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

SAP Center of Excellence – Security Services
October 2019
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.
SAP Security Patches
Why is patching necessary? Why are there so many Security Notes?

“Isn’t SAP using advanced techniques to avoid security flaws? Just like Microsoft, Google or Apple do?”

1. SAP operates research departments for code security which are top league.

2. In its code development lifecycle, SAP makes use of a variety of mechanisms to keep a very high level of quality. This includes dynamic code scanning, static code scanning, automated dynamic testing (such as fuzzing) and other techniques – wherever these are suitable.

3. Unfortunately, hackers and security researchers find new attack methods over time. This makes fixing newly discovered vulnerabilities inevitable. And Oracle, Microsoft, Google and Apple are no exception to this rule.

4. SAP makes sure that only critical patches or those with dependencies to other software releases are published.

Result: For its Business Suite (“ERP”), over the last 3 years SAP issued just 18 patches of priority “Hot News” (very high). Among these only 3 required a downtime. Put this into context of the over 400 million lines of code SAP has to maintain for the Business Suite. And compare this to Apple with some 90M lines of code for MacOS and MS being at roughly 50M for the Office Suite.

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1 Example: “Beyond Metadata: Code-centric and Usage-based Analysis of Known Vulnerabilities in Open-source Software” which just recently got the IEEE TCSE Distinguished Paper Award

2 While fuzzy testing is highly applicable to code written in C, it does not make much sense for database (SQL) based vulnerabilities.
What do security minded customers do?
Such customers implement 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**

“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*
And if you don’t do it? One story from real-life.
The real business impact when not patching

1. Customer SAP system was deeply compromised, including full administrative access & code changes
2. Attackers got in through “Hot News” (very high) vulnerability that was not patched for months
3. What next? Options were very limited:
   - SAP system was removed from the network immediately after attacks were identified
   - BUT: Backups were not usable to restore SAP system to point before first successful attacks
   - SAP system was not available for several weeks

Hack impact: Need for forensics and restore

Business: Bring up system back to normal operations
- SAP recommended to re-build system from scratch as attackers modified additional parts of the system
- Customer business decision:
  - SAP system was to go live again, with manual removal of infected parts
  - Unknown if attacker manipulated other parts of the SAP system, and may return
The bottom line

Risk and impact

- The operational impact of implementing SAP security patches is largely overestimated.
- The risk of lost availability and data theft due to vulnerable, unpatched SAP systems is largely underestimated.
- Customers who started security patching in real life found it remarkably smooth.

SAP Security Patching is a part of standard IT operations just like it is for other vendors.
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
... but maybe you prefer the “Expert Search” which offers detailed filters.

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.

### Security Notes in the SAP Support Portal

https://support.sap.com/securitynotes

#### SAP Security Notes

- **To Be Reviewed**
- **Confirmed**
- **Not Relevant**

#### 535 Document(s) To Be Reviewed

<table>
<thead>
<tr>
<th>SAP Component</th>
<th>Number</th>
<th>Title</th>
<th>Category</th>
<th>Priority</th>
<th>Released On</th>
<th>First Released On</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC-SYB-PB</td>
<td>2201710</td>
<td>Fixing Logjam and Alternative chains certificate forgery vulnerabilities in multiple SAP products</td>
<td>Program error</td>
<td>Correction with medium priority</td>
<td>19.03.2018</td>
<td>08.09.2015</td>
</tr>
<tr>
<td>XX-CSC-RU-FI</td>
<td>1908841</td>
<td>Potential disclosure of persisted data in XX-CSC-RU</td>
<td>Program error</td>
<td>Correction with medium priority</td>
<td>13.03.2018</td>
<td>13.03.2018</td>
</tr>
</tbody>
</table>
Security Notes in the SAP Support Portal

Changing the view shows the complete list of “All SAP Security Notes”

<table>
<thead>
<tr>
<th>SAP Component</th>
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<td>13.03.2018</td>
<td>13.03.2018</td>
</tr>
<tr>
<td>XX-CSC-RU</td>
<td>2331141</td>
<td>SQL Injection vulnerability in FI-LOC-FI-RU</td>
<td>Program error</td>
<td>Correction with high priority</td>
<td>13.03.2018</td>
<td>13.03.2018</td>
</tr>
</tbody>
</table>
“Notes Search” in the SAP Support Portal
https://support.sap.com/notes → “Launch the Expert Search”

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 February 2019:
~4276 Security Notes in total

Changed strategy:
Publish "Patch Day Notes" only but postpone "Support Package Notes"
Count of new or changed Security Notes per Month

March 2018 - February 2019:
212 Security Notes in total
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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➔ SAP Security Patch Process
  How to put all into a working mechanism
The challenge! – Find the right note for the right systems

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.

- Others like **system measurement notes** and **correction notes**
  Notes having ABAP correction instructions
Where to get information and recommendations about new released SAP Notes

- Your 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)

or (recommended)

- 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
- HotNews
- Performance relevant notes
- Legal Change notes
- System Measurement notes
- Correction 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](https://support.sap.com/securitynotes)

**System Recommendations**

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

**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 identifies the relevant patches and SAP notes
System Recommendations: Process Flow

**Customer**

1. Select system to check & update

2. Retrieve system information (SP level, patch level)

6. Retrieve system information (implemented notes)

**SAP**

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

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 “UISMMMySAPNotes” 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’).
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.
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.
System Recommendations in SAP Solution Manager 7.2
Integration with SAP Support Portal

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

User Status

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

Transaction
SM30_AGSSR_STATUS

for customizing table
AGSSR_STATUS
System Recommendations in SAP Solution Manager 7.2
Status and Comments

<table>
<thead>
<tr>
<th>Recommendation ID</th>
<th>Component</th>
<th>Status</th>
<th>Recommendation</th>
<th>Date</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001497330</td>
<td>FBT</td>
<td>ABAP</td>
<td>NEW</td>
<td>ROB</td>
<td>SR_TST_01</td>
<td>04.09.2015 14:41:24 test with rob#</td>
</tr>
<tr>
<td>0001497606</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
<tr>
<td>0001498406</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
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</tr>
<tr>
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<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
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<tr>
<td>0001494879</td>
<td>FBT</td>
<td>ABAP</td>
<td>NEW</td>
<td>PSP</td>
<td>SAVESELBERGW</td>
<td>21.06.2015 17:37:57 please postpone this note..</td>
</tr>
<tr>
<td>0001497104</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
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<tr>
<td>0001501945</td>
<td>FQ7</td>
<td>JAVA</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
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<td>FBT</td>
<td>ABAP</td>
<td>NEW</td>
<td>ROB</td>
<td>SR_TST_01</td>
<td>04.09.2015 14:41:24 test with rob#</td>
</tr>
<tr>
<td>0001500721</td>
<td>FBT</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
<tr>
<td>0001509604</td>
<td>FQ7</td>
<td>JAVA</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
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<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
<tr>
<td>0001523639</td>
<td>FBT</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
<tr>
<td>0001526853</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>IMP</td>
<td>SR_TST_01</td>
<td>23.06.2015 10:15:25 Implement me! :)</td>
</tr>
<tr>
<td>0001529905</td>
<td>FQ7</td>
<td>HANAD</td>
<td>NEW</td>
<td>NEW</td>
<td>SR_TST_01</td>
<td>11.09.2015 13:11:46 Der Anp änderungsauftrag 8000011640 wird für die folgenden SAP</td>
</tr>
<tr>
<td>0001540203</td>
<td>FQ7</td>
<td>JAVA</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
<tr>
<td>0001543951</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>SR_TST_01</td>
<td>12.08.2015 14:59:15</td>
</tr>
<tr>
<td>0001550925</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>SR_TST_01</td>
<td>24.06.2015 12:12:30 The change request 8000005935 is created for the following</td>
<td></td>
</tr>
<tr>
<td>0001552405</td>
<td>FBT</td>
<td>ABAP</td>
<td>NEW</td>
<td>LUANE</td>
<td>10.11.2015 14:44:51 A change impact analysis has been started in Business Proc</td>
<td></td>
</tr>
<tr>
<td>0001555144</td>
<td>SD7</td>
<td>ABAP</td>
<td>NEW</td>
<td>ET</td>
<td>ISW</td>
<td>23.06.2015 14:42:29 Das ist ein Test von Gordon - zurück auf New... dann New v</td>
</tr>
<tr>
<td>0001555144</td>
<td>SD7</td>
<td>ABAP</td>
<td>ISW</td>
<td>SR_TST_01</td>
<td>23.06.2015 14:42:29 Das ist ein Test von Gordon - zurück auf New... dann New v</td>
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<td>IND</td>
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<td>23.06.2015 14:41:46 Das ist ein Test von Gordon - zurück auf New... dann New v</td>
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</tbody>
</table>
The information about the usage count comes from UPL.
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_RFCACL).

Or start integrated Change Impact Analysis or Change Request Management
System Recommendations in SAP Solution Manager 7.2
Confirm download of SAP Notes into managed system

- 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>A</td>
<td>System Measurement / License Audit Notes (7.2 SP 8)</td>
<td>✔️</td>
</tr>
<tr>
<td>C</td>
<td>Correction Notes</td>
<td>✗</td>
</tr>
</tbody>
</table>

Correction notes (Type C – containing vital corrections to the SAP Solution Manager core functions) must be specified manually to be retrieved:

- Call transaction `SM30_DNOC_USERCFG_SR`
- In the field `SYSREC_NOTE_TYPES` add or remove the relevant values
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).
Overview about Application Components for DB/OS:

<table>
<thead>
<tr>
<th>Databases</th>
<th>Operating Systems</th>
<th>Operating Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA BC-DB-SDB</td>
<td>LVC BC-DB-LVC</td>
<td>SINIX BC-OP-FSC-REL</td>
</tr>
<tr>
<td>ADA BW-SYS-DB-SDB</td>
<td>MSS BC-DB-MSS</td>
<td>SOLARIS BC-OP-FSC-SOL</td>
</tr>
<tr>
<td>DB2 BC-DB-DB2</td>
<td>MSS BW-SYS-DB-MSS</td>
<td>SOLARIS BC-OP-SUN</td>
</tr>
<tr>
<td>DB2 BW-SYS-DB-DB2</td>
<td>ORA BC-DB-ORA</td>
<td>HP-UX BC-OP-HPX</td>
</tr>
<tr>
<td>DB4 BC-DB-DB4</td>
<td>ORA BW-SYS-DB-ORA</td>
<td>LINUX BC-OP-LNX</td>
</tr>
<tr>
<td>DB4 BW-SYS-DB-DB4</td>
<td>SAP BC-DB-SDB</td>
<td>LINUX BC-OP-PLNX</td>
</tr>
<tr>
<td>DB6 BC-DB-DB6</td>
<td>SAP BW-SYS-DB-SDB</td>
<td>LINUX BC-OP-ZLNX</td>
</tr>
<tr>
<td>DB6 BW-SYS-DB-DB6</td>
<td>SYB BC-DB-SYB</td>
<td>LINUX OS/3 BC-OP-LNX</td>
</tr>
<tr>
<td>HDB BC-DB-HDB</td>
<td>SYB BW-SYS-DB-SYB</td>
<td>LINUX OS/3 BC-OP-PLNX</td>
</tr>
<tr>
<td>HDB BW-SYS-DB-HDB</td>
<td>TD BC-DB-TD</td>
<td>LINUX OS/3 BC-OP-ZLNX</td>
</tr>
<tr>
<td>HDB HAN-DB</td>
<td>TD BW-SYS-DB-TD</td>
<td>OS/400 BC-OP-AS4</td>
</tr>
<tr>
<td>INF BC-DB-INF</td>
<td></td>
<td>WIN-NT BC-OP-NT</td>
</tr>
<tr>
<td>INF BW-SYS-DB-INF</td>
<td></td>
<td>Z/OS BC-OP-S390</td>
</tr>
</tbody>
</table>

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General Customizing and Personalization
Transaction SM30_DNOC_USERCFG_SR

SYSREC_STATUS_FILTER (*)
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.

SYSREC_UPL_ACTIVE (*)
Activate/deactivate the integration with UPL while showing the object list of ABAP notes.

SYSREC_UPL_MONTH (*)
Count of month for which UPL data get loaded. The default is 2 which represents the current and the previous month.

SYSREC_NOTE_TYPES
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, License Audit, and Correction.

SYSREC_LAST_MONTHYEAR
Defines the earliest calculated SAP Notes. By default the application calculates all SAP Notes which were released between January 2009 and the current month.

SYSREC_BPCA_USER
Defines if the current user should be added as selection for BPCA.

SYSREC_BPCA_DATE
Defines the earliest filter for BPCA results. You can change the start date for this period.

SYSREC_CHARM_LOG_TYPE
Defines the text id according to table TTXID for the text object CRM_ORDERH.

SYSREC_CHARM_USER
Defines if the current user should be added as selection for ChaRM.

SYSREC_CHARM_DATE
Defines the earliest filter for ChaRM results. You can change the start date for this period.

SYSREC_OBJECT_EXP
Lifetime of the cache which contains the object list of SAP notes. The default is 14 days.

SYSREC_REQ_EXP
Lifetime of the cache which contains the required notes of SAP notes. The default is 14 days.

SYSREC_SIDE_EFFECT
Lifetime of the cache which contains the side-effect notes of SAP notes. The default is 14 days.

SYSREC_UNSUPPORTED_SYSTEM (*)
System types which you want to block from SysRec (one entry per system type)

SYSREC_UNUSED_SUBHR (*)
Calculate results for unused HR components (see note 2712210)

(*) User specific personalization
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.
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
System Recommendations: Setup in SAP Solution Manager 7.2

System Recommendations job

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”
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).
**Fiori Web Assistant – In-Application Help**

**Open Help**

Use the help icon to activate the in-application help.

---

**Prerequisites:**
- Configure profile parameters and redirect file for SAP Web Dispatcher
- Create Fiori Catalog with specific target mapping
- Create role containing the Fiori Catalog and assign it to all users

**References:**
- Online Help - Setup of In-Application Help
- Blog - S/4HANA – HowTo: Activate context-sensitive help from SAP
What's this App?
Here, you can manage the SAP Notes and support package patches that are not yet implemented and installed on your managed systems. For more information, see System Recommendations (link is defect).

System Overview
Shows all the systems for which the background job is running successfully.

System Types
The system type is read from the LMBD. Choose a system type to filter for these systems.

Sort, Filter, and Group
You can sort by attribute, as well as filter by technical system, IT admin role, and system priority. You can group by system type and favorites.

What's this App?
This is the System Recommendation app.
After refreshing the status of the SAP Notes that are implemented on the managed systems, only the SAP Notes are displayed that are available, but that are not fully implemented. Thus, you can quickly check whether certain SAP Notes are already implemented.

You can show requests for changes and change impact analyses for one or several systems.
Fiori Web Assistant – In-Application Help
Note Overview

<table>
<thead>
<tr>
<th>SAP Notes for selection</th>
<th>Implementation Status</th>
<th>Processing Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Technical System</td>
<td></td>
</tr>
<tr>
<td>Note Type</td>
<td>Implementation Status</td>
<td>Processing Status</td>
</tr>
<tr>
<td></td>
<td>New</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Version</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Updated</td>
<td></td>
</tr>
</tbody>
</table>

- **Implementation Status**
  - New shows new SAP Notes (after the last run).
  - New Version shows whether there is a new version for an SAP Note that you did not already set a processing status for.
  - Updated shows whether there is a new version for an SAP Note that you are already processing.
  - When an SAP Note is in implementation status New Version or Updated, consider re-evaluating its processing status.

- **Processing Status**
  - You can assign workflow statuses, but you can also customize statuses that reflect implementation projects. Thus, you can assign SAP Notes to projects.
  - You can also assign comments when changing a processing status. The comment is displayed on the Show SAP Note detail page.

**Export**

- Download the SAP Notes to a file in CSV format.
- When downloading the SAP Notes overview file, the following applies:
  - Only the SAP Notes are included in the file that apply to the current filter criteria.
  - Regardless of which columns are displayed on the UI, the file contains all available columns, to provide a maximum of information.
Fiori Web Assistant – In-Application Help
Note Overview

Save as Tile
Filter for specific attributes such as systems or priority.
Choose Save as Tile.
You can now access the SAP Note Overview with your filters from a launchpad tile.

Integrated Desktop Actions
You can download SAP Notes, create requests for changes, and start change impact analyses for one or several systems.

Save Specific Filters
Save specific filters to quickly display them from the launchpad.

Integrated Desktop Actions
On the SAP Note Overview screen, you perform the integrated desktop actions.
Fiori Web Assistant – In-Application Help
Note Overview

Save as Tile
Filter for specific attributes such as systems or priority.

Choose Save as Tile.
You can now access the SAP Note Overview with your filters from a launchpad tile.

Integrated Desktop Actions
You can download SAP Notes, create requests for changes, and start change impact analyses for one or several systems.
Fiori Web Assistant – In-Application Help Note Details

<table>
<thead>
<tr>
<th>Note Title</th>
<th>Version</th>
</tr>
</thead>
</table>

**Priority:** 3 - Correction with medium priority

**Category:** A - Program error

**Security Category:** S - Support Package Notes

**Correction Types:**

**System Measurement:**

**Usage Count**

For ABAP systems, shows the data that is available from Usage and Procedure Logging.

**Object List**

- **Usage Count**
  - Shows the Usage and Procedure Logging data
Troubleshooting: Application Log

Use transaction SLG1 for log object AGS_SR to inspect the application log for the background job of System Recommendations.
Report `AGSNO_RPT_EASY_SUPPORT` records the same data sent from your SAP Solution Manager system to SAP backend during note calculation but in a readable format which is more appropriate for analysis on SAP backend.

**Execution of Report:**

1. Run report `AGSNO_RPT_EASY_SUPPORT` and choose the system ID and the system type (e.g. ABAP or JAVA).
2. Save the generated xml file in your local directory. You can inspect the xml file with any xml viewer.
3. Compress the xml file into a `.zip` file using the common zip program.
4. Create a support ticket on component `SV-SMG-SR` and add the zip file as an attachment.
You use program **SMBI_TRACE** (see note [1394862](#)) to trace the communication between your SAP Solution Manager system and the SAP Backbone system.

Some applications like System Recommendations (which has the application code **SOLMANNOTE**) may generate many trace files within a single transaction and it's difficult to manually download all trace files and analyze their content.

Use report **AGSNO_RPT_TRACE_DOWN** to batch download these trace files and to extract information from them into additional log files. An authorization to read trace file is required to run this report.
Send Configuration Validation reports via email (7.2 SP 3)
Note 2427770 - Configuration Validation: Sending compliance results via email

BW Information Broadcasting is not longer supported in SAP BW 7.40 (Note 2020590)

Conclusion: You cannot schedule broadcast notifications for the System Recommendations BW report in SAP Solution Manager 7.2 anymore

New report to send System Recommendations results via email:

System Recommendations Report DIAGCV_SEND_SYSREC
New filter option for individual notes:
Navigate to any notes list and adjust the filter by removing all other filter valued and enter individual note numbers.

Tip for using the date filter
Starting from: 01.01.2017 - 31.12.9999
Range: 10.05.2017 - 13.06.2017
One day: 13.06.2017 - 13.06.2017
Show side effect solving notes (7.2 SP 5)

Show side effect solving notes for selected list of notes:

Show side effect solving notes on detail screen of notes:

Recommendation: Implement side effect solving notes right after implementation of the original notes

<table>
<thead>
<tr>
<th>Note Number</th>
<th>Short text</th>
<th>Application Component</th>
<th>Priority</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006746</td>
<td>Load balancing on some workflow table while viewing process route logs of a case.</td>
<td>BC-SRV-RM</td>
<td>3 - Correction with medium priority</td>
<td>P - Performance</td>
</tr>
</tbody>
</table>
What’s new in System Recommendations

If a Software Component is not part of ABAP / JAVA / HANA systems in SLD / LMDB you do not find corresponding notes in System Recommendations.

Special Software Components:

**BC-FES-GUI**
added to all ABAP systems as a virtual software component of type ‘Support Package Independent‘ as of May 2017

**CRYPTOLIB 8 SP000**
added to ABAP and JAVA systems as a virtual software component as of July 2017

**SAPHOSTAGENT**
not covered yet
The “Implementation Status” is set by the background job automatically

- New: New note
- New version available: Implemented ABAP note for which a new version is available
- Updated: Updated note compared with previous run
- [Implemented]: Implemented notes are omitted in System Recommendations

The “Processing Status” is set by the user manually

- Maintain available status values in customizing table AGSNOTE_STATUS
- Ensure to enter texts in all required languages
- The background job migrates existing status data into the new field once
  If the old status was “New” or “New version available” then the new status becomes “Undefined”
System Recommendations 7.2 SP 7
Separation between “Implementation Status” and “Processing Status”

### SAP Status (fixed values)

- Implementation Status
- Processing Status

### User-defined Status

- Customizing table AGSNOTE_STATUS

### SAP Notes for selected technical systems: 4

<table>
<thead>
<tr>
<th>Technical System</th>
<th>Note Number</th>
<th>Short text</th>
<th>Release Date</th>
<th>Application Component</th>
<th>Priority ID</th>
<th>Support Package</th>
<th>Implementation Status</th>
<th>Processing Status</th>
<th>Correction Types</th>
<th>Attributes</th>
</tr>
</thead>
</table>
System Recommendations 7.2 SP 7
New column “Support Package containing the solution” for ABAP notes

You have to activate this column manually.

New column showing SP containing the solution

<table>
<thead>
<tr>
<th>Technical System</th>
<th>Note Number</th>
<th>Short text</th>
<th>Release Date</th>
<th>Application Component</th>
<th>Priority ID</th>
<th>Support Package</th>
<th>Implementation Status</th>
<th>Processing Status</th>
<th>Correction Types</th>
<th>Attributes</th>
</tr>
</thead>
</table>
You have to activate column “Support Package” manually at the settings on the Notes Overview page.

The columns “Implementation Status” and “Processing Status” are activated automatically.
What's new in System Recommendations 7.2 SP 8

Support for Notes which are Relevant for System Measurement

Similar like for HotNews, Performance Notes, or Legal Change Notes you can now identify relevant notes having the attribute „Relevancy for System Measurement“ aka „License Audit Notes“

Limitation: The Notes Search on SAP Support Portal [https://support.sap.com/notes](https://support.sap.com/notes) does not show a filter option for such notes
What's new in System Recommendations 7.2 SP 8
Support for Notes which are Relevant for System Measurement

Preparation, which only required if you have previously changed the customizing, i.e. to view correction notes, too.

In this case you have to extend the settings via transaction SM30_DNOC_USERCFG_SR for table DNOC_USERCFG

SYSREC_NOTETYPES  HSLPCA

See Online Help: https://help.sap.com/viewer/34eaf25a11d54485aecf05e041f78555/107/en-US/aab02c8d37b54536bc3319521ea08eff.html
What's new in System Recommendations 7.2 SP 8
Support for Notes which are Relevant for System Measurement

You can activate a new filter field on the SAP Note Overview screen:

You can display the System Measurement and System Measurement ID columns on the SAP Note Overview screen via the settings button:

SAP Notes for selected technical systems: 8

See Online Help: https://help.sap.com/viewer/34eaf25a11d54485aef05e041f78555/107/en-US/aab02c8d37b54536bc3319521ea08eff.html
What's new in System Recommendations 7.2 SP 8
Support for Notes which are Relevant for System Measurement -

**Examples**

**Engine Measurement Correction**

Note [2621557](#) - ILM Audit Module: Introduction of additional measurement units
Note [2512261](#) - FKINVF: Usage measurement for SAP Convergent Invoicing still includes documents for …
Note [2294328](#) - Measurement result for metric ID 3216 is 1 too high
Note [2254780](#) - Enhancement of software license audit for SAP GTS
Note [2234559](#) - Transaction USMM triggers a runtime error DBSQL_SQL_ERROR

**LAW Consolidation**

Note [2407507](#) - LAW 2.0 SDCCN transfer does not work to 7.31
Note [2164594](#) - LAW 2.0: Falsche Nutzertypen bei Konsolidierung
Note [2112104](#) - LAW 2.0: Fehlende Sortierfunktion im RFC STATUS

**System Measurement USMM**

Note [2213466](#) - System measurement: Performance during determination of user address data
Note [2170034](#) - System measurement: Incorrect measurement date is displayed in the License Administration Workbench
Note [1900773](#) - System measurement: Automatic measurement via RFC or as a background job

**RFC Result Transfer**

Note [2498932](#) - System measurement job RSUVM017 or RSUVM007 terminates sporadically
Note [2170036](#) - LAW 2.0: RFC results from component systems are placed in LAW1 inbox
Note [1630359](#) - Report RSLAW_PLUGIN: Error message in case of RFC problems
Online Help - SAP Solution Manager 7.2 SP 8
https://help.sap.com/viewer/product/SAP_Solution_Manager/7.2.08/en-US

➢ Change Control Management - System Recommendations (abstract only)
https://help.sap.com/viewer/8b923a2175be4939816f0981b73856c7/7.2.08/en-US/61d626565b13e121e10000000a4450e5.html

➢ Application-Specific Security Guide - Using System Recommendation Application (security)

Online Help - SAP Fiori for SAP Solution Manager

➢ System Recommendations @ Fiori 1.0 SPS 7 (documentation)
https://help.sap.com/viewer/34eaf25a11d54485aefc05e041f78555/107/en-US/a5e801557f614c55e10000000a4450e5.html
System Recommendations in SAP Solution Manager 7.2

SAP Fiori apps reference library

https://fioriappslibrary.hana.ondemand.com/sap/f/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”
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?
• 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 → Daily Job → Day Extract → Solution Manager

Every 45 min* → Once a day* → Daily housekeeping*

Report /SDF/SHOW_UPL

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10.01.2014</td>
<td>FUGR</td>
<td>RHD8</td>
<td>FORM</td>
<td>EXTERNAL</td>
<td>1.547</td>
</tr>
<tr>
<td>10.01.2014</td>
<td>FUGR</td>
<td>RHD8</td>
<td>FORM</td>
<td>FILL_D77D</td>
<td>2</td>
</tr>
<tr>
<td>19.01.2014</td>
<td>FUGR</td>
<td>RHD8</td>
<td>FORM</td>
<td>FILL_D77R</td>
<td>47</td>
</tr>
<tr>
<td>19.01.2014</td>
<td>FUGR</td>
<td>RHD8</td>
<td>FORM</td>
<td>FILL_D77EO</td>
<td>2.681</td>
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<tr>
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<td>FORM</td>
<td>GET_DYN_COND</td>
<td>1.547</td>
</tr>
<tr>
<td>10.01.2014</td>
<td>FUGR</td>
<td>RHD8</td>
<td>FORM</td>
<td>INIT_SPARTITION</td>
<td>1.547</td>
</tr>
<tr>
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<td>PARTITION_AUTH</td>
<td>6</td>
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<tr>
<td>19.01.2014</td>
<td>FUGR</td>
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* Default setting

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
### Display Usage & Procedure Logging Data

#### UPL data

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Dataflow in Solution Manager

Solman Extractor Framework

Once a day

RFC to Managed System

Solution Manager 7.1 Applications

Custom Code Lifecycle Management

Solution Documentation Assistant

Business Process Change Analyzer

Scope & Effort Estimator

System Recommendations

etc.

Managed System

Week

Month

BW Cube

APIs on BW queries
### SAP Usage and Procedure Logging (UPL)
#### Central Analysis using BW in SAP Solution Manager

#### BW Query: `OSM_CCL_UPL_MONTH`

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Analysis of Object Usage in System Recommendations
Data Collection of Usage Procedure Logging (UPL)

Available as of SolMan 7.1 SP 10(12)

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

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<th>Program ID</th>
<th>Object Type</th>
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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

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<td>SysRec: Count of month to read UPL data (default=2)</td>
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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
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

System specific part
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 `OSM_UPL_DATE_RANGE_BPCA` respective `OSM_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
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
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

Process Step „Sales Order“

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
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?

• 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

Challenges
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

<table>
<thead>
<tr>
<th>System 1</th>
<th>System 2</th>
<th>System N</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Sel.</th>
<th>NOTE</th>
<th>VERSION</th>
<th>TEXT</th>
<th>...</th>
<th>PRSTATUS</th>
<th>COMPONENT</th>
<th>RELEASE</th>
<th>EXTRELEA...</th>
<th>KERN...</th>
<th>KERN_PATCHLEVEL</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0001513474</td>
<td>0005</td>
<td>(Ignore) Fehlende Au...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) ST-PI</td>
<td>(2008_1_700)</td>
<td>3</td>
<td>(Ignore)</td>
<td>Ignore</td>
</tr>
<tr>
<td></td>
<td>0001526853</td>
<td>0005</td>
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<td>(...)</td>
<td>(E)</td>
<td>(-) SAP_BASIS</td>
<td>702</td>
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<td>Ignore</td>
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<tr>
<td></td>
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<td>0004</td>
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<td>(...)</td>
<td>(E)</td>
<td>(-) ST-PI</td>
<td>(2008_1_700)</td>
<td>3</td>
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<td>Ignore</td>
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<tr>
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<td>0001551513</td>
<td>0002</td>
<td>(Ignore) Fehlende Be...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) SAP_BASIS</td>
<td>702</td>
<td>6</td>
<td>Ignore</td>
<td>Ignore</td>
</tr>
<tr>
<td></td>
<td>0001553836</td>
<td>0003</td>
<td>(Ignore) Fehlende Be...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) ST-PI</td>
<td>(2008_1_700)</td>
<td>3</td>
<td>Ignore</td>
<td>Ignore</td>
</tr>
<tr>
<td></td>
<td>0001566749</td>
<td>0004</td>
<td>(Ignore) Unautorisier...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) SAP_BASIS</td>
<td>702</td>
<td>6</td>
<td>Ignore</td>
<td>Ignore</td>
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<tr>
<td></td>
<td>0001557613</td>
<td>0003</td>
<td>(Ignore) Aktualisierung...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) SAP_BASIS</td>
<td>702</td>
<td>6</td>
<td>Ignore</td>
<td>Ignore</td>
</tr>
<tr>
<td></td>
<td>0001557996</td>
<td>0001</td>
<td>(Ignore) Aktualisierung...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) WEBCUIF</td>
<td>701</td>
<td>3</td>
<td>Ignore</td>
<td>Ignore</td>
</tr>
<tr>
<td></td>
<td>0001560649</td>
<td>0001</td>
<td>(Ignore) Fest progra...</td>
<td>(...)</td>
<td>(E)</td>
<td>(-) SAP_BASIS</td>
<td>702</td>
<td>6</td>
<td>Ignore</td>
<td>Ignore</td>
</tr>
</tbody>
</table>
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

**System Recommendation Reporting**

![System Recommendation Reporting interface](image)
## 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, ...

### Query View Selection

**Standard View**

### Navigation Block:

### Configuration Items

<table>
<thead>
<tr>
<th>Config. Item</th>
<th>System</th>
<th>Compliance</th>
<th>Last Check [UTC]</th>
<th>Compliant (1=Yes, 0=No, _=Not valued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001490437</td>
<td>SQ7 0020230702</td>
<td>No</td>
<td>20110609180215</td>
<td>0</td>
</tr>
<tr>
<td>0001556749</td>
<td>SD7 0020270862</td>
<td>No</td>
<td>20110609181329</td>
<td>0</td>
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<tr>
<td></td>
<td>SI7 0020270862</td>
<td>No</td>
<td>20110609184107</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>SQ7 0020230702</td>
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<td>20110609180215</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>ST7 0020270862</td>
<td>No</td>
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<td>0001560649</td>
<td>SD7 0020270862</td>
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<tr>
<td></td>
<td>SI7 0020270862</td>
<td>No</td>
<td>20110609184107</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>SQ7 0020230702</td>
<td>No</td>
<td>20110609180215</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>ST7 0020270862</td>
<td>No</td>
<td>20110609180158</td>
<td>0</td>
</tr>
<tr>
<td>0001565444</td>
<td>SD7 0020270862</td>
<td>No</td>
<td>20110609181329</td>
<td>0</td>
</tr>
</tbody>
</table>
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

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

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➔ 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! – 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 identify 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. List of Security Notes
   support.sap.com/securitynotes

2. Monthly execution of „System Recommendations“

3. Check Security Notes within „Maintenance Planner“

4. Reduction of test effort using UPL or BPCA

5. Continuous Security Monitoring using „Configuration Validation“

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>
<thead>
<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

Monthly on 2nd Tuesday

SAP Security Patch Day

Check Support Portal /securynotes
Check System Recommendations in Solution Manager
Check SAP Security Notes Advisory /sos → Media Library

The week after the Patch Day

WORKFLOW: Apply within X days (policy)

Apply patch policy

Within one month, three months…

WORKFLOW: Scheduled implementation

Apply Security Notes

Perform individual regression test

Document exception

WORKFLOW: Check in X days

Check status

During next maintenance cycle

Apply additional manual configuration of SAP Security Notes if necessary

Apply Kernel Patches, Java Patches and ABAP Support Packages

Complete test
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

“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 Security Notes Webinar

ASUG Security SIG
English
Wednesday 18:00-19:00 CEST = 12:00 EST = 9:00 PST
Calendar: https://www.asug.com/events#!/events/cal?keyword=Security&categories=webinar&period=month

DSAG AG SAP Security Vulnerability Management
German
Thursday 14:00-15:00 CET
Calendar: https://www.dsag.de/arbeitsgremien/ag-sap-security-notes/veranstaltungen

SAP Enterprise Support Value Map Security / SAP Enterprise Support Academy
English
Thursday 10:00-11:00 CET
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

→ Advisories → Security Notes Webinar
How to register via SAP Enterprise Support Value Map Security

→ Forums (via Drop-down selector)

→ Subscribe (to get updates about the webinar series) and enter the forum “SAP Security Patch Days”

→ Open the latest “SAP Security Patch Day” blog

→ Scroll up, find and click on the link to register

→ Click the “Calendar view” for fast registration

→ Register all scheduled sessions of the series (to join the webinar sessions)
When publishing Security Notes on [https://support.sap.com/securitynotes](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](https://support.sap.com/securitynotes), 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](mailto: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](https://support.sap.com/sos) → Media Library → [SAP Security Notes Advisory](https://support.sap.com/sos)
<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 project 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, depending on affected application.</td>
<td>An authenticated attacker can inject arbitrary SQL commands using the application vulnerability.</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

The colors indicate the *source* of the information:

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


- **Blue:** Additional information from SAP Services
Basic information indicating applicability and severity of the issue

- Category: Programming error, Customing, Consulting
- System type: derived from affected component (Java, ABAP, HANA...)
- CVSS data
- External attention
- SPIN or PD note
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>CYSS Base Score</th>
<th>CYSS Base Vector</th>
<th>CYSS Access Vector</th>
<th>CYSS Access Complexity</th>
<th>CYSS Authentication</th>
<th>CYSS Confidentiality Impact</th>
<th>CYSS Integrity Impact</th>
<th>CYSS Availability Impact</th>
<th>Reported by external source</th>
<th>N P Example</th>
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</thead>
<tbody>
<tr>
<td>-</td>
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<td>No</td>
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<td>Apache</td>
<td>MURNCN</td>
<td>APPRM</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>Partial</td>
</tr>
<tr>
<td>5.0</td>
<td>Apache</td>
<td>LAUNCH</td>
<td>PINIAN</td>
<td>Low</td>
<td>Medium</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Partial</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>ARI</td>
</tr>
<tr>
<td>Keep</td>
<td>High</td>
<td>-</td>
<td>Information disclosure</td>
<td>Coding deviation abandoned</td>
<td>TH</td>
</tr>
<tr>
<td>Keep</td>
<td>High</td>
<td>-</td>
<td>SQL injection</td>
<td>Additional authorization check</td>
<td>ARI</td>
</tr>
<tr>
<td>keep (make lower)</td>
<td>Medium</td>
<td>City local application affected</td>
<td>Missing authorization check</td>
<td>Additional authorization check</td>
<td>FL</td>
</tr>
<tr>
<td>Keep</td>
<td>Medium</td>
<td>-</td>
<td>Information disclosure</td>
<td>User input screening strengthened</td>
<td>FL</td>
</tr>
</tbody>
</table>

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### 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>Type</th>
<th>Correction type</th>
<th>Correction implementation process</th>
<th>Correction implementation effort estimation</th>
<th>Additional comments</th>
<th>Correction testing effort estimation</th>
<th>Workaround (<em>“virtual patching“</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNOTE</td>
<td>Monthly patch process</td>
<td>05</td>
<td>No</td>
<td>Small correction, Note 104957 is prerequisite.</td>
<td>05</td>
<td></td>
</tr>
<tr>
<td>JavaPatch</td>
<td>Part of maintenance</td>
<td>05</td>
<td>No</td>
<td></td>
<td>05</td>
<td>Crossover escaping request targets like engine on IDAPS/Sifel wall systems</td>
</tr>
</tbody>
</table>
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 C/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
Handling best practices

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
SCN-2017-0758 [SAP--High]: SAP Multiple Vulnerabilities August Patch Day
© certannounce <certannounce@listserv.sap.corp> sent by 1more

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
© certannounce <certannounce@listserv.sap.corp> sent by 1more

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 2476681)
- CVSS3-Base: B.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)
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