

PDBs in der Praxis

Experiences Using PDBs

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Schlüsselworte Tags

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Introduction

This presentation is about experiences I made working with PDBs in real life and during testing. Major topic will be patching and moving of pluggable databases PDBs.

Patch level of a PDB is based on the patch level of its container or root database CDB. Patching of a PDB was (always) described as just unplugging and plugging the database into a new CDB having the desired patch level.

Sounds nice, but what do we really have to do if a PDB has to be plugged into a CDB with a higher patch level or even worse having a lower patch level? I will give some answers to these questions using live demos.

Last but not least I will also have a look at the system change number SCN of a database. Will the SCN of a CDB change after plugging a new PDB into this CDB? What will happen if a PDB with a higher SCN than the target database is plugged in? Will the PDB's SCN be decreased? Probably not!

Demo Environment

The demos I will show are based on virtual machines that were developed for a migration workshop held at DOAG Database 2016 in Düsseldorf. Instructions and basic files can be downloaded at <https://eleoracle.wordpress.com/2016/10/06/workshop-migration/>. This demo is primarily uses the second VM „Server 2“ because this VM comes with 2 Oracle homes having different patch levels.

Patchlevel

First of all we need to get the patch level of the current database. The patch level of a database can be read using Oracle's opatch utility or using a simple SQL statement. Beginning with Oracle 12 you can also read the patch information in the alert log file. During startup the current patch level is automatically written to this file.

Real Life Examples

When Oracle 12 was introduced, we were told that patching a PDB can be easily done. Simply unplug it and plug it into the database with the required patch level. In my demo I will create a new pluggable database based on an old patch level and then plug this PDB into a container database CDB with a higher patch level. We will see that plugging in the PDB requires several steps and that we have to invoke opatch to patch the PDB before it can be used.

In the next demo I assume that operations told the DBAs they are having problems with the PDB running with the new patch level and therefore the PDB has to be plugged back into the database with the former patch level.

There are several possibilities to accomplish this. After lots of testing we decided to first rollback the offending patches in the PDB and then unplug and plug the PDB into the container database having the lower patch level and patch the PDB once again.

System Change Number SCN

The SCN is an identifier that is assigned to one or more transactions. This number will be increased with each transaction and should be maintained per database. Even in a container database this SCN must be unique because the redo logs of a CDB are part of the root container. Therefore the SCN will be assigned the highest value of the existing container database and a PDB that is plugged into the container. If this were not the case we would probably find duplicate SCNs in redo or archive log files.

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