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| **Master Note: Overview of Oracle Background Processes (Doc ID 1503146.1)** | [To Bottom](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\o%20To%20Bottom) |  |





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| **In this Document**   |  |  | | --- | --- | |  | [Purpose](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20PURPOSE) | |  | [Scope](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20SCOPE) |  |  |  | | --- | --- | |  | [Details](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20BODYTEXT) | |  | [Concepts](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section31) |  |  |  | | --- | --- | |  | [Overview of Background Processes](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section32) | |  | [Mandatory Background Processes](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section33) |  |  |  | | --- | --- | |  | [Optional Background Processes](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section34) | |  | [Slave Processes](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section35) |  |  |  | | --- | --- | |  | [V$BGPROCESS](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section36) | |  | [Specifying the Maximum Number of Processes](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section37) |  |  |  | | --- | --- | |  | [New Background Processes](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20aref_section38) | |  | [References](https://support.oracle.com/epmos/faces/DocumentDisplay?id=1503146.1&_adf.ctrl-state=xa4v5i31u_72&_afrLoop=459235234040702%20\l%20REF) |     **APPLIES TO:**  Oracle Database - Enterprise Edition - Version 10.2.0.1 and later  Information in this document applies to any platform.  **PURPOSE**  The background processes of the Oracle instance manage memory structures, asynchronously perform I/O to write data to a file on a disk, and perform general maintenance tasks.  The purpose of this Document is to provide an overview of Oracle Background Processes. This note will help customers have a better understanding of what they are and the functions of some of the main Oracle Background Processes.  This is a LIVE document. Work is in progress to improve the quality of the content.  **SCOPE**  This document applies to a single instance environment and looks at a basic typical database configuration.  **DETAILS**  **Concepts**  An Oracle database system consists of an Oracle database and an Oracle instance. The database consists of a set of disk files that store user data and metadata, while the Oracle/database instance contains the set of Oracle Database background processes that operate on the stored data and the shared allocated memory that those processes use to do their work.   A process is a mechanism in an operating system that can run a series of steps. The mechanism depends on the operating system.  For example, on Linux an Oracle background process is a Linux process.  On Windows, an Oracle background process is a thread of execution within a process.  Multiple-process Oracle (also called multiuser Oracle) uses several processes to run different parts of the Oracle Database code and additional processes for the users. Each process in a database instance performs a specific job. By dividing the work of the database and applications into several processes, multiple users and applications can connect to an instance simultaneously while the system gives good performance.  A database instance contains or interacts with the following types of processes:   * Client processes run the application or Oracle tool code. * Oracle processes run the Oracle database code. Oracle processes including the following subtypes:      * Background processes perform maintenance tasks such as performing instance recovery, cleaning up processes, writing redo buffers to disk, and so on. * Server processes perform work based on a client request. * Slave processes perform additional tasks for a background or server process.     Oracle® Database Administrator's Guide (11.2)  Part Number E25494-02  5 Managing Processes  About Oracle Database Background Processes  [https://docs.oracle.com/cd/E11882\_01/server.112/e25494/manproc.htm#ADMIN11000](https://docs.oracle.com/cd/E11882_01/server.112/e25494/manproc.htm%20/l%20ADMIN11000%20/o%20Managing%20Processes%20/t%20_blank)  **Overview of Background Processes**  The background processes of the Oracle instance manage memory structures, asynchronously perform I/O to write data to a file on a disk, and perform general maintenance tasks. The background processes consolidate functions that would otherwise be handled by multiple Oracle Database programs running for each user process. They monitor other Oracle Database processes to provide increased parallelism for better performance and reliability.   Each background process has a separate task, but works with the other processes.  For example, the LGWR process writes data from the redo log buffer to the online redo log. When a filled log file is ready to be archived, LGWR signals another process to archive the file.   Oracle Database creates background processes automatically when a database instance starts. The background processes that are present depend on the features and options that are being used in the database. The startup and shutdown of background processes are normally seen logged in the database alert.log.  The following query can be used to list the background processes running on your database:  SELECT PNAME  FROM V$PROCESS  WHERE PNAME IS NOT NULL  ORDER BY PNAME;    Following query could be used in 12c as all the shared BG process belongs ti con\_id=0  SQL>select PNAME,con\_id,spid from V$process  where con\_id=0;    There are   * Mandatory Background Processes * Optional Background Processes * Slave Processes   See [Oracle Database Reference](http://docs.oracle.com/cd/E11882_01/server.112/e40402/bgprocesses.htm%20/l%20REFRN104%20/o%20Complete%20list%20of%20Oracle%20Background%20Processes%20/t%20_blank) for a complete list of Oracle Database background processes.  ***Mandatory Background Processes***  The mandatory background processes are present in all typical database configurations. These processes run by default in a database instance started with a minimally configured initialization parameter file.   |  |  |  | | --- | --- | --- | | **Name** | **Expanded Name** | **Description** | | PMON | Process Monitor | Monitors the other background processes and performs process recovery when a server or dispatcher process terminates abnormally | | SMON | System Monitor | Performs critical tasks such as crash recovery when the instance is started following a failure, dead transaction recovery, and maintenance tasks such as temporary space reclamation, data dictionary cleanup, and undo tablespace management | | DBW*n* | Database Writer | Writes modified blocks from the database buffer cache to the data files | | LGWR | Log Writer | Writes redo entries to the online redo log | | CKPT | Checkpoint | Signals DBW*n* at checkpoints and updates all the data files and control files of the database to indicate the most recent checkpoint | | MMON | Manageability Monitor | Performs many tasks related to manageability, including taking Automatic Workload Repository snapshots and performing Automatic Database Diagnostic Monitor analysis | | MMNL | Manageability Monitor Lite | Performs tasks relating to manageability, including active session history sampling and metrics computation | | RECO | Recoverer Process | Resolves distributed transactions that are pending because of a network or system failure in a distributed database |   ***Optional Background Processes***  An optional background process is any background process not defined as mandatory. This would include background processes that are specific to tasks or features installed in a database.  For example, the ARC*n* process only exists when the database is in ARCHIVELOG mode and automatic archiving is enabled. Also, there are many background processes only needed to support Oracle Automatic Storage Management (ASM).   |  |  |  | | --- | --- | --- | | **Name** | **Expanded Name** | **Description** | | ARC*n* | Archiver | Copies the redo log files to archival storage when they are full or an online redo log switch occurs | | CJQ0 | Job Queue Coordinator | Selects jobs that need to be run from the data dictionary and spawns job queue slave processes (J*nnn*) to run the jobs | | SMCO | Space Management Coordinator | Coordinates the execution of various space management tasks |   ***Slave Processes***  Slave processes are background processes that perform work on behalf of other processes. This section describes some slave processes used by Oracle Database.   |  |  |  | | --- | --- | --- | | **Name** | **Expanded Name** | **Description** | | I*nnn* | Disk and Tape I/O Slave Process | Serves as an I/O slave process spawned on behalf of DBWR, LGWR, or an RMAN backup session | | P*nnn* | Parallel Query Slave Process | Perform parallel execution of a SQL statement (query, DML, or DDL) | | J*nnn* | Job Queue Slave Process | Executes jobs assigned by the job coordinator |   **V$BGPROCESS**  V$BGPROCESS displays information about the background processes.   |  |  |  | | --- | --- | --- | | PADDR | RAW(4 | 8) | Address of the process state object | | PSERIAL# | NUMBER | Process state object serial number | | NAME | VARCHAR2(5) | Name of this background process | | DESCRIPTION | VARCHAR2(64) | Description of the background process | | ERROR | NUMBER | Error encountered |   **Specifying the Maximum Number of Processes**  The PROCESSES initialization parameter determines the maximum number of operating system processes that can be connected to Oracle Database concurrently.  The value of this parameter must be a minimum of one for each background process plus one for each user process. The number of background processes will vary according the database features that you are using. If you are using ASM, Advanced Queuing or the file mapping feature, then you will have additional background processes.  For example, if you plan on running about 50 user processes, a good estimate would be to set the PROCESSES initialization parameter to at least 70.  **New Background Processes**  It is likely that there will be new background processes with new Oracle releases and as new features are implemented.  The following highlight new background processes in the respective Oracle releases:  [Note 268197.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=1503146.1&id=268197.1%20\o%20Note%20268197.1%20\t%20_blank) - New Background Processes In 10g [Note 444149.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=1503146.1&id=444149.1%20\o%20Note%20444149.1%20\t%20_blank)- New Background Processes In 11g  [Note:1625912.1](https://support.oracle.com/DocumentDisplay?id=1625912.1) - New Background Processes In 12c      **REFERENCES**  [NOTE:268197.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=1503146.1&id=268197.1) - New Background Processes In 10g [NOTE:444149.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=1503146.1&id=444149.1) - New Background Processes In 11g [NOTE:1509616.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=1503146.1&id=1509616.1) - Master Note: Troubleshooting Oracle Background Processes [NOTE:1625912.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=1503146.1&id=1625912.1) - New Background Processes In 12c |