Problem Solving Methodology for Technical Issues within SAP Landscape

Applies to:

SAP Netweaver Platform (Any version). For more information, visit the Landscape Design and Architecture homepage.

Summary

Common Methodology to be adapted while working on different technical issues in SAP system as this will help to get near to the solution and will also make sure you are on the right track.

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Author Bio

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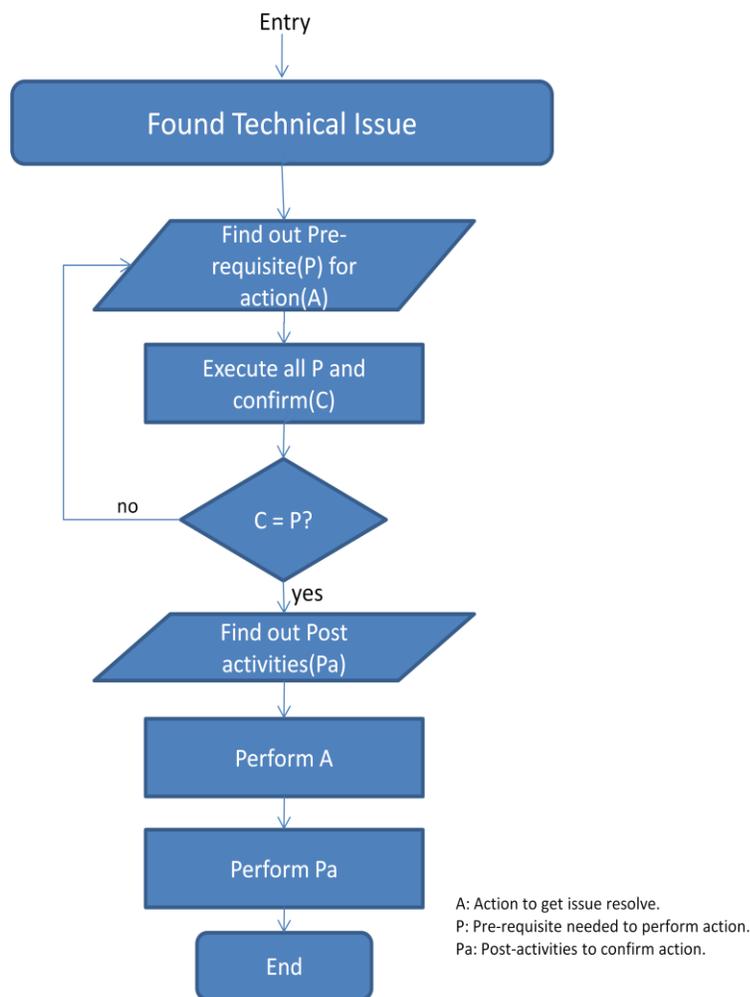
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Introduction

While working on technical issues you would have encountered several situations to which you have never been into. For such issues we need to apply common methodology to at least get near to the solution.

The most important thing which I would like to share with you here is "way to solve different problems on SAP system". As per my analysis we had invest a lot of time in finding final solution rather than working on root cause as most of the time we have been asked to provide solutions immediately. During this we do miss important steps or sometimes repeat previous mistakes. Below are few scenarios extracted from my day-to-day activities, which you too would have come across while working on SAP. What you should more focus on is "Pre-requisites" and "Post activities" and not on "Action" items. If you read them carefully you will analyze that the more pre-requisites checks leads to less action items and more Post activities steps will lead to nearly no escalations.

In below document you will find less technical details and more pragmatic approach to handle technical task which can be also applied to any other technology platform as they are very generic.

Entry

Found Technical Issue

Find out Pre-requisite(P) for action(A)

Execute all P and confirm(C)

C = P?

no

yes

Find out Post activities(Pa)

Perform A

Perform Pa

End

A: Action to get issue resolve.
P: Pre-requisite needed to perform action.
Pa: Post-activities to confirm action.

Algorithm for Problem Solving Methodology

Topics

Moving Objects to Development System

Pre-Requisites:
- List of objects should be very clear before starting this activity.
- Objects to be moved should be in active state and get it confirm by Developer.
- Proper authorization needs to be assigned in target development system.
- Source System should be locked for any new development during the activity.
- Target system should be unlocked for new development objects.

Actions:
- Create merge request following basic guidelines of transports ex: collect objects via packages or software component.
- Check merge request with development team to confirm their objects.
- Release merge request and import in target development system.

Post Activities:
- Check logs of request imported.
- Distinguish error between object related and system specific.
- Inform development team for object or syntax errors.
- Confirm namespace and software components are open for developments.
- Change DDIC tables entries in target system, source system column data should be the same as of System ID. This will allow objects to be editable.
- Make sure source system objects are locked for any new development, based on object release strategy.
- Try to edit new objects and create transport request from it.
- Request development to release request and see if they are able to do regular development task.

     Reference Link: Merging object list

Solving Missing Authorization for Development

Pre-requisite:
- Check business requirement for missing role. Get more info from functional consultant.
- Check what was previous roles assigned to users whose assignments are missing now.
- Roles which are required should meet system type requirement.
- Request developer to execute SU53 for missing objects in user profile.
- Check in SUIM if missing objects gives output with proper roles.
- Check if missing roles meet user's business work assignment.
- Check if user does not have any admin access to delete roles.
- Check in SUIM if role was deleted purposely by different user.

Actions:
- If system is connected to central user admin then assign roles from CUA.
- If system is not connected to CUA assign role via SU01 in target client.
- Assign validity for user roles specific to system type and user's work assignment.

Post Activities:
- Generate role from PFCG and do user comparison
- If connected to CUA make sure distribution is triggered.
- If it's mass distribution then schedule job for night activity.
- Check if other users are not disturbed in case of CUA distribution.
- Ask developer if he is able to proceed with his activity after distribution.
- If still he gets error ask again for SU53 trace and get any missing business requirement left to check.

    Reference Link: Administration of Users and Roles

ABAP Transports not reaching target systems

Pre-requisite:
- Know landscapes transport domain.
- Target System should be connected to transport domain.
- Transport request and task are in release state with no error in logs.
- Make sure Import job in target system finished with no error.
- Transport admin user is not locked.
- Transport RFC is connected and tested successful.
- Transport log directory file is not full.
- Usr/sap/trans exist as it required for tp to function.
- Check cofiles and data under trans folder, they should have r/w access to get import.

Actions:
- Import request in target client using STMS.
- If target client is not accessible import via OS level using command tp import <T11kxxxxxx> <xxx> U<xx>

Post Activities:
- Check logs of transport import. Make sure all import steps are executed properly.
- Check objects of request in system via table or reports.

Reference Link: Transporting configuration data

System Performance Check

Pre-requisite:
- Number of instances configuration to be known.
- Enqueue and replication server configuration to be known.
- Cluster environment to be known.
- Database configuration to be known.
- Database archiving configuration to be known.
- O.S level command prompts to be known.

Actions:
- Look for red alerts or long running work processes.
- Check imports have run successfully and no long running imports in active.
- Check if you find repetitive dumps and report it to development to get it fix.
- Check work process logs for DB specific issues.
- Check if all instances are in active state and response time are average.
- Check TREX engine and Livecache are activated.
- Check if you find any swaps increased beyond buffer threshold values.
- Login to portal and see if any work center dumps.

Post-Activities:
- Trigger backend query from BO for ex: sales data to see if data is retrievable.
- Trigger frontend query from business user for ex: open sales work center and create new order.

Reference Link: Technical system landscape

                          NW AS ABAP High Availability

Reaching out to dump root cause

Pre-Requisite:
- Repetitive dumps needs to check thoroughly, via overview tab in ST22.
- Check to which component dump belongs to.
- Information on where terminated is displayed in dump details, this will give program name.
- Source code extract will give after which functional module dump has occurred.
- Note down functional module and check to which package it belongs to via Se38 dictionary objects.
- Is dump occurring on single system in landscape or across the landscape.
- Is dump occurring with specific user, then check user related background jobs.
- Is dump related to system or application.
- Does your system performance is hampered due to dumps.

Actions:
- If not system specific dump then raise issue to component of package to which this dump program belongs to.
- Check SAP notes available for similar dumps and apply note, make sure software versions and compatibility of Note prerequisites are same.
- Get fix delivered to this system by transport or installation of components.
- If system specific dumps then check for users, background jobs and work process in detail.

Post Activities:
- Make sure fix applied is also delivered to other systems in order to avoid issue later on.
- Do not forget to check next day for similar type of dumps reoccurring.
- Bring in notice to development leads about application dumps as it hampers system performance.

Reference Link: ABAP Dump Analysis

Deployment of components

Pre-Requisite:
- Get business requirement clear from functional consultant before going forward.
- Status of components in source system should be locked and in to be deployed state.
- Version compatibility needs to be checked for source and target system.
- If found any mismatch, make sure you have taken approval from SAP experts before implementing.
- Check if you have user access in source for deployments.
- Steps for testing component in target should be in hand.
- Know the path where component SAR/CAR file would be stored, if its ABAP objects.
- Make sure no upgrade or transports are running in target system.

Actions:
- Login to admin client of target, use SAINT to install ADDON or SPAM for component.
- Execute in background mode if possible to not disturb active user task.

Post Activities:
- Check logs in details, if found any error check in detail.
- Ask developer to check logs and correct errors if found.

- Activate objects if any required.
- Ask functional consultant to cross-check functionality is available or not before you roll it out closing activity.

Reference Link: Viewing deployment related logs

NW AS Java High Availability

Setting up system in landscape

Pre-Requisite:
- For what purpose system is required, can existing system be used, if not then why.
- Before committing date to development or client make sure you have checked hardware availability.
- Find out what exact version of each component within system is required.
- Download all software related executables from Market place and store it on central sever in which you have admin access.
- Decide to which transport group it should belong to and its delivery path.
- Installation guide should be gone thoroughly at least once.
- Make sure you have SAP support ready in case of major issues reported.

Actions:
- Mount your shared files on server to which you need to Install software.
- Start installation referring installation guide.
- Do not skip any step which is required for business to run on installed software.
- Record every error in order to create proof of incident.

Post Activities:
- Start technical configuration, bring it to transport domain.
- Start business configuration.
- Create business users as well as admin users.
- Apply merges to bring system in sync with other systems in landscape.
- Connect system to solution manager.
- Adapt system parameters as per system load expected.

Reference Link: Central landscape and Transport Management

Single Point of Failure

Finding out issues with dispatcher

Pre-requisite:
- Check what kind of logon group policy is applied in backend.
- Know your landscape web dispatcher and ICM settings.
- Check ICM services are activated.
- Check ICM parameter in instance profile.
- Check HTTP request or JSP or BSP request has issues using tool ex: SMICM.
- Check Logon group has been defined for URL.

Actions:
- Go to transactions for ICM and check its status.
- Restart ICM services.
- Check web dispatcher admin URL able to open.
- Change ICM parameters if required and restart all instances.

Post Activities:

- Login via URL and see your user gets instance access, try in parallel with different user.
- Login via SAPGUI with logon group and see your user gets instance access.
- Check in work process summary transaction users are distributed to various instances.

Reference Link: SAP WebDispatcher

Setting system profile parameters

Pre-requisite:
- Check what's standard recommended value from SAP support team for specific parameter.
- Is that standard value needed to apply all instances of SAP system or only specific instance.
- Is that value needed to apply only in one system or others too required in landscape.
- Make sure user has auth to change parameter settings.
- Will that help to all users or only to specific ones.
- Make sure your hardware configuration is capable to handle the new value of parameter.
- If restart required, inform development and users in well advance, keep approval ready.

Actions:
- Change parameter value either from backend or O.S.Level.
- Activate instance to make sure changes will get reflect.
- Restart system during low load.
- Set system message before restart.

Post Activities:
- Check if parameter is reflected in all instances after restart.
- If it was requested by users, ask them to test the changes.
- If it was admin requirement check system is running properly after new value changed.
- Apply same changes in other systems too in the same landscape, if in future it needs to.

Reference Link: Changing and switching profile parameters

Fetch specific entries from tables and transport

Pre-requisite:
- Should know what's impact after import request in target.
- Check with developer what kind of entries from table they want to move.
- Note down each individual entries from table in a separate excel and get it cross check.
- Find out which keywords are common within all table entries.
- They must share some common keywords from key fields of tables.
- Make sure you have authorization to create request and import.

Actions:
- Create transport request.
- Browse Object window in request and add <PROGRAM><OBJECT TYPE><Object Name>.
- Select function key, Add Table Key name XYZ*.
- Select table contents specified by request from "display table contents".
- Check all objects required are displayed and selected.
- Release request to target system.

Post Activities:
- Import request in target from transport management tool.
- Check transport logs in details. Inform object owner if any error found in log.
- Check in target system all tables has new entries moved.
- Change object owner in DDIC tables in order to allow future release from target system.
- Cross check functionality is working fine after new objects in table.
- Request developer to cross check objects and dependency found in target system.

Reference Link: Specifying table keys

Revert back the development made in higher or lower version

Pre-requisite:
- Landscape release codeline to be known in order to take decision of version mismatch.
- Check what made developer to make changes in wrong codeline and what restrictions of system were violated during changes.
- Check what changes have been done by user and if possible calculate number of objects from transport request.
- Check if you have older version of code stored or available to retrieve.
- Estimate loss if revert back fails and new code is overwritten.
- Get approval from developer before starting revert back activity, if possible involve them in activity.
- If required de-registration of existing software component get functional module ready from developers.
- Delete forcefully objects from target if required.
- Generated objects will not get delete from various tables so be prepared to get errors during import run.
- Make sure your new codeline is open and old codeline is closed for any development, this will prevent any changes in source during import.

Actions:
- Add older version of data into new merge request from consolidation system.
- Get objects attached to request confirm from developer.
- Import it via installation tool in target backend.

Post Activities:
- Check if logs display any error and inform developers if it's related to object.
- Request developer to check if older version of code is available in target system.
- Check in both source as well as target has same version of object to be release.

Reference Link: Including objects from multiple request

Include objects in a Request Manually

Data connectivity failed between two systems

Pre-requisite:
- Understand your landscape webservice connectivity between SAP and non-SAP.
- Find out what type of RFC's or webservice connections are existing in landscape.
- Find out what type of User's are used to communicate within landscape.
- Check if any upgrade was schedule recently which might have changed RFC settings or user policy.
- Get the list of ports used between two systems and check with network team about their status.
- Check if services are active in backend which are used in webservice.
- Double sure if path mentioned in destination is correct. If you open it direct it should display in XML type.

Actions:

- Activate services.
- Correct user configurations.
- Open ports required for services.

Post Actions:
- Try connecting webservice or RFC using application.
- Check if services are still activated.

Reference Link: Security guides for connectivity and interoperability technologies

Developing roles for authorization for specific application access

Pre-Requisite:
- Find out what type of access to be provided, Backend or Frontend.
- Should be knowing overall development to create new roles.
- Get Object type, name, packages matrix on the list.
- Check those objects can be, if not then why.
- Find out, new role be added in group called part of existing roles composite or standalone.
- Decide to what type of business users will get the role assigned.
- Decide what validity period would these roles would be needed.
- Find out who would be the approver for assigning new roles.
- Current user policy to be known thoroughly in order to fit new roles.

Actions:
- Request admin team to create new role from backend and add object authorization as per matrix designed.
- Assign new role or profile generated to users in target system or via central user system and distribute.
- Generate roles and user comparison to make sure roles are properly assigned to user.

Post Activities:
- Login with user which has new role and try to run scenario end to end to make sure no missing auth error occurs.
- Import new role in different systems wherever required and generate the same role with user comparison.

Reference Link: Integrated role and user administration

Nominating master system to be used for multiple copies

Pre-Requisite:
- Purpose of master system should be clear as technical and functional.
- Check all transport request within landscape to be released to this system.
- Get list of testing scripts ready to test various business scenarios for end to end testing.
- User policy should be standard defined as per landscape rules.
- As system administrator check if there are no critical dumps in it.
- System should not be available to users during copies, downtime to be acceptable and agreed by all.
- Single source master cannot be used for multiple business types of copies.

Actions:
- Rollout system as ref master within team and specific business area.
- Lock generic users and only allow admin or functional testers to avoid changes directly.
- Run testing scripts.
- If transport requests are not up to date, import them via merge.

Post-Activities:

- Errors in test scripts should be reported to functional team and get fixes.
- During any upgrade run make it unavailable for copies.

Reference Link: System Copy

Installing new dimensional software components(Ex:Live Auction Cockpit)

Pre-Requisite:
- Request would have come from ex<SRM> functional team, check what functionality are they expecting from it.
- Find out relative SAP notes to check if pre-requisite component is already installed in system ex: AS Java or EPC.
- For each SP version you will have few different steps for installation as compared to its lower version, in that case you need to download correct installation guide.
- Use SAP tool like PAM Product availability matrix on market place to get exact pre-requisite.
- Go through installation guide thoroughly and get familiar with steps.
- Keep userid and password ready with specific access rights in backend as it might required during installation steps as per guide.
- If required lock users and inform development about activity.
- Download required version software component and mount it on server ex: Central instance.
- Check if you have access to O.S. level using SIDADM.
- Check in installation guide which ports are required for new component and get it enable from Network team.

Actions:
- Set display mode if you are in Linux O.S.
- Run installation from shared mount point.
- Enter configuration details like: client, host, port, userid, and password.
- Record each step and report to SAP if found critical error.

Post-Activities:
- Check if engine is up n running on which new software component was installed.
- Check version if updated.
- Ask functional consultant to check if new application is properly installed as per their requirement.
- Check if new dumps in system is found related to new software component.

Reference Link: Product and Software Components

Java deployments not reached test systems

Pre-Requisite:
- Need to know deploy schedule and track release within landscape.
- Every deployment system generates logs(jtp) periodically, check logs for major issue in it.
- Get confirmation from developer about deployment triggered with right timestamp.
- Check in system if deployment was really triggered on right timestamp as per system.
- Get name of model deployed by developer to see its status in log.
- Check if overnight deployment scheduled failed or ran successful.
- If scheduled deployment failed then need to identify root cause and then schedule deployment again.
- To find root cause, check if system was sync with all other systems in landscape and has not missed any regular inputs.
- Check if system was down during deployment.
- Check system dumps if new imports would have hampered performance and disturbed deployments.
- In parallel decide what would be feasible time to trigger deployment again and inform development.
- If overnight deployment went successful, check which specific model failed and trigger it manually.

Action:
- Get fixes released if root cause was found.
- Inform entire development team about deployment re-trigger.
- Schedule new deployment with current timestamp in background.
- If only few models failed inform developer about deployment re-trigger.
- Trigger manual deployment.

Post-Activities:
- Make sure fixes released are finally rectified and no more similar issue in it, also check if any other system has similar issue.
- Check with developer if changes arrived in system with all his/her components.
- Cross check if any other deployment failed from logs and if required trigger manual deployment.
- Apply cross check only in critical period(ex demo schedule next day) as it's not possible to check status of each deployment.

Reference Link: Deploying Applications

Business Objects(BO) Query results null value

Pre-Requisite:
- Fire different types of query on specific BO to make sure its BO issue and not wrong query on wrong object type.
- Check if your system is connected to central search engine i.e. TREX.
- If yes make sure connection with TREX is up n running with no issues in logs.
- Check specific BO nodes are all properly loaded.
- Cross check with other BO nodes also and see if they results data for query.
- if not then get load all BO's nodes or else get specific BO loaded.
- If specific load fails contact BO owner to check all objects related to BO in system.
- Check if system dump occurs while executing BO query, sometimes it may point to generic application issue, in that case get development notice this issue.

Action:
- Get search engines i.e. TREX up n running.
- Using ABAP report load individual BO, if specific BO has error or else load all BO in background.
- Check background job logs and see if replication finished successfully.

Post-Activities:
- Execute various queries on BO and see if results gets display.
- Confirm with developer if query result is as what they expected.
- Cross check with other BO nodes also if required using Fast search index tcodes.
- Make sure no more dumps related to BO found in the system.

Reference Link: Business Object

Testing ESF BO

Database troubleshooting

Pre-Requisite:
- Should know what network config. has been setup(Ex: Ethernet) and which partition is selected(Ex: RAID Level).
- Make sure kernel level is latest as per DB version.
- Check enough space is available in redo logs and data files directory.
- Check most table buffer are allocated enough memory as per RAM.
- Check communication between db background work process and database is working fine. Ex DBW0,LGWR,ARC0.
- Check archiving mechanism is functioning properly, as there might be chance of new data block not able to get write in online redo.
- Check if there was not activity schedule which will lead to offline state. Ex: offline backup.
- Check if processes are running ex: listener.
- Check config file if any parameter is changed in between.
- Check DB processes are up n running.
- Make sure transports are running perfect with return code less than 12(i.e. less critical).

Actions:
- Apply kernel patch if required.
- Activate processes required for DB to process background process.
- Clear archives of old files from Redo logs.
- Change DB parameter if required and take a restart.

Post-Activities:
- Make sure data files and redo logs has enough space.
- No alert messages found in DB logs.
- Schedule job which will send alerts for memory issue.

Reference Link: DB Troubleshooting

Database HighAvailability

Central user Management unable to dispatch user assignment roles

Pre-Requisite:
- Before proceeding with any technical checks try creating single user instead of mass and distribute it.
- Check if child system is defined with logical name in central user system.
- Check if child system is still connected with central user system or not using RFC connection having proper authorization.
- Check IDOCS/ALE connectivity, ports and active state for particular system in central user system.
- Check reports schedule in background for user distribution is having variants with right values.
- In child system check report used for fetching IDOCS is receiving messages.
- User Group under which child system is added has appropriate generated roles assignment

Actions:
- Define logical system name in central user system.
- Connect child and central user system with proper RFC connections.
- Get IDOCs/ALE port open for communication.
- Add child system in variant for user mass distribution job also regular distribution job.
- Add child system in user group to get added with multiple child system sharing same user authorization policy.

Post-Activities:
- Try creating single user to get into child system and run IDOCS distribution manually in target as well as receiving system.
- Make sure mass distribution job is schedule for night.
- Roles in target system are generated with mass comparison.
- Run User comparison in central user system.
- Should not be able to create user direct in child system even having admin rights.

Reference Link: <u>CUA set up field distribution parameters</u>

Go-Live for customer implementation

Pre-Requisite:
- Run early watch alert reports received from SAP for every production server.
- Run audit on user and roles authorization.
- Switch cluster environment on for testing.
- Check production server for below mentioned configurations:
- Mail configurations.
- Day/Night mode operations for schedule jobs.
- Backup strategy is implemented and configured.
- RFC's between test,dev and production are configured.
- Transport mechanism is installed and configured.
- CCMS alerts with recommended thresholds.
- Kernel patch is updated with latest versions as per available in market.
- CUA configured.
- Admin passwords adapted as per policy.
- Application patches are installed as per recommended by functional consultants.

Actions:
- GoLive analysis report received from SAP.
- GoLive Verification reports received from SAP.

Post-Actions:
- Check backend performance system and CCMS alerts.
- For Non-ABAP check garbage collection.
- Login to frontend with business user and browse work center.
- Monitor archiving and Backups.
- Check cluster environment.

Reference Link: <u>SAP Early Watch Alerts</u>

<u>SAP Solution Manager</u>

Related Content

Change Management

Landscape Design and Architecture.

Database administrator guide

For more information, visit the Landscape Design and Architecture homepage.

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