

Saving potential calculation

Throughout the service report subsequent sections indicate a savings potential (calculated in GB) for each document type under the heading 'Evaluation'. Bear the following in mind in relation to the individual calculations:

a) The number of records that could be removed in the analyzed client (according to SAP's best practices) is compared against the **total** number of records per table. The term **'total'** means that records from **all clients** are considered. This total figure is determined based on the database statistics. For the results to be correct, it is essential that the database statistics are updated regularly so that they represent the real database situation.

Note: If the total number of records of a table determined from the database statistics is less than the total number of records based on the TAANA analysis result, the database statistics are considered to be obsolete. In this case, the saving potential is calculated on the basis of the TAANA result.

b) The calculations are performed based on the annual distribution of records and an equal distribution of records throughout the year is assumed.

DART related information

Make a backup copy of all tax-relevant data before any data is archived. Select a storage format that the tax authorities can access. Take into account the country-specific legal requirements of your tax authority.

The SAP Data Retention Tool (DART) is available in the USA and Germany. In Brazil, transaction IN68 provides comparable functionality. DART gives access to tax-relevant data, which meets the requirements of these tax authorities. For more information, see the alias "DART" on SAP Service Marketplace.

Further Information Sources

DVM Wiki

<http://wiki.scn.sap.com/wiki/display/TechOps/Data+Volume+Management>

SAP ILM

<http://www.sap.com/pc/tech/enterprise-information-management/software/information-lifecycle/index.html>

SAP Note Numbers

71930: Sources of information for SAP data archiving

826000: Sources of Information for SAP XML-Based Data

Consulting notes on various archiving objects and latest information on display methods (best search by entering the name of the archiving object)

SAP Training

- BIT614 SAP Document Management
- BIT615 SAP Archive Link Document Management
- BIT660 Data Archiving
(overview about Data Archiving and its tools)
- BIT670 Data Archiving – Programming
(especially applicable to integrate an archive-access in Z-Reports)
- BC680 Data Retention Tool DART (international)
- WDE680 Data Retention Tool DART (only for Germany)

For details see www.sap.com/education

SAP Enterprise Support Academy

SAP Enterprise Support Academy helps you build up the knowledge and skills needed to fully maximize the benefit of SAP Enterprise Support. The program offers learning content and services in several formats, supporting different learning styles and needs, from ad hoc problem solving to structured, long-term knowledge acquisition.

For details see [SAP Enterprise Support Academy](#)

1 Standard Operation

1.1 Technical Archiving Customizing

It is possible to set parameters that apply only to a **specific archiving object**.

The technical customizing settings will be set via SAP transaction SARA -> Button: Customizing -> Archiving-object specific customizing -> Technical Settings.

Archive File Size	Settings in your system	Recommended settings
Max. Size in MB		100 – 200
Max. No. of Data Objects		Blank
Settings for Delete Program	Settings in your system	Recommended settings
Not scheduled/Start automatically/After Event/		Not scheduled
Build Index		Not activated
Settings for Postprocessing Program	Settings in your system	Recommended settings
Start Automatically		Activated
Place File in Storage System	Settings in your system	Recommended settings
Content Repository		to be maintained by the customer
Start Automatically		Activated
Sequence	Settings in your system	Recommended settings
Sequence		Store Before Deleting

The column 'Recommended settings' gives information about the recommended settings by SAP. Dependent on the archiving objects other settings can be recommendable e.g. regarding performance aspects. You will find the specialized recommendations in the single archiving chapters of the analyzed areas.

1. Archive File Size

- **Max. Size in MB**

It is recommended to define the archive file size with 100 MB as the interface to Archive Link could cause problems if the size is higher than 100 MB. We recommend choosing a file size of 100 MB, as 100 MB can still be handled well, are easy to transfer to an external content server. On the other hand, a larger file size of 100 MB will reduce the number of archive files being created and therefore will reduce the number of delete jobs that have to be scheduled. Ensure that the **size of the archive file** does not exceed about 200 MB.

Note that the maximum size of an archiving file is limited by the operating system and also by the external storage system if one is connected.

- **Max. No. of Data Objects.**

It is recommended to leave the field 'Number of Objects' blank. You only should operate with the parameter 'Size of Archive File [MB]'.

Please note: The value that is reached first triggers the creation of a new archive file. If you leave both fields blank, only one archive file is created.

2. Settings for delete program

- **Start automatically**

This radio button is of interest primarily if you want to save the archive files before the delete phase.

Please note:

- a. If there is a long time period between the write phase and the delete phase, there is a danger that the data could be changed before it is deleted, which means that the data in the archive and in the database are no longer the same. The delete phase should therefore be carried out as soon as possible after the write phase.
- b. If you activate the Start Automatically radio button, the delete program is run automatically immediately after archiving. However, if it was specified in Customizing that the file storage is to take place before the delete phase, the delete program is not started until the file has been stored.
- c. Since the deletion program is automatically started for each archive file, you can carry out delete and write jobs in parallel if relatively small archive files are created. This parallel activity can have a positive effect on the runtime of an archiving session, as the database is used more efficiently. If a file is too small, the number of processes rises and the system is negatively affected.

Build index

You can use the Build index indicator to specify whether an index is to be constructed for a particular archiving object. The index enables you to access specific data objects from the archive file (single document access). For example, the application specific archive index for FI_DOCUMNT is stored in table ARIX_BKPF. We recommend that you use the Archiving Information System (AS).

3. Settings for post processing program

- **Start automatically**

Here you can schedule a post processing program to run after the delete phase. Post processing programs carry out operations following an archiving session, such as updating statistics and cleaning up secondary indexes (e.g. table BSIS). Most archiving objects do not require a post processing program.

Please note: The post processing program only runs when:

- a. The last delete program in the archiving session is finished
- b. No archive files have the status Archived, Archiving or Deleting.

4. Place File in Storage System

- **Content Repository**

The name of the content repository is maintained here. You can find more information about content repositories in the SAP Library under Content Repositories.

- **Start automatically**

Indicates that archive files, after successful processing, are automatically transferred to a connected storage system.

If you mark this check box, an archive file is automatically stored in the Content Repository that was specified in Customizing.

- **Sequence**

- **Delete phase before storage:** The file is stored in the content repository after it has been processed by a live deletion program. If the deletion program is run in test mode, the file is not then automatically stored.
- **Storage before delete phase:** The file is stored in the storage system after the write program has created an archive file but before the deletion program has been run for this file.

1.2 Archive Routing

This function is used to create rules and conditions, based on which archive files are routed to specific content repositories. The criteria used in the rules and conditions can be on the level of organizational unit (such as company code) or time-based (such as fiscal year).

Due to legal compliance issues, companies, especially those with international locations, are increasingly forced to keep archived data separately in order to comply with different retention requirements for different kinds of data, lines of business or countries, for example. Compared to the manual selection of content repositories, Archive Routing offers companies more flexibility and automated options for this purpose.

Customizing

The routing rules and conditions are entered for individual archiving objects in Archive Routing. The function is available under *Archiving-Object-Specific Customizing* in Archive Administration (transaction SARA). If no rules have been entered, the content repository is selected the traditional way.

Archiving Process

During the archiving process the rules are checked twice: once during the write session and again during the storage phase. It is important to note that Archive Routing does not use the actual contents of the archive file to determine the content repository, but the selection criteria entered in the variant for the write session. Thus, the set of data covered by the selection criteria in the variant does not have to be exactly the same as the set of data covered by the routing rules and conditions - rather the variant selection must fall inside the latter. If this is not the case, the archiving session is terminated. If it is the case, the archiving session is carried out and the archive files are routed to the appropriate content repository during the storage phase.

For each archiving object you can create rules in customizing that determine which content repository is to be chosen based on the selection criteria of the write program variant. For each rule you enter conditions, which contain a selection criterion and a corresponding value or interval. It is possible to create one or more rules per archiving object and one or more conditions per rule. The complexity of the rules depends on how specific your criteria for separating your archived data into different content repositories is. The smallest unit for which a content repository can be determined using Archive Routing is an archiving session. This means that the individual archive files, and therefore all the data objects (documents) in an archiving session are routed to one and the same content repository. If you want to route data to different content repositories, you must start a separate session for each content repository.

For more Information refer to the Online documentation: <http://help.sap.com> → SAP ERP → ERP Central Component → Choose Language → SAP ERP Central Component → Data Archiving → Introduction to SAP Data Archiving → Customizing → Archiving-Object-Specific Customizing → Archive Routing

1.3 Scheduling Write Jobs

Depending on the data volume it may be required to schedule archive runs not only a few times a year but on a regular basis.

To avoid that archive write job variants have to be adjusted manually we recommend the definition of dynamic variants. Based on a dynamic variant it is possible to schedule the write job periodically using the same variant, but the content of the variant will be adjusted.

Some archiving objects (especially in the area of Finance and Controlling) require a data selection in the archive write job based on the fields fiscal year (and period).

For regularly scheduled archiving jobs, e.g. monthly scheduled jobs, try to use dynamic variants that can be scheduled periodically.

- For selection variants that will be based on a date field, predefined dynamically filled date fields are available.
- For fields like fiscal year and fiscal period you can use table TVARV to fill these fields dynamically. In this case you have to schedule a pre-processing job (based on a Z-Report), before the write job, that will fill table TVARV with the appropriate values.
- To fill the archiving note / comment that will be displayed in SARA Management View and in pop-ups when the user has to choose an archive file for sequential read access you have two options. Either use again table TVARV or maintain the archiving note manually after the session in SAP transaction SARA

1.4 Scheduling Delete Jobs

Delete Jobs should not be started automatically. To better fine-tune the data archiving delete phase to other processes running in your system, you really do not want to schedule the delete jobs via archive administration (Transaction SARA) or you want to limit the number of simultaneously scheduled delete jobs.

SAP provides the program RSARCHD for all releases that are currently being maintained.

For further information please see SAP Notes: 205585, 447921 and 820023.

In case there is no Content Server via Archive Link attached the archive files should be back-up before (!) the delete job is scheduled. A possible solution for this is to define a job that combines the start of RSARCHD with a copy job by defining two steps. The copy job can be a shell script that is defined with SAP transaction SM69. Delete Jobs should not run in parallel to long running write jobs to prevent the error ORA-1555 (snapshot too old).

Delete Jobs running parallel to your DB Online Backup will most probably increase the runtime of your backup.

1.5 Monitoring

Use SAP transaction RZ20 → Monitor Templates → Data Archiving Monitor to get a cross-archiving object overview. Use SAP transaction SARA for an archiving object specific and more detailed view.

1.6 Documentation

It is important to keep track which data was archived in which archiving session. Especially for sequential file scans the user should be able to decide which files should be chosen for the sequential read.

Possibilities for documentation:

- **Short Text of Archiving Session**
The Short Text that is displayed in the management overview in SAP transaction SARA and in any other pop-up where the user can choose an archive file for sequential read. **The Short Text should be maintained in any case.** This can be done in most cases in the variant for the archiving object. In some cases the selection screen for the archiving object does not offer a field "Archiving Note". In those cases the Short Text has to be maintained afterwards manually in SAP transaction SARA → Management View. The disadvantage of the short text is that for some special archiving session the number of characters available in the short text may not be sufficient to put all details of the selection variant in. The short text should include the most important selection criteria e.g. period, fiscal year, document type. In case there is no time criteria used in the selection variant of the write job as you will rely on the restrictions of the customizing you should nevertheless calculate from which time frame data will be archived and give this time frame in the short text.
- **Long Text for Archiving Session**
when you double-click a single archiving session in SARA → Management View you get a pop-up where you can choose to maintain a Long Text that describes the content and selection of the archiving session. As this always requires manual interaction this method of documentation is not very widespread in SAP's customer base.
- The values of the used selection variables of an archiving session are automatically stored and can be displayed in the Archive Administration (= SAP transaction SARA) ->
- as print list
When you tick the option "Selection Cover Page" in the Print Parameters the values of the selection screen is included in the top part of the spool file, that is created for the write job. In addition you have to choose "Archiving mode: Print and archive" instead of the default "Print only".
This solution gives you the highest level of detail with the lowest manual interaction as all necessary information will be stored in the print list automatically. But this solution requires a 3rd Party Solution in place to store the created print lists.

Recommendation

Maintain in all cases the short text for every archiving session.

In case you have a 3rd Party Solution as a Content Server implemented, use print lists to document the details of your archiving sessions.

1.7 Database Reorganization

1) Reorganization of Indexes

- There are no real restrictions for the online reorganization of indexes
(if possible: do not perform the online reorganization in times of high system load)

General Remarks concerning Index Reorganization:

We recommend always doing index reorganization after data archiving, because:

- It is not very resource intensive
- It can be done online
- Performance advantages usually outweigh the disadvantages
 - Better for chronologically sorted indexes
 - Less good for non-chronologically sorted indexes

2) Reorganization of Tables

- Reorganization should only be done if you expect a relevant and permanent reduction of the table; this means that you do not expect that the table will ever grow in such an extent that it would reach the current size once again

General Remarks concerning Table Reorganization:

Reorganization of database table

- Resource intensive
- Online Reorganization tools (third party tools) – but additional investment

Please consider the following points during data archiving in order to avoid data fragmentation and consequently to decrease the necessity of table reorganization:

- Use appropriate selection criteria for data archiving to avoid fragmentation (e.g. use a minimum of selection criteria - only residence time if possible)
- Avoid archiving for periods in which data records are “not business complete yet” - use test mode first

1.8 House-Keeping

Possibilities of Reduction: Data Deletion

There are a number of jobs that must periodically run in a live R/3 installation, for example, to delete outdated jobs or spool objects. As of release 4.6C, you can easily schedule these jobs as follows: **SAP Transaction SM36, press button 'Standard jobs'**.

The list below contains the required programs, their parameters, and the recommended repeat interval which are necessary for the house-keeping. In addition, names are suggested for the required jobs. Adhere to the recommendations, as the naming conventions enable us to check quickly and easily whether these jobs have been activated in your system.

Please review SAP Note 16083 'Standard jobs, reorganization jobs' to get detailed information regarding the jobs to be considered.

Application-specific reorganization programs are not included in this list.

Job Name	Program	Variant	Repeat-Interval	Client-dependent
SAP_REORG_JOBS	RSBTCDEL	Yes	Daily	No
SAP_REORG_SPOOL	RSPO0041/1041	Yes	Daily	Yes
SAP_REORG_BATCHINPUT	RSBDCREO	Yes	Daily	Yes
SAP_REORG_ABAPDUMPS	RSSNAPDL /RSNAPJOB	Yes	Daily	No
SAP_REORG_JOBSTATISTIC	RSBPSTDE	Yes	Monthly	No
SAP_COLLECTOR_FOR_JOBSTATISTIC	RSBPCOLL	No	Daily	No
SAP_COLLECTOR_FOR_PERFMONITOR	RSCOLL00	No		No
SAP_REORG_PRIPARAMS	RSBTCPRIDEL	No	Monthly	
SAP_CCMS_MONI_BATCH_DP	RSAL_BATCH_TOOL_DISPATCHING	No		
RSPO1043 Spool- consistency Batch	RSPO1043	Yes	Daily	
SAP_COLLECTOR_FOR_NONE_R3_STAT	RSN3_STAT_COLLECTOR	No	Daily	
SAP_REORG_XMILOG	RSMILOGREORG	Yes	Weekly	No

The deletion reports for the following data should be scheduled on a regular basis:

- Batch Input data table **APQD**
- RFC-Call data table **ARFCSDATA**
- ABAP Dumps table **SNAP**
- TemSe/Spool data table **TST03**

Tables **VBDATA**, **VBMOD** and **VBHDR** contain information about incomplete update requests (update requests that have not been executed yet). Update terminations and short dumps should be analyzed regularly and in detail by system administration (SAP transaction SM13).

1.9 SAP Transactions

The following **SAP transactions** were used during the data analysis of this DVM Strategy service:

SAP transaction	Description
DB02	Database Performance: Tables and Indexes
TAANA	Table Analysis: Administration
DB15	Tables and Archiving Objects
ST14	Application Analysis
SE16N	General Table Display
ST10	Table Call Statistics

DB02:

The SAP transaction DB02 will provide an overview of the database size. Select the Space Statistics button in the Tables and Indexes section. Display all the tables by entering *. Select 'All objects on' in the menu path under History. This will provide a list of tables and indexes. Select the month button to see the monthly growth and sort by size.

TAANA:

The SAP transaction TAANA will provide record counts for a given table. Create a variant (menu path: Environment – Analysis Variant). The variant should include fields from the table being analyzed that will provide a better understanding of how the data is being used. For example, select the period and year fields for the table BKPF to see how the data is distributed across periods/years. See SAP Notes 71930 and 689035 for further information and new functionality available for virtual fields and ad-hoc variants.

DB15:

The SAP transaction DB15 will display the relationships between tables and archiving objects. You can display:

- The **Archiving objects** for a particular table
- The **Tables** affected for a particular Archiving object

ST14:

The SAP transaction ST14 will provide application analysis data. First, schedule the job by using the schedule button. Include the client, a description and then select the application you would like to analyze. For data management, select cross applications and then data management. The job will execute in the background. Second, after the job is completed, review the result by selecting the analyses button or choosing an application.

SE16N:

The SAP transaction SE16N allows the display of database records to be done in the background. Each field can be selected or deselected in the 'Output' column, depending on the results required. In addition, the number of records for a period of time can be retrieved in the background by using the menu path: Edit – Number of entries (batch).

ST10:

The SAP transaction ST10 can be used to display the number of direct and sequential reads on tables. Select the radio buttons 'all tables' and 'previous months' and press [show statistics]. Select a month. Then search for the table in question. Review the output for column headings 'Direct reads' and 'Seq. reads'.

2 Troubleshooting

2.1 Write Job Terminates

The most common reasons for a terminated Write Job are:

- Database error ORA-1555: snapshot too old.
Recommendation:
 - Try to reduce the amount of selected data and by doing so reduce the runtime of the write job and increase the chance of finishing properly.
 - Run your archiving session when few updates/inserts are being made to the database. Especially avoid scheduling Archiving Delete Jobs in parallel to a still running Archiving Write Job. Do not start delete jobs automatically but via scheduling SAP report RSARCHD after the Write Job has finished.
 - For SD objects, select alternative DB Access or
 - Extend the rollback segments of the database.
- No disk space available for the creation of the archive files.

In the event of an error the ADK declares the last created file to be invalid. As a consequence it will not show up in SARA and it will not be possible to schedule a delete job for this last file.

If delete jobs have already been scheduled, there are two alternative procedures.

Case 1: No delete jobs have been started yet:

Step 1: Delete the archive files, which have already been created by this session.

Step 2: Set the "invalid" flag in archive management SARA for the interrupted run.

Step 3: Run a new archiving session using the same selection criteria.

Case 2: Delete jobs have already been started or the write job has already processed so far, that you want to keep the already created archive files.

Step 1: Double-Check in table ADMI_FILES if the last created file was really set to invalid from ADK. The file with the latest time stamp for this archiving session must show ADMI_FILES-OBJ_COUNT = 0. Proceed only, if this is the case. Otherwise please contact SAP via SAPNet R/3 Frontend message.

Step 2: Schedule the delete jobs for the existing (and valid) archive files.

Step 3: Delete the defective file from the file system.

Step 4: Run a new archiving session using the same selection criteria.

2.2 Delete Job Termination

Two cases have to be distinguished. Termination because of

- System error (e.g. lack of resources, shutdown, ...)
- Verification errors

In the case of system error you only have to restart the delete job, until it finishes successfully. There are no further steps necessary.

In case of verification errors during deletion, the data in the corrupt file will not be deleted from the database. The data from the corrupted files must be archived again in a new archiving session and must then be deleted.

Finally, the corrupted archive file must be removed manually from the management data of the Archive Development Kit and from the file system.

If verification errors occur when archive files are being read or reloaded, the data in the corrupted files is not read or reloaded. Because the corrupted files must have passed the verification during the delete phase, you can assume that the archive files were corrupted after that phase, for example, while they were being recopied. It may be possible to repair the defective file using SAP remote consulting service. A fee will be charged for this.