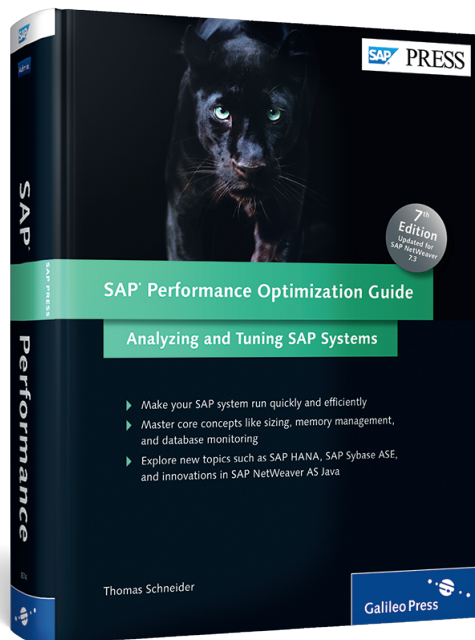


Performance-Relevant Configuration Parameters and Key Figures

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Performance-Relevant Configuration Parameters and Key Figures

This appendix lists performance-relevant configuration parameters and performance key figures in the central CCMS monitor. We've tried to summarize the most essential details from the large amount of information; however, we cannot guarantee the list's completeness.

The most essential performance key figures enable you to monitor system performance in the central CCMS Alert Monitor (Transaction RZ20). Chapter 2, Section 2.7, Continuous Monitoring Using CCMS, introduces this monitor.

With regard to the information in this appendix, please note the following:

- ▶ To display the list of current parameter settings for a given SAP instance, call the SAP memory configuration monitor (Transaction ST02) and then select CURRENT PARAMETERS.
- ▶ Exact configuration suggestions make sense only for concrete SAP systems and become obsolete rather quickly. Therefore, there are no direct suggestions for them in this book.
- ▶ You can change parameters either directly in the profile files or by using Transaction RZ10.
- ▶ Before making changes to a parameter, you should search for any SAP Notes regarding that parameter and consider the provided information for your actions.
- ▶ Depending on your operating system and release, there might be restrictions that could lead to memory management errors.
- ▶ When changing memory management parameters, always keep a backup of the old instance profiles. This backup will enable you to revert to the former parameter values if required. Before restarting the instance, test the new instance profiles using the auxiliary program `sappfpar` on the operating system level. After instance restart, verify that the instance is running without error. To obtain a description of the program, execute the operating system command `sappfpar ?`.

Changing Profile Parameters

[!]

Some profile parameters include a note indicating that the parameter must not be modified without prior recommendation by SAP. Heed these warnings. Instructions from SAP on changing the parameters can be provided by SAP employees or hardware or database partners who have analyzed your system, or through recommendations in an SAP Note. You can find SAP Notes in the SAP Service Marketplace. Ensure that the SAP Note applies to your SAP version, database system, database version, operating system, and operating system version.

ABAP Server

In addition to the performance-relevant configuration parameters that are listed together with a short description, this appendix includes an overview of the most important performance key figures for the ABAP server.

Configuration Parameters

For help on the SAP NetWeaver AS ABAP profile parameters, use Transaction RZ11 and follow these steps:

Documentation

1. Enter Transaction RZ11.
2. Enter the SAP profile parameter for which you require more information.
3. Select DOCUMENTATION.

The group in Table 1 contains a listing for each SAP buffer, describing the buffer and related SAP profile parameters.

Buffer

Table Definition Buffer (TTAB Buffer): Buffer for Table Definitions	
Parameter	Description
rsdb/ntab/entrycount	Specifies the maximum number of buffer entries.
The size of the TTAB buffer is approximately equivalent to rsdb/ntab/entrycount multiplied by 100 bytes.	

Table 1 Parameters for SAP Buffers (see SAP Note 103747)

Field Description Buffer (FTAB Buffer): Buffer for Field Definitions	
Parameter	Description
rsdb/ntab/ftabsize	Buffer size allocated at instance startup, in kilobytes.
rsdb/ntab/entrycount	The maximum number of buffer entries divided by two.
Field Description Buffer (FTAB Buffer): Buffer for Field Definitions	
Parameter	Description
rsdb/ntab/ftabsize	Buffer size allocated at instance startup, in kilobytes.
rsdb/ntab/entrycount	The maximum number of buffer entries divided by two.
Initial Record Buffer (IRBD Buffer): Initial Records for Table Rows	
Parameter	Description
rsdb/ntab/irbdsiz	Buffer size allocated at instance startup, in kilobytes.
rsdb/ntab/entrycount	The maximum number of buffer entries divided by two.
Short Nametab (SNTAB Buffer): Short Version of Table Information	
Parameter	Description
rsdb/ntab/sntabsiz	Buffer size allocated at instance startup, in kilobytes.
rsdb/ntab/entrycount	The maximum number of buffer entries divided by two.
Program Buffer (PXA Buffer): Buffer for ABAP Programs	
Parameter	Description
abap/buffersiz	Buffer size allocated at instance startup, in kilobytes.
CUA Buffer: Buffer for Menu Bars	
Parameter	Description
rsdb/cua/buffersiz	Buffer size allocated at instance startup, in kilobytes.
The maximum number of buffer entries in the CUA buffer equals half the value of the buffer size.	

Table 1 Parameters for SAP Buffers (see SAP Note 103747) (Cont.)

Screen Buffer (Presentation Buffer): Buffer for Screens	
Parameter	Description
zcsa/presentation_buffer_area	The buffer size allocated at instance startup (in bytes) multiplied by 2.
sap/bufdir_entries	Specifies the maximum number of buffer entries.
Export/Import Buffer: Buffer for ABAP Command EXPORT TO BUFFER	
Parameter	Description
rsdb/obj/buffersize	Buffer size allocated at instance startup, in kilobytes.
rsdb/obj/max_objects	Specifies the maximum number of buffer entries.
rsdb/obj/large_object_size	Estimated size of the largest objects, in bytes.
Export/Import SHM Buffer: Buffer for ABAP Command EXPORT TO SHARED MEMORY	
Parameter	Description
rsdb/esm/buffersize_kb	Buffer size allocated at instance startup, in kilobytes.
rsdb/esm/max_objects	Specifies the maximum number of buffer entries.
rsdb/esm/large_object_size	Estimated size of the largest objects, in bytes.
Generic Key Table Buffer: Table Buffer (for Generic Buffering)	
Parameter	Description
zcsa/table_buffer_ area	Buffer size allocated at instance startup, in bytes.
zcsa/db_max_bufstab	Specifies the maximum number of buffer entries.
Single Record Table Buffer: Table Buffer (for Single Record Buffering)	
Parameter	Description
Rtbb/buffer_length	Buffer size allocated at instance startup, in kilobytes.
Rtbb/max_tables	Specifies the maximum number of buffer entries.

Table 1 Parameters for SAP Buffers (see SAP Note 103747) (Cont.)

Calendar Buffer: Calendar Buffer	
Parameter	Description
zcsa/calendar_area	Buffer size allocated at instance startup, in bytes.
zcsa/calendar_ids	Specifies the maximum number of buffer entries.
Main Memory for Shared Objects	
Parameter	Description
abap/shared_objects_size_MB	Allocated main memory for shared objects (including administration information, in megabytes).

Table 1 Parameters for SAP Buffers (see SAP Note 103747) (Cont.)

SAP currently supports a number of operating systems for the implementation of the SAP application level:

Memory
management

- ▶ UNIX dialects such as AIX, HP-UX, Linux, and Solaris
- ▶ Microsoft Windows
- ▶ IBM i and IBM zSeries

You can find detailed information about available platforms in the SAP Service Marketplace under www.service.sap.com/platforms.

Table 2 lists SAP profile parameters for SAP memory management. With Zero Administration Memory Management, the parameters marked with an asterisk (*) in Table 2 are automatically set at instance startup. These automatic settings are overwritten if there are different values for these parameters in the instance profile. If your system uses Zero Administration Memory Management, SAP recommends that you delete the parameters listed in Table 2 from the instance profile and configure only the parameter `PHYS_MEMSIZE`. See also Chapter 6, Memory Management, and SAP Note 88416 on Zero Administration Memory Management.

The `TYPE` column includes a classification of the parameters: “P” denotes parameters that directly affect the performance of the SAP system. “S” denotes parameters that ensure the secure operation of the SAP system under high load; that is, these parameters are important for a robust and fault-tolerant system operation.

Parameter	Description	Type
ztta/ roll_area)*	Total local SAP roll area for all work processes (in bytes).	S/P
ztta/ roll_first)*	Portion of the local SAP roll area allocated to a dialog work process before SAP extended memory is allocated (in bytes).	P
Rdisp/ ROLL_SHM)*	Size of the SAP roll buffer in shared memory (in 8 KB blocks).	P
Rdisp/Pg_SHM)*	Size of the ABAP paging buffer in shared memory (in 8 KB blocks); for SAP version 4.0 and later, this has little effect on performance.	P
Rdisp/ ROLL_MAXFS)*	Size of the global SAP roll area, which comprises the SAP roll buffer plus the SAP roll file (in 8 KB blocks).	S
rdisp/ Pg_MAXFS)*	Size of the ABAP paging area, which comprises the ABAP paging buffer plus the ABAP paging file (in 8 KB blocks).	S
em/initial_ size_MB)*	Initial size of SAP extended memory (in megabytes).	S/P
em/ max_size_MB)*	Maximum size of SAP extended memory (in megabytes); some operating system limits keep the size of SAP extended memory smaller than this value.	S/P
em/ blocksize_KB)*	Size of a block in SAP extended memory (in kilobytes). Default value: 1024. Warning: Do not modify this parameter without prior recommendation by SAP.	P
em/address_ space_MB)*	Reserved for SAP extended memory (currently applies only under Windows NT).	S/P
ztta/roll_ extension)*	Maximum amount of SAP extended memory that can be allocated for each session (in bytes).	S/P
abap/ heap_area_dia)*	Maximum SAP heap memory for each dialog work process (in bytes).	S

Table 2 Parameters for SAP Memory Management (See SAP Notes 103747 and 88416)

Parameter	Description	Type
abap/heap_area_nondia)*	Maximum SAP heap memory for each non-dialog work process (in bytes).	S
abap/heap_area_total)*	Maximum SAP heap memory for all work processes (in bytes).	S
abap/heaplimit)*	Limit (in bytes) in the SAP heap memory that flags work processes so they are restarted after the end of the current transaction and can therefore release the heap memory.	S
em/global_area_MB	Size of global extended memory (SAP EG Memory).	S

Table 2 Parameters for SAP Memory Management (See SAP Notes 103747 and 88416) (Cont.)

Parameter	Description
rdisp/mshost	Name of the computer where the message server is running.
rdisp/msserv	Name of the message service.
rdisp/enqname	Name of the SAP instance where the enqueue server is running.
rdisp/atp_server	Name of the SAP instance where the ATP server is running.
rdisp/wp_no_dia	Number of dialog work processes (per SAP instance).
rdisp/wp_no_btc	Number of background work processes.
rdisp/wp_no_enq	Number of enqueue work processes.
rdisp/wp_no_spo	Number of spool work processes.
rdisp/wp_no_vb	Number of update work processes.
rdisp/wp_no_vb2	Number of work processes for V2 updates.

Table 3 Profile Parameters for Load Distribution

Parameter	Description
<code>rdisp/vb_dispatching</code>	<p>Activates or deactivates update dispatching:</p> <ul style="list-style-type: none"> ► If the parameter is set to 1 (the default setting), update dispatching is activated. ► If the parameter is set to 0, update dispatching is not activated.
<code>rdisp/vbstart</code>	<p>Controls the behavior of the update service at SAP system startup. At startup, the update service checks its queue to see whether there are any update requests that have not yet been processed. Such requests are marked and then processed:</p> <ul style="list-style-type: none"> ► If the parameter is set to 1 (the default setting), the update service processes update requests that have not yet been processed. ► If the parameter is set to 0, waiting update requests are not automatically processed.
<code>rdisp/max_wprun_time</code>	<p>Limits the maximum runtime of a transaction step in a dialog work process (in seconds). When this time has expired, the user request is terminated with the error message <code>TIME_OUT</code>. The default setting is 300.</p> <p>Warning: If a <code>Commit Work</code> command is executed in a program, this runtime starts again. While an SQL statement is being processed on the database, the program is not terminated, even when this runtime expires.</p>
<code>rdisp/gui_auto_logout</code>	<p>If there is no GUI activity for <code>rdisp/gui_auto_logout</code> seconds, the frontend is automatically logged off. If the parameter has the value 0, there is no automatic logoff.</p>
<code>login/disable_multi_gui_login</code>	<p>If this parameter is set to 1, multiple dialog logon connections (for the same client with the same user name) are blocked by the system. This parameter works for SAP GUI logon connections. This parameter has no effect on someone logging on using the Internet Transaction Server (ITS) or remote function call (RFC).</p>
<code>login/multi_login_users</code>	<p>This list contains the names of users who are authorized for multiple logon connections. Commas separate the user names (without client entry).</p>

Table 3 Profile Parameters for Load Distribution (Cont.)

Parameter	Description
rdisp/ max_alt_modes	This parameter specifies the number of parallel modes per logon session that a user is authorized to open. This should be done only for specific reasons (e.g., acute memory bottleneck). Depending on the situation, the system may, itself, automatically create invisible parallel modes. As of Basis Version 6.10, a maximum of 16 sessions is possible; for older versions, the maximum is six sessions. The default setting is six sessions.

Table 3 Profile Parameters for Load Distribution (Cont.)

Parameter	Description
rsdb/max_blocking_faktor	See Chapter 12, Section 12.3.2, Analyzing Buffered Tables. Warning: Do not modify this parameter without prior recommendation by SAP.
dbs/ io_buf_size	Size of the data area in an SAP work process, through which data is transferred to or copied from the database by an SQL statement (in bytes). Warning: Do not modify this parameter without prior recommendation by SAP.

Table 4 SAP Profile Parameters for the Database Interface

Parameter	Description
rdisp/ bufrefmode	Defines the type of buffer synchronization. Possible settings: sendon, exeauto (for a distributed system) or sendoff, exeauto (for a central system).
rdisp/ bufreftime	Time interval between two buffer synchronizations (in seconds).
zcsa/ inval_reload_c	Number of accesses the systems waits before it reloads an entry into the buffer after an invalidation; applies to individual buffer entries. Warning: Do not modify this parameter without prior recommendation by SAP.

Table 5 SAP Profile Parameters for Buffer Synchronization

Parameter	Description
zcsa/ sync_reload_c	<p>Number of accesses the systems waits before it reloads the buffer after an invalidation; applies to synchronization of the entire buffer.</p> <p>Warning: Do not modify this parameter without prior recommendation by SAP.</p>

Table 5 SAP Profile Parameters for Buffer Synchronization (Cont.)

Parameter	Description
rdisp/ tm_max_no	Maximum number of frontend connections in table TM_ADM.
rdisp/max_ comm_ entries	Maximum number of CPIC/RFC connections that can be managed in communication table COMM_ADM.
gw/max_conn	Maximum number of CPIC/RFC connections that can be managed by the gateway service in table CONN_TBL.
rdisp/ rfc_max_login	Limit for the number of RFC logon connections to an SAP instance. If this limit is exceeded, no resources are made available to the affected user.
rdisp/rfc_max_ own_login	Limit for the number of individual RFC logon connections to an SAP instance. If this individual limit is exceeded, no resources are made available to the affected user.
rdisp/rfc_max_ comm_entries	Limit for the number of communication entries used for RFCs. If this limit is exceeded, no resources are made available to the affected user. The number of communication entries is set via the profile parameter rdisp/max_comm_entries.
rdisp/rfc_max_ own_used_wp	Limit for the number of dialog work processes used for RFCs by an individual user. If this limit is exceeded, no resources are made available to the affected user.
rdisp/rfc_min_ wait_dia_wp	Limit for the number of dialog work processes to be reserved for non-RFC users. If this limit is exceeded, no resources are made available to the affected users.

Table 6 Profile Parameters for Interface Configurations (See SAP Note 74141)

Parameter	Description
rdisp/rfc_max_wait_time	Maximum number of seconds for which a work process can receive no resources before "going to sleep."

Table 6 Profile Parameters for Interface Configurations (See SAP Note 74141) (Cont.)

Parameter	Description
rstr/file	Name of the SQL trace file.
rstr/max_diskspace	Size of the SQL trace file, in bytes.
abap/atrapath	Path name for the ABAP trace files.
abap/atrasizeQuote	Size of the ABAP trace files.
rdisp/wpdebug_max_no	Maximum number of work processes that can be run simultaneously in debugging mode.

Table 7 SAP Profile Parameters for Configuring Monitoring Tools

Parameter	Description
rdisp/dynamic_wp_check	When set to TRUE, the system starts new work processes if processes are blocked. When set to FALSE, this function is deactivated.
rdisp/wp_max_no	Maximum number of work processes (both configured and dynamic). When set to DEFAULT, two dynamic work processes are allowed. The maximum value is 600.
rdisp/max_dynamic_wp_alive_time	Lifetime of dynamic work processes (in seconds). If no requests are processed during this time, the work processes are stopped.
rdisp/wp_no_restricted	Number of "reserved" work processes. Additional dialog work processes that can be reserved during normal operation and that can be assigned only for specific tasks. This includes (e.g., tasks in the Virtual Machine Container, or VMC). The default value is 0. Transaction SM50 displays the status RESERVED for these work processes. If you use the VMC, you should use either dynamic or reserved work processes.

Table 8 Profile Parameters for Dynamic Work Process Configuration

Parameter	Description
<code>rdisp/scheduler/ timeslice_millis</code>	Time control for the interruption of requests. When set to 500 (default setting), the system checks every 500 milliseconds whether requests should be interrupted. When set to 0, no checks are performed.
<code>rdisp/scheduler/ prio_high/ max_runtime</code>	Maximum runtime for high priority requests (default setting: 10 m). For compatibility reasons, this parameter and the two following parameters are activated only if the parameter <code>rdisp/max_wprun_time</code> is not set.
<code>rdisp/scheduler/ prio_normal/ max_runtime</code>	Maximum runtime for medium-priority requests (default setting: 60 m).
<code>rdisp/scheduler/ prio_low/ max_runtime</code>	Maximum runtime for low-priority requests (default setting: not set, or no restriction).
<code>rdisp/scheduler/ prio_normal/ max_quota</code>	Limit for requests with medium and low priority (absolute value or percentage). You cannot set a value smaller than the limit for low-priority requests.
<code>rdisp/scheduler/ prio_low/ max_quota</code>	Limit for requests with low priority (absolute value or percentage).

Table 9 SAP Profile Parameters of the New Load Distribution Concept (Kernel Version 7.40)

Performance Key Figures

You can find the most essential performance key figures under SAP CCMS MONITOR TEMPLATES • PERFORMANCE OVERVIEW MONITOR.

Performance
Overview Monitor

Entry in the Central CCMS Monitor	Explanation
DIALOG • RESPONSE TIME	Average response time of the dialog service.
DIALOG • USERS LOGGED IN	Number of logged-on users.

Table 10 Performance Key Figures for the ABAP Server in the Central CCMS Monitor

Entry in the Central CCMS Monitor	Explanation
DIALOG • QUEUE TIME	Average wait time in the dispatcher queue.
DIALOG • LOAD+GEN TIME	Average time for loading and generating ABAP programs.
DIALOG • DB REQUEST TIME	Average time for requests to the database.
MEMORY MANAGEMENT • R3 ROLL USED	Utilization of the roll area, as a percentage.
MEMORY MANAGEMENT • ES ACT	Utilization of the extended memory as a percentage.
MEMORY MANAGEMENT • HEAP ACT	Utilization of the heap memory, as a percentage.
MEMORY MANAGEMENT • PROGRAM\ SWAP	Number of displacements in the ABAP program buffer.

Table 10 Performance Key Figures for the ABAP Server in the Central CCMS Monitor (Cont.)

For monitoring load distribution, you can use the LOGON LOAD BALANCING MONITOR in the group SAP CCMS MONITORS FOR OPTIONAL COMPONENTS.

Logon load
balancing monitor

Entry in the Central CCMS Monitor	Explanation
USERS LOGGED IN • <NAME OF INSTANCE>	Number of logged-on users.
RESPONSE TIME • <NAME OF INSTANCE>	Average response time of the dialog service.
LOGON LOAD QUALITY • <NAME OF INSTANCE>	Abstract key figure calculated for load distribution; among other things, based on the number of users and response time. New logons have a high logon quality in the instances.
LOGON LOAD STATUS • <NAME OF INSTANCE AND LOGON GROUP>	Information about the instance that is used for the next new logon.

Table 11 Performance Key Figures for Load Distribution between ABAP Instances in the Central CCMS Monitor

The following are a few additional interesting monitors:

- ▶ **BUFFERS:** This shows displacements and fill levels of all buffers.
- ▶ **BACKGROUND PROCESSING MONITOR:** The **SYSTEM-WIDE FREE BPWP** entry indicates the number of free background work processes currently available. Other key figures show the (percentage) utilization of all background processes. Moreover, several key figures on error situations are also provided.
- ▶ **ENQUEUE:** SAP locks are responsible for performance problems only in rare cases. However, if you know that your system has some “hot spots” in the special locks area, you can use this monitor.

You can track the response times of certain clients or SAP transactions with the Alert Monitor. This is of particular importance for transactions you have included in the service-level agreement. For this purpose, the Alert Monitor contains the Transaction-Specific Dialog Monitor in the SAP CCMS Monitors for Optional Components collection.

Entry in the Central CCMS Monitor	Explanation	Monitoring individual ABAP transactions
<NAME OF TRANSACTION> • RESPONSE TIME	Average response time of the dialog service.	
<NAME OF TRANSACTION> • QUEUE TIME	Average wait time in the dispatcher queue.	
<NAME OF TRANSACTION> • LOAD+GEN TIME	Average time for loading and generating ABAP programs.	
<NAME OF TRANSACTION> • DB REQUEST TIME	Average time for requests to the database.	
<NAME OF TRANSACTION> • FRONTEND RESPONSE TIME	Response time at the presentation server.	

Table 12 Performance Key Figures in the CCMS Monitor for Individual Transactions

Internet Communication Manager

This section lists performance-relevant configuration parameters and performance key figures for the Internet Communication Manager (ICM).

Configuration Parameters

Parameter	Description
icm/ min_threads	Specifies the minimum number of threads in the ICM. This number corresponds to the number of connections that can be processed simultaneously. The minimum number of threads is set at startup, and you cannot go below this number at runtime.
icm/ max_threads	Specifies the maximum number of threads in the ICM. It corresponds to the maximum number of connections that can be processed simultaneously. When the workload is heavy, the ICM starts additional threads until the maximum number is reached. The number of threads actually needed is displayed in the ICM monitor (Transaction SMICM).
icm/max_conn	Maximum number of (simultaneously) open connections in the ICM. This parameter value can be greater than icm/max_threads because inactive connections in the ICM do not need a thread. The maximum value of this parameter is determined by the maximum number of open file handles in the operating system. Each ICM service needs a connection. These are displayed with the open connections. The number of connections actually needed is displayed in the ICM monitor (Transaction SMICM).
icm/listen_ queue_len	The operating system has to hold connection requests in a queue while waiting for a connection to be established. This parameter specifies the maximum number of threads that can be held in this status. If the network queue is full, additional connection requests are denied.
icm/ req_queue_len	All requests to the ICM are first saved in a queue before they are passed on to work threads. This parameter is specified by the size of the queue. The number of queue entries needed is displayed in the ICM monitor (Transaction SMICM).

Table 13 Profile Parameters for Configuring the Internet Communication Manager

Parameter	Description
mpi/ buffer_size	Data transfer within memory pipes is done in blocks of a fixed length. The mpi/buffer_size parameter defines the size of these blocks, in bytes.
mpi/ total_size_MB	Data transfer between ICM and the SAP work processes is done via memory pipes (MPI). The parameter mpi/total_size_MB gives the total size of the MPI, in megabytes. This memory area is created in the shared memory of the SAP instance.
icm/HTTP/ server_ cache_<xx>/ memory_size_MB	Size of the ICM server cache in the main memory, in megabytes
icm/HTTP/ server_ cache_<xx>/ size_MB	Total size of the ICM server cache (size in main memory and on the file system) in megabytes.
icm/HTTP/ server_ cache_<xx>/ expiration	Time interval after which objects stored in the ICM server cache are automatically invalidated.
icm/HTTP/ logging_<xx>	You can use this parameter to activate logging in the ICM. Further information on how to use it is available in SAP Help. Warning: Activating logging can lead to serialization effects.

Table 13 Profile Parameters for Configuring the Internet Communication Manager (Cont.)

Performance Key Figures

You can find the performance key figures on the ICM under SAP CCMS MONITOR TEMPLATES • ENTIRE SYSTEM. In this monitor, select your system and navigate to APPLICATION SERVER. Select an instance, and then select R3SERVICES • ICM • GENERAL.

Entry in the Central CCMS Monitor	Explanation
NOOFTHREADS	Number of currently generated ICM threads.
PEAKNOOFTHREADS	Maximum number of generated ICM threads.
NOOFCONNECTIONS	Number of current ICM connections.
PEAKNOOFCONNECTIONS	Maximum number of ICM connections in the past.
QUEUELEN	Current length of queue.
PEAKQUEUELEN	Maximum length of queue in the past.
MPISizeTOTAL	Size of the memory area for memory pipes.
MPIBUFFERCOUNT	Number of available memory pipes.
PEAKMPIBUFUSED	Maximum number of memory pipes used in the past.

Table 14 ICM Performance Key Figures in the Central CCMS Monitor

SAP Java Virtual Machine

The configuration parameters for Java heap memory and garbage collection on the SAP Java Virtual Machine (SAP JVM) are listed in Table 10.2 (Chapter 10, Section 10.1.4, Parameterization of Java Heap Memory and Garbage Collection). We list the most important performance key figures here.

Performance Key Figures

You can find the performance key figures on the SAP Java Virtual Machine (SAP JVM) under SAP CCMS MONITOR TEMPLATES • J2EE ENGINE • ENTIRE SYSTEM or in the ENGINE KERNEL and ENGINE SERVICES monitors, which are accessed by selecting MONITOR • SAP J2EE MONITOR TEMPLATES. The key figures are given for each dispatcher and each server.

Entry in the Central CCMS Monitor	Explanation
KERNEL • SYSTEM/APPLICATION THREADS POOL	Key figures on the threads in the system or in the application pool: initial and current number, free and occupied threads, and number of requests in queue
SERVICES • MEMORY INFO	Key figures on memory usage: memory allocated and currently in use, and memory limit

Table 15 Performance Key Figures of the SAP J2EE Engine in the Central CCMS Monitor (JVM-Independent)

If the SAP JVM is used as the Java Virtual Machine, as of SAP NetWeaver 7.10, the following performance key figures are provided under SAP J2EE MONITOR TEMPLATES • JAVA INSTANCE OVERVIEW. The key figures indicated are given for each server. The architecture of SAP NetWeaver as of version 7.10 does not provide dispatchers any longer; the ICM completely assumed the role of the dispatchers.

Entry in the Central CCMS Monitor	Explanation
THREADS • THREADS OF SERVERX • LONG RUNNING THREADS	Number of threads occupied for a long time during the processing of a request that are no longer available for new requests.
THREADS • THREADS OF SERVERX • ACTIVE THREADS	Number of active threads.
GARBAGE COLLECTION • GC OF SERVERX • AVERAGE PROPORTION OF TOTAL TIME	Time proportion (percentage) that the JVM requires for garbage collection.
GARBAGE COLLECTION • GC OF SERVERX • OBJECT HEAP USAGE AFTER FULL GC	Heap memory usage (percentage) after the last full garbage collection.
GARBAGE COLLECTION • GC OF SERVERX • CLASS HEAP USAGE AFTER FULL GC	Permanent memory usage (percentage) after the last full garbage collection.

Table 16 Performance Key Figures for the SAP JVM in the Central CCMS Monitor

Entry in the Central CCMS Monitor	Explanation
GARBAGE COLLECTION • GC OF SERVERX • DURATION OF LAST FULL GC	Duration of the last full garbage collection, in seconds.
PROCESS TABLE • SERVERX • CPU USAGE	CPU usage (percentage) of a J2EE server.

Table 16 Performance Key Figures for the SAP JVM in the Central CCMS Monitor (Cont.)

Java Virtual Machine Container

You can find the performance key figures on the VMC under SAP CCMS MONITOR TEMPLATES • VM CONTAINER.

Internet Transaction Server (Integrated Version)

Table 17 lists the performance-relevant configuration parameters for the Internet Transaction Server that is integrated in the SAP NetWeaver AS ABAP.

Parameter	Description
itasp/enable	Activation of the integrated ITS.
itasp/ Traces/ ... / TraceLevel *	Trace level for different ITS subcomponents.
itasp/SAPjulep/ MaxHtmlPPs	Maximum number of prepared templates in the buffer.
itasp/SAPjulep/ Profiling	Performance analysis of the HTML generation.
itasp/max_eg_ mem_percent	Limit of the memory area that the ITS can use in extended memory.
itasp/ memory_check	Activation of memory consumption monitoring.

Table 17 Profile Parameters for Configuring the Internet Transaction Server (Integrated Version)

Parameter	Description
em/ global_area_MB	Size of the global area in extended memory (see also the previous section on memory management).

Table 17 Profile Parameters for Configuring the Internet Transaction Server (Integrated Version) (Cont.)

Operating System

You can find the performance key figures for the operating system under SAP CCMS MONITOR TEMPLATES • OPERATING SYSTEM.

Entry in the Central CCMS Monitor	Explanation
CPU • CPU UTILIZATION	CPU utilization (percentage).
CPU • 5 MIN LOAD AVERAGE	Average number of waiting operating system processes (size of the queue).
PAGING • PAGING OUT	Swapped main memory pages per second.
PAGING • PAGING IN	Returned pages to the main memory per second.
COMMIT CHARGE • COMMIT CHARGE FREE	Free physical and virtual memory, in megabytes (on Windows operating systems).
COMMIT CHARGE • COMMIT CHARGE PERCENT	Used physical and virtual memory as a percentage (on Windows operating systems).
SWAP SPACE • FREE SPACE	Free swap space in megabytes (on UNIX operating systems).
SWAP SPACE • PERCENTAGE USED	Used swap space as a percentage (on UNIX operating systems).
OS COLLECTOR • STATE	Status of the operating system collector.

Table 18 Performance Key Figures for the Operating System in the Central CCMS Monitor

You can use the operating system monitor to monitor the status of any operating system process. A configuration step will make the process to be monitored known to the collector. You can find the monitoring results in the operating system monitor under **MONITORED PROCESSES**.

**Monitored
operating system
processes**

With the CCMS Alert Monitor, you can check the availability and performance of any computer in your system landscape—not only those running SAP systems. To do this, you need to install what is known as a “monitoring agent” on the computers you want to monitor.

**Computers
without
SAP software**

Database

You can find the performance key figures for the database under **SAP CCMS MONITOR TEMPLATES • DATABASE**. Typically, monitored key figures are buffer quality and the up-to-date status of database optimizer statistics. Table 19 provides key figures for SAP MaxDB, which are also valid for the SAP liveCache.

Entry in the Central CCMS Monitor	Explanation
MaxDB MONITORING • PERFORMANCE • DATA CACHE HITRATE–TOTAL	Hit ratio in the data buffer storing the data pages (percentage).
MaxDB MONITORING • PERFORMANCE • DATA CACHE HITRATE– OMS DATA	Hit ratio in the data buffer (OMS data; percentage).
MaxDB MONITORING • PERFORMANCE • DATA CACHE HITRATE– SQL DATA	Hit ratio in the data buffer (SQL data; percentage).
MaxDB MONITORING • PERFORMANCE • DATA CACHE HITRATE–HISTORY/UNDO	Hit ratio in the data buffer (History/Undo; percentage).
MaxDB MONITORING • PERFORMANCE • CATALOG CACHE HITRATE	Hit ratio of the catalog cache that stores SQL command context, especially the execution plans for SQL statements (percentage).
OPTIMIZER STATISTICS • LAST COLLECTION	Period since the last creation of optimizer statistics (in days).

Table 19 Performance Key Figures of the Database in the Central CCMS Monitor (MaxDB)