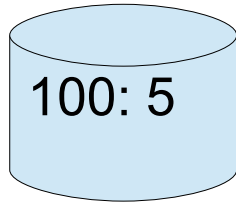
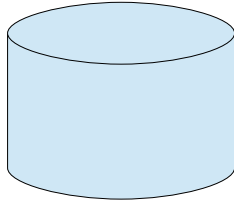


Beispiel: Update eines Datensatzes

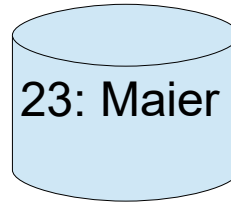
Data file 2



Undo file 3



Data file 4



```
UPDATE emp
SET sal=10
WHERE id=100
```

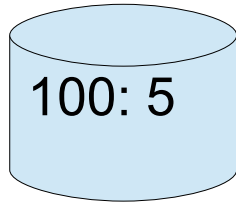
Database Buffer Cache

Redo Buffer

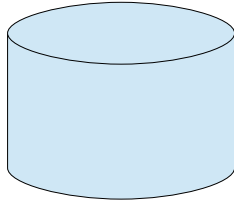
TID	File	Block	Row	Col	Value
-----	------	-------	-----	-----	-------

Beispiel: Update eines Datensatzes

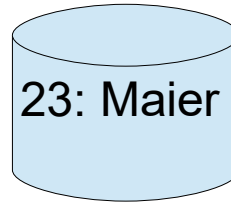
Data file 2



Undo file 3



Data file 4



```
UPDATE emp
SET sal=10
WHERE id=100
```

Database Buffer Cache

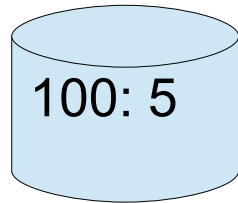
100: 5	
	U1: 5

Redo Buffer

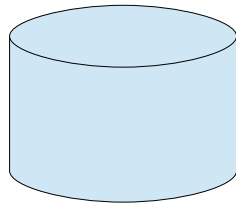
TID	File	Block	Row	Col	Value
T1	3	12	-	-	5

Beispiel: Update eines Datensatzes

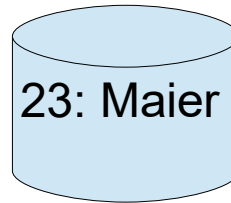
Data file 2



Undo file 3



Data file 4



```
UPDATE emp
SET sal=10
WHERE id=100
```

User #2:

```
UPDATE cust
SET
  name='Huber'
WHERE id=23
```

Database Buffer Cache

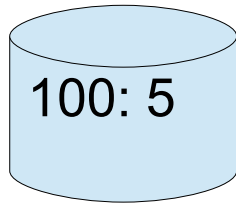
100: X 10	
	U1: 5

Redo Buffer

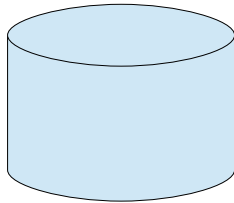
TID	File	Block	Row	Col	Value
T1	3	12	-	-	5
T1	2	123	41	6	10

Beispiel: Update eines Datensatzes

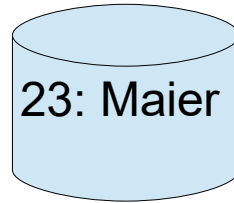
Data file 2



Undo file 3



Data file 4



```
UPDATE emp
SET sal=10
WHERE id=100
```

User #2:

```
UPDATE cust
SET
  name='Huber'
WHERE id=23
```

User #1:

```
UPDATE emp
SET sal=20
WHERE id=100
```

Database Buffer Cache

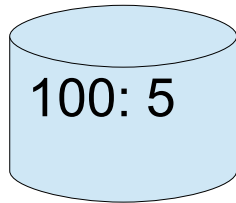
100: X 10	
	U1: 5
U2: Maier	23: Maier Huber

Redo Buffer

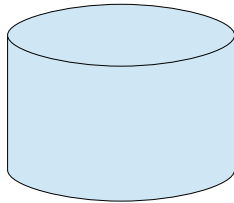
TID	File	Block	Row	Col	Value
T1	3	12	-	-	5
T1	2	123	41	6	10
T2	3	65	-	-	Maier
T2	4	89	28	22	Huber

Beispiel: Update eines Datensatzes

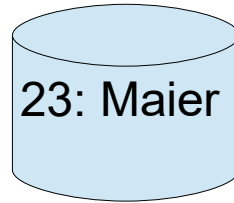
Data file 2



Undo file 3



Data file 4



User #1:

`commit;`

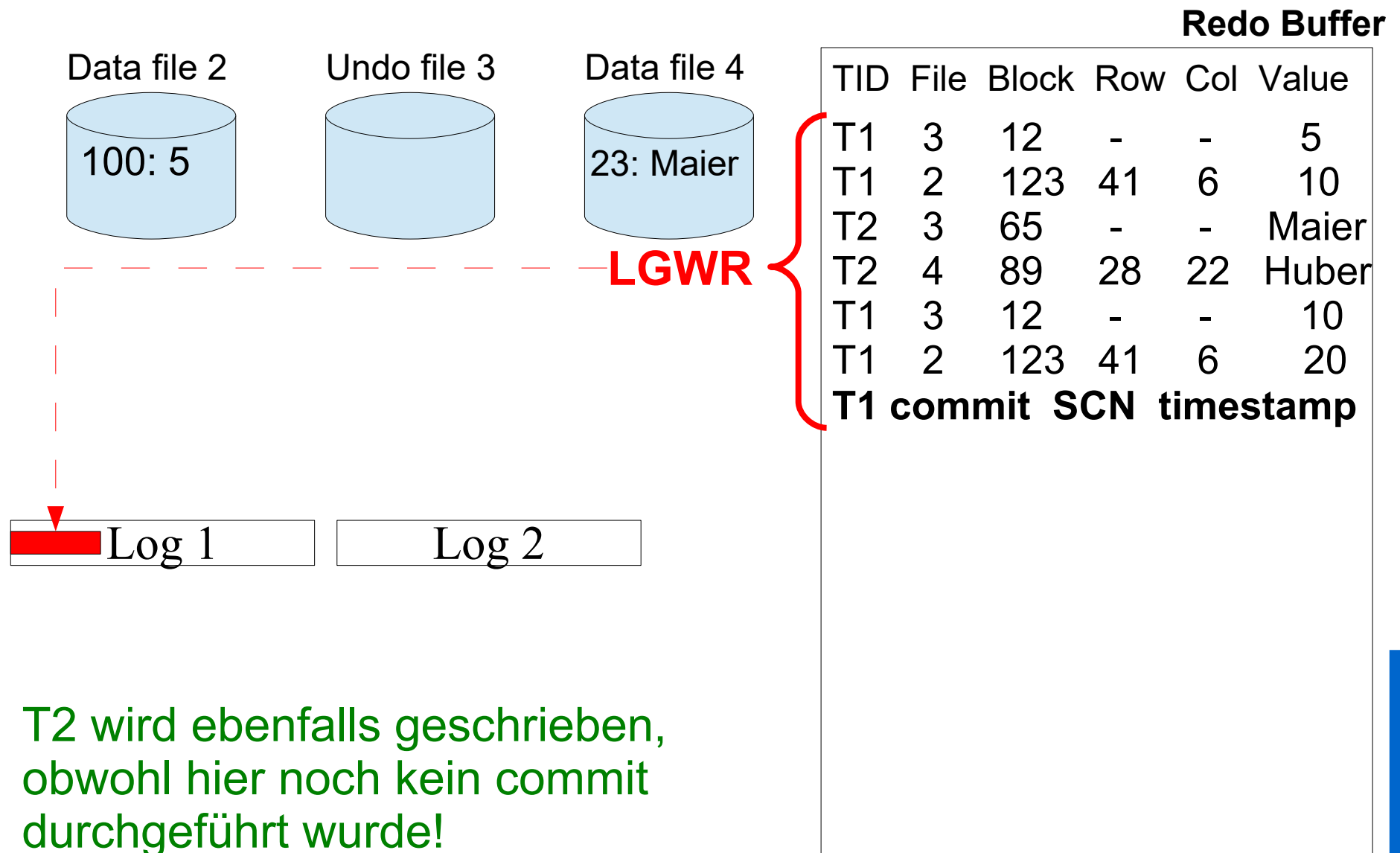
Database Buffer Cache

100: 20 20	
	U1: 5 10
U2: Maier	23: Maier Huber

Redo Buffer

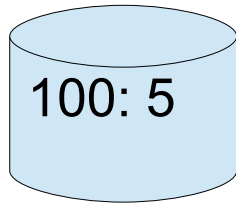
TID	File	Block	Row	Col	Value
T1	3	12	-	-	5
T1	2	123	41	6	10
T2	3	65	-	-	Maier
T2	4	89	28	22	Huber
T1	3	12	-	-	10
T1	2	123	41	6	20

Beispiel: Update eines Datensatzes

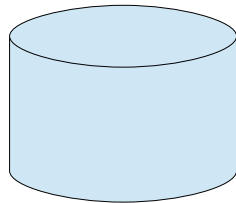


Beispiel: Update eines Datensatzes

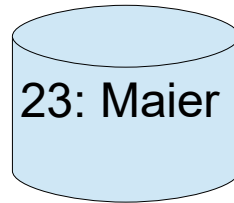
Data file 2



Undo file 3



Data file 4



Während des Schreibvorgangs
wurden weitere Änderungen
durchgeführt. Diese commits werden
zusammengefasst!

Log 1

Log 2

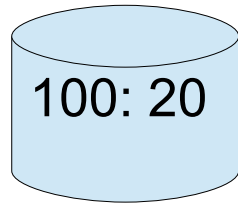
LGWR

Redo Buffer

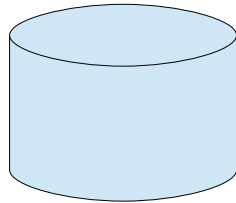
TID	File	Block	Row	Col	Value
T1	3	12	-	-	5
T1	2	123	41	6	10
T2	3	65	-	-	Maier
T2	4	89	28	22	Huber
T1	3	12	-	-	10
T1	2	123	41	6	20
T1 commit SCN timestamp					
T2	3	65	-	-	Huber
T2	4	89	28	22	Utz
T3	3	20	-	-	-
T3	7	47	34	9	22
T3 commit SCN timestamp					
T4	6	10	-	-	15
T4	22	17	61	7	22
T4 commit SCN timestamp					

Beispiel: Update eines Datensatzes - Recovery

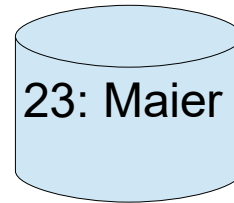
Data file 2



Undo file 3

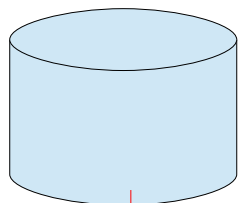


Data file 4



Recovery:
Mittels Control-File
wird der
notwendige Start-
punkt ermittelt!

Control File



Database Buffer Cache

Redo Buffer

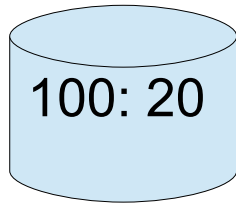
TID	File	Block	Row	Col	Value
T1	3	12	-	-	5
T1	2	123	41	6	10
T2	3	65	-	-	Maier
T2	4	89	28	22	Huber
T1	3	12	-	-	10
T1	2	123	41	6	20

T1 commit SCN timestamp

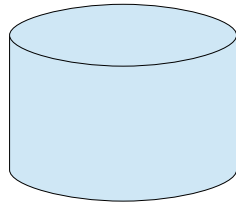
T2	3	65	-	-	Huber
T2	4	89	28	22	Utz
T3	3	20	-	-	-
T3	7	47	34	9	22
T3 commit SCN timestamp					
T4	6	10	-	-	15
T4	22	17	61	7	22
T4 commit SCN timestamp					

Beispiel: Update eines Datensatzes - Recovery

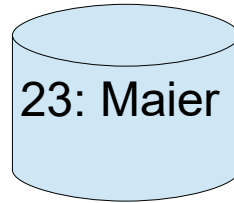
Data file 2



Undo file 3



Data file 4



Nachdem die
Daten wiederher-
gestellt wurden,
wird die DB auf
OPEN gesetzt!

Uncommitted
Transactions
werden
zurückgerollt!

Database Buffer Cache

100: 20 20	
23: Maier Huber	U1: 5 10
U2: Maier	

Redo Buffer

TID	File	Block	Row	Col	Value
T1	3	12	-	-	5
T1	2	123	41	6	10
T2	3	65	-	-	Maier
T2	4	89	28	22	Huber
T1	3	12	-	-	10
T1	2	123	41	6	20

T1 commit SCN timestamp

Recommitted!!

T2	3	65	-	-	Huber
T2	4	89	28	22	Utz
T3	3	20	-	-	-
T3	7	47	34	9	22

Rollback!

T3 commit SCN timestamp

Recommitted!!

T4	6	10	-	-	15
T4	22	17	61	7	22

T4 commit SCN timestamp

Recommitted!!