen



Nehmen sie die neuste Version von Oracle Linux 7. Zum Zeitpunkt da diese Anleitung entstand war das 7.7, wenn eine neuere Ausgabe der 7er Version vorhanden ist können sie ruhig jene nehmen.

Oracle Linux 8 sollten sie jedoch nicht nehmen, derzeit ist die Datenbank 19c jedenfalls noch nicht dafür freigegeben und die Installation scheitert.

Holen sie Oracle Linux von <https://edelivery.oracle.com>:

- Melden sie sich mit ihren Oracle Benutzer und Passwort an
- Suchen sie nach „Oracle Linux“
- Fügen sie „DLP: Oracle Linux 7.7.0.0.0 (Oracle Linux)“ zum Warenkorb hinzu
- Wählen sie beim Checkout „x86 64 bit“ als Plattform
- Akzeptieren sie die Lizenzvereinbarung
- Laden sie „VV983339-01.iso Oracle Linux Release 7 Update 7 for x86 (64 bit), 4.4 GB“ herunter

Kreieren der Virtuellen Maschine

Beispielvorschlag für eine brauchbare Entwicklungsdatenbank:

- Installations-Disk Image Datei (iso): V1004253-01.iso
- Name der virtuellen Maschine: ora19

- Maximale Festplattengröße: 100 GB
- Virtuelle Festplatte als eine einzige Datei speichern
- Arbeitsspeicher: 3 GB
- Prozessoren: 2
- Netzwerk-Adapter: Bridged

Für eine Produktionsdatenbank sollten sie je nach Anzahl Benutzern natürlich mehr Arbeitsspeicher und Prozessoren vorsehen.

Linux Installation

[Zeige alle Installationsschritte](#)



ORACLE
LINUX

ORACLE LINUX 7.7 INSTALLATION

us

Help!

WELCOME TO ORACLE LINUX 7.7.

What language would you like to use during the installation process?

English	English	English (United States)
Afrikaans	Afrikaans	English (United Kingdom)
አማርኛ	Amharic	English (India)
العربية	Arabic	English (Australia)
অসমীয়া	Assamese	English (Canada)
Asturianu	Asturian	English (Denmark)
Беларуская	Belarusian	English (Ireland)
Български	Bulgarian	English (New Zealand)
বাংলা	Bengali	English (Nigeria)
		English (Hong Kong SAR China)
		English (Philippines)

Quit

Continue

ORACLE
LINUX

INSTALLATION SUMMARY

ORACLE LINUX 7.7 INSTALLATION

 us

Help!

LOCALIZATION



DATE & TIME
Americas/New York timezone



KEYBOARD
English (US)



LANGUAGE SUPPORT
English (United States)

SOFTWARE



INSTALLATION SOURCE
Local media



SOFTWARE SELECTION
Minimal Install

SYSTEM



INSTALLATION DESTINATION



KDUMP

Quit

Begin Installation


We won't touch your disks until you click 'Begin Installation'.

 Please complete items marked with this icon before continuing to the next step.

DATE & TIME

Done

ORACLE LINUX 7.7 INSTALLATION

 us


Help!

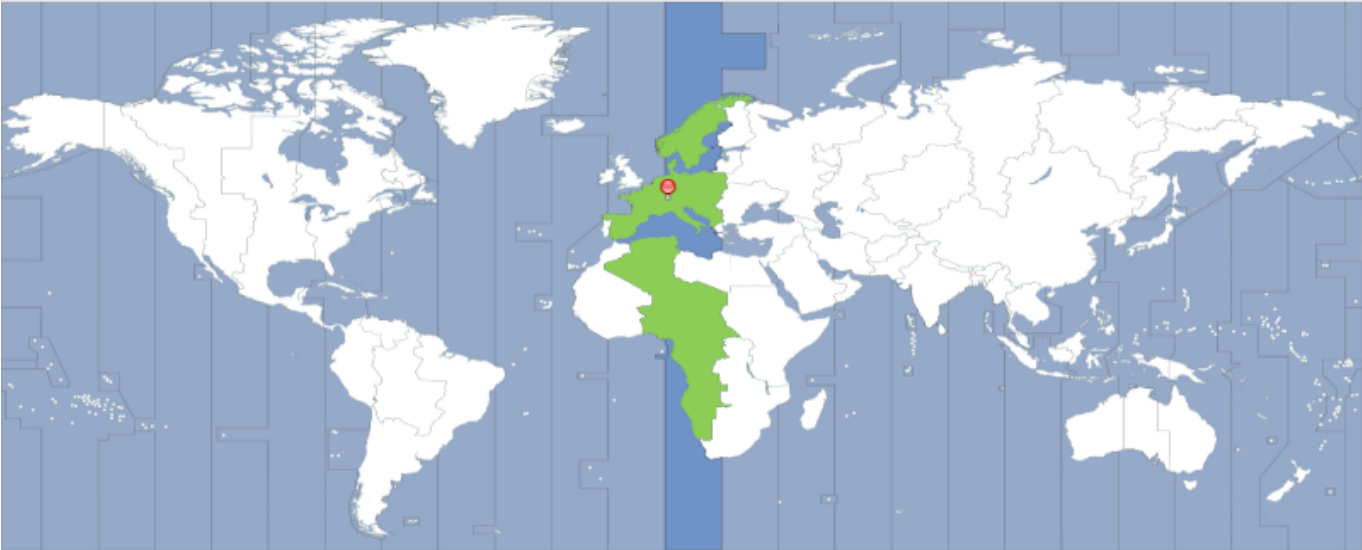
Region: Europe

City: Zurich

Network Time

OFF





^

12:04

▼

^

PM

▼

^

▼

☒ 24-hour

☐ AM/PM


09

/

27

/


2019

 You need to set up networking first if you want to use NTP

KEYBOARD LAYOUT

Done

ORACLE LINUX 7.7 INSTALLATION

 ch

Help!

Which keyboard layouts would you like to use on this system? You may move any layout to the top of the list to select it as the default.


Swiss German; Alemannic; Alsatian (German (Switzerland))

+

-

^

v



Test the layout configuration below:

öäü


Layout switching not configured.

Options

SOFTWARE SELECTION

ORACLE LINUX 7.7 INSTALLATION

Done

 ch

Help!

Base Environment

☐ **Minimal Install**
Basic functionality.

☐ **Infrastructure Server**
Server for operating network infrastructure services.

☐ **File and Print Server**
File, print, and storage server for enterprises.

☐ **Basic Web Server**
Server for serving static and dynamic internet content.

☐ **Virtualization Host**
Minimal virtualization host.

☒ **Server with GUI**
Server for operating network infrastructure services, with a GUI.

Add-Ons for Selected Environment

☐ **Backup Server**
Software to centralize your infrastructure's backups.

☐ **DNS Name Server**
This package group allows you to run a DNS name server (BIND) on the system.

☐ **E-mail Server**
Allows the system to act as a SMTP and/or IMAP e-mail server.

☐ **FTP Server**
Allows the system to act as an FTP server.

☐ **File and Storage Server**
CIFS, SMB, NFS, iSCSI, iSER, and iSNS network storage server.

☐ **Hardware Monitoring Utilities**
A set of tools to monitor server hardware.

☐ **Identity Management Server**
Centralized management of users, servers and authentication policies.

☐ **Infiniband Support**
Software designed for supporting clustering and grid connectivity using RDMA-based InfiniBand and iWARP fabrics.

☐ **Java Platform**

NETWORK & HOST NAME

Done

ORACLE LINUX 7.7 INSTAL

ch

Ethernet (ens33)
Intel Corporation 82545EM Gigabit Ethernet Controller

+

-

Ethernet (ens33)
Connected

ON

Hardware Address 00:0C:29:AD:DC:CC

Speed 1000 Mb/s

IPv4 Address 10.56.2.46

IPv6 Address 2a02:120b:2c24:98d0:d1c6:7cd1:b623:8663/64
2a02:120b:2c24:98d1:bbef:b344:592:b86f/64

Subnet Mask 255.255.0.0

Default Route 10.56.1.1



DNS 10.56.1.1

Configu


Host name: vmora19


Apply


Current host name: l




INSTALLATION SUMMARY


**DATE & TIME**
Europe/Zurich timezone

**KEYBOARD**
Swiss German; Al...an (Switze


**LANGUAGE SUPPORT**
English (United States)


SOFTWARE


**INSTALLATION SOURCE**
Local media


**SOFTWARE SELECTION**
Server with GUI

SYSTEM

**INSTALLATION DESTINATION**
Automatic partitioning selected

**KDUMP**
Kdump is enabled



**NETWORK & HOST NAME**
Wired (ens33) connected

**SECURITY POLICY**
No profile selected

Quit


Begin Ins


We won't touch your disks until you click 'Begin



CONFIGURATION

USER SETTINGS


**ROOT PASSWORD**
Root password is not set


**USER CREATION**
No user will be created

ORACLE LINUX 7.7 INSTAL

ch

Starting package installation process

**DTrace: Providing comprehensive tracing capabilities for complete software observability from a single too**

 Please complete items marked with this icon before continuing to the next step.

ROOT PASSWORD

ORACLE LINUX 7.7 INSTA

Done

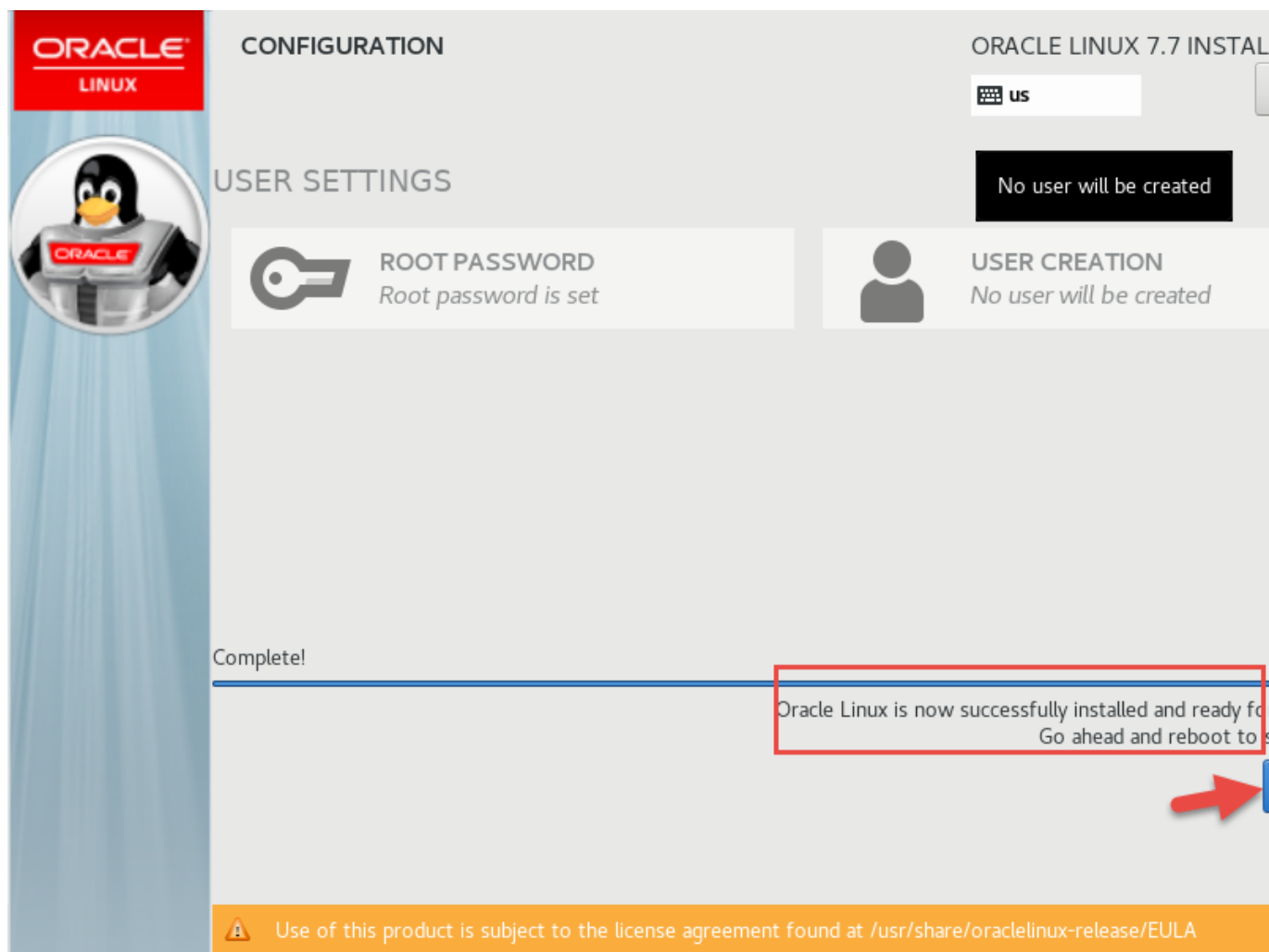
ch

The root account is used for administering the system. Enter a password for the root user.

Root Password:

Strong

Confirm:



An diesem Punkt des grafischen Setups halten wir inne. Vor der Fortsetzung muss das Paket „Oracle

19c preinstall“ installiert werden welches benötigte Komponenten hinzufügt und den Benutzer „oracle“ anlegt den wir im GUI verwenden wollen.

Aktualisierung und Datenbank Installationsvorbereitung

Öffnen sie mit PuTTY eine SSH Terminalverbindung zu „vmora19“ und melden sie sich als root mit dem oben festgelegten Passwort an.

Software aktualisieren:

```
# yum -y update
```

„Oracle 19c preinstall“ installieren:

```
# yum install -y oracle-database-preinstall-19c
```

Definieren eines Passworts für Benutzer „oracle“ damit wir uns anmelden können:

```
# passwd oracle
```

Neustart:

```
# reboot
```

Grafisches Setup beenden

[Zeige abschliessende Schritte](#)




ORACLE LINUX SERVER 7.7

ch Help!

INITIAL SETUP

LICENSING

 LICENSE INFORMATION
License not accepted

SYSTEM

 NETWORK & HOST NAME
Wired (ens33) connected

USER SETTING

 USER CREATION
No user will be created

QUIT

FINISH CONFIGURATION

Please complete items marked with this icon before continuing to the next step.

LICENSE INFORMATION

Done

ORACLE LINUX SERVER 7.7

ch Help!

License Agreement:

ORACLE LINUX LICENSE AGREEMENT

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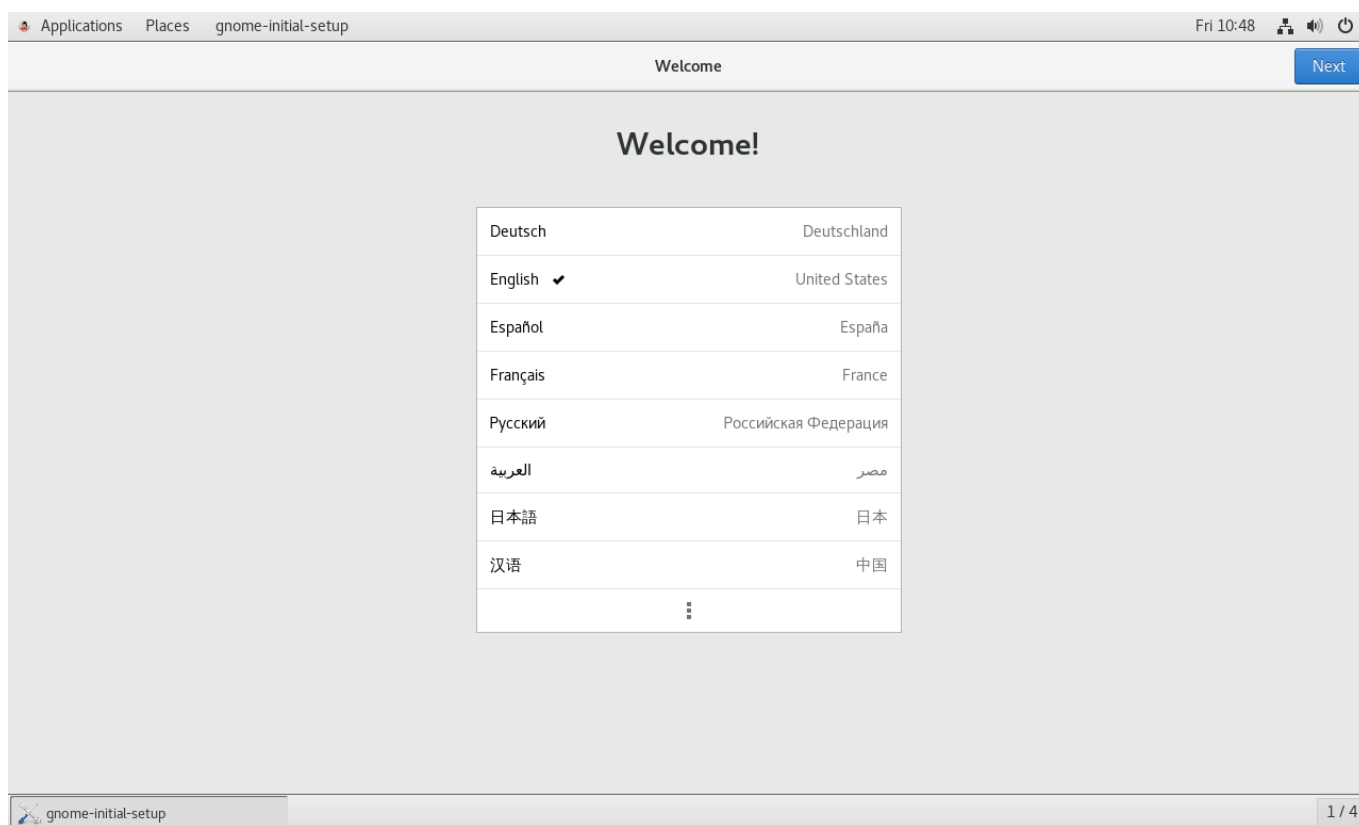
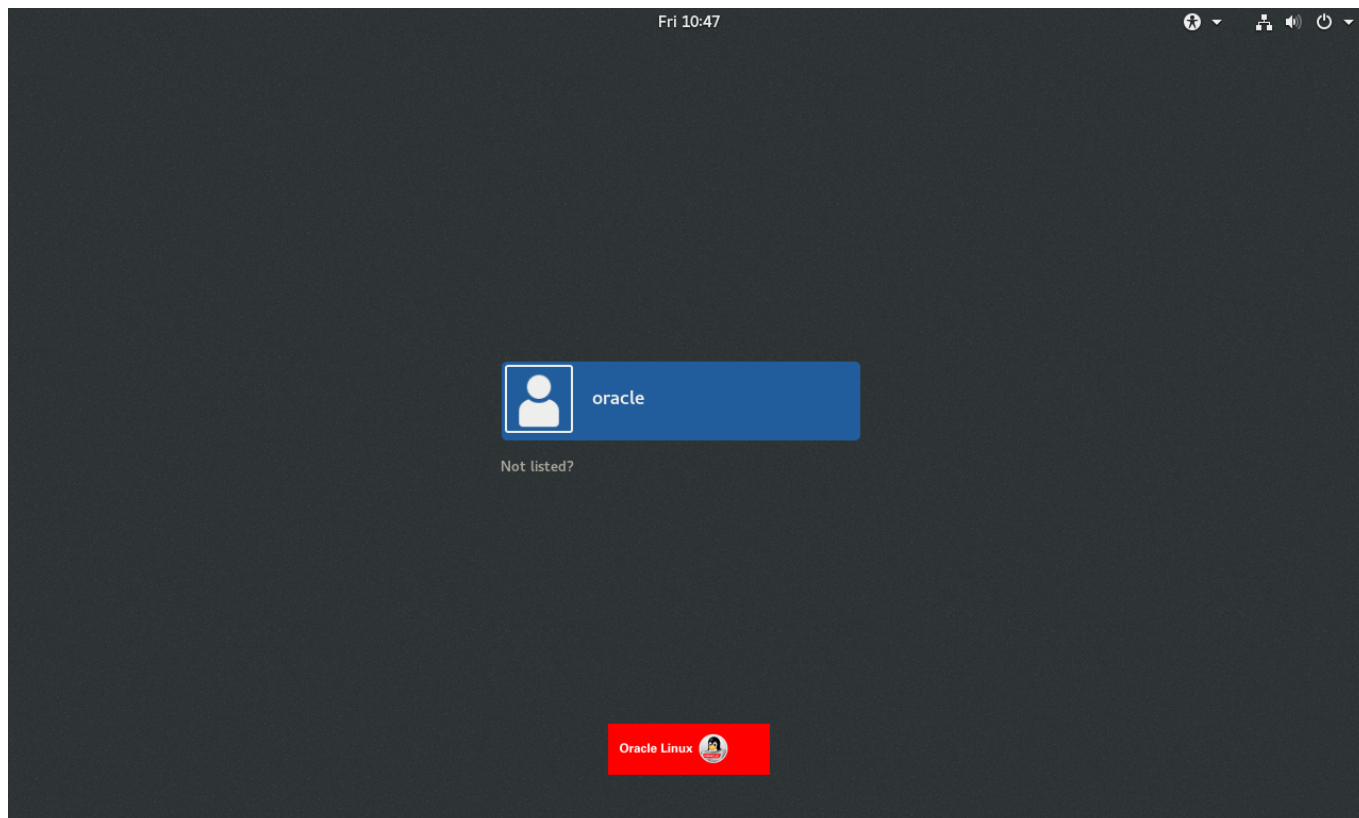
We are willing to provide a copy of the Oracle Linux programs to you only upon the condition that you accept all of the terms contained in this Agreement. Read the terms carefully and indicate your acceptance by either selecting the "Accept" button at the bottom of the page to confirm your acceptance, if you are downloading the Oracle Linux programs, or continuing to install the Oracle Linux programs, if you have received this Agreement during the installation process. If you are not willing to be bound by these terms, select the "Do Not Accept" button or discontinue the installation process.

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☒ I accept the license agreement.

Anmelden als "oracle" und gnome Benutzerkonfiguration durchführen



ApplicationsPlacesgnome-initial-setup

Fri 10:49

Previous

Typing

Next

Typing

Select your keyboard layout or an input method.

Cameroon Multilingual (Dvorak)	Preview
Cameroon Multilingual (QWERTY)	Preview
English (Australian)	Preview
English (Cameroon)	Preview
English (Canada)	Preview
English (US)	Preview
German (Switzerland)	<input checked="" type="checkbox"/> Preview
⋮	

gnome-initial-setup

1 / 4


ApplicationsPlacesgnome-initial-setup

Fri 10:50

Previous

Privacy

Next



Privacy

Location Services

☒

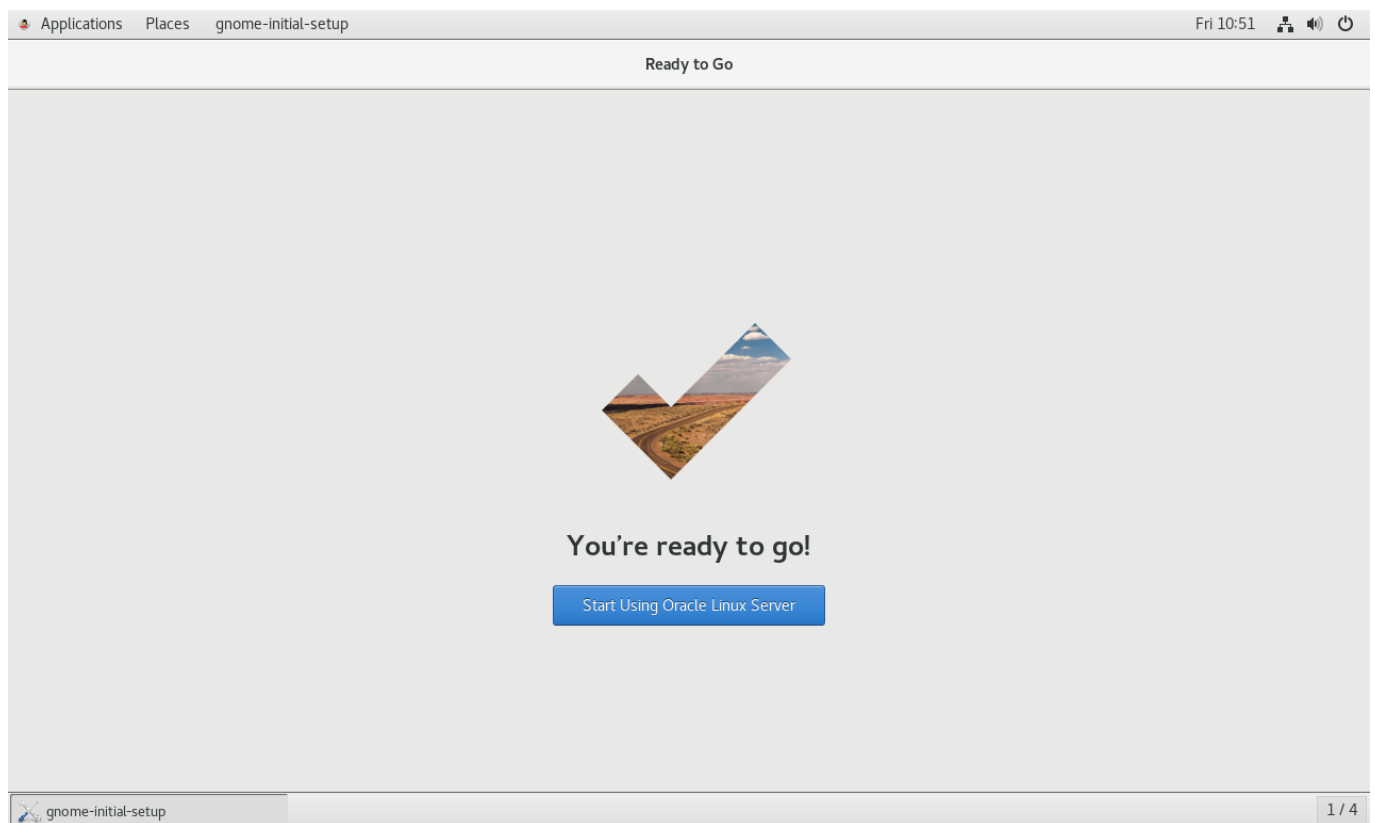
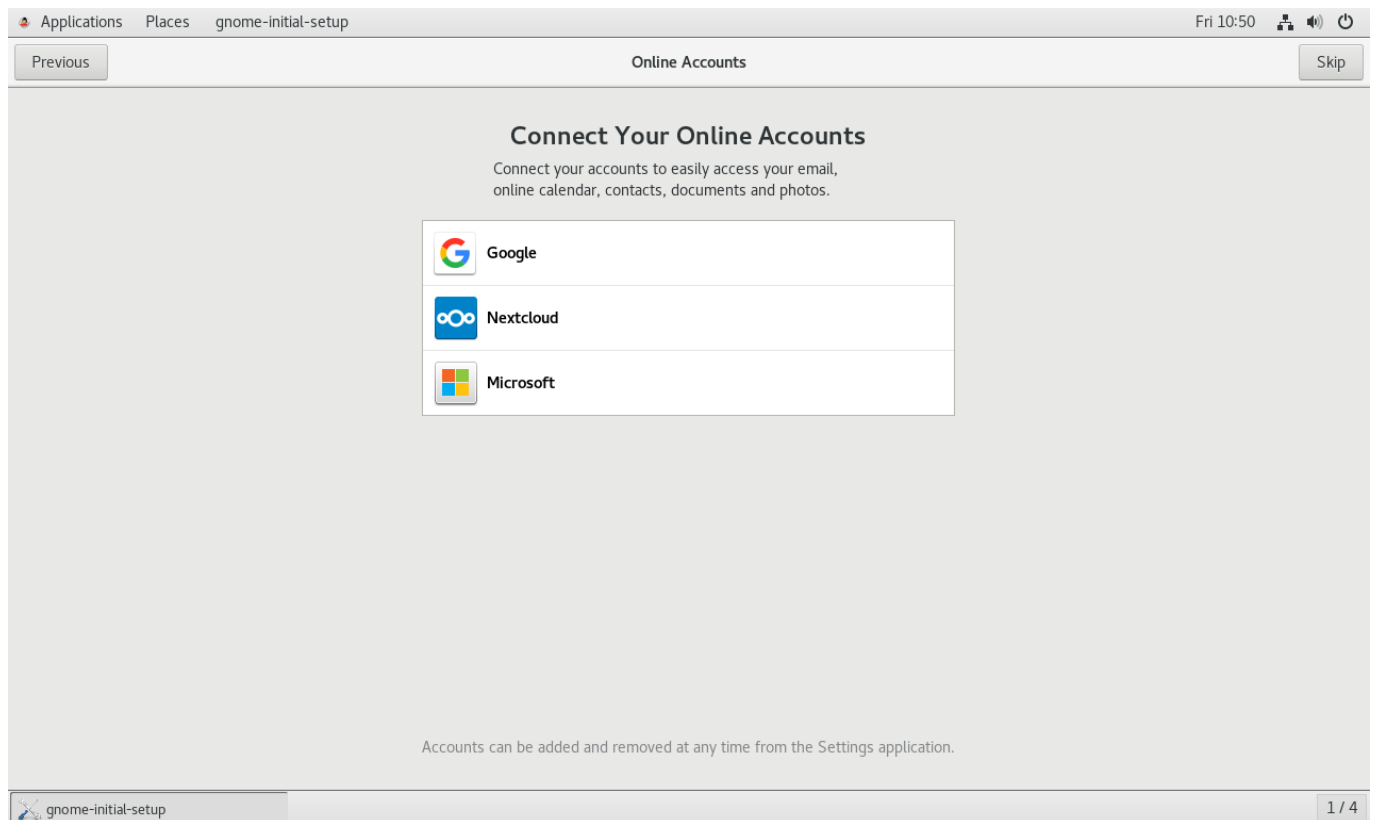
Allows applications to determine your geographical location. An indication is shown when location services are in use.

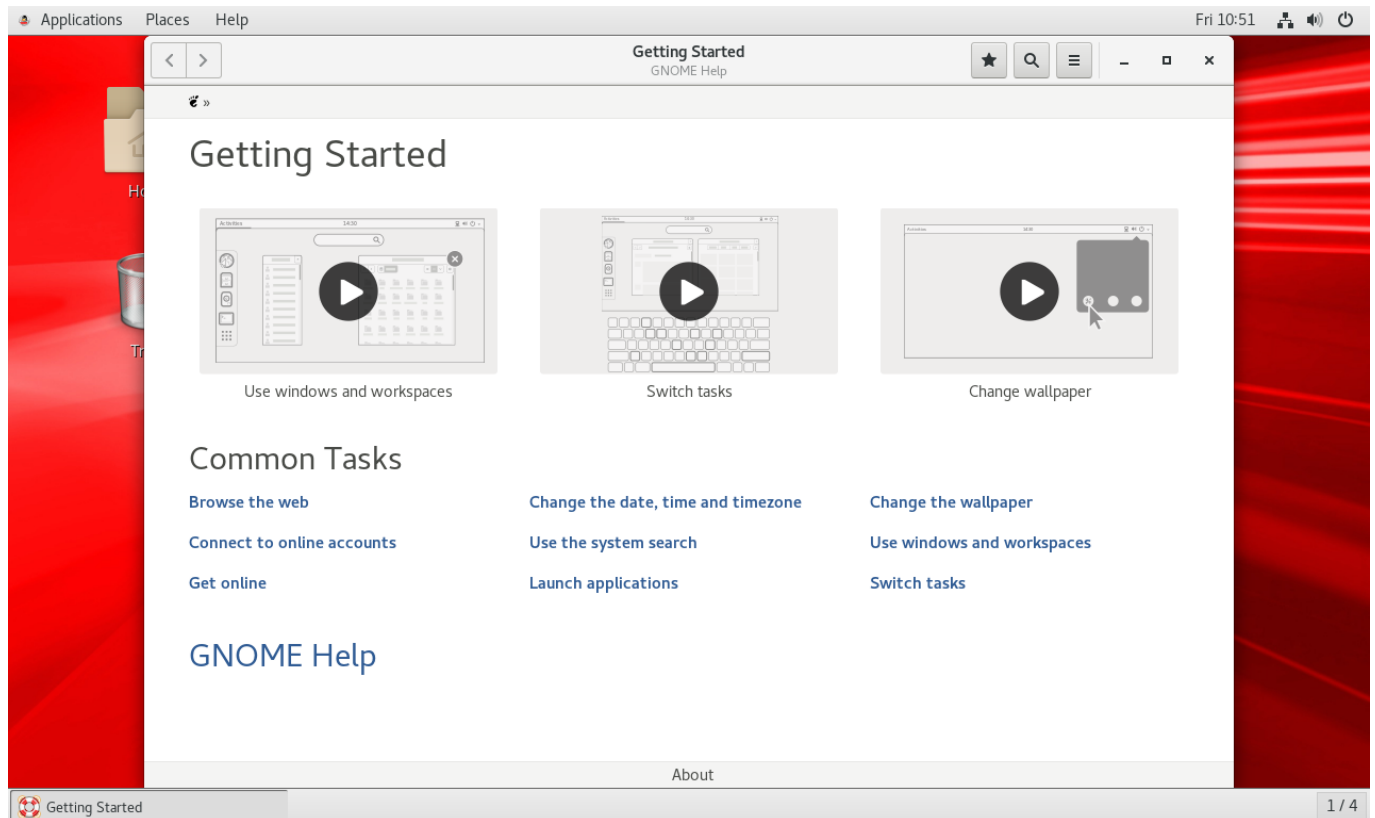
Uses Mozilla Location Service: [Privacy Policy](#)

Privacy controls can be changed at any time from the Settings application.

gnome-initial-setup

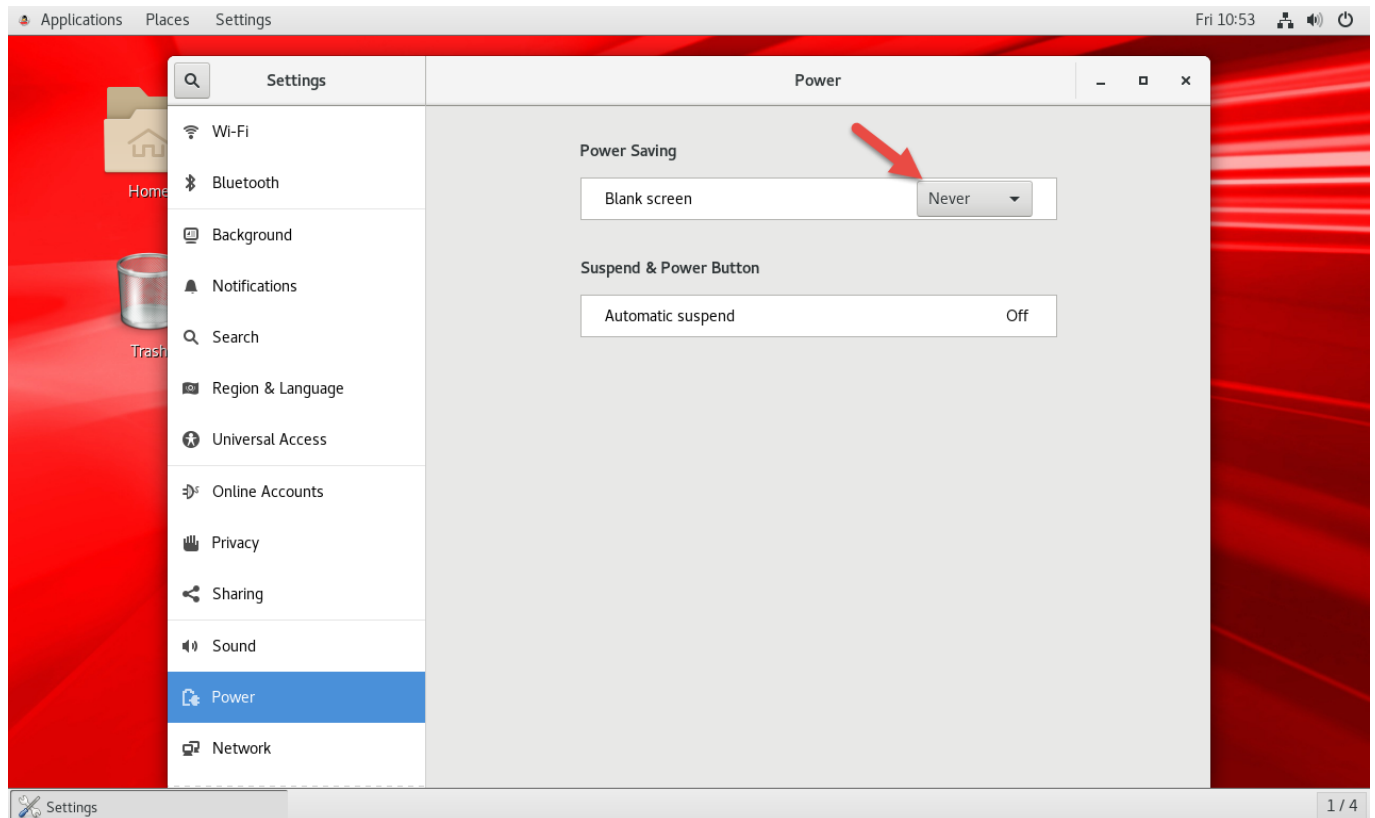
1 / 4





Bildschirm Timeout abschalten





SSH Schlüsselaufisierung für root

Verzeichnis ~/.ssh und Schlüssel generieren:

```
# ssh-keygen -t rsa -b 4096  
  <enter>  
  <enter>  
  <enter>
```

Persönlichen Schlüssel in PuTTYgen laden, und den Public Key ins die Zwischenablage kopieren:

PuTTY Key Generator

File Key Conversions Help

Key

Public key for pasting into OpenSSH authorized_keys file:

```
SE0AylPU
+eTIU7NKKodXsRjyR5EcO/L/ciEWpsZOdCGdRCC1cNv5gJ1Wcy9PkSYTgPj50IYz61
OjDgMjYrcI2NYJ/xHEotFvulhrp1L9+VHB6x2uBggCxETLJWaUjr44OJxAucoR2TnpWf1
JTavmUkIg5wLM4ysOqm60gRp8jc/EoUxXFctSTvXXJotAKRukrYyAFel8w/RHuFPw
UJYc2BXQh5xmj910Kmd+ziNjuGV6S0zZHN4Yksf64E= peterkoch
```

Key fingerprint: ssh-rsa 4096 11:d8:b3:27:33:94:78:1b:03:64:d4:3e:89:a8:c3:eb

Key comment: peterkoch

Key passphrase:

Confirm passphrase:

Actions

Generate a public/private key pair Generate

Load an existing private key file Load

Save the generated key Save public key Save private key

Parameters

Type of key to generate:

☒ RSA ☐ DSA ☐ ECDSA ☐ ED25519 ☐ SSH-1 (RSA)

Number of bits in a generated key: 2048

Public Key des persönlichen Schlüssels zu authorized_keys hinzufügen:

```
# nano ~/.ssh/authorized_keys
<paste>
```

Passwortanmeldung für SSH Verbindungen ausschalten:

```
# nano /etc/ssh/sshd_config
...
PasswordAuthentication no
...
```

SSH neu starten:

```
# service sshd restart
```

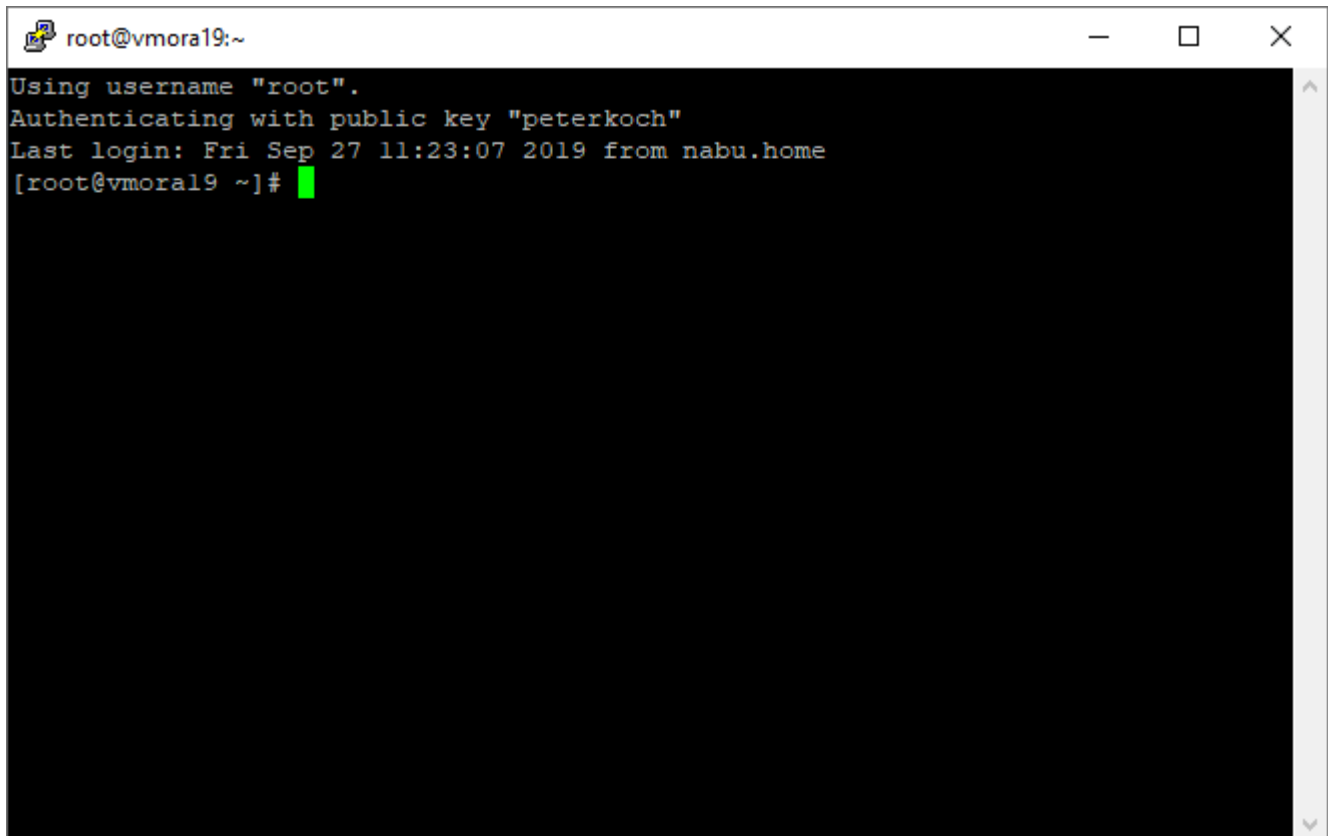
Aktuelles PuTTY Terminal zur Sicherheit noch offen lassen.

In PuTTY eine Session für root erzeugen und testen:

- Session
 - Host Name: ora19
 - Port: 22 / SSH
- Connection
 - Data
 - Auto-login username: root

- SSH
 - Auth
 - Private key file: (Speicherort meiner ppk Datei)
- Session
 - Saved sessions: ora19 - root
 - Save

Testen ob das Autologin funktioniert:

A terminal window titled 'root@vmora19:~' with standard window controls. The terminal output shows an SSH login process: 'Using username "root".', 'Authenticating with public key "peterkoch"', 'Last login: Fri Sep 27 11:23:07 2019 from nabu.home', and a prompt '[root@vmora19 ~]#' followed by a green cursor.

```
root@vmora19:~  
Using username "root".  
Authenticating with public key "peterkoch"  
Last login: Fri Sep 27 11:23:07 2019 from nabu.home  
[root@vmora19 ~]#
```

Motd Logo

Logo erzeugen bei <http://www.network-science.de/ascii/>

- Text: vmora19
- Font: slant
- Reflection: no
- Adjustment: center
- Stretch: no
- Width: 80
- do it!

Logo in Zwischenablage kopieren und in motd einfügen

```
# nano /etc/motd  
<paste>
```

rlwrap für Cursortasten in SqlPlus installieren

```
# wget  
https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm  
# rpm -ivh epel-release-latest-7.noarch.rpm  
# yum -y install rlwrap
```

SELinux auf Permissive ändern

```
# nano /etc/selinux/config  
SELINUX=permissive
```

```
# setenforce permissive
```

Firewall ausschalten

```
# systemctl stop firewalld  
# systemctl disable firewalld
```

Oracle Verzeichnisse anlegen

```
# mkdir -p /u01/app/oracle/product/19.3.0/dbhome_1  
# mkdir -p /u02/oradata  
# mkdir -p /u02/orafra  
# chown -R oracle:oinstall /u01 /u02  
# chmod -R 775 /u01 /u02
```

SSH Login für Benutzer oracle

Analog wie bei root:

```
# su oracle
```

```
$ ssh-keygen -t rsa -b 4096  
  <enter>  
  <enter>  
  <enter>
```

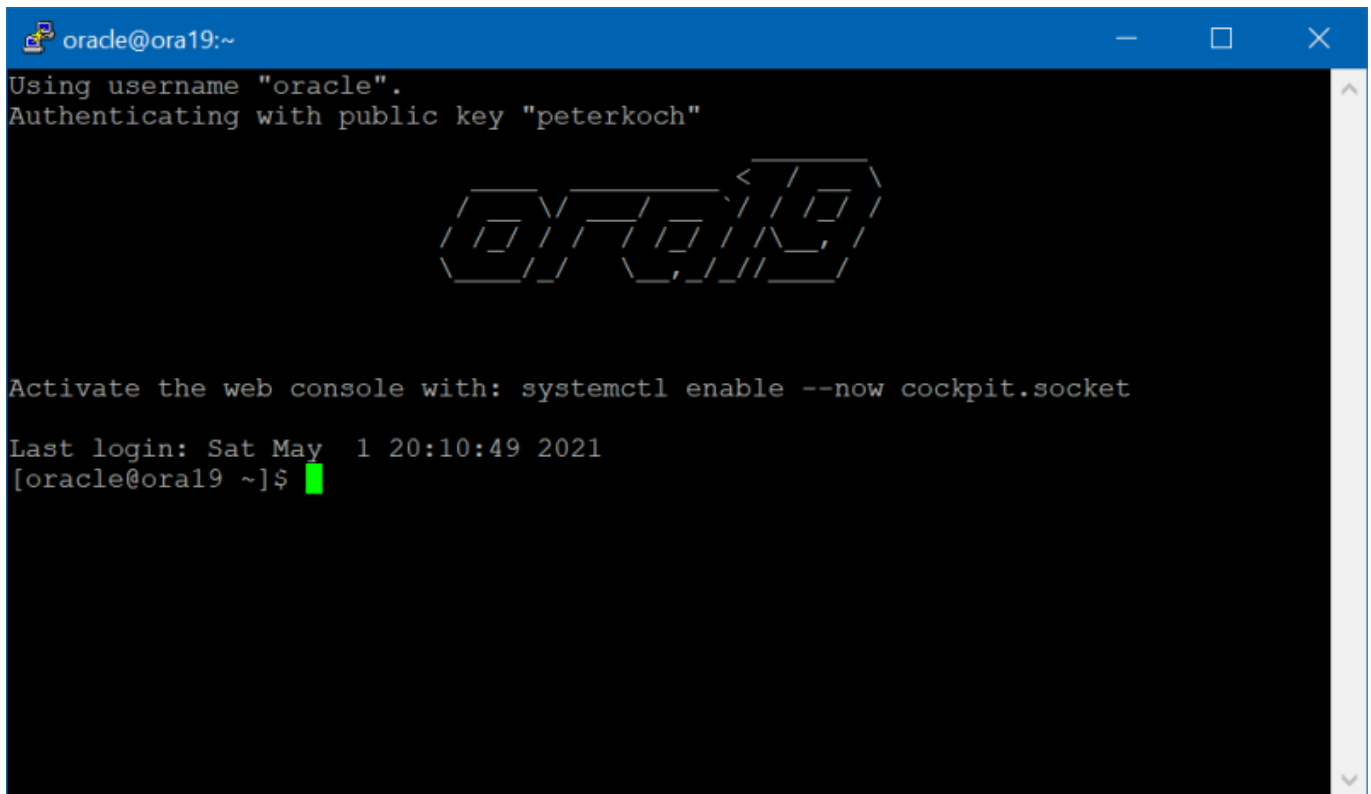
```
$ nano ~/.ssh/authorized_keys  
<paste des eigenen Public Key>
```

PuTTY Session anlegen

- Session „vmora19 - root“ laden
- Auto-login username ändern auf: oracle

- Session speichern als „vmora19 - oracle“

Testen ob es funktioniert:

A terminal window titled 'oracle@ora19:~' with standard window controls. It shows the login process for the 'oracle' user using the public key 'peterkoch'. The Oracle logo is displayed in a stylized, outlined font. Below the logo, it instructs to activate the web console with the command 'systemctl enable --now cockpit.socket'. It also shows the last login time as 'Sat May 1 20:10:49 2021' and the current prompt '[oracle@ora19 ~]\$' with a green cursor.

```
oracle@ora19:~  
Using username "oracle".  
Authenticating with public key "peterkoch"  
  
Oracle  
  
Activate the web console with: systemctl enable --now cockpit.socket  
  
Last login: Sat May 1 20:10:49 2021  
[oracle@ora19 ~]$
```

```
$ exit  
# reboot
```

Oracle Database 19c Software beschaffen

Download von <https://www.oracle.com/database/technologies/oracle19c-linux-downloads.html>

- Auswählen: LINUX.X64_193000_db_home.zip
- Lizenzvereinbarung akzeptieren
- Auf „Download“ klicken
- Mit eigenem Oracle Passwort anmelden
- Datei auf eigenem Arbeitsplatz-PC abspeichern

Filezilla verwenden um sich als oracle per SFTP/SSH zu verbinden, dann
LINUX.X64_193000_db_home.zip hochladen nach /home/oracle

Vorbereitungen als Benutzer oracle

Skripte erzeugen

```
$ mkdir ~/scripts  
$ nano ~/scripts/setEnv.sh
```

[~/scripts/setEnv.sh](#)

```
# Oracle Settings
export TMP=/tmp
export TMPDIR=$TMP

export ORACLE_HOSTNAME=ora19
export ORACLE_UNQNAME=cdb1
export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/19.3.0/dbhome_1
export ORA_INVENTORY=/u01/app/oraInventory
export ORACLE_SID=cdb1
export PDB_NAME=pdb1
export DATA_DIR=/u02/oradata

export PATH=/usr/sbin:/usr/local/bin:$PATH
export PATH=$ORACLE_HOME/bin:$PATH

export LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib
export CLASSPATH=$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib
```

```
$ nano ~/scripts/start_all.sh
```

[~/scripts/start_all.sh](#)

```
#!/bin/bash
. /home/oracle/scripts/setEnv.sh

export ORAENV_ASK=NO
. oraenv
export ORAENV_ASK=YES

dbstart $ORACLE_HOME
```

```
$ nano ~/scripts/stop_all.sh
```

[~/scripts/stop_all.sh](#)

```
#!/bin/bash
. /home/oracle/scripts/setEnv.sh

export ORAENV_ASK=NO
. oraenv
export ORAENV_ASK=YES

dbshut $ORACLE_HOME
```


Skripte ausführbar machen:

```
$ chmod u+x ~/scripts/*.sh
```

An Datei .bash_profile anhängen:

```
$ nano ~/.bash_profile
```

[~/.bash_profile](#)

```
. /home/oracle/scripts/setEnv.sh  
alias sqlplus="rlwrap sqlplus"
```

Abmelden, und erneut als oracle anmelden, dann:

```
$ cd $ORACLE_HOME  
$ unzip -oq ~/LINUX.X64_193000_db_home.zip
```

DB Software Installation starten

Im GUI als oracle anmelden und ein Terminal-Fenster öffnen.

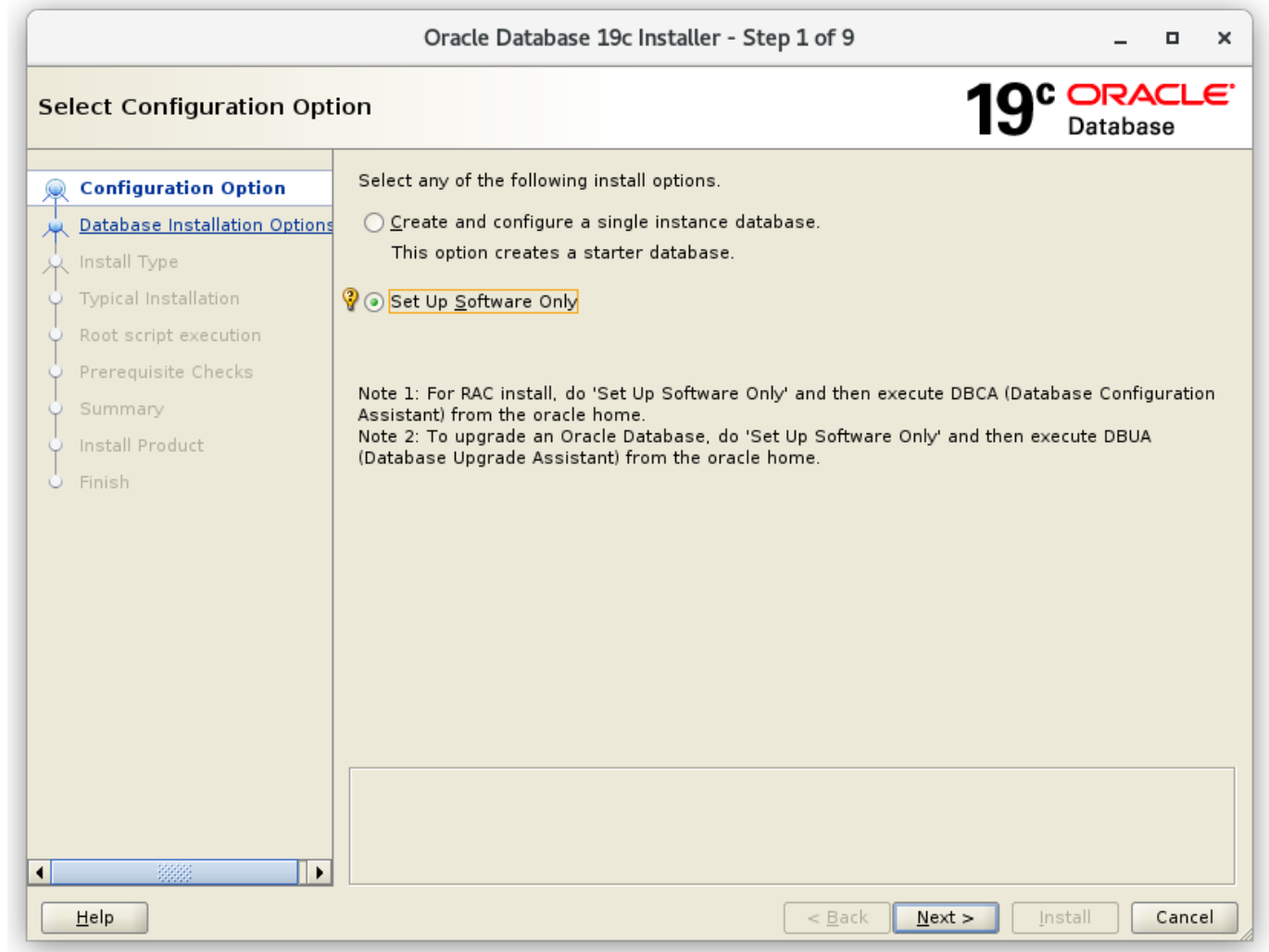
Ins ORACLE_HOME Verzeichnis wechseln und das Installationsprogramm starten:

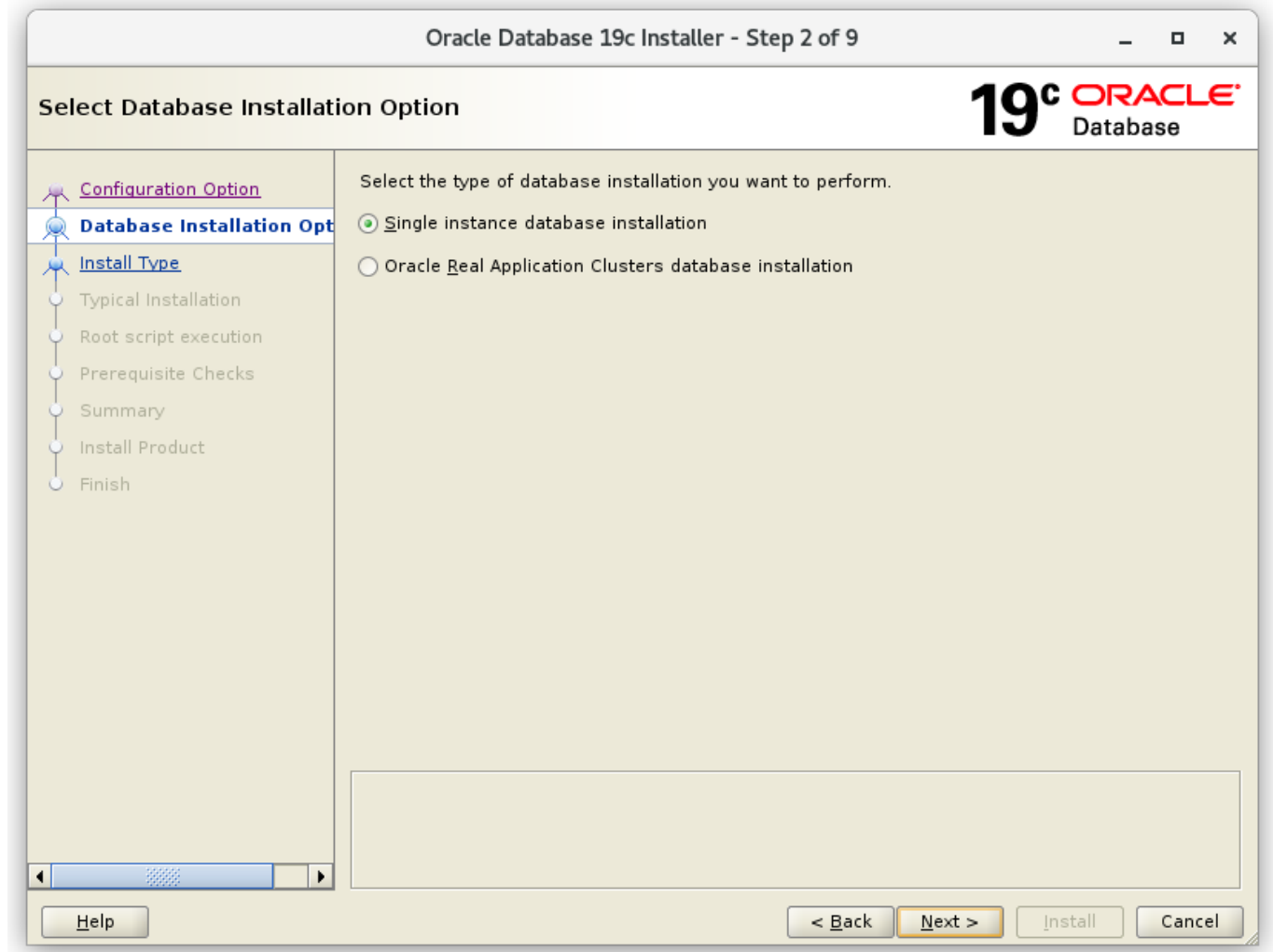
```
$ cd $ORACLE_HOME  
$ ./runInstaller
```

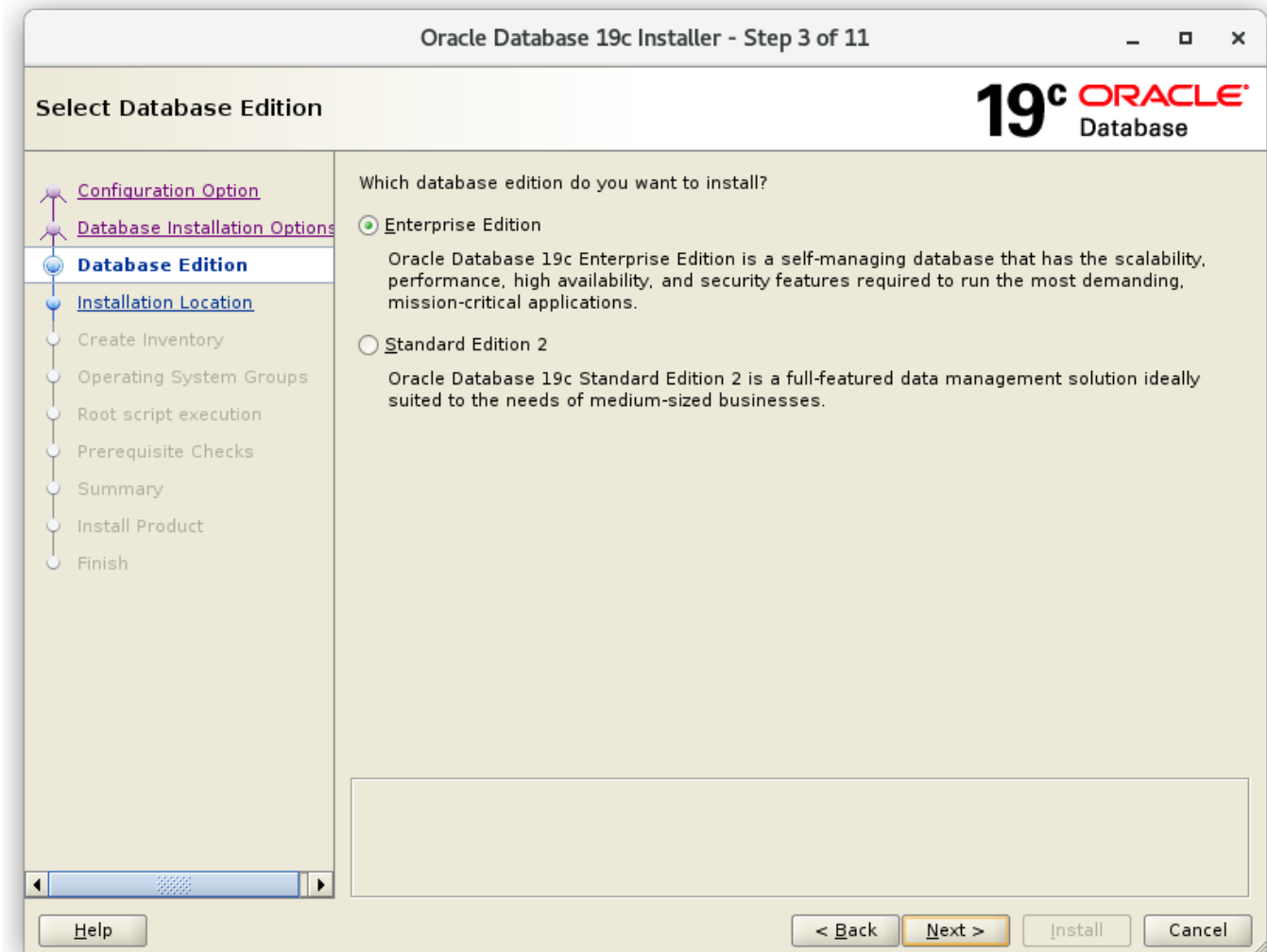
Setup mit dem Oracle Database 19c Installer

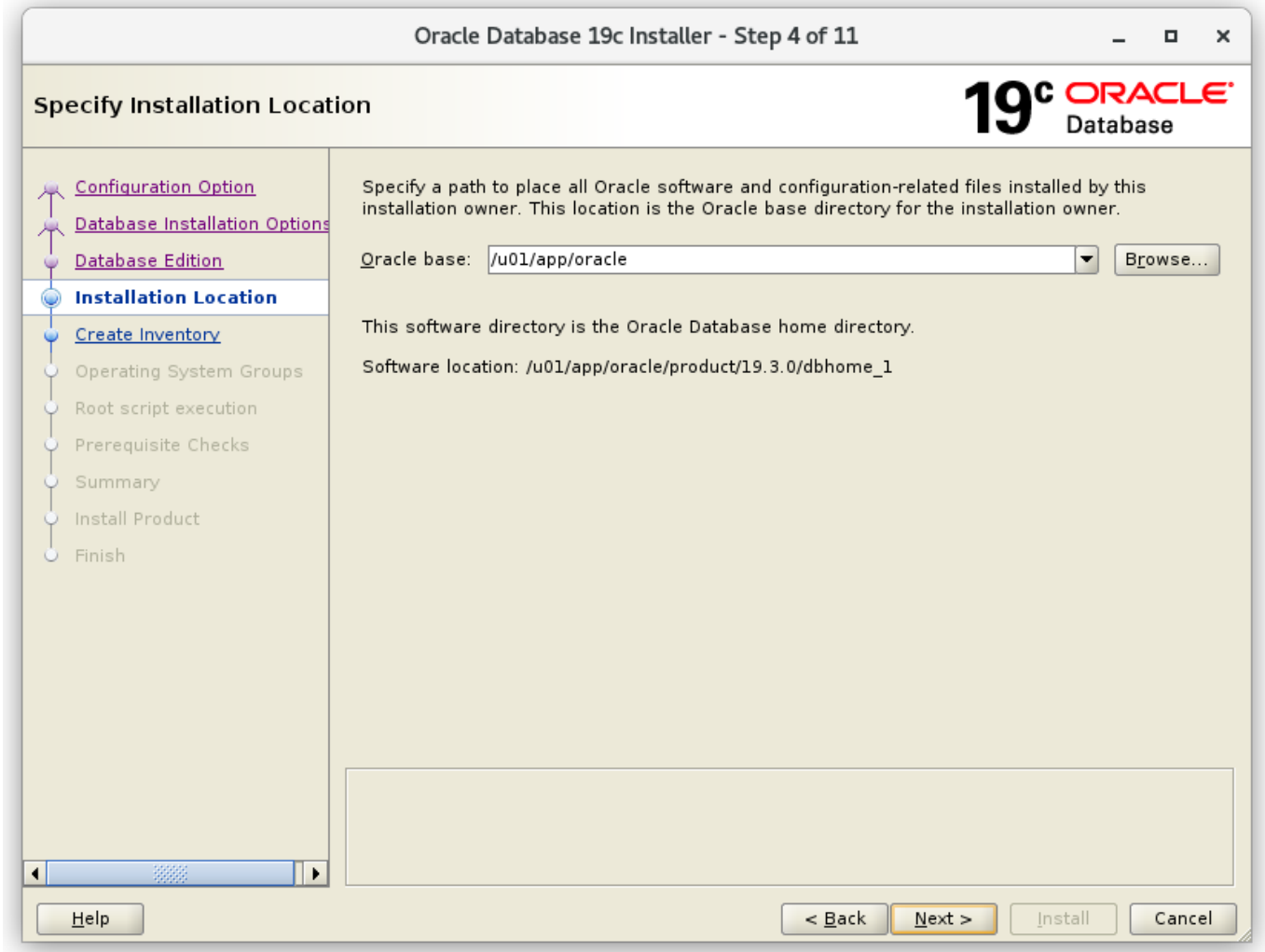
Setzen sie zunächst nur die Software auf, die Datenbank wird später mit dem [DBCA](#) Database Configuration Assistant erstellt.

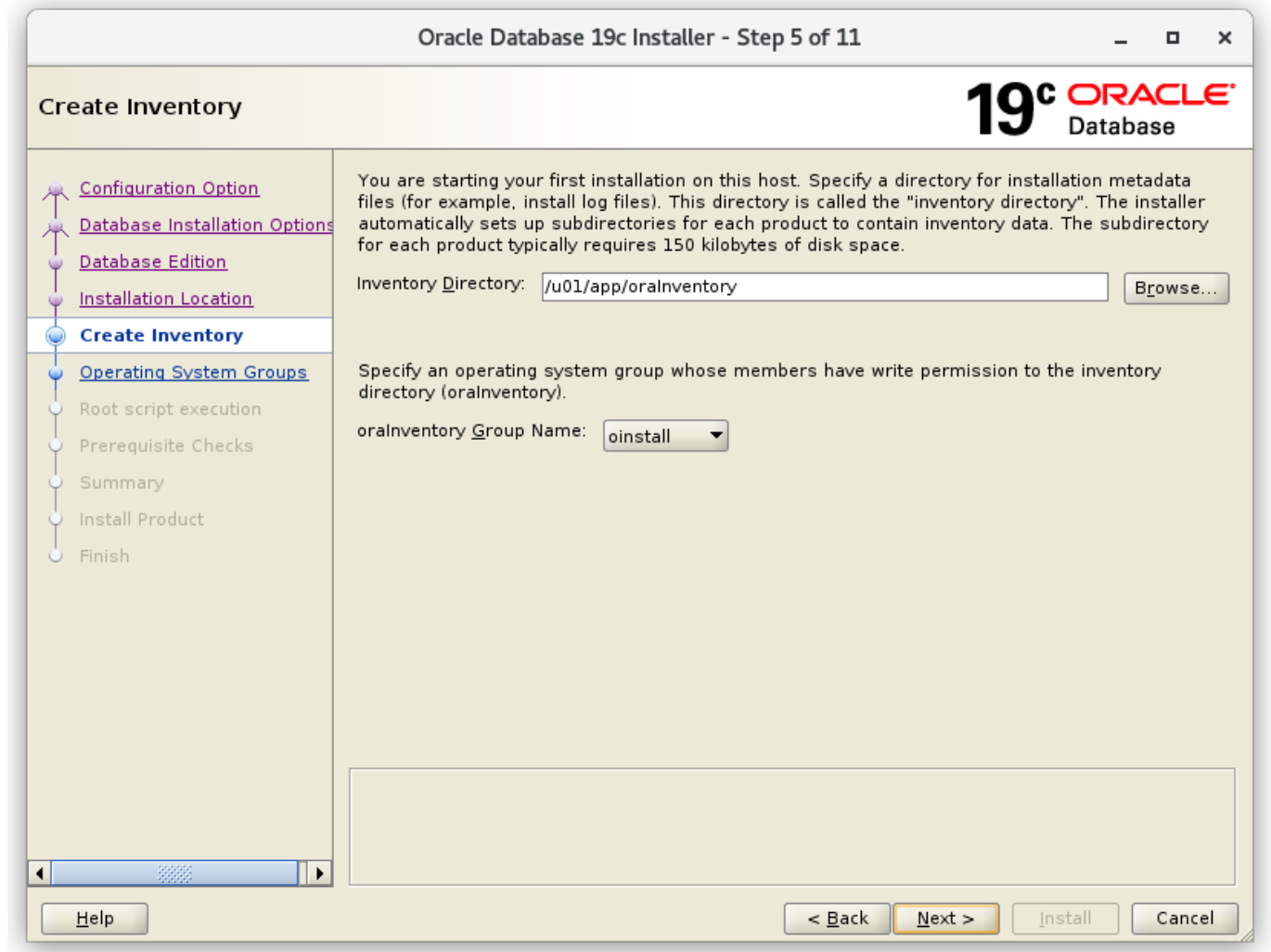
[Zeige alle Schritte](#)

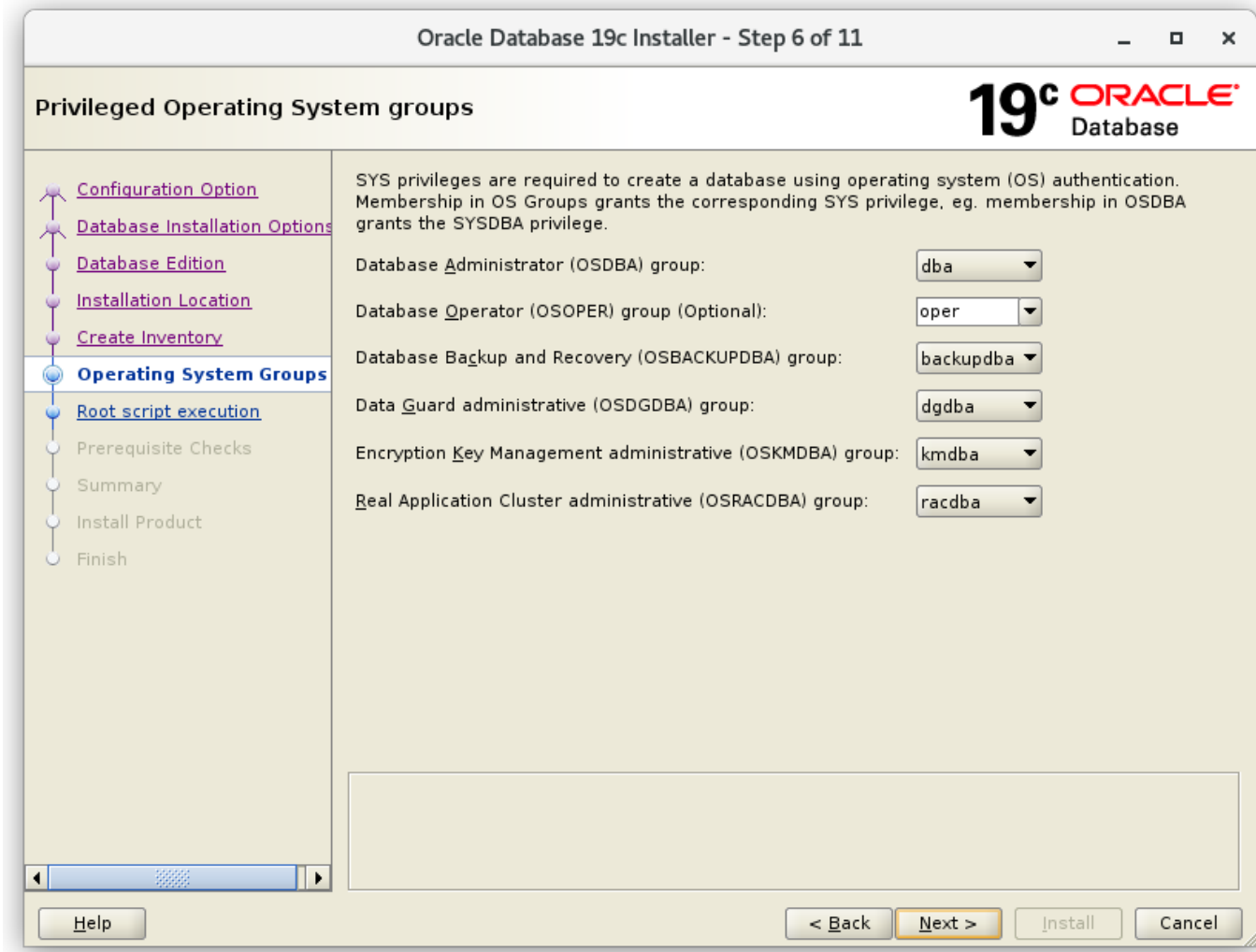












Oracle Database 19c Installer - Step 7 of 11

Root script execution configuration

19^c ORACLE[®] Database

Configuration Option

Database Installation Options

Database Edition

Installation Location

Create Inventory

Operating System Groups

Root script execution

Prerequisite Checks

Summary

Install Product

Finish

During the software configuration, certain operations have to be performed as "root" user. You can choose to have the installer perform these operations automatically by specifying inputs for one of the options below. The input specified will also be used by the installer to perform additional prerequisite checks.

☒ Automatically run configuration scripts

?

Use "root" user credential

Password :

☐ Use sudo

Program path :

User name :

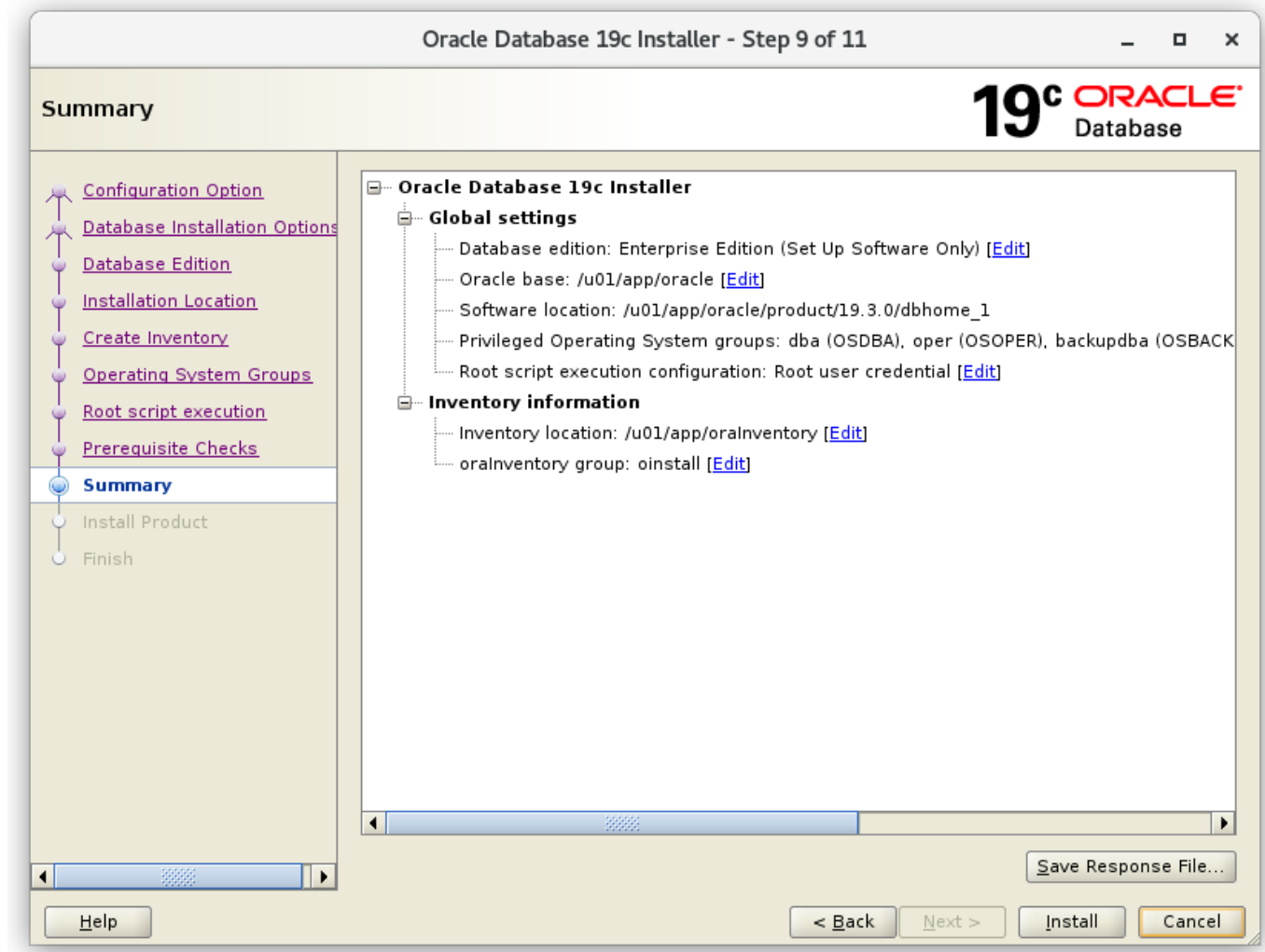
Password :

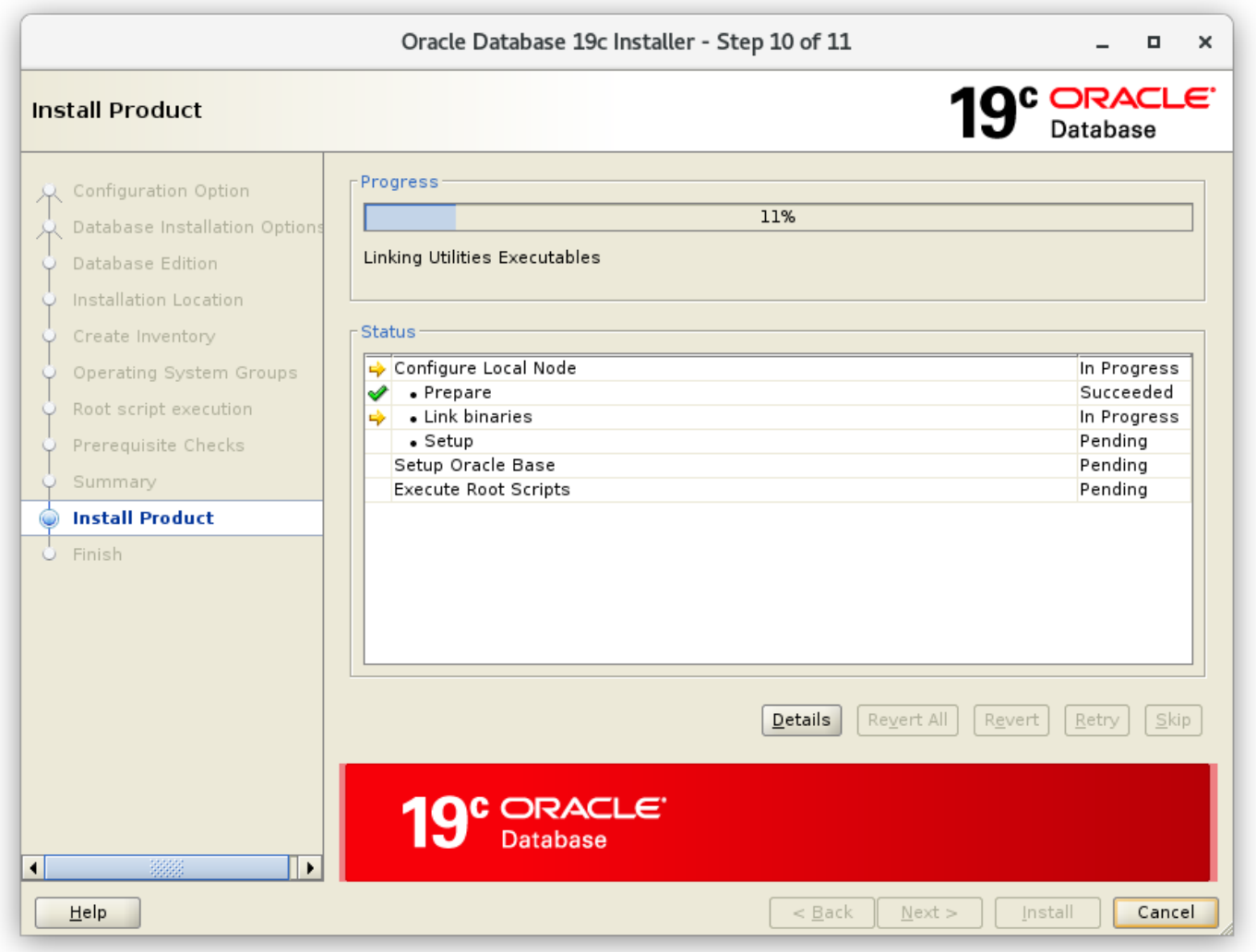
< Back

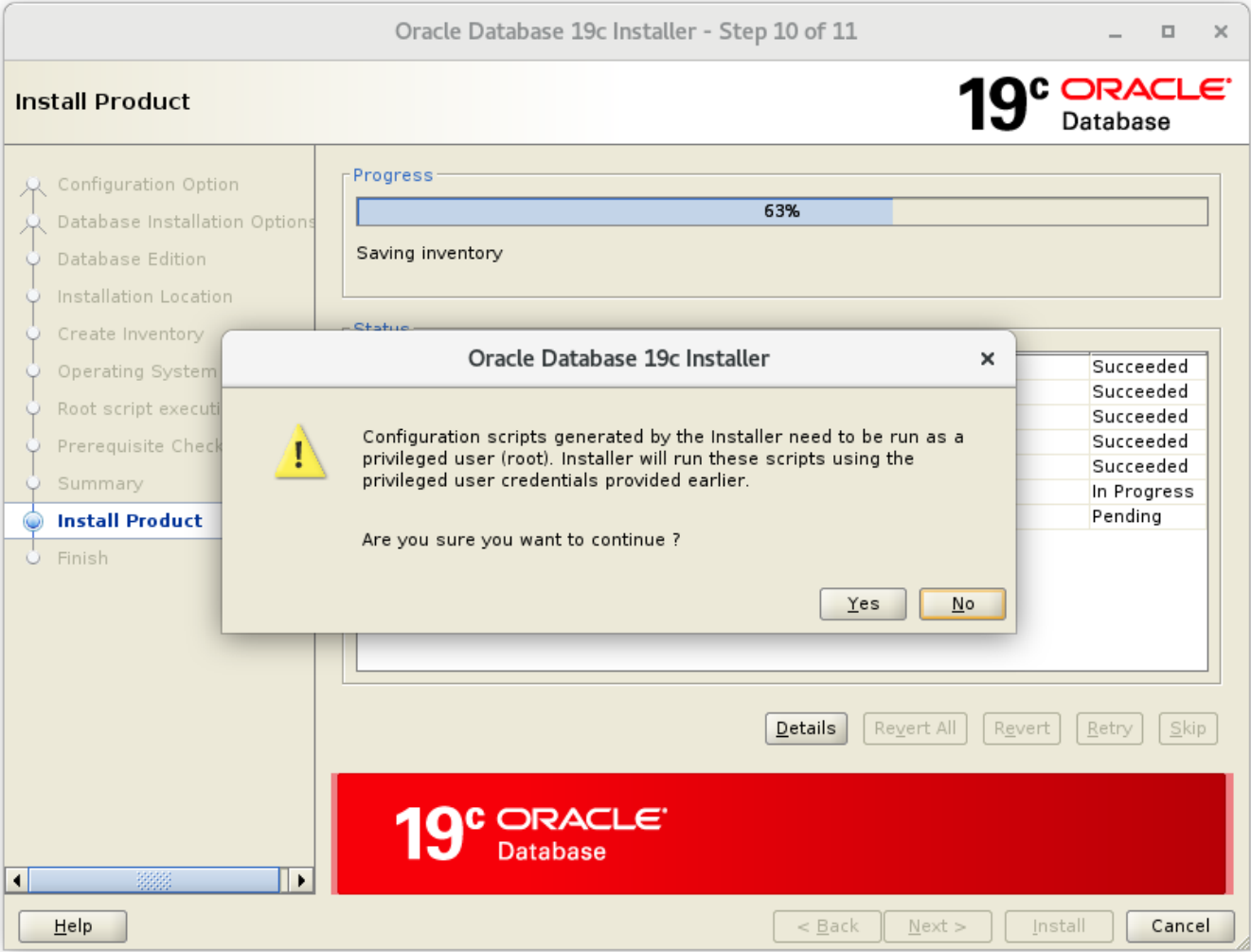
Next >

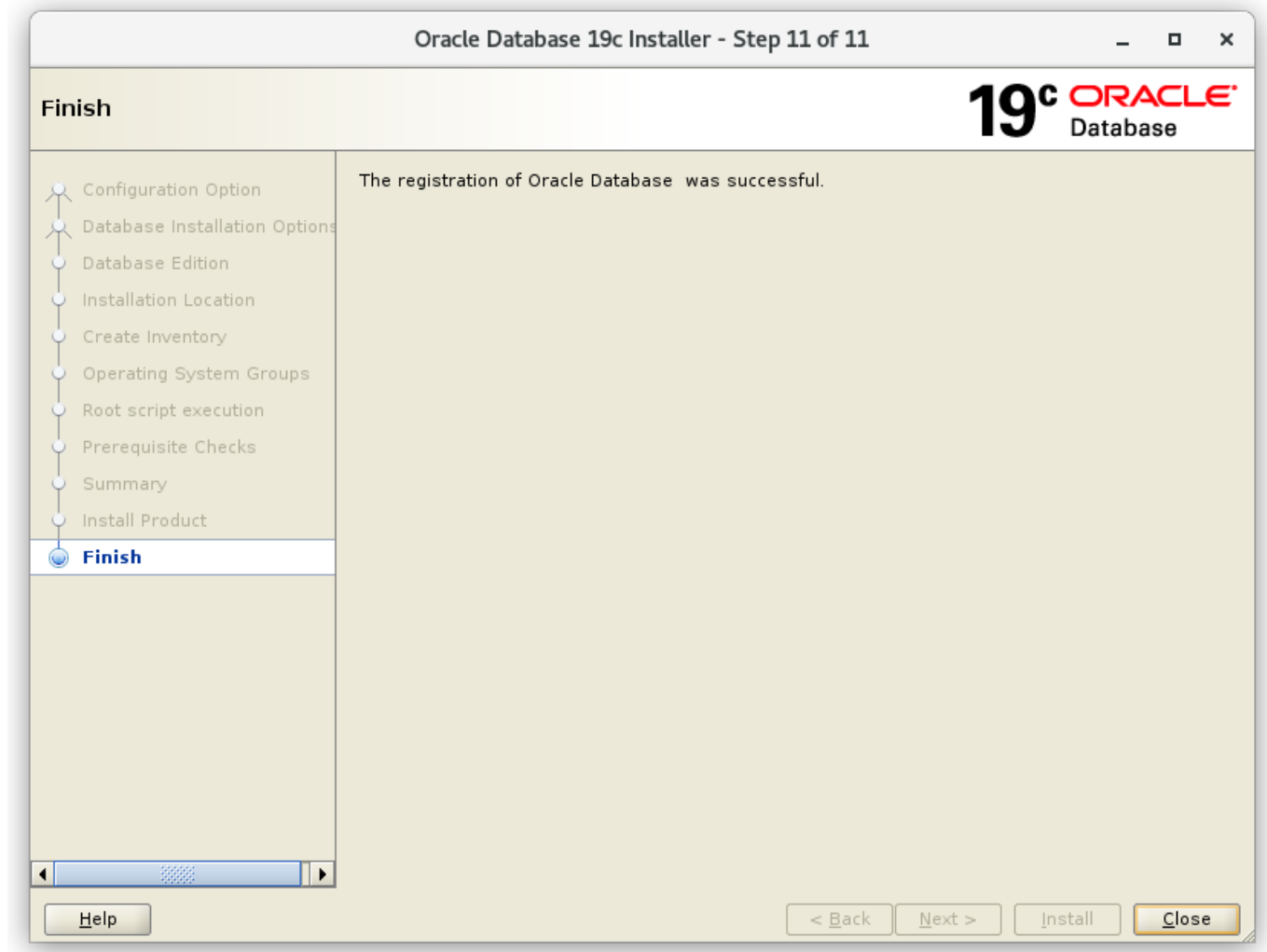
Install

Cancel









```
[oracle@vmora19 dbhome_1]$ ./runInstaller
Launching Oracle Database Setup Wizard...
```

The response file for this session can be found at:
/u01/app/oracle/product/19.3.0/dbhome_1/install/response/db_2019-09-28_07-17-03AM.rsp

You can find the log of this install session at:
/tmp/InstallActions2019-09-28_07-17-03AM/installActions2019-09-28_07-17-03AM.log

Moved the install session logs to:
/u01/app/oraInventory/logs/InstallActions2019-09-28_07-17-03AM

```
[oracle@vmora19 dbhome_1]$ █
```

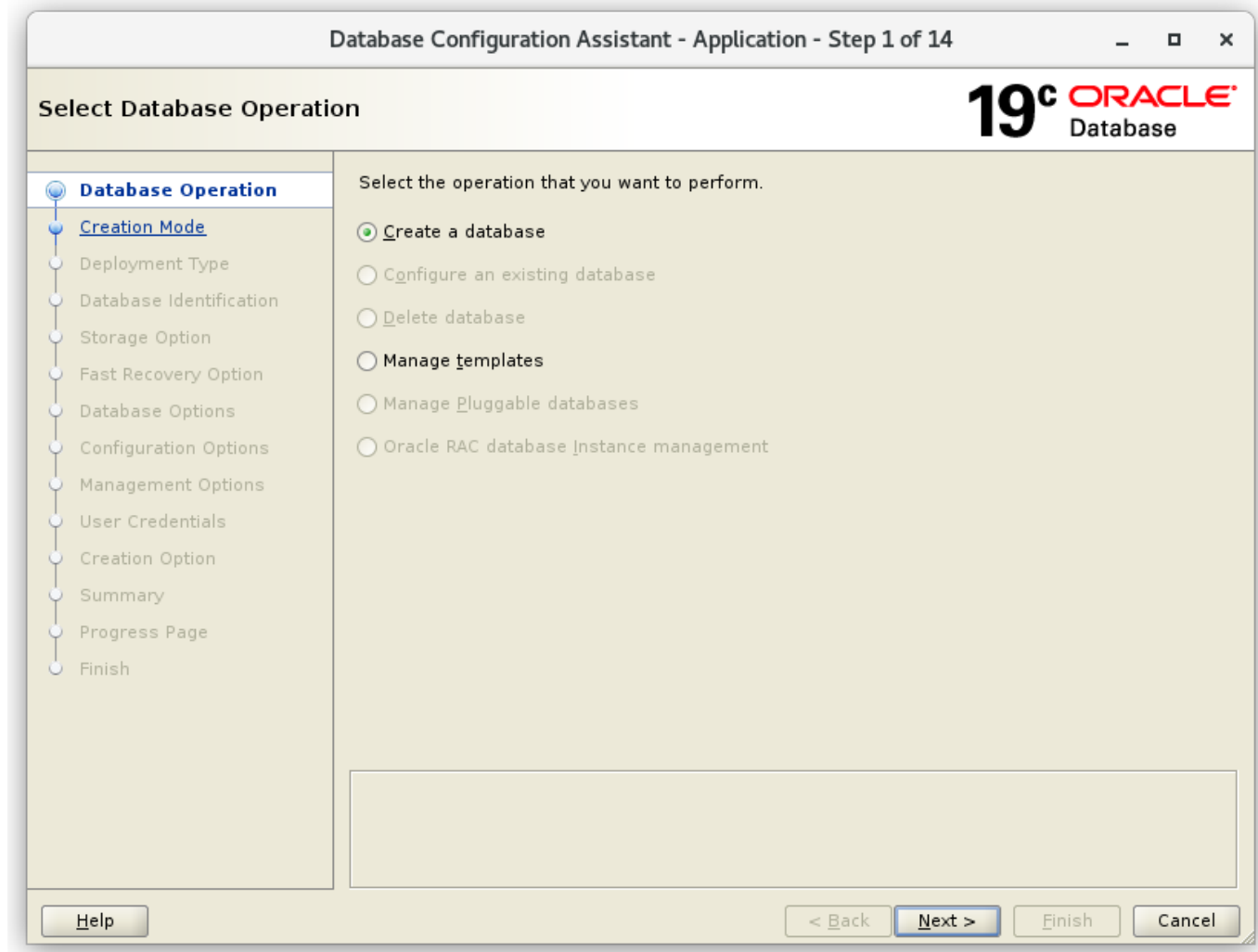
Datenbank mit dem DBCA erstellen

Im GUI als oracle anmelden und ein Terminalfenster öffnen.

Den Listener aufstarten und DCBA ausführen:

```
$ lsnrctl start
$ dbca
```

[Zeige alle Schritte](#)



Database Configuration Assistant - Create a database - Step 2 of 14

Select Database Creation Mode

19^c ORACLE[®] Database

Database Operation

Creation Mode

Deployment Type

Database Identification

Storage Option

Fast Recovery Option

Database Options

Configuration Options

Management Options

User Credentials

Creation Option

Summary

Progress Page

Finish

Typical configuration

Global database name: cdb1

Storage type: File System

Database files location: /u02/oradata/{DB_UNIQUE_NAME} Browse...

Fast Recovery Area (FRA): /u02/orafra/{DB_UNIQUE_NAME} Browse...

Database character set: AL32UTF8 - Unicode UTF-8 Universal character set

Administrative password:

Confirm password:

☒ Create as Container database

Pluggable database name: pdb1

Advanced configuration

Messages:

Administrative password:[DBT-06208] The 'ADMIN' password entered does not conform to the Oracle recommended standards.

Help

< Back

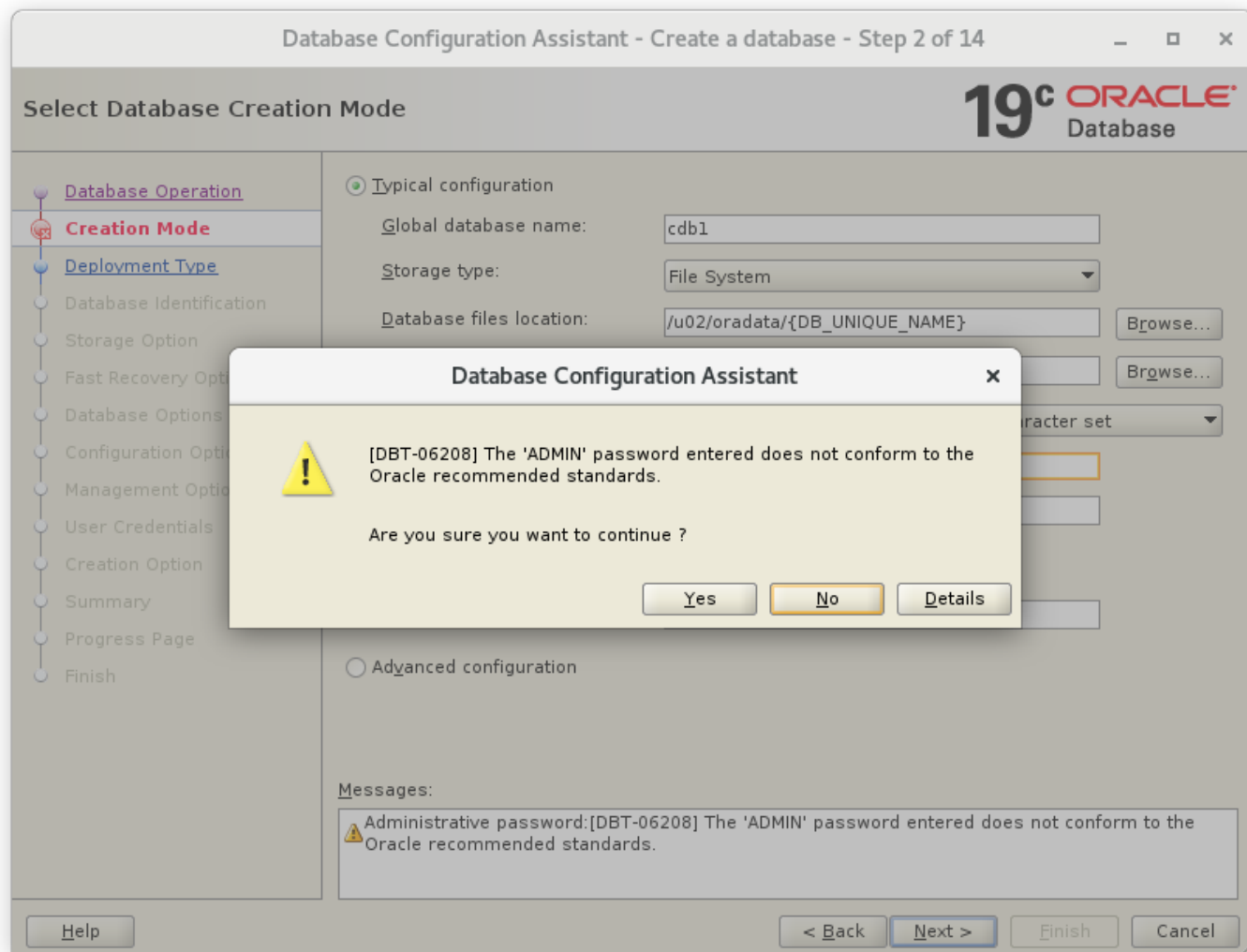
Next >

Finish

Cancel

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Database Configuration Assistant - Create 'cdb1' database - Step 3 of 5

Summary

Database Operation

Creation Mode

Summary

Progress Page

Finish

19^c ORACLE[®] Database

Database Configuration Assistant

Global Settings

Global database name: cdb1

Configuration type: Oracle Single Instance database

SID: cdb1

Create as Container database: Yes

Pluggable Database Name: pdb1

Number of Pluggable Databases: 1

Use Local Undo tablespace for PDBs: Yes

Database Files Storage Type: File System

Memory Configuration Type: Automatic Memory Management

Template name: General Purpose

Initialization Parameters

audit_file_dest: {ORACLE_BASE}/admin/{DB_UNIQUE_NAME}/adump

audit_trail: db

compatible: 19.0.0

db_block_size: 8 KB

db_create_file_dest: /u02/oradata/{DB_UNIQUE_NAME}/

db_name: cdb1

db_recovery_file_dest: /u02/orafra/{DB_UNIQUE_NAME}

db_recovery_file_dest_size: 12732 MB

diagnostic_dest: {ORACLE_BASE}

Save Response File...

Help

< Back

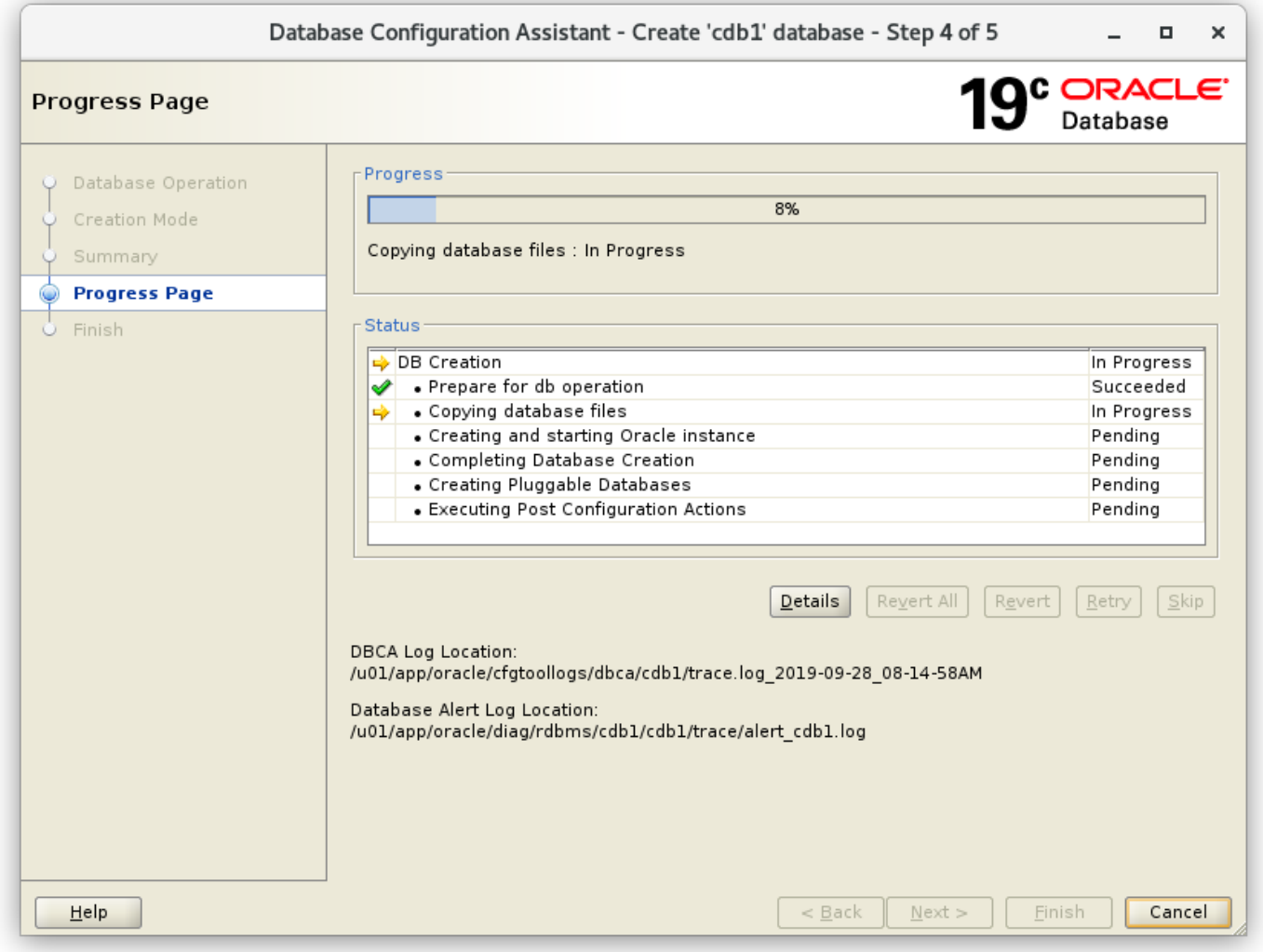
Next >

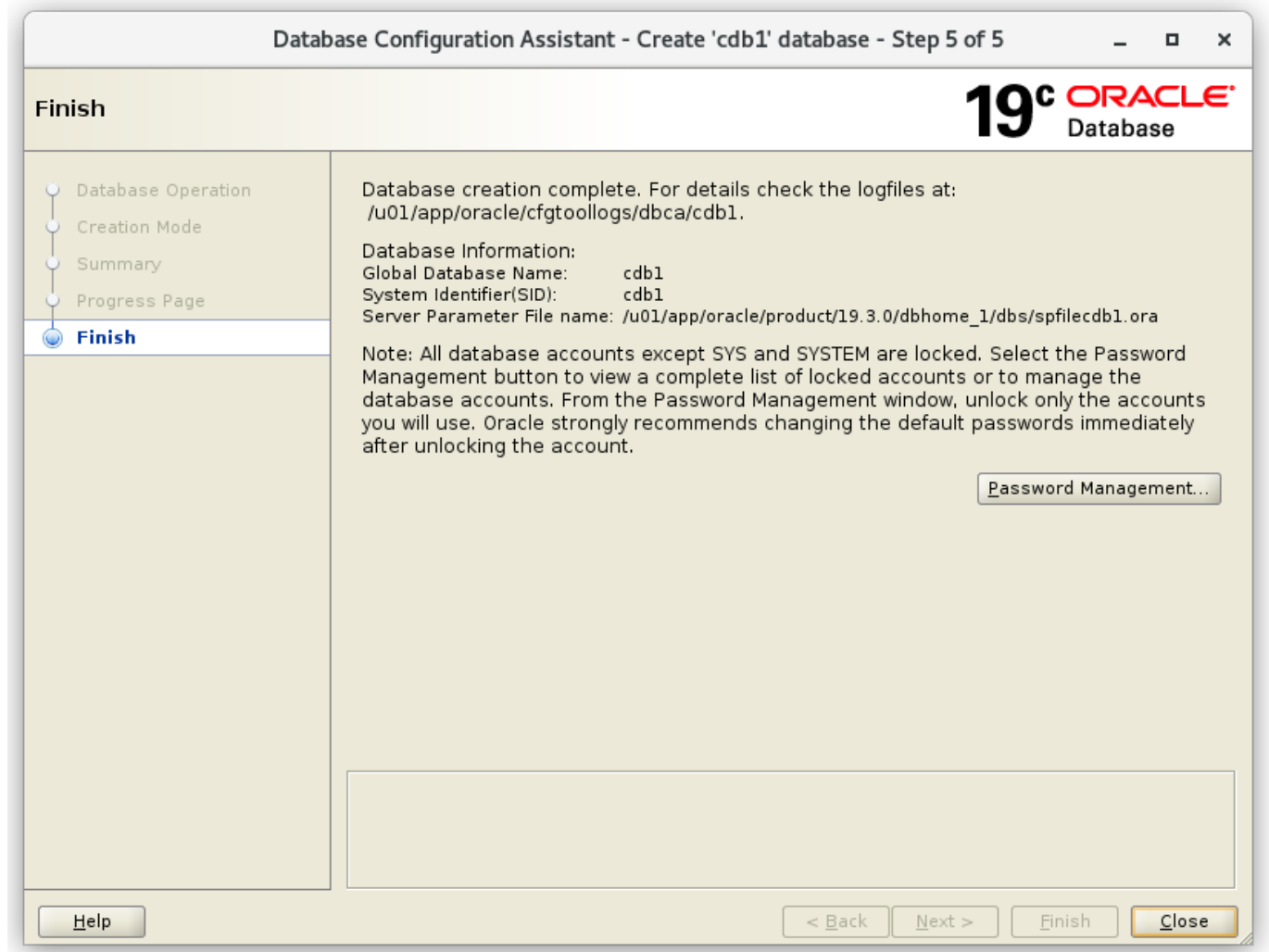
Finish

Cancel

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Server neu starten

Weitere Schritte nach der Installation

Als root

Datei `/etc/oratab` bearbeiten und das restart Flag auf 'Y' setzen damit die cdb1 beim DB Start ebenfalls automatisch startet:

```
# nano /etc/oratab
...
cdb1:/u01/app/oracle/product/19.3.0/dbhome_1:Y
...
```

Als oracle

Den Listener und die DB aufstarten:

```
$ lsnrctl start
```

```
~/scripts/start_all.sh
```

Oracle Managed Files (OMF) aktivieren einstellen dass die PDB ebenfalls startet wenn die Instanz gestartet wird.

```
$ sqlplus / as sysdba
--
alter system set db_create_file_dest='/u02/oradata';
alter pluggable database pdb1 open;
alter pluggable database pdb1 save state;
```

Automatisierung des DB Starts und des Herunterfahrens

Folgendes ist als root auszuführen:

Datei /etc/init.d/dbora erzeugen:

```
# nano /etc/init.d/dbora
```

[/etc/init.d/dbora](#)

```
#!/bin/sh
# chkconfig: 345 99 10
# description: Oracle auto start-stop script.
#
# Set ORA_OWNER to the user id of the owner of the
# Oracle database software.

ORA_OWNER=oracle

case "$1" in
    'start')
        # Start the Oracle databases:
        # The following command assumes that the oracle login
        # will not prompt the user for any values
        # Remove "&" if you don't want startup as a background process.
        su $ORA_OWNER -c "/home/oracle/scripts/start_all.sh >>
/home/oracle/scripts/startup_shutdown.log 2>&1" &

        touch /var/lock/subsys/dbora
        ;;
    'stop')
        # Stop the Oracle databases:
        # The following command assumes that the oracle login
        # will not prompt the user for any values
        su $ORA_OWNER -c "/home/oracle/scripts/stop_all.sh >>
/home/oracle/scripts/startup_shutdown.log 2>&1"
        rm -f /var/lock/subsys/dbora
        ;;
```

```
esac
```

Die Skript-Berechtigungen auf 750 einstellen

```
# chmod 750 /etc/init.d/dbora
```

Den „dbora“ Dienst mit passenden Runlevels assziieren und auf Auto-start einstellen

```
# chkconfig --add dbora
```

Sie können die Datenbank als root mit dem Dienst starten und herunterfahren, was genau das ist das beim Neustart des Systems geschieht:

```
# service dbora stop  
# service dbora start
```

Enterprise Manager Express aktivieren (optional)

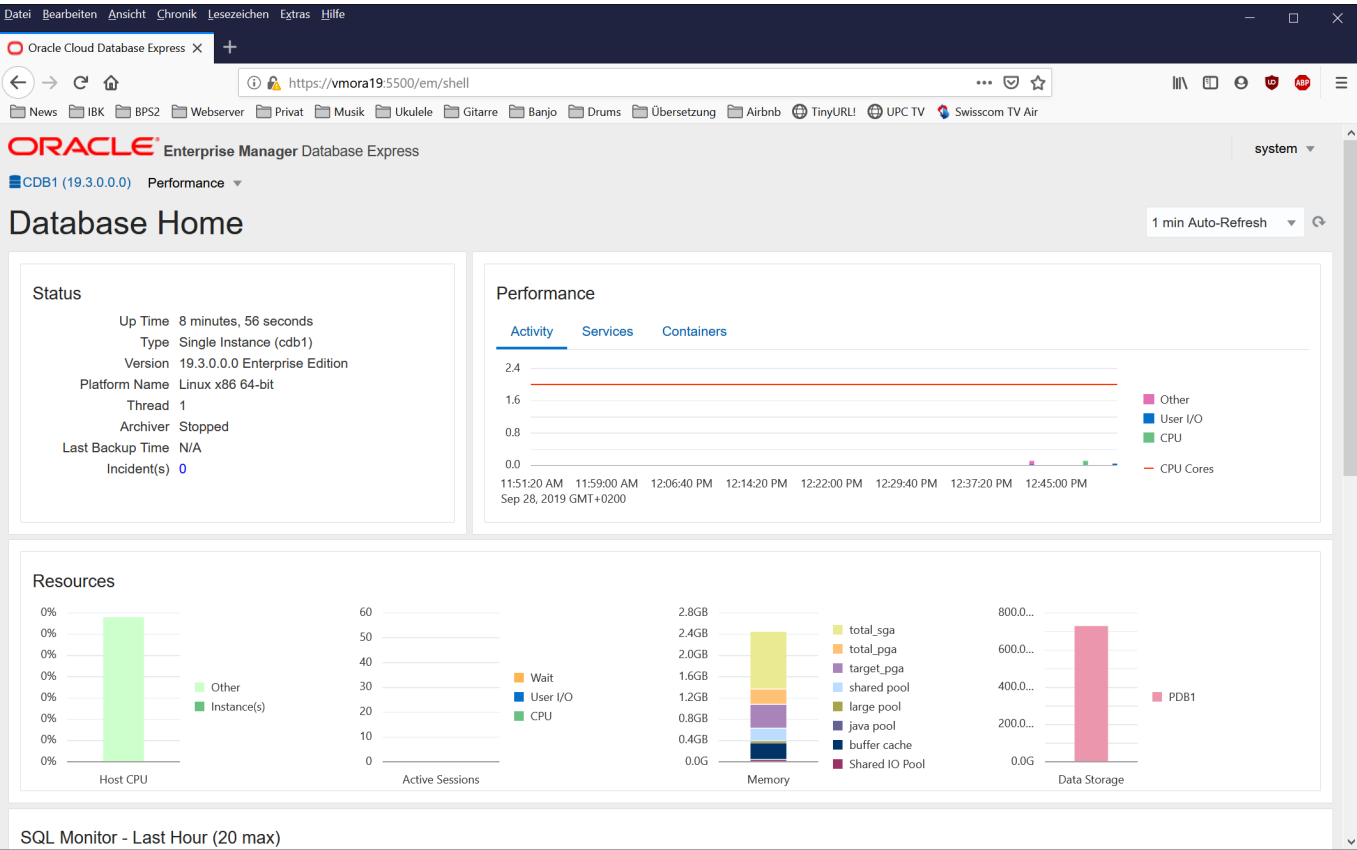
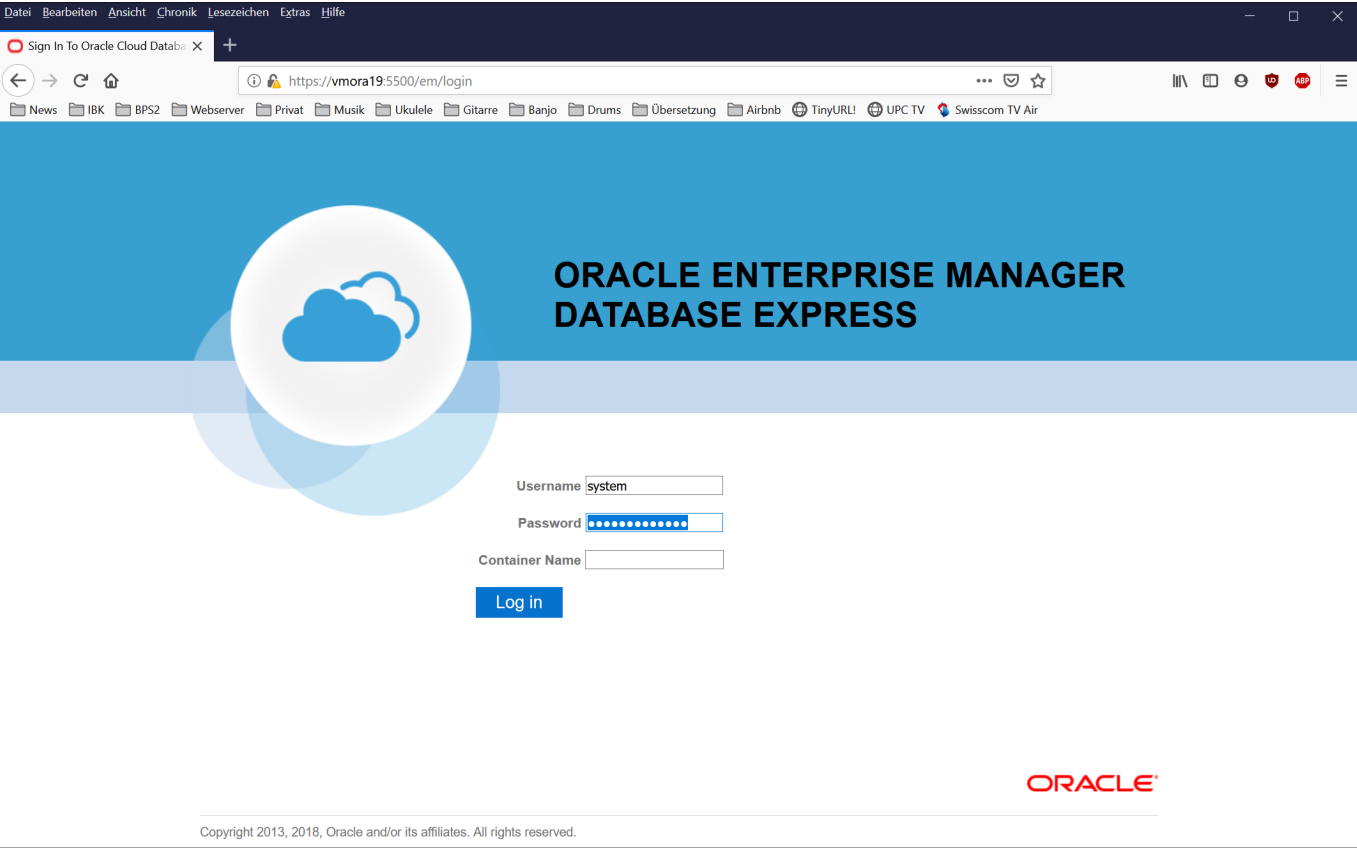


Diesen Teil bezeichne ich als optional, da der Web-basierte Enterprise Manager Express von Oracle 19c nur noch ein müder Abklatsch der früheren Enterprise Manager ist (deshalb nennen sie ihn wohl auch „Express“). Er taugt nur noch dazu den Status der DB grob zu beobachten, alle echten Management-Funktionen fehlen jedoch völlig. Der Nutzen ist deshalb äusserst fraglich.

Als oracle:

```
$ sqlplus / as sysdba  
--  
exec dbms_xdb_config.sethttpsport(5500);
```

Test im Browser



Administration

Tablespaces in pdb1 erzeugen

Sie denken vielleicht, dass es eine gute Idee ist, die Tablespaces unter den Verzeichnissen /u01 oder /u02 zu speichern, auch weil die Oracle-Dokumente über „optimale flexible Architektur“ dies zu suggerieren scheinen. Wenn Sie diese Anleitung befolgt haben, wird jedoch beim Überprüfen der verfügbaren Festplattengröße ein Problem angezeigt:

```
$ df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
devtmpfs	1.8G	0	1.8G	0%	/dev
tmpfs	1.8G	960M	879M	53%	/dev/shm
tmpfs	1.8G	9.5M	1.8G	1%	/run
tmpfs	1.8G	0	1.8G	0%	/sys/fs/cgroup
/dev/mapper/ol_vmora19-root	50G	28G	23G	55%	/
/dev/sda1	1014M	331M	684M	33%	/boot
/dev/mapper/ol_vmora19-home	445G	36G	409G	9%	/home
tmpfs	368M	0	368M	0%	/run/user/54321
tmpfs	368M	12K	368M	1%	/run/user/42

Wie Sie sehen können, befinden sich /u01 und /u02 unter /dev/mapper/ol_vmora19-root, was 50 GB gross ist. Der grösste Teil des Laufwerks ist jedoch unter /home verfügbar, nämlich 445 GB. Deshalb platziere ich meine Anwendungs-Tablespaces jeweils unter /home/oracle:

```
$ mkdir /home/oracle/pdb1
$ chmod 750 /home/oracle/pdb1
```

```
$ sqlplus / as sysdba
```

Tablespaces kreieren und auflisten:

```
SQL> ALTER SESSION SET CONTAINER = pdb1;
SQL> CREATE TABLESPACE lu_agrar_dat DATAFILE
'/home/oracle/pdb1/lu_agrar_dat.dbf' SIZE 100M AUTOEXTEND ON NEXT 100M;
SQL> CREATE TABLESPACE lu_agrar_inx DATAFILE
'/home/oracle/pdb1/lu_agrar_inx.dbf' SIZE 100M AUTOEXTEND ON NEXT 100M;
SQL> SELECT TABLESPACE_NAME, STATUS, CONTENTS FROM DBA_TABLESPACES;
```

TABLESPACE_NAME	STATUS	CONTENTS
SYSTEM	ONLINE	PERMANENT
SYSAUX	ONLINE	PERMANENT
UNDOTBS1	ONLINE	UNDO
TEMP	ONLINE	TEMPORARY
USERS	ONLINE	PERMANENT
LU_AGRAR_DAT	ONLINE	PERMANENT
LU_AGRAR_INX	ONLINE	PERMANENT

7 rows selected.

Überprüfen dass die neuen Tablespaces tatsächlich nur in pdb1 verfügbar sind:

```
SQL> ALTER SESSION SET CONTAINER = CDB$ROOT;
SQL> SELECT TABLESPACE_NAME, STATUS, CONTENTS FROM DBA_TABLESPACES;
```

TABLESPACE_NAME	STATUS	CONTENTS
SYSTEM	ONLINE	PERMANENT
SYSAUX	ONLINE	PERMANENT
UNDOTBS1	ONLINE	UNDO
TEMP	ONLINE	TEMPORARY
USERS	ONLINE	PERMANENT

Tablespaces aus pdb1 entfernen und löschen

```
$ sqlplus / as sysdba
```

Tablespaces anzeigen und löschen:

```
SQL> ALTER SESSION SET CONTAINER = pdb1;
SQL> SELECT TABLESPACE_NAME, STATUS, CONTENTS FROM DBA_TABLESPACES;
SQL> DROP TABLESPACE lu_agrar INCLUDING CONTENTS AND DATAFILES;
```

Speicherverbrauch überwachen

```
$ sqlplus / as sysdba
```

Speicherverbrauch pro Tablespace überwachen:

```
SQL> select tablespace_name, round(bytes/1024/1024) MB,
round(bytes/1024/1024/1024,3) GB from cdb_data_files;
```

Beispielausgabe:

TABLESPACE_NAME	MB	GB
USERS	5	.005
UNDOTBS1	65	.063
SYSTEM	840	.82
SYSAUX	580	.566
SYSTEM	290	.283
SYSAUX	430	.42
UNDOTBS1	220	.215
USERS	5	.005
LU_AGRAR_DAT	50	.049
LU_AGRAR_INX	50	.049

Wenn sie nur die Summe aller Benutzer-Daten wollen:

```
SQL> select round(sum(bytes)/1024/1024) MB,
```

```
round(sum(bytes)/1024/1024/1024,3) GB from cdb_data_files -
> where tablespace_name not like 'SYS%' and tablespace_name not like
'UNDO%';
```

Beispielausgabe:

MB	GB
-----	-----
2535	2.476

TNSNAMES Eintrag bei Clients

```
VMORA19 =
(DESCRIPTION =
  (ADDRESS = (PROTOCOL = TCP)(HOST = vmora19)(PORT = 1521))
  (CONNECT_DATA =
    (SERVER = DEDICATED)
    (SERVICE_NAME = pdb1)
  )
)
```

Ablaufen der Passworte verhindern

Möglicherweise möchten Sie das Ablaufen des Kennworts zumindest für SYSTEM und die BPS-Superuser deaktivieren.

```
$ sqlplus / as sysdba
```

Die Profile kontrollieren:

```
SQL> select profile from DBA_USERS where username = 'SYSTEM';
SQL> select profile from DBA_USERS where username = 'LU_AGRAR';
```

Einstellungen in den Profilen kontrollieren, z.B. im DEFAULT Profil:

```
SQL> select resource_name,limit from dba_profiles where profile='DEFAULT';
```

Auf unlimitiert ändern:

```
SQL> alter profile DEFAULT limit password_life_time UNLIMITED;
```

Einen Benutzer wieder entsperren:

```
SQL> alter user system identified by ***** account unlock;
```


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