Workload Analysis and Response times

This page contains instructions for how to analyze workload and key components of high response time.

Response Time

The following SAP Notes provide information about how response time is measured and contains information about the term in general. 8963 - Definition of SAP response time/processing time/CPU time 10630 61 - Information about response time in STAD/ST03 Guideline values when analyzing Average response time/Dialog step are outlined below.

- **Wait Time** < 10% of total response time (<50ms)
- **Roll In/Out** < 20ms
- **Roll Wait time** < 200ms
- **Load and Generate** < 50ms
- **Processing time** < 2 * CPU
- **Enqueue time** < 5ms
- **DB Time** < 40% (Response time – Wait time)
- **GUI time** < 200ms

*Please be aware these are only guideline figures, and*
The following section contains an introduction to the key components of response time and the general guide of troubleshooting.

**High Wait time**
The dispatcher of the SAP instance receives the incoming request and stores it in the request queue of the appropriate work process type. While the dispatcher is looking for a free work process, wait time is accumulated. Wait time ends, when the request is being forwarded to a free work process of the required type. Wait time is the first component of the overall dialog response time.

- Check the number of Dialog work processes in SM50 or TU02 ‘rdisp/wp_no_dia’
- Check for long running processes consuming a high number of Work Processes
- Check for Work processes in PRIV Mode, this can indicate insufficient extended memory
- Is high wait time the Root cause of the poor performance or a symptom of another issue
- Activate the /SDF/MON to analyze the running status of work processes

**High Roll Wait time**
In general roll wait time measures external communications and this could be GUI communication or RFC communication.

A way to check if the problem is in GUI communication or if is RFC communication is checking the GUI time and frontend network time. If you find high times then the problem is most likely to be related with GUI communication.

If not then RFC communication should be investigated.

Review SAP note 364625 that explains you GUI time and fronted time, and also provides details of how to review these times on a system.

Related SAP Notes:
- 2426336 - Performance analysis of external RFC server programs (registered program)
- 2418936 - High RFC time - Performance troubleshooting

Please see the detail information about GUI time analysis in the following section ‘High GUI Time’.

**High load and generate time**
Load and Generate time is the amount of the time taken by work process to copy and generate or to load and generate abap code and screens for the User request. The load and generator time is high the problem is the buffer sizes is too small (TP program or buffers and CUA buffers).

- Check in ST02, verify if the program buffer is sized sufficiently
- Up to 10,000 swaps per day is acceptable for the Program Buffer.
- HitRatio% and % Freespace should always be considered when analysing Buffer Size
- Always ensure sufficient main memory is available before making buffer increases and that all changes are tested before promoting to a production environment.

Related SAP Note:
- 1230076 - Generation of ABAP loads: Tips for the analysis

**High Enqueue time**
Enqueue time is used to request and set SAP locks by making use of the enqueue work process. Typically, this component of the dialog response time is rather small, usually less than 5 ms.

Related SAP Notes
- 97760 - Enqueue: Performance and resource consumption
- 2252679 - How to analyze an enqueue lock problem.
- 2126913 - ENQU: The enqueue log
- 2013043 - Performance Problems with Enqueue Work Process
- 2019532 - Performance of integrated enqueue server

Wiki Page:
Enqueue Performance : Analysis  https://wiki.scn.sap.com/wiki/x/IhRGg

**High Processing time**
Check Operating System Monitor for a CPU Bottleneck
High Database time
If data is read from the database or changed in the database, these actions are indicated as database time (Av. DB Time). Database time is measured from the moment the database request is sent to the database server and runs until the moment the data is returned to the application server.

- Check for expensive SQL causing high load on the system
- Check I/O performance stats
- Consult the SAP Notes outlined under the DBACOCKPIT section, depending on the Database Release and Version

High GUI Time
Analysis should focus on Front End: Front-End Ping (Network Check), Front-End Hardware, High Volume of Data Transferred, Many Roundtrips. If you discover that the GUI time is high despite a relatively small volume of data, this can be for two reasons: there may be a hardware bottleneck on the presentation server or a network bottleneck. Often, the simplest way to analyze this further is to filter out the users who typically experience these problems from the single-record statistics.

High GUI Time, can sometimes be the result of a non-optimally configured SAP Easy Access Menu. Check for high GUI Times associated with the transaction SESSION_MANAGER, if high times are identified it is a good idea to run the report ‘EASY_ACCESS_NUMBER_OF_NODES’ via SE38. This report identifies the number of menu nodes configured per user. A high number of menu nodes increases GUI time and reduces performance.

When using SAP Easy Access Menu:
Menu should not contain more than 1000 entries (For comparison: The complete SAP menu contains 70,000 entries). The Tree is loaded to the user context at a glance. A high number of menu entries leads to high memory consumption on the application server and to long response times for the menu.

Related SAP Notes
- 2428353 - How to analyze high GUI time on SAP systems
- 851012 - SAPGUI: Performance trace - technical details
- 305363 - Create frontend trace file
- 500235 - Network Diagnosis with NIPING
- 203617 - ‘High memory consumption with Easy Access menu’
- 357693 - ‘Redundancy avoidance in Easy Access’