Running WAY4™ Processes in Parallel

Contents

Introduction

This document is intended for system administrators.

When working with this document, familiarity with the following documents is recommended:

- "Daily Procedures" (Daily_Procedures.pdf).
- "WAY4™ Housekeeping" (housekeeping.pdf).

The following notation is used in the document:

- Field labels in screen forms are shown in *italics.*
- Screen form button labels are shown in square brackets, such as [Approve].
- Sequences for selecting user menu are given using arrows as follows: "Issuing → Contracts Input & Update".
- Variables that differ for each local instance, for example, directory and file names, as well as file path.s are shown in angular brackets, for example, <OWS_HOME>
- Warnings about the danger of making errors are marked with the  sign.
- Messages marked with the  sign contain information about important features, additional facilities, or the optimal use of certain functions of the system.

Chapter 1. Overview

There are some processes in WAY4 (for example, "Posting", "Accept Documents", "Contr Daily Update", etc.) can be run in several parallel threads.

The following modes are supported:

- Standard Parallel Run.
- Advanced Parallel Run.

The list of processes that can be run in parallel is provided in the section "Parallel Run" of the document "Daily Procedures".

Chapter 2. Standard Parallel Run

In the standard mode for running a parallel process, the required number of Oracle jobs is created. Data are read directly from the table being processed, records are distributed between threads based on a hash expression (by default, records in one physical block of objects being processed will go into one thread).

Process parameters are set in the "Process Parameters" form, menu item "Full → Configuration Setup → Main Tables → Process Parameters" (see Fig. 1).

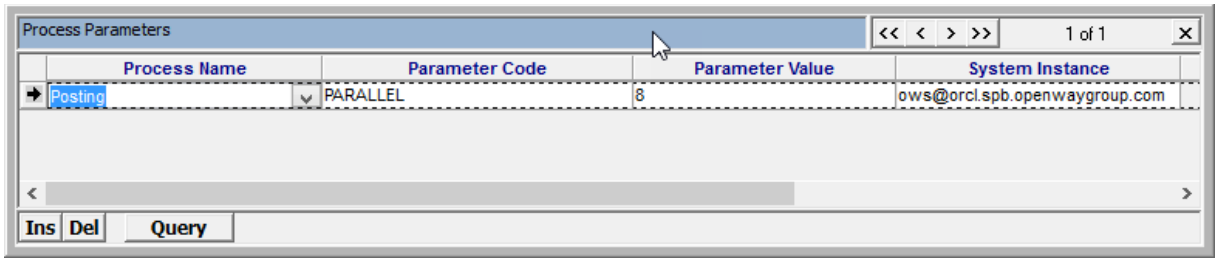

Fig. 1. Example of a process parameter

Set the following in the "Process Parameters" form:

- *Process Name* – process name. A value is selected from a list. If the list does not contain the process name, it can be copied from the *Process Name* field of the PROCESS_LOG table (menu item "Full → Process Log → Process Log").
- *Parameter Code* – parameter name. The value is either selected from a list or set manually.
- *Parameter Value* – parameter value.
- *System Instance* – node in which this parameter value must be used. If the value of this field is not specified, the parameter value is used in all nodes, otherwise, it is only used in the specified node.
- *Object Type* – name of the table whose row will be processed. The field is not filled in for the majority of processes.
- *Object ID* – identifier (ID) of the table row to be processed. The field is not filled in for the majority of processes .

List of parameters and possible values:

- "DELAY" – number of commits after which execution of a process is stopped for one second.
- "EXCEPTION_LIMIT" – maximum number of exceptions when executing each parallel thread in a process.

If an exception occurs during execution of a process, the process continues to work until the number of exceptions exceeds the limit set in the parameter. All exceptions go into Process Log → Messages.

The parameter's default value is 0. This means that a process will be stopped on the first exception.

- "JOB_CLASS" – name of the Oracle job class for redirecting required processes to another Oracle instance when Oracle RAC is used.

  By default, all parallel processes are executed as Oracle jobs with the "<OWS_Owner>_DJC" class.

  If some processes must be redirected to another node, do as follows:

  Using Oracle Enterprise Manager, create a new job class with the correct value in the *Service name* field. Specify "LOW_GROUP" in the *Resource Consumer Group* field.

  Set the JOB_CLASS parameter for the required processes.

- HASH_EXPR – hash expression used by the corresponding process to distribute records between parallel processing threads. Each thread will contain records whose remainder from dividing the hash expression by the number of threads is equal to the thread number.

  The parameter is only used in parallel mode (PARALLEL>1 for the process).

  For example, when the process for processing and accepting a document is executed in parallel ("Accept Documents" process) the parameter value "abs(sy_cycle.HASH_FROM_STR(target_number,16))" determines that documents for the same card will be processed in the same thread.

  The default value is dbms_rowid.BLOCK_NUMER (rowid). This means that records will be distributed between threads so that records in one physical block will go into the same thread.

- "HINT" – hints added to a SELECT operator for the optimization of queries selecting rows for processing or counting the number of rows.

  A hint is specified together with comments in brackets. For example, /*+ index (doc, doc_outward) */

  By default, no hint is set.

- "PARALLEL" – number of parallel processes when operating in parallel mode.

  The default value is "1".

- "MAX_NUMBER" – number of records that will be processed for each parallel process.

The default value is "0" (all records are processed). As a result, the MAX_NUMBER * PARALLEL number of records is processed.

The parameter is only used for load testing (so that each time the same number of records will be processed) and must not be used in a production system.

- "TIMING" – tracks the length of executing commit.

  When the parameter value is "Y", in each commit a record specifying the time spent on the processed portion of records is generated in the Process Log.

- "TO_COUNT" – when the parameter value is "Y" (default value), before starting, the number of records to be processed is counted and this value is put in the NUMBER_OF field of the PROCESS_LOG table.

  When the value is "N", the number of records to be processed is not counted. The value in the NUMBER_OF field of the PROCESS_LOG table will be equal to "0".

- "TRACE" – this parameter enables debugging for the corresponding process. Parameter values:

  - "N" – debugging is disabled; this is the default value.
  - "Y" – debugging is enabled.

- "TRACEFILE_IDENTIFIER" – postfix added to the name of a trace file when debugging is enabled (TRACE="Y"). This parameter simplifies identification of trace files.

  For example, for the "myproc" parameter value, the name of the trace file will appear as orcl_j001_8148_myproc.trc.

Chapter 3. Advanced Parallel Run

Advanced mode is used for processes where a query to select records for processing requires a significant amount of time and creates a large load on the system. Unlike standard mode, this mode makes it possible to execute such a query once only, instead of as many times as there are processes.

In advanced mode, data from a table being processed are preliminarily filtered to the DM_RECORD_LF table, from which records are distributed between threads based on a hash expression (by default, records in one physical block of objects being processed will go into one thread) and the number of buckets (number of subpartitions in DM_RECORD_LF). After the process has been run successfully, data from the DM_RECORD_LF table are deleted.

 Advanced mode to run a process in parallel for the WAY4™ Housekeeping R2 module is described in the document "WAY4™ Housekeeping".

Configuring Process Parameters

 All parameters from standard mode are used in advanced mode, except TO_COUNT and HINT_COUNT, since the number of records is always counted when inserting records into the DM_RECORD_LF table.

Advanced mode is enabled by setting the USE_DM_FS process parameter to "Y".

Table 1 shows the process parameters that are specific to advanced parallel mode.

Table 1. Process parameters specific to advanced parallel mode

Name	Description	Values	Default value
USE_DM_FS	If the value is "Y" the cycle works through DM_RECORD_LF collection	Y/N	N
USE_DM_FS_BUCKETS	Number of buckets (number of subpartitions in DM_RECORD_LF). It is recommended to set 5-10 threads for one bucket	Number	1
SELECT_HINT	Added as a hint to the main select operator or to the select part of insert select when selecting records from a table being processed	*+ any sql hints */	null
INSERT_HINT	Added as a hint to the insert operator when inserting records to DM_RECORD_LF	/*+ any sql hints */	/*+ append */

To use distribution of records between threads based on the number of buckets (number of subpartitions in DM_RECORD_LF), the DM_RECORD_LF table must be repartitioned.

Repartitioning the DM_RECORD_LF Table

To use distribution of records between threads based on the number of buckets (number of subpartitions in DM_RECORD_LF), the DM_RECORD_LF table must be repartitioned. To do so:

- Run the command:

```
TRUNCATE TABLE DM_RECORD_LF;
```

This command deletes Housekeeping module selection data. No actions will be performed for steps that are not completed. Completed steps will reselect records the next time they are run.

- Start the RedefineWiz.bat utility (<OWS Home>\install\RedefineWiz.bat):
  - In the "Migration Candidates" tab, select the DM_RECORD_LF table and check the "(Re)partit."checkbox.
  - Click on the [Start Migration] button to run the process for partitioning the table.

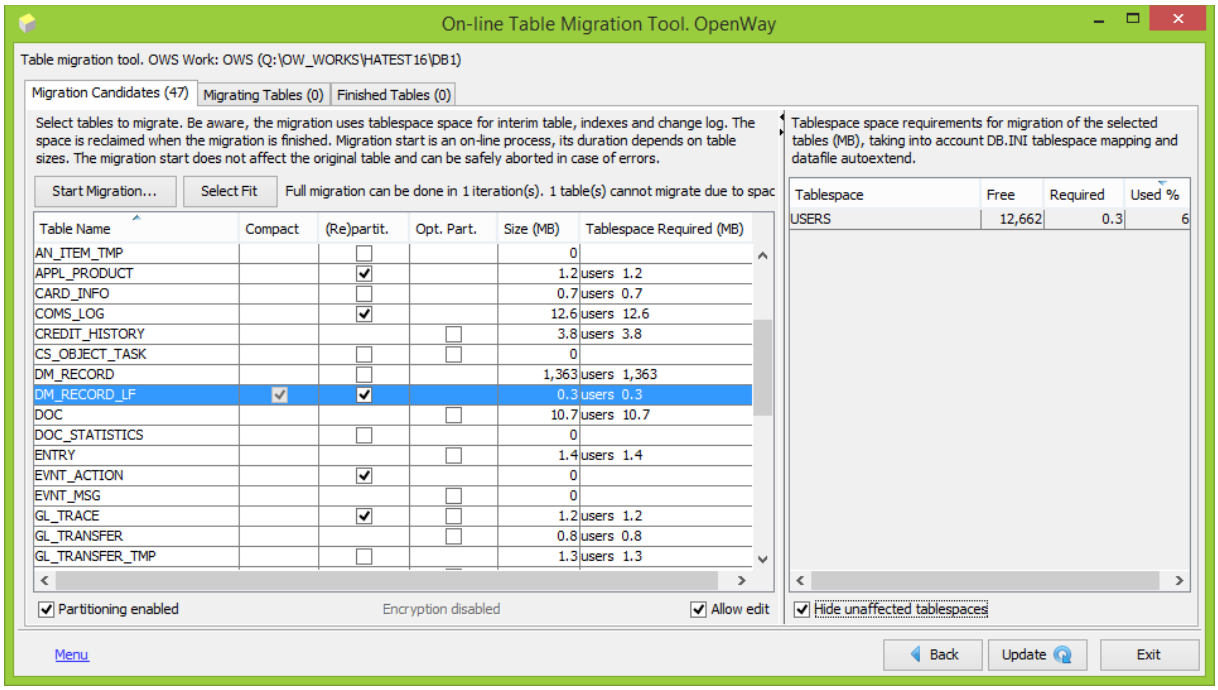

Fig. 2. Repartitioning the DM_RECORD_LF table