

SAP Netweaver 7.5 with MaxDB 7.9 on Azure using Azure NetApp Files (ANF)

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Overview

This article describes the setup of SAP ERP 7.5 with MaxDB 7.9. In addition, we will show how to use azacsnap to create application consistent snapshots. This article is written for an audience which are familiar with Azure, Linux and SAP Basis. Since the login mechanism changed in version 7.7 we can only support the MaxDB 7.9 with all the automation scripts explained here in the documentation.

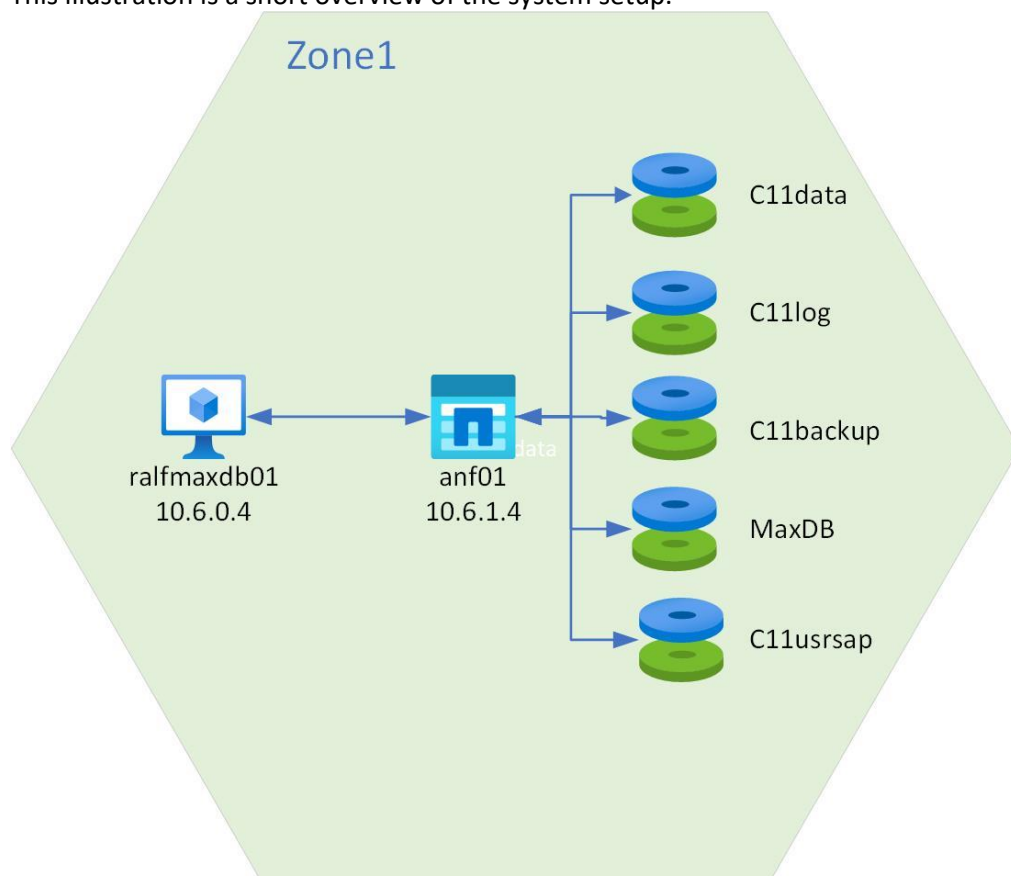
[SAP MaxDB: The SAP Database - Home](#)

[SAP MaxDB - MaxDB - Support Wiki](#)

[SAP MaxDB Directory Structure - MaxDB - Support Wiki](#)

System Configuration

This illustration is a short overview of the system setup.

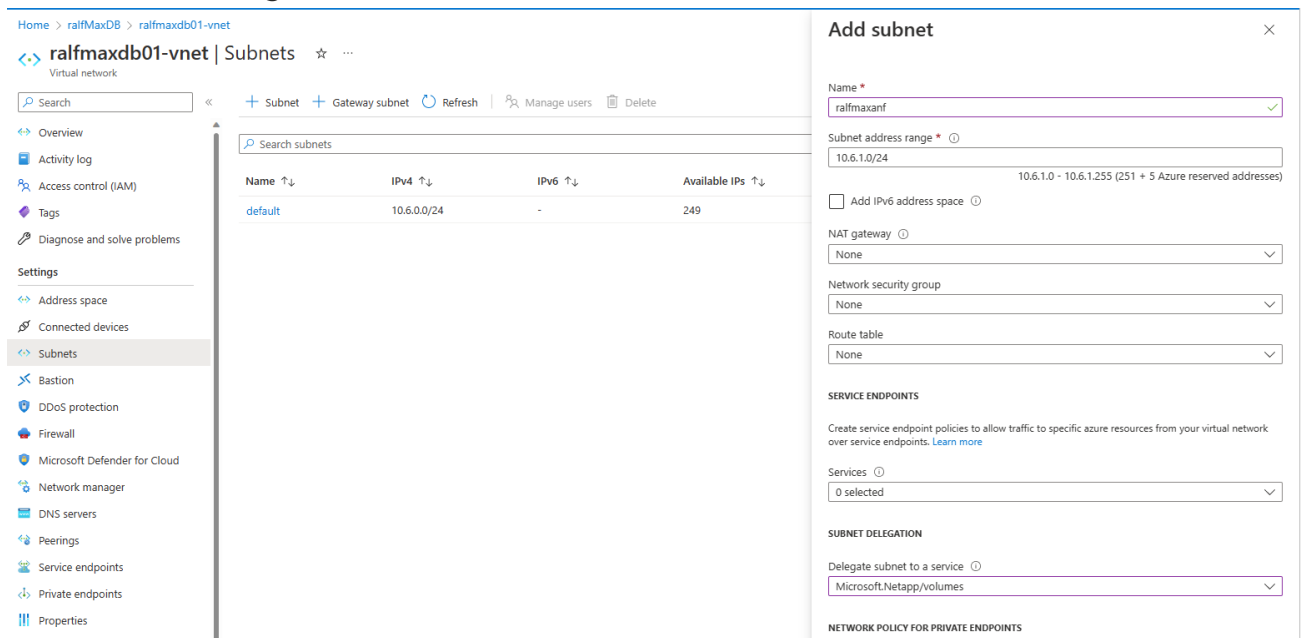


Create the Environment

The VM

Subscription	SAP	your subscription
Resource group	(new) ralfMaxDB	
Virtual machine name	ralfmaxdb01	
Region	East US	
Availability options	Availability zone	
Availability zone	1	
Security type	Standard	
Image	SUSE Enterprise Linux 15 SP3 +Patching - Gen2	
VM architecture	x64	
Size	Standard E16-8ads v5 (8 vcpus, 128 GiB memory)	
Authentication type	Password	
Username	admin01	

Create the delegated network for ANF



The screenshot shows the Azure portal interface for configuring a subnet. The main window displays the 'Add subnet' dialog with the following settings:

- Name:** ralfmaxanf
- Subnet address range:** 10.6.1.0/24 (10.6.1.0 - 10.6.1.255 (251 + 5 Azure reserved addresses))
- Add IPv6 address space:**
- NAT gateway:** None
- Network security group:** None
- Route table:** None
- SERVICE ENDPOINTS:** 0 selected
- SUBNET DELEGATION:** Delegate subnet to a service: Microsoft.Netapp/volumes

The background shows the 'Subnets' view of the virtual network 'ralfmaxdb01-vnet', with a table listing the existing 'default' subnet (10.6.0.0/24) and its available IP count (249).


Create the Volume Structure

Download the sources from the SAP Marketplace

The DB Export

<input type="checkbox"/>	51050829_3 NW 7.5 Installation Export	ZIP	3605690 KB	29.09.2016	29.09.2016	
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The SWPM

<input type="checkbox"/>	SWPM10SP37_0-20009701.SAR SWPM 1.0 SP37 for NW higher than 7.0x	0 SAR	428545 KB	13.02.2023	13.02.2023	
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The MaxDB

[SAP NETWEAVER / SAP NETWEAVER 7.5 /](#)

INSTALLATION AND UPGRADE

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)

 Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).

<input type="checkbox"/>	51052559_8 MaxDB 7.9 - SP9 Build 05 Linux on x86_64 64bit	ZIP	149180 KB	26.10.2017	26.10.2017	
--------------------------	--	-----	-----------	------------	------------	---


The SAPCAR

SAPCAR 7.22 (SUPPORT PACKAGES AND PATCHES)

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)


 Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).

Items Available to Download (1)

LINUX ON X86_64 64BIT 

Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	SAPCAR_1115-70006178.EXE SAPCAR	1115	EXE	4402 KB	28.01.2022	28.01.2022	

The Kernel

SAP KERNEL 64-BIT UNICODE /

SAP KERNEL 7.53 64-BIT UNICODE

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)


i Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).

Items Available to Download (22)

LINUX ON X86_64 64BIT

MAXDB



<input type="checkbox"/>	SAPEXEDB_1100-80002604.SAR Kernel Part II (753)	1100	SAR	18286 KB	09.12.2022	09.12.2022	
--------------------------	--	------	-----	----------	------------	------------	---

SAP KERNEL 64-BIT UNICODE /

SAP KERNEL 7.53 64-BIT UNICODE

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)

i Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).


Items Available to Download (52)

LINUX ON X86_64 64BIT

#DATABASE INDEPENDENT



Selected Items (0)

<input type="checkbox"/>	SAPEXE_1100-80002573.SAR Kernel Part I (753)	1100	SAR	385247 KB	09.12.2022	09.12.2022	
--------------------------	---	------	-----	-----------	------------	------------	---

The IGS

SAP IGS 7.53 (SUPPORT PACKAGES AND PATCHES)

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)


i Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).

Items Available to Download (15)

LINUX ON X86_64 64BIT



Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	igsexe_14-80003187.sar Installation for SAP IGS integrated in SAP Kernel	14	SAR	102444 KB	15.02.2023	15.02.2023	

SAP IGS HELPER (SUPPORT PACKAGES AND PATCHES)

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)

i Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).

Items Available to Download (5) # OS INDEPENDENT

Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	igshelper_17-10010245.sar SAP IGS Fonts and Textures	17	SAR	61489 KB	12.04.2018	12.04.2018	

Finally, the HOST Agent.

SAP HOST AGENT 7.22 (SUPPORT PACKAGES AND PATCHES)

[DOWNLOADS](#) [INFO](#) [ECCN INFO](#)

i Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See [SAP Note 886535](#).

Items Available to Download (16) LINUX ON X86_64 64BIT

Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	SAPHOSTAGENT59_59-80004822.SAR SAP HOST AGENT 7.22 SP59	59	SAR	78439 KB	09.01.2023	09.01.2023	

Volume design on ANF

Create the volume structure on ANF. The size of each volume depends on a proper capacity and performance sizing.

Mount the volumes and create the directories.

Modify the idmapd to align the NFSv4 domain.

```
vi /etc/idmapd.conf
# Example
[General]
Domain = defaulttv4iddomain.com
[Mapping]
Nobody-User = nobody
Nobody-Group = nobody
```

update the system

```
zypper up
```

Install the RPM's regarding the installation manual

```
zypper in motif libXtst-devel libXp-devel libX11-devel libSM-devel libICE-devel
zypper in glibc-32bit sapconf
```

Maintain the sysctl.conf

```
vi /etc/sysctl.conf
net.ipv6.conf.all.disable_ipv6 = 1
net.core.somaxconn = 4096
net.core.netdev_max_backlog = 300000
net.ipv4.tcp_rmem = 4096 131072 16777216
net.ipv4.tcp_wmem = 4096 16384 16777216
net.ipv4.tcp_max_syn_backlog = 16348
net.core.rmem_max = 16777216
net.core.wmem_max = 16777216
net.ipv4.tcp_slow_start_after_idle = 0
net.ipv4.conf.all.rp_filter = 0
net.ipv4.tcp_dsack = 1
net.ipv4.tcp_sack = 1
net.ipv4.tcp_no_metrics_save = 1
net.ipv4.tcp_moderate_rcvbuf = 1
net.ipv4.tcp_window_scaling = 1
net.ipv4.tcp_syn_retries = 8
net.ipv4.tcp_tw_reuse = 1
net.ipv4.tcp_timestamps = 1
net.ipv4.tcp_tw_recycle = 1
```

reboot the system to apply all the changes and reload the kernel after the update.

```
reboot
```

Check that sapconf is running and that it is enabled.

```
sapconf_check
```

```
This is sapconf_check v1.0.
```

```
It verifies if sapconf is set up correctly and will give advice to do so.
```

```
Please keep in mind:
```

- This tool does not check, if the tuning itself works correctly.
- Follow the hints from top to down to minimize side effects.

```
Checking sapconf
```

```
=====
```

```
[ OK ] sapconf package has version 5.0.5
[ OK ] sapconf.service is active
[ OK ] sapconf.service is enabled
```

```
Sapconf is set up correctly.
```

create the group ID for your SAP systems (should be the same for all SAP systems)

```
groupadd sapsys -g 79
groupadd sdba -g 1001
```






creating the DB users to avoid issues during the DB installation

```
useradd c11adm -g sapsys -c "SAP System Administrator" -u 1001 -s /bin/csh -d /home/c11adm
useradd sapadm -g sapsys -c "SAP System Administrator" -u 1002 -s /bin/false -d /home/sapadm
useradd sdb -g sdba -c "Database Software Owner" -u 1003 -s /bin/csh -d /home/sdb
useradd sqdc11 -g sapsys -c "Owner of Database Instance C11" -u 1004 -s /bin/csh -d /home/sqdc11

passwd c11adm
passwd sapadm
passwd sdb
passwd sqdc11
```

MaxDB Volume design for non XXL installations

As usual, create one shared volume for the Application Server part , a MaxDB volume for the database specific directories, data and log volume and the backup volume ideally on a different storage endpoint. In this PoC we have all storage endpoints on one IP, which is okay for small and medium installations.

Name	↑↓ Quota	↑↓ Throughput	↑↓ Protocol type	↑↓ Mount path	↑↓ Service level	↑↓ Network features ↑↓
 C11backup	1 TiB	128 MiB/s	NFSv4.1	10.6.1.4:/C11backup	Ultra	Standard
 C11data	1 TiB	128 MiB/s	NFSv4.1	10.6.1.4:/C11data	Ultra	Standard
 C11log	384 GiB	48 MiB/s	NFSv4.1	10.6.1.4:/C11log	Ultra	Standard
 C11MaxDB	384 GiB	48 MiB/s	NFSv4.1	10.6.1.4:/C11MaxDB	Ultra	Standard
 C11usrsap	248 GiB	31 MiB/s	NFSv4.1	10.6.1.4:/C11usrsap	Ultra	Standard

Get the FQDN name of the VM

```
hostname -f
ralfmaxdb01.lgbsmidv51rurp4qqyuwbceesh.bx.internal.cloudapp.net
```

maintain the /etc/hosts

```
vi /etc/hosts

127.0.0.1          localhost
#
10.6.0.4          ralfmaxdb01.lgbsmidv51rurp4qqyuwbceesh.bx.internal.cloudapp.net  ralfmaxdb01
10.6.1.4          anf01
```

Create the SAP App server structure

```
mount -o vers=4.1 anf01:/C11usrsap /mnt
mkdir -p /mnt/sapmnt /mnt/usr_sap
mkdir -p /usr/sap/C11 /sapmnt
umount /mnt
```

Create the MaxDB "installation" structure

```
mount -t nfs -o vers=4.1 anf01:/C11MaxDB /mnt
mkdir -p /sapdb
mkdir -p /mnt/C11
```

Create the data structure

```
mkdir -p /sapdb/C11/sapdata
mkdir -p /mnt/C11/sapdata
```

Create the log structure

```
mkdir -p /sapdb/C11/saplog
mkdir -p /mnt/C11/saplog
```

Create the backup structure

```
mkdir -p /mnt/C11/backup
mount -t nfs -o vers=4.1 anf01:/C11backup /mnt/C11/backup
mkdir -p /sapdb/C11/backup/data /sapdb/C11/backup/log
mkdir -p /mnt/C11/backup/data /mnt/C11/backup/log
umount /mnt/C11/backup
umount /mnt
```

Create the fstab

```
vi /etc/fstab
...
/dev/sdc /Software xfs defaults 0 0
anf01:/C11usrsap/usr_sap /usr/sap nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
anf01:/C11usrsap/sapmnt /sapmnt nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
anf01:/C11MaxDB /sapdb nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
anf01:/C11data /sapdb/C11/sapdata nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
anf01:/C11log /sapdb/C11/saplog nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
anf01:/C11backup/data /sapdb/C11/backup/data nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
anf01:/C11backup/log /sapdb/C11/backup/log nfs
rw,hard,timeo=600,vers=4.1,nconnect=8,rsize=262144,wsiz=262144,noatime,lock 0 0
```

```
mount -a
chown -R sdb:sdba /sapdb
```

Create the Software directory

Create a /Software directory where you store the SAP archives.

Create the Software Disk

```
lsblk
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda        8:0    0   30G  0 disk
├─sda1     8:1    0    2M  0 part
├─sda2     8:2    0   512M 0 part /boot/efi
├─sda3     8:3    0    1G   0 part /boot
└─sda4     8:4    0  28.5G 0 part /
sdb        8:16   0   600G  0 disk
└─sdb1     8:17   0   600G  0 part
sdc        8:32   0    1T   0 disk
```

```
mkfs -t xfs /dev/sdc
mkdir /Software
```

```
ll /Software
drwxrwxrwx 3 root root      263 Mar  6 20:06 Export
drwxrwxrwx 2 root root      173 Mar  6 19:51 Kernel
drwxrwxrwx 2 root root       60 Mar  6 19:51 MaxDB
-rwxrwxrwx 1 root root 4507168 Mar  6 15:27 SAPCAR_1115-70006178.EXE
drwxrwxrwx 2 root root       22 Mar  6 19:51 SWPM
```

copy the SAPCAR into the PATH

```
mv SAPCAR_1115-70006178.EXE /usr/bin/SAPCAR
```

ASCS Installation

Extract the SWPM archive and start the SAP Installation

```
cd /Software/SWPM
SAPCAR -xf SWPM10SP37_0-20009701.SAR
SAPCAR: processing archive SWPM10SP37_0-20009701.SAR (version 2.01)
SAPCAR: 837 file(s) extracted
```

set the root password on the VM (required for the SAP installation)

```
sudo su -
passwd
Changing password for user root.
New password: *****
Retype new password: *****
passwd: all authentication tokens updated successfully.
```

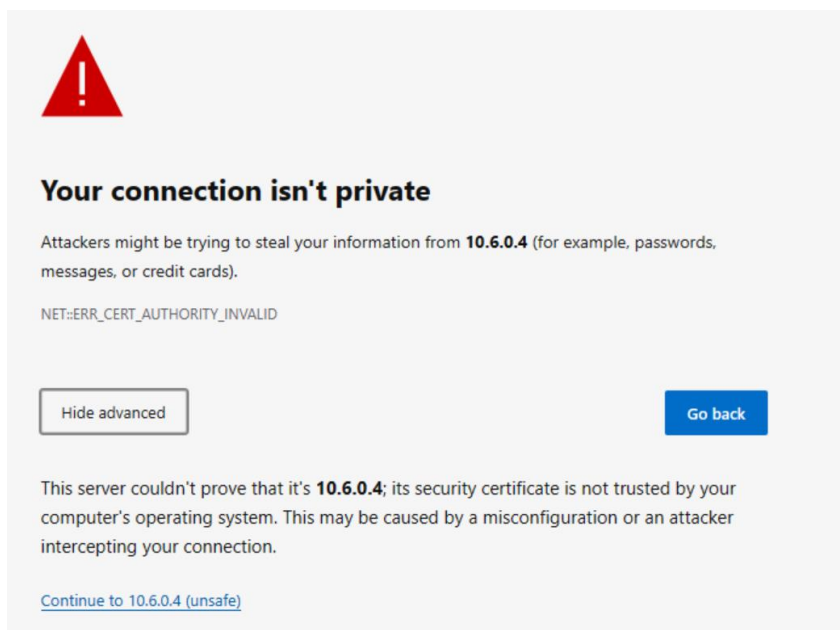
Start the SWPM

```
/Software/SWPM # ./sapinst
```

Open your browser with

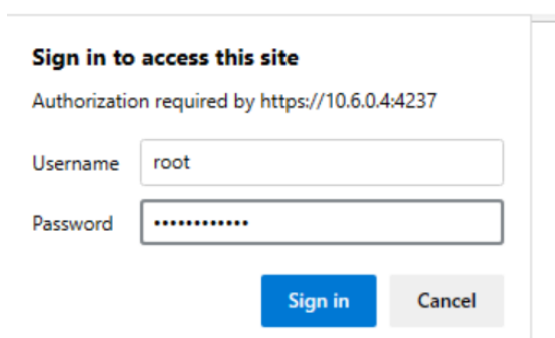
<https://10.6.0.4:4237/sapinst/docs/index.html>

and select **advanced**



Select continue.






Login as root




SAP Software Provisioning Manager

Welcome

Go to the option you want to execute.

- ▼  SAP NetWeaver 7.5
 - > IBM Db2 for Linux, UNIX, and Windows
 - > IBM Db2 for z/OS
- ▼  MaxDB
 - > Preparations
- ▼  Installation
- ▼  Application Server ABAP
 - > Standard System
 - ▼  Distributed System

 **ASCS Instance**

SAP ASCS Instance

Define Parameters Review Parameters Execute Service Service Completed

Parameter Settings

Choose whether you want to run the installation in a typical or a custom mode.

Parameter Settings

Parameter Mode

Typical

Custom

SAP ASCS Instance


Define Parameters » Review Parameters » Execute Service » Service Completed

General SAP System Parameters

Enter the SAP system ID.

SAP System

*SAP System ID (SAPSID)

SAP Mount Directory 


Additional Information

The *SAP System ID* is an identifier for your SAP system. It must be unique throughout your system landscape.
The system is installed under `/usr/sap/<SAPSID>/...` Common directories are linked to `<SAP Mount Directory>/<SAPSID>/...`

SAP ASCS Instance

Search Location

Specify the path to an archive, a download folder or a media location as *Package Path*.

Package Path 

Archive Locations

SAP ASCS Instance

Define Parameters » Review Parameters » Execute Service » Service Completed

ASCS Instance
Enter the instance parameters for the ABAP central services (ASCS) instance.

ASCS Instance
The following SAP system instances already exist on this host:

SAP System ID (SAPSID)	Instance Name
No data	

*ASCS Instance Number

*ASCS Instance Host

SAP ASCS Instance

Define Parameters » Review Parameters » Execute Service » **Service Completed**

100%
Execution of Service has been completed successfully.

Information

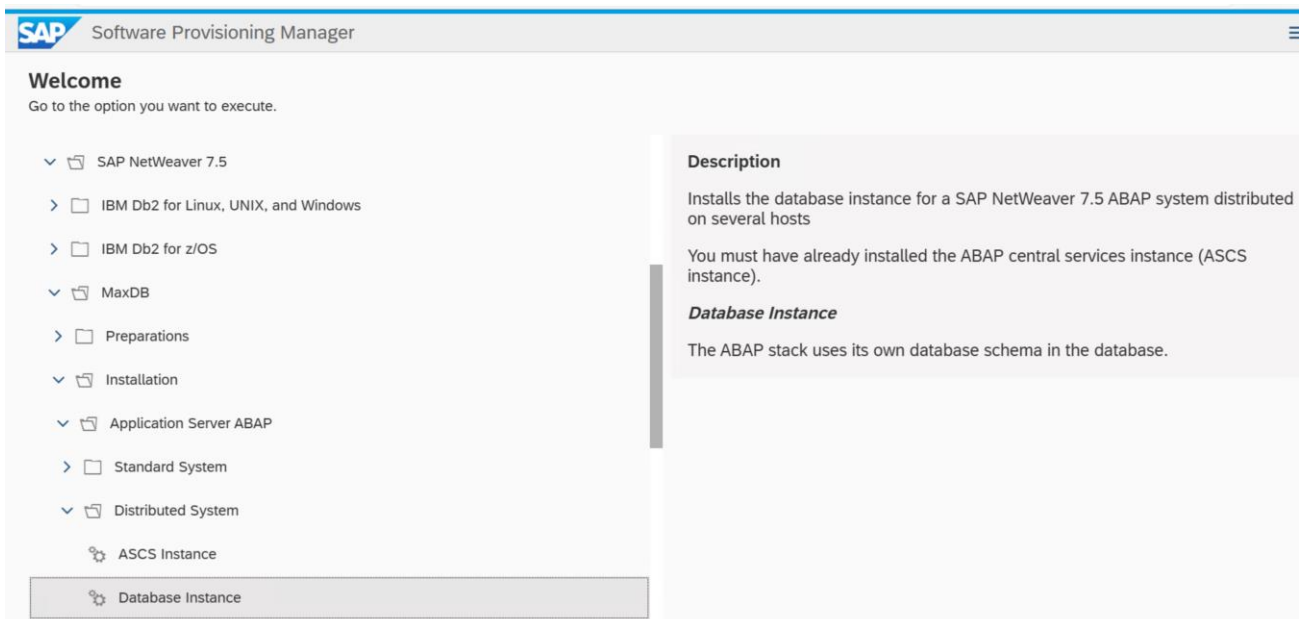
Execution of
SAP NetWeaver 7.5 > MaxDB > Installation > Application Server ABAP > Distributed System > ASCS Instance
has completed.

MaxDB Installation

After the ASCS is installed we now install the MaxDB and load the content into it.

```
ralfmaxdb01:/Software/SWPM # ./sapinst  
cd /Software/MaxDB
```

```
mkdir DB Patch  
mv unzip 51052559_8.ZIP DB  
mv 51054410_2.ZIP Patch/  
cd DB  
unzip 51052559_8.ZIP
```



The screenshot shows the SAP Software Provisioning Manager (SWPM) interface. The top bar displays the SAP logo and the text "Software Provisioning Manager". Below the bar, a "Welcome" message is shown, followed by a list of installation options. The "MaxDB" option is selected, and its details are displayed on the right side of the screen.

MaxDB

Description

Installs the database instance for a SAP NetWeaver 7.5 ABAP system distributed on several hosts

You must have already installed the ABAP central services instance (ASCS instance).

Database Instance

The ABAP stack uses its own database schema in the database.

SAP Database Instance

Define Parameters » Review Parameters » Execute Service » Service Completed

Parameter Settings

Choose whether you want to run the installation in a typical or a custom mode.

Parameter Settings

Parameter Mode

Typical

Custom

SAP Database Instance

Define Parameters » Review Parameters » Execute Service » Service Completed

SAP System Database

Enter the database parameters.

Database Identification

*Database ID (DBSID)

Database Host

Additional Information

If you want to use an existing database with a valid database release for this installation, enter the database ID of this database.

SAP Database Instance

Define Parameters Review Parameters Execute Service Service Completed

MaxDB Software Owner
Enter the parameters for the database software accounts.

Database Software Owner

*Account:

User ID:

*Group:

Group ID:

Additional Information
The software owner will be locked, so do not enter an administrator user as the database software owner. The fields *User ID* and *Group ID* should normally be left empty. If you enter specific user or group IDs, make sure they do not conflict with other IDs you enter later in the installation.

SAP Database Instance Tasklist Log Files Help

Software Package Browser
Specify the path to a download folder containing all software packages, or the paths to media locations or to several individual download locations of software packages.

Search Location
Specify the path to an archive, a download folder or a media location as *Package Path*.

Package Path:

Archive Locations
You can download the archives from the following locations on SAP Software Download Center:
[SAPEXE.SAR \(any version supporting your release\)](#)

The table below is updated with all packages detected at the specified *Package Path* when you choose *Next*.
While staying on this screen you can add or adjust paths for required packages by searching other locations. When all archives are specified and you do not wish to make any further adjustments, leave the above *Package Path* empty to continue.

Archive Scanning Information
An [information file](#) is written after the archives have been scanned. There you can find detailed information about matching and non matching archive files. This information file contains only results of the latest archive scan.

Detected Packages


	Package Name	Individual Package Location	Status
1	SAPEXE.SAR (any version supporting your release)		Still missing

SAP Database Instance Tasklist Log Files Help

Define Parameters >>>
 Review Parameters >>>
 Execute Service >>>
 Service Completed

Media Browser
Enter the location of the required software packages.

Software Package Requests

	Media	Package Location
1	Installation Export NW750 (folder EXP1)	/Software/Export 

SAP Database Instance

Define Parameters >>>
 Review Parameters >>>
 Execute Service >>>
 Service Completed

Reading from DVD...

Media Browser
Enter the location of the required software packages.

Software Package Requests

	Media	Package Location
1	RDBMS MaxDB	/Software/MaxDB/DB/51052559_


SAP Database Instance

Define Parameters Review Parameters Execute Service Service Completed

Looking up directories MaxDB directories...

MaxDB Software Destination
Enter the destination directory.

Database Software

MaxDB Directory 

SAP Database Instance

Define Parameters Review Parameters Execute Service Service Completed

Checking existence of database users...

MaxDB Database Users
Enter the passwords of the database system administrator and the database manager operator.

Database Users

Database ID

Database System Administrator (User: *superdba*)

*Password of superdba

*Confirm

Database Manager Operator (User: *control*)

*Password of control

*Confirm

SAP Database Instance Tasklist Log Files Help

Define Parameters Review Parameters Execute Service Service Completed

Preparing additional parameters for MaxDB database instance...

MaxDB Instance
Enter the parameters for the database instance.

Database Parameters

Database Host:

Database ID (DBSID):

Volume Medium Type

Raw Devices

File System

Mirror Log Volumes

CPUs Used Concurrently:

*I/O Buffer Cache [MB]:

*Number of Sessions:

Additional Information
The suggested value for *Number of Sessions* is only for the initial installation. If you plan to install further application server instances, you have to increase the initial value. Each database session requires its own memory.

Specify the data and log volumes

SAP Database Instance

Define Parameters Review Parameters Execute Service Service Completed

Setting default values for MaxDB Log Volumes...

MaxDB Log Volumes
Specify the log volumes for your database.


Database Information

Database ID (DBSID):

Minimum Log Size [MB]:

Log Volumes

Log Volume Locations

	Location	Size [MB]
1	<input type="text" value="/sapdb/C11/saplog"/> 	<input type="text" value="20000"/>

SAP Database Instance

Define Parameters Review Parameters Execute Service Service Completed

Setting default values for MaxDB Data Volumes...

MaxDB Data Volumes
Specify the data volumes for your database.





Database Information

Database ID (DBSID)

Minimum Data Size [MB]

Data Volumes

Data Volume Locations

	Location	Size [MB]
1	<input type="text" value="/sapdb/C11/sapdata"/> 	128000
2	<input type="text" value="/sapdb/C11/sapdata"/> 	128000
3	<input type="text" value="/sapdb/C11/sapdata"/> 	128000
4	<input type="text" value="/sapdb/C11/sapdata"/> 	128000

Dynamic Data Area Adjustment

Enable autoextend

Additional Information
Each row of the table above represents one data volume.

SAP Database Instance

Define Parameters Review Parameters Execute Service Service Completed

SAP System Database Import
Enter the general load parameters.

Database Load

SAP Code Page

*Number of Parallel Jobs

Additional Information
We recommend that you configure 24 processes for this environment and database type.

SAP Database Instance

Define Parameters Review Parameters **Execute Service** Service Completed

48%

Activating database instance C11. This might take a while...

...

SAP Database Instance Tasklist Log Files Help

Define Parameters Review Parameters Execute Service **Service Completed**

100%

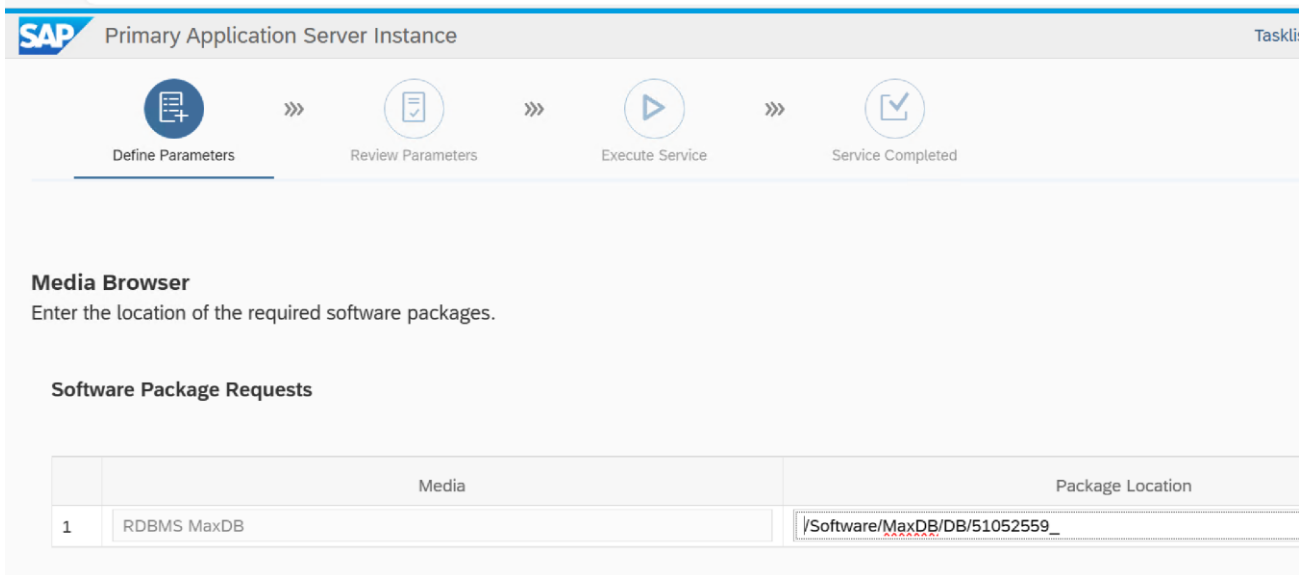
Execution of Service has been completed successfully.

Information

Execution of
SAP NetWeaver 7.5 > MaxDB > Installation > Application Server ABAP > Distributed System > Database Instance
has completed.

Primary App Server installation

```
./sapinst
```



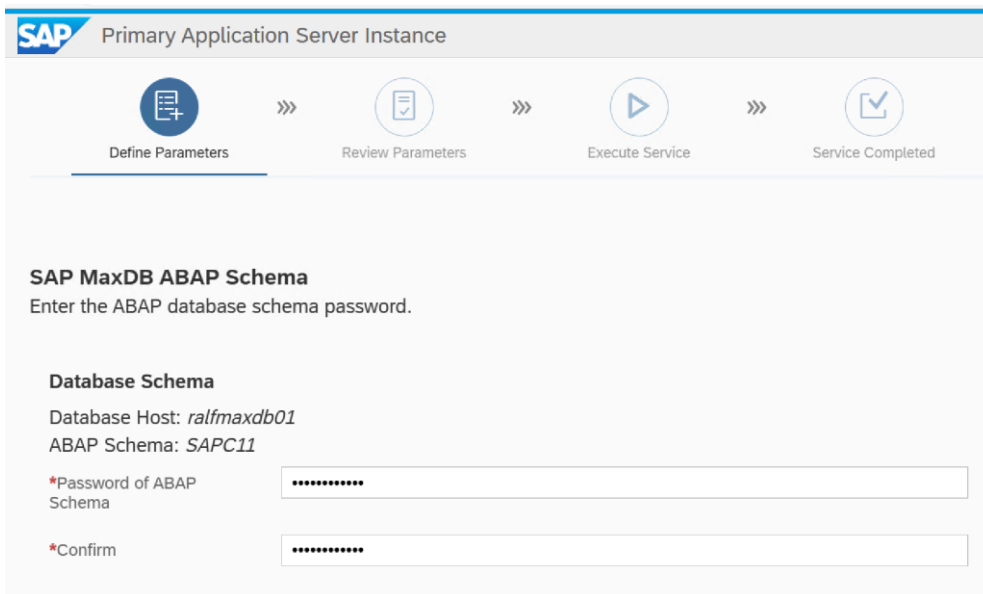
SAP Primary Application Server Instance Taskli...

Define Parameters » Review Parameters » Execute Service » Service Completed

Media Browser
Enter the location of the required software packages.

Software Package Requests

	Media	Package Location
1	RDBMS MaxDB	/Software/MaxDB/DB/51052559_



SAP Primary Application Server Instance

Define Parameters » Review Parameters » Execute Service » Service Completed

SAP MaxDB ABAP Schema
Enter the ABAP database schema password.

Database Schema
Database Host: *ralfmaxdb01*
ABAP Schema: *SAPC11*

*Password of ABAP Schema

*Confirm

SAP Primary Application Server Instance Tasklist Log Files

Define Parameters >>>
 Review Parameters >>>
 Execute Service >>>
 Service Completed

Primary Application Server Instance
 Enter the instance parameters for the primary application server (PAS) instance.

Primary Application Server Instance

The following SAP system instances already exist on this host:

	SAP System ID (SAPSID)	Instance Name	Instance Number
1	C11	ASCS00	00

*PAS Instance Number

*PAS Instance Host

Additional Information

The *Instance Number* and *Instance Host* are technical identifiers for controlling internal processes, such as assigned memory. The *Instance Host* can be either the physical host name or one of the virtual host names. In a high-availability system installation, use a virtual host name. The instance number must be unique for this installation host.

SAP Primary Application Server Instance Tasklist Log Files Help

Define Parameters >>>
 Review Parameters >>>
 Execute Service >>>
 Service Completed

100%

Execution of Service has been completed successfully.

Information

Execution of
 SAP NetWeaver 7.5 > MaxDB > Installation > Application Server ABAP > Distributed System > Primary Application Server Instance
 has completed.

Install the MaxDB Database Studio



<https://help.sap.com/docs/link-disclaimer?site=https%3A%2F%2Flaunchpad.support.sap.com%2F%23%2Fsoftwarecenter>

[Installing or Upgrading Database Studio for SAP MaxDB | SAP Help Portal](#)


MAXDB DATABASE STUDIO 7.9 (SUPPORT PACKAGES AND PATCHES)

DOWNLOADS INFO ECCN INFO

ⓘ Multispanning: Packages that are larger than 4 GB will be packed in an archive, which is split into 4 GB parts. All archives need to be downloaded and unpacked. For more details on multispanning and how to extract the multi-part .exe archive on UNIX See SAP Note 886535.

Items Available to Download (3) WINDOWS ON X64 64BIT  

Selected Items (0)

<input type="checkbox"/>	Name	Patch Level	File Type	File Size	Release Date	Change Date	Related Info
<input type="checkbox"/>	MAXDBSTDSDK7910_9-20006288.SAR MAXDB 7.9.10.10MAXDB DATABASE STUDIO 7.9	9	SAR	289692 KB	14.02.2023	14.02.2023	

Download SAPCAR for Windows and extract the MAXDBSTUDIO.sar archive in a separate folder. Then call the sbsetup.exe to install the MaxDB Studio

Backup the Database

[HowTo - SAP MaxDB Backup with Database Manager CLI - MaxDB - Support Wiki](#)

Before you can create snapshot based backups we need to take a full database backup. Then we can switch the logmode

```

su - c11adm
dbmcli -d C11 -u superdba,<pwd> user_getall
OK
control
superdba
dbmcli -d C11 -u superdba,<pwd> user_get superdba
OK
SERVERRIGHTS=UserMgm,InstallMgm,SystemCmd,DBFileRead,AccessUtility,Recovery,Backup,ParamFull,ParamCheckWrite,ParamRead,AccessSQL,ExecLoad,LoadSysTab,DBStop,DBStart,DBInfoRead,SharedMemoryMgm,SchedulerMgm,Scheduling,EvtDispMgm,EvtDisp
GUIRIGHTS=
SECONDPASSWORD=NO
DISABLED=NO
COMMENT=
USERTYPE=DBA
EXTERNAL_IDS=
MASTER_PW_ALTER_TIME=2023-03-07 18:51:54

```

Create an xuser key to be able password less access to the DB.

```
xuser set -U ADMIN -d C11 -u superdba,<pwd>
```

List the xuser entries

```
xuser -U ADMIN list
```

```
-----  
XUSER Entry 5  
-----  
Key :ADMIN  
Username :SUPERDBA  
UsernameUCS2 :S.U.P.E.R.D.B.A. . . . . .  
Password :?????????  
PasswordUCS2 :?????????  
PasswordUTF8 :?????????  
Dbname :C11  
Nodename :<unspecified>  
Sqlmode :<unspecified>  
Cachelimit :-1  
Timeout :-1  
Isolation :-1  
Charset :<unspecified>
```

Login as SUPERDBA using the XUSER key

```
dbmcli -U ADMIN  
dbmcli on C11>
```

Create template d1 for data backup:

```
dbmcli on C11> backup_template_create d1 to FILE /sapdb/C11/backup/data/DAT0001  
CONTENT DATA
```

Create template l1 for log backup:

```
dbmcli on DB1> backup_template_create l1 to FILE /sapdb/C11/backup/log/LOG0001  
CONTENT LOG
```

Starting a backup

```
db_connect  
backup_start d1
```

check the data backup location

```
ls -lh /sapdb/C11/backup/data/  
-rw-rw---- 1 sdb sdba 24G Mar 7 19:39 DAT0001
```

Checking a backup after completion

```
medium_label d1  
OK
```

Returncode	0
Date	20230307
Time	00193608
Server	ralfmaxdb01
Database	C11
Kernel Version	Kernel 7.9.09 Build 005-123-259-005
Pages Transferred	0
Pages Left	0
Volumes	
Medianame	
Location	/sapdb/C11/backup/data/DAT0001
Error text	
Label	DAT_000000001
Is Consistent	true
First LOG Page	6939
Last LOG Page	
DB Stamp 1 Date	20230307
DB Stamp 1 Time	00193608
Page Count	3044252
Devices Used	1
Database ID	ralfmaxdb01:C11_20230307_193608
Converter Page Count	1681

[Short Presentation Title \(sap.com\)](#)

As of SAP MaxDB Version 7.8 you can use external file snapshot in combination with SAP MaxDB snapshot to create a consistent backup in online database mode.

As of version 7.7 you can freeze the data area of a SAP MaxDB using internal database snapshots.

A snapshot can be created in the ONLINE operational state.

As of SAP MaxDB version 7.8 you can perform a complete data backup with an external file system snapshot in the operational state ONLINE in combination with a SAP MaxDB Database Snapshot.

First a SAP MaxDB (internal) Snapshot is created followed by the external file snapshot.

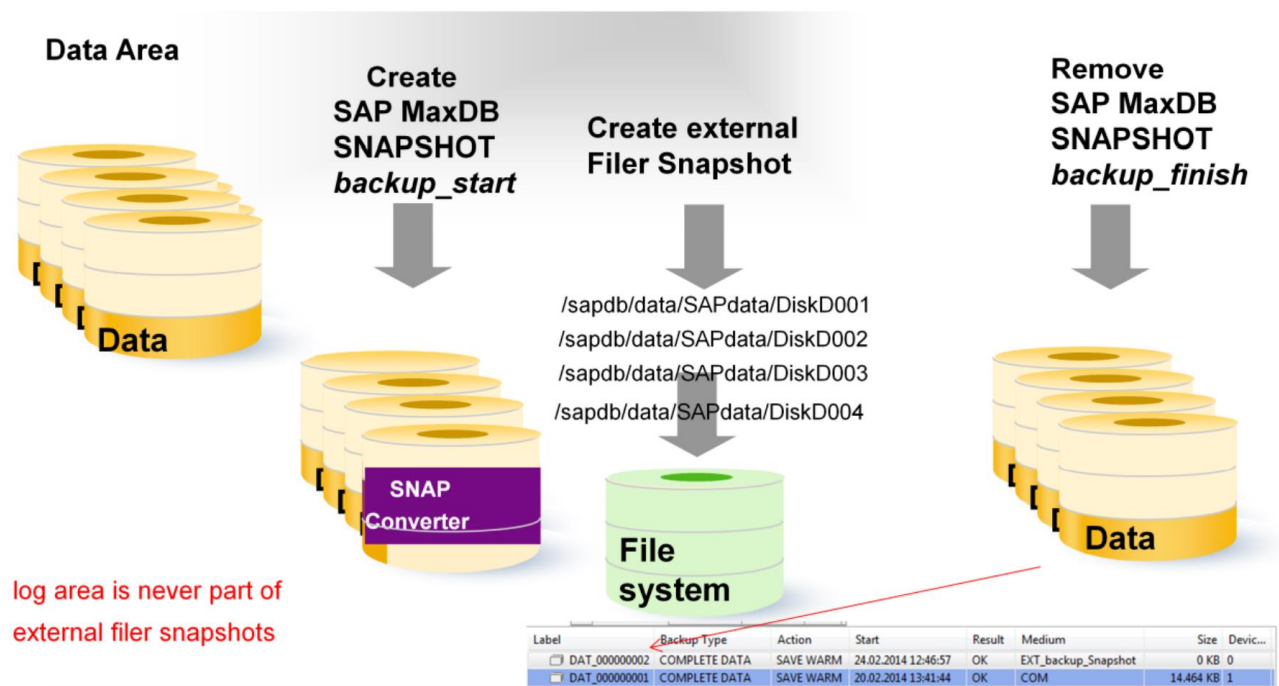
While this backup procedure the database is in online mode and the users can work with the application.

Moreover, this procedure guarantees that this external file system backup is included in the backup history.

The Log area is never part of this backup procedure.

Backup: Filer Snapshot in combination with SAP MaxDB Snapshot

Database is in mode ONLINE



In response to this command, the system displays the following output:

```
OK
Returncode -8020
...
Max Used Data Page 0
```

The return code -8020 together with the number of maximum used data pages (Max Used Data Page), in this case 0, displays in this case that the complete data backup was successfully started.

Create the Snapshot

```
backup_template_create External_Snapshot TO EXTERNAL SNAPSHOT

db_connect

backup_start External_Snapshot
OK
Returncode          -8020
Date                20230307
Time                00201047
Server              ralfmaxdb01
Database            C11
Kernel Version      Kernel    7.9.09   Build 005-123-259-005
Pages Transferred   0
Pages Left          0
Volumes
Medianame           External_Snapshot
Location
Errortext
Label               DAT_000000002
Is Consistent       true
First LOG Page      6940
Last LOG Page
DB Stamp 1 Date     20230307
DB Stamp 1 Time     00201047
DB Stamp 2 Date
DB Stamp 2 Time
Page Count
Devices Used        1
Database ID         ralfmaxdb01:C11_20230307_193608
Max Used Data Page  0
Converter Page Count
```

take the snapshot with azacsnap on ANF than finish the backup

```
backup_finish External_Snapshot ExternalBackupID 202303071508
```

(backup ID e.g. date and time)

```

backup_finish External_Snapshot ExternalBackupID 202303071508
OK
Returncode          0
Date                20230307
Time                00201047
Server              ralfmaxdb01
Database            C11
Kernel Version      Kernel    7.9.09   Build 005-123-259-005
Pages Transferred   0
Pages Left          0
Volumes
Medianame           External_Snapshot
Location
Errortext
Label               DAT_000000002
Is Consistent       true
First LOG Page      6940
Last LOG Page
DB Stamp 1 Date     20230307
DB Stamp 1 Time     00201047
DB Stamp 2 Date
DB Stamp 2 Time
Page Count
Devices Used        1
Database ID         ralfmaxdb01:C11_20230307_193608
Max Used Data Page  0
Converter Page Count
  
```

Check the logfile

```

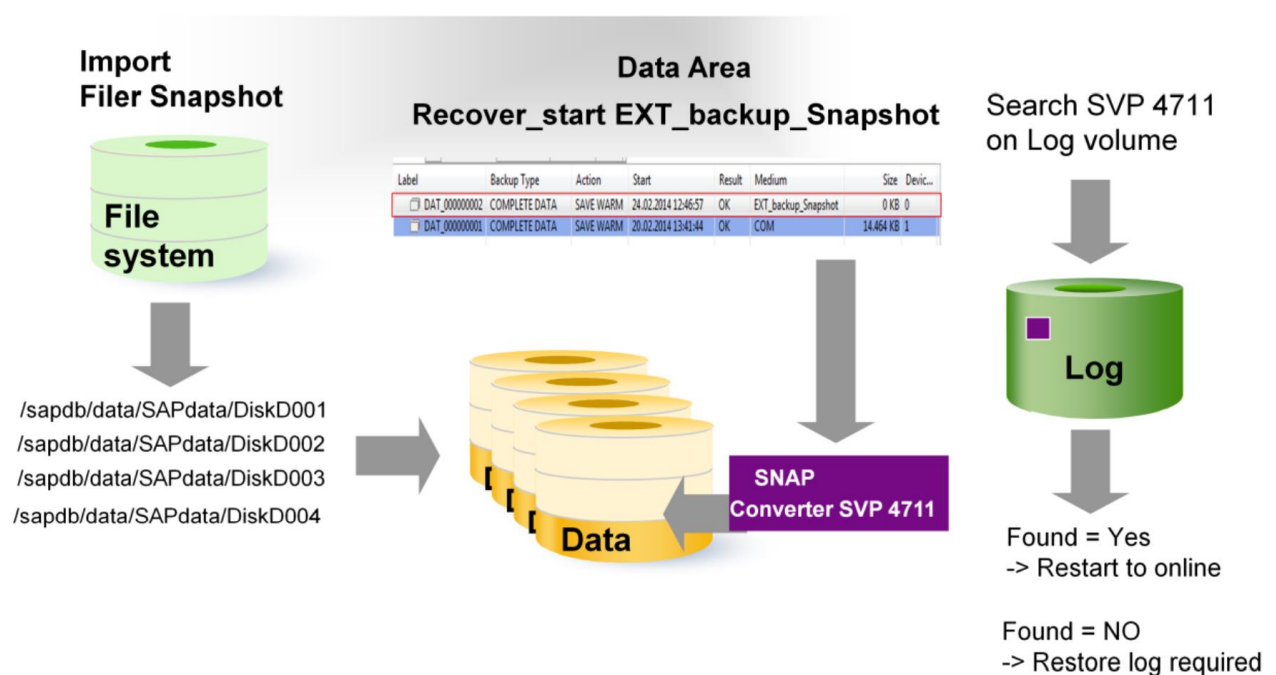
tail -f ./sapdb/C11/data/wrk/C11/dbm.prt
23611 INF 7 DBMKn1 Data: DBSTAMP1 DATE..... 20230307
23611 INF 7 DBMKn1 Data: DBSTAMP1 TIME..... 00201047
23611 INF 7 DBMKn1 Data: DBSTAMP2 DATE..... (null)
23611 INF 7 DBMKn1 Data: DBSTAMP2 TIME..... (null)
23611 INF 7 DBMKn1 Data: BD PAGE COUNT..... (null)
23611 INF 7 DBMKn1 Data: TAPEDEVICES USED.. 1
23611 INF 7 DBMKn1 Data: DB_IDENT.. ralfmaxdb01:C11_20230307_193608
23611 INF 7 DBMKn1 Data: MAX USED DATA PNO. 0
23611 INF 7 DBMKn1 Data: CONV PAGE COUNT.. (null)
2023-03-07 20:17:46 23611 INF 419 DBMSrv Command 'backup_finish' has ended
with return code 0.
  
```

Restore using an Snapshot

[HowTo - SAP MaxDB Recovery with Database Manager CLI - MaxDB - Support Wiki](#)

Restore:

Filer Snapshot in combination with SAP MaxDB Snapshot



Recovery tests

Crash the system by sending the sysrequest trigger b

```
echo b > /proc/sysrq-trigger
```


umount the data volume before we restore the snapshot

```
umount /sapdb/C11/sapdata
```

restore the SnapShot

Revert volume to snapshot ×

Revert volume C11data to snapshot Backup_202303071508

 This action is irreversible and it will delete all the volumes snapshots that are newer than Backup_202303071508. Please type 'C11data' to confirm.

Are you sure you want to revert the volume to the state of Backup_202303071508? Please type the volume name,'C11data', to confirm.



Remount the volume and start the DB for the automated recovery

```
mount -a
```

go to Restore the database → **page 43**

Creating automated DB SnapShots

A MaxDB Snapshot must be created before taking a storage Snapshot. The database will be set into a consistent state by quiescing the database. The following steps show how to perform database backup by using a storage Snapshot copy.

[Install the Azure CLI on Linux | Microsoft Docs](#) (SLES)

Download the azacsnap tool

<https://aka.ms/azacsnapinstaller>

[Get started with Azure Application Consistent Snapshot tool for Azure NetApp Files | Microsoft Learn](#)

[1612412 - SAP MaxDB: How does a database backup with external file system backups take place?](#)

[1928060 - Data backup and recovery with file system backup - SAP ONE Support Launchpad](#)

[2282054 - Background DBM server - SAP ONE Support Launchpad](#)

[SAP MaxDB | SAP Community](#)

Configure azacsnap

[Install the Azure Application Consistent Snapshot tool for Azure NetApp Files | Microsoft Learn](#)

Azacsnap is supporting only HANA, DB2 and Oracle at the moment. It is, however, possible to take a snapshot from the data volume and use the new feature in the version 6 with pre and post automation.

Create the service principal for your subscription and install azacsnap – in the Azure Portal

Store the output in a file I used `/tmp/auth.json`

```
az ad sp create-for-rbac --name "AzAcSnap" --role Contributor --scopes /subscriptions/{subscription-id} --sdk-auth
```

You will get an output which looks similar to this:

```
{
  "clientId": "0815**4711-4**-a91f-d937*****1",
  "clientSecret": "d~_8Q~****Zk****Y *****",
  "subscriptionId": "47110815-***-***-***-*****",
  "tenantId": "K47110815-****-4ecc-bda0-*****",
  "activeDirectoryEndpointUrl": "https://login.microsoftonline.com",
  "resourceManagerEndpointUrl": "https://management.azure.com/",
  "activeDirectoryGraphResourceId": "https://graph.windows.net/",
  "sqlManagementEndpointUrl": "https://management.core.windows.net:8443/",
  "galleryEndpointUrl": "https://gallery.azure.com/",
  "managementEndpointUrl": "https://management.core.windows.net/"
}
```

Create an auth.conf file and copy the content into this file

```
vi /tmp/auth.json
```

```
ls -l /Software/azacsnap*
admin01 users 16478438 Mar 8 15:30 /Software/azacsnap_7a_(1AA8343)_installer.run
```

Install azacsnap

```
cd /Software/
ralfmaxdb01:/Software # chmod 755 azacsnap_7a_(1AA8343)_installer.run
./azacsnap_7a_(1AA8343)_installer.run -I
```

Configure azacsnap

```
su - azacsnap
azacsnap -c configure --configuration=new
Building new config file
Add comment to config file (blank entry to exit adding comments): MaxDB
Add comment to config file (blank entry to exit adding comments):
Enter the database type to add, 'hana', 'oracle', 'db2', or 'exit' (to save and
exit): hana
=== Add SAP HANA Database details ===
HANA SID (e.g. H80): C11
HANA Instance Number (e.g. 00): 00
HANA HDB User Store Key (e.g. `hdbuserstore List`): ADMIN
HANA Server's Address (hostname or IP address): 10.6.0.4
Do you need AzAcSnap to automatically disable/enable backint during snapshot?
(y/n) [n]:
=== Azure NetApp Files Storage details ===
Are you using Azure NetApp Files for the database? (y/n) [n]: y
Enter new value for 'ANF Backup (none, renameOnly)' (current = 'none'):
renameOnly
--- DATA Volumes have the Application put into a consistent state before they
are snapshot ---
Add Azure NetApp Files resource to DATA Volume section of Database
configuration? (y/n) [n]:
--- OTHER Volumes are snapshot immediately without preparing any application for
snapshot ---
Add Azure NetApp Files resource to OTHER Volume section of Database
configuration? (y/n) [n]: y
Full Azure NetApp Files Storage Volume Resource ID (e.g.
/subscriptions/.../resourceGroups/.../providers/Microsoft.NetApp/netAppAccounts/
.../capacityPools/Premium/volumes/...):
/subscriptions/da/resourceGroups/ralfMaxDB/providers/Microsoft.NetApp/netAppAcco
unts/ralfmaxdbanf/capacityPools/ralfMaxDB/volumes/C11data
Service Principal Authentication filename or Azure Key Vault Resource ID (e.g.
auth-file.json or https://...): auth.json
Add Azure NetApp Files resource to OTHER Volume section of Database
configuration? (y/n) [n]:
=== Azure Managed Disk details ===
Are you using Azure Managed Disks for the database? (y/n) [n]:
```

```
=== Azure Large Instance (Bare Metal) Storage details ===
Are you using Azure Large Instance (Bare Metal) for the database? (y/n) [n]:
Enter the database type to add, 'hana', 'oracle', 'db2', or 'exit' (to save and
exit): exit
Editing configuration complete, writing output to 'azacsnap.json'.
```

Test the storage connection, at this point we “only” can test the storage connection. The ASE backup-mode will be scheduled as “runbefore” and “runafter”.

```
azacsnap -c test --test storage -preview
PASSED: Storage test completed successfully for all 'other' Volumes
END    : Storage tests complete
END    : Test process complete for 'storage'
```

Create the .bashrc for the azacsnap user (compare the environment from the SIDadm user)

```
vi .bashrc
test -s ~/.alias && . ~/.alias || true
export PATH=$PATH:/sapdb/clients/C11/bin:/sapdb/programs/bin
export
LD_LIBRARY_PATH=/usr/sap/C11/SYS/exe/run:/usr/sap/C11/SYS/exe/uc/linuxx86_64:/sapdb/clients/C11/lib
export LANG=C.UTF-8
```

create the user key

```
xuser set -U ADMIN -d C11 -u superdba,<pwd>
```

Test the dbmcli connection using the user-key

```
dbmcli -U ADMIN
dbmcli on C11>quit
```

Create the two Quiece and Unquiece scripts. (no Microsoft support) this is only an example.

```
vi cat MaxDBQuiece.sh
#!/bin/bash
SID="$1"
KEY="$2"
DATE="`date +%m-%d-%Y`"
LOGFILE="/tmp/MaxDM_Snapshot${SID}.log"
# MAX LOGFILE SIZE is 2 MB
MAXSIZE=2000000
# Get file size
FILESIZE=$(stat -c%s "$LOGFILE")
if [[ "$SID" == "" || "$KEY" == "" ]]; then
    echo "Usage: `basename $0` <SID> <USERSTOREKEY>" exit 1
fi
sqlFile=$(mktemp)
cat > $sqlFile << EOF
background_server_start myserver
background_server_execute myserver db_connect
background_server_get_reply myserver -wait
background_server_execute myserver backup_start External_Snapshot DATA
background_server_get_reply myserver -wait
EOF

echo "Size of $LOGFILE = $FILESIZE bytes." >>$LOGFILE
if (( $FILESIZE > $MAXSIZE)); then
    echo "Moving the MaxDM Snapshot logfile to a backup" >>$LOGFILE
    mv $LOGFILE ${LOGFILE}-${DATE}
else
    echo "Logfilesize OK" >>$LOGFILE
fi
echo "`date` Creating MaxDB SnapShot" >>$LOGFILE

#rc=`dbmcli -U $KEY -i $sqlFile -b | head -1 | tr -d "[:blank:]"`
dbmcli -U $KEY -uUTL -i $sqlFile >>$LOGFILE
echo "Returncode = $?" >>$LOGFILE
rm $sqlFile
```

```
vi MaxDBunQuiecee.sh
#!/bin/bash
SID="$1"
KEY="$2"
DATE="`date +%m-%d-%Y`"
LOGFILE="/tmp/MaxDM_Snapshot${SID}.log"
# MAX LOGFILE SIZE is 2 MB
MAXSIZE=2000000
# Get file size
FILESIZE=$(stat -c%s "$LOGFILE")
if [[ "$SID" == "" || "$KEY" == "" ]]; then
    echo "Usage: `basename $0` <SID> <USERSTOREKEY>" exit 1
fi
sqlFile=$(mktemp)
cat > $sqlFile << EOF
background_server_execute myserver backup_finish External_Snapshot
ExternalBackupID ANFSnapShot
background_server_get_reply myserver -wait
background_server_exit myserver
EOF

echo "Size of $LOGFILE = $FILESIZE bytes." >>$LOGFILE
if (( $FILESIZE > $MAXSIZE)); then
    echo "Moving the MaxDM Snapshot logfile to a backup" >>$LOGFILE
    mv $LOGFILE ${LOGFILE}-${DATE}
else
    echo "Logfilesize OK" >>$LOGFILE
fi
echo "`date` Creating MaxDB SnapShot" >>$LOGFILE

#rc=`dbmcli -U $KEY -i $sqlFile -b | head -1 | tr -d "[:blank:]"`
dbmcli -U $KEY -uUTL -i $sqlFile >>$LOGFILE
echo "Returncode = $?" >>$LOGFILE
rm $sqlFile
```

```
chmod 755 MaxDB*
```

create the cron script to schedule the azacsnap call

```
vi cron_backup_daily.sh
#!/bin/bash

BACKUP_PREFIX="daily"
PRIMARY_BACKUP_RETENTION=2
SAPSID="C11"
USERKEY="ADMIN"
## AZACSNAP - PRIMARY BACKUP ##
#HANA_CLIENT_PATH=`find /hana/shared/ -name hdbclient -type d -print
2>/dev/null`
#export PATH=$PATH:$HANA_CLIENT_PATH
#
echo "Executing primary backup with prefix $BACKUP_PREFIX (retention
${PRIMARY_BACKUP_RETENTION})."
/home/azacsnap/bin/azacsnap -c backup --volume other --prefix $BACKUP_PREFIX --
retention $PRIMARY_BACKUP_RETENTION -v --runbefore
"/home/azacsnap/bin/MaxDBQuiece.sh $SAPSID $USERKEY" --runafter
"/home/azacsnap/bin/MaxDBUnQuiece.sh $SAPSID $USERKEY" -preview
```

```
chmod 755 cron_backup_daily.sh
```

Schedule the daily backup in the cron

```
crontab -e
# create daily backups twice a day and replicate them via ANF backup
0 2,14 * * * /home/azacsnap/bin/cron_backup_daily.sh
```

Check the backup history in MaxDB

```
backup_history_list -c label,action,pages,stop,media
OK
END
          |HISTLOST |      |
          |HISTLOST |      |
DAT_000000001|SAVE WARM|44272|2023-03-07 19:39:57|d1
LOG_000000001|SAVE WARM| 6952|2023-03-07 19:45:09|11
DAT_000000002|SAVE WARM|    0|2023-03-07 20:17:45|External_Snapshot
DAT_000000005|SAVE WARM|    0|2023-03-08 16:52:18|External_Snapshot
DAT_000000008|SAVE WARM|    0|2023-03-08 17:10:02|External_Snapshot
```

Show the MaxDB Templates

```
backup_template_show ALL
```

```
OK
```

```
NAME                d1
CONTENT              DATA
CREATIONDATE         20230307193424
MODIFICATIONDATE     20230307193424
TOOL                 NONE
BLOCKSIZE            8
DATACARRIER
  TYPE               FILE
  LOCATION           /sapdb/C11/backup/data/DAT0001
  OVERWRITE          NO
  COMPRESSED         NO
```

```
NAME                11
CONTENT              AUTO
CREATIONDATE         20230307193440
MODIFICATIONDATE     20230307193440
TOOL                 NONE
BLOCKSIZE            8
DATACARRIER
  TYPE               FILE
  LOCATION           /sapdb/C11/backup/log/LOG0001
  OVERWRITE          NO
  COMPRESSED         NO
```

```
NAME                External_Snapshot
CONTENT              DATA
CREATIONDATE         20230307201008
MODIFICATIONDATE     20230307201008
TOOL                 DBMC
BLOCKSIZE            8
DATACARRIER
  TYPE               EXTERNAL
  LOCATION
  OVERWRITE          NO
  COMPRESSED         NO
```

List the taken SnapShots

```
azacsnap -c details --preview
```

```
>>> Preview Feature 'ANF Backup' enabled in config file 'azacsnap.json'.
```

```
=====
PREVIEWS ARE PROVIDED "AS-IS," "WITH ALL FAULTS," AND "AS AVAILABLE," AND
ARE EXCLUDED FROM THE SERVICE LEVEL AGREEMENTS AND LIMITED WARRANTY
https://azure.microsoft.com/support/legal/preview-supplemental-terms/
=====
```

```
-----
User has enabled execution of PREVIEW features with '--preview'.
-----
```

```
List snapshot details called with snapshotFilter ''
```

```
#, Volume, SnapshotName, Created
```

```
#1, C11data, Backup_202303141218, 14-Mar-2023 11:18:44am (UTC+0)
```

```
#2, C11data, Backup_202303141215, 14-Mar-2023 11:15:20am (UTC+0)
```

```
#3, C11data, Backup_202303131057, 13-Mar-2023 9:57:42am (UTC+0)
```

Restore using azacsnap

Shutdown SAP and ASE (if possible – if not simply “kill” the DB. We are restoring anyway.

```
stopsap all
```

umount the data volume

```
umount /sapdb/C11/sapdata
```

At the moment azacsnap does not support “Revert Volume” for ANF. If you would like to keep the volume names you have the option to “revert a volume using the Azure Portal.

See:

```
su - azacsnap
```

```
cd bin
```

```
azacsnap -c restore --dbsid C11 --restore revertvolume --configfile
```

```
azacsnap.json --snapshotfilter daily_F44BFE3175B_c11data
```

```
...
```

```
Azure NetApp Files volumes not supported for revertvolume, will not revert
volume.
```

With ANF you do have the option to clone a volume. This is probably the better option anyway. How to clone a volume for a recovery is demonstrated here:

AzAcSnap is designed to restore a collection of dataVolumes and otherVolumes. AzAcSnap makes sure all the dataVolumes share the same snapshot to be restored and the otherVolumes the latest snapshot to be restored. In a deployment with multiple data volumes (e.g., SAP HANA Scale-Out) this can save a lot of time trying to ensure all the snapshots match in the Azure Portal before cloning or reverting the volumes. This

means when using a setup with custom scripts to quiesce/unquiesce the database it's necessary to create a copy of the backup configfile and change "otherVolume" to "dataVolume" and change "dataVolume" to "otherVolume" effectively switching them.

```
cp azacsnap.json azacsnap_snaptovol.json
vi azacsnap_snaptovol.json
    "anfStorage": [
      {
        "otherVolume": [],
        "dataVolume": [
```

Down here are the specifications of your ANF volumes → keep unchanged change only dataVolume to otherVolume and otherVolume to dataVolume.

list the available SnapShots

```
azacsnap -c details
List snapshot details called with snapshotFilter ''
#, Volume, SnapshotName
#1, ralfC11data, daily__F44BFE3175B__c11data

azacsnap -c restore --dbsid C11 --restore revertvolume --configfile
azacsnap_snaptovol.json --snapshotfilter daily_F44BFE3175B_c11data
```

create the new /etc/fstab

```
pwd
/home/azacsnap/bin

grep rwclone ./logs/*.log
... Creating new volume 'ralfc11data-rwclone-20221111-0732'
... Volume 'ralfc11data-rwclone-20221111-0732' successfully created from snapshot.
...
... Creating new volume 'ralfc11sybase-rwclone-20221111-0732'
... Volume 'ralfc11sybase-rwclone-20221111-0732' successfully created from
snapshot.
```

Mount the cloned volume to the sapdata directory

```
mount -a
```

Recover the database

```
dbmcli -U ADMIN
dbmcli on C11>backup_history_list -c label,action,pages,stop,media
OK
...
..
DAT_000000030|SAVE WARM|0|2023-03-14 11:18:04|External_Snapshot |
DAT_000000031|SAVE WARM|0|2023-03-14 11:18:57|External_Snapshot |
---
dbmcli on C11>quit
```

Restore the latest SnapShot

```
dbmcli -U ADMIN

db_admin
OK

db_connect
OK
recover_start External_Snapshot DATA ExternalBackupID DAT_000000031
OK
```

Start the DB and SAP

The Database will automatically apply the latest logfiles to the database.

```
su - c11adm
startsap
```

Upgrade MaxDB

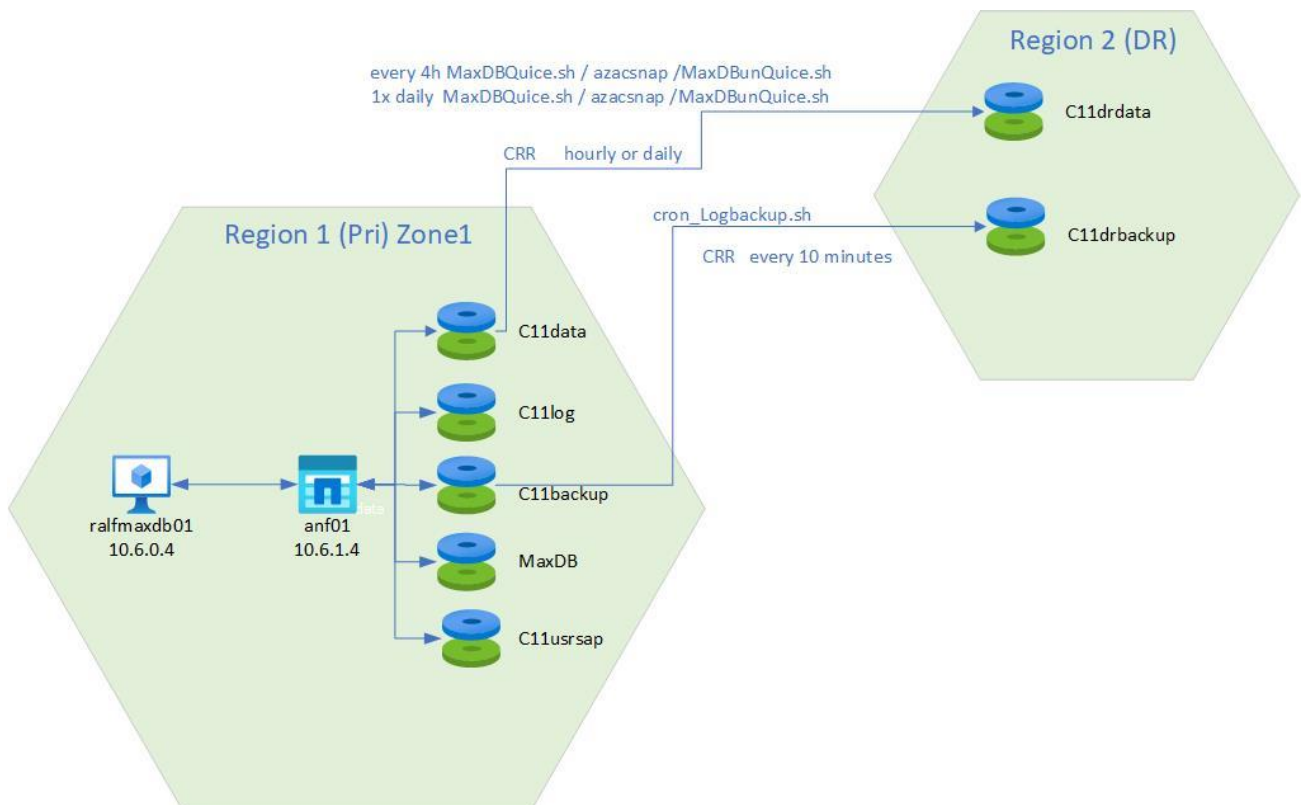
```
su - c11adm
stopsap
```

as root

```
cd
/Software/MaxDB/Patch/MaxDB_7.9__SP10_Build_05_/DATA_UNITS/MAXDB_LINUX_X86_64
./SDBUPD -d C11 -u control,<pwd>
```

ANF Cross Region Replication

Azure NetApp Files volume replication is supported between various Azure regional pairs and non-standard pairs. Azure NetApp Files volume replication is currently available between the following regions. You can replicate Azure NetApp Files volumes from Regional Pair A to Regional Pair B, and vice versa.



Azure regional pairs

Geography	Regional Pair A	Regional Pair B
Australia	Australia Central	Australia Central 2
Australia	Australia East	Australia Southeast
Asia-Pacific	East Asia	Southeast Asia
Brazil/North America	Brazil South	South Central US
Canada	Canada Central	Canada East
Europe	North Europe	West Europe
Germany	Germany West Central	Germany North
India	Central India	South India
Japan	Japan East	Japan West
Korea	Korea Central	Korea South
North America	East US	West US
North America	East US 2	Central US
North America	North Central US	South Central US

[Cross-region replication of Azure NetApp Files volumes | Microsoft Learn](#)

[Azure NetApp Files cross region replication and new enhancements in preview | Azure Blog and Updates | Microsoft Azure](#)

[Cross-zone replication of Azure NetApp Files volumes | Microsoft Learn](#)

Create an storage account in the destination region (must be the paired region (see table)).

[Home](#) > [Azure NetApp Files](#) >

New NetApp account ...

Name *

ralfmaxdbdranf ✓

Subscription

▼

Resource group *

(New) ralfmaxbdrwestus ▼

[Create new](#)

Location *

West US ▼

Create a VNET (if not already existing in the DR region)

Create virtual network ...

[Basics](#) [Security](#) [IP addresses](#) [Tags](#) [Review + create](#)

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation. [Learn more.](#) [↗](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

▼

Resource group *

ralfmaxbdrwestus ▼

[Create new](#)

Instance details

Virtual network name *

ralfwestusvnet

Region ⓘ *

(US) West US ▼

[Deploy to an edge zone](#)

Create the delegated network in the paired region for ANF

Home > ralfwestusvnet | Overview > ralfwestusvnet

ralfwestusvnet | Subnets ☆ ...

Virtual network

Search

+ Subnet + Gateway subnet Refresh Manage users Delete

Search subnets

Name ↑↓	IPv4 ↑↓	IPv6 ↑↓	Available IPs ↑↓
default	10.0.0.0/24	-	251

Add subnet ✕

Name * ralfanfetus ✓

Subnet address range * ①
10.0.1.0/24 10.0.1.0 - 10.0.1.255 (251 + 5 Azure reserved addresses)

Add IPv6 address space ①

NAT gateway ①
None

Network security group
None

Route table
None

SERVICE ENDPOINTS

Create service endpoint policies to allow traffic to specific azure resources from your virtual network over service endpoints. [Learn more](#)

Services ①
0 selected

SUBNET DELEGATION

Delegate subnet to a service ①
Microsoft.Netapp/volumes

Create a Capacity Pool for the DR volume (can be a different QoS level)

Home > ralfmaxdbdranf

ralfmaxdbdranf | Capacity pools ☆ ...

NetApp account

Search

+ Add pool Refresh

Search pools

Name	Capacity	Service level	QoS type
You don't have any capacity pools. Click Add pool to get started.			

New capacity pool ✕

Name * ralfanfdrdata ✓

Service level * ①
Standard

Size (TiB) * ①
4 4 TiB

QoS type
 Manual
 Auto

Create the target DR volume.

On the destination storage account overview select Add data Protection

ralfmaxdbdranf | Volumes ☆ ...

NetApp account

Search

+ Add volume **Add data replication** Refresh

Search volumes

Name	Quota	Throughput	Protocol type	Mount path
You don't have any volumes. Click Add volume to get started.				

Create a new protection volume ...

[Basics](#) [Protocol](#) [Replication](#) [Tags](#) [Review + create](#)

This page will help you create an Azure NetApp Files volume in your subscription and enable you to access the volume from within your virtual network. [Learn more about Azure NetApp Files](#)

Volume details

Volume name *	<input type="text" value="ralfc11drdata"/>	<input checked="" type="checkbox"/>
Capacity pool * ⓘ	<input type="text" value="ralfanfdrdata"/>	<input type="checkbox"/>
Available quota (GiB) ⓘ	<input type="text" value="4096"/>	4 TiB
Quota (GiB) * ⓘ	<input type="text" value="1024"/>	1 TiB
Available throughput (MiB/s) ⓘ	<input type="text" value="64"/>	
Throughput (MiB/s) ⓘ	<input type="text" value="16"/>	
Virtual network * ⓘ	<input type="text" value="ralfwestusvnet (10.0.0.0/16)"/> Create new virtual network	<input type="checkbox"/>
Delegated subnet * ⓘ	<input type="text" value="ralfanfestus (10.0.1.0/24)"/> Create new subnet	<input type="checkbox"/>
Network features ⓘ	<input type="radio"/> Basic <input checked="" type="radio"/> Standard	
Availability Zone ⓘ	<input type="text" value="None"/>	<input type="checkbox"/>
Show advanced section	<input type="checkbox"/>	

Access

Protocol type NFS SMB Dual-protocol

Configuration

File path * ⓘ	<input type="text" value="ralfc11drdata"/>	<input checked="" type="checkbox"/>
Versions *	<input type="text" value="NFSv4.1"/>	<input type="checkbox"/>
Kerberos	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	
LDAP	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	
Azure VMware Solution DataStore ⓘ	<input type="checkbox"/>	

Export policy

Configure the volume's export policy. This can be edited later. [Learn more](#)

Move up
 Move down
 Move to top
 Move to bottom
 Delete

<input type="checkbox"/>	Index	Allowed clients	Access	Root Access	Chown Mode
<input type="checkbox"/>	1	0.0.0.0/0	Read & Write	On	Restricted
		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Schedule an hourly replication for the data volume

Create a new protection volume ...

Basics Protocol **Replication** Tags Review + create

Source volume ID ⓘ ✓

Replication schedule ⓘ ✓

Now authorize the source volume for the replication.

ralfc11drdata (ralfmaxdbdranf/ralfanfdrdata/ralfc11drdata) ☆ ☆ ...

Volume

Search << Resize Edit Change throughput Delete

Overview Essentials JSON View

<ul style="list-style-type: none"> Overview Activity log Access control (IAM) Tags Settings Properties Locks Storage service Mount instructions Export policy Snapshots Replication 	<p>Essentials</p> <p>Resource group : ralfmaxdbdrwestus</p> <p>Mount path : 10.0.1.4/ralfc11drdata</p> <p>Subscription : [REDACTED]</p> <p>Subscription ID : [REDACTED]</p> <p>Quota : 1 TiB</p> <p>Throughput MiB/s : 16</p> <p>Maximum number of files : 100000000</p> <p>Virtual network/subnet : ralfwestusvnet/ralfanfestus</p> <p>End point type : Destination</p> <p>Backups : Disabled</p>	<p>Capacity pool : ralfanfdrdata</p> <p>Protocol type : NFSv4.1</p> <p>Location : West US</p> <p>Service level : Standard</p> <p>Hide snapshot path : Yes</p> <p>Security Style : Unix</p> <p>Network features : Standard</p> <p>Availability Zone : None</p> <p>Kerberos : Disabled</p> <p>Source : C11data</p> <p>LDAP : Disabled</p> <p>Unix Permissions : 0770</p> <p>Azure VMware Solution ... : Disabled</p>
---	---	--

Specify the volume resource ID of the DR volume to the Source volume

Home > C11data (ralfmaxdbanf/ralfMaxDB/C11data)

C11data (ralfmaxdbanf/ralfMaxDB/C11data) | Replication ☆ ...

Volume

Search << Authorize

Authorize ☆ ...

Authorize

You don't have any data protection volumes. Click Add data protection to get started.

Authorize ✕

Update the replication schedule ⓘ

Destination volume id ⓘ ✓

Home > C11data (ralfmaxdbanf/ralfMaxDB/C11data)

C11data (ralfmaxdbanf/ralfMaxDB/C11data) | Replication ☆ ...

Volume

Search << Refresh

- Overview
- Activity log
- Access control (IAM)
- Tags

Essentials

End point type : Source	Destination : ralfc11drdata
Health status : Healthy	Relationship status : Idle
Mirror state : Uninitialized	Total progress : 0 bytes

Finished

Now repeat the same for the log backup volume but schedule the transfer every 10 Minutes

Create a new protection volume ...

Basics Protocol **Replication** Tags Review + create

Source volume ID ⓘ

Replication schedule ⓘ

Crontab for snapshots and logbackup

```
crontab -l
# create daily backups twice a day and replicate them via ANF backup
0 2,14 * * * /home/azacsnap/bin/cron_backup_daily.sh
*/10 * * * * /home/azacsnap/bin/cron_logbackup.sh
```

The second part with the log volume is optional if you set the autolog_on to 300 second (5 minutes)

Create the logbackup script

```
vi cron_logbackup.sh

#!/bin/bash
SID="$1"
DATE="`date +%m-%d-%Y`"
LOGFILE="/tmp/MaxDM_Logbackup${SID}.log"
# MAX LOGFILE SIZE is 2 MB
MAXSIZE=2000000
# Get file size
FILESIZE=$(stat -c%s "$LOGFILE")
if [[ "$SID" == "" ]]; then
    echo "Usage: `basename $0` <SID> " exit 1
fi
echo "Size of $LOGFILE = $FILESIZE bytes." >>$LOGFILE
if (( $FILESIZE > $MAXSIZE)); then
    echo "Moving the MaxDM logbackup logfile to a backup" >>$LOGFILE
    mv $LOGFILE ${LOGFILE}-${DATE}
else
    echo "Logfilesize OK" >>$LOGFILE
fi
echo "`date` Creating MaxDB Logbackup" >>$LOGFILE

#rc=`dbmcli -U $KEY -i $sqlFile -b | head -1 | tr -d "[:blank:]"`
dbmcli -U ADMIN -uUTL -c backup_start 11 >>$LOGFILE
echo "Returncode = $?" >>$LOGFILE
```

as an alternative you can enable autolog backup to 300 seconds

```
dbmcli -U ADMIN
dbmcli on C11>db_connect
dbmcli on C11>autolog_off
dbmcli on C11>autolog_on 11 INTERVAL 300
dbmcli on C11>db_stop
dbmcli on C11>db_start
dbmcli on C11>exit
```

```

vmupapolca002:/sapdb/L2P/data # cd config/
vmupapolca002:/sapdb/L2P/data/config # ll
total 648
-rw-r--r-- 1 sdb sdba 29137 Apr  4 13:22 .M790835
-rw-rw---- 1 sdb sdba   23 Feb 25 09:25 .M790835.cfg
-rw-rw---- 1 sdb sdba  1536 Feb 25 09:56 .M790835.upc
-rw-rw---- 1 sdb sdba 31545 Apr  4 13:20 L2P
-r--r----- 1 sdb sdba 31545 Mar 30 13:03 L2P.01
-r--r----- 1 sdb sdba 31545 Mar 30 12:57 L2P.02
-r--r----- 1 sdb sdba 31545 Mar 30 12:53 L2P.03
-r--r----- 1 sdb sdba 31545 Mar 30 12:43 L2P.04

```

```

vmupapolca002:/sapdb/L2P/data/config # /sapdb/programs/bin/sdbregview -l
Installation: Global      /sapdb/programs
Global Listener           7.9.09.05    valid    64 bit
Installation Compatibility 7.9.09.05    valid    64 bit
Installer                 7.9.09.05    valid
SAP Utilities Compatibility 7.9.09.05    valid    64 bit

Installation: L2P        /sapdb/L2P/db
APO LC APPS              10.00.028    valid
Base                    7.9.08.35    valid    64 bit
DB Analyzer              7.9.08.35    valid    64 bit
Database Kernel          7.9.08.35    valid    64 bit
Fastload API            7.9.08.35    valid    64 bit
JDBC                    7.6.09.00    valid
Loader                  7.9.08.35    valid    64 bit
Messages                MSG 0.10302   valid
ODBC                    7.9.08.35    valid    64 bit
Redist Python            7.9.08.35    valid    64 bit
SAP Utilities            7.9.08.35    valid    64 bit
SQLDBC                  7.9.08.35    valid    64 bit
SQLDBC 76               7.6.06.28    valid    64 bit
SQLDBC 77               7.9.08.35    valid    64 bit
Server Utilities        7.9.08.35    valid    64 bit

vmupapolca002:/sapdb/L2P/data/config # █

```

```

vmudrapolca001:/sapdb/L2P/data/config # su - l2padm
vmudrapolca001:l2padm 188> dbmcli -U ADMIN
dbmcli on L2P>param_getvolsall
OK
UseMirroredLog          NO
MaxLogVolumes           3
MaxDataVolumes          21
LogVolumeName001        128000      F /sapdb/L2P/saplog/DISKL001 1
LogVolumeName002        1280000    F /sapdb/L2P/saplog/DISKL002 1
DataVolumeName0001      2201600    F /sapdb/L2P/sapdata/DISKD0001
DataVolumeName0002      2201600    F /sapdb/L2P/sapdata/DISKD0002
DataVolumeName0003      2201600    F /sapdb/L2P/sapdata/DISKD0003
DataVolumeName0004      2201600    F /sapdb/L2P/sapdata/DISKD0004
DataVolumeName0005      2201600    F /sapdb/L2P/sapdata/DISKD0005
DataVolumeName0006      2201600    F /sapdb/L2P/sapdata/DISKD0006
DataVolumeName0007      5248000    F /sapdb/L2P/sapdata/DISKD0007
DataVolumeName0008      5248000    F /sapdb/L2P/sapdata/DISKD0008
DataVolumeName0009      5248000    F /sapdb/L2P/sapdata/DISKD0009
DataVolumeName0010      5248000    F /sapdb/L2P/sapdata/DISKD0010
DataVolumeName0011      5248000    F /sapdb/L2P/sapdata/DISKD0011

---
dbmcli on L2P>

```

```

vmudrapolca001:/sapdb/L2P/data/config # su - l2padm
vmudrapolca001:l2padm 191> dbmcli -U ADMIN
dbmcli on L2P>db_state
OK
State
OFFLINE

---
dbmcli on L2P>medium_getall
OK
DISK      /import/MAXDB/FULL_P22.DMP      FILE  DATA  0      8      NO      NO      20230309084910 2
0230309084910  NONE  0
LOG       /import/MAXDB/L2P_LOG.dmp          FILE  AUTO   0      8      NO      NO      20230309090237 2
0230309090237  NONE  0
External_Snapshot  EXTERNAL  DATA  0      8      NO      NO      20230328134211 2
0230328134211  DBMC  0

---
dbmcli on L2P>

```

```

=8,noatime,rs size=262144,rw,sec=sys,tcp,vers=4,ws size=262144 0 0
vmudrapolca001:/sapdb/L2P/data/config # su - l2padm
vmudrapolca001:l2padm 195> dbmcli -U ADMIN
dbmcli on L2P>db_admin
OK

---
dbmcli on L2P>db_connect
OK

---
dbmcli on L2P>help recover_start
OK
recover_start          <medium_name> <backup_type> [ExternalBackupID
                        <ebid_list>] [<nnn>] [UNTIL <date> <time>]
                        [AUTOIGNORE] [LABEL <label>]

---
dbmcli on L2P>recover_start External_Snapshot
ERR
-24925,ERR PREPARE: preparation of backup operation failed
An external backup ID is needed, but not supplied.

---
dbmcli on L2P>recover_start External_Snapshot ExternalBackupID DAT_000000001
OK
Returncode             0
Date                   20230404
Time                   00154323
Server                 vmudrapolca001
Database               L2P
Kernel Version         Kernel    7.9.09   Build 005-123-259-005
Pages Transferred      0
Pages Left
Volumes
Medianame              External_Snapshot
Location
Errortext
Label                  DAT_000000015
Is Consistent          true
First LOG Page         197562
Last LOG Page
DB Stamp 1 Date        20230403
DB Stamp 1 Time        00140005
DB Stamp 2 Date
DB Stamp 2 Time
Page Count
Devices Used           0
Database ID            vmupapolca002:L2P_20230328_140015
Max Used Data Page     3571258
Converter Page Count

---
dbmcli on L2P>

```

```
-rw-r----- 1 sdb sdba 73953 Mar 30 12:31 xserver_vmupapolca003_7203.prt
vmupapolca002:/sapdb/L2P/data/wrk # cd L2P/
vmupapolca002:/sapdb/L2P/data/wrk/L2P # ll
total 309916
-rw-rw---- 1 sdb sdba 764 Mar 28 15:25 BackupTemplates.xml
drwxrwx--- 5 sdb sdba 4096 Mar 30 12:37 DIAGHISTORY
-rw-rw-rw- 1 sdb sdba 10701837 Apr 4 14:01 KnlMsg
-rw-rw-rw- 1 sdb sdba 10779661 Apr 4 13:20 KnlMsg.old
-rw-rw-rw- 1 sdb sdba 4944501 Apr 4 13:20 KnlMsgArchive
drwxrwx--- 5 sdb sdba 4096 Mar 28 11:52 analyzer
drwxrwx--- 2 sdb sdba 4096 Apr 4 14:00 dbahist
-rw-rw---- 1 sdb sdba 46 Mar 28 15:25 dbm.cfg
-rw-rw---- 1 sdb sdba 1984 Apr 4 02:01 dbm.ebf
-rw-rw---- 1 sdb sdba 70454 Apr 4 14:01 dbm.ebl
-rw-rw---- 1 sdb sdba 1764 Apr 4 14:01 dbm.ebp
-rw-rw---- 1 sdb sdba 2017007 Mar 27 14:21 dbm.ins
-rw-rw---- 1 sdb sdba 197586 Apr 4 02:05 dbm.knl
-rw-rw---- 1 sdb sdba 250648 Apr 4 02:05 dbm.mdf
-rw-rw---- 1 sdb sdba 604409 Apr 4 14:40 dbm.prt
-rw-rw---- 1 sdb sdba 3072 Mar 27 20:30 dbm.upc
-rw-rw---- 1 sdb sdba 14560 Mar 28 15:25 dbmcfg.his
-rw-rw---- 1 sdb sdba 271564800 Apr 4 13:21 knltrace
-r--r----- 1 sdb sdba 4050 Mar 27 14:58 lc_apo_plvlog.txt
-r--r----- 1 sdb sdba 3640 Mar 30 13:29 lc_apo_version.txt
-r--r----- 1 sdb sdba 10792279 Mar 27 15:16 lcapo_com_trace_01.txt
-rw-rw---- 1 sdb sdba 830229 Mar 27 20:30 lcinit.his
-rw-rw---- 1 sdb sdba 23190 Mar 27 20:30 lcinit.log
-rw-rw---- 1 sdb sdba 3149393 Apr 4 13:20 rtedump
drwxrwx--- 2 sdb sdba 57344 Apr 4 13:21 rtedump_dir
vmupapolca002:/sapdb/L2P/data/wrk/L2P # vi dbm.knl
vmupapolca002:/sapdb/L2P/data/wrk/L2P #
```

```
---
vmudrapolca001:l2padm 196> exit
logout
vmudrapolca001:/sapdb/L2P/data/config # ll /import/MAXDB/
total 512
-rw-r--r-- 1 sdb sdba 131072 Apr 3 14:00 L2P_LOG.dmp.625
-rw-r--r-- 1 sdb sdba 131072 Apr 3 14:05 L2P_LOG.dmp.626
-rw-r--r-- 1 sdb sdba 131072 Apr 4 02:00 L2P_LOG.dmp.627
-rw-r--r-- 1 sdb sdba 131072 Apr 4 02:05 L2P_LOG.dmp.628
-rw-r--r-- 1 l2padm sapinst 0 Apr 4 12:50 x
vmudrapolca001:/sapdb/L2P/data/config #
```

```
-rw-r--r-- 1 l2padm sapinst 0 Apr 4 12:50 x
vmudrapolca001:/sapdb/L2P/data/config # su - l2padm
vmudrapolca001:l2padm 198> dbmcli -U ADMIN
dbmcli on L2P>db_state
OK
State
ADMIN
---
dbmcli on L2P>db_connect
OK
---
dbmcli on L2P>recover_start External_Snapshot ExternalBackupID DAT_000000001
ERR
-24924,ERR_DBREQ: cannot start database kernel request
-24988,ERR_SQL: SQL error
-8056,Snapshot ID not found
---
dbmcli on L2P>
```

```

---
dbmcli on L2P>recover_start External_Snapshot ExternalBackupID DAT_000000001
ERR
-24924,ERR_DBREQ: cannot start database kernel request
-24988,ERR_SQL: SQL error
-8056,Snapshot ID not found

---
dbmcli on L2P>db_connect
OK

---
dbmcli on L2P>recover_start LOG 625
ERR
-24988,ERR_SQL: SQL error
-902,I/O error
3,Database state: OFFLINE
Internal errorcode, Error code 9050 "disk_not_accessible"
20017,RestartFilesystem failed with 'I/O error'
61,The logarea could not be opened

---
dbmcli on L2P>

```

```

data/      db/      sapbackup/ sapdata/  saplog/
vmudrapolca001:l2padm 199> cd /sapdb/L2P/data
vmudrapolca001:l2padm 200> cd wrk/
vmudrapolca001:l2padm 201> ll
total 260
drwxrwx--- 6 sdb sdba  4096 Apr  4 15:59 L2P
-rw-rw---- 1 sdb sdba   1988 Apr  4 15:57 L2P.knl
-rw-rw---- 1 sdb sdba     0 Dec 22 16:37 dbmsrv_vmudrapolca001.err
-rw-rw---- 1 sdb sdba  19250 Apr  4 13:48 dbmsrv_vmudrapolca001.prt
-rw-rw---- 1 sdb sdba 159277 Dec 22 17:15 loader.log
-rw-r----- 1 sdb sdba  73953 Dec 22 17:15 xserver_vmudrapolca001_7200.prt
vmudrapolca001:l2padm 202> cd L2P/
L2P/: Permission denied.
vmudrapolca001:l2padm 203> ex

```

```

vmudrapolca001:/sapdb/L2P/data/wrk/L2P #
vmudrapolca001:/sapdb/L2P/data/wrk/L2P # su - l2padm
vmudrapolca001:l2padm 204> dbmcli -U ADMIN
dbmcli on L2P>db_admin
OK

---
dbmcli on L2P>db_execute clear log

```

