# T-Codes

## User Administration

| | |
|---|---|
| SU01 | User Maintenance (Single User Creation / Lock & Un-Lock Users) |
| SU01D | User Display |
| SU10 | Mass User Creation (Multiple Users) |
| EWZ5 | Overview of Lock & Un-Lock Users |
| SUIM | Overview of Users Data |
| SMLG | Create Log On Load Balance |

## Client Administration

| | |
|---|---|
| SCC1 | Transport Role / Import Role |
| SCC3 | Copy Logs / Transport Log Analysis |
| SCC4 | Client Creation |
| SCC5 | Client Deletion |
| SCC7 | Client Import |
| SCC8 | Client Export |
| SCC9 | Remote Client Copy |
| SE37 | Lock & Un-Lock Clients |
| SCCL | Local Client Copy |

## Database Administration

| | |
|---|---|
| DB01 | Analyse Exclusive Lock Waits |
| DB02 | Analyse Tables and Indexes |
| DB03 | Database Parameters |
| DB12 | DB Backup Monitor |
| DB13 | DBA Planning Calendar |
| DB14 | DB BR Tools Logs |
| DB15 | Data Archiving: Database Tables |
| DBACOCKPIT | Monitor DB Logs |

## Background Jobs Administration

| | |
|---|---|
| SM36 | Background Job's Design / Standard Background Job's Design |
| SM37 | Background Job's Monitoring / Background Job's Deletion |

## Spool Administration

| | |
|---|---|
| SP00 | Spool and related areas |
| SP01 | Print Request Overview |
| SP02 | Display Spool Requests |
| SPAD | Create Spool Administration Request |

## Transport Management System

| | |
|---|---|
| **SE01** | **Transport Organizer (Extended View)** |
| **SE03** | **Transport Organizer Tools** |
| **SE06** | **Set Up Transport Organizer** |
| **SE09** | **Transport Organizer** |
| **SE10** | **Releasing Request** |
| **STMS** | **Create TMS Configuration (Transport Management System)** |
| **STMS_IMPORT** | **TMS Import Queue Task** |

## Alert Monitoring T – Codes

| | |
|---|---|
| **RZ20** | **CCMS Monitoring** |
| **AL01** | **SAP Alert Monitor** |
| **AL02** | **Database Alert Monitor** |
| **AL05** | **Monitor Current Workload** |
| **AL18** | **Local File System Monitor** |
| **AL16** | **Local Alert Monitor for Operating System** |

## Other Administration T – Codes

| | |
|---|---|
| **AL11** | **Display SAP Directories** |
| **SICK** | **Installation Check** |
| **SM35** | **Batch Input Monitoring** |
| **SM58** | **Asynchronous RFC Error Log** |
| **SM59** | **Remote Function Call Destination (Display/Maintain)** |
| **SM01_CUS** | **Lock & Un-Lock T-codes** |
| **SM02** | **System Message Send** |
| **BD54** | **Logical System Creation & Deletion** |
| **SE38** | **Background Job's Pause / Client Size** |
| **SU24** | **Relation b/w T-codes & Authorization Objects** |
| **SU53** | **Missing Authorizations** |
| **DICO** | **Delete TMS Configuration** |
| **SCUM** | **Create CUA & Distribution Model** |
| **SNRO** | **Increases no. of TEMSE Requests** |
| **PFCG** | **Profile Creation & Generation (Single, Derived & Composite Roles)** |
| **SAINT** | **SAP Add On Installation Tool** |
| **SPAM** | **Support Package Manager** |
| **SM14** | **Update Program Administration** |
| **SM56** | **Number Range Buffer** |
| **SM04** | **User Activities / User Overview** |
| **AL08** | **Global User List (all instance)** |
| **SM63** | **Display/Maintain Operation Modes** |
| **RZ03** | **Check Status of Server** |
| **RZ04** | **Operational Mode Creation & Deletion** |
| **ST03** | **Perform Workload Analysis** |
| **RZ10** | **Profile Maintenance & Change SAP Static Parameter Value / SAP* Enable** |
| **RZ11** | **Dynamic Parameter Creation** |

| | |
|---|---|
| ST01 | SAP System Trace |
| RZ12 | RFC Server Group Maintenance |
| SMGW | Gateway Monitor |
| ST07 | Application Monitor |
| ST02 | Tune Summary (view sap buffer & memory configuration) |
| ST04 | Performance Overview |
| ST05 | SQL Trace Performance Trace (works performed by users on system written in this trace) |
| SM18 | Reorganize Security Audit Log |
| SM19 | Enable Security Audit Log |
| SM20 | Analysis of Security Audit Log |
| ST11 | Monitor the Trace and Log |

## Daily Monitoring T – Codes

| | |
|---|---|
| SM50 | Work Process Overview for Individual Instances |
| SM51 | Monitoring Work Process for Instance wise |
| SM12 | Monitoring Lock Entries |
| SM13 | Monitoring Update Process |
| DB02 | DB Space Overview |
| DB12 | Monitor DB Backup Logs |
| SM37 | Overview of Background Job |
| SMQ1 | Outbound Queue Monitor |
| SMQ2 | Inbound Queue Monitor |
| ST22 | ABAP Runtime Error Analysis |
| ST06 | Monitoring CPU Utilization |
| SM21 | Monitoring System Logs |
| SM66 | Work Process Overview for System wide (Globally(Multiple Instances)) |

## Other BASIS T - Codes

| | |
|---|---|
| SLICENSE | SAP License Administration |
| SNOTE | Adding SAP Notes |
| I18N | Adding Language |
| SMLT | Importing Language |
| SU25 | Initial Profile Generator |
| SGEN | SAP Load Generator |
| SE12 | ABAP Dictionary |
| SE13 | Dictionary: Technical Settings |
| SBWP | Business Workplace of User |
| SO00 | Create Document and Send Mail |
| SOST | Status of Mail |
| SCOT | Node Creation for Mail Configuration |
| SALE | Create Logical System |
| SCUA | Create Model View (Central User Administration) |
| WE05 | Check Intermediate Doc (IDocs) |
| WE20 | Partner Profiles |
| WE21 | Ports in IDocs Processing |
| BD64 | Display Distribution Model |
| SP12 | TEMSE Management (Temporary Sequential) |

# Introduction to SAP BASIS

Basis is a set of programs and tools that act as an interface with Database, Operating system, Communication protocols and business applications (such as FI, CO, MM, etc.). Full form of **BASIS is "Business Application Software Integrated solution"**.

SAP applications such as FI, CO, PP etc. can run and communicate with each other across different Operating systems and Databases with the help of BASIS.

Nowadays Basis is known as **NetWeaver**.

Alias of BASIS is SAP Application Server Technology and alias of NetWeaver is SAP Web Application Server.

After adding **java stack (the applications which are developed in J2EE, BSP, JSP, etc.) enhanced security standard for business process.** Both ABAP and Java stack can be monitored from one platform. NetWeaver supports standard protocols such as HTTP, SMTP, XML, SOAP, SSO, WEBDAV, WSDL, WMLSSO, SSL, X.509 and Unicode format **(representation of handling text).**

We can say **Basis is the operating system for SAP applications and ABAP**. Basis provides services like communication with the operating system, database communication, memory management, runtime collection of application data, web requests, exchanging business data etc...

Basis supports a number of known operating systems (Unix flavours, Microsoft windows server edition, AS400, z/OS, etc.) and databases (Oracle, DB2, Informix, Maxdb, Microsoft SQL Server, etc.).

## As we know BASIS is a set of tools. This tool has the following different functionalities:

- System monitoring and administration tools
- Common monitoring tool CCMS (**Computing Centre Management System**) to monitor alerts of R/3 system from one place.
- Server side scripting in ABAP and JavaScript.
- Use of Business server pages to build online stores and portals.
- Database monitoring and administration utilities
- Resource management like memory, buffer, etc.
- Authorization and profile management tools for user management.
- Internet access control to the system and business objects.
- Transfer modifications in a screen, program, layout from the development to a production system for accuracy purpose by **Transport Management System**.
- Client-server architecture and configuration.
- Graphical User Interface designing for the presentation layer.

## SAP Basis consultant's responsibilities:

- SAP Basis is a middleware tool for applications, operating system, and database. SAP Basis consultant should able to do the following tasks: -
- SAP application server monitoring, ABAP dump, and system log analysis.
- Performance tuning
- Database maintenance, Database backup schedule and restore
- R/3, NetWeaver, solution manager installation, etc.
- SAP license maintenance.
- SAP landscape, transport management system installations, etc.
- Client creating, client copying, client deletion, etc.
- Creating user, assigning roles, locking and unlocking users, etc.

- Background jobs scheduling, job monitoring, job deletion, etc.
- Profile and operation mode maintenance
- Applying support patches, upgrading and installing add-ons
- SNOTE applying and removing errors.
- System copy, System refresh, etc.

This a generic list. There are many other responsibilities that a Basis consultant shoulders. Every day you learn something new!

**ECC stands for SAP ERP Central Component**, which is an on-premises enterprise resource planning (ERP) system. It's a key technology in business that integrates data from different areas of a company in real time.

# Introduction to ERP

SAP is a market leader in providing ERP (Enterprise Resource and Planning) solutions and services.

**Enterprise Resource Planning (ERP)** is a software that is built to organizations belonging to different industrial sectors, regardless of their size and strength. Its purpose is to manage any organization/company functions. It is a way to integrate the data and processes of an organization into one single system.

**Example** - SAP, Oracle, NetSuite, Epicor, Microsoft, Dynamics 365 etc.

The ERP package is designed to support and integrate almost every functional area of a business process such as procurement of goods and services, sale and distribution, finance, accountings, human resource, manufacturing, production planning, logistics & warehouse management.

# How to Download & Install SAP GUI for Windows

Before you can configure and use the SAP GUI, you need to download the software from the SAP Marketplace as per steps below

Time to configure your GUI

**1.Connection Type: -** Custom Application Server (Particular one host)

**2. Description: -** Name of instance

**3. Application Server: -** IP address of remote application server

**4. Instance number** which you can find from os level (Unix) GoTo /usr/sap/Sid/DVEBGMS00 Here instance number = 00

**5. System ID: -** As per you setting which you have specified during installation time.

# SAP Instance & SAP SID

## What is an Instance

Sap Instance is a group of resources such as

- Memory
- Work Processes
- Dispatcher
- Gateway

usually for a single application or database server within a SAP R/3 client-server environment.

**There are three types of instances:**

### 1. Dialog instance

### 2. Central Instance

### 3. Database Instance

```
SAP System= Dialog Instance + Central Instance + Database
Instance.
```

For one SAP system, all three instances share the same directory.

- **Dialog Instance:** Dialog instance exists in the application layer. Its purpose is to maintain the load on the server. Dialog instance exists on the different host. If a number of dialog instance increases hardware resources, dispatcher, work processes also increases so that more number of users can login at a time.
- **Central Instance:** Central instance can also work as dialog instance. But the main thing is that it contains Enqueue and message servers. All dialog instances communicate with central instance before requesting database with message server. When an instance is started, the dispatcher process attempts to establish a connection to the message server so that it can announce the services it provides (DIA, BTC, SPO, UPD, etc.). Lock table is managed in central instance by Enqueue service.
- **Database Instance:** As normal database instance accepts requests from central instance to fulfil the user's requests. As lock management system provided by Enqueue server, it will provide service to users.

## What is SID

SID is a unique identification code for every R/3 installation (SAP system) consisting of a database server & several application servers. SID stands for SAP System Identification. SAPSID — a three-character code such as C11, PRD, E56, etc.)

### Logical System Names:

When data is distributed between different systems, each system within a network has to be clearly identifiable. The "logical system" deals with this issue.

A logical system is an application system in which the applications work together on a common database. In SAP terms, the logical system is a client.

Since the logical system name is used to identify a system uniquely within the network, two systems cannot have the same name if they are connected to each other as BW systems or as source systems, or if there are plans to connect them in any way.

**Example for production system logical system name might be:**

**SID – PBG**

SID Description - P=Production(type), B=BW(component), G=Germany. (plant name)

**Logical System name**

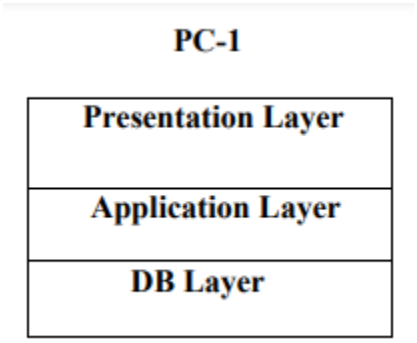
PBGCLNT100.This form is easy to understand.

# R/1, R/2, R/3 Architecture

## R/1 System

R- Real Time

1 Tire



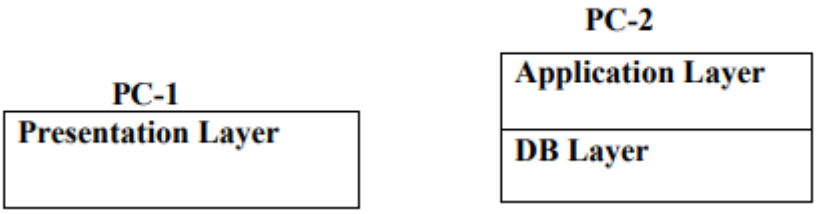

**Note:** Here in Application Layer Work Process Are going on.

**Drawback:** If we Lost Power in Presentation Layer we can't able to Login Remaining Systems.

## R/2 System

R- Real Time

2- 2 Tire




**Drawback:** If we Lost Power in Presentation Layer we can't able to Login Remaining 2 Layers.

There is No Q-Mechanism

## R/3 System

SAP R/3 is a 3 tier architecture consisting of 3 layers

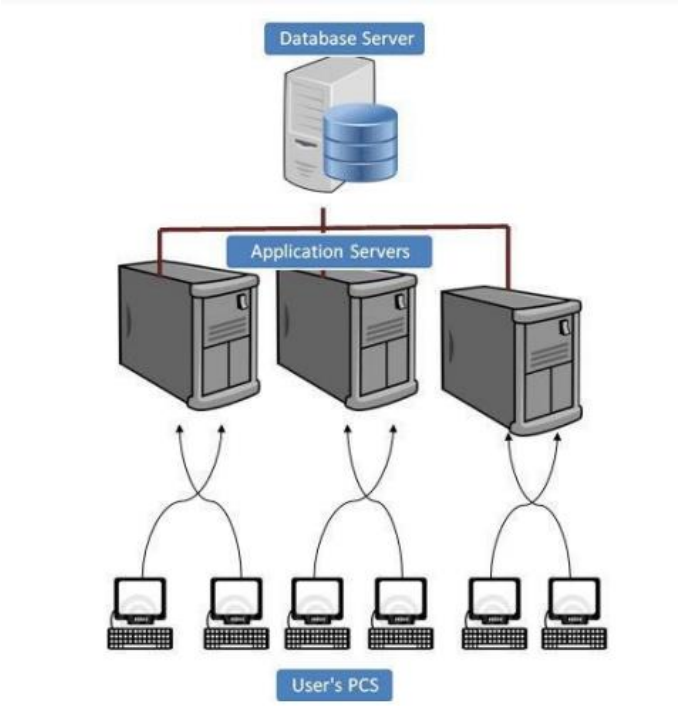
**1. Presentation**

**2. Application**

**3. Database**

In simple words, it's a client server architecture.

- **R** signifies Real-time system.
- **3** represents - 3-tier architecture.




**User's PC:**

Users can access SAP system in two ways:

1. Through SAP GUI

2. Through Web Browser

It's called front-end. Only the front-end is installed in the user's PC not the application/database servers.

Front-end takes the user's requests to database server and application servers.

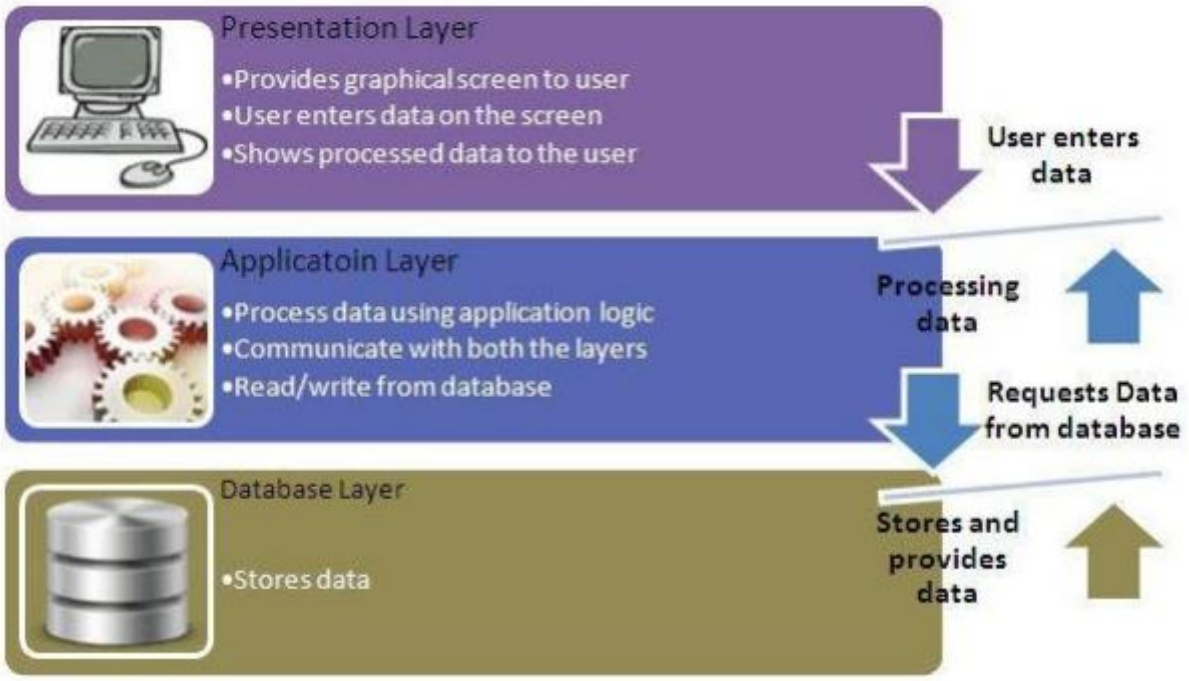
**Application Servers:** Application server is built to process business-logic. This workload is distributed among multiple application servers. With multiple application servers, the user can get the output more quickly.

Application server exists at a remote a location as compared to the location of the user PC.

**Database Server:** Database server stores and retrieves data as per SQL queries generated by ABAP and Java applications.

Database and Application may exist on the same or different physical location.

**Understanding different SAP layers**




# Presentation Layer

The **Presentation Layer** contains the software components that make up the SAP GUI (graphical user interface). This layer is the interface between the R/3 System and its users. The R/3 System uses the SAP GUI to provide an intuitive graphical user interface for entering and displaying data.

The presentation layer sends the user's input to the application server, and receives data for display from it. While a SAP GUI component is running, it remains linked to a user's terminal session in the R/3 System.

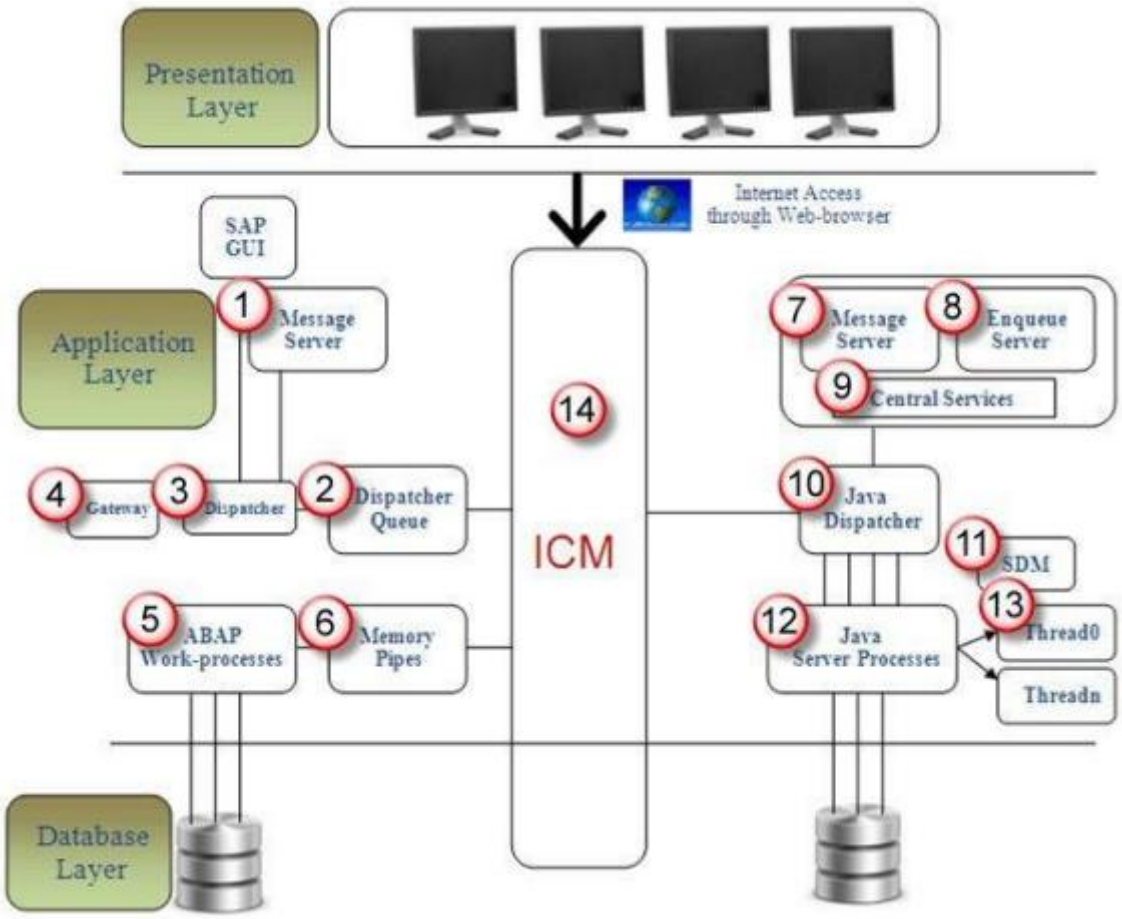
# Application Layer

The **Application Layer** consists of one or more application servers and a message server. Each application server contains a set of services used to run the R/3 System. Theoretically, you only need one application server to run an R/3 System. In practice, the services are distributed across more than one application server. The message server is responsible for communication between the application servers. It passes requests from one application server to another within the system. It also contains information about application server groups and the current load balancing within them. It uses this information to assign an appropriate server when a user logs onto the system.

# Database Layer

The **Database Layer** consists of a central database system containing all of the data in the R/3 System. The database system has two components - the database management system (DBMS), and the database itself. SAP has manufactured its own database named Hana but is compatible with all major databases such as Oracle. All R/3 data is stored in the database. For example, the database contains the control and customizing data that determine how your R/3 System runs. It also contains the program code for your applications. Applications consist of program code, screen definitions, menus, function modules, and various other components. These are stored in a special section of the database called the R/3 Repository, and are accordingly called repository objects. R/3 repository, objects are used in ABAP workbench.

**Understanding the components of SAP R/3 3-tier Architecture:**




ABAP+Java System Architecture

**1.Message Server:** It handles communication between distributed Dispatchers in ABAP system.

**2. Dispatcher Queue:** Various work process types are stored in this queue.

**3. Dispatcher:** It distributes requests to the work processes.

**4. Gateway:** It enables communication between SAP system and between SAP system and external systems.

**5. ABAP-Work processes:** It separately executes dialog steps in R/3 applications.

Types of work processes are given as below: -


**6. Memory-pipes:** It enables communication between ICM and ABAP work processes.

**7. Message Server:** It handles java dispatchers and server processes. It enables communication within java runtime environment.

**8. Enqueue Server:** It handles logical locks that are set by the executed Java application program in a server process.

**9. Central Services:** Java cluster requires a special instance of the central services for managing locks and transmitting messages and data. Java cluster is a set of processes that work together to build the reliable system. Instance is group of resources such as memory, work processes and so on.

**10. Java Dispatcher:** It receives the client requests and forwards to the server process.

**11. SDM:** Software Deployment Manager is used to install J2EE components.

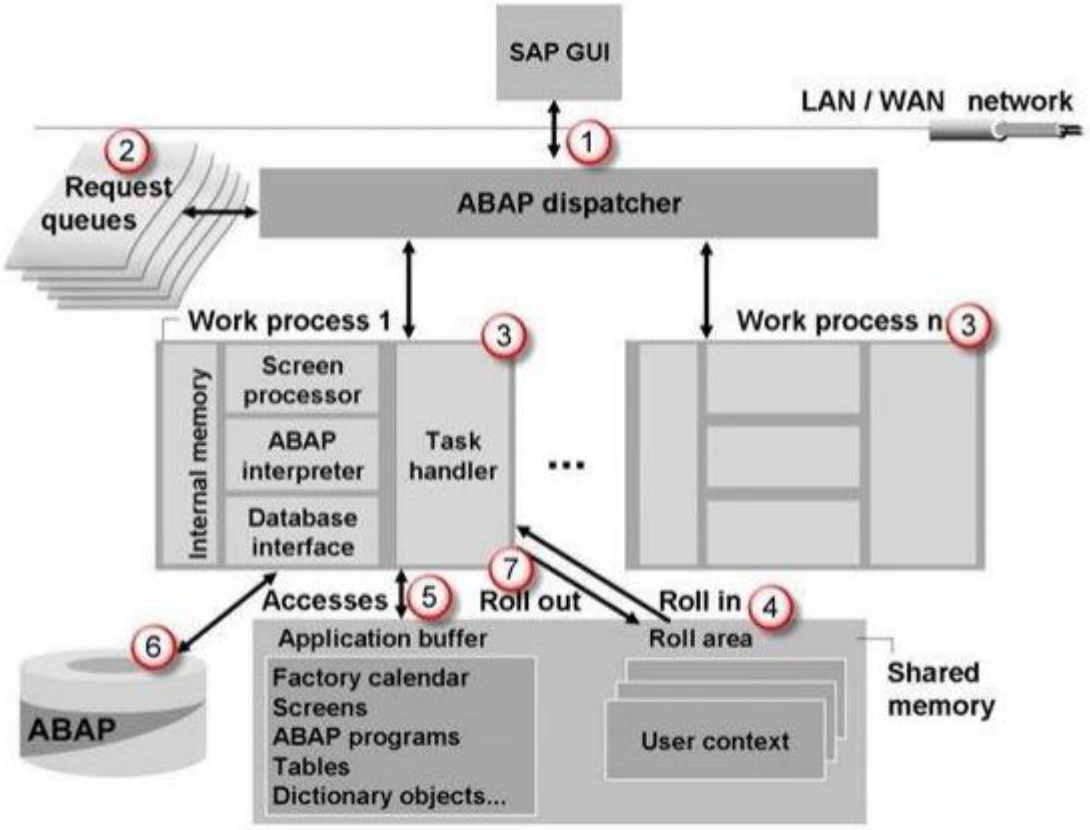
**12. Java Server Processes:** It can process a large number of requests simultaneously.

**13. Threading:** Multiple Processes executes separately in the background; this concept is called threading.

**14. ICM:** It enables communication between SAP system and HTTP, HTTPS, SMTP protocol. It means by entering system URL in the browser you can access SAP from browser also.

One more component is JCO. JCO is used to handle communication between java dispatcher and ABAP dispatcher when system is configured as ABAP+Java.

# SAP Logon Process Work




**Step 1)** Once a user clicks on the SAP system from GUI, the user request is forwarded to **Dispatcher**.

**Step 2)** Request is stored in **Request queues first**. Dispatcher follows **First in First out rule**. It will find free work process and if available will be assigned.

**Step 3)** As per user request, particular work process is assigned to user. For example, when user login to the system then Dialog work process is assigned to the user. If user runs a report in background, then background work process is assigned to the user. When some modifications are done at database level then update work process is assigned. So as per user's action work process is assigned.

**Step 4)** Once user is assigned the dialog work process then user authorizations, user's current setting are rolled in to work-process in shared memory to access user's data. Once dialog step is executed then user's data is rolled out from work process. Thus shared memory will be cleaned and other user's data can be saved in shared memory area. Dialog step means the screen movements. In a transaction, when a user's jumps from one screen to other the process is called a dialog step.

**Step 5)** First work process will find the data in the buffer. If it finds data in buffer, then there is no need to retrieve data from database. Thus response time is improved and this process is called hit. If it does not find the data in buffer, then it will find the data in database and this process is called miss. Hit ratio should be always higher than miss ratio. It improves the performance of system.

**Step 6)** Other requested data is queried from the database and once the process is complete, the result is sent back to GUI via dispatcher.

**Step 7)** At the end user's data is removed from shared memory so the memory will be available to other users. This process is called rollout.

# Client Creation

## What is a SAP Client

Client is a 'Customer'. in SAP. We can say that each customer maps to one client. Within one SAP instance, a number of Clients can be created. No need to install separate software's for each and every customer. It provides isolation, one client cannot see the data of another client.


As depicted above 100 and 200 clients exist under one roof. We can create a number of clients in SAP Application (from 000 to 999).

## Advantages of Client Concept

Client concept comes in with the following advantages

- You can share the same resources between multiple users.
- You can manage SAP system landscape as you can create multiple clients for DEV, QA and PROD team.
- You can share your SAP system with a large number of users.
- You can create clients in SAP system from **000-999.**

## What does client contain

**1. Application Data -** Application data is the data that are stored in the database tables.

**2. Customizing Data -** Customizing data is data created by customers when they customize their systems

**3. User Master Record -** A user master record defines the authorizations assigned to a user. Basis consultants are responsible for maintaining the user master record and assigning authorizations.

## Advantages of Client concept

1. Clients enable SAP SAS providers to install a small number of SAP Systems, but still cater to a large number of customers.

2. Costs are not only saved by sharing hardware and software but multiple customers also use the same application solution, including administration and support.

3. Clients help establish your SAP landscape. For instance, you can have a client for the development team, a client for a test team and a production client.

## SAP comes with three "standard clients":

1. 000

2. 001

3. 066

**000 Client: -** We can find this client in the system as soon as we install SAP r/3 software. This is called master client. Client 000 contains a simple organizational structure of a test company and includes parameters for all applications, standard settings, and configurations for the control of standard transactions and examples to be used in many different profiles of the business applications. It contains client independent data.

**001 Client: -** This client is a copy of the 000 client including the test company. This client's settings are client-independent if it is configured or customized. People normally use 001 clients to create a new client.

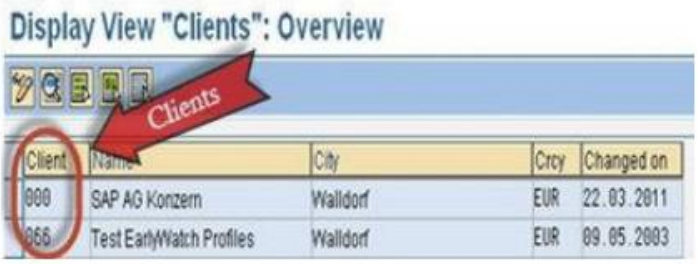
**066 Client: -** This client is called early watch client. The SAP early watch alert is a diagnosis service, for solution monitoring of SAP and non-SAP systems in the SAP Solution Manager. Alert may contain Performance issue, average response time, current system load, Database administration, etc.

# How to create a new Client

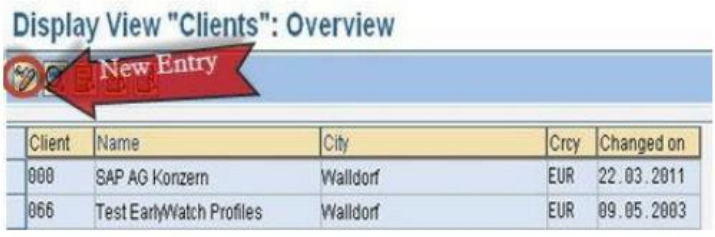
Theoretically, we can create clients from 000 to 999.But maintenance of such a large number of clients becomes a challenge.

**Step 1)** Execute T-Code **SCC4**


**Step 2)** It will bring you to the initial screen of SAP clients.




Click New Entry to make a new SAP Client



**Step 3)**

1. Enter basic details as given below.
    - Client number & description
    - City to which client Belongs (etc, NY-New York)
    - Logical system may be <Std>CLNT<Client Number>
    - Std Currency may be (etc EUR)
    - Client roles may be Customizing, Demo, Training/Education, Production, etc..

2. Enter your client specific data and set permission for the clients as per your requirement

3. Save

4. Press F3 to come back to **SCC4**


**Step 4)** New client will be there in the list. Here we have created client 100.

# Client Copy

## Client Copy

We can generate a blank client with SCC4.**But how to fill the data in the client? "Answer is the client copy."**

Client copy means **"transferring client specific data"** within the same instance(SID) or between different instances(SID).

Client copy can be performed with three different methods

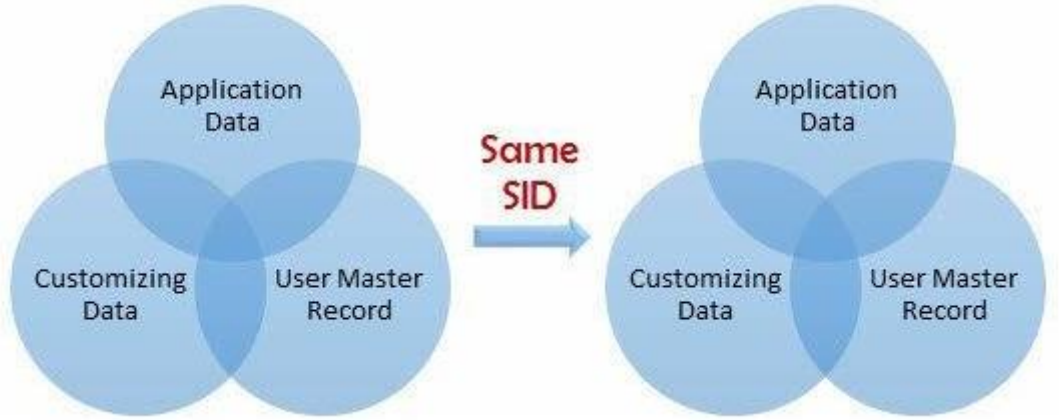
**1. Local client copy.**

**2. Remote client copy.**

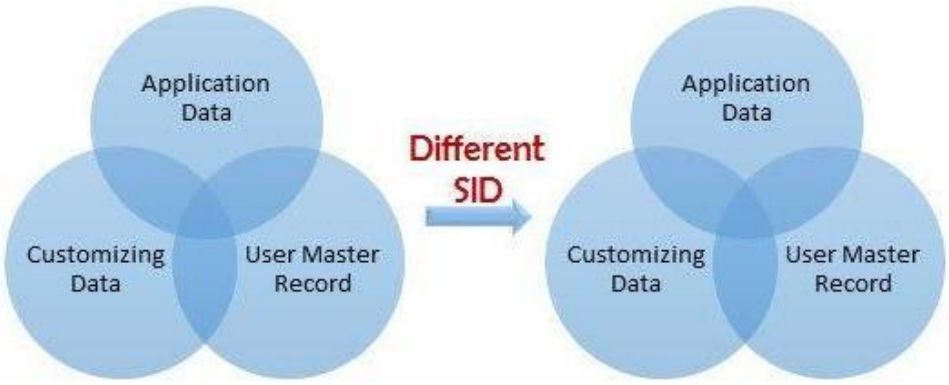
**3. Client Import/Export.**

Below brief details are given about client copy methods.

**Local Client Copy:** This method is used to copy client within the same instance (SID). It is done by T-code **SCCL.**




**Remote Client Copy:** This method is used to copy client between different instances(SID). It is performed by T-code **SCC9.**

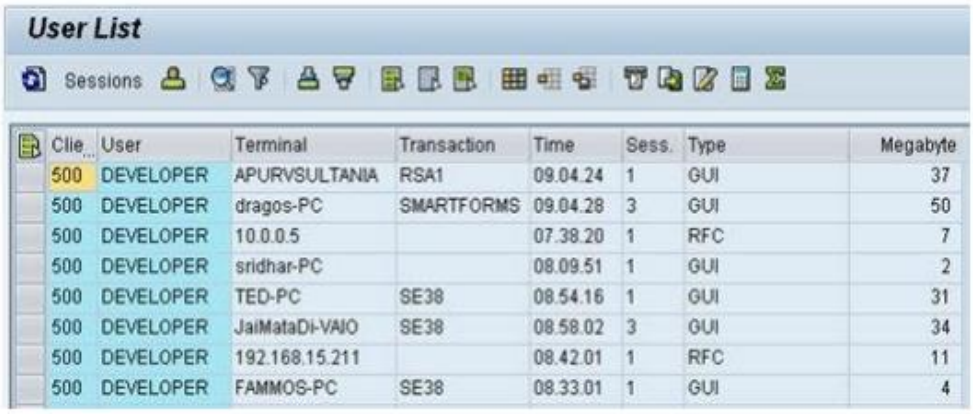



**Client Import/Export:** This method is used to copy client between different instances(SID). It is performed by T-code **SCC7/SCC8.**

## Client Copy Pre-steps

To avoid data **inconsistencies** there are few pre-steps to be performed before starting client copy:

1) **Disconnect and lock business users(SU10).** You can end the session of active users in the system through **SM04.** Once all users are logged out, check that no cancelled or pending update requests exist in the system.




| Clie... | User | Terminal | Transaction | Time | Sess. | Type | Megabyte |
|---|---|---|---|---|---|---|---|
| 500 | DEVELOPER | APURVSULTANIA | RSA1 | 09.04.24 | 1 | GUI | 37 |
| 500 | DEVELOPER | dragos-PC | SMARTFORMS | 09.04.28 | 3 | GUI | 50 |
| 500 | DEVELOPER | 10.0.0.5 | | 07.38.20 | 1 | RFC | 7 |
| 500 | DEVELOPER | sridhar-PC | | 08.09.51 | 1 | GUI | 2 |
| 500 | DEVELOPER | TED-PC | SE38 | 08.54.16 | 1 | GUI | 31 |
| 500 | DEVELOPER | JaiMataDi-VAIO | SE38 | 08.58.02 | 3 | GUI | 34 |
| 500 | DEVELOPER | 192.168.15.211 | | 08.42.01 | 1 | RFC | 11 |
| 500 | DEVELOPER | FAMMOS-PC | SE38 | 08.33.01 | 1 | GUI | 4 |

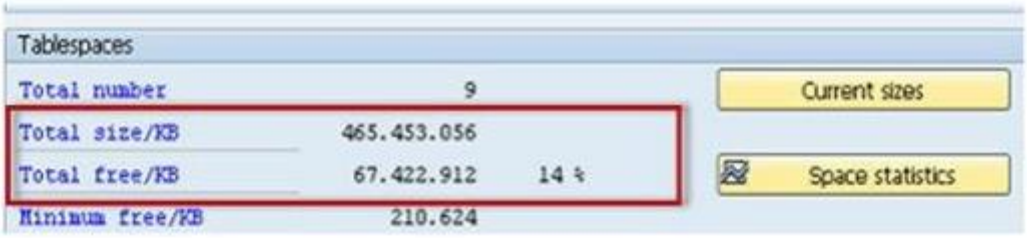
2) **Suspend all background jobs**

- Execute **SE38** as given below.


- Fill program name with **"BTCTRNS1"** as above figure.
- Press Execute.


3) **For a local copy, the system must have enough space in the database or table space.**

For remote copy, target system must have enough space in the database or table space. Check space using Tx **DB02**.




4) To avoid inconsistencies during client copy users should not be allowed to work in source client.

5) **rdisp/max_wprun_time** parameter should be changed to 2000 second as a SAP recommendation. Although you use parallel processes and schedule job in the background, dialog processes will be used.

# Local Client Copy

Local client copy is performed using Tcode **SCCL.**

**Note:** Here we have to Login Target Client.

**Eg:** Source Client (Default Client): 800

Target Client (Where we need to Transfer): 103

### Pre-Requirements

- Check out whether Source Client & Target Client Existing or not.
- If not Create Client using T-code as SCC4
- We have to Locked all Active Users in Source Client
- **Check out Size of Source Client & Target Client by using the T-code as SE38, Program as SPACECHECK**
- We have to **Pause all Background Job's by using T-code as SE38**

**Scenario:**

- Source Instance & client: = DKM-000
- Target Instance & client: = DKM-202

**Step 1)** Create an entry for your new target client using **SCC4**. In our scenario, we will create client 202 in DKM system. Log on to this newly created target client **(DKM-202)** with user SAP* and default password pass.

**Step 2)** Execute T-code **SCCL.**

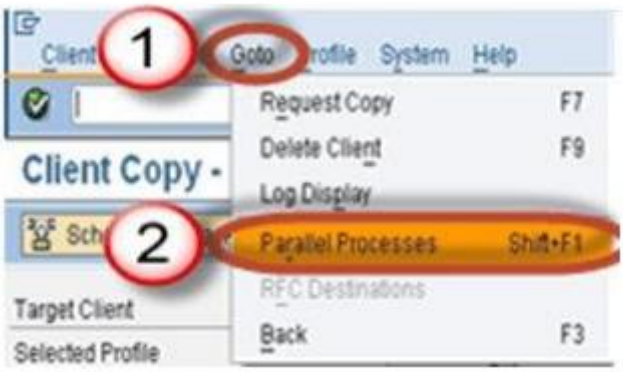

**Step 3)**

- Select your desired profile
- Enter Source client.
- Enter Description


**Step 4)** By default Client Copy is executed as a single process. A Single process will take a lot of time. We will distribute the workload of single the process to parallel(multiple) processes which will reduce time in copying a client.

1. Select **GoTo** from the menu bar.

2. Select **Parallel Process**. Parallel processes are used to exploit the capacity of database better




**Step 5)** Always execute long running processes in background mode rather than foreground/dialog mode. In fact, some processes run more quickly in the background.


**Step 6)** The client copy logs are available in **SCC3.** Status - **"Successfully Completed"** means client copy is completed.


# Remote Client Copy

This technique uses Remote function call. You can view RFC from SM59. This technique depends on the network, so network connectivity must be strong enough.

**Note:** Logon with Target Client

**Eg:** Source Client 800 Target Client 1 0 1

## Pre-requisites:

- For this we require Logical System & RFC
- 1st we need to check whether client having Logical System or not (In Source Client). If not, we have to create Logical System with the T-code as **BD54**
- 2nd we need to check whether client having RFC or not. If not, we have to create the RFC with T-code as **SM59** (In Source Client)

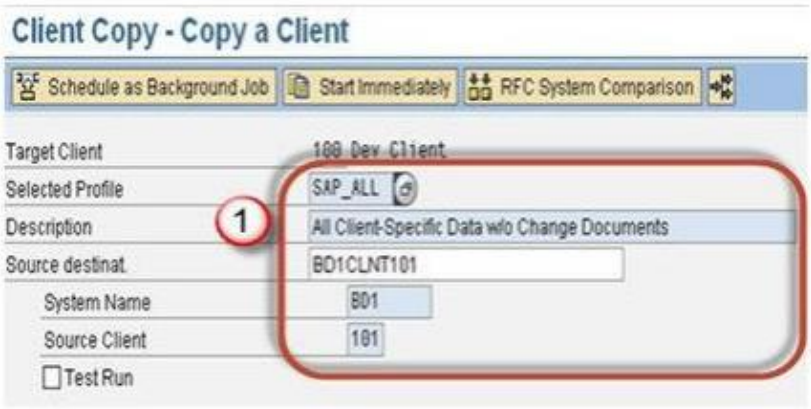
**Scenario:**

- Source Instance & client: = **BD1-101**
- Target Instance & client: = **DKM-202**

**Step 1)** Log on to the target system. Here we will log on to DKM system. Create a new target client entry (202) using **SCC4**. Log on to this new target client with user **SAP*** and default password **"pass".** Here we will log on to DKM-200 system.

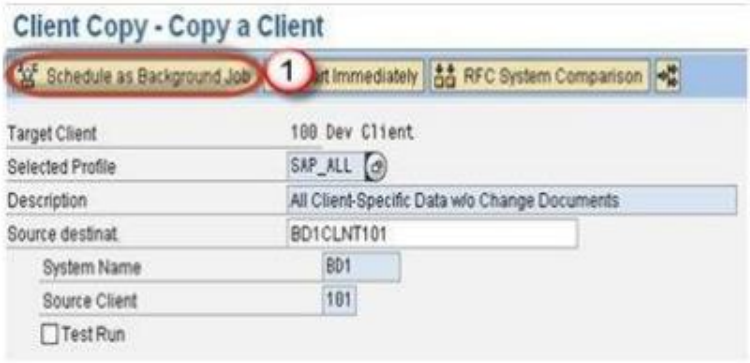
**Step 2)** Execute Transaction Code **SCC9.**


**Step 3)** Fill the basic details as per your requirement.

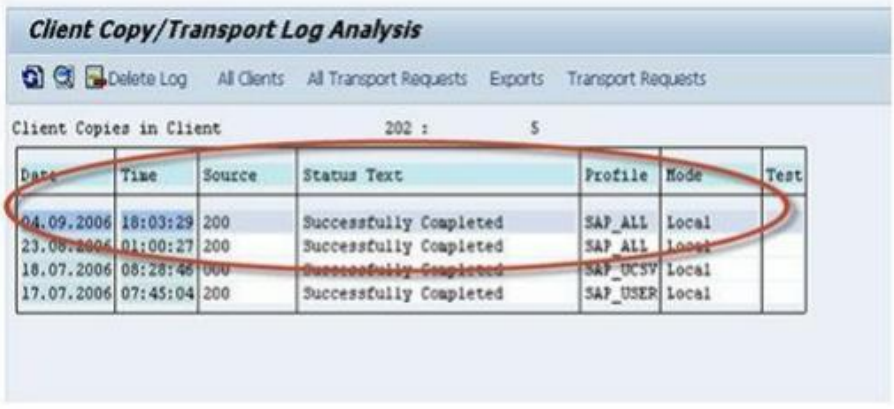



**Step 4)** Select Parallel Process. Parallel processes are used to exploit the capacity of database better.


**Step 5)** Schedule the client copy in background




**Step 6)** The client copy logs are available in **SCC3** as given below.



# Client Import/Export

For large database, it is recommended to use client import/export instead of remote client copy.

Scenario:

Source Instance & client: = PKT-300

Target Instance & client: = DKM-202

This technique always starts with client **export** step.

**Note:** You must have enough space in the **/usr/sap/trans_SID** file system to perform the client export.

In SAP command line enter T-code as **SCC8/ SCC7 (Client Export/Import)**

## How to export client

Step 1) Log on to the target system(DKM). Create an entry for your new target client using **SCC4**. Log on to the source system/source client(PKT).

Step 2) **Before you import a Client you need to export.** Export is nothing but transferring data files and co-files from source system's database to target system's import buffer. Execute T-code **SCC8.**


**Step 3)**

- Select profile
- Choose target system.


**Step 4)** Schedule the export in background


**Step 5)** Once the job is executed data files and co-files of profiles from **PKT system's database are transferred to DKM** system's import buffer. Once we will import request in DKM only then it will be reflected in a database of **DKM** system.

Depending on the chosen export profile there can be up to 3 transport requests created:

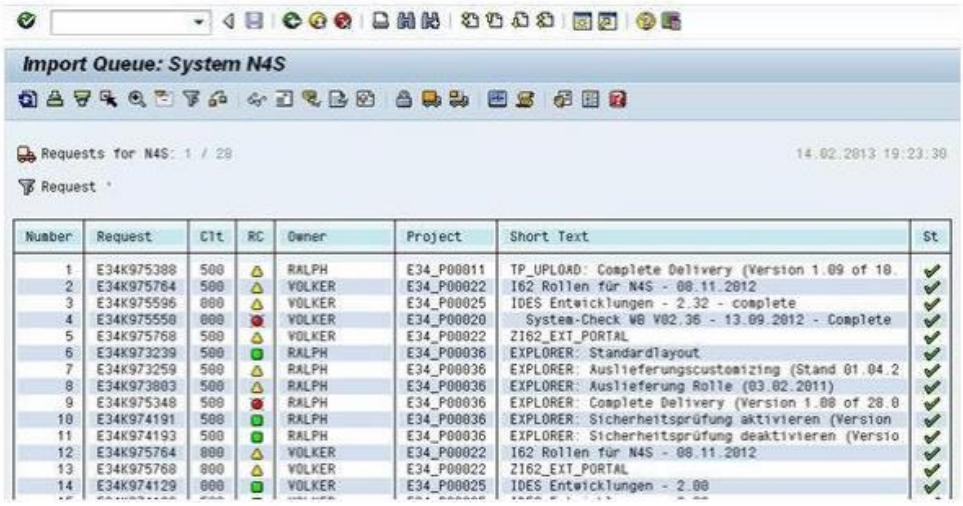
- Request PKTKO00151 will hold the cross-client data,
- Request PKTKT00151 will hold the client dependent data,
- Request PKTKX00151 will also hold some client dependent data.

# How to import the Client

**Step 1)** Log on to the newly created target client(DKM-202) using SAP* and password pass.

**Step 2)** Start the **STMS_IMPORT** transaction


As shown below, import queue will open



**Step 2)** Select the transport requests generated by client export. Import theses transport requests on the target client.

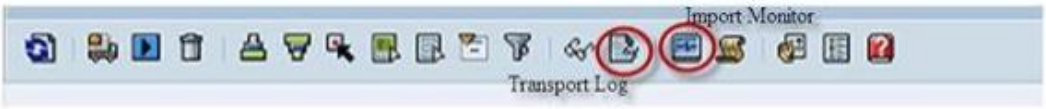
The transport requests should be imported in the following sequence:

1. Request PKTKO00151

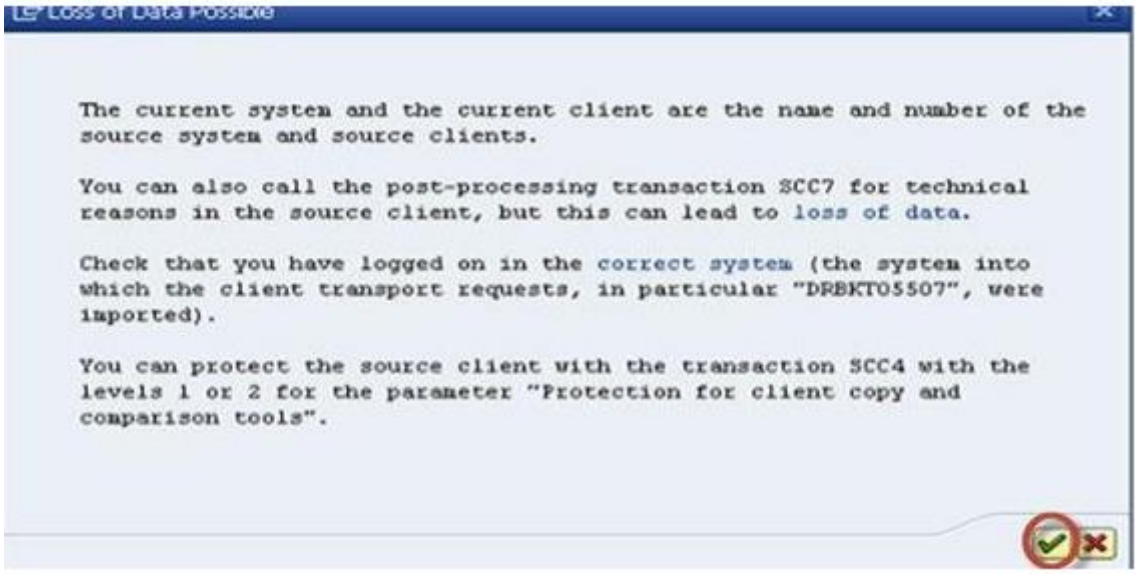
2. Request PKTKT00151

3. Request PKTKX00151 The system automatically detects these are client export transport requests and automatically performs the import of the 3 requests.

The import logs can be seen in **STMS_IMPORT.**




**Step 3)** Post import phase: - Once the import is done, execute **SCC7** to perform the post client import actions,




Schedule the post import job in background.


**Step 4)** Import log will be available in **SCC3.** The Client is successfully imported.

# Client Deletion

Following are the detailed steps to Delete a client in SAP

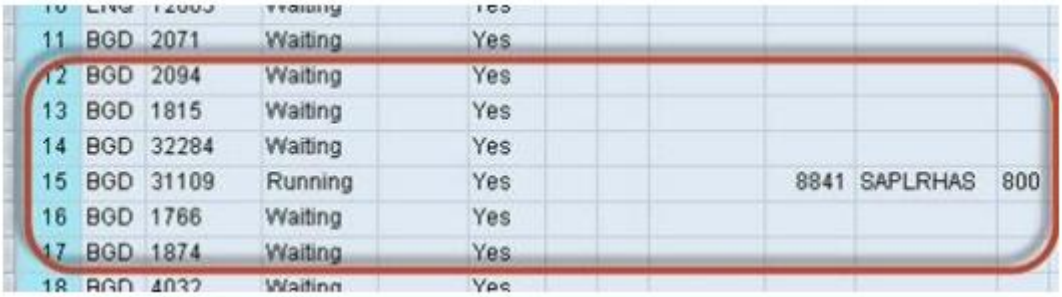
**Step 1)** T-code which is used for client deletion is **SCC5.**


**Step 2)** Click on "delete in the background" to run client deletion as background job. You can also check the option **"Delete an entry from T000"** table.


Table "T000" contains clients' entry which we have created in **SCC4.**


**Step 3)** Check the status of client deletion process using **SM50.**

Work process overview will open. **"BGD"** denotes background work process.



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11 | BGD | 2071 | Waiting | Yes | | | | |
| 12 | BGD | 2094 | Waiting | Yes | | | | |
| 13 | BGD | 1815 | Waiting | Yes | | | | |
| 14 | BGD | 32284 | Waiting | Yes | | | | |
| 15 | BGD | 31109 | Running | Yes | | 8841 | SAPLRHAS | 800 |
| 16 | BGD | 1766 | Waiting | Yes | | | | |
| 17 | BGD | 1874 | Waiting | Yes | | | | |

Once complete. Client will be deleted

# Create a New User

Following are the detailed steps to Create a user in SAP

**Step 1)** Execute T-code **SU01**


**Step 2)**

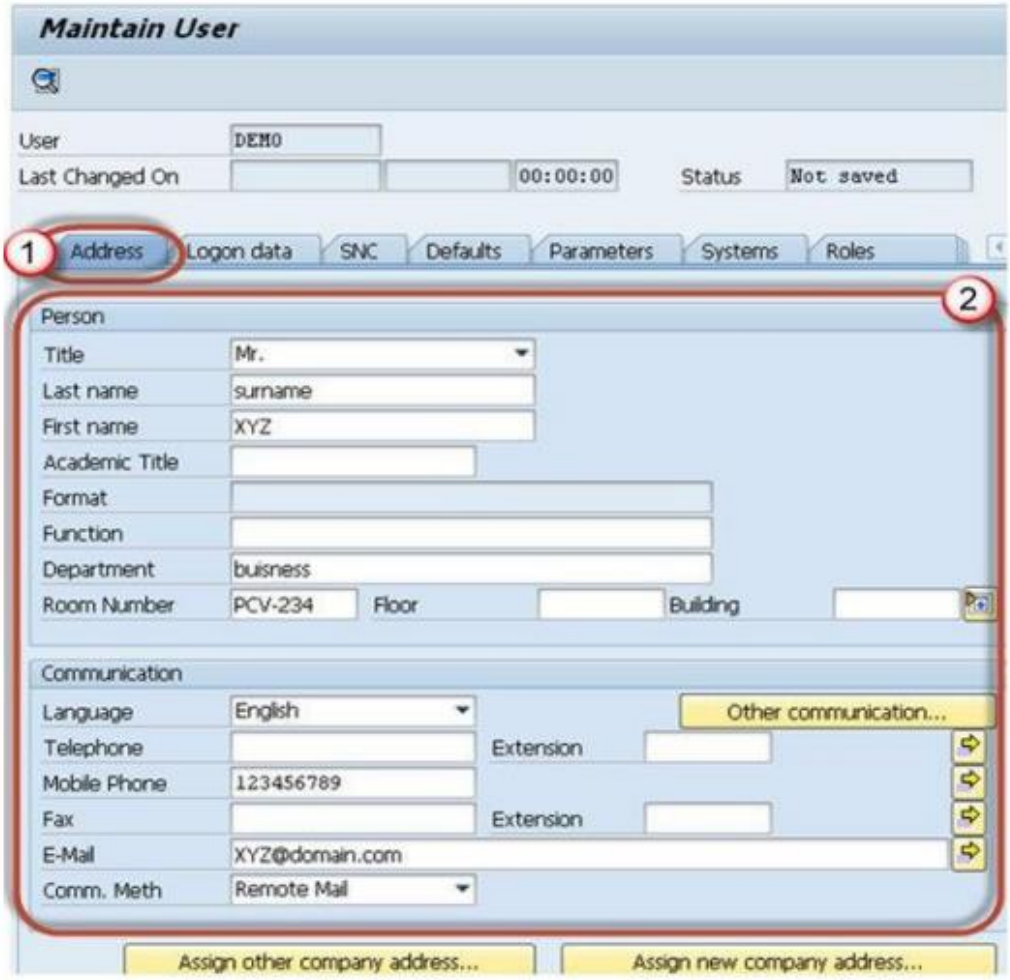
1. Enter **Username** which you want to create.

2. Click the create button


**Step 3)** In the next screen

1. Click the Address tab.

2. Enter Details




**Step 4)** Choose the user type in Logon Data tab.

**There are 5 different user types available in SAP system.**

**1 Communication**
**2 Dialog**
**3 Reference**
**4 Service**
**5 System**

## Communication Users

Users are not allowed/possible to logon using SAP GUI and can't able to access the data through SAP GUI screens. Users are allowed to change the password if expired using external link.
SAP system always checks for the password expiry, initial password and prompts when it requires to change depends on the logon method (interactive or non-interactive).
These users main purpose is to use for external RFC calls. These users can access the SAP system data through frontend or external applications.

**This user is used for external RFC calls.**

## Dialog Users

Users are allowed to logon using SAP GUI and can able to access the data through SAP GUI screens. System validates the password expiration, initial password and multi-logons.
The user can change the password by their own using SAP GUI. These users are individual users and individual personalized system access allowed.

**This user is used for interactive system access from GUI.**

## Reference Users

Users are not allowed/possible to logon using SAP GUI and can't able to access the data through SAP GUI screens. System doesn't check for initial password and password expiration.
Users for general, non-person related which allows the assignment of additional authorizations to the users like internet users. These users used to give authorization to other users.

**It is not possible to log on to the system with this user type. User type for general, non-person related users that allows the assignment of additional authorizations.**

## Service Users

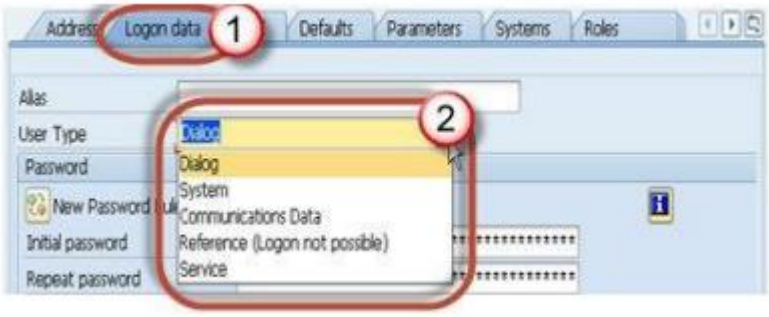
Users are allowed to logon using SAP GUI and can able to access the data through SAP GUI screens. System doesn't check for initial password and password expiration.
Multiple logins are allowed for this kind of users. Users are not allowed to change the password and only administrator can change the password. These users have very restricted/minimum authorizations.
There type users are created for anonymous users. After an individual authentication, an anonymous session begin with service user can be continued as person-related session with a dialog user.

**This user is created for a larger and anonymous group of users.**

## System Users

Users are not allowed/possible to logon using SAP GUI and can't able to access the data through SAP GUI screens. System doesn't check for initial password and expiration of password. Users are related System-related and internal system processes. The password change requirement does not apply to these user's passwords and it cannot be initial or expired. Only user administrator can change the password and multiple logons are permissible. These users are for background processing, external and internal RFC calls.

**This user is used for background processing, communication within a system.**




Step 5) Type the **initial password** for 2 times.

On first logon of the new user, system will ask to re-set the password.


**Step 6)**

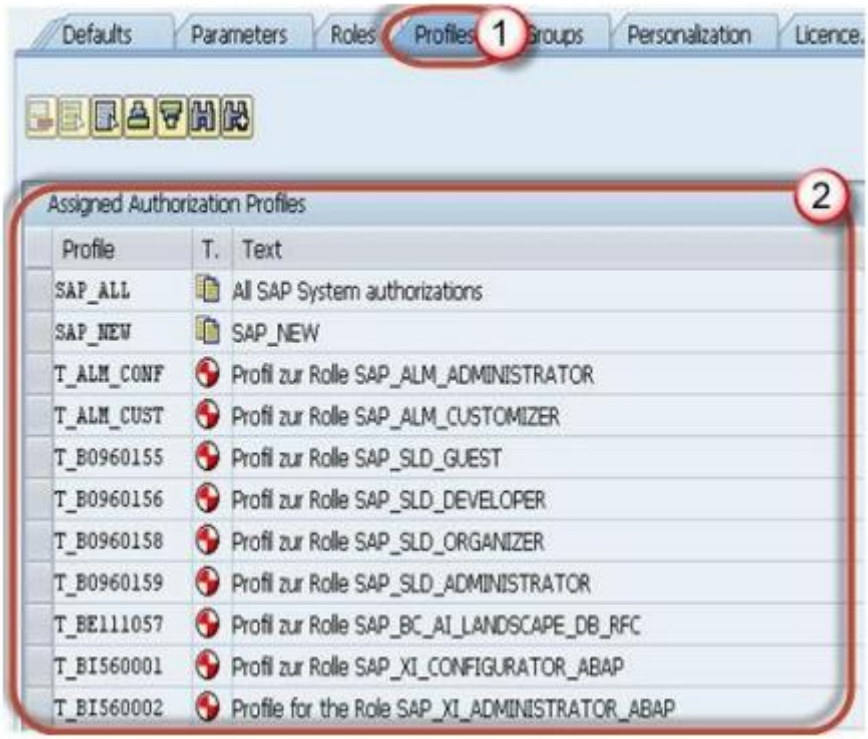
1. Select the roles tab

2. Assign roles as per requirements

**Step 7)**

1. Select the **profiles** tab

2. Assign profiles as per requirements




You can assign **SAP_ALL** and **SAP_New** profile to user for full authorization.

- **SAP_ALL:** You assign this profile to users who are to have all R/3 authorizations, including super-user authorization.
- **SAP_NEW:** You assign this profile to users who have access to all currently unprotected components. The SAP_NEW profile grants unrestricted access to all existing functions for which additional authorization checks have been introduced. Users can therefore continue to work uninterrupted with functions which are subject to new authorization checks which were not previously executed.

**Step 8)**

1. Press save
2. Then the **back button (F3)** button


User will be created!

# Users Lock & Unlock

## Locking a user

The Purpose of locking user is to temporarily deactivate the users so that they cannot longer access the system.

Users can be locked in 2 ways:

- Automatically
- Explicitly/Forcefully

**Automatically:** There are two possibilities when users get lock automatically

- Maximum number of failed attempts: - controlled via the parameter login/fails_to_user_lock. If a value is set to 3 it means after 3 failed attempts user will be locked.
- Auto unlock time: - "login/failed_user_auto_unlock" defines whether user locked due to unsuccessful logon attempts should be automatically removed at midnight.

**Explicitly/Forcefully:** We can lock and unlock users in 2 ways

**1. Lock single user (SU01)**

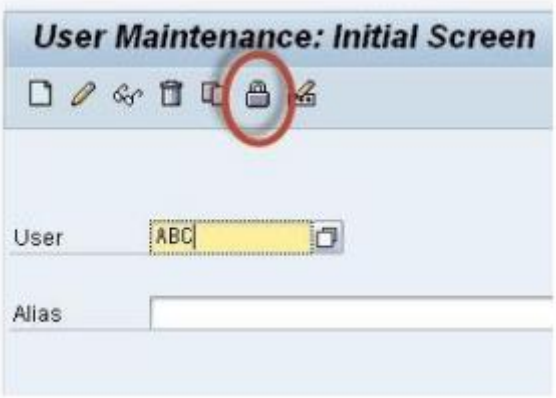
**2. Lock multiple user (SU10)**

## Procedure to lock a single user

**Step 1)** Execute T-code **SU01**


**Step 2)** Enter a username in **User** field.

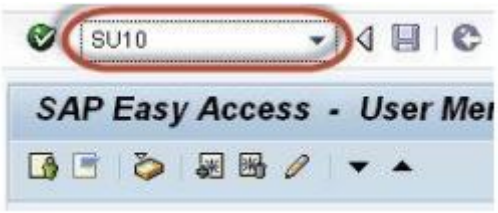

**Step 3)** Press **Lock/Unlock** button



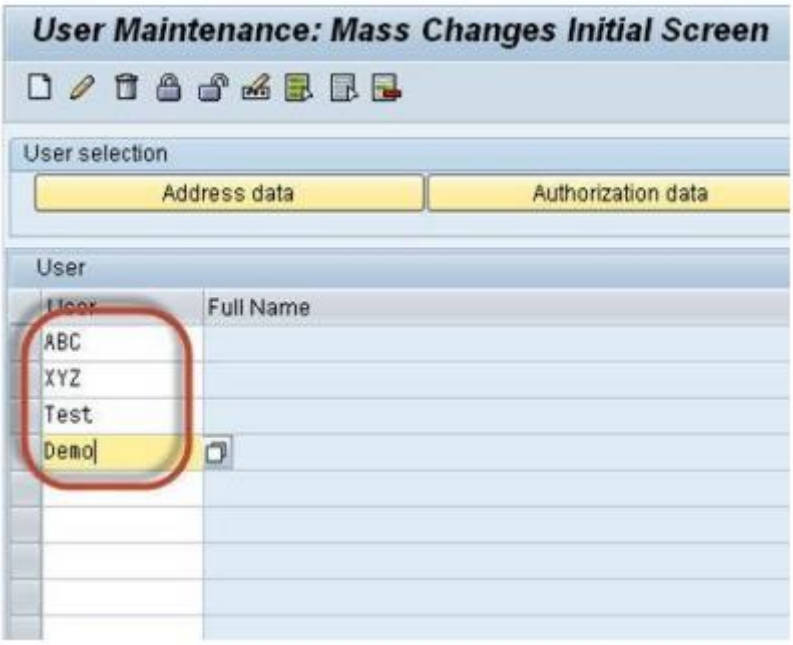

**Step 4)** In the next screen, Press **Lock** button again to lock the user.


# Procedure to lock multiple users

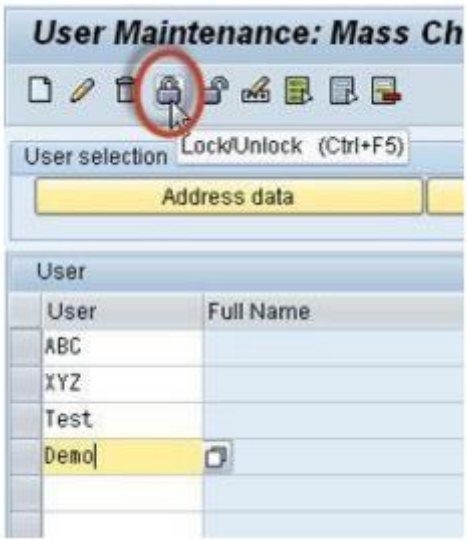
**Step 1)** Execute T-code **SU10**




**Step 2)** Enter users a username in **User** field.




**Step 3)** Press **Lock/Unlock** button

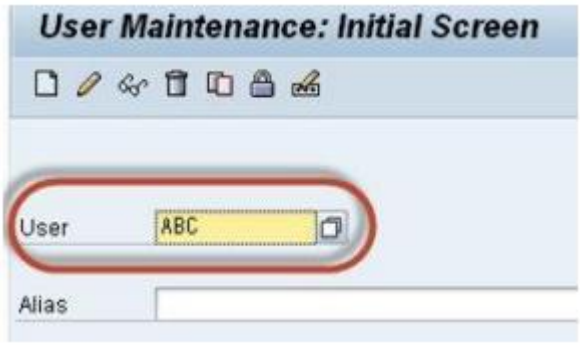



All the users listed will be locked

# Procedure to unlock a user

**Step 1)** Execute T-code **su01**


**Step 2)** Enter username in **User** field.



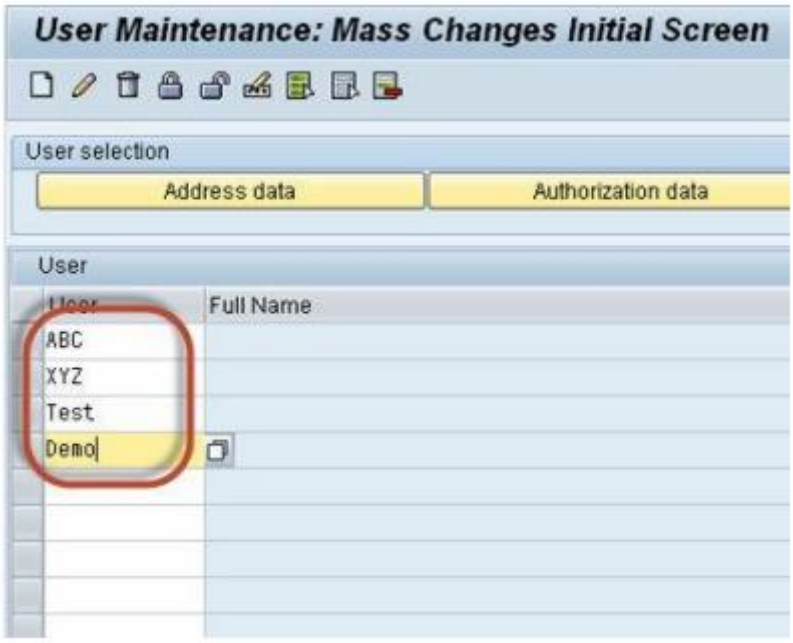

**Step 3)** Press **Lock/Unlock** button


**Step 4)** Press **Unlock** button

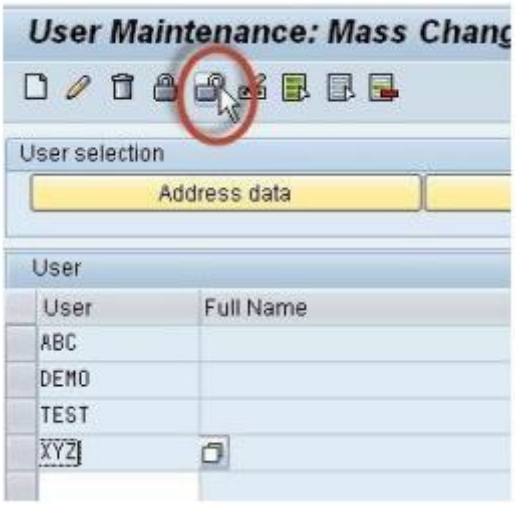

# Procedure to unlock multiple users

**Step 1)** Execute T-code **SU10**


**Step 2)** Enter users' username in **User** field.




**Step 3)** Press **Unlock** button




Users will be unlocked

# Logon Limit Attempts

Before we learn to limit logon attempts we need to know parameter

## What is a parameter

**Parameter** is the set of keys and values to manage the SAP system. There are two types of parameters

**1. Static: -** It needs a restart. It doesn't effect to the system immediately once you set the value for it.

**2. Dynamic: -** It does not need restart. It effects to the system immediately once you set the value for it.

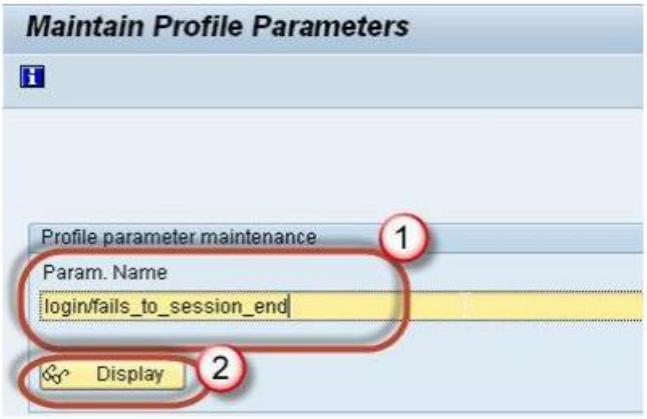
# How to view a Parameter?

**Step 1)** Execute T-code **RZ11**.

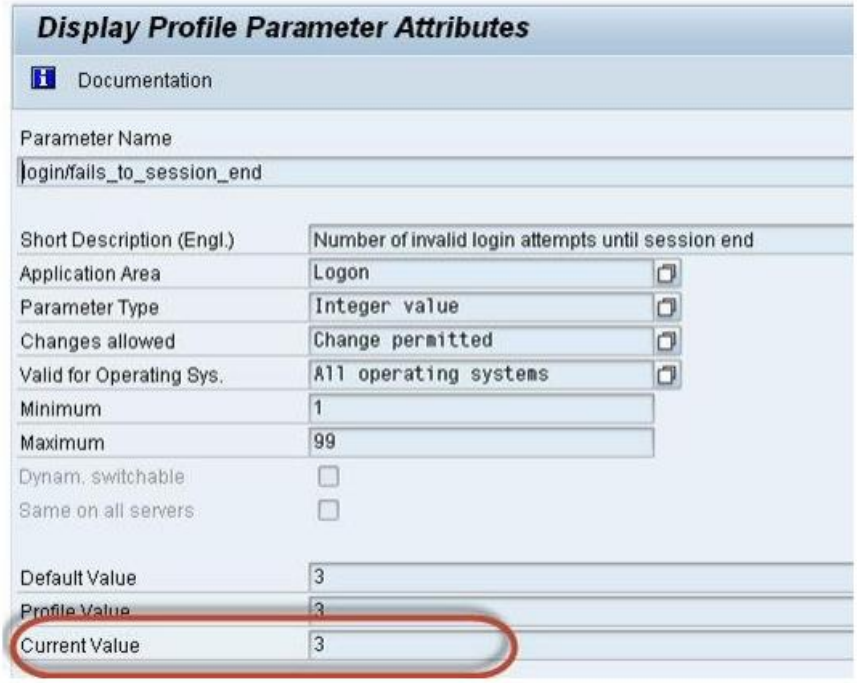

**Step 2)**

1. Put parameter name **"login/fails_to_session_end"** in text field. You can put any Parameter name.

2. Click Display




**Step 3)** The screen below shows the current value set for the parameter by the admin




In order to change a parameter, click the pencil icon and make desired changes.

## Important Parameters to limit login attempts

- **login/fails_to_session_end:** This parameter specifies the number of times that a user can enter an incorrect password before the system ends the logon attempt. The parameter is to be set to a value lower than the value of parameter
- **login/fails_to_user_lock:** This parameter specifies the number of times that a user can enter an incorrect password before the system locks the user against further logon attempts. Default value is 12. You can set it to any value between 1 and 99 inclusive.

## Incorrect Login Parameters

- **login/fails_to_session_end:** Specifies the number of unsuccessful logon attempts. The system does not allow any more logon attempts.
  The parameter set to be a value lower than the login/fails_to_user_lock value. The default value is 3. The allowed values are 1 to 99.
- **login/fails_to_user_lock:** Specifies the number of unsuccessful logons attempts before the system locks the user. The default value 5. The allowed values are 1 to 99.
- **login/failed_user_auto_unlock:** Specifies whether user locks due to unsuccessful logon attempts should be automatically removed at midnight. The default value is 0 (locks due to incorrect logon attempts remain in force for an unlimited period). The allowed values are 0 or 1.

# Password Restrictions

Every user requires a configured userid and password to access the SAP system. Initially, the password configured by the SAP system administrator.
On the first logon, user needs to change the password according to the rules/restrictions configured in the system by administrator. The rules/restrictions are configured in the system with some set of the parameters. The parameters with password rules are called as password rules parameters.

## Password rules parameters

| Parameter | Description |
|---|---|
| login/min_password_lng | Specifies the minimum length of the password. The default value is 6. The allowed values are from 3 – 40. |
| login/min_password_digits | Specifies the minimum number of digits (0-9) in passwords. The default value is 0. The allowed values are from 0 – 40. |
| login/min_password_letters | Specifies the minimum number of letters (A-Z) in passwords. The default value is 0. The allowed values are from 0 – 40. |
| login/min_password_lowercase | Specifies the number of characters in lower-case letters a password must contain. The allowed values are from 0 – 40. The default value is 0. |
| login/min_password_uppercase | Specifies the number of characters in upper-case letters a password must contain. The allowed values are from 0 – 40. The default value is 0. |
| login/min_password_specials | Specifies the minimum number of special characters in the password. The special characters allowed are !"@ $%&/()=?'`*+~#-_.,;:{[]}\<>\| and space and the grave accent. The default value is 0. The allowed values are from 0 – 40. |

| | |
|---|---|
| login/password_charset | This parameter specifies the password characters set. Allowed values are:<br>• 0 (restrictive): The password can consist only following (ASCII) special characters: !"@ $%&/()=?'*+~#-_.,;:{[]}\<>\| and space and the grave accent.<br>• 1 (backward compatible, default value): The password can consist of any characters including national special characters (ISO Latin-1, 8859-1).<br>• 2 (not backward compatible): The password can consist of any characters.<br>There are some other set of parameters with rules which are in effect when changing the password in the SAP system. Those parameters are called as password changes parameters. |

## Password changes parameters

| Parameter | Description |
|---|---|
| login/min_password_diff | Specifies the minimum number of characters that must be different in the new password compared to the old password. The default value is 1. The allowed values are from 1 – 40. |
| login/password_expiration_time | Specifies the validity period of passwords in days. The default value is 0. The allowed values are from 0 – 1000. |
| login/password_history_size | Specifies the number of passwords that the system stores and that the user cannot use again. The allowed values are from 1 – 100. The default value is 5. In this unit is number of entries. |
| login/password_change_waittime | Specifies the number of days that a user must wait before changing the password again. The allowed values are from 1 – 1,000. The default value is 1. In this unit is days. |

## Table USR40: Specifying Impermissible Passwords

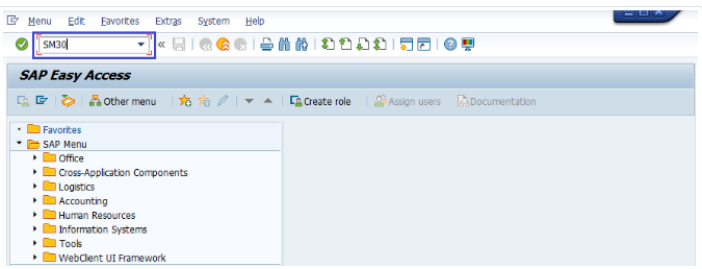
Users can be prevented from choosing passwords that administrator/company do not want to allow. Table USR40 contains the prohibited rules for the users.
To add new restriction, the restriction should be entered in table USR40. To maintain the table USR40, SM30 transaction can be used. There are two wildcard characters:
• ? - Specifies a single character
• * - Specifies a sequence of characters in any combination of any length.

**Example**

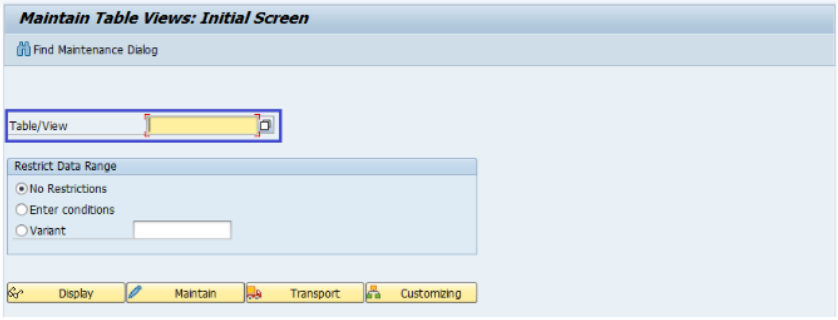
• 567* - Rejects any password that begins with the sequence “567”.
• *567*- Rejects any password that contains the sequence “567.”
• KL? - Rejects all passwords that begin with “KL” and have one additional character like “KLA”, “KLB”, “KLC” and so on.

## Table USR40: Adding new restriction

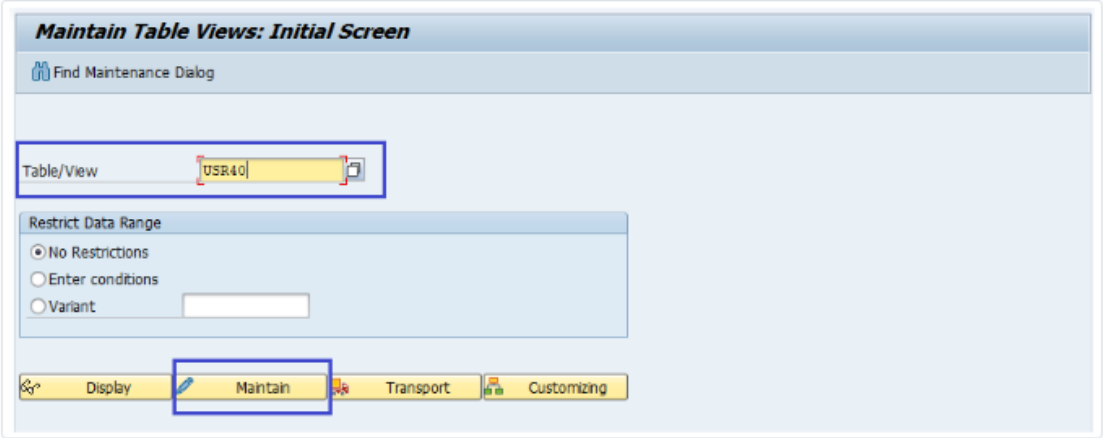
**Step-1:** Go to SM30.



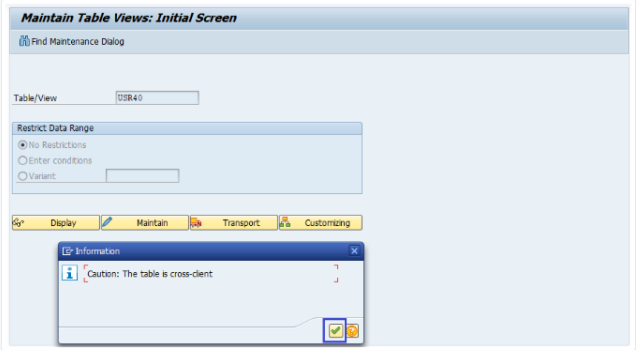
**Step-2:** It navigates to the "Maintain Table Views: Initial Screen".



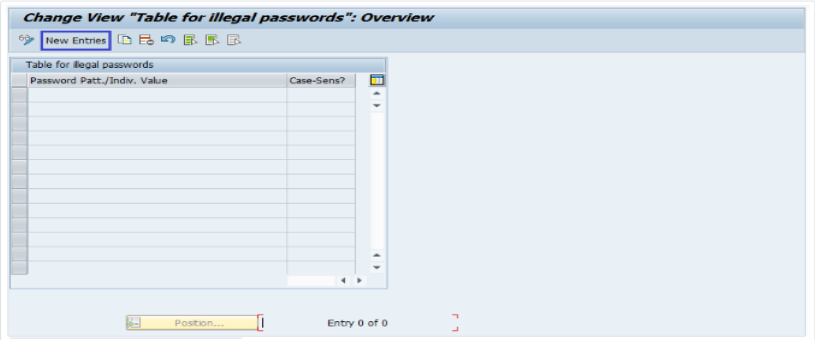

**Step-3:** Enter USR40 in the "Table/View" field. Click on the maintain icon.



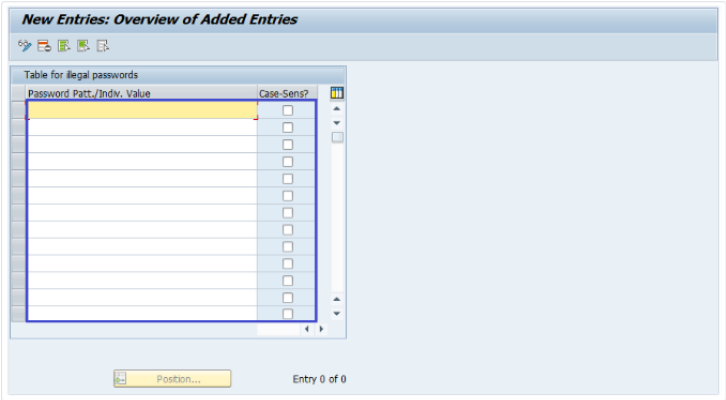

**Step-4:** It displays an informational dialog box showing a caution like below. Click on tick mark.



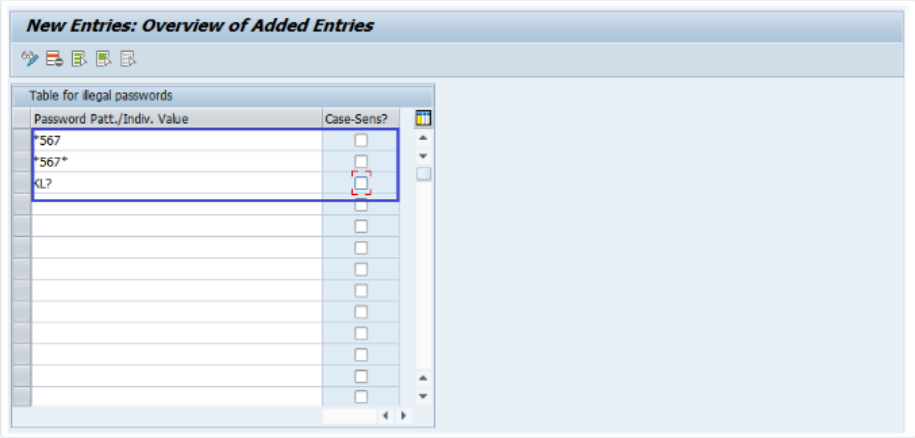

**Step-5:** Click on the new entries in the below screen to add a restriction.



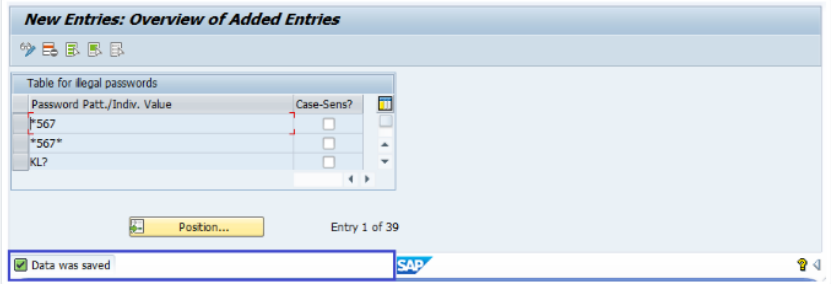

**Step-6:** Now the table is editable.




Enter the restrictions to the table below and click on save to restrictions become active.




**Step-7:** It prompts for a workbench request. Click on the right mark to proceed. Once the work bench request completed, all the restrictions added in effect.



# Background Job Create, Schedule, Reschedule

## What is a Background Job

Background job is a non-interactive process that runs behind the normal interactive operations. They run in parallel and do not disturb interactive (foreground jobs) processes and operations.

It is scheduled from **SM36**. You can analyse it from **SM37** by viewing its job log.

## Advantages of Background Jobs

- It reduces manual effort & automates the task.
- It can be scheduled as per user's choice.
- It reduces user interaction and can run seamlessly in the background without user input
- Once you define the variant for background job, the user doesn't have to worry about value input in the field. Thus, user confusion is also reduced.
- Ideal for time- consuming/resource intensive programs which can be scheduled to run in the night (when system load is low).

## Background jobs are classified into three categories

**1. Class A (High/critical Priority): -** Some tasks are urgent or critical and must be scheduled with class A priority job. Class A priority reserves one or more background work processes. Users have to decide how many background work processes should be assigned to Class A priority job. Suppose a user chooses 2 background work processes for this category then available background work processes for class B and C = (Total number of work processes set in operation modes RZ03)- (Background work processes allowed to class A category).

**2. Class B (Medium Priority): -** Once Class A jobs are completed, Class B job will start executing in the background before class C jobs.

**3. Class C (Low Priority): -** It runs after both class A and class B jobs are completed.

## Possible status of background jobs

**1. Scheduled: -** You have defined the program name and variant but not defined start condition like Start Date, End Date, Frequency etc. That means you have not defined when a job should be scheduled in system.

**2. Released: -** All required criteria are fulfilled for job definition. Start condition is must for the job to be in release status.

**3. Ready: -** All the required conditions are met to run the job in a background work process. But job scheduler has put the job in the queue because it is waiting for background work process to be free.

**4. Active: -** Job has started running in the background. We cannot change the status of the job once it is in Active status.

**5. Finished: -** Job is executed successfully. It means the desired task is competed without any error.

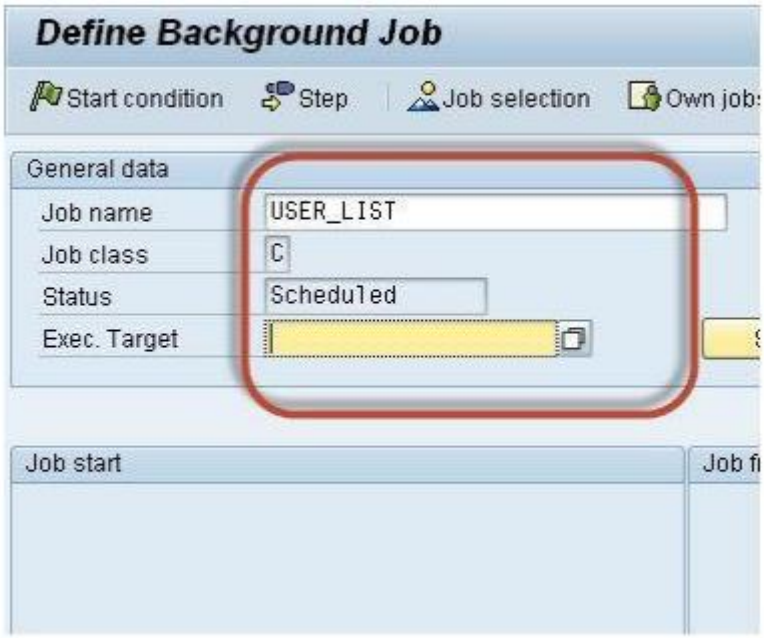
**6. Cancelled: -** There are two possibilities for this. The Administrator has forcefully cancelled the job or there might be some issue with job. You can investigate this from Job logs.

# How to schedule the background job

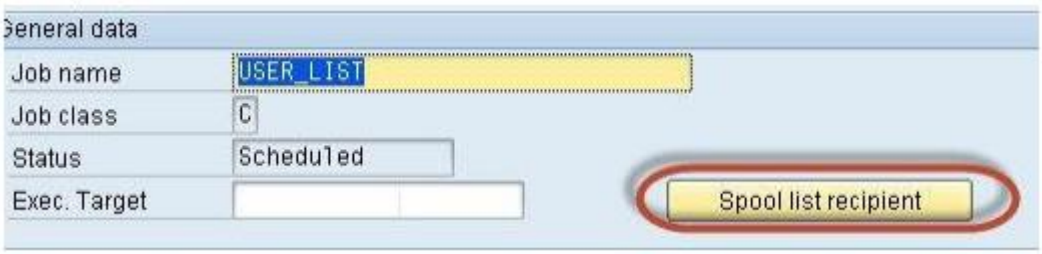
You can schedule the background job using SM36. Planned or immediate jobs can be scheduled.

**Step 1)** Execute T-code SM36.

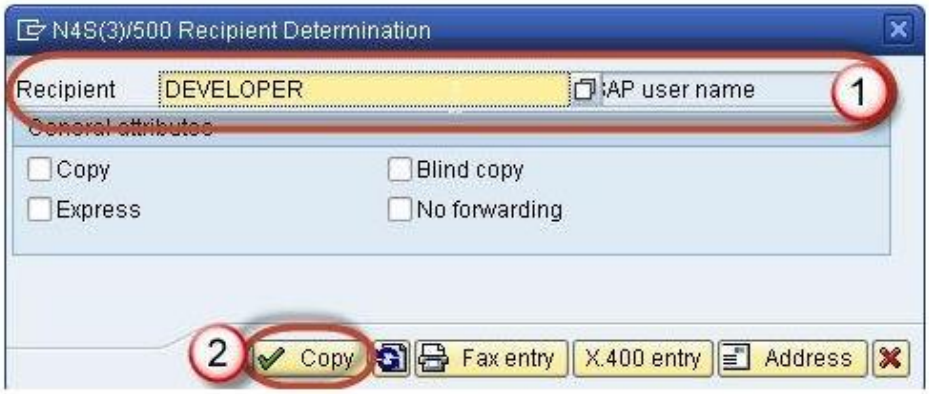

**Step 2)** Fill the job name, priority **(A/B/C)** and the target server. Background jobs once scheduled on a target server run on that server. Main purpose of defining target server is the workload balancing.




**Step 3)** Click on **"spool list recipient"**. You will get output in your mailbox. You can check email from **SBWP**.




**Step 4)** Insert your **SAP** username and click the copy button.



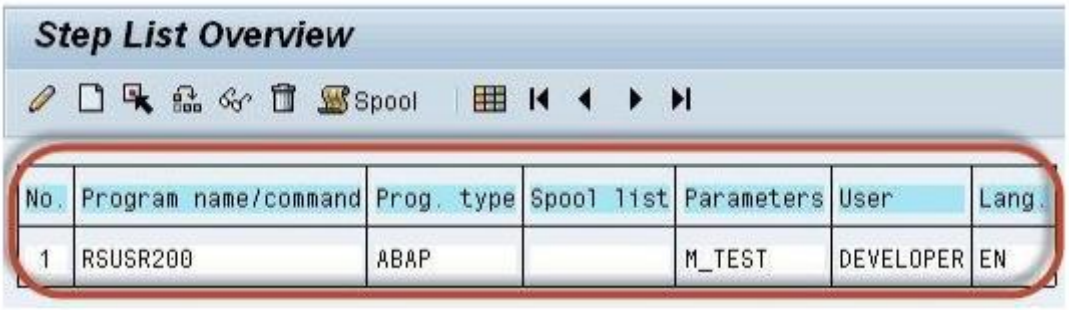

**Step 5)** Click **Step** button to define ABAP program, variant's details, etc.


**Step 6)** Define program name, variant details.

1. Enter your program name, Variant name in the field. If you have not created variant as per your requirement, then leave it blank.

2. Press save button.

**Step 7)** Once you schedule the job you will get the following screen.

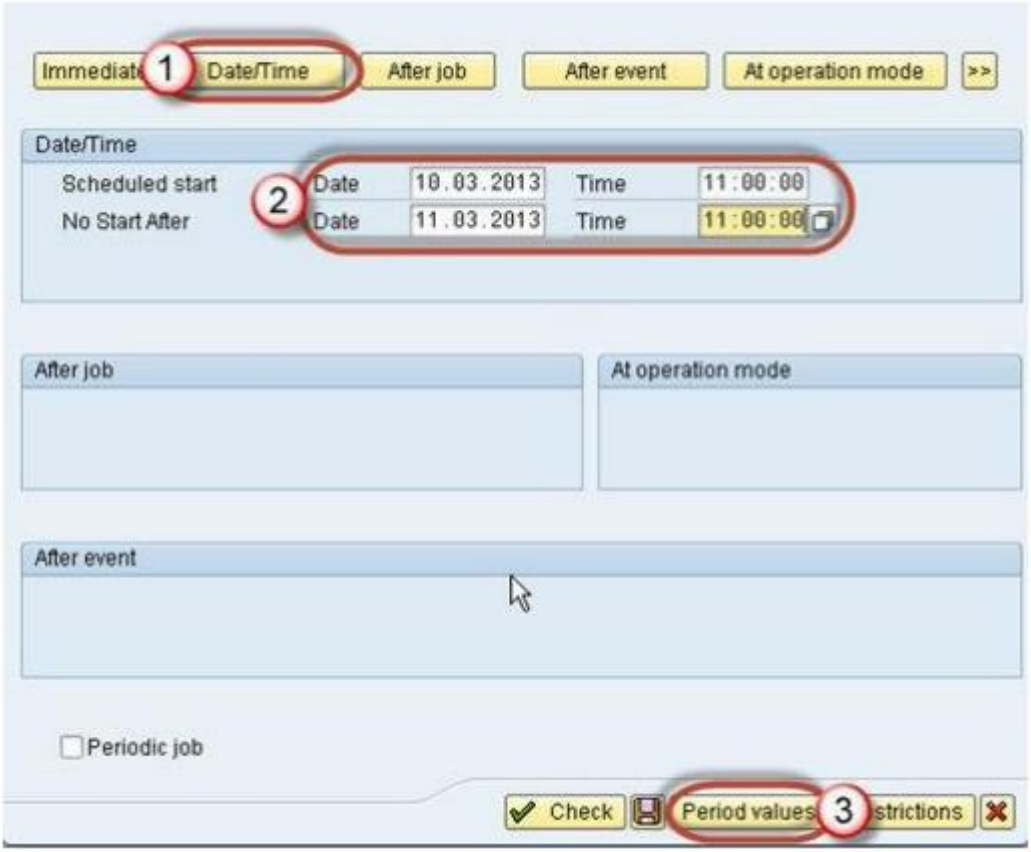



**Step 8)** Click Start conditions to fill start date, end date, frequency, etc. for job. If you do not specify start condition, **then job will always remain in scheduled status.** A job in scheduled status will never run.

1. Click on Date/Time (For periodic jobs). If you click "Immediate" then job will start running right away. But it will not be set as periodic job. It's like "press and run."

2. Define job's start date/time, end date/time. The job will be released only once it meets its Scheduled start date/time.

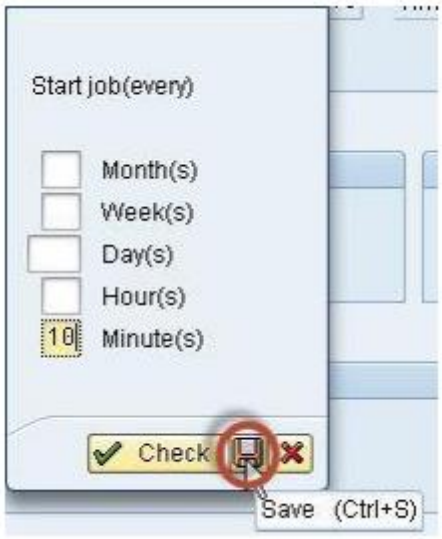
3. Press periodic values.




**Step 9)** Click on Hourly/Daily/Weekly period to define the frequency of the job as per your requirement. We will select Other Period

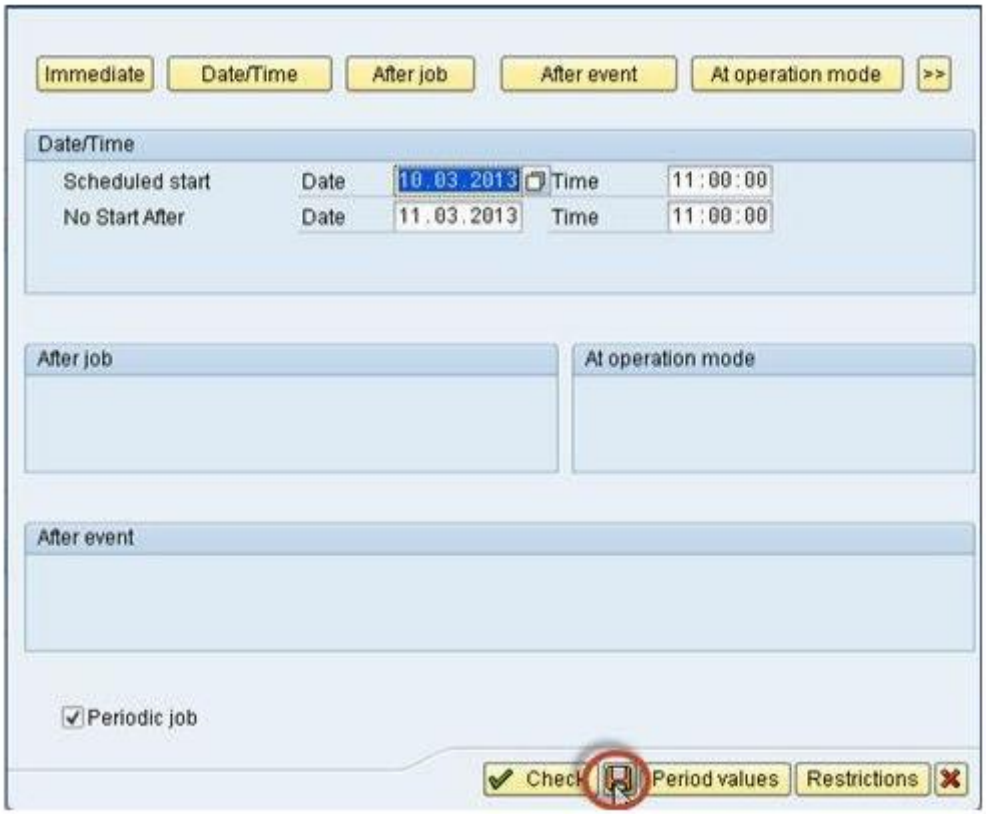

**Step 10)** Here you specify the recurring criteria of the job. For example, you can have the Job run after every 5 days from the Start Date. Here we select job to run every 10 minutes.


**Step 11)** Click on save button.

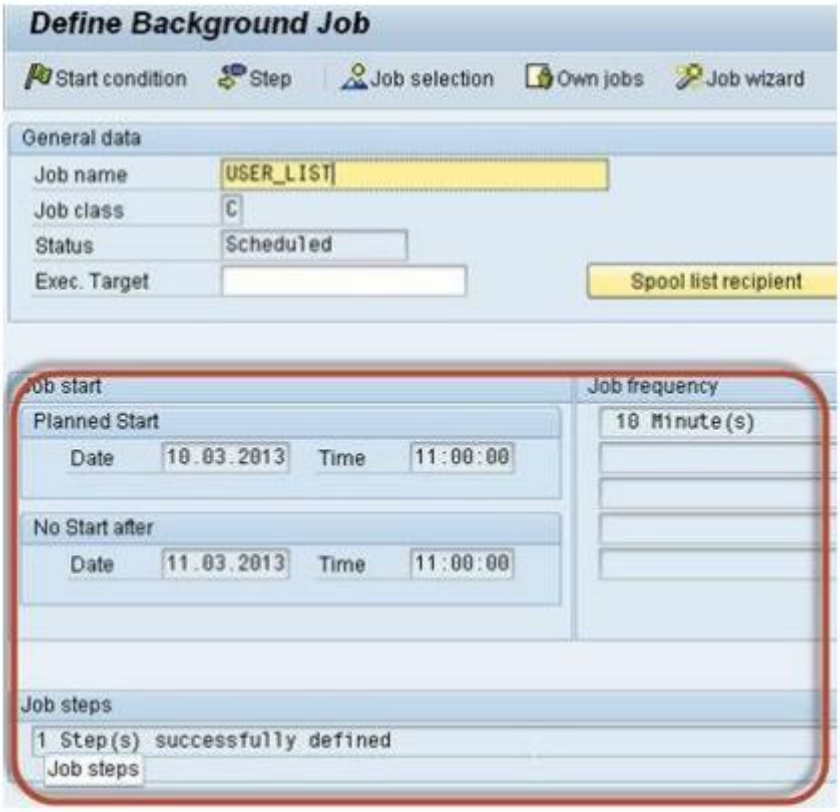



**Step 12)** Click on save again.

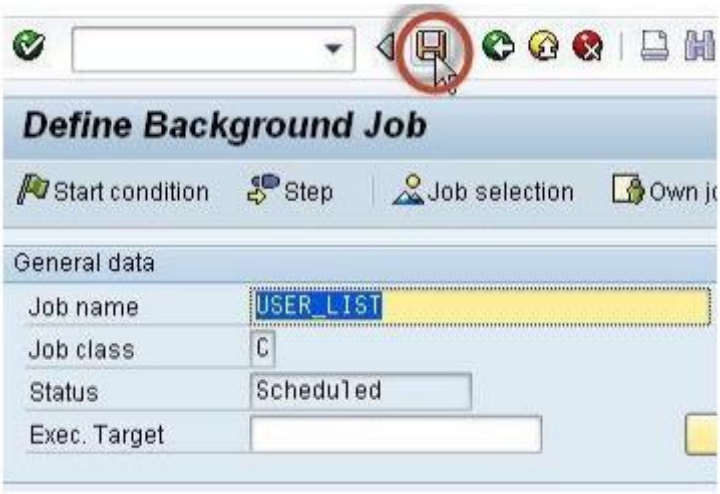

**Step 13)** Click save again



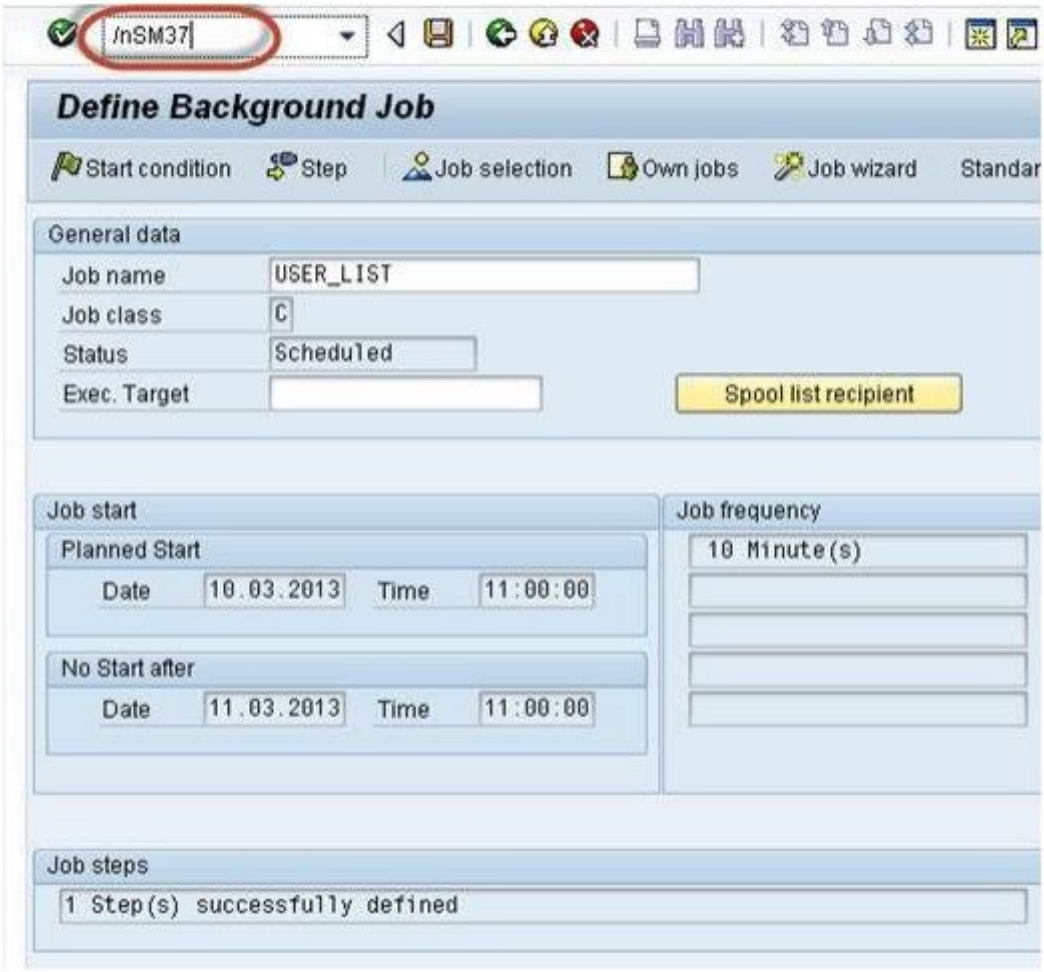

**Step 14)** Once **Job step and start conditions** are defined the following window will appear.




**Step 15)** Press save.




**Step 16)** GoTo **SM37** to know the status of the job.

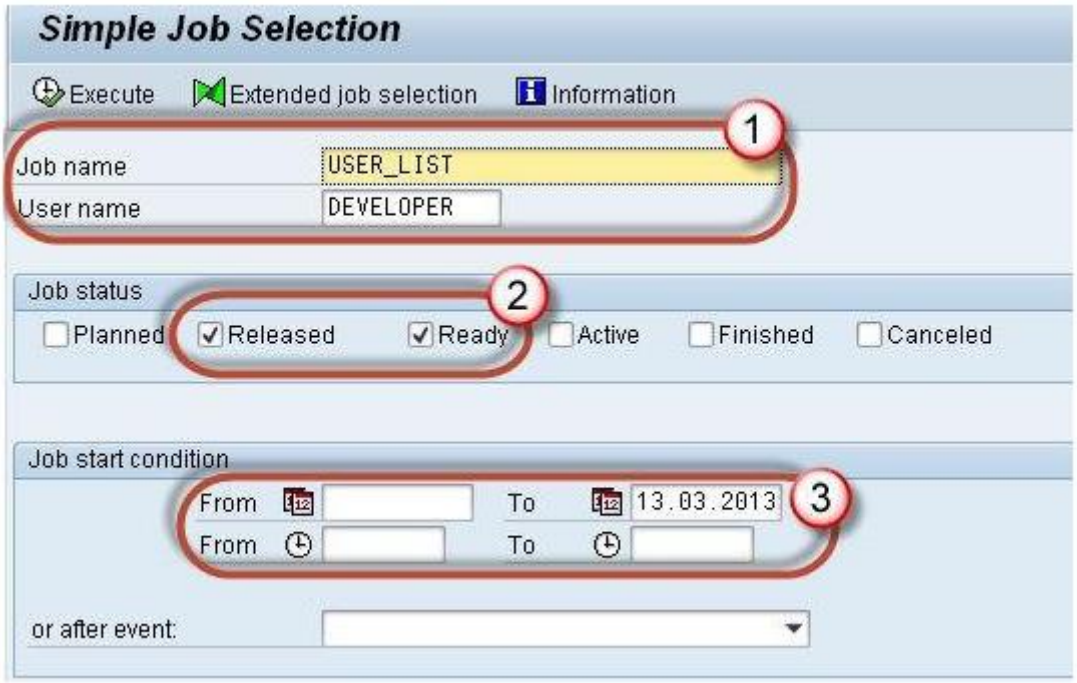



**Step 17)** Select your criteria for the job which you want to monitor.

1. Put your job name and username who scheduled the job.

2. Select the status of the job.

3. Specify the date range. In our scenario, we just specify the end date while keeping from Date Open.




**Step 18)** You will get the following screen. Look at the status, it's a released means start conditions are met, and the job is in the queue is waiting for **background work process to be free.**


# How to Reschedule a background job

Rescheduled jobs will not run in the future. Remember, you cannot deschedule the job once it's in active status.

**Step 1)** Execute SM37.

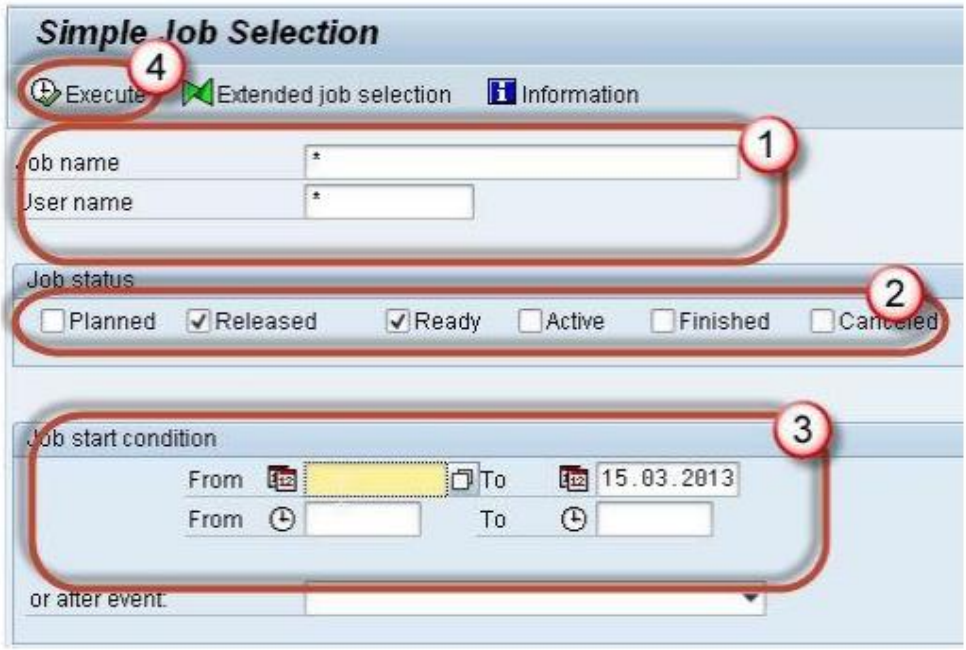

**Step 2)** Fill the criteria.

1. Job name and username by which job is scheduled.

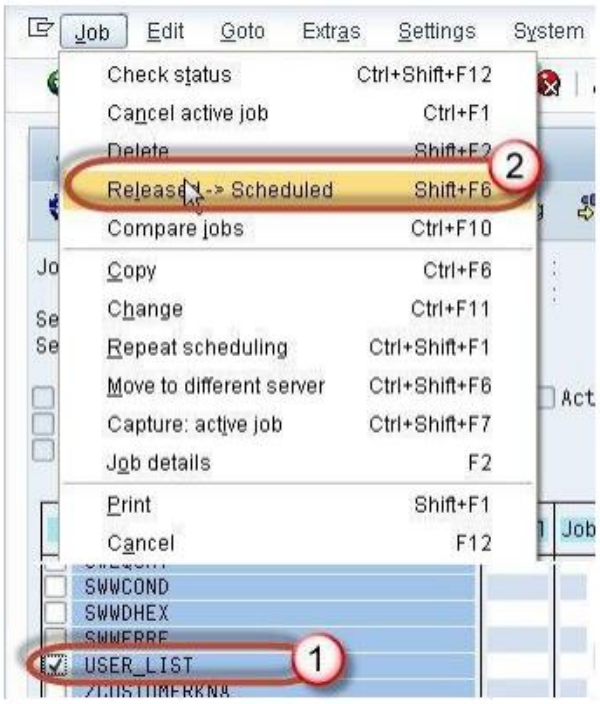
2. Select the status. To deschedule the job you can only select Released/Ready status.

3. Specify the date range.

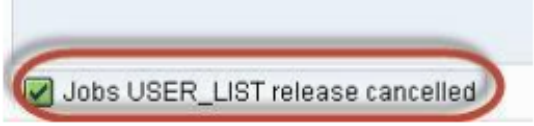
4. Press Execute(F8) button.




**Step 3)** Select specified job and press **Job -> (Released -> Scheduled).**




**Step 4)** You will find the message in the status bar once you press "Released -> Scheduled".



# Background Job Monitoring

Monitoring background job is important because once you schedule the job it might be cancelled due to some error. To investigate the root cause use SM37.

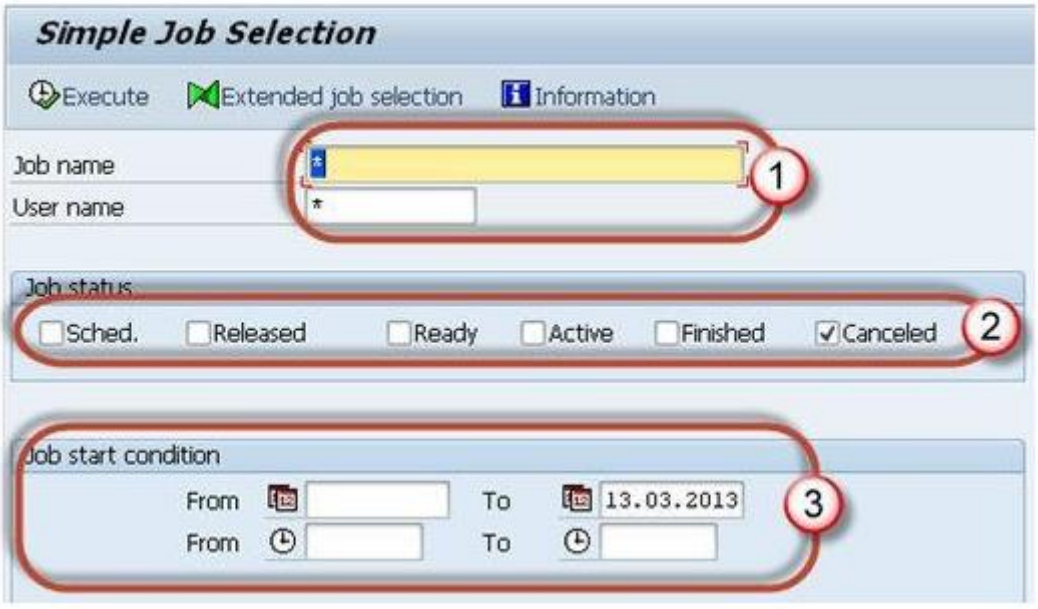
**Step 1)** Execute T-code **SM37**.


**Step 2)** Fill the required criteria.

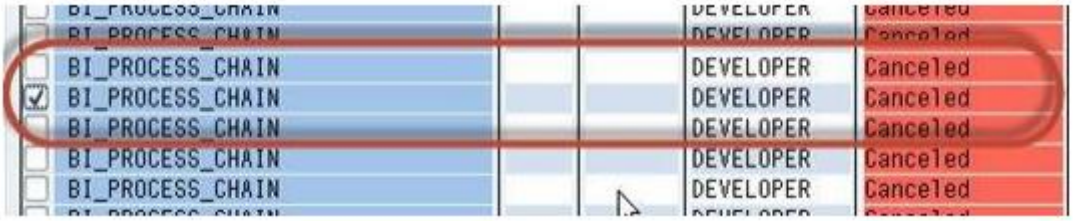
1. **Job name and username** (who scheduled the job). You can put * to get details of all jobs scheduled by all the users.

2. Select job status which you want to monitor. If you find that a background job is not completed, select Cancelled status.

3. Put the date range as per your requirement.

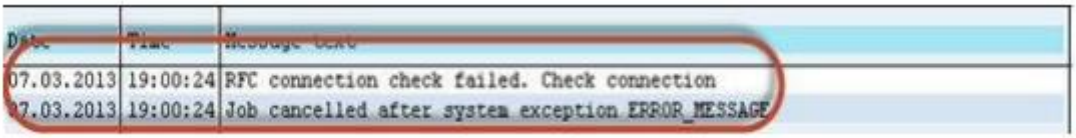



**Step 3)** You will get a screen as shown below.




**Step 4)** Click on **Job Log** button to trace the error due to which job was cancelled.


**Step 5)** You will get the following details. In the below example, job was cancelled since there was an issue with RFC connection to the remote system. As a resolution use SM59 to check if there is an authorization issue to the remote system.




Sometimes jobs in Active status may also cause an issue.

You may face issues like table spaces are full; the duplicate job is running with the same name and timing, job is selecting or updating large data, etc.

**You can also check such jobs from SM37. Follow the procedure as below.**

**Step 1)** Execute **SM37**.

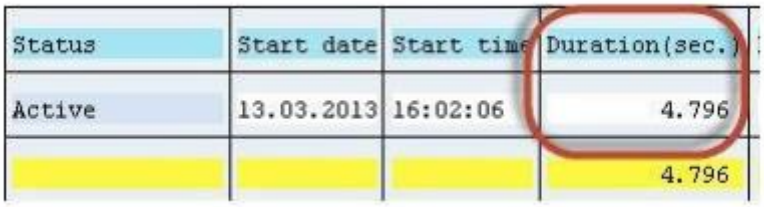
**Step 2)** Fill the required criteria.

1. Job name and username (by which job is scheduled).

2. Select job status which you want to monitor. **If you find a system performance issue or if a task is not completed for a very long time, then select active status.**

3. Put the date range as per your requirement.

**Step 3)** Look into Duration column (which signifies the job is running since n seconds). If you find a large number in duration, then investigate the job details from job log. Some jobs use a large number of data. Using SE16 check table entries for the tables used by the job.



| Status | Start date | Start time | Duration(sec.) |
|---|---|---|---|
| Active | 13.03.2013 | 16:02:06 | 4.796 |
| | | | 4.796 |

Sometimes jobs show to be in Active Status even though they are completed.

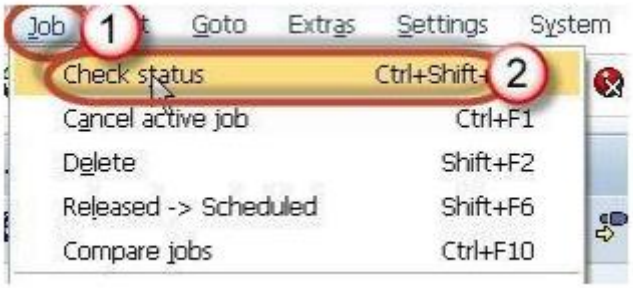
**How to correct them? Follow the below set of procedure**

**Step 1)** As shown above, Execute T-code **SM37** and select the job with an active status.

**Step 2)** Select the **active** job which is causing the problem.

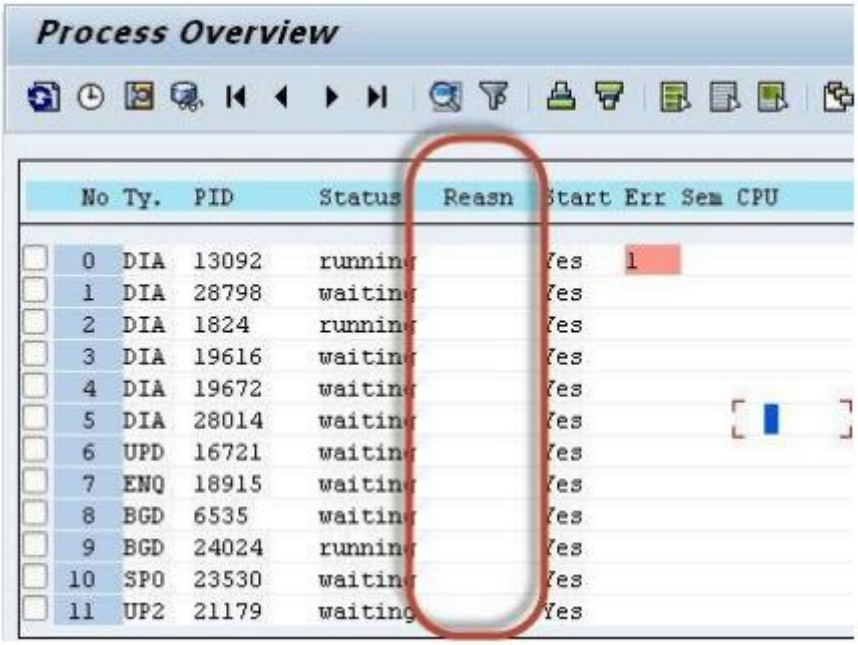
| Job | Ln | Job createdB |
|---|---|---|
| BI_WRITE_PROT_TO_APPLLOG | | DDIC |

**Step 3)** Click the **Job->Check status**




**Step 4)** In the **status bar** of the window you will find as below message. **This will repair Job Status if there was a problem.**


**Step 5)** If still job is in running status then GoTo **SM50**. Below screen will open. Have a look at **"Reason"** column which shows any errors or exceptional issue. Investigate it further.




# Background Job Deletion

## Why Delete Background Job

Old jobs occupy space on the system. To avoid any inconsistencies within the system normally we delete the logs. Because if the file system gets full, your SAP system will crash!

**You can delete jobs in two ways:**

**1. Multiple jobs at once.**

**2. Single job deletion.**

Delete Multiple Jobs at once The best way to do this is use report **RSBTCDEL2(New version of RSBTCDEL).** Old job logs will be deleted and will not show in the job overview.

**Step 1)** Execute T-code **SE38**.


**Step 2)** Put the program name in the field as **RSBRCDEL2.**


**Step 3)** Fill the proper details.

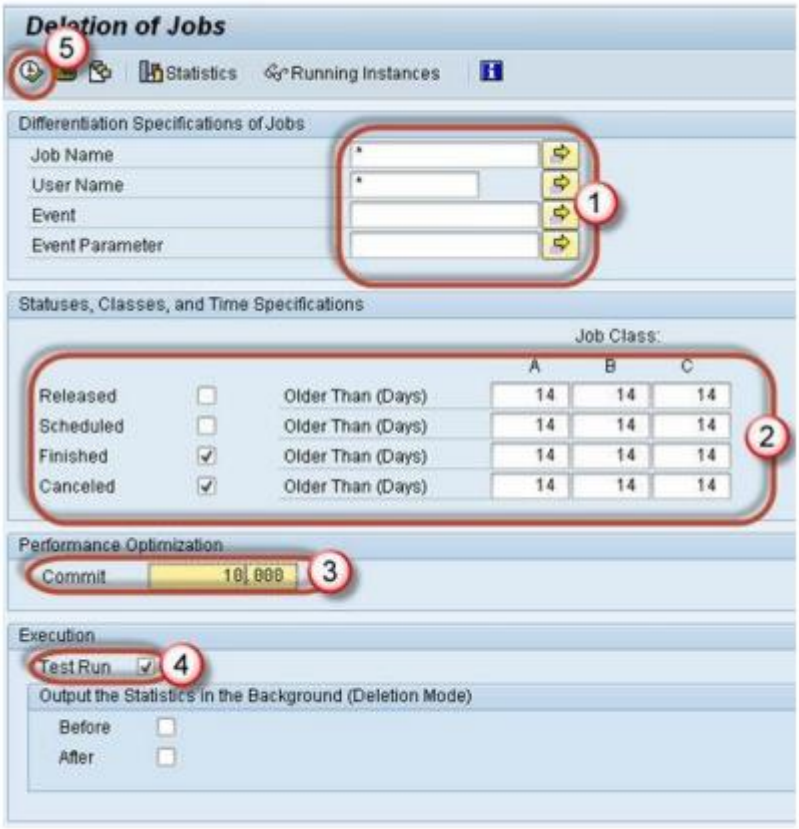
1. Which job do you want to delete? If you put * means all jobs. If you want to delete jobs from a specific user, give Username.

2. Specify Status of Job to be deleted. Specify time period of Deletion. For instance, delete jobs older than 14 days. NOTE: Once the job is inactive status, it is impossible to delete them.

3. Specify Commit. Commit value is proportional to program performance. If the commit value is high, then job deletion will run faster. Recommended value is >= 1000.

4. Check Test run to simulate the deletion. Jobs will not be deleted. Once you are sure only then uncheck the Test run.

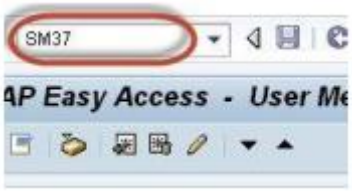
5. Press Execute.



# Single job deletion

You can also delete a single job from **SM37.**

**Step 1)** Execute **SM37.**

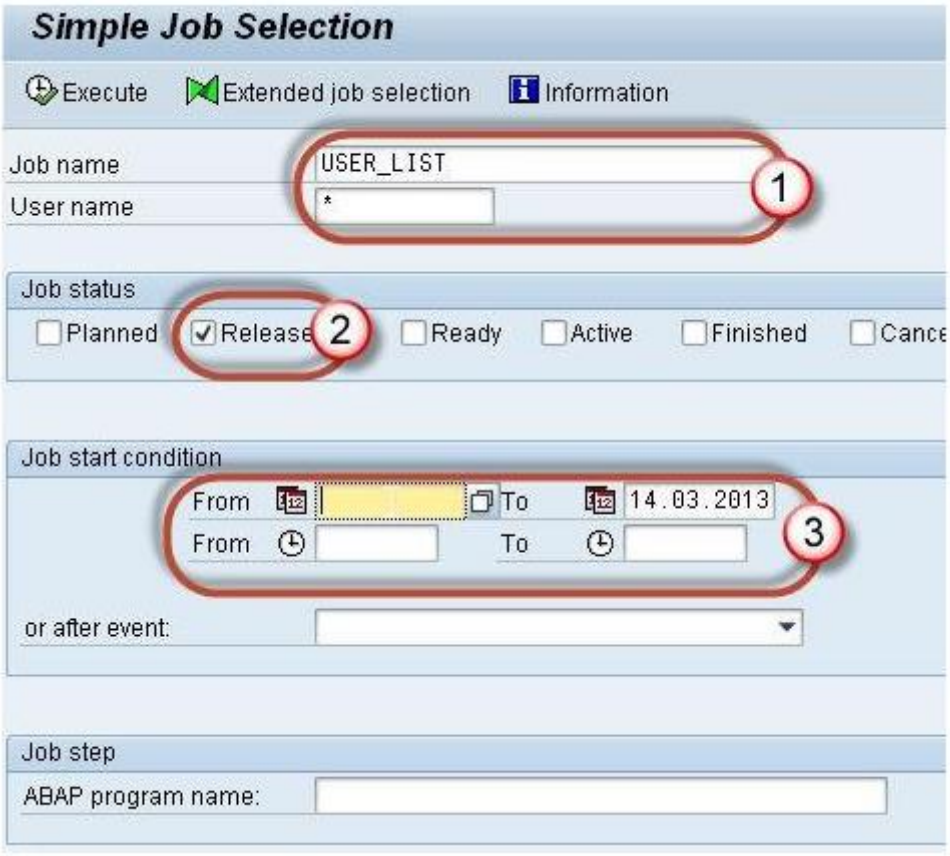



**Step 2)** Fill your criteria.

1. Job name and username

2. Status of the job.

3. Select the date range.




**Step 3)** Select the job you want to delete.


**Step 4)** GoTo Job-> Delete.


You can also delete the jobs from OS level under directory

**/usr/sap//SYS/global/JOBLG. Folder.**

But deletion from OS level may cause **Temse** inconsistency issue. To remove inconsistencies GoTo **SP12-> Consistency check.** Once you get the list, delete the objects.

Normally, Job- **SAP_REORG_JOBS** (Program to Delete old background jobs) must be scheduled within the system with program **RSBTCDEL2** at the daily frequency.

# TMS (Transport Management System)

## What is TMS

TMS is used to move, manage, control, copy development objects and customizing settings in an orderly fashion across SAP systems in a landscape through pre-defined transport routes (RFC Connections). The transport process basically consists of exporting of objects out of the source SAP system and importing them into the target SAP system/s. TMS Stands for Transport Management System

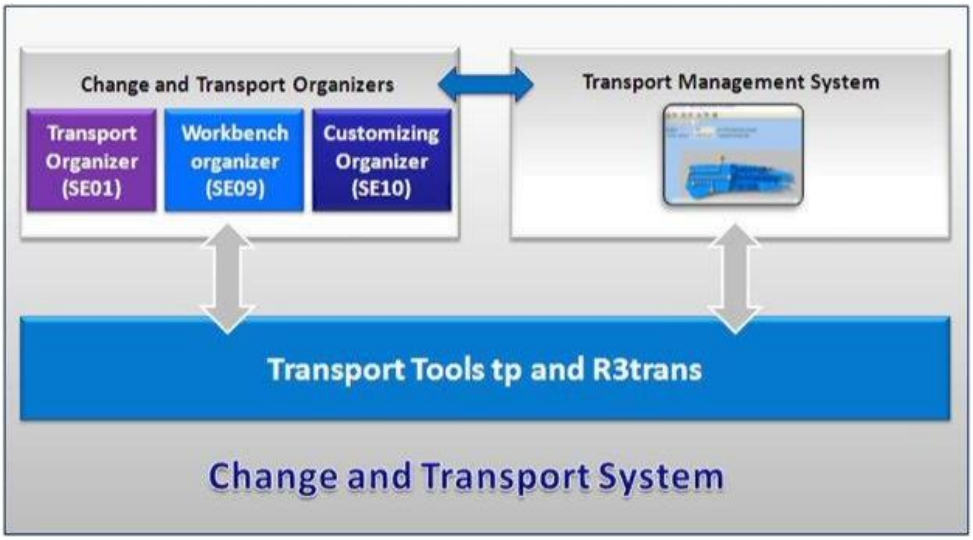
## Why do we need a Transport System


The CTS components play an important role in the overall development and customization environment. CTS stand for Change and Transport System

CTS is an instrument for:

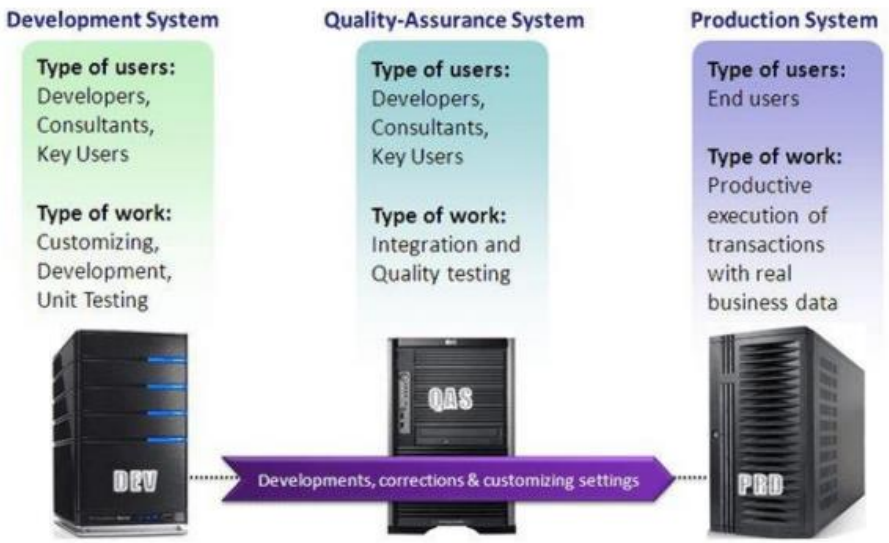
- Administering & controlling new development requests.
- Managing transports
- Recording of where and by whom changes are made
- Configuring systems landscape

# Overview of CTS Components




- **CTO (Change and Transport Organizer) –** It's the main tool for managing, browsing, and registering the changes done on the repository and customizing objects. It's the central point for organizing the development projects. SE01 is the transaction with the new extended view.
- Transport Tools – The actual transports happen in the backend at the OS level using transport tools, which are part of SAP Kernel and includes the program **R3trans** and the transport control program **tp**.
- **(TMS) Transport Management System**

# System Landscape



The system landscape (also known as SAP System Group) is the arrangement of SAP servers. Ideally, in a SAP environment, a three system landscape is recommended. It consists of the

**1. Development Server – DEV**

**2. Quality Assurance Server - QAS**

**3. Production Server - PRD**

Transport cycle in a very basic sense is the release of new Developments/ Customizing Changes from DEV which are imported in both Quality and Production systems. However, import in PRD can happen only once integration Testing and quality check have been performed in QAS (and marked as checked).

# What is Customizing, How does

# TMS help in Customizing

- Customizing is a process to adapt the SAP system according to the customer's need. To perform the customizing, users and consultants take help of SAP Reference Implementation Guide (IMG), which is accessible through transaction SPRO.
- Customizing is ideally done in DEV. The Transport Organizer (SE01) is used in conjunction with IMG to record and transport customized changes further.


Most of the Customizing changes (though, not all) are client specific, i.e., the changes are supposed to be reflected in a particular client only and not intended for all the system clients. When the Transport Request is exported, it extracts the relevant table entries from the database of the SAP system and copies them to the

transport directory. Relevant table entries are locked when the customizing transaction is being used. However, they are unlocked as soon as the changes are saved to a Transport Request.

# Repository and Development Changes

Apart from customizing already existing objects, new developments are also required in most of the cases. Development object is any object that is created (developed) by you in SAP system.

A Collection of all such objects (client-specific or cross-client) is called **Repository**.

Development is mostly done with the help of ABAP Workbench (SE80). Therefore, such changes are also known as Workbench Changes.

Examples:

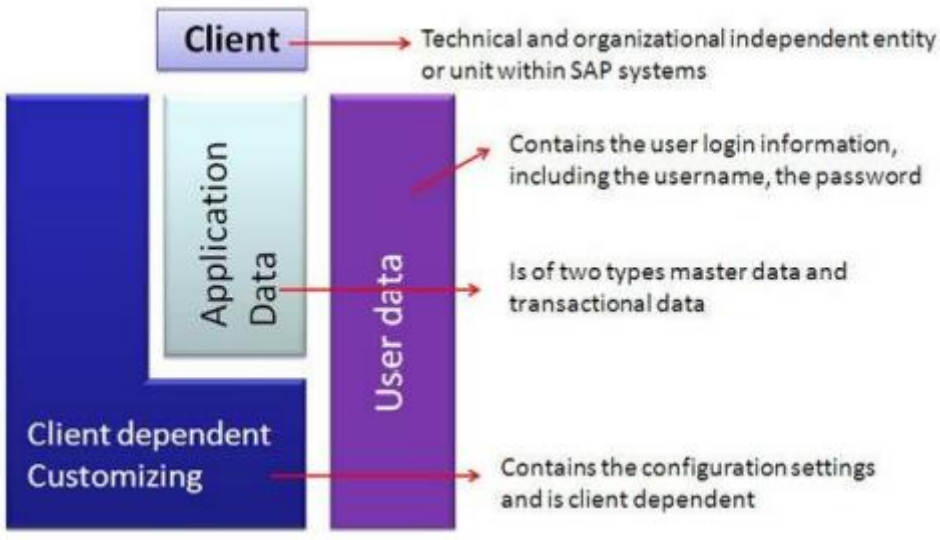
- ABAP Dictionary Objects: Tables, Domains, Data elements, etc.
- ABAP Programs, function modules, menus, screens
- Documents, Application defined transport-objects, etc.

Workbench is also fully integrated with TMS, to record and transport the changes.

Most of the Workbench changes (though, not all), are **cross-client**, i.e. changes will be reflected in all the system clients of the target system. Objects transported from the source system overwrite objects in the target system that has the same names.

# Clients and the type of Data in SAP System

- Conceptually, client is a technical and organizational independent unit, that contains its own set of data (Master Data, Application/ Operational data, Customizing Data)
- Clients create separate environments for users from different user groups or with a different purpose, within same SAP system, without actually using the different database.
- From the Technical point of view, a client is specified using 3-digit numeric ID, which also acts as the value for the table field 'MANDT', in the case of client-specific jobs.




Among client specific data, there are 3 types of data:

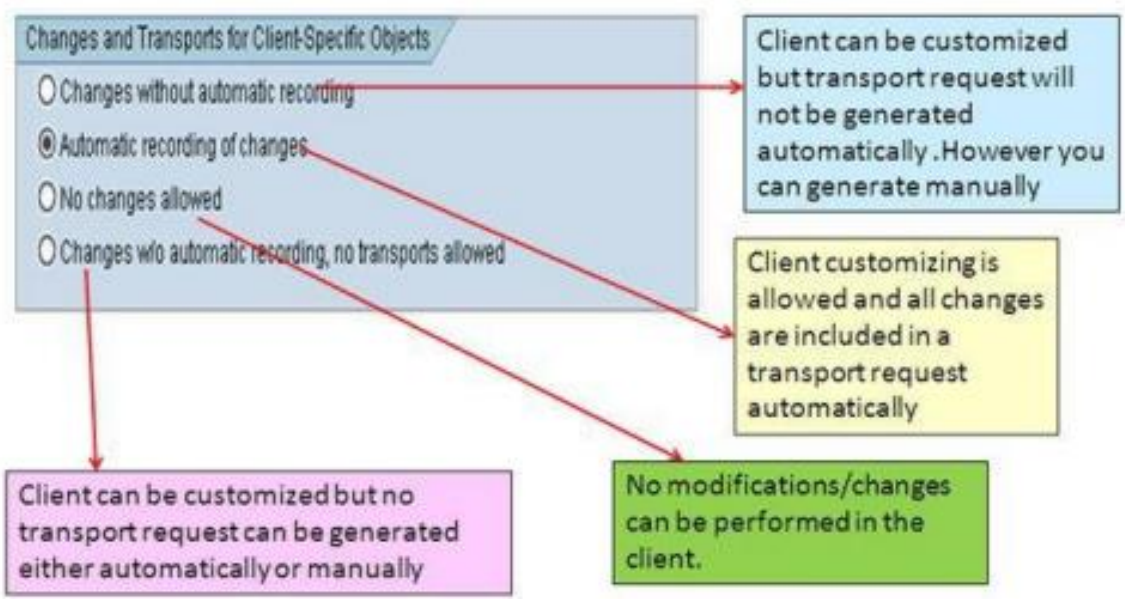
- **User Master Data** contains the user login information, including the username, the password and the user defaults, the authorization profiles or roles, and the other useful information such as user groups, communication and so on. This data is physically present in a specific set of tables (the USR* tables).

- **Customizing Data** contains the configuration settings to customize organizational structure and the business processes for the companies implementing SAP. This data is client dependent and is stored in tables known as customizing tables.
- **Application Data** are also client dependent and normally users distinguish two types' master data and transactional data.

1. Master Data such as vendor master, material master (tables such as MARA)

2. Transactional data such as sales order, financial documents, Production Orders (POs) and so on.

# Client Customization Options




# Transport Directory and Its configuration

# SAP Transport Directory:

- It is the global transport directory (/usr/sap/trans), which is actually a shared location (residing in the Domain Controller System) among all the member systems of a landscape (system group). It also contains certain subdirectories, that are created automatically during the installation of the SAP system. This is mandatory for setting up the Transport Management System.
- Basically, Transport Directory is the location where all the changes are saved (in the form of files) after they are released from DEV. Therefore, it acts as a source for the changes to be eventually imported in QAS and PRD. Hence, we have to make sure that the transport directory is shared properly among all the systems in a landscape.

As an example, in Windows NT, the shared directory location can be accessed using the following address: \\

**< SAPTRANSHOST >\sapmnt\trans** where SAPTRANSHOST (Domain Controller System's address) is defined in the host's file in Windows Directory of all SAP systems in the landscape. Domain Controller – is one of the systems in a landscape that acts as an overall controller for change management and transport process in the landscape. Domain Controller is chosen (out of D / Q / P) by the team of system administrators, on the basis of system availability and the time of installation.

# Change Request Types

### 4 Types

### Customizing Request

It Contains Client Specific Objects (Data Dependent).

### Workbench Request

It Contains Cross Client Object (Data Independent).

### Transport of Copies

It is used to Move the Tables for User Data.

### Relocation

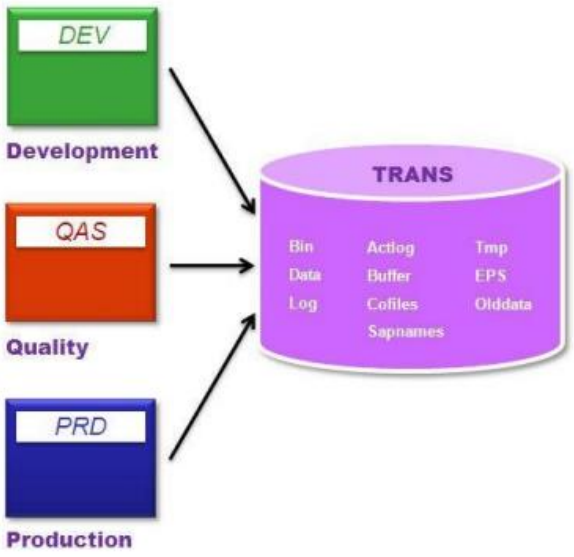
It is used to Changing the Location of the Objects from One System to Another System.

# Written Codes

0 Import with Successfully.
4 Import with Warnings.
8 Some Objects are not Transformed.
12 Critical Transport Errors.

# Main Subdirectories:

- **Cofiles:** Contains Change Request Information files with complete details and commands. It Starts with "K".
- **Data Files:** Contains the actual values and data to be used in implementing the change. It Start with "R".
- **Log:** Contains Transport logs, traces or statistics, used for troubleshooting, in case any error occurs in the transport process.
- **EPS:** Download directory for advanced corrections and support packages



## Other Subdirectories are:

**bin:** Configuration files for tp (Transport Program) and TMS

**old data:** Old Exported Data for archival or deletion

**actlog:** Action logs for all requests and tasks

**buffer:** Transport buffer for each system declaring the transports to be imported

**sapnames:** Information regarding transport requests made by respective users

**tmp:** Temporary and data log files

## Setting up of Transport Directory and TPPARAM

- While configuring TMS, one of the main pre-requisite is to setting up the Transport Directory and the Transport Parameter file.
- It ensures that the Directory is shared properly among all the systems in a Landscape, for that all the systems taking part in the group/landscape are to be included in the global configuration file TPPARAM (transport parameter file), located under the **bin** subdirectory of /use/sap/trans. We have to make sure that the entries for all the participating systems are made in this file.
- In case, any entry is missing, copy another system's entry and change the values (for instance, System ID, Host name)
- At the time of installation, transport directory & the subdirectories are created automatically, including an initially configured template of TPPARAM file.

**Operating System Tools - TP and R3trans**

**tp – The Transport Control Program:**

- **tp** is the SAP program that administrators use for performing and planning transports between systems and also in upgrades of the SAP systems. This is used by the CTO and TMS.
- Actually, **tp** uses other special tools/programs and utilities to perform its functions. Mainly, it calls **R3trans** utility program. However, it also offers a more extensive control of the transport process, ensuring the correct sequence of the exported/imported objects, to avoid severe inconsistencies in the system, which may arise due to the wrong sequence.
- **tp** is located in the standard runtime directory of the SAP system: **/usr/sap/SYS//exe/run.** It is automatically copied in the installation process.
- As a pre-requisite, the **tp** global parameter file (**TPPARAM**), must be maintained, specifying at least, hostnames of the systems taking part in the transport process.
- **tp** is mainly used for performing imports in target systems. It uses utilities called Import Dispatchers – **RDDIMPDP & RDDIMPD_CLIENT_<nnn>,** these are ought to be scheduled as background jobs in every system where imports will be performed. If for any reason they are deleted, we can schedule these jobs by running report **RDDNEWPP.**
- These jobs are actually "event triggered", meaning that **tp** sends a signal (an event) to the R/3 system and the job starts. These events are named as **SAP_TRIGGER_RDDIMPDP** and **SAP_TRIGGER_RRDIMPDP_CLIENT.**

## R3trans – The Transport Control Program

- **R3trans** is the SAP system transport program that can be used for transporting data between different SAP systems. It is normally not used directly but called from the **tp** control program or by the SAP upgrade utilities.
- **tp** controls the transports and generates the r3trans control files, but does not connect to the database itself. All the "real work" is done from **R3trans**.
- It supports the transporting of data between systems running on different OS and even different DB.

# Configure STMS (SAP Transport Management System)

STMS is the transport tool that assists the CTO for central management of all transport functions. TMS is used for performing:

- Defining Transport Domain Controller.
- Configuring the SAP system Landscape
- Defining the Transport Routes among systems within the system Landscape
- Distributing the configuration
- **Transport Domain Controller –** one of the systems from the landscape that contains complete configuration information and controls the system landscape whose transports are being maintained jointly. For availability and security reasons, this system is normally the Productive system.

Within transport domain, all systems must have a unique System Ids and only one of these systems is identified as the domain controller, the transport domain controller is the system where all TMS configuration settings are maintained. Any changes to the configuration settings are distributed to all systems in the landscape. A transport group is one or more systems that share a common transport directory. Transport Domain – comprises all the systems and the transport routes in the landscape. Landscape, Group, and Domain are the terms that are used synonymously by system administrators.

## TMS Configuration

**Step 1:** Setting up the Domain Controller

Log on to the SAP system, which is decided to be the Domain Controller, in client 000 and enter the transaction code STMS.

If there is no Domain Controller already, a system will prompt you to create one. When the Transport Domain is created for the first time, following activities happen in the background:

- Initiation of the Transport Domain / Landscape / Group
- Creating the user **TMSADM**
- Generating the RFC Destinations required for R/3 Configurations, TMSADM is used as the target login user.
- Creating **DOMAIN.CFG** file in usr/sap/trans/**bin** directory

This file contains the TMS configuration and is used by systems and domains for checking existing configurations.

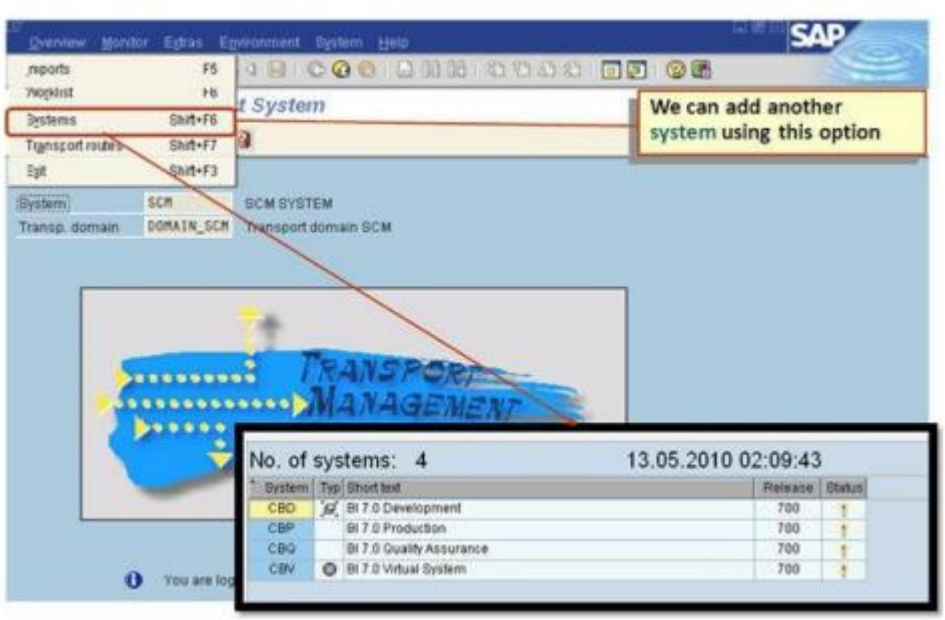
**Step 2:** Transaction **STMS**



**Step 3:** Adding SAP systems to the Transport Domain

- Log on to SAP systems (to be added in the domain) in client 000 and start transaction STMS.
- TMS will check the configuration file DOMAIN.CFG and will automatically propose to join the domain (if the domain controller already created). 'Select' the proposal and save your entries.
- For security purpose, system status will still be in 'waiting' status, to be included in the transport domain.

- For complete acceptance, login to Domain Controller System (Client 000) -> **STMS -> Overview -> Systems**. New system will be visible there. From the menu choose **'SAP System' -> Approve.**



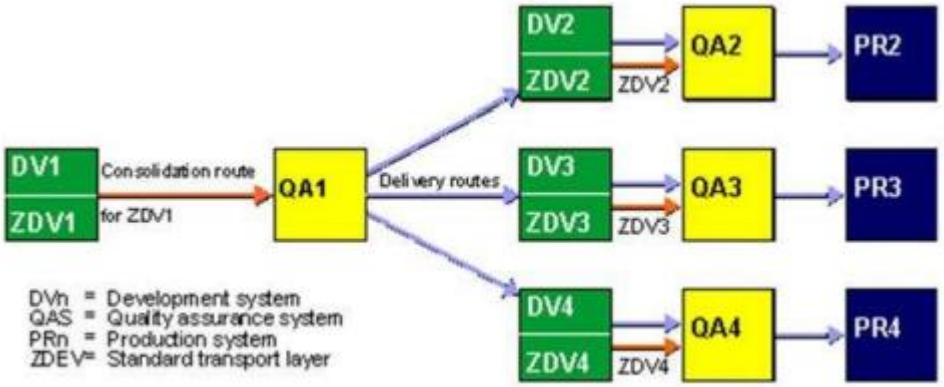

**Step 4:** Configuring Transport Routes

- **Transport Routes –** are the different routes created by system administrators and are used to transmit changes between the systems in a system group/landscape. There are two types of transport routes:
- **Consolidation** (From DEV to QAS) – Transport Layers are used
- **Delivery** (From QAS to PRD) – Transport Layers not required
- **Transport Layer –** is used to group the changes of similar kinds, for example, changes are done in development objects of same class/category/package, logically should be sent through same transport route. Therefore, transport layers are assigned to all objects coming from DEV system. Layers are used in Consolidation routes, however after Testing happens in QAS, layers are not used and the changes are moved using single routes towards PRD system.

**Package –** (formerly known as Development Class) is a way to classify the objects logically belonging to the same category or project. A package can also be seen as an object itself and is assigned to a specific transport layer (in consolidation route), therefore, changes made in any of the development object belonging to a particular Package, will be transmitted towards target system through a designated Transport Layer only, or else the change will be saved as a Local (non-transportable) modification.

# STMS Routes & Layers

**Consolidation routes –** We need to establish a consolidation route for each transport layer. Development/ Integration system is taken as the source of these consolidation routes. Quality assurance/ Consolidation system as the transport target. Any modified objects that have a consolidation route for their transport layer can be included in change/transport requests. After the request has been released the objects can be imported into the consolidation system. If the changes are made to the objects with no consolidation route set-up (or in Customizing requests without a transport target) for their transport layer, such changes will be automatically taken as local change requests, i.e., not-transportable. **Only one consolidation route per transport layer per system can be set-up.**



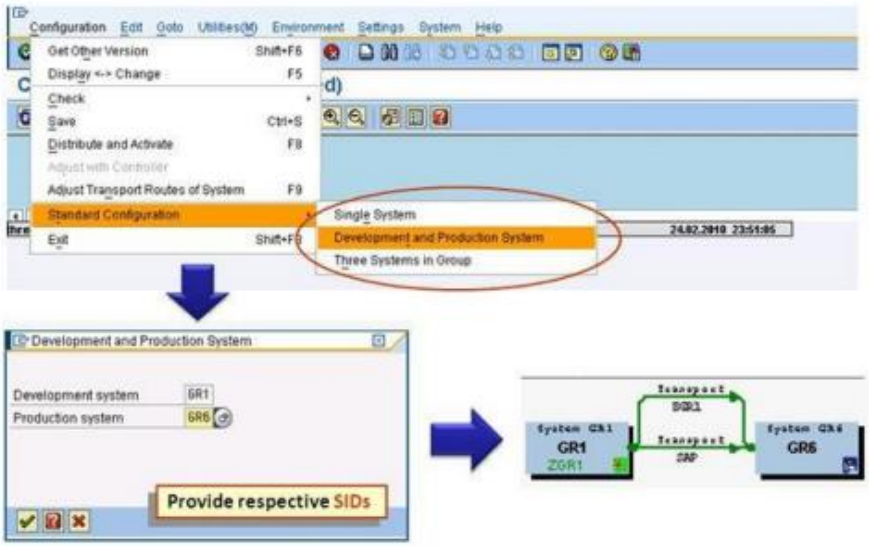

# Setting up Transport Routes

Once the Domain and other systems of a landscape are defined, we need to connect them with the help of proper transport routes (and layers). As for many customers' systems landscape falls into the same categories, the TMS provides some standard system groups that can be used for easily defining routes. When standard options are used, routes are generated automatically; we can select one of the following options:

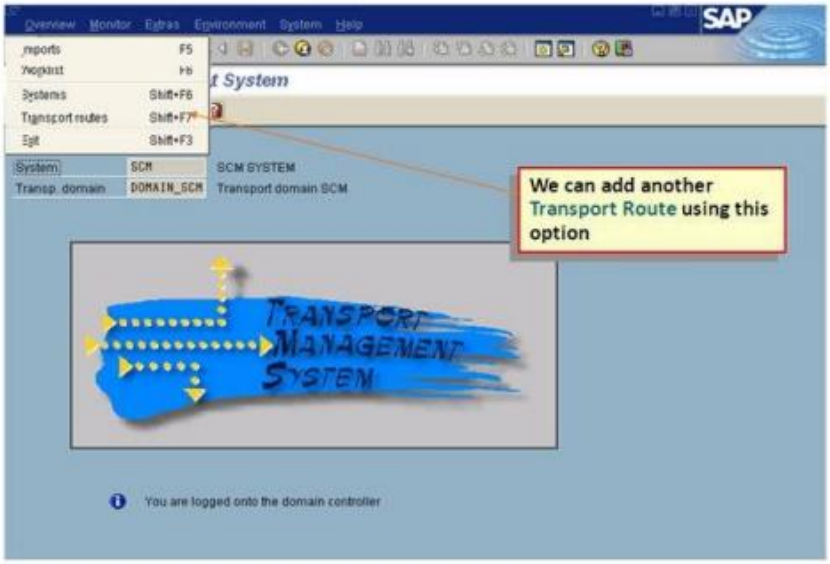
- Single System
- Two-System landscape: DEV and PRD
- Three System landscape: DEV, QAS, and PRD

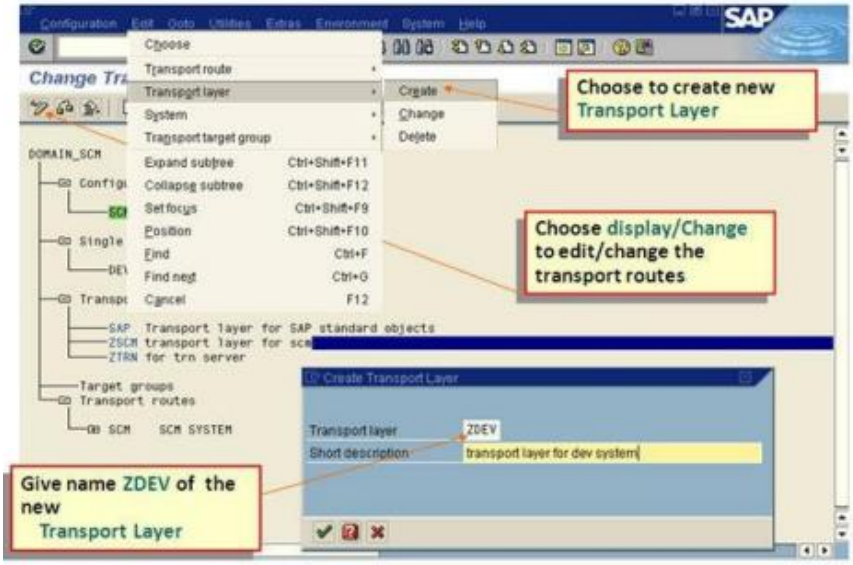
If we need to define a more complex transport system, we can also use standard options initially and there after defining additional consolidation and delivery routes.

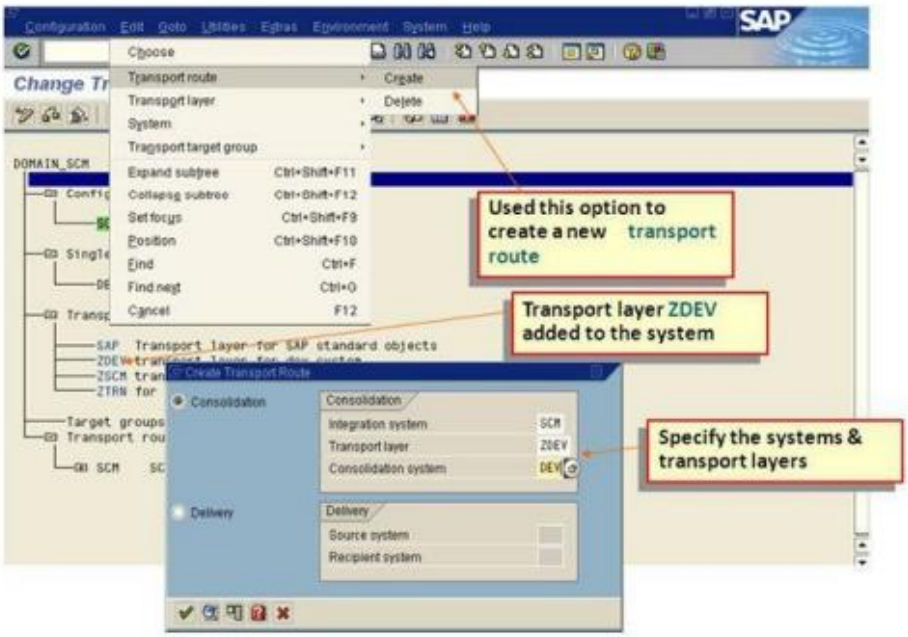
# Transport Routes – Standard Configuration

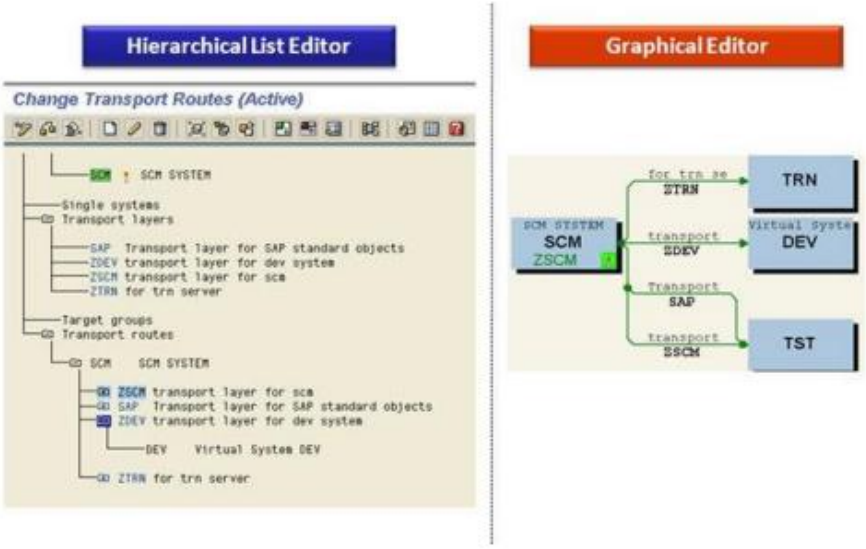



# Transport Routes – Manual Configuration

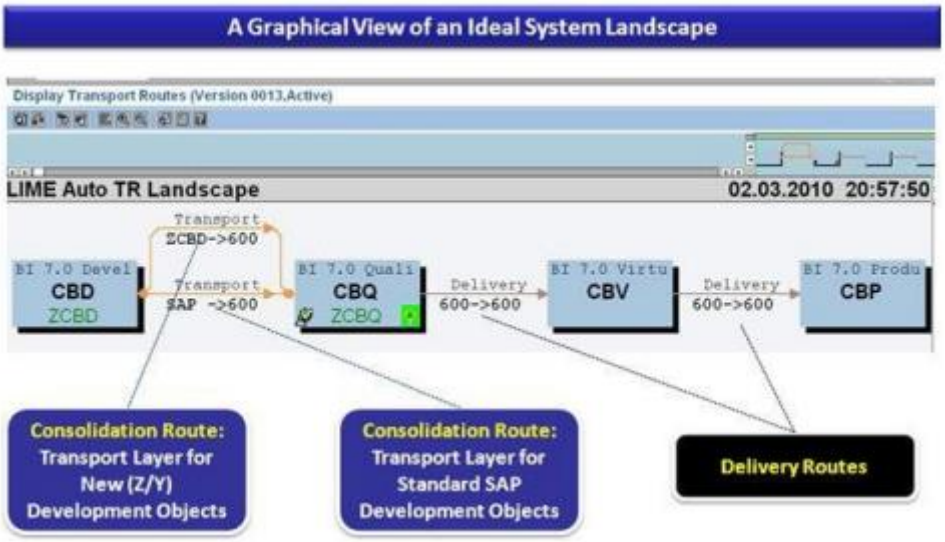

We can add another Transport Route using this option
TRANSPORT MANAGEMENT SYSTEM
You are logged onto the domain controller


Choose to create new Transport Layer
Choose display/Change to edit/change the transport routes
Give name ZDEV of the new Transport Layer
Create Transport Layer
Transport layer
ZDEV
Short description
transport layer for dev system


Used this option to create a new transport route
Transport layer ZDEV added to the system
Specify the systems & transport layers
Consolidation
Integration system
SCM
Transport layer
ZDEV
Consolidation system
DEV
Delivery
Source system
Recipient system




# Transport Routes




# Distributing and Verifying the Configuration

After the transport route settings are made or modified in the domain controller, all other member systems of the domain ought to know the new configuration. For that we need to execute **STMS -> Transport Routes Screen -> Systems Overview -> Configuration -> Distribution and Activate Configuration**

Additionally, we should also verify various check-points, to ensure that the whole arrangement is behaving in the desired manner:

For **RFC Connections**: Overview -> Systems -> SAP System ->Check -> Connection Test

For **Network**: Transport Routes Overview -> Config. -> Check -> Request Consistency

For **tp & TPPARAM**: System Overview Screen -> SAP System -> Check -> Transport Tool

# SAP Transport Request, How to Import/Export TR

## What is a Transport Request

- **Transport Requests (TRs) –** is a kind of 'Container / Collection' of changes that are made in the development system. It also records the information regarding the type of change, the purpose of transport, request category and the target system. It is also known as Change Requests.
- Each TR contains one or more change jobs, also known as change **Tasks** (minimum unit of transportable change). Tasks are stored inside a TR, just like multiple files are stored in some folder. TR can be released only once all the tasks inside a TR are completed, released or deleted.
- Change Task is actually a list of objects that are modified by a particular user. Each task can be assigned to (and released by) only one user. However multiple users can be assigned to each Transport Request (as it can contain multiple tasks). Tasks are not transportable by themselves, but only as a part of TR.

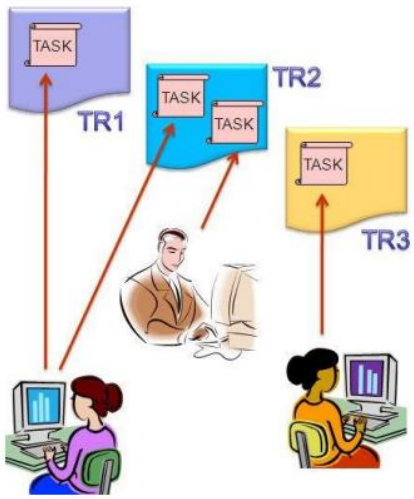
Change requests are named in a standard format as: **<SID>K<Number> [**Not modifiable by system administrators]

- **SID** – System ID
- **K** – Is fixed keyword/alphabet
- **Number** – can be anything from a range starting with 900001

Example: DEVK900030

**Tasks** also use the same naming convention, with 'numbers' consecutive to the number used in TR containing them.

For Example, Tasks in the above mentioned TR Example can be named as: **DEVK900031, DEVK900032 …**

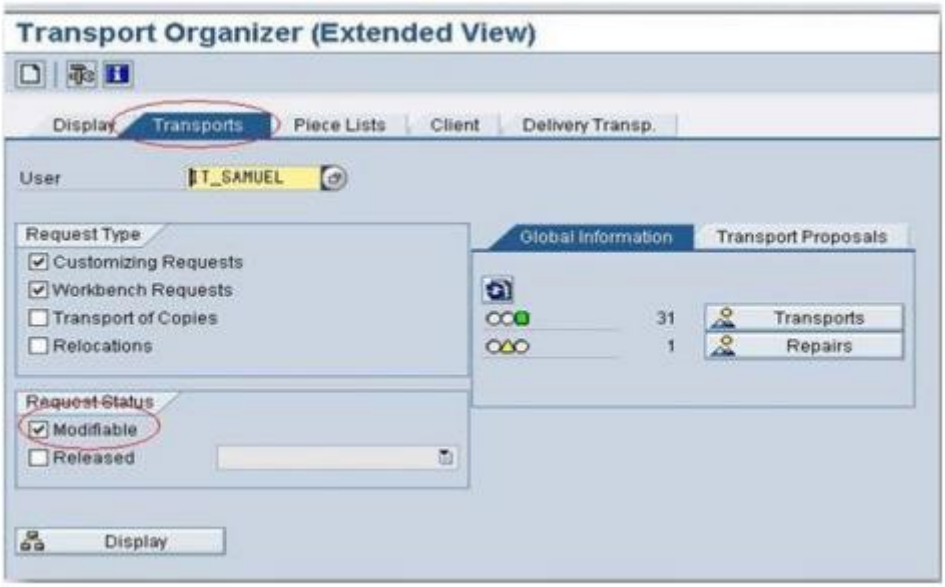



- The project manager or designated lead is responsible to create a TR and assign the project members to the TR by creating task/s for each project member.
- Hence, she/he is the owner with control of all the changes that are recorded in that TR and therefore, she/he can only release that TR.
- However, assigned project members can release their respective change tasks, once completed.


**Workbench Request –** contains repository objects and also 'crossclient' customizing objects. These requests are responsible for making changes in the ABAP workbench objects.

**Customizing Request –** contains objects that belong to 'client- specific' customizing. As per client settings, these requests are automatically recorded as per when users perform customizing settings and a target system is automatically assigned as per the transport layer (if defined).

# SE01 – Transport Organizer – Extended View

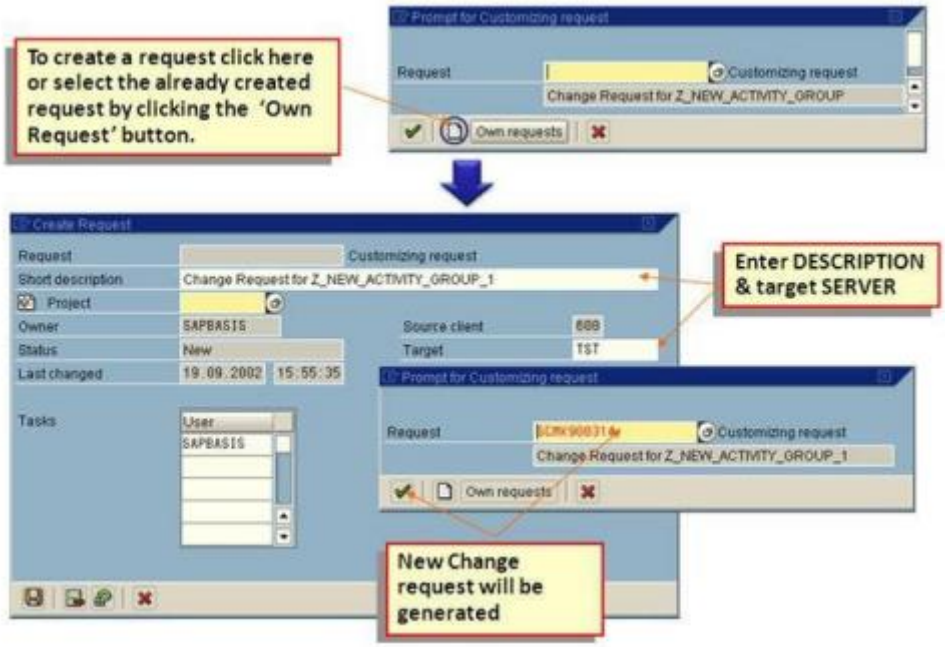


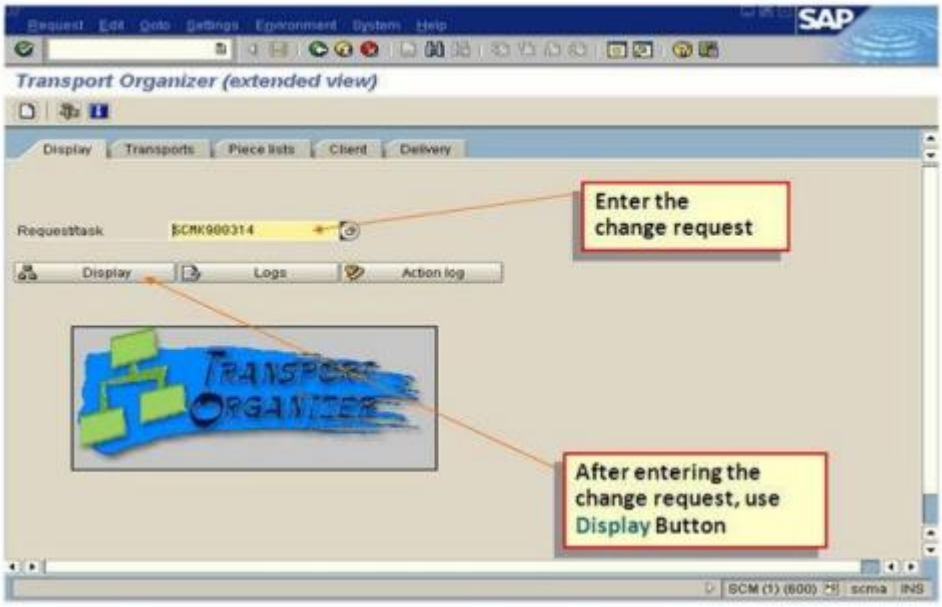

# Create a Change Request

### Change Request can be created in two ways:

**Automatic –** Whenever creating or modifying an object, or when performing customizing settings, the system itself displays the 'Dialog box' for creating a change request or mention name of an already created request, if available.

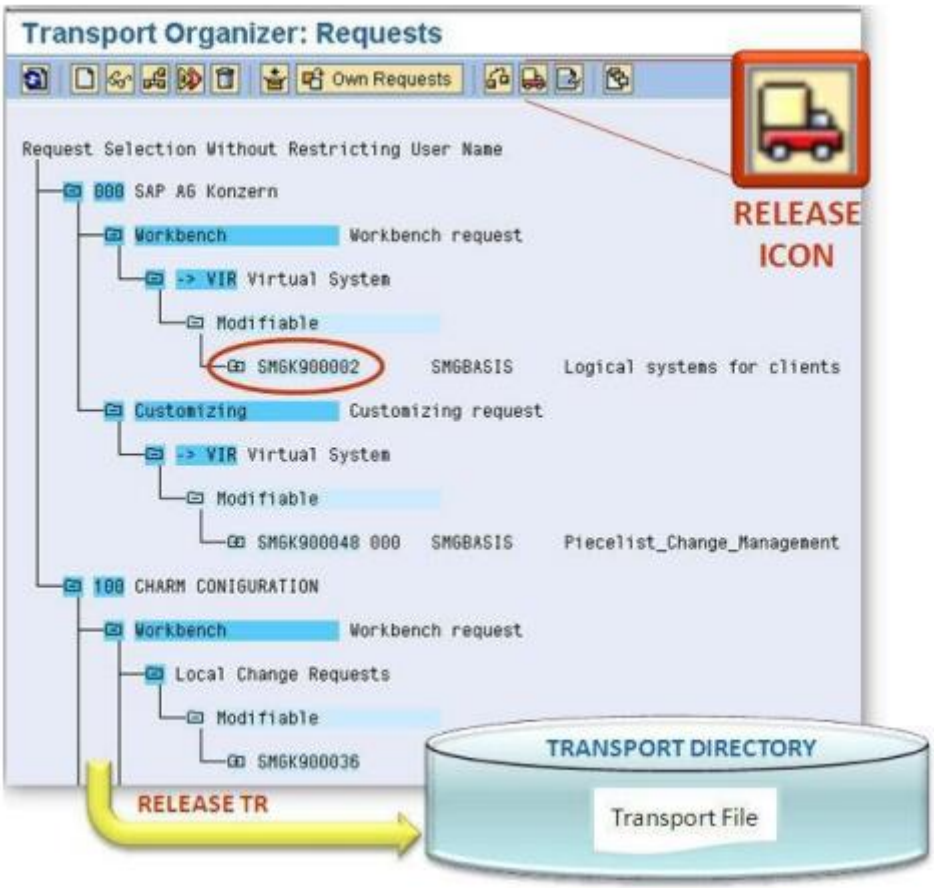
**Manually –** Create the change request from the Transport Organizer, and then enter required attributes and insert objects.




**Release the Transport Request (Export Process)**

- Position the cursor on the TR name or a Task name & choose the Release icon (Truck), a record of the TR is automatically added to the appropriate import queues of the systems defined in the TMS.
- Releasing and importing a request generates export & import logs.




# The Import Process

Importing TRs into the target system

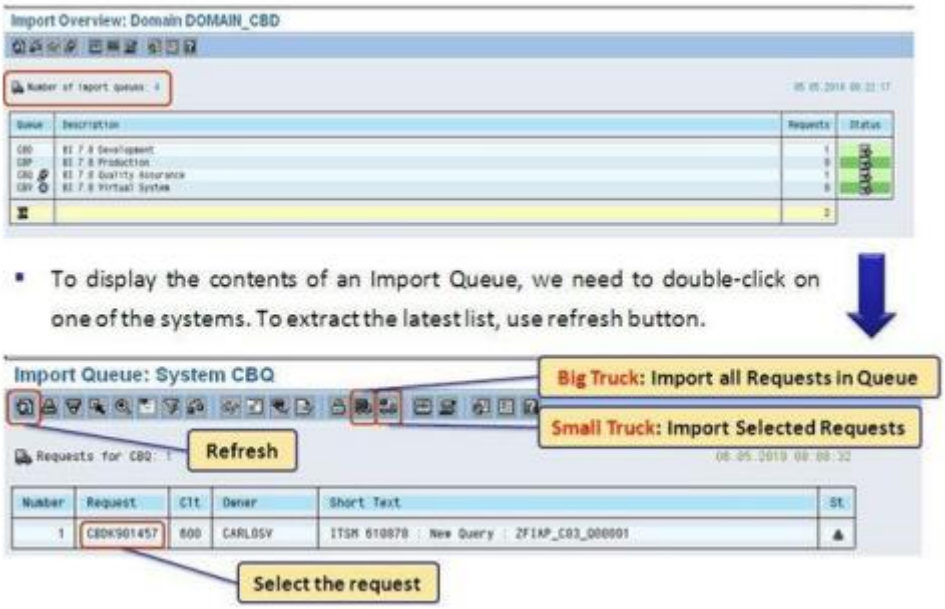
After the request owner releases the Transport Requests from Source system, changes should appear in quality and production system; however, this is not an automatic process.

As soon as the export process completes (releasing of TRs), relevant files (Cofiles and Data files) are created in the common transport directory at OS level and the entry is made in the **Import Buffer** (OS View) **/ Import Queue** (SAP App. View) of the QAS and PRD.

Now to perform the import, we need to access the import queue and for that, we need to execute transaction code **STMS -> Import Button** OR select **Overview -> Imports**.

It will show the list of systems in the current domain, description, and a number of requests available in Import Queue and the status.

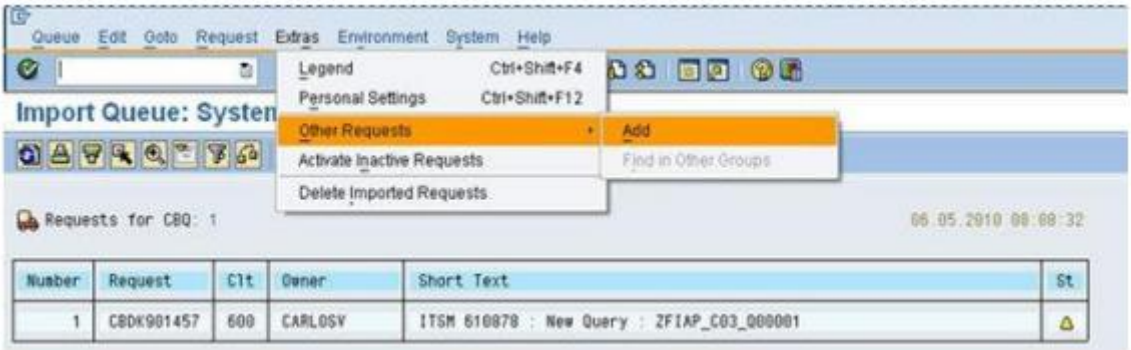
**Import Queue ->** is the list of TRs available in the common directory and are ready to be imported into the target system, this is the SAP Application View, at the OS level it is also known as **Import Buffer.**




# The Import Status

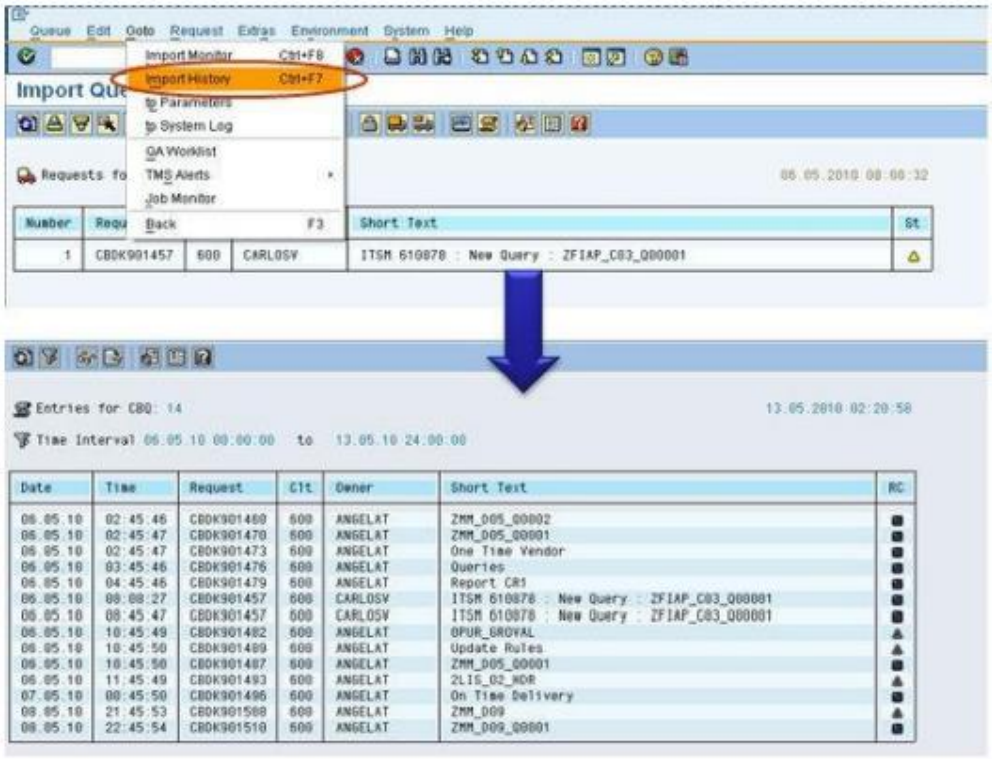
Import Queue shows some standard '**status icons**' in the last column, here are the icons with their meanings, as defined by SAP:


In case, a request is not added automatically in the import queue/buffer, even though the OS level files are present, then we can add such requests by the following method, however, we should know the name of intended TR:



# Import History

We can also check the previous imports that happened in the system as follows:



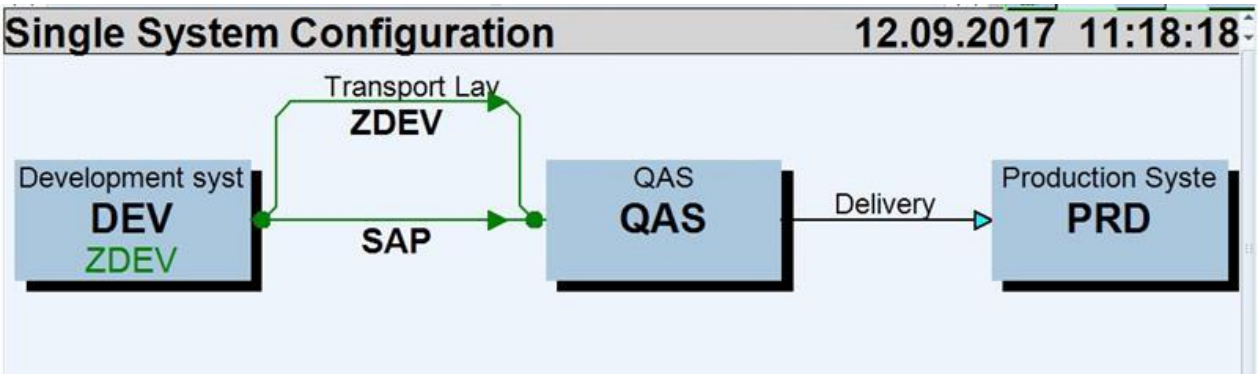

# Transport logs and return codes

After the transport has been performed, the system administrator must check whether it was performed properly or not, for that SAP has provided us with the following type of **logs (SE01 -> GOTO -> Transport Logs):**

- **Action Log –** which displays actions that have taken place: exports, test import, import and so forth.
- **Transport Logs –** which keep a record of the transport log files.

One of the important information provided by logs are the return codes:

- **0:** The export was successful.
- **4:** Warning was issued but all objects were transported successfully.
- **8:** A warning was issued and at least one object could not be transported successfully.
- **12 or higher:** A critical error had occurred, generally not caused by the objects in the request.



# SAP Monitoring & Performance Checks

## What is System Monitoring

System monitoring is a daily routine activity and this document provides a systematic step by step procedure for Server Monitoring. It gives an overview of technical aspects and concepts for proactive system monitoring. Few of them are:

- Checking Application Servers.
- Monitoring System-wide Work Processes.
- Monitoring Work Processes for Individual Instances.
- Monitoring Lock Entries.
- CPU Utilization
- Available Space in Database.
- Monitoring Update Processes.
- Monitoring System Log.
- Buffer Statistics

Some others are:

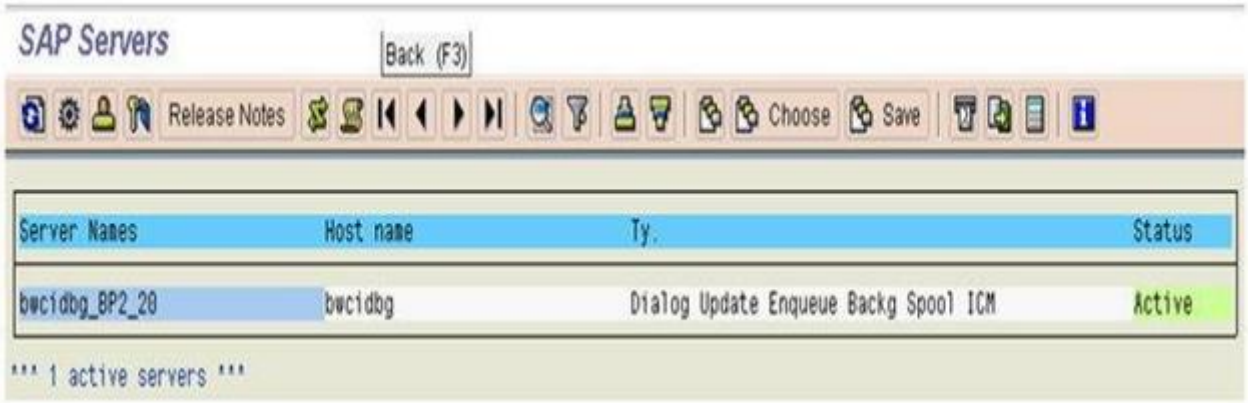
- Monitoring Batch Jobs
- Spool Request Monitoring.
- Number of Print Requests
- ABAP Dump Analysis.
- Database Performance Monitor.
- Database Check.
- Monitoring Application Users.

## Why Daily Basic checks / System Monitoring


## How do we do monitor a SAP System

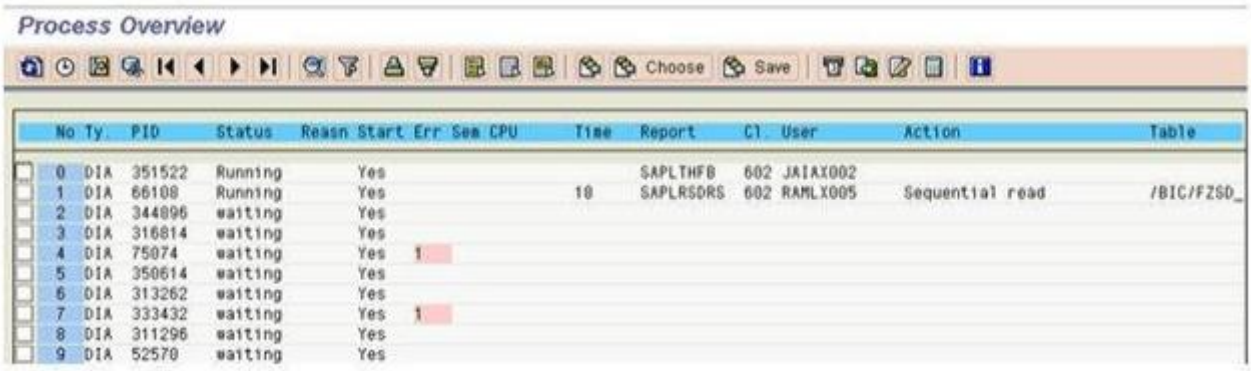
# Checking Application Servers (SM51)

This transaction is used to check all active application servers.




Here you can see which services or work processes are configured in each instance.

Displays all running, waiting, stopped and PRIV processes related to a particular instance. Under this step we check all the processes; the process status should always be waiting or running. If any process is having a status other than waiting or running, we need to check that particular process and report accordingly.




This transaction displays a lot of information like:

1. Status of Work process (whether it's occupied or not)

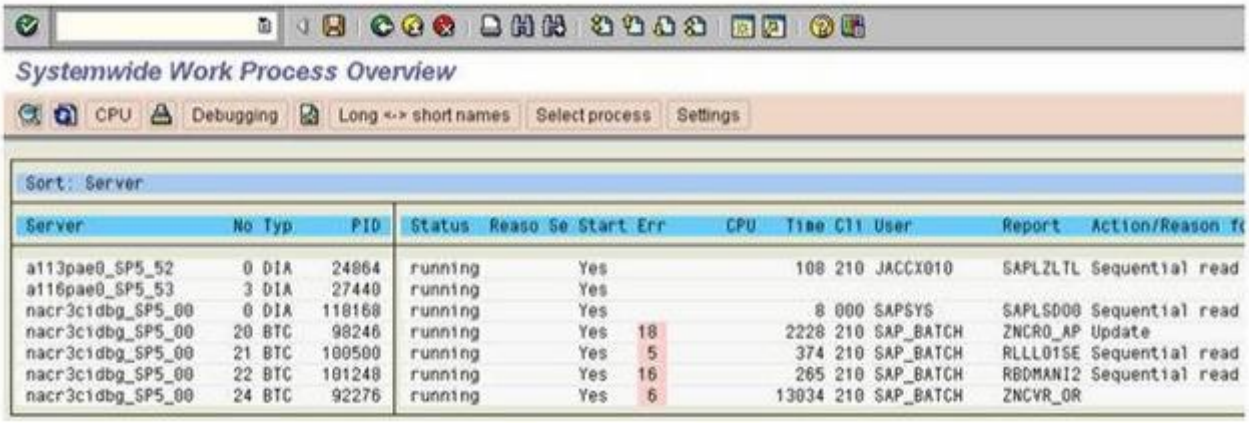
2. If the work process is running, you may be able to see the action taken by it in the Action column.

3. You can which table is being worked upon

Some of the typical problems:

- The user takes a long time to log on/not able to logon/online transaction very slow. This could be the result of the DIA work processes are fully utilized. There could be also the result of long running jobs (red indicator under the Time column). If necessary, you can cancel the session by selecting the jobs then go to Process>Cancel Without core. This will cancel the job and release the work process for other user/process
- Some users may have PRIV status under **Reason** column. This could be that the user transaction is so big that it requires more memory. When this happen the DIA work process will be 'owned' by the user and will not let other users use. If this happens, check with the user and if possible run the job as a background job.
- If there is a long print job on SPO work process, investigate the problem. It could be a problem related to the print server or printer.

# Monitoring System-wide Work Processes (SM66)




By checking the work process load using the global work process overview, we can quickly investigate the potential cause of a system performance problem.

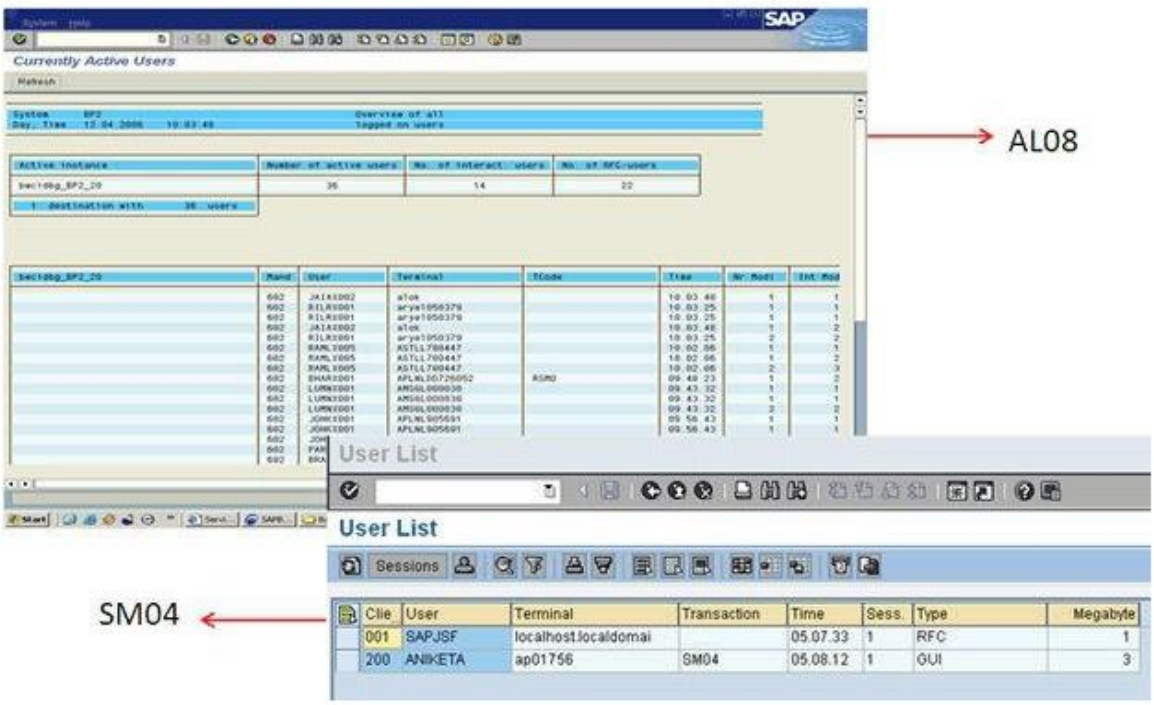
Monitor the work process load on all active instances **across the system**

Using the Global Work Process Overview screen, we can see at a glance:

- The status of each application server
- The reason why it is not running
- Whether it has been restarted
- The CPU and request run time
- The user who has logged on and the client that they logged on to
- The report that is running

# Monitor Application User (AL08 and SM04)

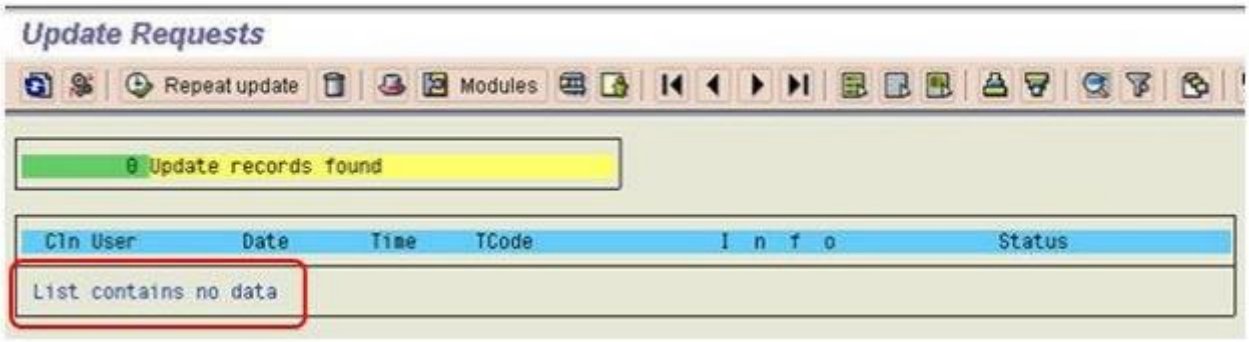
This transaction displays all the users of active instances.



# Monitoring Update Processes (SM13)

Execute Transaction SM13 and put '*' in the field USER and click on Executive button.


If there are no long pending updates records or no updates are going on than this queue will be empty as shown in the below screen shot

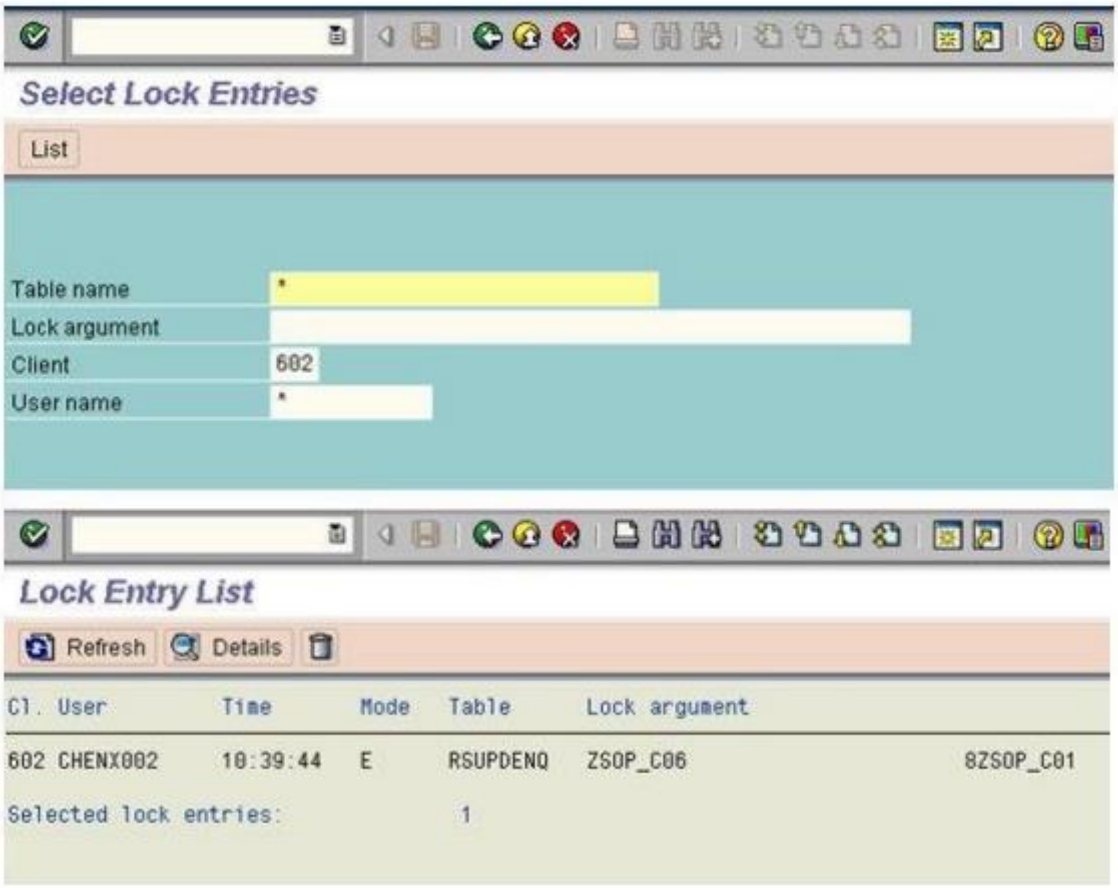



But, if the Update is not active then find the below information:

- Is the update active, if not, was it deactivated by the system or by a user?
- Click on **Administration** button and get the information.
- Click on Executive button and get the below information:
- Is any update cancelled?
- Is there a long queue of pending updates older than 10 minutes?

# Monitoring Lock Entries (SM12)

Execute Transaction SM12 and put '*' in the field User Name




SAP provides a locking mechanism to prevent other users from changing the record that you are working on. In some situations, locks are not released. This could happen if the users are cut off i.e. due to network problem before they are able to release the lock.

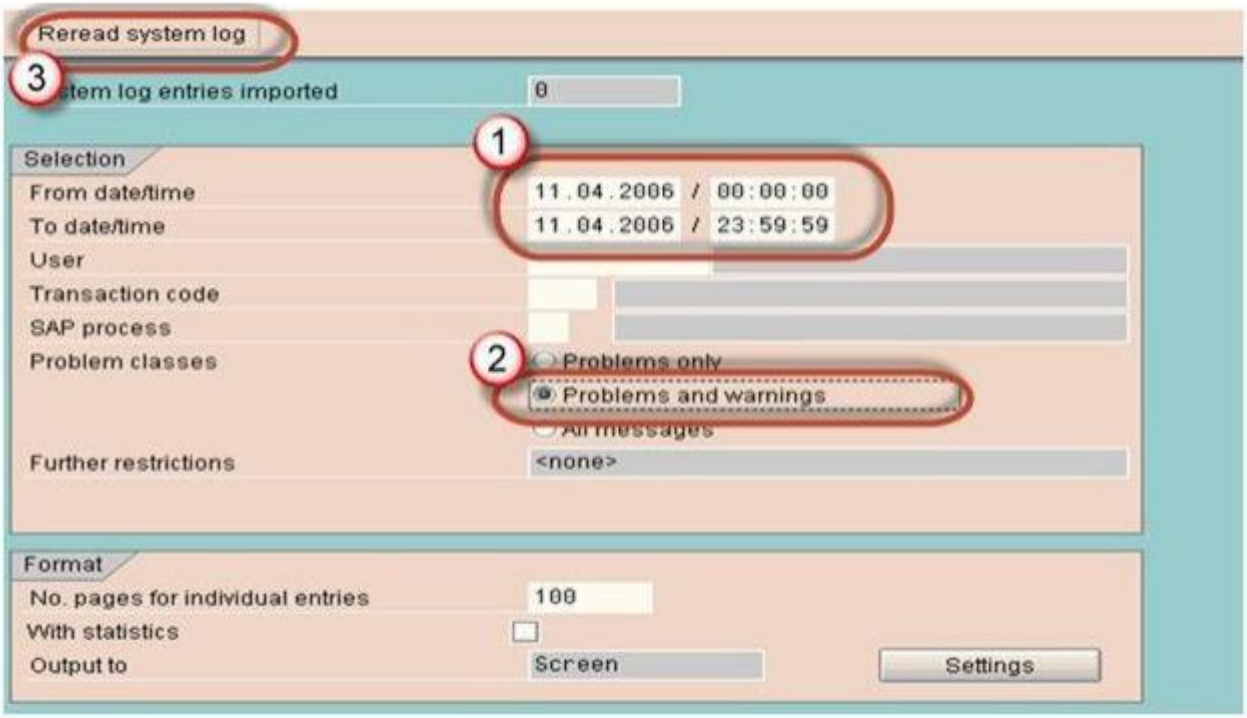
These old locks need to be cleared or it could prevent access or changes to the records.

We can use lock statistics to monitor the locks that are set in the system. We record only those lock entries which are having date time stamp of the previous day.

# Monitoring System Log (SM21)

We can use the log to pinpoint and rectify errors occurring in the system and its environment. We check the log for the previous day with the following selection/option:

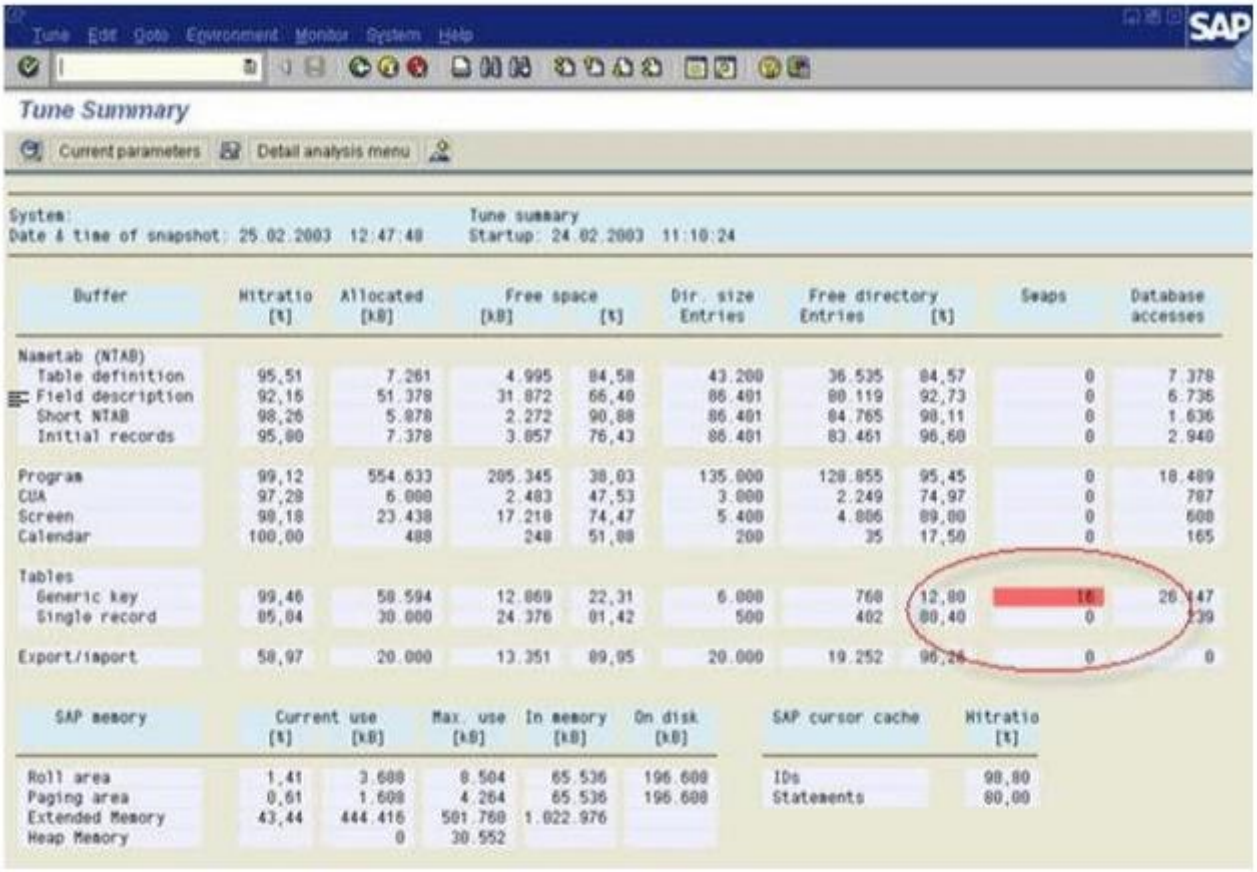
- Enter Date and time.
- Select Radio Button Problems and Warnings
- Press Reread System Log.



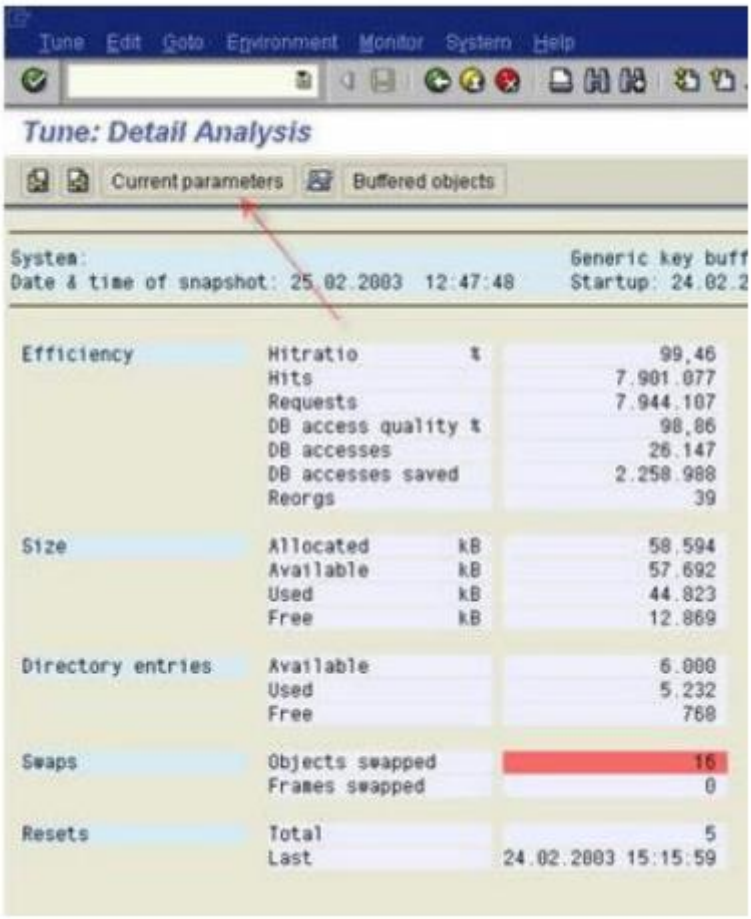

# Tune Summary (ST02)

**Step 1:** Go to ST02 to check the Tune summary.

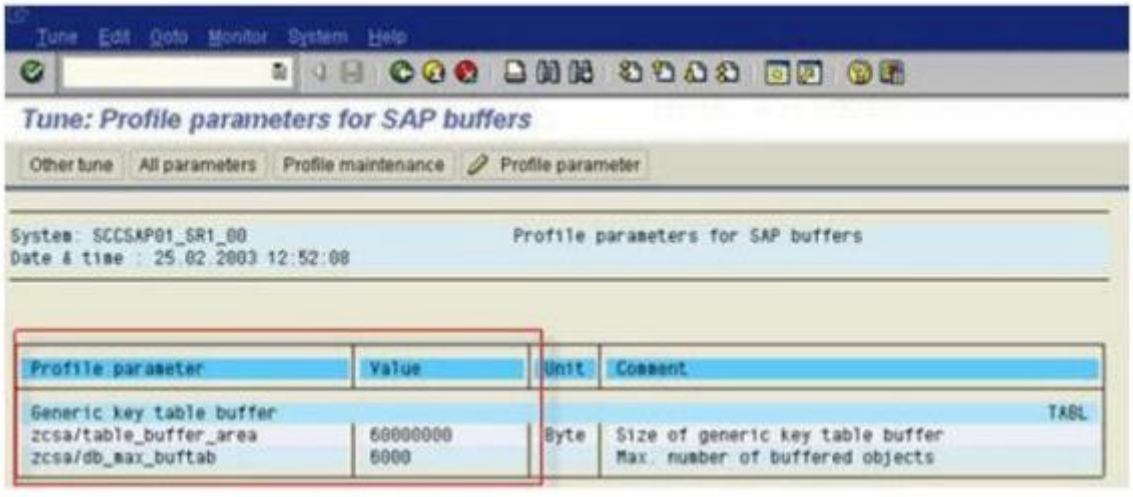
**Step 2:** If you see any red values, in SWAPS, double –click the same.



**Step 3:** In the below screen click on the tab 'Current Parameters'




**Step 4:** Note down the value and the Profile parameters

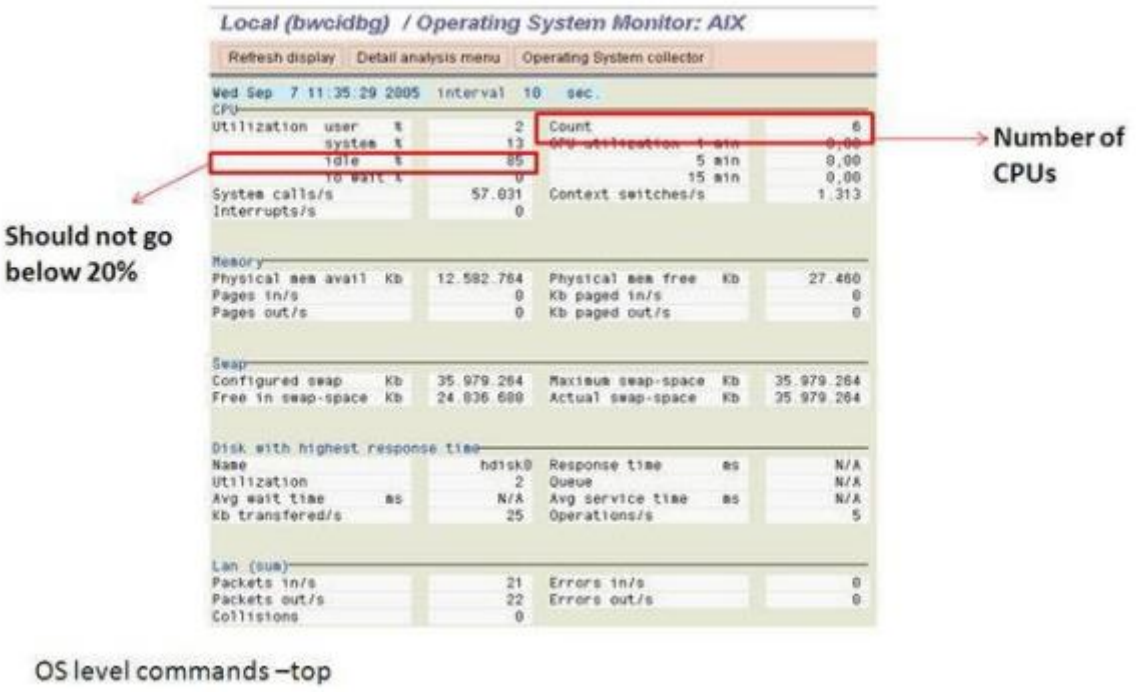



**Step 5:** Go to RZ10 (to change the Profile parameter values)

**Step 6:** Save the changes.

**Step 7:** Restart the server to take the new changes effect.

# CPU Utilization (ST06)

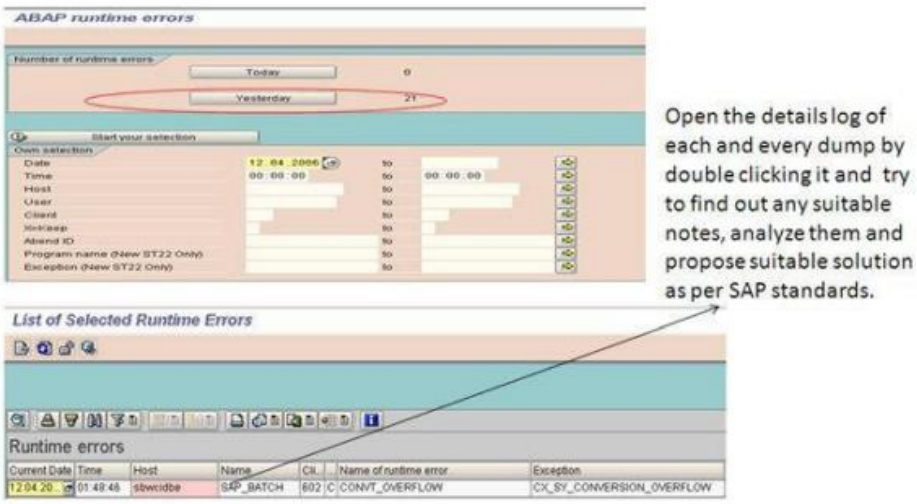



Idle CPU utilization rate must be 60-65%, if it exceeds the value then we must start checking at least below things:

- Run OS level commands – top and check which processes are taking most resources.
- Go to SM50 or SM66. Check for any long running jobs or any long update queries being run.
- Go to SM12 and check lock entries
- Go to SM13 and check Update active status.
- Check for the errors in SM21

# ABAP Dumps (ST22)

Here we check for previous day's dumps



# Spool Request Monitoring (SP01)

For spool request monitoring, execute SP01 and select as below:

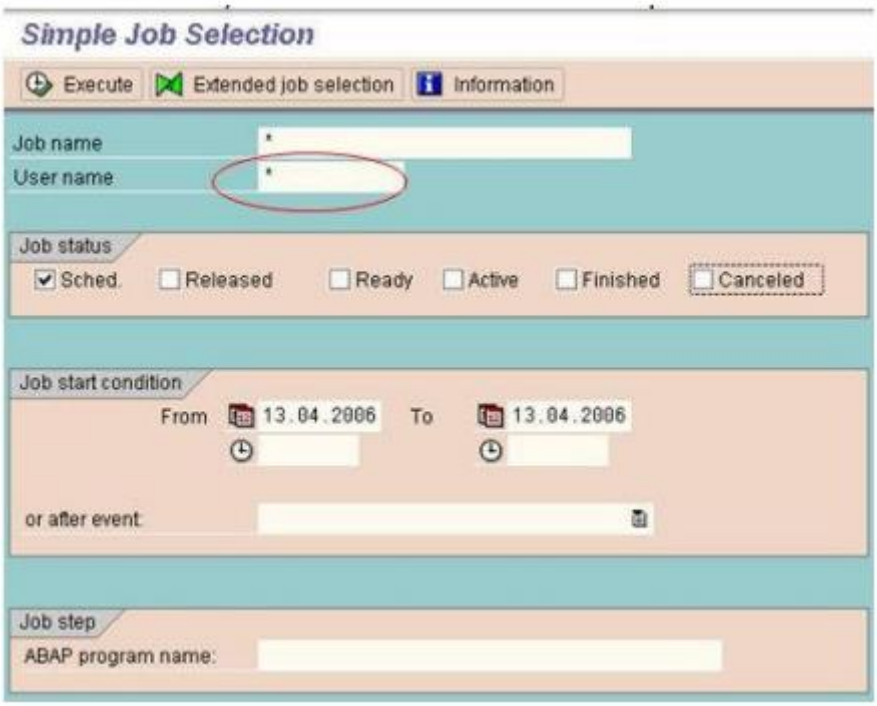
- Put '*' in the field Created By
- Click on execute button.


Here we record only those requests which are terminated with problems.


# Monitoring Batch Jobs (SM37)

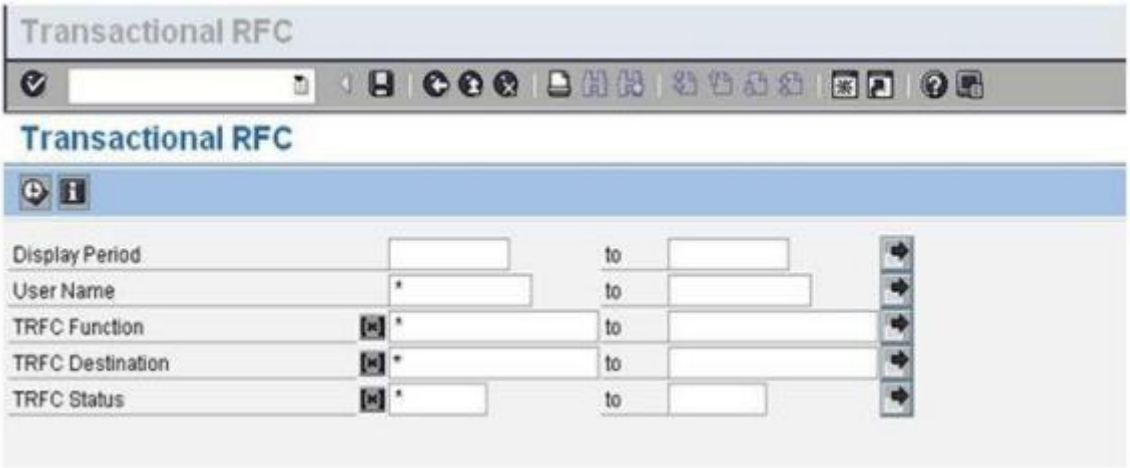
For Monitoring background jobs, execute SM37 and select as below:

- Put '*' in the field User Name and Job name
- In Job status, select: Scheduled, Cancelled, Released and Finished requests.




# Transactional RFC Administration (SM58)

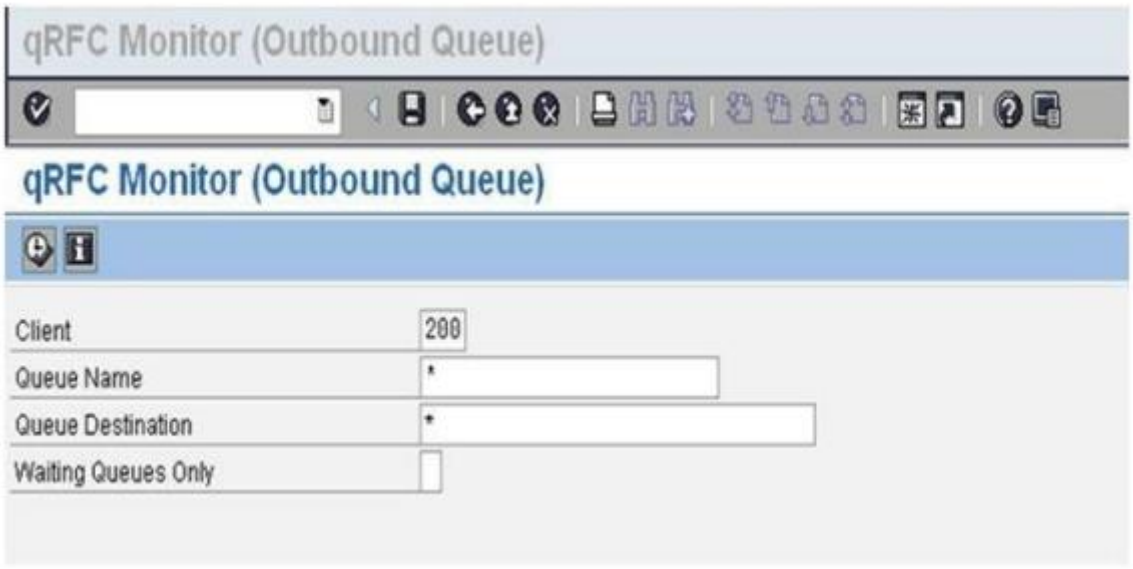
Transactional RFC (tRFC, also originally known as asynchronous RFC) is an asynchronous communication method which executes the called function module in the RFC server only once.



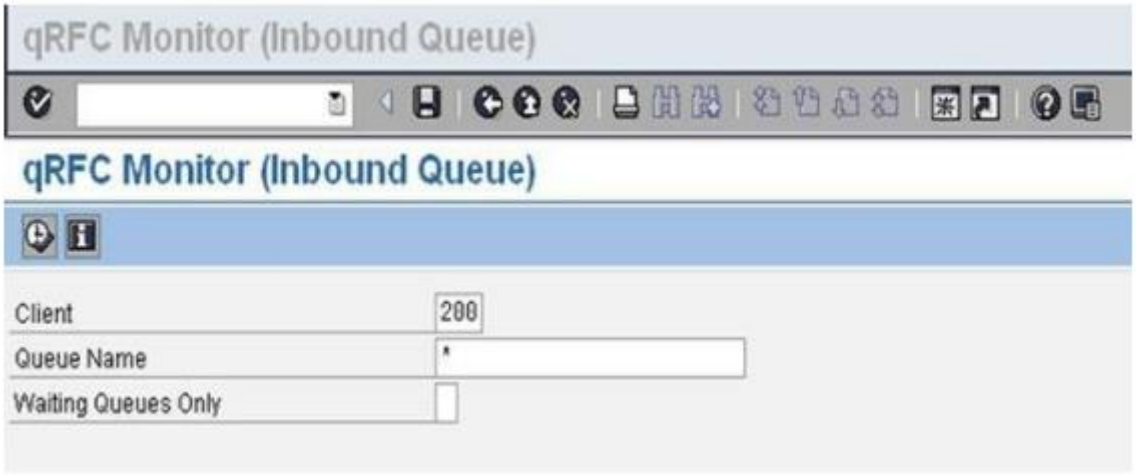

We need to select the display period for which we want to view the tRFCs and then select '*' in the username field to view all the calls which have not be executed correctly or waiting in the queue.

# QRFC Administration (Outbound Queue-SMQ1)

We should specify the client name over here and see if there any outgoing qRFCs in waiting or error state.

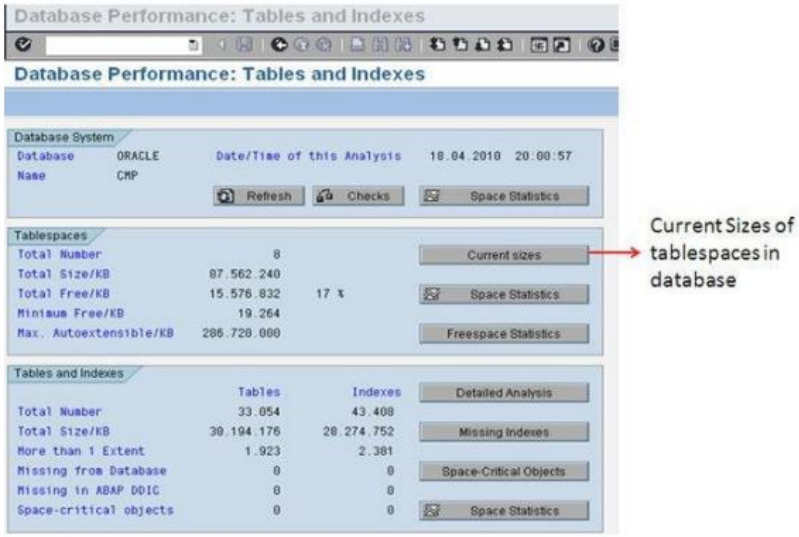



# QRFC Administration (Inbound Queue-SMQ2)




We should specify the client name over here and see if there any incoming qRFCs in waiting or error state.

# Database Administration (DB02)



After you select **Current Sizes** on the first screen we come to the below screen which shows us the current status of all the table spaces in the system.

Memory Management: Tablespaces

Tablnd | History of tablesp. | Storage management | Freespace analysis | Critical tables/ind.

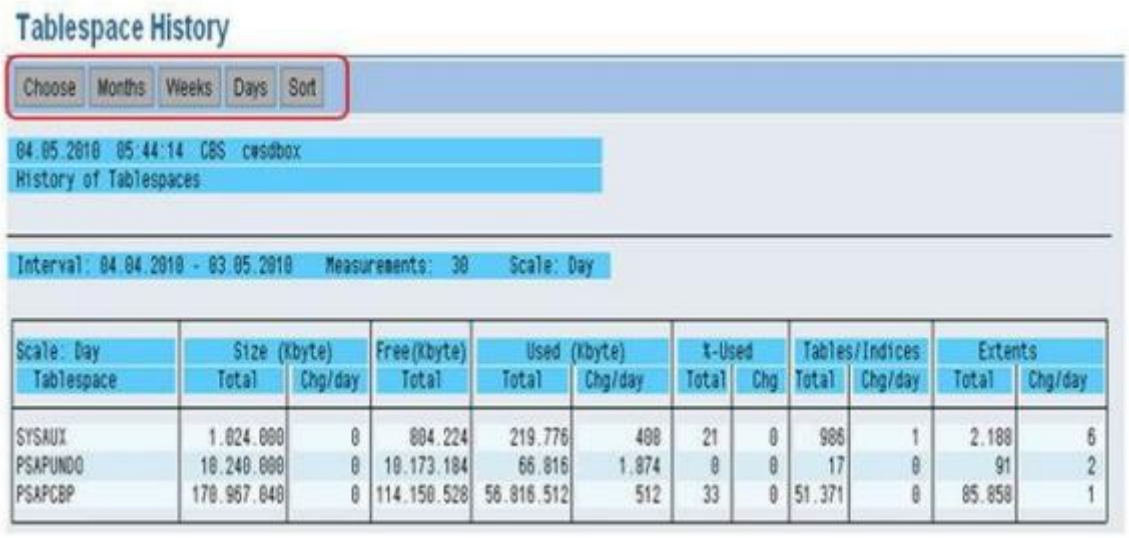
04.05.2010 05:43:32 CBS cwsdbox
Tablespace status

Date/time of this analysis: 03.05.2010 20:55:12

| Tablespace | Size (kb) | Free (kb) | Used (%) | Tab/ind | Extents | AutoExt (kb) | Used (%) | Status | Backup |
|---|---|---|---|---|---|---|---|---|---|
| PSAPCBP | 170.967.040 | 114.150.528 | 33 | 51.371 | 85.858 | 645.120.000 | 9 | ONLINE | NOT ACTIVE |
| PSAPCBP640 | 27.955.200 | 27.954.432 | 0 | 0 | 0 | 122.880.000 | 0 | ONLINE | NOT ACTIVE |
| PSAPCBP700 | 17.817.600 | 13.440 | 99 | 960 | 6.894 | 20.480.000 | 87 | ONLINE | NOT ACTIVE |
| PSAPCBPDB | 5.120.000 | 4.013.632 | 21 | 1.012 | 1.618 | 30.720.000 | 4 | ONLINE | NOT ACTIVE |
| PSAPCBPUSR | 40.960 | 40.192 | 1 | 11 | 11 | 10.240.000 | 0 | ONLINE | NOT ACTIVE |
| PSAPSR3DB | 5.120.000 | 5.119.888 | 0 | 0 | 0 | 30.720.000 | 0 | ONLINE | NOT ACTIVE |
| PSAPTEMP | 10.240.000 | 10.237.952 | 0 | 0 | 0 | 10.240.000 | 0 | ONLINE | NOT ACTIVE |
| PSAPUNDO | 10.240.000 | 10.173.184 | 0 | 17 | 91 | 10.240.000 | 0 | ONLINE | NOT ACTIVE |
| SYSAUX | 1.024.000 | 804.224 | 21 | 986 | 2.188 | 10.240.000 | 2 | ONLINE | NOT ACTIVE |
| SYSTEM | 624.640 | 14.464 | 97 | 1.203 | 2.568 | 10.240.000 | 6 | ONLINE | NOT ACTIVE |
| Total | 249.149.440 | 172.521.056 | 30 | 55.560 | 99.228 | | | | |

If any of the tablespaces is more than 95% and the auto extent is off then we need to add a new datafile so that the database is not full.

We can also determine the history of tablespaces.



Tablespace History

Choose | Months | Weeks | Days | Sort

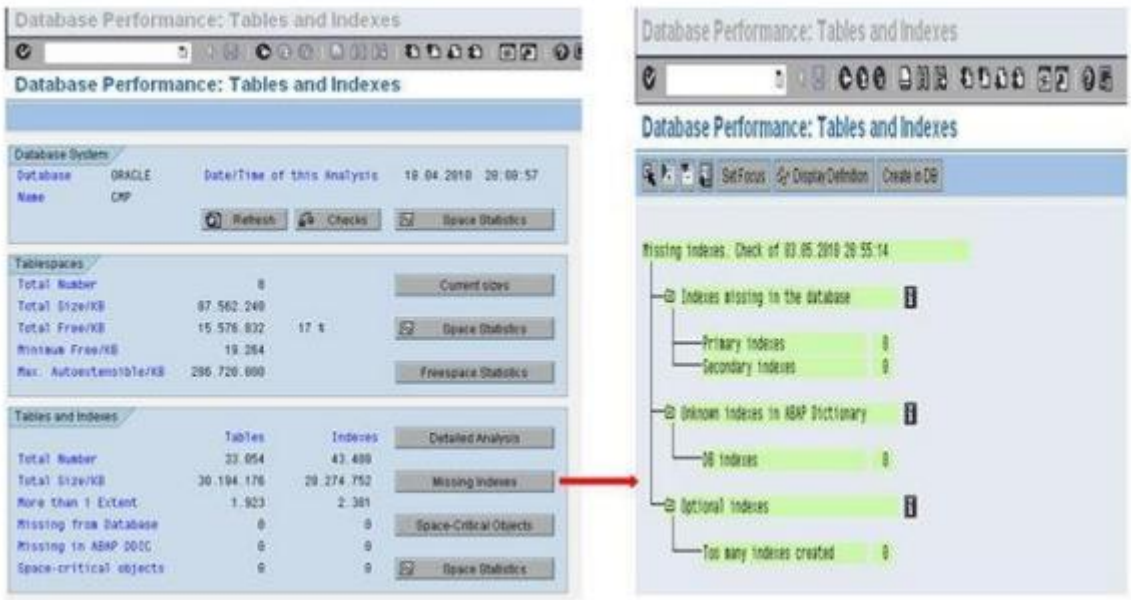
04.05.2010 05:44:14 CBS cwsdbox
History of Tablespaces

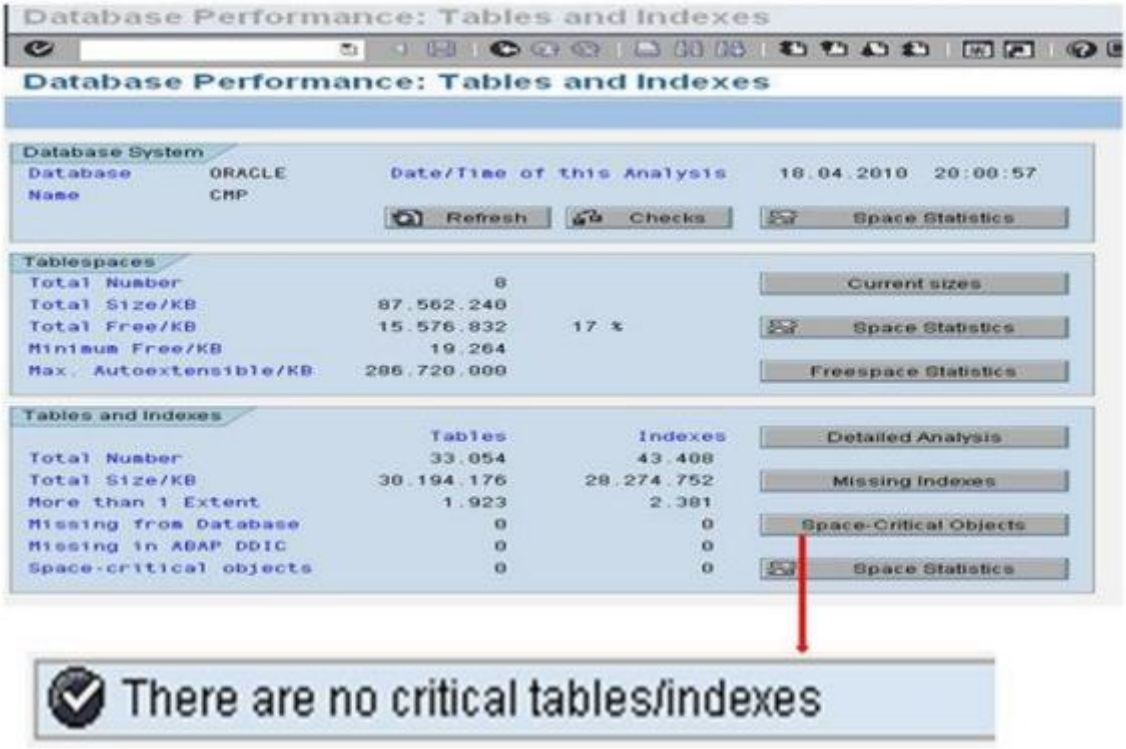
Interval: 04.04.2010 - 03.05.2010 Measurements: 30 Scale: Day

| Scale: Day / Tablespace | Size (Kbyte) Total | Size (Kbyte) Chg/day | Free(Kbyte) Total | Used (Kbyte) Total | Used (Kbyte) Chg/day | %-Used Total | %-Used Chg | Tables/Indices Total | Tables/Indices Chg/day | Extents Total | Extents Chg/day |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SYSAUX | 1.024.000 | 0 | 804.224 | 219.776 | 408 | 21 | 0 | 986 | 1 | 2.188 | 6 |
| PSAPUNDO | 10.240.000 | 0 | 10.173.184 | 66.816 | 1.874 | 0 | 0 | 17 | 0 | 91 | 2 |
| PSAPCBP | 170.967.040 | 0 | 114.150.528 | 56.816.512 | 512 | 33 | 0 | 51.371 | 0 | 85.858 | 1 |

We can select Months, Weeks or Days over here to see the changes which take place in a tablespace.

We can determine the growth of tablespace by analyzing these values.

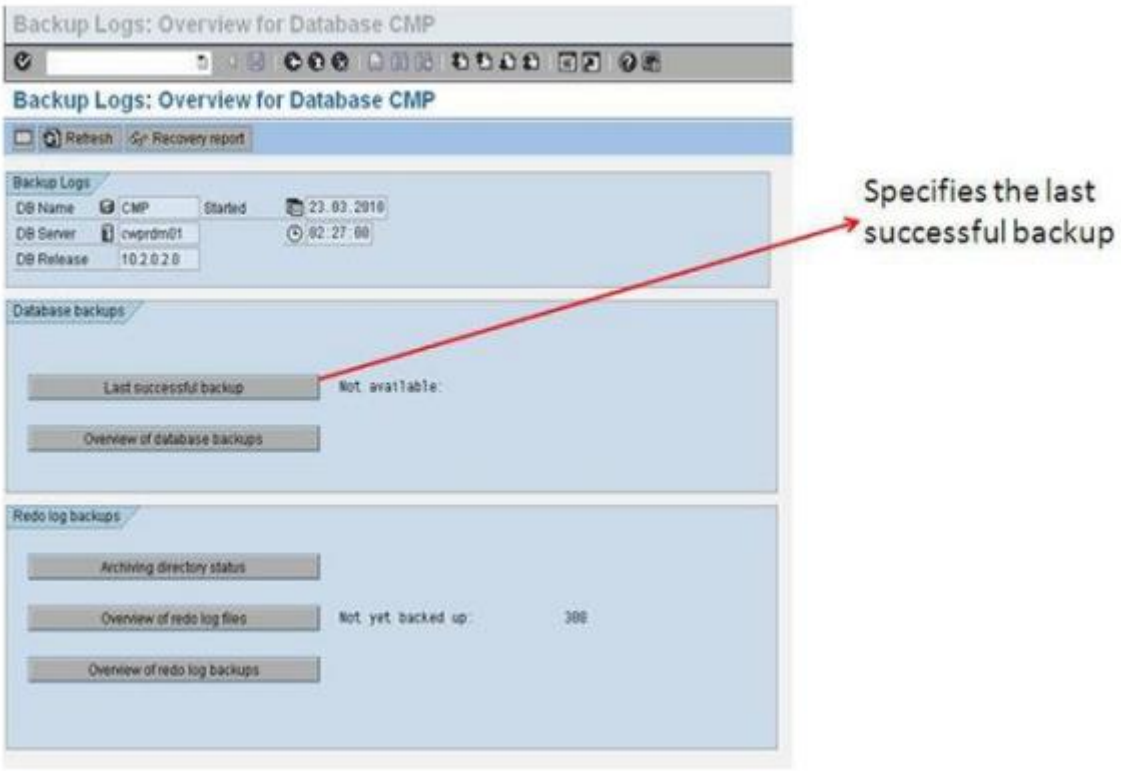



# Database Backup logs (DB12)

From this transaction, we could determine when the last successful backup of the system was. We can review the previous day's backups and see if everything was fine or not.

We can also review the redo log files and see whether redo log backup was successful or not.




# Quick Review

Daily Monitoring Tasks

**1. Critical tasks**

**2. SAP System**

**3. Database**

# Critical tasks

| No | Task | Transaction | Procedure / Remark |
|---|---|---|---|
| 1 | Check that the R/3System is up. | | Log onto the R/3 System |
| 2 | Check that daily backup executed withouterrors | DB12 | Check database backup. |

# SAP System

| No | Task | Transaction | Procedure / Remark |
|---|---|---|---|
| 1 | Check that all application servers are up. | SM51 | Check that all servers are up. |
| 2 | Check work processes (started from SM51). | SM50 | All work processes with a “running” or a “waiting” status |
| 3 | Global Work Process overview | SM66 | Check no work process is running more than 1800 second |
| 3 | Look for any failed updates (update terminates). | SM13 | Set date to one day ago<br>• Enter * in the user ID<br>• Set to “all” updates Check for lines with<br>• “Err.” |
| 4 | Check system log. | SM21 | Set date and time to before the last log review. Check for:<br>Errors<br>• Warnings<br>• Security messages<br>• Database problems<br>• |
| 5 | Review for canceled jobs. | SM37 | Enter an asterisk (*) in User ID.Verify that all critical jobs were successful. |
| 6 | Check for “old” locks. | SM12 | Enter an asterisk (*) for the user ID. |
| 7 | Check for users on the system. | SM04AL08 | Review for an unknown or different user ID and terminal.This task should be done several times a day. |
| | | | Enter an asterisk (*) for Created ByLook for |
| 8 | Check for spool problems. | SP01 | spool jobs that have been “In process” for over an hour. |
| 9 | Check job log | SM37 | Check for:<br>• New jobs<br>• Incorrect jobs |
| 10 | Review and resolve dumps. | ST22 | Look for an excessive number of dumps. Look for dumps of an unusual nature. |
| 11 | Review buffer statistics. | ST02 | Look for swaps. |

# Database

| No | Task | Transaction | Procedure / Remark |
|---|---|---|---|
| 1 | Review error log for problems. | ST04 | |
| 2 | Database GrowthMissing Indexes | DB02 | If tablespace is used more than 90 % add new data file to itRebuild the Missing Indexes |
| 3 | Database Statisticslog | DB13 | |

# Remote Function Call (RFC)

## What is RFC

RFC is a mechanism that allows business applications to communicate and exchange information (in pre-defined formats) with other systems. RFC stands for **'Remote Function Call'**

RFC consists of two interfaces:

1. A calling interface for ABAP Programs

2. A calling interface for Non-SAP programs.

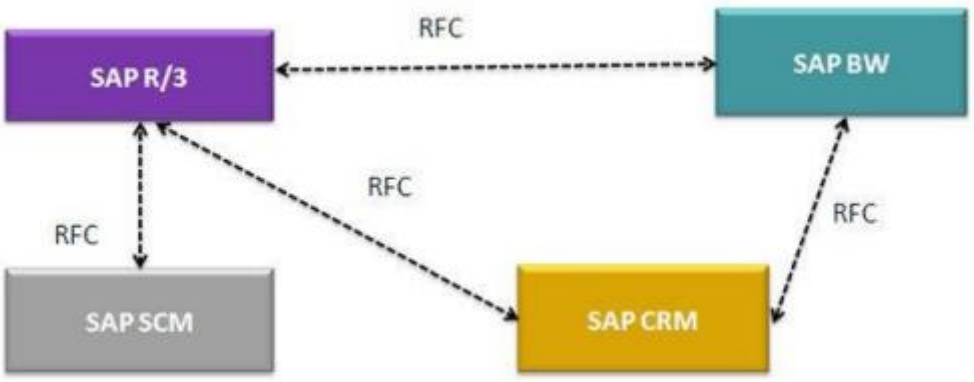
Any ABAP program can call a remote function using the **CALL FUNCTION...DESTINATION** statement. The **DESTINATION** parameter tells the SAP System that the called function runs in a system other than the callers.
**Syntax-**

```
CALL FUNCTION 'remotefunction'

DESTINATION dest

EXPORTING f1 =

IMPORTING f2 =

TABLES t1 =

EXCEPTIONS
```

Logical Destinations are defined via transaction **SM59** and stored in Table **RFCDES**

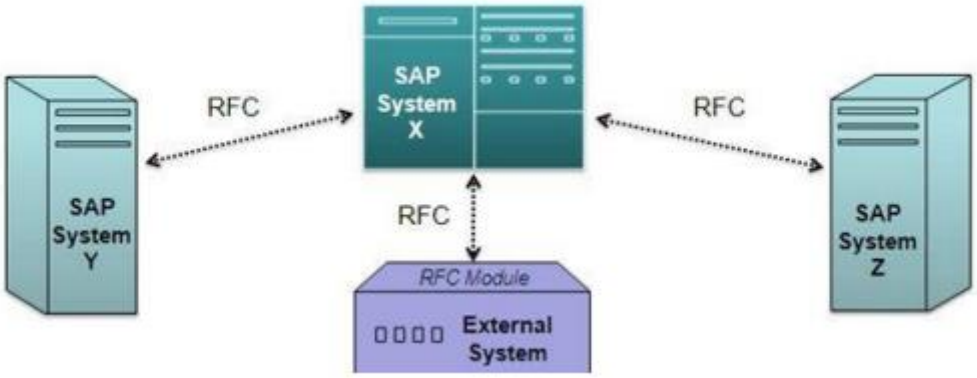
**Functions of the RFC interface**

- Converting all parameter data to the representation needed in the remote system
- Calling the communication routines needed to talk to the remote system.
- Handling communications errors, and notifying the caller, if desired (using EXCEPTIONS parameter of the CALL FUNCTION).




RFC is a SAP protocol to handle communications between systems to simplify the related programming. It is the process of calling a function module which is residing on a different machine from the caller program. RFCs can

be used to call a different program on the same machine as well, but usually, it is used when 'calling' and 'called' function modules/ programs are running on separate machines.




In SAP, RFC Interface system is used for setting-up RFC connections between different SAP systems, and also between a SAP and an external (non-SAP) system.

# Must Know Details About RFC

- SAP Uses CPIC (Common Programming Interface for Communication) Protocol to transfer data between Systems. It is SAP Specific protocol. Remote Function Call (RFC) is a communications interface based on CPI-C, but with more functions and easier for application programmers to use
- The RFC library functions support the C programming language and Visual Basic (on Windows platforms)
- RFC connections can always be used across the entire system. This means that an RFC connection you have defined in client 000 can also be used from client 100 (without any difference).
- RFC is the protocol for calling special subroutines (function modules) over the network. Function modules are comparable with C functions or PASCAL procedures. They have a defined interface through which data, tables and return codes can be exchanged. Function modules are managed in the R/3 System in their own function library, called the Function Builder.
- The Function Builder (transaction SE37) provides application programmers with a useful environment for programming, documenting and Testing function modules that can be called locally as well as remotely. The R/3 System automatically generates the additional code (RFC stub) needed for remote calls.
- You maintain the parameters for RFC connections using transaction SM59. The R/3 System is also delivered with an RFCSDK (Software Development Kit) that uses extensive C libraries to allow external programs to be connected to the R/3 System.
- The only difference between a remote call of a function module to another server and a local call is a special parameter (destination) that specifies the target server on which the program is to be executed.

The RFC Advantages

RFC helps to reduce the efforts of programmers, by letting them avoid the re-development of modules and methods at remote systems. It is capable enough to:

- Convert the data into the format understandable by the remote (target) system.
- Convert the data into the format understandable by the remote (target) system.
- Call up certain routines which are necessary to start communication with the remote system.
- Handle errors that might occur in the process of communication

# Types of RFC


# Synchronous

Requires both the systems (client and server) to be available at the time of communication or data transfer. It is the most common type and is required when the result is required immediately after the execution of sRFC.

sRFC is a means of communication between systems where acknowledgments are required. The resources of the Source System wait on the target system and ensure that they deliver the message/data with ACKD. The Data is consistent and reliable for communication.

The issue is if the target system is not available, the source system resources wait until target system is available. This may lead to the Processes of source system to go into Sleep/RFC/CPIC Mode at target systems and hence blocks these resources.

**Used for**

- For communication between systems
- For communication between SAP Web Application Server to SAP GUI

# Asynchronous

It is communication between systems where acknowledgments are not required (it is similar to postcard delivery).It doesn't require both the systems to be available at the time of execution and the result is not immediately required to be sent back to the calling system.

The Source System resource does not wait for the target system as they deliver the message/data without waiting for any acknowledgment. It is not reliable for communication since data may be lost if the target system is not available. **Used for –**

- For communication between systems
- For parallel processing

# Transactional

It is a special form of aRFC. Transactional RFC ensures transactionlike handling of processing steps that were originally autonomous.

Transactional RFC is an asynchronous communication method that executes the called function module in the RFC server only once, even if the data is sent multiple times due to some network issue. The remote system need not be available at the time when the RFC client program is executing a tRFC. The tRFC component stores the called RFC function, together with the corresponding data, in the SAP database under a unique transaction ID (TID). tRFC is similar to aRFC as it does not wait at the target system (Similar to a registered post). If the system is not available, it will write the Data into aRFC Tables with a transaction ID (SM58) which is picked by the scheduler RSARFCSE (which runs for every 60 seconds). **Used For**

- Extension of Asynchronous RFC
- For secure communication between systems

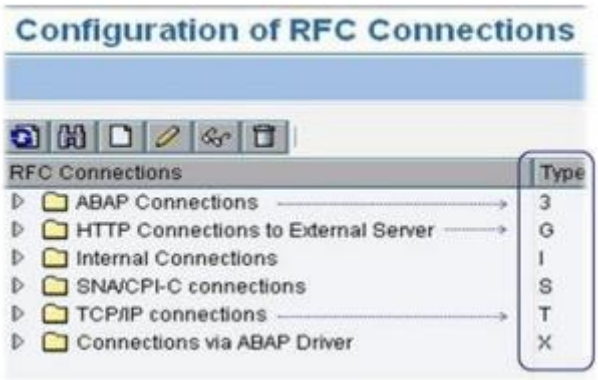
# Queued

Queued RFC is an extension of tRFC. It also ensures that individual steps are processed in sequence.

To guarantee that multiple LUWs (Logical Unit of Work/ Transaction) are processed in the order specified by the application. tRFC can be serialized using queues (inbound and outbound queues). Hence the name queued RFC (qRFC). Used For

- Extension of the Transactional RFC
- For a defined processing sequence
- Implementation of qRFC is recommended if you want to guarantee that several transactions are processed in a predefined order.

# Types of RFC Connections




**Type 3** - entries specify the connection between ABAP systems. Here, we must specify the host name / IP address. You can, however, specify logon information if desired. This is applicable for both type of RFCs, between ABAP systems and external calls to ABAP systems

**Type I** - entries specify ABAP systems connected to the same database as the current system. These entries are pre-defined and cannot be modified. Example entry name: ws0015_K18_24

ws0015=host name

K18=system name (database name)

24=TCP-service name

**Type T** - destinations are connections to external programs that use the RFC API to receive RFCs. The activation type can be either Start or Registration. If it is Start, you must specify the host name and the pathname of the program to be started.

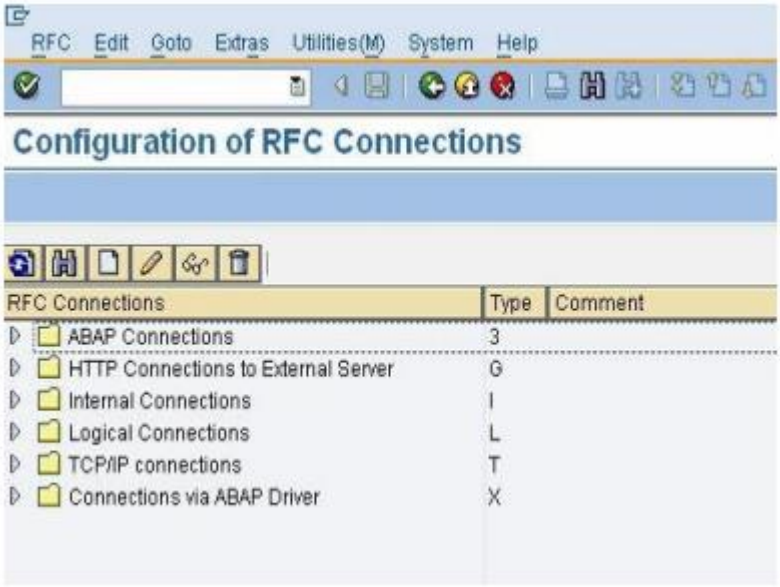
# How to Code an RFC

1.In the function module attributes tab (transaction code SE37), set the processing type as Remote-enabled module to create a remote function module.


2.Write the code for the function module.

```
*get user details from SRM system
    CALL FUNCTION 'ZZ_MM_GET_USER_DETAILS' destination l_dest
      EXPORTING
        p_objectid    = l_objectid
      IMPORTING
        p_userid      = l_userid
        p_fullname    = l_fullname
        p_email       = l_email
        p_langu       = l_langu
        p_userid_po   = l_userid_po
        p_fullname_po = l_fullname_po
        p_email_po    = l_email_po
        p_langu_po    = l_langu_po.
```

3.Define the destination of the RFC server in the RFC client system that calls the remote function ( via SM59 transaction).



**4.Declaring Parameters:** All parameter fields for a remote function module must be defined as reference fields, that is, like ABAP Dictionary fields.

**5.Exceptions:** The system raises COMMUNICATION_FAILURE and SYSTEM_FAILURE internally. You can raise exceptions in a remote function just as you would in a locally called function.

## Debugging Remote Function Calls

- It is **not possible to debug** a remote function call to another system.
- However, when testing ABAP-to-ABAP RFC calls, you can use the ABAP debugger to monitor the execution of the RFC function in the remote system.
- With remote calls, the ABAP debugger (including the debugging interface) runs on the local system. Data values and other run Page 197 information for the remote function are passed in from the remote system.

# How to Configure & Test RFC Connection in SAP

This tutorial is divided into 4 sections

**Step 1:** Setup an RFC connection

**Step 2:** Trusted RFC connection

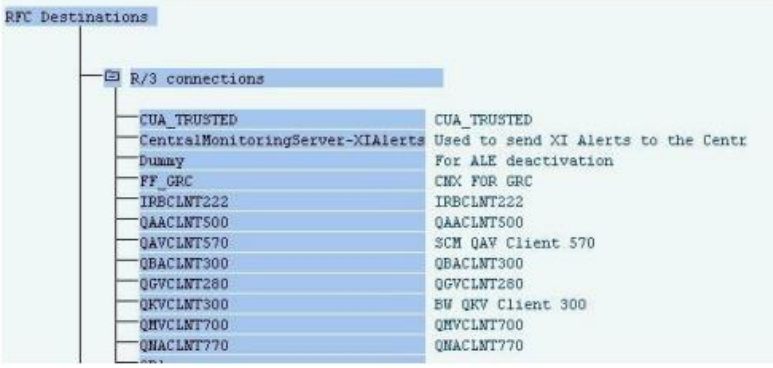
**Step 3:** Testing an RFC connection

**Step 4:** Error Resolution

## Step 1: Procedure to setup an RFC connection:

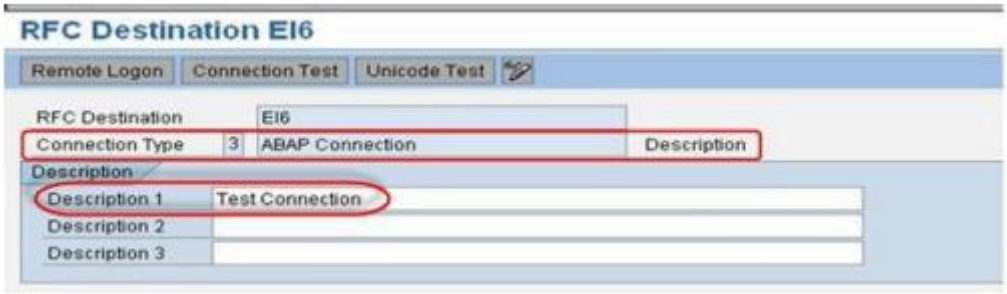
Enter Transaction Code **SM59**


In the SM59 screen, you can navigate through already created RFCs connection with the help of option tree, which is a menu-based method to organize all the connections by categories.



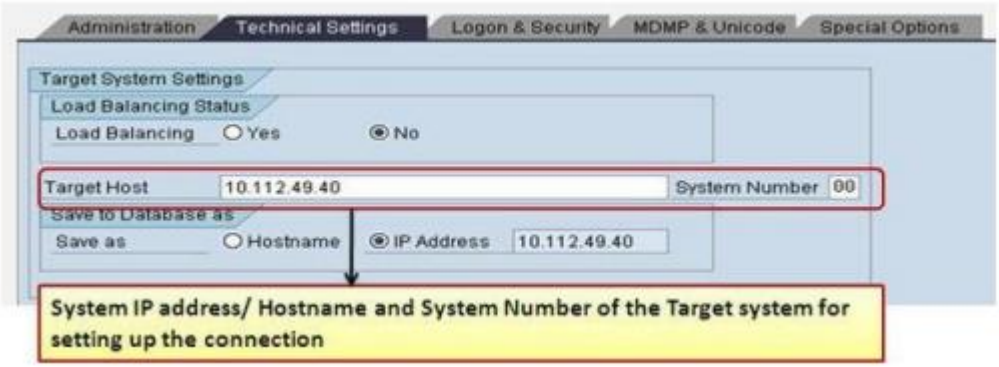
Click the 'CREATE' button. In the next screen , Enter –

- **RFC Destination –** Name of Destination (could be Target System ID or anything relevant)
- **Connection Type –** here we choose one of the types (as explained previously) of RFC connections as per requirements.
- **Description –** This is a short informative description, probably to explain the purpose of connection.




After you **'SAVE'** the connection, the system will take you to 'Technical Settings' tab, where we provide the following information:

- **Target Host–** Here we provide the complete hostname or IP address of the target system.
- **System Number –** This is the system number of the target SAP system.
- Click Save

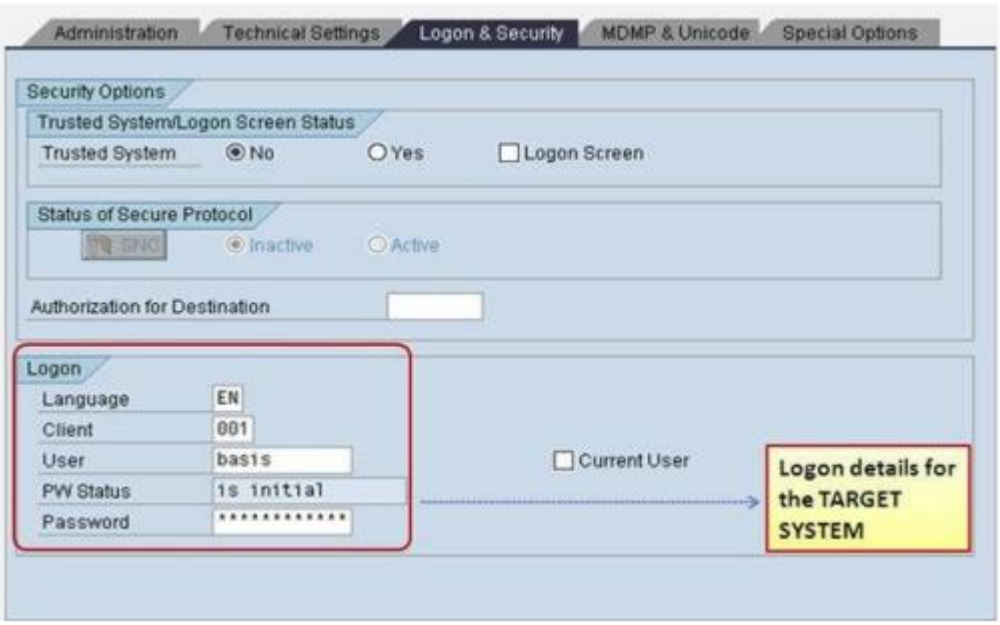



In the **'Logon and Security'** Tab, Enter Target System Information

**Language –** As per the target system's language

**Client –** In SAP we never logon to a system, there has to be a particular client always, therefore we need to specify client number here for correct execution.

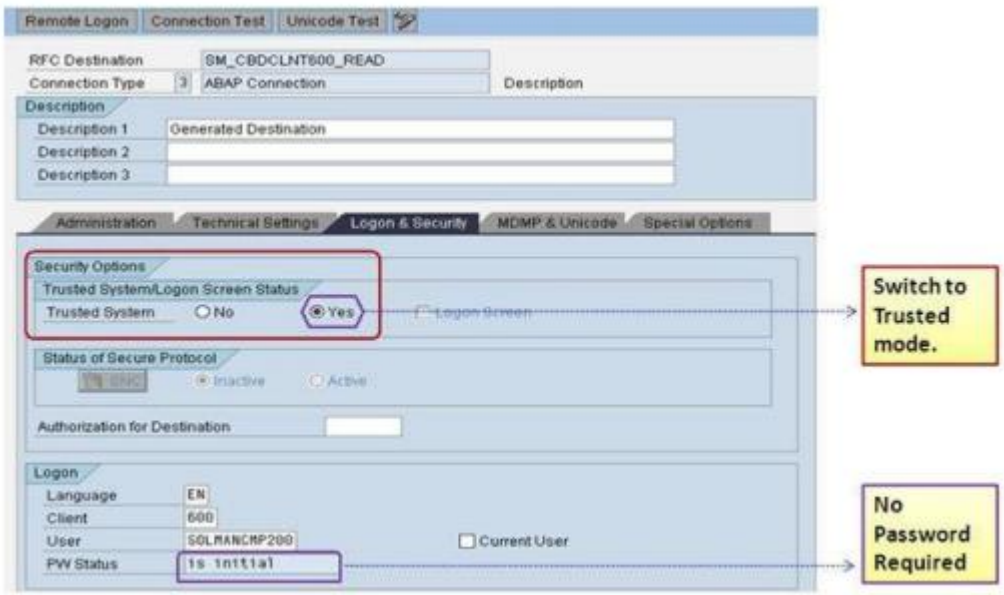
**User ID and Password –** preferably not to be your own login ID, there should be some generic ID so that the connection should not be affected by constantly changing end-user IDs or passwords. Mostly, a user of type 'System' or 'Communication' is used here. Please note that this is the User ID for the target system and not the source system where we are creating this connection.




Click Save. RFC connection is ready for use

**Note:** By default, a connection is defined as aRFC. To define a connection as tRFC or qRFC go to Menu Bar -> Destination aRFC options / tRFC options ; provide inputs as per requirements. To define qRFC, use the special options tab.

**Step 2:** Trusted RFC connection There is an option to make the RFC connection as **'Trusted'**. Once selected, the calling (trusted) system doesn't require a password to connect with target (trusting) system.



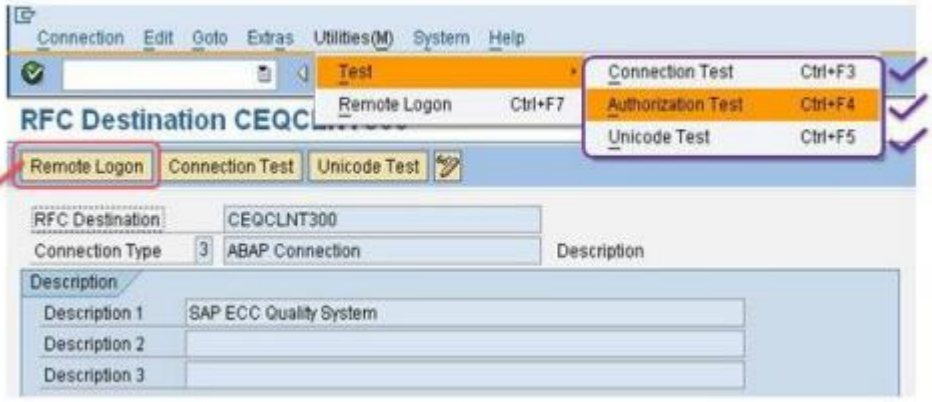

Following are the advantages for using trusted channels:

- Cross-system Single-Sign-On facility
- Password does not need to be sent across the network
- Timeout mechanism for the logon data prevents misuse.
- Prevents the mishandling of logon data because of the time-out mechanism.
- User-specific logon details of the calling/trusted system is checked.

The RFC users must have the required authorizations in the trusting system (authorization object **S_RFCACL**). Trusted connections are mostly used to connect SAP Solution Manager Systems with other SAP systems (satellites)

**Step 3:** Testing the RFC Connection

After the RFCs are created (or sometimes in the case of already existing RFCs) we need to test, whether the connection is established successfully or not.




As shown above we go to SM59 to choose the RFC connection to be tested and then we expand drop down menu - **"Utilities->Test->...".** We have three options:

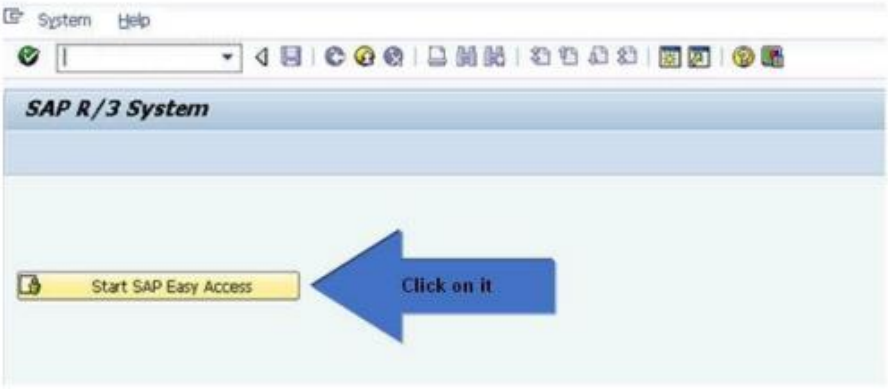
**Connection test ->** This attempts to make a connection with the remote system and hence validates IP address / Hostname and other connection details. If both systems are not able to connect, it throws an error. On success, it displays the table with response times. This test is just to check if the calling system can reach the remote system.

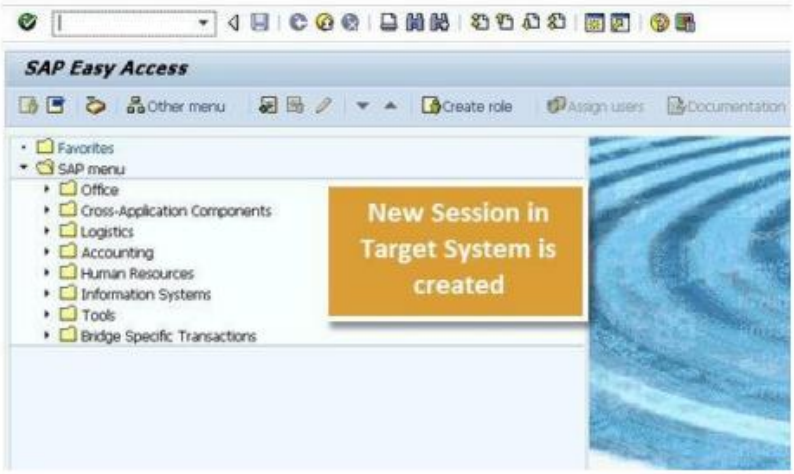

**Authorization Test ->** It is used to validate the User ID and Password (provided under 'logon and security' tab for the target system) and also the authorizations that are provided. If a test is successful, then the same screen will appear as shown above for the connection test.

**Unicode Test ->** It is to check if the Target system is a Unicode or not.


**Remote Logon –>**This is also a kind of connection test, in which a new session of the target system is opened, and we need to specify a login ID and Password (if not already mentioned under 'Logon and Security' tab). If

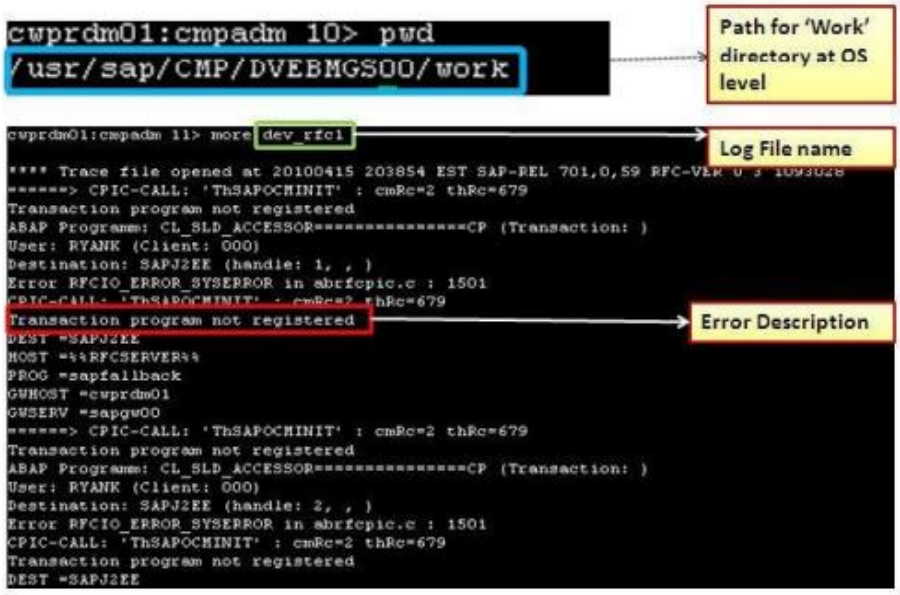
the user is of type 'Dialog' then a dialog session is created. To justify the successful connection test, output will be the response times for the communication packets, else error message will appear.




**Step 4:** What went wrong?

If somehow the RFC connection is not established successfully, we can check the logs (to analyze the issue) at OS level in the 'WORK' director. There we can find the log files with the naming convention as "dev_rfc" and the error description can be read from such files.



# Work Process

SAP system resources and they are responsible for processing all the tasks executed by the users.

Work process are 5 types in every central instance.

## DVEBMGS

**D - Dialog**

**V - Update**

**E - Enqueue**

**B - Background**

**M - Message**

**G - Gateway**

**S – Spool**

## Dialog work process (DIA)

It is the only Work Process to Interact directly with SAP System.

Act as Engine.

It should be 2 for Every Server (DIA-2).

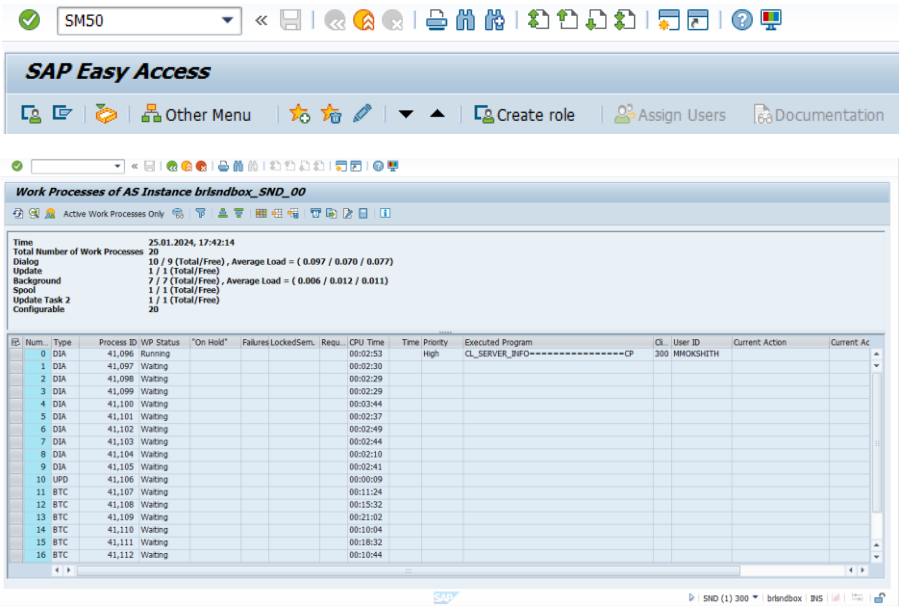
Parameter is, **RDISP/WP_NO_DIA=Total no. of DIA's**

It is only process which is used to communicate with the user's interactivity.

Take the request and process the user request.

**SM66 - Global WP Overview**

**SM50 - Local WP Overview**



# Update work process (UP-1)

Initiated by Dialog Work Process.

Used for Update the User Records.

Eg: User Id, Password, Parameters, Authorizations etc,.

These are Min-1 & Max-2 for any Server.

Parameters are,

**RDISP/WP_NO_VB=1◊Critical Updates.**

**RDISP/WP_NO_VB1=1◊Normal Updates.**

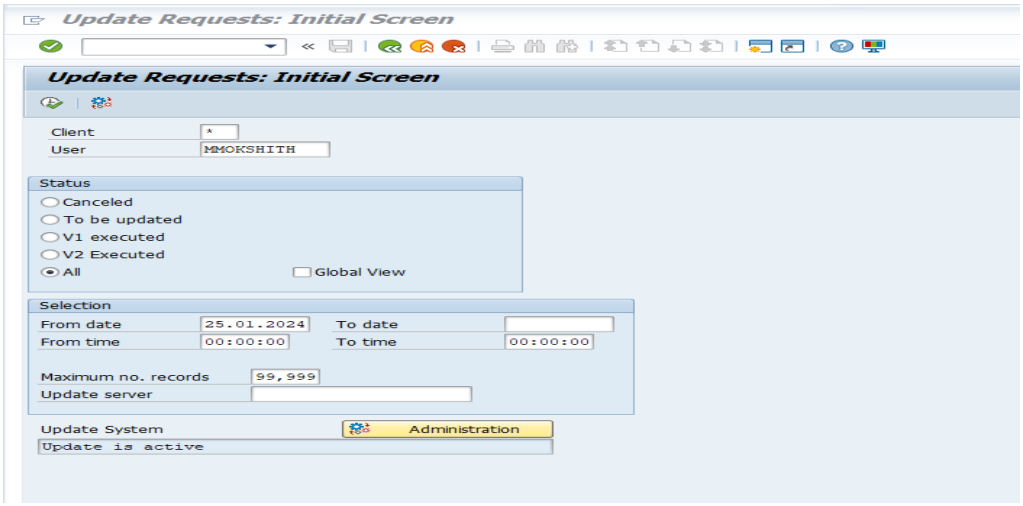
It is used to update the database by reading from the tables. Update the user records into Database.

There are two types of update work processes V1 update-processes & V2 update-processes.

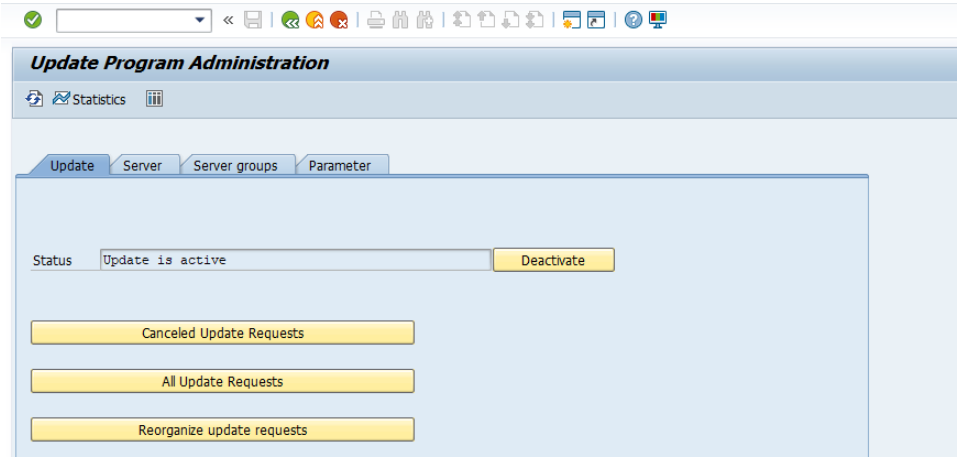
V1 update-processes (UPD) handle time-critical database changes (high priority database updates)

V2 update-processes (UPD2) handle non-time-critical database changes (low priority database updates)

**SM13 - To check if they are any failed updates.**




**SM14 - We can check whether active or not.**



# Enqueue work process (ENQ-1)

Initiated by Dialog Work Process.

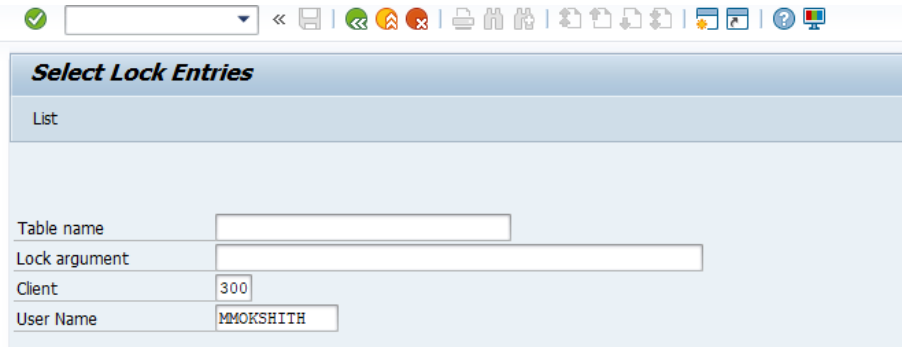
Used for Lock & Un-Lock User Objects during DB Update

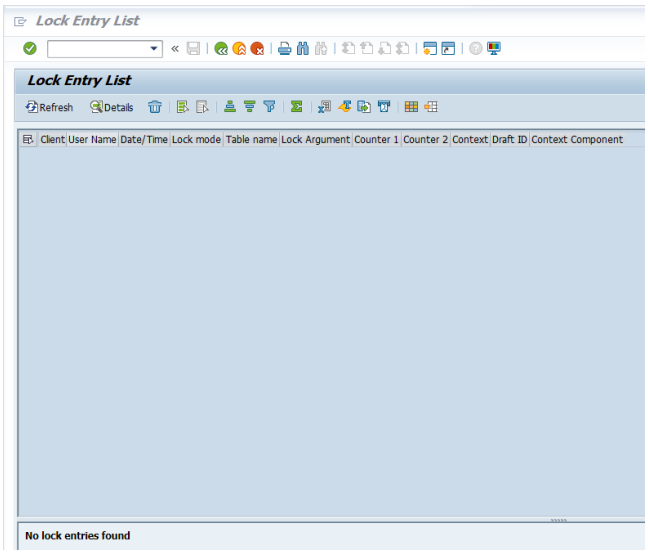
Parameter is, **RDISP/WP_NO_ENQ=1**

Every Server should be having 1 Enque Work Process.

It is responsible for locking mechanism and used to lock or unlock the records during an update. Whenever one user is working on particular job on that time the system will be automatically locked the particular user.

**SM12 - Lock entry**




# Background work process (BGD-2)

Initiated by Dialog Work Process.

It having the Time Taking & Long Running Jobs.

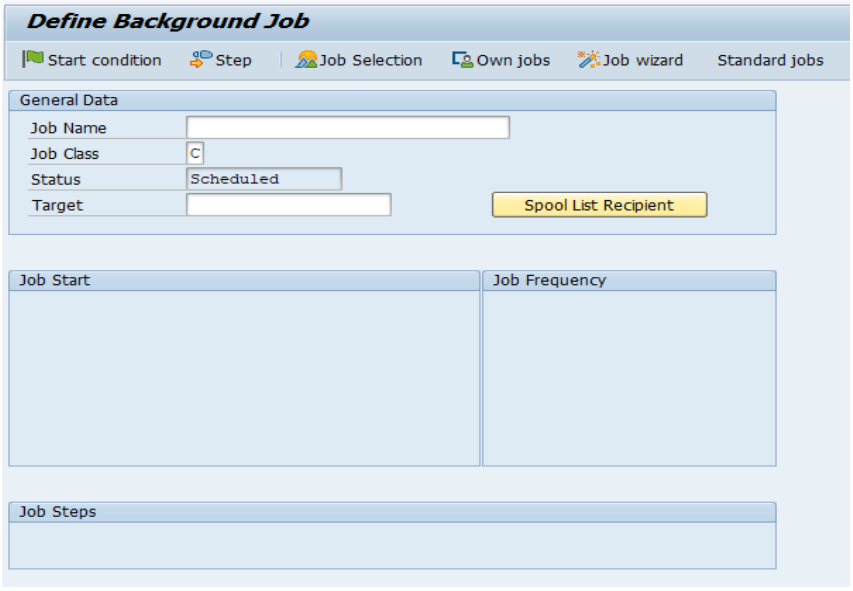
Parameter is, **RDISP/WP_NO_BTC=Total no. of BGD's.**

It having Restriction Time is 1800sec.

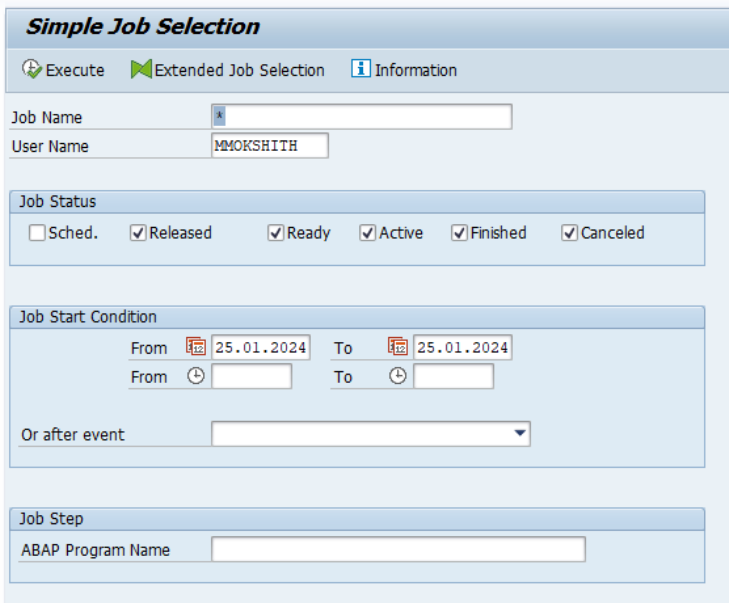
Parameter is**, RDISP/MAX_WPRUN_TIME=1800/2000sec**

It is the process of programs that can be executed without user interaction and doesn't any particular time limit.

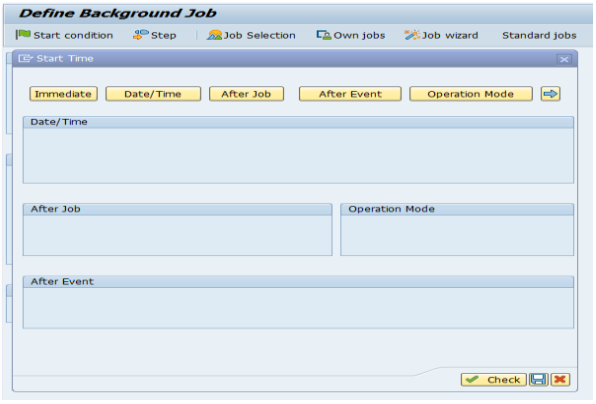
## SM36 - Define Background Job



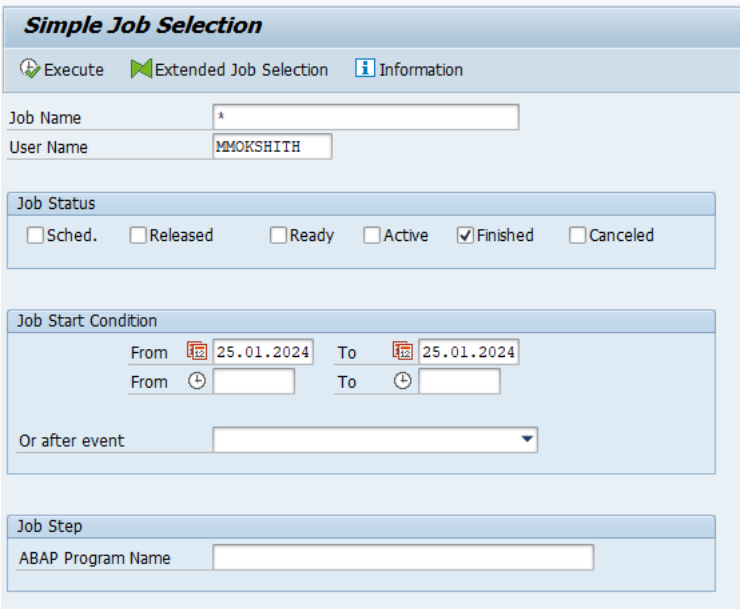

Enter Job Name and after click on Job selection




Go back and click on start condition



**SM37 - Check the status**




# Spool work process (SPO-1)

Initiated by Dialog Work Process.

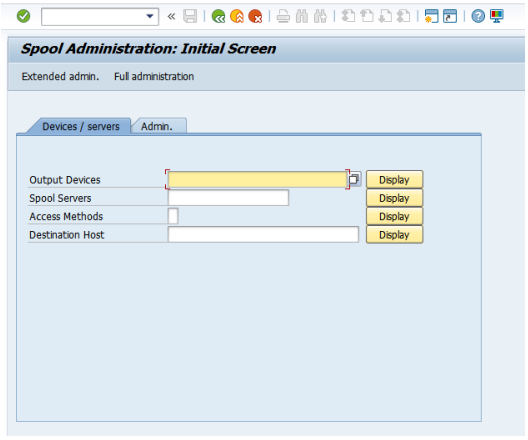
Used to take Doc Prints from Output Devices Eg: Printer, Fax

Parameter is, **RDISP/WP_NO_SPO=1**

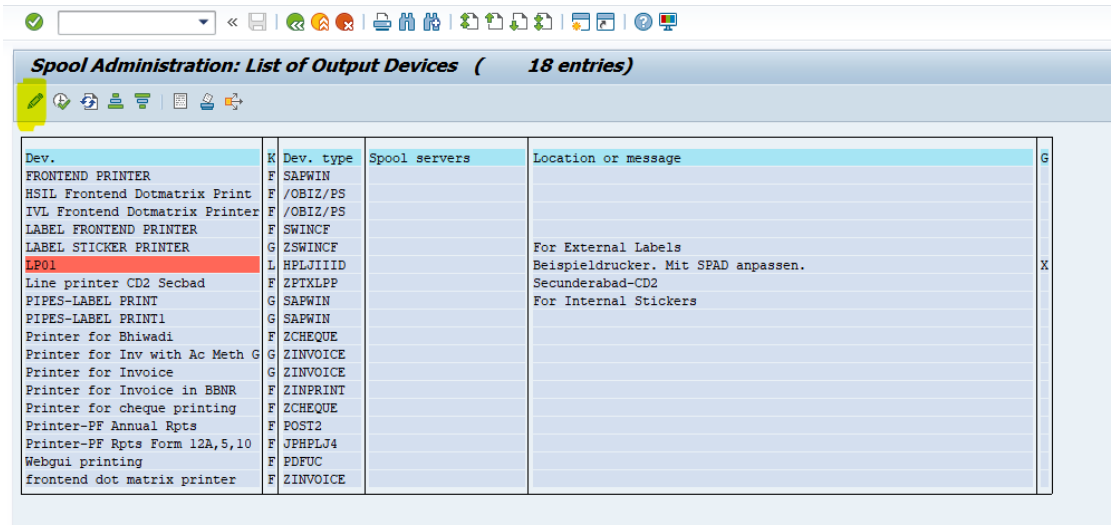
Every Server should be having 1 Spool Work Process.

It is used to O/P the documents to Printers/Emails/SMS

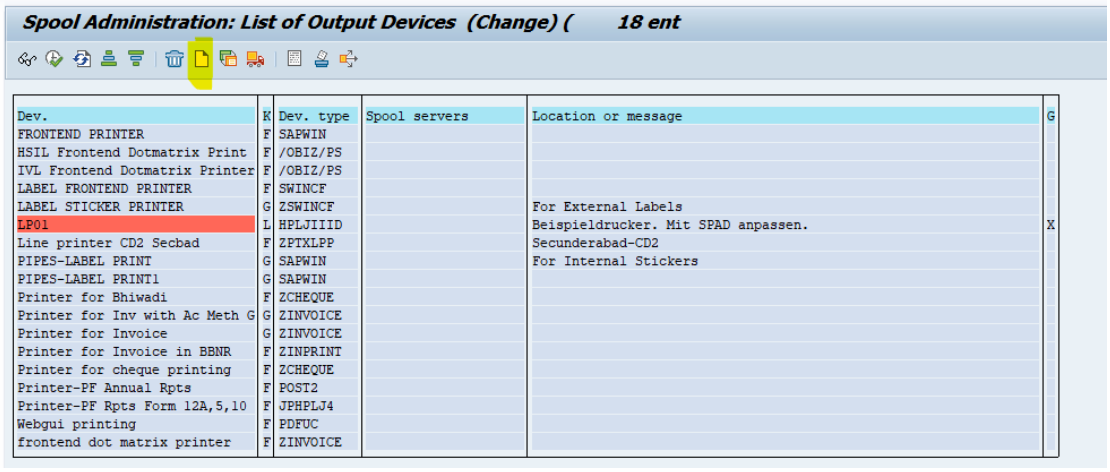
**SPAD - Administration**



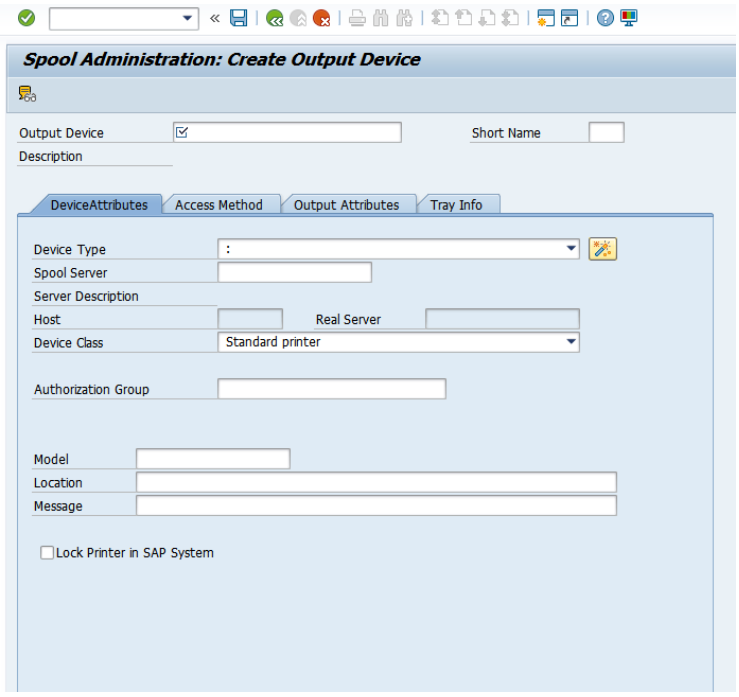

Click on Output Devices Display



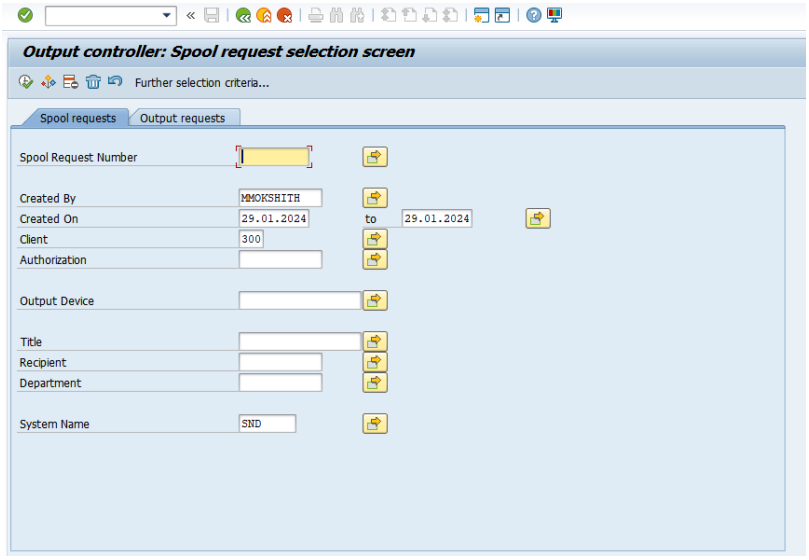

Click on edit to create new printer

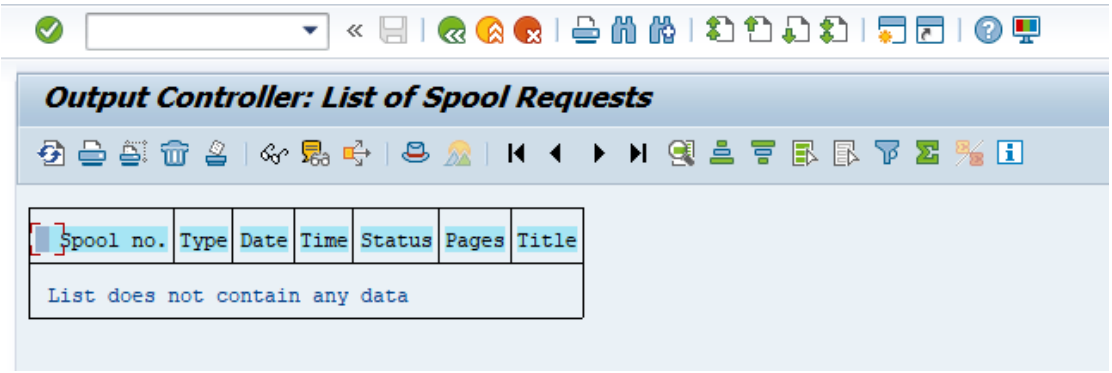



Click on create symbol



**SP01 - Print the check outputs**

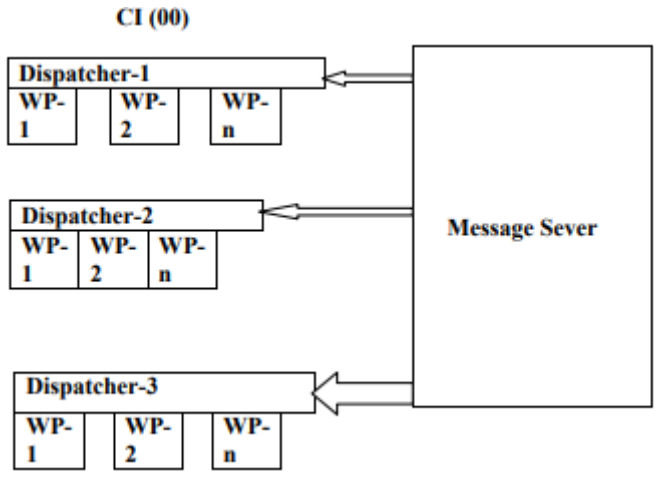



# Message Server

It is responsible for communication between SAP applications.

It is responsible for load balance activity




**Note:**

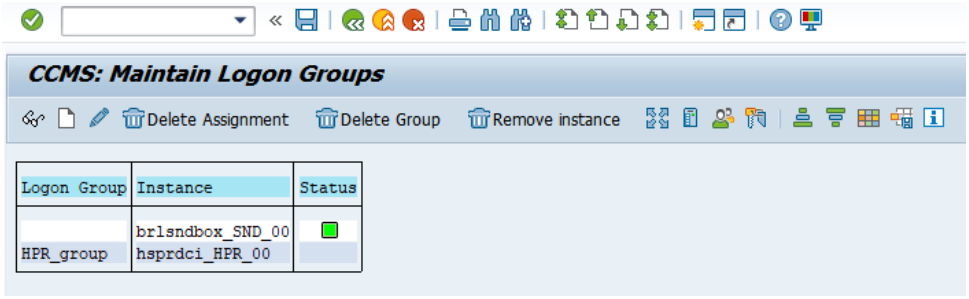
Here Dispatcher Range from 00 to 99 Only.

WP- Work Process.

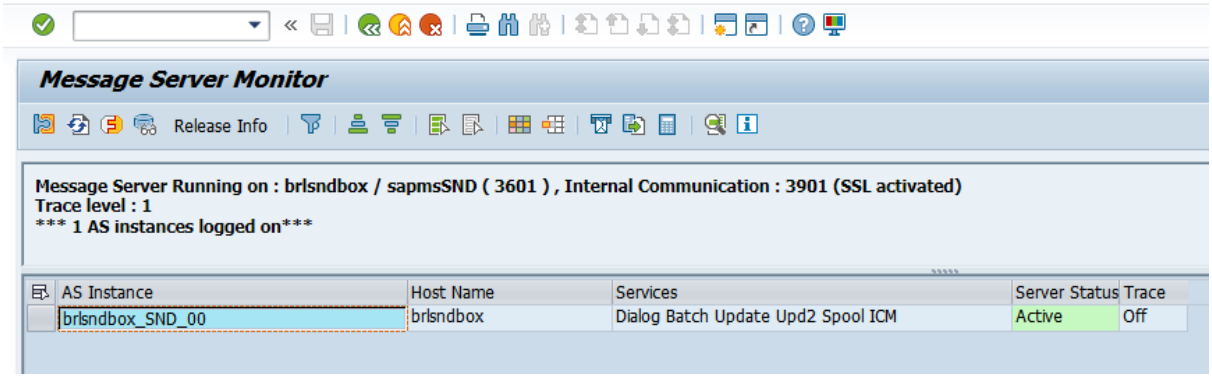
Used for Load Balance on Dispatchers.

It is looking for 1st Dispatcher (CI) if 1st Dispatcher Busy Message Sever Assign the Request to 2nd Dispatcher likewise Cycle will be going on.

### SMLG - To create logon groups




### SMMS - Message Server Monitor

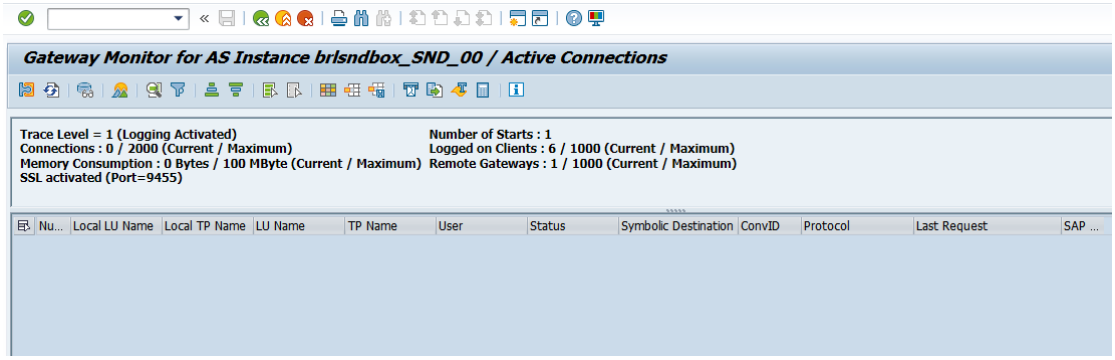



# Gateway Server

Security Vulnerability

It is used to communicate between SAP to SAP and SAP to Non-SAP systems

### SMGW - Gateway Monitor



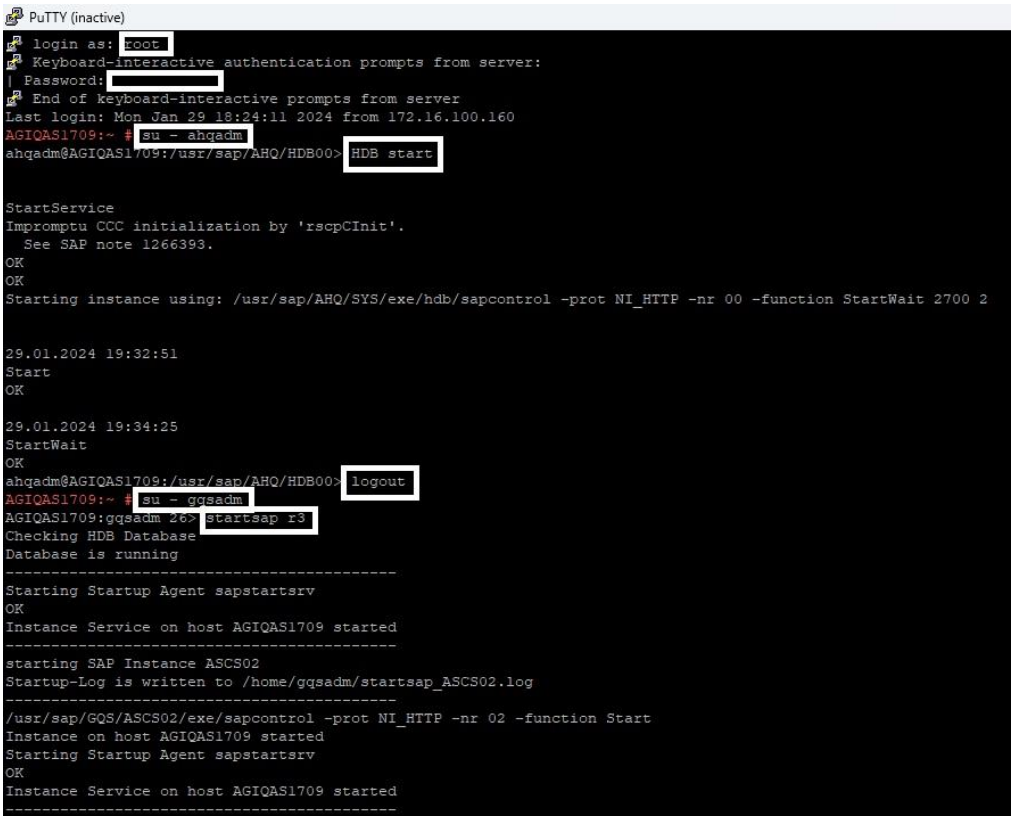
# START & STOP PROCESS

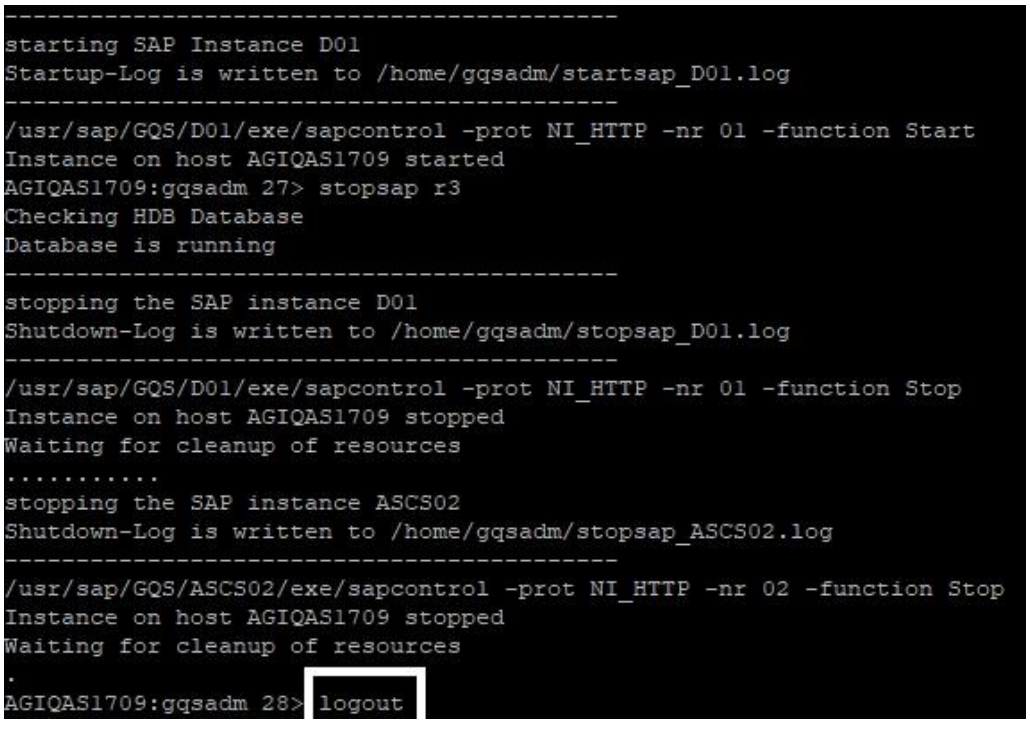
## START the Process

Open **PUTTY** and Enter the IP Address

Enter username and password

**First start DB and then start the application**



# STOP the Process

Open **PUTTY** and Enter the IP Address

Enter username and password

**First shutdown the application then after shutdown the DB.**

```
172.16.60.65 - PuTTY
login as: root
Keyboard-interactive authentication prompts from server:
| Password:
End of keyboard-interactive prompts from server
Last login: Mon Jan 29 11:55:49 2024 from 172.16.100.23
AGIQAS1709:~ # whoami
root
AGIQAS1709:~ # su - gqsadm
AGIQAS1709:gqsadm 22> stopsap r3
Checking HDB Database
Database is running
-----------------------------------------
stopping the SAP instance D01
Shutdown-Log is written to /home/gqsadm/stopsap_D01.log
-----------------------------------------
/usr/sap/GQS/D01/exe/sapcontrol -prot NI_HTTP -nr 01 -function Stop
Instance on host AGIQAS1709 stopped
Waiting for cleanup of resources
..........
stopping the SAP instance ASCS02
Shutdown-Log is written to /home/gqsadm/stopsap_ASCS02.log
-----------------------------------------
/usr/sap/GQS/ASCS02/exe/sapcontrol -prot NI_HTTP -nr 02 -function Stop
Instance on host AGIQAS1709 stopped
Waiting for cleanup of resources
.
AGIQAS1709:gqsadm 23> exit
logout
AGIQAS1709:~ # su - ahqadm
ahqadm@AGIQAS1709:/usr/sap/AHQ/HDB00> HBD stop
-sh: HBD: command not found
ahqadm@AGIQAS1709:/usr/sap/AHQ/HDB00> HDB stop
hdbdaemon will wait maximal 300 seconds for NewDB services finishing.
Stopping instance using: /usr/sap/AHQ/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function Stop 400

29.01.2024 18:31:05
Stop
OK
Waiting for stopped instance using: /usr/sap/AHQ/SYS/exe/hdb/sapcontrol -prot NI_HTTP -nr 00 -function WaitforStopped 600 2


29.01.2024 18:32:11
WaitforStopped
```

```
OK
hdbdaemon is stopped.
ahqadm@AGIQAS1709:/usr/sap/AHQ/HDB00> logout
AGIQAS1709:~ # init 0
```

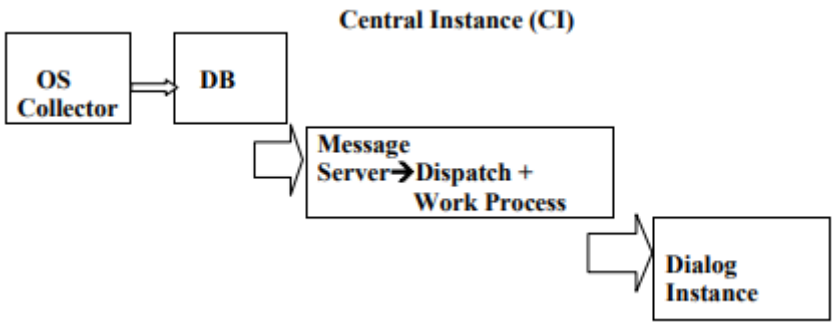
# Start & Stop process in windows

## Startup Process

Double Click on,
SAP MMC→Select Our Server→Right Click on Server→All Tasks→Start.

**Eg:**

Server is, ECC, DM0 etc,.

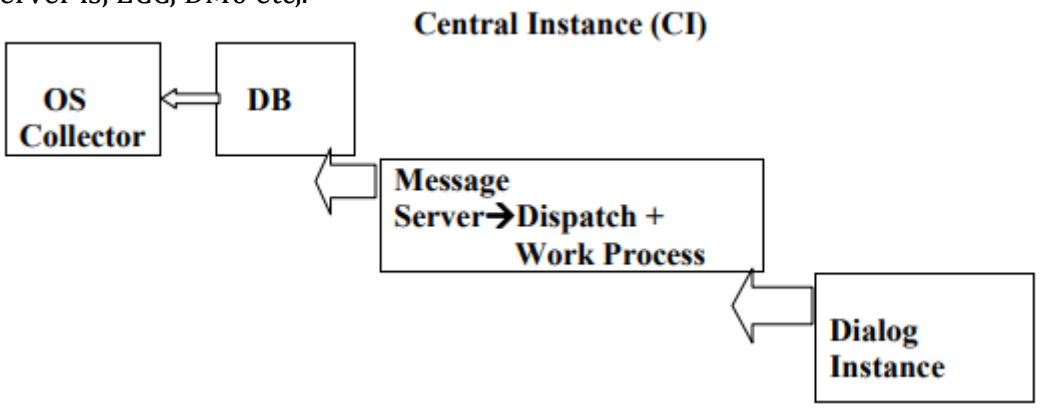


**Stop Process**

Double Click on,

SAP MMC→Select Our Server→Right Click on Server→All Tasks→Stop.

**Eg:** Server is, ECC, DM0 etc,.




# SAP Stopping in Real Time Procedure

Check out Logged on Users by Using T-code as **SM04**.

- We have to Send System Messages for All Active Users using T-code as **SM02**.
- Check whether Background Jobs Are Running or not using T-code as
- Enter the Program Name as,

**RSBTCTRNS1 - For Pause.**

**RSBTCTRNS2 –For Resume.**

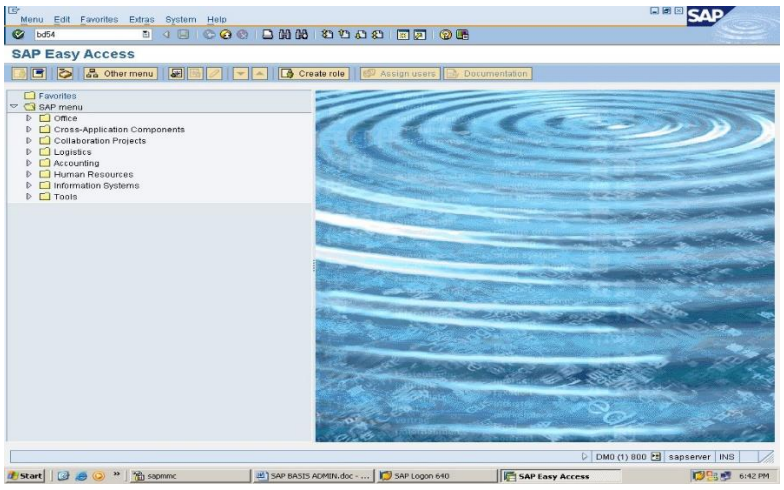
**Note:**

/n – For Back Page.

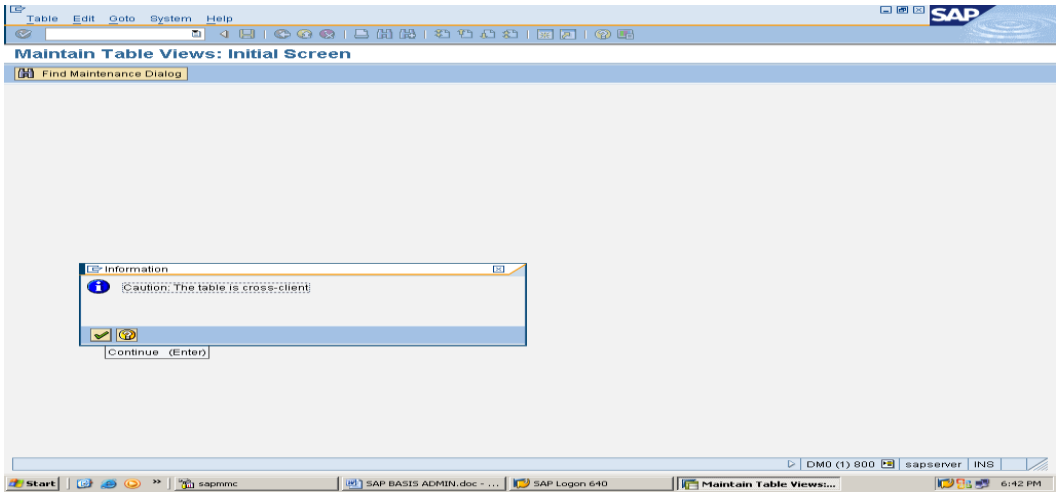
/o – For New Page.

# Logical System Creation

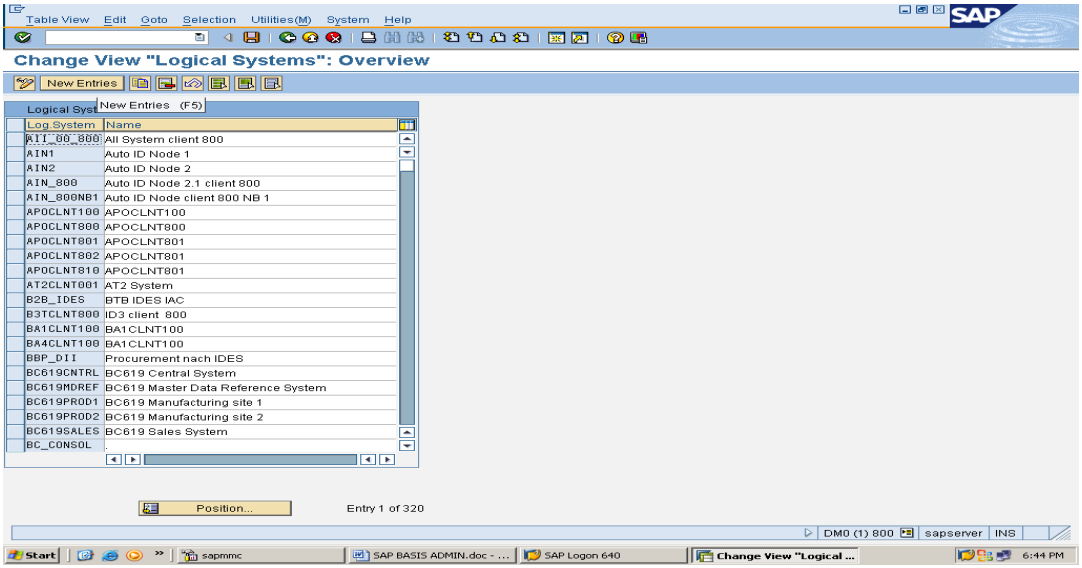
In SAP command line enter the T-code as **BD54**



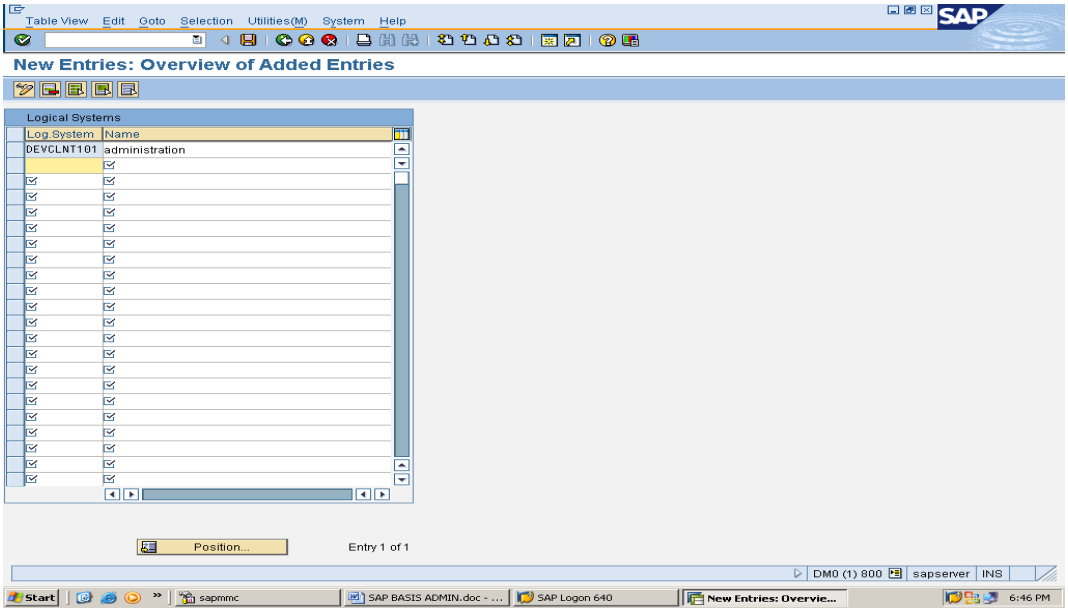

Click on Continue



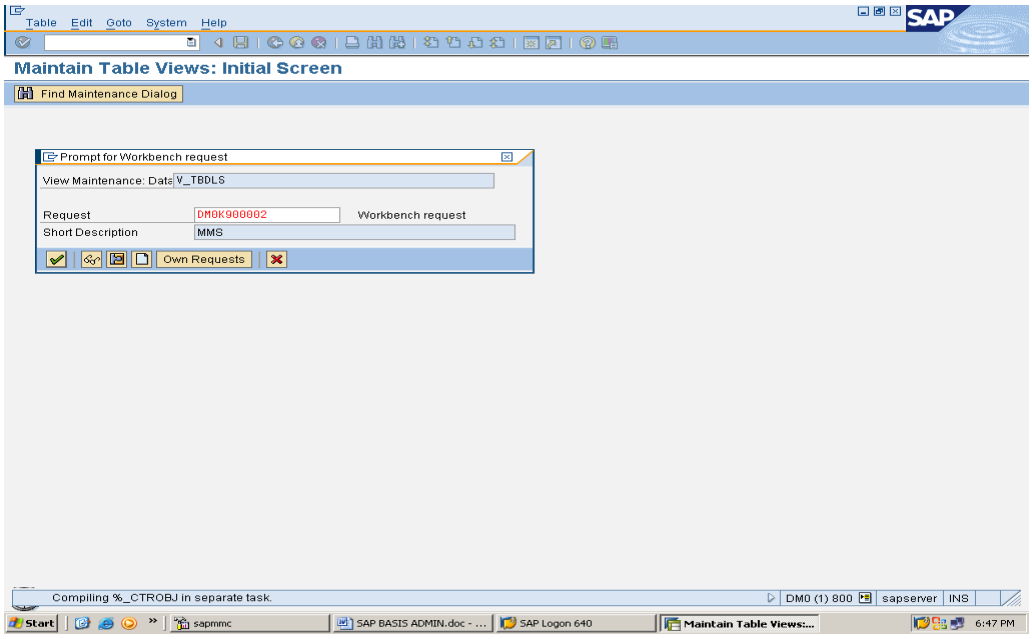

Click on Change/Display and then Continue Click on New Entries




Enter the Logical System and Name




Then Save it and Continue



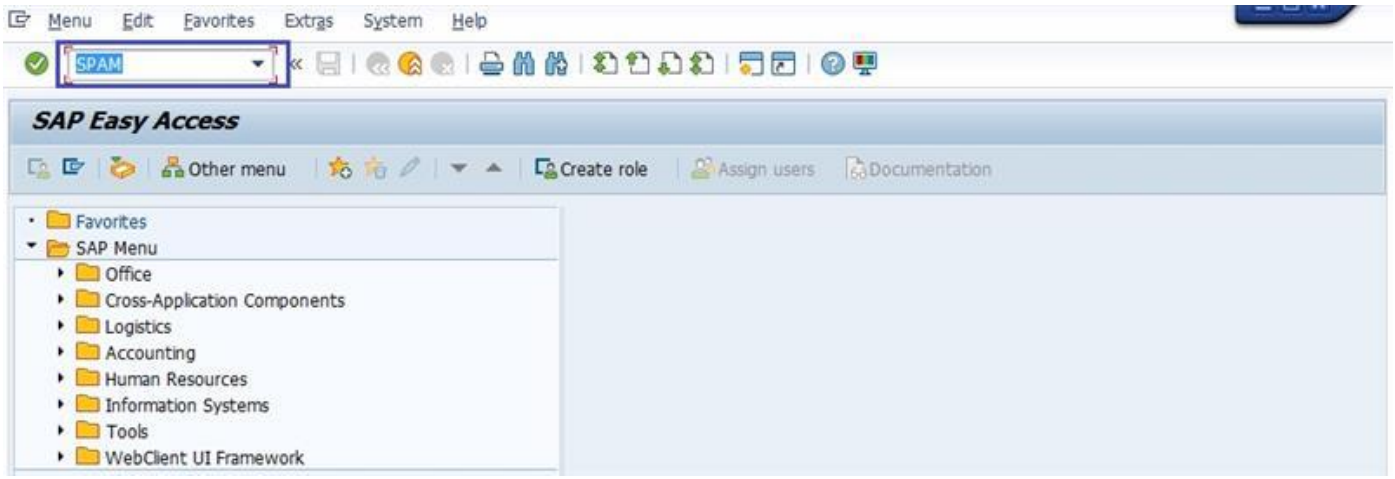

# Managing Queue

Queue is used to validate support packages for different SAP components in system landscape. Managing the Queue has below stages

**1. Defining Queue**
**2. Importing Queue**
**3. Verifying Queue**

## Define Queue

Step-1: Go to SPAM transaction.




Step-2: Click on Display/Define.

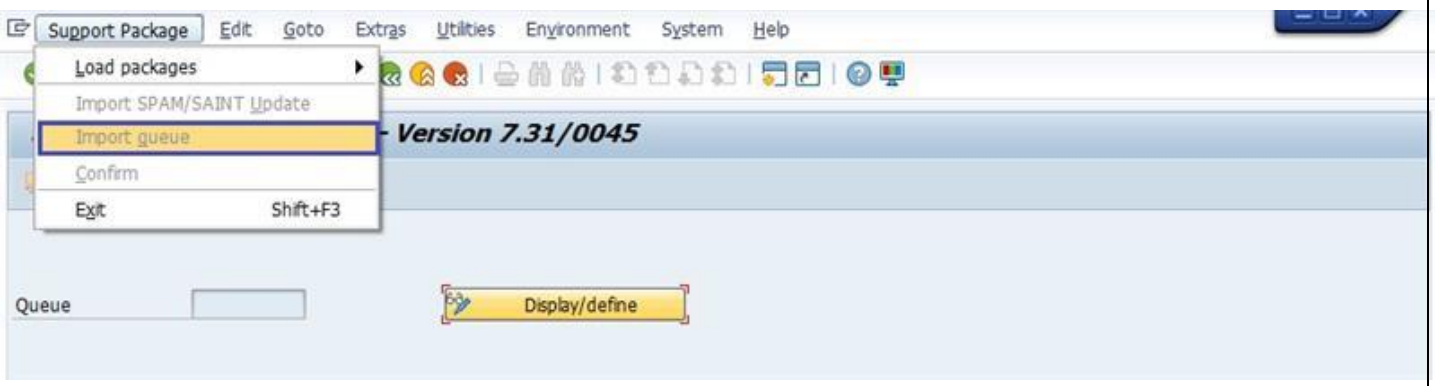

Step-3: A list of installed software components (SAP_BASIS, SAP_HR, SAP_BW etc.) is displayed.

| Component | Software C | SP-Level | Support Package | Short description of the component |
|---|---|---|---|---|
| SAP_BASIS | 731 | 0002 | SAPKB73102 | SAP Basis Component |
| SAP_ABA | 731 | 0002 | SAPKA73102 | Cross-Application Component |
| PI_BASIS | 731 | 0002 | SAPK-73102INPIBASIS | Basis Plug-In |
| ST-PI | 2008_1_700 | 0005 | SAPKITLRD5 | SAP Solution Tools Plug-In |
| SAP_BW | 731 | 0002 | SAPKW73102 | SAP Business Warehouse |
| GRCPINW | V1000_700 | 0008 | SAPK-10308INGRCPINW | SAP GRC NW Plug-in |
| LCAPPS | 2005_700 | 0010 | SAPKIBHD10 | LC Applications (LCAPPS) 2005_700 |
| MDG_FND | 731 | 0002 | SAPK-73102INMDGFND | MDG Foundation 731 |
| SAP_AP | 700 | 0026 | SAPKNA7026 | SAP Application Platform |
| SAP_BS_FND | 731 | 0002 | SAPK-73102INSAPBSFND | SAP Business Suite Foundation |
| WEBCUIF | 731 | 0002 | SAPK-73102INWEBCUIF | SAP Web UI Framework |
| MDG_APPL | 606 | 0002 | SAPK-60602INMDGAPPL | MDG Applications 606 |
| SAP_APPL | 606 | 0002 | SAPKH60602 | Logistics and Accounting |
| SAP_HR | 604 | 0046 | SAPKE60446 | Human Resources |
| SAP_HRCAR | 604 | 0046 | SAPK-60446INSAPHRCAR | Sub component SAP_HRCAR of SAP_HR |
| SAP_HRCAT | 604 | 0046 | SAPK-60446INSAPHRCAT | Sub component SAP_HRCAT of SAP_HR |
| SAP_HRCAU | 604 | 0046 | SAPK-60446INSAPHRCAU | Sub component SAP_HRCAU of SAP_HR |

Step-4: Once the required component selected, the current queue appears with the Support Packages available for the selected component in the system.
If the displayed queue meets the requirements, confirm it by choosing Confirm Queue.
Step-5: If the queue successfully defined, the status bar shows the message "Support Package queue defined and saved".

## Importing Queue

Once the Queue defined, need to perform 'Import queue' to start importing the selected support pack.
Step-1: Click on Support Package --> Import Queue

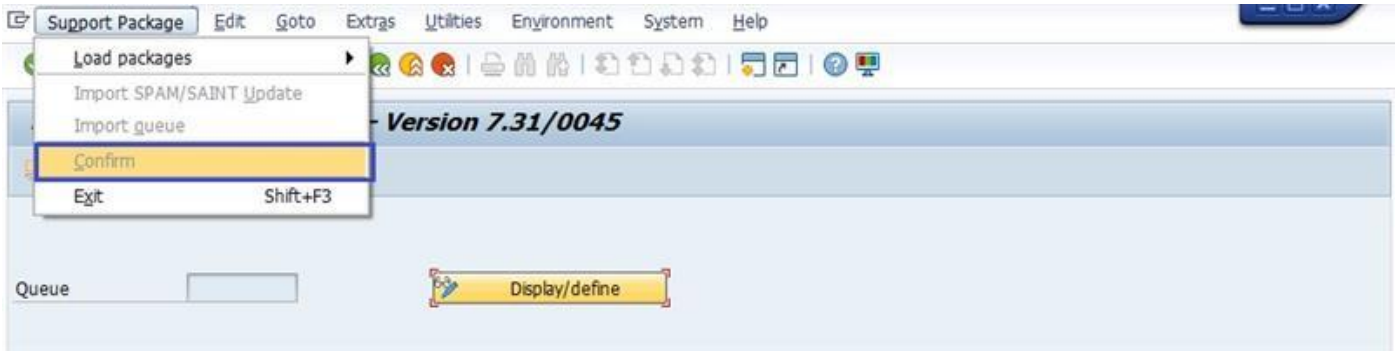



Step-2: It opens a new dialog box and the support package import has been started.

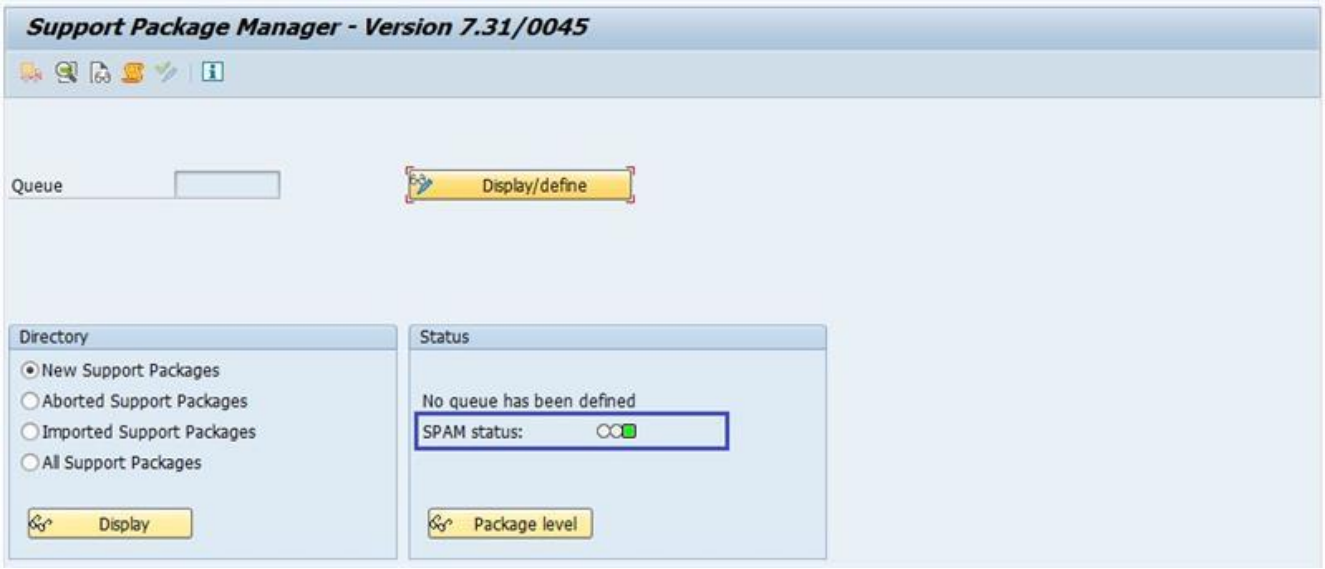
## Confirm Queue

As a last step, we need confirm the queue has been imported successfully.
This process is required to import Support Packages in the future. If queue not confirmed, then support packages can't able to inform in future.
Step-1: Once Queue imported, SPAM status becomes YELLOW like below.


Step-2: Now click on "Support Package --> Confirm" to confirm the package.

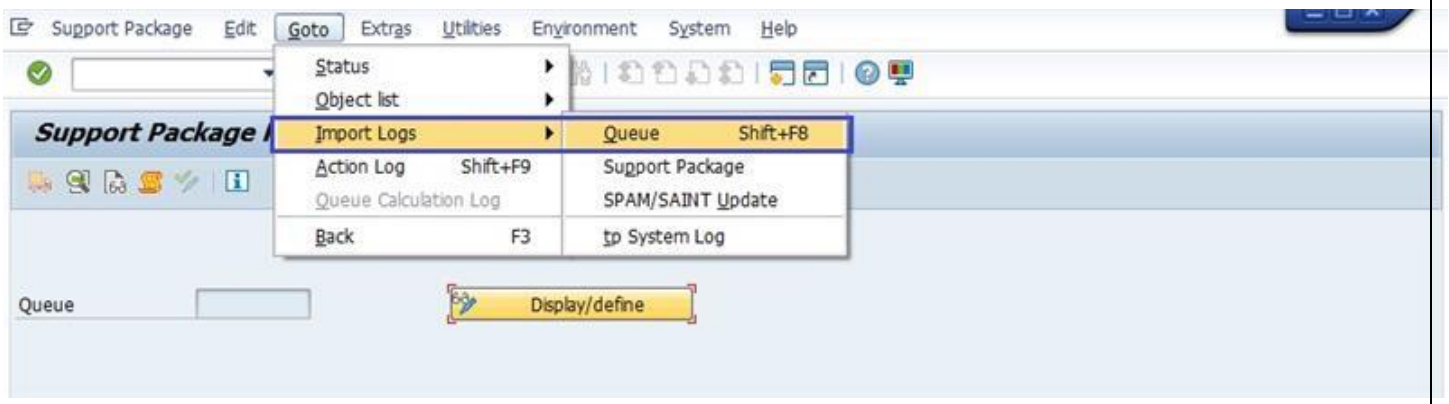



Step-3: After successful confirm, SPAM status becomes GREEN like below.

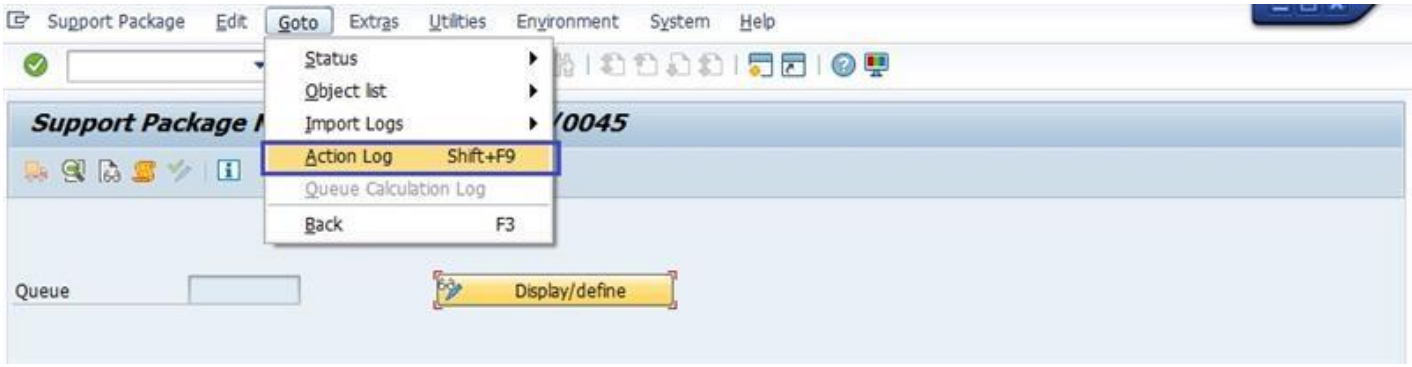



## Logs

Import Log: Displays Support Package Manager Phases logs used by transport control program. To open import log, click on Go to--> Import log -->Queue

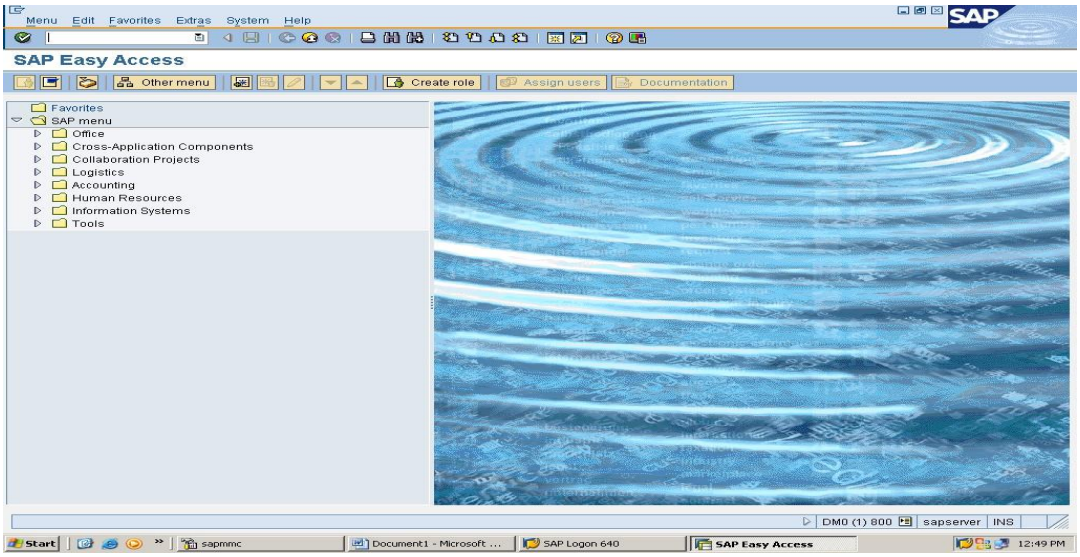



Action Log: Displays actions information taken during the individual phases and has detailed information. To open action log, click on Go to-->Action log.

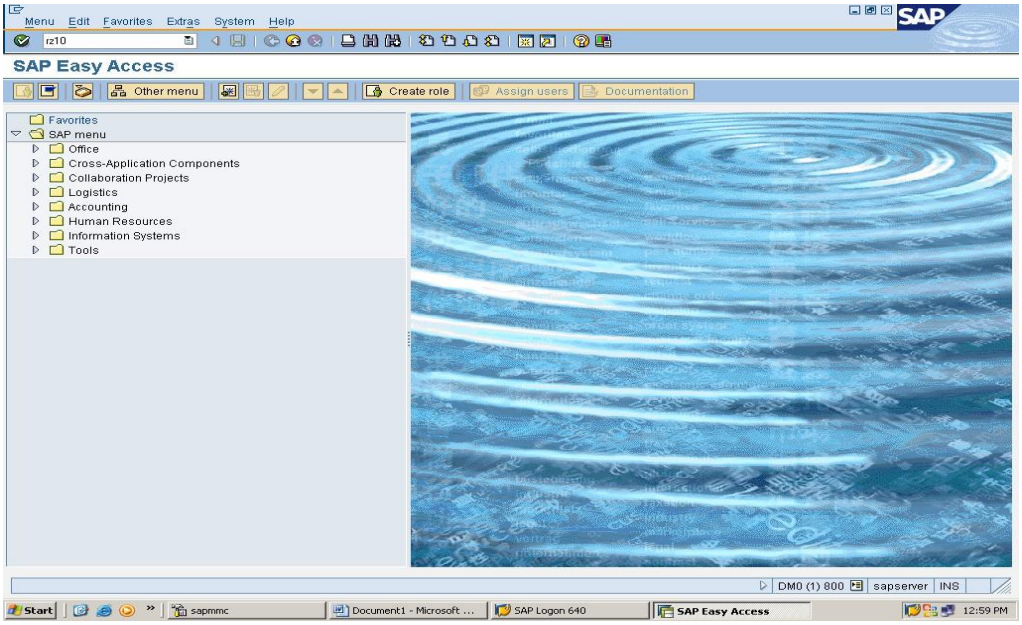


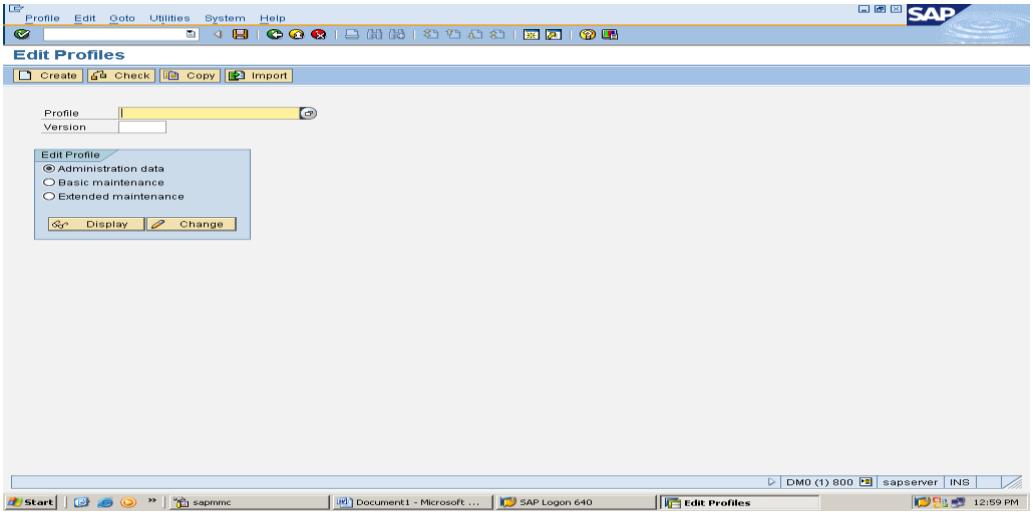

# Enable SAP*

Whenever we install SAP 1st time in our system by default SAP* was in Disable Mode.
Parameter value is"1" and we need to change this value to "0".
Navigation is,
**Login with Default client 800 with the User of SAP USER and the Password is india123.**

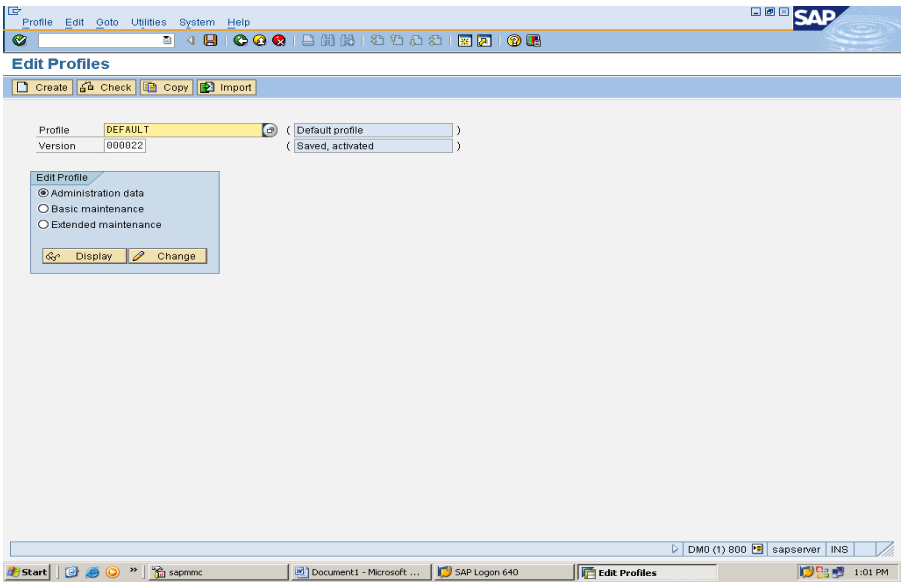


In SAP Command line enter the T-code as **RZ10** (Static i.e., if we done any changes then we need to Restart Server to effect the changes.)

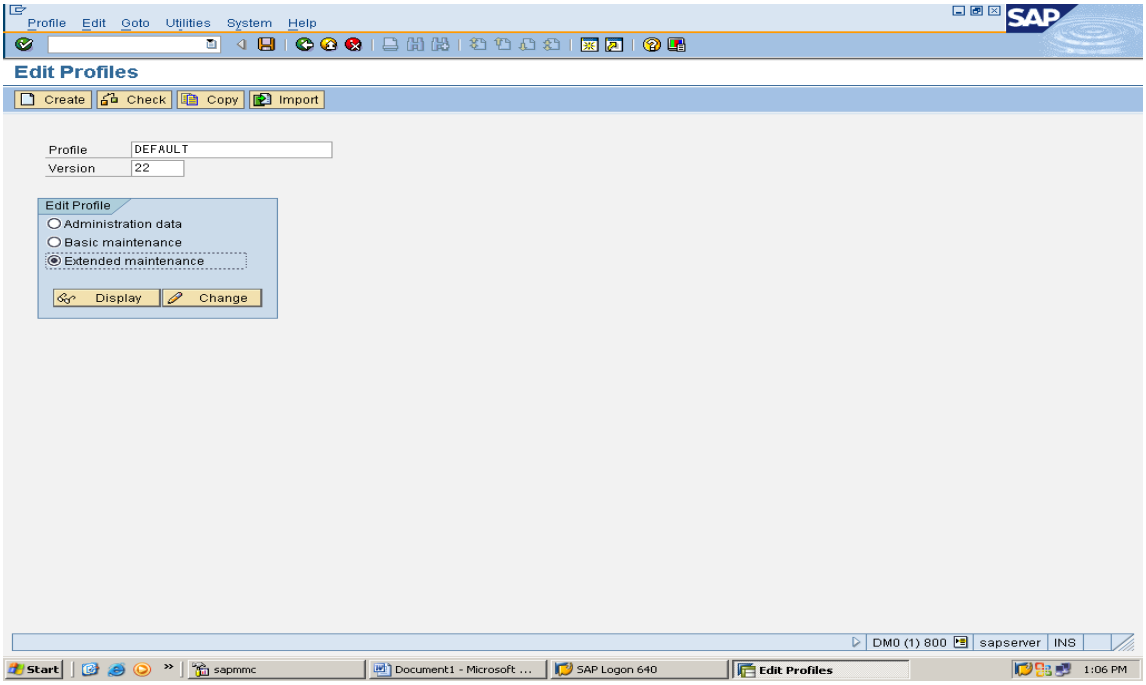


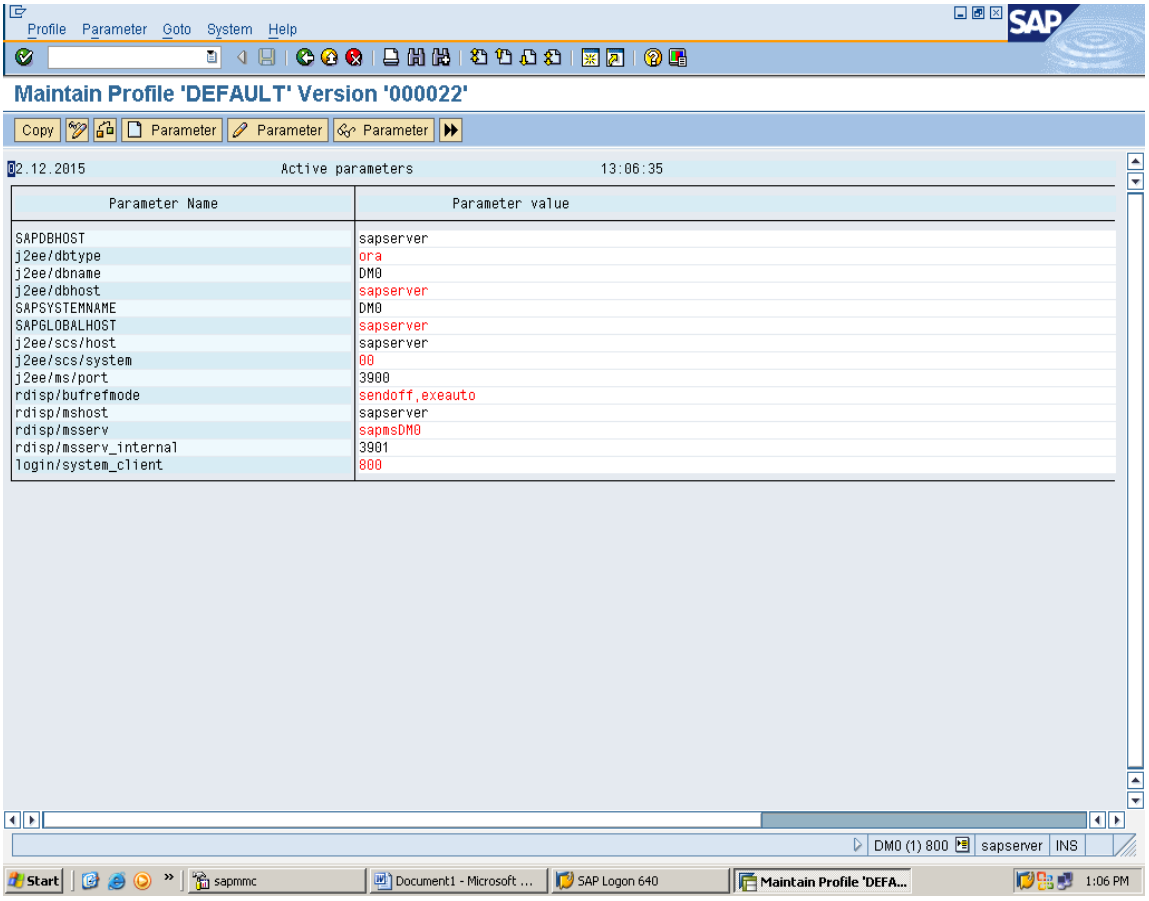

Profile Selected from browser > Default



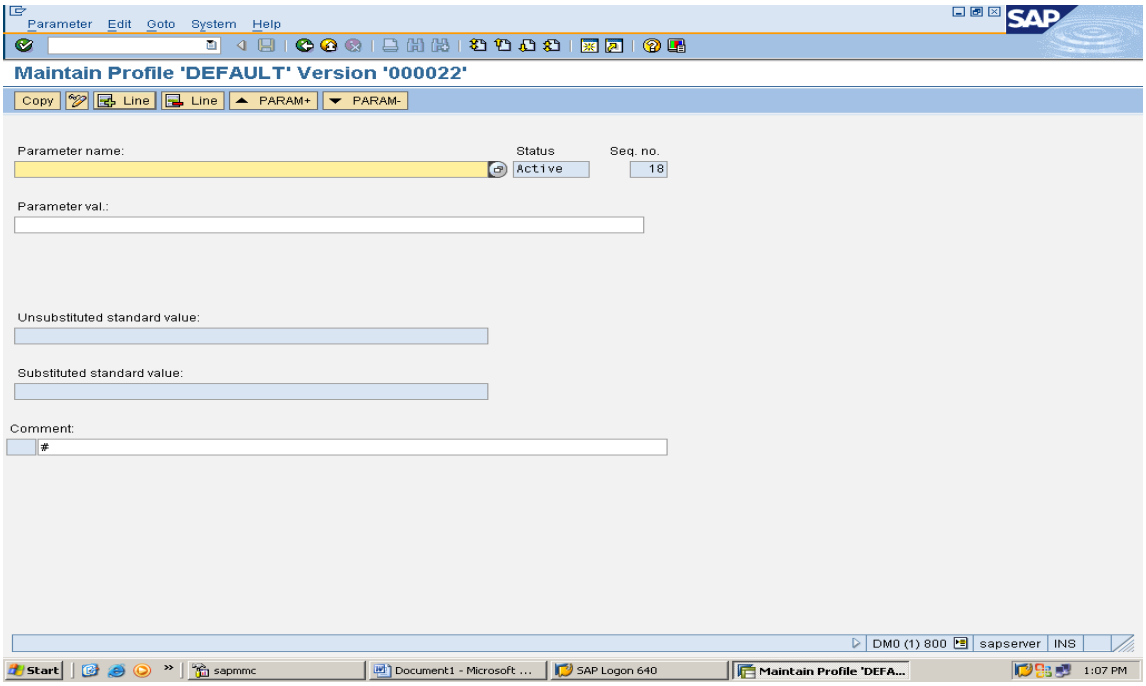
Select the Radiant button  Extended maintenance



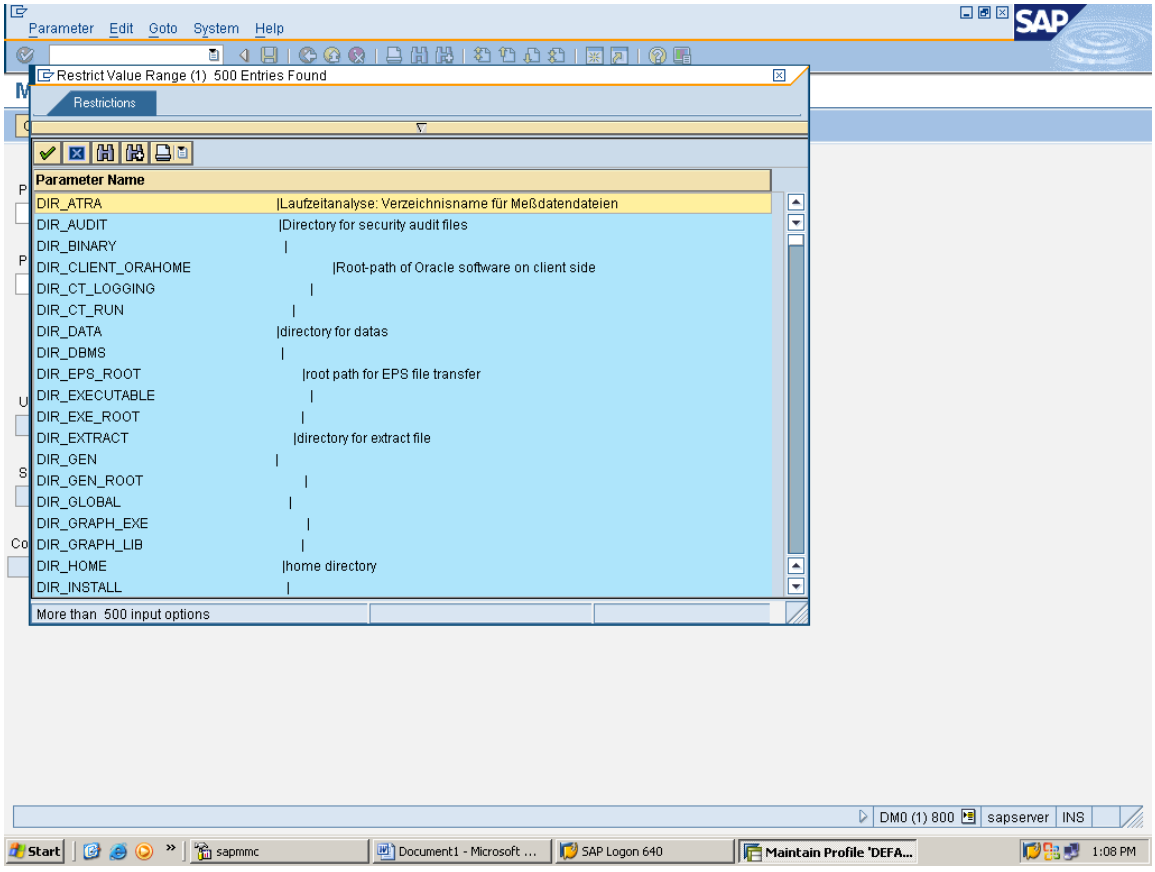

Click on change



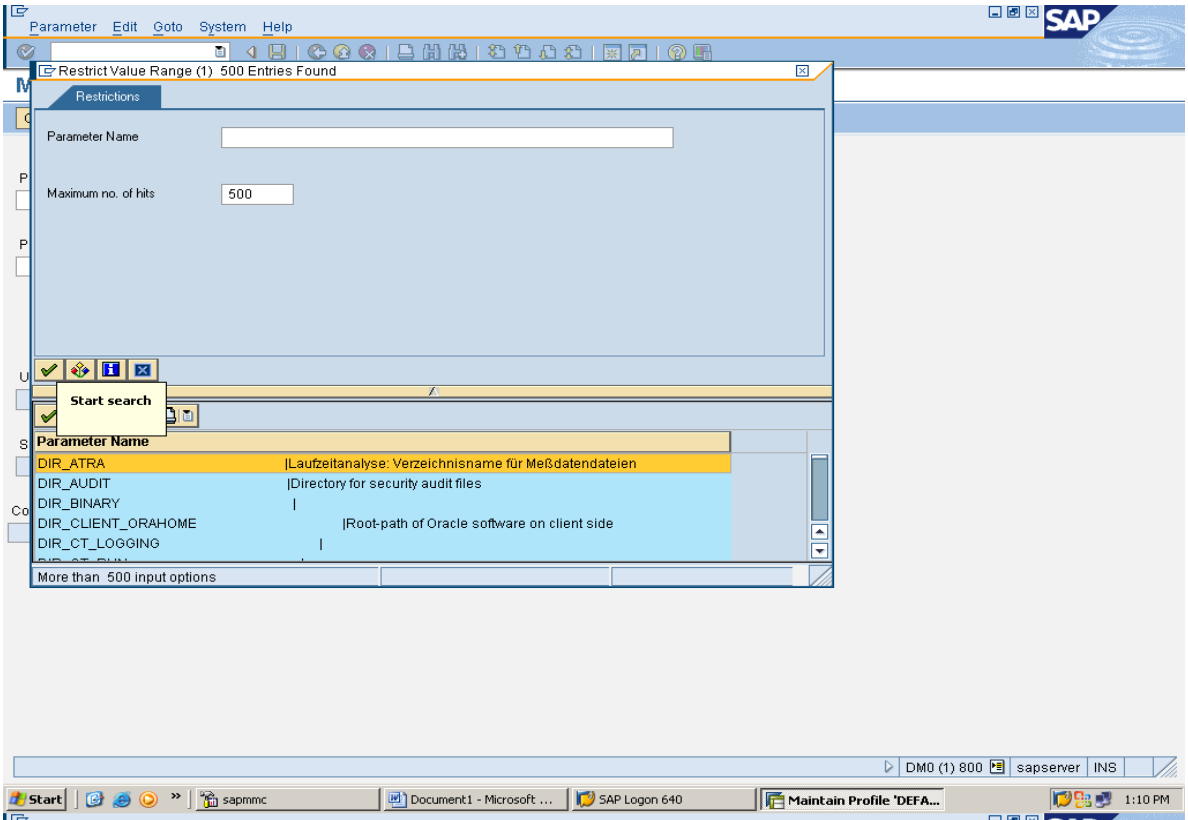

Click on Create Parameter & Select Parameter name from browser

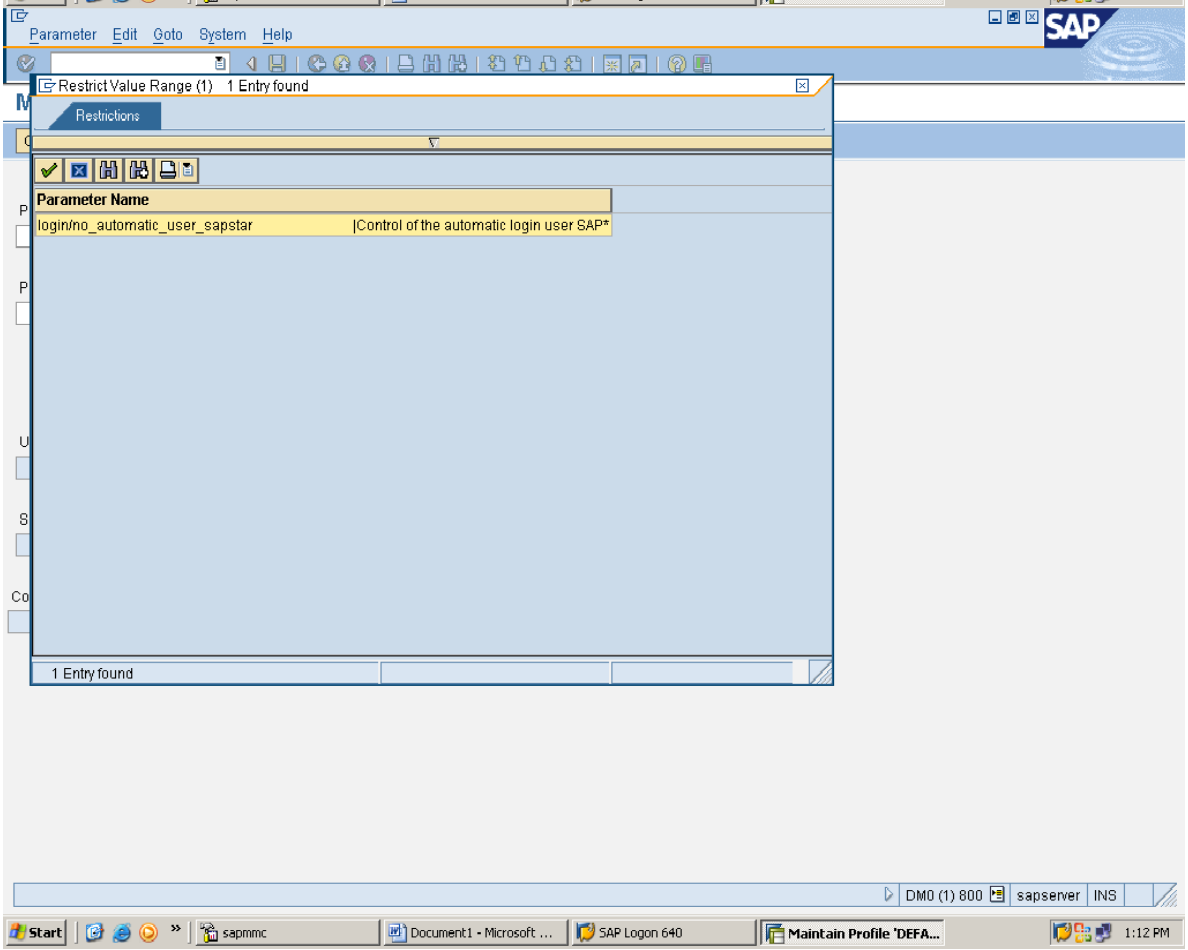



Again click on browser

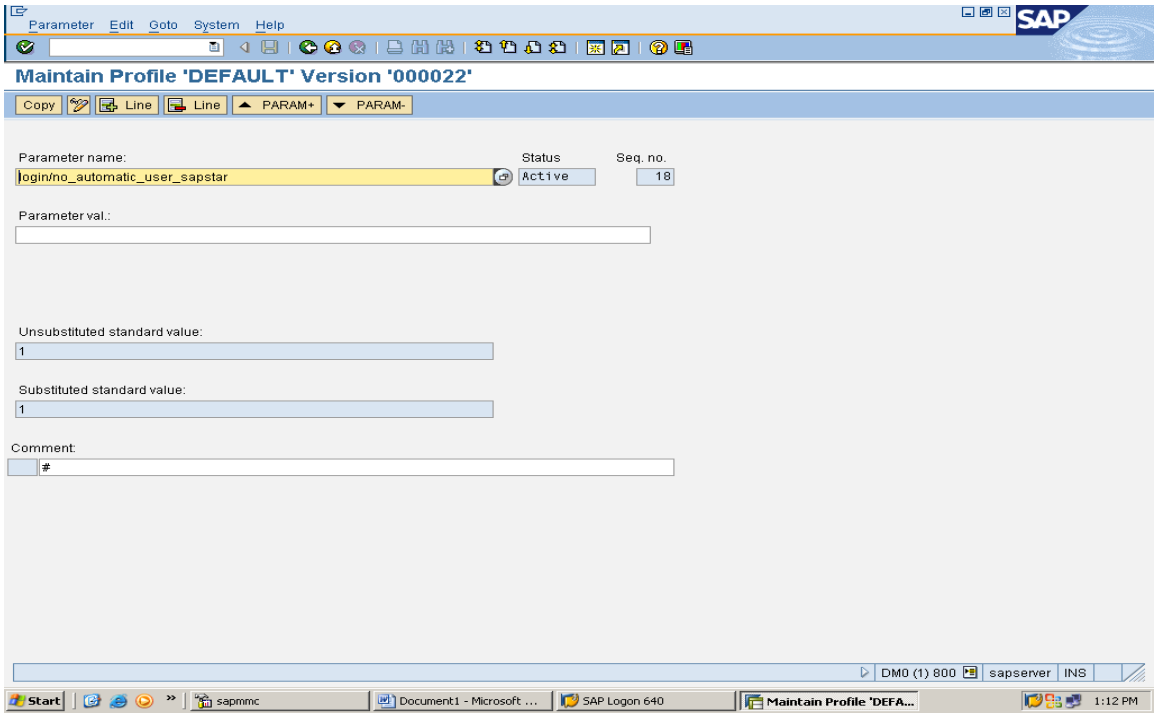



Parameter name as type LOGIN/NO* then hit the enter

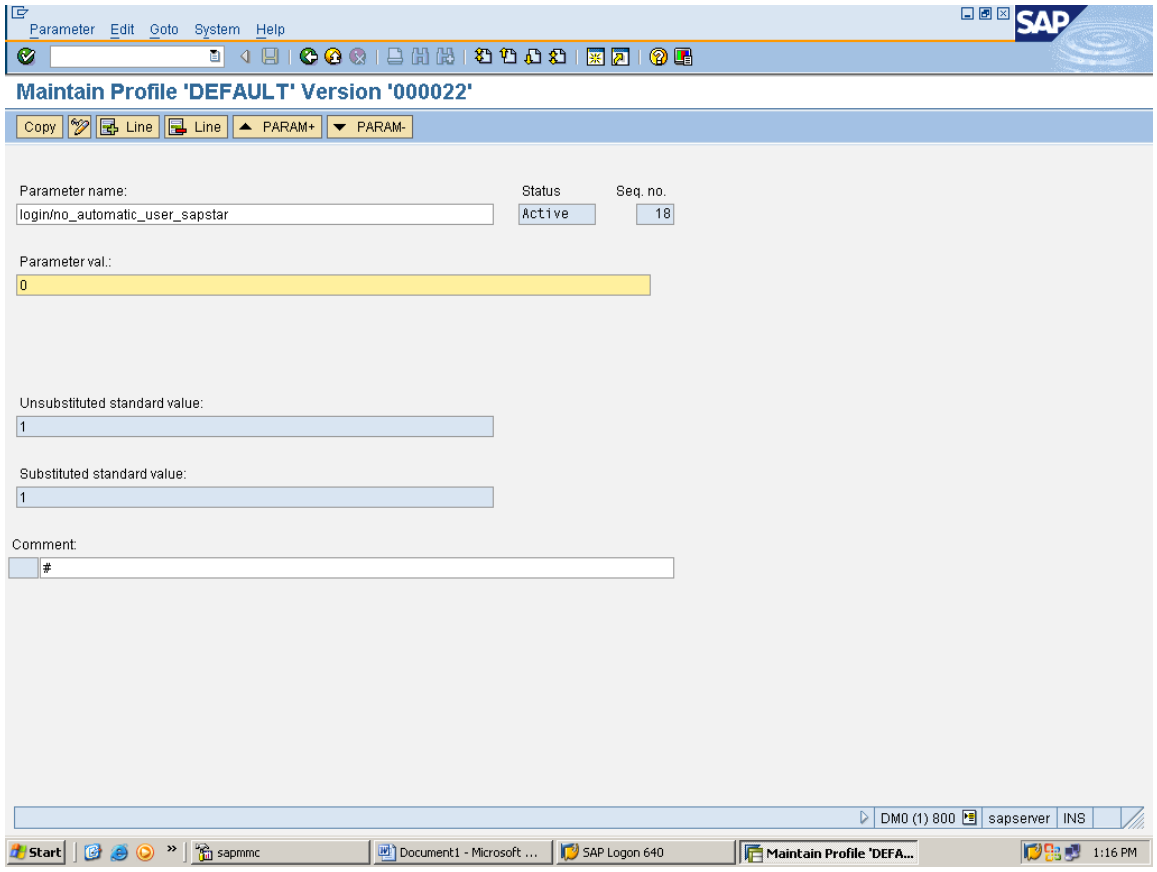


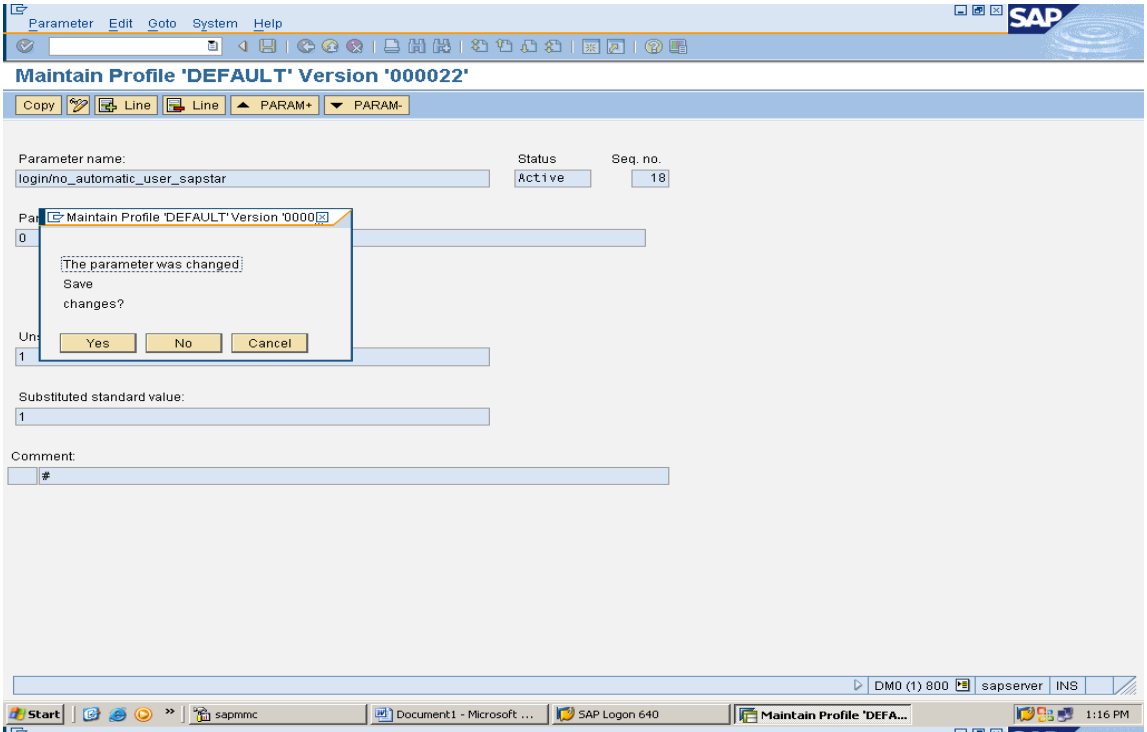

Click on copy

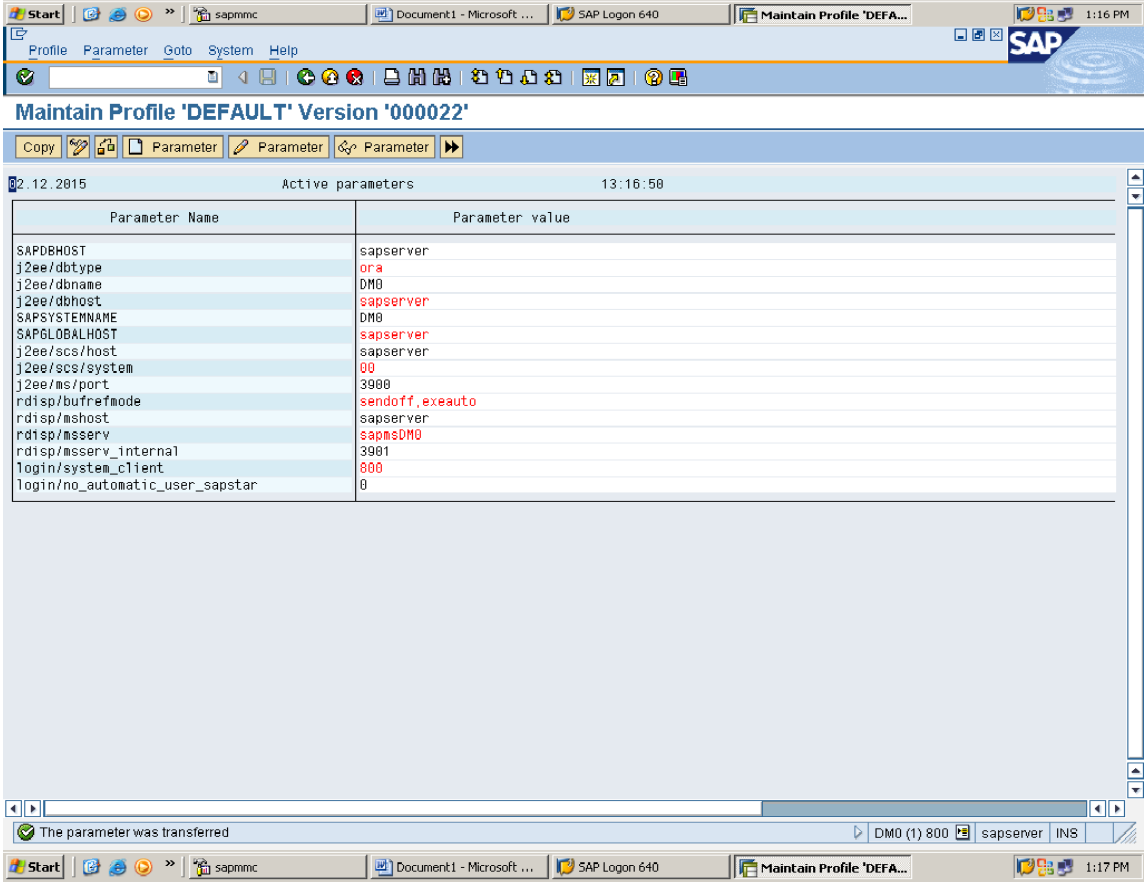



**NOTE:** By default, Parameter value as empty. We need to enter "0" manually.

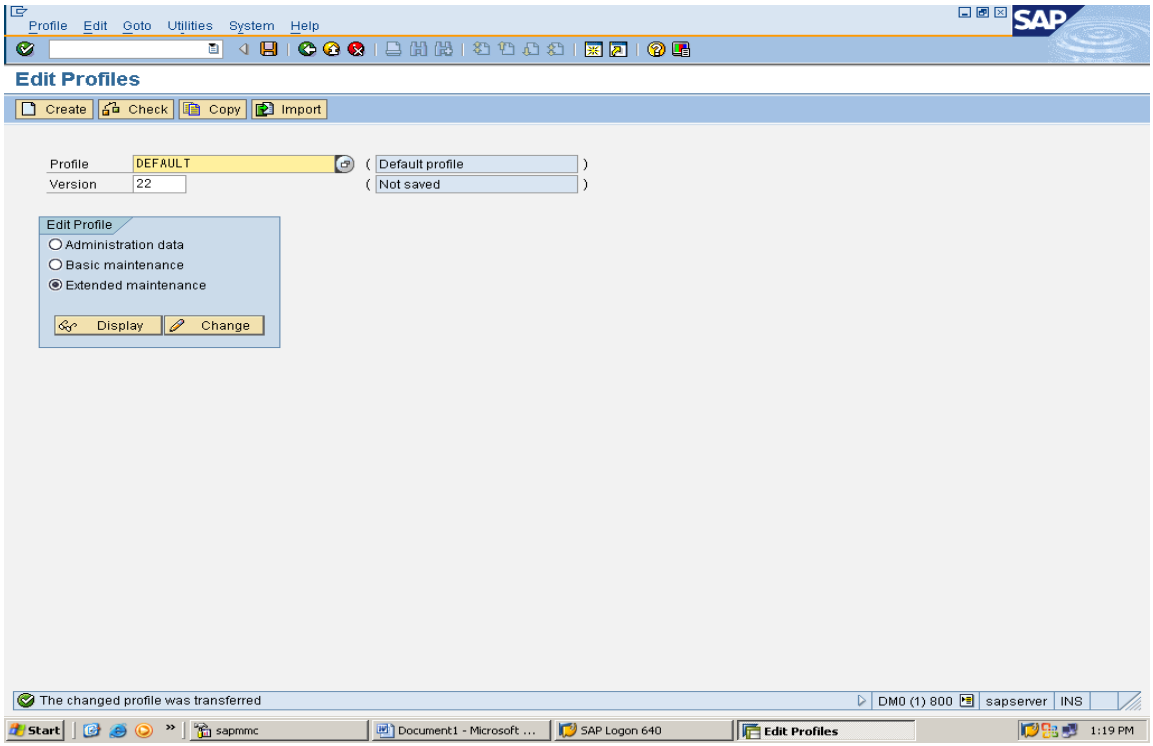



Click on back
One pop-up will be come
Click on Yes

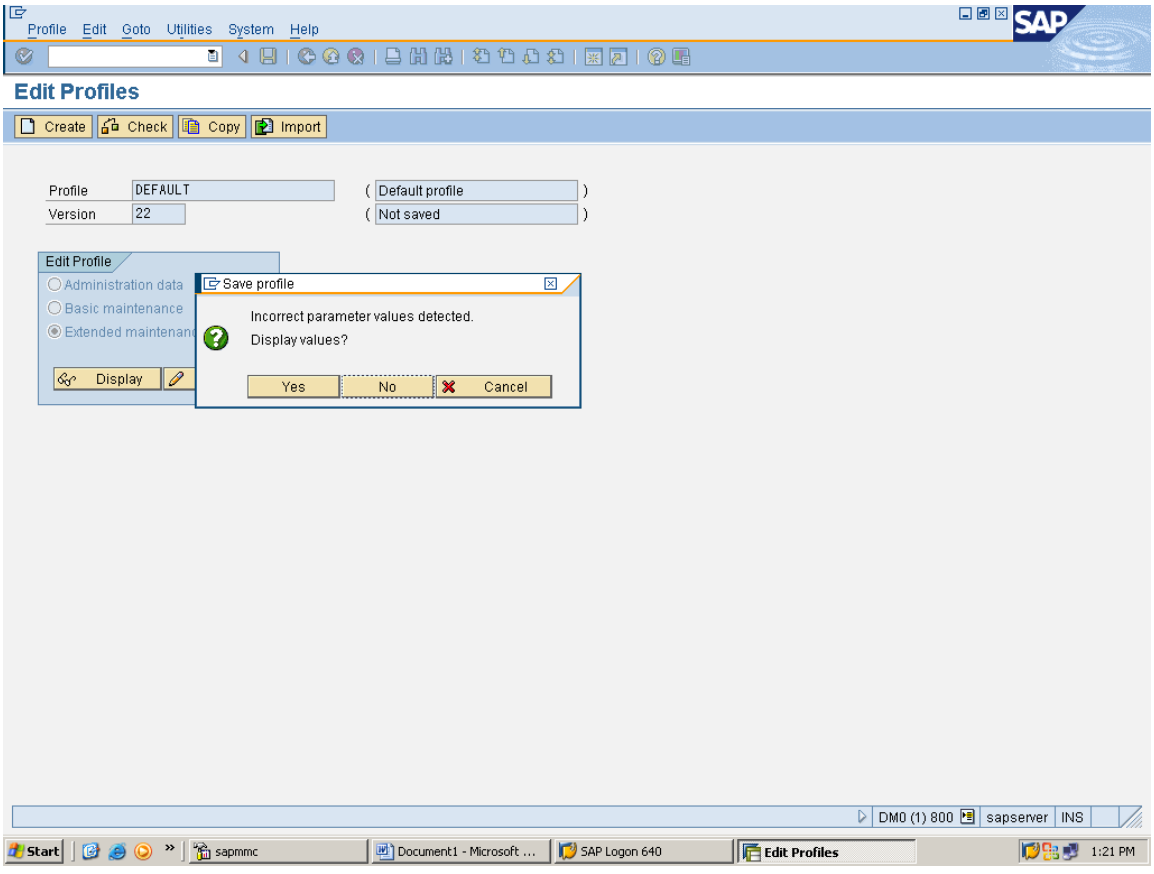


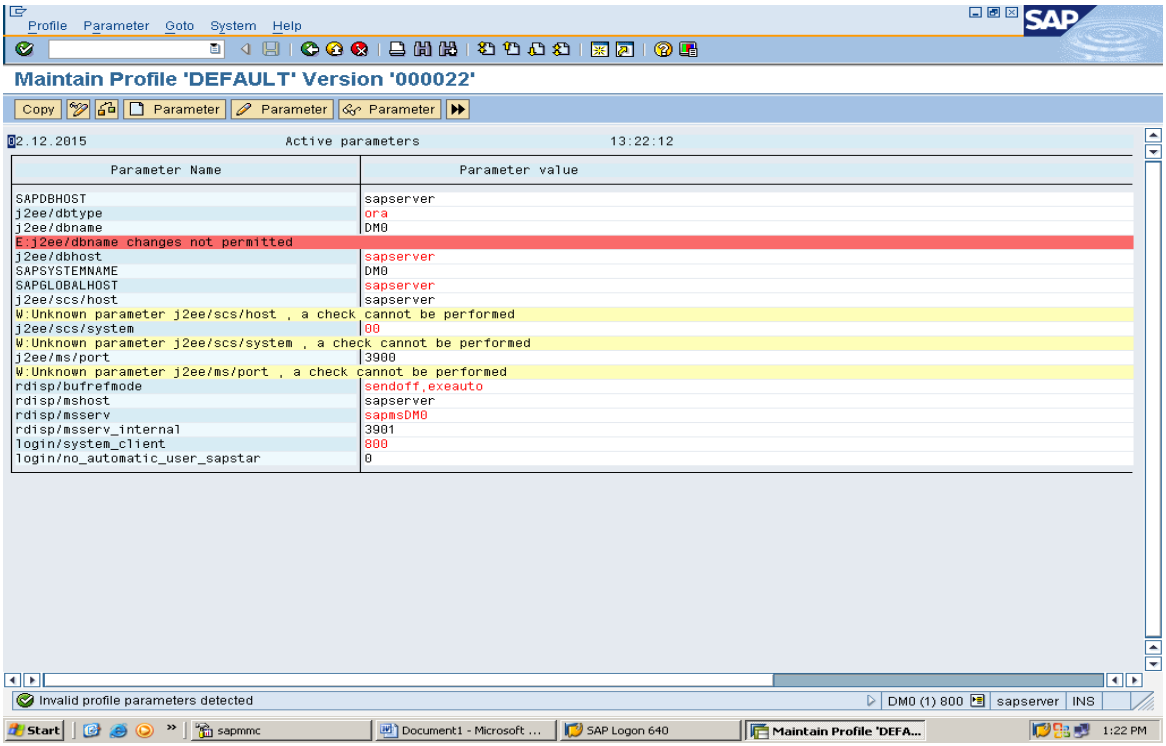

Click on Exit one pop-up will be come



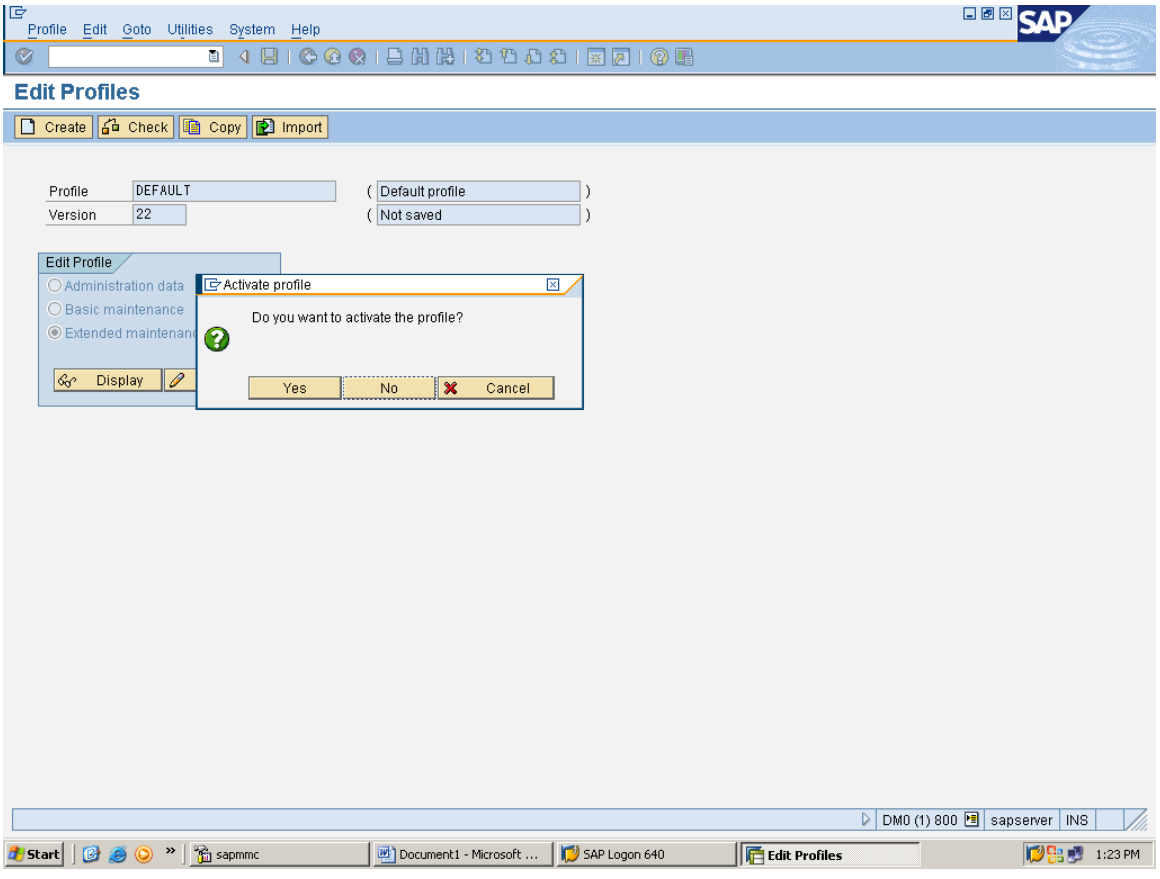

Click on Save one pop-up will be come

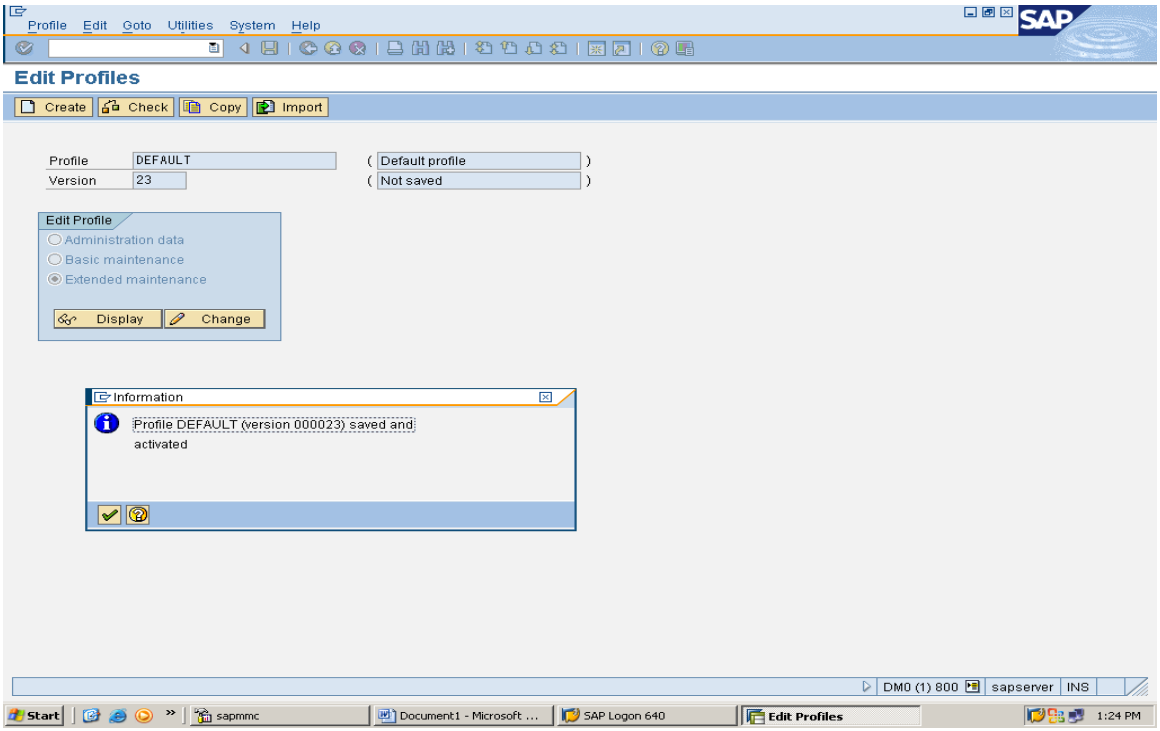



Click on Yes

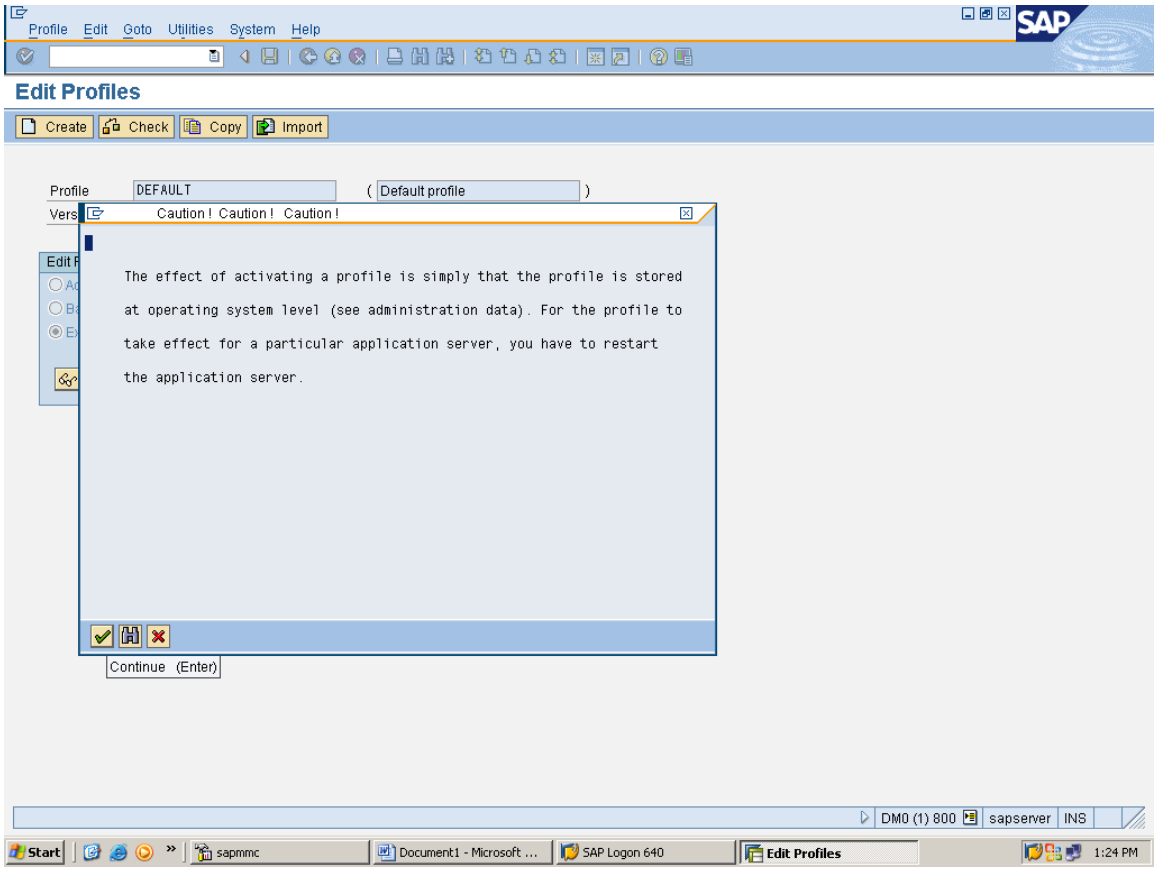



Click on Exit one pop-up will be come & Click on Yes.

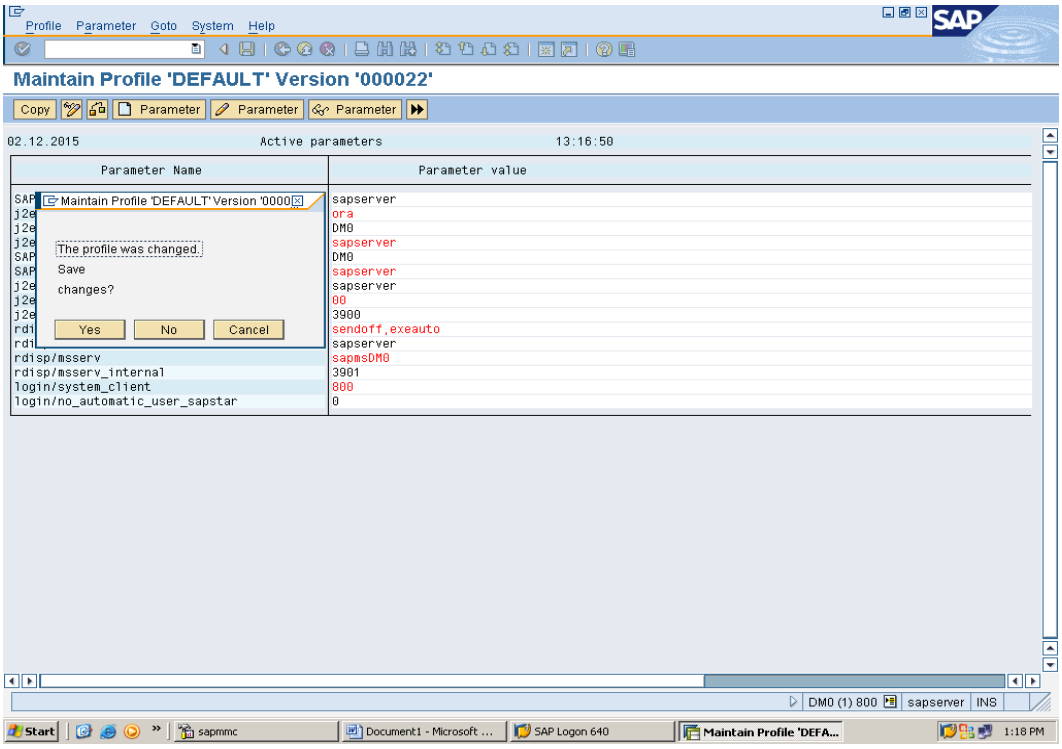




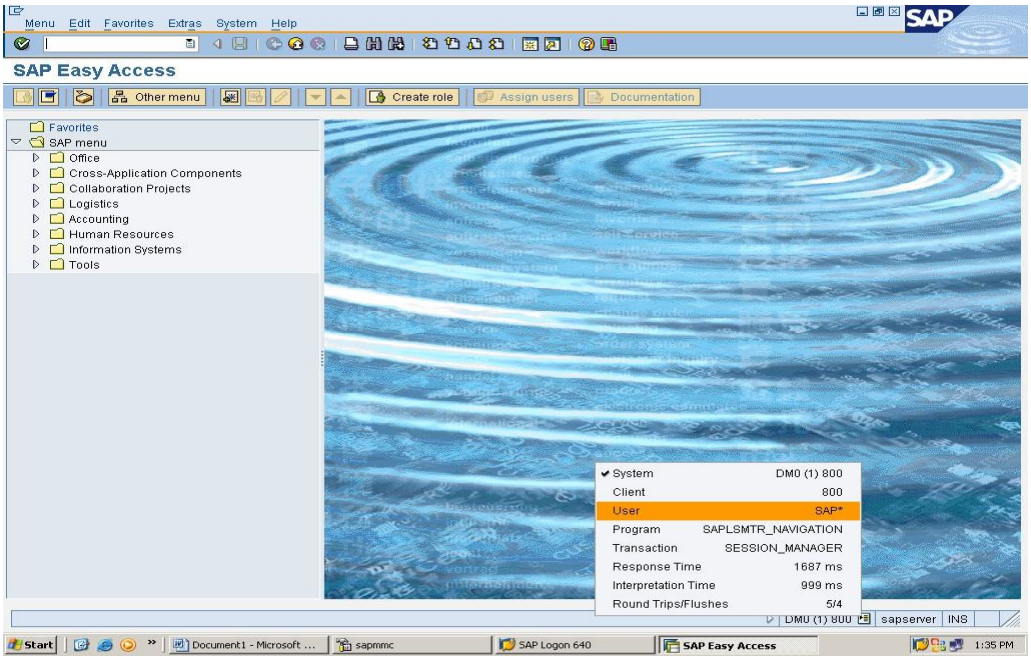

Click on Continue




Again click on continue & then Click on Yes




After Restart the Server login with SAP* and the password is pass(or) 06071992



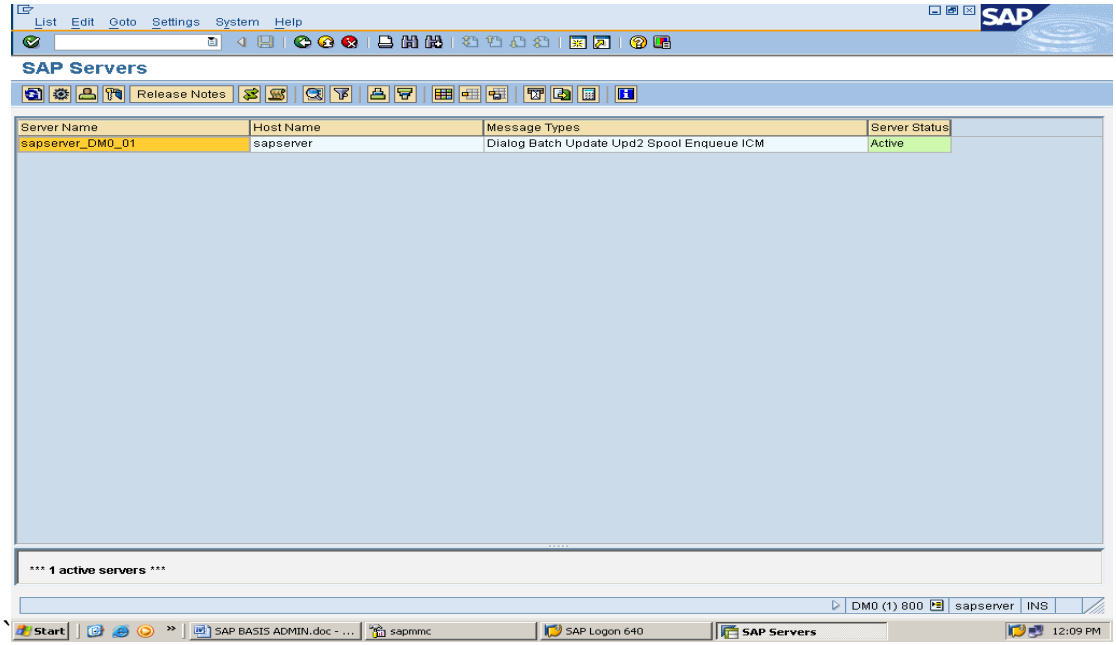

# OS Level:

Path is, In SAP Installed Drive/USR/SAP/SID/SYS/PROFILE Then Click on Default Profile
Add the Parameter as LOGIN/NO_AUTOMATIC_USER_SAPSTAR=0

# How to Check Active Servers

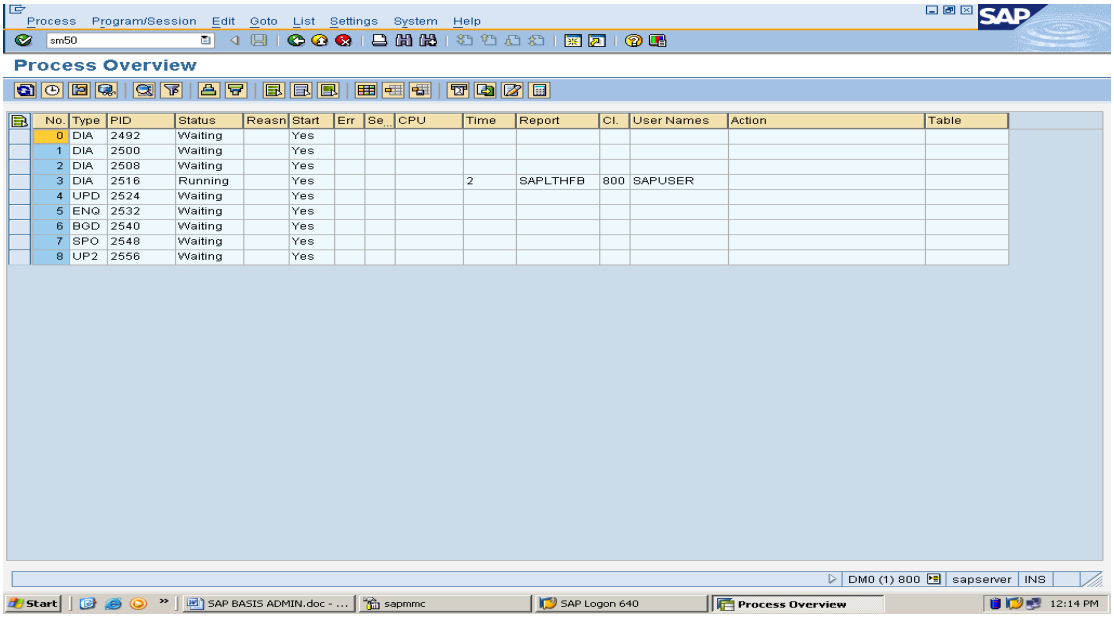
In SAP command line enter T-code as **SM51**

Here we can see the below col's



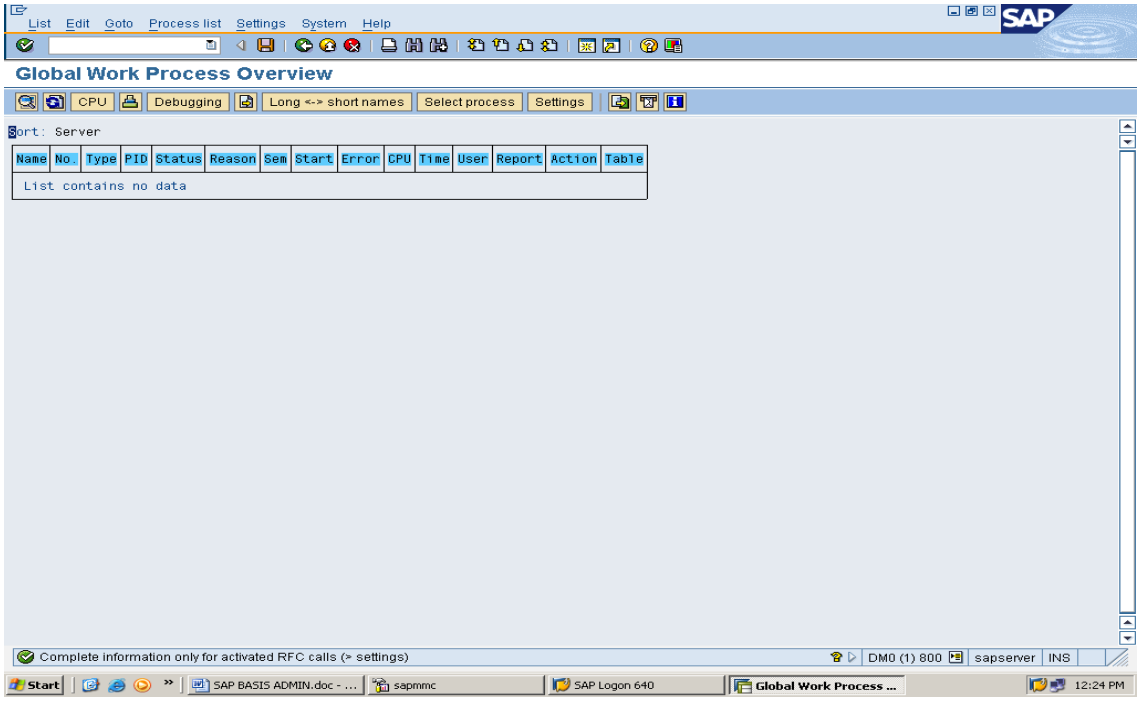

# How to check Work Process Overview (Instance Wise)

In SAP command line enter the T-code as **SM50**



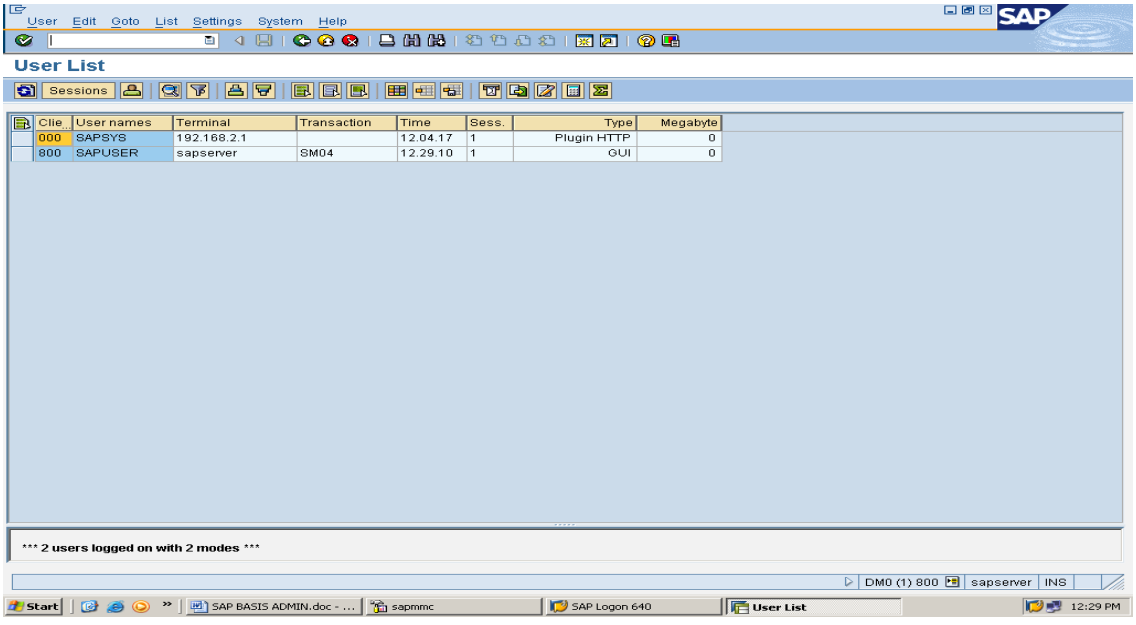
# How to check Globally Work Process Overview (Multiple Instance in System Wise)

In SAP command line enter the T-code as **SM66**

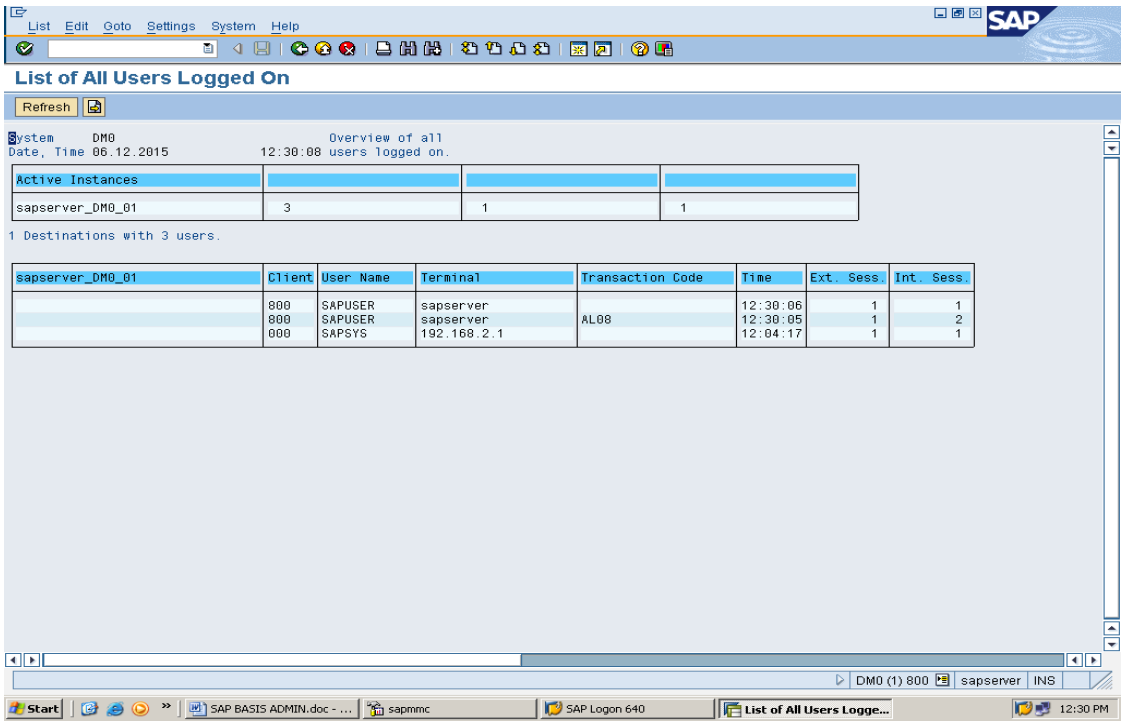



# How to check User Overview

In SAP command line enter the T-code as **SM04/AL08**.If you can use T-code as SM04 we can see the below col's

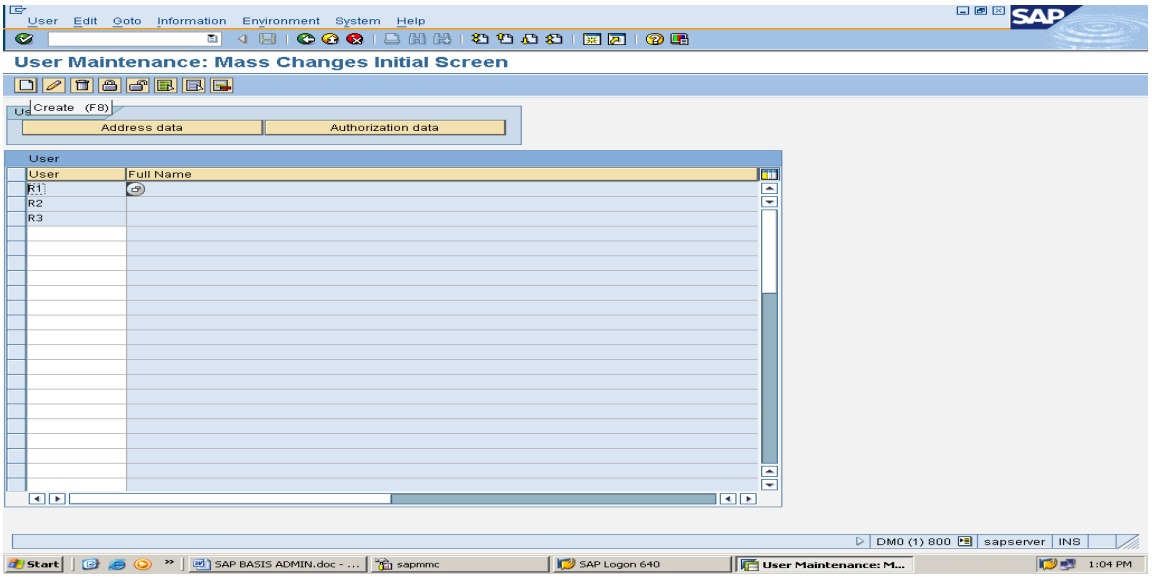


If you can use T-code as **AL08** we can see the below col's.



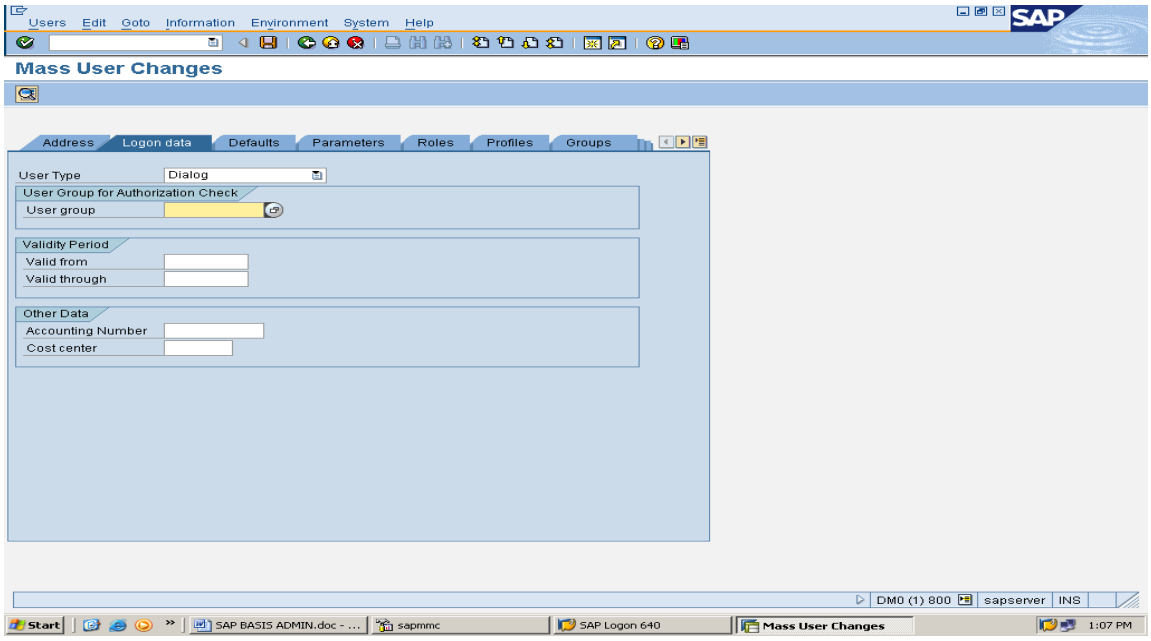

# How to Create Mass User (Multiple Users)

In SAP command line enter the **SU10** for Mass User Creation.
Give Multiple Users.
Click on Create.



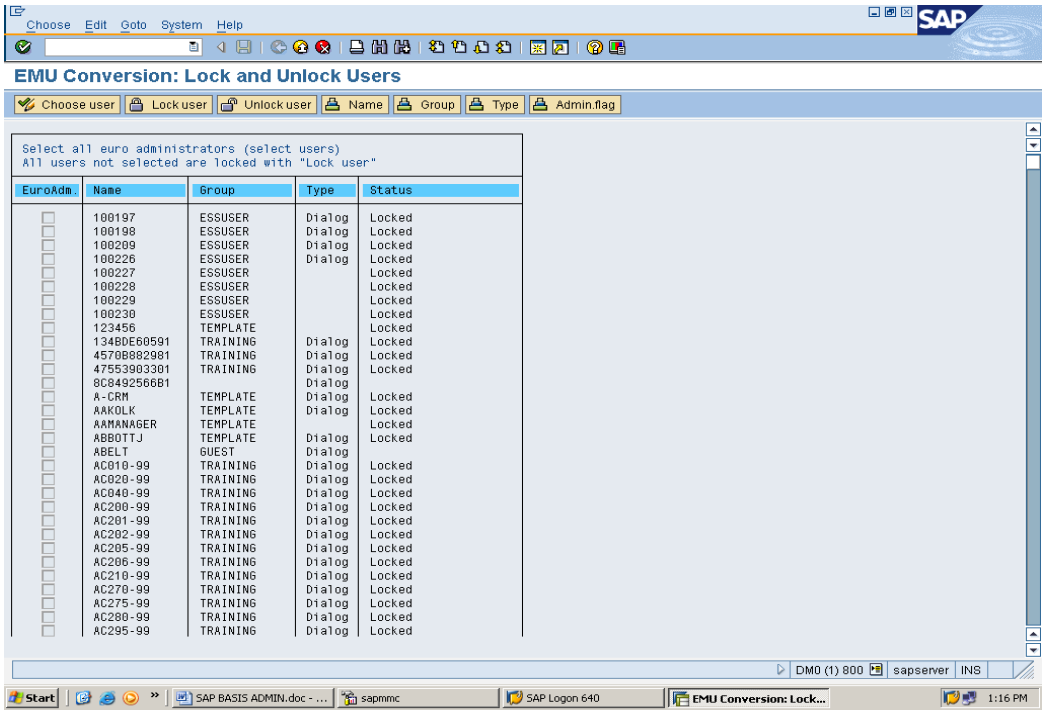
If you can use T-code as AL08 we can see the below col's .

Fill all fields.



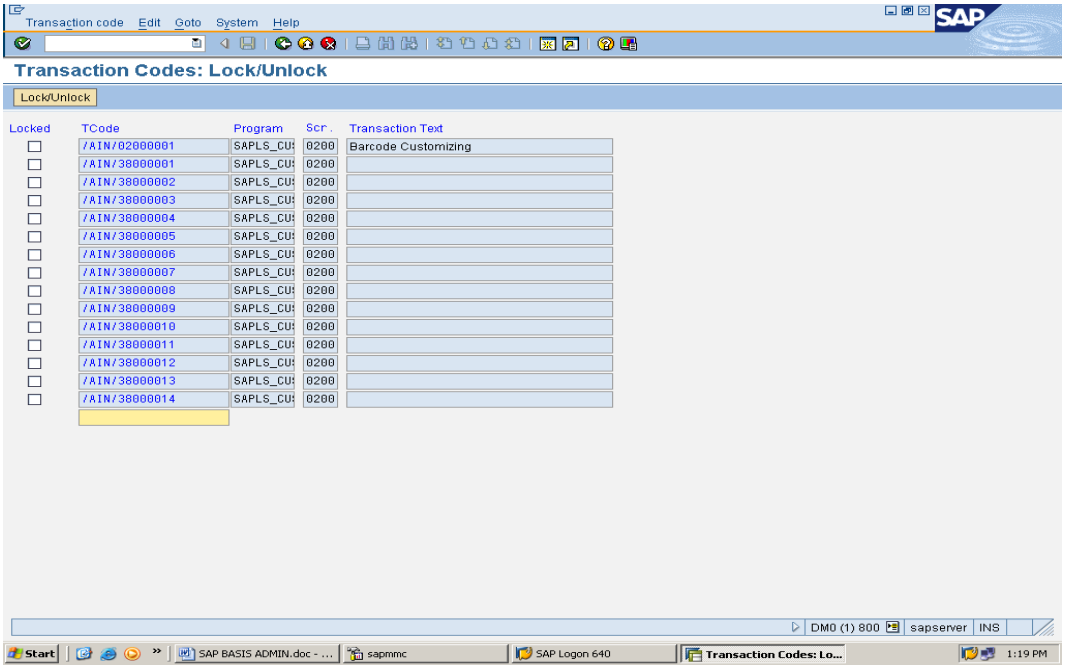

# How to Check Overview of Lock & Un-Lock Users List

In SAP command line enter T-code as **EWZ5**



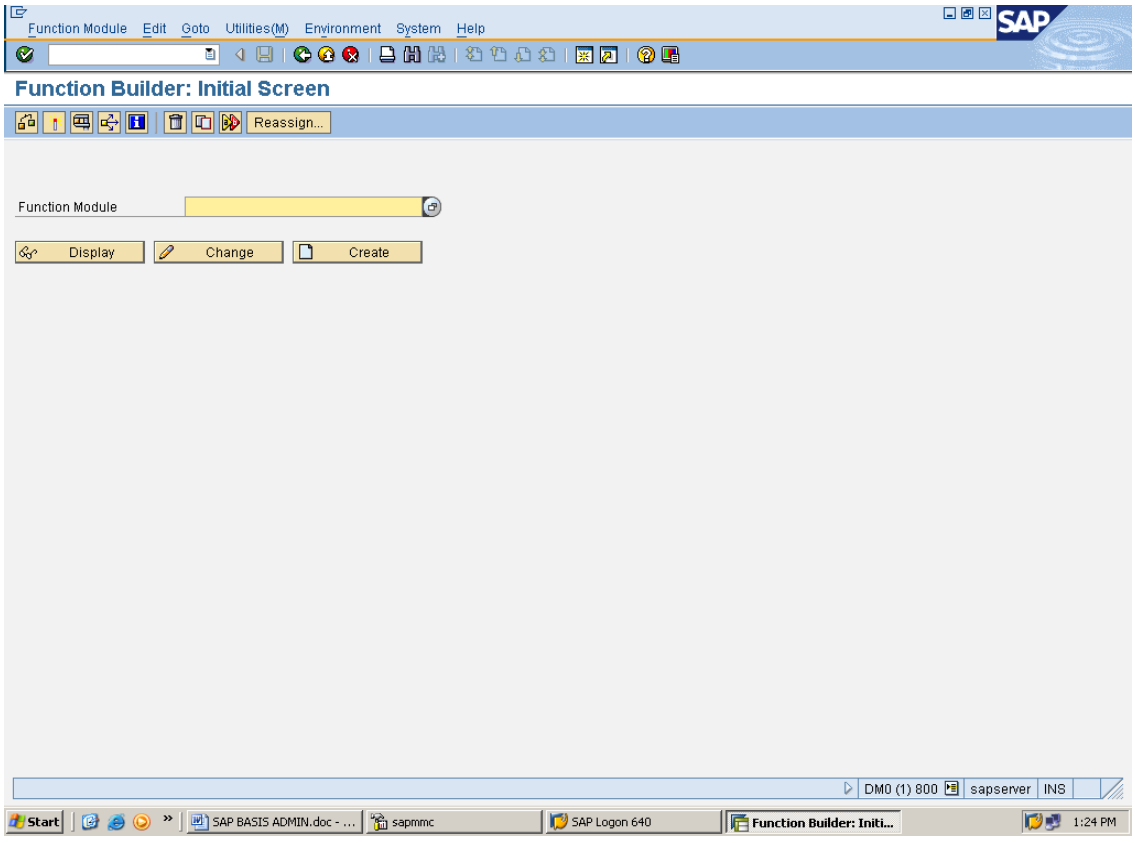
# How to Lock & Un-Lock T-code's

In SAP command line enter T-code as **SM01**




# How to Lock & Un-Lock Clients

In SAP command line enter T-code as **SE37**

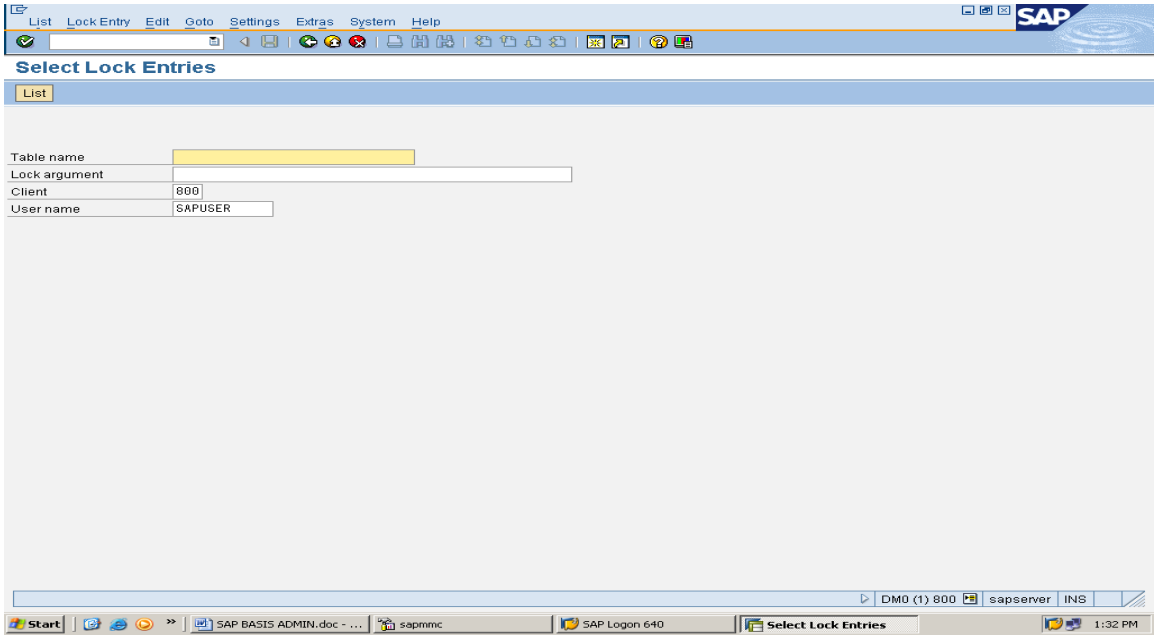



**Note:** If you want to Lock Client,1st you have to logion Different Client Then Lock

the Client.
If you have already gave the Remote Connection then you can't able to Un-Lock.

# How Monitoring Lock Entries (Users, Clients, T-codes, etc)

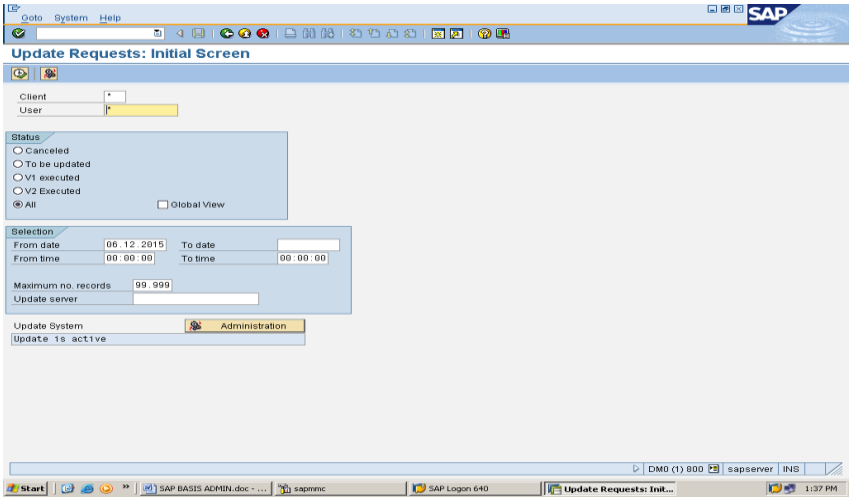
In Sap command line enter the T-code as **SM12** Here we can Check Table Name Wise.




# How to Monitoring Update Process

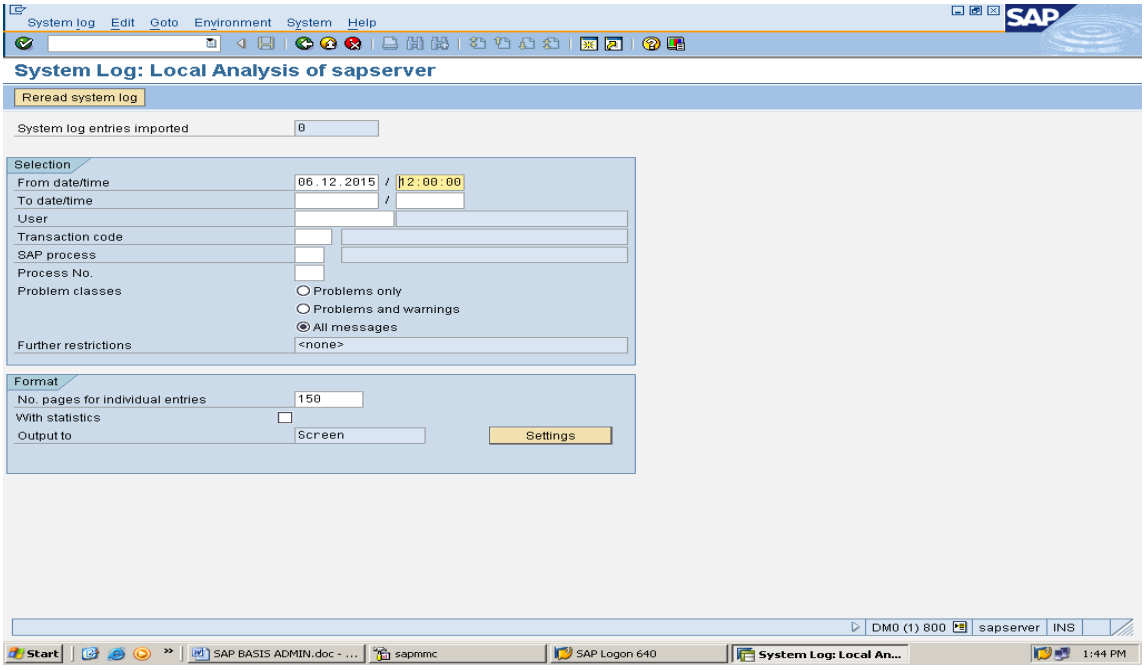
In SAP command line enter T-code as **SM13**

**Note:** Update System Should Be Active.



# How to Monitoring System Logs

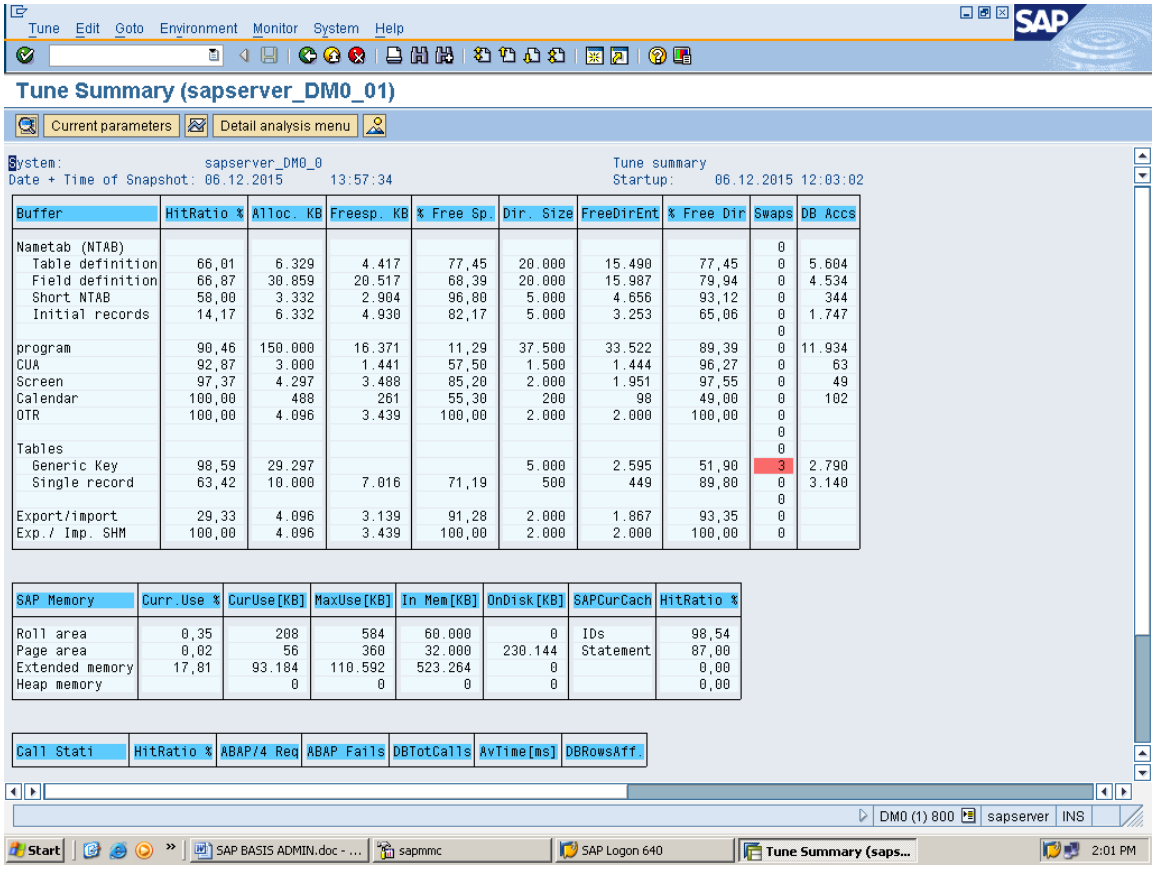
In SAP command line enter the T-code as **SM21**

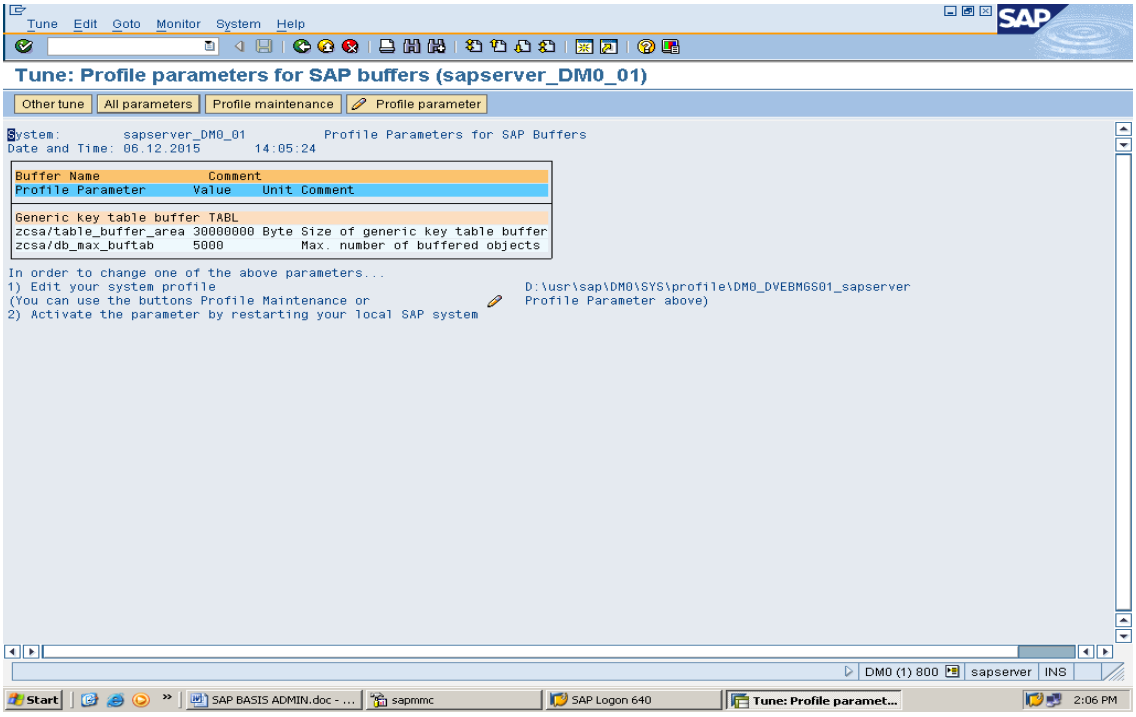



# How to check Buffer Statistics (Tune Summary)

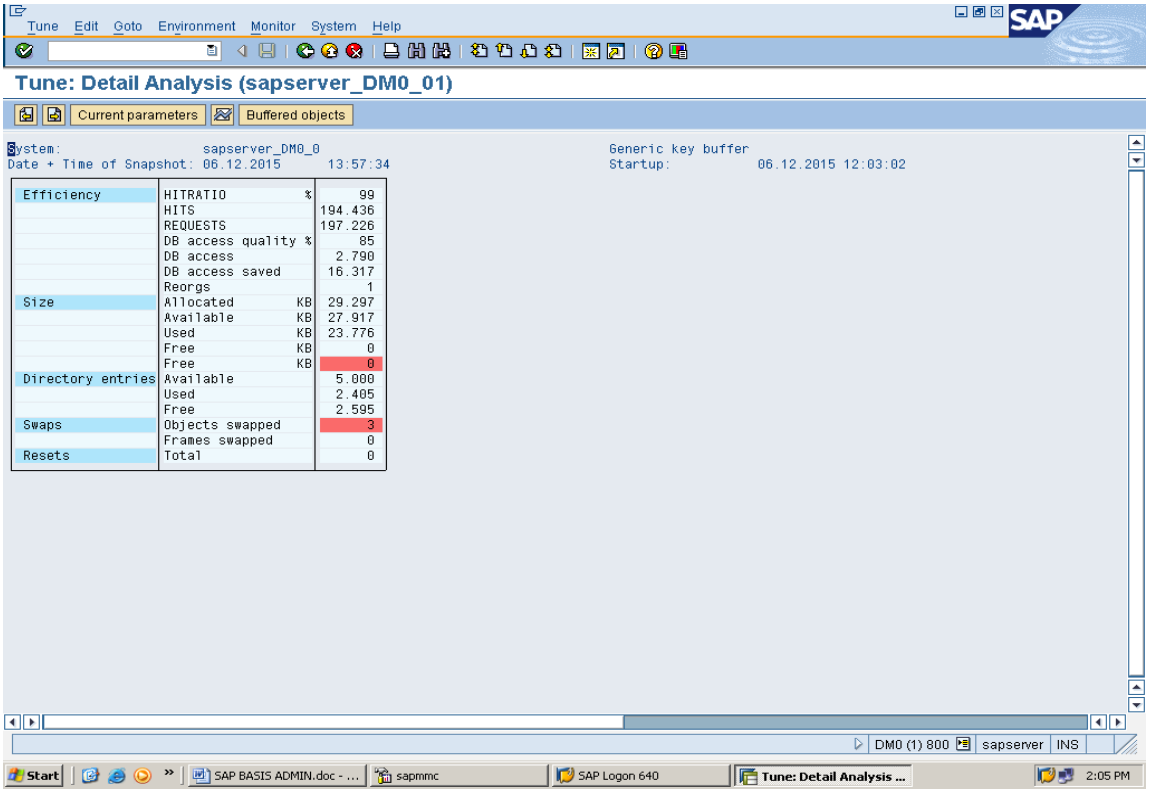
In SAP command line enter T-code as **ST02**

If SWAPS Col having any Red color values Double Click on that.




Then Click on Current Parameters




Now Note it down the Profile Parameter and Value in above mentioned screenshot.

# How to Create Profiles and Generate the Profiles

**Note:**

**Authentication:**

Provide the User id & Password to the Users.

**Authorization:**

Give the Permission to Perform some Activities in The System by using User id & Password.

**Authorization Object Class:**

Collection of Authorization Objects.

**Authorization Object:**

- Collection of Authorization Field.
- 1 Authorization Object having not more than 10 Authorizations.
- Overview of Authorization Object by using the T-code as SU21/SU22

**Authorization Fields:**

- Collection Authorization field values.
- Overview of Authorization Field by using the T-code as SU20

**Signals:**

Here we are having 3 types of Colors.
Red : Unmaintained Organization Levels.
Yellow: Partially Unmaintained Authorization Fields.
Green : Maintain Authorization Fields.

**Legend:**

Here we are having 6 types of Colors.
Orange - Authorization Object Class
Green - Authorization Objects
Yellow - Authorizations
Gray - Authorization Fields
Blue - Field Change
White - Field Values

- Here we are having 3 types of Profile Role Creations.

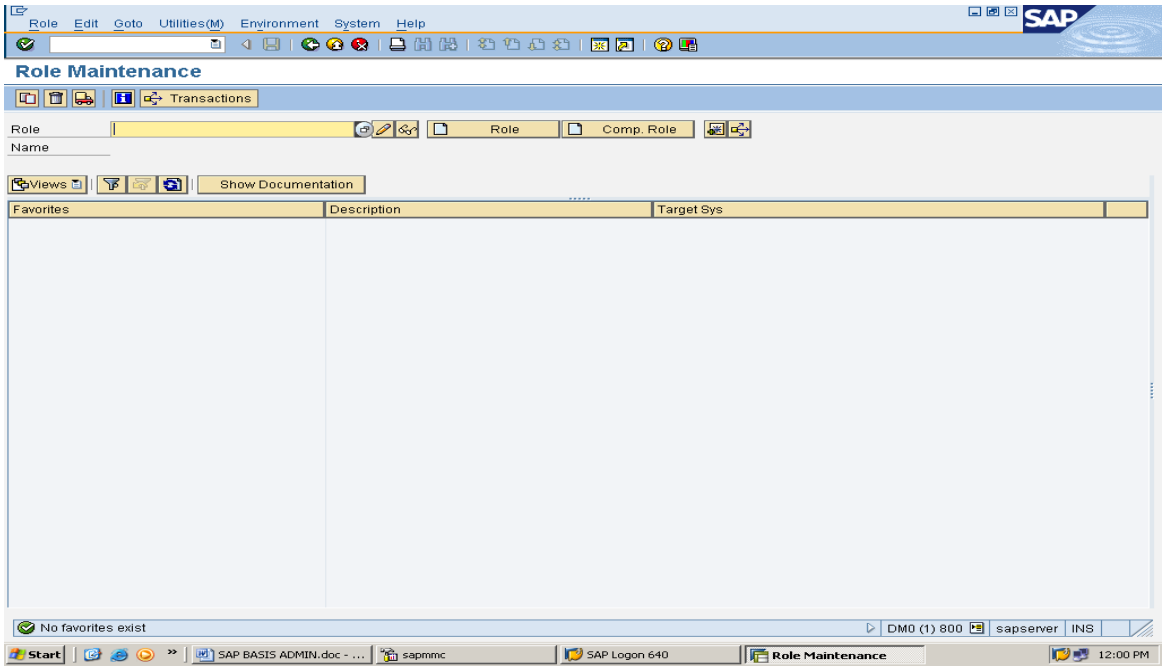
Single Role Creation, Derived Role Creation, Composite Role Creation (Collection of Single Role Creation).

**Note:**
Naming conversion start with Y: or Z:

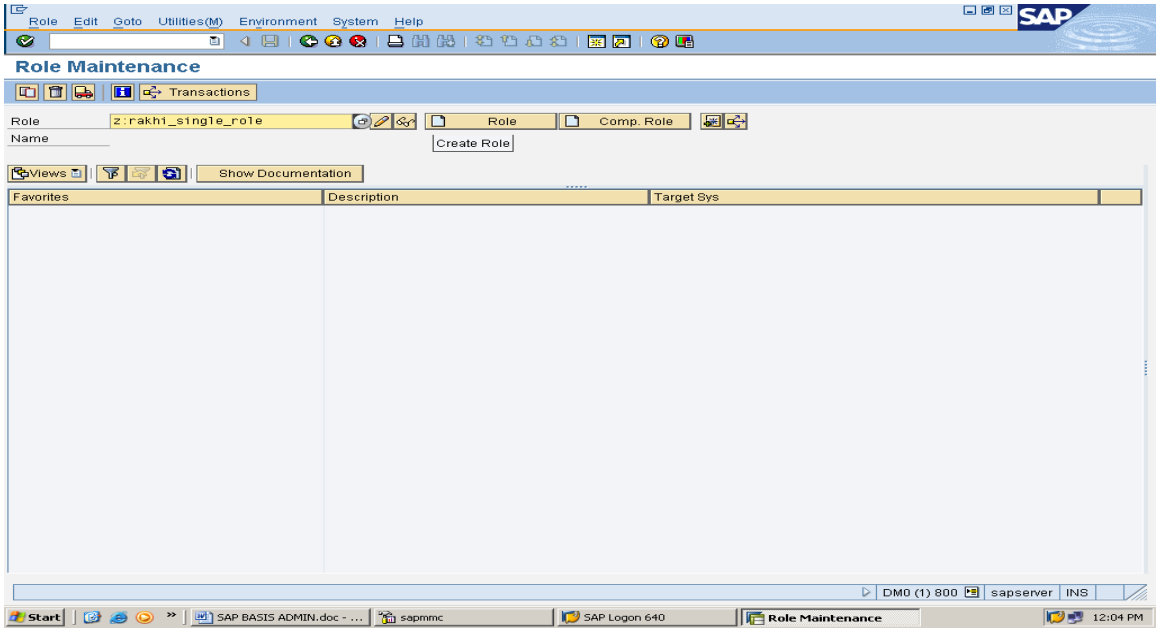
# Single Role Creation

**Pre-Requirements**

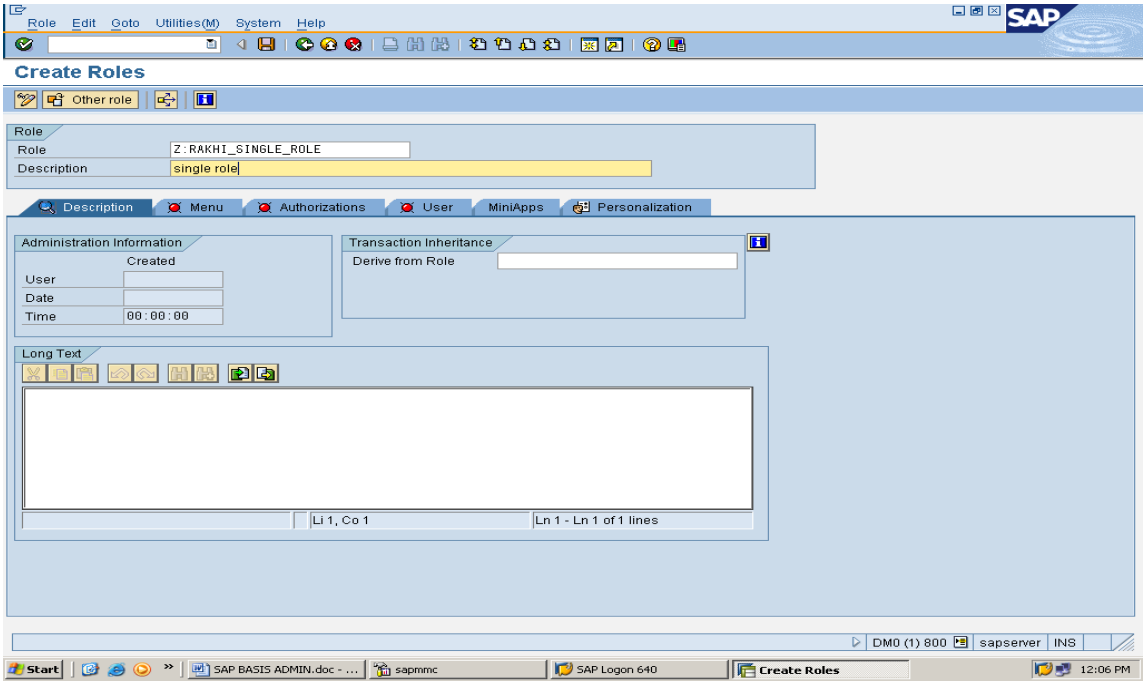
We have to check whether User was existing or not for which we are going to assign Role.
In SAP command line enter the T-code as **PFCG**



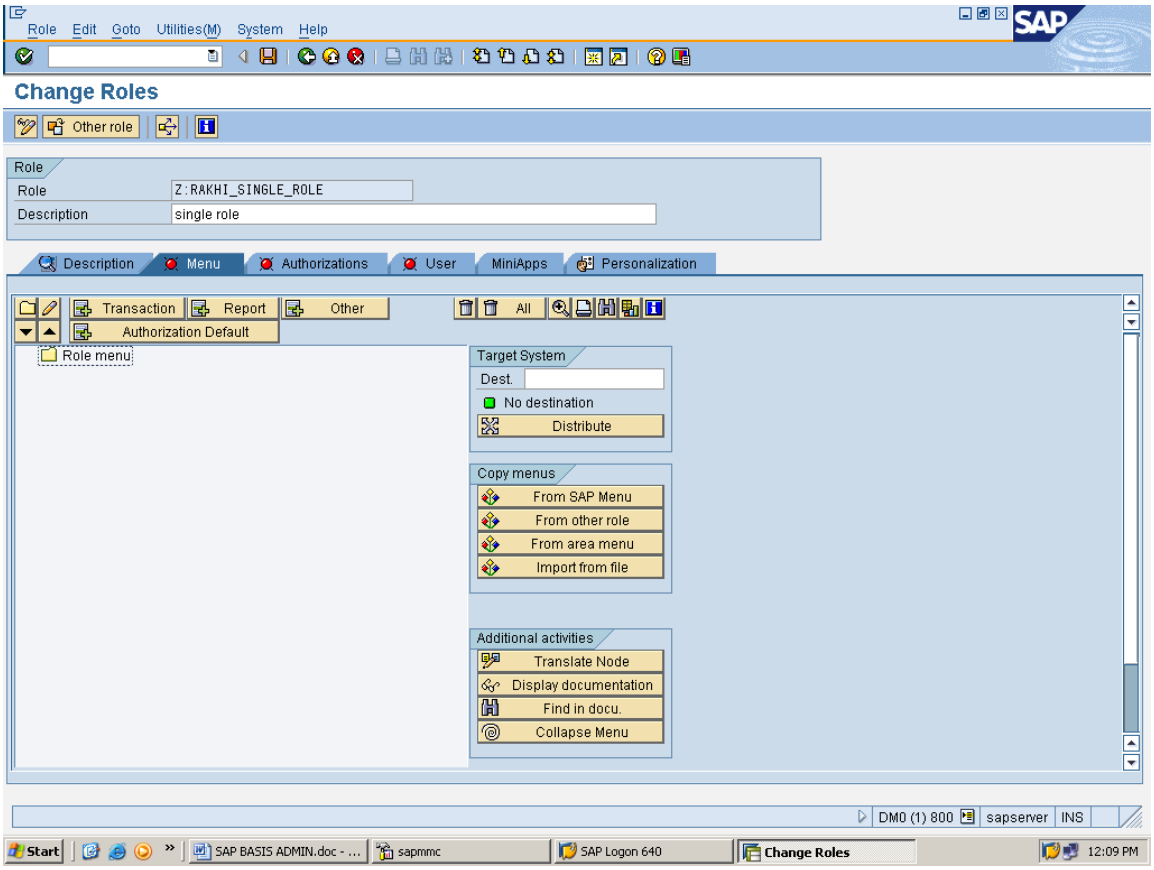

Click on Create Role



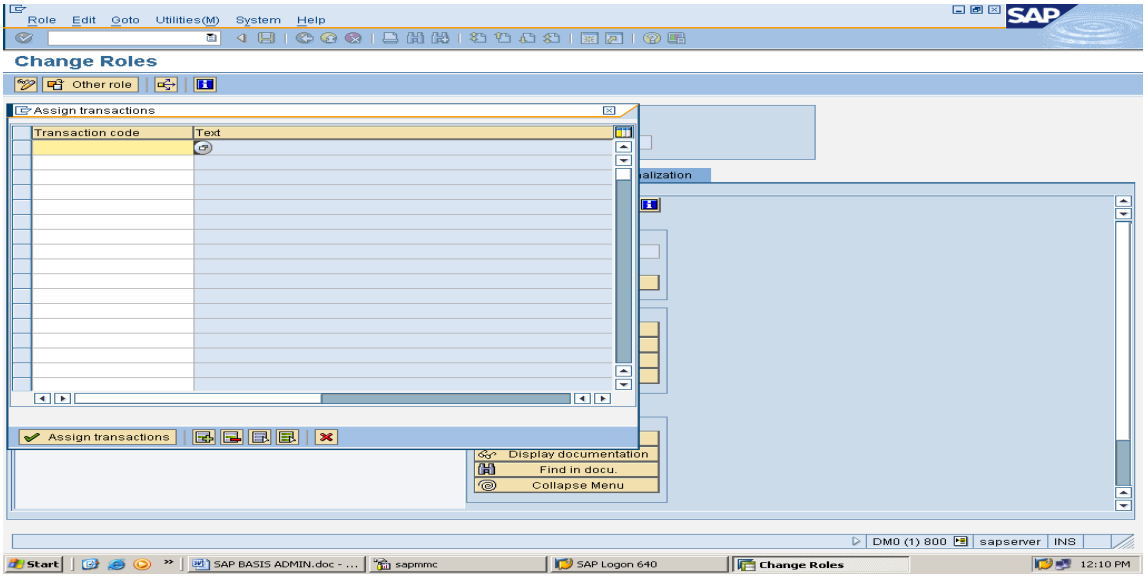

Here fill all the fields as per below screenshots and Save it.



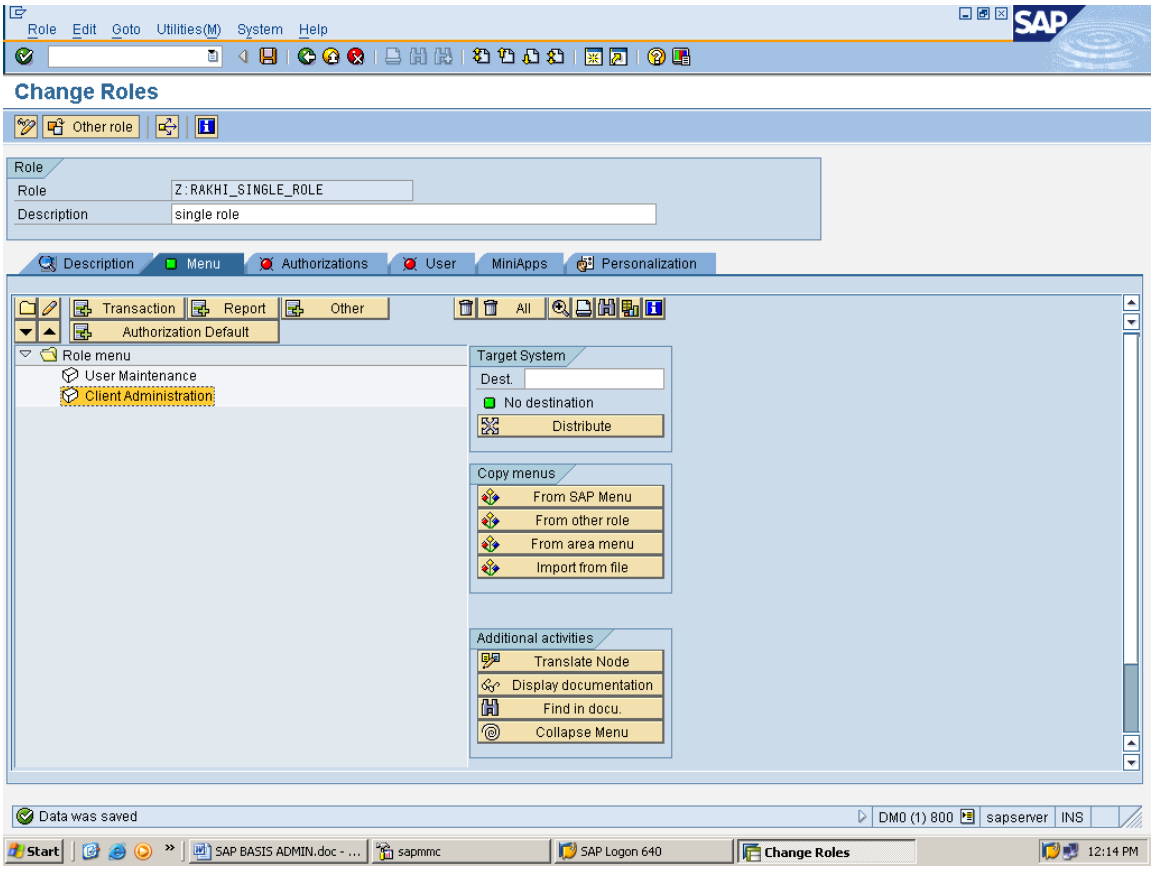

Click on Menu tab
Click on Transaction tab.



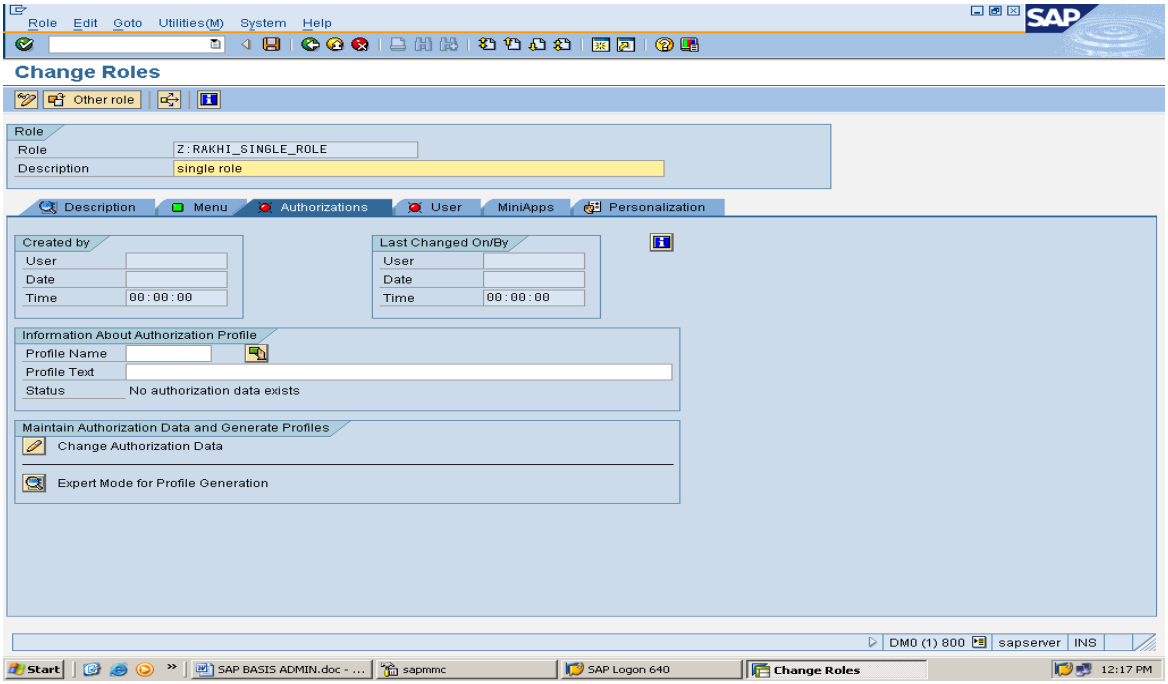

Enter the T-codes which you need to assign to the Role.



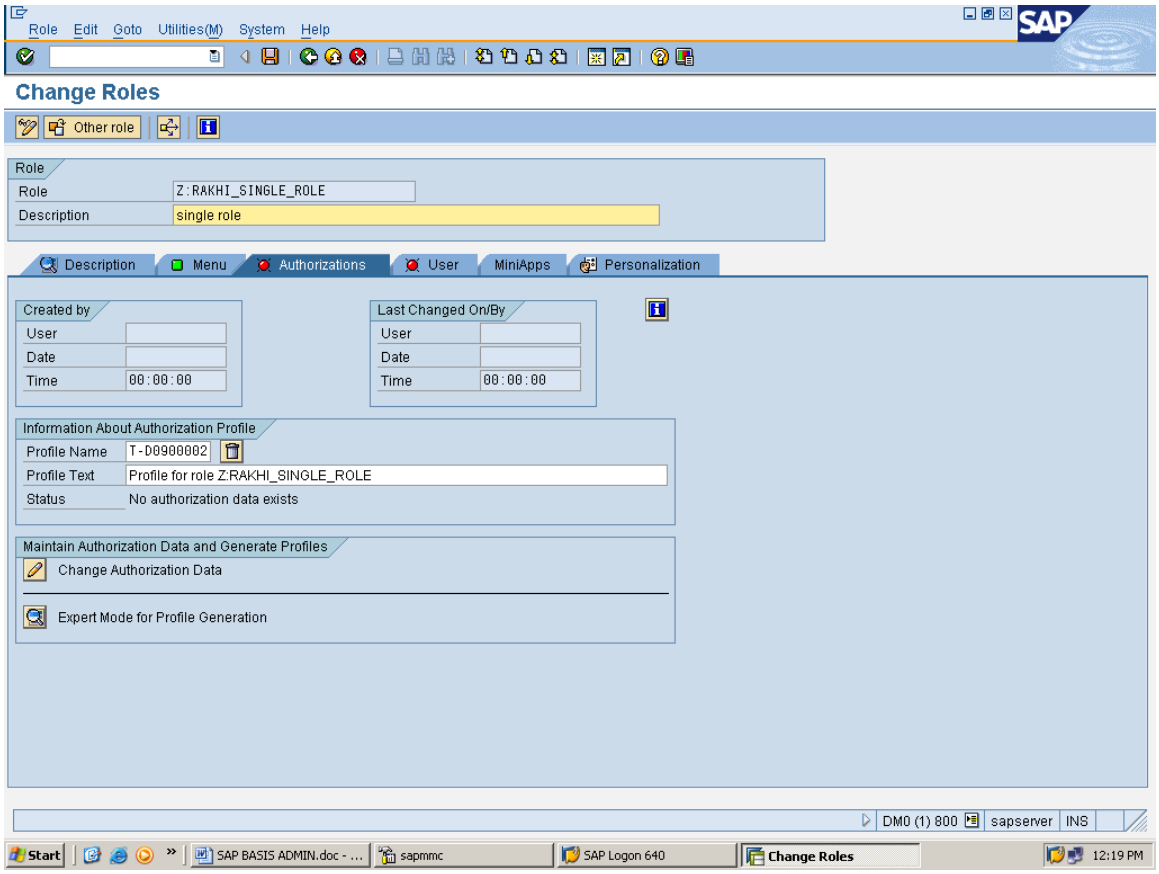

Click on Assign Transactions Then Save it.



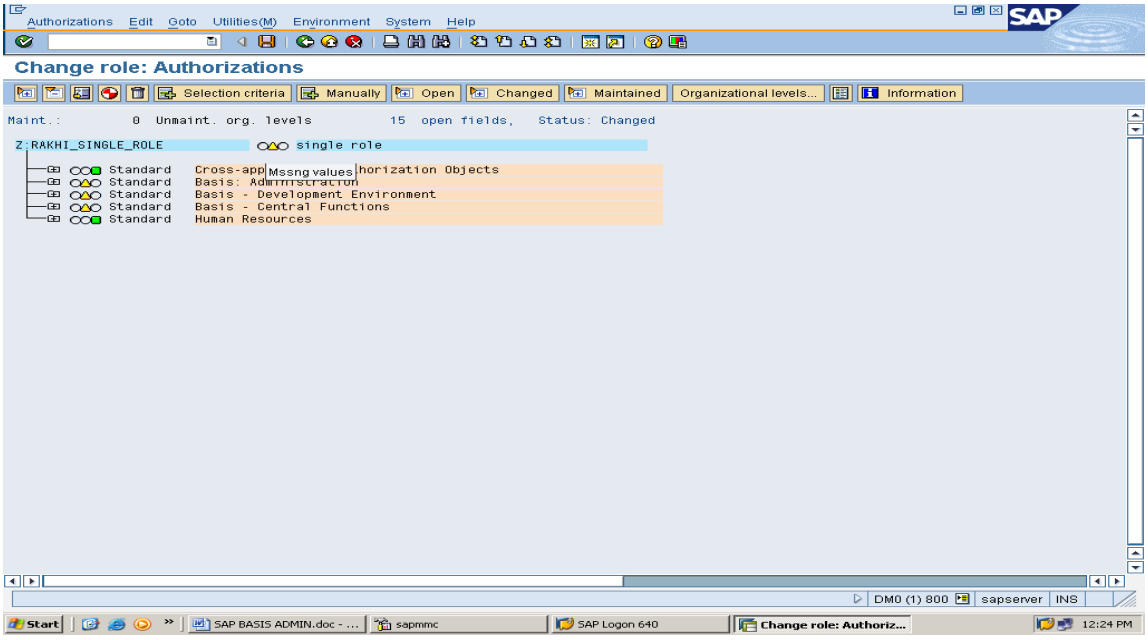

Click on Authorization tab



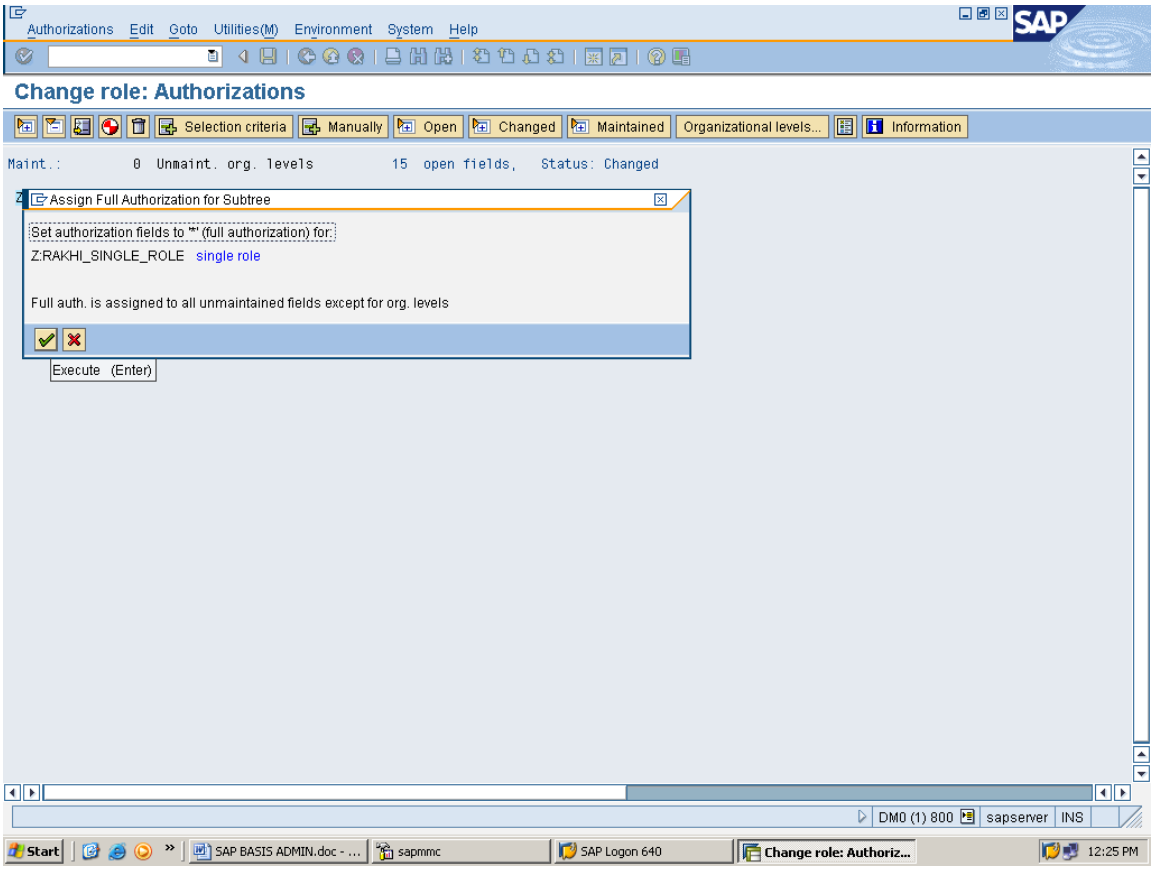

Click on Profile Name Browser then data will be automatically fetched and Save it.



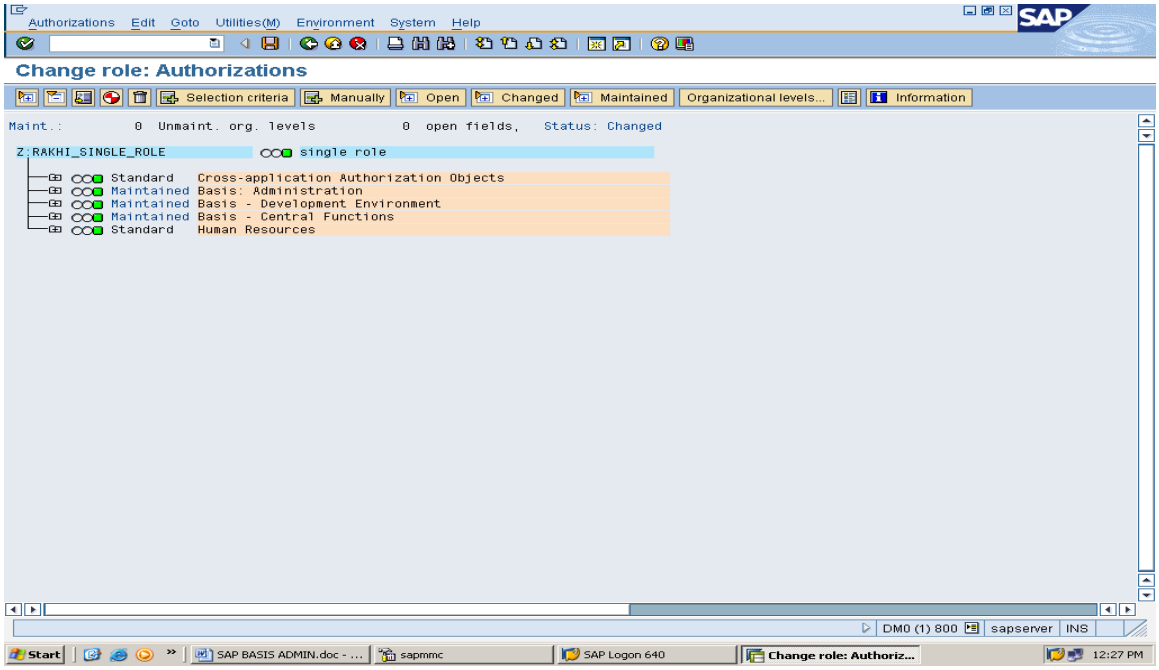

Click on Change Authorization Data



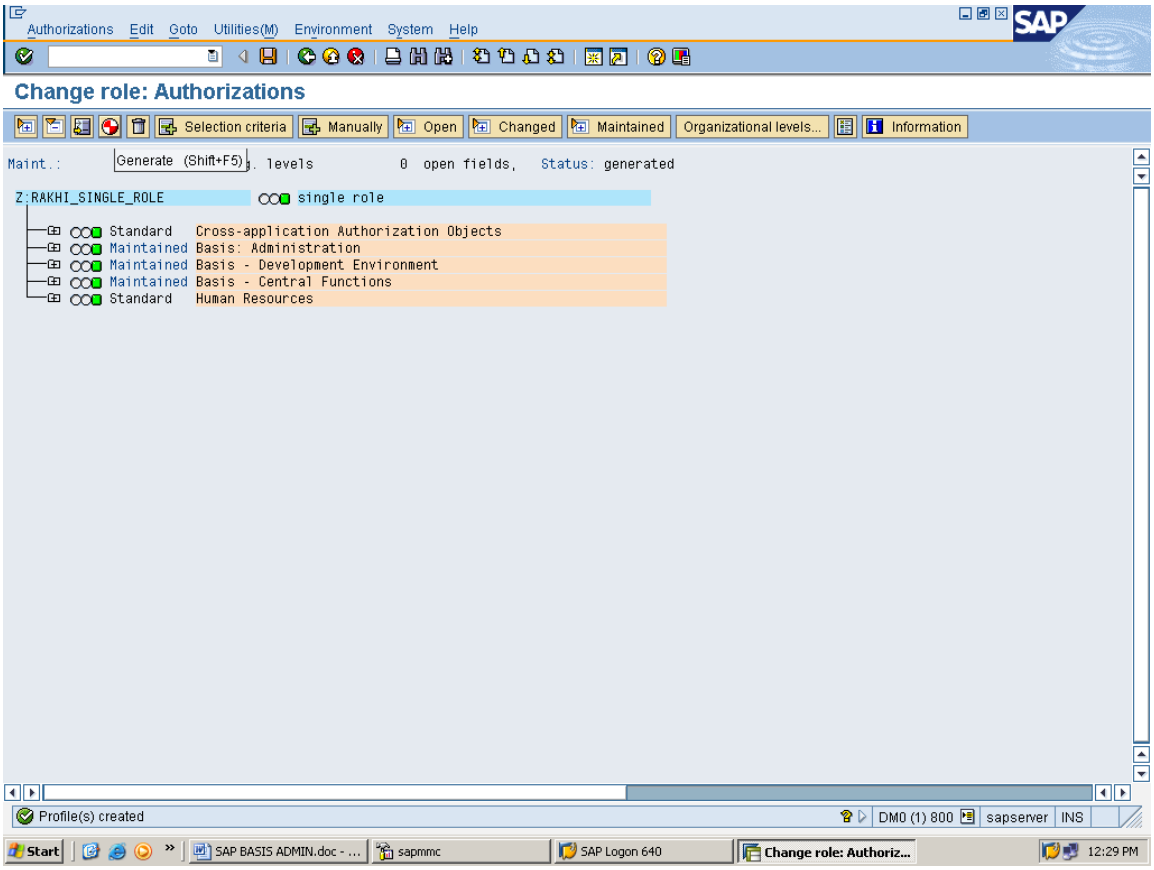

Click on Last Circle Symbol of Single Role in above screenshot i.e Missing Values.
Then click on Execute.



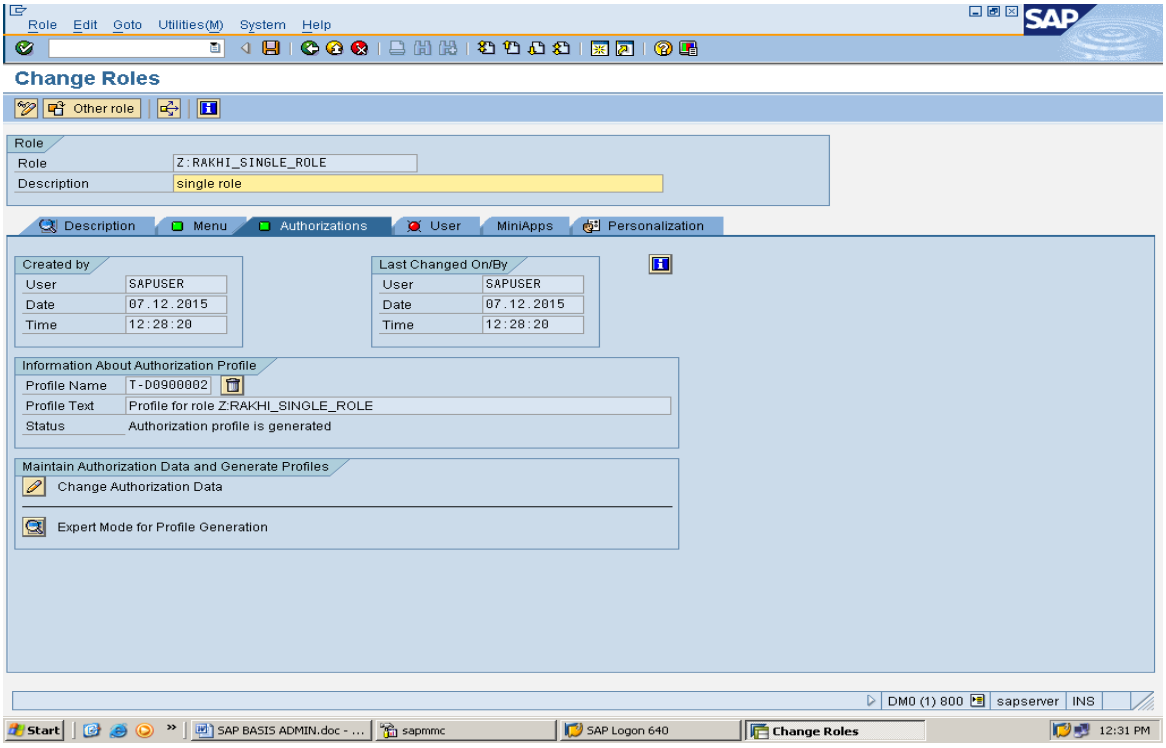

Now all the fields will be come into Green color then Save it.



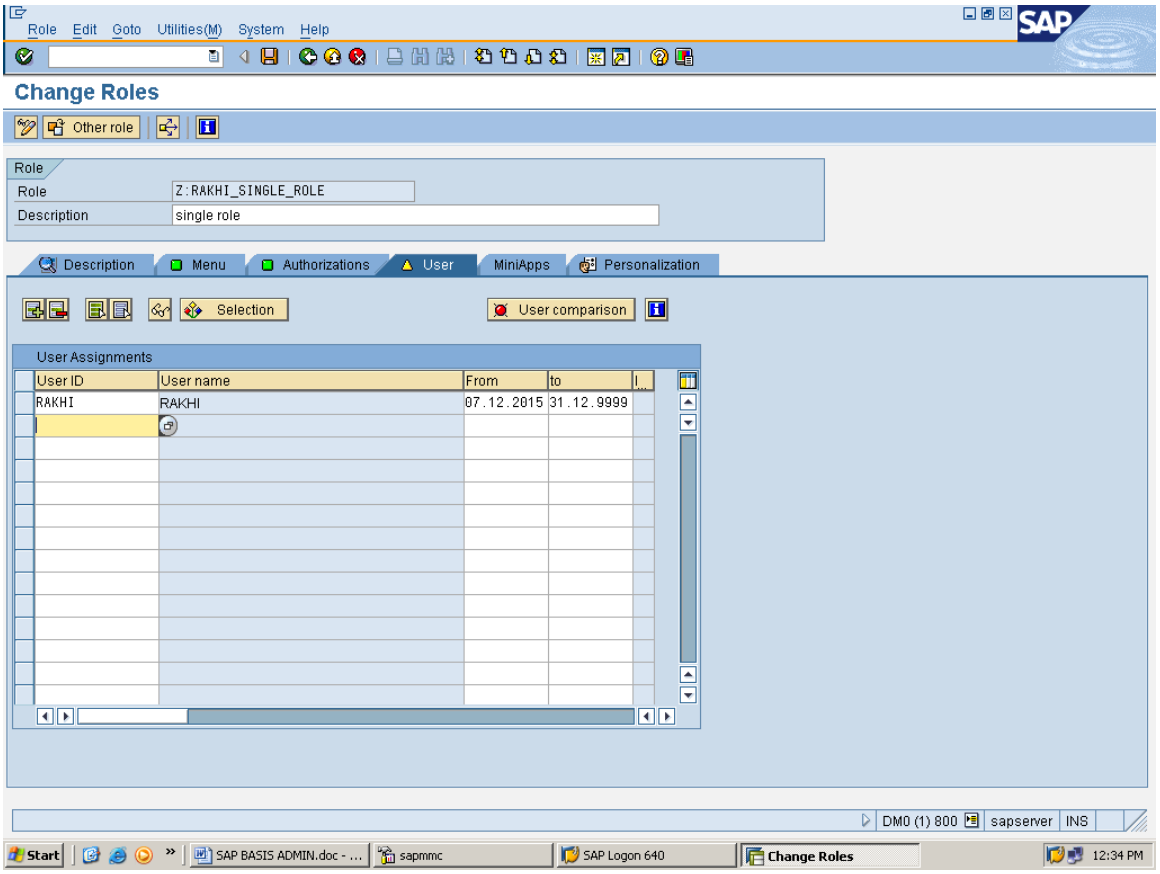

Click on Generate Symbol.
Now Profile was created.



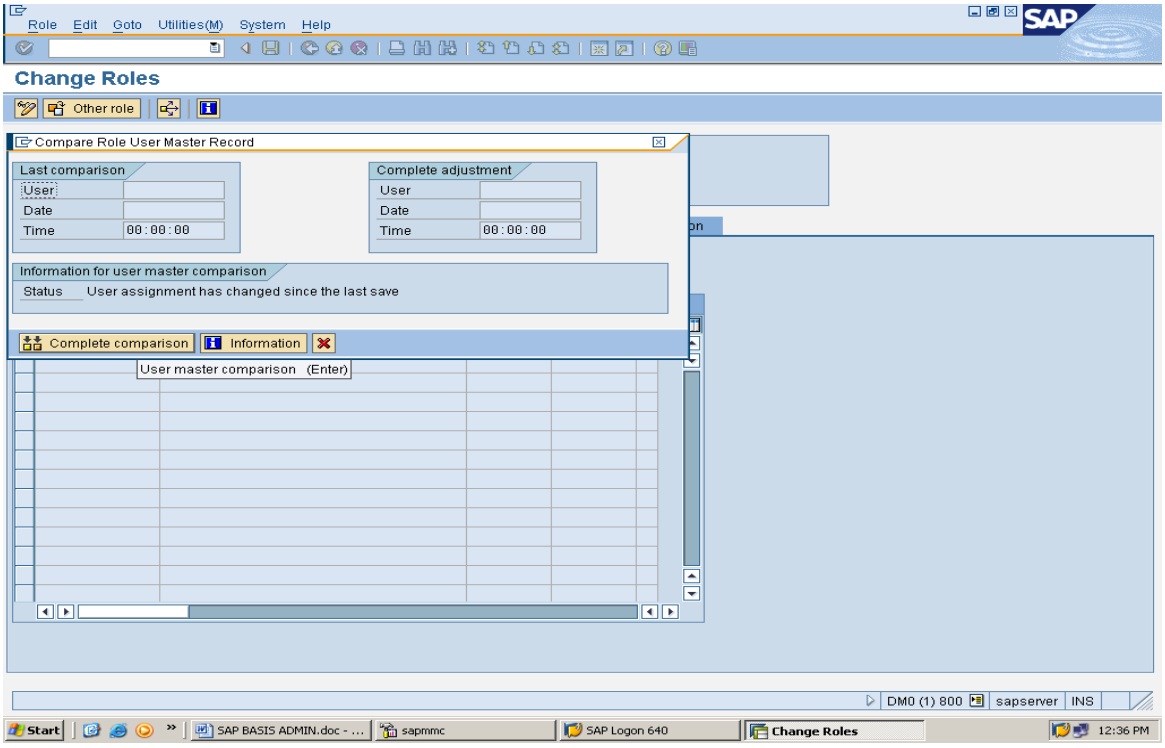

Click on Back now Authorization field come into Green color




Click on User tab and give the User id.
Click on User Compression.

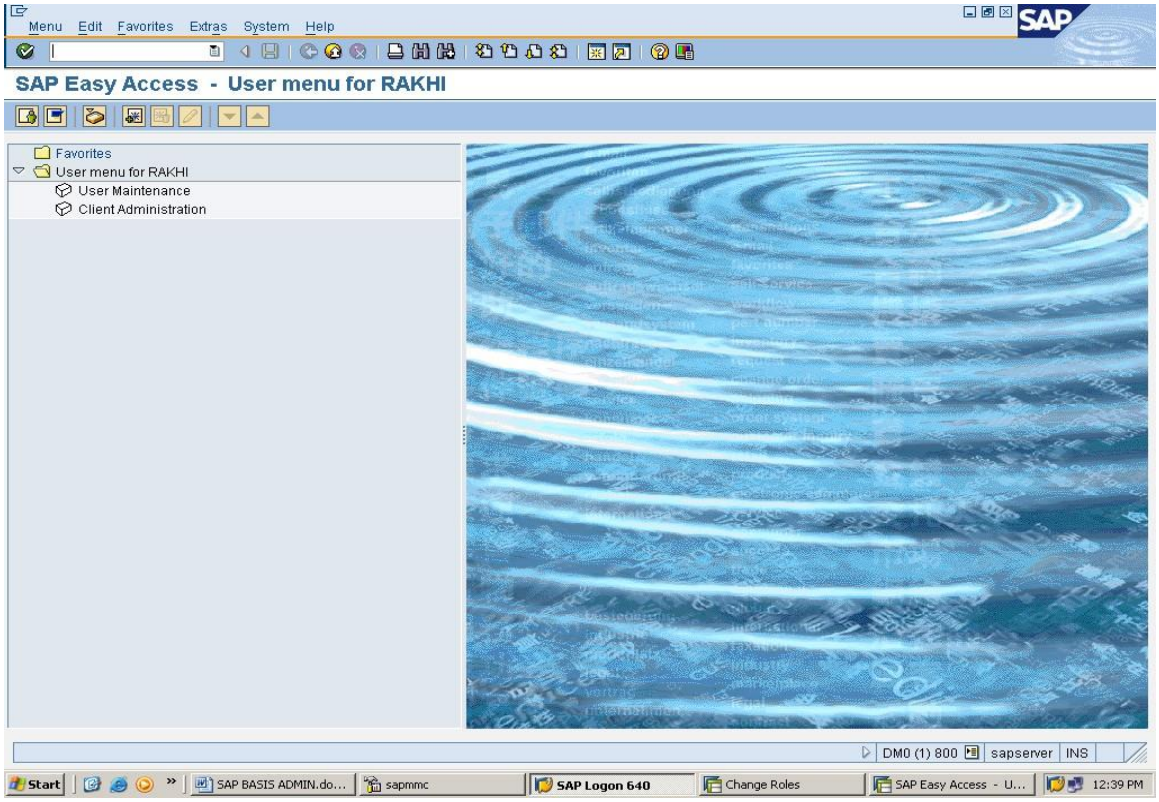



Then click on Complete Compression then click on Yes

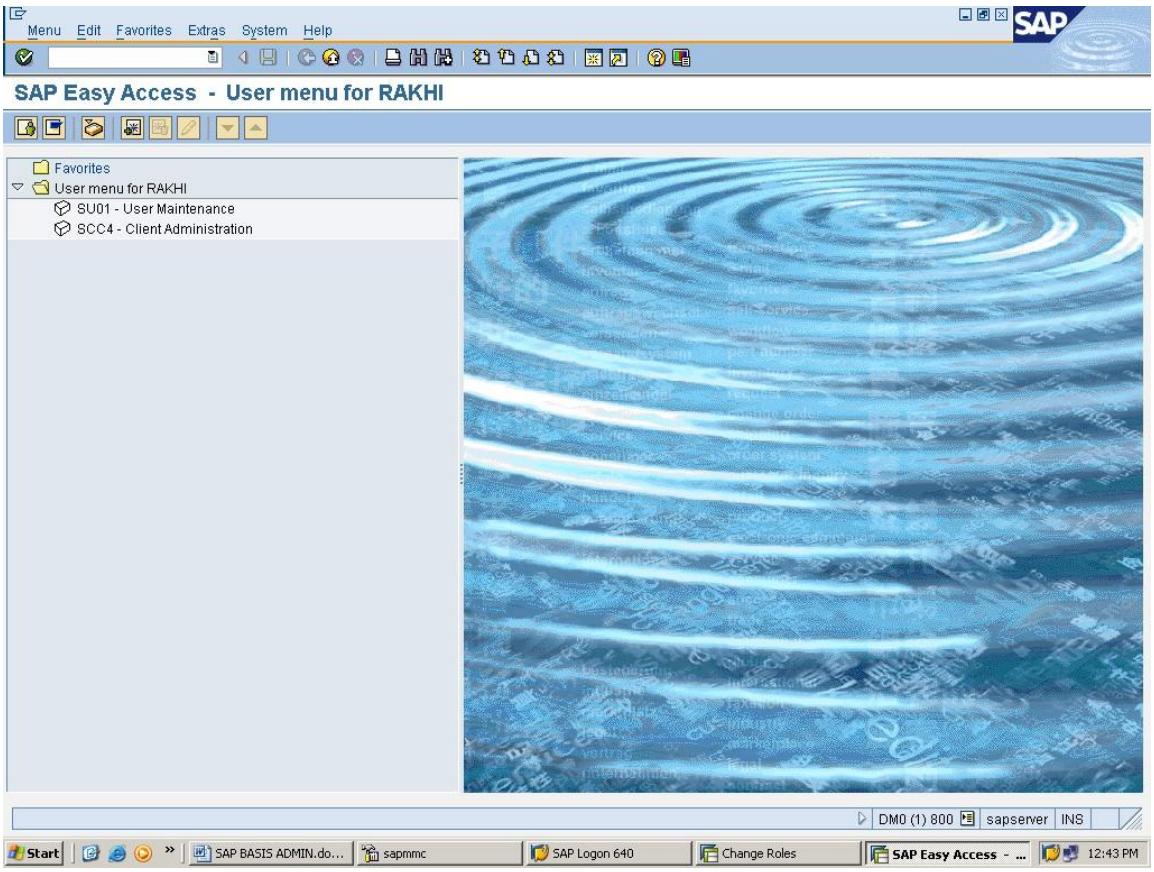



Now User tab also come into Green color.
For Checking Login with Roles assigned User.

**Eg:**rakhi/india123




Here we can see the Assign T-codes to the User
For showing T-codes Technical Names, in top menu bar click on
Extras→Settings→Check the display names



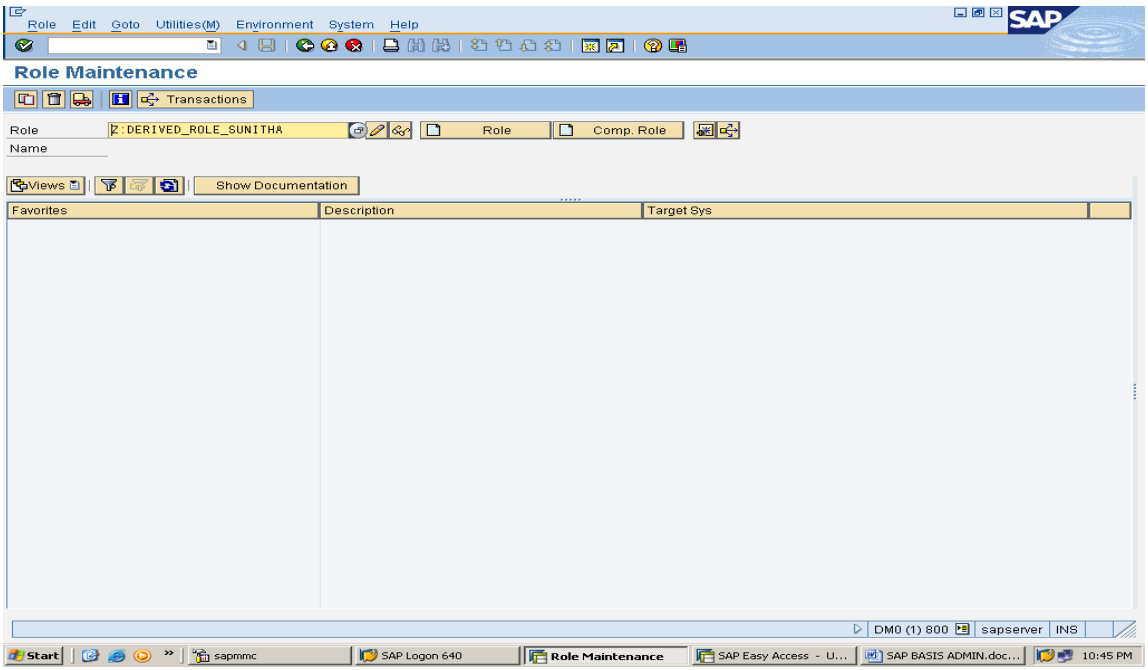

# Derived Role Creation

## Pre-Requirements

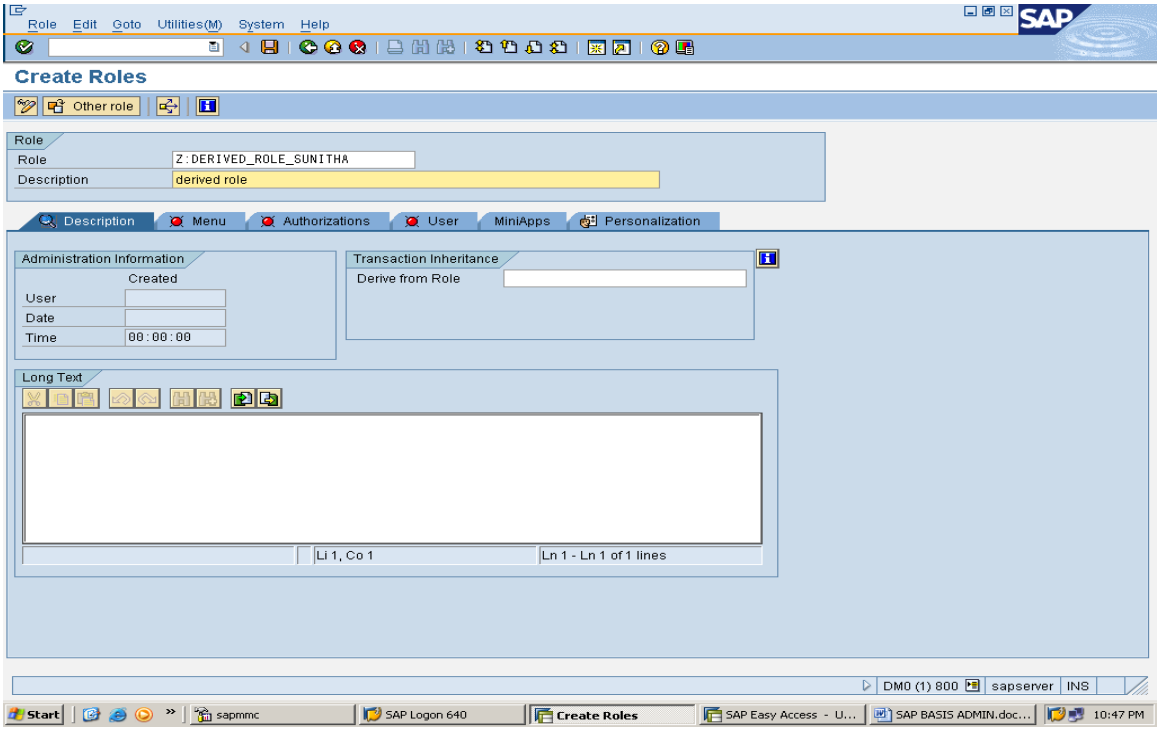
One Parent Role & another one Child Role
**Eg:** Parent Role rakhi_single_role
T-codesSU01, SCC4

Child Role teja_single_role

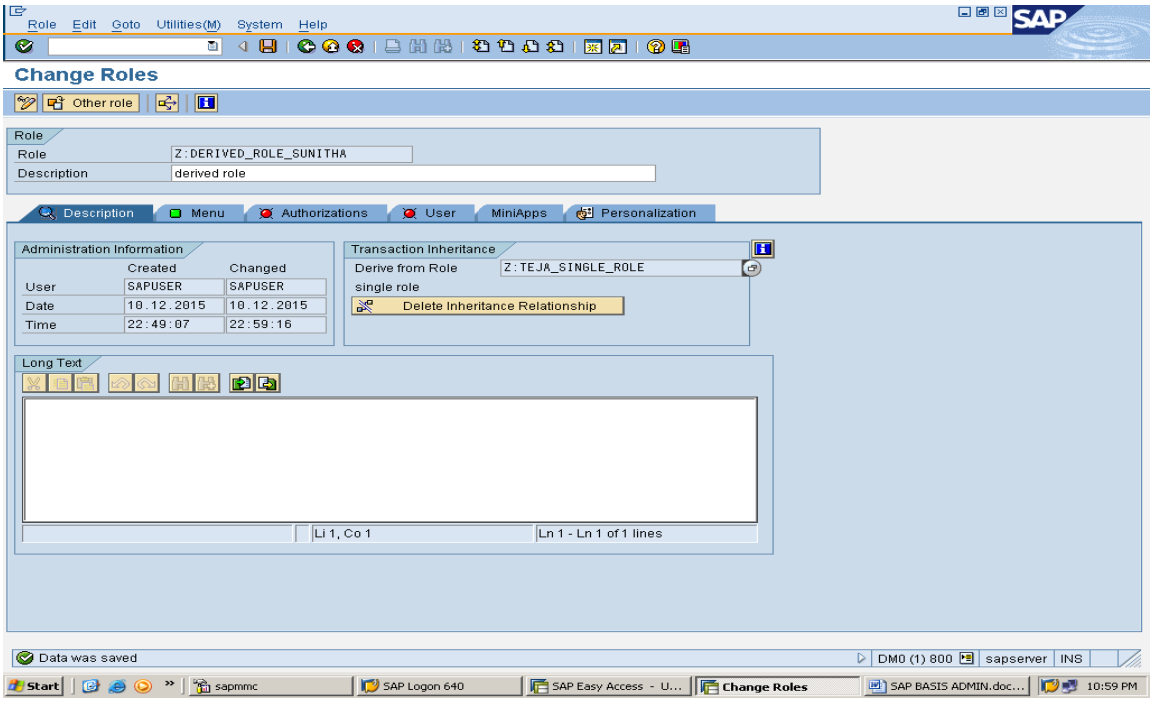
T-codesSCC5, SCC3



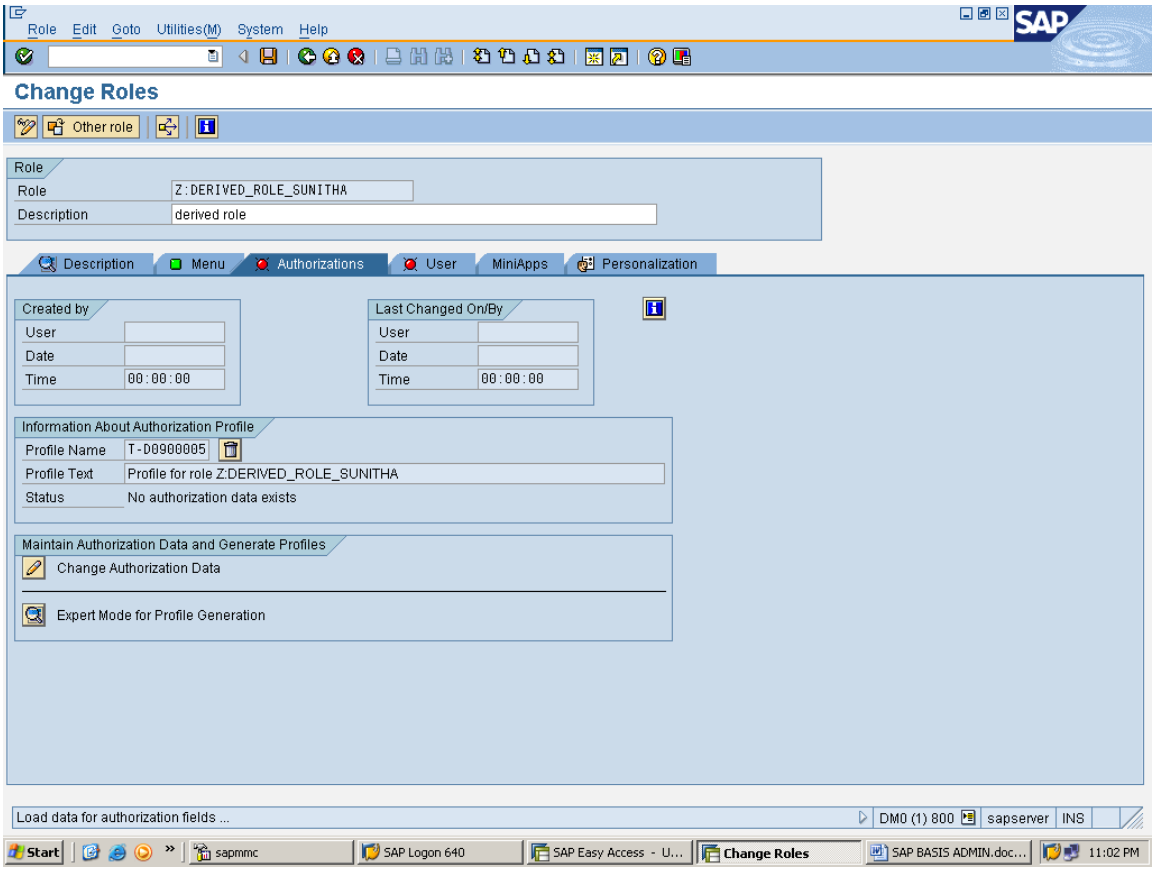

Click on Create Role and Save it



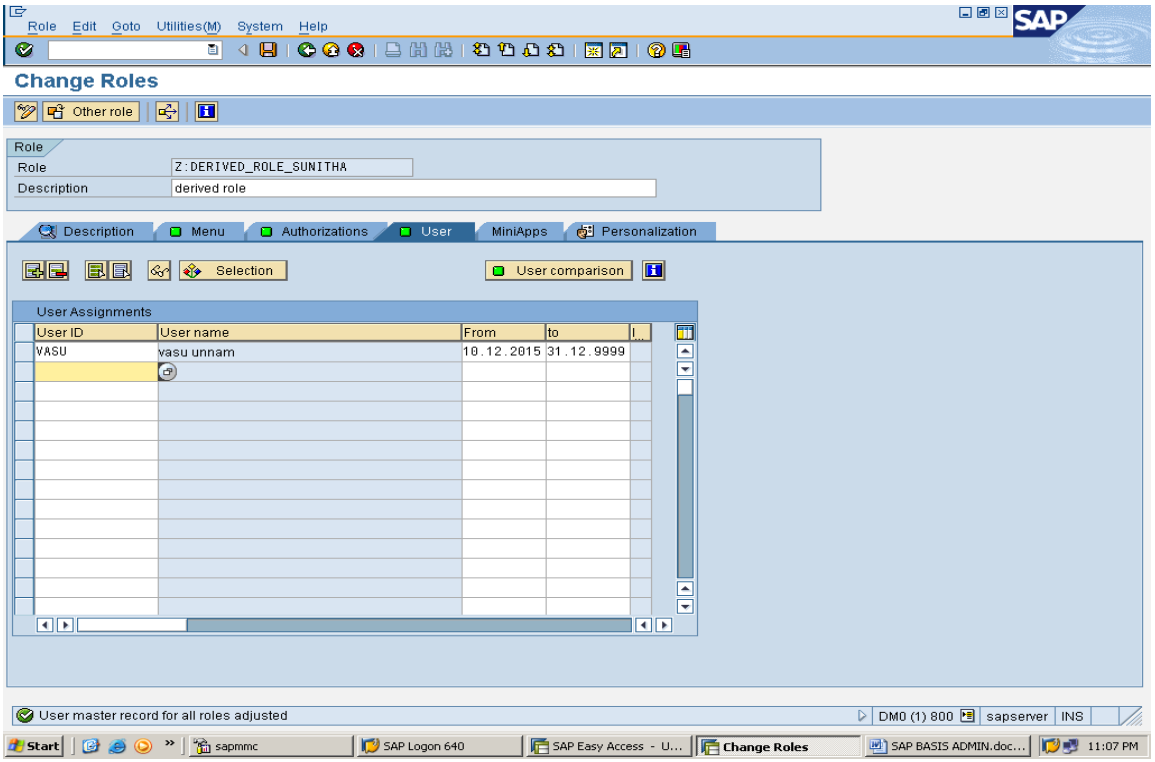

Click on Menu tab and Enter the Derived from Role then Save it.
Here one Link was enable i.e, Delete Inheritance Relationship



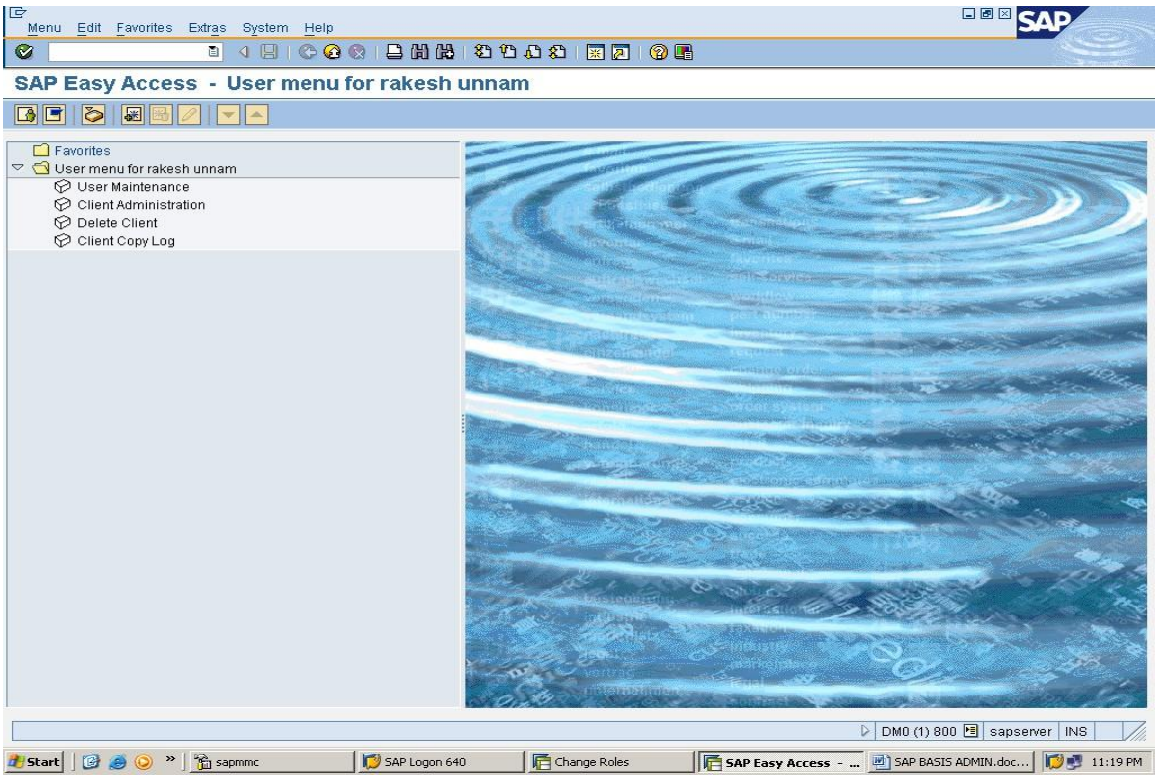

Click on Authorizations




Similarly to the Single Role Creation




Now Login with Client - 800, User - rakhi, Password – india123
Here we can see the Both Single Role's T-codes




If we Delete the Link
(Delete Inheritance Relationship) Both the Single Role's will be act as Independent

# Composite Role

Collection of Single Role's as Composite Role.

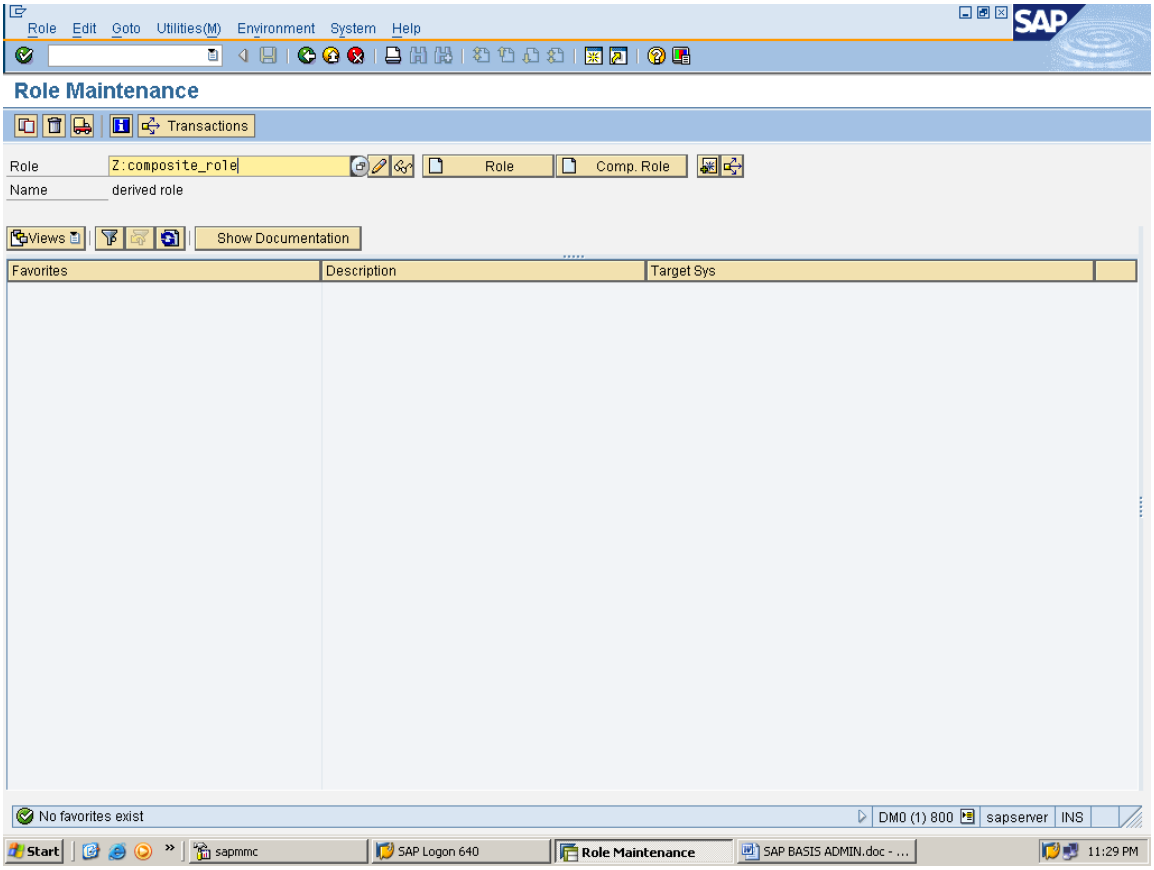
## Pre-Requisites

Here we need 2 Single Role's

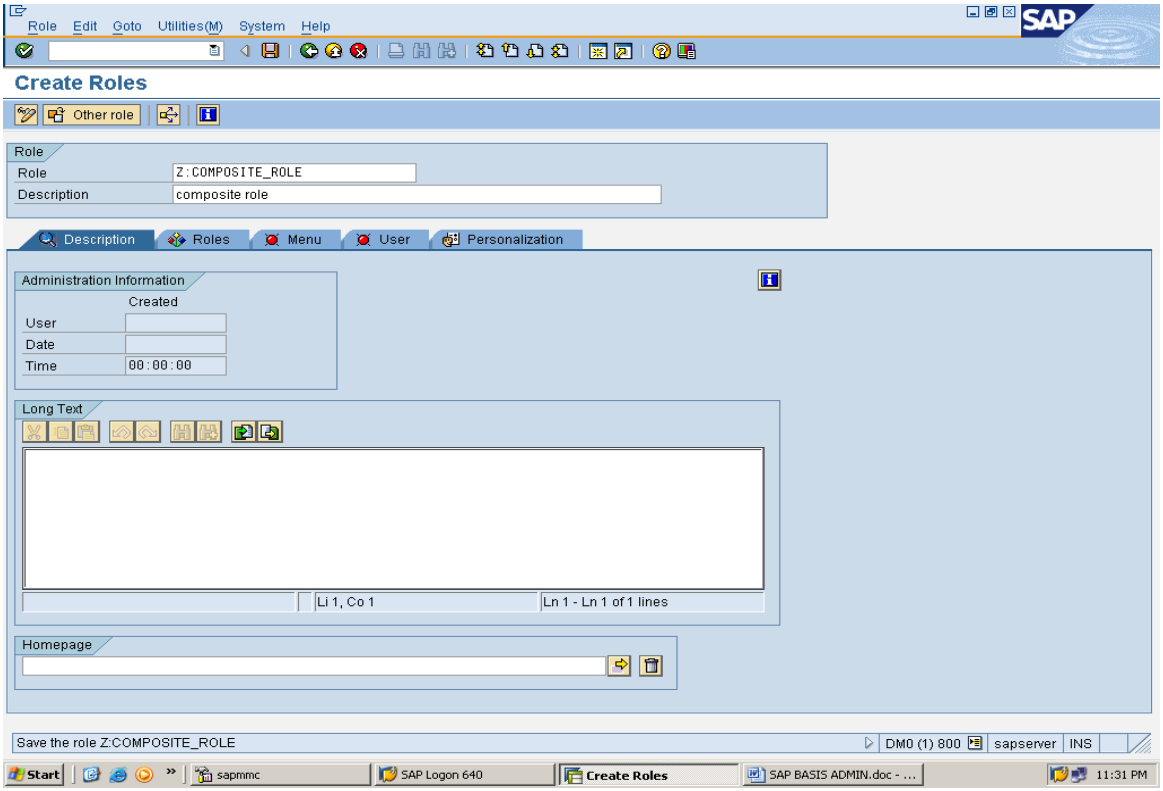
**Eg:**

Rakhi_single_role,teja_single_role

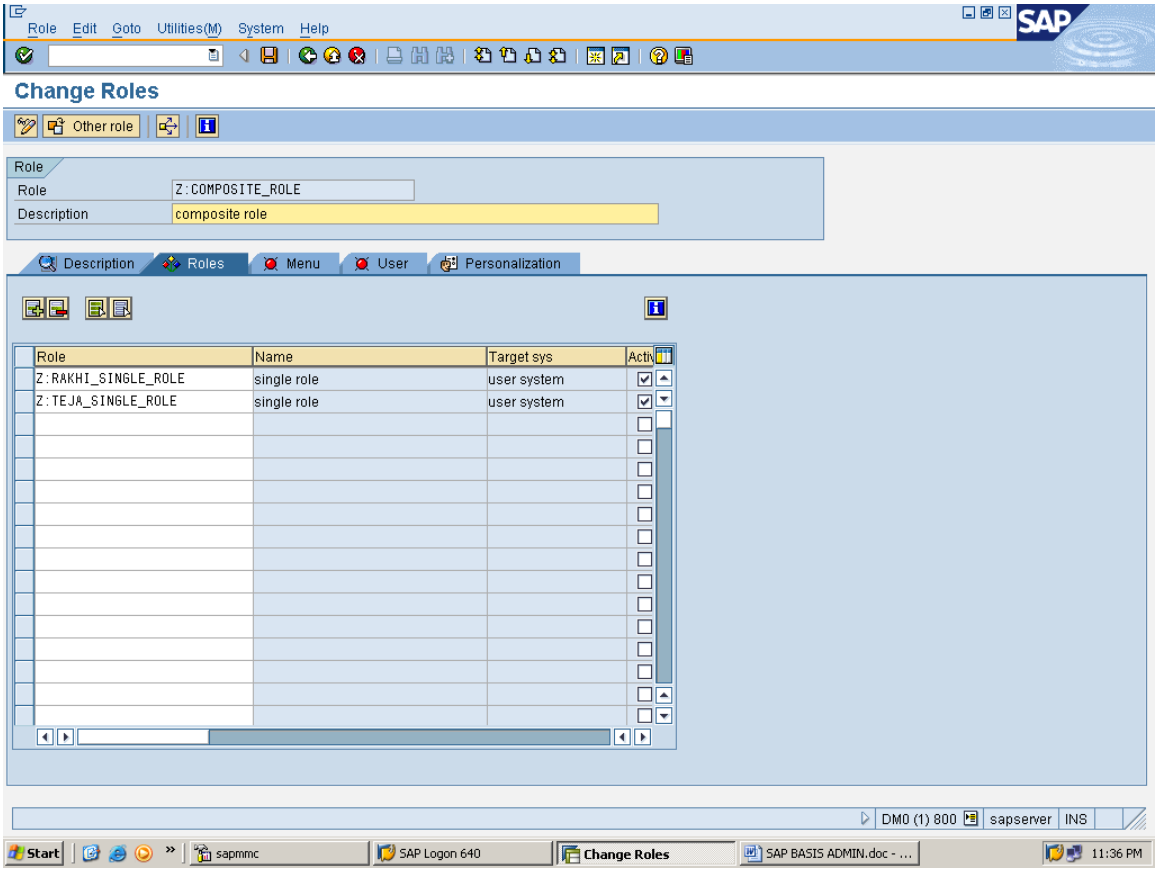
Click on Comp.Role tab.



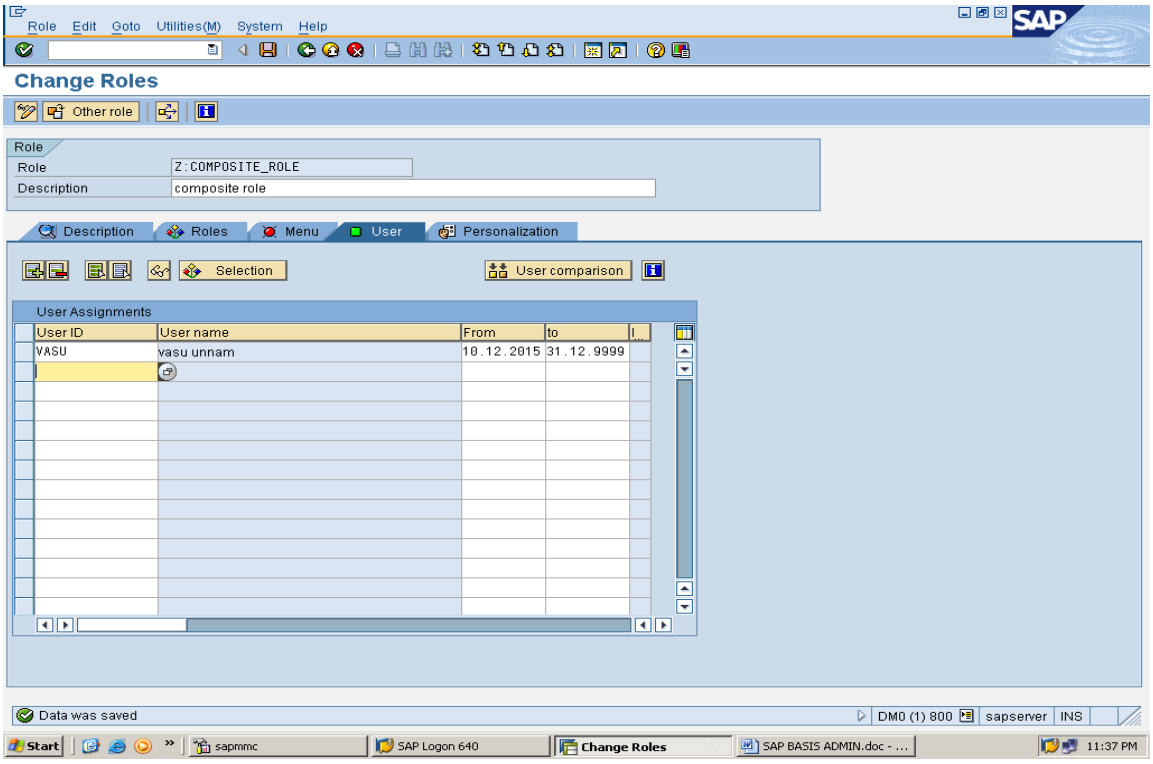
Then Save it.



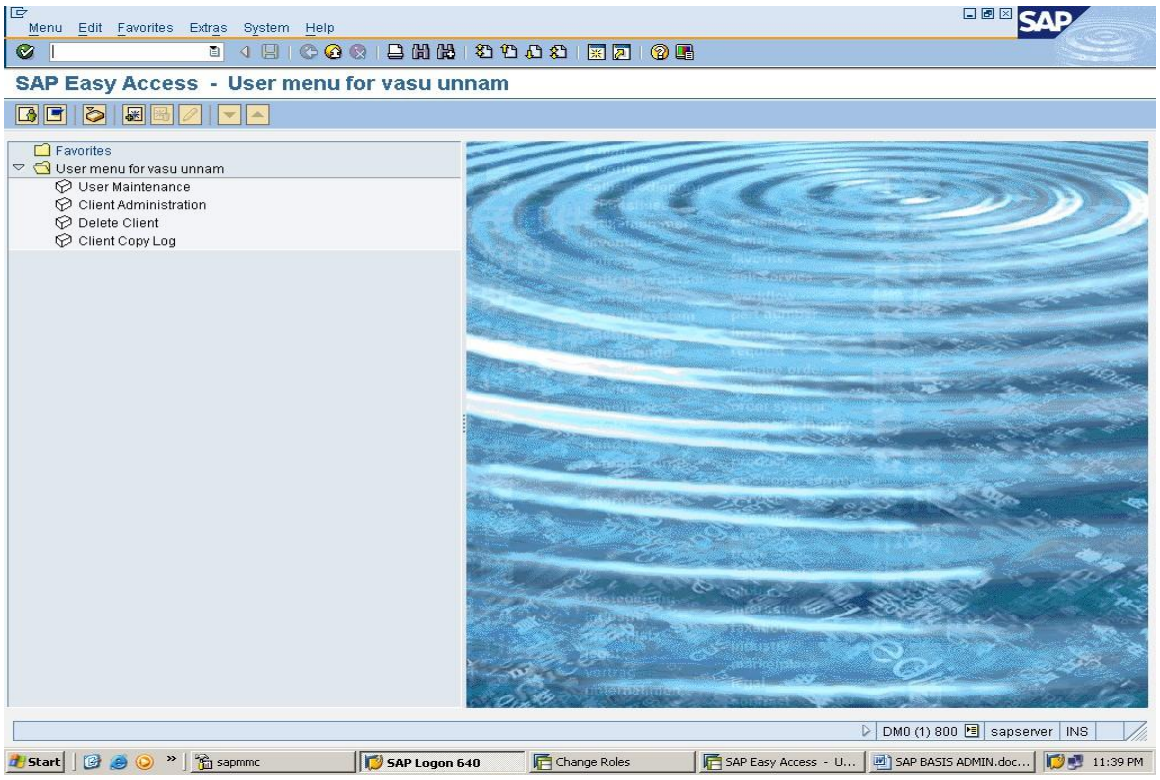

Click on Roles tab & fill the Role's as below then Save it.



Click on User's tab




Now Login to Client: 800, User: vasu, Password: india123
Here we can see the T-codes of 2 Single Roles

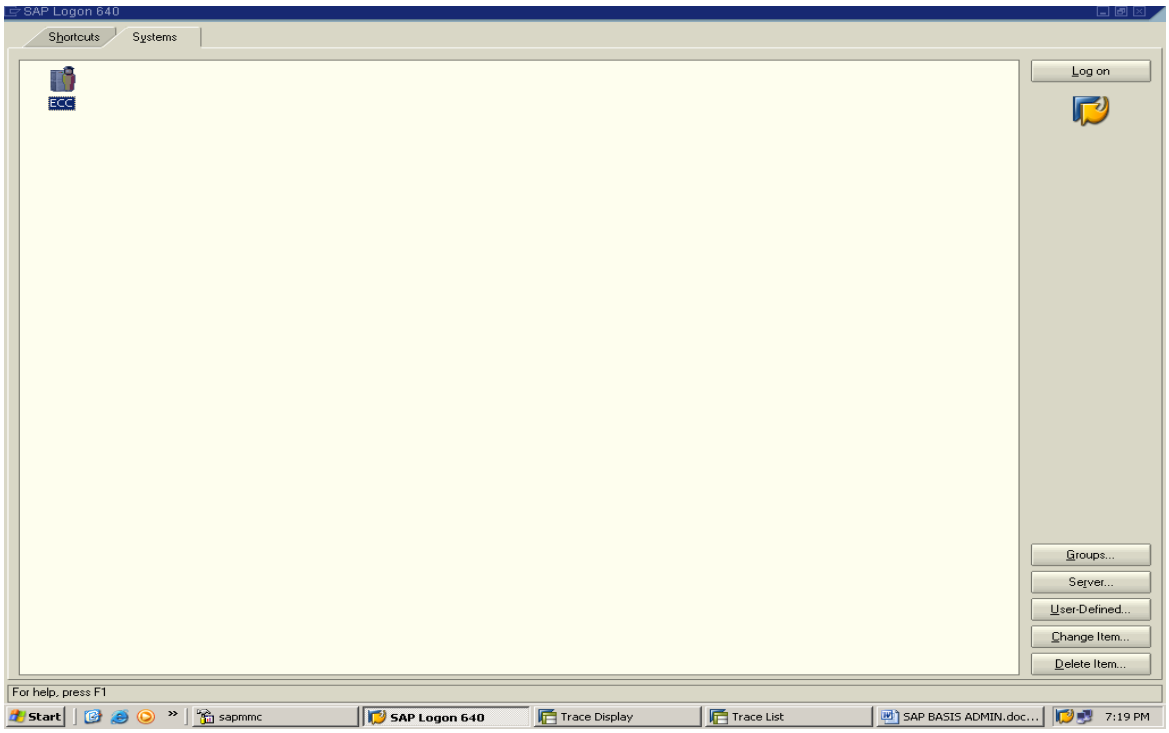


# How to maintain Logon Load Balance

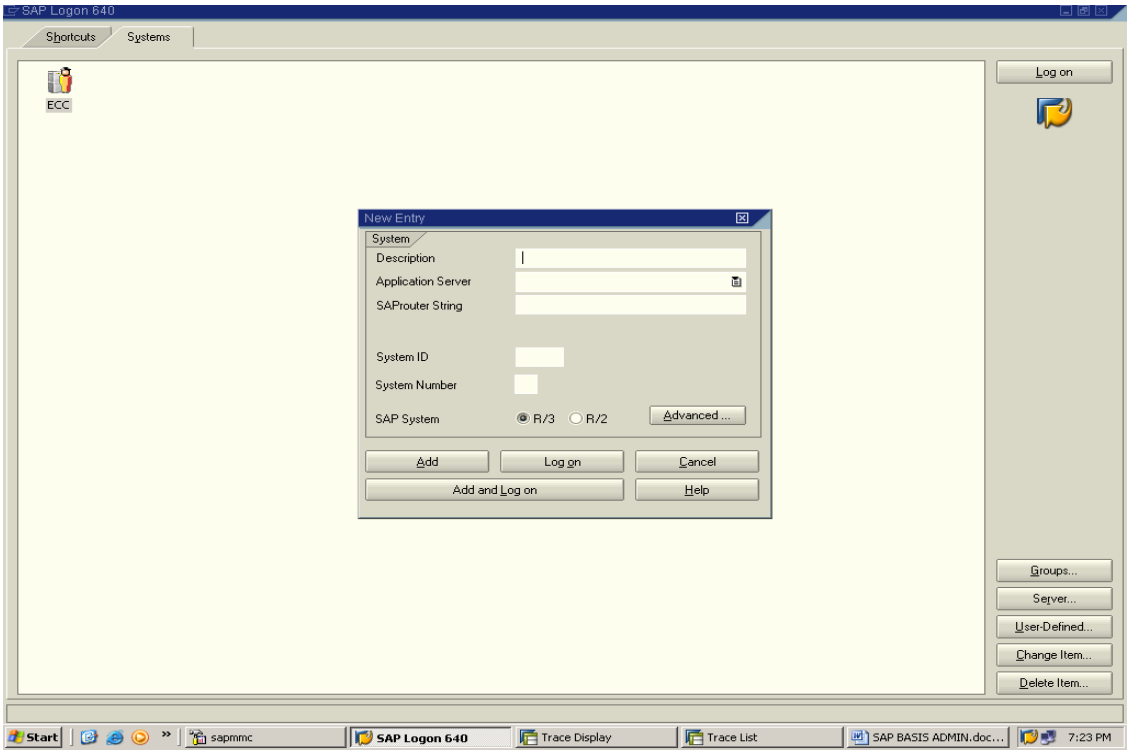
**Note:**

Each Work Process having 10 Users only

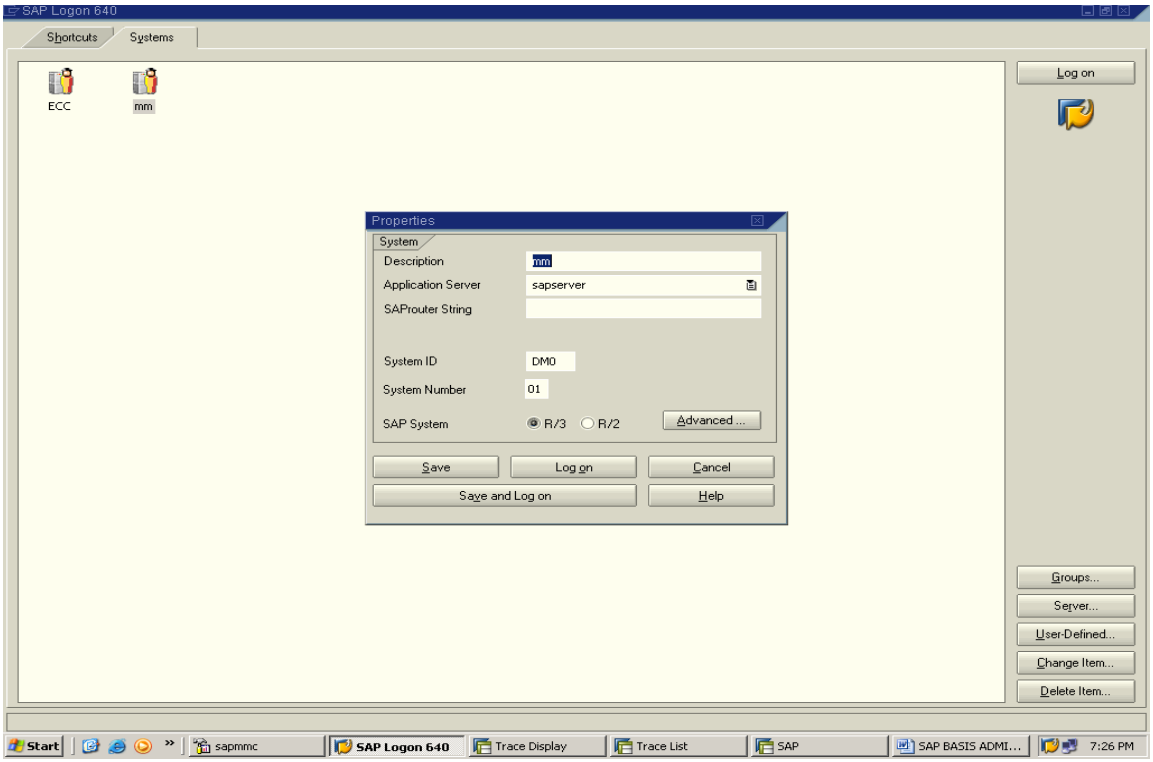
In SAP Logon Icon



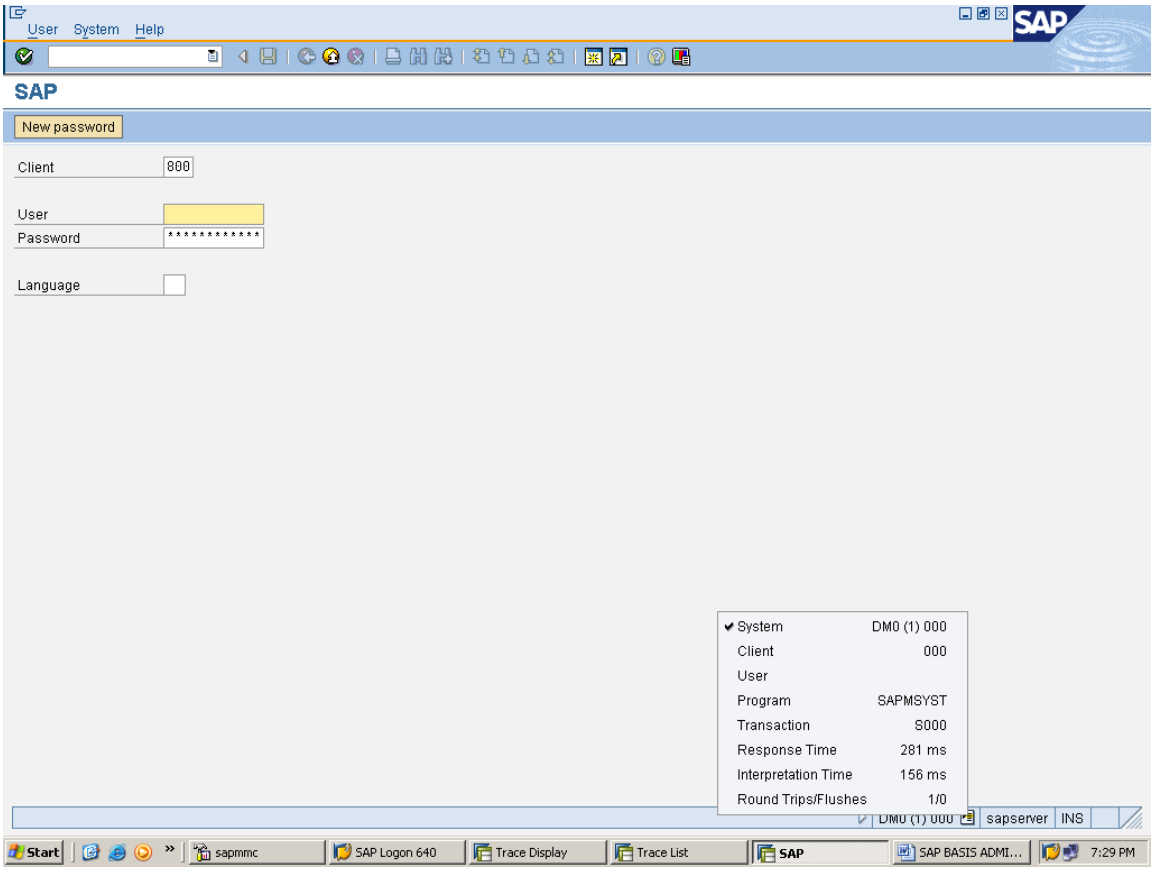

Click on New Tab or User Specified System



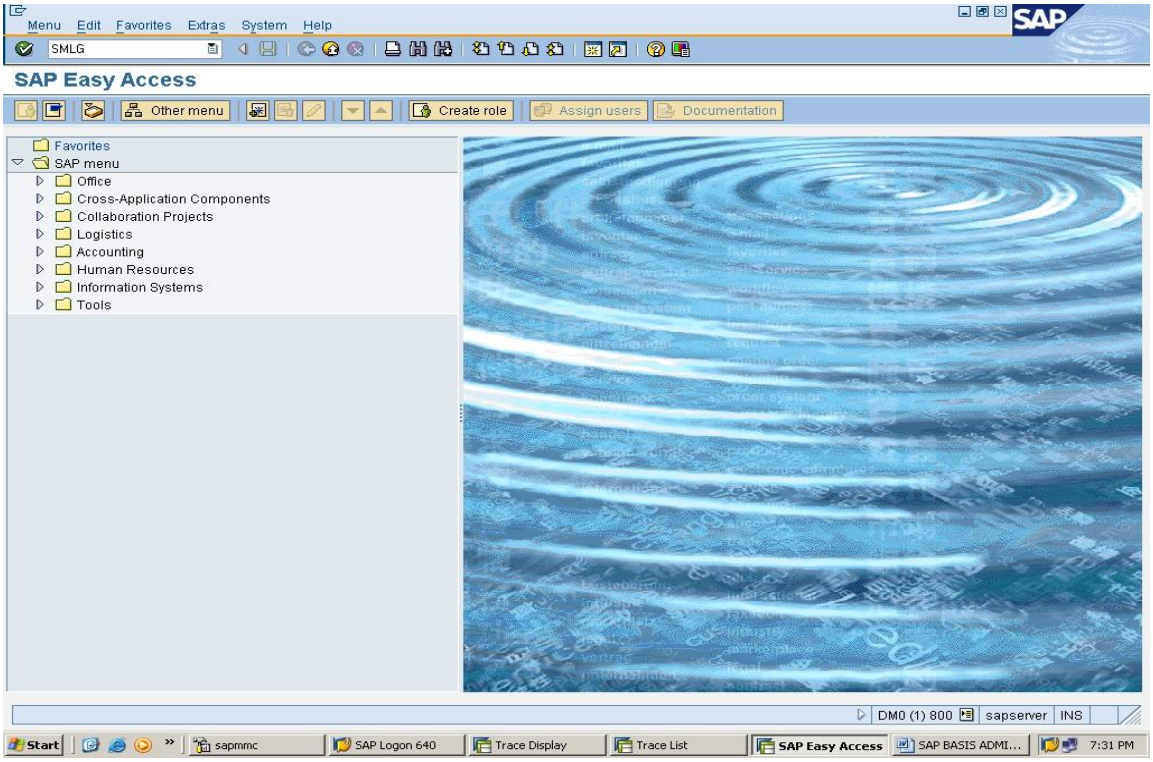
Fill the details as below & then click on Save and Logon



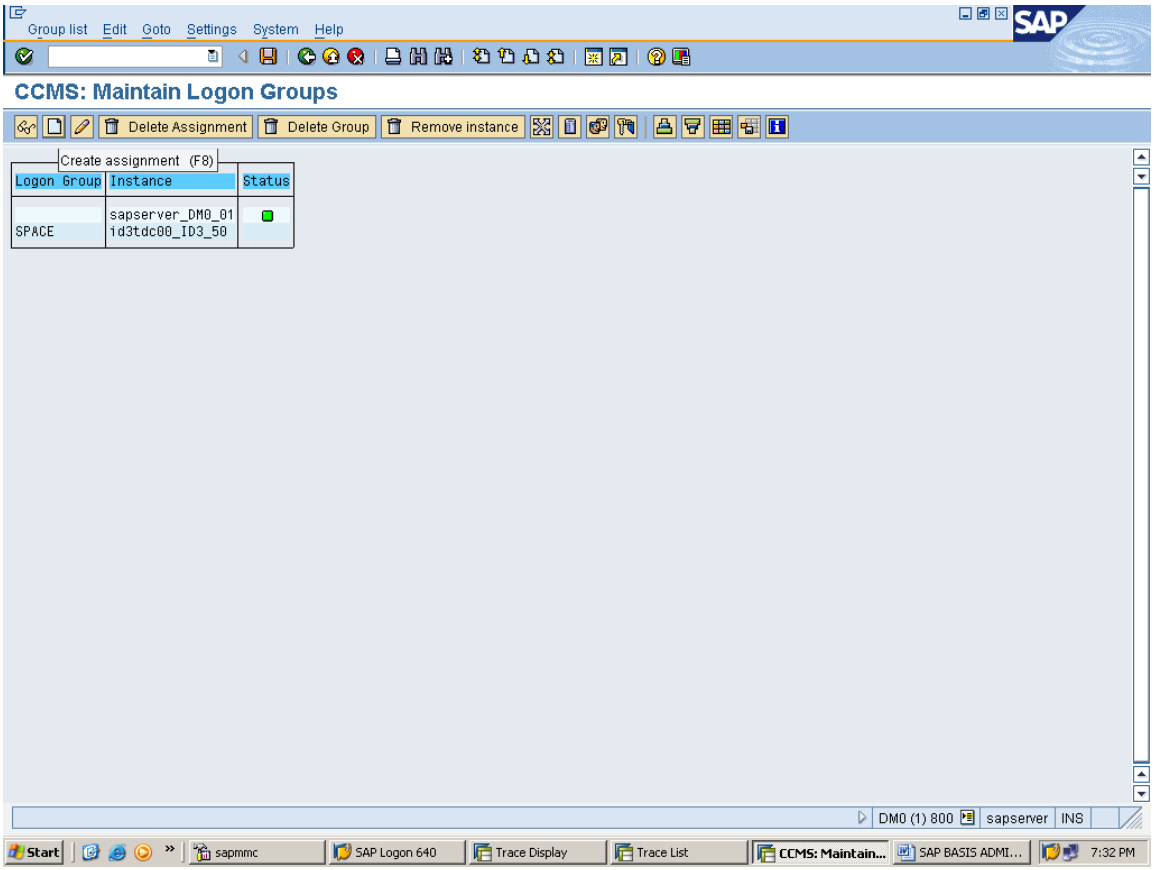

You will directly go to Dialog Instance as below

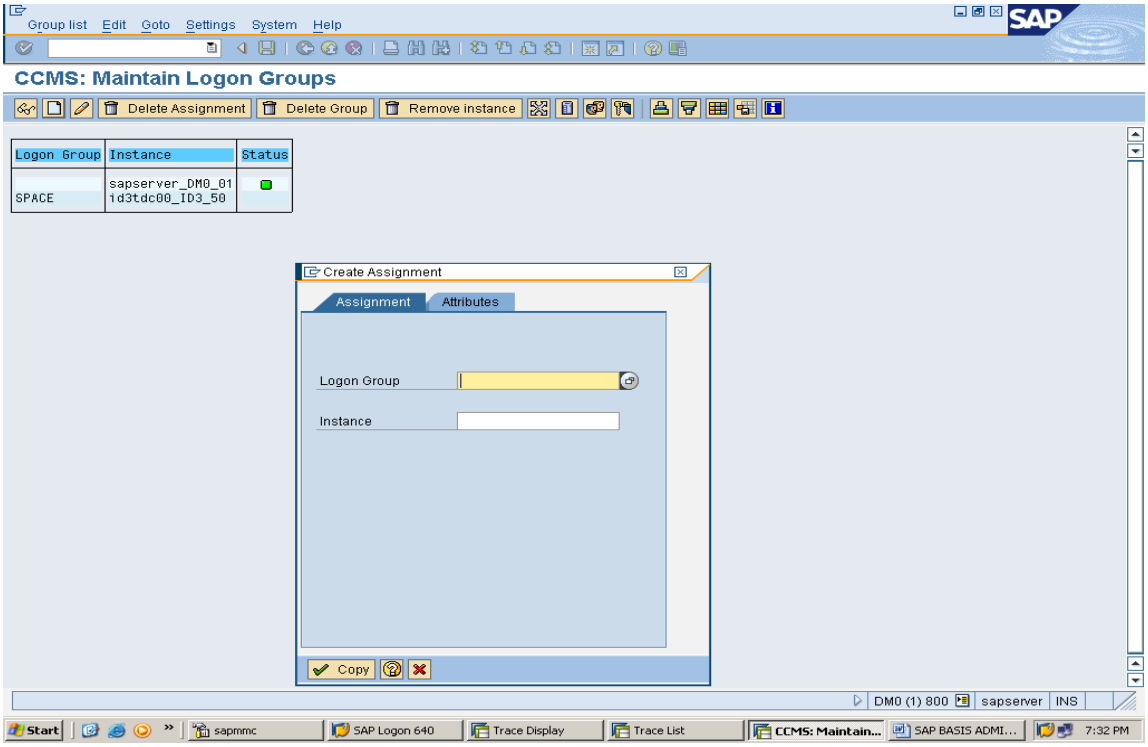


In SAP command line enter the T-code as **SMLG**

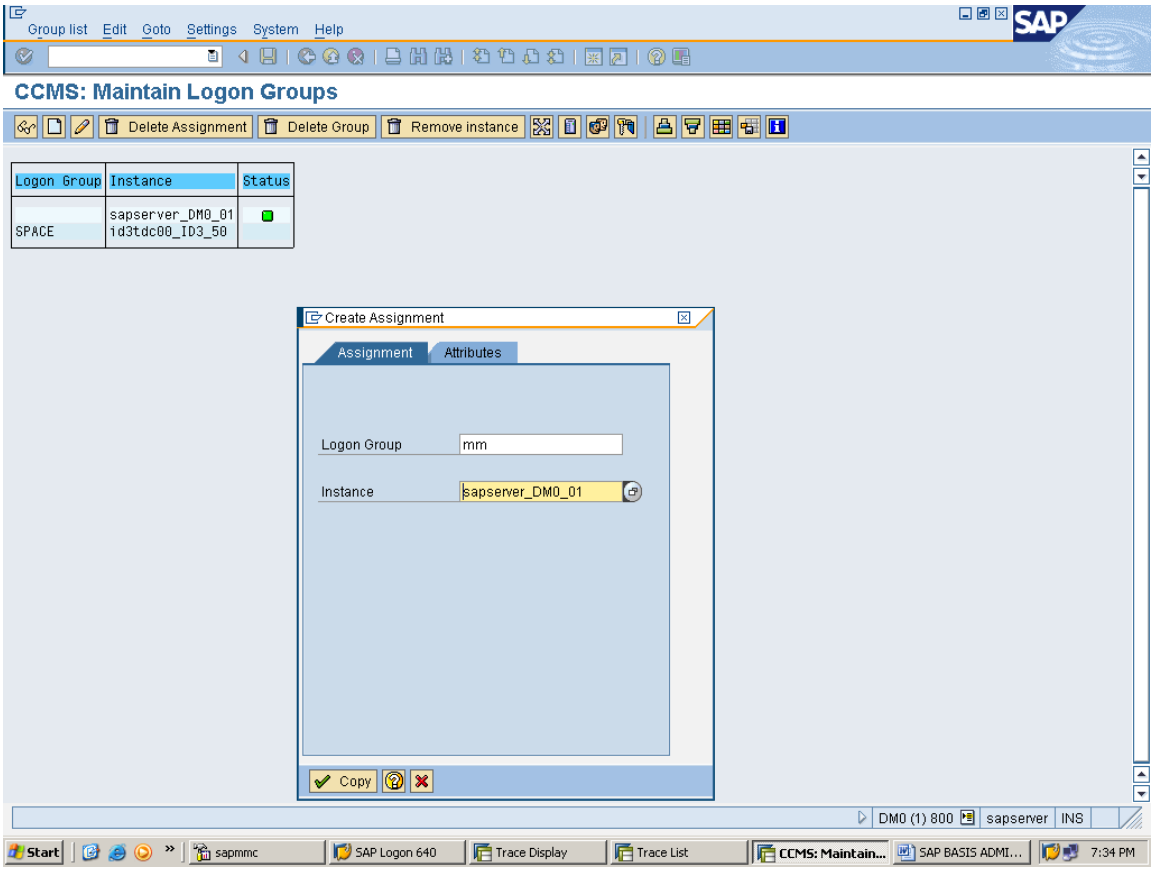



Now click on Create Assignment






Give the details as below




Click on Copy & Save it.

# How to Assign T-code as Manually

Eg:

We have Role as rakhi_single_role, Now we need to add one
T-code as SCC1 (Local Client Transport Role or Import Role)

- 1st we need to assign T-code as SU53 as temporally to the Role.
- SU53 T-code is used for to getting Missing Authorizations.
- After got missing Authorizations we need to Remove the SU53 T-code from the Role.

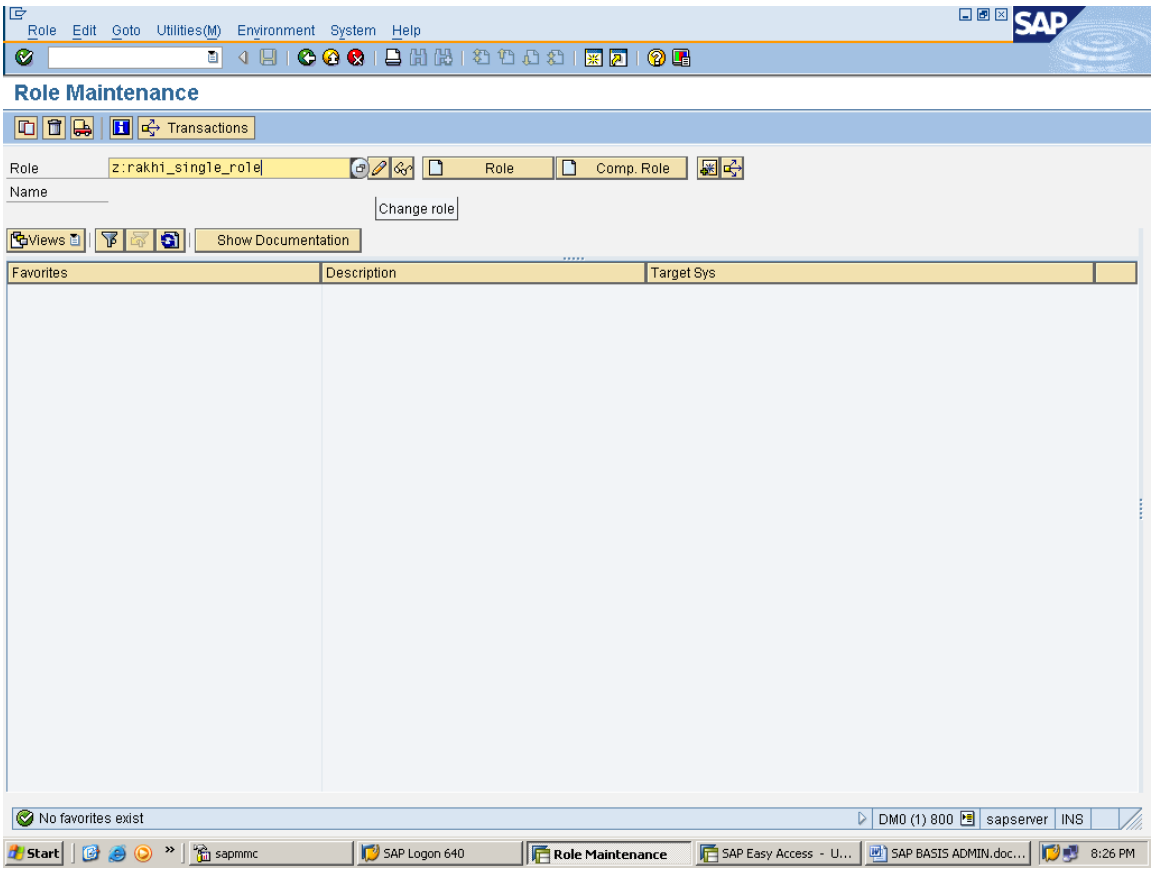
Note:

- We need to open both SAP Admin Window
(SAP Consultant Window) Eg: Client: 800, User: sapuser & User Window (Eg: Client: 800, User: rakhi).
- Before going to open User Window we have to check User Roles with the help of T-code is SU01

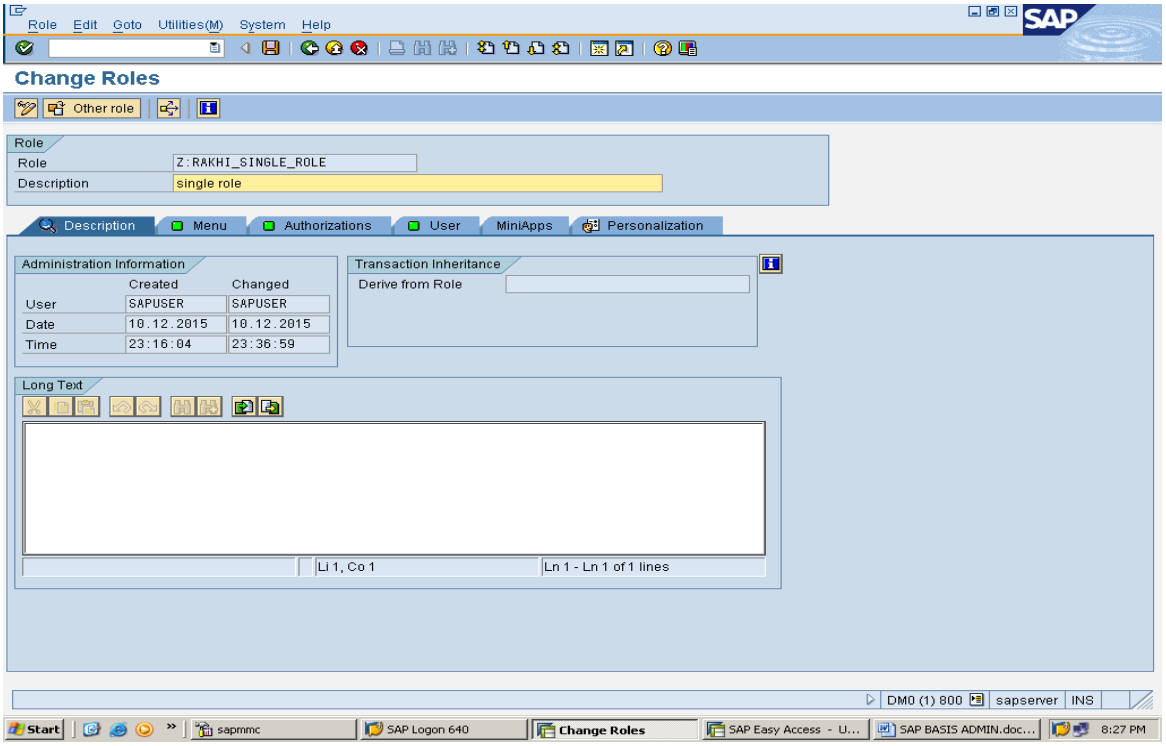
### SAP Admin Window (SAP Consultant Window):

Eg: Client: 800, User: sapuser

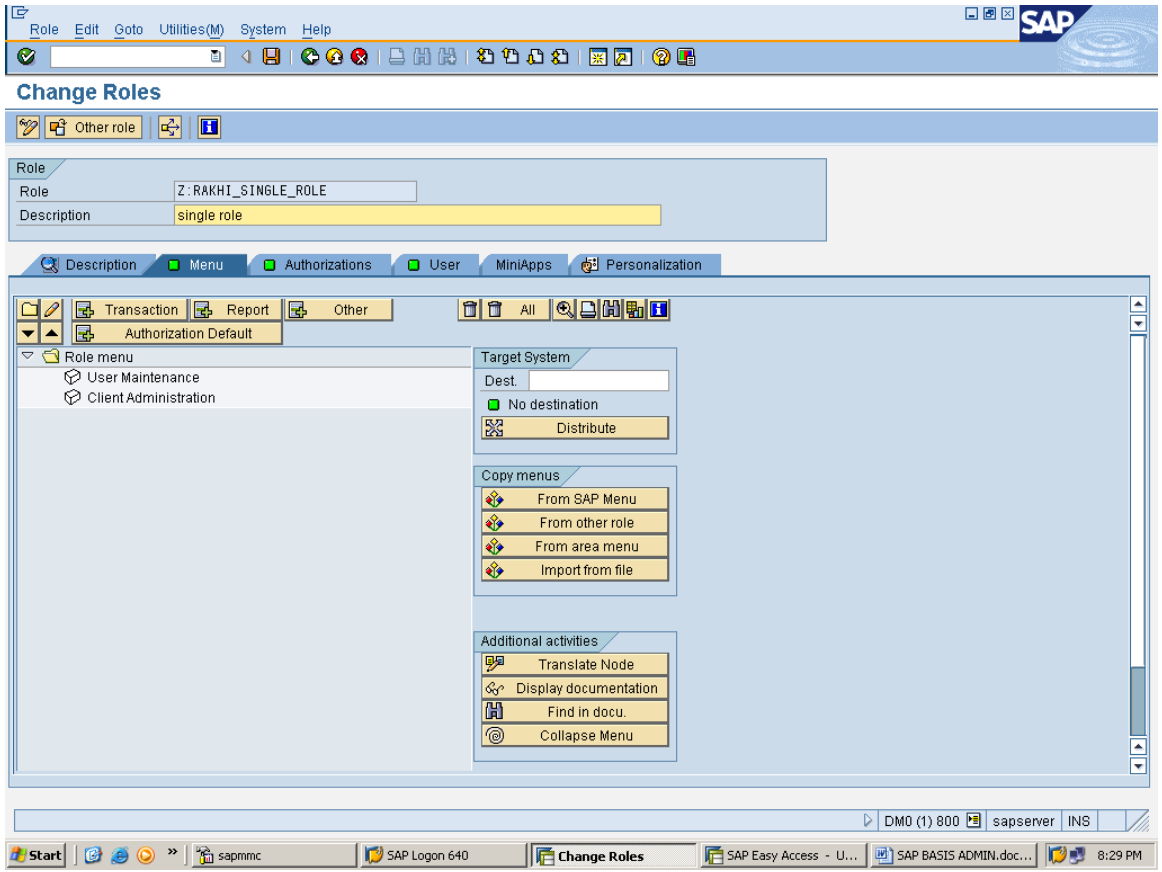
In SAP command line enter the T-code as **PFCG**
Give the Role and Click on Change icon.



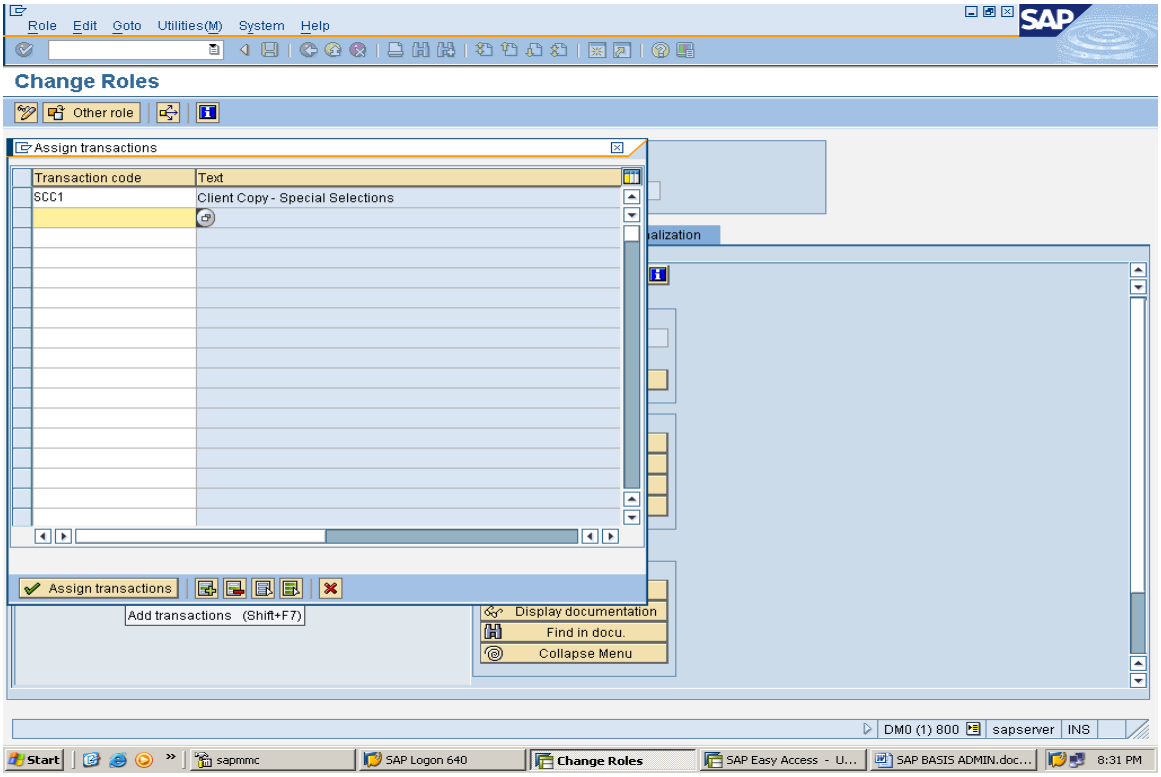
Click on Menu tab.



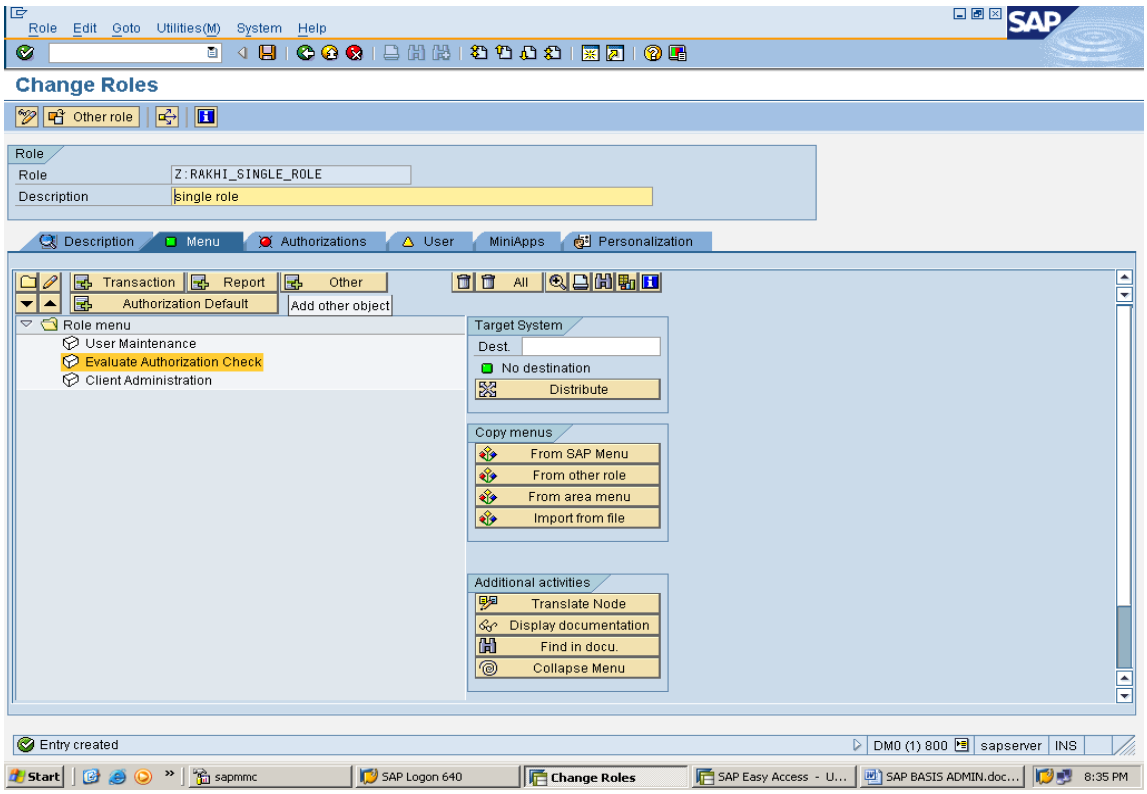

Click on Transaction tab.



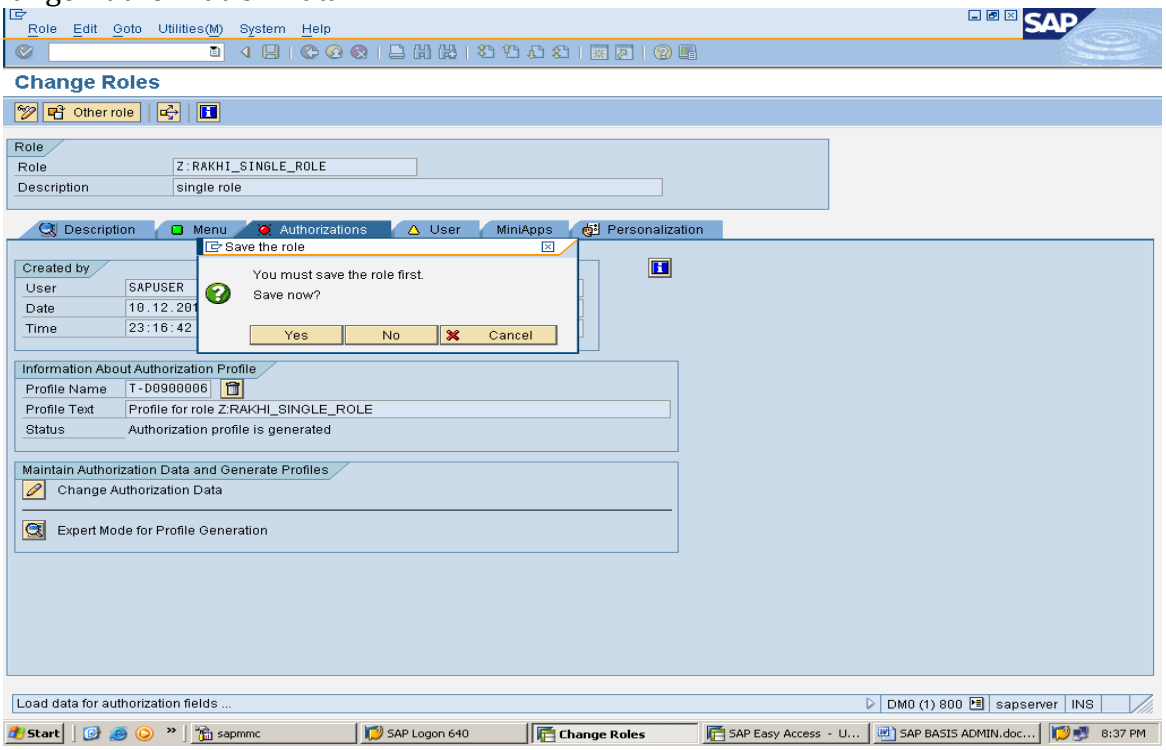
Add T-code as SU53 (Evaluate Authorization Check) Then click on Assign Transaction.



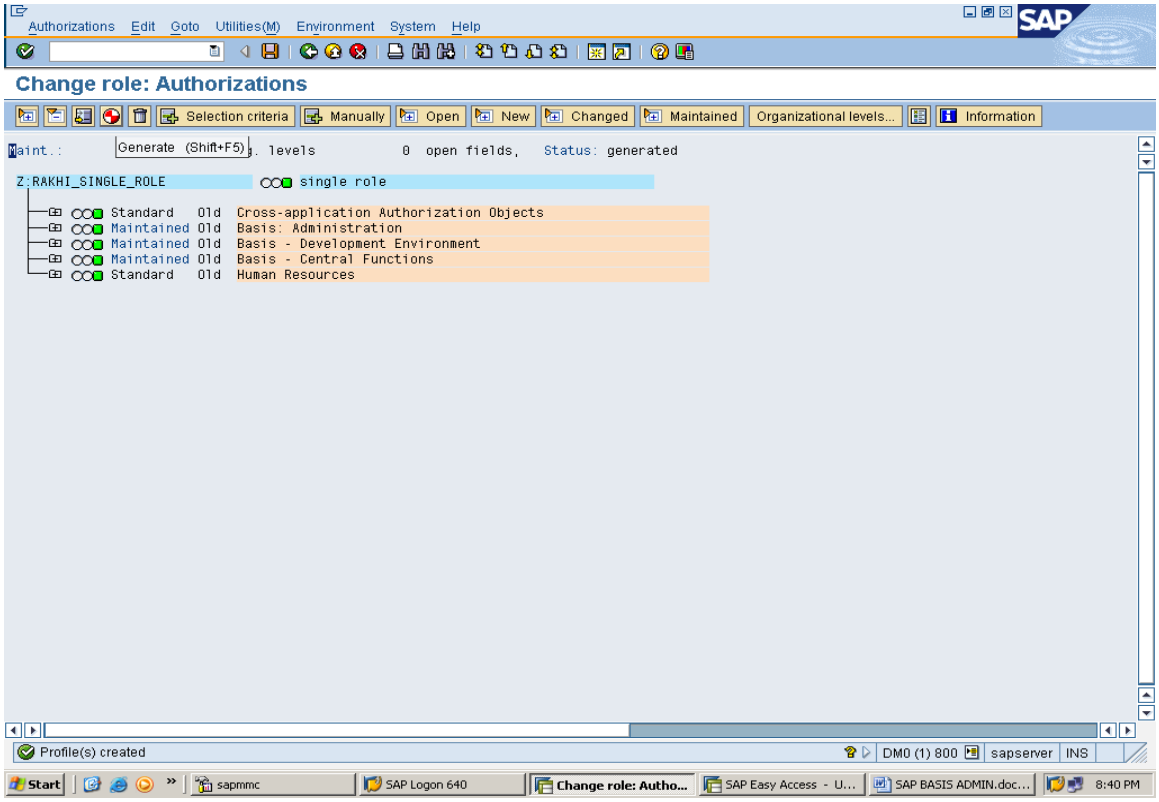

Click on Authorization tab



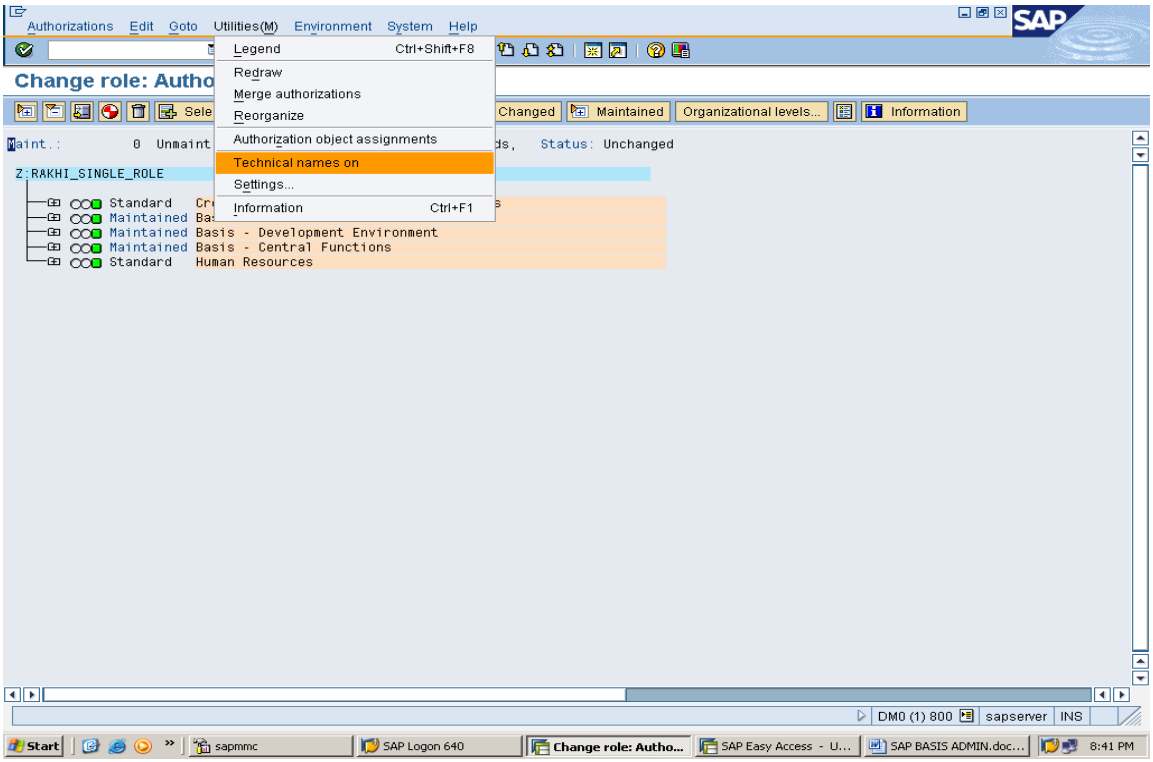
Click on Change Authorization Data




Click on last circle symbol of Single Role to change the Yellow color to Green color
Save it and Generate.

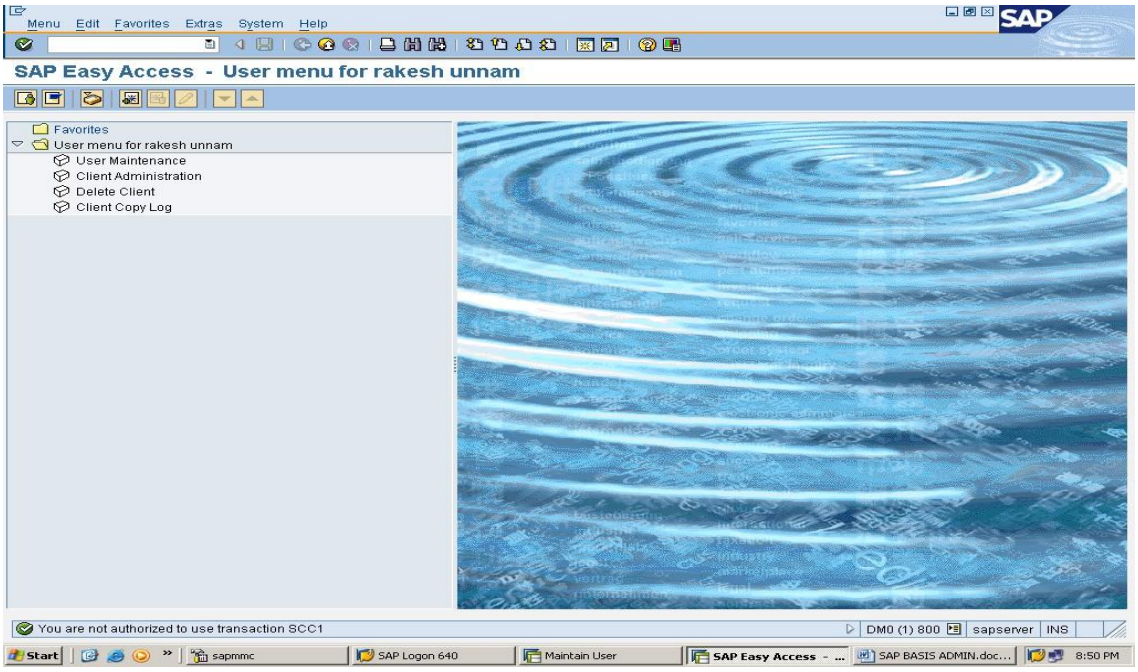



Click on Utilities Technical Names On

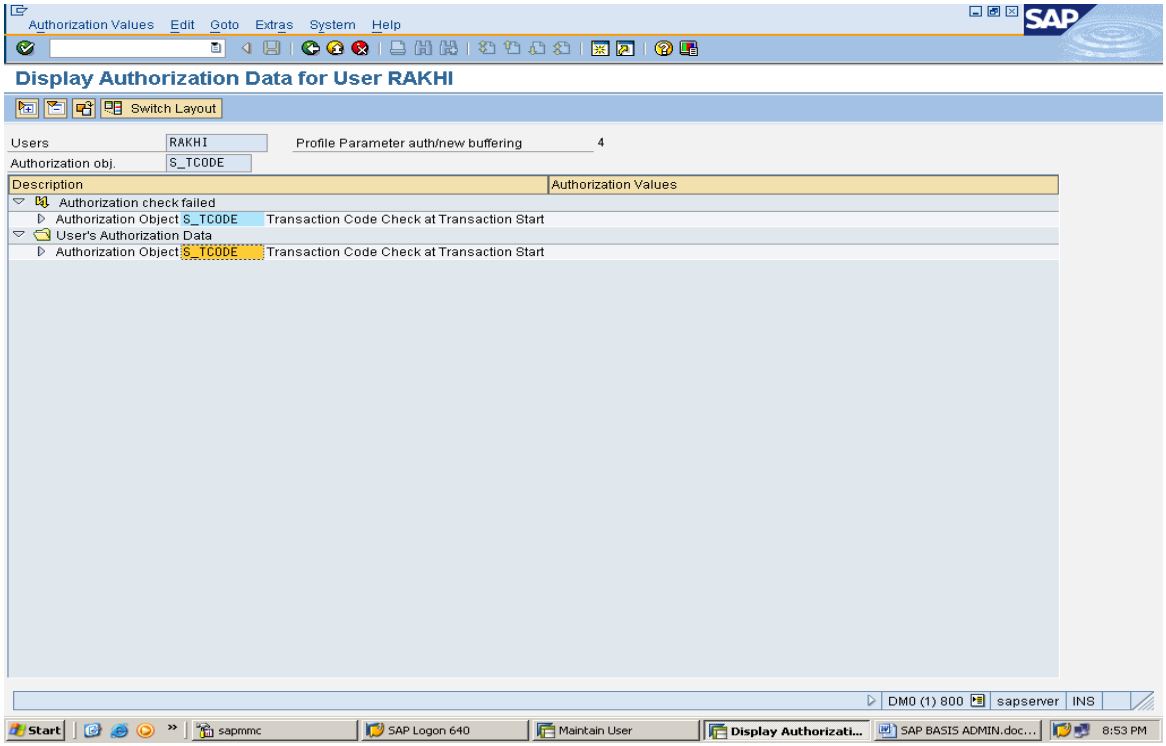



## User Window

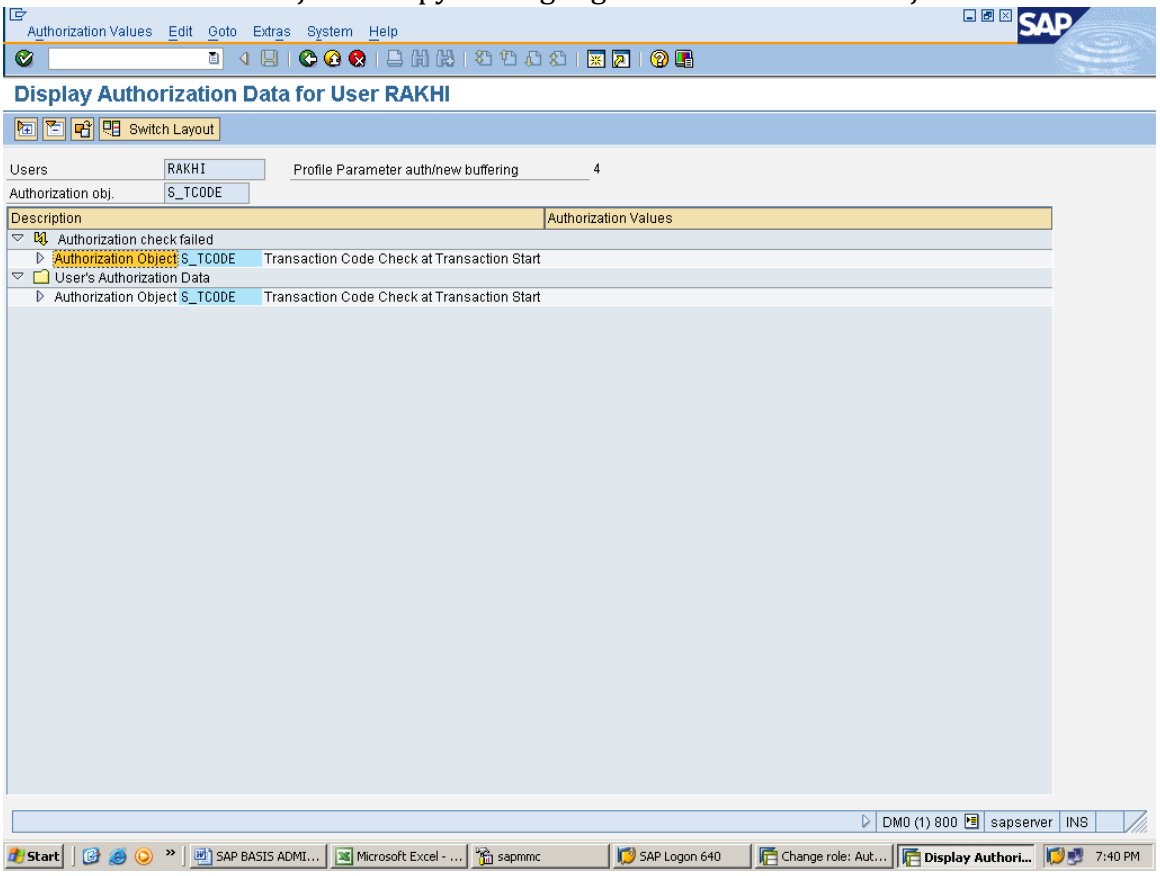
**Eg:** Client: 800, User: rakhi
In SAP command line enter the T-code which we need to add Manually (Eg: SCC1)
Here we will get one Error Message like you are not Authorized



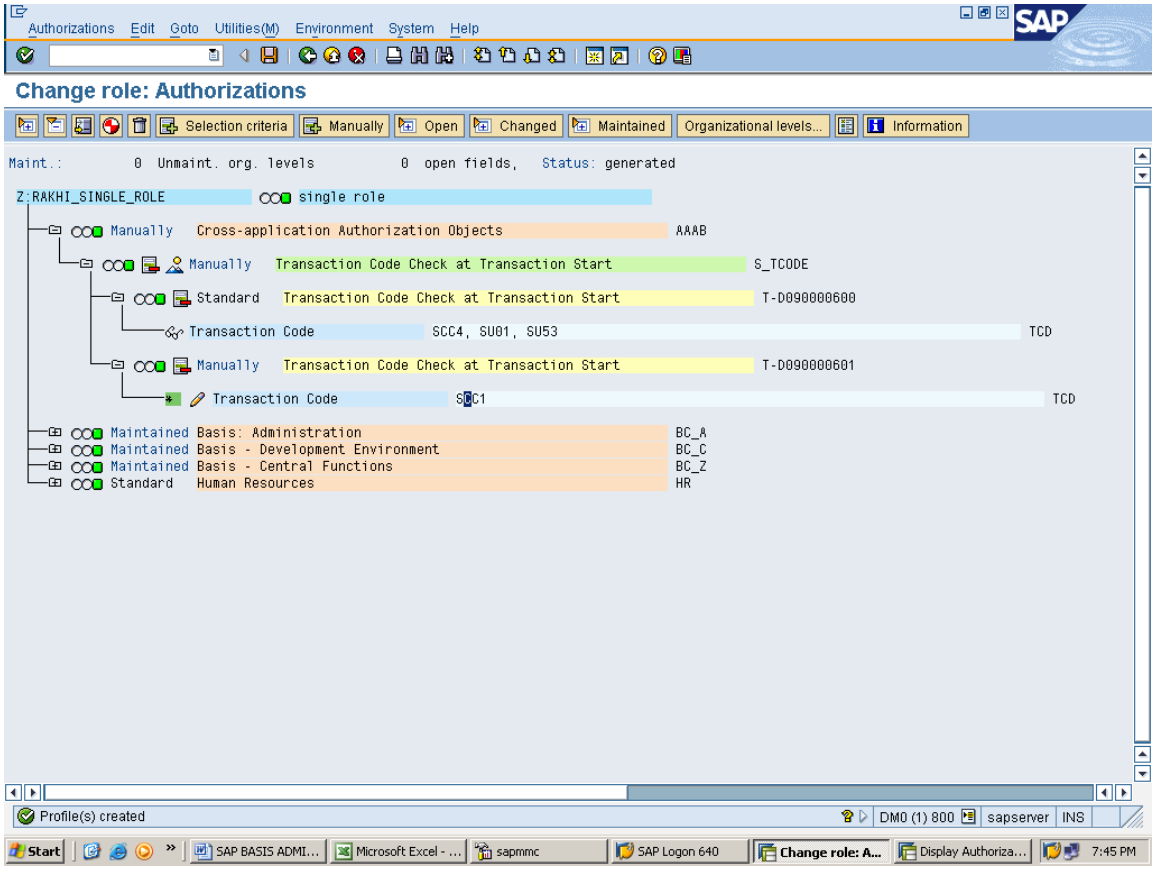
Now in SAP command line enter the T-code as SU53




Now Expand Authorization Object & Copy the Highlighted Authorization Object.



SAP Consultancy Window Click on Manually tab.




Now one screen will be open in that past the Authorization Object.

- Then again go to User Window Copy the T-code.
- Then again go to SAP Consultancy Window Click on Empty T-code area & then one screen will be open in that past the Copied T-code. Now all the Circle Symbol's will be Convert as Green color.
- Save it and Generate.

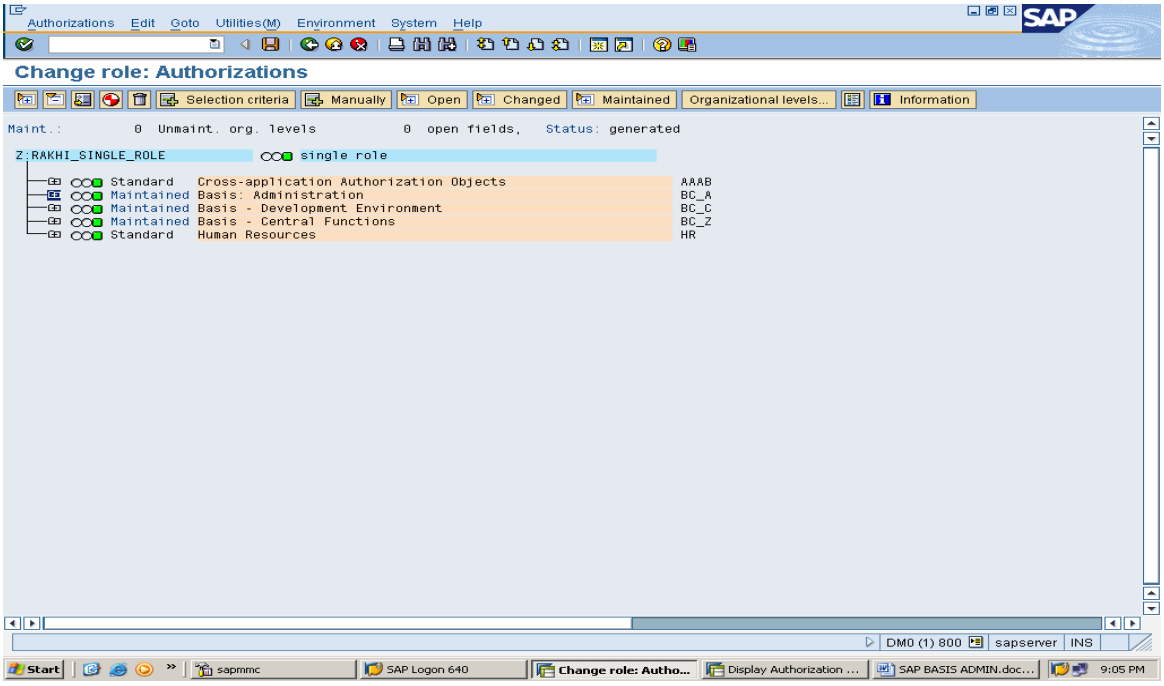
**NOTE:**

After Manually Adding the T-code as SCC1 we need to Delete SU53 T-code from SAP Consultancy Window.

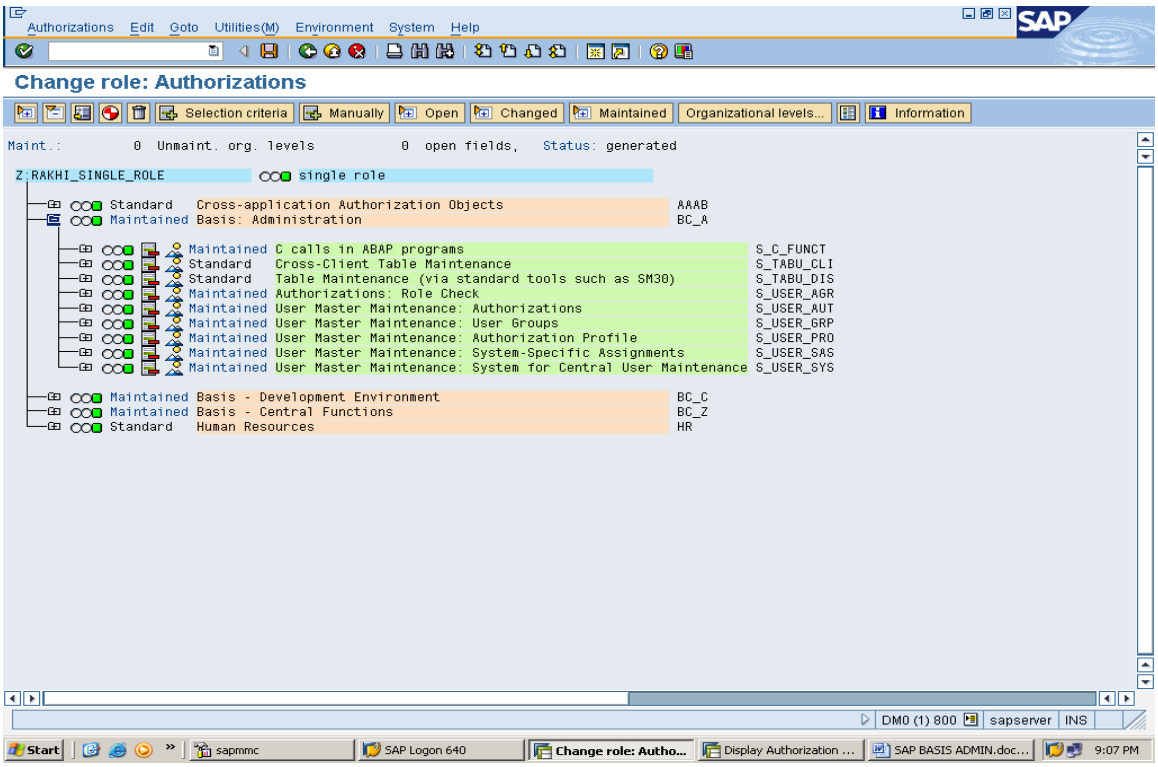
# How to Restrict Activities of T-codes

In SAP command line enter the T-code as **PFCG**
Client: 800, User: sapuser

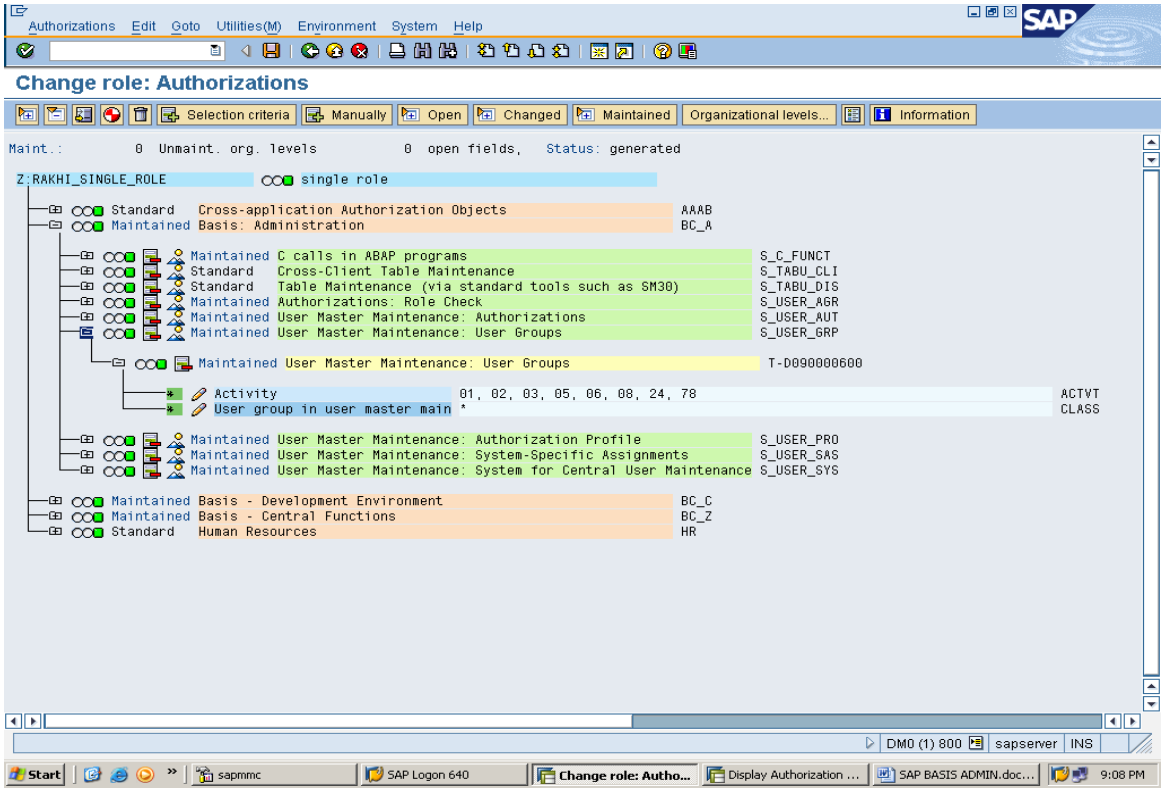
In SAP Consultancy Window



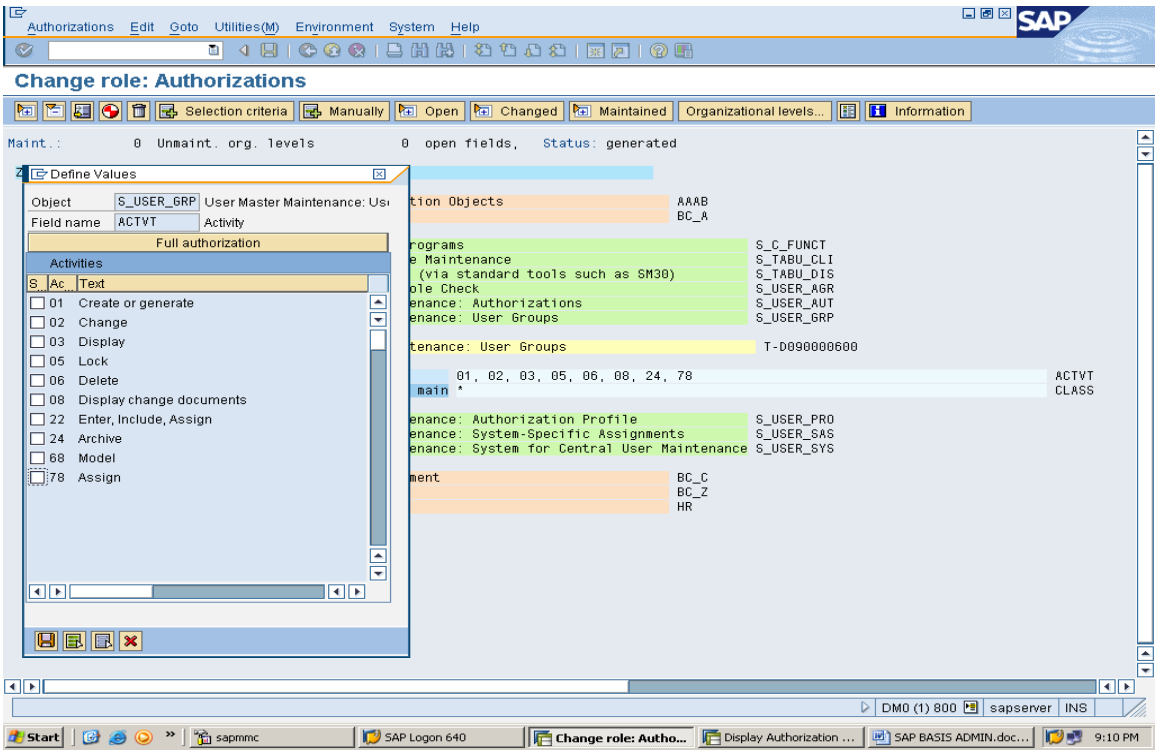

Click on Basis: Administration



Click on User Groups

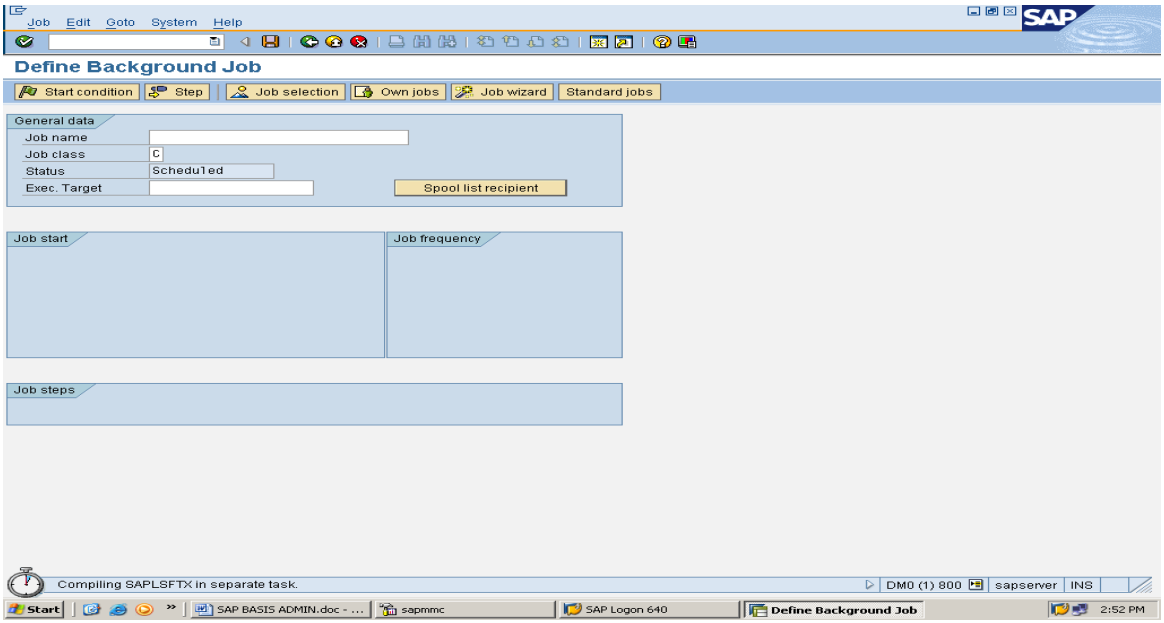



Click on all Activity no's.
Then Un-Check all Activities & Save it.

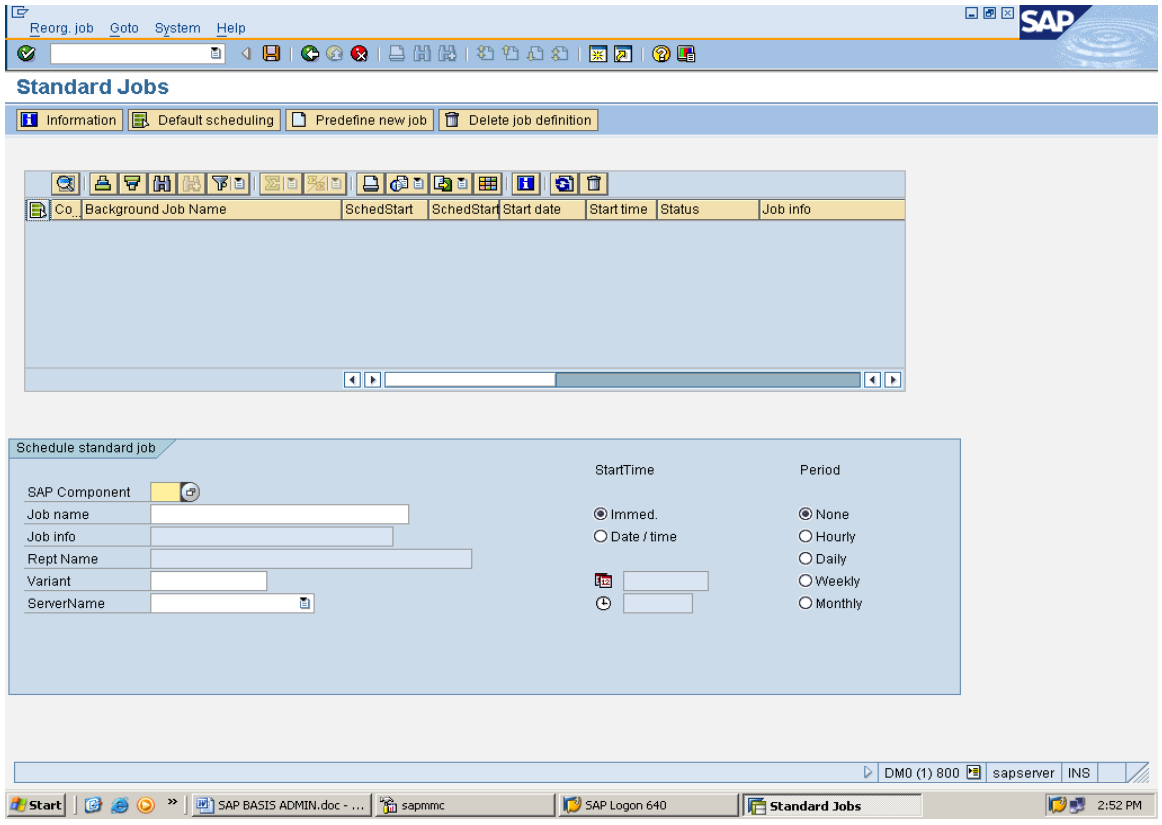


# How to Create Standard Jobs (House Keeping Jobs)

In SAP command line enter the T-code as **SM36**




Click on Standard Jobs



**Note:** If you enter T-code as SM36 Background Jobs Automatically Running.

# What is Profile Parameters

Whenever we Install the SAP in our System, Default Profiles are created at OS level.

Profile contain parameters that specifies how to Start Instance & Stop Instance.

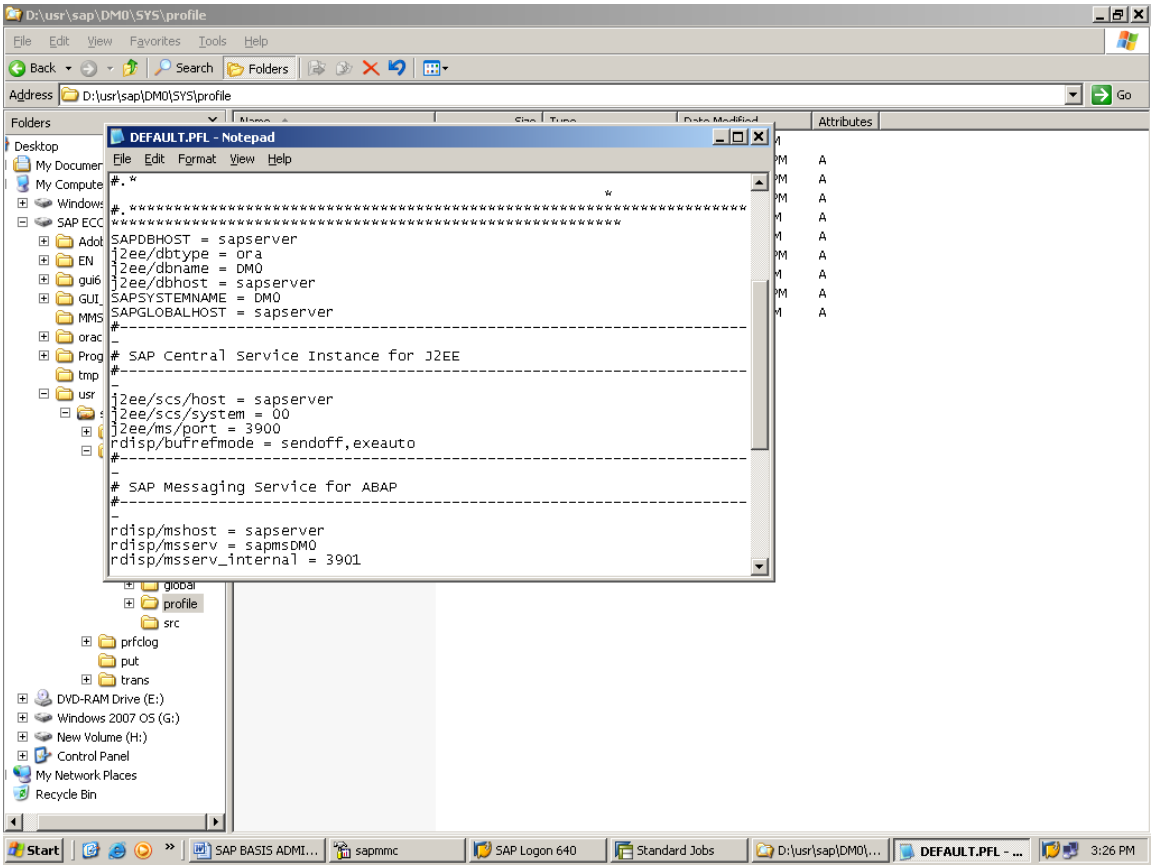
**Profile Path is, USR/SAP/SID/SYS/PROFILE**
Eg:
sapserver/sapmmc/dm0/sys/default

We have to Import these OS level Profiles to SAP level by using flowing procedure.
RZ10→Utilities→Import Profiles→Of Active Servers

## Profiles are 3 Types

### Default Profile

It having Global Parameters.
Changes are made in Default Profile those Changes effect in All Instances within Server.
**Naming Convention**, DEFAULT.PFL




### Startup Profile:

It is used to Start DB, Message Server, Dispatcher & Work process (App.Server)
**Naming Convention,** START_INSTANCE NAME_HOST NAME
Eg: START_DVEBMGS01_SAPSERVER

**Instance Specific Profile:**

It contains Instance Specific Profile Data & the Changes will be effect within Instance only.
Naming Convention is, SID_INSTANCE NAME_HOST NAME Eg: DM0_DVEBMGS01_SAPSERVER

**T-code as RZ10:**

It is Static. We need to Restart the SAP Server to Effect the Changes.
Few Static Parameters,
RDISP/WP_NO_DIA
RDISP/WP_NO_BTC etc,.

**T-code as RZ11:**

It is Dynamic. We no need to Restart the SAP Server to Effect the Changes.
Few Dynamic Parameters,
RDISP/MAX_WPRUN_TIME
RDISP/TRACE
RDISP/MAX_PRIV_TIME etc,.

**Note:**
We can Change the Work Process (DIA & BTC) no's.

## What is Operational Modes

In Day Shift we need More Dialog Work Process & Less Background Work Process.

In Night Shift we need More Background Work Process & Less Dialog Work Process.

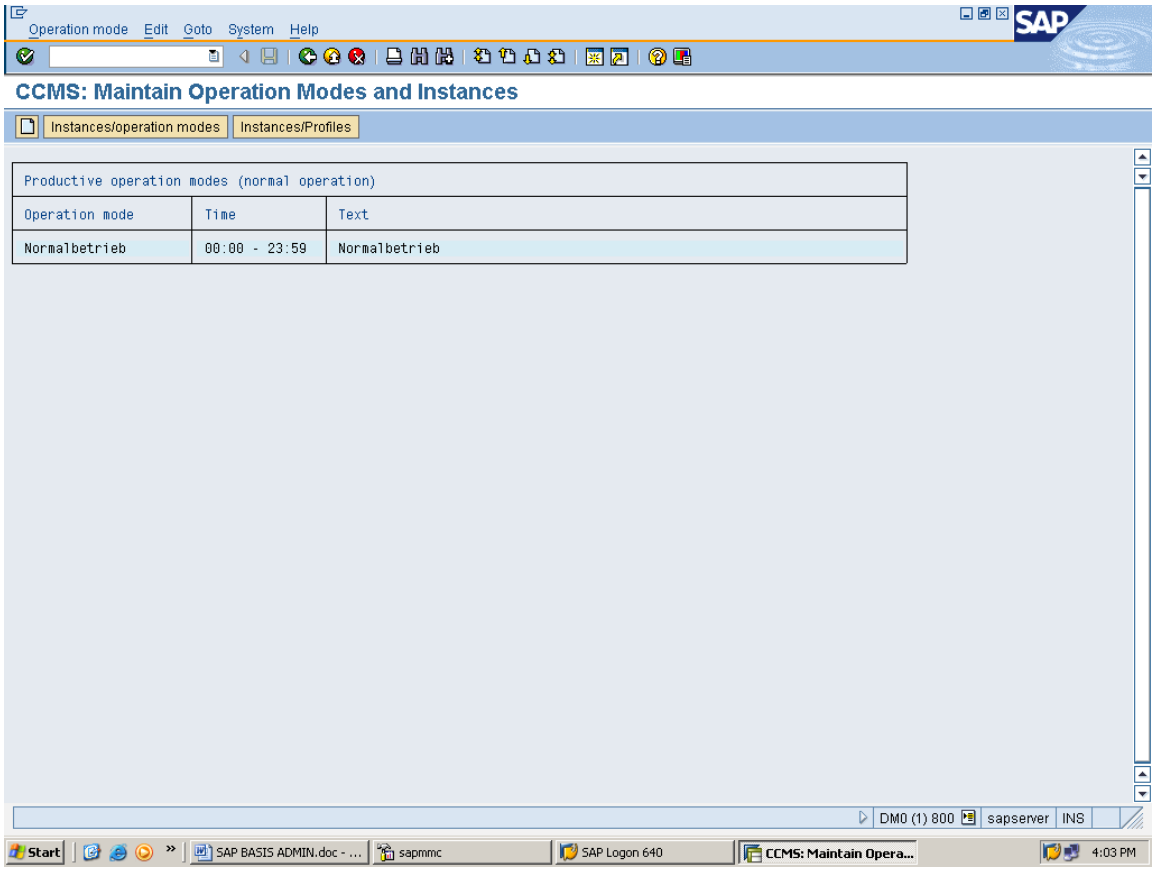
We can Change No.of Work Process (Dialog, Background) as per our requirement.

**Note:**

If Operational Modes are already Existing in Instance, 1st we have to Delete those Operational Modes.

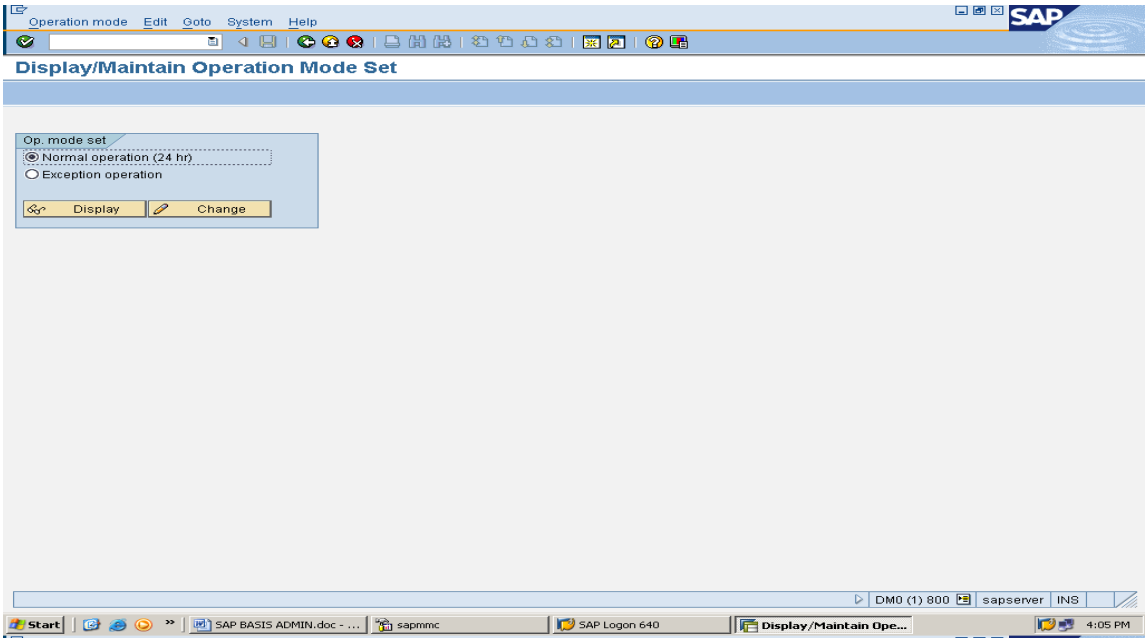
# How to Delete Operational Modes

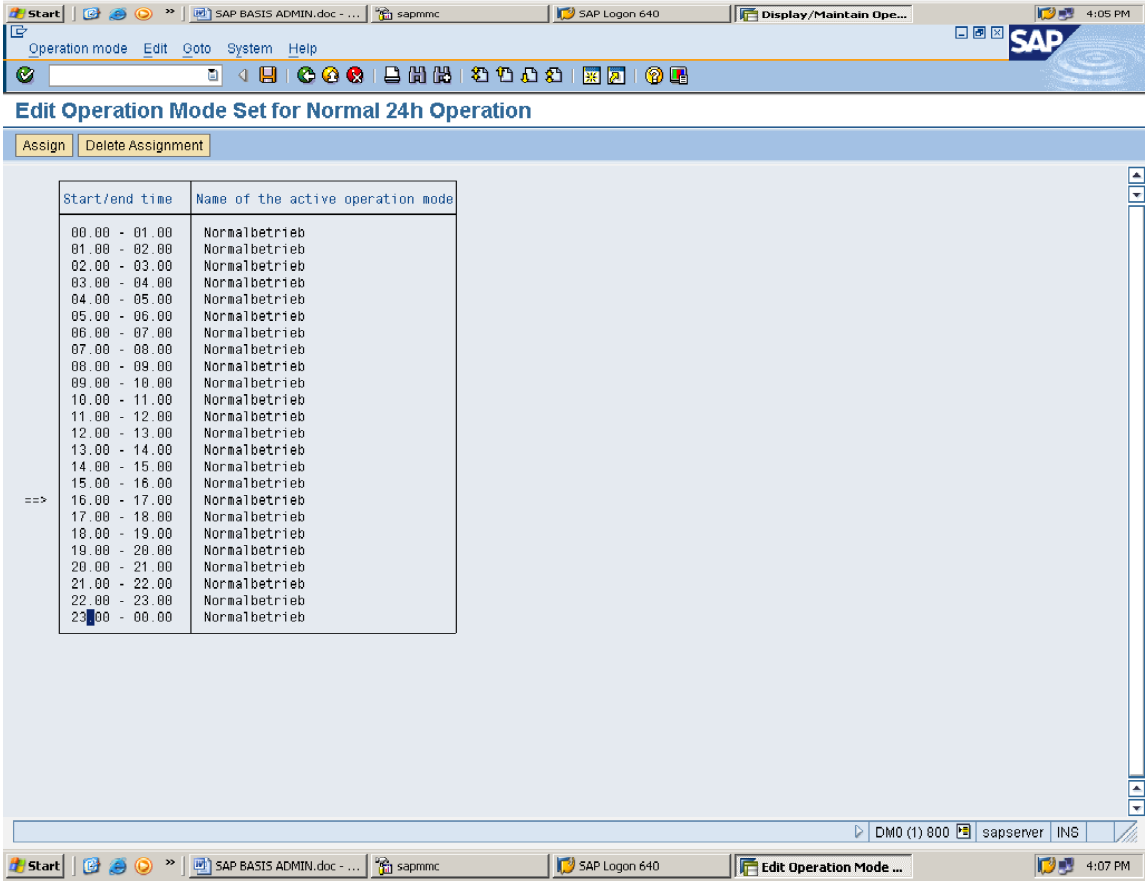
In SAP command line enter the T-code as **RZ04**



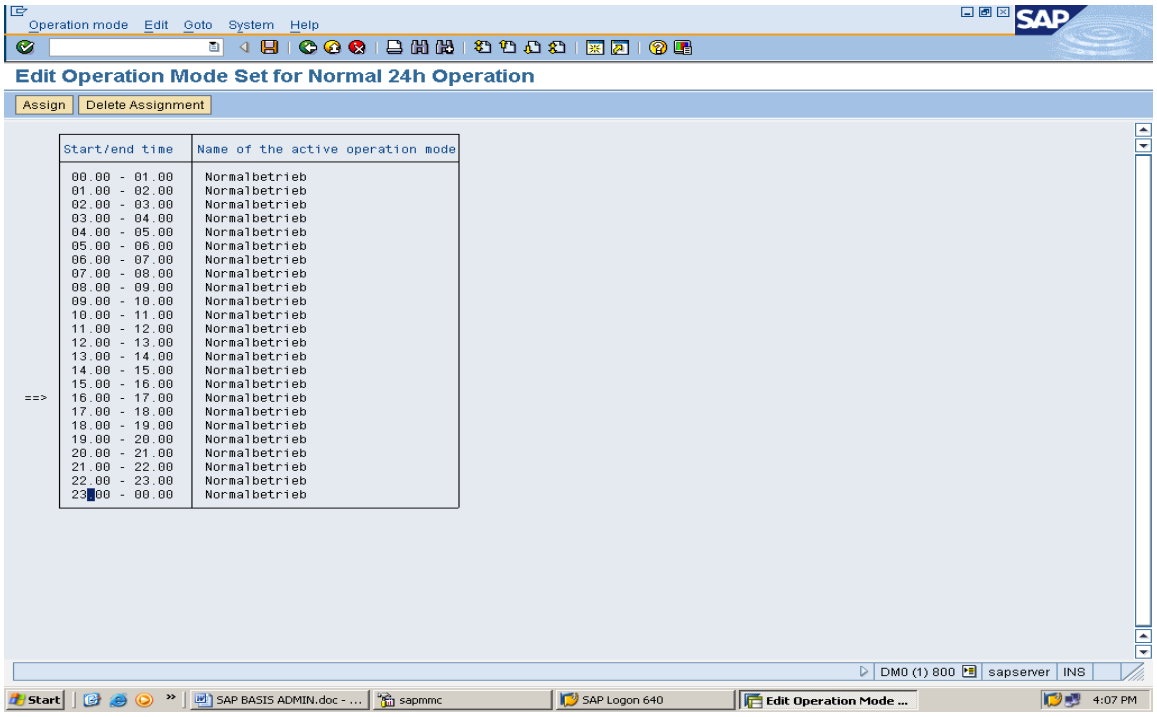

Click on Operational Mode & Time Table on Top Header level.

Click on Change.

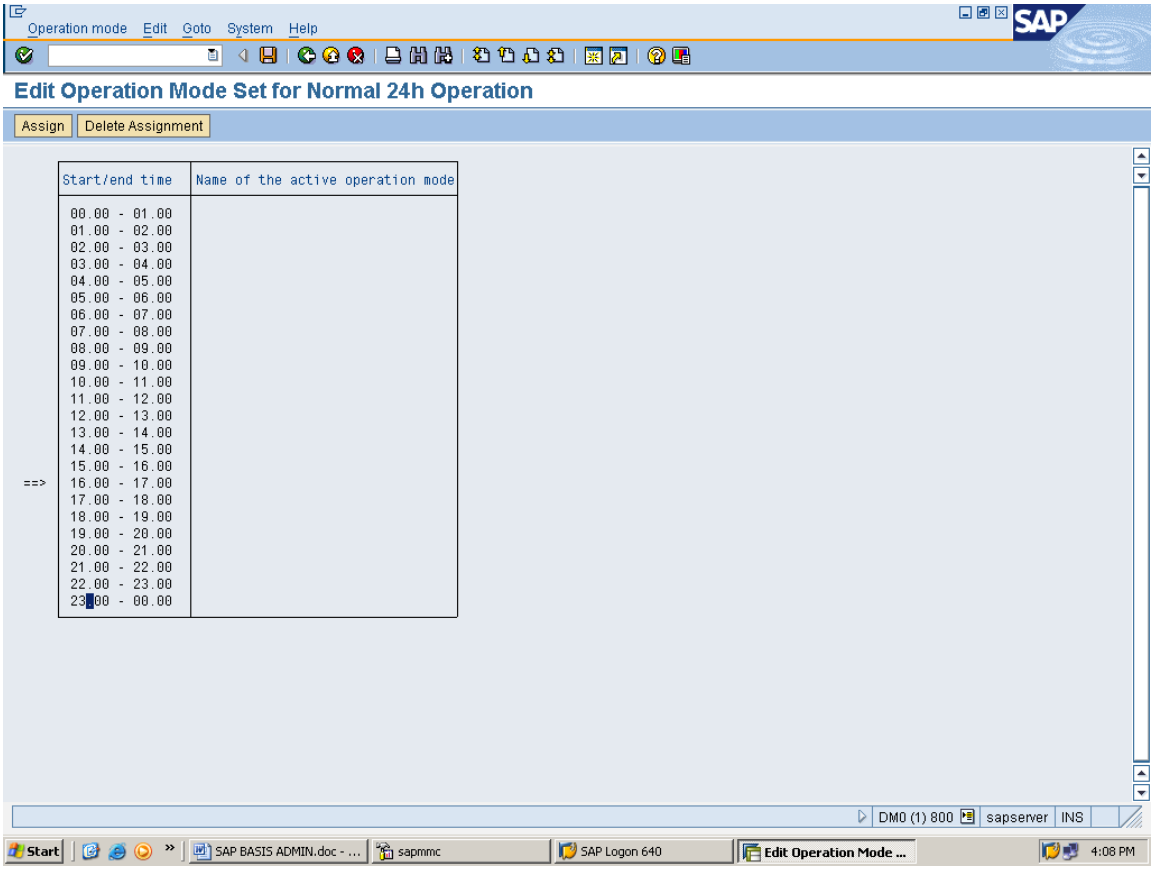

Operation mode Edit Goto System Help
Display/Maintain Operation Mode Set
Op. mode set
Normal operation (24 hr)
Exception operation
Display
Change
DM0 (1) 800
sapserver
INS
Start
SAP BASIS ADMIN.doc - ...
sapmmc
SAP Logon 640
Display/Maintain Ope...
4:05 PM


Operation mode Edit Goto System Help
Edit Operation Mode Set for Normal 24h Operation
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 Normalbetrieb
13.00 - 14.00 Normalbetrieb
14.00 - 15.00 Normalbetrieb
15.00 - 16.00 Normalbetrieb
==> 16.00 - 17.00 Normalbetrieb
17.00 - 18.00 Normalbetrieb
18.00 - 19.00 Normalbetrieb
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
DM0 (1) 800
sapserver
INS
Start
SAP BASIS ADMIN.doc - ...
sapmmc
SAP Logon 640
Edit Operation Mode ...
4:07 PM

Now Double click on Start Time & End Time as per our requirement.

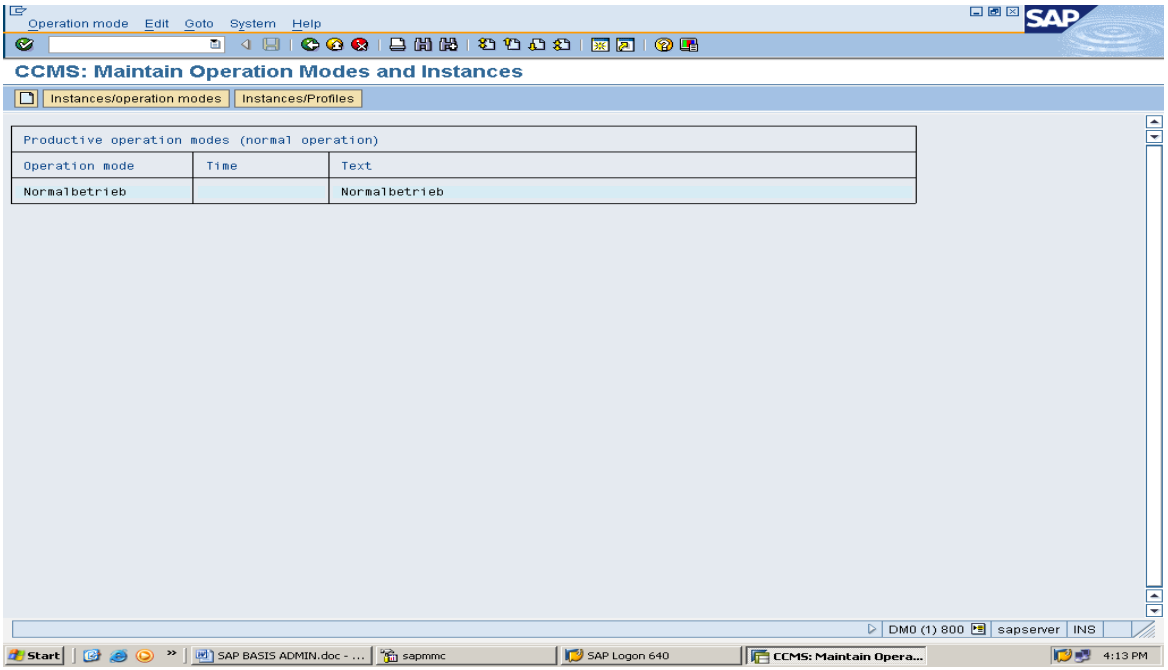



Click on Delete Assignment & Save it.

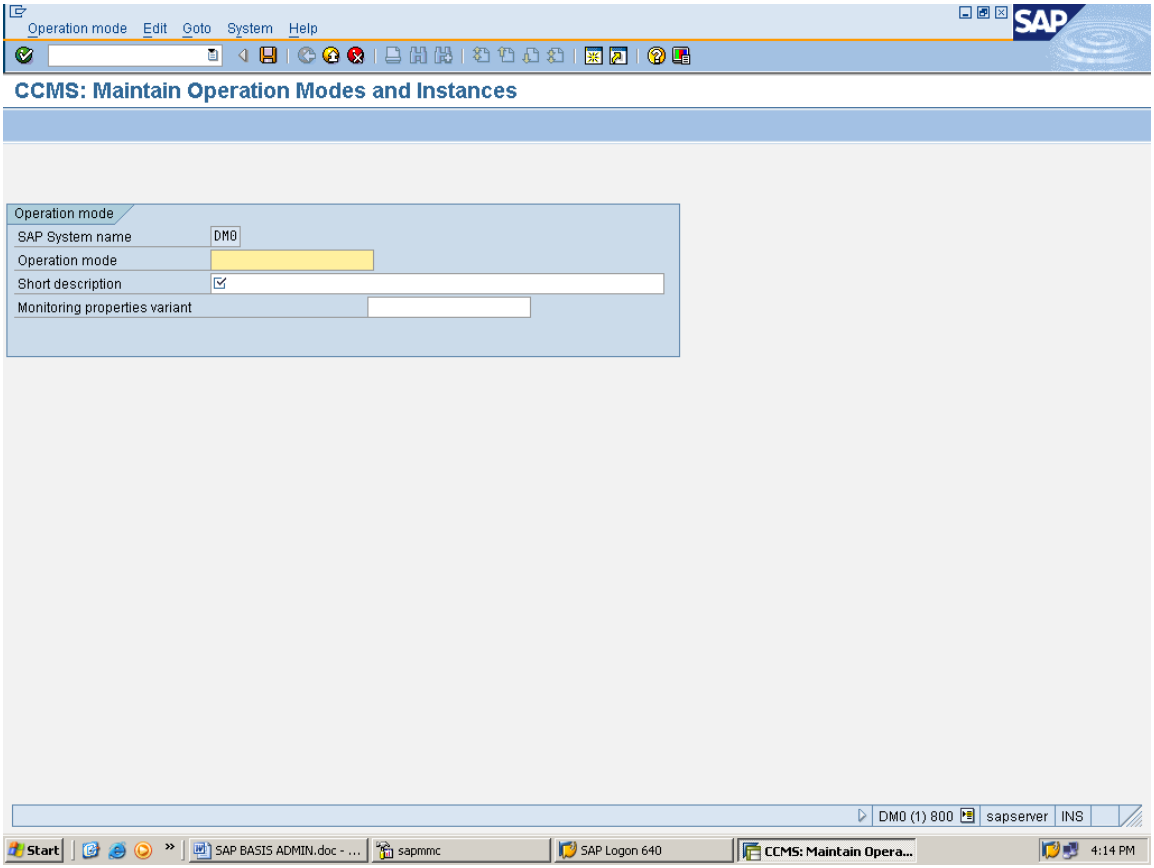


# How to Create Operational Modes

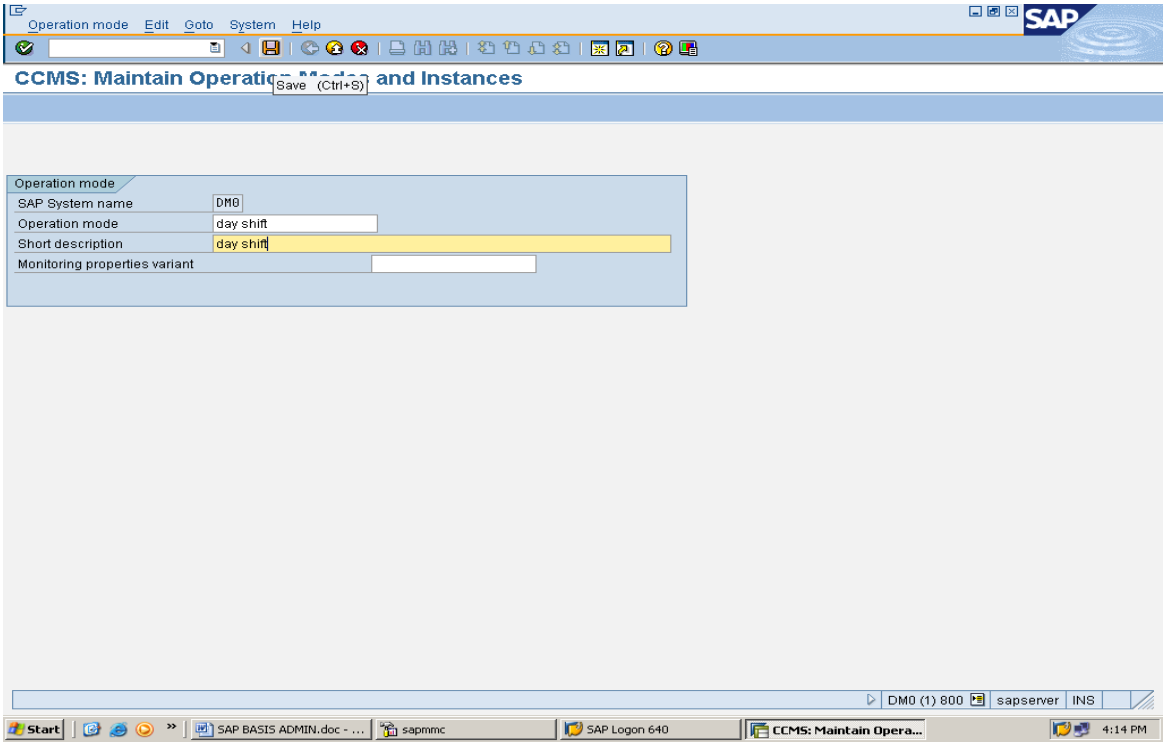
In SAP command line enter the T-code as **RZ04**




Click on Create Operational mode.

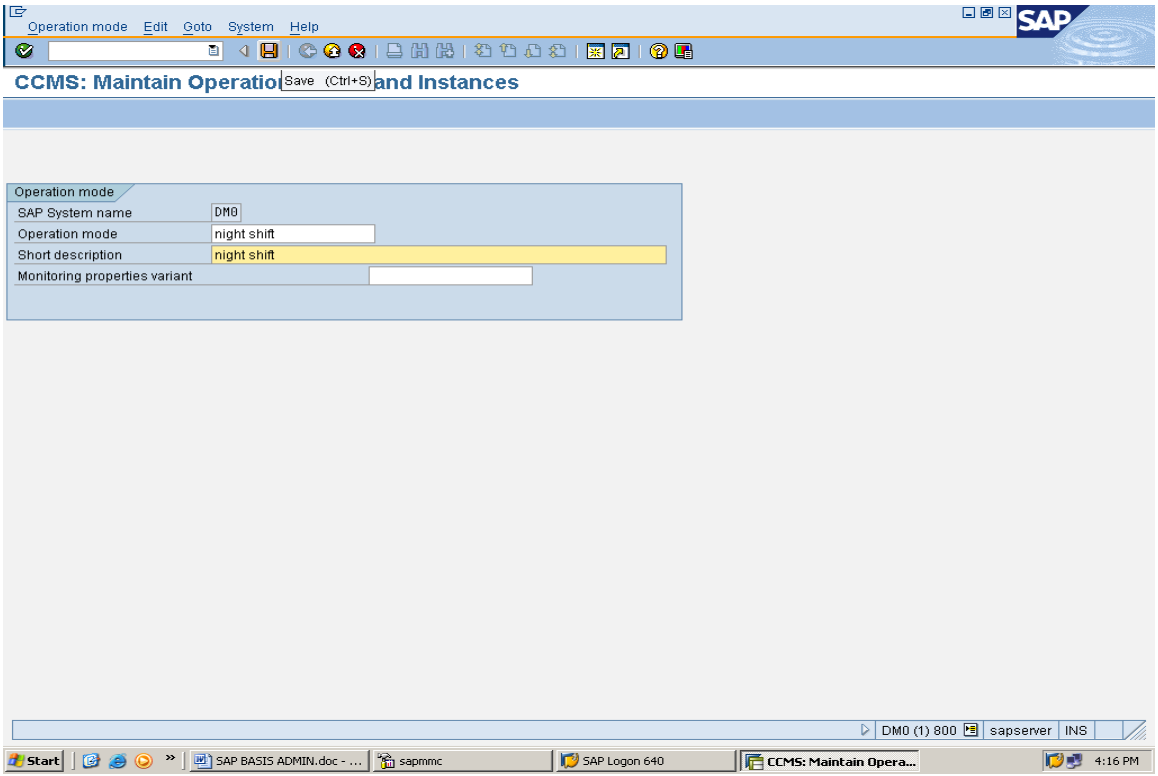


Give the Details as below & then Save it.

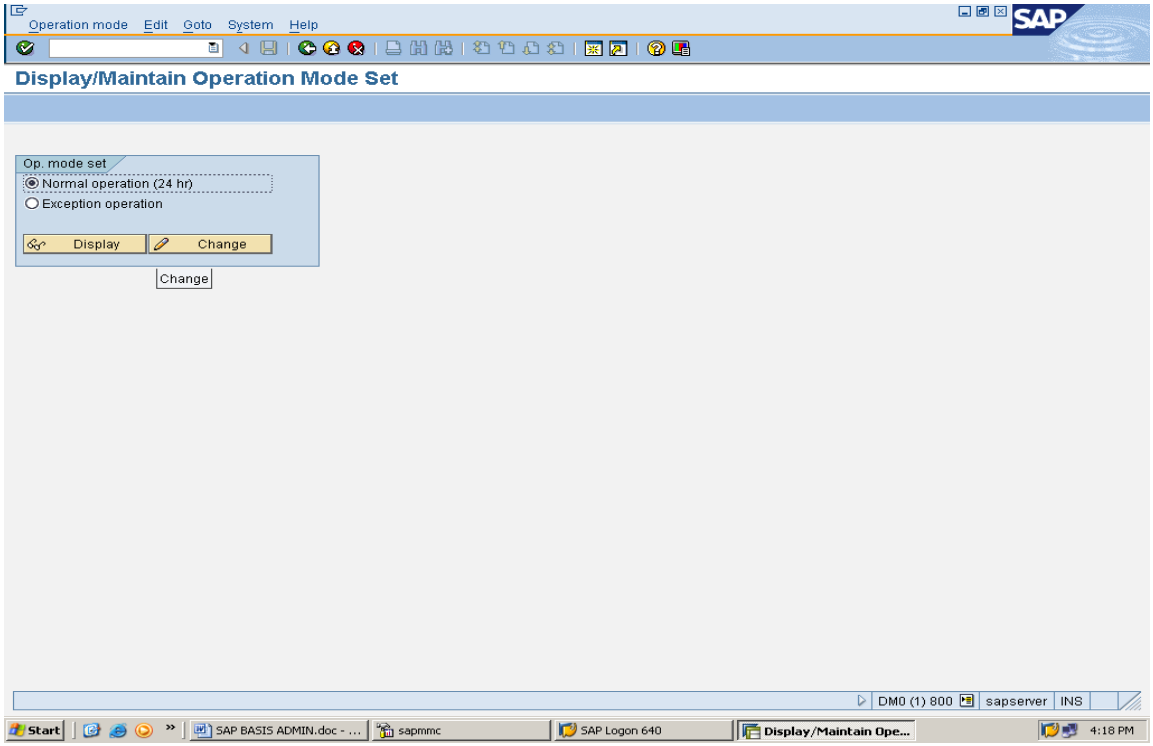



Again Click on Create Operational Mode

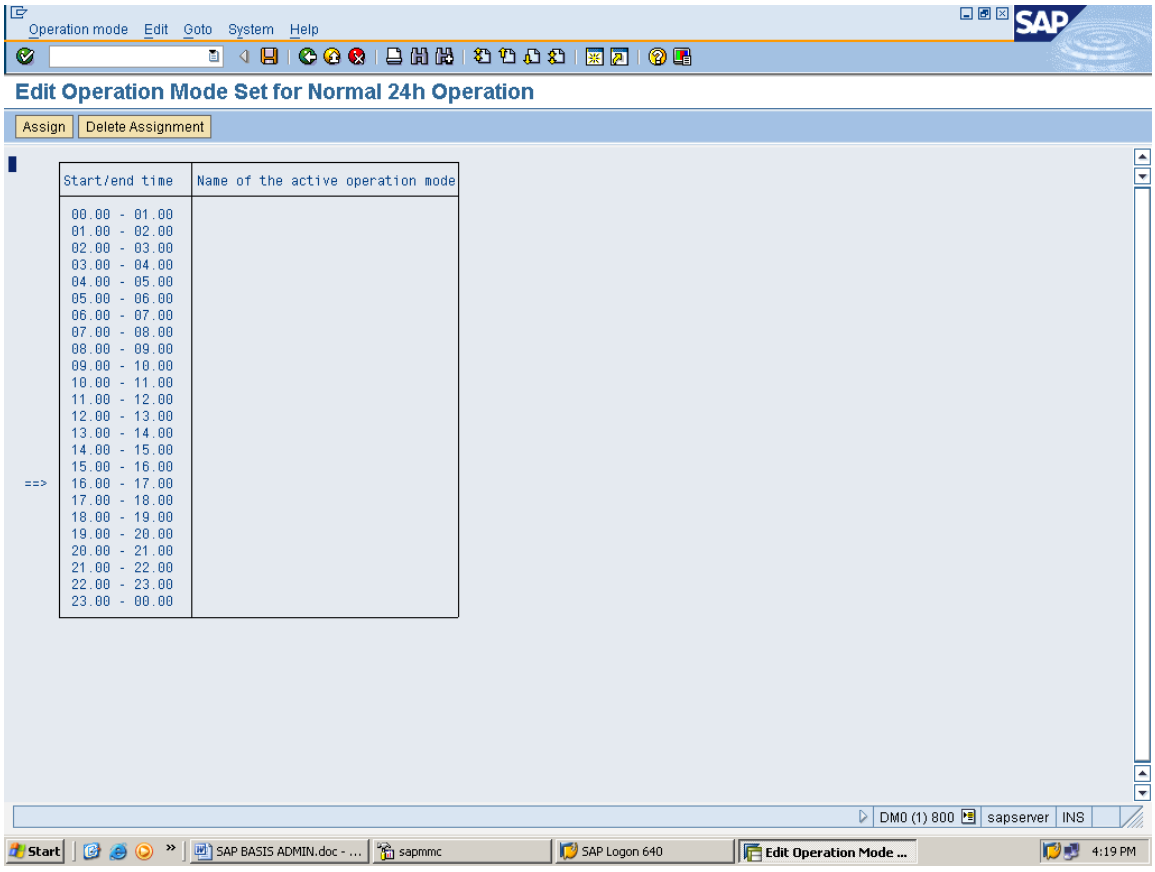
Give the Details as below & then Save it.



Click on Operational Mode & Time Table on Top Header level.



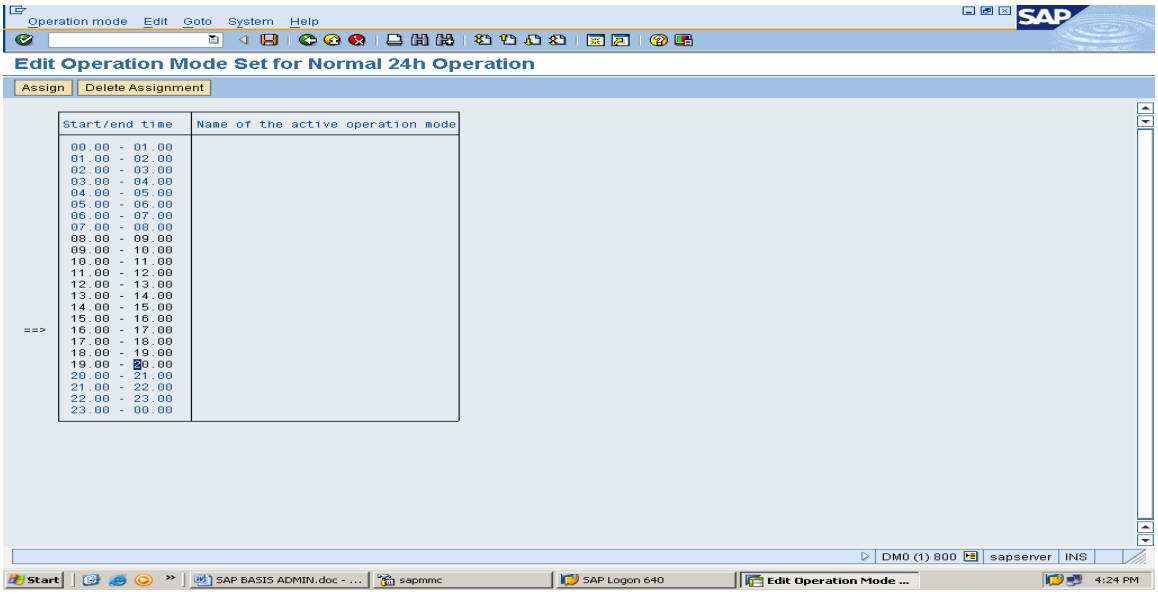

Click on Change.



Now Double Click on Time of Start (Operational Mode). Now Color will be Change to Black Color.

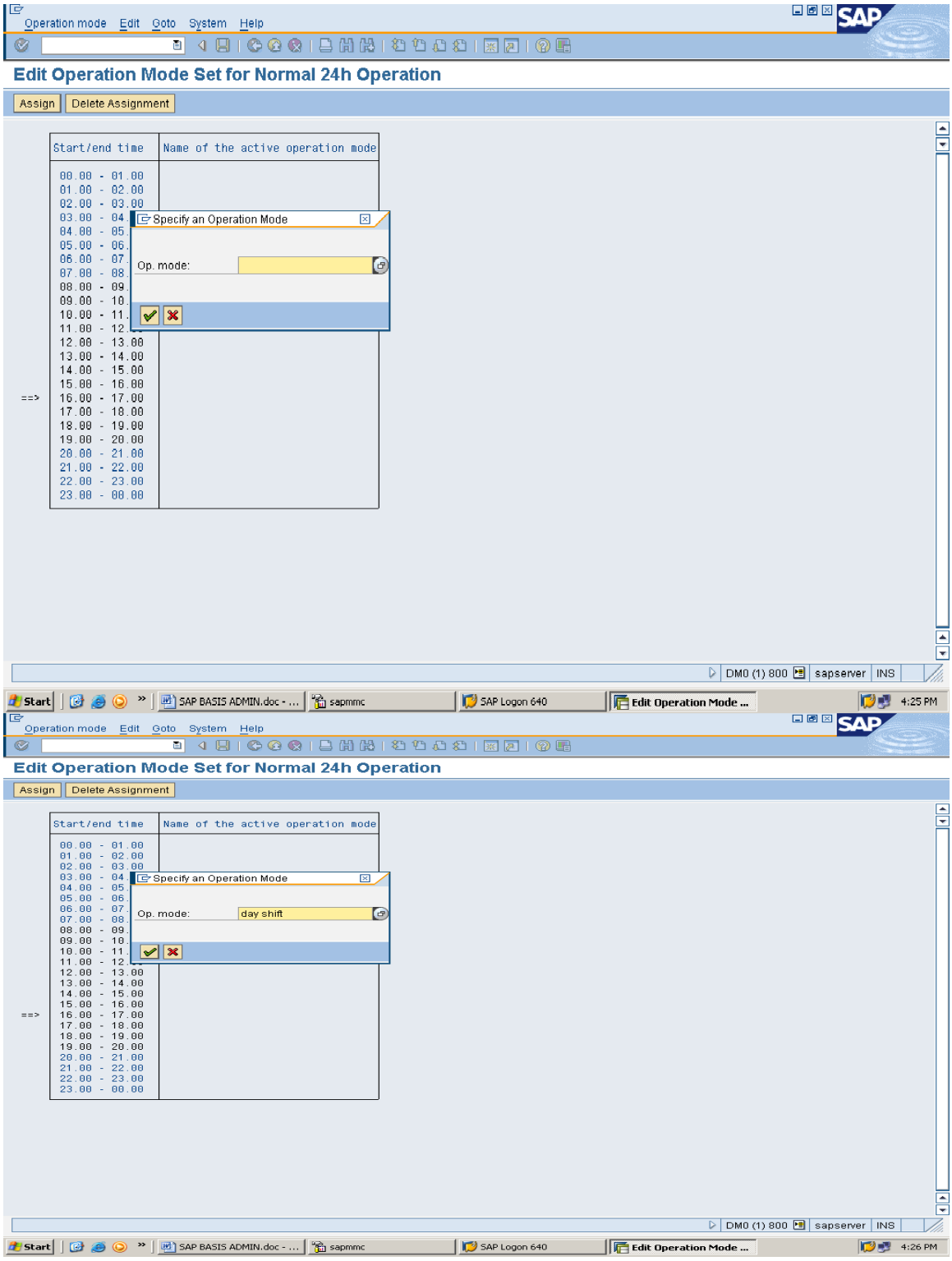
**Eg:** 08:00am to 08:00pm (Day Shift)

Click on Assign




Assign Operational Mode as selected from browser.

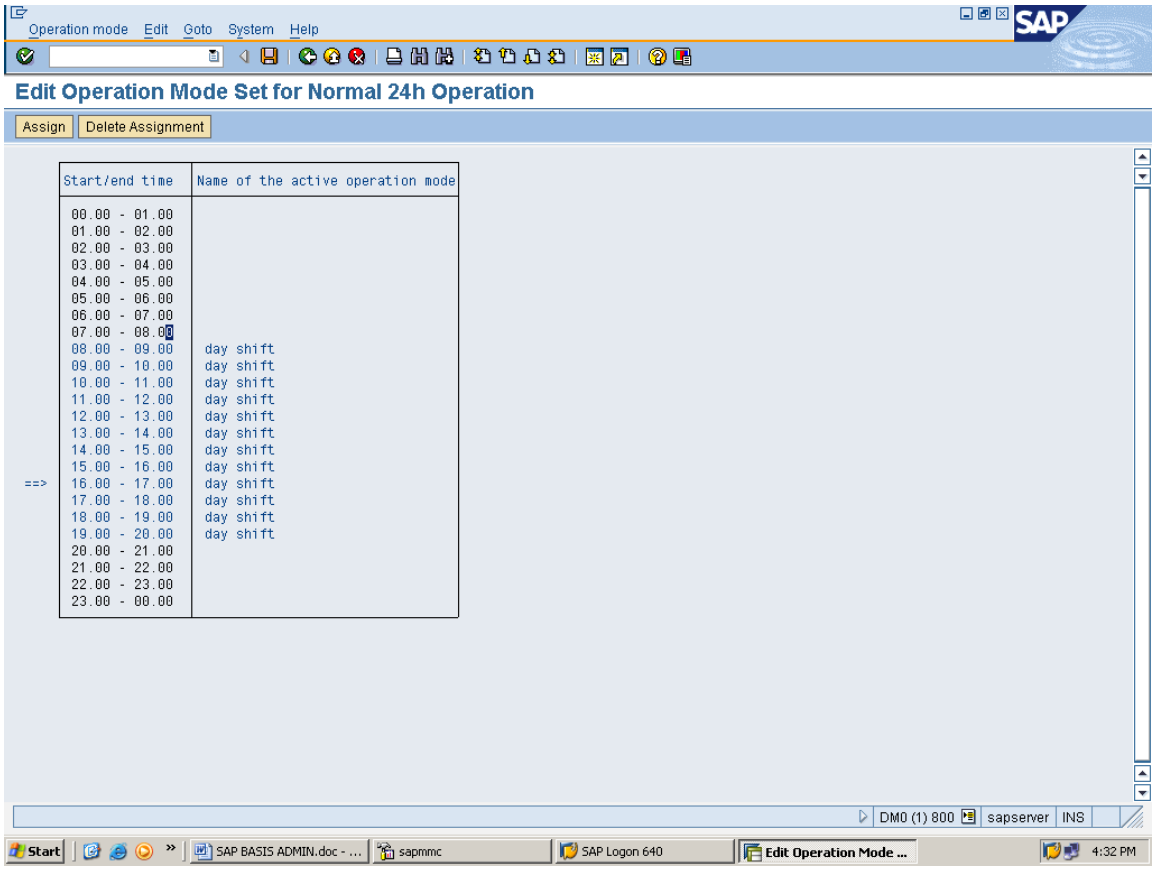
Eg: Day Shift



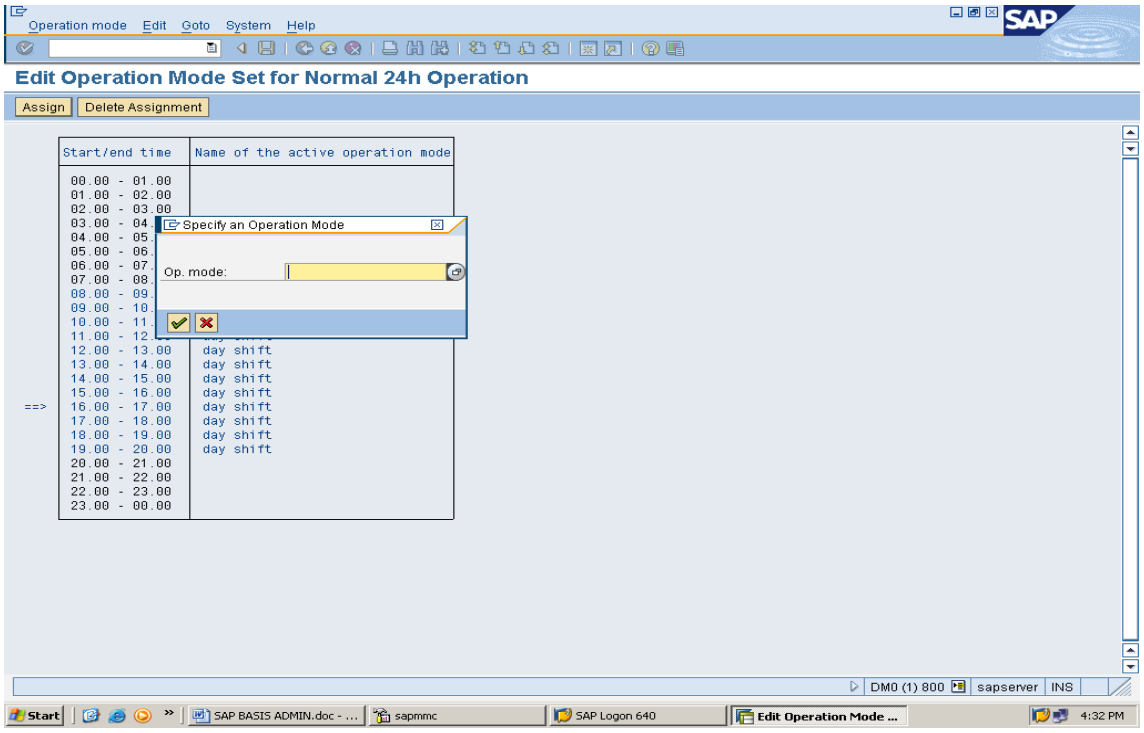

Now again Double Click on Time of Start (Operational Mode). Now Color will be Change to Black Color.

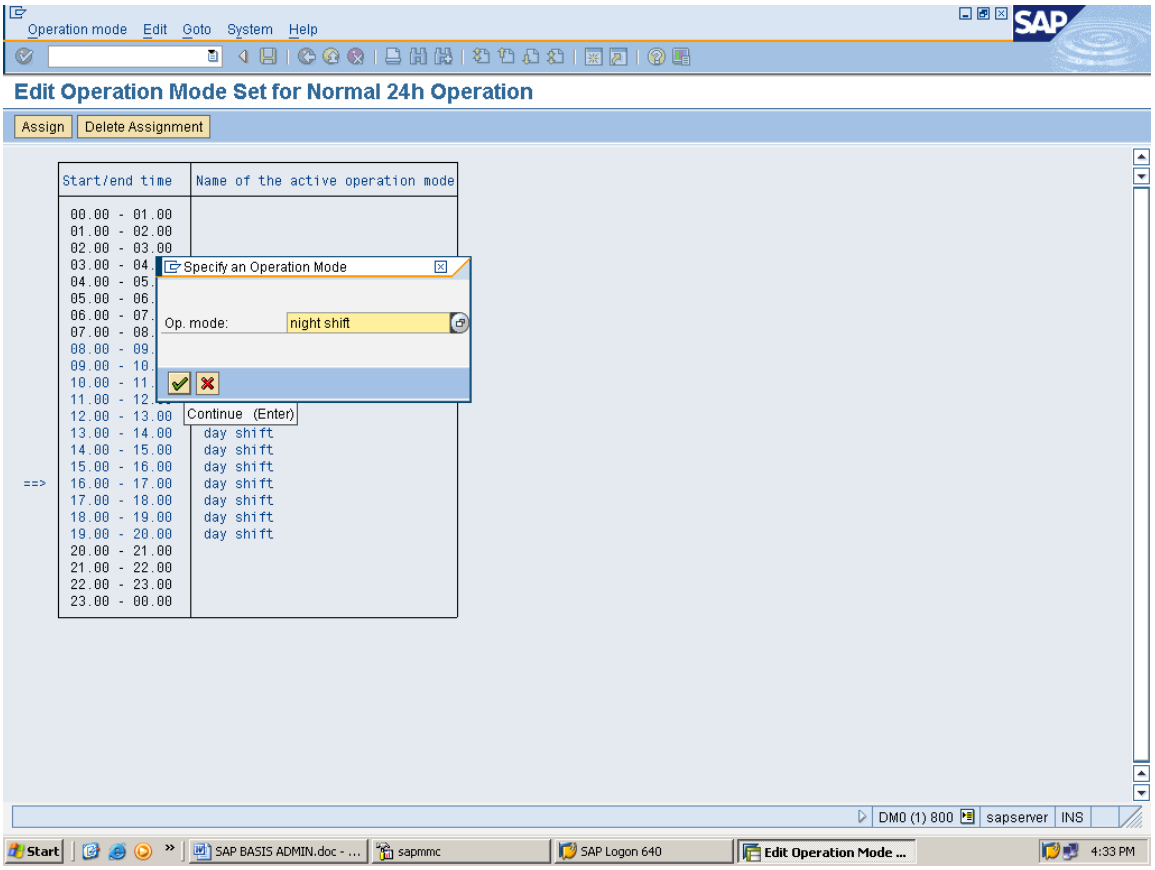
**Eg:** 08:00pm to 08:00am (Night Shift)

Click on Assign

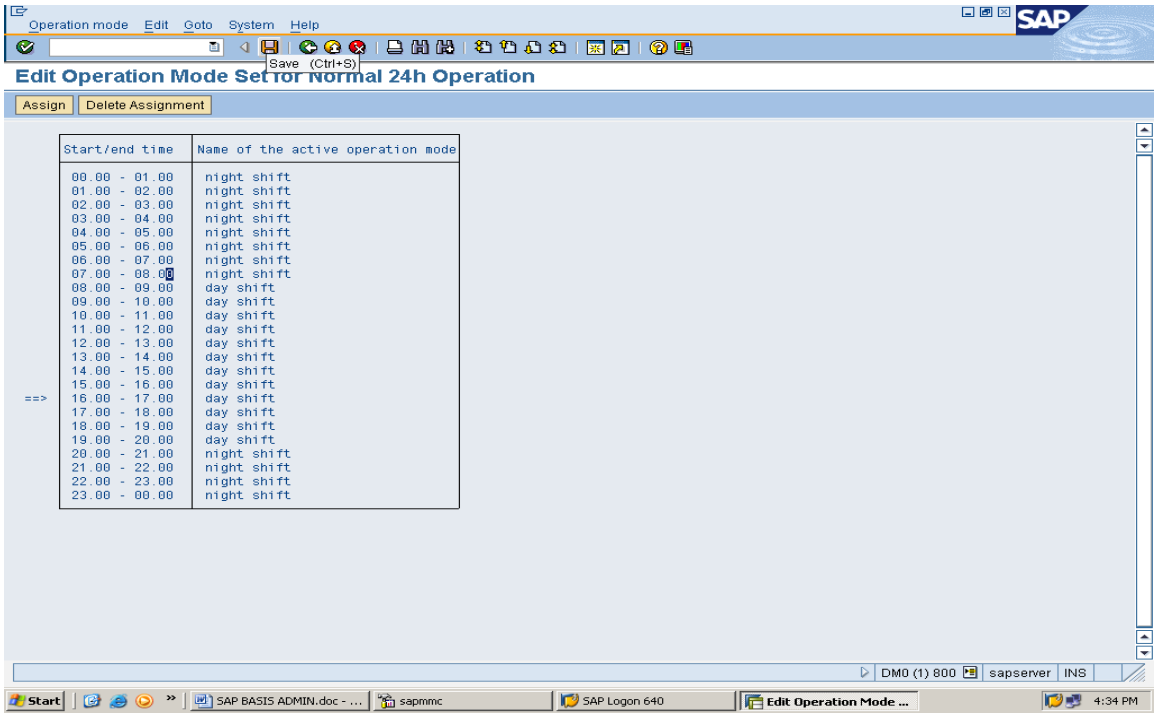


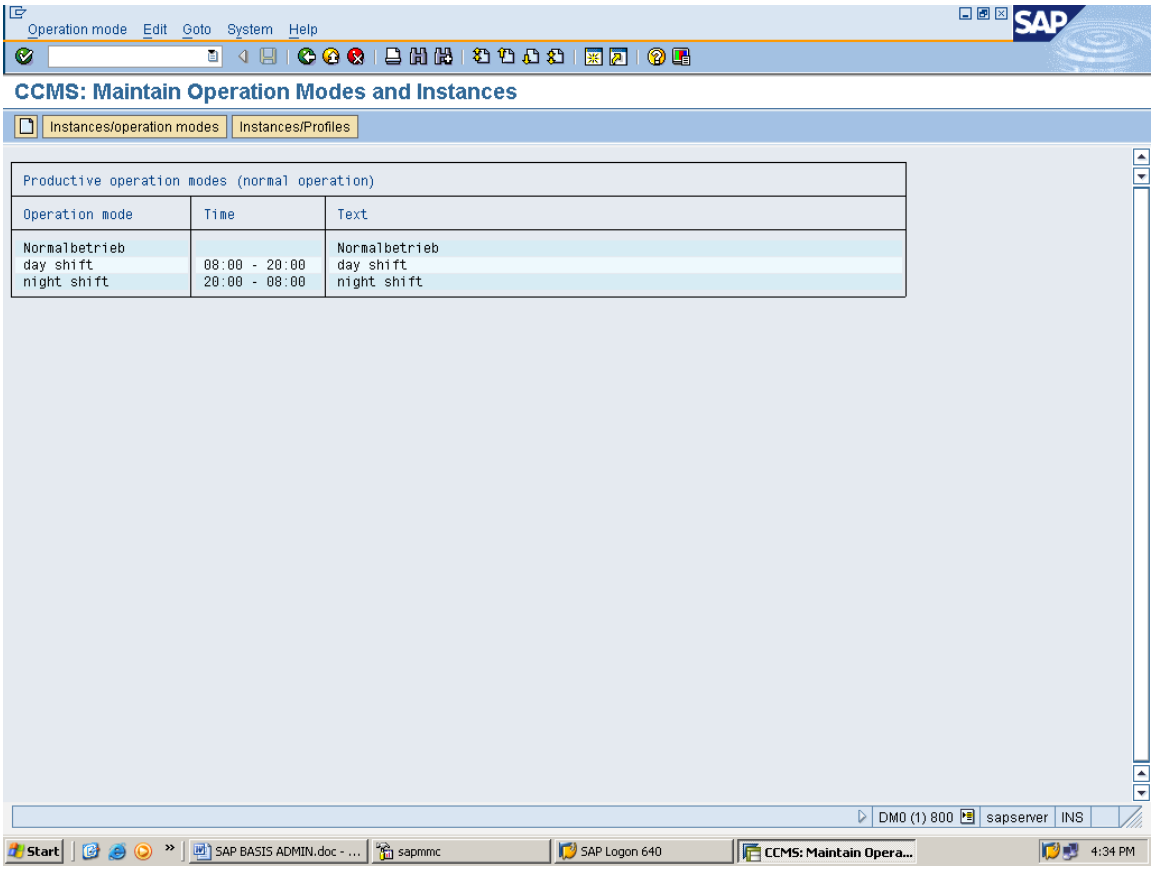

Assign Operational Mode as selected from browser.
**Eg:** Night Shift



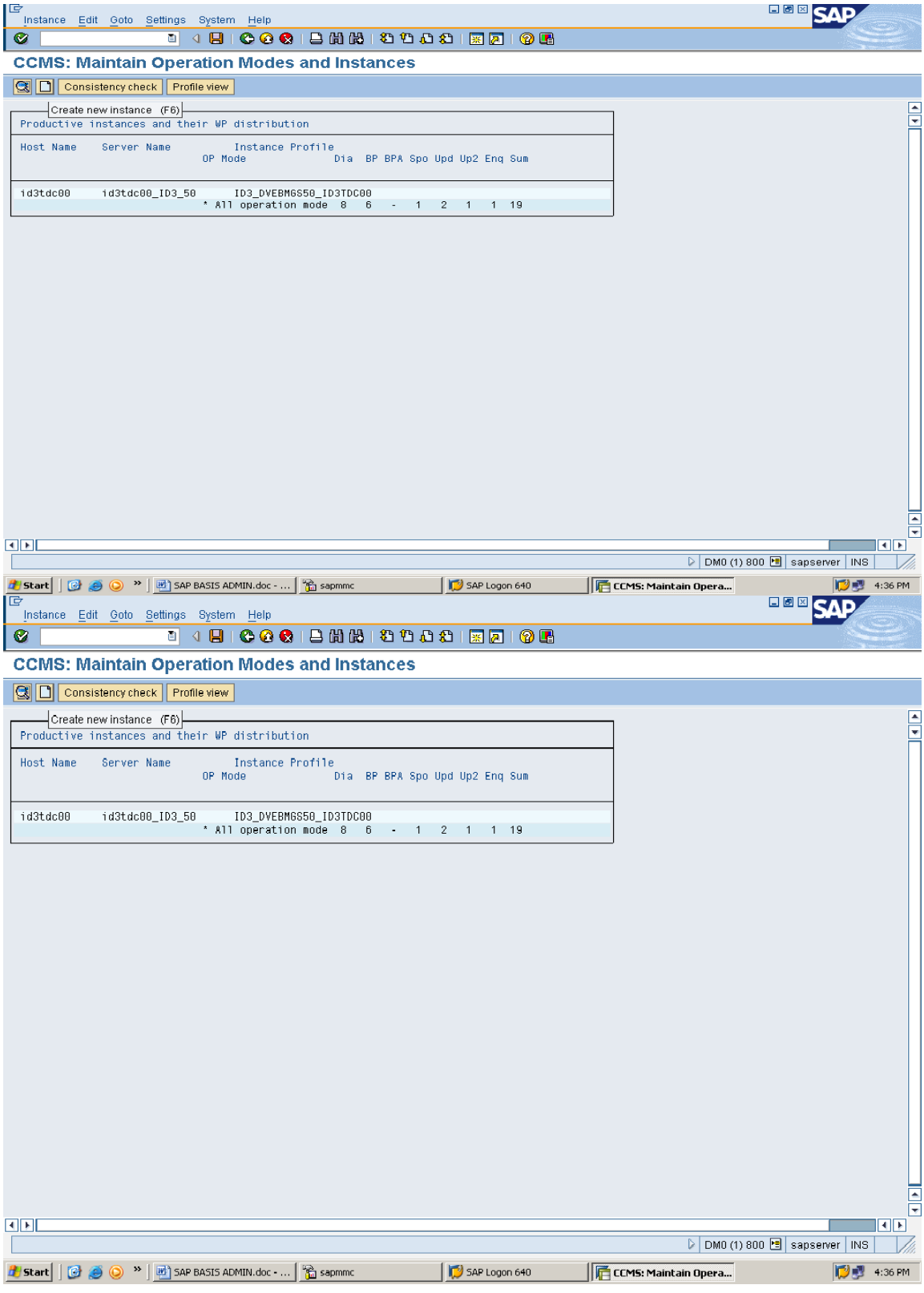



Now click on Save & Click on back.

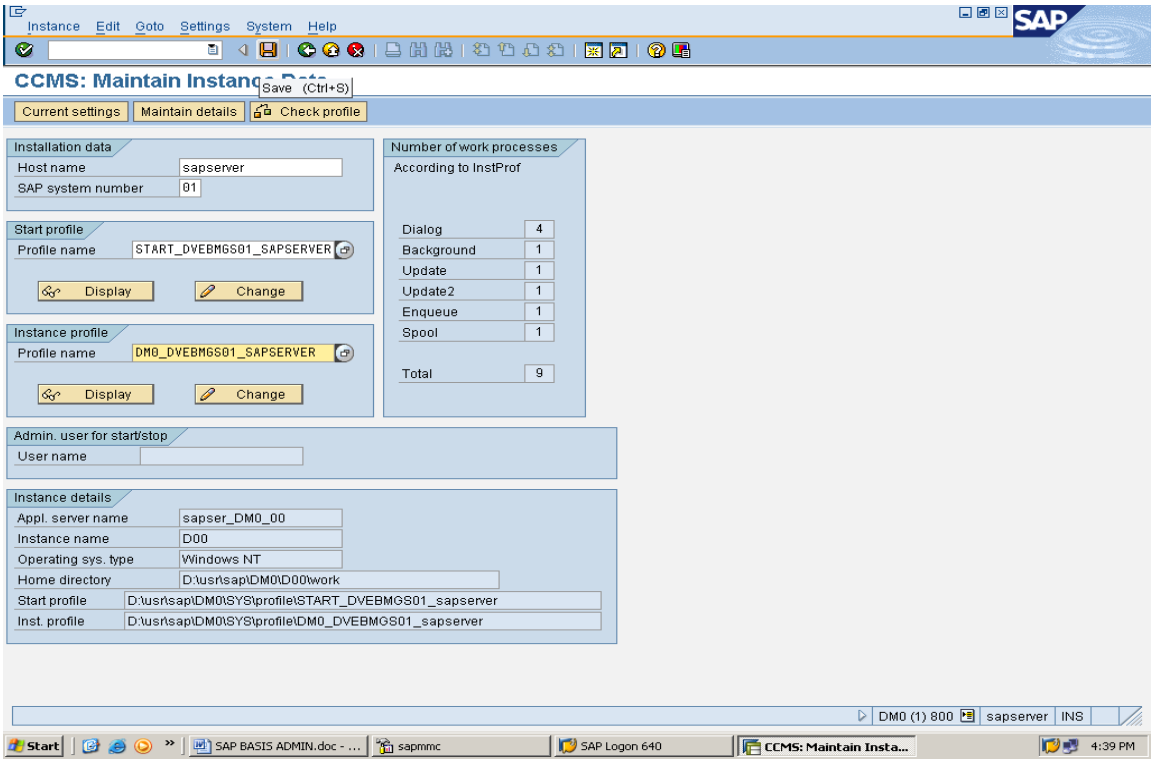




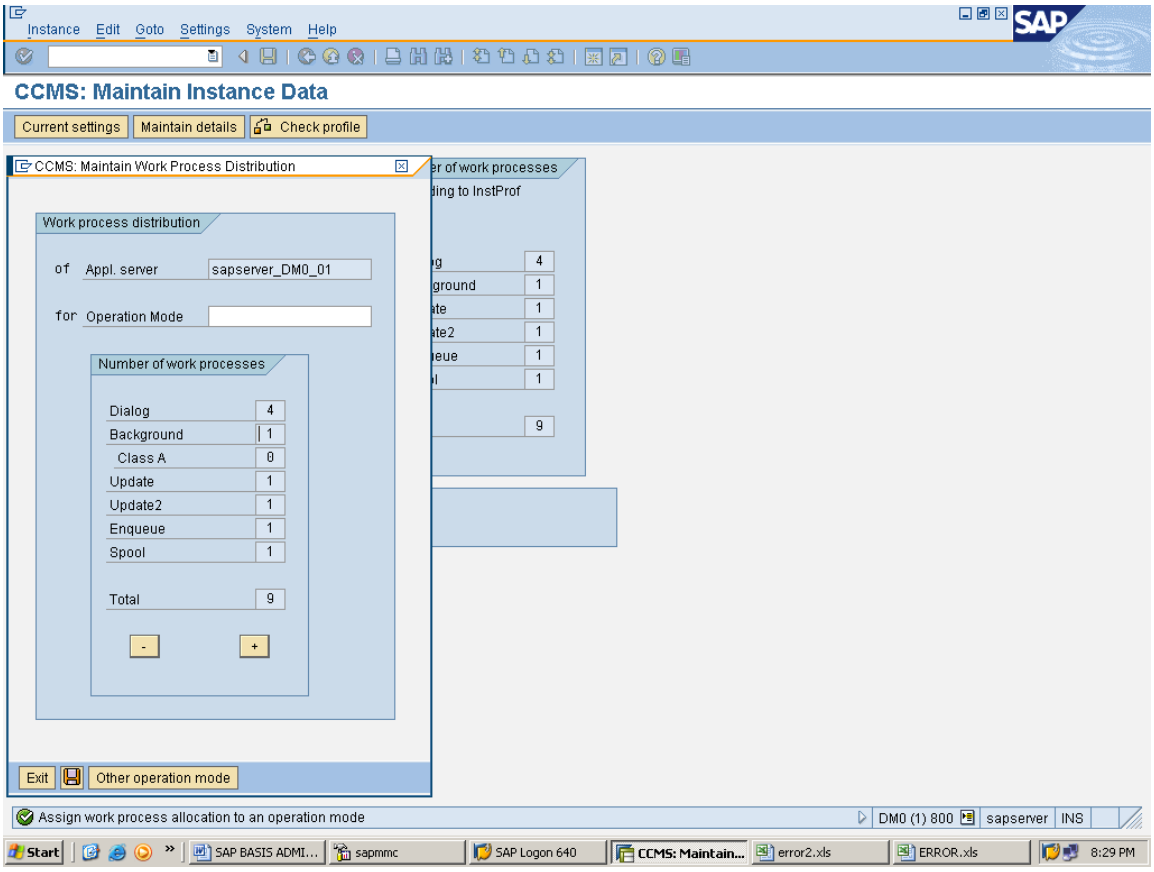

Click on Instances/Operational
Modes. Click on Create New Instance




Fill the details as below & Save it.

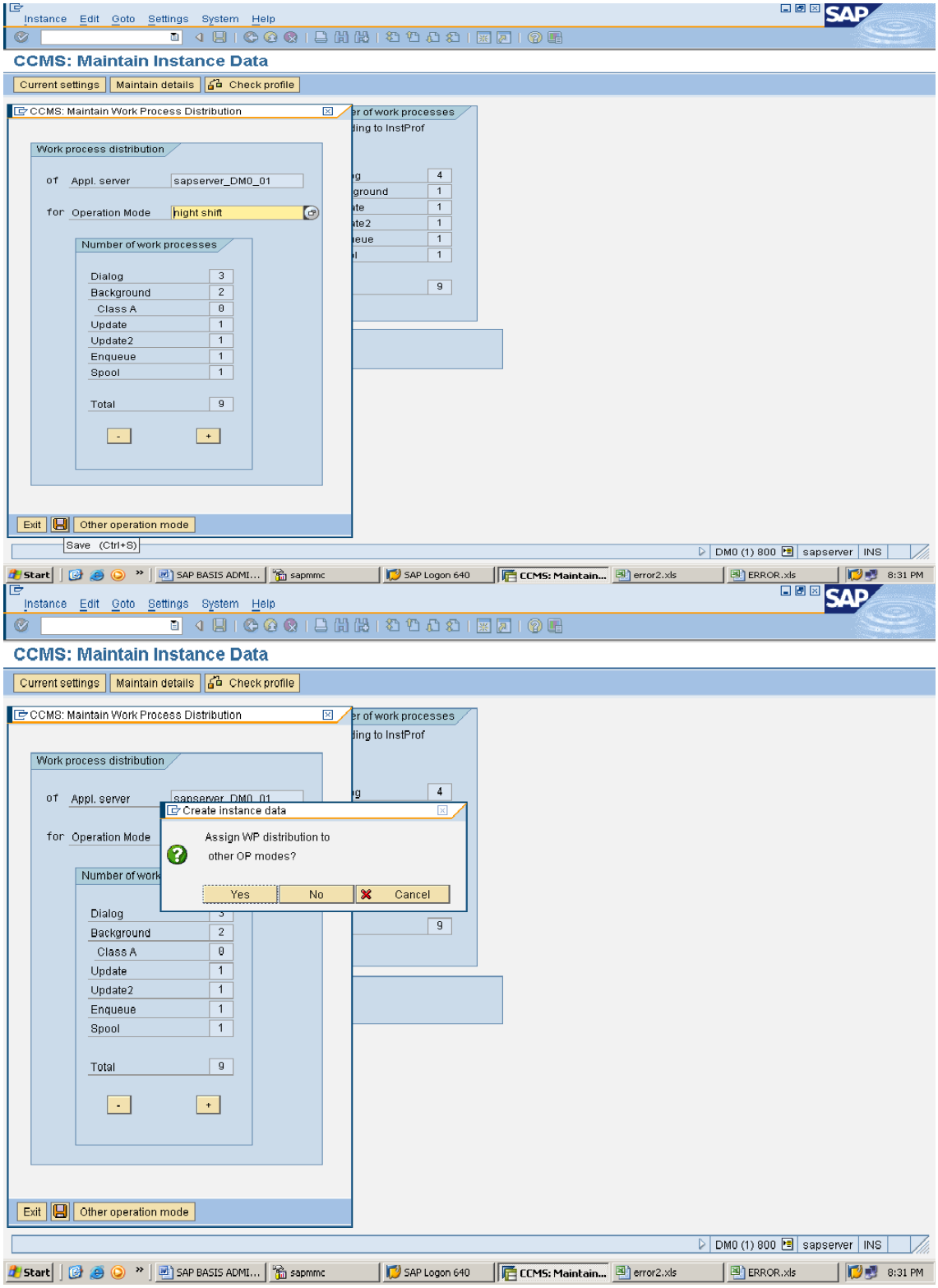



Click on Yes




Here we can Change the Dialog Work Process & Background Work Process.

Assign Operational Mode & Save it.



# What is Spool Administration

It is used to Print the Documents from Output Devices.

Eg: Printers, Fax etc

- In entire System at least 1 Spool Process requires.
- Spool Profile Parameter is, **RDISP/WP_NO_SPO=1**
- We can Create Spool Request (Print Request) from Dialog Work Process & Background Work Process.
- In OS level Spool Request Stored in Global level & Path is, **USR/SAP/SID/SYS/GLOBAL**
- Print Request Are Stored in a Location which was determined by a parameter & the Parameter having 2 Values 1) G (Global) 2) DB (Database).
- **RSPO/STORE_LOCATION=G  Global Directory at OS level.**
  **RSPO/STORE_LOCATION=DB  Spool Request Stored in DB tables.**
- Database Tables are TST01, TST03.
- Spool Request Stored or Referred as TEMSE (Temporary Sequential File).
- Default TEMSE Size is 32000 Requests & also we can Increases the no. of
- Requests up to 2 million.
  TST01 Having TEMSE Objects
  TST02 Having TEMSE Protection Rules
  TST03 Having TEMSE Data
- We can Increases no. of TEMSE Requests by using T-code as SNRO.

**Types of Printing are 3,**

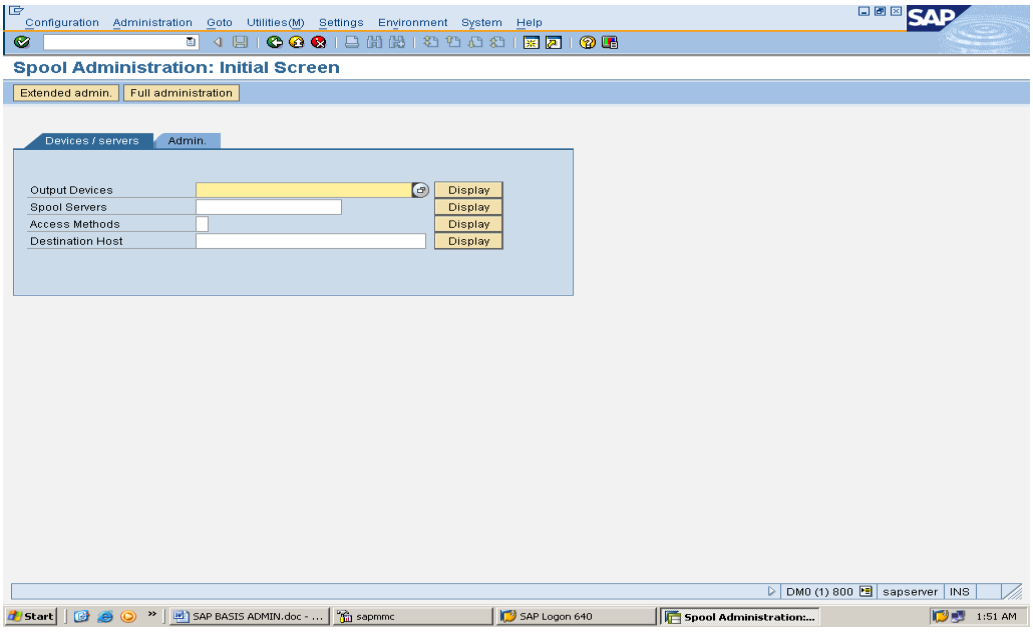
Local Printing Access If Spool Server & OS Spooler in the Same System.

Remote Printing Access If Spool Server & OS Spooler are in

Different System.  Front End Printing Access Printing with the SAP GUI.

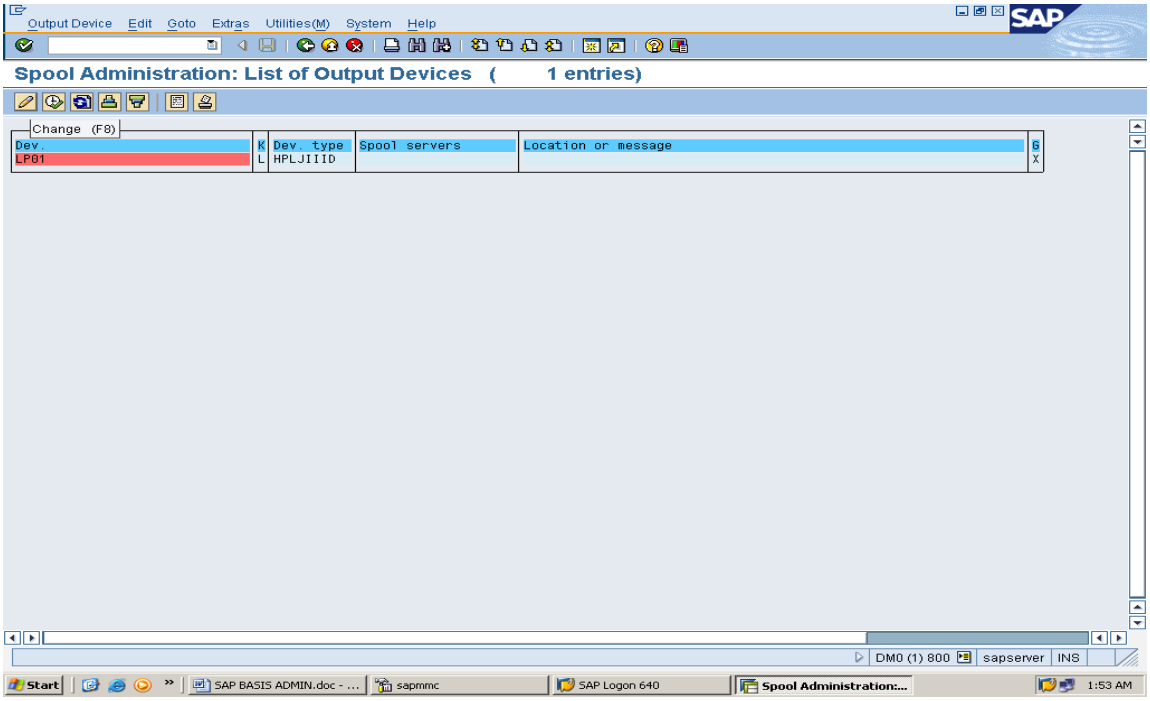
# How to Create Spool Requests (Print Request)

In SAP command line enter T-code as **SPAD**

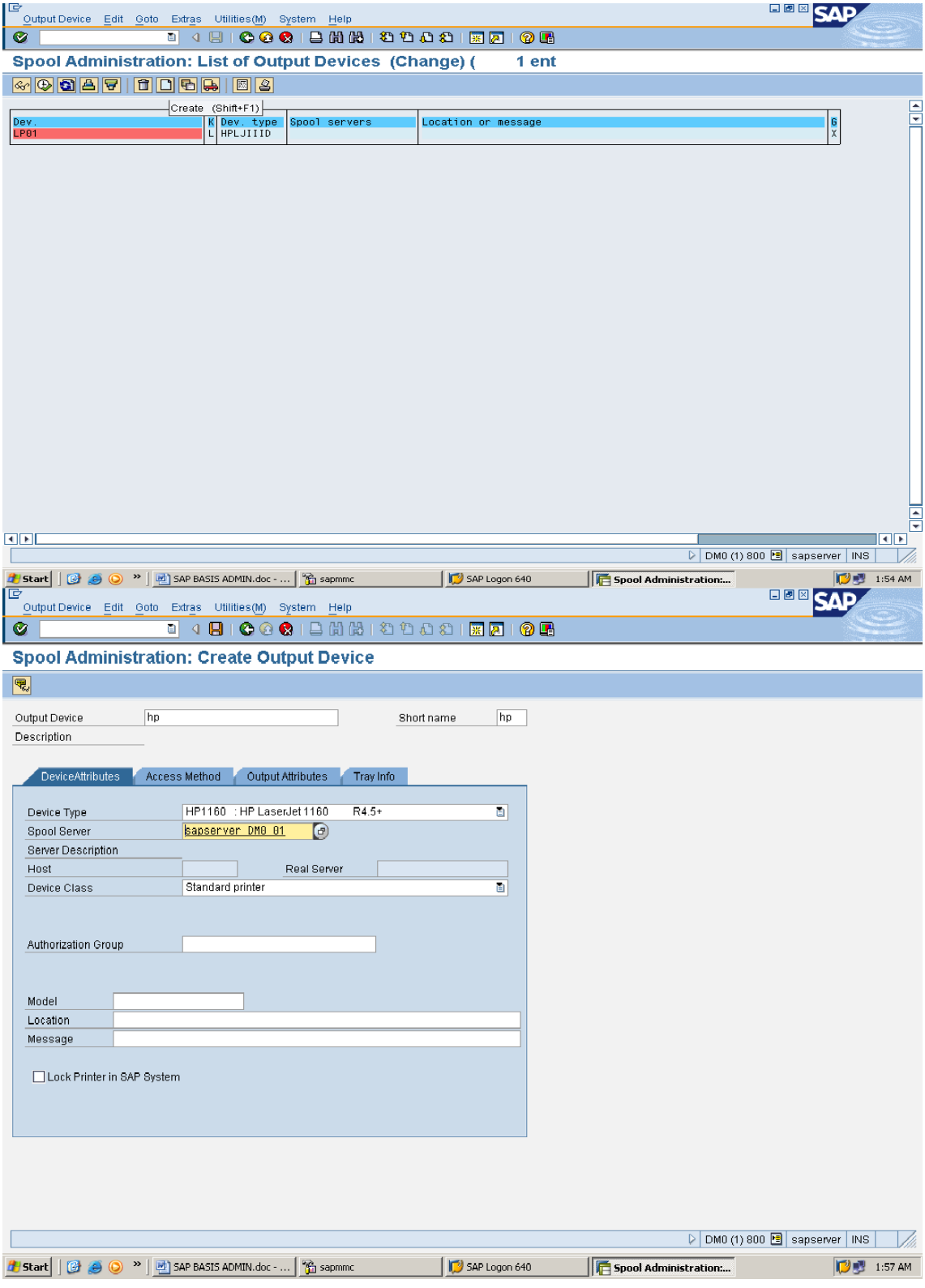



Click on Display & Click on Change

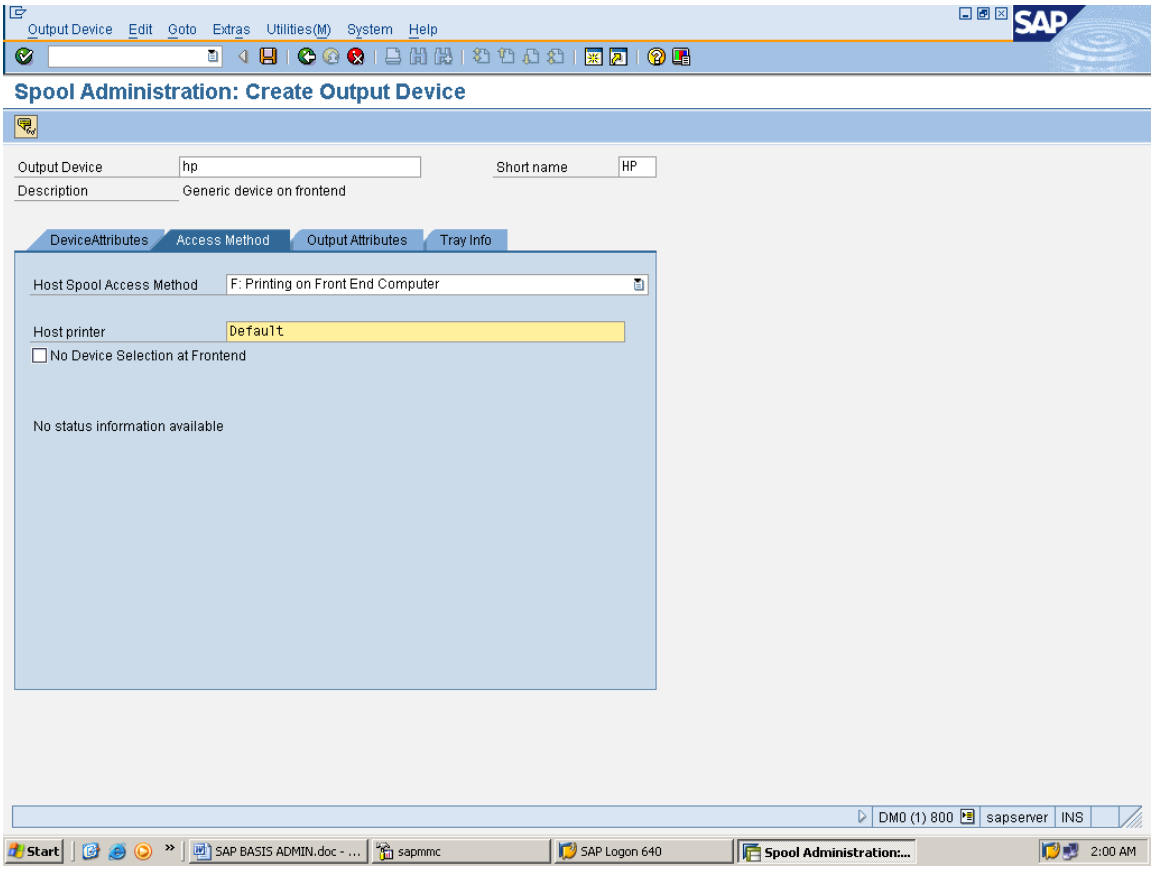
Fill the Details as below




Click on Create & fill details as below

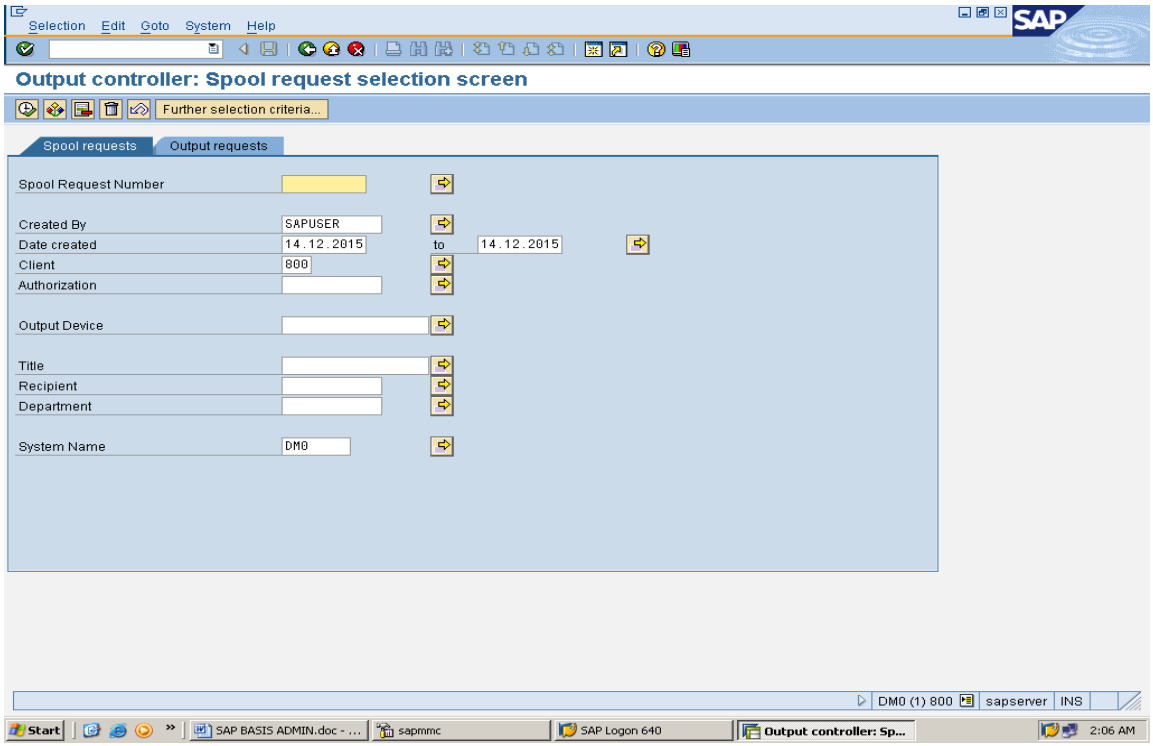



Click on Access Method tab
As per our requirement select Host Spool Access Method from browser & give Host Printer as Default.
Then Save it.

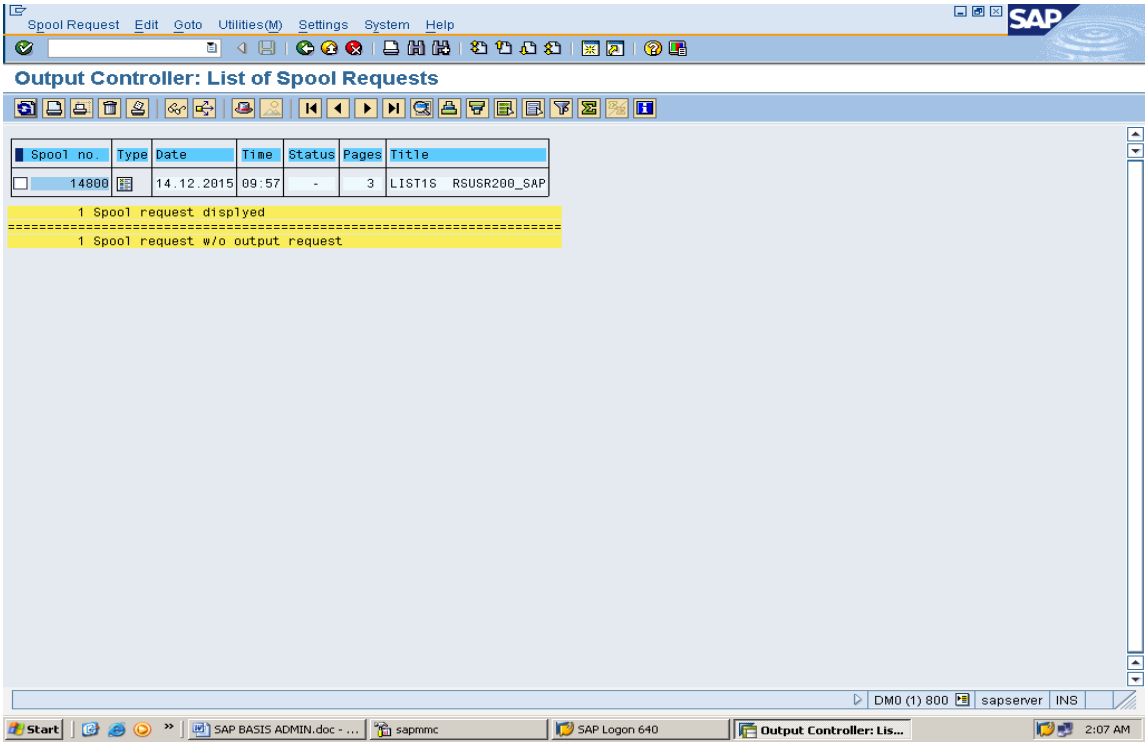



# How to Create Spool Request (Print Request) Overview

In SAP command line enter T-code as **SP01**



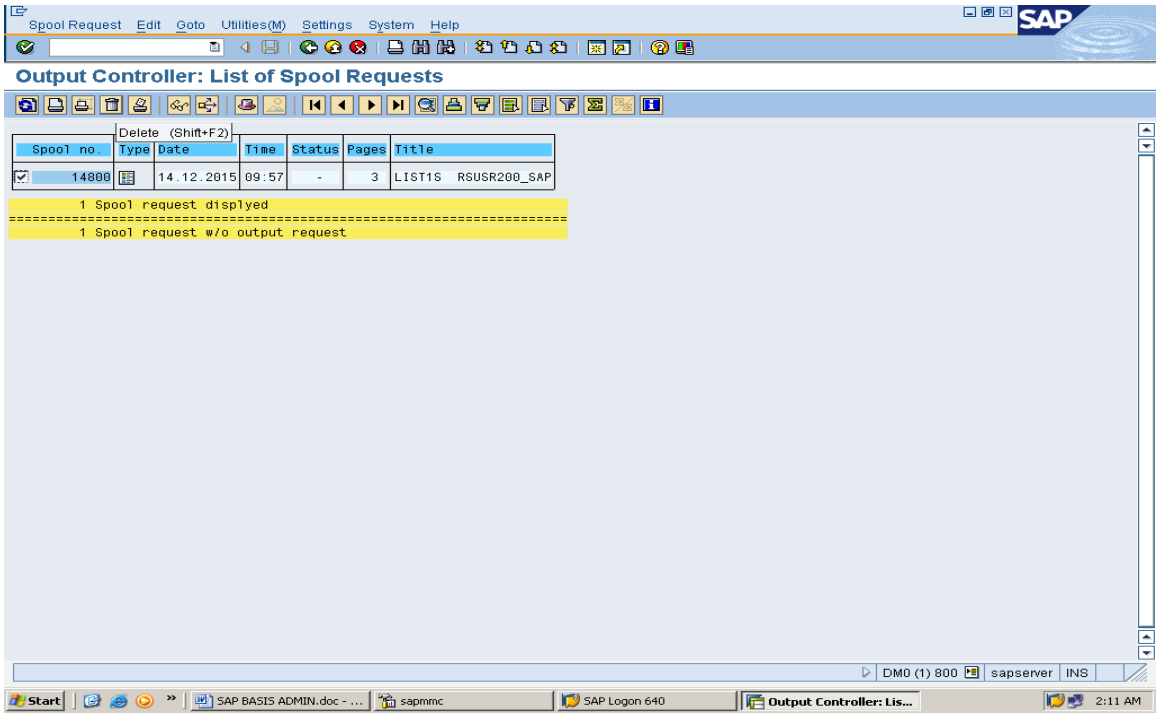

Click on Execute.




# How to Delete Old Spool Request (Print Request)

In SAP command line enter T-code as **SP01/RSP0041**

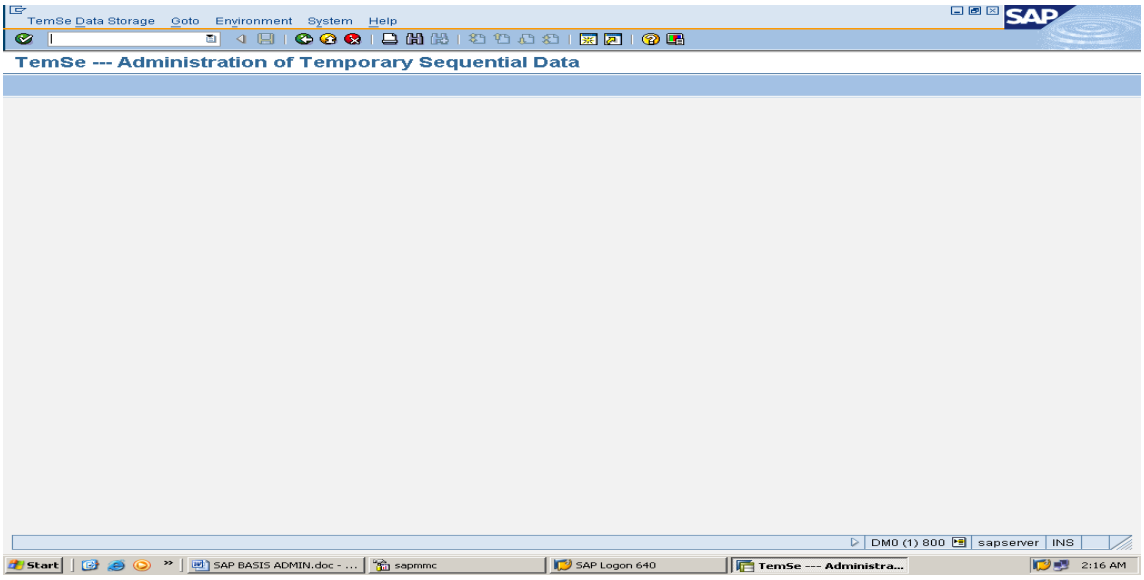
Check the Check box of Spool no & then Click on Delete.




# How to Overview of TEMSE Management

It having Administration of Temporary Sequential Data.

In SAP command line enter T-code as **SP12**

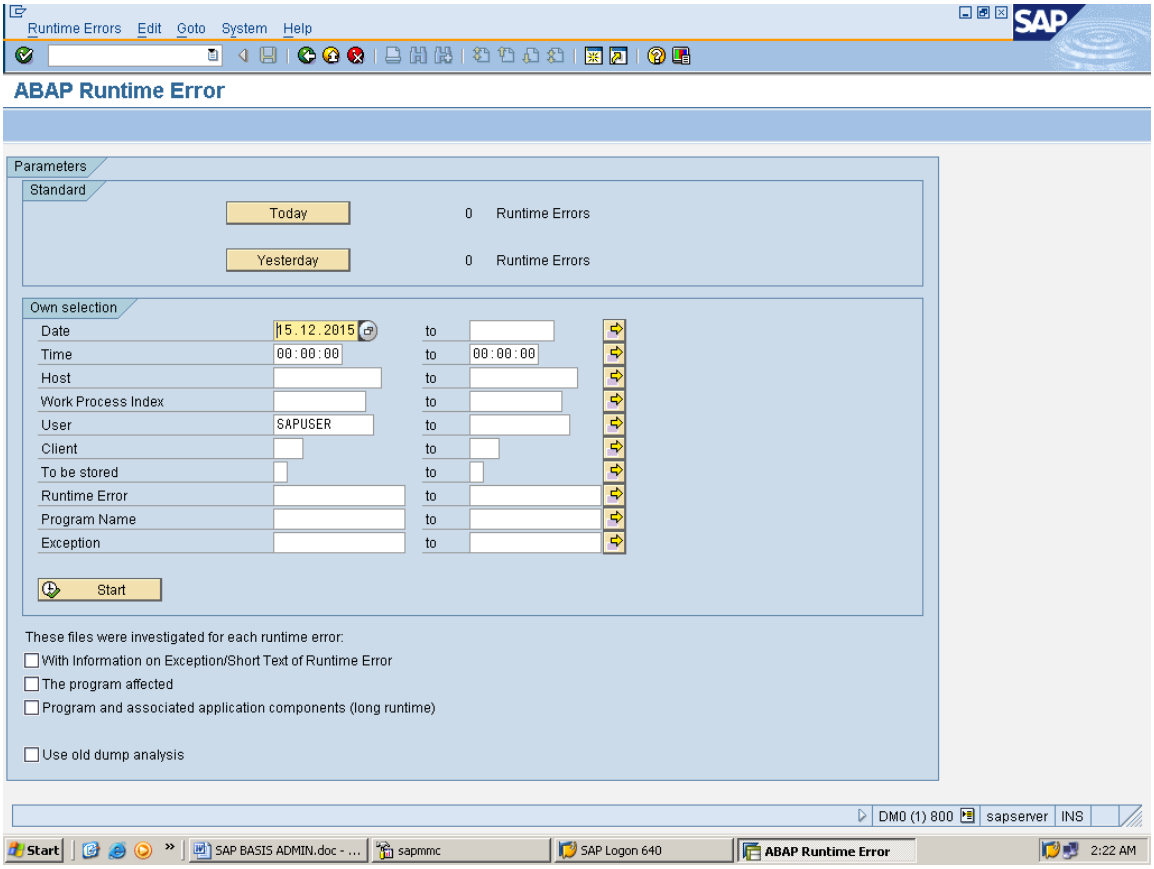



Click TEMSE Data Storage, Consistency Check, & then Delete all.

# What is ABAP Dumps

It is Run Time Error. Which is always generate whenever a transaction is Terminated to a serious error.

In SAP command line enter T-code as **ST22**




Here we can see the Today Errors, Yesterday Errors & also we can see the Back Month Errors.
If you click on Particular Error, you will get Explanation of Error.

**Eg:** TIME_OUT Error, RFC_ATTACH_GUI_FAILED Error, RFC_NO_AUTHORITY Error etc.

# What is Memory Management

We Having 6 Types of Memory Management.

### Physical Memory:

Memory Configured in System (RAM)

### Virtual Memory:

Memory that is configured Physical Memory & Some Part of the Hard disk.

### Note:

For SAP Installation we need to assign 3 Times of Physical Memory.

**Shared Memory:**

Memory that is used by SAP App & OS App

**Extended Memory:**

Memory that is used by SAP All Work Process.

**Local Memory:**

Memory that is used by SAP 1 Work Process only.

**Heap Memory:**

Memory that is Exactly (Totally) used by Private Memory.

**Note:**

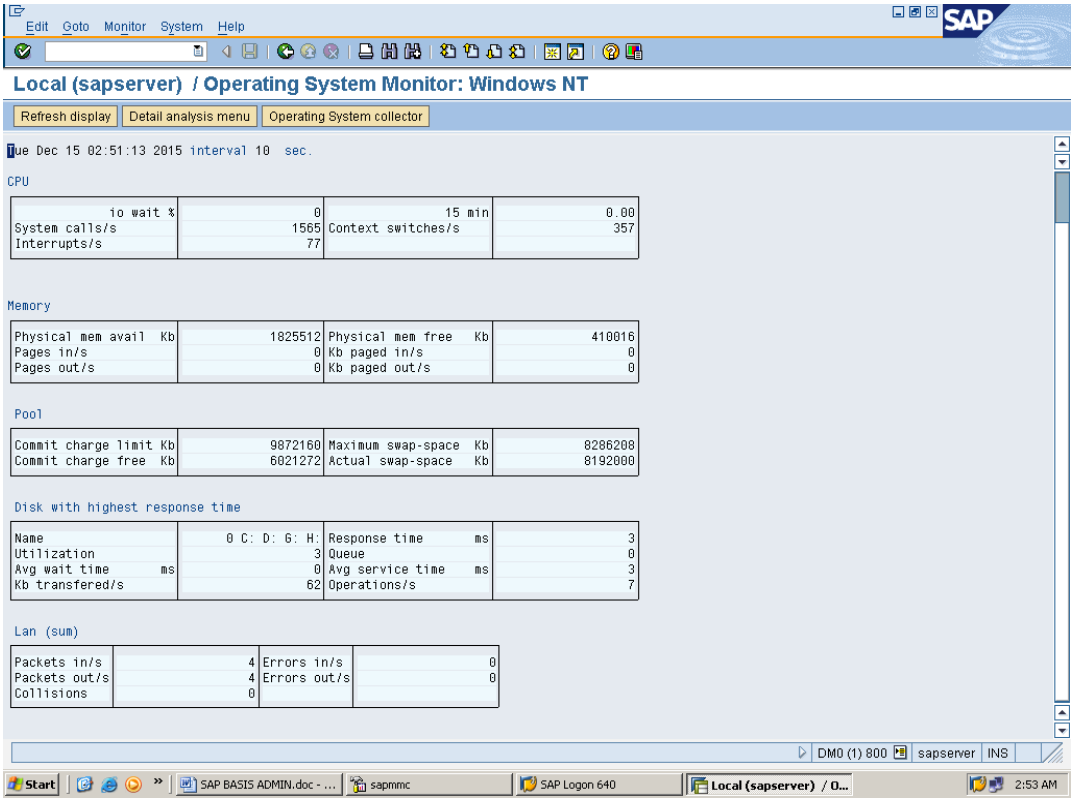
Whenever we find out Work Process in Private (PRIV) Mode no one Can Access SAP.

# How to Kill the Long Run Job

Go to MMC→Work Process→Select PRIV Work Process→Right Click→ All Task→Kill

# How to Check CPU Utilization

In SAP command line enter the T-code as **ST06**



# NetWeaver System

SAP NetWeaver is a web-based, open integration, application platform that serves as the foundation for enterprise service-oriented architecture (enterprise SOA) and allows the integration and alignment of people, information, and business processes across business and technology boundaries. It allows the composition, provisioning, and management of SAP and non-SAP applications across a heterogeneous software environment.

The following table defines the Main Use Cases of SAP NetWeaver and its key area

| Use Case | Description |
|---|---|
| Data Warehousing | SAP BW |
| Building Integration scenarios | SAP Process Integration PI |
| Mobilizing Business Processes | SAP NetWeaver Mobile |
| Building Composite Applications | SAP Composition Environment |
| Integration with SAP Enterprise Portal | SAP Enterprise Portal |
| Application Development ABAP | ABAP Development on NetWeaver Application Server ABAP |

To implement these use cases, SAP has provided mapping between use cases and SAP NetWeaver software components.

Consider the use case of data warehousing, it has multiple product instances and client tools to use NetWeaver for data warehousing.

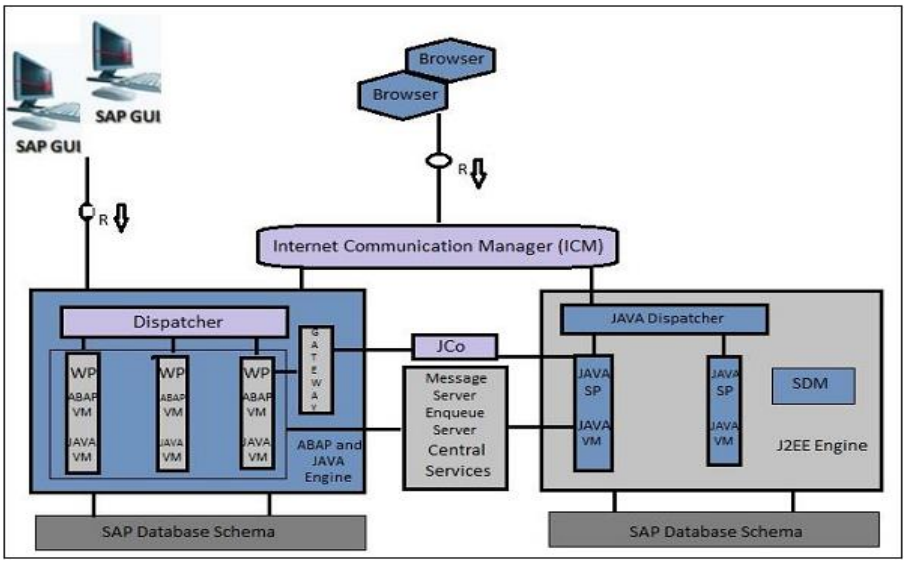
| Standalone Engines | Product Instance | Client Tool |
|---|---|---|
| Search and Classification (TREX) | • AS ABAP<br>• BW ABAP<br>• AS Java<br>• NW Product Description [optional]<br>• AS Java Extensions [optional]<br>• BI Java [optional]<br>• EP Core – Application Portal [optional]<br>• Enterprise Portal | • SAP GUI with Business Explorer (BI Add-On)<br>• SAP BusinessObjects Analysis, Edition for Microsoft Office* [optional]<br>• SAP BusinessObjects Crystal Reports [optional]<br>• SAP BusinessObjects Dashboards [optional]<br>• SAP BusinessObjects Web Intelligence [optional]<br>• SAP BusinessObjects Design Studio [optional] |

# NetWeaver Architecture

SAP NetWeaver is one of the central components of the entire SAP software stack and provides you a platform for other components and JAVA and ABAP applications.

SAP Application server consists of multiple application server instances and also database servers. With use of dialog instance, it also contains message server and an Enqueue server.

The following is a dialog instance executed by a user




These are the different components of the Dialog Instance

**Internal Communication Manager** – This is used to process both client and server web requests. It supports protocol – HTTP, HTTPS, SMTP.

**Dispatcher** – This is used to distribute the user request to different work processes. If all the work processes are busy, requests are stored in the dispatcher queue.

**Work Processes** – These are used to execute Java or ABAP programs.

**SAP Gateway** – This provides RFC interface between SAP instances.

**Message Server** – This is used for message communication and also balances the load in SAP system.

## Installation Options for SAP NetWeaver

SAP NetWeaver provides the following installation options –

- **ABAP System** – This comes with an integrated VM Container. With this installation, you can run ABAP programs and selected SAP Java applications (shown in left box).
- **Java System** – The components to the right in the above image constitute the Java System. With the installation of this, you can run J2EE applications but not any ABAP programs.
- **ABAP + Java system** – All the components shown in the above image constitute the ABAP + Java System.

## Application Centre and Instances

The SAP NetWeaver work centre includes the configuration of the following tools –

**Adobe Document Services** – This allows you to register the Adobe Reader Rights credentials as well as keep track of all unlicensed interactive form designs in your system.

**Application Module** – This allows you to view the details of the deployed applications and their modules. Here, you can also perform the run-time configuration of the application modules.

**Application Resources** – This allows you to enable applications to make use of external resources. A NW Administrator can add or delete the application resources.

**Authentication and Single Sign-On** – This allows you to choose the required authentication mechanism for your applications. You can configure the following authentication and SSO –

- AS Java as a Service Provider
- Kerberos

**Certificates and Keys** – This allows you to manage the AS Java certificates and keys.

**Composite Application Framework Authorization Tool** – This allows you to manage business rules and Instance Level Permissions for CAF applications, business object nodes and AS Java instances.

**Configuration Wizard** – You can make technical settings required for the technical processing of a system or a technical scenario.

**Destinations** – This can be used to specify the remote service's address and the user authentication information for remote connections.

**Development Infrastructure** – This is required while developing with Java and you want to manage it with Transport Management System (TMS).

**Identity Management** – This allows you as an administrator to control applications access by creating users and providing these users with a means of authenticating themselves to an application.

**Internationalization** – This allows you to manage data from double stack systems and also used for synchronization purpose.

**Java HTTP Provider Configuration** – You can create new virtual hosts and configure existing ones for all registered systems.

**Java Class Loader Viewer** – You can monitor the hierarchy and references between the class loaders in the AS Java.

**Java System Properties** – Using this, you can view current system configuration of Application server JAVA and you can edit the properties that are marked as online modifiable.

**Java Connection JCo RFC Provider** – You can manage the Java Connector Remote Function Call (JCo RFC) Destinations. This allows you to create, edit and view existing connections.

**JMS Server Configuration** – This is used to create new JMS resources.

**Licenses** – You can request and install new SAP licenses.

**Log Configuration** – You can view current log configuration, change security or reset it to default.

**Message Server** – You can monitor message server parameters and settings.

**SAP NetWeaver Administrator Tool** – SAP NetWeaver Administrator (NWA) is a web-based tool that allows you to perform configuration, advanced administration, and also to monitor, troubleshoot, and diagnose a SAP NetWeaver system.

You can use NWA tool in the following working modes –

- Online
- Local and remote

## Managing Java Instances using NWA

Follow these steps to change the status of Java instances at runtime.

**Step 1** – Go to SAP NetWeaver Administrator > Operations > Systems > Start & Stop

**Step 2** – Now, go to Java Instances tab under NWA.

**Step 3** – You can see all available instances with corresponding information about the server processes within the instance.

**Step 4** – Select an instance to perform the following functions under NWA –

- Start, stop or restart a Java instance.
- Enable or disable debug mode for AS Java processes.
- View and refresh OS processes.
- Clear the DNS cache for a particular instance.
- Set a number of server processes (nodes).

## SAP NW System Landscape

Follow these steps to perform the implementation of SAP NetWeaver system –

**Step 1** – Plan the implementation by defining the scope, hardware and software requirements, and release instructions.

**Step 2** – Define the system landscape for the use cases.

**Step 3** – Install the components of SAP NetWeaver system.

**Step 4** – Configure SAP NW systems.

## System Landscape Management using SAP Solution Manager

SAP recommends the use of the latest version of the SAP Solution Manager to manage your system landscape. You can download the latest version from SAP Support Portal http://support.sap.com/solutionmanager

It is important to correctly define your SAP system landscape in the following versions of SAP Solution Manager to maintain it correctly.

### SAP Solution Manager 7.0

You can use the SAP Solution Manager System Landscape transaction code — SMSY for the complete system description.

### SAP Solution Manager 7.1 SP01 to SP04

You can use the Landscape Management Database transaction code — LMDB to maintain technical system information. To maintain logical product information, you can use the transaction code — SMSY.

### SAP Solution Manager 7.1 SP05 and higher

You can use the Landscape Management Database transaction code — LMDB for the complete system description and in this, transaction code — SMSY is no longer required.

### Verifying Landscape with SAP Solution Manager

To verify and correct your system landscape, SAP recommends that you use the verification functions of the following versions of SAP Solution Manager.

### SAP Solution Manager 7.0 to 7.1 SP04

Use Landscape Verification 1.0 for SAP Solution Manager. This add-on allows you to identify and correct issues in your SAP Solution Manager landscape (Transaction SMSY) before they cause problems, for example, during a system update. Example for errors are a missing connection to the System Landscape Directory or the incorrect assignment of products to technical systems. For each type of error, a generic description for the solution is provided.

### SAP Solution Manager 7.1 SP05 or higher

Use the landscape verification function that is embedded into the product system editor of the Landscape Management Database (LMDB). It replaces the previous Landscape Verification tool.

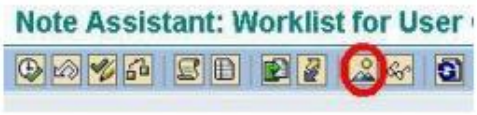
# What is OSS Notes, SAP SNOTE

## What is OSS Note

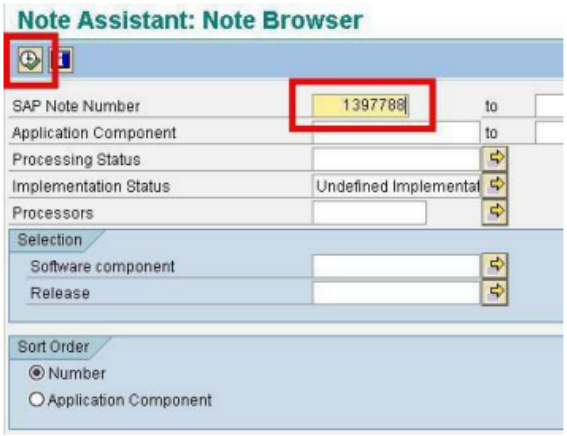
OSS Note is frequently released bug fixes, new program developments or enhancements or other miscellaneous updates by SAP. OSS stands for “Online SAP Support" At times before you begin work, it will be required to check whether a particular note is present in your SAP system To ensure that a particular OSS note is present in your SAP system, execute the following steps:

a) In SAP command prompt, Enter TCode # **SNOTE**


b) In the next screen, Click SAP Note Browser




c) Type in your SAP Note Number in the corresponding text field and click execute




d) Next Screen shows status of the SAP note


For a background, a SAP note could have any of the following seven statuses –

- Can be implemented
- Cannot be implemented
- Completely implemented
- Incompletely implemented
- Obsolete
- Obsolete version implemented
- Undefined Implementation State

# SAP Kernel Download & Upgrade

## What is a Kernel

- The Kernel is a central program which **acts as an interface between SAP application and operating system.**
- The Kernel consists of the executable programs that reside under the **path "/sapmnt//exe" (UNIX) or \usr\sap\SID\SYS\exe\run (Windows)**

- These files help startup the R/3 system, initialize the memory, create buffers and start managing the requests from users and effectively utilizing of hardware resources.
- The kernel is also responsible for starting and stopping all the application services like dispatcher, message server, collector etc

# Why Kernel Upgrade

SAP Kernel is the core of the application. Like all other applications, the Kernel contains the executable files (.EXE files for stating various processes in SAP).

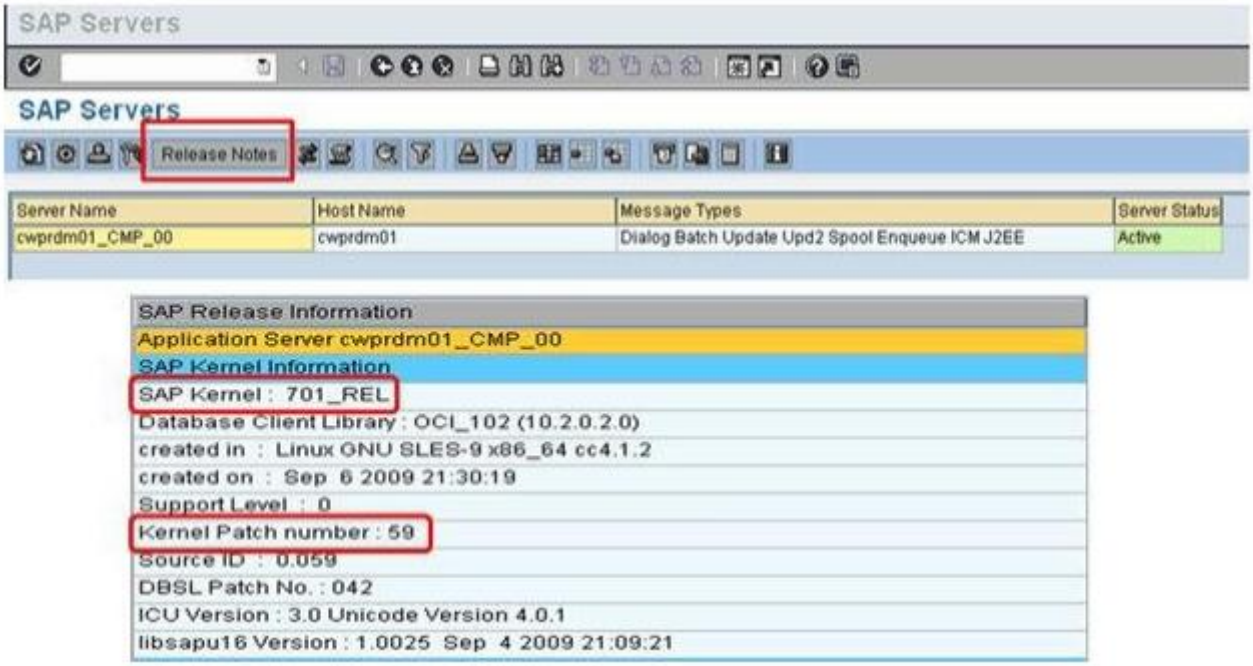
The Kernel is the heart of the operating system. It contains those files which are used to run every event in SAP. E.g.|: starting database, shutdowns of the database, starting sap, shutdown of sap, saposcol, to uncar the sap files etc.

That's the reason why when a Kernel upgrade is done it means new versions of the various EXE files replace the older versions.

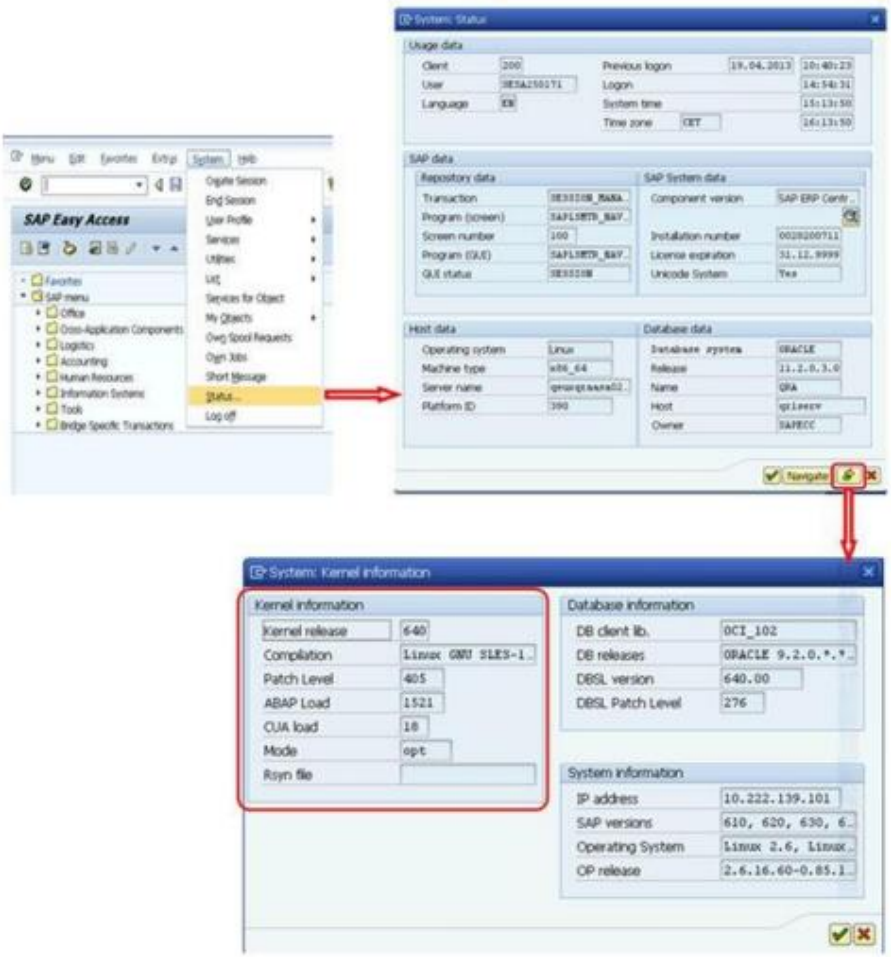
# How to check Kernel Version

There are many ways to check the Kernel Version

**Method 1)** Logon to SAP system and go to SM51 à Release Notes




**Method 2)** Logon to SAP system and go to **System** tab in the menu bar and select **Status**




**Method 3)** Logon in operating system, switch to user adm and give the command **disp+work**

You can also give **disp+work –version**

```
qriserv:qraadm 5> disp+work
-------------------
disp+work information
-------------------

kernel release                640

kernel make variant           640_EX2

compiled on                   AIX 2 5 00029F1AD300 for "rs6000_64"

compiled for                  64 BIT

compilation mode              UNICODE

compile time                  Jun  3 2012 20:48:23

update level                  0

patch number                  405

source id                     0.405

---------------------
supported environment
---------------------

database (SAP, table SVERS)   610
                              620
                              630
                              640

operating system
AIX 2 5
AIX 3 5
AIX 1 6
AIX 1 7
qriserv:qraadm 6>
```

# Download Kernel from Service Marketplace

- Go to "SAP Service Marketplace. " (https:\\service.sap.com) You will need your OSS ID and password.
- Then go to Downloads à SAP Support Packages -> Entry by Application Group -> SAP Kernel 6.00 64 Bit -> Select your OS (LINUX/WINDOWS/SOLARIS/AIX) -> Database Dependent and Database Independent Kernel Patch.
- Two SAR files SAPEXE.SAR and SAPEXEDB.SAR are downloaded from Service Marketplace.

Database Independent

Database Dependent: ORACLE

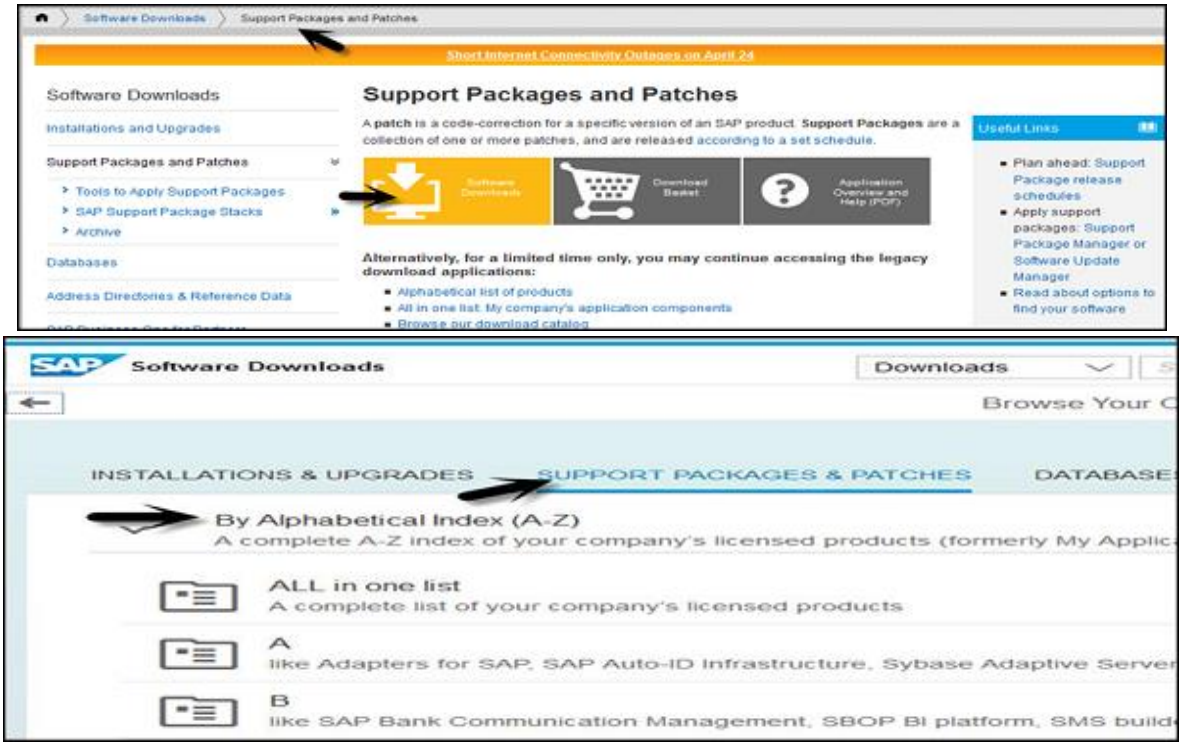
In UNIX, use **disp+work** – version to see information on the current Kernel version.

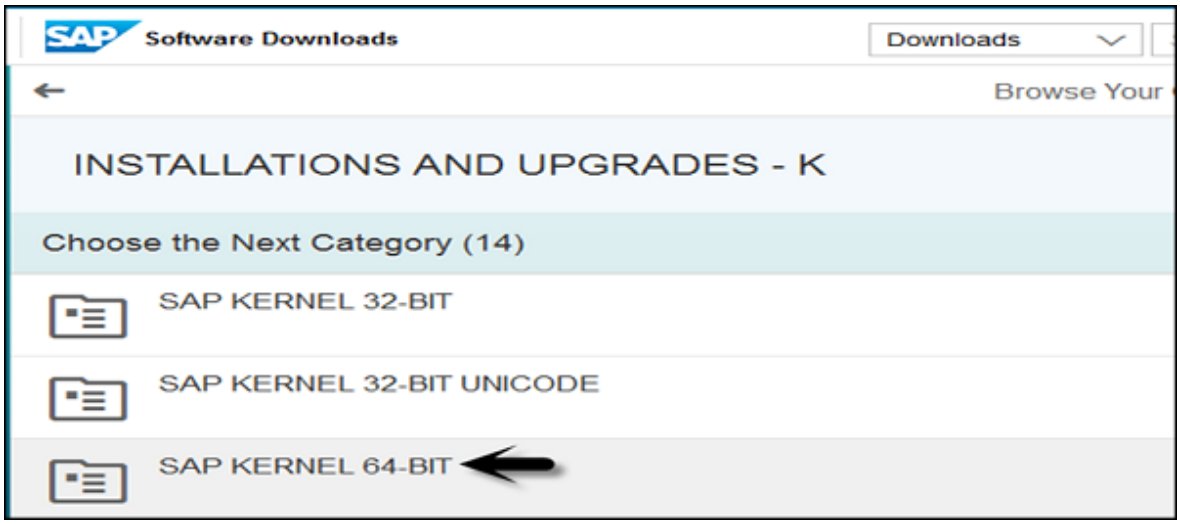
Follow these steps to **download Kernel from SAP Market Place** –

**Step 1** – Open URL — https:\\service.sap.com and login with SID and password.

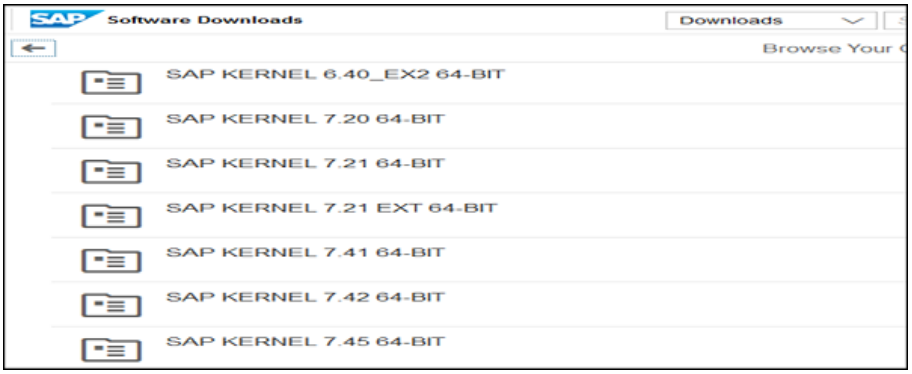
**Step 2** – Go to SAP Support Portal from dropdown → Software Downloads.


**Step 3** – Go to Support Packages and patches under software downloads. Go to Software Downloads.






**All Kernel Versions are available in 64-bit –**




**Step 4** – Select the Kernel version and download the files as per the Operating System – Windows, Linux, Solaris, AIX, and HP-UX.


## Upgrade Kernel Version

Let us now follow these steps to upgrade the Kernel version –

**Step 1** – Create a directory with enough disk space and enter the name of directory.

**Step 2** – Copy the upgrade files SAPEXEDB.SAR & SAPEXE.SAR files to the new directory at OS level.

**Step 3** – To check directory, use 'pwd' to ensure you are in the same directory.

**Step 4** – Now, uncompressed. SAR files by sapcar exe.

SAPCAR –xvf sapexe.SAR

SAPCAR –xvf sapexedb.SAR


**Step 5** – To take backup of existing Kernel, you have to create one more directory with the name "exe_old<ddmmyy>" and take backup of existing Kernel file.

**Step 6** – To perform upgrade, stop the SAP application. You don't need to shut down the database for Kernel upgrade but you need to stop the SAP application using this command — stopsap r3.

**Step 7** – Copy the files from the new kernel directory exe_new<ddmmyy → to the existing kernel directory exe.

**Step 8** – Use this command to copy — cp -rp /sapmnt/<SID>/exe_new<ddmmyy>/* /sapmnt/<SID>/exe/

**Step 9** – Now if you check the current Kernel version using disp+work, then check the kernel version from OS level by the command **disp+work – versions** and new patch version should be displayed.

**Step 10** – Login to the operating system as root specific to UNIX. Execute the script in Kernel directory — ./saproot.sh <SID>

You use this to assign correct permissions to all the executable programs in the kernel such as br* file etc.

**Step 11** – Start SAP Applications using this command — startsap r3.

**Step 12** – If you run Transaction SM52, you can see current kernel version level.

# Support Package & Stack Upgrade

## What is a Support Package

- When an end user of SAP finds a bug in the SAP product, he reports the same to SAP support. SAP programmers inspect the bug and develop a correction for the bug. **This correction is known as SNOTE (SAP Note).**
- With time, multiple end users, report bugs for which SAP releases SNOTE. SAP collects all these corrections in one place and this collection is called SUPPORT PACKAGE. This support package also includes enhancements to earlier versions of SAP.
- In simple words collection of SAP NOTES is called as SUPPORT PACKAGE.
- Support Packages are implemented in SAP system using Transaction SPAM (Support Package Manager)

## What is Support Package Stack (SPS)

The Support Package Stack is a list of ABAP and Java Support Packages for all software components (SC) included in SAP NetWeaver. It is used to bring each Software Component of SAP NetWeaver to a defined Support Pack (SP) level. Support Package Stack, commonly known as STACK bundles all required components

or individual patches that are already tested together and recommended applying as SPS instead of individual patch (until and unless you face some problem which requires certain components to be patched).

Go to http://service.sap.com/sp-stacks/, select your NW version to check the current SPS level and other details.

## Support Package Stack (SPS)

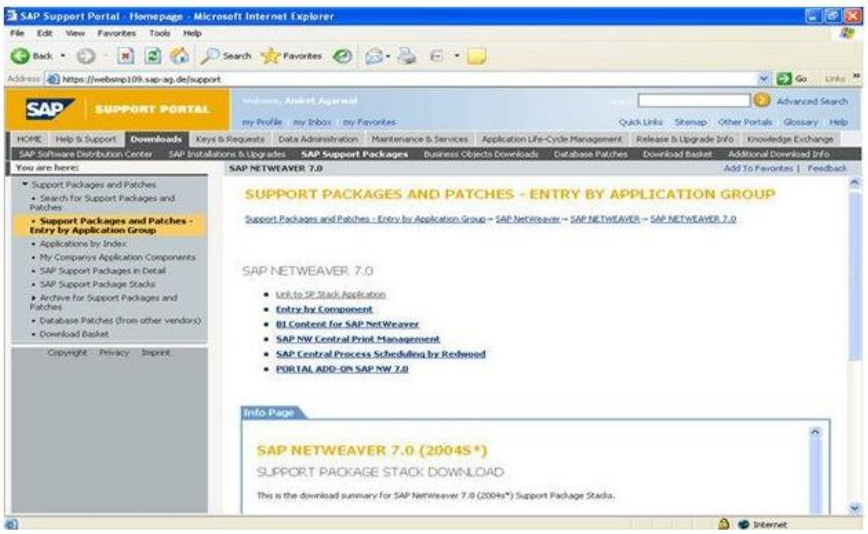
A Set of ABAP and Java Support Packages and patches for all software components are called as Support Package Stack. SPS used to bring the installed software to a specific level by implementing bug fixes that are already tested.
Go to http://service.sap.com/sp-stacks/, to check the current Support Package Stack level and more details. Support Package Stack technical name refers as a combination of "SAP" keyword, release number, and Stack number.
Each software component package has a separate sequence of Support Packages. The following list contains the components technical names and the notation for their Support Packages:
• SAP_ABA (Application Basis SP): SAPKA<rel><no>
• SAP_APPL (SAP APPL Support Package): SAPKH<rel><no>
• SAP_BASIS (Basis Support Package): SAPKB<rel><no>
• SAP_BW (BW Support Package): SAPKW<rel><no>
• SAP_CRM (CRM Support Package): SAPKU<rel><no>
• SAP_HR (SAP HR Support Package): SAPKE<rel><no>
• SAP_SCM (SCM Support Package): SAPKY<rel><no>

# Pre-requisites for Support Package implementation

- Support packages should be always applied in client 000.
- The user to be used for the support package implementation must have authorizations equivalent to DDIC or SAP*
- Call the transaction SPAM and see if any previous Support Package import is incomplete. You can proceed ahead unless the previous support package import is successful.
- Ensure that there is enough space in the transport directory. The transport directory is located at /usr/sap/trans

## Steps to Upgrade the Support Package

**Step 1:** Download Support Packs Support Packages are available in SAP Support Portal, under **service.sap.com/patches**



**Step 2: Loading Support Packages**

To load support packages, we have two options

**1. From Application Server**

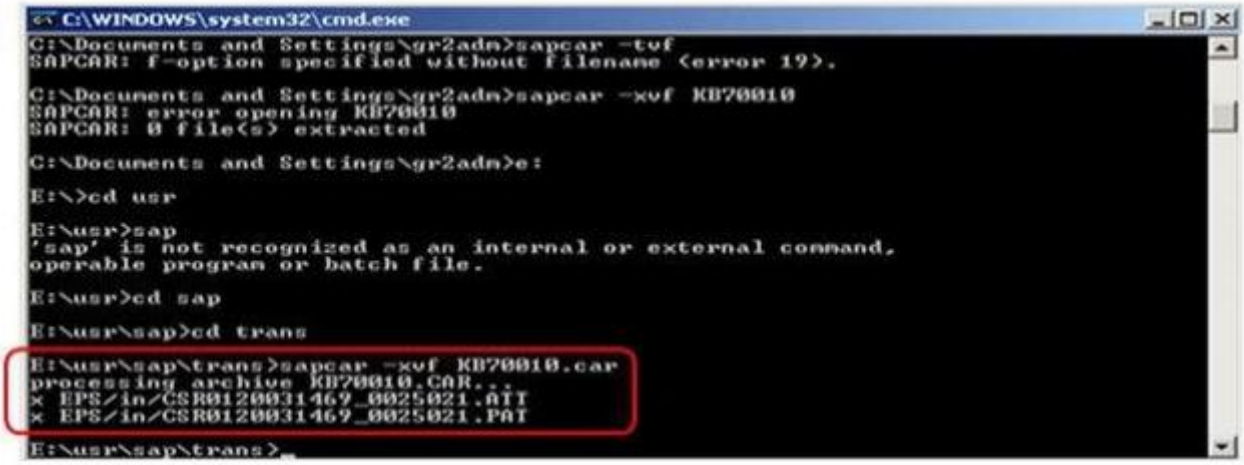
**2. From Front End**

## From Application Server

1. Download the support packages from service marketplace and save them at OS level in directory /usr/sap/trans.

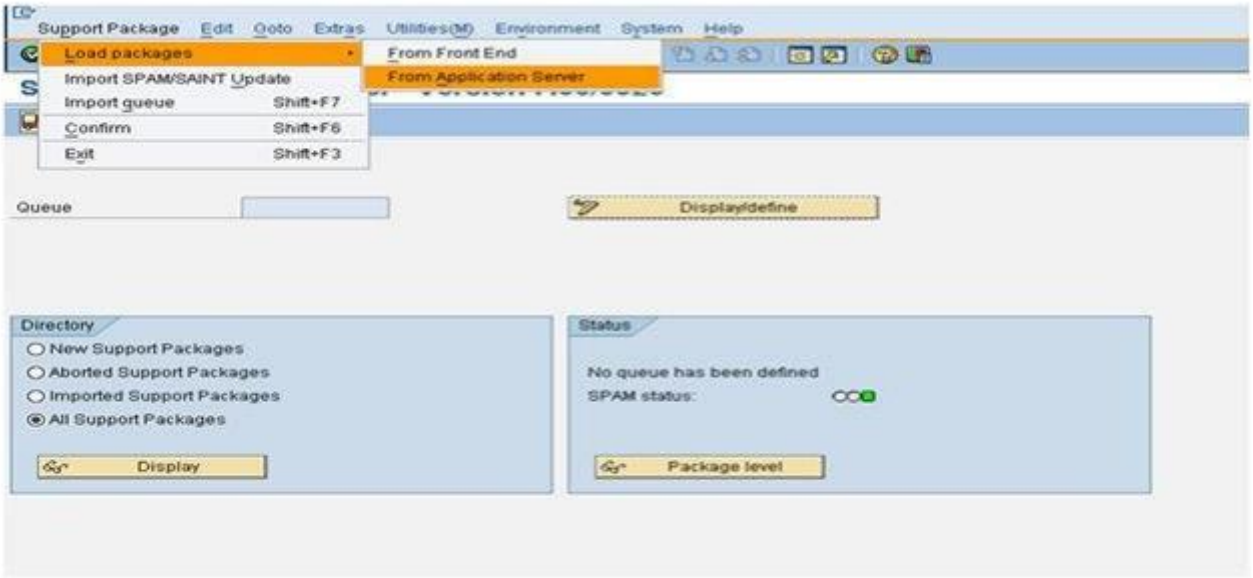
2. Uncompress these files using sapcar executable

```
sapcar -xvf <support package name>
```



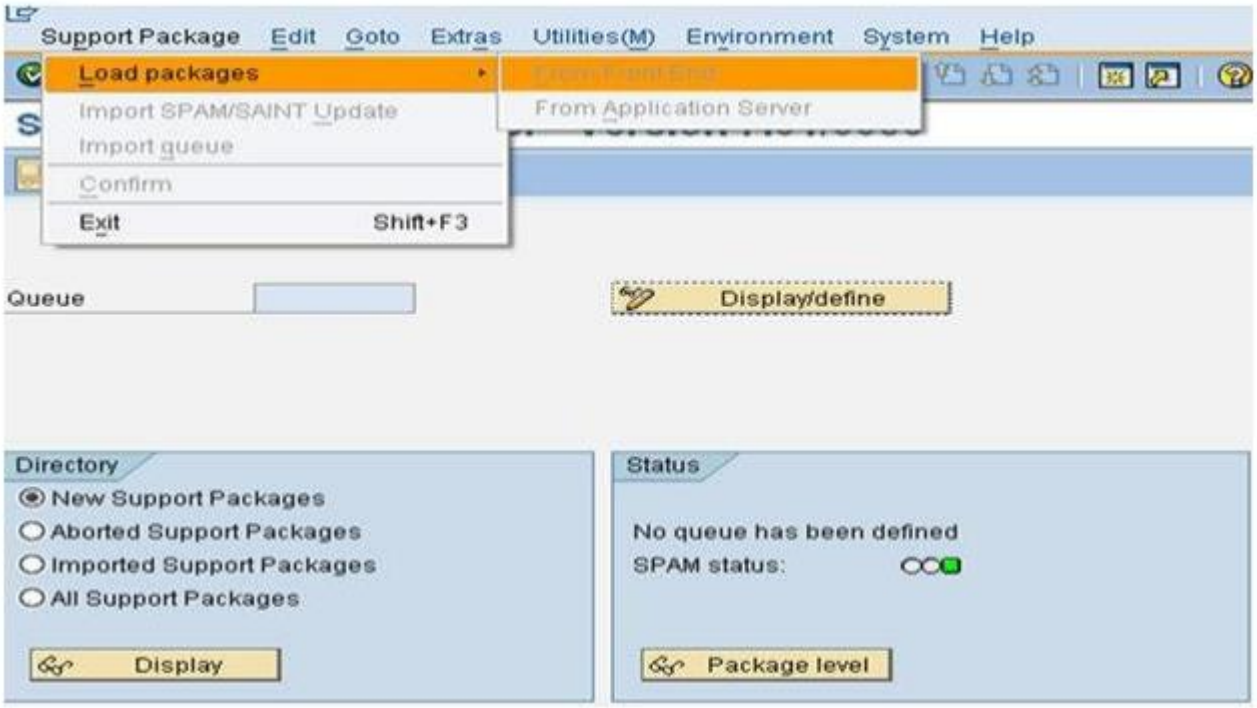

**After uncompressing the support packages at OS level the .PAT and. ATT files are stored in /usr/sap/trans/EPS/in directory.**

Next, load the Support Packages into SAP system by choosing Support Package -->Load Package --> From Application Server

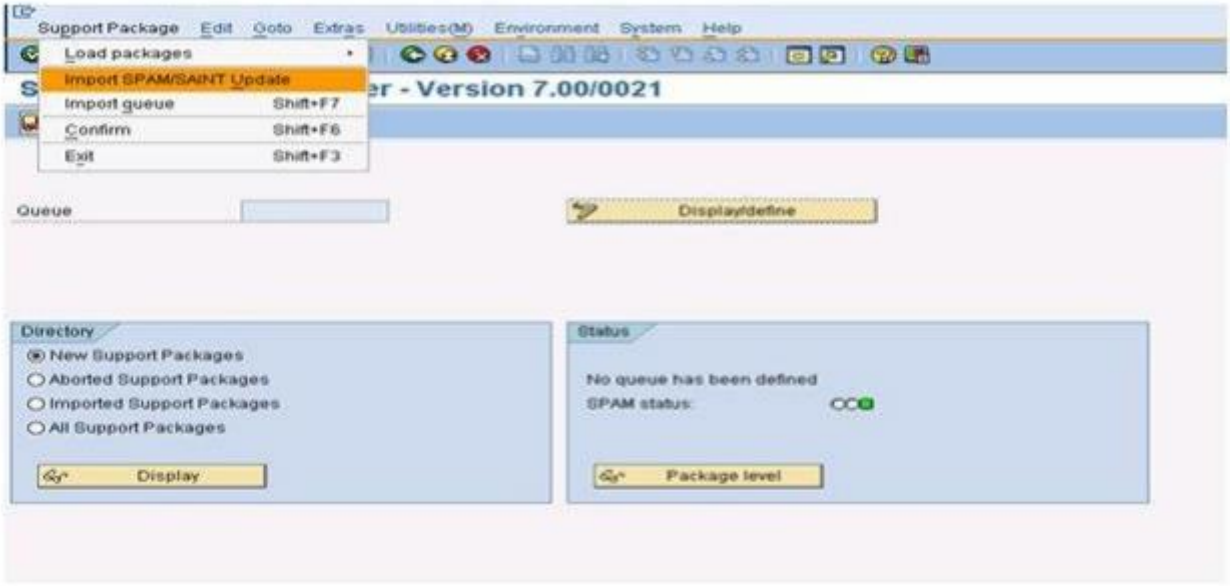


## From Front End

Choose Support Package --> Load Packages --> From Front End



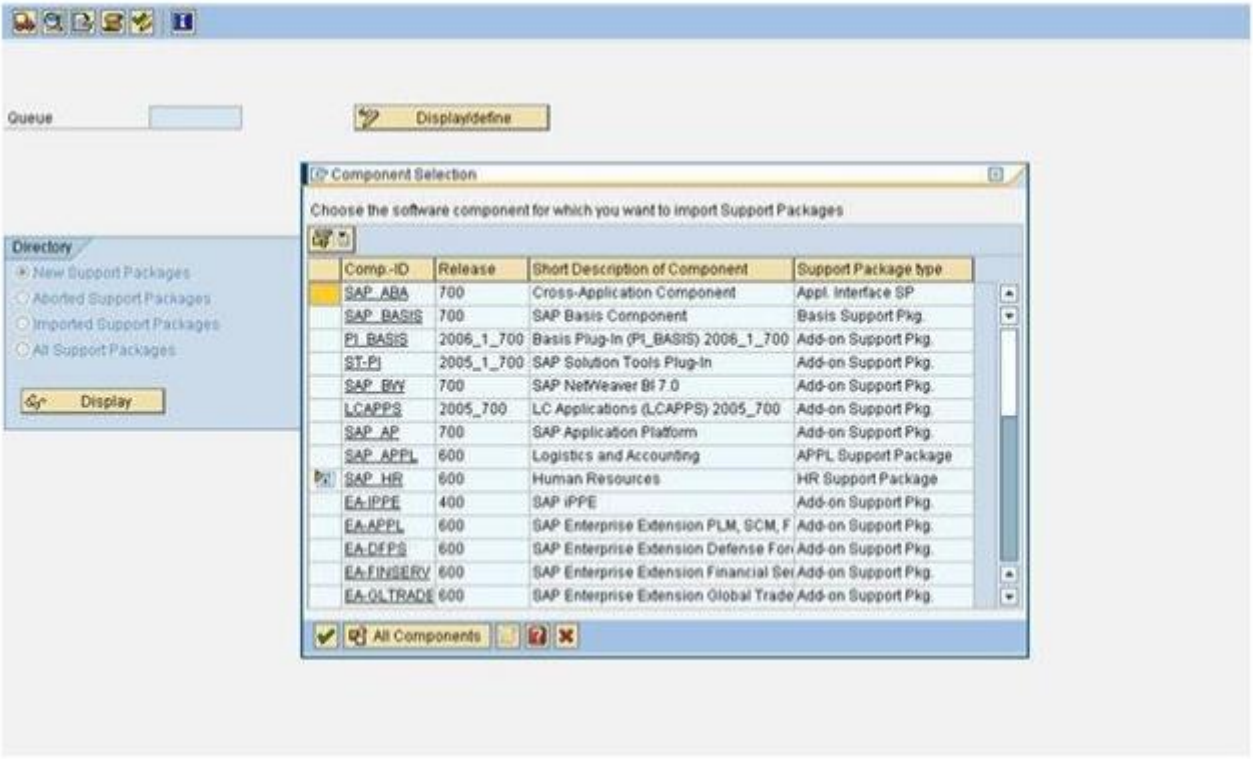

**Step 3: SPAM/SAINT Update:** A SPAM/SAINT Update contains updates and improvements to Support Package Manager (SPAM) and Add-On Installation Tool (SAINT). There is always one SPAM update for each release. SPAM/SAINT update is mandatory before any support package upgrade.



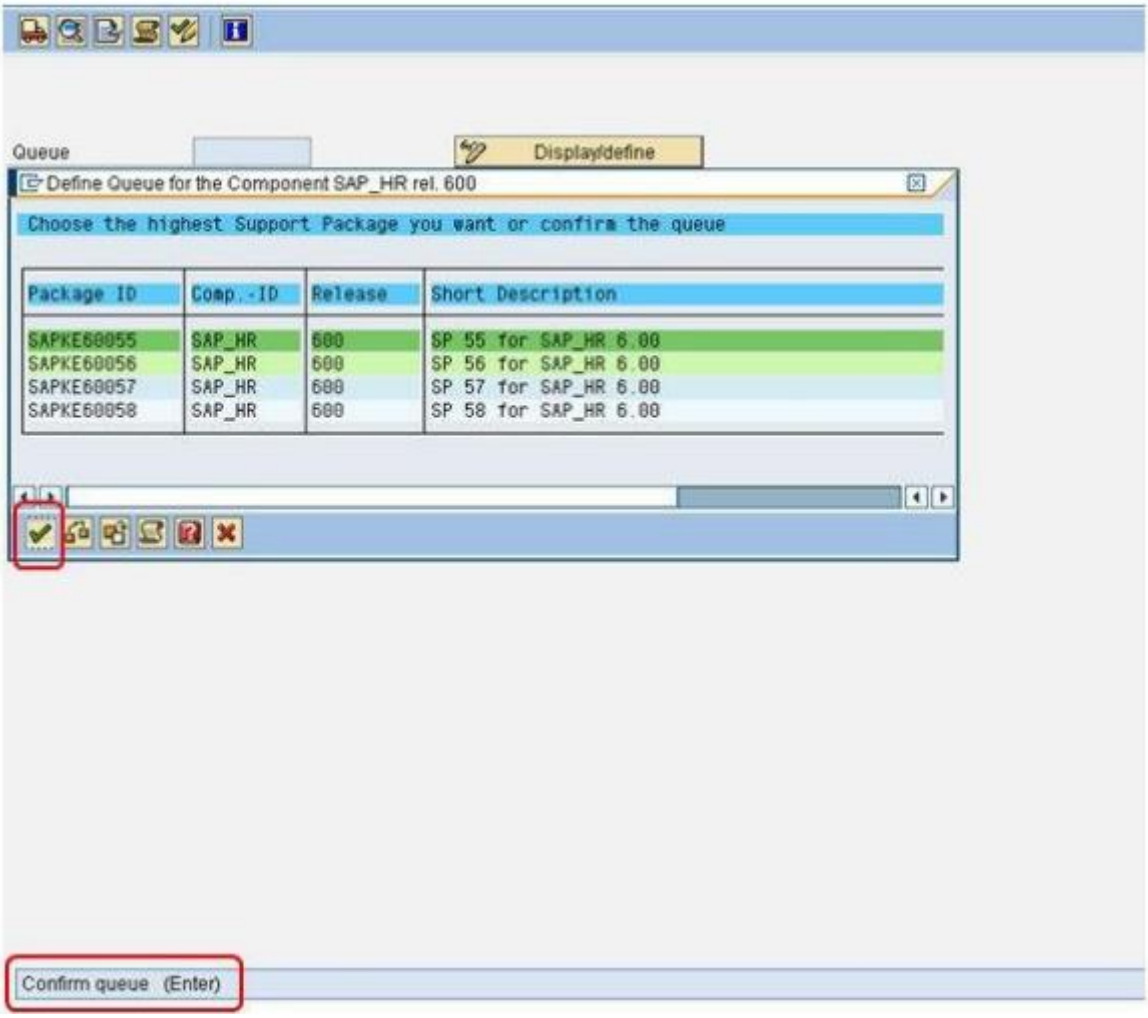

**Step 4:** Defining Queue contains the Support Packages available for the different SAP Components installed in your system. This Queue information is derived from the support pack uploaded in Step 2.

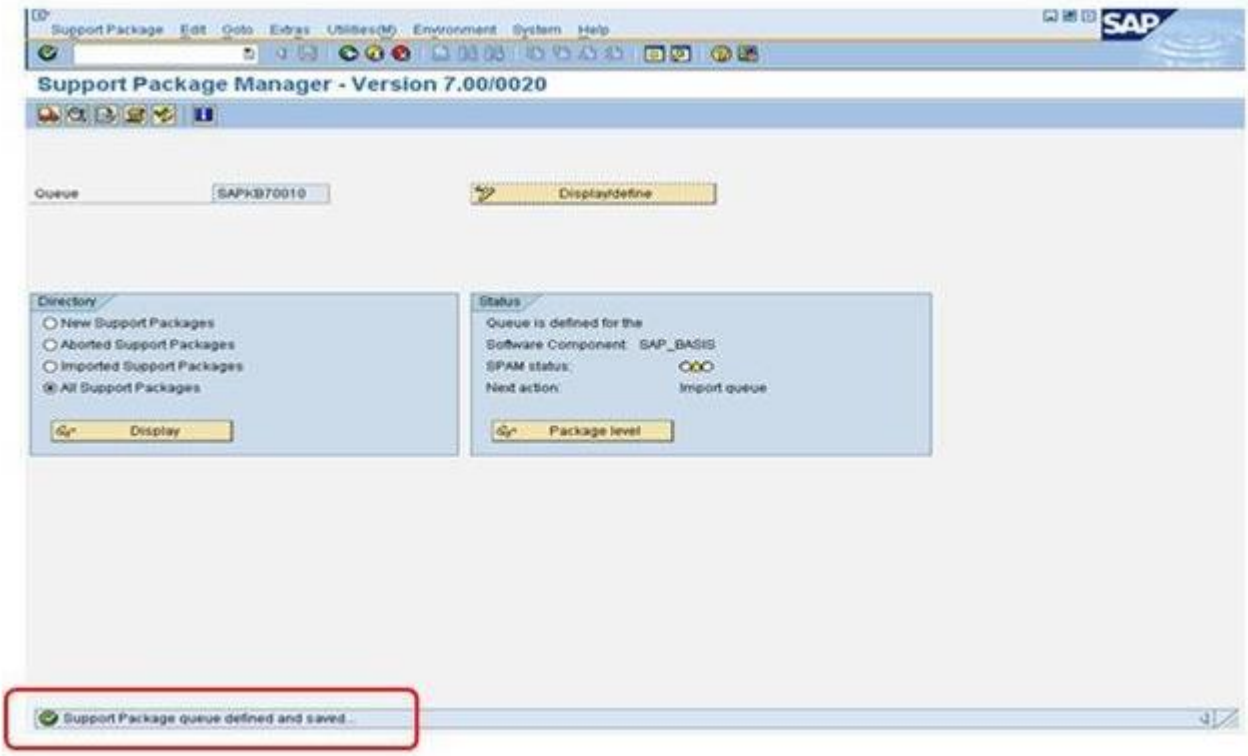
1.On the initial screen in Support Package Manager, choose Display/Define.

2.A list of installed software components (for example, SAP_BASIS, SAP_HR, SAP_BW) is displayed



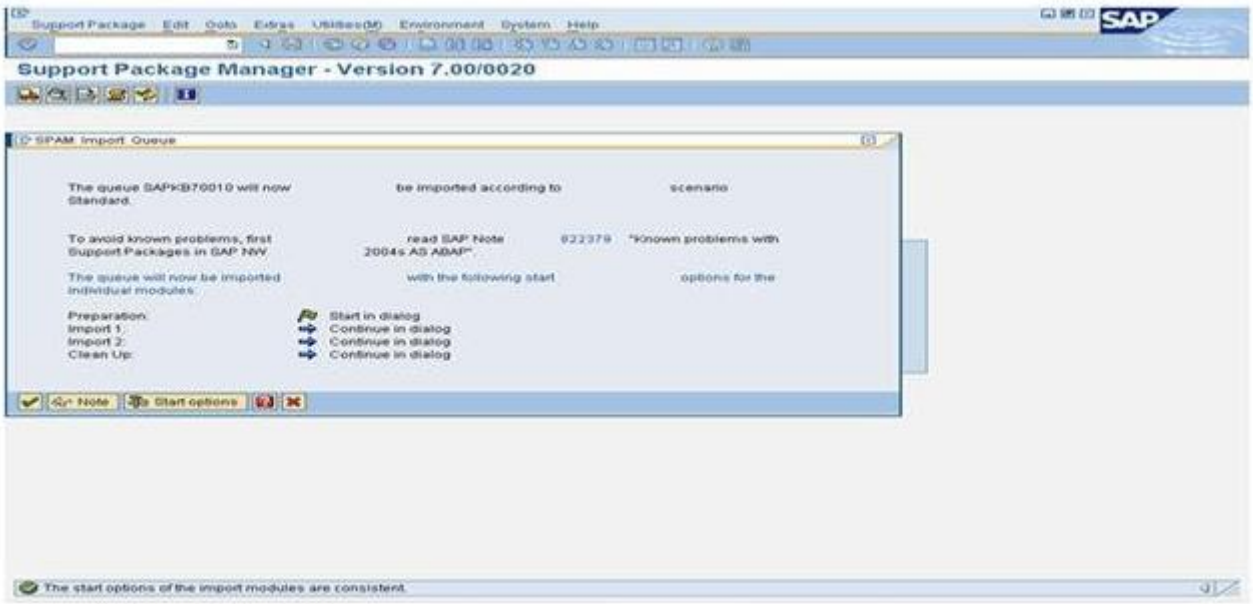

3.Once you select the required component, the current queue appears. This queue contains the Support Packages available for the selected component in your system. If you want to define the queue for another software component, choose Other Component. If the displayed queue meets your requirements, you can confirm it by choosing Confirm Queue


Queue
Display/define
Define Queue for the Component SAP_HR rel. 600
Choose the highest Support Package you want or confirm the queue
Package ID
Comp.-ID
Release
Short Description
SAPKE60055
SAP_HR
600
SP 55 for SAP_HR 6.00
SAPKE60056
SAP_HR
600
SP 56 for SAP_HR 6.00
SAPKE60057
SAP_HR
600
SP 57 for SAP_HR 6.00
SAPKE60058
SAP_HR
600
SP 58 for SAP_HR 6.00
Confirm queue (Enter)


Support Package Edit Goto Extras Utilities(M) Environment System Help
SAP
Support Package Manager - Version 7.00/0020
Queue
SAPKB70010
Display/define
Directory
New Support Packages
Aborted Support Packages
Imported Support Packages
All Support Packages
Display
Status
Queue is defined for the
Software Component SAP_BASIS
SPAM status:
Next action:
Import queue
Package level
Support Package queue defined and saved.

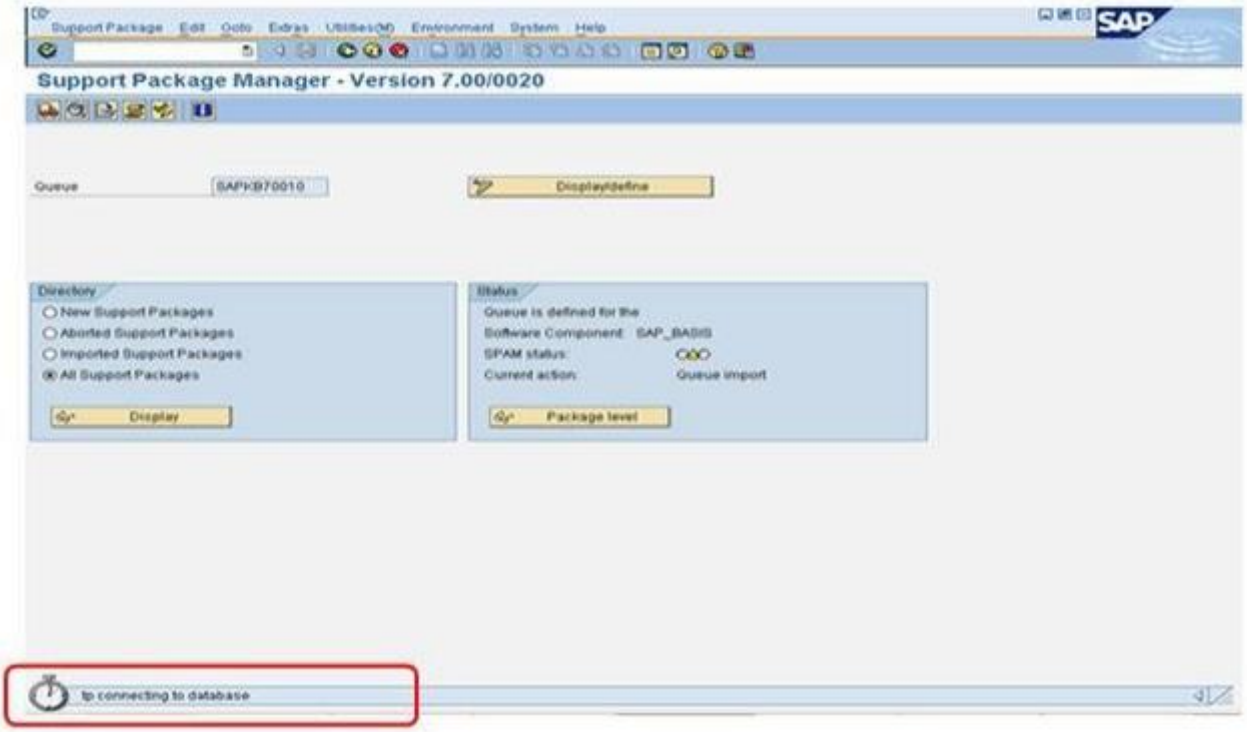
**Step 5:** Importing Queue. Once you a define a Queue (Step 4) while selecting a particular component (for which we want to upgrade support pack), we need to do 'Import queue' to start importing/applying that particular selected support pack (as per the standard SAP process).

Choose Support Package --> Import Queue




**To become familiar with known problems and issues, always read the note mentioned in above screenshot.**

The support package import has been started




**Step 6: Confirming Queue:**

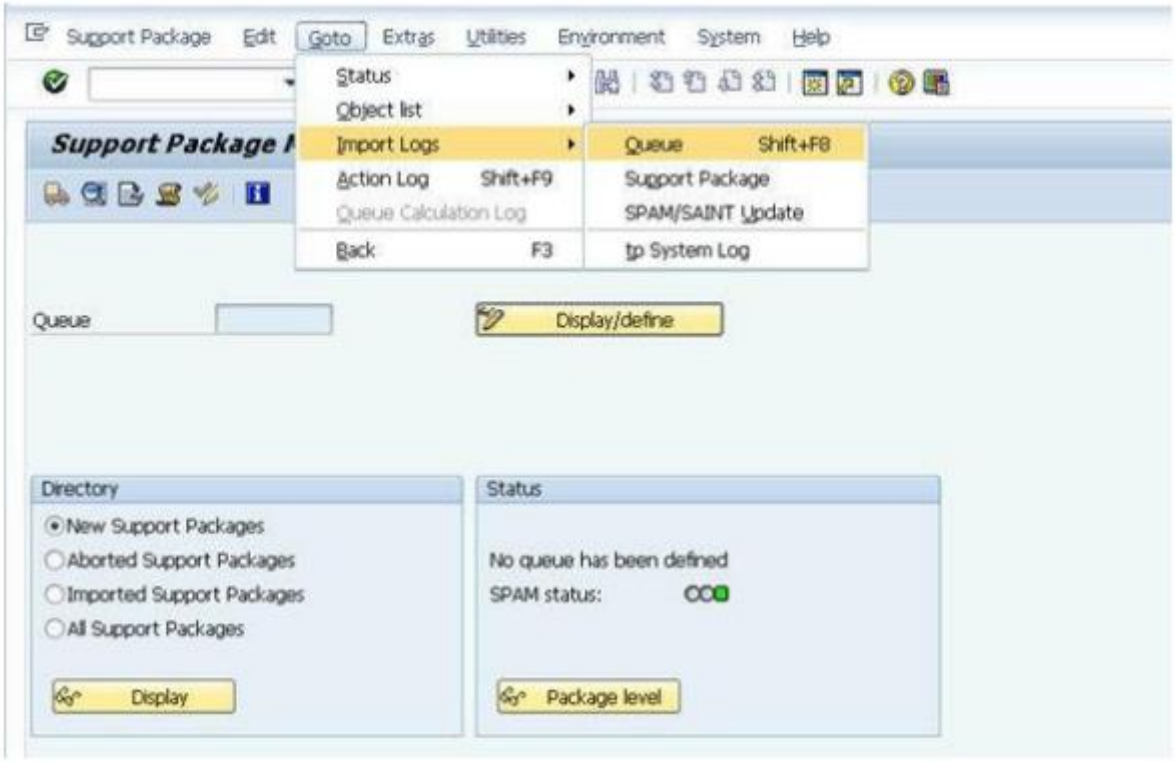
Confirm that the queue has been imported successfully into your system. This allows you to import Support Packages in the future. You will not be able to import Support Packages further, if you do not confirm the queue.


Once Queue has been imported, SPAM status becomes YELLOW

Confirm successful import of the Support Packages into your system by choosing Support Package à Confirm.


# Checking Logs

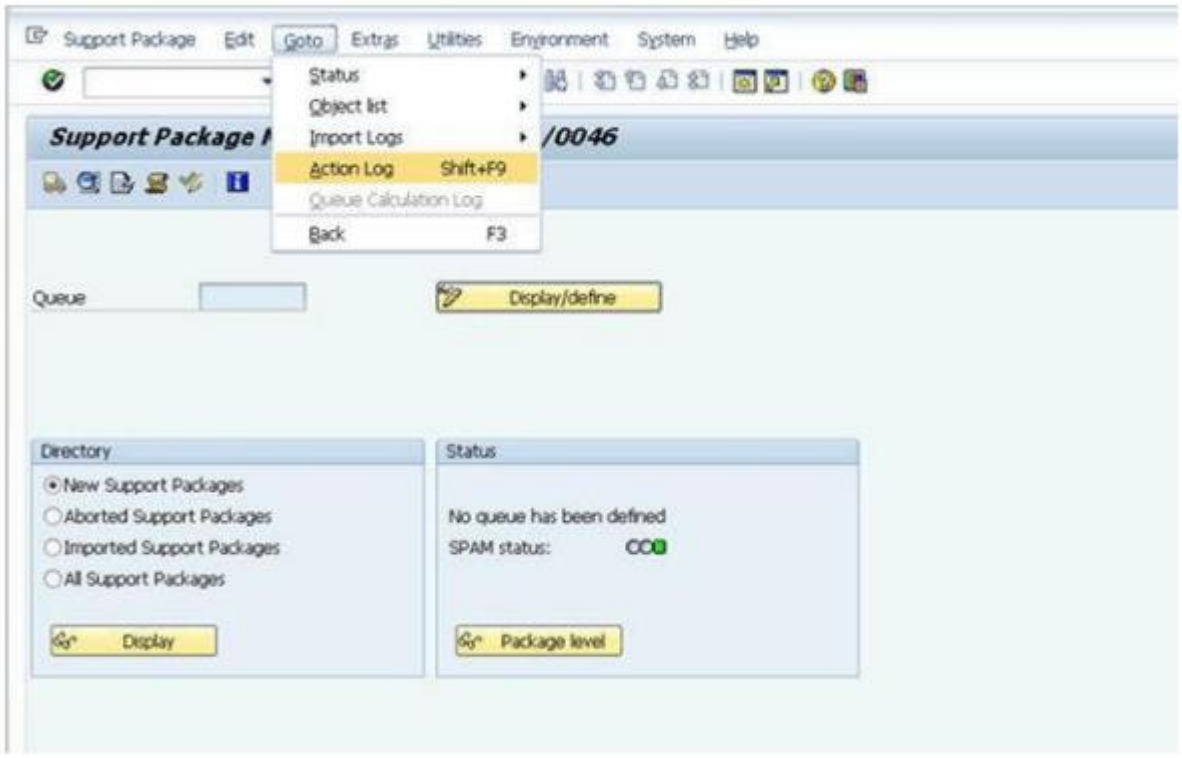
- **IMPORT LOG:** It displays logs for Support Package Manager Phases that are used by transport control program tp(transport control program). Go to-->Import log-->Queue



- **ACTION LOG:** It contains information about the actions that take place during the individual phases (while importing the current queue).

  It also includes information about the point at which a phase was stopped, as well as detailed error information.

  To display the logs for the current queue Go to-->Action log




- While the support packages are being imported, logs are made into the tmp directory (path: usr/sap/trans/tmp)
- Once the import process is completed logs can be viewed from the log directory (path: usr/sap/trans/log)

# Import SLL/TLS Certificates

In SAP, there are 2 main PSE where SSL/TLS certificates can be imported to trust an external API connection.

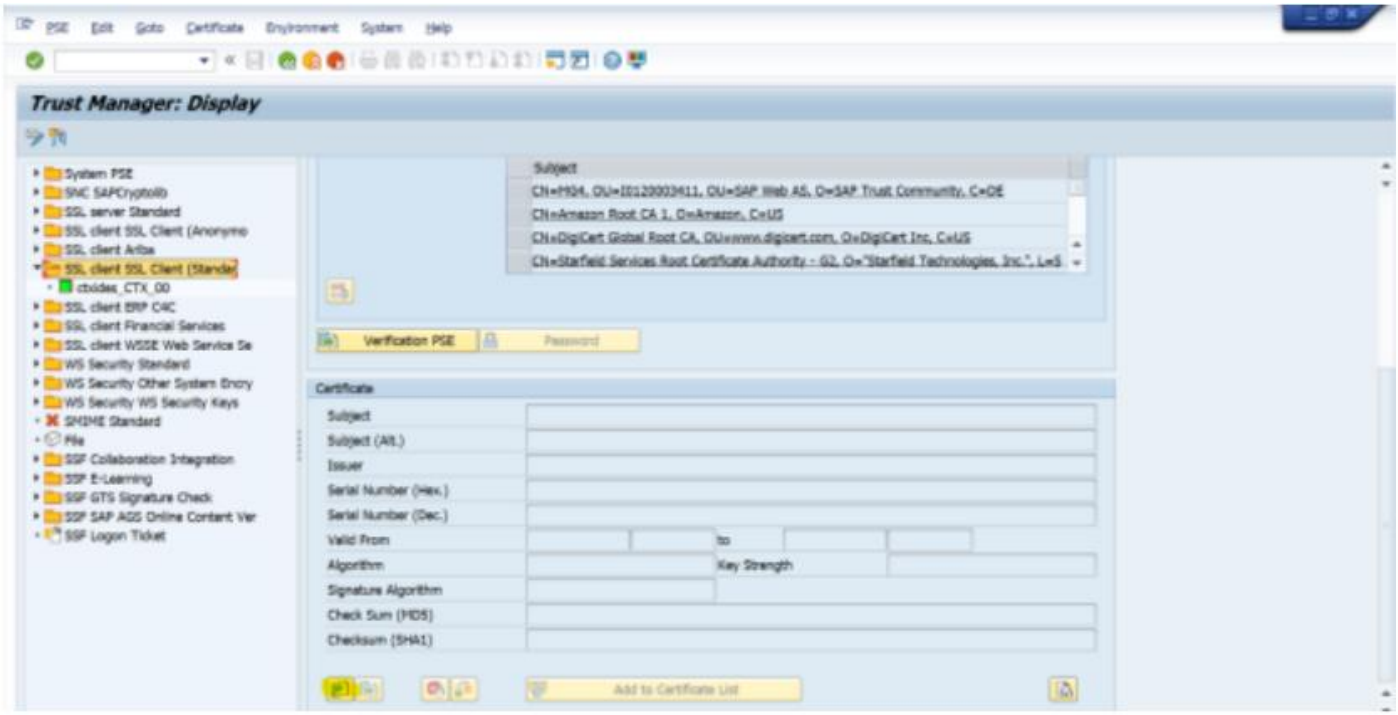
**1. SSL Client SSL Client (Standard)**

**2. SSL Client SSL Client (Anonymous)**

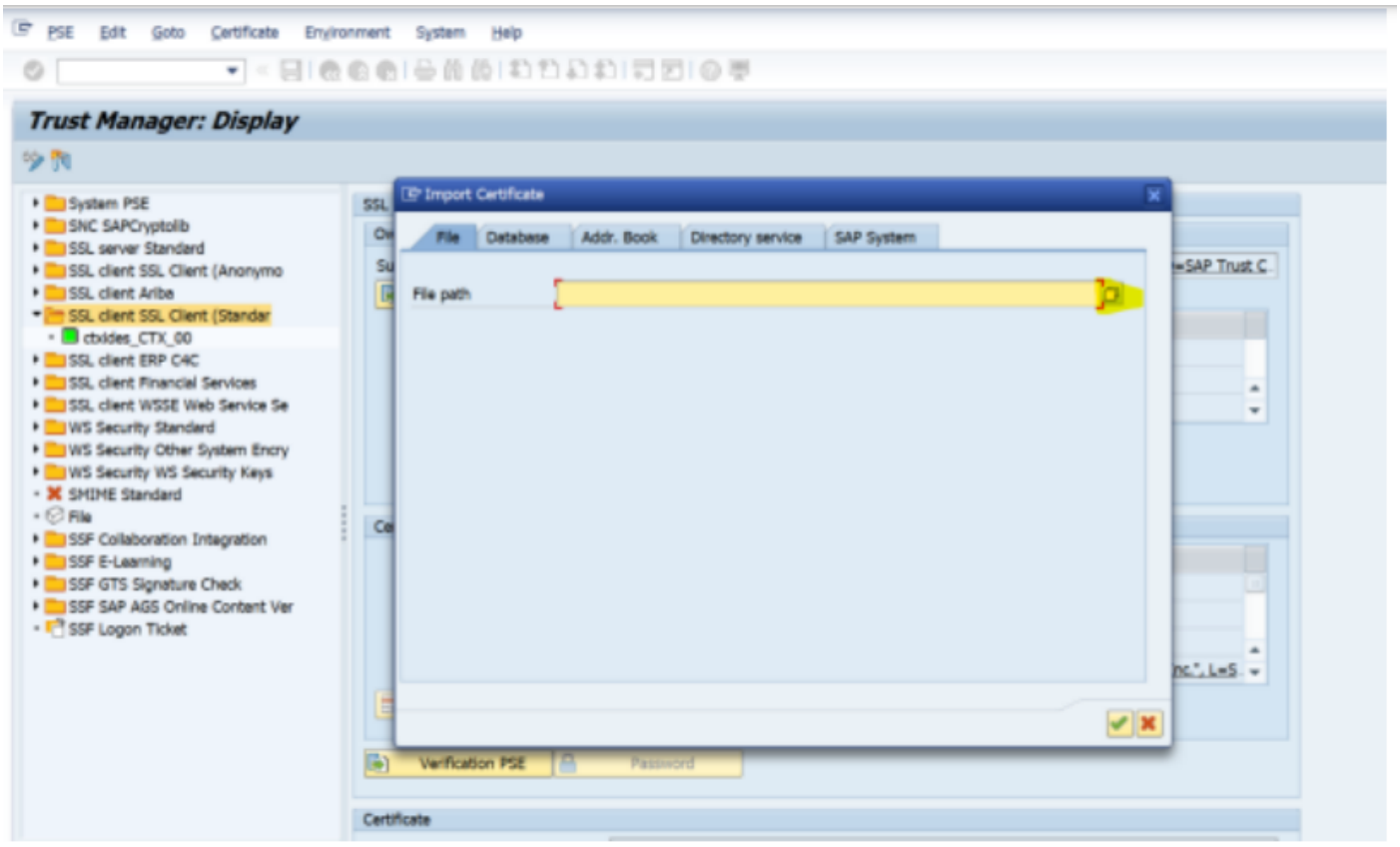
**Step 1:** RUN the T-code **STRUST** and select the SSL client SSL Client (Standard).

**Step 2:** Go to Change mode by clicking the Change icon, then scroll down to the bottom of the page and look for the Import Certificate option on the right-hand side, as shown below.

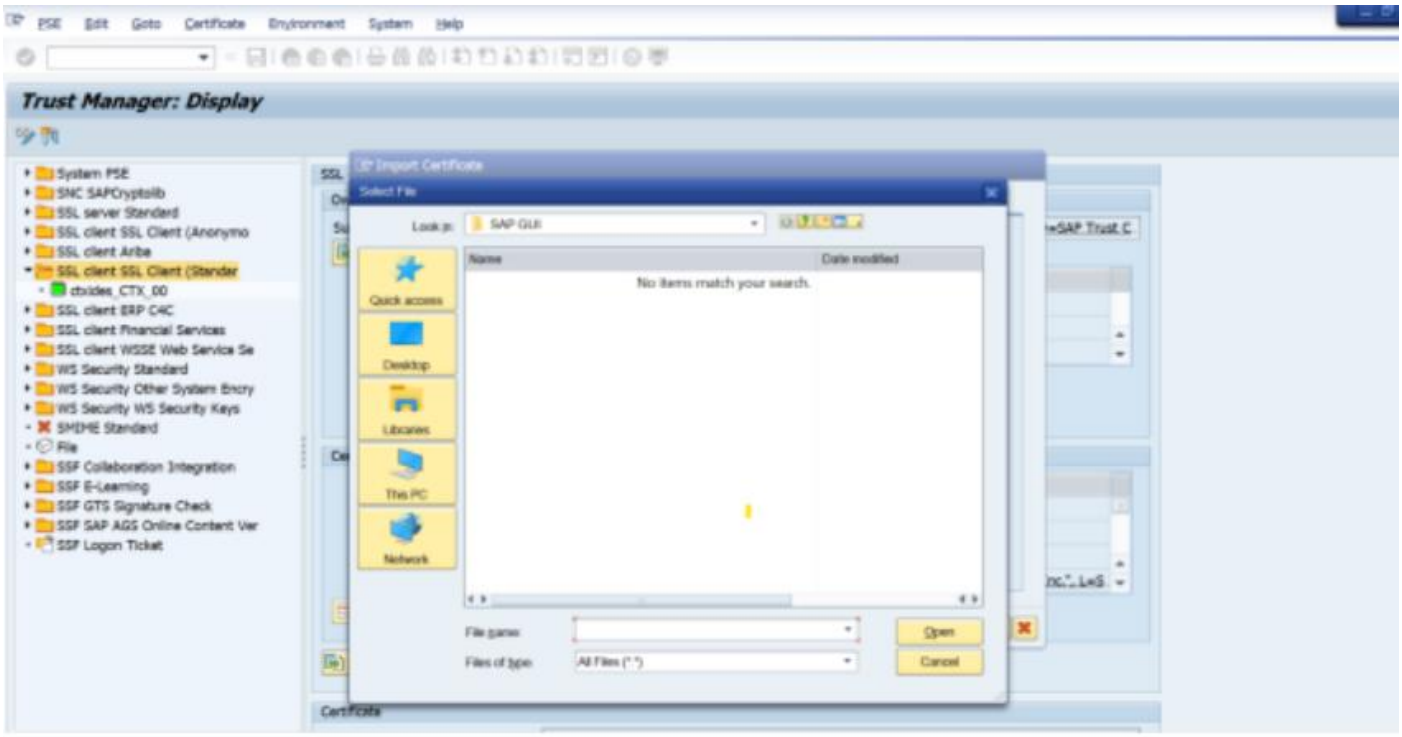
**Note:** Based on your program and configuration, one of the above PSE will be used. To be on the safer side, we recommend you to follow the below steps for both the above PSE one by one.



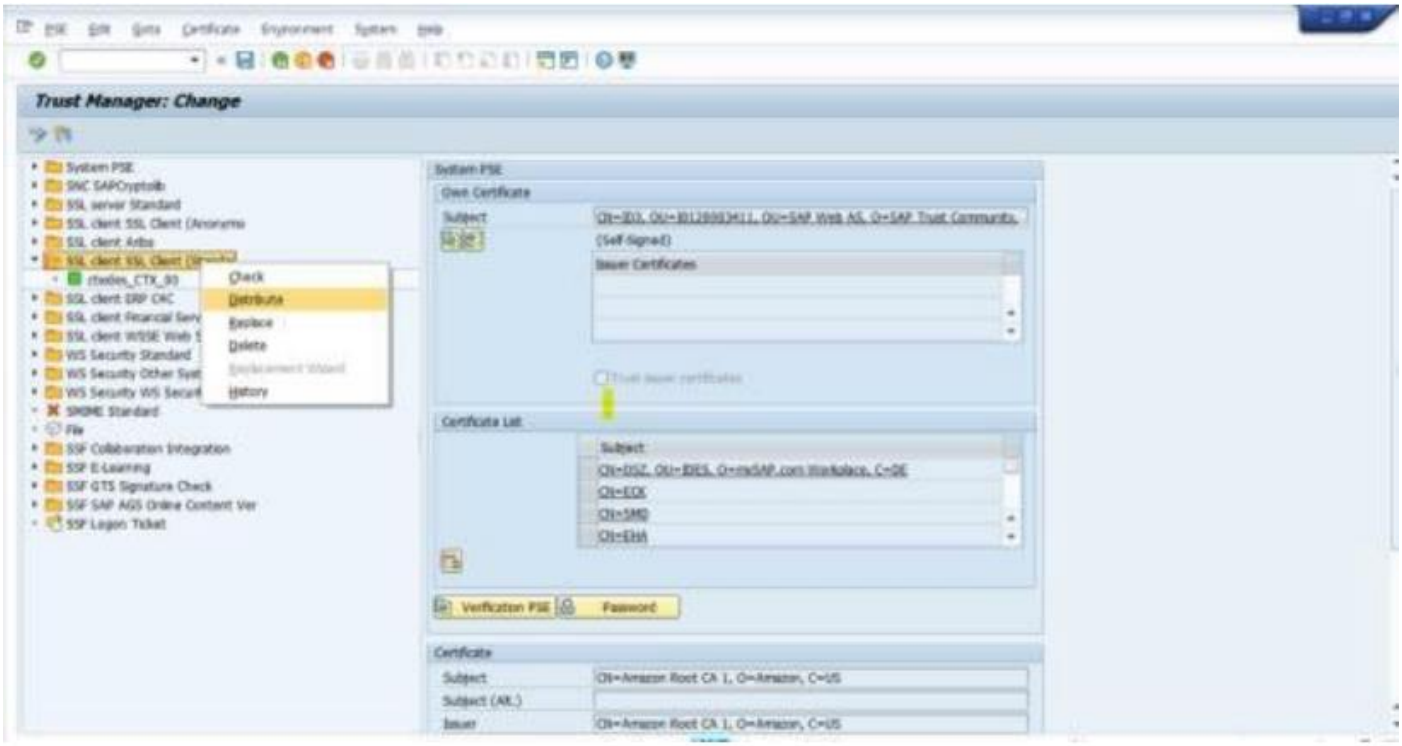

**Step 3:** Select the file path and then choose F4 to select the certificate from the local system.




**Step 4:** Once the file has been selected, go to the bottom of the page and click the Add to certificate button.




**Step 5:** Right-click the SSL client SSL Client (Standard) and choose Distribute from the menu.




**Step 6:** On the top, click the Save button, and you'll be able to see the certificates in the Certificate List.

**Note:** If you have multiple app servers, click on "PSE" from the menu, and then click on “Distribute” in the context menu. This will distribute the SSL/TLS certificate across all nodes.

## Q & A

**What is an SSL Certificate in SAP?**

An SSL (Secure Socket Layer) certificate ensures encrypted communication between SAP servers and other systems. It prevents unauthorized access to sensitive information during data exchanges.

**Why is it Used?**

*Data Encryption*: Encrypts data between clients and servers.

*Authentication*: Confirms that the entities communicating are legitimate.

*Compliance*: Ensures the SAP system meets security standards and regulations.

**What is PSE (Personal Security Environment)?**

The *PSE* is a digital storage in SAP that contains the system's public and private key pairs along with the SSL certificates. It's vital for managing your system's secure communication.

**When to Import an SSL Certificate?**

- After setting up a secure communication channel.
- When renewing an expired certificate.
- When updating or configuring a new communication partner.

**Where to Import SSL Certificates?**

You import SSL certificates into hashtag#STRUST (Trust Manager), which manages the PSE. You'll typically import:

- hashtag#Root certificates and hashtag#Intermediate_certificates for trusting external systems.

- *Client certificates* for your SAP system's authentication.

**SSL Client (Anonymous) vs. SSL Client (Standard)**

- *SSL Client (Anonymous): This type of configuration enables the system to establish an SSL connection **without requiring client authentication*. It is used in scenarios where the server doesn't need to authenticate the client, providing a less secure but functional connection.

***SSL Client (Standard): Here,** **both client and server authentication* are required. This ensures higher security, as the client must provide a valid certificate during the SSL handshake. Typically, *SSL Client (Standard)* is used in more secure environments where client identity verification is crucial.

**Key SAP Notes (Snotes):**

- *SAP Note 510007*: SSL for SAP Web AS ABAP.

- *SAP Note 2040649*: Configuring SSL for Web Dispatcher and ICM.

- *SAP Note 2284059*: SSL certificate troubleshooting.

*🔍 Important T-Codes: *

1. STRUST: Manage PSE and certificates.

2. SMICM: Configure the Internet Communication Manager (ICM) for SSL.

3. RZ10: Edit and maintain system profile parameters for SSL configurations.

## Common Issues & Solutions

**1. Expired SSL Certificate**

*Solution: Regularly check the certificate expiry in **STRUST* and renew it before expiration.

**2. Incorrect SSL Configuration**

*Solution: Double-check profile parameters in **RZ10* and follow the steps in *SAP Note 510007*.

**3. SSL Handshake Failure**

*Solution: Ensure the cipher suites and SSL versions are aligned between client and server. Troubleshoot with **SMICM*.

**4. Certificate Not Trusted**

*Solution: Import root and intermediate certificates into **STRUST* PSE. Use *SAP Note 2040649* for guidance.

# DB Refresh

## Pre Activates

Export TR's list from QAS & PRD make a list of differential TR's.

Take Backup of User and Profiles

Take Backup RFC Connections

Present QAS Backup

Present PRD Backup

## Post Activates

User Master Profile will be restored back

RFC Backup will be taken and restored back

Differential TR's Importing: TR's which are there in QAS and not yet imported in to PRD will be reimported in to QAS back

Delete all Jobs in QAS

*Please recheck **RFC, SSL**

1. Stop SAP Application
2. Login in to SAP HANA STUDIO and Keep Recover Tenant Database to QAS server.
3. Start SAP Application
4. Slicense apply SAP license
5. Stop Background Jobs.
6. Stop SMTP
7. Delete Backup Schedule
8. STMS Configuration