

WAY4™ Housekeeping

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Introduction



The WAY4™ Housekeeping R2 module is used to delete historical data from the WAY4 database and to create backup data copies that can be restored later.

This document is intended for bank or processing centre employees responsible for configuring the Housekeeping module and describes the module's operating principles.

When working with this document, it is recommended to use the following resources from the OpenWay documentation series:

- "DB Manager User Management"
- "Running WAY4™ Processes in Parallel"
- "DB Manager Manual"
- "WAY4™ PA-DSS Implementation Guide"
- "Housekeeping and DataWarehouse Export: Transportable Tablespace Usage".

The following conventions are used throughout the document:

- Field labels in screen form are shown in *italics*.
- Screen form button labels are enclosed in square brackets, such as [Approve].
- Sequences for selecting user menu items are given with arrows, as in: "Issuing → Contracts Input & Update".
- Sequences for selecting system menu items are given with a different type of arrow, for example: "Database => Change password".
- Key combinations used when working with DB Manager are shown in angular brackets as in <Ctrl>+<F3>.
- Values that vary for each local instance; for example, directory and file names, as well as file paths, are shown in angular brackets, as in <OWS_HOME>.
- Warnings that there is a danger of making an incorrect action 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. Housekeeping Operating Principles

If WAY4 has been in operation for a long time, it is inevitable that its database contains data whose storage is not required, as the period for using the data has expired.

Historical data must be regularly deleted as large volumes of data stored in the database decrease system performance. However, it must be possible to access deleted data, if required.

The Housekeeping R2 module has the following features:


- Tasks to delete and back up historical data are executed automatically according to a preconfigured schedule.
- Most errors occurring during task execution are processed automatically, including the "Snap shot too old" error.
- The main Housekeeping process is executed on the server, not on the administrator's workstation.
- The use of Batch interface technology in data processing allows the speed of task execution to be increased.
- Data processing can also be increased due to the execution of tasks in several streams.
- Deleted historical data stored in the archive is accessed using SQL expressions.

 The module provides the capability to delete historical data when several nodes are used on which WAY4 is installed; for example when the High Availability solution is implemented. In this case, rules for deleting historical data can be configured individually for each node.

Housekeeping Architecture

The Housekeeping R2 module consists of the following components (see Fig. 1):

- Housekeeping Engine is a server process operating according to specific rules (see the section "Deleting Historical Data"). It deletes historical data from the WAY4 database and backs up historical data.

 The Housekeeping Engine process is implemented as an Oracle job. Therefore, if the database is stopped while the process is running, the process will continue working after the database is next started. If full backup of the database was made while the process was running, the backup copy is restored on another system, and the database is started, the process will be copied and continue working on this system.

- Archive is special storage space for historical data deleted from the WAY4 database (see the section "Storing Historical Data").

- Administrator's Workstation is a workplace used to configure, manage and monitor the Housekeeping Engine (see the sections "Housekeeping", "Managing Housekeeping" and "Monitoring Housekeeping").

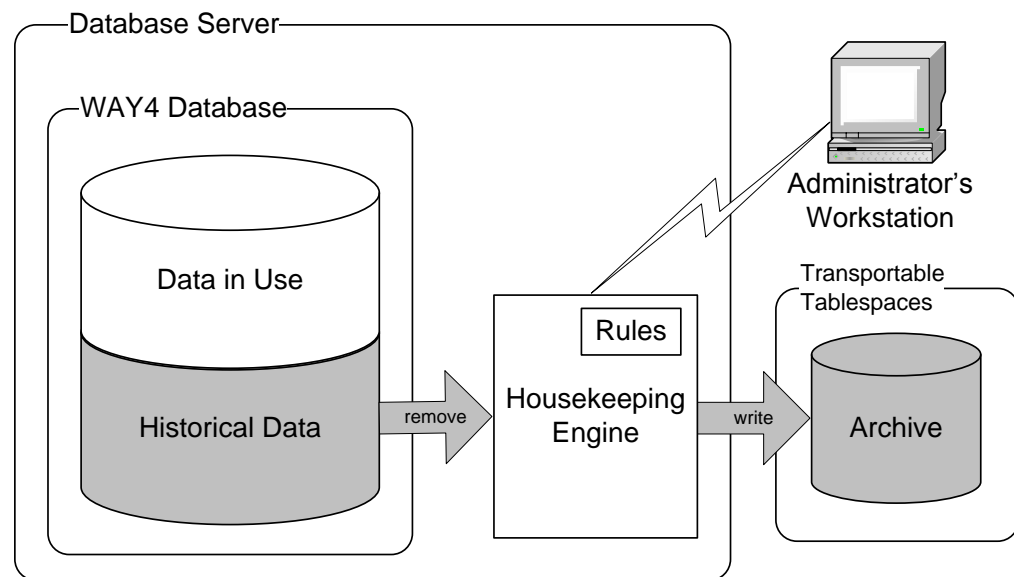


Fig. 1. Housekeeping R2 operating principles

Deleting Historical Data

The Housekeeping Engine deletes historical data from the WAY4 database and saves its backup copy to a special place (see the section "Storing Historical Data") according to the following rules:


- Historical data are records that have had one of the following logical statuses for a prolonged time:
 - "Expired" – dynamic data whose effective period has expired (for example, documents or macrotransactions).
 - "Closed" – manually deleted records or the records of closed contracts.
 - "Inactive" – records stored as the history of changes (see the section "Logging Changes in Grid Form Records" of the document "DB Manager User Management").
- Tables to be analysed and rules for analysis are determined by the WAY4 vendor.
- Backup of records with the "Closed", "Expired" or "Inactive" status can be enabled or disabled for every table to be analysed.
- Historical data is deleted and backed up during execution of three types of Housekeeping Engine tasks:
 - "Purge Expired" – task for records for which the term of storage has expired.
 - "Purge Closed" – task for records with the "Closed" status.
 - "Purge Inactive" – task for records with the "Inactive" status.
- The following task types are used for tables using Oracle partitioning:

- "Drop Partition" –deletes the oldest partitions. If a partition to be deleted still contains data, this data will be safely moved to another partition and will not be lost.
- "Create Partition" – creates new partitions.
- Housekeeping Engine tasks are executed according to a preconfigured schedule.
- Some PA-DSS requirements are fulfilled by Housekeeping Engine tools, for example, timely deletion of cryptographic data from the database or copying the Oracle audit journal, executed with a "Process Audit Log" task.

Storing Historical Data

Housekeeping uses Oracle Transportable Tablespaces technology to archive data. This technology has the following advantages:

- Transportable tablespaces can be easily detached from the database.
- Transportable tablespaces can be easily attached to the original database or to any other database.
- Various technologies such as Oracle Recovery Manager (RMAN), Oracle Export Utility and Oracle Data Pump can be used to archive transportable tablespaces. Direct data file copying can also be used.
- It takes very little time to copy data through a server process using simple SQL expressions.

 For more information about this technology, see the section "Transporting Tablespaces Between Databases" of the document "Oracle® Database Administrator's Guide" 11g Release 2 (11.2).

Instructions on working with transportable tablespaces are provided in the document "Housekeeping and DataWarehouse Export: Transportable Tablespace Usage" (see `<OW_HOME>\manuals\system\hsk_transportable_ts.html`).

Chapter 2. Housekeeping Setup

Housekeeping setup consists of initialising default values and if necessary, configuring custom rules for execution of Housekeeping Engine tasks. To do so, use the "OpenWay → Housekeeping → Configuration" user menu group items.

Initialising Values for Housekeeping Engine Task Execution Rules

Housekeeping Engine tasks are executed according to rules specified for each database table.

Rule parameters include the following:

- Parameters whose values may only be changed by the WAY4 vendor:
 - Types of Housekeeping Engine tasks (see the section "Deleting Historical Data").
 - The list of operations used to analyse and delete historical data for each of the tables according to the Housekeeping Engine task type.
- Customisable parameters with values specified by default (see the section "Custom Parameterisation of Housekeeping Engine"):
 - List of tables from which the Housekeeping Engine will delete historical data.
 - List of rules for analysing these tables' records that will be classified as historical data.
 - List of rules for analysing other tables' records related to the records of these tables, that will also be classified as historical data.
 - Length of the time interval after which data will be classified as historical, as well as the frequency with which the Housekeeping Engine task will be executed.



It is recommended that custom values always be assigned to these parameters.


The Housekeeping Engine's default configuration contains rules for deleting values that may not be stored pursuant to PA-DSS. The names of these rules have the postfix "secured". The maximum length of the time interval after which these data must be deleted is one calendar day.



Note that it is not permitted to change the length of the time interval for these rules.

- Parameters affecting the database server load when executing Housekeeping Engine tasks (see the section "Parameters for Executing Operations Determining the Load on the Database Server (DB Params Custom)").

- Parameters specifying whether records with the "Expire" and "Inactive" status must be backed up to the archive for each table.

 Before starting the Housekeeping module, assign default values to the parameters by selecting the menu item "OpenWay → Housekeeping → Configuration → Import Standard Settings".

The default values of parameters are shown in forms accessed by selecting the menu items "Tables View", "DB Parms View" and "Expire Parms View" in the "OpenWay → Housekeeping → Configuration" menu group.


Custom Parameterisation of Housekeeping Engine Tasks

If custom parameterisation of Housekeeping Engine tasks is required, it should be done as follows:

- For each type of Housekeeping Engine task (see the section "Deleting Historical Data"), set up standard and/or create additional rules determining the length of the time interval after which data will be classified as historical, as well as the frequency with which Housekeeping Engine tasks will be executed (see the section "Housekeeping Engine Task Parameters (Expire Parms Custom)").
- Instead of the standard rules, assign these additional rules to the required tables (see the section "Configuring Rules for Housekeeping Engine Tasks (Rules Cust)").

Moreover, the following additional actions may be taken:

- For each required table, assign a rule specifying whether it is necessary to back up records with the "Expired" and "Inactive" statuses to the archive (see the section "Assigning Rules to Database Tables (Tables Cust)").
- For each required table, assign a rule specifying the values of parameters that affect the database server load while Housekeeping Engine operations are executed on this table's data (see the section "Parameters for Executing Operations Determining the Load on the Database Server (DB Parms Custom)").

 For the changes to take effect, initialise the new values by selecting the menu item "OpenWay → Housekeeping → Configuration → Make Steps".


Housekeeping Engine Task Parameters (Expire Parms Custom)

By default, data for all tables is considered historical after it has been stored in the database for one year and Housekeeping Engine tasks are executed once a month.

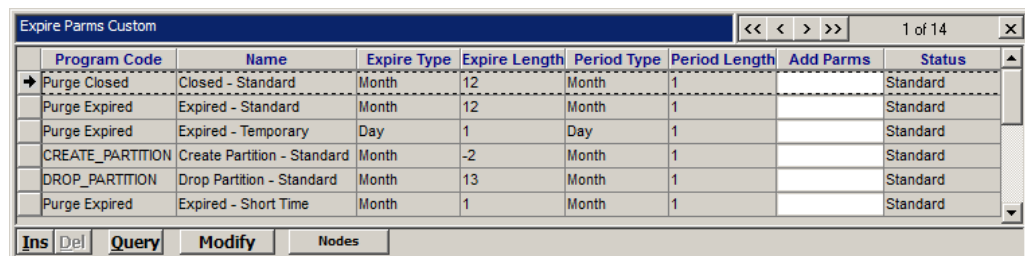
There are two ways to modify the values:

- Change default values – the new values will be used for all tables using default values.
- Create a new rule specifying the value of the time interval and frequency of execution and use it as a custom rule for the required tables (see the section "Configuring Rules for Housekeeping Engine Tasks (Rules Cust)").

Rules for deleting values that may not be stored pursuant to PA-DSS are an exception. The names of these rules have the postfix "secured". The maximum length of a time interval after which these data will be deleted is one day.

 Note that it is not permitted to change the length of the time interval for these values. It should also be noted that pursuant to PA-DSS requirements, audit log data (the SY_AUDIT_LOG table) must be stored in the database for no less than three months (see the section "Database Server Requirements" of the document "WAY4™ PA-DSS Implementation Guide"). Rules for archiving data from this table must be configured with consideration for this requirement.

The "Expire Parms Custom" form (see Fig. 2) is used to configure task parameters (OpenWay → Housekeeping → Configuration → Expire Parms Custom).



Program Code	Name	Expire Type	Expire Length	Period Type	Period Length	Add Parms	Status
Purge Closed	Closed - Standard	Month	12	Month	1		Standard
Purge Expired	Expired - Standard	Month	12	Month	1		Standard
Purge Expired	Expired - Temporary	Day	1	Day	1		Standard
CREATE_PARTITION	Create Partition - Standard	Month	-2	Month	1		Standard
DROP_PARTITION	Drop Partition - Standard	Month	13	Month	1		Standard
Purge Expired	Expired - Short Time	Month	1	Month	1		Standard


Fig. 2. "Expire Parms Custom" form

The following fields are available in this form:


- *Program Code* – type of Housekeeping Engine task (see the section "Deleting Historical Data").
- *Name* – rule name.
- *Expire Type* – units in which the time interval is measured (day, month, quarter, year), after which data will be classified as historical.
- *Expire Length* – length of the time interval.
- *Period Type* – units in which the frequency of Housekeeping Engine task execution are measured (day, month, quarter, year).
- *Period Length* – execution frequency value.
- *Add Parms* – field is reserved for future use.
- *Status* – rule status:
 - "Standard" – standard rule; default values are specified.
 - "Upgrade" – standard rule, but custom values are specified.
 - "Custom" – custom rule.

To assign custom values to standard rules, select a rule and click the [Modify] button. The rule will be assigned the "Upgrade" status, and the *Expire Type*, *Expire Length*, *Period Type* and *Period Length* fields will become editable.

If it is necessary to return to the default values, select a rule and click the [Restore] button.

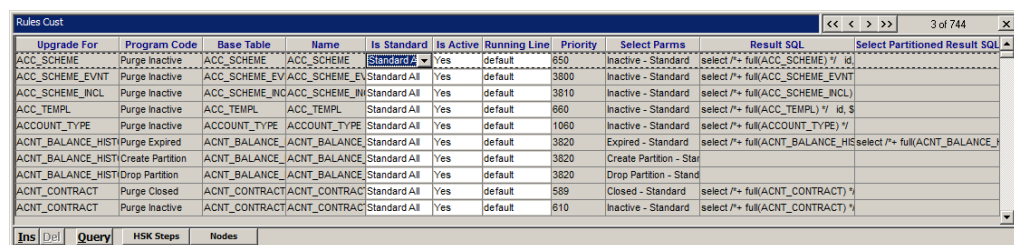
 Note that the settings in the "Expire Params Custom" form are used by default for all nodes on which WAY4 is installed. If it is necessary to use settings that differ from the default ones for a certain parameter in a certain node, use the [Nodes] button. Clicking this button opens the "Nodes for..." child form in which the corresponding node may be specified for the selected parameter and the values required for this node.

The [Ins] button of the "Expire Params Custom" form is used to add custom rules.

 For the new rules to take effect, initialise their values by selecting the menu item "OpenWay → Housekeeping → Configuration → Make Steps".

Configuring Rules for Housekeeping Engine Tasks (Rules Cust)

The "Rules Cust" form (see Fig. 3), opened by selecting the menu item "OpenWay → Housekeeping → Configuration → Rules Cust", is used to assign rules to tables specifying the time interval after which data will be classified as historical and the frequency of Housekeeping Engine task execution.




Upgrade For	Program Code	Base Table	Name	Is Standard	Is Active	Running Line	Priority	Select Params	Result SQL	Select Partitioned Result SQL
ACC_SCHEME	Purge Inactive	ACC_SCHEME	ACC_SCHEME	Standard All	Yes	default	650	Inactive - Standard	select /*+ full(ACC_SCHEME) */ id,	
ACC_SCHEME_EVNT	Purge Inactive	ACC_SCHEME_EV	ACC_SCHEME_EV	Standard All	Yes	default	3800	Inactive - Standard	select /*+ full(ACC_SCHEME_EVNT)	
ACC_SCHEME_INCL	Purge Inactive	ACC_SCHEME_IN	ACC_SCHEME_IN	Standard All	Yes	default	3810	Inactive - Standard	select /*+ full(ACC_SCHEME_INCL)	
ACC_TEMPL	Purge Inactive	ACC_TEMPL	ACC_TEMPL	Standard All	Yes	default	660	Inactive - Standard	select /*+ full(ACC_TEMPL) */ id, \$	
ACCOUNT_TYPE	Purge Inactive	ACCOUNT_TYPE	ACCOUNT_TYPE	Standard All	Yes	default	1060	Inactive - Standard	select /*+ full(ACCOUNT_TYPE) */	
ACNT_BALANCE_HIST	Purge Expired	ACNT_BALANCE	ACNT_BALANCE	Standard All	Yes	default	3820	Expired - Standard	select /*+ full(ACNT_BALANCE_HIS	select /*+ full(ACNT_BALANCE_HIS
ACNT_BALANCE_HIST	Create Partition	ACNT_BALANCE	ACNT_BALANCE	Standard All	Yes	default	3820	Create Partition - Stand		
ACNT_BALANCE_HIST	Drop Partition	ACNT_BALANCE	ACNT_BALANCE	Standard All	Yes	default	3820	Drop Partition - Stand		
ACNT_CONTRACT	Purge Closed	ACNT_CONTRACT	ACNT_CONTRACT	Standard All	Yes	default	589	Closed - Standard	select /*+ full(ACNT_CONTRACT) */	
ACNT_CONTRACT	Purge Inactive	ACNT_CONTRACT	ACNT_CONTRACT	Standard All	Yes	default	610	Inactive - Standard	select /*+ full(ACNT_CONTRACT) */	

Fig. 3. "Rules Cust" form

To assign a custom rule to a Housekeeping Engine task type, select the record with the name of the required task type in the *Program Code* field and the required table in the *Name* field; in the *Is Standard* field, select a value with the "Custom" prefix. The corresponding form fields will become editable.

Possible values:

- "Standard All" – default parameters.
- "Custom Params", "Standard SQL" – if this option is selected, the *Select Params* field becomes editable. This field can be used to specify parameters for determining when data becomes historical for the selected table. These parameters are set earlier using the form "Expire Params Custom" (see the section "Housekeeping Engine Task Parameters (Expire Params Custom)").
- "Custom Params and SQL" – when this option is selected, the *Select Params* and *Result SQL* fields become editable. The former makes it possible to specify parameters for determining when data becomes historical for the selected table. These parameters are set earlier using the "Expire Params Custom" form. The latter is used to make changes in the template for executing the SQL expression generated for string selection.
- "Custom All" – the fields *Select Params*, *Result SQL* and *Program Code* become editable.

 Note that it is recommended to change standard rules with the approval of the WAY4 vendor, as such changes may lead to automatic upgrade of rules being impossible when upgrading the system.

Specifying the "No" value in the *Is Active* field prohibits the execution of a custom or standard rule.

The *Running Line* field specifies the name of the stream in which the task is being executed (see the section "Settings for Running Lines").

i When filling in this field, consider the sequence in which dependent tasks are executed; for example, do not delete records from the DOC table (documents) before deleting from the M_TRANSACTIONS table (macrotransactions). Rules that depend on one another should be included in the same stream.

In the *Priority* field, specify the priority of the selected task. Usually, tasks are executed in the following order: first those that are frequently executed, then overdue tasks, then tasks with a higher priority.

! For the changes to take effect, initialise the values by selecting the menu item "OpenWay → Housekeeping → Configuration → Make Steps".

The [Ins] button is used to add custom rules. Custom rules are created with the agreement of the WAY4 vendor.

The [HSK Steps] button opens the "HSK Steps for <name of table>" form. This form contains information about operations executed as part of this task for the current table.

i Note that the settings in the "Rules Cust" form are used by default for all nodes on which WAY4 is installed. If it is necessary to use settings differing from the default ones for a certain rule in a certain node, use the [Nodes] button. Clicking this button opens the "Nodes for..." child form (see Fig. 4) in which the corresponding node can be specified for the selected rule and the values required for this node.

Node	Is Active	Is to Save	Running Line
[Dropdown]	Yes	No	default

Fig. 4. Setting a rule for a specific node

By selecting "Yes" in the *Is To Save* field, it is possible to redefine existing default settings and specify that data will be archived when the rule is executed.

i The recommended value for this field is "No".

Assigning Rules to Database Tables (Tables Cust)

To open the "Tables Cust" form (see Fig. 5), select the menu item "OpenWay → Housekeeping → Configuration → Tables Cust". This form is used to assign rules to the required tables specifying whether to back up historical data with the "Expired" and "Inactive" statuses, as well as set a number of other parameters.

Tables Cust							<< < > >>		1 of 780		✕
	Upgrade For	Table Code	Is Standard	Priority	Save Expired	Save Inactive	Partitioning Mode				
➔	ACC_SCHEME	ACC_SCHEME	Standard	4930	Yes	No					
	ACC_SCHEME_EVNT	ACC_SCHEME_EVNT	Standard	4940	Yes	No					
	ACC_SCHEME_INCL	ACC_SCHEME_INCL	Standard	4950	Yes	No					
	ACC_TEMPL	ACC_TEMPL	Standard	4960	Yes	No					
	ACCOUNT	ACCOUNT	Standard	4990	Yes	No					
	ACCOUNT_TYPE	ACCOUNT_TYPE	Standard	2380	Yes	No					
	ACNT_BALANCE	ACNT_BALANCE	Standard	5030	Yes	No					
	ACNT_BALANCE_HISTOR	ACNT_BALANCE_HISTO	Standard	5040	Yes	No	Drop Purged				
	ACNT_CONTRACT	ACNT_CONTRACT	Standard	4980	Yes	No					
Ins Del Query Act Options Tablespace Restrictions											

Fig. 5. "Tables Cust" form

This form contains the following fields:

- *Upgrade for* – name of the table to which the rule is assigned.
- *Save Expired* – flag specifying whether to back up historical data with the "Expired" and "Closed" status (if no value is specified, data will be backed up by default).
- *Save Inactive* – flag specifying whether to back up historical data with the "Inactive" status (if no value is specified, data will be backed up by default).
- *Is Standard* – drop-down list of values:
 - "Standard" – if this value is specified, the *Save Expired* and *Save Inactive* fields will not be editable.
 - "Upgrade" – if this value is selected, the *Save Expired* and *Save Inactive* fields will be editable.
 - "Custom" – if this value is selected, all form fields except *Upgrade for* will be editable.
- *Priority* – the priority for processing the table. Usually, tasks are executed in the following order first those that are frequently executed, then overdue tasks, then tasks with a higher priority.
- *Partitioning Mode* – this field is used for tasks related to table partitioning:
 - "Drop Purged" – before deleting partitions data must be deleted by the Housekeeping Engine.
 - "Drop with Data" – partitions are deleted together with data.

The [Act Options] button is used to open the "Act Options for <name of database table>" form (see Fig. 6).

Action Code	Program Code	Is Standard	DB Parms
SELECT		Standard	Select - Standard
DELETE		Standard	Delete - Standard
SAVE		Standard	Save - Standard
CHECK		Standard	Check - Standard
SUPPL_SELECT		Standard	Suppl - Standard

Ins Del Query

Fig. 6. Relation of operations to parameters determining the database server load

This form allows every operation connected with a table to specify a value in the *DB Parms* field, determining the load on the database server when executing the operation (see the section "Parameters for Executing Operations Determining the Load on the Database Server (DB Parms Custom)").

The [Tablespace] button allows a transportable tablespace to be specified for the table (see the section "Tablespace Group").

The [Restrictions] button is used to open the "Restrictions for <name of database table>" form (see Fig. 7). This form is used to set restrictions on operations with linked records.

Base Restriction	To Table	For	From Table	From Column	Customizing Mode	Is Active	SQL Text
	ACNT_LOG	Check Refs	ACNT_LOG	ACNT_LOG_OID	Standard All	Yes	select /*+ full(ACNT_LOG) */ACNT_LOG_
	ACNT_LOG	Check Refs	GL_TRACE_ADD	CRE_BY_STORNO	Standard All	Yes	select /*+ index_ffs(GL_TRACE_ADD GL_T
	ACNT_LOG	Check Refs	GL_TRACE_ADD	STORNO_PLAN	Standard All	Yes	select /*+ index_ffs(GL_TRACE_ADD GL_T
	ACNT_LOG	Check Refs	GL_DOC_ADD	CRE_BY_STORNO	Standard All	Yes	select /*+ index_ffs(GL_DOC_ADD GL_DO
	ACNT_LOG	Check Refs	GL_DOC_ADD	STORNO_PLAN	Standard All	Yes	select /*+ index_ffs(GL_DOC_ADD GL_DO
	ACNT_LOG	Superselect	ACNT_LOG	ACNT_LOG_OID	Standard All	Yes	select /*+ leading\$(MARKED_H)) use_has
	ACNT_LOG	Subselect	ACNT_LOG	ACNT_LOG_OID	Standard All	Yes	select /*+ leading\$(MARKED_H)) use_has

Ins Del Query

Fig. 7. Configuring restrictions on operations with linked records

In the *To Table* field of this form, specify the name of the table on the records of which restrictions are being set.

In the *From Table* field, specify the name of the table containing records linked with those of the original table. The records of these tables are linked through a column (the name of which is specified in the *From Column* field) of the table specified in the *From Table* field.


Restriction types are set in the *For* field:

- "Subselect" – when deleting a record from the original table, linked records from the table specified in the *From Table* field are also deleted.
- "Check Refs" – before deleting records from the original table, a check is made for references to these records from the table specified in the *From Table* field; if such references are found, records from the original table are not deleted.

Parameters for Executing Operations Determining the Load on the Database Server (DB Parms Custom)

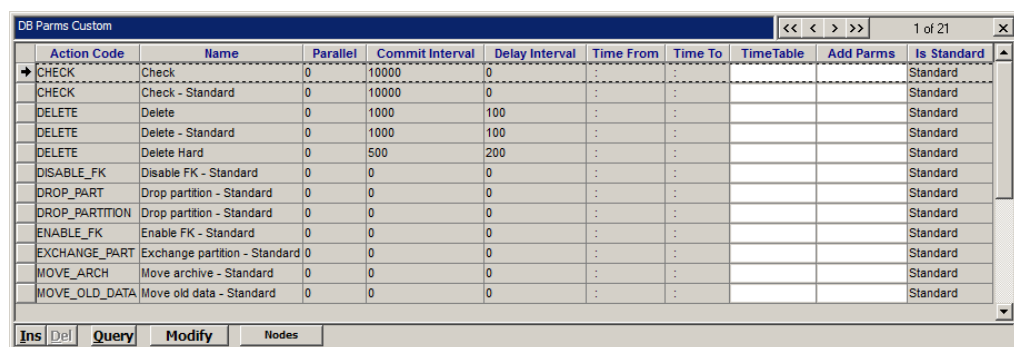
The "DB Parms Custom" form (see Fig. 8), opened by selecting the menu item "OpenWay → Housekeeping → Configuration → DB Parms Custom", is used to configure rules for executing operations. These rules are used to specify the

values of parameters affecting the database server load. For example, some operations that significantly increase the database server load should be executed at night when the increased load will not affect the processing of other operations.

 Note that the values of these parameters should only be modified if database server performance is low.

There are two ways to modify the parameter values of the rules for processing historical data in different tables:

- Change the default value – the new values will be used for all tables using default values.
- Create a new set of parameters and specify this as a custom set for the required tables (see the section "Assigning Rules to Database Tables (Tables Cust)").



Action Code	Name	Parallel	Commit Interval	Delay Interval	Time From	Time To	TimeTable	Add Params	Is Standard
CHECK	Check	0	10000	0	:	:			Standard
CHECK	Check - Standard	0	10000	0	:	:			Standard
DELETE	Delete	0	1000	100	:	:			Standard
DELETE	Delete - Standard	0	1000	100	:	:			Standard
DELETE	Delete Hard	0	500	200	:	:			Standard
DISABLE_FK	Disable FK - Standard	0	0	0	:	:			Standard
DROP_PART	Drop partition - Standard	0	0	0	:	:			Standard
DROP_PARTITION	Drop partition - Standard	0	0	0	:	:			Standard
ENABLE_FK	Enable FK - Standard	0	0	0	:	:			Standard
EXCHANGE_PART	Exchange partition - Standard	0	0	0	:	:			Standard
MOVE_ARCH	Move archive - Standard	0	0	0	:	:			Standard
MOVE_OLD_DATA	Move old data - Standard	0	0	0	:	:			Standard

Fig. 8. "DB Params Custom" form

This form contains the following fields:

- *Action Code* – type of operation executed with the table data:
 - "SELECT" – select data that will presumably be deleted.
 - "SUPPL_SELECT" – select data from child tables of the current table that will presumably be deleted.
 - "CHECK" – check for the existence of references to the selected data; if no references to the selected data are found, the data are marked for deletion; if references are found, data will not be deleted until the records referring to them are deleted.
 - "SAVE" – back up data marked for deletion.
 - "DELETE" – delete marked data.
- *Name* – name of operation execution rule.
- *Parallel* – field reserved for future use.
- *Commit Interval* – number of elementary operations executed within one database transaction. For example, in the case of a "delete" operation, on the one hand, the higher the value, the faster the operation is executed, and on the other hand, the size of the undo segment increases and consequently, the database load.
- *Delay Interval* – Housekeeping Engine process downtime after each executed transaction (milliseconds). On the one hand, the higher the value, the slower


the operation is executed and on the other hand, the database server load decreases.

- *Time From* – time from which the operation may be executed, if the *Time Table* field is not filled in.
- *Time To* – time until which the operation may be executed, if the *Time Table* field is not filled in.
- *Time Table* – field to specify the time interval/intervals when the Housekeeping Engine process can be run.

This field contains time intervals delimited by the ";" character; each interval consists of the following components:

- Sequence number of the day of the week or a letter to indicate working ("W") and non-working ("H") days, delimited by the ";" or "-" character.
- ":" character, separating the specified day of the week from the time interval allowed for this day (in hours and minutes).
- Time intervals in hours and minutes in "HHMM-HHMM" format, delimited by the ";" character.

If a day/days of the week are set, but no time interval is specified, this means that there are no time restrictions on running the process during that day.

 A sequence number's correspondence to a day of the week (for example, whether the first day of the week is Sunday or Monday) is determined by the value of the NLS_TERRITORY parameter set in the database instance.

Examples of filling in the *Time Table* field:

1. Example.

```
1, 3-5:0900-1300, 1400-1800; 6-7:1800-0100;
```

In this case, the process can be run on the first day of the week and from the third to the fifth day of the week from 09:00 to 13:00 and from 14:00 to 18:00; on the sixth and seventh days of the week – from 18:00 to 01:00 of the next day.

2. Example.

```
W:-1300, 1400-1800; H:1800-0100;
```

In this case, the process can be run on working days until 13:00 and from 14:00 to 18:00; on non-working days – from 18:00 to 01:00 of the next day.


- *Add Parms* – reserved for future use.
- *Is Standard* – rule status:
 - "Standard" – the rule is standard and default values are specified.
 - "Upgrade" – the rule is standard but custom values are specified.
 - "Custom" – custom rule.


To assign custom values to standard rules, select the required rule and click the [Modify] button. The rule will be assigned the "Upgrade" status, and the

Commit Interval, Delay Interval, Time From, Time To, Time Table and *Add Parm*s will become editable.

If it is necessary to return to the default values, select the required rule and click the [Restore] button.

The [Ins] button is used to add custom rules.

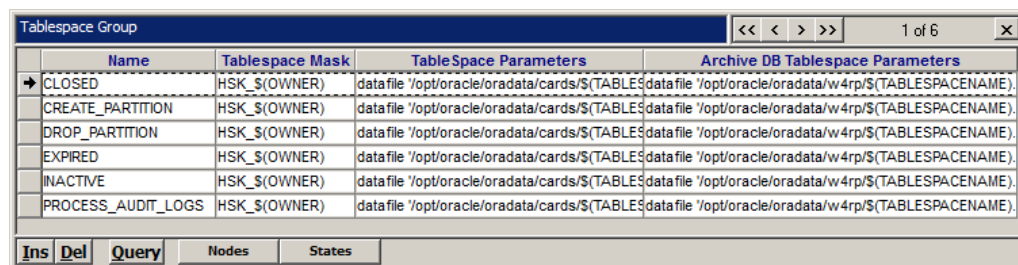
 For the new values take effect, initialise them by selecting the menu item "OpenWay → Housekeeping → Configuration → Make Steps".

 Note that the settings in the "DB Parms Custom" form are used by default for all nodes on which WAY4 is installed. If it is necessary to use settings differing from the default ones for a certain operation in a certain node, use the [Nodes] button. Clicking this button opens the "Nodes for..." child form in which the corresponding node can be specified for the selected operation and the values required for this node.

Transportable Tablespaces Tablespace Group

In the Housekeeping module, Oracle Transportable Tablespaces technology is used to store historical data.

Settings for using this technology are configured in the "Tablespace Group" form (see Fig. 9), opened by selecting the menu item "OpenWay → Housekeeping → Configuration → Tablespace Group".




Name	Tablespace Mask	TableSpace Parameters	Archive DB Tablespace Parameters
CLOSED	HSK_\$(OWNER)	datafile '/opt/oracle/oradata/cards/\$(TABLES	datafile '/opt/oracle/oradata/w4rp/\$(TABLESPACENAME).
CREATE_PARTITION	HSK_\$(OWNER)	datafile '/opt/oracle/oradata/cards/\$(TABLES	datafile '/opt/oracle/oradata/w4rp/\$(TABLESPACENAME).
DROP_PARTITION	HSK_\$(OWNER)	datafile '/opt/oracle/oradata/cards/\$(TABLES	datafile '/opt/oracle/oradata/w4rp/\$(TABLESPACENAME).
EXPIRED	HSK_\$(OWNER)	datafile '/opt/oracle/oradata/cards/\$(TABLES	datafile '/opt/oracle/oradata/w4rp/\$(TABLESPACENAME).
INACTIVE	HSK_\$(OWNER)	datafile '/opt/oracle/oradata/cards/\$(TABLES	datafile '/opt/oracle/oradata/w4rp/\$(TABLESPACENAME).
PROCESS_AUDIT_LOGS	HSK_\$(OWNER)	datafile '/opt/oracle/oradata/cards/\$(TABLES	datafile '/opt/oracle/oradata/w4rp/\$(TABLESPACENAME).

Buttons: Ins Del Query Nodes States

Fig. 9. Configuring transportable tablespaces

This form contains the following fields:

- *Name* – name of tablespace group.
- *Tablespace Mask* – mask used to name the transportable tablespace in the database.
- *TableSpace Parameters* – parameters for creating transportable tablespace (see the section "Setting Up HSK to Use TTS" of the document "Housekeeping and DataWarehouse Export: Transportable Tablespace Usage").
- *Archive DB Tablespace Parameters* – parameters used to work with the archive database (contact WAY4 customer support for additional information).

 Note that settings in the "Tablespace Group" form are used by default for all nodes on which WAY4 is installed. If it is necessary to use settings differing from the default ones for a tablespace group in a certain node, use the [Nodes] button. Clicking this button opens the "Nodes for..." child form in which the

corresponding node can be specified for the selected tablespace group and the values required for this node

The name of the tablespace group is specified when rules are assigned to database tables (see the section "Assigning Rules to Database Tables (Tables Cust)"). This technology makes it possible to configure the storage of data from different database tables in different transportable tablespaces.

When the Housekeeping Engine creates a new tablespace, the name of this space is generated based on the value of the *Tablespace Mask* field in the "Tablespace Group" form. The following values are permissible when describing the mask:

\$(OWNER) – the first characters of the *OWS_Owner* name.

\$(PROGRAM) – the first characters of the Housekeeping program name (for example, EXP or Expire).

\$(CURRENTDATE) – the current date.

By default, the mask value is equal to "\$ (OWNER)\$ (PROGRAM)_\$(CURRENTDATE)". A postfix consisting of an underline character "_" and the WAY4 version number is added to the tablespace name.

For example, the name of a tablespace generated on the basis of a mask by default may appear as follows: "OWSEXP_20120907_0334".

The part of the CREATE TABLESPACE command used to create tablespace files is specified in the *Tablespace Parms* field, for example:

```
datafile 'D:\app\mydb\oradata\myway\$(TABLESPACENAME)_01.dbf' size 10m
autoextend on next 10m maxsize 32767m
```

When a tablespace is created, the name of this tablespace, for example "OWSEXP_20120907_0334_01", will be used instead of the value "\$ (TABLESPACENAME)".

If a tablespace name must be entered manually, select the tablespace group and click the [States] button. The "States for..." form will open (see Fig. 10).

Node	Last Table Space Name
→	HSK_HSK_HEA_034012

Fig. 10. Tablespace state

The name of the last tablespace created is automatically specified in the *Last Table Space Name* field of this form.

To manually enter the tablespace name, click the [Set Name] button and specify the required value in the *New Tablespace Name* field of the "Set Tablespace Name" form that opens.

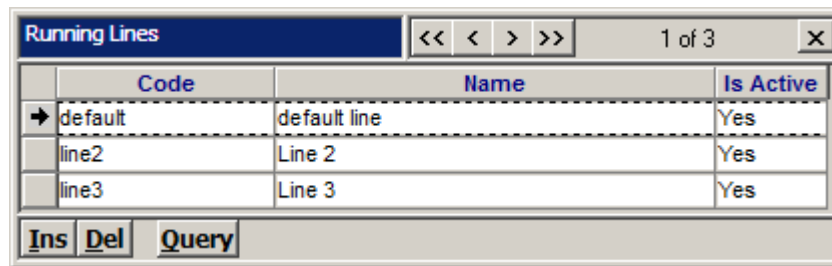
Settings for Running Lines

The Housekeeping R2 module makes it possible to execute tasks in several streams by specifying during configuration of task execution rules the name of the stream in which the task must be executed (see the section "Configuring Rules for Housekeeping Engine Tasks (Rules Cust)"). Usually, the

Housekeeping Engine works with one set of tables, executing one operation with one table at a time. When running lines are used, it becomes possible to separate the general list of processed tables into several sets that are unconnected according to [referential integrity](#). Each stream processes its set of tables.

Use of running lines makes it possible to increase the speed of Housekeeping. An effect can only be achieved if the database server and disk subsystem have enough capacity.

Task execution streams are registered in the "Running Lines" form (see Fig. 11), opened by selecting the menu item "OpenWay → Housekeeping → Configuration → Running Lines".




Code	Name	Is Active
→ default	default line	Yes
line2	Line 2	Yes
line3	Line 3	Yes

Ins Del Query

1 of 3

Fig. 11. Registering task execution streams

In this form, register the required number of streams for parallel processing of tasks.

 Consult WAY4 vendor representatives to determine rules for each stream.

Running Housekeeping Module Processes in Parallel

Housekeeping module processes can be run in parallel.

The following operation modes are supported:

- Standard Parallel Run.
- Single SQL Query Mode.

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).

The parameters for standard parallel run are described in the section "Standard Parallel Run" of the document "Running WAY4™ Processes in Parallel".

The parameters of the "HSK.main" process that are specific for parallel run are given in Table 1 below.


 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. For detailed information, see the section "Repartitioning the DM_RECORD_LF Table" of the document "Running WAY4™ Processes in Parallel".


Table 1. Parameters of the "HSK.main" process that are specific for parallel run

Name	Description	Values	Default Value
<TABLE_NAME>.LF	Operation mode with the DM_RECORD_LF collection: - A – previously set collection is used. - N –DM_RECORD is used instead of DM_RECORD_LF. - Y – each collection in a separate partition. - S – one common partition DM_RECORD_LF for all HSK collections for one table.	Y/N/A/S	A
<TABLE_NAME>.LF_BUCKETS	Number of buckets (number of subpartitions in DM_RECORD_LF). It is recommended that the number of threads be a multiple of the number of buckets (for example, 30 threads for 3 buckets).	Number	1

Single SQL Query Mode


Single SQL query 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 only once, instead of as many times as there are processes.

In this mode, the result of data selection is inserted into the table in an sql statement "insert from select" instead of processing data in parallel jobs. Data are inserted in the "append" and "nologging" modes, which substantially reduces the load on the system.

 Single SQL query mode is supported for the following Housekeeping module processes:

- "HSK.SELECT"
- "HSK.SUPPL_SELECT"
- "HSK.SAVE".

Single SQL query mode only works for SQL queries that have the /*DMAPIVER 2 */ hint.

 All parameters from standard mode are used in single SQL query mode, except the PARALLEL parameter. Insertion is made in one thread. If necessary, sql statement performance can be increased by using Oracle Parallel Query.

The affected partition's indexes are disabled during insertion. After insertion, they are rebuilt.

Single SQL query mode is enabled by setting the SINGLE_SQL parameter to "Y". The mode works with the DM_RECORD_LF table only, i.e. the <TABLE_NAME>.LF parameter must be set to "S" or "Y".

Table 2 below shows the process parameters that are specific to single SQL query mode.

Table 2. Process parameters specific to single SQL query mode

Name	Description	Values	Default Value
SINGLE_SQL	If "Y", single SQL query mode is activated.	Y/N	N
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. It is recommended for enabling Oracle Parallel Query.	*+ any sql hints */	null
INSERT_HINT	Added as a hint to the insert operator when inserting records to DM_RECORD_LF. It is recommended for enabling Oracle Parallel Query.	/*+ any sql hints */	/*+ append */
REBUILD_INDEX_OPTS (for the "HSK.SELECT" and "HSK.SUPPL_SELECT" processes only)	Added in a tail of the alter index rebuild subpartition XXXX <Rebuild Index Options>.	String	null

Chapter 3. Managing Housekeeping

In the Housekeeping R2 module, Housekeeping Engine server process tasks are executed automatically according to a predefined schedule. For this to happen, the administrator must do as follows:

- Set up a task execution schedule.
- Start the Housekeeping Engine process.
- If necessary, for example, for repeat initialisation of parameters, stop the Housekeeping Engine process.

Configuring the Housekeeping Engine Task Execution Schedule (Global Parm)

To configure the schedule for executing Housekeeping Engine tasks, use the "Global Parm" form (see Fig. 12), opened by selecting the menu item "OpenWay → Housekeeping → Runtime → Global Parm".

Program Code	Next Start	Time From	Time To	Tablespace Group	Add Parm
Purge Closed	01/01/2001	:	:	CLOSED	
Create Partition	01/01/2000	:	:		
Drop Partition	01/01/2000	:	:		
Purge Expired	01/01/2001	:	:	EXPIRED	
Purge Inactive	01/01/2001	:	:	INACTIVE	
Process Audit Logs	01/01/2001	:	:	PROCESS_AUDIT_LOGS	

Buttons: Ins, Del, Query

Fig. 12. Form for configuring the Housekeeping Engine task execution schedule

This form contains the following fields:

- *Program Code* – type of Housekeeping Engine task (see the section "Deleting Historical Data").
- *Next Start* – date of the next task execution.

i Note that when starting the parameter initialisation process for the first time (see the section "Initialising Values for Housekeeping Engine Task Execution Rules"), all records in this field are assigned the value "00/00/0000". Therefore, before first starting the Housekeeping Engine, the next start date must be manually specified. It is not recommended to edit this value further on as it will be automatically updated.


i If for some reason execution of Housekeeping Engine tasks must be suspended, this can be done by editing the value in this field.

- *Time Table* – field to specify the time interval/intervals when the Housekeeping Engine process can be run.

This field contains time intervals separated by a ";" character. Each interval consists of the following components:

- Sequence number of the day of the week or a letter to indicate working days ("W") and holidays/weekends ("H"), separated by a "," or "-" character.
- ":" character separating the specified day of the week from the time interval allowed for this day (in hours and minutes).
- Time intervals in hours and minutes in "HHMM-HHMM" format, separated by a "," character.

If a day/days of the week are set but no time interval is specified, this means there are no time restrictions on running the process during that day.

 A sequence number's correspondence to a day of the week (for example, whether the first day of the week is Sunday or Monday) is determined by the value of the NLS_TERRITORY parameter set in the DB instance.

Examples of filling in the *Time Table* field:

Example 1.

```
1,3-5:0900-1300,1400-1800;6-7:1800-0100;
```


In this case, the process can be run on the first day of the week, and from the third to the fifth days of the week from 09:00 to 13:00 and from 14:00 to 18:00; on the sixth and seventh days of the week from 18:00 to 01:00 of the next day.

Example 2.

```
W:-1300,1400-1800;H:1800-0100;
```

In this case, the process can be started on working days until 13:00 and from 14:00 to 18:00; on weekends/holidays from 18:00 to 01:00 of the next day.

- *Time From* – starting time of task execution.
- *Time To* – ending time of task execution.

 Note that it is not recommended to edit the value in these fields. If it is necessary to execute specific operations on data that reduce system performance, assign custom values to the parameters in the "DB Parms Custom" form (see the section "Parameters for Executing Operations Determining the Load on the Database Server (DB Parms Custom)"). This must be done at a strictly defined time.

- *Tablespace Group* – the name of the transportable tablespace group (see the section "Tablespace Group").
- *Add Parms* – reserved for future use.

Starting the Housekeeping Engine Process

The Housekeeping Engine process is started by selecting the menu item "OpenWay → Housekeeping → Runtime → Start Housekeeping".

Stopping the Housekeeping Engine Process

The Housekeeping Engine process is stopped by selecting the menu item "OpenWay → Housekeeping → Runtime → Stop Housekeeping". As a result, tasks being executed at the time the menu item is selected will also be stopped. When the Housekeeping Engine is restarted, the interrupted tasks will automatically continue to executing starting with the operation being processed at the time of interruption.

Clearing Collections

When rules for a Housekeeping Engine task are changed, if there are already records selected for being processed by the old rule, the corresponding collections must be cleared.

For example, when the storage period is increased, if there are already records selected for deletion according to the old period, the following steps must be taken:

- Stop the Housekeeping Engine process using the menu item "OpenWay → Housekeeping → Runtime → Stop Housekeeping".
- Clear the collection. The "Collections" form opened by selecting the menu item "OpenWay → Housekeeping → Runtime → Collections" is used to clear collections. Select the required collection and click on the [Clear] button.
- Initialize the values of the task's parameters by selecting the menu item "OpenWay → Housekeeping → Configuration → Make Steps".
- Start the Housekeeping Engine process by selecting the menu item "OpenWay → Housekeeping → Runtime → Start Housekeeping".

Chapter 4. Working with the WAY4 Housekeeping Module during System Upgrade

When upgrading WAY4, proceed as follows:

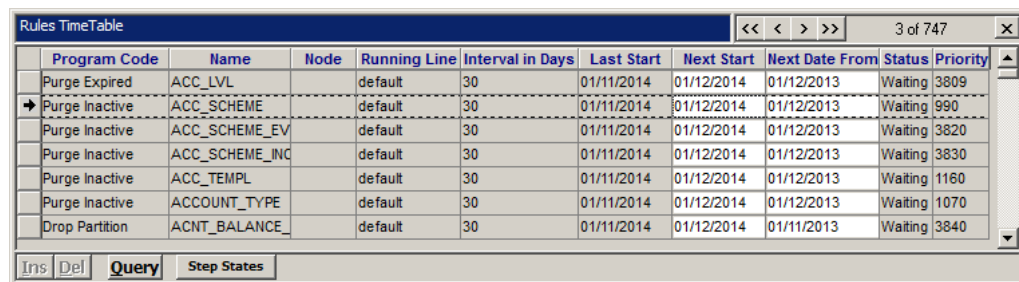
- Stop the Housekeeping Engine process.
- Upgrade WAY4.
- Assign default values to parameters using the menu item "OpenWay → Housekeeping → Configuration → Import Standard Settings" (this does not change custom settings).
- If custom parameterisation is required, assign the corresponding parameters the necessary values and initialise these values by selecting the menu item "OpenWay → Housekeeping → Configuration → Make Steps".
- Start the Housekeeping Engine process.

Chapter 5. Monitoring Housekeeping

This chapter describes tools for monitoring Housekeeping operations.

"Rules TimeTable" Form

The "Rules TimeTable" form (see Fig. 13) is used to monitor the execution of all types of Housekeeping Engine tasks for all tables from which historical data are to be deleted. This form is opened by selecting the menu item "OpenWay → Housekeeping → Runtime → Rules TimeTable".



Program Code	Name	Node	Running Line	Interval in Days	Last Start	Next Start	Next Date From	Status	Priority
Purge Expired	ACC_LVL		default	30	01/11/2014	01/12/2014	01/12/2013	Waiting	3809
Purge Inactive	ACC_SCHEME		default	30	01/11/2014	01/12/2014	01/12/2013	Waiting	990
Purge Inactive	ACC_SCHEME_EV		default	30	01/11/2014	01/12/2014	01/12/2013	Waiting	3820
Purge Inactive	ACC_SCHEME_INC		default	30	01/11/2014	01/12/2014	01/12/2013	Waiting	3830
Purge Inactive	ACC_TEMPL		default	30	01/11/2014	01/12/2014	01/12/2013	Waiting	1160
Purge Inactive	ACCOUNT_TYPE		default	30	01/11/2014	01/12/2014	01/12/2013	Waiting	1070
Drop Partition	ACNT_BALANCE		default	30	01/11/2014	01/12/2014	01/11/2013	Waiting	3840

Fig. 13. Form for monitoring execution of Housekeeping Engine tasks

This field contains the following fields:

- *Program Code* – task type.
 - *Name* – name of database table.
 - *Node* – name of the node on which the task is executed.
 - *Last Start* – date when the task was last executed.
 - *Next Start* – date when the task will be executed next.
 - *Next Date From* – date used to classify data as historical; meaning data created or modified before this date are considered historical. For the "Create Partition" program, this is the maximum date until which data can be inserted.
- i** Although the *Next Start* and *Next Date From* fields are editable, it is not recommended to manually change their values. These values are automatically updated according to the set rules (see the section "Configuring Rules for Housekeeping Engine Tasks (Rules Cust)").
- *Status* – task execution status:
 - "In Work" – task is currently being executed.
 - "Waiting" – task is waiting to be executed.
 - *Running Line* – name of the stream in which the task is executed (see the section "Settings for Running Lines").
 - *Priority* – task execution priority. Usually, tasks are executed in the following order: first, those that are frequently executed, then overdue tasks, then tasks with a higher priority.

i To determine that a process has completed and is waiting to be started again in the future, filter all records with the required name of the task type. The date in the *Next Start* must be later than the current date. If there is even one record with a date that is earlier, the process has not been completed yet.

The [Step States] button is used to open the " Step States for <name of table>" form, containing a list of operations executed by the Housekeeping Engine as part of this task (see Fig. 14).

Step States for ACC_SCHEME							<< < > >>		1 of 3	b x
Step #	Action Code	Table Code	Ref Table	Result SQL	DB Parms	Additional Information	Status			
0	SELECT	ACC_SCHEME	ACC_SCHEME	select /*+ full(ACC_SCHEME) */ id, \$(INFO) from ACC_SCHEME where AMIN	Select - Standard		Waiting			
1	DELETE	ACC_SCHEME	ACC_SCHEME	DELETE ACC_SCHEME ...	Delete - Standard		Waiting			
2	FINISH	ACC_SCHEME	ACC_SCHEME				Waiting			

Fig. 14. List of operations executed in a task

The *DB Parms* field specifies the task execution rule defined for this table (see the section "Housekeeping Engine Task Parameters (Expire Parms Custom)).

The *Status* field may have one of the following values:

- "Waiting" – the operation is awaiting execution.
- "Active" – the operation is being executed.
- "Posted" – the operation has been executed.

Process Log

The results of executing Housekeeping Engine tasks are logged in the process log (see the section "DB Manager Processes" of the document "DB Manager Manual").

The "HSK.main" value is specified in the *Process Name* field as the name of the main Housekeeping Engine process. Operations executed as part of tasks are logged as child processes of the main process and have the prefix "HSK" in their names (see Fig. 15).

A record of the parameter initialisation process (see the section "Initialising Values for Housekeeping Engine Task Execution Rules") contains the "Renew HSK parms" value as its name.

Process Log												<< < > >>		1 of 2415	x
Process Name	Started	Finished	Status	Parameters	Bank Date	Started By	Stopped By	rrnt Numl	Last Updated	Number Of	Parent Process	Object Type	Object Id	Error Level	
HSK main	20/12/12 16:22:21	00/00/00 00:00:00	Active	LINE=line3	01/02/2009	DEMGOD		1	20/12/12 16:22:22	0					
HSK main	20/12/12 16:22:21	00/00/00 00:00:00	Active	LINE=default	01/02/2009	DEMGOD		0	20/12/12 16:22:21	0					
HSK main	20/12/12 16:22:21	00/00/00 00:00:00	Active	LINE=line2	01/02/2009	DEMGOD		0	20/12/12 16:22:21	0					
HSK Make Steps	18/12/12 15:49:31	18/12/12 15:49:36	Closed		01/02/2009	DEMGOD		0	18/12/12 15:49:36	0					
HSK Make Steps	18/12/12 15:49:18	18/12/12 15:49:23	Closed		01/02/2009	DEMGOD		0	18/12/12 15:49:23	0					
HSK Import Standard Settings	18/12/12 15:49:15	18/12/12 15:49:18	Closed		01/02/2009	DEMGOD		0	18/12/12 15:49:18	0					
HSK EXPRED.SAVE.LOGIN_HIS	18/12/12 01:06:57	18/12/12 01:06:57	Closed	procD=10000000	01/02/2009	DEMGOD		123	18/12/12 01:06:57	0	HSK.main				
HSK EXPRED.DELETE.LOGIN_HIS	18/12/12 01:06:57	18/12/12 01:06:57	Closed	procD=10000000	01/02/2009	DEMGOD		123	18/12/12 01:06:57	0	HSK.main				
HSK EXPRED.SUPPL_SELECT.LC	18/12/12 01:06:38	18/12/12 01:06:38	Closed	procD=10000000	01/02/2009	DEMGOD		0	18/12/12 01:06:38	0	HSK.main				
HSK EXPRED.CHECK.LOGIN_HIS	18/12/12 01:06:38	18/12/12 01:06:38	Closed	procD=10000000	01/02/2009	DEMGOD		123	18/12/12 01:06:38	0	HSK.main				

Fig. 15. Logging execution of Housekeeping Engine tasks in the process log

i For quick identification of the reasons for failures and errors during Housekeeping Engine operation, it is recommended that an error report be provided to WAY4 customer support (see the section ""Housekeeping Report" Report").


"Error Log" Form

The "Error Log" form (see Fig. 16) opened by selecting the menu item "OpenWay → Housekeeping → Runtime → Error Log", is used to analyse messages about errors that occurred during Housekeeping Engine operation.



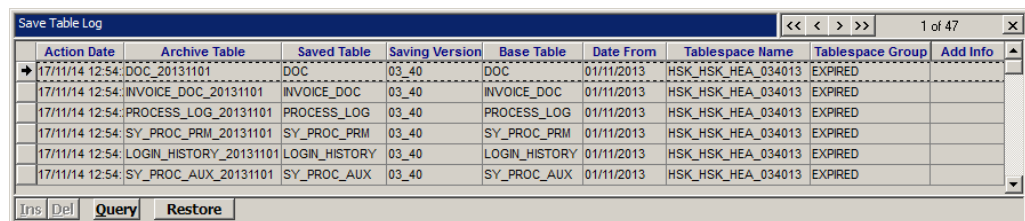
Action Date	Program Code	Action Code	Table Code	SQL String	Resp Msg	Resp Code
28/12/06 18:35:44	Purge Expired	SAVE	SERVICE_APPROVED	SAVE SERVICE_APPROVED		99

Fig. 16. Form containing error messages

 If errors occur during Housekeeping Engine operation, contact WAY4 customer support.

"Save Table Log" Form

The "Save Table Log" form (see Fig. 17), opened by selecting the menu item "OpenWay → Housekeeping → Runtime → Save Table Log" is used to obtain information about the transportable tablespaces where historical data from processed WAY4 database tables are stored.




Action Date	Archive Table	Saved Table	Saving Version	Base Table	Date From	Tablespace Name	Tablespace Group	Add Info
17/11/14 12:54: DOC_20131101	DOC	DOC	03_40	DOC	01/11/2013	HSK_HSK_HEA_034013	EXPIRED	
17/11/14 12:54: INVOICE_DOC_20131101	INVOICE_DOC	INVOICE_DOC	03_40	INVOICE_DOC	01/11/2013	HSK_HSK_HEA_034013	EXPIRED	
17/11/14 12:54: PROCESS_LOG_20131101	PROCESS_LOG	PROCESS_LOG	03_40	PROCESS_LOG	01/11/2013	HSK_HSK_HEA_034013	EXPIRED	
17/11/14 12:54: SY_PROC_PRM_20131101	SY_PROC_PRM	SY_PROC_PRM	03_40	SY_PROC_PRM	01/11/2013	HSK_HSK_HEA_034013	EXPIRED	
17/11/14 12:54: LOGIN_HISTORY_20131101	LOGIN_HISTORY	LOGIN_HISTORY	03_40	LOGIN_HISTORY	01/11/2013	HSK_HSK_HEA_034013	EXPIRED	
17/11/14 12:54: SY_PROC_AUX_20131101	SY_PROC_AUX	SY_PROC_AUX	03_40	SY_PROC_AUX	01/11/2013	HSK_HSK_HEA_034013	EXPIRED	

Fig. 17. "Save Table Log" form

This form contains the following fields:

- *Action Date* – date of Housekeeping Engine task execution.
- *Archive Table* – name of table to which data are saved.
- *Saved Table* – name of table from which data are saved.
- *Saving Version* – WAY4 version to which saved data belong.
- *Base Table* – the name of the parent table for the table specified in the *Saved Table* field.
- *Date From* – date used to classify data as historical; data created or modified before this date are considered historical.
- *Tablespace Name* – name of the transportable tablespace. Every time a Housekeeping Engine is executed, a tablespace is automatically created whose name also contains the date and time of its creation (see the section "Transportable Tablespaces Tablespace Group").
- *Add Info* – field reserved for future use.

Since data are usually only archived on one WAY4 node, a field with the name of the node is not provided for.

 The [Restore] button may only be used with the WAY4 vendor's agreement.

"Housekeeping Report" Report

To analyse the results of procedures for deleting historical data, and in particular, to identify failures and bugs in Housekeeping Engine operation, a special report is used, started using the menu item "OpenWay → Housekeeping → Runtime → Housekeeping Report".

This report consists of three sections"

- Overall report – list of processes that were run, specifying the number of starts, execution time, number of records processed, etc.
- Settings report – task time parameters: date after which a task can be started, frequency of task execution, etc.
- Chronological report – detailed information about the task execution progress.

Chapter 6. DB.INI File Parameters for the Housekeeping Module

Parameters for the Housekeeping module can be set in the DB.INI file (for example, WAY4 Cards, WAY4 Datamart).

During installation, parameters from the DB.INI file are automatically saved in the SYS_CONSTANTS table. When new parameters are added to the DB.INI file, or the values of existing parameters are changed, the changes must be loaded to the DB. The loaddbini.bat script is used to load DB.INI parameters.

DB.INI file parameters for the Housekeeping module:

- <TABLE_NAME>_PRT_DATERANGE – partition interval for the <TABLE_NAME> table partitioned by the date type field. Values:
 - "<N> months" – number of months.
 - "<N> days" – number of days.
- PARTITION_SIZE_<TABLE_GROUP> – partition interval for the <TABLE_GROUP> table group partitioned by the date type field. For example, 1 days, 1 months.

Chapter 7. Monitoring with WAY4 Health Monitoring Gen2

The Housekeeping R2 module can provide information about its operation with SNMP using the WA4 Health Monitoring Gen2 product:

- About Housekeeping Engine messages and metrics.
- About messages received as a result of the Housekeeping Engine's operation (for example, that partitions are missing or running out for a DB table).

This information is gathered by calling DB stored procedures. By default, the frequency of calling procedures that gather information about the Housekeeping Engine process (process with the "HSK.main" code) is one minute. By default, the frequency of calling procedures gathering information about results of the Housekeeping Engine's operation is 6 hours. A license for each of the following components is required for monitoring:

- "dbAgentsExecutor_hsk" – component responsible for monitoring results of the Housekeeping Engine's operation.
- "dbAgentsExecutor_hsk_process" – component responsible for monitoring the Housekeeping Engine process.

For more information about enabling and setting up monitoring, see the document "Administering WAY4 Health Monitoring Gen2".

Table 3 shows parameters for monitoring the Housekeeping R2 module.

Table 3. Parameters for monitoring the Housekeeping R2 module

Parameter	Parameter type	Group	Description
Housekeeping/Default	Alert (trap)	hsk	Error about missing future partitions for tables partitioned by date or number ranges. If future partitions are missing, the error occurs in advance by the number of days set in the global parameter MISSING_FUTURE_PART_ERROR (the default value is 3 days).
Housekeeping/Default	Alert (trap)	hsk	Warning about missing future partitions for tables partitioned by a date range. If future partitions are missing, the warning occurs in advance by the number of days set in the global parameter MISSING_FUTURE_PART_WARNING (the default value is 10 days).
Housekeeping/Default	Alert (trap)	hsk_process	Error if the "HSK.main" process is not started.
Housekeeping/Default	Alert (trap)	hsk_process	Error for the "HSK.main" process or its subprocesses.
Housekeeping/Processed_rows	Metric	hsk_process	Number of records processed by the "HSK.main" process.