

2560709 - [WEBINAR] Understanding and Troubleshooting SAP Memory Management

Version	4	Type	SAP Knowledge Base Article
Language	English	Master Language	English
Release Status	Released to Customer	Category	How To
Component	BC-CST-MM (Memory Management)	Released On	02.01.2018

Please find the original document at <https://launchpad.support.sap.com/#/notes/2560709>

Symptom

This document contains a 60-minute Expert Webinar on the SAP Memory Management topic.

In this Webinar you will learn about the most relevant topics to understand and troubleshoot the memory management layer of a SAP system.

The agenda of the Webinar will cover the following items:

1. Memory types;
2. Relevant parameters and OS-specific ones;
3. Memory monitoring tools;
4. Dumps and troubleshooting;

The session will be finalized with Q&A about the topics presented.

Environment

This Technical Webinar covers:

- Memory Management configuration
- Troubleshooting on most common dumps

Target audience:

- SAP System Admins
- Key users
- End users

Knowledge level:

- Basic
- Intermediate

Resolution

You can find the slides of the presentation in the attachments section, and also screenshots from the memory dumps analyzed.

The recording of the session is available here:

Media not computed.

See Also

Asked Questions:

Q.Where can I find further information about SAP Memory Management?

A.You can find further details about SAP Memory Management in the CST [wiki page](#)

Q.Is it possible to increase Extended Memory size without restarting application server?

A. No. With RSMEMORY report we are able to dynamically change defined Quotas for Extended Memory and Heap Memory. But, when changing total size or Extended Memory (or Heap Memory), it's necessary to re-start application server so that change is correctly done.

Q.How does ZMM work?

A. This is one of new features on memory management that have been developed as of Kernel Release 7.40; detailed on Note #[2085980](#) - New features in memory management as of Kernel Release 7.40.

The values of the individual memory configuration parameters are automatically derived from the value of the central profile parameter PHYS_MEMSIZE with the help of formulas given on the Note. This Note also provides a table with default values of profile parameters that are relevant in the memory management environment.

Q.Please confirm if removal of specific parameter for ZAMM requires only for default profile or also for all instances profiles.

A. Memory management parameters should be set per instance / application server.

Q.How is Page memory mapped?

A. SAP Paging enables the memory to be extended at ABAP runtime when a large is handled, using a file at Disk. SAP's memory management concept currently limits SAP Paging to cases where the ABAP commands EXTRACT and EXPORT... TO MEMORY... are used.

At the time of the system starts, a file PAGFIL\$\$ will be created on DIR_DATA directory. Initially, the size of this file is 0 (it's created empty); once it's used, the size of the file increases.

There's a part of Page memory that will be stored on the Shared Memory layer (not on the file system).

So, R/3 page buffer is made up of 2 parts:

- Memory is first taken from Shared Memory (size is defined by parameter rdisp/PG_SHM).
- Then, if more memory is needed, it's taken from disk until size defined by parameter rdisp/PG_MAXFS. When increasing it, there should be enough free space in the disk where this directory is located.

You also have the option to reserve the memory space for SAP Paging completely in the Shared Memory, setting both parameters to same value.

Q.I am getting the SAP System Message "roll in failed backend session terminated" while login to SAP and not able to login. Are you able to advice what is the best practice to solve this error and issue?

A. In this case, correct approach should be to check the trace file from the affected work process and Dispatcher (via OS level) and get more information.

If access to the system is possible, transaction ST02 provides a good overview of memory consumption and status on each application server (since latest restart).

Q.What would be the optimum memory allocation for each dia/non dia work process?

A. In general, there's no reason for changing it, sequence should be left with the value that it has by default. DIA work processes' allocation sequence shouldn't be changed in any case.

Remember that with RSMEMORY report, from SE38 transaction, we can see allocation sequence for dialog and non-dialog work processes. This is defined with numbers 1 for Extended Memory and 2 for Heap Memory. Note that changes made here only apply to the application server instance that you are currently logged on to, and only remain in effect until the application server instance is stopped again.

Q. We are getting PXA_NO_SHARED_MEMORY dumps in the system. Could you please provide reason and parameters to tune? Thanks.

A. The memory dump PXA_NO_SHARED_MEMORY happens because available virtual memory in the server is exhausted and requested memory by the work processes to start cannot be provided by the OS.

Q. What about for Java SAP system?

A. Java instances have their own memory management that is not covered in this Webinar.

Q. In RSMEMORY, the amount of EM shown is different than the one set in em/initial_size_MB parameter. Why?

A. The information that we can see on RSMEMORY report corresponds to the Extended Memory quotas and Heap Memory quotas, not to the total size of the Extended Memory area (which is defined by parameter em/initial_size_MB).

Q. In case of swaps in buffers, how can we find the correct value of the buffer, objects? swaps occur even if ZAMM is enabled?

A. There is not right values, you should check the swaps in ST02 transaction. Note [#1918603](#) - ST02 - Swaps in various buffers could give you some hints

Q. For SAP Note [#2417223](#) - LOAD_NO_ROLL dump and Extended Memory exhausted as of Kernel 74x ... How much Extended Memory we need to increased? Is there any formula for this?

A. There's no recommended value for the size of the Extended Memory area; as it depends on what is being executed on the system, or the amount of users logged.

Extended Memory can be increased, depending on many facts: if the database is installed on that host, if there are other applications running there apart from SAP... Correct value needs to be chosen taking into account all these facts.

Q. Zero Administration Memory Management calculation is taken from the available free space RAM?

A. ZAMM is using PHYS_MEMSIZE value to calculate the rest of the parameters.

PHYS_MEMSIZE by default takes the RAM size [Size of the main memory]. If there are more SAP instances running in that host or another non-SAP applications this value should be adjusted.

Q. We are facing an issue with work process frequently turning to PRIV mode even when we employed ZMM.

A. In case a work process starts taking Heap Memory (either because the Extended Memory quota has been used up, either because the total Extended Memory has been exhausted) it will enter into PRIV mode.

- You might need to check if the assigned quota (ztta/roll_extension) is too small.

- If all work processes enter into PRIV mode at the same time, this means that Extended Memory has been used up and should be adjusted.

Q. How can we identify that there are memory leaks in system?

A. "Memory leak" means unexpected and significant uncontrolled increase in the memory consumption of an ABAP server.

In this kind of situations, you notice a process consuming memory from the operating system and not releasing this memory when it is not needed anymore.

You should first check if there's a known error (see regression Note) causing this memory leak. Then, you should try to find out which process consumes most of the memory, and check if it's a non-SAP process or SAF process.

Q.How can I get registered to receive information about such seminars in future?

A. Following closely the following [Expert Webinar sessions page](#)

Keywords

memory management, configuration, troubleshooting, webinar, common dumps, memory monitoring tools

Products

SAP NetWeaver all versions

This document refers to

SAP Note/KBA	Title
2417223	LOAD_NO_ROLL dump and Extended Memory exhausted as of Kernel 74x
1918603	ST02 - Swaps in various buffers
2085980	New features in memory management as of Kernel Release 7.40
	CST wiki
	https://wiki.scn.sap.com/wiki/x/1UyKGw

Attachments

File Name	File Size	Mime Type
MM_Webinar_Dec_2017.pdf	1179	application/pdf
dumps.pdf	735	application/pdf

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