COSC430
Advanced Database Topics

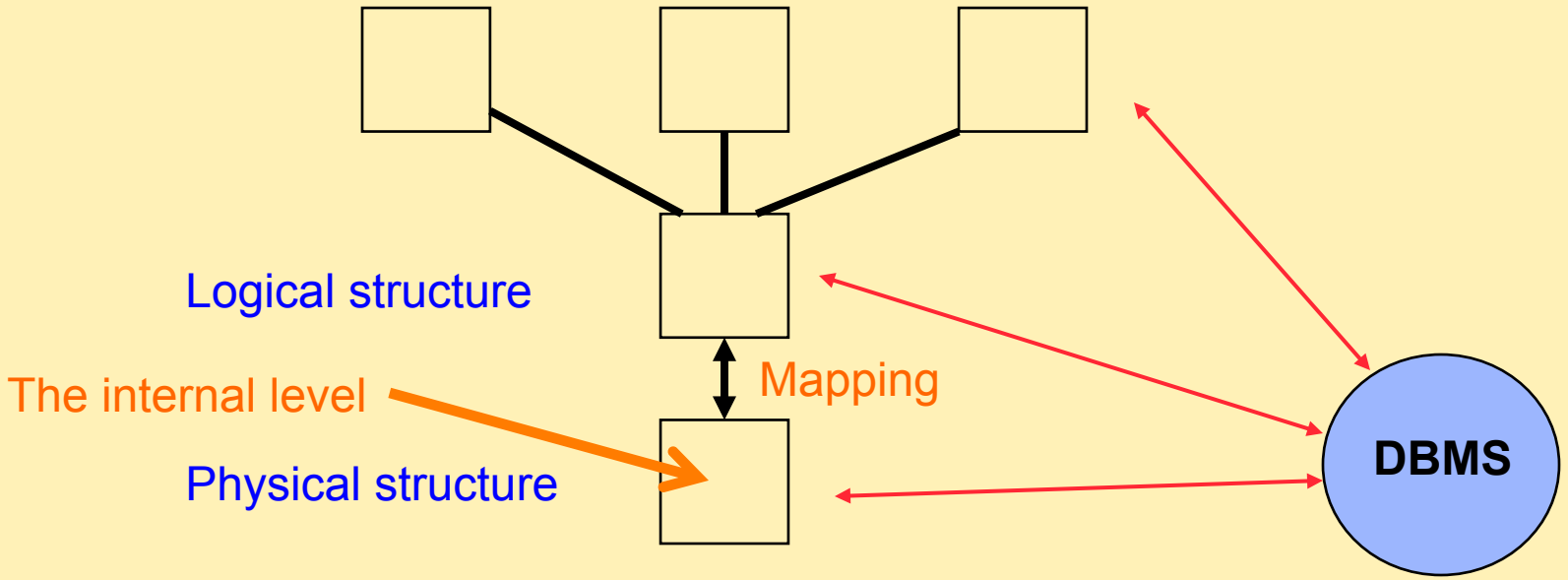
Ian McDonald

Oracle
DBMS architecture
A quick overview

25 March 2013

The DBMS and the ANSI/SPARC architecture

- How does the DBMS keep track of your table names, attributes, constraints, triggers, etc and where does it store them?



Basic Structure of Oracle

Oracle server - the computer that runs the Oracle software

- Oracle database
- Oracle instance
  - System global area
  - Set of (background) processes

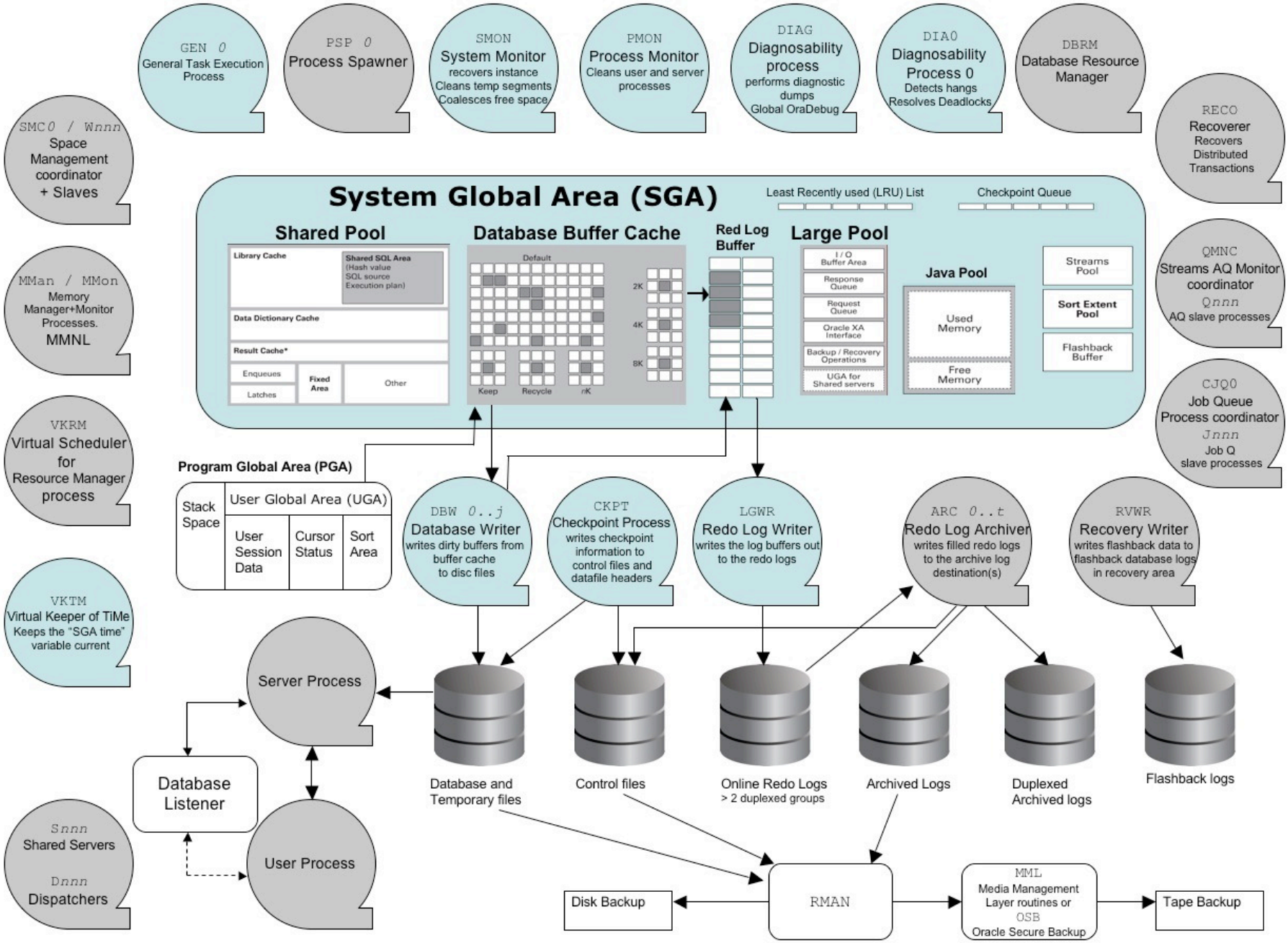
Oracle database

- Physical structure – the actual stored data
  - *mapped from the*
- Logical structure – tables and so on

Oracle Database 11*g* Architecture Diagram

Processes in **blue** are mandatory for the database to be functional

SS64.com



Memory Structure and Database Files

Memory Structure

- System global area(SGA) - shared memory region for an Oracle instance
  - database buffers
  - redo log buffers
  - the shared pool
  - ....
- Program global area(PGA)
  - A memory buffer that contains data and control information for a server process

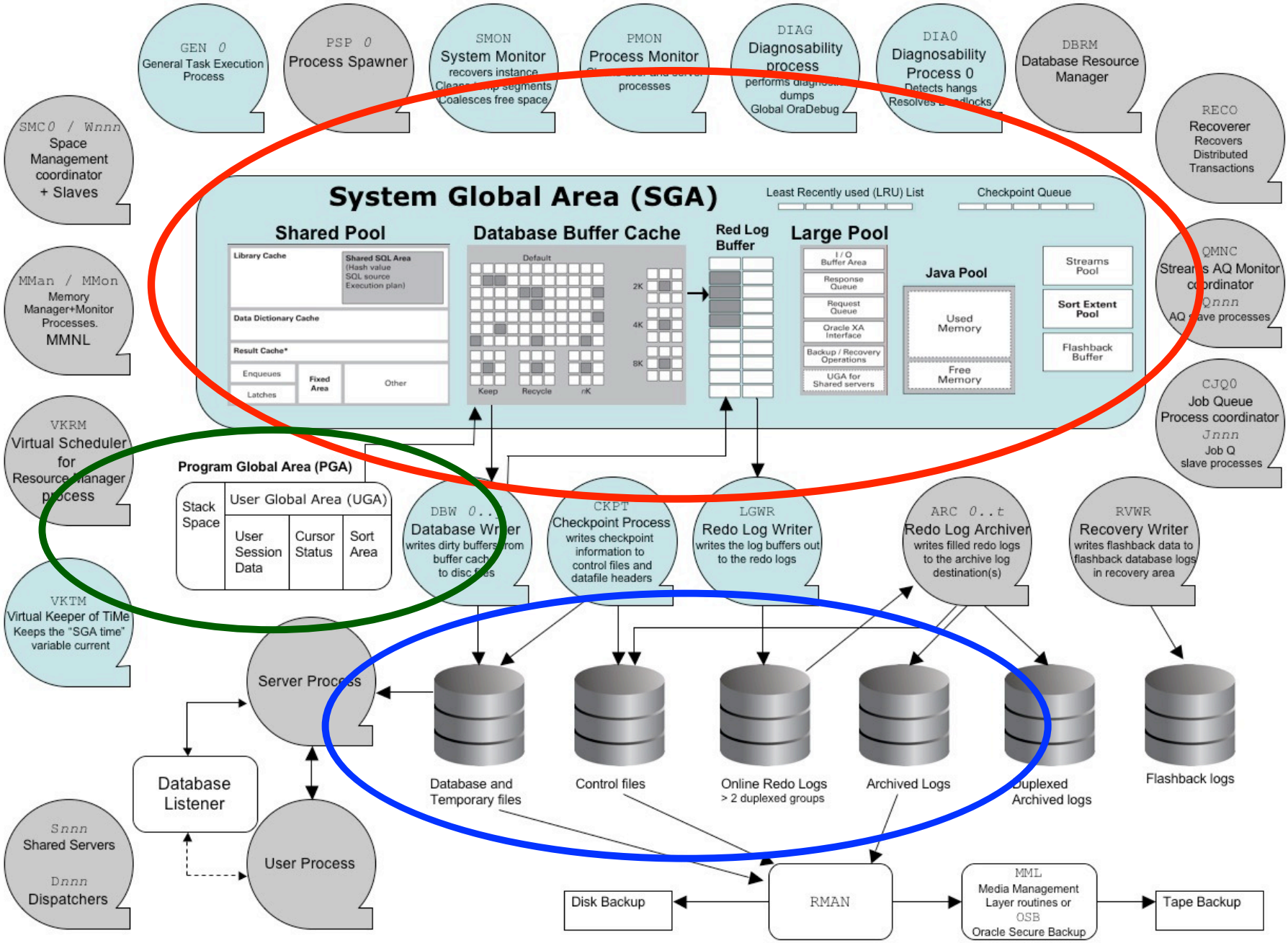
Database Files

- Data files
- Redo log file
- Control file

Oracle Database 11*g* Architecture Diagram

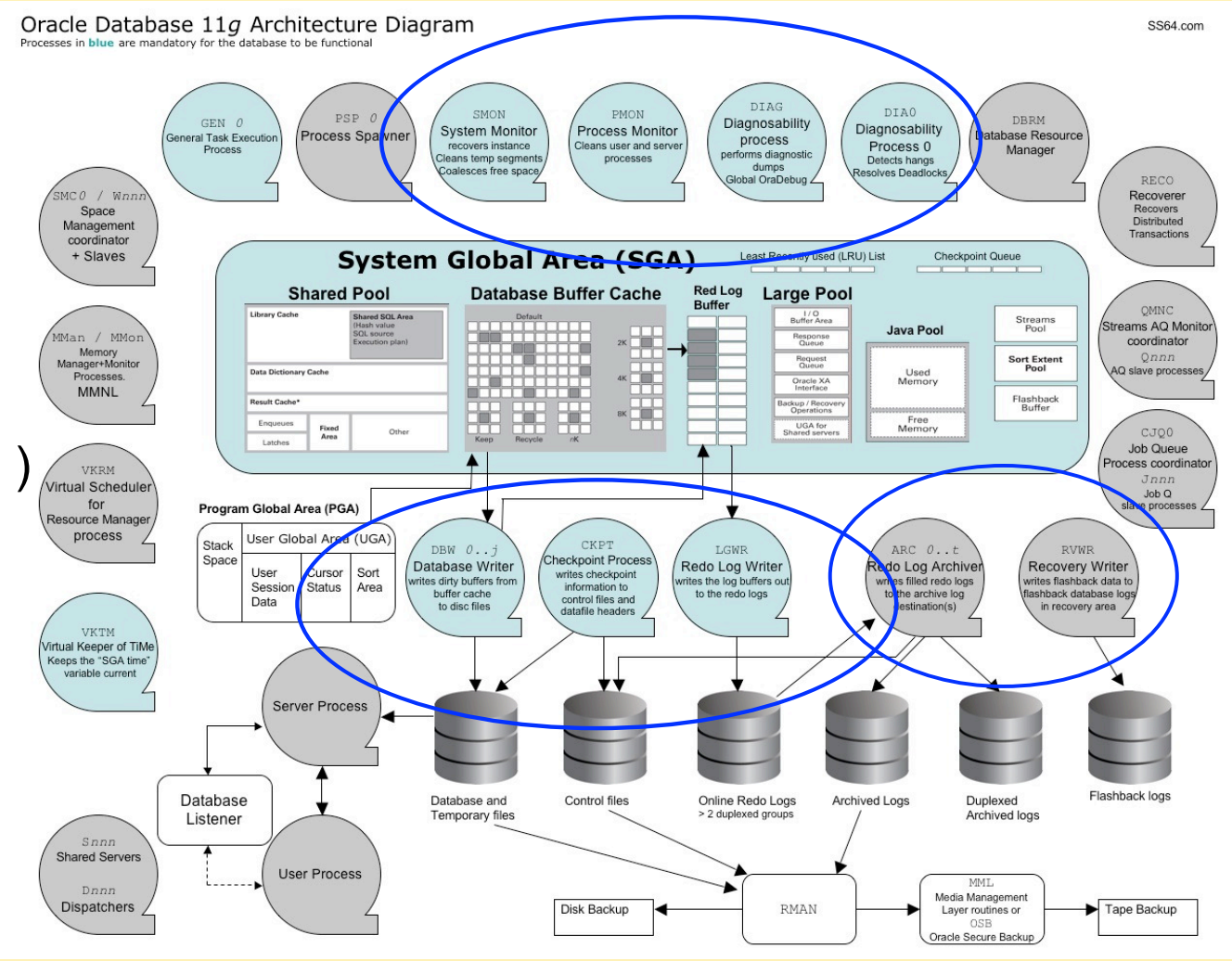
Processes in **blue** are mandatory for the database to be functional

SS64.com



Oracle Background Processes

Database writer (ora_dbw0_)
Log writer (ora_lgwr_)
Checkpoint (ora_ckpt_)
System monitor (ora_smon_)
Process monitor (ora_pmon_)
Recoverer process (ora_reco_)
Archiver (ora_arcx_)



Some Oracle processes (Linux ps auwx | grep -i ora)

```
jrm      4663    1  0 11:27 ?        00:00:00 ora_pmon_olaf13
jrm      4665    1  0 11:27 ?        00:00:00 ora_dbw0_olaf13
jrm      4667    1  0 11:27 ?        00:00:00 ora_lgwr_olaf13
jrm      4669    1  0 11:27 ?        00:00:00 ora_ckpt_olaf13
jrm      4671    1  0 11:27 ?        00:00:00 ora_smon_olaf13
jrm      4673    1  0 11:27 ?        00:00:00 ora_reco_olaf13
```