



# SAP BASIS Introductory Training Program

# Day 3: Agenda

**System Configuration and Operation Modes**

**Break**

**SAP Memory and Buffer Management**

**Lunch Break**

**Performance and Workload Analysis**

**Break**

**Performance and Workload Analysis**

**Exercise & Break Out Session**



## System Configuration & Operation Modes

# System Configuration

## Report RSPFPAR

This report displays in one single table , all environment variables as well as

Display Profile Parameter			
Parameter Name	User-Defined Value	System Default Value	System Default Value(Unsubstituted Form)
rdisp/vmcRollOutCheck		off	off
rdisp/wait_after_deadlock		1000	1000
rdisp/wall_entry_max_no		0	0
rdisp/workdir	/usr/sap/IDS/DVEBMGS00/work	/usr/sap/IDS/D00/work	\$(DIR_HOME)
rdisp/wp_abap_restart		0	0
rdisp/wp_auto_restart		0	0
rdisp/wp_ca_blk_no		300	300
rdisp/wp_no_btc	4	0	0
rdisp/wp_no_dia	11	2	2
rdisp/wp_no_enq	1	0	0
rdisp/wp_no_spo	2	0	0
rdisp/wp_no_spo_Fro_max		1	1
rdisp/wp_no_vb	1	0	0
rdisp/wp_no_vb2	2	0	0
rdisp/wp_restart_interval		5 m	5 m
rdisp/wpdebug_max_no		1	1
rdisp/wppriv_max_no	6	-1	-1
rec/client		OFF	OFF
reorg/file	/usr/sap/IDS/DVEBMGS00/data/R++++++	/usr/sap/IDS/D00/data/R++++++	(Default)
r/cp_convert/conversion_char		0023	0023

# System Configuration using Profile Parameters

To change the number of work processes , change the values of the parameters indicated below :

Dialog:                    rdisp/wp\_no\_dia

Background(Batch):        rdisp/wp\_no\_btc

Enqueue:                    rdisp/wp\_no\_enq

Update:                    rdisp/wp\_no\_vb

Spool:                    rdisp/wp\_no\_spo

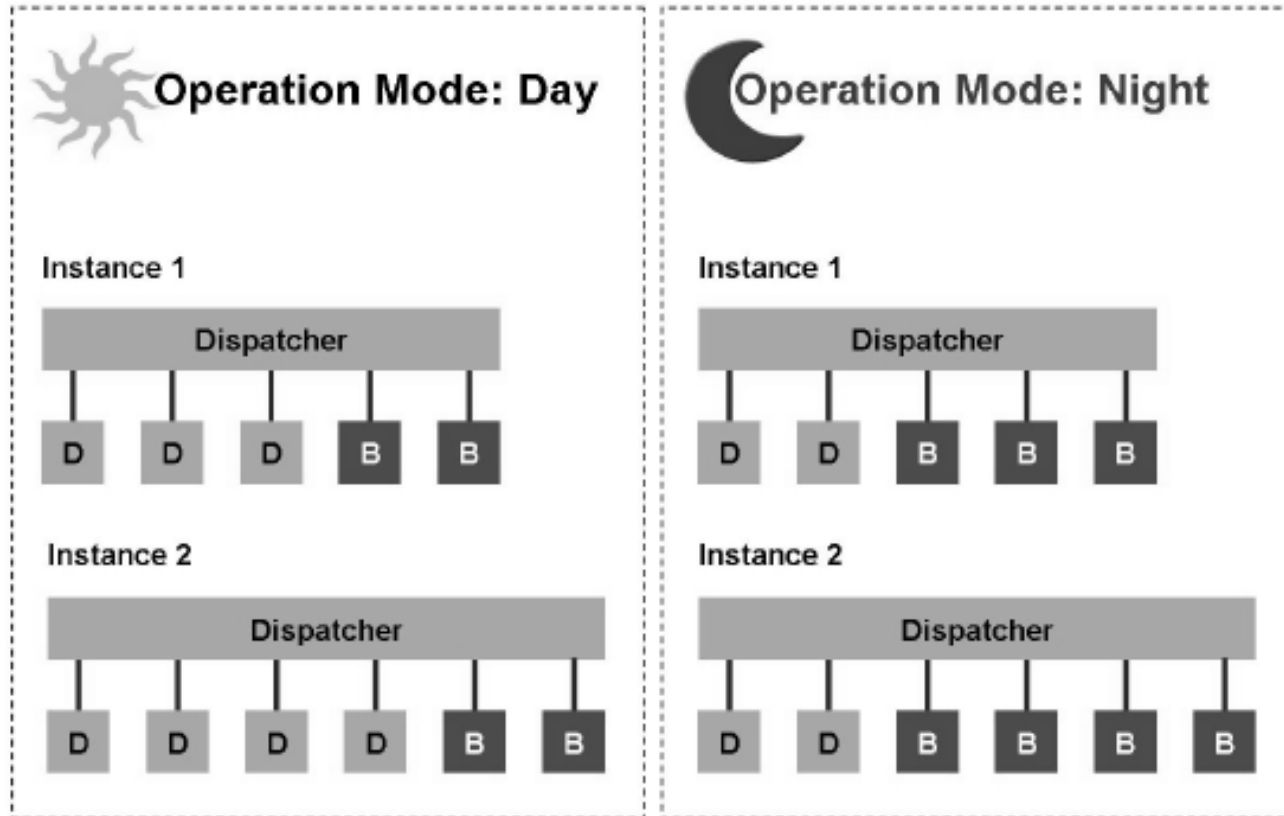
rdisp/max\_wprun\_time sets the limit on the amount of time a process can run without user intervention. Typically for long running background jobs , one has to take care in setting a cap on the runtime. It may be necessary that a job runs for 8 hours and should not be interrupted in between

# Operation Modes

## Concept of Operation Modes

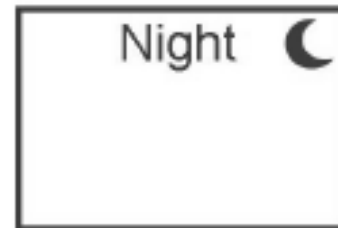
The demands of users on the SAP system vary during the course of the day. During the day, a large number of dialog users, who want to be served with high performance by the system, are working. Therefore, a large number of dialog work processes should be available for users during the day. During the night, however, only a small number of these dialog work processes are used, and the system can be used to a larger extent to process background jobs.

# Operation Modes Example

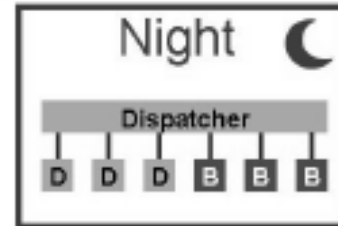
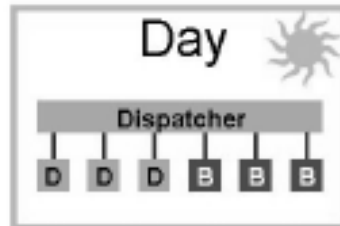


# Setting up Operation Modes

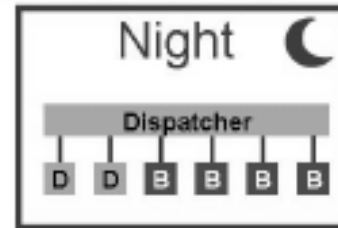
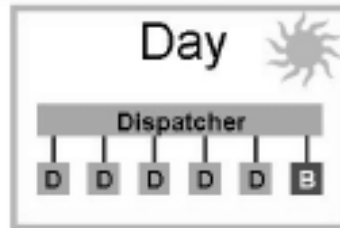
**Create  
operation mode:**



**Set up  
distribution of the  
work processes using  
instance definition:**



**Adjust  
distribution of the  
work processes:**



**Define time plan:**






# Constraints on Operation Modes Settings

Work Process Type	Type of Changeability (+ = increase number, - = reduce number)
Dialog	only indirectly changeable
Background	+ : possible, reduces the number of D-WPs accordingly - : possible, increases the number of D-WPs accordingly
Class A	determines the subset of the B-WPs that are only to process class A background jobs
Update	+ : possible, if at least 1 V-WP exists, reduces the number of D-WP accordingly - : possible, if at least 1 V-WP remains, increases the number of D-WPs accordingly
V2 Update	+ : possible, if at least 1 V2-WP exists, reduces the number of D-WPs accordingly - : possible, if at least 1 V2-WP remains, increases the number of D-WPs accordingly
Enqueue	+ : possible, if at least 1 V2-WP exists, reduces the number of D-WPs accordingly - : possible, if at least 1 E-WP remains, increases the number of D-WPs accordingly <b>You should only increase the number of E-WPs if this procedure is suggested by SAP Support.</b>
Spool	cannot be changed

# Operation Modes administration – RZ04

## CCMS: Maintain Operation Modes and Instances

 Instances/operation modes Instances/Profiles

Productive operation modes (normal operation)

Operation mode	Time	Text
Daily		Daily mode
NIGHTMODE2	12:00 - 19:00	NIGHT MODE 2 PR
Night		Night Mode
Normalbetrieb	19:00 - 12:00	Normalbetrieb
night one		night one

CCMS: Maintain Operation Modes and Instances

Operation mode

SAP System name IDS


Operation mode Day

Short description Daytime operation mode

Monitoring properties variant \*

Create the operation mode

## CCMS: Maintain Operation Modes and Instances

 Consistency check Profile view

Productive instances and their WP distribution

Host Name	Server Name	Instance Profile								
		OP Mode	Dia	BP	BPA	Spo	Upd	Up2	Enq	Sum
id3tdc00	id3tdc00_ID3_50	IDS_DVEBM6S00_IDESECC								
		* All operation mode	11	4	1	2	1	2	1	21

Configure the operation mode



# Activating the Operation Mode – SM63

**Display/Maintain Operation Mode Set**

Op. mode set

☒ Normal operation (24 hr)

☐ Exception operation

 Display  Change

Using the change button , you can specify which operation mode should be chosen for the specific time slot in a 24 hour cycle

**Edit Operation Mode Set for Normal 24h Op**

Assign Delete Assignment

	Start/end time	Name of the active operation mode
	00.00 - 01.00	Normalbetrieb
	01.00 - 02.00	Normalbetrieb
	02.00 - 03.00	Normalbetrieb
	03.00 - 04.00	Normalbetrieb
	04.00 - 05.00	Normalbetrieb
	05.00 - 06.00	Normalbetrieb
	06.00 - 07.00	Normalbetrieb
	07.00 - 08.00	Normalbetrieb
	08.00 - 09.00	Normalbetrieb
	09.00 - 10.00	Normalbetrieb
	10.00 - 11.00	Normalbetrieb
	11.00 - 12.00	Normalbetrieb
	12.00 - 13.00	NIGHTMODE2
	13.00 - 14.00	NIGHTMODE2
	14.00 - 15.00	NIGHTMODE2
==>	15.00 - 16.00	NIGHTMODE2
	16.00 - 17.00	NIGHTMODE2
	17.00 - 18.00	NIGHTMODE2
	18.00 - 19.00	NIGHTMODE2
	19.00 - 20.00	Normalbetrieb
	20.00 - 21.00	Normalbetrieb
	21.00 - 22.00	Normalbetrieb
	22.00 - 23.00	Normalbetrieb
	23.00 - 00.00	Normalbetrieb

# Break





# SAP Buffers & Memory Management

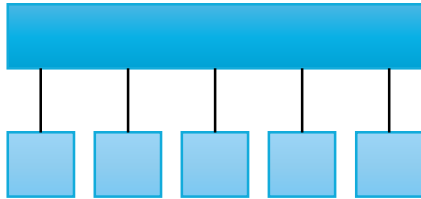
# Overview of AS ABAP Operations – Part 2

- SAP Memory Management
- Performance monitoring of SAP systems
- Troubleshooting errors in SAP
- Using CCMS for monitoring
- ITS and ICM Technologies
- RFC Connections
- Communication & Integration Technologies

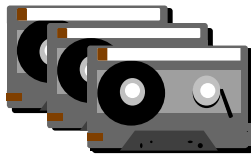
# System Monitoring – Who, What, Why, When

## What – Components in SAP

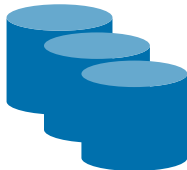
**SAP** (application servers, buffers, applications, ...)



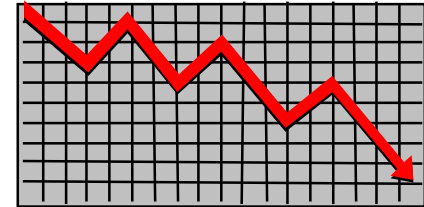
**Database:** (performance, backup,..)



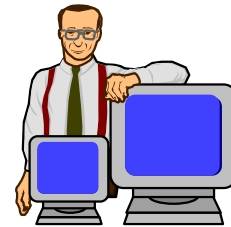
**Operating system:** (CPU, file system,..)



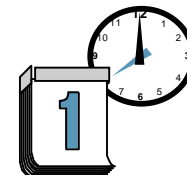
## Why – Keep the system running Improve performance



## Who – Administrators

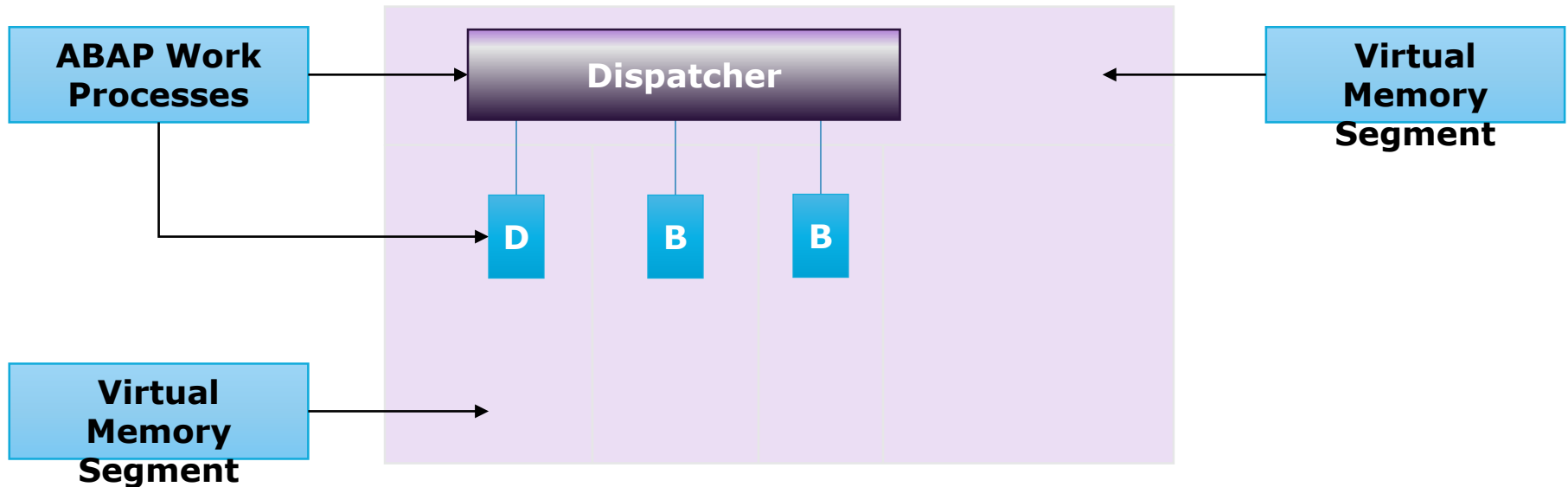


## When – Periodically



# SAP Memory Management

- To optimize the performance of SAP Systems, it is necessary to understand Memory Management in SAP
- The previous sessions provided explanation on SAP work processes and how they are executed
- For each work process to execute a certain amount of memory is required. This memory can be a part of the RAM or part of Paging File also called Swap)



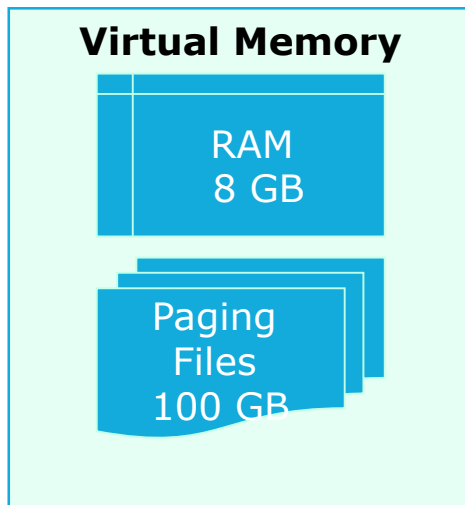


# Concepts of Physical and Virtual Memory

- Memory refers to a part of the SAP system which is used as a temporary container of data used by processes. This includes Operating system processes, Database processes as well as SAP application processes
- A system consists of physical memory, called RAM
- Physical memory may not be sufficient in most cases, so some part of the file system disk storage can be used to supplement the physical memory
- Using the concept of virtual memory, the Operating system can provide SAP applications with a contiguous memory combining both RAM and Files on the OS. Such files are known as paging files or swap
- This virtual memory available to SAP processes is called “Virtual Addressable Space”
- The virtual memory is further subdivided into a stack area and heap area. A stack is where data related to recursive functions and loops in function calls are stored for the process that needs the data. A heap is where the data elements such as constants and variables are stored during report and function execution

# Concepts of SAP Memory Management

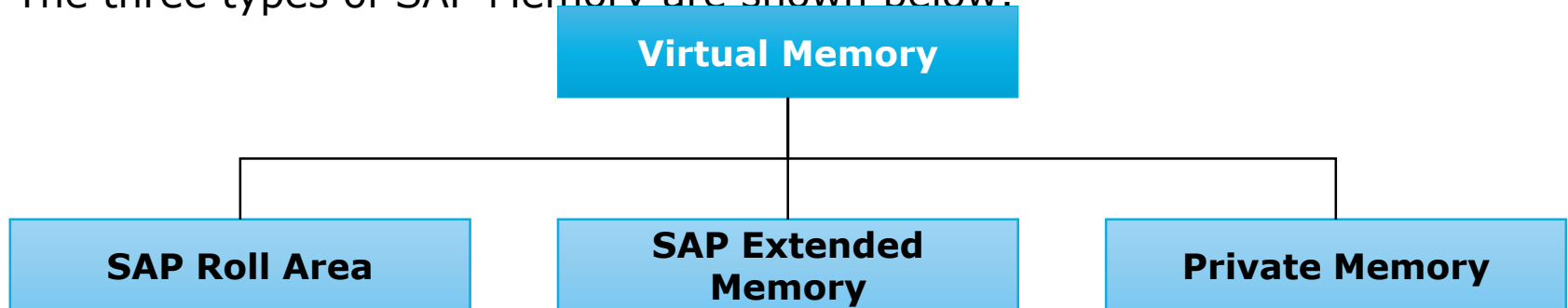
- In 32 Bit systems, each SAP work process can only address up to  $2^{32}-1$  bits of memory space, which is around 4 GB
- But most Operating systems will not permit a single process to address 4 GB of space. There are limitations and differences between operating systems, but about 2 GB of virtual memory is available to each SAP work process. This is the maximum addressable limit
- Please see the example below



- Theoretically, the configuration indicates a total of 108 GB of virtual memory, which can support up to 54 SAP processes during peak memory utilization. However the amount of memory to be allocated should be decided on actual performance of the system

# Concepts of SAP Memory Management

- The operating system will reserve a part of the virtual memory, known as a segment when the SAP work processes starts to execute. The size of this segment is set in the SAP profile parameters.
- The operating system will reserve local process memory as well as a shared process memory
- The “local process memory” segment can be addressed only by one of the processes, i.e., any one of the DVEBMS processes.
- There are data elements that needs to be shared between say, a dialog process and an update process, and these elements are processed in the “shared memory” segment.
- The three types of SAP Memory are shown below:



# Types of Memory

## SAP Roll Area

- This is the memory segment made available immediately to a work process
- It has a physical memory part and a paging file part. The paging file specific to roll memory is called a “roll” file
- Work processes switch contexts, meaning that one work process may process data related to a particular user request, and then may switch to perform processing related to another user request. Whenever such a switch happens, the data in the roll area is transferred to the roll file, which is a common memory segment for all work processes
- A roll buffer between the role area and the roll file prevents repeated copying from occurring

## SAP Extended Memory

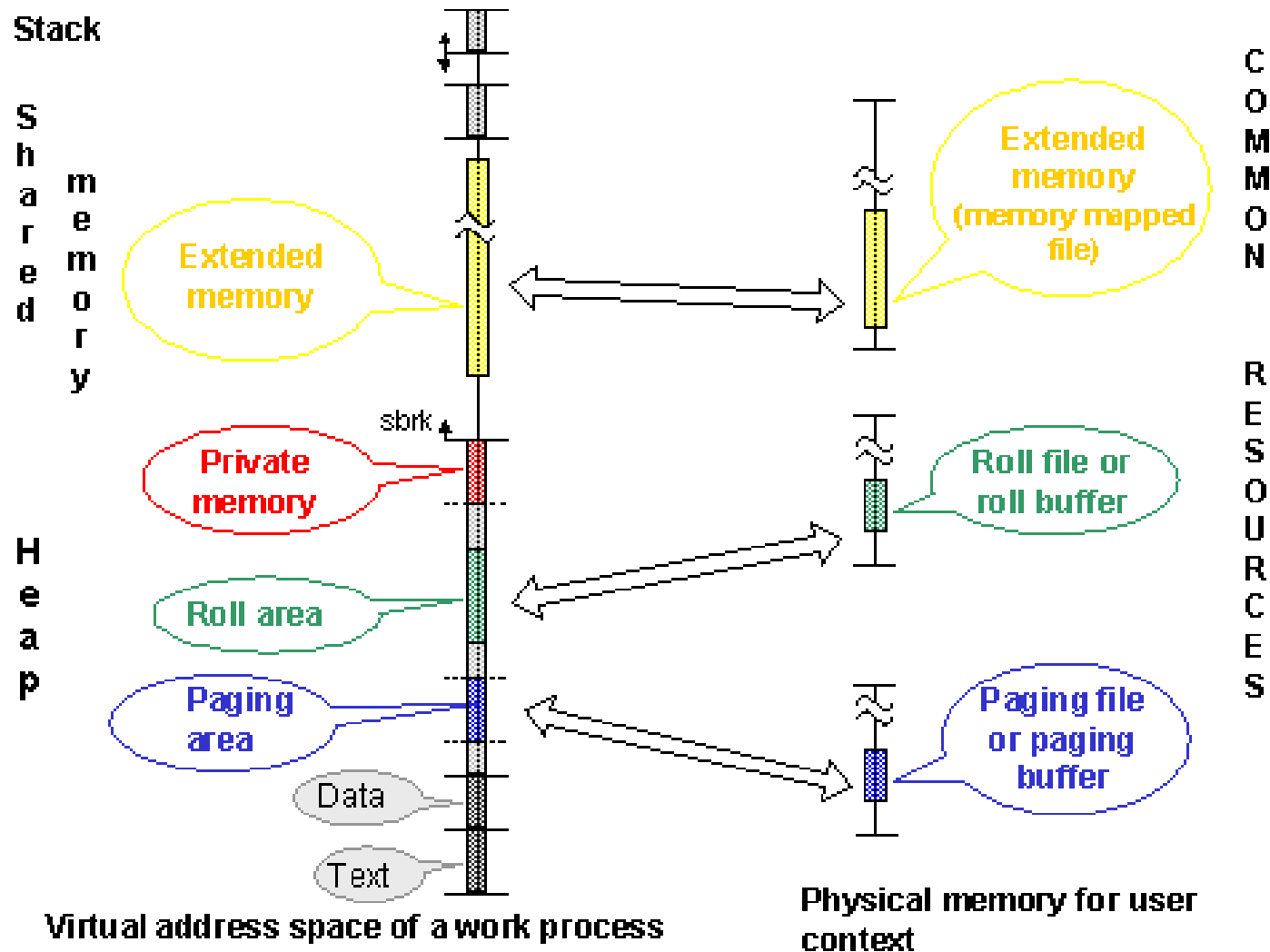
- This is the main memory segment for an SAP application
- Each work process is assigned a segment of the extended memory for further processing of data, once the roll area memory is exhausted

# Continued..

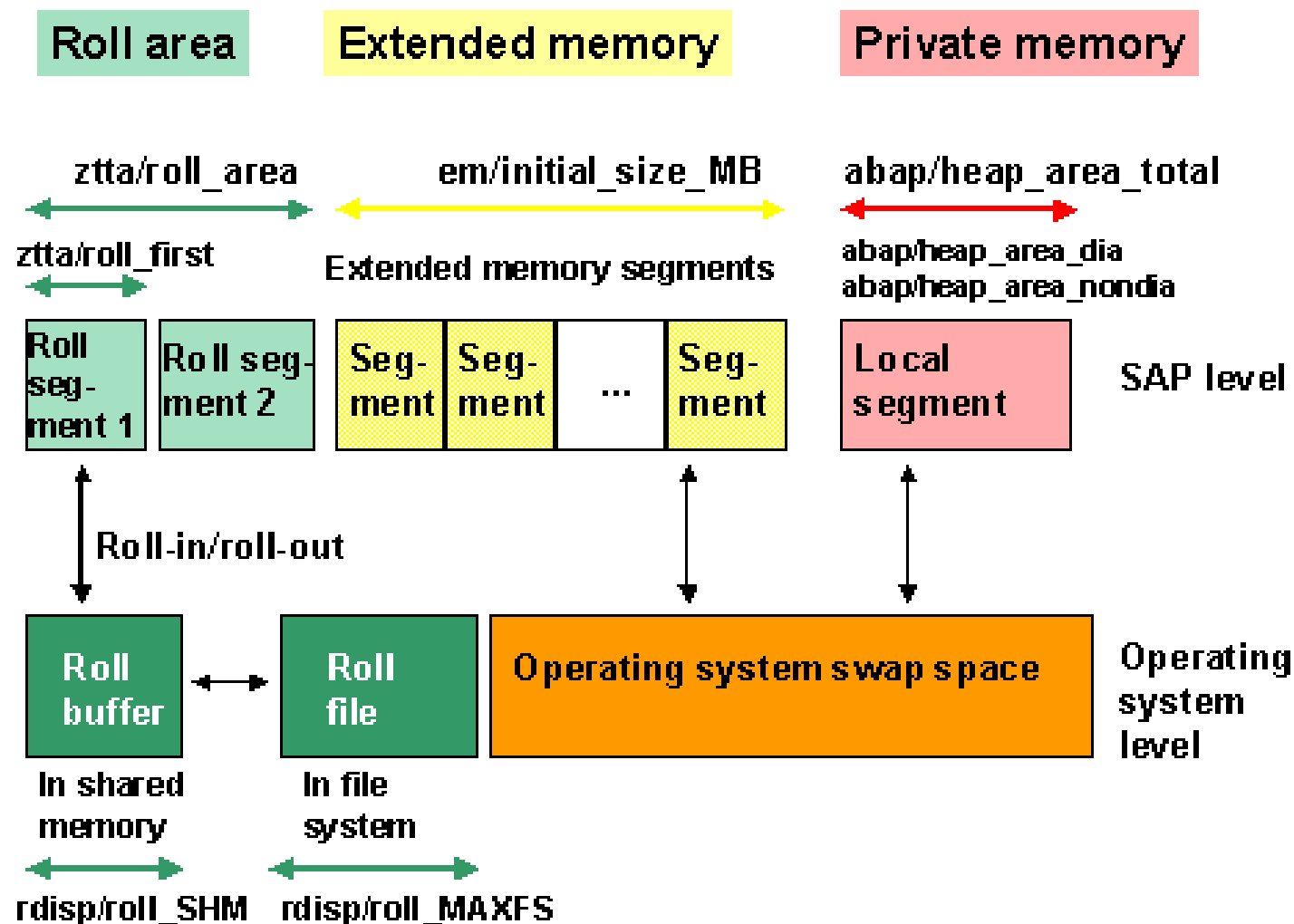
## Private Memory

- Work processes such as background, update, enqueue and spool may exhaust all roll area and extended memory. In such a case, the dialog process is unable to execute. To ensure that some amount of memory is ALWAYS available to a dialog process, SAP provides a Private memory for each dialog work process

# Virtual Address Space for a Process



# Important Profile Parameters



# Concept of SAP Buffers

SAP buffers store frequently-used data, and make this data available to the local application server instance. This helps to reduce the number of database accesses, the load on the database server (it does not need to be accessed repeatedly to obtain the same information), and network traffic. As a result, system performance is considerably improved

Each SAP instance (application server) has its own buffers. These buffers are also known as client caches because they are implemented on the client, that is, the application server. SAP buffers occupy memory areas that are local to the work process, and in individual shared memory segments that can be accessed by all work processes.

The roll area discussed earlier is considered to be a type of SAP Buffer

The data that is buffered includes ABAP programs and screens, ABAP Dictionary data, & company-specific data. Typically these remain unchanged during system operation

You can change, or tune, the sizes of buffers to optimize performance for a particular hardware configuration. There are several ways to tune buffers. As there are many constraints to consider when change the buffer size, several difficulties may arise.

You can use table buffering to fine-tune applications, that is, some or all of the contents of infrequently changed tables can be held in local buffers



# Types of SAP Buffers

There are 8 groups of SAP Buffers found in the shared memory segment:

<b>Repository (Nametab) Buffer</b>	<ul style="list-style-type: none"><li>▪ The name table (nametab) contains the table and field definitions that are activated in the SAP System. An entry is made in the Repository buffer when a mass activator or a user (using SE11) requests to activate a table. The corresponding name table is then generated from the information that is managed in the Repository. There are 4 sub-buffers: Table definition, Field definition, Short Nametab and Initial records.</li></ul>
<b>Table Buffer</b>	<ul style="list-style-type: none"><li>▪ This buffer can store a single record with its field values, or multiple table records. There are two types, Partial Table and Generic Table buffer</li></ul>
<b>Program Buffer</b>	<ul style="list-style-type: none"><li>▪ Compiled version of ABAP programs are stored in this buffer</li></ul>
<b>SAPgui Buffer</b>	<ul style="list-style-type: none"><li>▪ There are two types: Presentation and CUA buffers. The generated screens from SAP transactions are stored in this buffer as well as SAPgui menus, pushbutton definitions etc.</li></ul>
<b>Roll &amp; Paging Buffers &amp; Extended Memory</b>	<ul style="list-style-type: none"><li>▪ This buffer stores the input &amp; output data from a user request for processing. The extended memory stores a large portion of the internal tables of a program.</li></ul>
<b>SAP Calendar Buffer</b>	<ul style="list-style-type: none"><li>▪ All defined factory and public holiday calendar objects are stored in this buffer</li></ul>
<b>Import/Export Buffer</b>	<ul style="list-style-type: none"><li>▪ Import/export buffers are used to store data that must be available to several work processes. They are used, for example, for the Available-To-Promise logic (ATP logic) in Logistics</li></ul>
<b>SAP Cursor Cache</b>	<ul style="list-style-type: none"><li>▪ The SAP cursor cache helps to improve system performance by reducing the number of parsing of SQL statements; it is database-dependent</li></ul>

# SAP Buffer Management – ST02

## Tune Summary (idesecc\_IDS\_00)

Current parameters Detail analysis menu

System: idesecc\_IDS\_00 Tune summary  
Date + Time of Snapshot: 18.03.2009 16:25:09 Startup: 09.02.2009 12:18:28

Number of Objects in the buffer

Size of the Buffer in KBs

Buffer	HitRatio %	Alloc. KB	Freesp. KB	% Free Sp.	Dir. Size	FreeDirEnt	% Free Dir	Swaps	DB Accs
Nametab (NTAB)								0	
Table definition	99.39	6,789			19,971			59,238	107,173
Field definition	98.17	31,566	1,935	6.45	19,971	14,773	73.97	208,215	214,904
	99.82	3,624	50	1.67	4,992	231	4.63	1,394	6,173
	45.95	6,624	538	8.97	4,992	642	12.86	109,097	113,550
								0	
	99.03	500,000	1,031	0.21	125,000	112,703	90.16	248,813	804,972
	98.86	3,000	102	4.27	1,500	1,368	91.20	521,360	16,178
	99.12	4,297	34	0.83	2,000	1,737	86.85	15,335	19,744
	99.59	488	250	52.97	200	50	25.00	0	111
	82.21	4,096	3,152	96.07	2,000	1,52			
	99.68	29,297	1,683	6.07	5,000	1,81			
	97.60	10,000	325	3.31	500	47			
	68.66	4,096	1,551	47.27	2,000	1,44			
	78.50	4,096	3,279	99.94	2,000	1,99			

Hit Ratio is percentage of times an object was found in the SAP buffer, instead of having to fetch the object from the database. A high hit ratio signifies very good buffer quality and is indicative of good

system performance

The swaps value is the number of objects that had been kept in the buffer for sometime, but had to be swapped with a new object that was fetched from the database as part of new user request. Ideally the number of swaps should not exceed the setting for directory size in a system. As part of buffer tuning, ensure that number of swaps are not more than twice the number of objects set for a buffer. If this is not the case, increase the size of the Buffer


memory to reduce swaps and reduce the database

SAP Memory	Curr.Use %	CurUse[KB]	MaxUse[KB]	In Mem[KB]	OnDisk[KB]	SAPCurCac
Roll area	0.59	1,542	22,136	131,072	131,072	IDs
Page area	0.01	15	108,304	65,536	196,608	Statement
Extended memory	4.69	147,456	2,654,208	3,141,632	0	
Heap memory		0	0	581,533	0	

The sum of "In Mem" will give you the Total Physical Memory allocated to this SAP instance by the Operating System. In this case the total RAM allocated is 3.5 GB

# Tuning of SAP Buffers

## Tune: Profile parameters for SAP buffers (idesecc\_IDS\_00)

Other tune Profile maintenance  Profile parameter

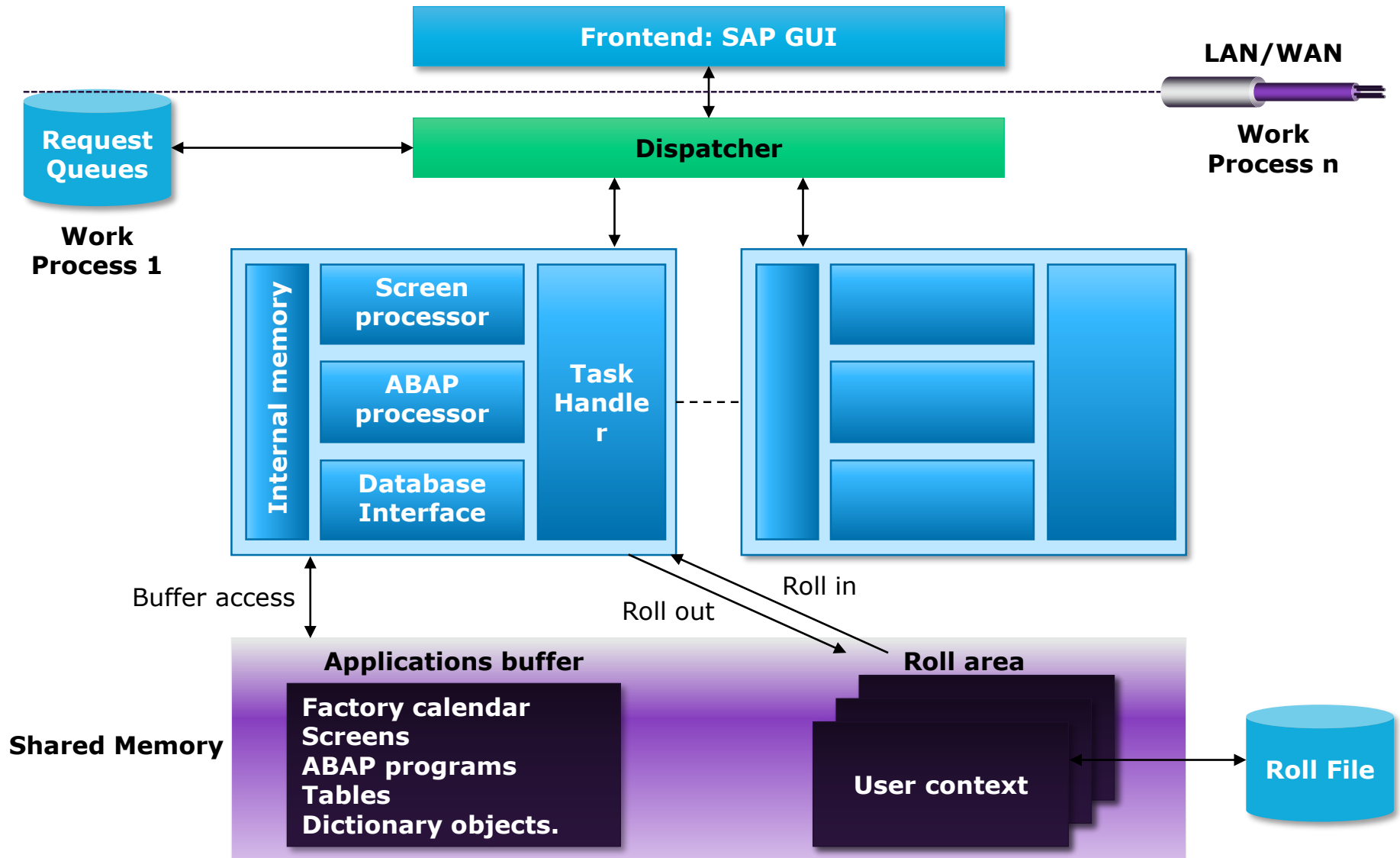
System: idesecc\_IDS\_00 Profile Parameters for SAP Buffers  
Date and Time: 18.03.2009 17:00:00

Buffer Name		Comment	
Profile Parameter	Value	Unit	Comment
Program buffer		PXA	
abap/buffersize	500000	kB	Size of program buffer
abap/pxa	shared		Program buffer mode
CUA buffer		CUA	
rsdb/cua/buffersize	3000	kB	Size of CUA buffer
The number of max. buffered CUA objects is always: size / (2 kB)			
Screen buffer		PRES	
zcsa/presentation_buffer_area	4400128	Byte	Size of screen buffer
sap/bufdir_entries	2000		Max. number of buffered screens
Generic key table buffer		TABL	
zcsa/table_buffer_area	30000128	Byte	Size of generic key table buffer
zcsa/db_max_bufstab	5000		Max. number of buffered objects
Single record table buffer		TABLP	
rtbb/buffer_length	10000	kB	Size of single record table buffer
rtbb/max_tables	500		Max. number of buffered tables
Export/import buffer		EIBUF	
rsdb/obj/buffersize	4096	kB	Size of export/import buffer
rsdb/obj/max_objects	2000		Max. number of objects in the buffer
rsdb/obj/large_object_size	8192	Bytes	Estimation for the size of the largest object
rsdb/obj/mutex_n	0		Number of mutexes in Export/Import buffer

## Note

- Using ST02, you can tune the buffer parameter values. Typically the program and table buffers are allocated higher values.
- But buffer tuning is a fine art. The SAP system after installation will have some default values. You must observe the system behavior for a couple of months and then see the buffer quality and swaps pattern to take a decision to change the memory limit for a buffer

# Summary Graphic for SAP Memory and Buffers



# Lunch Break





# Performance & Workload Analysis

# Workload Analysis using ST03N

The transaction ST03N is the most important transaction in SAP for a BASIS consultant

This transaction provides information on system performance, response times for SAP, Database and frontend, dialog steps information per user, per transaction

The information is available as a snapshot, as well as aggregated over days, weeks and months

The transaction provides critical data for troubleshooting SAP performance issues

There are various profiles for viewing the system performance data, that is, by users, by transactions or by time of the day

It is possible to look individually at each dialog instance and compare the system performance across instances of the SAP system

# Using ST03N

**Workload Monitor**

Navigation icons: Back, Forward, Full screen on/off, Save view, Help

**Expert mode**

- Workload
  - idesecc\_IDS\_00
  - Total
- Detailed Analysis
  - Business Transaction Anal
  - Last Minute's Load
- Load History and Distribution
- BI Workload
- Collector and Performance DB

**Overview of instances and last analysis data**

ABAP Instance	Host Name	Last Measuremnt	Time	Active Work Processes
idesecc_IDS_00	idesecc_IDS_00	18.03.2009	15:59:23	Dia BTC Upd Up2 Sps Enq ICMan
TOTAL	TOTAL	17.03.2009	23:59:59	

Dialog Instance Aggregated over All Instances



# Expert Mode View – ST03N

Expert mode

Workload

idesecc\_IDS\_00

Day

Week

Month

Total

Day

Week

Month

Detailed Analysis

Business Transaction A

Analysis Views

Workload Overview

Transaction Profile

Time Profile

Ranking Lists

Memory Use Statistics

RFC Profiles

User and Settlement Statis

Frontend Statistics

Spool Statistics

Response Time Distributio

Load from External System

Web Statistics

DB Connection Statistics

Instance

idesecc\_IDS\_00

Period

02/2009

Task type

All

First record

01.02.2009 00:00:00

Last record

28.02.2009 23:59:59

Time period

28 Day(s) 00:00:00

Times

Database

Roll information

Parts of response time

All data

User

Workload overview: Average time per step in ms

Task Type Name	# Steps	Ø Time	Avg. Proc. Time	Ø CPU Time	Ø DB Time	Ø Time	Ø WaitTim	Ø Roll In	Ø Roll Wait Time	Ø Load- + G
AUTOABAP	3,301	5,208.2	4,512.4	2,473.5	314.6	0.0	55.9	7.4	0.0	
AUTOTH	2,519	794.6	647.9	3.9	0.9	0.0	145.9	0.0	0.0	
BACKGROUND	85,720	620.0	378.1	154.0	140.3	0.0	81.8	1.5	0.0	
BUFFER SYNC	8,232	202.4	18.0	1.0	1.9	0.0	182.5	0.0	0.0	
DDLOG CLEANUP	8,414	225.4	35.9	0.6	2.2	0.0	187.4	0.0	0.0	
DEL. THCALL	16,662	137.1	22.5	0.6	0.1	0.0	114.5	0.0	0.0	
DIALOG	110,795	1,115.1	499.7	148.6	89.1	0.0	245.4	30.3	164.7	
HTTP	237	1,177.5	675.8	180.0	203.5	0.0	34.1	0.9	0.0	
OTHER	14	1,494.9	546.8	48.6	9.1	0.0	0.5	2.1	914.6	
RFC	6,561	4,535.6	1,705.0	524.0	219.8	0.0	182.1	45.2	2,186.5	
RPCTH	364	4,780.1	3,468.3	1,235.9	1,309.6	0.0	0.2	0.0	0.0	
SPOOL	16,432	192.6	101.9	5.2	5.5	0.0	83.1	0.2	0.0	
UPDATE	2,510	1,499.5	805.8	109.5	174.7	0.0	396.8	0.0	0.0	
UPDATE2	136	6,216.8	3,390.7	96.6	536.6	0.0	1,458.3	0.0	0.0	

# Transaction Profile View for a Month

**Workload in System IDS**

Full screen on/off Save view

Expert mode

- Day
- Week
- Month
- Total
  - Day
  - Week
  - Month
- This month
  - 02/2009
  - 01/2009
- Detailed Analysis
- Analysis Views
  - Workload Overview
  - Transaction Profile
    - Standard
    - EarlyWatch
    - Time Profile
    - Ranking Lists
    - Memory Use Statistics
    - RFC Profiles
    - User and Settlement Statistics
    - Frontend Statistics
    - Spool Statistics
    - Response Time Distribution
    - Load from External Systems
    - Web Statistics
    - DB Connection Statistics

Instance: TOTAL  
Period: 02/2009  
Task type: All

First record: 01.02.2009 00:00:00  
Last record: 28.02.2009 23:59:59  
Time period: 28 Day(s) 00:00:00

Times Database Parts of response time GUI times All data

Task type Aggregation

**Transaction profile: Times: T Total time (s), Ø Time/step (ms)**

Report/Transaction	Background Job	# Steps	T Response Time	Ø Time	Process.	Avg. Proc. Time	T CPU~	Ø CPU~
RFC		5,093	24,719	4,853.4	7,884	1,548.1	1,893	371.7
SESSION_MANAGER		4,369	23,348	5,344.0	14,474	3,313.0	1,887	431.8
AutoABAP		3,301	17,192	5,208.2	14,895	4,512.4	8,165	2,473.5
RSABAPPROGRAM		18,234	14,711	806.8	6,553	359.4	2,587	141.9
(BATCH)		39,949	14,125	353.6	5,817	145.6	1,457	36.5
CV01N		588	11,800	20,067.8	3,089	5,252.9	69	117.0
RSBTC RTE		23,456	11,578	493.6	9,645	411.2	3,971	169.3
RSAL_BATCH_TOOL_	SAP_CCMS_MONI_BAT	548	9,072	16,554.7	2,541	4,637.7	2,007	3,662.8
RSCOLL00	SAP_COLLECTOR_FOF	285	7,370	25,858.8	5,623	19,731.0	3,331	11,689.3
Login_Pw		1,596	6,318	3,958.6	197	123.2	19	12.0
SE11_OLD		12,035	6,071	504.5	2,197	182.6	867	72.0
SE71		7,694	4,133	537.1	1,291	167.8	595	77.3
SAPMSEU0		4,378	4,002	914.1	1,439	328.8	544	124.3
RSPOWP00		16,432	3,164	192.6	1,675	101.9	86	5.2
SPRO		5,416	3,087	570.0	1,466	270.7	466	86.1
MM01		4,645	3,054	657.6	1,812	390.0	481	103.7

# Linking Transaction Usage to Users

**Workload in System IDS**

Full screen on/off Save view

Expert mode

- Day
- Week
- Month
- Total
  - Day
  - Week
  - Month
  - This month
  - 02/2009
  - 01/2009
- Detailed Analysis
- Analysis Views
  - Workload Overview
  - Transaction Profile
    - Standard
    - EarlyWatch
  - Time Profile
  - Ranking Lists
  - Memory Use Statistics
  - RFC Profiles
  - User and Settlement Sta
  - Frontend Statistics
  - Spool Statistics
  - Response Time Distribu
  - Load from External Syst
  - Web Statistics
  - DB Connection Statisti

Instance TOTAL First record 01.02.2009 00:00:00  
 Period 02/2009 Last record 28.02.2009 23:59:59  
 Task type All Time period 28 Day(s) 00:00:00

Times Database Parts of response time GUI times All data

Task type Aggregation Transaction profile: Times: T Total time (s), Ø Time/step (ms)

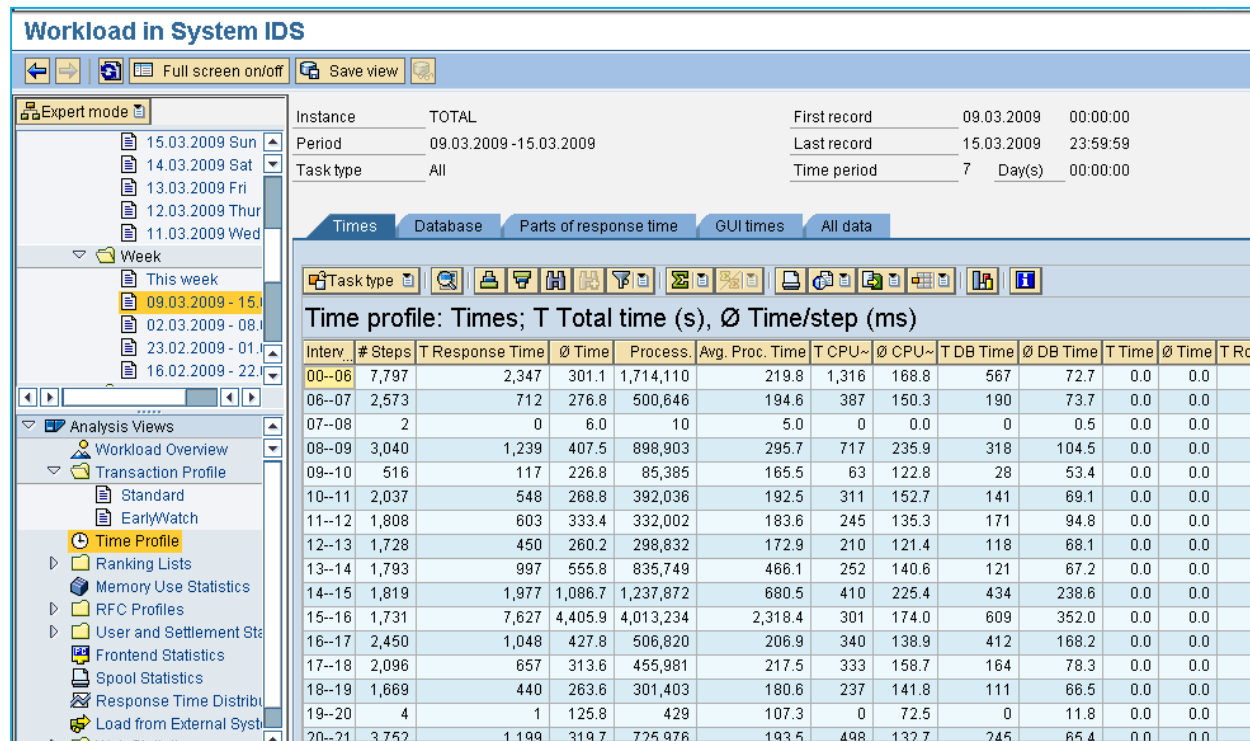
**Transaction profile** Aggregation

**User to Transaction MM01**

Report/Transaction	User	Job Name	# Steps	T Response Ti...	Ø Time	Process.	Avg. Proc. Time	T CPU~	Ø CP...	T D
Login_Pw										
SE11_OLD	196528		610	654	1,071.5	331	543.0	54	88.1	
SE71	193322		143	572	3,999.9	433	3,030.1	13	90.6	
SAPMSEU0	WF-BATCH		293	341	1,165.2	261	892.3	10	35.4	
RSP0WP00	253042		45	322	7,145.3	115	2,556.7	13	297.1	
SPRO	213046		198	249	1,256.1	174	877.4	5	26.4	
MM01	181136		440	146	331.3	65	148.7	48	108.3	
SMARTFORMS	189445		323	119	369.5	76	236.4	70	217.6	
<delayed function call>	122744		486	95	196.0	62	126.9	49	101.6	
RSARFCSE	202600	ARFC	93	91	974.2	20	210.6	11	123.4	
SBWP	163005		381	89	232.8	50	132.1	43	112.9	
SAPMSYST	238934		281	79	282.4	50	179.0	45	160.6	
<adm message>	162328		411	65	157.3	41	99.6	35	86.3	
<ddlog cleanup>										
SAPMS380										
RSA1			4	1,717	429,320.8	1,434	358,609.5	1,382	345,577.5	

IDS (1) 800 idesecc INS

# Time Profile



- The time profile information provides clues on the behavioral pattern of the system. You can identify load and activity on the system by looking at the number of steps and the average response time for each step. Comparatively higher response times indicate that the system is under load

# User Profile

## Workload in System IDS

Full screen on/off Save view

Expert mode

15.03.2009 Sun  
14.03.2009 Sat  
13.03.2009 Fri  
12.03.2009 Thur  
11.03.2009 Wed

Week  
This week  
09.03.2009 - 15.03.2009  
02.03.2009 - 08.03.2009  
23.02.2009 - 01.03.2009  
16.02.2009 - 22.02.2009

Analysis Views  
Workload Overview  
Transaction Profile  
Standard  
EarlyWatch  
Time Profile  
Ranking Lists  
Memory Use Statistics  
RFC Profiles  
User and Settlement Statistics  
User Profile  
Settlement Statistics  
Frontend Statistics  
Spool Statistics  
Response Time Distribution  
Load from External System

Instance TOTAL  
Period 09.03.2009 - 15.03.2009  
Task type All

First record 09.03.2009 00:00:00  
Last record 15.03.2009 23:59:59  
Time period 7 Day(s) 00:00:00

Times Database Parts of response time GUI times All data

Task type

### User Profile: Times; T Total Time (s), Ø Time/Step (ms)

User	# Steps	T Response Time	Ø Time	T CPU~	Ø CPU~	T DB Time	Ø DB Time	T Time	Ø Time	T WaitTime	Ø WaitTime
SAPSYS	24,212	7,987	329.9	2,550	105.3	648	26.8	0.0	0.0	1,324	54.2
HOUSEKEEPING	713	4,828	6,771.7	1,481	2,077.8	1,482	2,078.2	0.0	0.0	180	252.0
WF-BATCH	8,611	2,835	329.3	1,161	134.8	279	32.4	0.0	0.0	131	15.1
DDIC	1,937	1,563	806.9	539	278.1	718	370.8	0.0	0.0	15	7.2
232555	660	1,265	1,916.7	86	129.5	167	253.0	0.0	0.0	287	434.0
231659	626	733	1,171.4	47	75.8	45	72.5	0.0	0.0	1	2.0
116182	834	475	569.3	85	102.2	242	290.5	0.0	0.0	2	1.0
UNKNOWN	46	374	8,135.1	1	15.2	25	550.6	0.0	0.0	319	6,938.0
243377	16	348	21,723.0	43	2,685.0	134	8,372.3	0.0	0.0	1	46.0
161259	166	299	1,798.9	27	160.8	66	397.9	0.0	0.0	0	2.0
196501	444	163	368.2	56	125.9	44	99.5	0.0	0.0	2	4.0
TCSADM	29	98	3,374.6	57	1,979.3	16	547.5	0.0	0.0	0	7.0
222758	25	46	1,852.9	5	218.8	15	604.9	0.0	0.0	0	3.0
221337	17	35	2,069.2	4	219.4	4	247.6	0.0	0.0	0	3.0
249257	81	34	418.0	8	97.4	11	133.7	0.0	0.0	0	0.0
119361	7	18	2,613.7	1	190.0	1	170.9	0.0	0.0	0	2.0

# Performance Analysis using ST06

Apart from ST03N where the performance is measured in terms of dialog steps and response times, SAP provides ST06 for performance measurement of systems by looking at the hardware configuration elements

These elements include the CPU's, Memory, Filesystem, Disk and LAN Activity

ST06 uses the SAP OS Collector, which runs as a process in Unix and as a service in Windows OS

The SAP OS Collector must be active in order for the information to be collected

# SAP OS Collector from ST06

The saposcol can be managed from the ST06 transaction

**Local (idesecc) / Operating System Collector**

Start Stop Log file Status Details on Details off Available Days

Wed Mar 18 18:50:39 2009  
interval 10 sec.  
SUNOS IDESECC 5.10 GENERIC\_118822-25 SUN4U  
Collector Version: COLL 20.89 700 - V3.72 64Bit  
Date/time 18.03.2009 18:53:33  
Start of Collector Fri Jan 9 14:14:32 2009#  
Status report

Collector Versions	running	COLL 20.89 700 - V3.72 64Bit
dialog	COLL 20.89 700 - V3.72 64Bit	
Shared Memory	attached	
Number of records	3340	
Active Flag	active (01)	
Operating System	SunOS idesecc 5.10 Generic_118822-25 sun4u	
Collector PID	2032 (000007F0)	
Collector	running	
Start time coll.	Fri Jan 9 14:14:32 2009	
Current Time	Wed Mar 18 18:53:33 2009	
Last write access	Wed Mar 18 18:53:30 2009	
Last Read Access	Wed Mar 18 18:50:51 2009	
Collection Interval	10 sec (next delay).	
Collection Interval	10 sec (last ).	
Status	free	
Collect Details	required	
Refresh	required	
Header Extension Structure		
Number of x-header	Records	1
Number of Communication	Records	60
Number of free Com.	Records	60

**Start the SAP OS Collector**

# SAP OS Collector from Unix Command Line

The saposcol can be managed from the ST06 transaction

```
idesecc:idsadm 4% saposcol -s
*****
Collector Versions :
  running : COLL 20.89 700 - V3.72 64Bit
  dialog  : COLL 20.89 700 - V3.72 64Bit
Shared Memory      : attached
Number of records   : 3340
Active Flag        : active (01)
Operating System    : SunOS idesecc 5.10 Generic_118822-25 sun4u
Collector PID       : 2032 (000007F0)
Collector           : running
Start time coll.    : Fri Jan  9 14:14:32 2009

Current Time        : Wed Mar 18 19:09:03 2009

Last write access   : Wed Mar 18 19:09:00 2009

Last Read  Access   : Wed Mar 18 19:05:51 2009

Collection Interval : 10 sec (next delay).
Collection Interval : 10 sec (last ).
Status              : free
Collect Details     : required
Refresh             : required

Header Extension Structure
Number of x-header   Records : 1
Number of Communication Records : 60
Number of free Com.   Records : 60
Resulting offset to 1.data rec. : 61

Trace level          : 2

Collector in IDLE - mode ? : NO
  become idle after 300 sec without read access.
  Length of Idle Interval : 60 sec
  Length of norm.Interval : 10 sec
*****
idesecc:idsadm 5%
```

## Commands

- Saposcol -s can be used to check the status
- Start Saposcol:
- Saposcol [-l] [pf=complete name of saposcol profile] [-t[level]] [-z]
- Stop saposcol
- Saposcol -k [pf=complete name of Saposcol profile] [-t[level]] [-z]



# Using Detailed Analysis in ST06

**Local (idesecc) / Operating System Monitor: SunOS**

Operating System collector

Analyze operating system

Snapshot analysis

CPU

Memory

Swap

Disk

LAN

FileSys

Top CPU

Monitored Processes

Previous hours

CPU

Memory

Swap

Disk

LAN

FileSys

OS Log

HW Info

Performance database

Compare recent days

Compare all servers

Additional functions

System configuration

Parameter Changes

LAN Check by Ping

# CPU Usage

Local (idesecc) / CPU Snapshot				
Refresh display				
Wed Mar 18 19:42:00 2009 Range 10 Second				
CPU	User (%)	System (%)	Idle (%)	
0	0	0	100	
1	0	2	98	

**Snapshot: Current real time CPU usage**

Local (idesecc) / CPU Last 24 Hours							
Graphics by Column							
Wed Mar 18 19:43:01 2009 Range 10 Second							
Stunde	User (%)	System (%)	Idle (%)	IO Wait %	SysCalls/h	Interr./h	Cbk. Switch
19	2	1	97		1,585,017	2,209,926	8,057,134
18	2	1	97		1,520,240	7,821,976	8,062,114
17	1	1	98		1,470,070	2,195,218	8,032,584
16	2	1	97		1,614,646	2,214,320	8,080,122
15	1	1	98		1,539,711	2,209,505	8,067,721
14	1	1	98		1,418,719	2,216,041	8,033,519
13	2	1	97		1,913,498	2,537,910	8,218,642
12	2	1	97		1,539,954	2,214,931	8,067,970
11	1	1	98		1,482,787	2,229,812	8,037,575
10	1	1	98		1,467,808	2,308,948	8,065,125
9	1	1	98		1,499,281	2,230,463	8,042,154
8	2	1	97		1,560,480	2,179,173	8,063,020
7	2	1	97		1,715,316	2,277,606	8,103,162
6	1	1	98		1,438,591	2,161,380	8,030,568
5	1	1	98		1,463,454	2,173,252	8,037,498
4	2	1	97		1,548,946	2,172,017	8,064,293
3	1	1	98		1,451,596	2,166,103	8,032,481
2	1	1	98		1,457,498	2,177,156	8,032,537
1	1	1	98		1,448,990	2,159,905	8,033,444
	2	1	97		1,808,904	2,282,941	8,150,957
23	1	1	98		1,546,328	2,257,891	8,051,723
22	2	1	97		1,437,028	2,176,281	8,028,568
21	1	1	98		1,489,768	2,173,427	8,040,274
20	2	1	97		1,670,568	2,275,990	8,107,955

**CPU Usage in Last 24 Hours**

# Memory, Filesystem, Disk Usage

Local (idesecc) / Memory Last 24 Hours							
Graphics by Column							
Wed Mar 18 19:44:42 2009 Range 10 Second							
Stunde	Pages/h In	Page out	KB/h (In)	KB/h (Out)	Min freiKB	Max freiKB	mtl Freipl
19	6,560	155	52,480	1,240	437,304	527,848	473,361
18	9,061	155	72,488	1,240	478,856	578,296	513,747
17	1,317	142	10,536	1,136	513,256	608,784	541,887
16	3,882	170	31,056	1,360	438,616	638,488	569,286
15	2,710	147	21,680	1,176	533,576	646,576	584,308
14	2,242	149	17,936	1,192	567,280	672,128	603,936

Local (idesecc) / File / Last 24 Hours				
Previous file system				
Next file system				
File system monitor				
Wed Mar 18 19:45:02 2009 Range 10 Second				
Stunde	Name	Size	Free (MB)	Free (%)
19	/	20,171	9,208	46
18	/	20,171	9,208	46
17	/	20,171	9,208	46
16	/	20,171	9,208	46
15	/	20,171	9,209	46

Local (idesecc) / Disk sd0 Last 24 Hours									
Disk -- Disk ++ Graphics by Column									
Wed Mar 18 19:45:22 2009									
Stunde	Ausl. (%)	Queue Lng.	Wait (ms)	Servi (ms)	Oper(MB/h)	Oper./h	Oper. KB/h	Operatn./s	
19	1	0	0	14	39	5,811	11	2	
18	1	0	0	12	60	6,806	17	2	
17	1	0	0	15	35	4,679	10	1	
16	1	0	0	12	39	6,244	11	2	
15	1	0	0	15	37	5,006	11	1	
14	1	0	0	15	40	5,364	11	1	
13	2	0	0	20	582	23,244	166	6	
12	1	0	0	18	59	4,816	17	1	

# Breakout Session



# Exercise 1

## Exercise

- Login into the system with the userid/password provided by your instructor
- Study the Performance of the SAP system for a) Last week b) Last Month using ST03N
- Using the data collected from ST03N, compare the number of dialog steps, users and programs that generated the highest response times
- For the set of data chosen from ST03N, compare the system performance using ST06
- Identify peak load on the system and analyze for potential causes
- Use SM21, ST22 and SM37 to determine root cause
- Check the memory parameters in ST02 and check the profile parameters for each of the buffers
- Adjust abap/heap\_limit value by 10 MB using RZ10

# Exercise 2

## Exercise

- Go to transaction SICF
- Check the options available for activating/deactivating the nodes
- Launch the web service mentioned in the course
- Check the structure of the URL and identify the port
- Go to SMICM transaction
- Navigate to Goto → Display Connections, Check the details of the HTTP connections established
- From Administration, Navigate to ICM → Exit(Soft) → Global
- Return to SICF, and try and launch the webservice. Check the error message received
- Return to SMICM, and Start the ICM again