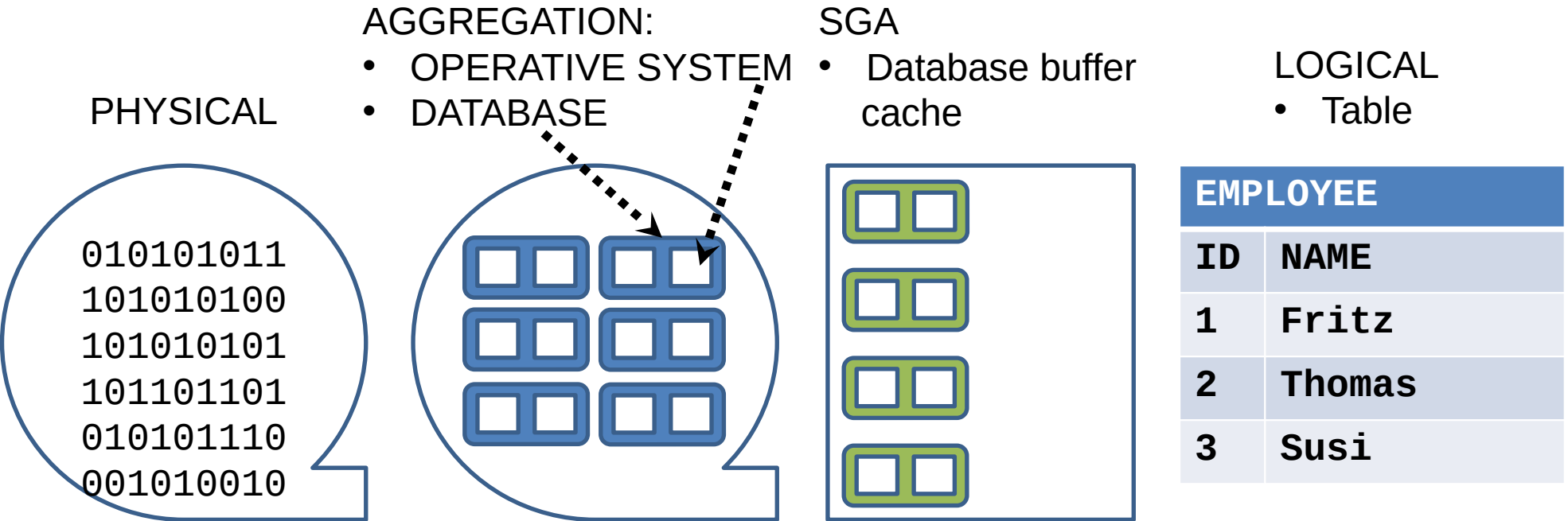


Storage structures

Mag. Thomas Griesmayer

Physical / logical

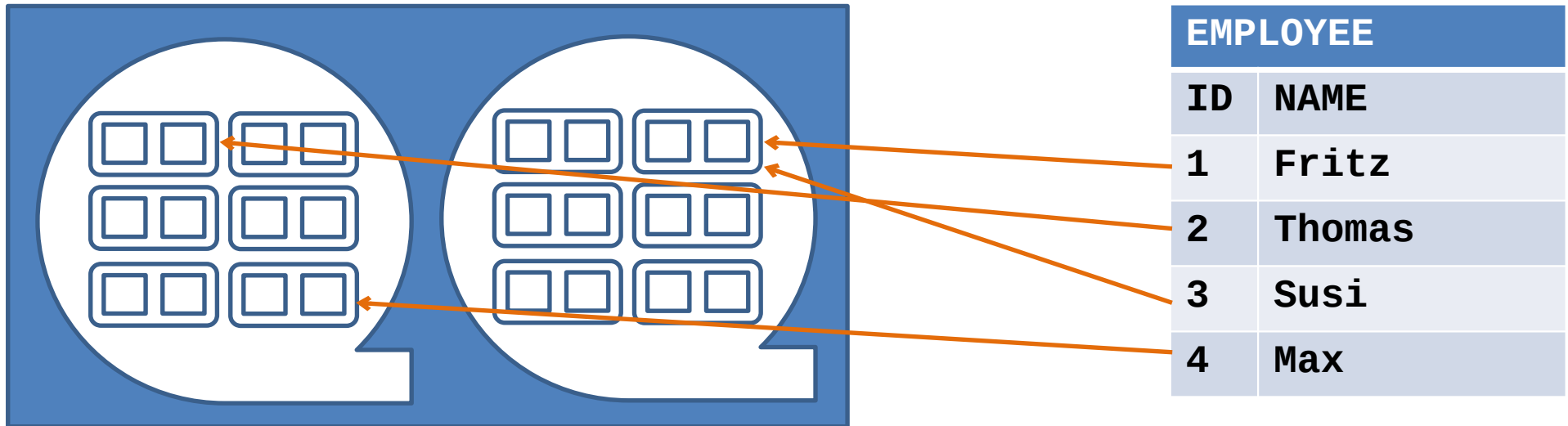
- Physical structures are provided by the operating system - Files.
 BIT -> BYTE -> Operative system block -> Database block
- Logical structures are organized by Oracle.



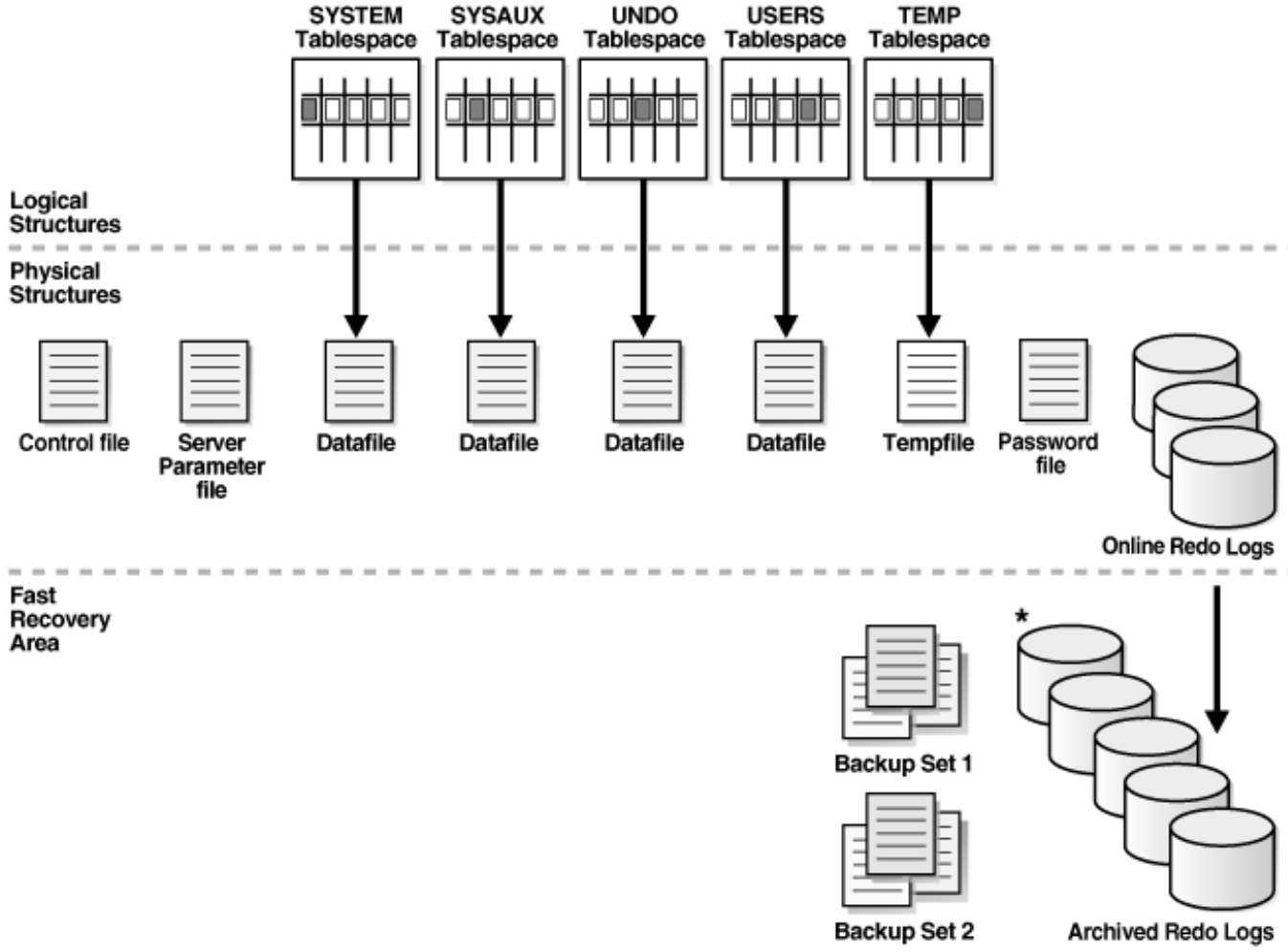
EMPLOYEE	
ID	NAME
1	Fritz
2	Thomas
3	Susi

Tablespace

- A database is divided into logical storage units called tablespaces.
- A tablespace consists of one or more physical datafiles.
- Database objects assigned to a tablespace are stored in the physical datafiles of that tablespace.
- The backup and recovery features of Oracle Database enable you to back up or recover at the tablespace level.



Oracle Database




* Archived Redo Logs present only after turning on log archiving (ARCHIVELOG mode)


database fi


Docker Desktop


Upgrade plan

Search for images, containers, volumes, extensions and more


 Containers


 Images

 Volumes

 Dev Environments **BETA**

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 Learning center


Extensions 

oracle21c



[gvenzl/oracle-xe:21-full](#)

ecda68130a8b 

[1521:1521](#) 

Logs

Inspect

Bind mounts

Terminal

Files

Stats

```
sh-4.4$ ls -l /opt/oracle/oradata/XE/XEPDB1
```

```
total 1030212
```

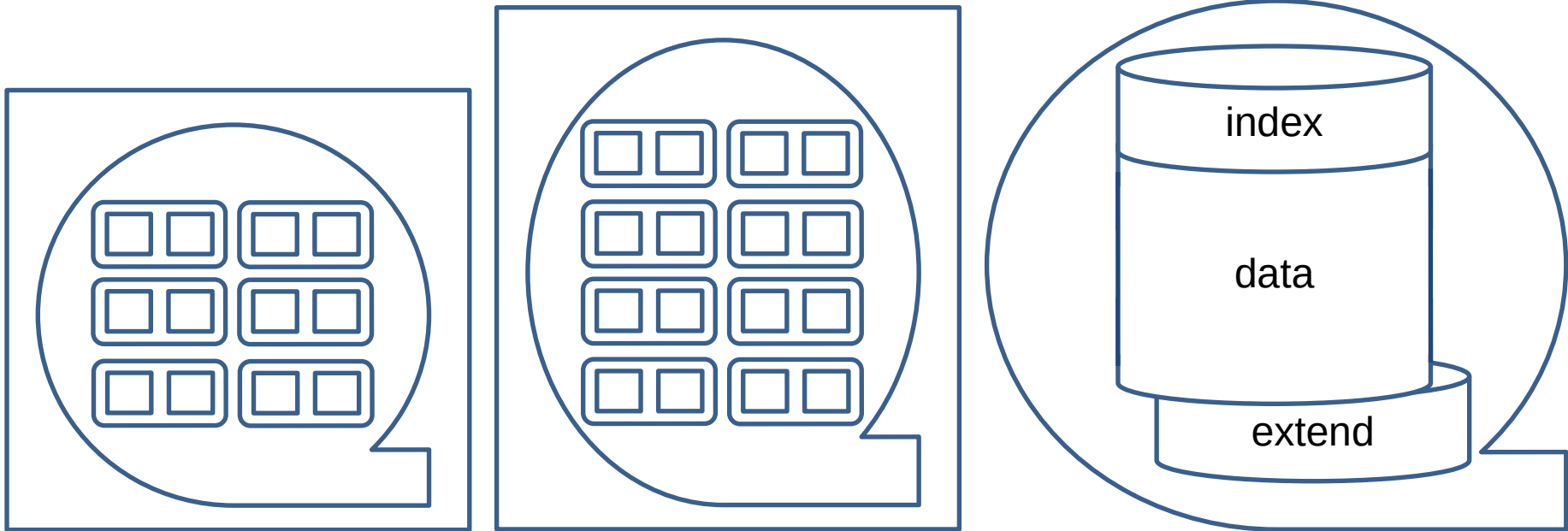
-rw-r-----	1	oracle	oinstall	10493952	Oct	7	19:12	griesmayer1.dbf
-rw-r-----	1	oracle	oinstall	10493952	Oct	7	19:18	griesmayer2.dbf
-rw-r-----	1	oracle	oinstall	408952832	Oct	7	19:23	sysaux01.dbf
-rw-r-----	1	oracle	oinstall	304095232	Oct	7	19:23	system01.dbf
-rw-r-----	1	oracle	oinstall	223354880	Oct	7	17:33	temp01.dbf
-rw-r-----	1	oracle	oinstall	104865792	Oct	7	19:23	undotbs01.dbf
-rw-r-----	1	oracle	oinstall	5251072	Oct	7	19:12	users01.dbf

```
sh-4.4$ cat /opt/oracle/product/21c/dbhomeXE/dbs/init.ora
db_name='ORCL'
memory_target=1G
processes = 150
audit_file_dest='<ORACLE_BASE>/admin/orcl/adump'
audit_trail = 'db'
db_block_size=8192
open_cursors=300
remote_login_passwordfile='EXCLUSIVE'
undo_tablespace='UNDOTBS1'
control_files = (ora_control1, ora_control2)
compatible = '11.2.0'
```

```
sh-4.4$ ls /opt/oracle/product/21c/dbhomeXE/bin/orapwd
/opt/oracle/product/21c/dbhomeXE/bin/orapwd
```

Extend

- Datafiles contains data from tables, indexes, ... and are stored in an Oracle proprietary format.



Control file

- The control file stores the physical components of the database and is used by the processes to find all files of the database.
- If any control file is lost, the database becomes unavailable.
- By installing Oracle it creates three identical files of the control file.

Redo log file

- By changing data the redo log file stores the changes.
- Due to a hardware failure, the data can be restored by a restore and a rerun of the redo log files.
- To protect against losing the redo log, it is possible to keep an identical copy of the redo log.
- The redo log files are overwritten by the time.
- If the database is used in archived redo log mode, the redo log file is copied before reusing it.

/home/oracle/app/oracle/oradata/orcl

/home/.../2019_09_15

redo01.log

redo02.log

redo03.log

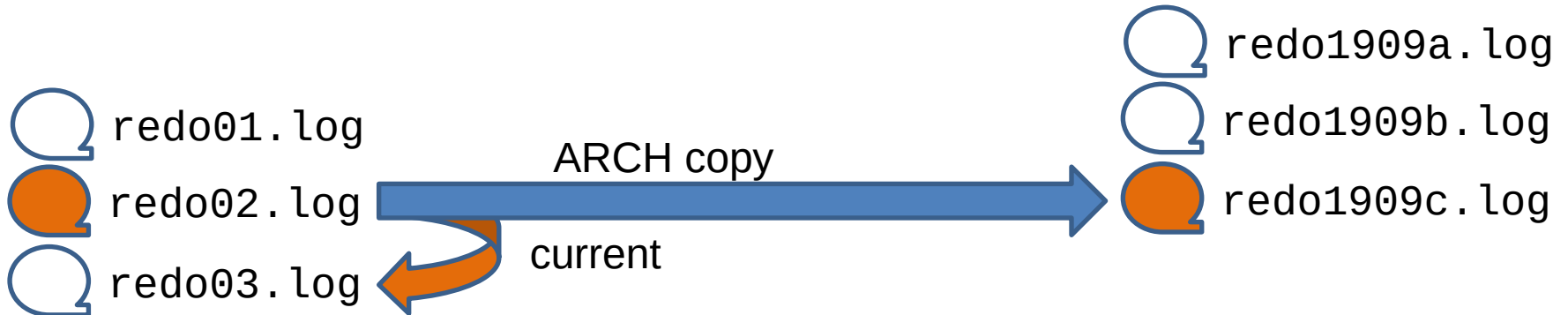
ARCH copy

current

redo1909a.log

redo1909b.log

redo1909c.log



Oracle tablespaces

- The internal **SYSTEM** tablespace is used to manage the database. It contains the data dictionary and tables and views for administrative work.
- The **TEMP** stores temporary data. For example for sorting the result set.
- The **UNDOTBS** is used by the database to store undo information.
- The **USERS** tablespace stores permanent user objects and data.