

Hinweise



- Dieses Skript beinhaltet evtl. Fehler, die von mir gewollt sind.
- Vermutlich gibt es in diesem Skript auch Fehler, die nicht von mir gewollt waren.
- Manche Folien / Beispiele sind unvollständig. Dies ist Absicht.
- Die Lösungen zu den Beispielen werden in der Vorlesung besprochen.



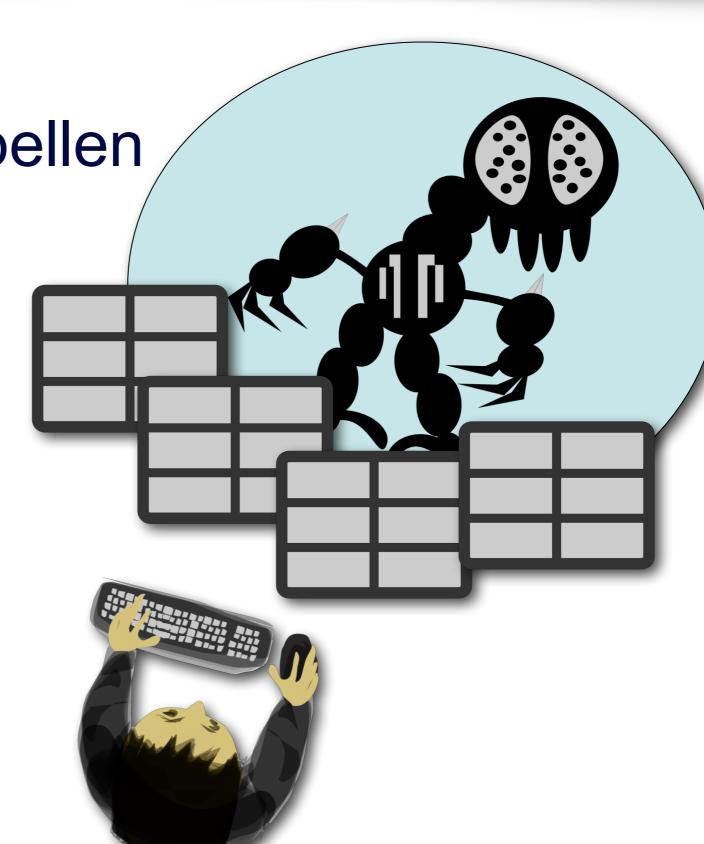


2. Systemtabellen

Im **Systemkatalog** von Oracle stehen Metadaten (= Informationen über das Datenschema).

Der Systemkatalog ist durch Tabellen und Views zugreifbar

=> Konsistente Zugriffsmethode, kein Bruch





Die Systemrelationen von Oracle



Es gibt zwei Klassen von Systemtabellen

- Internal Tables: haben kryptische Namen, die mit x\$ beginnen. In diesen speichert Oracle Basisinformationen für die Datenbankfunktionalität, Konfigurationsdaten und statistische Informationen
- Data Dictionary Tables: enthalten Informationen über alle
 Datenbankobjekte, wie beispielsweise Benutzer, Tabellen, Views, Indizes, usw.

und zwei Klassen von Views

- Dynamic Performance Views: beinhalten Laufzeitinformationen über die aktuelle Datenbankinstanz. Die Namen dieser Views beginnen mit v\$
- Data Dictionary Views basieren auf den Internal Tables und Data Dictionary Tables und liefern Informationen über Benutzer und Tabellen, usw.



Dynamic Performance Views



- Der Eigentümer dieser Views (und auch der anderen Systemtabellen) ist der User SYS. Um als normaler Benutzer auf diese Views zugreifen zu können, muss man die SELECT_CATALOG_ROLE haben.
- Diese Views bieten Informationen über
 - laufende Datenbankinstanzen (V\$DATABASE)
 - aktive Sessions (V\$SESSION)
 - den aktuellen Lock-Status (V\$LOCK)
 - das Redo-Log File (V\$LOGFILE)
 - Datenbankparameter (V\$PARAMETER)
 - angefragte SQL-Statements (V\$SQL)

Beispiele:

- Informationen zur aktiven Datenbankinstanz: SELECT * FROM V\$DATABASE
- Benutzer der aktiven Sessions: SELECT DISTINCT USERNAME FROM V\$SESSION
- Welche Log-Files werden verwendet? SELECT * FROM V\$LOGFILE
- Wie sehen die Parameter der Datenbank aus? **SELECT** * **FROM** V\$PARAMETER



Data Dictionary Views



- Auch hier ist die SELECT_CATALOG_ROLE notwendig, um Anfragen stellen zu können
- Es gibt drei Arten von Data Dictionary Views:
 - DBA_views (z.B. DBA_TABLES, DBA_USERS,...) zeigen die Informationen aller Objekte an (z.B. aller Tabellen in der Datenbank)
 - ALL_views zeigen genau die gleichen Informationen aber nur über die Objekte, auf die der Benutzer der die Anfrage stellt zugreifen kann
 - USER_views zeigen analog nur die Informationen über Objekte an, die dem Benutzer gehören
- Beispiele (angemeldet sei der Benutzer ora_benutzer)
 - Informationen über alle in der Datenbank befindlichen Tabellen: SELECT * FROM sys.DBA_TABLES
 - Informationen über die Tabellen des aktuellen Users: SELECT * FROM sys. USER TABLES
 - Die durch den User zugereifbaren Indizes (nicht Eigentümer):

```
SELECT *
FROM sys.ALL_INDICES
WHERE owner != 'ORA_BENUTZER'
```

– Auf welche Views darf der aktuelle Benutzer nicht zugreifen?

```
SELECT owner, view_name FROM sys.DBA_VIEWS
WHERE (owner, view_name) NOT IN
  ( SELECT owner, view_name FROM sys.ALL VIEWS );
```





Welche Rechte verbergen sich hinter der SELECT CATALOG ROLE?

```
select *
from role_tab_privs
where role='SELECT_CATALOG_ROLE';
```

Wer hat die Rolle SELECT_CATALOG_ROLE?

```
select *
from dba_role_privs
where granted_role='SELECT_CATALOG_ROLE';
```



Data Dictionary Views und Dynamic Performance Views



ALL ALL TABLES ALL ARGUMENTS ALL ASSOCIATIONS ALL CATALOG ALL CLUSTERS ALL CLUSTER HASH EXPRESSIO NS ALL COLL TYPES ALL COL COMMENTS ALL COL PRIVS ALL COL_PRIVS_MADE ALL COL PRIVS RECD **ALL CONSTRAINTS** ALL CONS COLUMNS ALL CONTEXT ALL DB LINKS ALL DEF AUDIT OPTS ALL DEPENDENCIES ALL DIMENSIONS ALL DIM ATTRIBUTES ALL DIM_CHILD_OF ALL DIM HIERARCHIES ALL DIM JOIN KEY ALL DIM LEVELS ALL DIM_LEVEL_KEY ALL DIRECTORIES ALL ERRORS **ALL INDEXES** ALL INDEXTYPES ALL INDEXTYPE OPERATORS ALL IND COLUMNS ALL IND EXPRESSIONS ALL IND PARTITIONS ALL IND SUBPARTITIONS ALL_INTERNAL_TRIGGERS ALL JOBS ALL LIBRARIES

ALL LOBS

ALL LOB PARTITIONS

ALL METHOD PARAMS

ALL METHOD_RESULTS

ALL LOB SUBPARTITIONS

ALL MVIEWS ALL_MVIEW_AGGREGATES ALL MVIEW ANALYSIS ALL MVIEW DETAIL RELATIONS ALL MVIEW JOINS ALL MVIEW KEYS ALL NESTED TABLES ALL OBJECTS ALL OBJECT TABLES ALL OPANCILLARY ALL OPARGUMENTS ALL OPBINDINGS **ALL OPERATORS** ALL OUTLINES ALL OUTLINE HINTS ALL PARTIAL DROP TABS ALL PART COL STATISTICS ALL PART HISTOGRAMS ALL PART INDEXES ALL PART_KEY_COLUMNS ALL PART LOBS ALL PART TABLES ALL POLICIES ALL QUEUES ALL QUEUE TABLES ALL REFRESH ALL REFRESH CHILDREN ALL REFRESH DEPENDENCIES ALL REFS ALL_REGISTERED_SNAPSHOTS ALL SEQUENCES **ALL SNAPSHOTS** ALL SNAPSHOT LOGS ALL SNAPSHOT REFRESH TIMES ALL SOURCE ALL SUBPART COL STATISTICS ALL SUBPART HISTOGRAMS ALL SUBPART KEY COLUMNS ALL SUMDELTA

ALL SYNONYMS

ALL_TAB_COLUMNS

ALL TABLES

ALL TAB COL STATISTICS ALL TAB COMMENTS ALL TAB HISTOGRAMS ALL TAB MODIFICATIONS ALL TAB PARTITIONS ALL TAB PRIVS ALL TAB PRIVS MADE ALL TAB PRIVS RECD ALL TAB SUBPARTITIONS ALL TRIGGERS ALL TRIGGER_COLS ALL TYPES ALL TYPE_ATTRS ALL TYPE METHODS ALL UNUSED COL TABS ALL UPDATABLE COLUMNS ALL USERS ALL USTATS ALL VARRAYS ALL VIEWS AUDIT_ACTIONS CAT **CATALOG** CHAINED ROWS CLU CODE PIECES CODE SIZE COL **COLS** COLUMN_PRIVILEGES DBA 2PC NEIGHBORS DBA 2PC PENDING DBA ALL TABLES DBA ANALYZE OBJECTS DBA ASSOCIATIONS DBA AUDIT EXISTS DBA AUDIT OBJECT DBA AUDIT SESSION DBA AUDIT STATEMENT

DBA AUDIT TRAIL

DBA BLOCKERS

DBA CATALOG

DBA CLUSTERS DBA_CLUSTER_HASH_EXPRESS ONS DBA CLU COLUMNS DBA COLL TYPES DBA COL COMMENTS DBA_COL_PRIVS **DBA CONSTRAINTS** DBA CONS COLUMNS DBA CONTEXT DBA DATA_FILES DBA DB LINKS DBA DDL LOCKS DBA DEPENDENCIES DBA DIMENSIONS DBA DIM ATTRIBUTES DBA DIM CHILD OF DBA DIM HIERARCHIES DBA DIM JOIN KEY DBA DIM LEVELS DBA_DIM_LEVEL_KEY **DBA DIRECTORIES** DBA DML LOCKS DBA ERRORS DBA EXP FILES DBA EXP OBJECTS DBA EXP VERSION **DBA EXTENTS** DBA FREE SPACE DBA_FREE_SPACE_COALESCED DBA INDEXES DBA INDEXTYPES DBA INDEXTYPE OPERATORS DBA IND COLUMNS DBA IND EXPRESSIONS DBA IND PARTITIONS DBA IND SUBPARTITIONS DBA_INTERNAL_TRIGGERS DBA_JOBS -DBA JOBS RUNNING

DBA KGLLOCK





DBA LIBRARIES DBA LOBS DBA_LOB_PARTITIONS DBA LOB SUBPARTITIONS DBA LOCKS DBA_LOCK_INTERNAL DBA METHOD PARAMS DBA_METHOD_RESULTS DBA MVIEWS DBA_MVIEW_AGGREGATES DBA MVIEW ANALYSIS DBA_MVIEW_DETAIL_RELATIONS DBA MVIEW JOINS DBA MVIEW KEYS DBA_NESTED_TABLES DBA_OBJECTS DBA_OBJECT_SIZE DBA OBJECT TABLES DBA_OBJ_AUDIT_OPTS DBA OPANCILLARY DBA OPARGUMENTS DBA OPBINDINGS DBA_OPERATORS DBA_ORPHAN_KEY_TABLE DBA OUTLINES DBA OUTLINE HINTS DBA PARTIAL DROP TABS DBA PART COL STATISTICS DBA PART HISTOGRAMS DBA PART INDEXES DBA_PART_KEY_COLUMNS DBA PART LOBS DBA PART TABLES DBA PENDING TRANSACTIONS DBA POLICIES DBA PRIV AUDIT OPTS DBA PROFILES DBA QUEUES DBA_QUEUE_SCHEDULES DBA_QUEUE_TABLES DBA RCHILD DBA_REFRESH

DBA_REFRESH_CHILDREN DBA REFS DBA REGISTERED SNAPSHOTS DBA_REGISTERED_SNAPSHOT_GRO **UPS** DBA_REPAIR_TABLE DBA_RGROUP DBA ROLES DBA ROLE PRIVS DBA ROLLBACK SEGS DBA RSRC CONSUMER GROUPS DBA_RSRC_CONSUMER_GROUP PR **IVS** DBA RSRC MANAGER SYSTEM PRI VS DBA RSRC PLANS DBA_RSRC_PLAN_DIRECTIVES DBA_RULESETS DBA SEGMENTS DBA SEQUENCES DBA SNAPSHOTS DBA SNAPSHOT_LOGS DBA_SNAPSHOT_LOG_FILTER_COLS DBA_SNAPSHOT_REFRESH_TIMES DBA SOURCE DBA STMT AUDIT OPTS DBA SUBPART COL STATISTICS DBA_SUBPART_HISTOGRAMS DBA_SUBPART_KEY_COLUMNS DBA SYNONYMS DBA_SYS_PRIVS DBA TABLES DBA TABLESPACES DBA TAB COLUMNS DBA TAB COL STATISTICS DBA TAB COMMENTS DBA TAB HISTOGRAMS DBA_TAB_MODIFICATIONS DBA TAB PARTITIONS DBA TAB PRIVS DBA TAB SUBPARTITIONS

DBA TEMP_FILES

DBA TRIGGERS DBA TRIGGER COLS DBA_TS_QUOTAS DBA TYPES DBA TYPE ATTRS DBA_TYPE_METHODS DBA UNUSED COL TABS DBA_UPDATABLE_COLUMNS DBA USERS DBA USTATS DBA VARRAYS **DBA VIEWS** DBA WAITERS DBMS ALERT INFO DBMS_LOCK_ALLOCATED **DEPTREE** DICT DICTIONARY DICT_COLUMNS ERROR SIZE **EXCEPTIONS** FILEXT\$ FILE LOCK FILE PING GLOBAL NAME HS_ALL_CAPS HS ALL DD HS_ALL_INITS HS BASE CAPS HS_BASE_DD HS_CLASS_CAPS HS CLASS DD HS CLASS INIT HS EXTERNAL OBJECTS HS_EXTERNAL_OBJECT_PRIVILEGE S HS_EXTERNAL_USER_PRIVILEGES HS_FDS_CLASS

HS FDS INST

HS INST DD

HS_INST_INIT

HS INST CAPS

IDEPTREE IND INDEX_HISTOGRAM INDEX STATS NLS_DATABASE_PARAMETERS NLS INSTANCE_PARAMETERS NLS SESSION PARAMETERS OBJ PARSED_PIECES PARSED SIZE PLAN TABLE PLUGGABLE_SET_CHECK PRODUCT COMPONENT VERSION **PSTUBTBL PUBLICSYN** PUBLIC_DEPENDENCY QUEUE_PRIVILEGES RC RESOURCE COST RESOURCE MAP ROLE ROLE PRIVS **ROLE SYS PRIVS** ROLE TAB PRIVS **SEQ** SESSION_CONTEXT SESSION PRIVS SESSION ROLES SOURCE SIZE STMT AUDIT OPTION MAP SYN **SYNONYMS** SYSCATALOG SYSFILES SYSSEGOBJ SYSTEM_PRIVILEGE_MAP TAB TABLE PRIVILEGES TABLE_PRIVILEGE_MAP **TABQUOTAS TABS** TRUSTED SERVERS

TS_PITR_CHECK





TS PITR OBJECTS TO BE DROPPED UNI PLUGGABLE SET CHECK USER ALL TABLES USER_ARGUMENTS USER ASSOCIATIONS USER AUDIT OBJECT USER AUDIT SESSION USER AUDIT STATEMENT USER AUDIT TRAIL **USER CATALOG USER CLUSTERS** USER_CLUSTER_HASH_EXPRESSIONS USER CLU COLUMNS USER COLL TYPES USER COL COMMENTS USER COL PRIVS USER COL PRIVS MADE USER COL PRIVS RECD **USER CONSTRAINTS** USER CONS COLUMNS USER DB LINKS USER DEPENDENCIES **USER DIMENSIONS** USER DIM ATTRIBUTES USER DIM CHILD OF USER DIM HIERARCHIES USER_DIM_JOIN_KEY USER DIM LEVELS USER DIM LEVEL KEY **USER ERRORS USER EXTENTS** USER FREE SPACE **USER INDEXES** USER INDEXTYPES USER INDEXTYPE OPERATORS USER IND COLUMNS USER IND EXPRESSIONS USER IND PARTITIONS USER IND SUBPARTITIONS USER_INTERNAL_TRIGGERS USER JOBS USER LIBRARIES USER LOBS USER LOB PARTITIONS USER LOB SUBPARTITIONS

USER METHOD PARAMS USER METHOD RESULTS USER MVIEWS USER MVIEW AGGREGATES USER MVIEW ANALYSIS USER_MVIEW_DETAIL_RELATIONS USER MVIEW JOINS USER MVIEW KEYS USER NESTED TABLES **USER OBJECTS** USER OBJECT SIZE USER_OBJECT_TABLES USER OBJ AUDIT OPTS USER OPANCILLARY USER OPARGUMENTS **USER OPBINDINGS USER OPERATORS** USER OUTLINES USER OUTLINE HINTS USER PARTIAL DROP TABS USER PART COL STATISTICS USER PART HISTOGRAMS USER PART INDEXES USER PART KEY COLUMNS USER_PART_LOBS USER PART TABLES USER PASSWORD LIMITS **USER POLICIES** USER QUEUES USER_QUEUE_SCHEDULES USER_QUEUE_TABLES USER REFRESH USER REFRESH CHILDREN USER REFS USER REGISTERED SNAPSHOTS USER RESOURCE LIMITS USER ROLE PRIVS USER RSRC CONSUMER GROUP PRIV V\$ARCHIVE PROCESSES USER_RSRC_MANAGER_SYSTEM_PRIV USER RULESETS

USER SEGMENTS

USER SEQUENCES

USER SNAPSHOTS

USER SNAPSHOT LOGS USER SNAPSHOT REFRESH TIMES USER SOURCE USER_SUBPART_COL_STATISTICS USER SUBPART HISTOGRAMS USER_SUBPART_KEY_COLUMNS **USER SYNONYMS** USER SYS PRIVS USER TABLES USER TABLESPACES USER TAB COLUMNS USER_TAB_COL_STATISTICS USER TAB COMMENTS USER TAB HISTOGRAMS USER TAB MODIFICATIONS USER TAB PRIVS USER TAB PRIVS MADE USER TAB PRIVS RECD **USER TAB SUBPARTITIONS** USER_TRIGGERS USER TRIGGER COLS USER TS QUOTAS USER TYPES USER TYPE ATTRS USER TYPE METHODS USER UNUSED COL TABS USER_UPDATABLE_COLUMNS **USER USERS USER USTATS** USER_VARRAYS USER_VIEWS **V\$ACCESS** V\$ACTIVE INSTANCES V\$AQ **V\$ARCHIVE** V\$ARCHIVED_LOG **V\$ARCHIVE DEST V\$BACKUP** V\$BACKUP ASYNC IO V\$BACKUP CORRUPTION

V\$BACKUP DATAFILE V\$BACKUP DEVICE

V\$BACKUP REDOLOG

V\$BACKUP PIECE

V\$BACKUP SET V\$BACKUP SYNC IO V\$BGPROCESS V\$BH V\$BUFFER POOL V\$BUFFER POOL STATISTICS V\$CACHE V\$CACHE LOCK **V\$CIRCUIT** V\$CLASS PING **V\$COMPATIBILITY V\$COMPATSEG V\$CONTEXT** V\$CONTROLFILE V\$CONTROLFILE RECORD SECTION V\$COPY_CORRUPTION **V\$DATABASE V\$DATAFILE** V\$DATAFILE COPY V\$DATAFILE HEADER **V**\$DBFILE V\$DBLINK V\$DB OBJECT CACHE V\$DB PIPES V\$DELETED OBJECT **V\$DISPATCHER** V\$DISPATCHER RATE V\$DLM ALL LOCKS V\$DLM CONVERT LOCAL V\$DLM CONVERT REMOTE V\$DLM LATCH V\$DLM LOCKS V\$DLM MISC





V\$DLM_RESS V\$ENABLEDPRIVS V\$ENQUEUE_LOCK V\$EVENT_NAME V\$EXECUTION V\$FALSE_PING V\$FAST_START_SERVERS V\$FAST_START_TRANSACTIONS

V\$FILESTAT V\$FILE_PING V\$FIXED_TABLE V\$FIXED_VIEW_DEFINITION V\$GLOBAL_BLOCKED_LOCKS

V\$GLOBAL_BLOCKED_LOC V\$GLOBAL_TRANSACTION V\$HS_AGENT V\$HS_PARAMETER

V\$INDEXED_FIXED_COLUMN

V\$INSTANCE

V\$HS SESSION

V\$INSTANCE_RECOVERY

V\$LATCH

V\$LATCHHOLDER
V\$LATCHNAME
V\$LATCH_CHILDREN
V\$LATCH_MISSES
V\$LATCH_PARENT
V\$LIBRARYCACHE

V\$LICENSE V\$LOADCSTAT V\$LOADTSTAT

V\$LOCK

V\$LOCKED_OBJECT

V\$LOCKS_WITH_COLLISIONS

V\$LOCK_ACTIVITY V\$LOCK_ELEMENT

V\$LOG V\$LOGFILE V\$LOGHIST

V\$LOGMNR_CONTENTS V\$LOGMNR_DICTIONARY V\$LOGMNR_LOGS V\$LOGMNR_PARAMETERS

V\$LOG_HISTORY V\$MTS

V\$MYSTAT V\$NLS_PARAMETERS V\$NLS_VALID_VALUES V\$OBJECT_DEPENDENCY V\$OBSOLETE PARAMETER

V\$OFFLINE_RANGE V\$OPEN_CURSOR

V\$OPTION

V\$PARALLEL_DEGREE_LIMIT_MTH

V\$PARAMETER

V\$PING

V\$PQ_SESSTAT V\$PQ_SLAVE V\$PQ_SYSSTAT V\$PQ_TQSTAT V\$PROCESS

V\$PROXY_ARCHIVEDLOG V\$PROXY_DATAFILE V\$PWFILE_USERS V\$PX_PROCESS

V\$PX_PROCESS_SYSSTAT

V\$PX_SESSION V\$PX_SESSTAT

V\$QUEUE

V\$RECOVERY_FILE_STATUS

V\$RECOVERY_LOG

V\$RECOVERY_PROGRESS V\$RECOVERY_STATUS V\$RECOVER FILE

V\$REQDIST

V\$RESERVED_WORDS

V\$RESOURCE

V\$RESOURCE_LIMIT

V\$ROLLNAME V\$ROLLSTAT V\$ROWCACHE

V\$ROWCACHE_PARENT

V\$ROWCACHE_SUBORDINATE

V\$RSRC_CONSUMER_GROUP V\$RSRC_CONSUMER_GROUP_CPU

MTH

V\$RSRC PLAN

V\$RSRC PLAN CPU MTH

V\$SESSION

V\$SESSION_CONNECT_INFO V\$SESSION_CURSOR_CACHE

V\$SESSION_EVENT
V\$SESSION_LONGOPS
V\$SESSION_OBJECT_CACHE

V\$SESSION WAIT

V\$SESSTAT V\$SESS_IO V\$SGA V\$SGASTAT

V\$SHARED_POOL_RESERVED

V\$SHARED_SERVER V\$SORT_SEGMENT V\$SORT_USAGE

V\$SQL V\$SQLAREA V\$SQLTEXT

V\$SQLTEXT_WITH_NEWLINES

V\$SQL_BIND_DATA
V\$SQL_BIND_METADATA
V\$SQL_CURSOR

V\$SQL_SHARED_MEMORY

V\$STATNAME V\$SUBCACHE V\$SYSSTAT

V\$SYSTEM_CURSOR_CACHE

V\$SYSTEM_EVENT V\$SYSTEM_PARAMETER

V\$TABLESPACE V\$TEMPFILE

V\$TEMPORARY_LOBS

V\$TEMPSTAT

V\$TEMP_EXTENT_MAP V\$TEMP_EXTENT_POOL

V\$TEMP_PING

V\$TEMP_SPACE_HEADER V\$THREAD

V\$TIMER

V\$TRANSACTION

V\$TRANSACTION_ENQUEUE

V\$TYPE_SIZE V\$VERSION V\$WAITSTAT