Security Patch Process
Implementing SAP Security Notes: Tools and Best Practices

SAP Center of Excellence – Security Services
April 2018
Abstract

This session shows how to set up a monthly patch process based on the application System Recommendations within the SAP Solution Manager to track down critical Security Notes which are required for your systems.

See the integration with the Usage Procedure Logging (UPL) and the Business Process Change Analyzer (BPCA) to identify business processes which might get affected by the implementation of security notes.

And you will get additional information about the cross-system queries of Configuration Validation which can be used to analyze the security configuration for single systems as well as for the complete system landscape.

Goals:

➢ Identify required security notes for a large system landscape.
➢ Manage work lists with notes that should be implemented.
➢ Audit successful implementation of required security notes.
Agenda

- SAP Security Notes and SAP Security Patch Day
  What they are, when they’re published

Security Tools and Services

- System Recommendations
  Tool to find the applicability of notes to systems

- Usage And Procedure Logging (UPL)
  Tool to find unused code notes address

- Business Process Change Analyzer (BPCA)
  Tool to find the spots to test after note implementation

- Configuration Validation
  Tool to run cross-system validation

- SAP Security Patch Process
  How to put all into a working mechanism
Security Notes

- are standard SAP Notes / HotNews
- with information about known security vulnerabilities
- and appropriate countermeasures (correction instruction, configuration, service pack, upgrade, manual measures)
- whose corrections are contained in subsequently released Support Packages, if possible

They can be found here: https://support.sap.com/securitynotes

- Each customer has to regularly review this list and has to verify for each entry whether the security note applies to his systems or not and what to do if necessary
Security Notes in the SAP Support Portal

https://support.sap.com/securitynotes

Here you can find all Security Notes published by SAP

In addition you find Security Spotlight News
Initially you start with a **filtered list** based on your own favorite systems which you have selected from the systems which belong to the customer numbers of your S-user.
You can do some simple status management but keep in mind that this is your personnel classification which others cannot access.
Changing the view shows the complete list of “All SAP Security Notes”

<table>
<thead>
<tr>
<th>New</th>
<th>Updated</th>
<th>Expert Search</th>
<th>My Favorites</th>
</tr>
</thead>
</table>

**Standard**

- **Search Term**: 
  - *Enter search term* [ ]

- **Released On (Free)**: 
  - 14.02.2018 - 13.03.2018

- **Priority**: 
  - *No Restriction* [ ]

- **Document Type**: 
  - SAP Security Notes [ ]

- **System**: 
  - Enter System

- **Support Package**: 
  - No Restriction

- **Category**: 
  - No Restriction

- **Country**: 
  - No Restriction

- **Components (Exact)**: 
  - No Restriction

**Fuzzy Threshold**

- Close Match (0.9)

**Components (Start with)**

- No Restriction

**Excluded Components (Exact)**

- No Restriction

**Released On (Pre-Defined)**

- No Restriction

**Use the filter to select**

- Document Type = SAP Security Notes
- Priority = <HotNews, High, …>
- Released On (Free) = <Date range, e.g. since previous Patch Day>
Patch Day Notes vs. Support Package Implementation Notes

Patch Day Notes
• SAP Security Notes published on and for Security Patch Day
• Contain important security corrections with priorities: HotNews, High, Medium, or Low
• Very often address security issues reported from external sources
• Have CVSS scoring and CVE entries in most cases

Support Package Implementation Notes (SPIN)
• Typically address security issues found SAP internally with priorities: High, Medium, or Low
• Should not be published in the first place but just be contained in future SPs
• Had to be published outside SP and outside the Patch Day schedule because some customer production issue depended on it to be implemented first

SPIN might be published on Patch Day dates as well!
Count of new or changed Security Notes per Month

Most notes are covered by a regular support package update.

Caution: There are exceptions because of notes describing manual security configurations.

Status from March 2018:
~4100 Security Notes in total

Changed strategy:
Publish "Patch Day Notes" only but postpone "Support Package Notes"
SAP Security Notes address vulnerabilities in SAP applications

Risk and impact

- Full control over SAP systems bypassing any other SAP security controls
- Manipulation of data which endangers legal compliance
- Data theft
- No traceability due to missing audit trail
- Unavailability of data and systems

Manipulation of business processes in SAP systems is possible, availability at risk
Three key messages as take away!

Go for **regular Support Package updates** first

Establish a **monthly patch process** to analyze and implement **SAP Security Notes**

Schedule **security optimization projects** to cover new options for **security configuration**
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How to identify important SAP Security Notes that need to be implemented?
You have to apply various types of notes and patches to keep your SAP systems up-to-date and secure.

- **Security notes**: SAP's expert advice regarding important actions and patches to ensure the security of your customers' systems.
  
  https://support.sap.com/securitynotes

- **Performance relevant notes**: SAP notes containing information and corrections for performance improvement of SAP systems.

- **Java patches**
  - A patch is a code-correction for a specific version of an SAP product.

- **Legal Change notes**
  - Respond to requirements caused by changes in legal regulation.

- **HotNews**
  - SAP customer notes with priority 1 (very high priority) to resolve or avoid problems that can cause the SAP system to shut down or lose data.

- **General SAP notes**
  - Notes having ABAP correction instructions.
Where to get information and recommendations about new released SAP Notes

- You can set up a filter for a (registered) system in SAP Support Portal to show new notes for that system in the SAP ONE Launchpad:
  https://support.sap.com/kb-incidents/notifications.html
  (Limitation: You cannot define notifications)

- You can use application System Recommendations in the SAP Solution Manager to check all relevant notes and patches for the selected systems and easily keep all of your systems up-to-date.
System Recommendations
Advantages & Features

- Increase system security by applying up-to-date security-relevant notes exactly tailored for the respective system
- Provides a detailed recommendation based on the system release and already implemented SAP notes
- Easy-to-use filter settings allow exact selection of system or solution

- The recommendations comprise the following notes categories:
  - Security notes
  - Performance relevant notes
  - HotNews
  - Legal change notes
  - Correction notes / Patch notes (deactivated by default)

- Integration into Change Request Management (CharM) to directly create Requests for Change for the selected notes
- Integration with Usage Procedure Logging (UPL) to distinguish between used and unused code
- Integration into Business Process Change Analyzer (BPCA) to calculate the test
How System Recommendations supports your security
Process flow

SAP Patch Day

SAP releases security patches on the second Tuesday every month
https://support.sap.com/securitynotes

System Recommendations

Select system(s) to check & update and the time frame

System Recommendations identifies the relevant patches and SAP notes

Implementation Tools

The checked relevant SAP notes and patches are applied to the SAP system using the corresponding tools, e.g. SNOTE, SUM.
System Recommendations: Process Flow

1. Select system to check & update
2. Retrieve system information (SP level, patch level)
3. Connect to SAP Global Support Backbone
4. Provide information on latest relevant notes (for SP level, patch level)
5. Send information back to the customer’s SAP Solution Manager system
6. Retrieve system information (implemented notes)
7. Calculate delta between OSS provided notes and already implemented notes. Show relevant notes of the system(s) via System Recommendations or Configuration Validation
System Recommendations in SAP Solution Manager 7.2

➢ User Interface based on Fiori
➢ Individual views and selections as Fiori tiles
➢ Cross-system view
➢ Customizing for status values
➢ Status with history and cumulative comments
➢ Detail screens: Object List with Usage Data (UPL), Prerequisite Notes
➢ Hide Application Components which do not match to used DB or OS installations
➢ General Customizing and Personalization
➢ Simplified Activation
Open the Fiori Launchpad

On the Solution Manager, start the **Fiori Launchpad** and navigate to the Fiori Tile Group “SAP Engagement and Service Delivery”

How?
Start transaction **“SOLMAN_WORKCENTER”** and then navigate to “SAP Engagement and …”

or
Start the Work Center from the **Easy Access menu** tree

or
Add a link for the Fiori Launchpad on your **Favorites**.
Add Favorites link for Fiori Launchpad

Add a link on your Favorites.

How?

1. Go to the Favorites Menu and choose “Add other objects”

2. In the “Add additional object” window, scroll and select the “SAP Fiori App”

3. Choose radio button “SAP Fiori Launchpad”
Add Favorites link for System Recommendations

Add a link on your Favorites.

How?

1. Go to the Favorites Menu and choose “Add other objects”

2. In the “Add additional object” window, scroll and select the “SAP Fiori App”

3. Choose radio button “Intent” Enter Semantic Object “Action” and Action “UISMMySAPNotes” You can add parameters for the client and language, too.
Call transaction `SM_WORKCENTER` to start Fiori Launchpad.

You can store individual views and selections as Fiori tiles.

The example shows security notes for these systems for which you are responsible having selected status values ('new').
System Recommendations in SAP Solution Manager 7.2

System Overview

Mark one or several systems and select one of available actions:

- Show **Java** Support Packages and Patches to prepare an update of the selected system(s)
- Show SAP Notes to work with the list of recommended SAP notes for the selected system(s)
- Refresh SAP Notes to run the corresponding background job, collecting the information.

<table>
<thead>
<tr>
<th>System</th>
<th>IT Admin Role</th>
<th>System Priority</th>
<th>Security Notes</th>
<th>Hot News</th>
<th>Performance Notes</th>
<th>Legal Change Notes</th>
<th>Favorite</th>
</tr>
</thead>
<tbody>
<tr>
<td>A24~ABAP</td>
<td>Undefined</td>
<td>Undefined</td>
<td>156</td>
<td>101</td>
<td>230</td>
<td>225</td>
<td></td>
</tr>
<tr>
<td>AHN~ABAP</td>
<td>DEVELOP</td>
<td>High</td>
<td>219</td>
<td>119</td>
<td>671</td>
<td>562</td>
<td>★</td>
</tr>
<tr>
<td>BE6~ABAP</td>
<td>Test System</td>
<td>Undefined</td>
<td>201</td>
<td>124</td>
<td>600</td>
<td>547</td>
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<tr>
<td>BEA~ABAP</td>
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<td>Undefined</td>
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<td></td>
<td></td>
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<tr>
<td>E2E~ABAP</td>
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<td>Undefined</td>
<td>223</td>
<td>124</td>
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<td>Undefined</td>
<td>73</td>
<td>104</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
System Recommendations in SAP Solution Manager 7.2

Note Overview

- You can filter this list of available SAP notes by:
  - Technical system
  - Release date
  - Note type
  - Note status
- Use “Advanced Search” for further filter options.
- Click on the note number or short text for more details.
- At “Actions” you can navigate to the Object List, Prerequisite Notes or Side-Effect Notes for the selected SAP notes.
In the Advanced search you can reduce the list of SAP notes.

- The SAP note status „New“ and „New version available“ are pre-selected, other could be added manually. Keep this in mind working with the note list.
- SAP notes marked “Kernel” in the corresponding field contain kernel corrections.
- Release dependent SAP notes are relevant for the system they addressed to and should be implemented.
- For release independent SAP notes it is not technically possible to determine its relevance. Check the relevance by your own.
- After setting additional filters click on “Search” button.
Clicking on the Note number or the short text allows the navigation to the note in the SAP Support Portal https://support.sap.com/notes
Or choose the navigation to the detailed information (explained on the next slide)
System Recommendations in SAP Solution Manager 7.2
Note Details: Overview

- Status records and comments are stored with timestamp and user and never get modified or deleted
- Using Actions → Change Status you can change the current status or add a comment to this SAP note
Individual and cross-system mass status management possible

You can customize user status values, e.g. for ‘fast track transport’, ‘normal transports’, or specific projects.

Status records and comments are stored with timestamp and user and never get modified or deleted.
### Status and comments customizing (1)

<table>
<thead>
<tr>
<th>Status ID</th>
<th>Default Statuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMP</td>
<td>To Be Implemented</td>
</tr>
<tr>
<td>INP</td>
<td>New version available</td>
</tr>
<tr>
<td>NEW</td>
<td>New</td>
</tr>
<tr>
<td>NOR</td>
<td>Irrelevant</td>
</tr>
<tr>
<td>PSP</td>
<td>Postponed</td>
</tr>
</tbody>
</table>

To add your own status proceed as follows:
- Call transaction **SM30**
- Maintain table **AGSSR_STATUS**
- Select existing status and copy it with Copy as…
- Edit the information in the table
- Save your changes
### System Recommendations in SAP Solution Manager 7.2

**Status and Comments**

Transaction `SM30_AGSSR_STATUS` for customizing table `AGSSR_STATUS`

#### Change View "User Status": Overview of Selected Set

<table>
<thead>
<tr>
<th>User Status</th>
<th>Lang.</th>
<th>Status ID</th>
<th>Short Text</th>
<th>Long Text</th>
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<tbody>
<tr>
<td>FN</td>
<td>DONE</td>
<td>Done</td>
<td>Done</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>ET</td>
<td>Erica test</td>
<td>Erica test2</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>FILE</td>
<td>Directory Traversal Project</td>
<td>Postponed for specific Directory Traversal Project</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>IMP</td>
<td>To Be Implemented</td>
<td>To Be Implemented</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>INP</td>
<td>New version available</td>
<td>New version available</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>ISW</td>
<td>Isoldes Test</td>
<td>Isoldes Test</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>NEW</td>
<td>New</td>
<td>New</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>NOR</td>
<td>Irrelevant</td>
<td>Irrelevant</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>NQR</td>
<td>Irrelevant</td>
<td>Irrelevant</td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>PSP</td>
<td>Postponed</td>
<td>Postponed</td>
<td></td>
</tr>
<tr>
<td>FN</td>
<td>ROB</td>
<td>Robs Shorttext</td>
<td>Robs Longtext</td>
<td></td>
</tr>
</tbody>
</table>
## System Recommendations in SAP Solution Manager 7.2

### Status and Comments

<table>
<thead>
<tr>
<th>Recommendations ID</th>
<th>Language</th>
<th>Module</th>
<th>Status</th>
<th>Recommendation ID</th>
<th>Description</th>
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<tbody>
<tr>
<td>0001487330</td>
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<td>NEW</td>
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<td>SR_TST_01</td>
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<tr>
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<td>HANADB</td>
<td>FQ7</td>
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<td>ET</td>
<td>SR_TST_02</td>
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<td>NEW</td>
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<td>0001555144</td>
<td>ABAP</td>
<td>SD7</td>
<td>NEW</td>
<td>ISW</td>
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</tr>
<tr>
<td>0001555144</td>
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<td>SD7</td>
<td>NEW</td>
<td>ISW</td>
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<td>0001555144</td>
<td>ABAP</td>
<td>SD7</td>
<td>NEW</td>
<td>ISW</td>
<td>SR_TST_01</td>
</tr>
</tbody>
</table>
The information about the usage count comes from UPL.
System Recommendations in SAP Solution Manager 7.2
Note Details: Prerequisite Notes

- A list of prerequisite SAP notes for the selected one is available
- Using “Action” menu it is possible to change the notes status
- Using “Integrated Desktop Actions” it is possible to download the SAP notes into the managed systems from SAP Solution Manager directly (If you have a trusted user in the managed system with the role SAP_SM_S_RFACACL).

Or start integrated Change Impact Analysis or Change Request Management
Check the system ID and click on Confirm Download
Transaction SNOTE will be automatically called in the new window and you can start with the note implementation
Select at least one system for which you want to install a support package patch and choose Actions → Show (JAVA) Support Package Patches
Select the support package patches, you want to download and choose Put in Download Basket.

Use the SAP Download Manager to retrieve the selected packages

Install the support package patches

or

use the Maintenance Planner to prepare and run the update
Integration with Business Process Change Analyser (BPCA) and Change and Request Management (ChaRM)

- The BPCA has been automatically opened in the new window
- The Object Type and Object Name of the selected note are taken over.

- A new Request for Change (RfC) has been created automatically
- You can be navigated to the RfC by clicking on its number
The RfC Description “Created from System Recommendation” and the user data are taken over into General Data AB.

The notes number is added into SAP Notes Assignment Block (AB).
Filter by IT Admin Role or Priority

Use transaction **LMDB** to maintain the IT Admin Role and the Priority of systems. You can use these fields for filtering.
## System Recommendations in SAP Solution Manager 7.2
### Adding additional SAP Note Types

<table>
<thead>
<tr>
<th>Field Value</th>
<th>Type</th>
<th>Retrieved by default in System Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>HotNews</td>
<td>☑</td>
</tr>
<tr>
<td>S</td>
<td>Security Notes</td>
<td>☑</td>
</tr>
<tr>
<td>L</td>
<td>Legal Change Notes</td>
<td>☑</td>
</tr>
<tr>
<td>P</td>
<td>Performance Notes</td>
<td>☑</td>
</tr>
<tr>
<td>C</td>
<td>ABAP Correction Notes</td>
<td>☒</td>
</tr>
</tbody>
</table>

Correction notes (Type C – normal notes having ABAP correction instructions) must be specified manually to be retrieved:

- Call transaction `SM30_DNOC_USERCFG_SR`
- In the field `SYSREC_NOTE_TYPES` add or remove the relevant value, i.e. enter `HSLPC`
Hide Application Components of not-used DB or OS installations

Transaction
SM30_AGSSR_OSDB

for customizing table
AGSSR_OSDB

Set components, do not match your used OS and DB to inactive (for additional information refer to the next slide).

<table>
<thead>
<tr>
<th>Typ</th>
<th>Pattern</th>
<th>Application Component</th>
<th>Vendor</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database</td>
<td>DB6</td>
<td>BC-DB-DB6</td>
<td>SAP</td>
<td>Active</td>
</tr>
<tr>
<td>Database</td>
<td>DB6</td>
<td>BW-SYS-DB-DB6</td>
<td>SAP</td>
<td>Active</td>
</tr>
<tr>
<td>Database</td>
<td>HDB</td>
<td>BC-DB-HDB</td>
<td>SAP</td>
<td>Inactive</td>
</tr>
<tr>
<td>Database</td>
<td>HDB</td>
<td>BW-SYS-DB-HDB</td>
<td>SAP</td>
<td>Inactive</td>
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<tr>
<td>Database</td>
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<td>HAN-DB</td>
<td>SAP</td>
<td>Inactive</td>
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<td>Database</td>
<td>INF</td>
<td>BC-DB-INF</td>
<td>SAP</td>
<td>Inactive</td>
</tr>
<tr>
<td>Database</td>
<td>INF</td>
<td>BW-SYS-DB-INF</td>
<td>SAP</td>
<td>Inactive</td>
</tr>
<tr>
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<td>BC-DB-LVC</td>
<td>SAP</td>
<td>Inactive</td>
</tr>
<tr>
<td>Database</td>
<td>MSS</td>
<td>BC-DB-MSS</td>
<td>SAP</td>
<td>Inactive</td>
</tr>
<tr>
<td>Database</td>
<td>MSS</td>
<td>BW-SYS-DB-MSS</td>
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### Overview about Application Components for DB/OS:

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### General Customizing and Personalization

**Transaction SM30_DNOC_USERCFG_SR**

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<th>Parameter</th>
<th>Description</th>
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<tbody>
<tr>
<td>SYSREC_STATUS_FILTER (*)</td>
<td>Defines which SAP Notes are counted on the overview page: By default it only shows SAP Notes that are in the 'new' or 'new version available' status.</td>
</tr>
<tr>
<td>SYSREC_UPL_ACTIVE (*)</td>
<td>Activate/deactivate the integration with UPL while showing the object list of ABAP notes.</td>
</tr>
<tr>
<td>SYSREC_UPL_MONTH (*)</td>
<td>Count of month for which UPL data get loaded. The default is 2 which represents the current and the previous month.</td>
</tr>
<tr>
<td>SYSREC_NOTE_TYPES</td>
<td>Defines for which types of SAP Notes the application calculates results. Enter the list of characters representing the note types HotNews, Security, Performance, Legal Change, Correction.</td>
</tr>
<tr>
<td>SYSREC_LAST_MONTHYEAR</td>
<td>Defines the earliest calculated SAP Notes. By default the application calculates all SAP Notes which were released between January 2009 and the current month.</td>
</tr>
<tr>
<td>SYSREC_DELTA_DAYS</td>
<td>Note delta calculation time period according to note 2304751 (default = 7 days).</td>
</tr>
<tr>
<td>SYSREC_BPCA_USER</td>
<td>Defines if the current user should be added as selection for BPCA.</td>
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<tr>
<td>SYSREC_BPCA_DATE</td>
<td>Defines the earliest filter for BPCA results. You can change the start date for this period.</td>
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<tr>
<td>SYSREC_CHARM_LOG_TYPE</td>
<td>Defines the text id according to table TTXID for the text object CRM_ORDERH.</td>
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<td>SYSREC_CHARM_USER</td>
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<td>SYSREC_OBJECT_EXP</td>
<td>Lifetime of the cache which contains the object list of SAP notes. The default is 14 days.</td>
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<td>Lifetime of the cache which contains the required notes of SAP notes. The default is 14 days.</td>
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<td>Lifetime of the cache which contains the side-effect notes of SAP notes. The default is 14 days.</td>
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</tbody>
</table>

(*) User specific personalization
System Recommendations in SAP Solution Manager 7.2
Simplified Activation

The activation of System Recommendations is an automated activity within Managed System Configuration.
In an upgrade to SolMan 7.2 you get a notification if EWA Monitoring or System Recommendations is not activated yet.
System Recommendations: Setup in SAP Solution Manager 7.2

Entry point

Generally the System Recommendations scenario is ready to be used when the following guided procedures have been successfully finished:

- Mandatory configuration (transaction SOLMAN_SETUP)
  - System Preparation
  - Infrastructure Preparation
  - Basic Configuration

- Managed Systems Configuration
Check setup of RFC destination SAP-OSS

- **Transaction** SOLMAN_SETUP
  - System Preparation
  - Step 3.1 Setup Connectivity
  - RFC destination SAP-OSS should be successfully created and rated green.

- You can additionally check this RFC in transaction SM59
  - ABAP Connections
  - Choose RFC destination SAP-OSS
  - Utilities
  - Test
  - Authorization test
Check System Recommendations Job scheduling

- **Transaction** SOLMAN_SETUP
  - Basic Configuration
  - Step 2 “Schedule Jobs”
  - Select the System Recommendations job SM:SYSTEM RECOMMENDATIONS and schedule it by clicking on “Schedule Jobs as Planned”
  - Ensure that you schedule the job weekly after PatchDay closing which is Tuesday morning right after midnight in CET timezone
Enable System Recommendations for managed systems

- **Transaction** SOLMAN_SETUP
  - Managed Systems Configuration
  - Select technical system (with green RFC status)
  - Start full of minimal configuration
  - Navigate to step 5 “Enter Landscape Parameters”
  - Set the mark to “Enable System Recommendations”
Enable System Recommendations for Managed Systems

Apply Settings for System Recommendations

- **Transaction** SOLMAN_SETUP
  - Managed Systems Configuration
  - Select technical system (with green RFC status)
  - Start full of minimal configuration
  - Navigate to step 8 “Finalize Configuration”
  - Ensure that this step has been executed and rated green
System Recommendations: Setup in SAP Solution Manager 7.2 Requires roles

Roles having authorizations for running System Recommendations on SolMan (#):

- **SAP_SYSREC_DIS**: System Recommendations (with work center Change Management)
- **SAP_SYSREC_ALL**: System Recommendations (with work center Change Management)

Roles to show the Fiori application of System Recommendations on Fiori Hub:

- **SAP_STUI_SYSREC_TCR**: Solution Manager: System Recommendations Technical Catalogue
- **SAP_STUI_SYSREC_AUTH**: Solution Manager: System Recommendations Authorizations (*)

(#) There is no special display-mode in System Recommendations. Both roles offer same functionality including entering status and comments for notes.

(*) As described in the role documentation you have to add an authorization proposal into the role menu.
System Recommendations: Setup in SAP Solution Manager 7.2

Requires roles

If you are using a separate **Fiori Hub** you need to generate the OData service for System Recommendations using transaction `/n/IWFND/MAINT_SERVICE` as described in the Security Guide of the SAP Solution Manager (see chapter 4.6.1 SAP Fiori Launchpad and NWBC).

In any case for role **SAP_STUI_SYSREC_AUTH** you have to add an ‘Authorization Default’ in the role menu. Choose ‘TADIR Service’ with object type IWSG and search for the TADIR service name AGS_SYSREC_SRV_*

Navigate to the authorizations. You will see an authorization for authorization object S_SERVICE.

Finally, generate the authorization profile and assign the user(s).
You find the Online Documentation about System Recommendations in the App section for Fiori

Navigation path, e.g. starting at SolMan documentation:

System Recommendations in SolMan 7.2

→ Fiori
https://help.sap.com/solman_fiori

→ Application Help → SAP Solution Manager Fiori Apps →

System Recommendations

SAP Support Portal https://support.sap.com/sysrec
System Recommendations in SAP Solution Manager 7.2
SAP Fiori apps reference library

https://fioriappslibrary.hana.ondemand.com/sap/fix/externalViewer

→ e.g. search for Required Back-End Product

→ SAP Solution Manager

→ Check System Recommendations

At „Implementation Information“ you find references for roles in the Front-End and the Back-End as well as the list of related oData Services.

See Blog
How To Explore “Fiori Apps Reference Library”
SAP Solution Manager 7.2
Additional Information

- Release Notes
  Changes and New Features in SAP Solution Manager 7.2 SPS 1
  Changes and New Features in SAP Solution Manager 7.2 SPS 2

- SAP Support Portal
  https://support.sap.com/solutionmanager

- SAP Solution Manager WIKI @ SCN
  https://wiki.scn.sap.com/wiki/display/SM/Solution+Manager+Home

- SAP Solution Manager Roadmap
  https://service.sap.com/roadmaps
  → Product and solution roadmaps → Database and Technology → Platform → SAP Solution Manager.
Benefit of SAP Solution Manager System Recommendations

Result and value

- Detailed gap analysis of SAP systems for Security Notes
- Listing of missing notes with possibility to set status
- Integration into change management and reporting

Limitation

- The automatic analysis covers the software level but not new options for security configuration

Use System Recommendations to create work lists for implementing Security Notes
Agenda

- SAP Security Notes and SAP Security Patch Day
  What they are, when they’re published

Security Tools and Services

- System Recommendations
  Tool to find the applicability of notes to systems

- Usage And Procedure Logging (UPL)
  Tool to find unused code notes address

- Business Process Change Analyzer (BPCA)
  Tool to find the spots to test after note implementation

- Configuration Validation
  Tool to run cross-system validation

- SAP Security Patch Process
  How to put all into a working mechanism
The challenge! – Find notes addressing unused code

What code do I use anyway?
Usage and Procedure Logging (UPL)  
The New Way Getting the Real System Usage

- Kernel based logging technology with no measurable performance impact
- Easy to activate via central Solution Manager 7.1
- 100 % reliable based on execution of ABAP procedure units like methods, function modules, subroutines and much more
- Data base for additional activities like clearing, test scoping, reduction of custom code maintenance
- Indicator for business criticality based on time slices
- Full BW reporting capability
SAP Usage and Procedure Logging (UPL)
FAQ about UPL

How to find out if UPL collection is collecting data?
Start transaction SCOV in the managed system. If UPL is activated, you will see a status information "SCOV lite is activated!" Furthermore the traffic light under "Data collection" should be green. In this case everything is fine.

Will UPL have any impact on the system performance?
No, there is no measurable impact, because we count the usage as soon as the ABAP compiler is loading the code. This is confirmed by the SAP benchmark team.

Are there any risks to activate UPL?
No, there is no known risk to activate UPL.

How much data will be consumed in the managed system?
We collect usage data on a daily basis. As soon as one ABAP program was executed, we increase only the execution counter. From our experience the needed DB space is between 2-10 MB for 14 days of data. But this depends on the real usage of different programs.

There is an error message "Data collection was not performed" in monitor of SCOV.
Ensure settings and server are correct. If not please use report /SDF/UPL_CONTROL to stop UPL mode. Start transaction SCOV and correct the server settings. Then reactivate the UPL again.

In case of technical issues open a customer message on component SV-SMG-CCM-CDM
Data Flow in Managed System

Work processes
- Reports
- Functions
- Methods
- Procedures

Buffer in Memory → Collector Job

Procedure Usage
- Every 45 min*

UPL data

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Daily Job
- Once a day*
- Daily housekeeping*

Day Extract

Solution Manager

* Default setting

Report /SDF/SHOW_UPL

ABAP Code Inspector

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How to read the UPL data in the managed system?
Use the report /SDF/SHOW_UPL to show the UPL data on the managed system. This includes viewing of existing time slices and also the current UPL collection in progress. In most cases the usage information is instantly available.

Output format (selection of most important ones)

- **Date**: All entries with the same UPL date were executed at this date (no time available).
- **Object Type**: Describes the transport type of objects. PROG for programs, FUGR for function groups, etc.
- **Object Name in Object Directory**: Name of the ABAP repository object (TADIR).
- **Tcode/Program**: Name of the ABAP include containing the ABAP procedure.
- **Type**: Type of ABAP processing block. You are able to distinct between executions of function modules (FUNC), class methods (METH), selection screens, report events, user exits, etc.
- **Processing Block**: Name of the ABAP processing block
- **Accumulated Executions**: Number of executions
# SAP Usage and Procedure Logging (UPL)

Usage Analysis (local in managed system)

## Display Usage & Procedure Logging Data

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Dataflow in Solution Manager

Once a day, the Managed System extracts RFCs to Managed System data. This data is processed by the Solman Extractor Framework, which generates APIs on BW queries. These APIs are used to analyze BW cubes for week and month data. The results are then used by various applications in Solution Manager 7.1, including:

- Custom Code Lifecycle Management
- Solution Documentation Assistant
- Business Process Change Analyzer
- Scope & Effort Estimator
- System Recommendations
- etc.
### SAP Usage and Procedure Logging (UPL)

Central Analysis using BW in SAP Solution Manager

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<td>FUNC</td>
<td>21</td>
</tr>
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</table>

**BW Query**: OSM_CCL_UPL_MONTH
Analysis of Object Usage in System Recommendations
Data Collection of Usage Procedure Logging (UPL)

UPL Data Load to SAP Solution Manager

Consolidated UPL analysis for main programs (transport object), and detailed counts for functions and methods

System Recommendations

Object List

Export | Start BPCA Analysis

<table>
<thead>
<tr>
<th>SAP Note</th>
<th>TADIR Entry</th>
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<tbody>
<tr>
<td>Note Number</td>
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<td>0001699267</td>
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</tr>
</tbody>
</table>

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The information about the usage count comes from UPL.
Analysis of Object Usage in System Recommendations
Best practice

**Preparation**
- Connect DEV, TEST, and PROD Systems to System Recommendations
  - Use DEV system to view notes which should be added to work lists for implementation
  - Use PROD system to validate that selected important notes have reached production after given time
- Activate UPL for TEST and PROD systems
  - You can skip DEV systems as these will not show useful usage data

**Analysis of Results**
- Zero count in PROD system
  - No explicit testing required as you are not using the programs (but you still should implement the notes)
- High count in PROD system and high count in TEST system
  - No explicit testing required as you are executing the programs with normal activities in test environment
- High count in PROD system and zero count in TEST system
  - You might need explicit testing
Analysis of Object Usage in System Recommendations

Best practice

Personalization

SysRec loads UPL data for the previous and current month by default (= 4 to 8 weeks). This seems to be reasonable for TEST systems because you do not want to see very old usage data from test systems. However, you might want to increase the time period for PROD systems to catch rare execution of programs, too.

In SolMan 7.1 you can personalize the time range via transaction SU3 using user parameter SYSREC_UPL_MONTH.
SAP Usage and Procedure Logging (UPL)
Prerequisites for the monitored system

- SAP NetWeaver SAP_BASIS 7.01 SP10 or 7.02 SP9 (= SAP ERP 6.0 EHP4 or SAP ERP 6.0 EHP5)
- ST-PI 2008_1_700 SP4 or SP5 & Note 1683134 or ST-PI 2008_1_700 SP6 or higher
- Kernel 720 Patch 94 or higher according to …
- SAP Note 1785251 - SCOV/UPL: Error messages in monitor (Kernel 720 Patch 410 / 721 Patch 112)
- SAP Note 1822227 (to allow changing the data retention time using report /SDF/UPL_CONTROL )
- SAP Note 1906451 - Technical Preparation for Custom Code Management

- Based on our experience the space requirements are 2-10 MB for 14 days of data. So even data collection of one year won’t massively affect space requirements. Nevertheless verify your individual storage settings / database free space for a higher retention time value.

- Report /SDF/CONTROL shows the status of UPL:

- Tipp: use System Recommendations to search for latest correction notes of application component SV-SMG-CCM-CDM for the managed system and for the SAP Solution Manager
SAP Usage and Procedure Logging (UPL)
Activation via SAP Solution Manager

The UPL activation procedure was subject of continuous enhancements in the SAP Solution Manager infrastructure. Starting with many manual steps in SAP Solution Manager 7.1 SP5 it has finally reached a fully guided and system supported version in SAP Solution Manager 7.1 SP 11.

The **SOLMAN_SETUP** scenario for Custom Code Management contains all necessary steps and UIs to handle UPL configuration end to end including job scheduling of related UPL jobs.

See
Note [1955847](#) - UPL: Activation Procedure and Authorization Handling in SAP Solution Manager

Additional authorizations:
- **S_COV_ADM** with change activity
- **S_RFC** for function group /SDF/SCOV_LITE
SAP Usage and Procedure Logging (UPL)
Guided Procedure as of SAP Solution Manager 7.1 SP 11
Analysis of Object Usage in System Recommendations

Troubleshooting

If you do not see the additional column in System Recommendations or if you get zero results only:

- **Check if UPL is active in managed system**
  - Report `/SDF/UPL_CONTROL` should show UPL recording is activated
  - Report `/SDF/SHOW_UPL` should show some data (run it for a previous day to get results faster)

- **Check if SolMan gets usage data**
  - BW-Query `0SM_UPL_DATE_RANGE_BPCA` respective `0SM_CCL_UPL_MONTH` should show some data
    - Keep in mind that it takes some time (up to 2 days) to replicate usage data into this query
  - Note 2077995 describes new report `AGS_CC_INFRASTRUC_CHECK` for SolMan 7.1 SP 12 which checks the UPL setup

- **Check notes of application component SV-SMG-SR**
  - Note 2099728 - SysRec: Object list for ABAP notes does not show Usage Procedure Logging data (UPL) from 02.12.2014 for SolMan 7.1 SP 9 - 12

- If UPL is not working ask for advice via application component SV-SMG-CCM-CDM
- If SysRec does not show existing usage data, create a ticket on application component SV-SMG-SR
- If report `ZSYSREC_NOTELIST` does not show existing usage data, send me a mail or comment on https://scn.sap.com/community/security/blog/2011/07/18/report-zsysrecnotelist--show-results-of-system-recommendation
System Recommendations and UPL

Combined value

- Retrieve affected objects from System Recommendations
- Retrieve used objects via UPL
- Compare both lists
- If objects from a Security Note are not in UPL list: Note will not affect running processes
- Implement Security Note without testing

Effortless implementation of Security Notes for unused components
Agenda

- SAP Security Notes and SAP Security Patch Day
  What they are, when they’re published

Security Tools and Services

- System Recommendations
  Tool to find the applicability of notes to systems

- Usage And Procedure Logging (UPL)
  Tool to find unused code notes address

- Business Process Change Analyzer (BPCA)
  Tool to find the spots to test after note implementation

- Configuration Validation
  Tool to run cross-system validation

- SAP Security Patch Process
  How to put all into a working mechanism
The challenge! – Find the right test for the changes a Note makes

Which process is affected, where to test for side effects?
Business Process Change Analyzer (BPCA)

Motivation and Approach

**Motivation**

SAP Solution updates occur frequently
- SAP triggered: Support Packages, Enhancement Packages, SAP Security Notes
- Customer triggered: Customizing changes, Custom code development

**Pain Point**

Which critical business processes are affected by planned changes?

**Approach**

SAP Solution Update

- Change Impact Analysis
  - Identification of business processes affected by change
  - Risk-based Test Recommendation

- Test Planning
  - Test Case review and creation of missing test cases
  - Test Plan generation

- Test Execution
  - Regression Tests
    - Manual Tests
    - Automated Tests
BPCA: Change Impact Analysis at an early stage

Solution Architect

A BPCA Change Impact Analysis is performed using the top objects of the planned development against the business processes for risk assessment.
BPCA – Preparation
Business Process Documentation

Lean Process Documentation
BPCA requires a process hierarchy, system information and executables to be documented in a project or a solution.

Process hierarchy
- Business scenario
- Business processes
- Business steps

System information
Transactions, custom development
BPCA TBOM Generation
TBOM Creation during Manual Testing

Business Scenario “Order to Cash”

Quotation → Sales Order → Delivery → Billing

Customer SAP Landscape (SAP ERP, ...)

Tester starts manual test case from Tester Worklist

Tester executes the process step in SAP managed System while BPCA traces all SAP objects used by the Process Step in the background

Generated TBOM is assigned to Process Step / Business Process

Business Blueprint

- Order to Cash (O2C)
  - Quotation
  - Sales Order
  - Outbound Delivery
  - Goods Issue
  - Billing
BPCA - TBOM Generation
Current Alternatives plus new Approach

Static TBOM generation approach
- Positive: background job to generate all TBOMs without manual effort
- Disadvantage: less precision compared to dynamic TBOMs due to limit to 4 branching levels

Dynamic TBOM generation approach
1. Manual execution of business transaction by user with TBOM generation in the background
2. Initial: Work-Item for Business User in PRD system
   Update: Manual Testers in TST system
3. Automatic generation via automated tests (eCATT, SAP TAO, HP QTP, …)

Semi-dynamic TBOM generation approach

BPCA TBOM Background Job + UPL Data in PRD system (Usage and Procedure Logging of ABAP objects at Kernel level) + UPL Filter for BPCA TBOM generation = Semi-dynamic TBOM
- ✓ No manual effort through background processing (overnight)
- ✓ High precision
- ✓ Repeatable at any time
Don’t have documented processes yet?  
Automatic generation of Business Blueprint / Process Step Library

Process Step Library

• List of Process Steps by any grouping, e.g. by SAP Modules
• Assigned entities like Executables (e.g. transaction codes) and documentation

Example:
Process Steps and Transactions for SD

Automatic generation of Process Step Library

• Programm RUTILITY_BLUEPRINT_GENERATION via SAP Note 2061626 for SAP Solution Manager SP10 - see next pages for details
• Application „Scope and Effort Analyzer“ (SEA) – available with SAP Solution Manager SP11
Extended Functions in System Recommendations
Integration with Business Process Change Analyzer

Execute Business Process Change Analyzer (BPCA) to identify business processes which should be tested.
System Recommendations and BPCA

Combined value

- Run BPCA to know which technical objects are used in which process
- Hand over objects affected by SAP Security Notes from System Recommendations to BPCA
- Determine affected processes
- Develop suitable test cases for side effects

Efficient testing after SAP Security Note implementation
Agenda

- **SAP Security Notes and SAP Security Patch Day**
  What they are, when they’re published

**Security Tools and Services**

- **System Recommendations**
  Tool to find the applicability of notes to systems

- **Usage And Procedure Logging (UPL)**
  Tool to find unused code notes address

- **Business Process Change Analyzer (BPCA)**
  Tool to find the spots to test after note implementation

- **Configuration Validation**
  Tool to run cross-system validation

- **SAP Security Patch Process**
  How to put all into a working mechanism
Consider Customers Situation of Today …

- Are the OS, DB, Software and Kernel on the certain / latest level? … on all Systems? .. Please show me?
- Are all our CRM systems compliant with the new Configuration Baseline ?.. not compliant.. which systems? what exactly?
- Have we applied SAP Note xxxxx on all systems? ...please report implementation status for all systems?
- Have we imported Transport request xxxxx (with important performance changes) on all systems? ... could I have a list of the systems where it is still missing?
- Are security settings applied? ...on all systems? ... could you please confirm and report?

Challenges

- A large number of systems… Complex SAP Landscape …
- … Need to perform comparison of current configuration status against a defined target or standard configuration baselines
- … with minimum efforts and ASAP
What is Configuration Validation?
The Idea behind Configuration Validation

A reporting to understand how homogeneous the configuration of systems is

Reference System

**Configuration Items**
- Software Packages
- ABAP Notes
- Kernel level
- Transports
- Parameters

Configuration Validation

Compared Systems

System 1
- Configuration Items
  - ABAP Notes
  - Software Packages
  - Transports
  - Parameters

... System N
- Configuration Items
  - ABAP Notes
  - Software Packages
  - Transports
  - Parameters

Compliance with Reference System

System 1 | System 2 | System N
---|---|---
Software Packages | | |
ABAP Notes | | |
Transports | | |

Typical questions are:
- All systems on a certain OS level or DB level?
- Template configuration (SAP or DB parameter) applied on all systems?
- No kernel older than 6 month on all systems?
- Security policy settings applied? Security defaults in place?
- Have certain transports arrived in the systems?
Configuration Validation
Options to report about SAP Notes

A) Configuration Validation using a **Target System** which is based on EarlyWatch online recommendations (**RSECNOTE**)  
- Use this option to produce a cross-system analysis comparable to RSECNOTE (ABAP only)
- The target system defines which notes should be checked. The note list and the check conditions are loaded from EarlyWatch online recommendations.

B) Configuration Validation using a **Target System** which is based on **Notes**  
- Use this option to produce a cross-system analysis on selected notes (ABAP and Java)
- The target system defines which notes should be checked. The initial note list is loaded from System Recommendations, and can be reduced or extended.
- The check conditions are loaded from note definition available at the SAPNet.

C) **System Recommendations** Reporting  
- Use this option to produce a cross-system analysis for System Recommendations
Configuration Validation
B) Configuration Validation using a Target System based on Notes

Option b) all notes based on System Recommendations

The SAP Notes relevant for the source system can be restricted via

- Data Range
- Note Group – for example only Security and Hotnews SAP Notes can be inserted
Using the predefined report 0TPL_OSMD_VCA2_SYS_RECOM_NOTES of the application “Configuration Validation” you can define arbitrary selections, filters and views for a cross-system report based on the results of the application “System Recommendations”.

Select note area ..

.. or select notes which have been classified as being ‘important’ by your CERT department

CERT = Computer Emergency Response Team
New option to paste note numbers into the selection screen of the reporting as of SolMan 7.1 SP 9 for the query showing results of System Recommendations.

1. Step: Activate the new option

2. Step: Paste the system names or the note numbers into the new popup
### Configuration Validation Result

#### Selected ConfigStores and Items - Only Non compliant Items with Value and Target Value

**Selection: Reference and Comparison System, Config Store and Item(s)**

OGNRT001VIRTUAL, SD7 0020270862, SI7 0020270862, SQ7 0020230702, ST7 0020270862, SW7 0020270862, SD7, SI7, SQ7, SI

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Cross-System reporting about System Recommendations

Combined value

- Run cross-system BW reporting about System Recommendations
- Validate if selected notes have reached production systems
- Determine quality of patch processes

Efficient validation after SAP Security Note implementation
Agenda

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  What they are, when they’re published

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- SAP Security Patch Process
  How to put all into a working mechanism
The challenge! – Weighting security risk against operational risk

Whether to patch, or not to patch?
Security Patch Day:
How to implement which note in which system?

Unfortunately the tools reduce the mass and effort issue only partially:

- Depending on the age of the system very many Security Notes (up to hundreds) are relevant per system.
- The priority of the notes is not a strong, selective criteria as approximately 80% of all notes have priority „HotNews“ or „high“.
- Depending on the size of the system landscape you have to patch many systems. You have to align exceptional security patches with regular maintenance activities.
- The effort to analyze and to implement security notes, to identity the test requirements and to document all activities is quite high.
- You don't get any guarantee that there are no notes which produce massive issues during implementation or usage in production systems.
- Different technologies (especially ABAP, Kernel, Java, HANA) require special patch processes.
- and in case of other products like Business Objects or Mobile it’s even difficult to find relevant notes.
The 5 Stages of a Security Patch Process

1. Monthly execution of „System Recommendations“
2. Check Security Notes within „Maintenance Planner“
3. Reduction of test effort using UPL or BPCA
5. List of Security Notes support.sap.com/securitynotes

Useful Documentation:
- Details about System Recommendations: support.sap.com/sysrec
- Demo of System Recommendations: Link

* UPL – Usage Procedure Logging, BPCA – Business Process Change Analyzer (support.sap.com/testing)
Most Important: SAP Security (Patch) Policy

The best support to bring a patch process to live:

➢ Describes organization (responsibilities) and processes relevant for implementing security patches

➢ Defines the mandatory timelines for published security patches and implementation of SPs

➢ Often dependent on security classification of systems or applications

➢ Should provide hard targets but should also allow for documented, approved exceptions

➢ Goal: Make patching mandatory but balance security risk against operational risk
Trivial SAP Security Patch Policies

Business first
No patching at all. Only exceptions are SPs every 2 years (or less) or one or two “Hot News” notes a year for severe vulnerabilities

Security first
No discriminating patching policy, no assessments, trade-offs. Security Notes are implemented immediately regardless of priority
Non-Trivial SAP Security Patch Policies

**Business first**
No patching at all. Only exceptions are SPs every 2 years (or less) or one or two “Hot News” notes a year for severe vulnerabilities.

**Patch with reason**
Assess security and implementation risk, weigh trade-off to determine best approach for SAP Security Note implementation.

**Security first**
No discriminating patching policy, no assessments, trade-offs. Security Notes are implemented immediately regardless of priority.
The patching process: Actions to take

   a) Ongoing project: Monthly patch process to catch new notes
   b) Special project to cover the backlog of old notes once the monthly patch process works fine

2. Classify the notes for the patching policy: Assess the security risk (i.e. priority & CVSS).

3. Classify the notes for the patching policy: Assess the implementation risk (UPL, BPCA).

4. Apply patching policy. Results in timeline until when to patch.

5. Communicate targets. Follow up on implementation progress / patching compliance.
Classification of Security Notes by Type

1. **ABAP Correction Instructions**
   Use Note Assistant (transaction SNOTE) to implement the correction or apply the Support Package

2. **ABAP Software-like manual corrections**
   Implement the correction manually, e.g. deactivate a web-based service, and use normal transports

3. **Kernel Notes**
   Install a new Kernel

   **Java Notes**
   Install Java Support Packages or Patches

   **HANA Notes**
   Install new revision

4. **Notes about other components**
   Individual procedure to find notes and to update the CryptoLibrary, other Databases, SAPGUI, RFC Library, Business Objects, Sybase, ..

5. **Other manual instructions**
   Anything else. Sometimes described in White Papers or Documentation, too.
Classification of Security Notes by Implementation Process

1. **Implementation as part of a monthly standard patch process**
   e.g. for ABAP Correction Instructions or ABAP software-like manual corrections

2. **Implementation as part of a project**
   e.g. for notes about other components or other manual instructions

3. **Implementation as part of maintenance activities**
   e.g. Support Package upgrade, Kernel upgrade, Java upgrade

4. **Implementation after maintenance activities**
   e.g. manual instructions which require a Support Package upgrade or Kernel upgrade as a prerequisite
Sample SAP Security Patch Policy

1. Every system / application has to be put into a security category / classification [Very High, High, Medium, Low]

2. No SP level must be older than 1,5yrs

3. Security Notes published by SAP must be assessed and classified by priority [Very High, High, Medium, Low] and implementation process [Monthly, Maintenance, Project]

4. The following timelines apply (excerpt):

<table>
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<tr>
<th>System Class [Max]</th>
<th>Note Priority</th>
<th>Impl Process</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>Very High</td>
<td>&lt;any&gt;</td>
<td>30 days</td>
</tr>
<tr>
<td>Very High</td>
<td>High</td>
<td>Monthly</td>
<td>30 days</td>
</tr>
<tr>
<td>Very High</td>
<td>High</td>
<td>Maintenance</td>
<td>90 days</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>Project</td>
<td>180 days</td>
</tr>
</tbody>
</table>

5. Exceptions are allowed for good reason but must be documented and approved by IT Security
Sample patch process
Integrated approach with policy adoption and checks

<table>
<thead>
<tr>
<th>Monthly on 2nd Tuesday</th>
<th>The week after the Patch Day</th>
<th>Within one month, three months…</th>
<th>During next maintenance cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAP Security Patch Day</strong></td>
<td><strong>WORKFLOW</strong>: Apply within X days (policy)</td>
<td><strong>WORKFLOW</strong>: Apply Security Notes</td>
<td><strong>Apply additional manual configuration of SAP Security Notes if necessary</strong></td>
</tr>
<tr>
<td><strong>Check Support Portal /securitynotes</strong></td>
<td><strong>Check System Recommendations in Solution Manager</strong></td>
<td><strong>Perform individual regression test</strong></td>
<td><strong>Complete test</strong></td>
</tr>
<tr>
<td><strong>Check System Recommendations in Solution Manager</strong></td>
<td><strong>Check SAP Security Notes Advisory /sos → Media Library</strong></td>
<td><strong>Document exception</strong></td>
<td><strong>Check status</strong></td>
</tr>
</tbody>
</table>

**WORKFLOW**: Check in X days
What’s happening at the customer side?
Customers Demonstrate an Increasing Adoption of SAP Security Patches as a Corporate Policy

Trade-off tips to the patching side
“We apply SAP security patches immediately and move them to our productive systems after a 1 month cooling time whether or not we've had the time to test them.”
ExxonMobil, October 2014

Time to patch follows priority
“We decided to apply all security notes (immediately after every patch day) and our operations managers have to do it within the decided processing times per note priority.”
BMW, October 2014

Negligible critical side effects
“We from a security patching perspective we can confirm that we have had no impact on the productivity of the systems in the last 6 months.”
ExxonMobil, October 2014
Hosts of the monthly Security Notes Webinar

**ASUG Security SIG**

**DSAG AG SAP Security Vulnerability Management**
Calendar: [https://www.dsag.de/arbeitsgremien/ag-sap-security-notes/veranstaltungen](https://www.dsag.de/arbeitsgremien/ag-sap-security-notes/veranstaltungen)

**SAP Enterprise Support Academy**
To access the SAP Learning Hub, edition for SAP Enterprise Support, a one-time registration via an s-user is required. The registration triggers an automatic eligibility check. Access is included in SAP Enterprise Support and SAP Enterprise Support, Cloud Edition as well as in SAP Product Support for Large Enterprises.

You can find the latest version of the presentation on SAP Support Portal /sos

[https://support.sap.com/sos](https://support.sap.com/sos)

→ Advisories → Security Notes Webinar
How to register at SAP Enterprise Support Academy

→ Access Learning Catalog
→ Browse the Catalog
→ Search for “Updates from the last SAP Security Patch Day”
→ Register / View Registration
→ Register yourself to all available sessions

You may use filters as well:
- Category: Instructor led
- [X] Show courses with online content
- [X] Scheduled courses only
- Course level: Service and Support
- Delivery method: Meet-the-Expert
- Subject Areas: SAP Enterprise Support Edition - Support & Maintenance
When publishing Security Notes on https://support.sap.com/securitynotes, SAP also publishes a prioritization. This prioritization is based on certain criteria from a development / product point of view, also incorporating CVSS scores where applicable.

With the SAP Security Notes Advisory, SAP Global Service & Support offers an additional prioritization. This prioritization is no contradiction to the original priorities given by the SAP product development. It supplements these priorities with a field view, adding experiences from both practical security and implementation of SAP applications and operation of systems by SAP Global Service & Support. The Advisory also gives hints on side-effects to expect and recommends an implementation approach for the Security Notes published each month.

Important note: This service is delivered by the SAP Consulting (part of SAP Global Service & Support). Please address any questions about this Advisory to security.consulting@sap.com

If you have issues with individual SAP Note implementation steps, please open a message on the component of the SAP Note.

You can find the latest version of the Advisory on SAP Support Portal /sos https://support.sap.com/sos
→ Media Library → SAP Security Notes Advisory
# SAP Security Notes Advisory by SAP Consulting Example

<table>
<thead>
<tr>
<th>Number</th>
<th>Application Area</th>
<th>Short text</th>
<th>Affected System Type</th>
<th>Priority recommendation [SAP Services]</th>
<th>SAP Priority [SAP Services]</th>
<th>Reason for deviation</th>
<th>Risk explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1694057</td>
<td>PLM-CFO</td>
<td>Unauthorized modification of displayed content in PLM-CFO(3)</td>
<td>ABAP</td>
<td>keep</td>
<td>High</td>
<td>-</td>
<td>Specific OAPR pages allow adversaries to modify displayed application content without authorization and to potentially obtain authentication information from other legitimate users.</td>
</tr>
<tr>
<td>1791940</td>
<td>IS-DFS-MA</td>
<td>Potential modification of persisted data in MDS</td>
<td>ABAP</td>
<td>increase (make higher)</td>
<td>High</td>
<td>Application-wide data manipulation possible, potentially impact entire SAP system.</td>
<td>An authenticated attacker can inject arbitrary SQL commands using the function module available in an AM role to launch a DoS attack.</td>
</tr>
<tr>
<td>1830797</td>
<td>BC-MID-ICF</td>
<td>Missing authorization check in BC-MID-ICF</td>
<td>ABAP</td>
<td>keep</td>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1955742</td>
<td>BC-JAS-SEC-LGN</td>
<td>Potential Denial of Service in SAML2</td>
<td>Java</td>
<td>increase (make higher)</td>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1973081</td>
<td>BC-ABA-SC</td>
<td>XSRF vulnerability: External start of transactions with OKCode</td>
<td>ABAP</td>
<td>keep</td>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

---

Information is contained in Excel download of Security Notes from SAP Support Portal

Information is contained inside Security Notes text

Additional Information and Recommendations from SAP Services
Core elements of the advisory

The advisory is a simple Excel workbook with several data sheets

- Cover sheet
- Summary / Howto
- Legend (color coding)
- Advisory sheet (main content)

- Notes list (month)
- Notes chart (all)
- Notes statistics (all)
- Notes list (all)
Color coding of the advisory sheet columns

<table>
<thead>
<tr>
<th>Number</th>
<th>Application Area</th>
<th>Group text</th>
<th>Category</th>
<th>Affected System Type</th>
<th>SAP Priority [<em>PASS</em>*]</th>
<th>CVSS Base Score</th>
<th>CVSS Base Version</th>
<th>Reported by external source</th>
<th>Support Package Implementation Note</th>
<th>Priority recommendation</th>
<th>SAP Prining [Consulting]</th>
<th>Reason for deviation</th>
<th>Type of update</th>
</tr>
</thead>
<tbody>
<tr>
<td>964772</td>
<td>DRMA-SA-TEC</td>
<td>Update nonstandard note 964772</td>
<td>Programme</td>
<td>Java</td>
<td>Denial with high priority</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td>No</td>
<td>Keep</td>
<td>High</td>
<td>-</td>
<td>Complete swap</td>
</tr>
</tbody>
</table>

The colors indicate the source of the information

- **Grey:** Original information from SAP Security Notes publication (https://support.sap.com/securitynotes)

- **Olive:** Original information from individual SAP Security Note (https://service.sap.com/sap/support/notes/<note number>)

- **Blue:** Additional information from SAP Services
Header data from SAP Security Note

Basic information indicating applicability and severity of the issue

- **Category:** Programm error, Customing, Consulting
- **System type:** derived from affected component (Java, ABAP, HANA…)
- **CVSS data**
- **External attention**
- **SPIN or PD note**

<table>
<thead>
<tr>
<th>Category</th>
<th>Affected System Type</th>
<th>SAP Priority [PSRT]</th>
<th>CVSS Base Score</th>
<th>CVSS Base Vector</th>
<th>Reported by external sources</th>
<th>Support Package Implementation Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program error</td>
<td>Java</td>
<td>Connection with medium priority</td>
<td>6.6</td>
<td>AYNIAC/MALISIC/PAM/P</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Program error</td>
<td>Java</td>
<td>Connection with high priority</td>
<td>8.6</td>
<td>AYNIAC/MALISIC/PAM/P</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Program error</td>
<td>ABAP</td>
<td>Connection with high priority</td>
<td>9.6</td>
<td>AYNIAC/MALISIC/PAM/P</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>F</td>
<td>Program error</td>
<td>ABAP</td>
<td>Connection with high priority</td>
<td>4.6</td>
<td>AYNIAC/MALISIC/PAM/P</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### CVSS Data from SAP Security Note

#### CVSS Vector Details

- Open additional columns with “+” at column H
- Automatically derived from vector spec
- Gives additional hints on attack complexity
- Also has indicators on damage (confidentiality, integrity, availability)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td>AWSAC:MiUNc:APPAL</td>
<td>Low</td>
<td>Medium</td>
<td>None</td>
<td>None</td>
<td>Partial</td>
<td>None</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>AWSAC:LaUNGPIMIAN</td>
<td>Low</td>
<td>Low</td>
<td>None</td>
<td>Partial</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
Note assessment (1/2)

Additional information on priority and risk (field point of view)

- Priority recommendation
- (Changed) Priority
- Reason for deviation from product development priority
- Vulnerability type
- Risk details
- Solution type

<table>
<thead>
<tr>
<th>Priority recommendation</th>
<th>SAP Priority (Consulting)</th>
<th>Reason for deviation</th>
<th>Type of vulnerability addressed</th>
<th>Risk explanation</th>
<th>Solution (short)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep</td>
<td>High</td>
<td>-</td>
<td>OS command injection</td>
<td>User input screening strengthened</td>
<td></td>
</tr>
<tr>
<td>Keep</td>
<td>High</td>
<td>-</td>
<td>Information disclosure</td>
<td>Coding dexterity strengthened</td>
<td></td>
</tr>
<tr>
<td>Keep</td>
<td>High</td>
<td>-</td>
<td>SQL injection</td>
<td>Additional authorization check</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>GIS local application</td>
<td>Missing authorization check</td>
<td>An authenticated attacker can use functions of ECC-DISC-HP to which access should be restricted</td>
<td>Additional authorization check</td>
<td></td>
</tr>
<tr>
<td>Keep</td>
<td>Medium</td>
<td>-</td>
<td>Information disclosure</td>
<td>User input screening strengthened</td>
<td></td>
</tr>
</tbody>
</table>
## Additional information on implementation risk and approach

- Type of correction
- Implementation recommendation
- Effort indicators
- Side effects, note dependencies
- Additional topics to consider
- Possible workarounds

<table>
<thead>
<tr>
<th>Correction type</th>
<th>Recommended implementation process</th>
<th>Correction implementation effort estimation</th>
<th>Downtime required</th>
<th>Additional comments</th>
<th>Correction testing effort estimation</th>
<th>Workaround (&quot;virtual patching&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNOTE</td>
<td>Monthly patch process</td>
<td>0.5</td>
<td>No</td>
<td>Small correction, Note 1049557 is prerequisite.</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Java Patch</td>
<td>Part of maintenance</td>
<td>0.5</td>
<td>No</td>
<td></td>
<td>0.5</td>
<td>Cisco vs. adaptive request filter engine on IDMS/finall systems</td>
</tr>
</tbody>
</table>
Correction data from SAP Security Note

Additional information on applicability

- SPs containing the correction
- ABAP objects affected
- Java components
The **Patch Day Security Notes** with ABAP corrections are supported by an impact analysis which will provide information on which end user applications might be impacted by a given note.

This information enables customers to perform regression testing before patching the productive systems thereby taking informed decisions and ensuring continuity of their processes.

The impact analysis is based on **static analysis of dependencies** performed internally at SAP on a standard SAP system which is on the latest release. Custom coding is not supported.

The analysis currently supports dependencies related to Reports, Transactions, Remote-Enabled Functions (RFC) and WebDynpro ABAP applications.

<table>
<thead>
<tr>
<th>Application Description</th>
<th>Object Type</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC-EIM-ESH: NetWeaver Enterprise Search</td>
<td>TRAN</td>
<td>ESH_ADM_TREX_DEST</td>
<td>Set TREX Destination</td>
</tr>
<tr>
<td>BC-EIM-ODP: Operational Data Provisioning</td>
<td>RFC</td>
<td>RODPS_ESH_ODP_TREX_CHECK_RFC</td>
<td>Prüft Verfügbarkeit der BWA Indizes</td>
</tr>
<tr>
<td>BC-EIM-ESH: NetWeaver Enterprise Search</td>
<td>PROG</td>
<td>ESH_ADM_SET_TREX_DESTINATION</td>
<td>Set the RFC Destination of TREX or DB Connection to SAP HANA</td>
</tr>
</tbody>
</table>
Security Notes assessment: monthly steps

1. Receive the advisory via mail

2. Refine the advisory on a global (system independent) level
   - Add company specific details and handling recommendations
   - Add timeline-to-patch from company policy
   - Remove irrelevant data

3. Either globally or per system owner:
   Download list of applicable notes for each system from System Recommendations application

4. Merge Excels of applicable notes with refined recommendations from advisory

5. Send result to system owner / application manager to handle
   On application level, exception might be necessary
If you are looking for an EWA / RSECNOTE like information:
- Filter “Correction type” for “SNOTE” (no manual steps)
- Filter “Recommended implementation process” for “Monthly patch process”
- Filter “Priority” to be at least “High”
- This will result in all notes that are important and easy to implement (which was the aim of RSECNOTES)

Testing recommendations
- Obsolete code: “Solution” columns
  - When code is removed, it shouldn’t have been there right from the start
  - High probability that this code had never been used in customer production either
- ABAP: Use UPL to measure object usage
  - Performance impact negligible
  - Reports /SDF/UPL_CONTROL, /SDF/SHOW_UPL
  - UPL functionality is contained in ST-PI components
  - Compare results with affected objects from advisory
- Objects that are not used might be used by an attacker. But patching is easy because no testing required.
Handling best practices

By vulnerability type:

- Directory traversals: very often difficult to implement
  A project approach is advisable for non-recent SP levels
  Security risk depends highly on “read” vs. “write”
- Missing authorization: very often fairly easy to implement
  (but watch out for objects that might be missing in roles)
- XSS: very often fairly easy to implement and test
- Code / SQL (write) / Command injection: dangerous! – and often easy to implement
- Information disclosure / SQL (read) injection:
  No imminent danger to system integrity

Check “Additional comments” for implementation issues (dependent notes) and side effects

Some customers calculate time-to-patch on both implementation approach and security risk.
Three key messages as take away!

Applying SAP Security Notes is a **challenging topic**.

SAP provides tools for an efficient matching of notes to **systems and processes**.

The setup of a **proper patch process** is key in keeping important business systems secure.
SAP CERT / Vulnerability Advisory Service

Key Message:
• Absolute baseline security / first and most effective security measure against exploits and attacks.
• The advisory team screens timely commercial as well as public security sources and filters relevant vulnerabilities.
• All components used within SAP are in scope incl. SAP NetWeaver or SAP HANA patches.

Monitor + Analyze
• Monitor vulnerability advisory service channels
• Prioritise vulnerability advisory service channel based on criticality of assets and risk
• Analyse and research vulnerabilities for applications and infrastructure components

Rate Vulnerability
• Rate vulnerabilities by using the Common Vulnerability Scoring System (CVSS).
• Steer and coordinate SAP Threat Round Table meetings

Create SAP CERT Advisory
• Timely and effective dissemination of vulnerability information to actively subscribed users
• Provide patch notification for fixing vulnerability incl.
  • Threat Level
  • Severity rating / CVSS score
  • Recommendation
  • Patch Timeframe
SAP CERT / Vulnerability Advisory Service - Examples

SCN-2017-0758 [SAP--High]: SAP Multiple Vulnerabilities August Patch Day

- SAP CERT Vulnerability Advisory
- ID: SCN-2017-0758
- Topic: SAP Multiple Vulnerabilities August Patch Day
- Overview:
  - Access Vector: Network
  - Impact/Damage: Cross-Site Scripting
  - URL Redirection
  - SQL Injection
  - Denial of Service
  - Missing Authorization Check
  - Other
- Threat Level:
  - Overall patch rating: High
  - Patch rating for Servers: High
  - Patch rating for Client (incl. Office-WTS): Low
- Recommendation on client systems:
  Install patch on affected systems during next maintenance.
- Recommendation on server systems:
  Install patch immediately on all affected systems. If you need assistance, please contact Global IT.
- Rating score:
  - CVSS3-Base: N/A
  - CVSSv3-Vector: N/A
- Solution:

SCN-2017-0656 [SAP--High]: SAP Multiple Vulnerabilities July Patch Day

- SAP CERT Vulnerability Advisory
- ID: SCN-2017-0656
- Topic: SAP Multiple Vulnerabilities July Patch Day
- Overview:
  - Access Vector: Network
  - Impact/Damage: Cross-Site Scripting
  - Information Disclosure
  - Other
- Threat Level:
  - Overall patch rating: High
  - Patch rating for Servers: High
  - Patch rating for Client (incl. Office-WTS): Low
- Recommendation on client systems:
  Install patch on affected systems during next maintenance.
- Recommendation on server systems:
  Install patch immediately on all affected systems. If you need assistance, please contact Global IT.
- Rating score: (Note 2476601)
  - CVSS3-Base: 8.1
Standard approach for SAP Business Systems

**Step 1**
- SAP Vulnerability Advisory Service provides SAP Security Note details on SAP Patch Day

**Step 2**
- Central operation team in SAP IT reviews Advisory and related SAP Security Notes

**Step 3**
- Creation of task list via application System Recommendations respective [FRUN](#) CSA Validation

**Step 4**
- System Owner verifies task list and confirms list of to-be-implemented notes

**Step 5**
- Implementation of Notes in Bugfixing Systems using the standard change management process incl. creation of relevant master change tickets

**Step 6**
- Import and testing is done based on criticality and rating of notes either via monthly release delivery or via Emergency Change / Fast Track for Very Critical Patches.

**Step 7**
- Tracking and reporting is done via [FRUN](#) CSA Validation (which is similar to Configuration Validation)
Approach for Kernel and Support Package Upgrade

➢ Kernel upgrades are done as part of **planned downtime** activates at least every quarter. For critical fixes **emergency changes process** applies.

➢ Security Patches available only as part of **Support Package Updates** are done on a regular basis, but **at least 2 times a year**.

➢ Only **remaining Security Notes** need to be implemented as part of monthly patch processes.
Contact information:

Frank Buchholz  
SAP CoE Security Services  
frank.buchholz@sap.com

Security Patch Process FAQ  
https://scn.sap.com/community/security/blog/2012/03/27/security-patch-process-faq