



BR*Tools - Development Update

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CUSTOMER



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Agenda

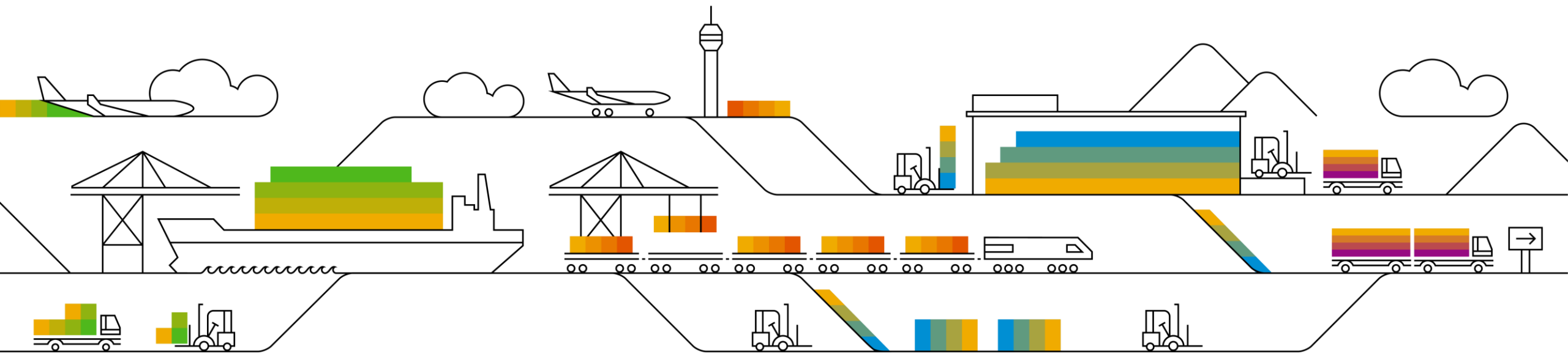
New Oracle 12c features supported by BR*Tools

Recent functional enhancements in BR*Tools

BR*Tools support for Oracle multitenant database

Questions & answers

New Oracle 12c features supported by BR*Tools 7.40



New Oracle 12c features supported by BR*Tools 7.40 (1)

Move data file online

- New option in BRSPACE function “dfmove” (move data files):

-o|-online yes | no

- Example:

```
brspace -u / -f dfmove -f /oracle/PRD/sapdata1/system_1/system.data1 -d sapdata3 -o yes
```

Move table partition online

- New option *values* in BRSPACE function “tbreorg” (reorganize tables):

-m|-mode move_online | move_ononly | move_offonly

- Example:

```
brspace -u / -f tbreorg -s PSAPSR3 -t allsel -n PSAPSR3NEW -m move_ononly
```

```
brspace -u / -f tbreorg -s PSAPSR3 -t allsel -n PSAPSR3NEW -m redef
```

New Oracle 12c features supported by BR*Tools 7.40 (2)

Support for advanced index compression

- New option *value* in BRSPACE functions “idrebuild” and “tbreorg” (rebuild indexes / reorganize tables):
`-ic|indcompr adv_low`
- Example:
`brspace -u / -f idrebuild -s PSAPSR3 -i allsel -p 8 -c cind -ic adv_low`

Compression of tables with more than 255 columns

- No new options in BRSPACE function “tbreorg” (reorganize tables) required!
- Caution: Number of table columns may increase during a SAP upgrade

New Oracle 12c features supported by BR*Tools 7.40 (3)

Using Oracle 12g ADO/ILM with SAP

- Oracle ADO/ILM = Automatic Data Optimization / Information Lifecycle Management
- In SAP environment, Oracle ADO/ILM is treated as a replacement for Oracle 11g table compression
- Oracle ADO/ILM is used for delayed compression of data in tables
- Main benefit of this new feature is performance improvement
- Advanced Compressed Option license required (included in SAP software license for Oracle)
- ADO/ILM is being activated at tablespace level

BR*Tools support for Oracle ADO/ILM

- The support is implemented in two BRSPACE functions:
 - [Creation of tablespaces](#)
 - [Reorganization of tables](#)

New Oracle 12c features supported by BR*Tools 7.40 (4)

BR*Tools support for Oracle ADO/ILM

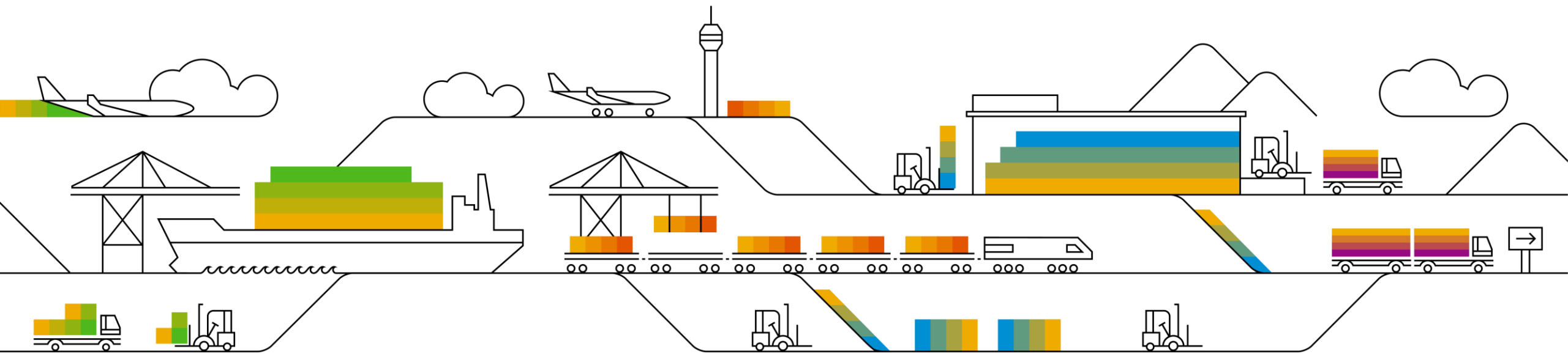
- Creation of an ILM tablespace – new “ILM policy” option for BRSPACE function “tscreate”
`-y|-policy [rscar<days>|standard|rscas<days>|cscqls<days>|bw_standard|rscar<days>+rscas<days>|rscar<days>+cscqls<days>|std+bw]`
 - `rscar<days>` - row store compress advanced row after <days> of no modification
 - `standard` - rscar40
 - `rscas<days>` - row store compress advanced segment after <days> of no modification
 - `cscqls<days>` - column store compress for query low row level locking segment after <days> of no modification (Oracle HCC required)
 - `bw_standard` - rscas400 or cscqls400
 - `rscar<days>+rscas<days>` - rscar<days> and rscas<days>
 - `rscar<days>+cscqls<days>` - rscar<days> and cscqls<days> (Oracle HCC required)
 - `std+bw` - rscar40 and rscas400/cscqls400
 - default: rscar40 - standard value

New Oracle 12c features supported by BR*Tools 7.40 (5)

BR*Tools support for Oracle ADO/ILM

- Activation of an ADO/ILM policy – reorganization of tables into an ILM tablespace
 - Creation of a new tablespace with an ILM policy:
`brspace -u / -f tcreate -t PSAPSR3NEW -l PSAPSR3 -y standard`
 - *Online* reorganization with relocation of all tables from the old to the new tablespace:
`brspace -u / -f tbreorg -a reorg -s PSAPSR3 -t allsel -n PSAPSR3NEW -p 4`
 - Deletion of the old (now empty) tablespace:
`brspace -u / -f tsdrop -t PSAPSR3`
 - Renaming of the new tablespace to the old name:
`brspace -u / -f tsalter -a rename -t PSAPSR3NEW -n PSAPSR3`

Recent functional enhancements in BR*Tools 7.40



Recent functional enhancements in BR*Tools 7.40 (1)

Extended support for backup of Oracle standby databases

- Online consistent backup of a standby database (in connection with Oracle Data Guard)
- Backup of standby database for a primary Oracle RAC database
- Backup of standby archivelog files with BRARCHIVE

Extensions in recovery procedures of BRRECOVER

- Reconfiguration of online redolog files during database recovery
- Creation of a single instance database from RAC database backup
- Creation of a copy of an ASM database (according to SAP note 1003028)

Recent functional enhancements in BR*Tools 7.40 (2)

Support for update statistics of table functions in BRCONNECT

- Table functions: new database objects – “extended views” with parameters
- Statistics on table functions will be updated automatically in the standard run (“-f stats -t all”)
- New “expert” option values for the BRCONNECT “stats” function: -f|-force allfunc | nofunc | selfunc

Recreation of Oracle RAC database with BRSPACE

- Extension to BRSPACE function “dbcreate” (recreate database)
- Automatically handled by BRSPACE
- Additional options for online redolog threads and undo tablespaces

Recent functional enhancements in BR*Tools 7.40 (3)

Support for encryption wallet in ASM and HSM (hardware security module)

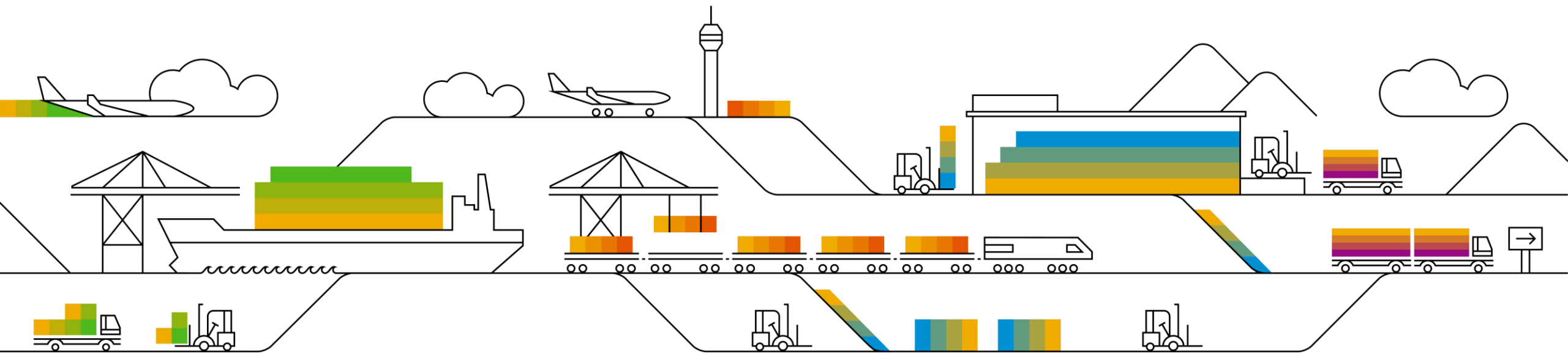
- ASM as a shared storage is particularly suitable for Oracle wallet
- HSM offers higher level of security for the storage of encryptions keys
- Restricted range of actions BRSPACE function “mdencr” is supported for (HSM)
- No additional option required

Changing database password using BR*Tools secure storage account

- In previous BRCONNECT versions calling “brconnect -u // -f chpass” return an error
- New BRCONNECT option “-po|-pass_old|-PO|-PASS_OLD [<old_password>]” must be set
- Example:

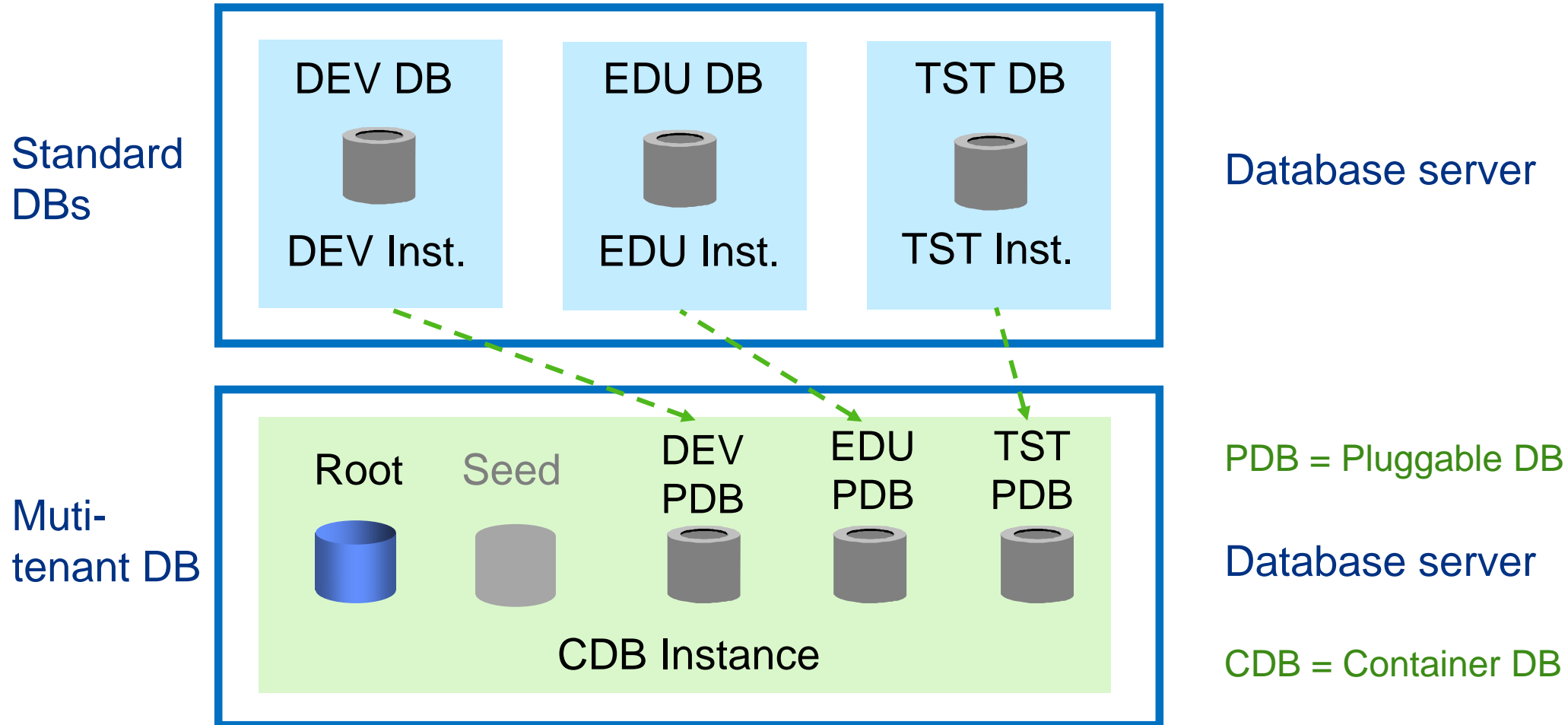
```
brconnect -u // -f chpass -o SAPSR3 -p <new_pwd> -po <old_pwd>
```

BR*Tools support for Oracle multitenant database



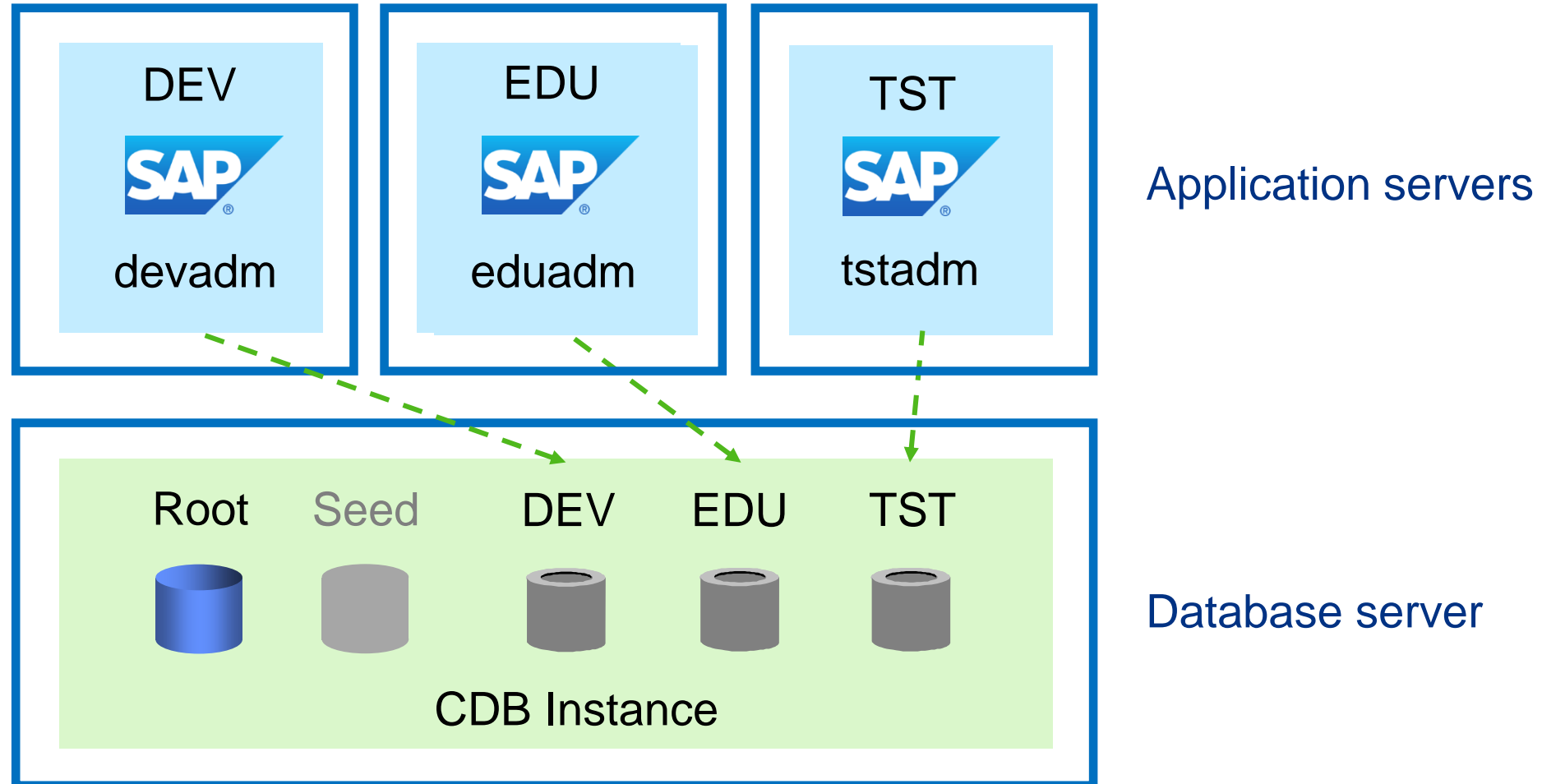
BR*Tools support for Oracle multitenant database (1)

Concept of Oracle multitenant database



BR*Tools support for Oracle multitenant database (2)

Concept of Oracle multitenant database



BR*Tools support for Oracle multitenant database (3)

Naming conventions for database files

- Container database “CDB”

/oracle/CDB/sapdata1/system_1/system.data1

/oracle/CDB/sapdata2/sysaux_1/sysaux.data1

/oracle/CDB/sapdata3/undo_1/undo.data1

/oracle/CDB/sapdata1/temp_1/temp.data1

/oracle/CDB/origlogA/log_g11m1.dbf

/oracle/CDB/sapdata1/cntrl/cntrlCD1.dbf

- Pluggable database “DEV”

/oracle/CDB/dev_sapdata1/dev_system_1/dev_system.data1

/oracle/CDB/dev_sapdata1/dev_sysaux_1/dev_sysaux.data1

/oracle/CDB/dev_sapdata2/dev_sr3_1/dev_sr3.data1

/oracle/CDB/dev_sapdata3/dev_sr3740_1/dev_sr3740.data1

/oracle/CDB/dev_sapdata4/dev_sr3usr_1/dev_sr3usr.data1

/oracle/CDB/dev_sapdata1/dev_temp_1/dev_temp.data1

BR*Tools support for Oracle multitenant database (4)

Global (common) database users

- Global OPS\$ database users

- C##OPS\$ORACLE
- C##OPS\$ORA<DBSID>
- C##OPS\$<SAPSID1>ADM
- C##OPS\$SAPSERVICE<SAPSID1>
- C##OPS\$<SAPSID2>ADM
- C##OPS\$SAPSERVICE<SAPSID2>

- BR*Tools-specific secure storage user

- C##BRT\$ADM

sqlplus / as sysdba

```
SQL> create user C##BRT$ADM identified by <password> container = all;
```

```
SQL> grant sysdba, sysoper, sysbackup to C##BRT$ADM container = all;
```

```
SQL> alter session set container = DEV;
```

```
SQL> grant sapdba to C##BRT$ADM;
```

BR*Tools support for Oracle multitenant database (5)

Using BR*Tools in a multitenant database environment

- Configuration of the BR*Tools corresponds to the installations under the "oracle" user

```
-rwsrwsr-- 1 oracle oinstall 7732338 May 31 16:30 brarchive
-rwsrwsr-- 1 oracle oinstall 7908129 May 31 16:30 brbackup
-rwsrwsr-- 1 oracle oinstall 9970354 May 31 16:30 brconnect
-rwsrwsr-- 1 oracle oinstall 8376747 May 31 16:30 brrecover
-rwsrwsr-- 1 oracle oinstall 2783544 May 31 16:30 brrestore
-rwsrwsr-- 1 oracle oinstall 10479944 May 31 16:30 brspace
-rwxr-xr-x 1 devadm sapsys 4103679 May 31 16:30 brtools
```

- Use of the BR*Tools corresponds to the installations under the "oracle" user
 - BR*Tools are running under the <sid>adm OS users
 - New environment variable ORA_PDB_NAME defines the PDB BR*Tools are connecting to:
ORA_PDB_NAME = DEV (ORACLE_SID = CDB, ORACLE_HOME = /oracle/CDB/121)
- BR*Tools log and profile directories
 - There are no changes to BR*Tools profiles and log directories in a multitenant database environment

BR*Tools support for Oracle multitenant database (6)

Global, local and mixed BR*Tools operations

- Global BR*Tools operations
 - Database backup (BRBACKUP)
 - Archivelog backup (BRARCHIVE)
 - Database restore (BRRESTORE)
 - Database recovery (BRRECOVER)
- Local BR*Tools operations
 - Update database statistics (BRCONNECT)
 - Extend tablespace (BRSPACE)
 - Move data file (BRSPACE)
 - Reorganize tables (BRSPACE)
 - Rebuild indexes (BRSPACE)
- Mixed BR*Tools operations
 - Database system check (BRCONNECT)
 - Clean up database logs and tables (BRCONNECT)
 - Start up /shut down CDB / PDBs (BRSPACE)

BR*Tools support for Oracle multitenant database (7)

Parameterization of the BR*Tools

- Active pluggable databases parameter

active_pdb = **all_pdb** | (**<PDB_NAME1>[:<SAP_SID1>][,<PDB_NAME2>[:<SAP_SID2>],...]**)

- all_pdb - all pluggable databases in the container database (default value)
- <PDB_NAMEn> - name of a pluggable database
- <SAP_SIDn> - system ID of SAP system connected to the pluggable database

- Primary pluggable database parameter

primary_pdb = **any_pdb** | **<PDB_NAME>**

- any_pdb - Any pluggable database functions as the primary pluggable database (default value)
- <PDB_NAME> - name of a selected pluggable database

- Working pluggable database option

-x|-pdb <pdb_name>

- <pdb_name> - name of the working pluggable database (default: value of ORA_PDB_NAME)

BR*Tools support for Oracle multitenant database (8)

Typical BR*Tools usage scenario

- Parameterization
 - `active_pdbs = all_pdbs`
 - `primary_pdb = DEV`
- Operations scheduled only for the primary pluggable database (e. g. in DBACOCKPIT)
 - Database backup (BRBACKUP)
 - Archive log backup (BRARCHIVE)
 - Manual operations like instance, space and segment management (BRSPACE)
- Operations scheduled for each pluggable database (e. g. in DBACOCKPIT)
 - Update database statistics (BRCONNECT)
 - Database system check (BRCONNECT)
 - Clean up database logs and tables (BRCONNECT)

Additional Sources of Information

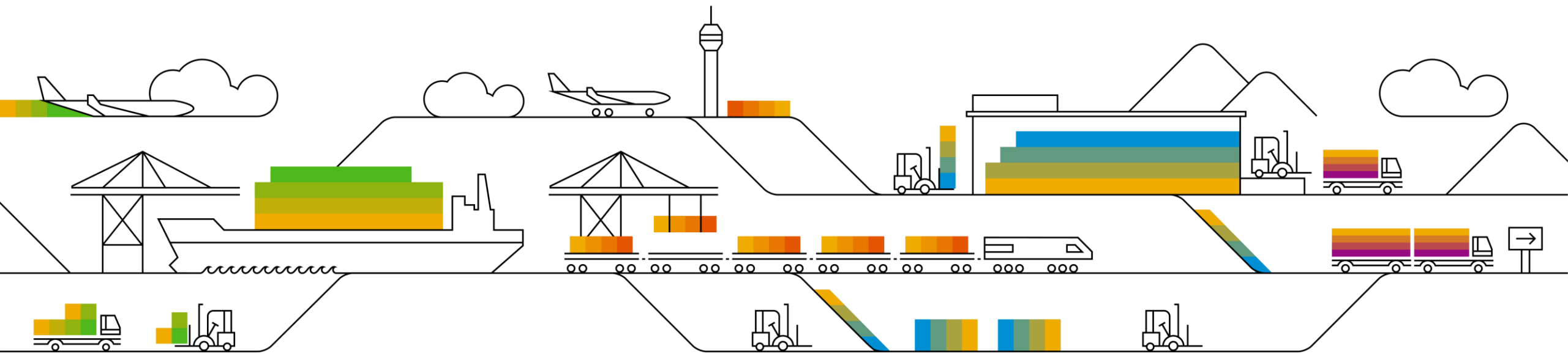
SAP notes

- 2087004 - BR*Tools support for Oracle 12c
- 2254836 - BR*Tools support for Oracle ADO/ILM
- 1882182 - Functional enhancements in BRARCHIVE 7.40
- 1844380 - Minor functional enhancements in BR*Tools (5)
- 2086966 - Minor functional enhancements in BR*Tools (6)
- 2333995 - BR*Tools support for Oracle multitenant database
- 2471317 - Corrections in BR*Tools 7.40 Patch 30

Updated documentation of BR*Tools 7.40

- <https://www.sap.com/community/topic/oracle.html> -> Related Resources -> Oracle DBA Overview -> "SAP Database Guide: Oracle"

Questions & Answers





Thank you!

Georg Chlond, SAP