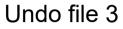
### **Redo Buffer**

Data file 2

100: 5

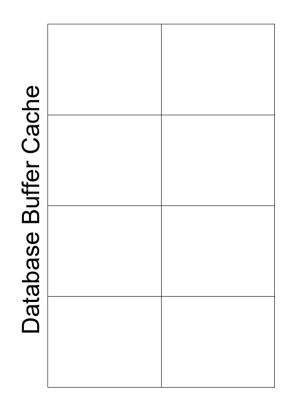




Data file 4

23: Maier

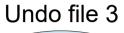
UPDATE emp SET sal=10 WHERE id=100

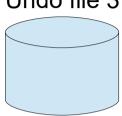


TID File Block Row Col Value

### Data file 2

100: 5

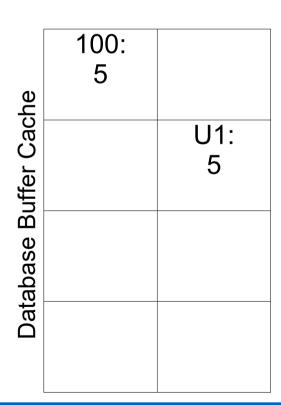




### Data file 4

23: Maier

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



### **Redo Buffer**

TID File Block Row Col Value T1 3 12 5

#### Data file 2

100: 5





### Data file 4

23: Maier

### **Redo Buffer**

TID File Block Row Col Value T1 12 2 123 41 T1 10

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

### **User #2:**

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

he	100: <b>X</b> 10	
Database Buffer Cache		U1: 5
abase B		
Dat		

#### Data file 2

100: 5





Data file 4

23: Maier

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

100: <b>X</b> 10	
	U1:
	5
112.	23:
Maier	
	Huber
	10 U2:

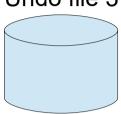
### **Redo Buffer**

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

Data file 2

100: 5

Undo file 3

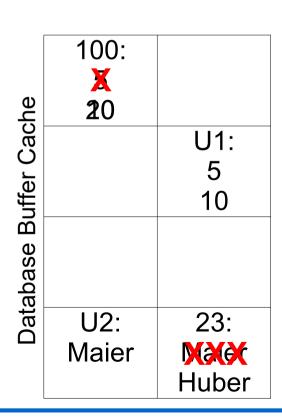


Data file 4

23: Maier

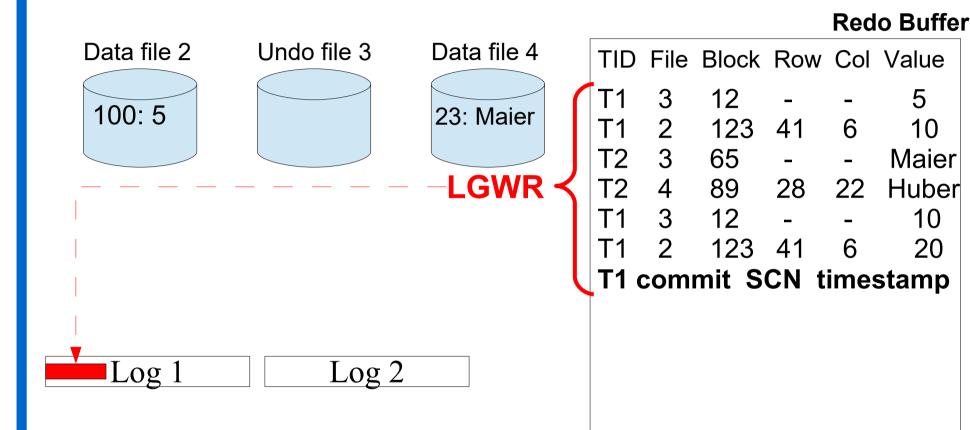
**User #1:** 

commit;



### **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



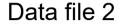
T2 wird ebenfalls geschrieben, obwohl hier noch kein commit durchgeführt wurde!

10

10

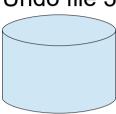
20

### **Redo Buffer**



100: 5





23: Maier

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



Log 2

**LGWR** 

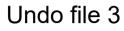
TID	File	Block	Row	Col	Value
T1	3	12	_	_	5
T1	2	123	41	6	10
T2	3	65	_	-	Maier
T2	4		28	22	Huber
T1	3	12	-	-	10
T1	2	123	41	6	20
T1 (	com	mit S	CN t	ime	stamp
ТО	0	0.5			I loda an

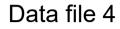
T2	3	65	-	-	Huber
T2	4	89	28	22	Utz
T3	3	20	-	_	-
T3	7	47	34	9	22
T3 commit SCN timestamp					
T4	6	10	-	_	15
T4		17	61	7	22
T4 (	comr	nit S	CN ti	mes	tamp

## Beispiel: Update eines Datensatzes - Recovery

#### Data file 2

100: 20



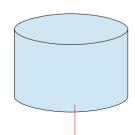


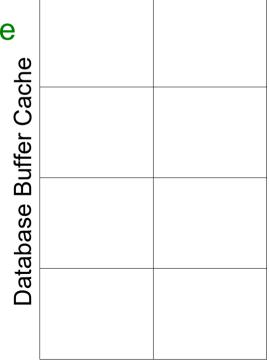
23: Maier

### **Recovery:**

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

Control File





### **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 (	comr	nit S	CN ti	mes	tamp
T4	6	10	-	-	15
T4	22	17	61	7	22
T4 commit SCN timestamp					

## Beispiel: Update eines Datensatzes - Recovery

Data file 2

100: 20

Undo file 3

Data file 4

23: Maier

Nachdem die Daten wiederhergestellt wurden, wird die DB auf OPEN gesetzt!

Uncommited Transactions werden zurückgerollt!

ache	100: <b>20</b> <b>20</b>	
Ca	23:	U1:
er (	MXIX	5
uff	Huber	10
Database Buffer Cache		
Dat	U2: Maier	

#### TID File Block Row Col Value T1 12 5 123 T1 41 6 10 T2 65 Maier T2 89 22 28 Huber T1 3 12 10 123 20 41 T1 commit SCN timestamp Recommitted!! T2 65 Huber T2 89 28 T3 20 T3 47 34 T3 commit SCN timestamp T4 10 17 61 T4 commit SCN timestamp Recommitted!!

**Redo Buffer**