



# Service, please!

## Services in der Oracle Datenbank

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Spitzenleistung heißt, sich auf seine Stärken zu konzentrieren.

## merlin.zwo

Wir machen Oracle - nur Oracle.  
Aus gutem Grund.

[www.merlin-zwo.de](http://www.merlin-zwo.de)



1

Einleitung

2

Was ist ein Oracle Datenbank Service ?

3

Wie werden Services verwendet ?

4

Wann müssen Services verwendet werden ?

5

Wann sollten Services verwendet werden ?

6

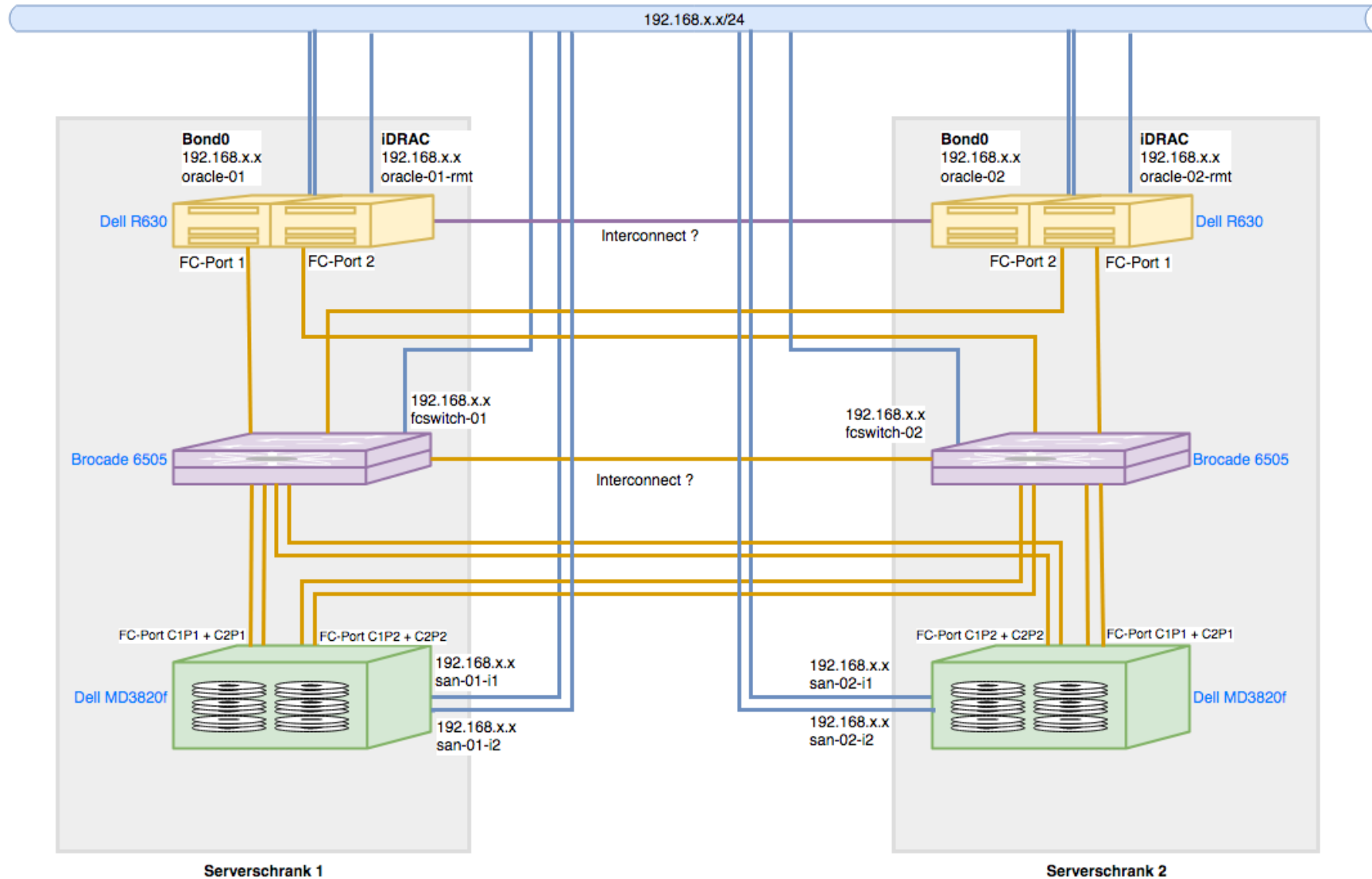
Zusammenfassung







## Manuelle Standby-Konfiguration mit erhöhter Datensicherheit



## Definition der Connection:

```
mzwo =  
  (DESCRIPTION_LIST =  
    (FAILOVER = ON)  
    (LOAD_BALANCE = OFF)  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP) (HOST = m2doag1) (PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP) (HOST = m2doag2) (PORT = 1521))  
      )  
      (CONNECT_DATA =  
        (SERVICE_NAME = mzwo)  
        (SERVER = DEDICATED)  
      )  
    )  
  )  
)
```

## XYZ-Anwendung

Username

XYZ

Passwort

\*\*\*\*\*

Verbindung zu Oracle-Datenbank:

Server

10.43.15.7

Port

1521

SID

XE

Anmelden

....

[ORACLE]

USER=XYZ

PASS=VERYSECRET

SERVER=10.43.15.7

PORT=1521

SID=XE

....









1 Einleitung

2 Was ist ein Oracle Datenbank Service ?

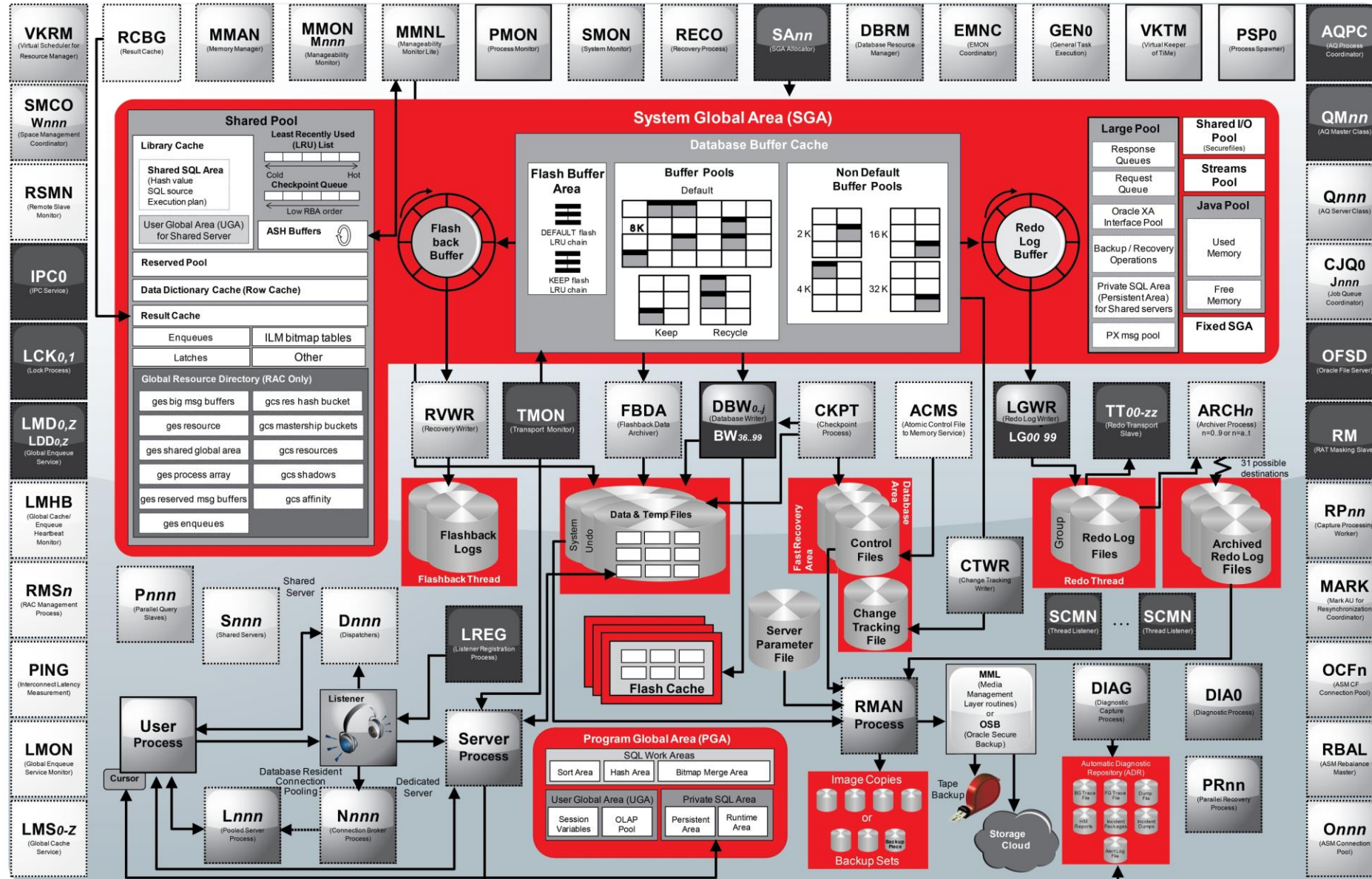
3 Wie werden Services verwendet ?

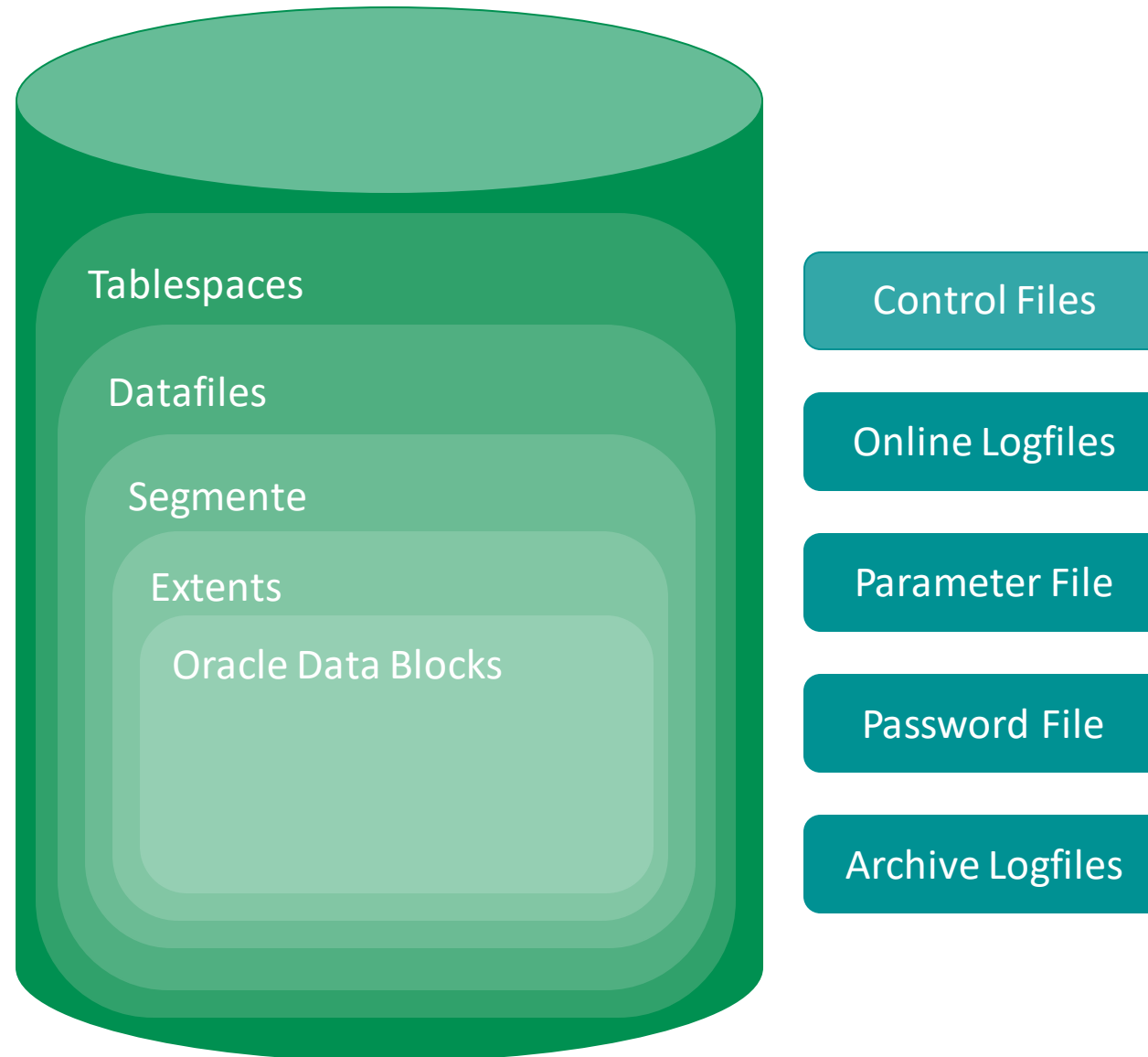
4 Wann müssen Services verwendet werden ?

5 Wann sollten Services verwendet werden ?

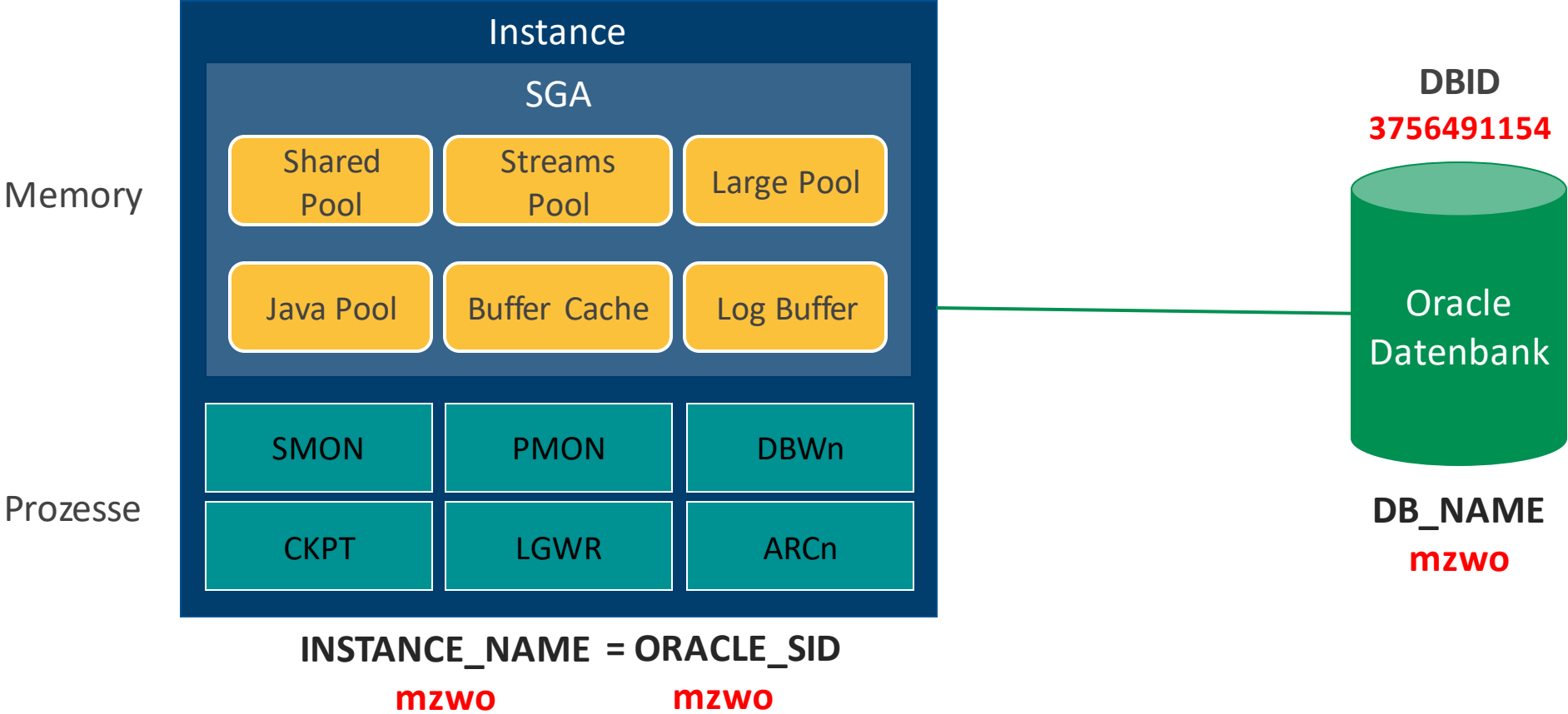
6 Zusammenfassung

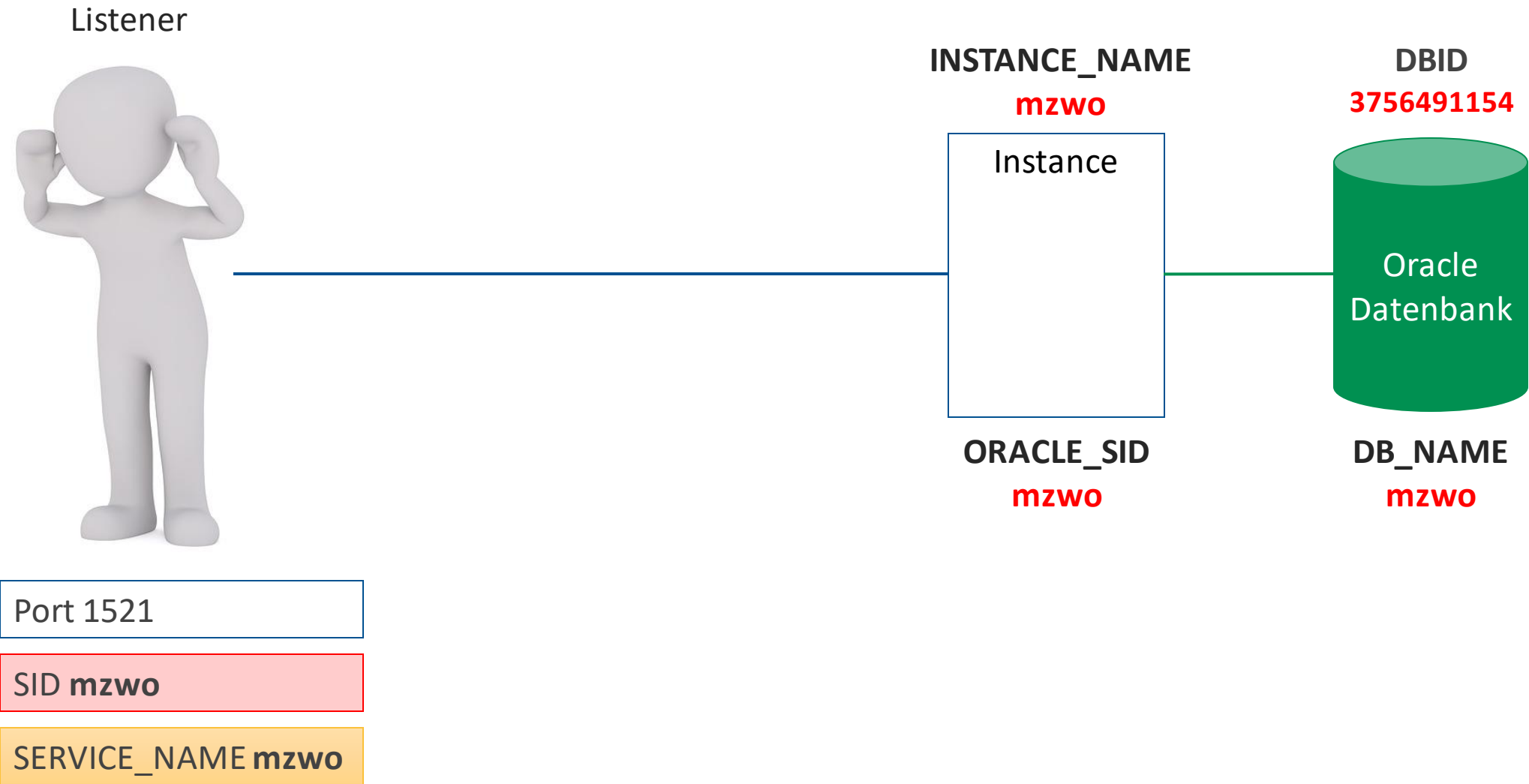






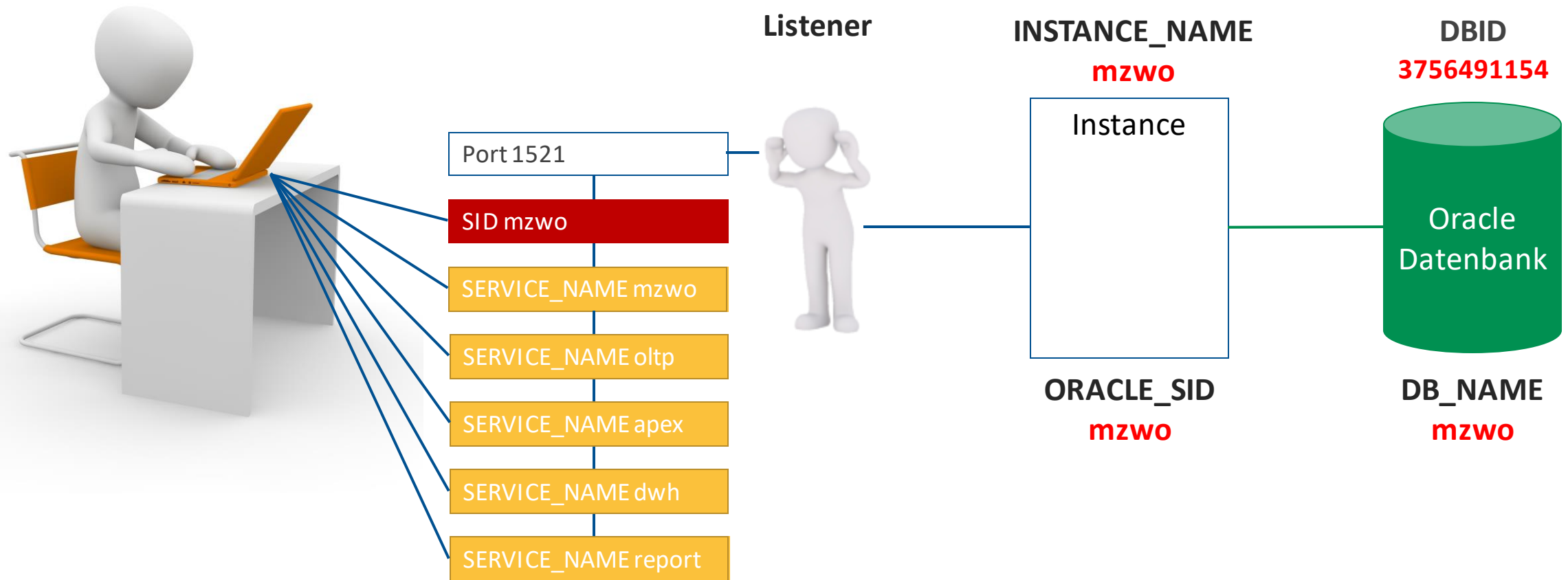








# Verbindung zur Datenbank



```
alter system set service_names = 'mzwo, oltp, apex, dwh, report';
```

# Verbindung zur Datenbank



Listener

Port 1521

INSTANCE\_NAME

**mzwo**

Instance

ORACLE\_SID

**mzwo**

DBID

**3756491154**

Oracle  
Datenbank

DB\_NAME

**mzwo**

Listening Endpoints Summary...

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=m2doag)(PORT=1521))

Services Summary...

**Service "mzwo"** has 1 instance(s).

Instance "mzwo", status READY, has 1 handler(s) for this service...

**Service "oltp"** has 1 instance(s).

Instance "mzwo", status READY, has 1 handler(s) for this service...

**Service "apex"** has 1 instance(s).

Instance "mzwo", status READY, has 1 handler(s) for this service...

**Service "dwh"** has 1 instance(s).

Instance "mzwo", status READY, has 1 handler(s) for this service...

**Service "report"** has 1 instance(s).

Instance "mzwo", status READY, has 1 handler(s) for this service...

Service "mzwoXDB" has 1 instance(s).

Instance "mzwo", status READY, has 1 handler(s) for this service...

Aliasname für eine oder mehrere Datenbankinstanzen

Default-Service entspricht dem Datenbanknamen

Datenbankinstanz kann einen oder mehrere Services beim Listener registrieren

Client muss bei der Verbindung keine Instanz angeben

GDS: Client weiß nicht, wo der Service läuft



Mit Services Applikationen gruppieren

Gleichartige Anwendungen

Prozessgruppen (OLTP, DWH, Batches, Web-Zugriffe)

Gleichartige Programmtypen (Client-Server, APEX, PHP)

Gleiche SLAs

Applikationen in Teilbereiche aufteilen

Applikationen getrennt handhaben

1 Einleitung

2 Was ist ein Oracle Datenbank Service ?

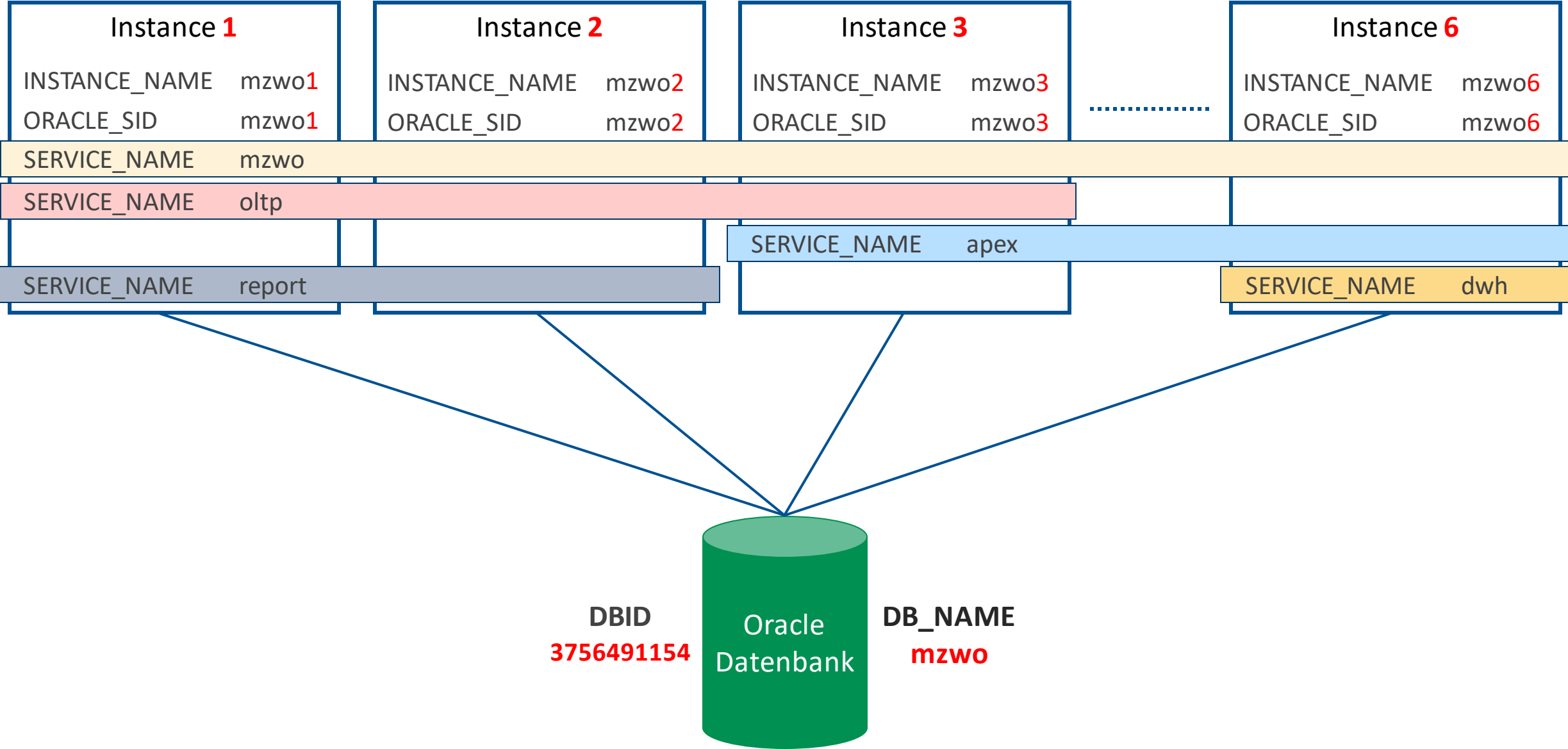
3 Wie werden Services verwendet ?

4 Wann müssen Services verwendet werden ?

5 Wann sollten Services verwendet werden ?

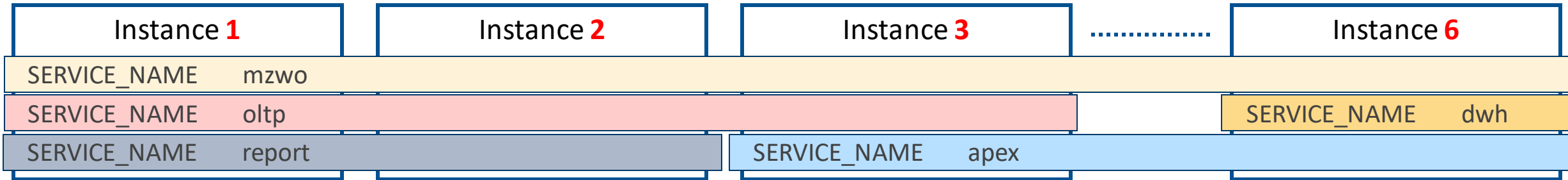
6 Zusammenfassung

# Verbindung zur Datenbank: Real Application Cluster





## Verbindung zur Datenbank: Real Application Cluster



Services Summary...

....

**Service "mzwo"** has 1 instance(s).

Instance "mzwo1", status READY, has...

**Service "oltp"** has 1 instance(s).

Instance "mzwo1", status READY, has...

**Service "report"** has 1 instance(s).

Instance "mzwo1", status READY, has...

....

Services Summary...

....

**Service "mzwo"** has 6 instance(s).

Instance "mzwo1", status READY, has...

Instance "mzwo2", status READY, has...

Instance "mzwo3", status READY, has...

Instance "mzwo4", status READY, has...

Instance "mzwo5", status READY, has...

Instance "mzwo6", status READY, has...

**Service "oltp"** has 3 instance(s).

Instance "mzwo1", status READY, has...

Instance "mzwo2", status READY, has...

Instance "mzwo3", status READY, has...

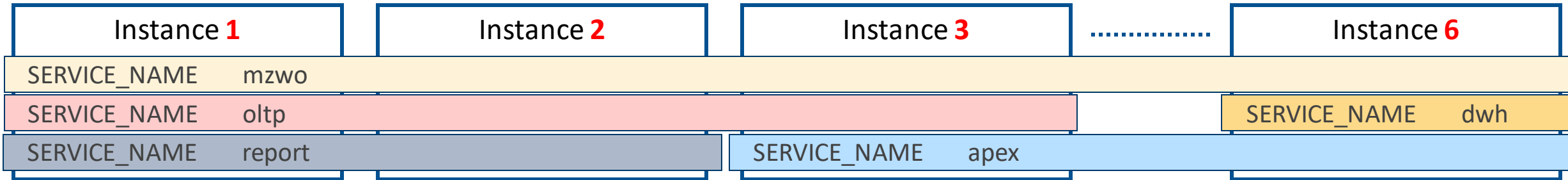
**Service "apex"** has 4 instance(s).

Instance "mzwo3", status READY, has...

Lokaler Listener auf Instance 1

„Globaler“ SCAN-Listener

## Verbindung zur Datenbank: Real Application Cluster



Services Summary...

....

**Service "mzwo"** has 1 instance(s).

Instance "mzwo1", status READY, has...

**Service "oltp"** has 1 instance(s).

Instance "mzwo1", status READY, has...

**Service "report"** has 1 instance(s).

Instance "mzwo1", status READY, has...

....

Instance "mzwo6", status READY, has...

**Service "oltp"** has 3 instance(s).

Instance "mzwo1", status READY, has...

Instance "mzwo2", status READY, has...

Instance "mzwo3", status READY, has...

**Service "apex"** has 4 instance(s).

Instance "mzwo3", status READY, has...

...

Instance "mzwo6", status READY, has...

**Service "dwh"** has 1 instance(s).

Instance "mzwo6", status READY, has...

**Service "report"** has 2 instance(s).

Instance "mzwo1", status READY, has...

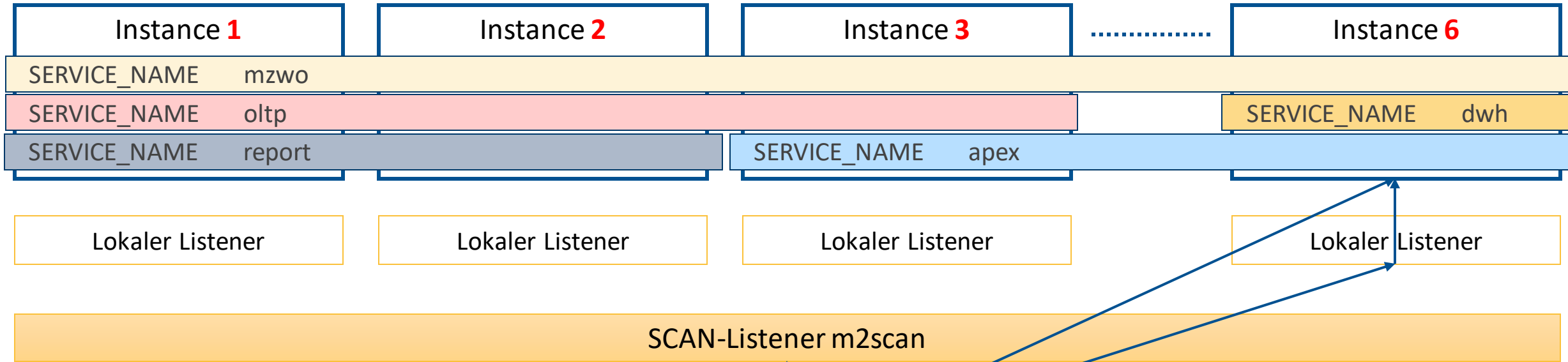
Instance "mzwo2", status READY, has...

....

Lokaler Listener auf Instance 1

„Globaler“ SCAN-Listener

# Verbindung zur Datenbank: Real Application Cluster



scott/tiger@m2scan:1521/dwh



~~scott/tiger@m2scan:1521:dwh~~



~~scott/tiger@mzwo-host6:1521:dwh~~

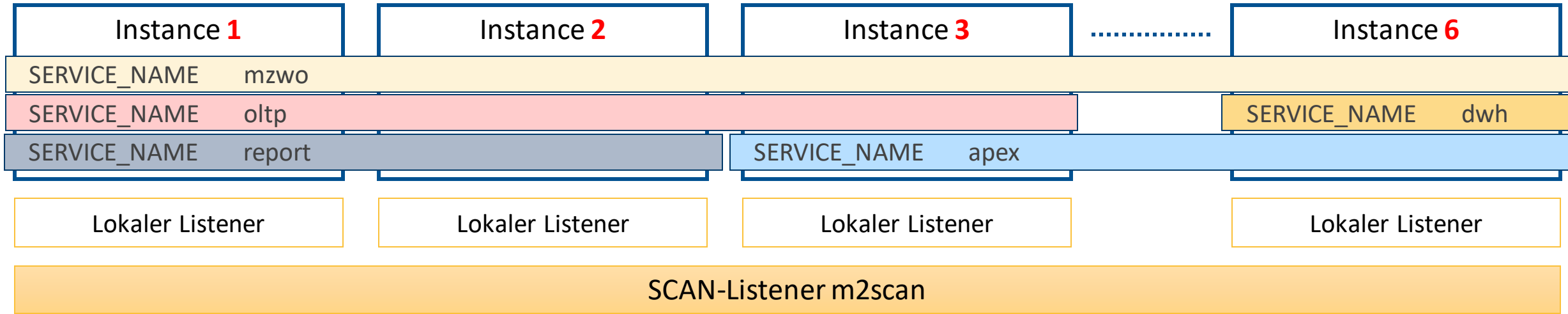


scott/tiger@mzwo-host6:1521/dwh





# Verbindung zur Datenbank: Real Application Cluster



```
srvctl add service  
-db mzwo  
-service oltp  
-preferred "mzwo1,mzwo2,mzwo3"  
-tafpolicy BASIC  
-failovertype SESSION  
-failovermethod BASIC  
.....
```

scott/tiger@m2scan/oltp



```
oltpdb =  
(DESCRIPTION =  
  (ADDRESS = (PROTOCOL = TCP)  
    (HOST = m2scan)(PORT = 1521))  
  )  
(CONNECT_DATA =  
  (SERVICE_NAME = oltp)  
  (SERVER = DEDICATED)  
  ))
```

scott/tiger@oltpdb

1 Einleitung

2 Was ist ein Oracle Datenbank Service ?

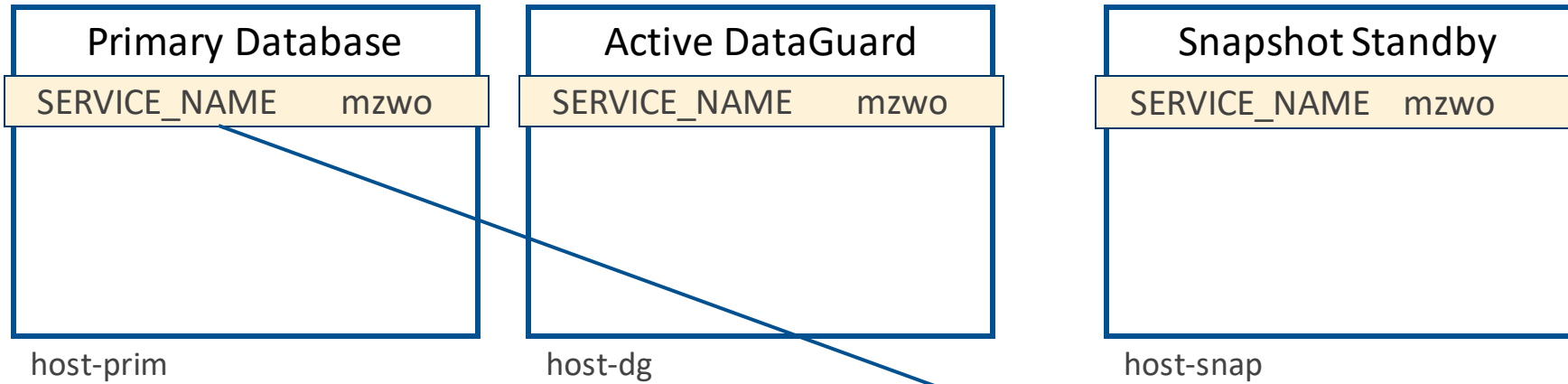
3 Wie werden Services verwendet ?

4 Wann müssen Services verwendet werden ?

5 Wann sollten Services verwendet werden ?

6 Zusammenfassung

## Verwendung von Services: DataGuard

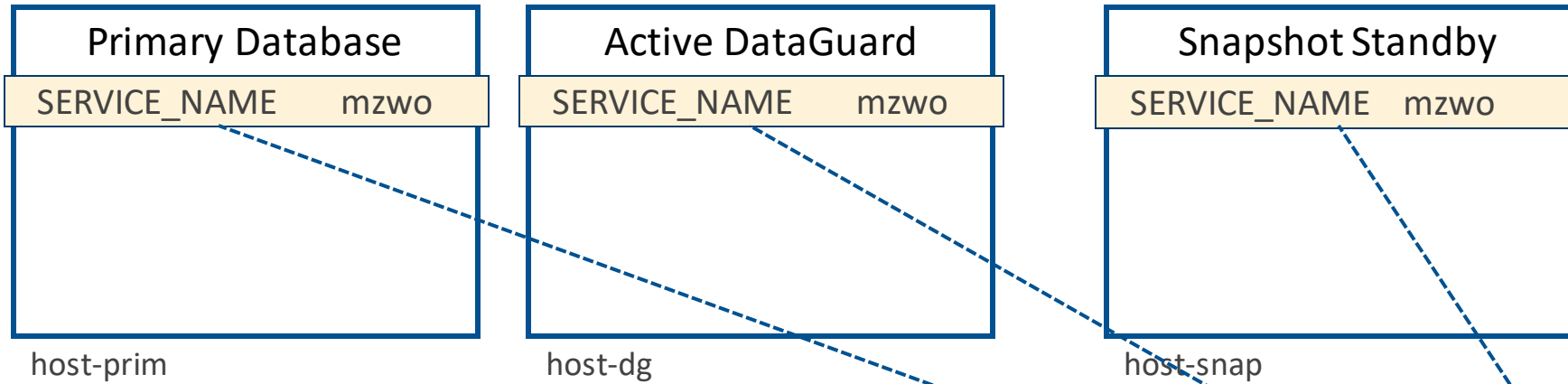


```
mzwo =  
  (DESCRIPTION_LIST =  
    (FAILOVER = ON)  
    (LOAD_BALANCE = OFF)  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-prim)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-dg)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-snap)(PORT = 1521))  
      )  
      (CONNECT_DATA =  
        (SERVICE_NAME = mzwo)  
        (SERVER = DEDICATED)  
      )  
    )  
  )  
)
```





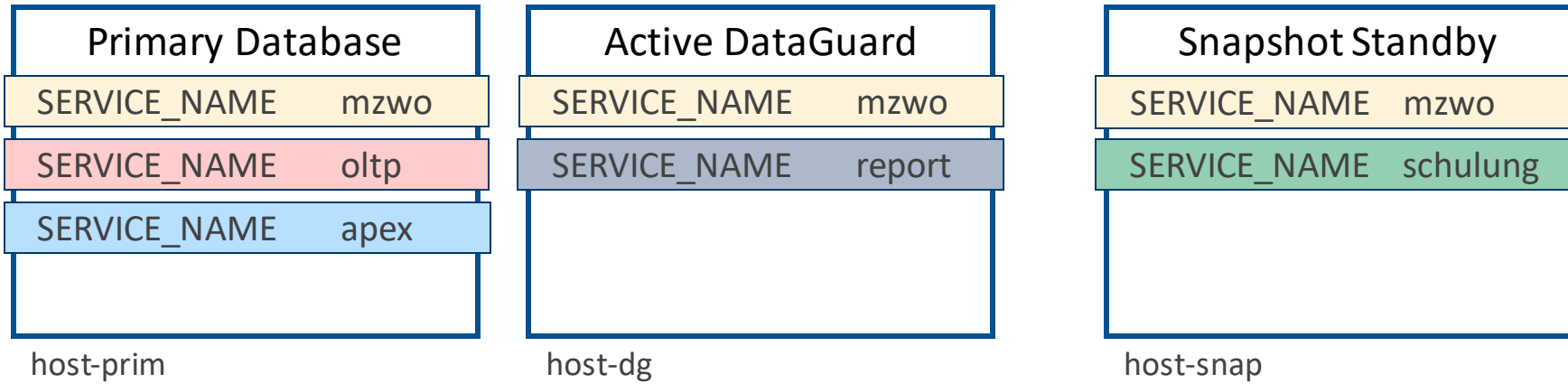
## Verwendung von Services: DataGuard



```
mzwo =  
  (DESCRIPTION_LIST =  
    (FAILOVER = ON)  
    (LOAD_BALANCE = OFF)  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-prim)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-dg)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-snap)(PORT = 1521))  
      )  
      (CONNECT_DATA =  
        (SERVICE_NAME = mzwo)  
        (SERVER = DEDICATED)  
      )  
    )  
  )  
)
```



## Verwendung von Services: DataGuard



```
srvctl add service  
-db mzwo  
-service oltp  
-role PRIMARY  
.....
```

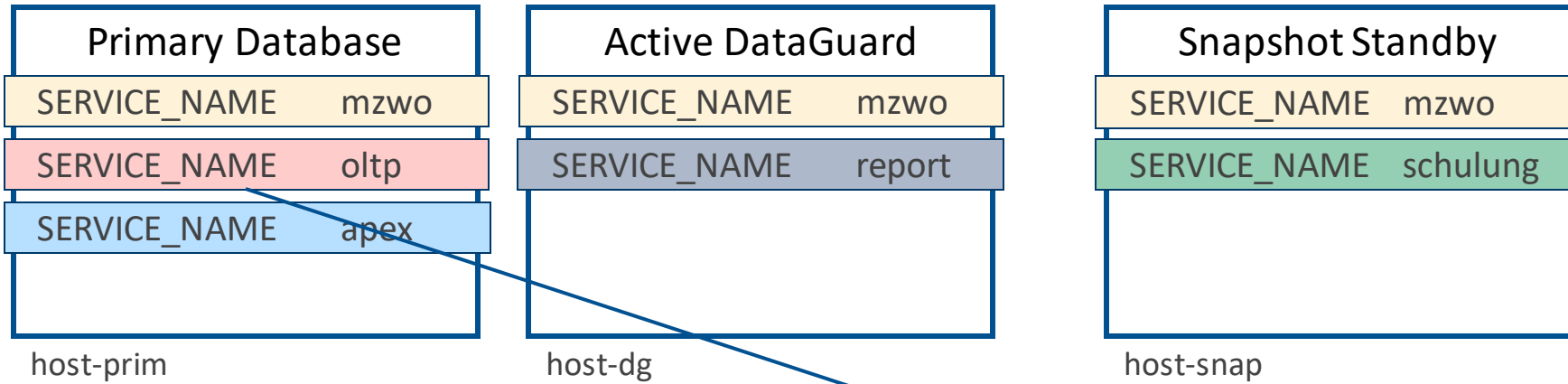
```
srvctl add service  
-db mzwo  
-service apex  
-role PRIMARY  
.....
```

```
srvctl add service  
-db mzwo  
-service report  
-role PHYSICAL_STANDBY  
.....
```

```
srvctl add service  
-db mzwo  
-service schulung  
-role SNAPSHOT_STANDBY  
.....
```



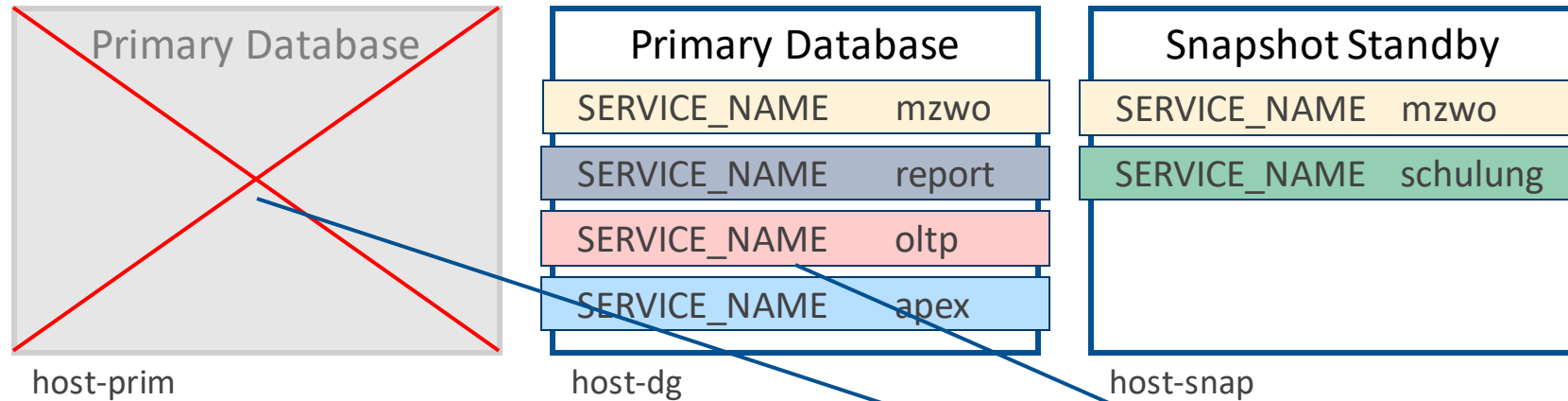
## Verwendung von Services: DataGuard



```
oltpdb =  
  (DESCRIPTION_LIST =  
    (FAILOVER = ON)  
    (LOAD_BALANCE = OFF)  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-prim)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-dg)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-snap)(PORT = 1521))  
      )  
      (CONNECT_DATA =  
        (SERVICE_NAME = oltp)  
        (SERVER = DEDICATED)  
      )  
    )  
  )  
)
```



## Verwendung von Services: DataGuard



```
oltpdb =  
  (DESCRIPTION_LIST =  
    (FAILOVER = ON)  
    (LOAD_BALANCE = OFF)  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-prim)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-dg)(PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP)(HOST = host-snap)(PORT = 1521))  
      )  
      (CONNECT_DATA =  
        (SERVICE_NAME = oltp)  
        (SERVER = DEDICATED)  
      )  
    )  
  )  
)
```





## Verwendung von Services: Multitenant

### Instance

INSTANCE_NAME	mzwo
ORACLE_SID	mzwo

**Container**

INSTANCE\_NAME = ORACLE\_SID = mzwo

Services Summary...

....

**Service "mzwo"** has 1 instance(s).

Instance "mzwo", status READY, has...



Services Summary...

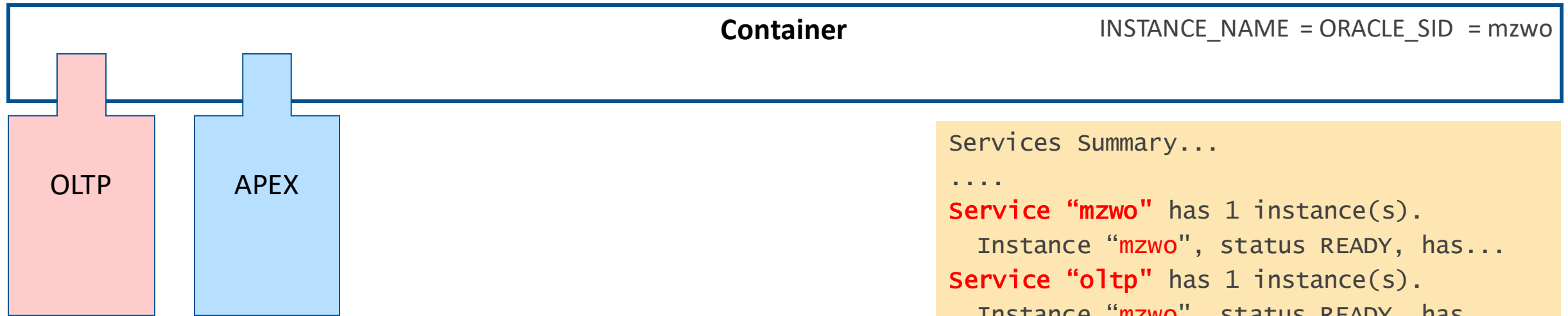
....

**Service "mzw0"** has 1 instance(s).

Instance "mzw0", status READY, has...

**Service "oltp"** has 1 instance(s).

Instance "mzw0", status READY, has...



Services Summary...

....

**Service "mzw"** has 1 instance(s).

Instance "mzw", status READY, has...

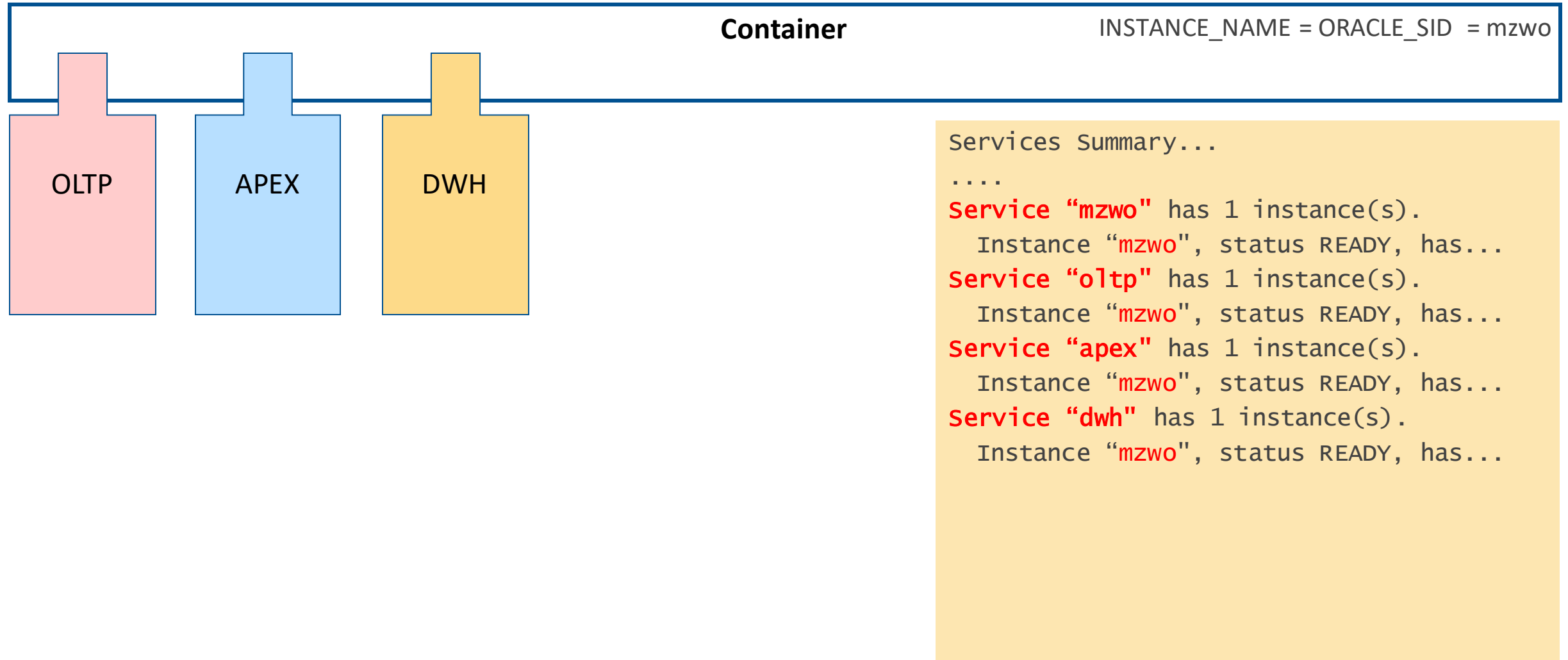
**Service "oltp"** has 1 instance(s).

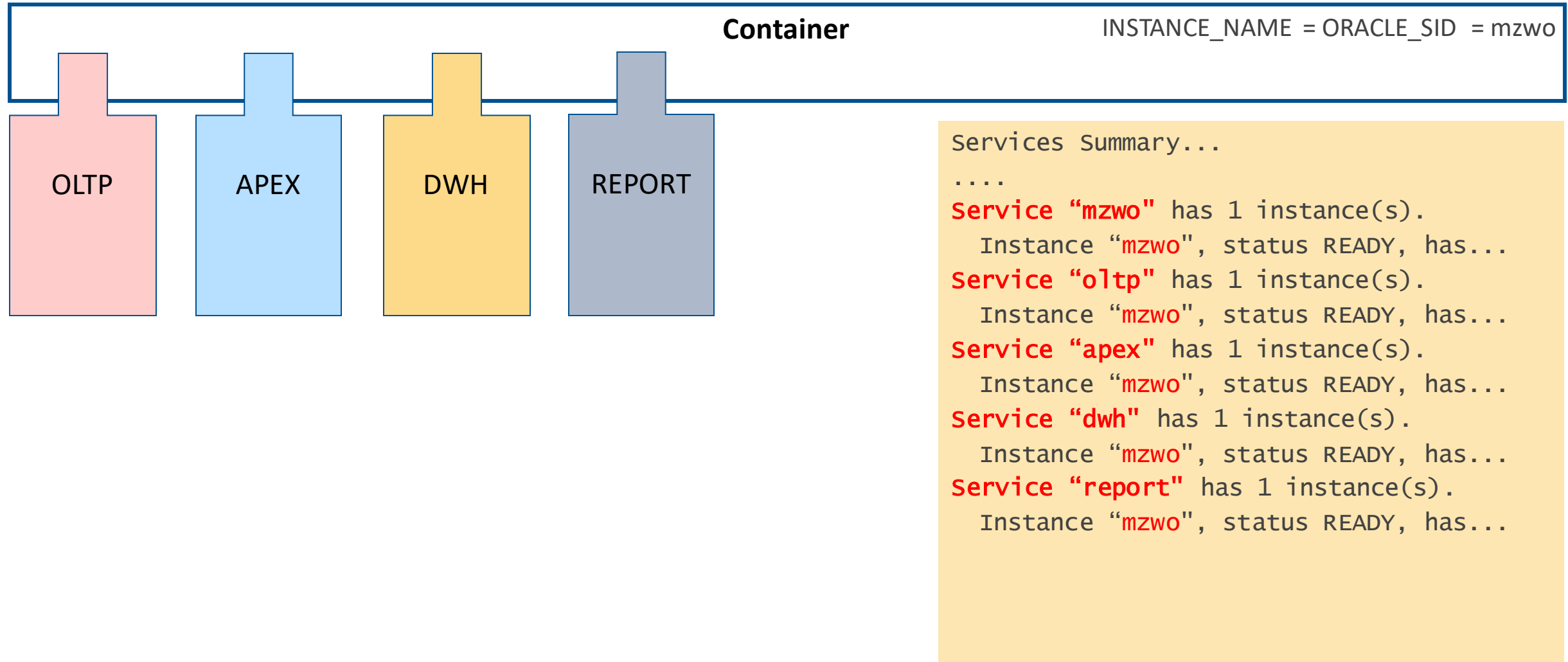
Instance "mzw", status READY, has...

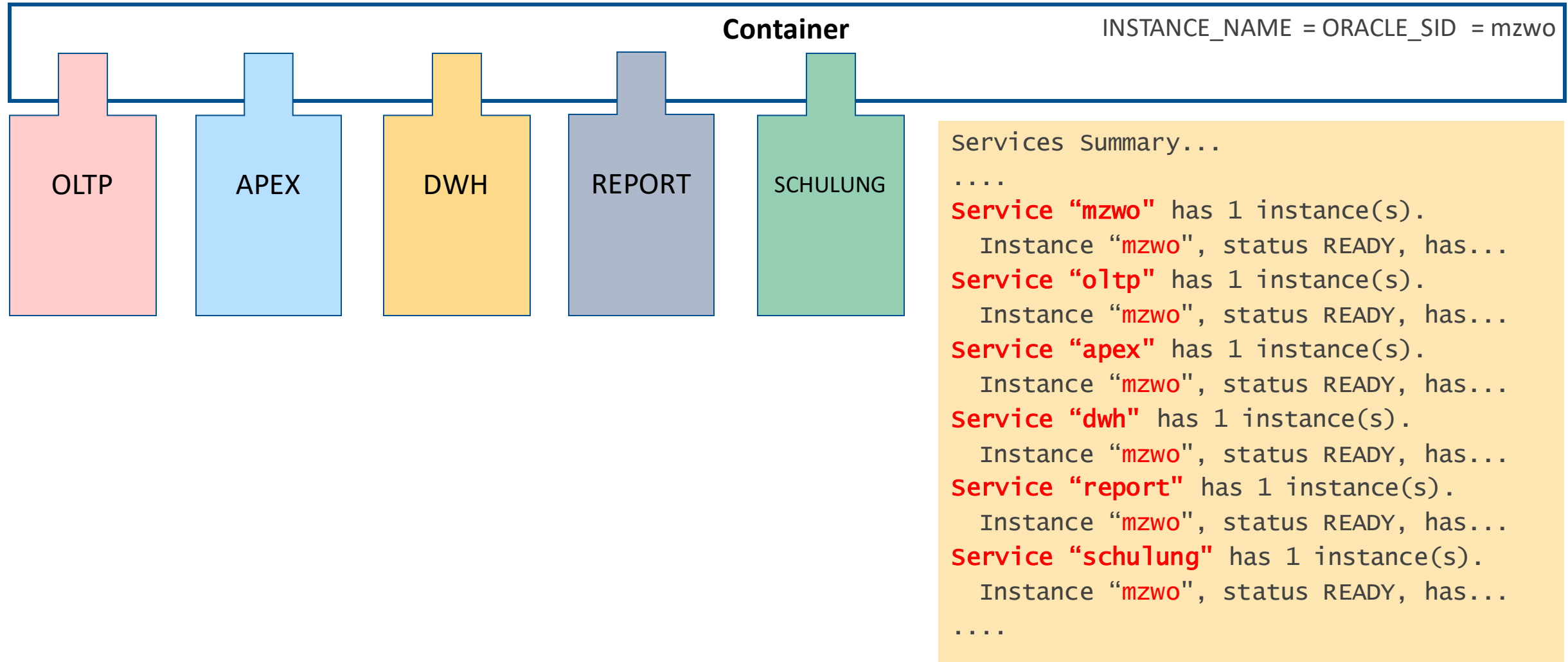
**Service "apex"** has 1 instance(s).

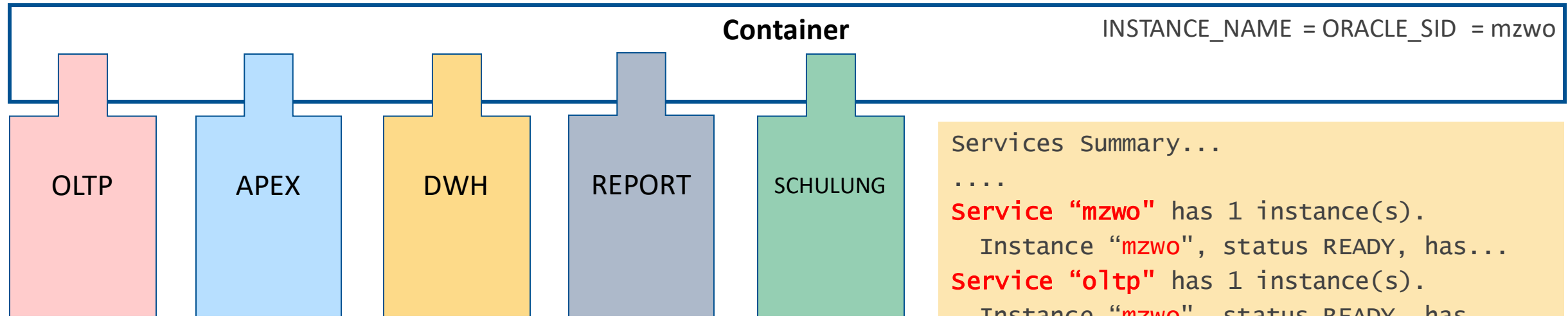
Instance "mzw", status READY, has...











## Services Summary...

....

**Service "mzw0"** has 1 instance(s).

Instance "mzw0", status READY, has...

**Service "oltp"** has 1 instance(s).

Instance "mzw0", status READY, has...

**Service "apex"** has 1 instance(s).

Instance "mzw0", status READY, has...

**Service "dwh"** has 1 instance(s).

Instance "mzw0", status READY, has...

**Service "report"** has 1 instance(s).

Instance "mzw0", status READY, has...

**Service "schulung"** has 1 instance(s).

Instance "mzw0", status READY, has...

....

scott/tiger@m2doag:1521:mzw0 ⚠

scott/tiger@m2doag:1521/mzw0 ✓

scott/tiger@m2doag:1521:oltp ✗

scott/tiger@m2doag:1521/oltp ✓

scott/tiger@m2doag:1521:apex ✗

scott/tiger@m2doag:1521/apex ✓



## Verwendung von Services notwendig

### Real Application Cluster

Automatisches LoadBalancing  
Automatischer Client Failover  
SCAN-Listener mit SID geht nicht

### DataGuard

Automatischer Client Switchover  
Automatischer Client Failover

### Manual Standby

Automatischer Client Reconnect

### Multitenant

Connect zu PDB nur über Service

### Global Data Services

Funktioniert nur über Service

### Sharding

Funktioniert nur über Service

## XYZ-Anwendung

Username

XYZ

Passwort

\*\*\*\*\*

Verbindung zu Oracle-Datenbank

Server

10.43.15.7

Port

1521

SID

XE

Anmelden

**DEAD  
END**

.....  
[ORACLE]  
=XYZ  
VERYSECRET  
10.43.15.7

## XYZ-Anwendung

Username

XYZ

Passwort

\*\*\*\*\*

Verbindung zu Oracle-Datenbank:

Server

10.43.15.7

Port

1521

**Service**

oltp

Anmelden



```
....
[ORACLE]
USER=XYZ
PASS=VERYSECRET
SERVER=10.43.15.7
PORT=1521
SERVICE=oltp
....
```

```
....
[ORACLE]
USER=XYZ
PASS=VERYSECRET
CONNECT=m2scan:1521/oltp
....
```

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6 Zusammenfassung



## Anlegen eines Service: Single Instance

```
alter system set service_names = 'mzwo, oltp, apex, dwh, report';
```

Services stehen unmittelbar zur Verfügung

Alternativ:

```
exec dbms_service.create_service(service_name => 'oltp', network_name => 'oltp')
exec dbms_service.create_service(service_name => 'apex', network_name => 'apex')
exec dbms_service.create_service(service_name => 'dwh', network_name => 'dwh')
exec dbms_service.create_service(service_name => 'report', network_name => 'report')
```

Service muss explizit gestartet werden

```
exec dbms_service.start_service('oltp')
```

## Beenden eines Service: Single Instance

```
alter system set service_names = 'mzwo';
```

Alle Services außer mzwo werden unmittelbar beendet.

Aktive Sessions bleiben bestehen!

Alternativ:

```
exec dbms_service.stop_service('oltp')  
exec dbms_service.stop_service('apex')  
exec dbms_service.stop_service('dwh')  
exec dbms_service.stop_service('report')
```

Aktive Sessions können beendet werden:

```
exec dbms_service.disconnect_session('apex',IMMEDIATE)
```

## Anlegen eines Service: Real Application Cluster

```
srvctl add service -db mzw0 -service oltp -preferred "inst1,..." -tafpolicy BASIC  
-failovertype SESSION -failovermethod BASIC .....
```

Service muss explizit gestartet werden

```
srvctl start service -db mzw0 -service "oltp, ...." [-instance ....] .....
```

## Beenden eines Service: Real Application Cluster

```
srvctl stop service -db mzwo -service "oltp, ...." [-instance ....] ....
```

Service wird beendet, aktive Sessions bleiben bestehen

```
srvctl stop service -db mzwo -service "oltp, ...." [-instance ....] .... -force
```

Service und aktive Sessions werden unmittelbar beendet

Bei Verwendung von Oracle Restart:

```
srvctl add service -db mzwo -service oltp -role PRIMARY .....  
srvctl add service -db mzwo -service apex -role PRIMARY .....  
srvctl add service -db mzwo -service report -role PHYSICAL_STANDBY .....  
srvctl add service -db mzwo -service schulung -role SNAPSHOT_STANDBY .....
```

Ohne Verwendung von Oracle Restart:

```
create or replace trigger ich_bin_primary after startup|db_role_change on database  
declare  
    rolle varchar2(30);  
begin  
    select database_role into rolle from v$database;  
  
    if rolle = 'PRIMARY' then  
        dbms_service.start_service('OLTP');  
        dbms_service.start_service('APEX');  
    end if;  
end;
```



Wann sollten Services verwendet werden?

Einfache Antwort: **Immer!**



## Wann sollten Services verwendet werden?

Seit Oracle 8i recommended!

Oracle 8i wurde 1998 released.

Der Default-Service bleibt dem Administrator vorbehalten.

Kontrolle über die Datenbank behalten:

Neues Release der Anwendung einspielen

Amok laufende Prozesse aussperren

Wieviel Last über welchen Service

Wieviele Prozesse über welchen Service

Ressourcenbegrenzung über Resource Manager (CPU, I/O)

Ressourcen zeitgesteuert zuweisen

Schemas / Datenbanken transparent verschieben

∞ mehr Möglichkeiten .....

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6 Zusammenfassung

Kein Datenbankzugriff über SID!

Der Default-Service ist dem Administrator vorbehalten!

```
mzwo =  
  (DESCRIPTION =  
    (ADDRESS =  
      (PROTOCOL = TCP)  
      (HOST = m2doag)  
      (PORT = 1521))  
    )  
    (CONNECT_DATA =  
      (SID = mzwo)  
      (SERVER = DEDICATED)  
    )  
  )
```

```
mzwo =  
  (DESCRIPTION =  
    (ADDRESS =  
      (PROTOCOL = TCP)  
      (HOST = m2doag)  
      (PORT = 1521))  
    )  
    (CONNECT_DATA =  
      (SERVICE_NAME = oltp)  
      (SERVER = DEDICATED)  
    )  
  )
```

sqlplus scott/tiger@mzwo

sqlplus scott/tiger@m2doag:1521/oltp

sqlplus scott/tiger@m2doag/oltp

jdbc:oracle:thin:@m2doag:1521/oltp

jdbc:oracle:thin:@m2doag/oltp







Fragen?



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<http://www.merlin-zwo.de>

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**Weitere Vorträge von merlin.zwo:**

Di, 14:00 Uhr, F. Tokio

Sven Jagic: *Oracle JET in Apex*

Mi, 12:00 Uhr, Riga:

Daniel Nelle: *Solokarriere als Oracle NoSQL Cluster*

Mi, 14:00 Uhr, Istanbul:

Sebastian Wittig: *OWASP und APEX*

Mi, 16:00 Uhr, Prag:

Jochen Kutscheruk: *Oracle VM: Der Ausweg aus dem Virtualisierung-Dilemma*

Mi, 17:00 Uhr, Shanghai: Jochen Kutscheruk: *Service, please!*

