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Your development architecture has to support your goals, but have you considered where SAP is heading and how well your development group is positioned to keep up? Well, it helps to know what SAP's plans are. Jon Reed interviewed Thomas Jung, SAP's NetWeaver™ Product Manager to identify strategies and trends you should know. Follow Jon and Thomas as they look into tomorrow.

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From the Managing Editor

The 2008 SAPHIRE®/ASUG conference brought no surprise announcements, but rather reinforced what we already knew. It's all about eSOA baby! As the Service Oriented Architecture gains acceptance and momentum in the marketplace, SAP becomes more agile and more entrenched. As we assimilate the ideas and strategies we learned at the conference, what could be more timely...or appropriate, than an insightful interview with Thomas Jung, SAP's NetWeaver Product Manager? In our cover story,

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On MM

Materials Management – Master the Best Practices Part IV: Inventory Management Best Practices

By Jocelyn Hayes, SAPtips Director of Training and Consulting

Whether tracking by quantity or value of stock, a small mistake can translate to a costly error. You need to know how to get the maximum mileage out of your IM installation, and you can get most of that knowledge right here. Jocelyn Hayes shares her hard won best practices for Inventory Management in her continuing "best practices" series. Of course, you can learn even more details from Jocelyn by registering for her MM course. Spend some time with Jocelyn, or spend your weekends reconciling inventory...it's your choice.

On MM

Using MD07 in SAP: Evaluating Stock On Hand/On Order

By Adam Tysman, SAP Value and Effectiveness Specialist

A person could make a career of learning and refining the use of MRP, especially as it applies to SAP...and that's just what Adam Tysman has done. In this issue Adam simplifies the process by showing you how to use the MD07 transaction to more accurately evaluate the stock on-hand and on-order, to identify weaknesses and strengths in your MRP configuration. Although there are only a couple steps involved, there are a myriad of configuration options and decisions to be made in each. Adam takes you through each of these options and explains their use...and the resulting affect on your Stock On-hand.

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Jon Reed relates the highlights of his podcast interview with Thomas about positioning your development department to "shapeshift" along with SAP's innovations. See Jon's article on page 8.

Along these lines, Bill McNaughten explains how even a non-development type can use the Performance Trace tool to help define specifications for custom development (page 58). Once the development work is completed and tested, you'll need to transport it into production. Joey Hirao explains why you shouldn't use separate transport directories...but how to do it in the event that it's your only option. Joey's article is on page 53.

Do you and your staff have the skills you'll need to stay up with the development trends? SAPtips has added ABAP and Web Dynpro to our public training offerings. Check out our full lineup and schedule at www.SAPtips.com/WorkshopSchedule.asp. We're even offering some summer classes in Atlanta, but you'll need to get registered right away...seats are filling up.

This issue of SAPtips has a plethora of useful tips for the non-techies among us as well. Our Director of Consulting and Training, Jocelyn Hayes, describes the configuration of quality notification messages (page 19), to squeeze a little more juice out of your QM investment. Need to fine tune FI/CO? On page 49, Anurag Barua presents a guide for detecting and resolving duplicate vendor invoices. On the sales side of the business, Matthias Liebich returns to SAPtips with an overview for understanding and configuring scale and group pricing conditions; see his article on page 32.

Don't forget that the Mastery Level experts who contribute articles to SAPtips are also available for onsite training. Contact Jocelyn Hayes at 1.877.832.2594, ext 122 or Jocelyn.Hayes@ERPtips.com, or refer to our Website at www.SAPtips.com for more details.

Stay Cool!

Cheryl A. Cave,
Managing Editor, SAPtips
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White Papers continued from previous page

On BI

Migrate Your BW 3.5 InfoSets into BI 7.0: Without Losing Your InfoObject Master Data By Elizabeth Helen Sacknus, Syssoft Brazil

Some upgrades are harder than others. If you're making the move from BW 3.5 to BI 7.0, you'll discover that it can be a huge undertaking if you have to recreate all of your InfoObject master data. You certainly want to invest the time to make the upgrade successful, but hey...it's not an endurance test. You can save yourself a lot of work, late nights, and headaches by using Elizabeth Sacknus' migration method.

Jocelyn Hayes' View from the Trenches

After attending the annual SAPPHIRE® and ASUG conference in Orlando last month, I find that SAP® is certainly listening to its customers now more than ever before. They are lining themselves up as a much more progressive company with a focus on Business Network Transformation and Enterprise SOA. For any of our readers not into all the lingo, let me give you my definition of these terms.

Business Network Transformation is the new EDI on steroids. It is a methodology to enable business-to-business collaboration and goes a step beyond sending transactions back and forth between suppliers and customers. It truly integrates technology seamlessly through methods like SOA, or **Service Oriented Architecture**, where companies (like Google) expose Web services that enhance intercompany collaboration. SOA, is the technology that supports Business Network Transformation.

The theme of SAPPHIRE was "Business Without Boundaries". Bill McDermott and Henning Kager-

mann delivered another inspirational keynote around this topic. They spoke of ESOA and Business Network Transformation and how the NetWeaver™ platform enables the SAP customer to take advantage of conducting Business without Boundaries.

Other exciting things are happening closer to home. The Klee Associates SAP practice is launching new classes this fall. After great success this past spring with our new Materials Management, Advanced Pricing, and ABAP classes, we have invested in developing Advanced Purchasing, Financials, Plant Maintenance, and Web Dynpro classes, which we will offer this fall at our Dallas training facility. We are also offering our Materials Management, Sales and Distribution, and Advanced Pricing classes in our new Atlanta training center this summer – for those of you who have been begging us to come east! Link [here](#) to the schedule page.

As SAP moves forward with new technologies and methodologies, SAPtips will continue to support our



Jocelyn Hayes

customers through teaching mastery level configuration and technical classes focused on the latest versions of SAP. The addition of Web Dynpro to our course list speaks to our commitment to providing advanced training workshops.

Enjoy your summer, take some time to spend with family and friends, and maybe come enjoy a week at SAPtips University in Atlanta!

Jocelyn Hayes

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Best Practices in SAP® Programming:

How to Keep Your Development Shop in Tune with Where SAP Is Headed

By Jon Reed, JonERP.com

***Editor's Note:** In February 2008, Jon Reed conducted a podcast interview with Thomas Jung, SAP NetWeaver™ Product Manager. This article reflects the high points of that interview. Jon and Thomas tackle topics such as the importance of Object Oriented Programming, Java vs ABAP development, and how it all fits in with Composition Environment (CE) and eSOA. There is some discussion of SAP modeling tools, and even the ever-present issue of how to appropriately staff for the evolving SAP environment.*



SAP development has become more confusing and more promising at the same time. Not long ago, the SAP development process came down to deciding which parts of SAP to customize, and how to hire the ABAP programmers who would do the work. Now, in the Enterprise SOA (eSOA) era, the number of SAP development options is dizzying.

From the variety of Java-based SAP tools to the new process-driven development approaches, from the NetWeaver™ Composition Environment (CE) to the growing library of composite apps (xApps), there are enough development choices to make an SAP manager's brain go into temporary gridlock.

The good news? If the purpose behind these tools can be clearly understood, and if the skills needed for each development approach can be identified, then the SAP manager has a much more flexible (and bottom-line friendly) approach to development than ever before.

In February of 2008, I did a podcast with Thomas Jung, SAP NetWeaver Product Manager, on the future of SAP development. (This podcast is available on the SAP Developer Network, where Thomas writes a popular blog on SAP development.) In the podcast, Thomas did an excellent job of summarizing SAP's development strategy and suggesting practical next steps that individual consultants (and SAP shops) could do to stay on track.

In this article, I will feature the key points Thomas made in the podcast, with the goal of addressing some of the burning questions facing SAP development teams.

The Importance of Object-Oriented Programming to eSOA

I started out the podcast by asking Thomas about the adjustment that SAP programming teams need to make in order to get the most out of SAP's NetWeaver platform. He pointed out that the first step is to make sure that everyone is well-versed in the fundamentals of object-oriented (OO) programming. "The biggest adjustment is designing and building in an object-oriented way," said Jung. "But there is no reason why people on the 4.6 level shouldn't already be doing that. The core ABAP object-oriented concepts were all there in 4.6c, but people don't take advantage of it."

Thomas went on to explain that programming teams may be wary of making an initial investment in the OO learning curve, because it is a new programming paradigm. But in the long haul, Jung believes that the investment will pay off, because so much of SAP's eSOA strategy is founded on object-oriented programming concepts. It's also a lot easier to bring in (and train) ABAP Objects talent than it is to invest in those rare outside consultants who have already been through an actual eSOA project.

Thomas explained how OO skills can be applied to eSOA projects. "If you've already mastered or at least feel comfortable with OO, then truly the biggest adjustment that you should make is this idea of Service-Oriented Architecture," said Jung. Jung pointed out that eSOA is driven by simple concepts of re-useable code. "It's taking those concepts of encapsulation, of reuse, of smaller units of work that have their own unit test built into them, and applying that to everything that

you build,” he said. “Whether it’s a one off accounting financial report or a big custom application, these concepts will make you a better programmer and will benefit whomever you’re developing for.”

Java Doesn’t Replace ABAP – Java Complements ABAP

With the possible exception of outsourcing, no subject has generated more controversy in the SAP community than the supposed “death of ABAP”. For SAP developers, the notion that SAP is abandoning ABAP has led to massive career uncertainty. For SAP project teams, questions about SAP’s commitment to ABAP have led to difficulties planning future development efforts.

Fortunately, we can now say that the so-called “death of ABAP” was always more fear than reality. Certainly, the global SAP labor pool has changed how ABAP projects are staffed, but ABAP work is alive and well. On the other hand, the eSOA era has definitely changed how SAP customers should think about their development efforts. During the podcast, Thomas described how the SAP Labs team views ABAP, Java, and model-driven development. As it turns out, it was never about “ABAP versus Java”, with one language winning out across the board.

As Thomas explained, it’s more about understanding the relative strengths of each. “If you look at ABAP and Java, each have their inherent strengths and weaknesses, and there’s no value in turning Java into ABAP or vice versa,” said Jung. “If you look at where SAP is primarily using each language internally, the Business Suite continues to have its business logic written in ABAP. ABAP is an excellent language for multi-user session environments— all the inner guts of an ABAP-based system are well tuned to those types of massive user systems. Obviously, the ABAP language is well suited to writing business logic. We also have a huge investment in ABAP, and so do our customers; there’s just not tangible value in rewriting it in Java for the sake of rewriting it in Java.”

According to Thomas, the savvy SAP development team uses ABAP for established, high-volume systems, but turns to Java for middleware and Web-based development. Thomas and many others refer to these cutting edge projects as “edge applications”, because these apps sit at the edge of the enterprise, often running on top of the ERP system, and they communicate seamlessly with the applications of customers and suppliers because they share the same Web-based protocols. “Middleware is often better served by Java,” said Thomas. “Because Java is based upon open standards, being able to lever-

age community development, open source development, and edge applications, as well as composite applications where you’re combining multiple systems, maybe SAP and non-SAP systems together – these are obviously areas where Java is strongest.”

An even more interesting discussion is how SAP is trying to move its platform to the point where the development language of choice is not important. At TechEd 2007, in a group interview session, I had the chance to ask SAP Chief Technology Officer Vishal Sikka about which programming language SAP was favoring going forward. He basically said that we need to reframe the question. His point was that with the new NetWeaver-driven eSOA development platform, the idea is to make it irrelevant which programming language we choose to use.

Essentially, the eSOA layer is designed to work with any open standard, so whether a company chooses to program in Java, ABAP, or .NET would not really matter, because the code would be “wrapped” in an SOA layer that would be able to communicate seamlessly with any non-SAP or external systems.

I asked Thomas if he agreed with that perspective. “Obviously, if we follow an eSOA paradigm, if we truly open and enable everything that we build, and we build in these smaller units of work that can be tested individually, that opens things up,” said Thomas. “Then, when SAP delivers something – business logic for example – maybe it’s written in ABAP, but like we said earlier, it doesn’t matter any more. I can consume that in .NET, I can consume that in Java, I can consume it in another ABAP environment, so it does open things up.”

Thomas did emphasize, however, that even though SAP is “opening up” its architecture, there is still a major advantage to standardizing on SAP’s own eSOA tools. “Although it doesn’t matter which programming language we choose, I would say that SAP provides the best tools in the marketplace for building Enterprise Services,” said Thomas. “And when it comes to security and scalability, it can matter whom you get your tools from to build Enterprise Services: Although we’re all based on open standards, not everybody’s performance and security running within that is the same. So at SAP, we feel that we still provide the best tools, but at the same time, they’re inter-operable, and how you consume what’s been built as an enterprise service is an open option as well.”

Returning to the question of ABAP versus Java, in Thomas’ view, “interoperability” means that SAP customers have the freedom to choose the develop-

ment approach that is best suited to their own internal staff and business model. "To the question of ABAP or Java, it becomes a bit of a moot point, and I recommend to people that they use the one that they are most comfortable with," said Thomas. "That means to work in the areas where they already have a skill set investment, where they already have transport and versioning mechanisms set up, and where they see their company being the most efficient because, at the end of the day, it's about providing value to the business.

"The business end user doesn't care whether you used ABAP or Java to implement your service, and even when it comes to user interfaces, much of the user-interface technology looks the same to the end user; so whether using ABAP or Java, they care about how quickly you delivered it to them, at what cost, and how flexible it is moving to the future. Those are the real questions that IT departments should be concerned with."



With SAP, Companies Can Choose Their Own Development Paradigm

I found it interesting to learn that the approach SAP recommends to its clients is the exact same freedom SAP provides its own development teams when choosing which language to use. "The paradigm that we're following internally is looking at the skill sets of the teams doing the development," said Thomas. "We also look at an existing business logic we're building on top of and into, including the new edge applications, and new composites, and we use those criteria to decide which language to base them in.

"The idea of Enterprise SOA, of taking your core business logic and exposing it in open standards-based ways, means that even though business logic might be implemented in ABAP, it's exposed via an open standard and can be consumed by any other language that complies with that open standard," said Thomas. "So all of a sudden, if customer X comes along or partner X, and they're more comfortable with Java, and they already have experience in it, there's no reason why they can't continue to develop in that language and consume our Enterprise Services and the process goes either way. It isn't limited to ABAP and Java once you look at it from an Enterprise Server standpoint; it's really open to many other options."

I wasn't going to let Thomas off the subject of staffing development teams without asking him about offshoring. "Offshoring, used in the proper medium, can be very beneficial to a company," said Thomas. "Obviously, my personal opinion is that it isn't well suited to all aspects of programming. There are obviously advantages to having a programmer who's more in tune with your business, who's part of your company, who's going to be the one who gets a support call in the middle of the night and has personal knowledge of the business and connections within the business. I also think that doing research activities and doing architectural design for a company – making those architectural decisions and putting the proper technologies in place – are things better left to someone who has an intimate knowledge of the business, who's often part of the business and not somebody from another company."

How Project Teams Should Prepare for CE/eSOA

SAP's Composition Environment (CE), a key component of NetWeaver 7.1, brings SAP's next generation Java-based tools into one environment. I asked Thomas to share some of the highlights of CE. "First of all, it's the latest release of Java EE (EE 5.0), so CE is on the cutting edge of what's supported by the standards. Because CE is standards-based, you find yourself being able to inter-opt with other Java-based applications easier. We've also built a lot into CE that's obviously focused on creating composites. So the modeling tools and the programming capabilities of the Java environment, of Visual Composer, of the newest version of Guided Procedures that is integrated into CE – these are all very much focused on how you can combine services from different sources."

I asked Thomas how CE could help companies take better advantage of eSOA-based programming. "CE

has integration with the Enterprise Services Repository (ESR) to help you find services more easily,” said Thomas. “Then that integration flows right into Visual Composer, so now, not only can I access BAPIs from backend SAP systems and drag and drop them onto my design area, but I have those same kinds of capabilities going right into the ESR. I think the other important capability is the tool sets. If you look at Web Dynpro for Java, if you look at Visual Composer and Guided Procedures – these are our latest versions, so they have the latest capabilities built into them, and with CE being this lean environment for building composites, it’s obviously something where we can deliver innovations quicker than we can to the core standalone release of NetWeaver. So you’ll see us integrating new capabilities much faster.”

Thomas also cited NetWeaver Voice as another example of CE-based innovations. “The other area that we’re focused on is identifying some non-traditional application areas,” said Thomas. “If you look at the first release of NetWeaver CE, we introduced NetWeaver Voice: That’s the capability to create phone-based, touch-tone, and voice input-based applications, so we’re looking at other types of composites that we can build into this framework. Yet, as in the case of NetWeaver Voice, we leveraged Visual Composer, so if you already know how to use Visual Composer, then you really use those tool-based skill sets you have to build a new type of composite.”

SAP’s Latest Modeling Tools: Supporting Developers and Business Users

With each iteration of NetWeaver, 7.1 as of this writing, SAP seems to come out with yet another modeling tool to aid in eSOA-based development. Fortunately, NetWeaver CE pulls a lot of these previously disparate products into one location. Asking SAP about modeling tools was a little tricky, because prior to Sapphire ’08, SAP was keeping quiet about the latest modeling tools coming out. However, Thomas was willing to give his take on the modeling tools that are currently available. He pointed out that there are two kinds of modeling tools to consider: one type can help business experts get more involved in the development process, and the other type enables programmers to avoid repetitive functions.

“If you look at the current version of NetWeaver CE, there are modeling tools all throughout it. The ones that are given the main focus as modeling tools: Visual Composer and Guided Procedures, and there are new tools coming down the road,” said Thomas. “But there’s also the idea of taking the parts of traditional program-

ming that are kind of repetitive and dropping in some modeling capabilities. So I think we see two aspects of modeling tools: the first aspect, and what a lot of people notice right away is, ‘Hey, I don’t necessarily need to be a programmer. I’ve got these tools that can take me so far, that can let me build a certain type of application, and I can be a business process expert or, even if I’m a programmer, I can quickly prototype something.’ And that’s where a tool like Visual Composer is particularly strong.”

“Then we see other aspects where we can use modeling tools as productivity enhancements for full-blown developers, and we’re building those kinds of capabilities into the core development platform: NetWeaver Development Studio and the ABAP Workbench. So we take the things that would be difficult to describe in code or would be repetitive, and we replace those parts of the programming model with modeling tools, but still give you the full power of the underlying programming language.”

How Should IT Managers Cultivate eSOA Talent?

We wrapped up the podcast by asking Thomas to put on his CIO cap and tell us how SAP project teams can start to develop the kind of in-house talent necessary for eSOA development projects. “Putting my mindset in the shoes of a CIO, one of the biggest things that I would look for is a project team that’s really self-motivating and self-teaching,” said Thomas. “That kind of team is going to not only produce good output, but is willing to get out there, learn on their own what’s out there, and be able to come back to me with good technical options. I think what’s more important than a team that knows XYZ technology is the ability to adjust, adapt, and bring everything to the table as new things come along, because the innovation is moving so fast.


“To me, this means staying connected, using SDN, using other Websites, keeping up with what’s going on and, like you mentioned, taking advantage of the free downloads on SDN for CE, for NetWeaver, for the Java and ABAP core. They’re all available on SDN, so I really would expect my team – even if the business is still on an older release, even if we haven’t bought into whatever the next release SAP is offering – to have downloaded whatever evaluation software is available on SDN as soon as it’s available and already be playing with it.

“That’s one of the key components: You can’t wait until the business is ready to do the upgrade to start learning about what the next release contains from a technical standpoint.”

Conclusion

When we look at the array of tools and approaches, SAP development has never been more complex. But once the options are understood, there is a huge upside: the NetWeaver platform brings with it a much greater flexibility to choose the development tactics most appropriate to your business strategy and in-house talent. There's no way to spell out all the best practices for SAP development in one article. Having said that, I hope this interview with Thomas Jung provided a useful framework for understanding where SAP is headed and how to take advantage of these new technologies.

Thomas Jung, SAP Labs. Thomas Jung is an SAP NetWeaver Product Manager focusing on Custom Development – particularly in the areas of ABAP, MDM APIs, UI Strategy, and NetWeaver Voice. Before joining SAP Labs in 2006, Thomas was an applications developer for an SAP customer. He was involved in SAP implementations at this customer as an ABAP Developer for nearly ten years. He is also the co-author of the SAP Press Books, *Advanced BSP Programming* and *Next Generation ABAP Development*.

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Two Useful Report Strategies for HR Users: A Guide for SAP® HR Users

By Rehan Zaidi, Siemens Pakistan

***Editor's Note:** The Human Resource function in a firm could almost be summed up with the description "collection, maintenance, and reporting of employee data". It seems that being able to provide key staff data at a moment's notice is not a just goal, but a requirement of management these days. You'll be pleased to see that Rehan Zaidi has two strategies to improve your HR reporting in this issue. Rehan introduces two helpful reports and walks you through their functionality. You'll even learn to create a PDF file directly from the printer spool file. Now that's news you can use.*

Introduction

One excellent feature of SAP's HR suite is its capability to report. The SAP HR module is full of a number of useful programs and reports. Many of these reports save users from a lot of hassle, as well as allow them to work efficiently. I have noticed that many useful reports are either not known to users and consultants, or they are underutilized in SAP implementations (or day-to-day SAP work).

The aim of this article is to examine two important reports for HR users. Both RPLINFCO and RSTXP-DFT4 will be explained in detail, with their possible uses. The steps required to generate an employee's payslip and turn it into an email-ready PDF file will also be explained. These are some of the questions this article will address:

- What is the usefulness of the RPLINFCO Infotype report?
- How do you execute the RSTXP-DFT4 report?
- How can these reports be beneficial to HR users?
- What are the steps required to create a PDF file for an employee's payslip?

This article is intended for both SAP HR users and consultants. I will assume that the reader is familiar with basic HR concepts, as well as having knowledge of their Infotypes. For more information, refer to the SAP documentation on <http://help.sap.com>. All the screen shots have been taken from ECC 6.0.

Many of these reports save users from a lot of hassle, as well as allow them to work efficiently.

Report RPLINFCO – Infotype Overview for Employee

Using the RPLINFCO report, authorized users can display all employee Infotypes. The start date, end date, and the last user who changed the Infotype record are shown in one screen along with the Infotype numbers. Then, to see the detail of a specific Infotype, all the user has to do is double-click it and enter the Infotype Record Details screen.

The RPLINFCO report offers a variety of advantages to users and consultants:

- It is a very useful program that can be used as an alternative to transactions PA20 (display HR master data) and the PA10 (display personnel file). RPLINFCO's advantage over PA20 and PA10 is its summary screen, which summarizes all of an employee's Infotypes into one group. This relieves the user from the burden of going through numerous screens in order to find the required information.
- The RPLINFCO report is very useful when looking for a quick summary of an individual employee's master data. For example, master data that was changed within a certain period can easily be tracked.
- In addition, employee data can easily be compared between different systems via the usage of this report. For example, if an employee's data is built into a testing system in order to recreate a production case, the report will quickly tell you which of the Infotypes must be maintained for a given employee.

The report RPLINFCO may be run directly by using the transaction PC00_M02_LIF0. However, this report may

also be run from transaction SE38 (ABAP Editor) or SE80 (ABAP Development Workbench).

When the transaction code or the program is run, the selection screen of the program appears, as shown in Figure 1.

The user may choose how this report is to be run via usage of the various selection fields. He or she may enter any combination of personnel number, country, and validity period for Infotypes, along with Infotype numbers. For the Infotype field, the program allows you to restrict the selection by entering specific Infotype numbers.

Note: The report RPLINFCO can only be run for one employee at a time. In our example, we run the program for employee 00000018. Figure 2 shows the output of the report.

The output is in a tree form. All the various Infotypes that are maintained for the employee are shown in the form of tree nodes. Along with standard Infotypes, the output also displays data contained in customer-specific Infotypes. You may expand the Infotype nodes in order to view the details of the rows existing for that Infotype.

In case you select the 0000 Actions node, the various records existing are displayed. The start and end dates are displayed for the records, along with the date of the last change and the user who changed the Infotype records in question. This is shown in Figure 3.

The screenshot shows the 'Infotype Overview for Employee' selection screen. It includes a 'Selection' tab with the following fields: Personnel number (00000018), Country, Validity period (01.01.1800 to 31.12.9999), and Infotypes. There are icons for help and search.

Figure 1: Selection Screen of the Report RPLINFCO

The screenshot shows the 'Infotype Overview' output for employee 00000018 Test. It is a tree structure with the following nodes: 0000 Actions, 0001 Organizational Assignment, 0002 Personal Data, 0003 Payroll Status, 0006 Addresses, 0007 Planned Working Time, 0008 Basic Pay, 0009 Bank Details, 0016 Contract Elements, 0019 Monitoring of Tasks, 0021 Family Member/Dependents, 0022 Education, 0031 Reference Personnel Numbers, 0041 Date Specifications, 0105 Communication, 0185 Personal IDs, 2001 Absences, 2006 Absence Quotas, and 9020 Dependant Details.

Figure 2: Output Showing All Infotypes Maintained for Employee

The screenshot shows the 'Infotype Overview' output for employee 00000018 Test, expanded to show the 0000 Actions node. It displays a record for 06.06.2007 - 31.12.9999, last modification: 06.06.2007 through MCA.

Figure 3: Infotype 0000 Records Displayed

For Infotypes that are composed of subtypes, the report displays a list of the maintained subtypes when the particular node is expanded (see Figure 4). For example, for Infotype 0006, suppose we have records stored

against two subtypes (namely Permanent Residence and Temporary Residence); two nodes will appear under the Infotype 0006 category, as shown in Figure 4.

Note: Standard SAP authorizations are applied by the system while this report is being executed; therefore, if authorizations prevent Infotype 0008 (basic pay) from appearing, it will not be shown in the output.

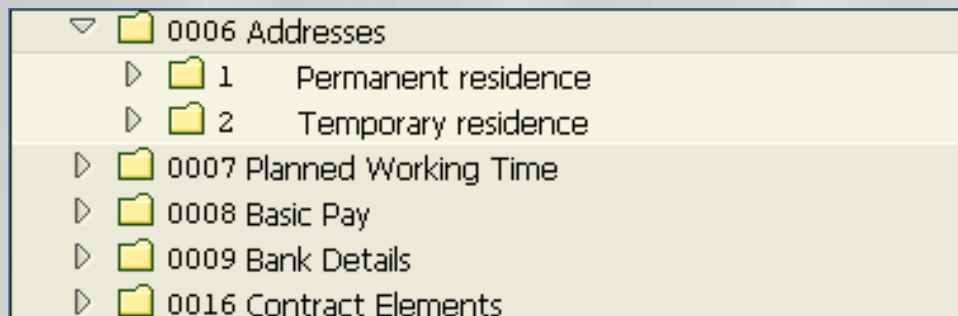
By expanding each subtype, the various Infotypes that are stored against the given subtype are displayed. For the 0021 Infotype, there are various subtypes (for example Child, Spouse, etc.). For the Child subtypes, there may be sequential numbers assigned. In the RPLINFCO output, the various sequence numbers are shown as subnodes of the respective Child subtype, as shown in Figure 5.

The SAP system starts PA20 (Display Master Data transaction) when the user double-clicks on any of the Infotype records. This will show the full detail of the selected Infotype record. Once the data have been viewed, you can press the backspace key (or F3) to bring back the report output of program RPLINFCO.

Report Strategy 2: Using RSTXPDT4

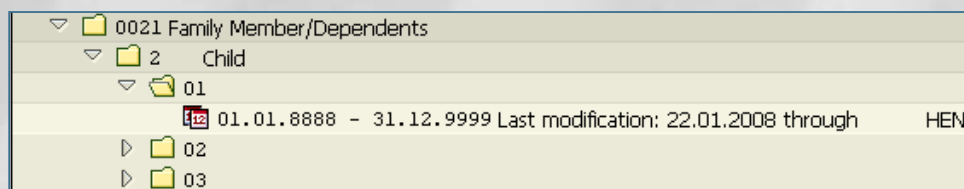
Now let us discuss the usefulness of standard report RSTXPDT4. A major problem that users face is when they are asked to submit their reporting output to other users. They usually download the report's output to Microsoft Word or Excel, and then reformat it. This method takes a lot of time and it is possible for changes to occur in the report data.

Now let us discuss the usefulness of standard report RSTXPDT4.



▼	0006 Addresses
▶	1 Permanent residence
▶	2 Temporary residence
▶	0007 Planned Working Time
▶	0008 Basic Pay
▶	0009 Bank Details
▶	0016 Contract Elements

Figure 4: Valid Subtypes for Infotype 0006 (Addresses)



▼	0021 Family Member/Dependents
▼	2 Child
▼	01
	01.01.8888 - 31.12.9999 Last modification: 22.01.2008 through HEN
▶	02
▶	03

Figure 5: Details of 0021 Infotype

The SAP standard report RSTXPDT4 can turn any spool file into a PDF file, which can be easily emailed or transferred without worrying about corruption or alterations to information. A good example of this is the employee salary slip that may be sent to loan approvers using the mentioned report.

To illustrate the usage of this report, we consider a simple example of generating an employee remuneration statement and converting it to a PDF file output. The steps required to generate an employee's payslip and turn it into an email-ready PDF file are shown in the steps that follow.

Note: The program RSTXPDT4 may be used to convert into PDF the output of any report. The remuneration statement is only shown as an example.

Step 1. Generating the Salary Slip – The first step is to call the program for generating the remuneration statement. The transaction code used depends on the country code that you are using. For US, PC00_M10_CEDT should be used. In the United Kingdom, transaction code PC00_M08_CEDT is used. The selection screen of the program is shown in Figure 6.

Once the salary slip is successfully generated, we send the output to a spool file, as discussed in the next step.

Step 2. Sending the Display to the Spool File – When the output is displayed, click the Print button. The dialog appears as shown in Figure 7.

Figure 6: Remuneration Statement Program

Figure 7: The Print Screen List Dialog

Click the Properties button. The Print Properties screen appears, as shown in Figure 8.

Figure 8: The Print Properties Settings

Select the Time of Printing from the General Properties category. When the user double-clicks on the Time of print field, a selection field appears in the lower half of the screen. Selecting the option “Send to SAP Spooler Only for now” will generate an SAP spool file. Also select the indicator saying “Show Selected Print Parameters on Initial Screen”. Press Enter. The Print Screen List Dialog changes, as shown in Figure 9.

Press the Enter key again. This will generate a spool request instead of sending the file to the printer. A status message appears, as shown in Figure 10.

The spool request number (in this case 21979) should be noted because it will be used later as the key to generate the PDF file.

Note: Data that are to be printed within the system are temporarily stored by SAP on a spool file. If a document is saved to a spool file instead of immediately being printed, it can be accessed to print later, or it can be printed by someone else. By saving the file as a spool file, it is possible to have that file printed in another location.

**By saving the
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Step 3. Converting the Spool Request into PDF–

The final step now is to convert the spool request generated in the previous step into a PDF file. The program RSTXP4 may be used for this purpose. This program can be accessed by a customer transaction or via transaction SE38. This report converts a spool file to PDF.

Call transaction SE38 or the Z* transaction created for the report. Enter the program name RSTXP4. Then, click

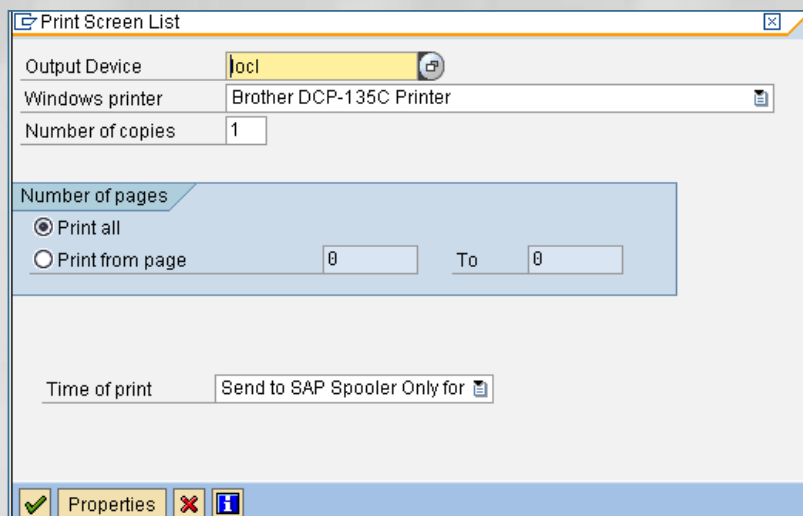


Figure 9: Changed Print Screen Dialog

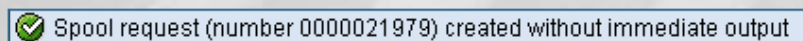


Figure 10: Spool Request Created Without Immediate Output

on the Execute icon or press the F8 key to run the program.

Note: If the spool file number was not noted, the spool list can be viewed from any transaction by selecting menu path System→Own Spool Requests.

The selection screen of the program appears as shown in Figure 11.

The spool request number should be typed in the field provided. You should also specify the file path where the PDF is to be saved, along with a suitable PDF file name. It is necessary to check the “Download PDF File”. When all the correct entries are made, you may then click the Execute icon (or press the F8 key).

The dialog box showing the file location and name are displayed. Confirmation of this information is required to generate the PDF file. See Figure 12.

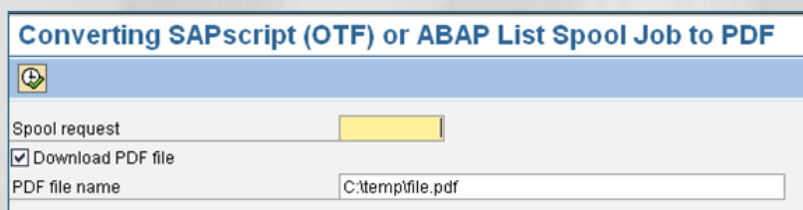


Figure 11: Selection Screen of Program RSTXP4

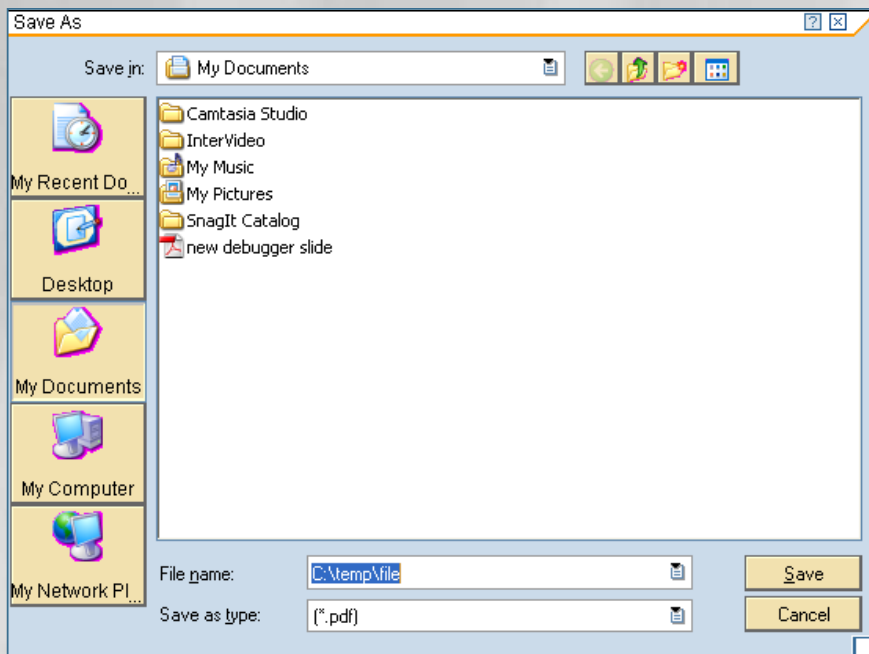


Figure 12: PDF Creation Confirmation Dialog

You must click the Save button in order to create the PDF version of the report output.

The output of the program RSTX-PDFT4 then displays the message showing the successful creation of the PDF file at the given location. It also denotes the number of bytes transferred (see Figure 13).

The PDF file may now be sent to other users or parties.

Conclusion

In this article, RPLINFCO and RSTXPDFT4 reports have been discussed. The article provided an overview of both these reports, and their potential value to HR users were discussed. Examples were presented, as well as the steps required for generating an employee's payslip, and turning it into an email-ready PDF file, were explained in detail. RPLINFCO and RSTXPDFT4 reports are both extremely useful for HR staff. I hope that this article proves to be a valuable resource to your SAP HR consultants and users, and will allow them to achieve their related day-to-day tasks in the least possible time.

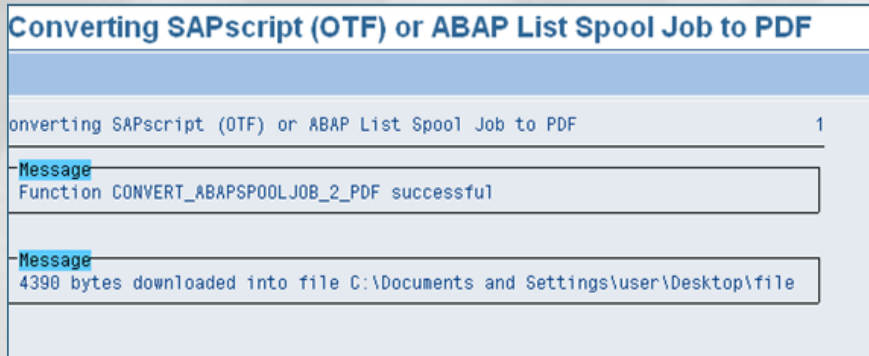


Figure 13: Output of Program after Successful PDF Creation

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Quality Management: Configuring Quality Notifications

By Jocelyn Hayes, SAPtips Director of Consulting and Training

***Editor's Note:** Whoops...something happened during production and a less-than-perfect product slipped through the lines. Now, in order to be ISO compliant, you need to document and get to the bottom of this problem, as well as indicate what actions you've taken to fix it. SAP® offers a nifty tool to assist with this: Quality Notifications. Our own Jocelyn Hayes shows you how to configure this functionality; which will help you manage any quality issues that inevitably crop up in every company.*

Introduction

Quality Notifications allow you to document quality issues, and capture corrective actions. For those familiar with ISO, following this international standard and staying ISO compliant requires you to capture the root cause and the corrective action; both represent components of an SAP Quality Notification. Quality Notifications also lead to diagnosis of defects, recording quality costs, and managing status of actions related to quality tasks.

Quality Notifications can either integrate with other modules of SAP, such as Sales Order quality issue tracking and resolution, or not integrate. Notifications can represent stand-alone issues not related to a product or piece of equipment, but possibly to a process or procedure. For example, you could have a general quality notification used to document issues of staff not following a manual process, such as a security protocol.

The notification allows you to record the defect type, defect location, defect cause, activity, and defect valuation.

**Quality Notifications allow
you to document quality
issues, and capture
corrective actions.**

The Five Step Process

In this article, I will present a five-step process to lead you through the configuration of a new Quality Notification document type. Each step offers tips to help you tiptoe through the potential minefield of gotchas. They are:

1. Copy the Existing Quality Notification Type
2. Define Screen Templates
3. Maintain Catalogs
4. Define Action Box
5. Define Status Profile

Step 1: Copy Existing Quality Notification Type to New Quality Notification Type

In this step, we will copy a standard SAP Quality Notification Type (Q1) to a custom quality notification type (ZS).

Note: Use Transaction QCC2 to access the Implementation Guide for Quality Notifications. This is slightly faster than navigating to the IMG and through the menu path.

Follow the path Quality Notifications → Notification Creation → Notification Types → Define Notification Types. See Figure 1.

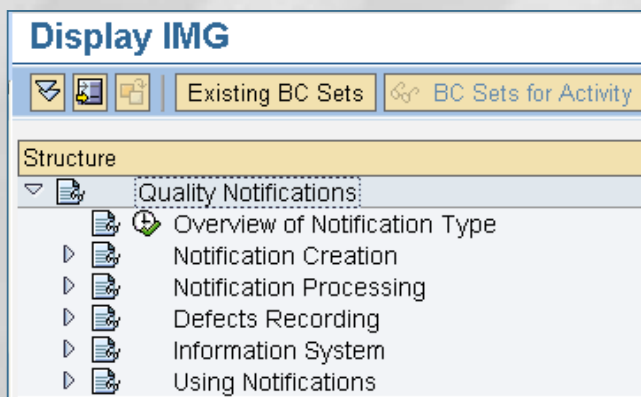


Figure 1: Implementation Guide for Quality Notifications

Select a Notification type from which to copy, and click the Copy icon. In this example, I selected Q1, and copied to ZS (Figure 2).

Note: At this point, you can create a custom catalog profile to be used for your custom notification type. The catalog profile restricts the values used in the notification to classify the task type, defect type, action type, etc. To navigate to the configuration, click on the Catalog Profile field, press the F1 key, click the icon, navigate to the Quality Notifications → Define Catalog Profile option, and copy profile 00000001 to a custom catalog profile.

You can also define a custom number range or use a different number range. In this example, I have left the standard number range for Customer Complaints.

Change View "Notification Types": Details of Selected Set

Notification type	KS	SAP CustomerComplain
Notif.cat	02	Quality Notification
Parameters		
Notification origin	Q1 Customer complaint	
Catalog profile	Z0MSAP001 SAPTips Customer Complaints QN	
Update group (stats)	32 QMIS: QM Notification Compression to Customer Analysis	
<input type="checkbox"/> Early no. alloc.	03 Number range	

Figure 2: Copy Notification Type Q1 to ZS.

Step 2: Define Screen Templates





This step includes up to eight Activities. For the purposes of this article, I will provide a description of each activity and why you should or should not carry them out. Figure 3 shows a list of the activities.

Note: As I step through the Activities, you will notice that I describe the second Activity on the list (in Figure 3) before I describe the first Activity. This is because SAP does not copy the screen definitions from the notifi-

Choose Activity

Activities

Perf...	Name of Activity
	Define Screen Areas and Tabs
	Copy Screen Areas from the Standard System
	Define Initial Screens
	Format Notification Long Text
	Field Selection: General Screens
	Field Selection: Initial Screens
	Field Selection: Reference Object Screens
	Field Selection: Partner Screens

Perform the activities in the specified sequence



 Choose
 

Figure 3: Define Screen Templates: Activities

cation type, which you copied in Step 1. Therefore, you have to first copy the screen areas from the standard system to your custom notification type, then define any changes you want to make to the standard settings.

Copy Screen Areas from the Standard System

In this activity, you copy the screen areas from the reference notification type (the notification origin field from the previous step – see Figure 2) to your custom notification type. Don't forget to remove the "test" flag when you execute this Activity. Figure 4 shows the results of the copy.

Define Screen Areas and Tabs

In this task, you will define what screens and tabs to use in the Notification Type. For example, let's say you decided not to display the Activities tab that is in the standard Customer Complaint Quality Notification. In this case you could exclude the Activities tab from your definition of the tabs.

This step is broken down into three sub-steps:

- Define Header and Screen Areas** – this defines the screens displayed at the header level of the Notification Type. It is possible to create your own custom header level screen, though this would require some help from your ABAP friends who are familiar with developing SAP screens.
- Define Simplified View of Screen Areas** – this defines which sub-screens display on the Reference Objects tab (this is the first tab you see when you start to create the Quality Notification).

Transfer of Customizing Settings in Table TQSCR

Notif type	Tab	ActCat	Notif cat	Icon	Tab	ScrnArea 1	ScrnArea 2	ScrnArea 3	ScrnArea 4	ScrnArea 5	Tab Divisn	CustScreen	Cust
ZS	10TAB00		02			031	010	037			0		
ZS	10TAB01		02	X		005	040	025	045	070	0		
ZS	10TAB02		02	X		031	050	092			0		
ZS	10TAB03		02	X		010	035	080			0		
ZS	10TAB04		02		X						0		
ZS	10TAB05		02								0		
ZS	10TAB06		02								0		
ZS	10TAB10		02		X						0		
ZS	10TAB11		02		X						0		
ZS	10TAB12		02		X						0		
ZS	10TAB13		02								0		
ZS	10TAB14		02								0		
ZS	10TAB15		02								0		
ZS	10TAB16		02								0		

Notif type	Tab	ActCat	Language	Tab header
ZS	10TAB01		EN	Reference object
ZS	10TAB02		EN	Subject
ZS	10TAB03		EN	Processing
ZS	10TAB10		EN	Items
ZS	10TAB11		EN	Tasks
ZS	10TAB12		EN	Activities
ZS	20TAB01		EN	Overview
ZS	20TAB02		EN	Causes
ZS	20TAB03		EN	Tasks
ZS	20TAB04		EN	Activities

Figure 4: Transferring Screen Settings to Custom Notification Type

- Define Extended View of Tabstrips and Screen Areas** – this is the area where you can really have fun! You can add/remove tabs and fields. To remove the tab from the Notification Type, deselect the tab check-box, and remove the references to the screen areas (as shown in Figures 5 and 6).

Change View "Extended View: Tabstrips and Screen Areas": Details

Dialog Structure

- Notification Types
 - Notification Header and
 - Simplified View: Screen
 - Extended View: Tabstrips

Notifictn type: ZS SAP CustomerComplain
 Notification category: 02 Quality Notification

Function

Activity cat. ☐
 Tab: 10TAB03 Additional data 2

Tabstrip control

Tab header: Processing
 Icon: ☐
☒ Tab Tab Page Allocatn: 0

Screen area

Screen area	Screen area 1	Screen area 2	Screen area 3	Screen area 4	Screen area 5
Processing	010	035	080		
Contact person (customer/vendor/author)					
QM Order					

Screen 1 ☐
 Screen 2 ☐
 Screen 3 ☐
 Screen 4 ☐
 Screen 5 ☐

Figure 5: Screen Shot to Include the Processing Tab in the Notification Type

Change View "Extended View: Tabstrips and Screen Areas": Details

Dialog Structure: Notification Types, Notification Header and, Simplified View: Screen, Extended View: Tabstrips and Screen Areas

Notification type: ZS SAP CustomerComplain
Notification category: 02 Quality Notification

Function
Activity cat.: ☐
Tab: 10\TAB03 Additional data 2

Tabstrip control
Tab header: Processing
Icon: ☐
☐ Tab Tab Page Allocatn: 0

Screen area
Screen area 1: ☐ Screen 1: ☐
Screen area 2: ☐ Screen 2: ☐
Screen area 3: ☐ Screen 3: ☐
Screen area 4: ☐ Screen 4: ☐
Screen area 5: ☐ Screen 5: ☐

Figure 6: Screen Shot to Exclude the Processing Tab in the Notification Type

Change View "Initial Screen - Quality Notifications": Overview

Typ	Notification type	Name of the function module	Init. sc
ZS	SAP CustomerComplain	QM03_CREATE_QMEL_WITH_WINDOW	0130

Figure 7: Initial Screen for Custom Notification Type

Define Initial Screens

If you want to have a pop-up screen requesting a reference document for which you are creating the Quality Notification, you can maintain an initial screen. In this example, which is for customer complaints, we will configure a pop-up screen requesting the reference sales order and item. Figure 7 shows the configuration.

Format Notification Long Text

You can prevent changes to long text, which appears in the subject area of the Reference Object tab, in this step. This prevents changes to the existing text, while still allowing users to add to the existing text. Sounds like a good practice to me!

Field Selection: General, Initial, Reference Object, and Partner Screens

Unfortunately, field selection is for ALL notification types. If your company is only using a couple notification types, it is a good idea to hide the fields that are not relevant to your business. Just use caution when hiding the fields because there may be applications for them in the future.

Step 3: Maintain Catalogs

Catalogs in Quality Management represent a categorization of the various values you enter on a Quality Notification. You can maintain a catalog for defect type, defect location, task type, action, and activity. You maintain the catalog as master data, meaning you do not transport it from client to client, or SAP system to SAP system. Each notification type is assigned to a catalog profile, which contains the listing of all the catalogs available to use for the Notification Type.

Catalogs in Quality Management represent a categorization of the various values you enter on a Quality Notification.

I recommend you copy the standard catalogs to your own custom catalogs, and assign your custom catalogs to a Custom Catalog Profile, which you then assign to your Notification Type (refer to Figure 2 to see where you make this assignment).

The following steps provide the necessary instruction to create catalogs and assign them to a catalog profile.

1. Review the Catalogs assigned to your reference Catalog Profile (the catalog profile assigned to the reference notification type). In this example, our reference notification type is Q1, and the catalog profile assigned to Q1 is 000000001. Follow the menu path: Quality Notifications → Notification Creation → Notification Content → Define Catalog Profile. Copy Catalog Profile 000000001 to a custom catalog profile as shown in Figure 8. In a later step, we will modify the Catalogs used in this Catalog Profile.

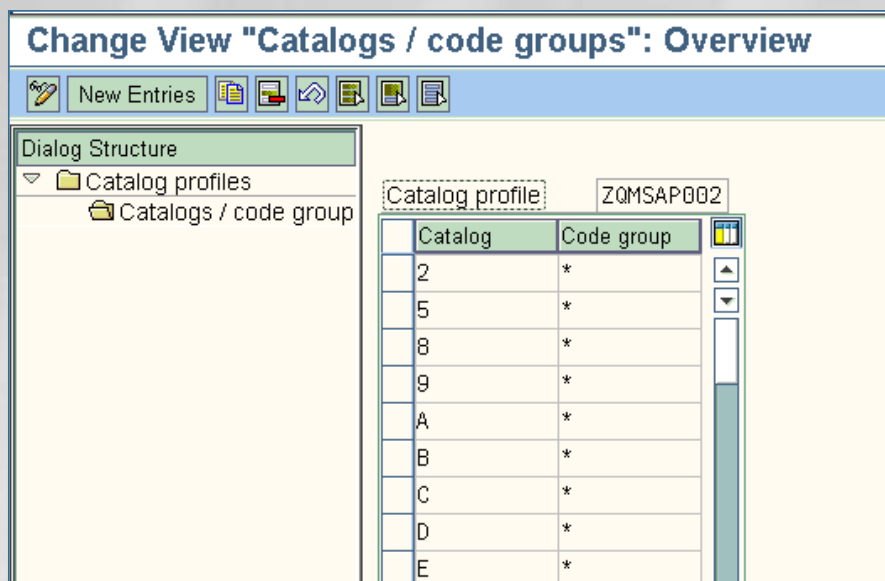


Figure 8: Custom Catalog Profile

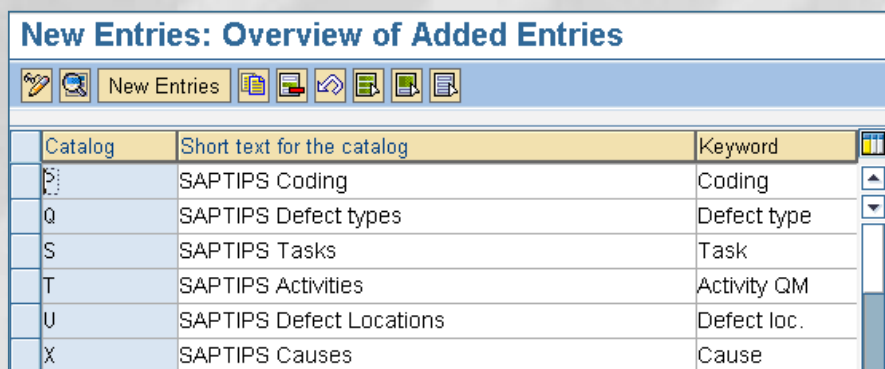


Figure 9: Custom Catalogs Copied from Standard

2. Next, we will copy the catalogs to custom catalogs. Copy each of the catalogs shown in Figure 8 to a custom catalog, as shown in Figure 9.

The table in Figure 10 shows which catalogs I copied from and to:

Copied From Catalog	To Catalog	Keyword
D	P	Coding
9	Q	Defect Type
2	S	Task
8	T	Activity QM
E	U	Defect Loc
5	X	Cause

Figure 10: Catalog Copy

3. Now, we will modify the Catalog Profile to include the catalogs we just created. Delete all the existing entries, and add the new catalogs you created in the previous step. See Figure 11.

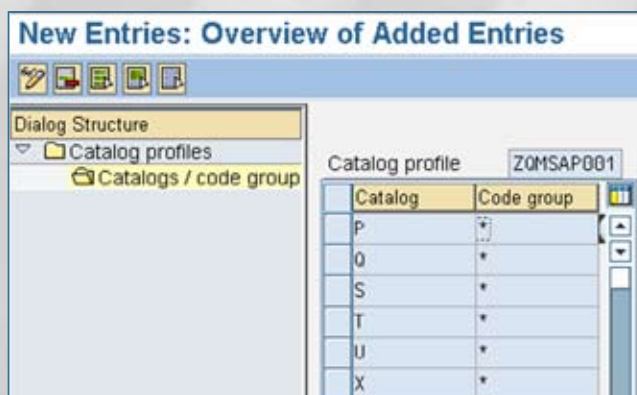


Figure 11: Assigning Catalogs to Catalog Profile

Change View "Catalogs for notification types": Details		
Notification type	ZS	SAP CustomerComplain
Notification type	02	Quality Notification
catalog profile		
Catalog profile	ZQMSAP001	SAPTIPS Customer Complaints QN
Catalogs for		
Coding	P	SAPTIPS Coding
Problems	Q	SAPTIPS Defect types
Causes	X	SAPTIPS Causes
Tasks	S	SAPTIPS Tasks
Activities	T	SAPTIPS Activities
ObjectParts	U	SAPTIPS Defect Locations
<input type="checkbox"/> Class.active		

Figure 12: Assigning the Catalog Profile and Catalogs to the Notification Type

4. Assign the Catalog Profile and Catalogs to the Notification Type (Figure 12).

Note: Use transaction QS41 to maintain the catalogs.

Step 4: Define Action Box

The Action Box is found in the right pane, when entering a new Quality Notification, as shown in Figure 13.

In some cases, you may not want to include all the possible actions available in the Action Box. To configure the Action Box, follow these steps.

1. Follow the IMG menu path: Quality Notifications → Notification Processing → Additional Notification Functions → Define Action Box

2. Review the entries for the reference Notification Type Q1 and determine which Action Box items you wish to maintain. Create the new entries.

In some cases, you may not want to include all the possible actions available in the Action Box.

Figure 13: Displaying Action Box on "Create Quality Notification" Transaction

Note: To create the new entries, copy from the Reference Notification Type Q1, by selecting the Action Box items you want to have in your Notification Type. Then click the Copy icon, and simply change the Notification Type to your custom Notification Type, as shown in Figure 14.

Step 5: Define Status Profile

Status profiles define what statuses a document can have. For example, in Quality Notifications, some of the standard header level statuses are Initial, Released, and Complete. It is also possible to have a status profile at the task level, such as Released, Completed, and Successful.

To configure your own custom status profile, follow these steps.

1. Follow the IMG menu path: Quality Notifications → Notification Processing → Status Management → Define Status Profile
2. Copy QM_N_001 for header notification statuses or QM_T_001 for task level statuses.
3. Change the statuses as necessary; see Figure 15 for a screen shot. Note that when you copy, you will be asked for a language. Enter EN and it will translate the German into English.

Figure 14: Copy Action Box Function to Custom Notification Type

Statu...	Status	Short Text	Long...	Init. st...	Lowest...	Highest...	Positi...	Priority	Auth. code
1	INIT	Message prepared		<input checked="" type="checkbox"/>	1	4	1	1	
2	REL	Released for processing		<input type="checkbox"/>	2	4	1	1	
3	LOCK	Processing locked		<input type="checkbox"/>	2	4	1	1	
4	CANC	Message cancelled		<input type="checkbox"/>	4	4	1	1	
				<input type="checkbox"/>					
				<input type="checkbox"/>					
				<input type="checkbox"/>					
				<input type="checkbox"/>					
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				<input type="checkbox"/>					
				<input type="checkbox"/>					
				<input type="checkbox"/>					
				<input type="checkbox"/>					

Figure15: Copy Action Status Profile

4. Once you have maintained the custom status profile, you can assign it to the notification type in the second activity in this IMG configuration. Simply assign the new status profile to the notification type, as shown in Figure 16.

Conclusion

In this article, I provided the steps to create a new Quality Notification Type. While I did not cover all of the configuration possible for QM-QN, I did cover the basics to get you started using the functionality with relative ease.

Change View "Status profile of notifications": Details		
Notifictn type	ZS	SAP CustomerComplain
Notif.cat	02	Quality Notification
Status profile for notifications		
Status Profile	ZQM_001	
Status profile for tasks		
Status Profile		

Figure 16: Assign Status Profile to Notification Type

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Off-limits: Blocking User Access to a Storage Location in SAP®

By Maria Nikolova, SAP Senior Expert, National Electricity Company, Bulgaria

Editor's Note: In the business world, we often have to set boundaries and restrictions for staff. At first blush that may sound like we don't trust our staff. However, these decisions are not ours, and perhaps not even those of management. Many of these result from government compliance or auditor requirements. And while they may appear to question the integrity of staff, they're actually there to protect them. One such requirement that you may face is that of blocking user access to storage locations. This can be a little tricky if you've never done it before, but with Maria Nikolova as your guide, you'll have it done in no time.

Introduction

As material managers know, materials can be stored at several storage locations. So, being able to block a user's access to data in a storage location can be a very useful part of MM customizing. Primarily, this function is used for audit trails and inventories. It can also help ensure correct shipments (e.g., various employee groups can only access and ship certain items in their area of responsibility). Typically, companies designate groupings of users who work with certain types of storage items. For instance, Storage Experts, Group A, are responsible for a specific number of storage locations, and only they should have access to these storage locations. Other Storage Experts, say Group B, might not have access to the storage locations of Group A.

You block the user access to a storage location in SAP R/3 via a check mark set in a table via the standard SAP Reference IMG customization tool (transaction code SPRO). The authorization object that controls the access is M_MSEG_LGO.

This article explains the customization required to block user access to a stor-

age location. The screens shown in this article are based on SAP R/3 4.6C; however, all information presented here is valid for other releases, too.

Getting Started

Often, the authorization consultant is asked if the storage location is defined in the appropriate authorization object. The answer is "Yes", the users can access all storage locations, though the system warns that the authorization field has no authorization set. The authorization object that controls the access to a storage location is M_MSEG_LGO /Goods Movements: Storage Location. The fields in this object are shown in Figure 1.

Object	M_MSEG_LGO
Text	Goods Movements: Storage Location
Class	MM_B Materials Management: Inventory Management/Phys.Invento
Author	SAP

Authorization fields	
ACTVT	Activity
WERKS	Plant
LGORT	Storage location
BWART	Movement type (inventory management)

Authorization object documentation

Display object documentation

Further authorization object settings

Conversion for authorization fields allowed

Permitted activities

Figure 1: Fields of Authorization Object M_MSEG_LGO

Note that there are two Information icons shown in this screen. The first information box gives information about the Conversion for authorization fields. The second information box gives information about the Permitted activities.

Fields, Parameters, and Relationships of the Authorization Object

There are a few things you need to understand before undertaking this task. In this section, I will walk you through an understanding of the fields, parameters, and relationships of the Authorization Object M_MSEG_LGO.

Let's first take a look at the Activity Values for the Object M_MSEG_LGO.

Activity: This field defines whether the user is authorized to enter (Activity=01), change (Activity=02), or display (Activity=03) goods movements for a specific storage location. Figure 2 shows these activities.

Movement Type: Defines the list of movement types that a user can enter to maintain goods movements.

Storage Location: Tells which storage locations, in which plants, the user can maintain.

Plant: Defines which plants the user is authorized to maintain.

All possible activities (ACTVT) are stored in table TACT; all possible movement types (BWART) are stored in table T156; all possible storage locations (LGORT) are stored in table T001L; all possible plants (WERKS) are stored in table T001W.

All tables can be seen via transaction SE16 /Data browser/ or transaction SE16N /General Table Display/.

Each authorization object must be assigned to an object class when it is created.



Figure 2: Activity Values for Object M_MSEG_LGO

Note: Authorization object M_MSEG_LGO is assigned to object class MM_B (Materials Management: Inventory Management/Phys.Inventory). Each authorization object must be assigned to an object class when it is created. Object classes are organized according to the components of the system. A list of Object Classes can be displayed via transaction code SU03.

Users can access all storage locations because the setting to activate storage location authorization for goods movement is not set.

As of Release 4.0A, in the standard SAP installation, you can carry out an authorization check for goods movements for each storage location.

The table in Figure 3 lists some MM transaction codes for which object M_MSEG_LGO is set (by SAP), as checked in the programs. Figure 3 reveals the default SAP settings.

Transaction Code	Description
MB01	Post Goods Receipt for Purchase Order
MB02	Change Material Document
MB03	Display Material Document
MB11	Goods Movement
MB1A	Goods Withdrawal
MB1B	Transfer Posting
MB1C	Other Goods Receipts
MB31	Goods Receipt for Production Order
MB51	Material Doc. List
MBST	Cancel Material Document
MI10	Create List of Differences without Document
MIGO	Goods movement
MSC2N	Change Batch

Figure 3: Some MM Transaction Codes for Which Object M_MSEG_LGO Is Checked

Let the Customization Begin

Customizing the authorization check setting happens in two ways: perform customization in the development system and then transport it via the standard transport system.

Customization Method 1 – via IMG Path

The authorization check for storage location can be defined via IMG path: Materials Management → Inventory Management and Physical Inventory → Authorization Management → Authorization Check for Storage Location.

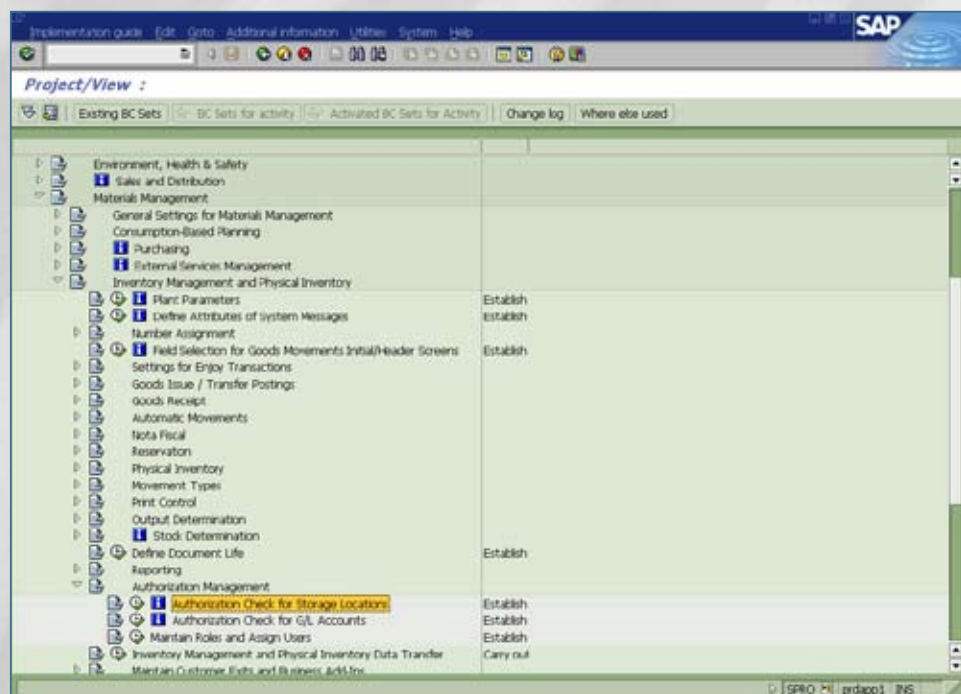


Figure 4: IMG Path /Transaction Code SPRO (Customization Method 1)

See where you can define the authorization control via flagging on the “Authorization” option for individual storage locations in Figure 4. By setting this, you can maintain the authorization object M_MSEG_LGO to restrict the entry of goods movement in the storage location for a particular movement type. Via this authorization object, you protect the goods stored in a particular storage location.

Customization Method 2 –via Transaction Code SM30

To do the same customization directly (without following the IMG menu path), start transaction code SM30 and enter view V_001L_B in the Table/view field (see Figure 5). On this screen, click on the Maintain button; this leads you to the screen for customizing the activa-

tion of the authorization check for storage locations. Keep in mind that the view V_001L_B is not cross-client (not a global customization). That means you must transport the customization in every client for which you want to have the setting.

The screen for customizing the activation of the authorization check for storage locations is shown in Figure 6. In the last column of the view V_001L_B, the MM consultant has to set the authorization check for a storage location, and we are going to set access restrictions for it. Determine the users who need to access a storage location. Specify who is going to access each storage location.

This screen is valid for both methods – Customization Method 1 and Customization Method 2.

Determine the users who need to access a storage location.

The customizations shown in Figure 6 dictate an authorization check for storage location 0001, but not for storage location 0088. So, if the authorization consultant working with the Profile Generator tool (transaction code PFCG) enters the values 0001 and 0088 in the field of authorization object M_MSEG_LGO,

Figure 5: Maintain Table Views Screen /Transaction Code SM30 (Customization Method 2)

field LGORT, the user access is not restricted to storage location 0088. The restriction is only valid for storage location 0001. So we see that M_MSEG_LGO does not stop you from posting to a storage location if table view V_001L_B has no authorization check set. You do not have to set anything if you do not need an authorization check per storage location.

Note: The Profile Generator tool is central to generating authorizations and authorization profiles. It lets you configure job roles for users throughout the company.

Pass It On

After you customize table view V_001L_B, you must transport it from the development system to the production system of your enterprise. In the main screen of transaction code SM30 (Figure 5), click on the Transport button. The system asks you to enter a Change Request (Figure 7).

Figure 6: Screen for Activating the Storage Location Authorization Check for Authorization Object M_MSEG_LGO /Transaction Code SM30/

Figure 7: Create a Change Request

Follow these steps to create a new change request.

1. Create a new request by pressing F8, or by selecting the white icon for creating a new request. Enter a description for the request; in our example, the name is "table V_001L_B".
2. Next, you have to fill in the name of the system into which you want to insert the changes; in our example, it is PRD. **Note:** You have to check the definition of the system with your system administrator.
3. Save the request by clicking on the Save icon, or just by pressing Enter.
4. Now you have to go to transaction code SE10, in order to find your request. You will see that the system has created a task for your request, too. Here you have to release (as a first step) the task and (as a second step) the request. Both steps can be performed by pressing F9, or by menu path Request/Task/Release/Directly.
5. Transport the request via the standard transport system/transaction code STMS/.

Your company is probably set up with a transport manager who is responsible for all transports performed in the system landscape, and who will do the import for you via transaction code STMS.

Conclusion

This article details two simple methods to customize your system for blocking a user's access to a storage location. This customization makes your SAP investment pay off. For additional information about blocking the user access to a storage location, see SAP note 523511, which answers Frequently Asked Questions about the authorization check for storage locations.

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Scales and Group Conditions:

When Group Values Are Worth More Than the Sum of Their Parts

By Matthias Liebich, MLI Solutions, LLC

Editor's Note: Buy more, spend less? SAP's pricing helps you help your customers save money by purchasing in quantity. There are many ways of accomplishing this through Scales and Group Conditions. Mr. Liebich presents a variety of pricing scenarios, complete with explanations of how each scenario will be calculated. He presents the setup and configuration, followed by each scenario's breakdown.

Scale basis	Short Descript.
B	Value scale
C	Quantity scale
D	Gross weight scale
E	Net weight scale
F	Volume scale
G	Scale based on a formula
L	Point scale
M	Time period scale - Month
N	Time period scale - Years
O	Time period scale - Days
P	Time period scale - Week
R	Distance
S	Number of shipping units
T	reserved (IS-OIL, time prices)
X	reserved (IS-OIL, day prices)

Figure 1: Configuration Options for Scales in a Condition Type

Introduction

A common marketing strategy is to get you to buy more products by offering a better price per unit. In this article, I will explain how SAP® supports this functionality with Scales and Group Conditions. I will start with some easy examples and graduate to the more complex scenarios that might be required for your business processes and strategies.

Examples for such strategies include a list price based on the number of units purchased or freight based on truck load size. All screen shots and examples in this article were executed in an SAP R/3 ECC 6.0 system, but also apply to previous releases, from SAP R/3 Release 4.6 going forward.

Scales Configuration

Pricing scales, or brackets, as they are sometimes called, are maintained in Pricing Condition Records. What type of scale and how it is to be used in a pricing record is defined in the respective Condition Type. Go to IMG path SPRO→Sales and Distribution→Basic Functions→Pricing→Pricing Control→Define Condition Types, and select "Maintain Condition Types" from the resulting pop-up screen. Select the Condition Type for which you would like to define scale functionality for. For the example scenarios, I created three new price Condition Types: "PR10", "PR11", and "PR12". In the Condition

Type configuration, go to the "Scales" box to look at the scale related configuration options.

The Scales box (see Figure 1) of the Condition Type configuration addresses the use of scales or brackets within a Condition Record.

The Scale Basis defines the values on which the scale is based. A quantity scale, for example, uses the number of units to determine which level of the scale is reached. A volume scale would use the volume of the item. For a complete list of possible scale basis types, click on the pull-down for this field.

The field "Check Value" determines if the scale values for the respective Condition Type should be ascending or descending. A descending quantity scale might look like this:

From	1 PC	\$ 10
From	10 PC	\$ 8
From	100 PC	\$ 5

The Descending is related to the price, not the quantity of the scale. This means that the quantity of units is ascending with each level of the scale, and the price for each level is actually being reduced. The more you

buy of an item, the less you pay per unit. If the dollar amounts were set to increase with each level in a descending scale Condition Record, the system would issue an information message and would not let you save the Condition Record. A descending scale is most common for a "Base-Scale".

The Scale Type configuration field determines what type of scale should be used. The Scale Types available in the standard SAP system are Base-Scale, To-Scale, and Graduated-to Interval Scale.

Base-Scale (in previous SAP R/3 releases called From-Scale): This is the most commonly used scale type for a descending scale. For example, it defines that for a quantity scale, the scale level starts from a specified quantity. The last level of a Base Scale Condition Record would specify that all quantities above that specified quantity will be assigned the price set for this scale level.

The Scale Type configuration field determines what type of scale should be used.

To-Scale: This scale type works in reverse of the Base Scale. You define up to which quantity a certain price applies. If your order quantity is above that quantity, the system will look for the next scale level quantity. A potential issue that needs to be avoided for this scale type is that the last scale level has an insufficiently high quantity. If, for example, the last scale level is 100 units; that means up to 100 units will receive the respective scale level price. If the order quantity were 120 units, the system could not determine a price, since no scale level for this quantity exists. Only a scale for up to 100 units was defined. Therefore, I recommend entering an artificially high quantity like 99,999 for these To-Scale Condition Records.

Graduated-to Interval Scale: This Scale type is a variation of the To-Scale. For both the Base-Scale and the To-Scale, the order quantity of an item determines one price that applies to each unit of this line item.

Graduated scales, however, allow you to apply different prices for the same item depending on the quantity of the scale bracket. Let's look at another example:

To	5 EA	10
	10 EA	9
	20 EA	8

In a regular To-Scale, an order quantity of 12 EA would apply a price of 8 USD for each of the 12 EA for a total line item value of 96 USD. In a Graduated Scale, the following prices apply:

For the first 5 EA, the price is 10 USD per EA.
For EA 6-10, the price is 9 USD.
For EA 11-12, the price is 8 USD.

The total line item value would therefore be 111 USD (50 (5 * 10) + 45 (5*9) + 16 (2*8)).

Multiple prices of the same Condition Type will apply for the same line item. I will show you the details of this scenario later in this article. The same issue as for the To-Scale applies to the Graduated Scale, in regards to the last scale quantity. The difference for the Graduated Scale is that prices will apply up to the last scale quantity, and after that, no prices will apply.

Taking the previous example scale, an order quantity of 25 units would price the first 20 items at the appropriate levels, but not the final 5 units. This is actually more dangerous than the To-Scale. Assume that your Sales Order line item incompleteness procedure is configured to make your line item incomplete if no net value exists. Since the 20 units in the Graduated Scale would have a net value, the Sales Order line item would not be incomplete. A non-price in the To-Scale scenario, in comparison, would make the order incomplete, and prevent it from shipping. You would essentially give away free product with a Graduated Scale that is maintained like in our example, which is as you will agree, not desirable.

Leaving the Scale Type blank in the configuration of the Condition Type will allow that the type of scale can be specified in the maintenance of the respective Condition Record. However, if you specify a From-, To-, or Graduated Scale Type, this will be the only type available during Condition Record creation. The Scale Type field in the Condition Record is therefore not available for input if a Scale Type is specified in configuration.

The system allows adding custom code via the Scale Formula field to determine a different scale basis for the Condition Type than what the standard system is calculating. I will discuss this in more detail when I cover Group Conditions later in the article.

The scale UoM can be different than the actual pricing UoM.

Depending on the Scale Basis, a default unit of measure (UoM) can be entered in the Unit of Meas. field, which will automatically apply in the condition record. For example, for a weight related scale, LBS or KG can be defaulted. The scale UoM can be different than the actual pricing UoM. For example, the Condition Type may be quantity dependent, but the scale is volume based. The price would apply per unit, but the scale would be determined by the number of cubic feet (CFT).

An exception to the default UoM is if a Condition Record has the material number as part of its key, the base UoM would apply as the scale UoM, regardless of what the configured default UoM indicates. Any Condition Record without a material number in its key will take the configuration UoM as its default. If no configuration UoM exists, the system will prompt for the input of a valid UoM at Condition Record maintenance.

Condition Record Maintenance

Now that the Condition Type(s) are configured, it is time to create the scales in the Condition Records. This is done by using either transaction VK11 or VK31, just like regular Condition

Record maintenance. Enter the Condition Type (in our example for the Base-Scale condition PR10) and select your desired key combination. Enter the key fields of the Condition Record. In order to create scales, select the Condition Record and click on the Scales button on the top of the screen. This will display the Scales screen as can be seen in Figure 2.

In the Variable Key section of the screen, the key combination of the Condition Record is displayed. Below that, the validity period and information regarding the scale basis and the check type (which are being applied based on the settings in the Condition Type) are shown.

In the Scales section, enter three scale levels with the respective prices. As can be seen in Figure 2, the scale type indicates From, which means prices apply beginning with the respective scale quantity. Although the PR10 Condition Type was maintained with a UoM of "PC", the scale quantity UoM of CSE is defaulted from the base UoM of the material in the Condition Record key.

Since the scale is defined as descending, the price is reduced as more units are ordered. The scale type for a To-Scale or a Graduated Scale will display To in the Scale Type column. Once all scale brackets are entered, save the Condition Record.

Create Price for base scale Condition (PR10) : Scales						
Variable key						
SOrg	D	Dv	Customer	Material	Description	
3000	10	00	4023	MAT-011	Scale Test Material 01	
Validity						
Valid From			01/01/2008			
Valid to			12/31/9999			
Control data						
Scale Basis			C Quantity scale			
Check			A Descending			
Scales						
Scale Type	Scale quantity	U	Amount	Unit	per	UoM
From	1	CSE	10.00	USD		1 CSE
	10		9.00			
	20		8.00			

Figure 2: Scales Screen of a Base-Scale Condition Type

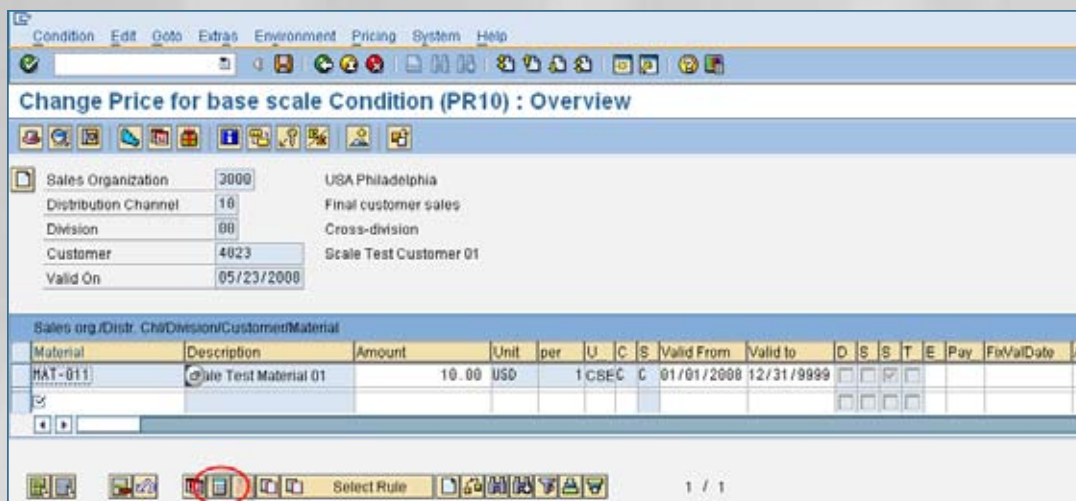



Figure 2a: Executing a Price Increase for Scale Condition Records

One more note regarding Condition Record maintenance of scale conditions: When changing condition records and executing a price increase, always use the Change Amount  function (see Figure 2a) after selecting all applicable condition records. Just changing the price on the Fast Entry screen in Figure 2a will change only the first level of the scale.

Application of Basic Scales on Sales Documents

To show the application of scales in a sales document, I created a Condition Record for each of the scale types that were discussed so far. They look as follows:

Base-Scale				
From	1	CSE	10	USD
	10	CSE	9	USD
	20	CSE	8	USD

To-Scale				
To	10	CSE	20	USD
	20	CSE	18	USD
	30	CSE	16	USD

Graduated Scale				
To	10	CSE	30	USD
	20	CSE	27	USD
	30	CSE	22	USD

Enter a Sales Order for three line items, each one corresponding with one of these scales: Item 1 for a Base-Scale quantity of 15 CSE, item 2 for a

To-Scale quantity of 5 CSE, and item 3 for a Graduated Scale quantity of 25 CSE. Stop reading now and test your acquired knowledge from earlier to determine the applied prices for each line item.

That wasn't difficult; or was it? Item 1 for 15 CSE falls into the second scale bracket of the Base-Scale and has a price of 9 USD per unit applied (see Figure 3).

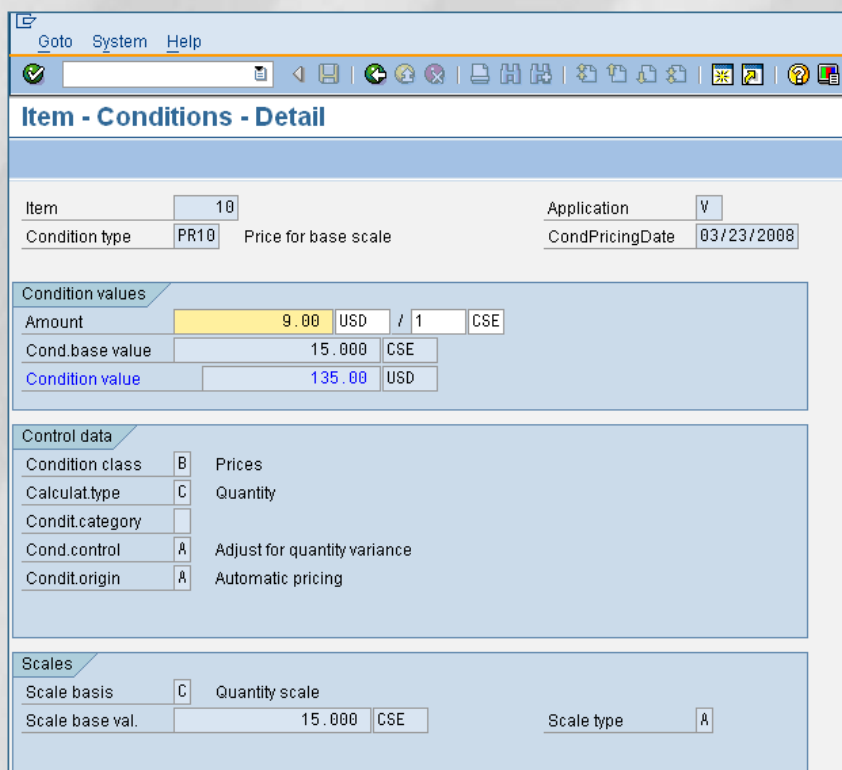


Figure 3: "Base-Scale" Applied on a Sales Order Line Item

The screenshot shows the 'Create Standard Order: Item Data' window. The 'Pricing Elements' table is expanded, showing three 'PR12 Price Interval Scale' entries. The first entry (10 units) is priced at 30.00 USD, the second (10 units) at 27.00 USD, and the third (5 units) at 22.00 USD. The total quantity is 25 CSE.

Non	CnTy	Name	Amount	Crcy	per	U	Condition value	Curr	Status	NumC	OU	CCon	Un	Condition value	CdCur	St
		PR12 Price Interval Scale	30.00	USD	1	CSE	300.00	USD			1	CSE	1	CSE	0.00	
		PR12 Price Interval Scale	27.00	USD	1	CSE	270.00	USD			1	CSE	1	CSE	0.00	
		PR12 Price Interval Scale	22.00	USD	1	CSE	110.00	USD			1	CSE	1	CSE	0.00	

Figure 4: Applied Graduated Scale on a Sales Order Line Item

Item 2 for 5 CSE doesn't even reach the next scale level and has the highest scale price of 20 USD applied to it. Compared to the previous items, line item 3 has three prices applied to it. Since it is a Graduated Scale and 25 CSE were ordered, the first 10 CSE apply with a price of 30 USD per unit, the second 10 CSE have a price of 27 USD, and the remaining 5 CSE are priced at 22 USD per unit. Figure 4 displays how the line item pricing appears on a Sales Order for this Graduated Scale.

Displaying the Condition Details for the last "PR12" Condition Type shows the Graduated Scale information in Figure 5. It shows that this price applied for the Graduate Scale bracket between 20 and 30 units.

The screenshot shows the 'Scales' tab for a condition type. It displays a 'Quantity scale' with a 'Scale basis' of 'C' and a 'Scale type' of 'D'. The scale base value is 25.000 CSE, the interval start is 20.000, and the end of interval is 30.000.

Scales	
Scale basis	C Quantity scale
Scale base val.	25.000 CSE
Interval start	20.000
End of interval	30.000
Scale type	D

Figure 5: Condition Type Details for a Graduated Scale Condition

Group Conditions

The example in Figure 5 shows a simplistic scale scenario for which each scale Condition Record applied is based on the quantity of the individual line item. Given the scales set up above, an item quantity of 10 units per line item would have resulted in the lowest scale bracket for most of the line items.

But what if the scale should be based on the total quantity of the Sales Order? To accomplish this, Group Conditions need to be utilized. The line item quantities need to be "grouped" together to make up the scale base for the scale Condition Record. Instead of 10 units for a line item, the total quantity of all line items (10+10+10=30) would be the scale basis, and result in the price for a higher scale bracket.

In the example of the Base-Scale above, 9 USD instead of 10 USD per unit would be applied to the line item. The trick here is that the Condition Type needs to be set up as a Group Condition. This is done in the configuration settings of the Condition Type. **Note:** You cannot use Graduated Scales for Group Conditions. Also, rebate Condition Types can't be defined as Group Conditions.

But what if the scale should be based on the total quantity of the Sales Order?

The combination of line items values is just one function of the Group Condition. Another one is the distribution of an amount to multiple line items.

Group Condition Configuration

Figure 6 displays the configuration settings for Group Conditions in the "Group Condition box" of the Condition Type.

Group cond.: Selecting this field identifies the Condition Type as a Group Condition. This means that for the scale basis in a sales document, the system takes the sum of multiple items into account to determine the scale level.

GrpCond.routine: This field defines which items will be included in a Group Condition calculation. The following options are available in the standard SAP Release:

- Blank = Order quantities of line items with the same Condition Type and Condition Table key are added to the Scale Base Value. Example: Both line items need to have Condition Type "ZG03" apply with a key combination of Sales Area/Customer/Material. If one line item had the "ZG03" with a different key combination, the quantities would not be added.
- 1 = The same as the blank rule with the exception that the applied Condition Table keys can be different. One line item can have a "ZG03" apply by Sales Area/Customer/Material, and another a

"ZG03" by Sales Area/Material, and both line item quantities would be added to the Scale Base Value.

- 2 = A combination of the blank and "1" rule. Line item quantities are combined to the Scale Base Value if they have the same Condition Type or a different Group Condition Type with the same Group Condition Routine "2" and the same or different Condition Table key.
- 3 = Only line item quantities of items that have the same Condition Type and the same Material Pricing Group and the same or different Condition Table key are added to the Scale Base Value.

If none of these routines satisfies your business needs, you can certainly define your own Group Condition routine. Go to transaction VOFM and select Formulas→Structure of grp. Key, to add a routine in the customer reserved area, starting with number 500.

RoundDiffComp: The Rounding Difference Comparison is used if a Group Condition amount is distributed across multiple line items. For example, if the Group Condition amount is \$100, and this amount should get distributed across the three line items on the Sales document, \$33.33 would be allocated to each line item. The sum of the line items (\$99.99) is then compared with the amount from the header (\$100). Checking the rounding field will allocate the difference between these amounts to the item with the largest net value, making it therefore \$33.34. If all line items are the same, the difference is allocated to the last line item.

R	Description
1	Total document
2	Across All Cond Typs
3	Mat.Pricing Group
30	Brazil: Rounding

Figure 6: Group Condition Configuration

If no Group Condition Rounding is specified, the system automatically assigns the rounding difference to the last line item. If the defined Condition Type is a Fixed Amount (Calculation Type "B"), the setting of the Rounding Difference Comparison flag is mandatory.

Group Condition Applications

The best way to show how Group Conditions work is with examples. For example 1, let's observe a percentage Condition Type "ZG01" that is not configured as a Group Condition, and is entered

on the Conditions→Header screen. The example Sales Order has three line items, all for a quantity of 10 units. If a 10% discount is entered as the rate on the Header, each Sales Order line item will have the 10% discount applied. The same would be true if the Condition Type were configured as a fixed amount Condition.

In example 2, a different Condition Type “ZG02” is configured as a Line Item Condition and applies by customer, for a flat amount of \$100. This Condition Type is configured as a Group Condition. Looking initially at the Item→Conditions screen, you can see that the Condition Rate has applied, but no extended amount is shown as allocated to that line item. Since the Group Condition logic is executed at the Header level, you need to go to the Header→Conditions screen first and then go back to the line item in order to see the allocated amount. Even if you don’t do that, the correct pricing will apply, since the Header pricing logic is executed at Sales Order save time.

You might wonder how the \$100 is allocated. If no allocation was configured in the Pricing Procedure (I’ll explain this in a minute), the total amount is distributed by the net value of the line items. For a Sales Order with three line items (with \$200, \$300, and \$500 net value), the \$100 would get allocated with \$20 for line 1, \$30 for line 2, and \$50 for line 3. To allocate by a different measure than net value, use the Alternate Condition Base Value field in the Pricing Procedure Configuration (see Figure 7).

In our example, we are allocating the \$100 by volume. Figure 7 also displays other values that could allocate the fixed amount. Of course, if your required value is not listed, you can create a new custom formula with trans-

Variable key	SOrg.	DChl	Dv	Customer	Description
	3000	10	00	4023	Scale Test Customer 01

Validity		Control data	
Valid From	01/01/2008	ScaleBasis	C Quantity scale
Valid to	12/31/9999	Check	None

Scale Type	Scale quantity	U	Amount	Unit
From	30.000	CSE	10.000-%	
	50.000		12.000-%	
	100.000		15.000-%	

Figure 7: Alternate Condition Base Value to Allocate Group Condition Amounts

action VOFM. Use the Formulas→Condition Base Value path and create a new formula in the customer reserved namespace (starting at number 500).

The third example brings us back to our scale problem from earlier where we wanted to base the scale on the sum of all line items. Figure 8 displays the Condition Record for the Group Condition type “ZG03”. It is set up by customer, and kicks in if at least 30 units are being purchased.

Step	Co	C-Obj	Description	Val	To	Wa	R	Stat	P	SubTo	Repl	CarTy	BasType	Accp	Alloc
PR10			Price for base scale												
PR11			Price for ts-scale												
PR12			Price Internal Scale												
			Base Price												
ZG01			Header Discount 01	100											
ZG02			Group Discount 01	100											
ZG03			Group Discount 02	100											

Figure 8: Group Condition Record Scales View

Creating a Sales Order for three items with a quantity of 10 units each wouldn't bring in the discount in our previous scale scenario. However, looking at Figure 9, it is obvious that although only 10 Units were ordered for line item 10, the 10% discount for Condition Type "ZG03" applied.

Figure 9 also shows the first example, where the \$100 from the Header→Conditions screen was applied to each line item. The "ZG02" Condition Type in Figure 9 shows the second example that allocated the \$100 by volume.

I mentioned earlier that it is necessary to go to the Header-Conditions screen in order to see the allocation of a Group Condition to the line items. If at least one Condition Type is configured as a Group Condition AND as a Scale Condition, this manual step is not necessary. The reason is that the system needs to go to the Header pricing logic to gather the total quantity of the Sales Order to determine the appropriate scale. The system basically went to Header→Conditions for you, and therefore the allocated amounts for Condition Types that don't have scales can be seen. **Note:** If the Sales Order has line items with different sales UoMs, all will be converted to the scale UoM.

Go to Header→Conditions and double-click on the "ZG03" Condition Type to see the scale basis on the details screen. In Figure 10, the "Scales" box shows the Scale base value is 30 Units. Therefore the scale bracket from 30 units applied.

Finally, I would like to address an issue with scales that can occur during invoicing. Take example three with the three line items of 10 units each and the "ZG03" Condition Type applied with 10% on each line item. If the Sales Order is delivered as ordered, the invoice will have

N	Only Name	Amount	Qty	per	Condition value	Curr.	Status	Item C	Item C	Item C	Condition value	Cond. Cur	Stat
FR11	Price for 10-scale	20.00	USD	1	CSE	200.00	USD	1	CSE	1	CSE	0.00	
	Base Price	20.00	USD	1	CSE	200.00	USD	1	CSE	1	CSE	0.00	
2901	Header Discount 31	100.00	USD			100.00	USD					0.00	
2902	Group Discount 01	100.00	USD			33.33	USD					0.00	
2903	Group Discount 02	10.000	%			20.00	USD					0.00	

Figure 9: Group Conditions on Sales Order Line item

Condition type: ZG03 Group Discount 02

Application: V

CondPricingDate: 04/06/2008

Condition values

Amount: 10.000 - %

Cond.base value: 590.00 USD

Condition value: 59.00 - USD

Control data

Condition class: A Discount or surcharge

Calculat.type: A Percentage

Condit.category:

Cond.control: A Adjust for quantity variance

Condit.origin: E Item total

☒ Group condition

Scales

Scale basis: C Quantity scale

Scale base val.: 30.000 CSE

Scale type: A

Figure 10: Scale Base Value of the Group Condition Type

the same "ZG03" discounts as on the order. However, if the order is delivered partially or in three separate deliveries, the invoice results might differ, depending on the pricing rule that is used in copy control. My article "Pricing Dates and Pricing Rules – Ways of Changing How Pricing Applies on Documents" from the August/September 2004 edition of SAPtips goes into great detail on how pricing rules work. For now, let's examine just two of them.

First, we are using pricing rule “C”, which re-prices all automatically determined Condition Types and retains the manually added ones. If the order was delivered with three separate deliveries and each delivery invoiced individually, the pricing rule “C” causes the scales of Condition Type “ZG03” to be re-determined. The total quantity for this invoice is only 10 units, so the “ZG03” discount will not apply, since it did not reach the first scale level quantity.

In another scenario, the pricing rule is “D”, which means to copy all pricing unchanged. The scale basis is retained and the “ZG03” Conditions Type still applies, although the total invoice quantity is only 10 units.

So what can you do if your business wants to re-price AND still keep the scales? There are two options. One would be to create a custom pricing rule, which would re-determine pricing without re-determining scales (please also refer to my pricing rule article mentioned earlier). The other option would be to create a custom scale base formula that would base the scale at invoice time on the scale base of the respective Sales Order.

At first you need to create a new custom field in table VBAK. This field needs to be filled with the scale basis (like total quantity, volume, or weight) that is used to determine the Group Condition scale in user-exit program MV45AFZZ, routine USEREXIT_MOV_FIELD_TO_VBAK. The reason this has to be done is that SAP does not store a total volume or weight in the Sales Order header database table.

Although these values can be seen on the Sales Order Header→Shipping screen, they are dynamically calculated and not stored at Sales Order save time. After that, go to Formulas→Scale Base in transaction VOFM. Create a new Scale Base Formula in the customer reserved namespace (starting with number 500) and attach it to the Condition Type in field “Scale Formula” (see Figure 1). The Scale Basis Formula will then use this stored field value at invoice time as the scale basis value, even if scales are being re-determined. The “ZG03” discount will use the total Sales Order quantity as its basis, and the discount will therefore apply.

Conclusion

As you can see, the possibilities are plentiful to utilize the Scales and Group Condition functionality and you might have a scenario that was not covered in this article. So if you feel like you didn’t get enough information, feel free to peruse relevant OSS notes. OSS notes 24944, 39034, 63070, and 109708 are an especially good start and have references to other related OSS notes for this subject.

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Parallel Currencies in SAP® – Part II: Supporting Local Legal Financial Reporting

By Dimitris Lngas, SAP Consultant

***Editor's Note:** A world apart? Not these days when globalization seems more the rule than the exception. If you're not currently involved in multi-national manufacturing, the odds are that you will be. When that time arrives, you'll be glad you had a "heads up" on financial reporting issues and solutions, from someone who's done it. Dimitris Lngas laid the foundation for supporting parallel currencies in Part I of his series, including detailed steps for configuring and assigning a new currency code. In Part II of the series, he wraps up the process with an overview of the required Actual Costing-Material Ledger configuration, as well as suggestions on handling issues that arise from using parallel currencies.*

Introduction

In the first installment of my article, I explained the benefits of using parallel currencies to accommodate for the legal financial requirements of your local subsidiaries. I took you through the general system configuration of setting up a new currency code, assigning this currency to the country and company code in question, and showed how to configure the Account Determination for the Foreign Currency Valuation. We then looked at all the settings in the Fixed Assets (FI-AA) module that are necessary in order to value your financial statements (and the fixed assets sub-ledger) correctly in the parallel currency.

In this second and final installment of my series, we will look at all the required Actual Costing-Material Ledger (CO-PC-ACT) settings, in case you are setting up this module for your new company code, and then we will see how the parallel currencies can be put into action to provide for the financial reporting requirements of both your Group Finance and the local finance communities. I will close the article with a discussion of some questions that usually come up during a parallel currency implementation.

The transactions in this article were executed on an SAP ERP 6.0 system, but all the concepts and functionalities presented are available in earlier R/3 4.x versions too.

Parallel Currency: Actual Costing – Material Ledger Settings

I must note here that in this article, I assume that you are setting up the parallel currencies for a new company code, one that is not already productive. For the reasons I described in the first installment, this would normally be the case, as you will (or should) always know from the start of business that a parallel currency requirement exists for the new company code. It is, therefore, of utmost importance that you set up and enable the parallel currencies in a company code as of the Go Live of your "roll-out" project. If you are considering setting up the parallel currencies for a company code that is already "live", please refer to the discussion in the first installment of my article, as well as the "miscellaneous questions" section, at the end of this article, where I come back to this topic.

It is, therefore, of utmost importance that you set up and enable the parallel currencies in a company code as of the Go Live of your "roll-out" project.

In the case that you are going to be using the Actual Costing-Material Ledger functionality of the Controlling - Product Costing (CO-PC) module in your new company code, you will also need to make the necessary settings in that area, in order to correctly value all your stock movements and related financial transactions in the additional parallel currency.

In the remainder of this section, I will take you through all the relevant customizing steps that will allow you to value all your material and stock related transactions automatically in the new currency, without any additional effort required by the users.

The customizing steps entail the following activities:

- Create a new Material Ledger Type (ML Type) and assign Currency Type 40 to it.
- Assign your new company code's plants (Valuation Areas) to the new ML Type.
- Activate the Material Ledger.

Creating a New Material Ledger Type and Assigning Currency Type 40

If you are already using the Material Ledger (ML) module in your system for other companies that do not use parallel currencies, then you must create a new ML Type, and not change the existing one currently being used.

You create a new ML Type in transaction OMX2 or via IMG → Controlling → Product Cost Controlling → Actual Costing/Material Ledger → Assign Currency Types to Material Ledger Type. In my example (Figure 1), I am creating a new ML Type "Z2" to assign to my company code 0001.

In a second step, you need to assign Currency Type 40 to the new ML Type, by selecting "Define individual characteristics" (Figure 2).

Assigning the New ML Type to the Plants (Valuation Areas) of Your Company Code

The next step in your ML customizing is to assign all the plants of your company code to the new ML Type you have just created. You do this in transaction OMX3 or via IMG → Controlling → Product Cost Controlling → Actual Costing/Material Ledger → Assign Material Ledger Types to Valuation Area.

In my example company code, I have two plants, "0001" and "0002", and I assign both to ML Type Z2 (Figure 3).

Note: You should never change the currency type assignment to a Material Ledger Type when it is already assigned to plants with Active ML. Notice that in Figure 3, ML Type ZZZZ is already assigned to numerous plants. I therefore had to create a new ML Type Z2, rather than assigning Currency Type 40 to

ML Type	CT from FI	CO CrctyType	Manual	Description
0000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Standard: CT from FI & CO
Z2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	For company 0001
ZZZZ	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ML - Currency 10

Figure 1: Creating a New Material Ledger Type Z2 (Transaction OMX2)

Crcty type	Short Descript.
10	Company code currency
40	Hard currency

Figure 2: Assigning Currency Type 40 to Material Ledger Type Z2 (Transaction OMX2)

Valuation area	Mat. ledger type
0001	Z2
0002	Z2
BD01	ZZZZ
BE12	ZZZZ
BE13	ZZZZ
BE15	ZZZZ

Figure 3: Assign All the Company's Plants to the New Material Ledger Type (Transaction OMX3)

the ML Type ZZZZ. Had I assigned Currency Type 40 to ML Type ZZZZ, I would have created serious inconsistencies in the ML data and disruptions to the system. Even displaying plant-specific material master data – transaction MM03 – would not be possible. This is because, during productive use of the Material Ledger, the system populates ML tables with the currencies already assigned to the relevant ML Type. If you change these currencies, the system will be displaying the message shown in Figure 4 in all the relevant transactions (refer to OSS Note 53947 “Changing currencies after production startup”).



Figure 4: Material Ledger Currencies Were Changed (Error Message C+ 039)

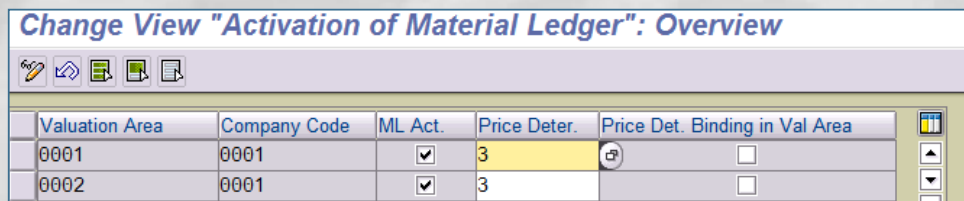


Figure 5: Activating the Material Ledger for All the Plants in Your Company Code (Transaction OMX1)

Activating the Material Ledger

This brings us to the last step of the required ML customizing, which is to activate the Material Ledger for all the plants of your company code. Please note that the configuration steps presented in this article only cover the parallel currency related settings. Before actually activating the Material Ledger, you should ensure that all other relevant settings have been completed, according to your business process requirements.

Activating the Material Ledger is done in transaction OMX1 or via IMG→ Controlling→ Product Cost Controlling→ Actual Costing/Material Ledger→ Activate Valuation Areas for Material Ledger (Figure 5).

Before actually activating the Material Ledger, you should ensure that all other relevant settings have been completed, according to your business process requirements.

This completes all the necessary configuration settings to enable the parallel currencies functionality for the Material Ledger module. Before moving on however, let us take a look at some of the effects of these customizing steps on the Material Management and the Material Ledger modules.

The “Future Price Maintenance” screen, in transaction CKMPRPN shown in Figure 6 for one of the materials in my plant 0002, contains a tab called “Hard” which corresponds to the “Hard” currency assigned to the ML Type we customized earlier.

The CKMPRPN transaction can be found in the SAP menu under Accounting→ Controlling→ Product Cost Controlling→ Actual Costing/Material Ledger→ Material Ledger→ Set Prices.

In a similar fashion, transactions MR21 “Change Material Prices” and MR22 “Debit/Credit Materials”, also found under the same menu path, contain tabs for the “hard currency” (ZSKK) valuation. Figure 7 shows the first tab named “SKK Company code currency”.

Future Price Maintenance

Manual Individual Maintena

Material 60101349 to

Plant 0002 to

Valuation Type to

Validity date of the flag

☐ Begin.subsequent per 01.04.2008

☒ Current period 31.03.2008

☐ Manual date

Rule Maintenance

Co.Code Hard

Mode Mark price

Use 1 Future valuation price

In Curr. / Valuation 40 Hard currency

Translation date 18.03.2008

Exchange Rate Type EURX

Additional Factor 1.00000

Figure 6: Maintaining the Future Price of a Material (Transaction CKMPRPN)

Figure 8 shows the second tab named “ZSKK Hard Currency”, where the system allows us to change the material price for the ZSKK currency.

Price Change - Overview Screen

Display Document

Posting Date 12.04.2008

Company Code 0001 Company in Slovakia

Plant 0002 Plant for 0001

Reference DEMO PRICE CHNGE Revaluation Reason CHG price change

Doc.Header Text

SKK Co.Code ZSKK Hard

Variant MR21_LAGERMATERIAL_BWKEY_02 Company code currency

Material	Valuation type	P Current valuation	New price	Current pri	New price	Current statisti	New statistical
60011281	⊕	S 50.00	50.00	1	1	0.00	0.00

Figure 7: Price Change for a Material – “Official” Local Currency SKK (Transaction MR21)

Price Change - Overview Screen

Display Document

Posting Date 12.04.2008

Company Code 0001 Company in Slovakia

Plant 0002 Plant for 0001

Reference DEMO PRICE CHNGE Revaluation Reason CHG price change

Doc.Header Text

SKK Co.Code ZSKK Hard

Variant MR21_LAGERMATERIAL_BWKEY_02 Hard currency

Material	Valuation type	P Current valuation	New price	Current pri	New price	Current statisti	New statistical
60011281	⊕	S 37.13	37.13	1	1	0.00	0.00

Figure 8: Price Change for a Material – “Parallel” Local Currency ZSKK (Transaction MR21)

Finally, Figure 9 shows how the accounting view of the material master (transaction MM03) looks after activating parallel currencies. Notice how in the “Prices and values” group all the values are visible in two separate sections, one for each currency.

Both currencies will now be updated automatically by the system for every valued material movement, making it very easy, as I will show in the next section, to deliver financial statements in both your subsidiary’s “official” local currency and in the parallel currency.

Parallel Currencies in Action: Generating Financial Statements in Parallel Currencies

After this long journey through the intricacies of the parallel currency customizing steps, we have now reached the point where we are ready to use this functionality for the benefit of both the Group and the local finance communities.

Summarizing the concepts that we have been looking at in the two installments of my article so far, we have basically achieved two things:

- (1) We have made all the required “General/system” settings to allow the management of one additional currency in parallel to the “official” local currency.
- (2) We have made all the required customizing settings to allow the system to correctly update all of the financial documents for this additional local currency; it is important to note once more that all financial documents will be updated no matter if they are posted manually by a

Figure 9: Accounting View of the Material Master with Parallel Currencies (Transaction MM03)

user or generated automatically by any SAP module or even an external interface, using custom-made ABAP programming. The FI - Financial Accounting module will always update each financial document with the values for the parallel currency.

I should also point out that the maintenance of the exchange rates can be perfectly segregated in the system. Compare for example the exchange rate between EUR and the parallel currency (ZSKK) shown in Figure 10 with the rate between EUR and the official local currency (SKK) in Figure 11.

Change View "Currency Exchange Rates": Overview									
New Entries									
ExRt	ValidFrom	Indir.quot		Ratio(from)	From	Dir.quot.		Ratio (to)	To
EURX	01.01.2008	25.00000	X	1	ZSKK	=		X	1 EUR

Figure 10: Maintaining the Exchange Rate for the Parallel Local Currency ZSKK (Transaction OB08)

Change View "Currency Exchange Rates": Overview

New Entries									
ExRt	ValidFrom	Indir.quot		Ratio(from)	From		Dir.quot.	Ratio (to)	To
EURX	17.01.2008	33.68000	X	1	SKK	=		X	1 EUR

Figure 11: Maintaining the Exchange Rate for the "Official" Local Currency SKK (Transaction OB08)

The first exchange rate (ZSKK/EUR) is manually maintained by your subsidiary's local finance people and is the rate provided by the local National Bank (Slovakian in my example). The second one (SKK/EUR), however, is uploaded by Group Finance (usually automatically via an interface to an external financial data provider) and is the "leading" one for all other financial transactions, including those of other subsidiaries that happen to do business with our Slovakian subsidiary.

Another important aspect of the parallel currency is that it is behaving in exactly the same manner as all other currencies that you are already using in SAP. During a manual posting for example, the system will use the exchange rate to calculate the parallel currency amount but that amount will be available for the user to change, if necessary, thus forcing a "manual" exchange rate (Figure 12).

Enter Accrual posting: Correct G/L account item

More data				Acct model		Fast Data Entry		Taxes	
G/L account		65000000		Interest group					
Company code		0001		Company in Slovakia					
Item 1 / Debit entry / 40 / Addit.Details									
Amount		500.00		SKK		Amount in LC		500.00 SKK	
						Group curr.amnt		14.85 EUR	
Negative pstng		<input type="checkbox"/>				Hard crcy amt		371.15 ZSKK	
						Settlmnt period			
						Trading Partner			
Next line item									
PstKy	Account	SGL Ind	TType	New co.code					

Figure 12: Posting an Accounting Document (Transaction FB01)

Financial Statements

G/L account selection		Chart of accounts		SC00		Crcy type/val.view (3)		9 Entries found	
G/L account						Restrictions			
Company code		0001							
Selection using search help									
Search help ID									
Search string									
Search help									
Transaction Figures Selection									
Business area									
Currency type		40							
Crcy ty	Short Descript.								
10	Company code currency								
11	Company code currency, group valuation								
12	Company code currency, profit center valuation								
30	Group currency								
31	Group currency, group valuation								
32	Group currency, profit center valuation								
40	Hard currency								
50	Index-based currency								
60	Global company currency								

Figure 13: Select the Required Currency Type in Your Financial Statements (Transaction F01)

With all this in mind, we can now sit back and enjoy very easily generated financial statements for our Slovakian subsidiary in the Currency Type of our preference: 10 (Company code-), 30 (Group-), or 40 (Hard-) currencies. All we have to do is just start the standard SAP Financial Statements (transaction F.01) and select the required currency type (Figure 13).

Financial Statements

Company in Slovakia Bratislava			Financial Statements		Time 17:10:26 RFBILA00/S08313	Date Page
Company code 0001 Business area ****			Amounts in ZSKK			
C	Comp	Bus.	Texts	Reporting period (01.2008-16.2008)	Comparison period (01.2008-16.2008)	Absolute difference
F	code	area				
	0001		49203000 Accrued interests - Group companies	2,078.39-	2,078.39-	0.00
			BL4923 ACCRUED FINANCIAL PAYABLES GROUP	2,078.39-	2,078.39-	0.00
			BL4299 Short Term financial Liabilities	2,078.39-	2,078.39-	0.00
			TOTAL LIABILITIES & EQUITY	2,078.39-	2,078.39-	0.00

Figure 14: Financial Statements Using the Local National Bank's Exchange Rates (Transaction F01)

By selecting currency type 40-Hard currency, we get the displayed financial statements in the parallel currency ZSKK (Figure 14).

Closing this section, let's consider the slightly more complex situation where many subsidiaries from different countries also have a similar requirement; i.e., they also need to value their financial transactions and generate their financial statements using different exchange rates than the ones you receive centrally from your financial data provider. I have come across this request from customers operating companies in Poland, Slovakia, and the Baltic States (Lithuania, Latvia, and Estonia). Some South American countries, due to their high inflation rates, may also have this requirement (see OSS Note 110550 "Parallel currencies Colombia, Mexico, Venezuela").

Usage of parallel currencies for more than one country-subsidiary therefore will not be such an unusual request for a multinational company operating in numerous countries around the world. In such a situation, you will have not only one but many parallel currencies in your system, one for every country where a subsidiary exists that has a need for such functionality. The table in Figure 15 lists some examples.

Country	Official Currency	Parallel Currency
Slovakia	SKK	ZSKK
Poland	PLN	ZPLN
Latvia	LVL	ZLVL
Lithuania	LTL	ZLTL
Mexico	MXN	ZMXN

Figure 15: Example List of Subsidiaries That Use a Parallel Currency

Even more in this case, with multiple parallel currencies, it is necessary to adopt this solution; otherwise it would be impossible to accommodate the local legal requirements. Without parallel currencies, each subsidiary would need to update its local currency in its own required way, which of course would affect not only its own local business but all postings between that subsidiary's company code and any other internal or external business partner. The additional parallel currencies, along with the segregation of exchange rate maintenance, are the only way to allow for local legal financial reporting without any negative impact to the Group Finance's exchange rate-related processes and requirements.

Before closing this article, it is worth looking at some of the questions that usually come up relating to the setup and use of parallel currencies.

Miscellaneous Questions That May Come Up

The first question I usually get asked when discussing the parallel currency functionality with a customer is how many parallel currencies can we set up in the system? For those that have been reading through this article carefully, the answer should be obvious by now: you can have up to two parallel currencies ("index-based" and "hard" currency) in addition to the primary company code currency. In other words, the FI system can store a total of up to three parallel currency valuations; an FI document can accommodate up to four different currencies including the transaction currency.

Another question that may come up sometimes is if it is possible to use these parallel currency figures for internal-management reporting via the Controlling

(CO) modules, like for example Profit Center Accounting (PCA) and CO-Profitability Analysis (CO-PA). The simple answer has to be “no”; parallel currencies are a very helpful functionality allowing you to accommodate local legal financial reporting requirements, but it is not meant to be used for internal-management reporting purposes. Even though it is possible to create your own parallel currency reporting using the report painter/writer functionality, you should aim to restrict these activities to externally required fiscal reporting. As I have shown, it is not very difficult to set this functionality up for business processes directly affecting your legal financial statements, because it is based on SAP standard FI customizing, but the same does not apply for SAP’s Controlling modules.

The parallel currency functionality has remained basically unaffected in the New G/L, so there is nothing to worry about!

With many implementations of the New General Ledger (New G/L) currently under way or in planning, the question will surely come up if and how the New G/L affects parallel currencies or the other way around. The answer is again very simple: the parallel currency functionality has remained basically unaffected in the New G/L, so there is nothing to worry about! You can implement parallel currencies irrespective of whether you use the classic G/L or the New G/L. You might also refer to OSS Note 1070629 “FAQs: New General Ledger Migration”.

Finally, a delicate topic is often the issue of activating and de-activating parallel currencies. As I mentioned earlier, parallel currencies should ideally be set up from the productive go-live of a new company code. If you have missed that chance and are considering setting up this functionality later, then you should consult OSS Note 39919 “Introducing parallel currencies in FI”. I would, however, strongly recommend introducing parallel currencies only at a Fiscal Year change. Also, please take into account that if you are using the Material Ledger module, the exercise will be extra tricky (ML is not mentioned at all in OSS Note 39919).

De-activating parallel currencies, on the other hand, is a little bit more straightforward, but again it should be attempted at a Fiscal Year change. If you are considering de-activating a parallel currency, please also consult OSS Note 89531 “Deactivating parallel currencies in FI”.

Conclusion

Considering that the parallel currency functionality has been available for ages (actually, it has been available since SAP R/3 release 2.2!), it is amazing how little attention it has received in the literature and how many misconceptions still exist about it. In this two-installment article, I tried to provide a detailed account of the functionality, its purpose and uses, go through all the relevant configuration steps in the various SAP financials modules, and provide answers to some of the questions that often come up relating to it.

Parallel currencies can accommodate very well the local legal requirements that exist in some countries to use locally provided exchange rates. Whether the request is to value only your assets and liabilities in the local National Bank’s exchange rates, or there is a legal requirement to produce your complete financial statements in those rates, you can set up and use a parallel currency to give the local finance community the flexibility and reporting that is required without the need to worry at all about your Group Finance processes.

As I have shown in this article, it is worth it to take the time to implement parallel currencies if you have subsidiaries in countries where such requirements exist. It is a relatively simple and straightforward functionality to implement, and it will certainly pay off!

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Vendor Invoices in SAP®: Finding and Resolving Duplicates

By Anurag Barua

***Editor's Note:** There's simply no value in a duplicate invoice. If you're on the receiving end of one of these, you find it an annoyance, at a minimum. If you are on the originating end of a duplicate invoice, you've likely just wasted precious resources and made your company look unprofessional. That's why Anurag Barua put together this handy guide for identifying duplicate vendor invoices, deleting them, and reconciling affected GL accounts.*

Recently, I received an invoice from a magazine that I've subscribed to for years. Let's call it the Hardwork Business Preview (HBP). A quick glance at the invoice is all it took for me to realize that I'd not only received a similar invoice from HBP a few weeks ago, but had also paid the first one. The thought that immediately came to my mind was that if I'd delegated this responsibility to someone else, this invoice would most certainly have been paid twice. In fact, if I'd been distracted or had a memory lapse, I might have paid the second invoice myself. Do I need to remind anyone of the inconveniences incurred in trying to get a credit, or a refund – the correspondences, the many attempts to get to speak to a live person, the wait for the actual refund, etc.?

**We all know how easy it is to
give our money away
and also how hard it is to get
what is owed to us.**

We all know how easy it is to give our money away and also how hard it is to get what is owed to us. Now think how bad this situation can become if an enterprise receives duplicate invoices from vendors to the tune of millions of dollars. Or, if in the process of invoice entry, the same invoice is entered into your SAP® system twice (or more). Worse still, imagine making duplicate payments for large amounts. There is no reason to worry or despair though. If your enterprise runs SAP ECC or R/3 (even an early release such as 4.X), you can have the

system warn you, or stop you from entering a duplicate vendor invoice into your system, based on certain matching data. In this article, I will explain to you the concept of the duplicate invoice check, the customization options in the IMG, and share with you some of my experiences and observations. Upon reading this article, you should be able to not only understand how this check works in SAP, but also be able to set up this check in your enterprise.

How Does Duplicate Invoice Checking Work?

Duplicate invoice check can be realized for vendor invoices in Financials (FI) as well as those in Logistics Invoice Verification (LIV). It is important to clarify at the outset that there are differences in the way this check works for the two categories. The one prerequisite common to both categories of invoices is the vendor master duplicate invoice check. This is explained in detail in the next section.

- FI vendor invoices: Assuming this flag is checked, if the fields Company Code, Vendor Number, Document Date, Currency, Reference Number, or Amount are identical in two documents, the second document will get a default warning message about the possibility of a duplicate invoice. Certain conditions must also be met. SAP's official documentation on its Help Website (link provided in the References section of this article) provides a detailed explanation of the conditions.
- LIV invoices: These are vendor invoices you enter in Materials Management (MM) via transaction MIRO. By default, the system checks for the same fields as in FI vendor invoices, and if a match is found, a warning message is displayed by default. Additionally, you can deactivate certain fields from being compared in the check for duplicates. This is explained in the next section.

Customizing

There is a single prerequisite that must be satisfied for vendor invoices in both FI and LIV to be subject to the duplicate invoice check. The duplicate invoice flag (or the "Chk double inv.") in the Payments Transaction tab in the Company Code data maintenance in vendor master maintenance (transaction code XK01 or XK02) needs to be turned on. This is shown in Figure 1.

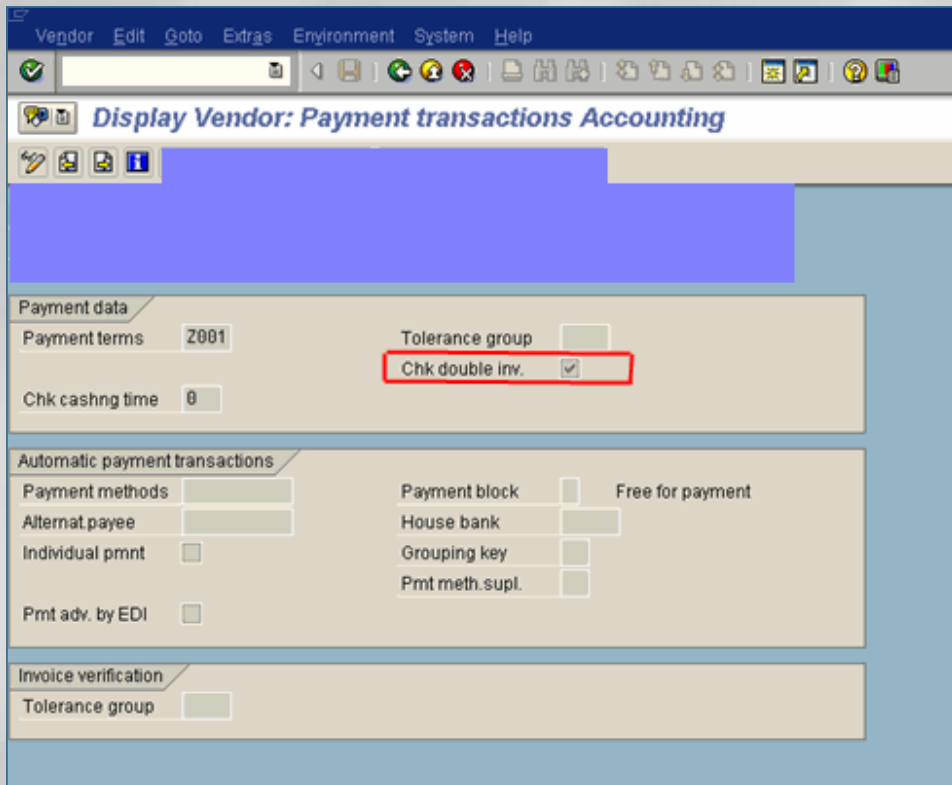


Figure 1: Duplicate Invoice Check in Vendor Master (Maintenance)

For the LIV duplicate invoice check to take place, customization has to be done. Run transaction OMRDC, or navigate as follows from the IMG menu: Materials Management → Logistics Invoice Verification → Incoming Invoice → Set Check for Duplicate Invoices. You will arrive at the screen shown in Figure 2 where you will find the three fields that you can specify for inclusion in the duplicate invoice check. The more flags you check (in the screenshot in Figure 2, all three of them have been selected), the more specific the comparison for duplicate invoices. With this configuration in place, the system will compare the company code, invoice reference, and date for both the invoices. Now, let's say you uncheck the "Check reference" box. The system will now only compare the company code and invoice date for the duplicate invoice check. As a result, it is likely to find more duplicate invoices than it would with all three boxes turned on. In essence, these flags help you control the specificity of the comparison for duplicate invoices.

Important Facts and Observations

Here are a few things you'll need to understand to successfully set up duplicate invoice checking:

- Duplicate invoice check can only be configured for vendor invoices (in FI and Logistics Invoice Verification), and not customer invoices. We want to make sure during the invoice verification process that a vendor (that supplied us with a good or a service) did not send us (the consumer) a duplicate invoice that might result in a double payment, or over-payment. The idea behind setting up this check is that you do not want to overpay your vendor. In the case of customer invoices, the enterprise has control over the invoice creation process and is unlikely to send out a dupli-

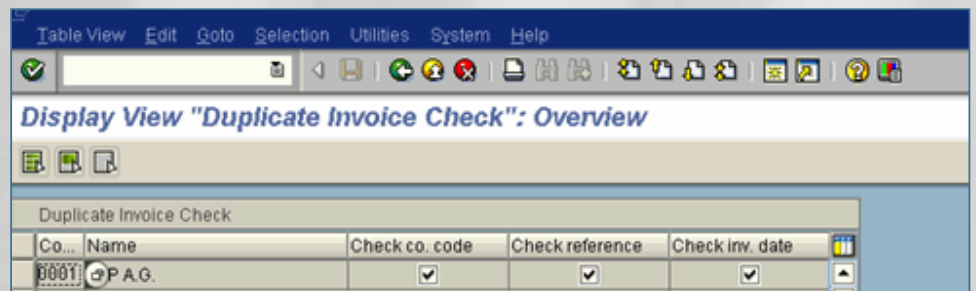


Figure 2: Configuration of Duplicate Invoice Check in the IMG

cate invoice. Even if it does, it is unlikely that the customer will make a double payment because they are likely to have their own checks and balances that catch such errors. For example, if you have implemented SAP's Sales and Distribution (SD) module, the process of generating a customer invoice (billing) is based on reference documents that have been created, and a duplicate invoice situation is virtually impossible.

- Table BSIP stores information on duplicate vendor invoices. In fact, it is an index table that is intended to expedite the document search. Please note that if the "Chk double inv." checkbox shown in Figure 1 is not checked, the table BSIP will not store invoice information. When a subsequent invoice is posted, the system will check this table, provided the configuration for the duplicate invoice check in the IMG is enabled.
- I have come across instances of SAP customers using validations and substitutions to implement duplicate invoice checks instead of using SAP's standard functionality. In fact, what makes very little sense is if you employ validations and substitutions when the fields on which you want your duplicate invoice check to be carried out match the ones provided by SAP. If you want your check to include a field not currently considered by SAP (e.g., userID), you may consider validations and substitutions.

You have another option that you should evaluate. What if you want to base the duplicate FI vendor invoice check on a subset of the default fields SAP bases its search on? There is a Business Transaction Event (BTE) number 00001110 that SAP provides wherein you can specify the fields on which to base your comparison. The downside of this technique is that you will need to be proficient in ABAP to implement this customization.

- You may want a hard error or a warning to be displayed once there is a match in duplicate invoice criteria. In fact, you may want to switch off this message completely if it is perceived to be nothing more than an annoyance.

Some organizations are very stringent about posting duplicate invoices, and they want to prevent this from happening. Others prefer to be merely warned so they can take the necessary corrective action. Still others may prefer to switch them off completely. You can customize the severity of this message both for your FI and LIV invoices. The customizable message for FI invoices is message number 117 in message class F5, and that for LIV invoices is message number 108 in message class M8. You can choose to make message number 117 either a warning or an error, and 108 can be either an informational or error message. Keep in mind that you can completely switch off message 108, but cannot switch off 117.

Note: You can browse the customizing options for a particular message in table T100S. This table contains a list of standard SAP messages whose severities can be customized by the user. Figure 3 shows the information corresponding to message number 117 (MSGNR = 117) in application area F5 (ARBGB = F5) in the table browser.

The field "MSGTA" has the values "W" and "E". This means that you can set this message to either a warning or an error. For example, setting the "MSGTD" field with a "W" value, means that the default severity of this message is a warning. The field "XIGNO" is blank, which means that you cannot switch this message off. To carry out the actual customization, you will have to run the respective message control customization transaction. For the FI message, the customization is done in transaction OBA5, and for the LIV message it is done in transaction OMRM. A technical SAP resource may be

ARBGB	MSGNR	MSGTA	MSGTD	XIGNO
F5	117	WE	W	

Figure 3: Checking Message Details in Table T100S

needed to make this change since not everyone is likely to have authorization for table maintenance.

- Duplicate invoice checks are not limited to those entered online. Those entered in non-online mode (i.e., batch mode) are also checked for the criteria discussed earlier. In fact, the severity of the message displayed for both the FI and LIV invoices can be controlled for batch mode in addition to, obviously, the online mode. Thus, you can realize a different level of message severity for an invoice check for an invoice directly entered into SAP as opposed to one entered in batch mode.
- Standard SAP functionality in MM allows for duplicate invoice checks, but not for duplicate credit memos. SAP customers often come across this need. There isn't an option in SAP to configure this functionality. However, by implementing certain (non-standard) changes as explained in SAP Note 305277, you will be able to realize duplicate credit memo checks.

Conclusion

Duplicate vendor invoice check is a useful functionality supported by SAP. The ability to customize key aspects of this check makes it powerful. By implementing it, an enterprise can catch data entry errors and, more importantly, avert the potential of over-payments or double payments. As for the duplicate invoice I received from HBP, I did not make a double payment. But I did implement a rudimentary solution – a spreadsheet based invoice tracking system based on SAP's invoice checking concept – that will effectively serve my limited needs.

References

- *SAP's Help Website at http://help.sap.com/saphelp_47x200/helpdata/en/ce/4f3e39ea3aee02e10000000a114084/frameset.htm contains official documentation on the configuration of the duplicate invoice check. It also has a good example.*
- *SAP Note 305201 is an FAQ note on duplicate invoice checking with a focus on the differences between the nature of the checks in FI and MM. This is a very helpful note since there continues to be some confusion in how one works relative to the other.*

Anurag Barua is Senior Manager for a major IT service provider. He has 16 years of experience in conceiving, designing, managing, and implementing complex software solutions, including nearly 10 years of SAP experience. He has been associated with several SAP implementations in various capacities. Anurag's core SAP competencies include FI/CO, Logistics, SAP BW and SAP NetWeaver™ BI, SAP NetWeaver tools and technologies, Sarbanes-Oxley compliance, reporting, and project management. Anurag is a frequent speaker at SAP conferences and contributes to several publications. He has a B.S. in computer science and an MBA in finance. You may contact the author at SAPtips.Authors@ERPtips.com. Be sure to mention the author's name or the title of the article.



Separate Transport Directories? Not Unless You Have To

By Joey Hirao, SAP® Basis Expert

Editor's Note: Although it might not be the best option, sometimes you have to go your own way. It's the same deal with transport directories. There are some circumstances that just dictate that separate transport directories need to be created. And that can add a layer of complexity (and headaches) if it's not handled properly. Joey Hirao has been dealt this hand before, so if separate is a must, rather than an option, take the time to read Joey's guide to make this less-than-ideal situation work for you.

Introduction

This article focuses on the implementation tips and techniques for STMS and multiple Transport Directories. The version that I refer to technically is based on NetWeaver™ 2004s or WEB AS 7.0. The discussion is database independent, but it is operating system specific to UNIX and Windows.

Before we jump into the technical details of this article, let me share a short story. I landed a project in the Northeastern US on a new, small SAP® implementation. I came late in the game, so change or rework was impossible. With only a couple months left until "Go Live", my job was to take what had been designed and built and push it thru the finish line. My predecessor had departed for personal reasons. The client had outsourced their landscape to two vendors. Production was with vendor A, and everything else was with vendor B. Vendors A and B did not communicate well with each other. The problem, as usual, was with transports. The client demands "Why is this (transport) not working?" Countless meetings and traces later, we discovered that firewall

rules prohibited communication within vendor A's data center, as well as between the two vendor's data centers. Why so complex? Who knows?

Acronyms, Buzzwords, and Definitions

Since its infancy in the early 90s, SAP has evolved and grown into a mature and robust enterprise software solution. After all these years and four major release updates, the terms and concepts of SAP have become a jumbled up pot of alphabet soup. The catchy terms and acronyms originating from the heart of SAP (Waldorf) really end up confusing us all. To avoid drowning in acronyms and buzzwords, I define terms and acronyms relating to transports in the following table.

Term/Acronym	Definition
CTS	CTS, "Change and Transport System" is the SAP module that captures configuration and development changes. SAP labels CTS as the Basis Component (BC)-CTS module.
Transport Organizer	Contains the mechanisms available to manage and package changes in the system.
TMS	TMS, "Transport Management System" is the conduit for change. It moves changes across the landscape.
SID	SID, "System Identifier" is the three-character (alphabetic and numeric) combination that uniquely identifies an SAP system. A SID is also a type of system.
System Landscape	The combination of systems in your SAP implementation. Example: ECC 6.0 implementation with development, quality, and production systems make up the System Landscape.
Transport Domain	All SAP systems that are logically grouped together with identifiable systems and specific transport routes.
Transport Route	The path that changes follow in a Transport Domain. Example: A change released in development will go to quality; then after importation into quality, it is eligible for importation into production.
Transport Directory	The physical location where data is written. The SAP instance parameter is DIR_TRANS. The default value is (UNIX) /usr/sap/trans (WINDOWS) similar variation with Windows slashes and a drive letter. In UNIX, the transport directory can be directly (physically) attached to a server; or it can be mounted on other servers via the network using a protocol such as network file system (NFS). In Windows, the same concept is true; direct-attached disk storage is mounted locally, similar to UNIX. "Windows Shares" is synonymous with NFS in UNIX.
Transport Group	A collection of systems in a Transport Domain that share a common Transport Directory.
Domain Link	The Domain Link provides interconnectivity between different transport domains.

Figure 1: Table of Transport Terms and Definitions

Figure 1 defines the key terms surrounding transports.

The Scenario

The transport directory is the key integration point between systems connected in a transport domain. It enables and facilitates the movement of exported transport requests into other systems within the landscape. Most organizations can live with a shared transport directory mounted across the systems. Physically, this means that a disk file system is available for “read and writes” simultaneously to all systems in the landscape. This is illustrated in Figure 2.

The types of files written and stored in the transport directory are buffer, temporary, data, cofiles, and log files. In a UNIX environment, NFS file systems are mounted on all systems within the transport domain. In Windows, the similar concept is implemented using SMB shares. Figure 2 shows an example of a three-system landscape – DEV (Development), QAS (Quality Assurance System), and PRD (Production) – that shares a NFS file system exported from the NFS server, in an all UNIX environment.

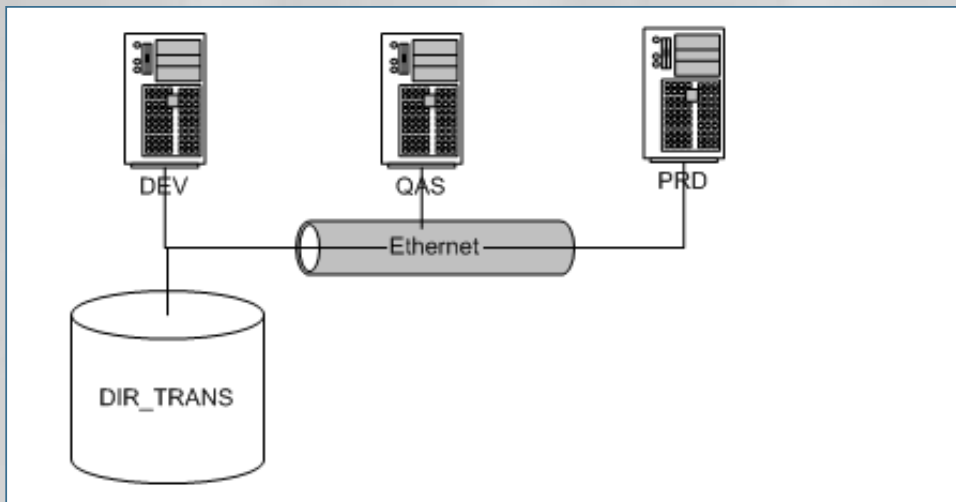


Figure 2: Three-System Landscape with a Common Transport Directory

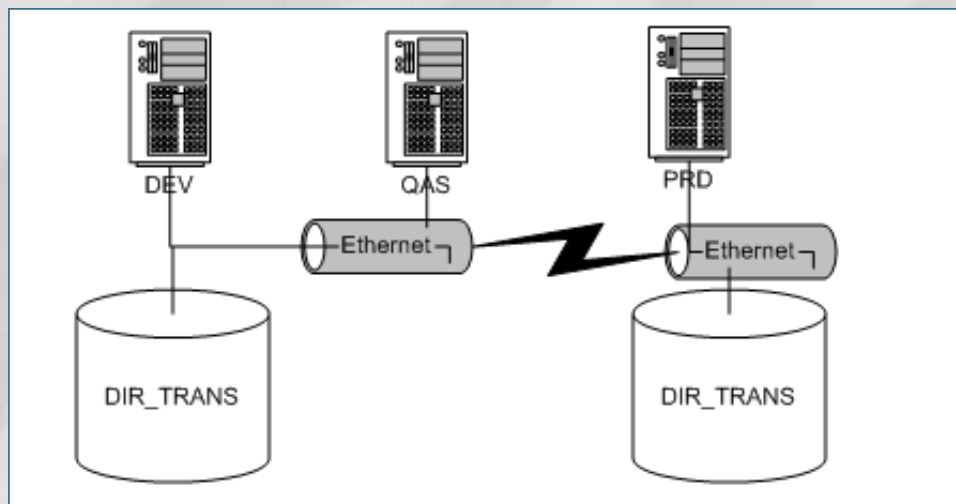


Figure 3: Three-System Landscape with a Separate Transport Directory

If you have no compelling reason to segregate the transport directory, then, in my opinion, don't.

There are ample problems associated with transports, such as export and import errors; the last thing we need to worry about is physical connectivity. This is where the theme of KISS comes into play. If you have no compelling reason to segregate the transport directory, then, in my opinion, don't. The Transport Organizer usually works.

With that said, here is the flip side and the whole reason for this article: Separating the Transport Directory inter-system. Suppose your company has rules or physical constraints precluding it from cross-mounting a common transport directory. In this situation, separate transport directories might be required per system (or systems). If you live in a world with only one transport directory, this idea may sound absurd or be hard to visualize. Figure 3 shows the same example as in Figure 2, but this time the production system has its own transport directory.

1. Your organization has policies that prohibit sharing files between environments. An example of this is a policy that prohibits the active sharing of non-production files with the production system.
2. Your organization splits its systems into different geographies. An example of this is when the Development system resides in Ontario, Canada and the production system is located in Toronto, Canada.
3. Your organization firmly disbelieves in network file systems. An example of this implementation is when all systems in the landscape have a dedicated Transport Directory.
4. Your organization defines each system as a separate silo with no interconnectivity with other systems in the System Landscape. An example of this is an implementation in which firewalls encapsulate each system, prohibiting inter-system connectivity.
5. Your organization runs a heterogeneous landscape. Different systems within the landscape operate on different platforms. An example of this is an environment in which Development and Test run on a Microsoft platform and Production runs on UNIX.

Figure 4: Top 5 Reasons for Segregating the Transport Directory

Figure 4 illustrates the top five reasons to use this configuration; these come from actual customers that I've encountered over the years who insisted on a segregated Transport Directory.

The Decisions

If you're still reading, it must be because you are determined to implement a segregated Transport Directory. Or it's my great writing skills, or maybe not. In any event, we now need to make some decisions, plan, and execute. This section of the article asks questions to help guide you to effective decisions.

Question 1

Who will control the Transport Domain? If your answer is singular, like The Basis team, then I suggest you use a single transport Domain. If different groups own and manage the Transport Domain, it's best to have one Domain per controlling interest.

Question 2

Are the systems prohibited in communicating with one another via SAP ports and operating system-specific ports used for file system sharing? If yes, then you will definitely need a separate Transport Directory. Be prepared for slow moving change through your landscape. Files must be physically copied from one transport directory to another.

Note: If SAP ports can be accessed for communications on an inter-system level, transport movement can be accomplished between systems with separate transport

directories. The challenge happens when the ports are denied.

Implementation

If one Transport Domain is needed, then we create one landscape and multiple Transport Groups. We'll discuss this in Scenario 1. If multiple Transport Domains are necessary, we need to create separate Transport Domains that are linked together. We'll discuss that in Scenario 2.

If SAP ports can be accessed for communications on an inter-system level, transport movement can be accomplished between systems with separate transport directories.

Scenario 1

In the first scenario, we create a single transport Domain with two separate Transport Directories. Refer to the model depicted in Figure 3 to understand the foundation for this scenario solution.

Starting with three systems – DEV, QAS, and PRD – we make PRD the Transport Domain Controller. In this example, we use a local mounted file system /usr/sap/

trans as the transport directory (the default value is /usr/sap/trans).

If you want to change the value from the standard to another directory, then you need to edit the Instance Parameter file. The Instance Parameter file is an actual file that SAP reads during startup to determine run-time values.

The transaction code RZ10 allows users to maintain the values within the files without having to use operating system tools. Transaction code RZ10 also keeps version history of the changed values. A good tip is to edit and maintain the values via RZ10. If you edit values directly in the file, you may lose those changes (and other changes made through the RZ10 transaction code).

The steps to set up the Transport Domain are listed in Figure 5.

The next step is to include DEV and QAS into the domain. The steps in Figure 6 describe how to include systems without a common transport directory into the Transport Domain (created in Figure 5). Do the steps illustrated in Figure 6 for the QAS and DEV systems.

Scenario 2

Scenario 2 is also based on Figure 3, but we have two Domain Controllers, PRD and QAS. First perform the steps in Figure 5 for QAS and PRD. Figure 7 lists the remaining steps to link the two Transport Domains.

1. Logon to Client 000 of PRD.
2. Navigate to transaction code STMS.
3. As this is a new TMS configuration, a popup appears asking for short text input on the Domain name.
4. Save the entries in the popup box.

Figure 5: Setup the Domain Controller

1. Log on to Client 000 of QAS.
2. Navigate to transaction code STMS.
3. As this is a new TMS configuration, a popup appears.
4. Select the icon for Other Configuration. A new set of input options appears.
5. Enter the hostname for the Transport Domain Controller and the Instance number.
6. Save the entries in the popup box.
7. Log back in to the Transports Domain Controller to approve the request for inclusion into the Transport Domain.
8. Log on to Client 000 of PRD.
9. Navigate to transaction code STMS.
10. Navigate to menu option Overview&systems.
11. Place the cursor on the newly included system, QAS, and approve by selecting SAP System&Approve from the menu.

Figure 6: Include Systems into the Domain

1. Logon to Client 000 of QAS.
2. Navigate to transaction code STMS.
3. Navigate to menu option Overview&systems.
4. Navigate to menu option SAP System&Create&Domain Link.
5. Enter the data for PRD: hostname, system name, and system number.
6. Save.
7. Logon to Client 000 of PRD.
8. Navigate to transaction code STMS.
9. Navigate to menu option Overview&Systems.
10. Place the cursor on the newly included system, QAS, and approve by selecting SAP System&Approve from the menu.

Figure 7: Linking Two Transport Domains

For both Scenarios 1 and 2 to work, the SAP ports must be open between the systems to allow SAP RFC communication. At a minimum, dispatcher ports are required. Figure 8 explains the port ranges.

<u>Port</u>	<u>udp/tcp</u>	<u>Description</u>
32XX	tcp	Dispatcher port
33XX	tcp	Gateway port
36XX	tcp	Message port
47XX	tcp	Dispatcher security port
48XX	tcp	Gateway security port


XX is the SAP instance number

Figure 8: SAP Ports

At this point, you are ready to customize your transport routes; customizing transports is not covered in this article. If the ports are not available, or cannot be opened, the physical transport files must be copied from one location to another. With Scenarios 1 and 2, the transport files, data, and co-files are copied to the non-shared Transport Directory. The beauty of this setup is the lack of manual file copying between transport directories.

Summary

Occasionally, customers want to separate the Transport Directory. Some do it because they have business requirements such as security or other technical regulations. However, others just do it because it's available. The distributed Transport Directory works, but without a real need, it seems ridiculous to implement. The guidelines in this article are for those of you whose business requires a separate Transport Directory. There are enough problems with transports without adding another wrinkle.

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Performance Trace in SAP®: Identifying Design Specifications with a Standard Report

By William McNaughten, Entrecor

***Editors Note:** If anyone knows how to extract information out of SAP, it's a FI/CO expert. That's how Bill McNaughten came to learn about the Performance Trace tool in the ABAP Workbench. The good news is that Bill is living proof that you don't have to be a developer to use and enjoy the benefits of this slick tool. In this issue, Bill shows how the tool can be useful in determining tables and fields required for custom development work. Try it on for size.*

Introduction

In my last 12 years of working on SAP implementations, I have used the Performance Trace tool extensively. It's a valuable tool for determining the tables and fields needed to develop specifications for custom development. However, before embarking on custom development, you must completely understand the development requirement.

In sorting through the development requirement, you will be surprised how many times you ask the same simple question and get different answers. So, you must always check and double check the facts and document your findings to prevent going down the wrong path. By this, I mean avoid the humiliation of delivering a custom solution to your client that misses a step. I can assure you that the unwanted recognition you receive under these circumstances is embarrassing (if not painful).

Also, fully understand your area of responsibility so you can advise on available standard reports. If you doubt the value of the information, challenge the business to determine the value of the development efforts. Make sure the value of the development efforts outweighs the development costs. The SAP implementation is the optimal time to eliminate unnecessary or outdated reports. No doubt, you will develop some sales skills in this process because you will probably have to negotiate.

Once you clearly understand the requirement, offer alternatives, such as a report with a different format or the option of running two reports to obtain the necessary data. As a final note, corporate politics can naturally play a role in many decisions. Be careful as you advise and influence people. Don't be too cavalier, or you could be pay a price.

Investigating the tables shown in the trace is an excellent way to learn a lot about your module.

What the Performance Analysis Tool Does

SAP provides the Performance Analysis tool to help you determine the tables, SQL statements, and the structures invoked when a transaction code or report is executed. The tool allows you to activate the analysis, execute a transaction or report, deactivate the trace, and view a log of the tables, SQL statements, and structures used. This valuable information provides the tables and fields necessary to create the development specifications.

Additionally, investigating the tables shown in the trace is an excellent way to learn a lot about your module. You get a thorough understanding of the functionality through studying the tables supporting the application. Even though the transaction code for the performance trace resides in the SAP Workbench Application Area Tools, which is typically used by developers and other technical resources, we will explore its use for people like ourselves who implement the system.

Note: The tables analyzed in this article are specific to the CO module; yet, the Performance Trace functionality described here applies to all modules. The performance trace is applicable to all versions of SAP since 3.0. This example is based on ECC 6.0.

Time for a Test Drive

Execute the performance trace from any SAP screen using the menu path shown in Figure 1. You can also access the Performance Trace tool via the SAP menu path: ToolsAdministrationEMonitoringETracesST05 Performance Trace.

Select menu path Utilities→Performance Trace to display the screen in Figure 2.

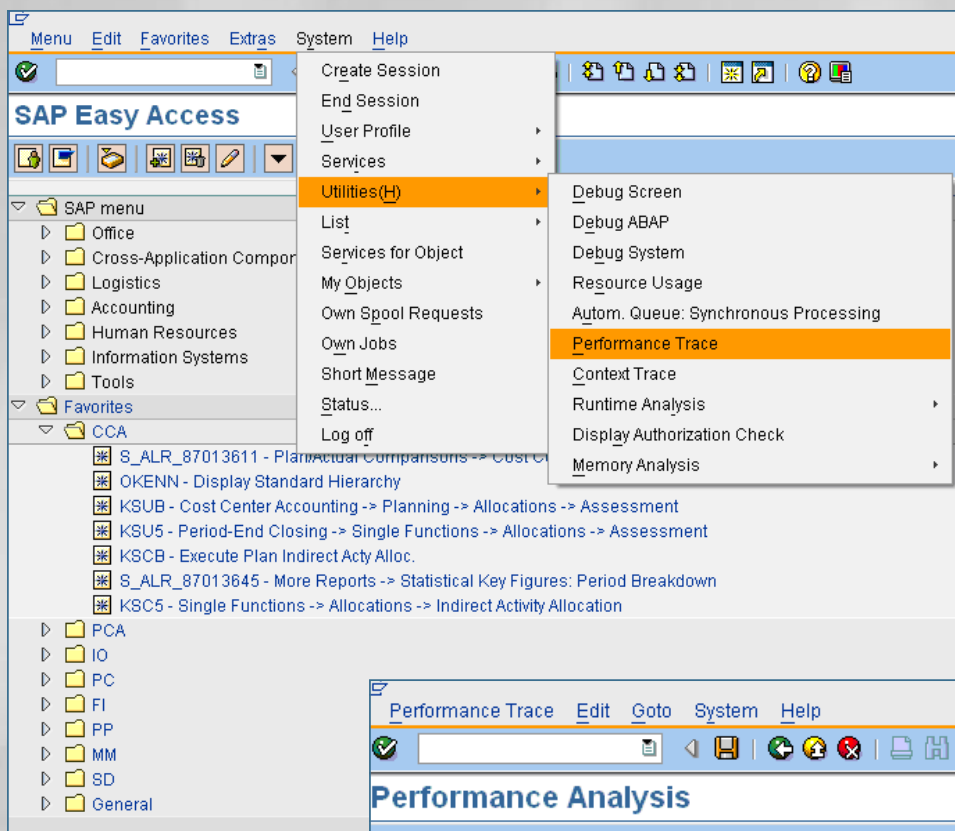


Figure 1: Performance Trace Menu

Note: Prior to executing the analysis, you must know the transaction code for executing the transaction or report. Once the analysis is activated, it records any menu path navigation or program execution. Avoid recording extraneous menu path navigation or typing errors, which causes irrelevant files to appear in the analysis.

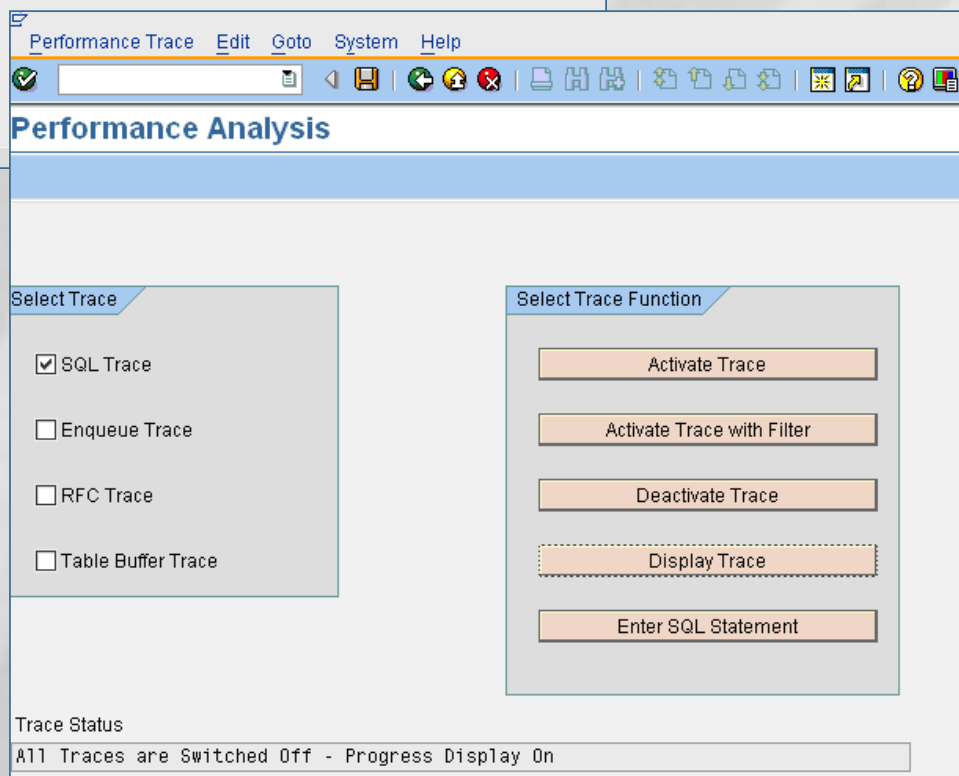


Figure 2: Performance Analysis

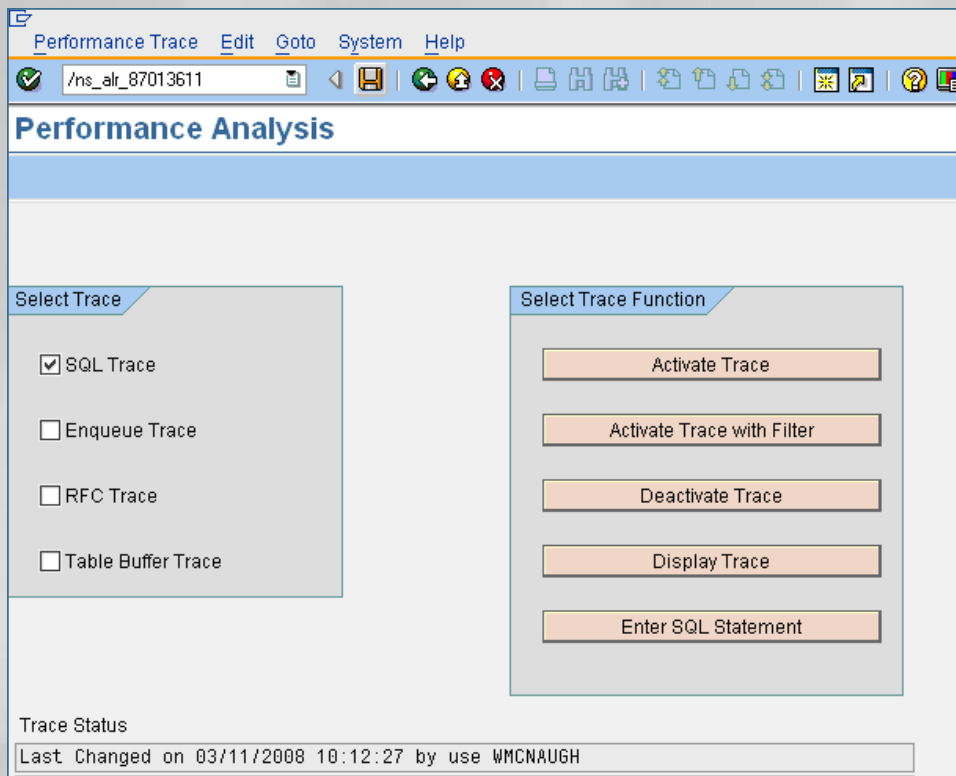


Figure 3: Performance Analysis with Transaction Code

Activate the Analysis

To determine the files used by the transaction or report, select the SQL Trace checkbox, and then select the Activate Trace button, as shown in Figure 2.

Enter the transaction code, as in Figure 3, (or report transaction) for which you want to determine the processed files. Select the Execute icon, to display the report shown in Figure 4.

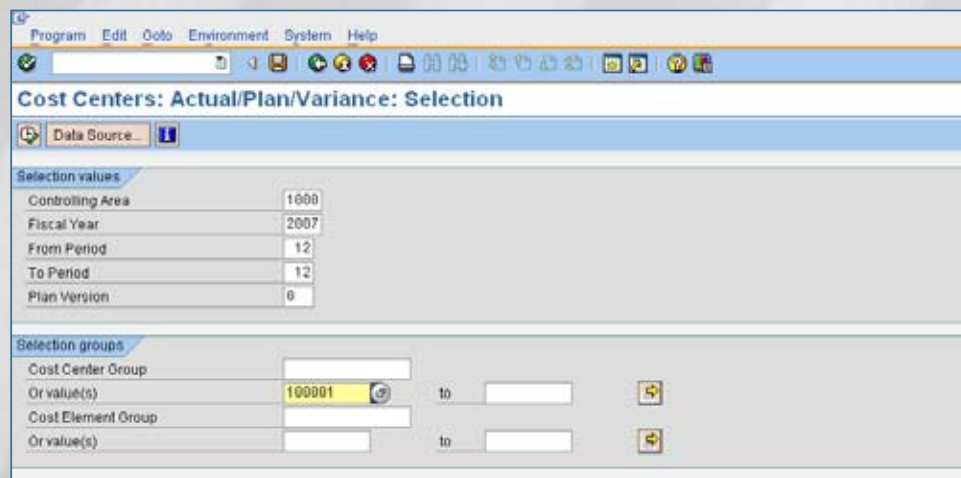


Figure 4: Cost Centers Actual/Plan/Variance: Selection

Cost Elements	Act. Costs	Plan Costs	Var. (Abs.)	Var. (%)
500007 C06S - Misc	799.26		799.26	
500015 C06S - Adjustments	128,889.57		128,889.57	
500050 C06S - Frt In	24,007.13		24,007.13	
520010 Gain/Loss Inv Varia	7,709.37		7,709.37	
520070 Inv Change-Trading	3,143.43-		3,143.43-	
520071 Inv Change-Cycle Cn	645.17		645.17	
520080 Inv Change- Misc	3,648.83		3,648.83	
520081 Inv Change - Dead S	3,521.98-		3,521.98-	
530000 Gain/Loss Price Var	672.57		672.57	
540000 AuC Settlement				
550000 Rebates	70,426.83-		70,426.83-	
550005 CO-OP	39,143.56-		39,143.56-	
550010 Vendor Discounts	34,630.65-		34,630.65-	
610040 T&E - Meals				
610070 T&E - Air, Rail				
610100 PR - Other Pers Exp				
610200 Payroll - Bonus	2,046.00		2,046.00	
610300 Payroll - Overtime	3,121.84		3,121.84	
610400 PR - Vacation Pay	13,912.08		13,912.08	
610404 PR - Vac Pay - Sal	6,899.28		6,899.28	
610406 PR - Accrued Vacati	22,257.01-		22,257.01-	
610430 PR - Non-Exempt Hol	6,844.11		6,844.11	
610432 PR - Exempt Holiday	822.40		822.40	

Figure 5: Cost Centers Actual/Plan/Variance

Execute a Transaction or Report

After entering the desired parameters, select the Execute icon, to display the screen in Figure 5.

Now that the report has executed, the trace identifies all of the SQL tables and structures used to populate the data on the report. Figure 6 shows the menu path to the Performance Analysis screen (Figure 7) where you can turn off the trace function.

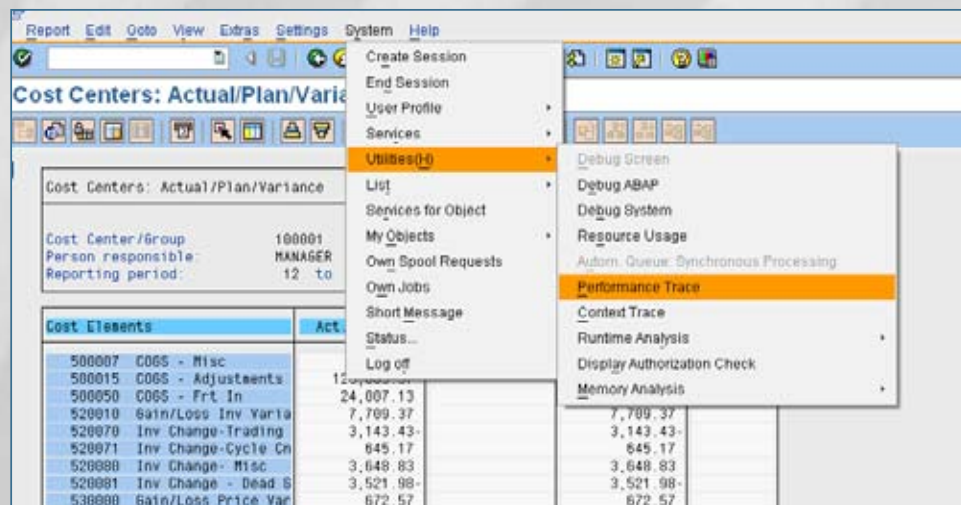


Figure 6: Cost Centers Actual/Plan/Variance Turn off Trace

Deactivate the Trace

Select the Deactivate Trace option, then click the Display Trace button (shown in Figure 7).

View the Log of Tables, SQL Statements, and Structures Used.

In Figure 8, the system sets the defaults to show the log for the transaction or report executed.

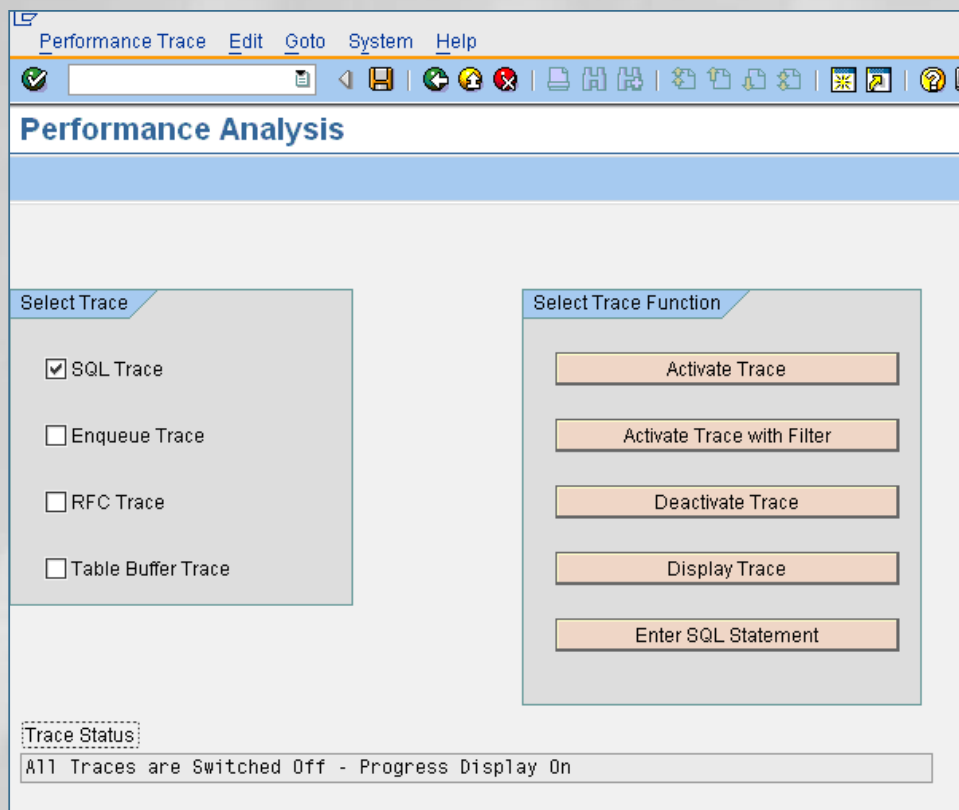


Figure 7: Performance Analysis – Turn Off / Display Trace

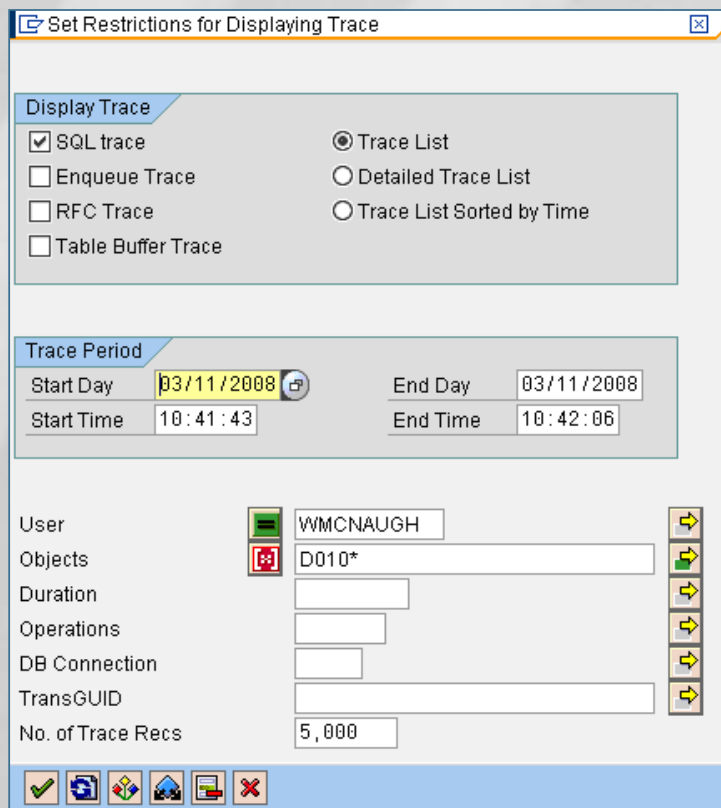


Figure 8: Set Restrictions for Displaying Trace

Transaction START_REPORT		Work process no 0		Proc. Type DIA	Client 300	User WMCNAUGH	TransGUID 47D47E8C8D536D4AE1000000AC19CEDE	Date 03/11/2008
Duration	Obj. name	Op.	Recs.	RC	Statement			
8	INDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "RELID" = 'RT' AND "SRTFD" = 'START_REPORT_WMCNAUGH' AND "SRTF2" >= 0 ORDER			
407	INDX	FETCH	1	1403				
359	INDX	REEEXEC	1	0	UPDATE SET "LOEKZ" = ' ', "SPERR" = ' ', "AEDAT" = 00000000, "USERA" = ' ', "PGMID" = ' ', "BEGDT" = 000			
143	INDX	REEEXEC	0	0	DELETE WHERE "MANDT" = '300' AND "RELID" = 'RT' AND "SRTFD" = 'START_REPORT_WMCNAUGH' AND "SRTF2" = 1			
5	T003J	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "RGJNR" = '1SIP'			
224	T003J	FETCH	1	0				
5	AVERS	REOPEN		0	SELECT FROM "AVERS" ORDER BY "ADDONID", "ADDONRL"			
489	AVERS	FETCH	28	1403				
5	PAT03	REOPEN		0	SELECT FROM "PAT03"			
1,045	PAT03	FETCH	101	0				
1,636	PAT03	FETCH	101	0				
1,166	PAT03	FETCH	65	1403				
4	TRDIR	REOPEN		0	SELECT WHERE "NAME" = '6P4QLQKH46VZJ3P1A40A2353HJ6300'			
223	TRDIR	FETCH	1	0				
5	TRDIR	REOPEN		0	SELECT WHERE "NAME" = '6P4UV6V51DMR0FZDN8FLH56ORV0300'			
170	TRDIR	FETCH	1	0				
5	TRDIR	REOPEN		0	SELECT WHERE "NAME" = '6P4VZX0GZ204R44JTSN9002F05300'			
171	TRDIR	FETCH	1	0				
5	TRDIR	REOPEN		0	SELECT WHERE "NAME" = '6P4SQ6PT260D9RU7607XRMHF4P8300'			
170	TRDIR	FETCH	1	0				
5	REPPINDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "APPLID" = '6-1'			
234	REPPINDX	FETCH	2	1403				
5	REPPINDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "APPLID" = '6'			
277	REPPINDX	FETCH	8	1403				
5	REPPINDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "APPLID" = 'COOM'			
438	REPPINDX	FETCH	22	1403				
5	TRDIR	REOPEN		0	SELECT WHERE "NAME" = '6P4QLQKH46VZJ3P1A40A2353HJ6300'			
175	TRDIR	FETCH	1	0				
5	GRRT	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "RELID" = 'GL' AND "RGJNR" = '1SIP' AND "VERSN" = 00000001 AND "TYPE" = 'JT'			
832	GRRT	FETCH	5	1403				
7	TPRI_DEF	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "RELID" = 'UF' AND "BNAME" = '21WMCNAUGH' AND "SRTF2" >= 0 ORDER BY "MANDT"			
234	TPRI_DEF	FETCH	0	1403				
5	TPRI_DEF	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "RELID" = 'GF' AND "BNAME" = '21' AND "SRTF2" >= 0 ORDER BY "MANDT", "RELID"			
433	TPRI_DEF	FETCH	0	1403				

Figure 9: Performance Trace Overview

Select the Enter icon to display the trace shown in Figure 9.

The trace displays the table or structure name in the Obj. name column, and the selection parameters in the Statement column. Usually, the first couple pages are the processed selection parameters. Page down to display the tables, as shown in Figure 10.

Find the Report Table

The transaction SE11 - ABAP Dictionary, may be used to investigate the tables used by the report. As an example, we can investigate table COSP to determine if it contains the data needed for the design specification. By

Transaction START_REPORT		Work process no 0		Proc. Type DIA	Client 300	User WMCNAUGH	TransGUID 47
Duration	Obj. name	Op.	Recs.	RC	Statement		
5	ONRKL	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "OBJNR" >= 'KL100000001000		
147	ONRKL	FETCH	0	1403			
6	COSP	REOPEN		0	SELECT WHERE "GJAHR" = 2007 AND "LEDNR" = '00' AND "OBJNR"		
5,353	COSP	FETCH	237	1403			
5	REPPINDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "APPLID" = '6-I'		
229	REPPINDX	FETCH	2	1403			
5	REPPINDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "APPLID" = '6'		
270	REPPINDX	FETCH	8	1403			
5	REPPINDX	REOPEN		0	SELECT WHERE "MANDT" = '300' AND "APPLID" = 'COOM'		
434	REPPINDX	FETCH	22	1403			
6	COSS	REOPEN		0	SELECT WHERE "GJAHR" = 2007 AND "LEDNR" = '00' AND "OBJNR"		
487	COSS	FETCH	5	1403			
5	COSPP	REOPEN		0	SELECT WHERE "GJAHR" = 2007 AND "OBJNR" = 'KS100000001000001		
210	COSPP	FETCH	0	1403			
5	COSSP	REOPEN		0	SELECT WHERE "GJAHR" = 2007 AND "OBJNR" = 'KS100000001000001		
200	COSSP	FETCH	0	1403			
5	COSL	REOPEN		0	SELECT WHERE "GJAHR" = 2007 AND "LEDNR" = '00' AND "OBJNR"		
198	COSL	FETCH	0	1403			

Figure 10: Performance Trace Overview

starting a new session and executing SE11, you will display the screen shown in Figure 11.

Investigating the tables via SE11 is an iterative process and a great opportunity to learn the tables in your module.

Note: As you figure out the data in the table and its purpose, it's a good idea to document your findings in a Word document. It may be handy for your next development effort (or 6 months later when you have forgotten your discoveries).

Display Table Fields

Select the Execute icon to display the fields contained in the table, as shown in Figure 12.

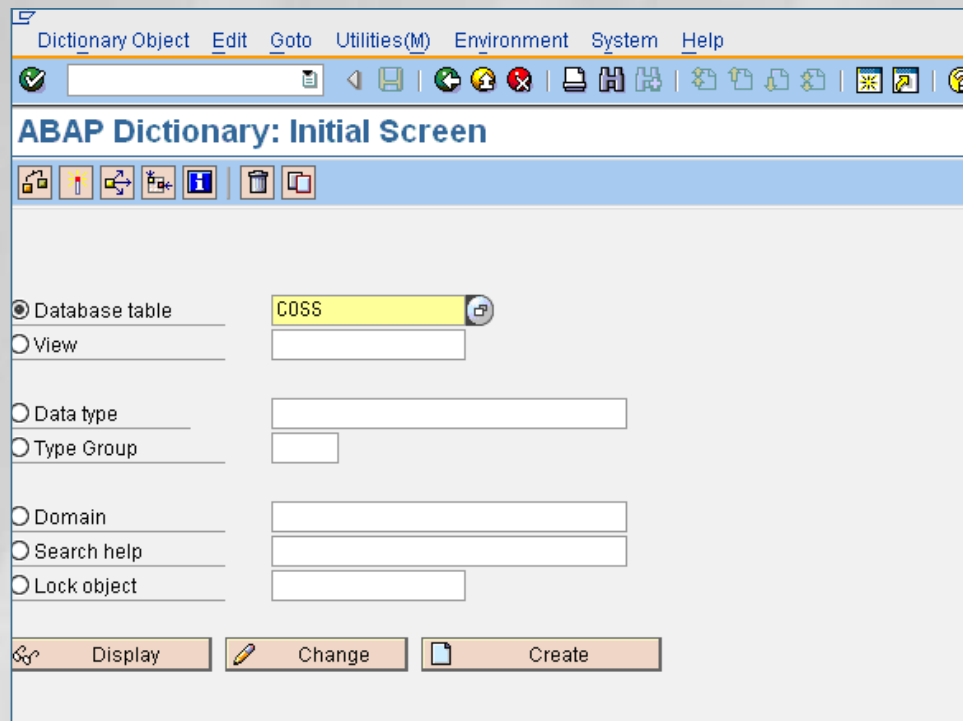



Figure 11: ABAP Dictionary

Field	Key	Indi	Data element	Data Ty	Length	Decim	Short Description
MANDT	✓	✓	MANDT	CLNT	3		0 Client
LEONR	✓	✓	LEONR	CHAR	2		0 Ledger for Controlling objects
OBJNR	✓	✓	J OBJNR	CHAR	22		0 Object number
GJAHR	✓	✓	GJAHR	NUMC	4		0 Fiscal Year
WRTP	✓	✓	CO-WRTP	CHAR	2		0 Value Type
VERSN	✓	✓	VERSN	CHAR	3		0 Version
KSTAR	✓	✓	KSTAR	CHAR	10		0 Cost Element
HRHFT	✓	✓	CO-SUBKEY	CHAR	14		0 CO key subnumber
VORG	✓	✓	CO-VORGANG	CHAR	4		0 CO Business Transaction
PAROB	✓	✓	PAROB	CHAR	22		0 Partner Object
USPOB	✓	✓	USPOB	CHAR	22		0 Source Object (Cost Center/Activity Type)
BEKNZ	✓	✓	BEKNZ	CHAR	1		0 Debit/Credit indicator
TWAER	✓	✓	TWAER	CUKY	5		0 Transaction Currency
PERBL	✓	✓	PERBL	NUMC	3		0 Period block
MEINH	✓	✓	CO-MEINH	UNIT	3		0 Unit of Measure
WTG001	✓	✓	WTGXXX	CURR	15		2 Total Value in Transaction Currency

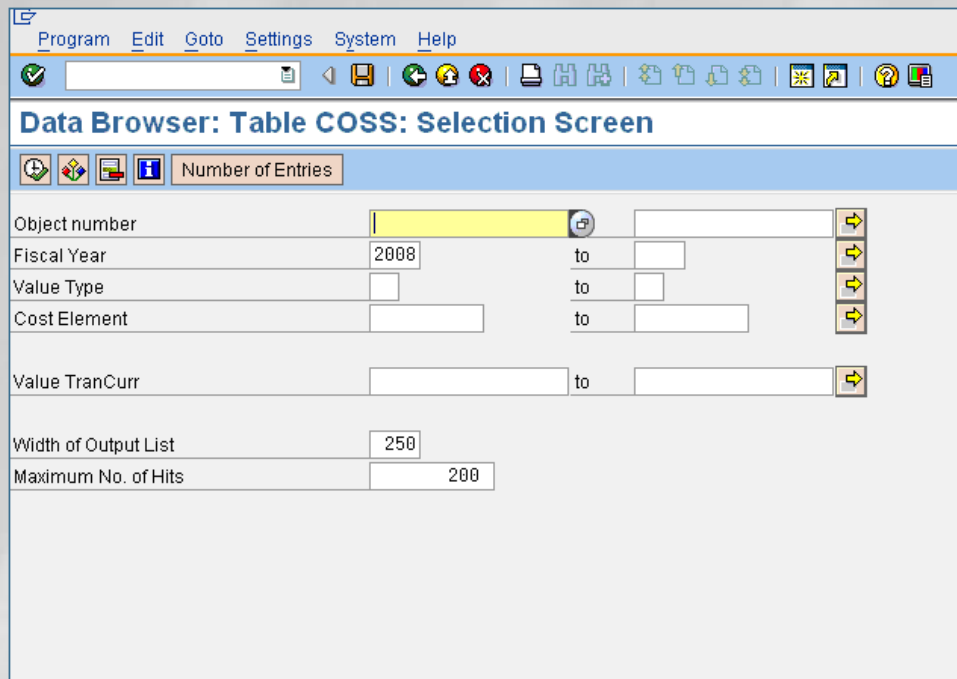
Figure 12: Dictionary: Display Table

Once you have found a table and would like to investigate the data to determine if it can be used for the design specification, it's a good idea to display the data in the table to ensure it is what you expected. To display the data contained in the table, select the  icon to display the screen shown in Figure 13.

Fill in the selection parameters to filter the data contained in the file. Results appear in Figure 14.

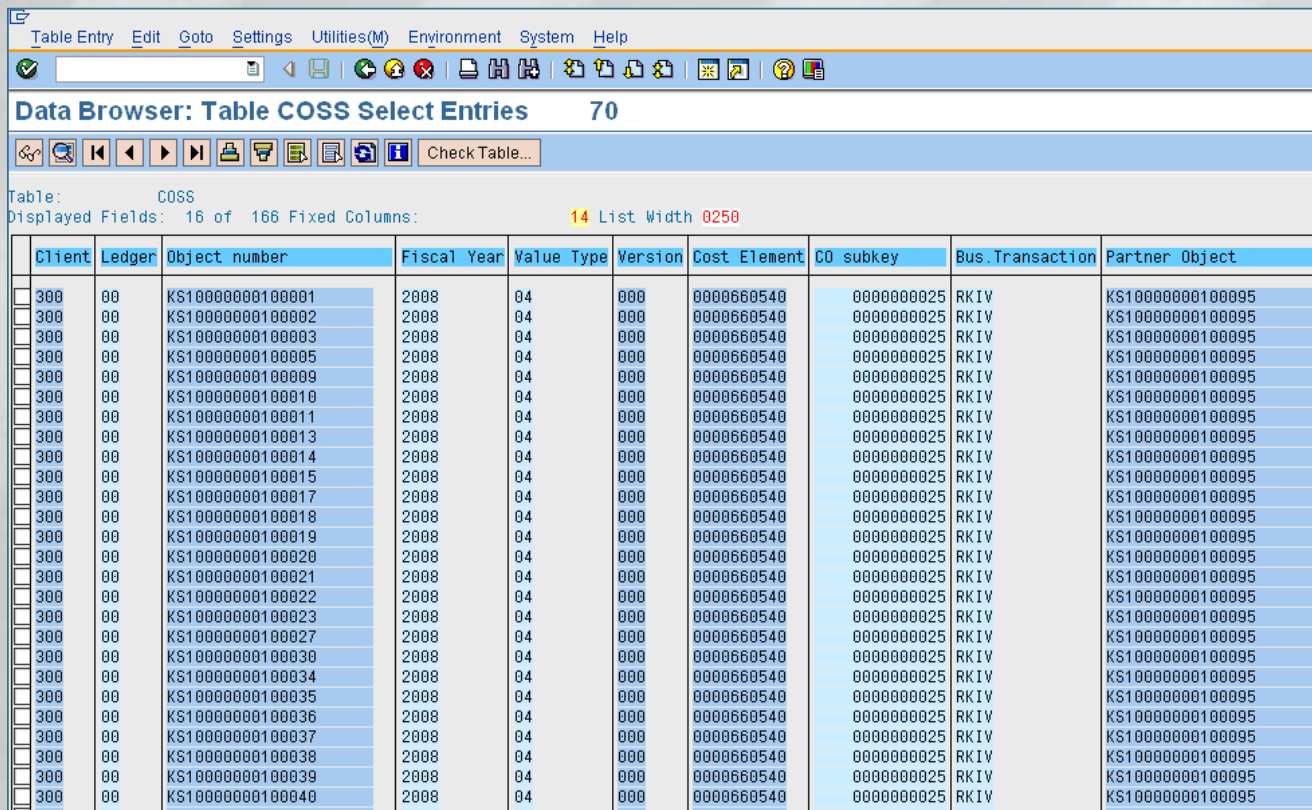
Validate the Field Results

After you identify the table and display the data, it is a good idea to validate.



The screenshot shows the 'Data Browser: Table COSS: Selection Screen' in SAP. It includes a menu bar (Program, Edit, Goto, Settings, System, Help) and a toolbar. The main area contains several input fields for selection criteria: Object number, Fiscal Year (set to 2008), Value Type, Cost Element, Value TranCurr, Width of Output List (set to 250), and Maximum No. of Hits (set to 200). There are also icons for various functions like search, print, and help.

Figure 13: Data Browser



The screenshot shows the 'Data Browser: Table COSS Select Entries' screen. It displays a table with 10 columns: Client, Ledger, Object number, Fiscal Year, Value Type, Version, Cost Element, CO subkey, Bus.Transaction, and Partner Object. The table contains 40 rows of data, all with Client 300 and Ledger 00. The Object number ranges from KS10000000100001 to KS10000000100040. The Fiscal Year is 2008, Value Type is 04, Version is 000, Cost Element is 0000660540, CO subkey is 000000025, Bus.Transaction is RKIV, and Partner Object is KS10000000100095.

Client	Ledger	Object number	Fiscal Year	Value Type	Version	Cost Element	CO subkey	Bus.Transaction	Partner Object
300	00	KS10000000100001	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100002	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100003	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100005	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100009	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100010	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100011	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100013	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100014	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100015	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100017	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100018	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100019	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100020	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100021	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100022	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100023	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100027	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100030	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100034	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100035	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100036	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100037	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100038	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100039	2008	04	000	0000660540	000000025	RKIV	KS10000000100095
300	00	KS10000000100040	2008	04	000	0000660540	000000025	RKIV	KS10000000100095

Figure 14: Data Browser

Typically, you tie the data (provided in Figure 14) to a standard report such as cost center report S_ALR_87013611. For example, double click the first line of the file to show the detail (Figure 15).

Here, we gather the details necessary to execute the standard SAP cost center report S_ALR_87013611. The cost center report is used to validate that the data on the table COSS is in fact what we need to include in the development specification.

The field object number contains KS for the cost center, the next four characters are the Controlling Area (1000), and the remaining characters represent the following:

- Cost Center 100001
- Fiscal Year 2008
- Value Type 4 (regarding actual postings)
- Version 0 (Contains the actual postings and plan values)
- Cost Element 660540

There are other fields displayed, but we only need WTG001 2642.53 for the cost center report. Note that fields WTG001 through WTG016 represent January through December, and WTG013 through WTG016 represent the special periods that may be used for year-end processing.

Show the Parameters

To pull up the Parameters screen shown in Figure 16, start a new session and execute transaction code S_ALR_87013611.

Based on the fields defined in Figure 15, we can populate the parameters on the cost center report

Client	300
Ledger	0
Object number	KS10000000100001
Fiscal Year	2008
Value Type	4
Version	0
Cost Element	660540
CO subkey	0000000025
Bus.Transaction	RKIV
Partner Object	KS10000000100095
Source Object	KS10000000100001
Dr/Cr indicator	C
Trans. Currency	USD
Period block	16
Unit of Measure	
Value TranCurr	(WTG001) 2,642.53
Value TranCurr	(WTG002) 0.00
Value TranCurr	(WTG003) 0.00
Value TranCurr	(WTG004) 0.00
Value TranCurr	(WTG005) 0.00
Value TranCurr	(WTG006) 0.00
Value TranCurr	(WTG007) 0.00

Figure 15: Table COSS Display

Selection values	
Controlling Area	1000
Fiscal Year	2008
From Period	1
To Period	1
Plan Version	0
Selection groups	
Cost Center Group	
Or value(s)	100001
Cost Element Group	
Or value(s)	660540

Figure 16: Cost Centers: Actual/Plan/Variance: Selection

S_ALR_87013611 to ensure the data in the tables reflects the data provided through standard reporting. This will ensure the data used in the design specification is accurate and reflects what is shown in standard reporting:

- KS, which identifies the posting as occurring on a cost center so we use a cost center report
- Controlling area = 1000
- Fiscal Year 2008

- From – To Periods = Set to 1, from the posting in field WTG001, which represents January

- Plan Version = 0

- Cost Center = 100001

- Cost Element = 660540

Select the Execute icon to display the screen shown in Figure 17.

Based on the selection parameters entered, we now see a value of 2642.53, which ties to the value in table COSS (see Figure 15).

In performing the previous steps, we identified the tables in which SAP stores the postings on a cost center report. This technique should be applied in custom development where data is needed across several modules (FI, MM, PP, and SD) or where the standard tools (such as Query and Report Painter) do not provide the data or format required.

Conclusion

Once you evaluate the development request, and determine that standard reporting and other tools (such as report painter and query) will not to meet the development requirements, you may want to suggest using a combination of reports, report painter, and query before beginning the custom development techniques offered in this article. However when these options do not meet your clients expectations, use the Performance Analysis tool to determine the tables and fields necessary for

Report Edit Goto View Extras Settings System Help

Cost Centers: Actual/Plan/Variance

Cost Centers: Actual/Plan/Variance

Date: 03/19/2008

Page: 2 / 2

Cost Center/Group

100001

DC SAN DIEGO

Person responsible:

MANAGER

Reporting period:

1 to 1 2008

Column: 1 / 2

Cost Elements	Act. Costs	Plan Costs	Var. (Abs.)	Var. (%)
660540 Serv Chgrs Collecti	2,642.53		2,642.53	
* Debit	2,642.53		2,642.53	
** Over/Underabsorption	2,642.53		2,642.53	

Figure 17: Cost Centers: Actual/Plan/Variance

creating a development specification. In addition to the data identified by Performance Analysis, the development request will also require logic and formatting. However, once the data is identified, these tasks are relatively simple.

Utilizing the approach offered in this article will ensure that you employ standard SAP reports whenever possible to eliminate development costs completely. When the Performance Analysis approach is used you will also save development costs through details provided in the tables and fields documented in the functional specification.

William McNaughten of Enterprise Resource Corporation is an independent consultant with 12 years experience in SAP implementation. He specializes in all aspects of the Controlling module. You may contact the author at SAPtips.Authors@ERPtips.com. Be sure to mention the author's name and/or the article title.

DO You Have What It Takes to Be a CIO?

By John A. Zarb

Editor's Note: Are you ready for the C-level?

Sure, you've got a great resume and you know you can lead.

But do you have the heart to be a Chief Information Officer?

John Zarb has over 38-years experience in IT; 12 of that he's spent as a CIO. As he'll tell you—there is a very good reason they pay you the “big bucks”. Whether you're a director who's the “heir apparent” to the current CIO, or you're at the bottom or mid-rung of the corporate ladder, hoping to climb your way to the top, you'll want to read John's assessment on the leadership skills and other considerations you'll need to take into account before you say, “I want that job. Sign me up.”



Three Jobs in One

What I've learned in the 12 years of being a CIO is that it is not one job, but three jobs – three very different jobs, each with its own criteria for success. And it isn't enough to be good in one or two of the jobs either; you must be excellent at all three. This requirement, incidentally, is the same as for a COO, CEO, or any other

“C” level executive – it is, by nature of the level this position holds in the company, expected.

Let's first talk over what a CIO does and what you will be expected to provide to the many constituents whom you will serve.

C –

The first of the three jobs you are asking for is to be the CHIEF. Have you given this enough thought? What is the difference between the chief versus a supervisor or manager or director? It is huge, my friend! Being the chief, not “a” chief, but “the” chief, means that you are the person ultimately accountable and responsible for all matters that relate to, or even remotely relate to, the topic of IT at your company. As in a tribal culture, there is but one chief and that person has earned the title through continual successes and growth through failures. The chief uses instincts as much, or more, than science. Much like the second baseman who flawlessly grabs and throws the ball to first base without so much as thinking about the throw, the chief must trust his or her instincts on matters from people to programs to projects to processes and beyond. To have to revert to formulas may mean that you are not ready for this awesome role within a company. For those who rise to the role from within an organization, the trust factor is often more established and deserved. For those who “come in from the outside”, you best have your padding on as you will regularly have your motives and abili-

You've been in IT for many years. You have progressively been promoted and you are considered one of the best to have ever worked in the department. You have earned the right to be called the “go to” person as over-and-over again you have bailed out the boat. You possess skills beyond Java and are well liked by the teams you lead. You have an impressive resume with a smart mix of education along with your experience and even hold several technical and business certifications. The current CIO has just submitted a resignation and you are thinking of submitting your name as a viable candidate. So, you want to be a CIO!

I am a CIO. I became one in June 1995 and have been one ever since. I wanted to be one from the time I started in our trade 38 years ago – I never wanted any other job. In my early years, I had no concept of what the top job would be like, but I imagined that it was the “end-game” for me when I landed in this field as unexpectedly as so many others who today are IT professionals. The path was unplanned, included several lateral or “U” turns, but it's always been an enjoyable challenge.

ties questioned – but the chief cannot waste any time on self-doubt. The chief of one function must be able to work with the chiefs of other functions, whether that be as peers (finance, production, sales, human resources, etc.) as well as your boss (CEO). To do this requires an amazing blend of confidence and balance. Heroes are not welcome. Non-communicators are not welcome. Straight technologists are not welcome. Single-skilled people are not welcome. Quitters are not welcome. Overt risk-takers or risk-adverse types are not welcome.

Chiefs are tasked with many important responsibilities, not the least of which is unencumbered delegation – this is the hardest trait to find. But beyond being able to delegate, the chief needs to engage responsible people to whom to delegate the work – another difficult task. Sometimes you grow up with the team and this is in place for you. Most of the time, you inherit a team and need to quickly determine if they are the people you can trust enough to consistently achieve yours and the company's goals. The last point requires human skills beyond what 85% of the candidates for "chief" jobs bring to the interview. Those naps during H.R. sessions have proven a bad idea given the importance of knowing how to motivate, coach, and mentor – so few manager or director level people master these skills. Are you the type of person whom \$180,000 per year directors are going to follow on the first day of your new appointment? You better be!

***Are you the type of person whom
\$180,000 per year directors are
going to follow on the first day
of your new appointment?
You better be!***

I –
Information is a company asset. It is much like natural gas – you can't usually see it nor can you smell it (at least most of the time you can't) – but it is all around you. This is the clay we mold in our profession and it is often the least understood element of the job. Information surrounds a company today and it is your job to determine the value of each bit and byte of this valuable asset. Whether we are talking about transactions or records or files or databases, information requires meticulous examination relative to longevity, security, and eventually usability. Where is it needed? When is

it needed? Why is it needed? Who needs it? What is its value independently? What is its value when coupled with other information? What is its source and is this source consistently credible? How do you educate workers as to the value of the information that circulates our company? Do you have a grip on external information as much (or more) than you do on internal information? How much do you know about industry information? Customer information? Competitive information? If data=information=knowledge, are you managing all three of these layers appropriately? Are you capable of mastering the information that surrounds your business each minute of each day? Your competition is doing so. Oh, almost forgot; you need to know technology inside and out, today's and tomorrow's – this is what most CIO candidates are best at and, frankly, it is not the most critical of the skills you'll need to be successful (you can buy this!). But, on the other hand, you must know enough not to be fooled!

O –
Be careful what you ask for here. Being a company Officer is different than being a manager or a director or a vice-president. Much like in the military, there is a very precise difference in being an officer and being a worker. You have fiduciary responsibilities. You are, effectively, an OWNER of the business and must consistently think like an owner, like a lawyer, like a banker, like a minister, like a tax accountant, and like an accountant and an auditor too! You have to understand what the owners are thinking now and tomorrow. Oh, and you have to know who the owners are! Public companies have hundreds, maybe thousands, and as an Officer, they are your bosses, too. Private companies may have one owner, or a family; they too are your bosses – and you better know what they are thinking, whether they are a Venture Capital company or Warren Buffet – their agenda is your agenda. If you have never read proxy statements or 8Ks or other SEC reports, you better start doing so – your D&O insurance policy (Directors and Officers) may not cover you on all exposures. If you are timid about having personal information publicized, turn back now, because public companies must disclose information, such as age, salary, perk information, and much more on the highest compensated employees, which generally includes most officers. You also better be ready to talk the universal language – "business" – in board meetings, officer meetings, and shareholder meetings. Are you ready to answer this question from a board member at dinner tonight: "If we can build our product more cheaply in Portugal, why do we want to continue operating our plant in Cleveland?" Incidentally, "This doesn't have anything to do with IT" is not

an appropriate answer – you’re a company officer and it is expected that you are thinking of the business in a holistic way – every day. And yes, you must run an excellent IT shop, too!

Being a CIO is a privilege, an honor - it is leading the youngest function at the company.

We have not even scratched the surface in describing the three jobs that you are contemplating. Suffice it to say that there is neither college curriculum nor any executive class that is going to “fill in all the blanks”. Instead, you are going to have to have the technical, managerial, intuitional, and gut instinct skills that will allow you, ON DAY #1, to deliver as a Chief, as an Information Manager, and as an Officer of the firm. So, if somebody taunts you someday with CIO meaning “Career Is Over”, tell that person to go fly a kite; it is far from over. Being a CIO is a privilege, an honor – it is leading the youngest function at the company. It is going against the grain that most functions have been traveling for years – it is doing precision work at super-sonic speeds. It is the “company change agent” position but with a different title.

Summary

Lastly, I’d like to share a thought with you, albeit cheesy, just in case you decide to go ahead and submit that resume: in addition to being in our trade for 38 years, I also have been married to the same partner for practically the same time period. In some ways, there is a similarity between these parallel journeys. When I met the gal who would become my wife, my heart went pitter-patter from the first moment; and that still happens today. When I walked into the computer center at Fort MacArthur, California in September 1969 and saw the row of punch-card equipment along with the newly acquired UNIVAC 1005 electronic accounting machine, my heart also went pitter-patter. Today I have the privilege of teaching IT classes at the University of Toledo, and when I see a student enjoying and learning from the lecture, again, my heart goes pitter-patter. If you don’t feel this, you might want to pass on the prospect. You see, you can be the best chief in the tribe, the most knowledgeable Information manager around, and even the best prospective Officer around, but in the end, you have to love the gears that turn when we do our magic as the CIO.

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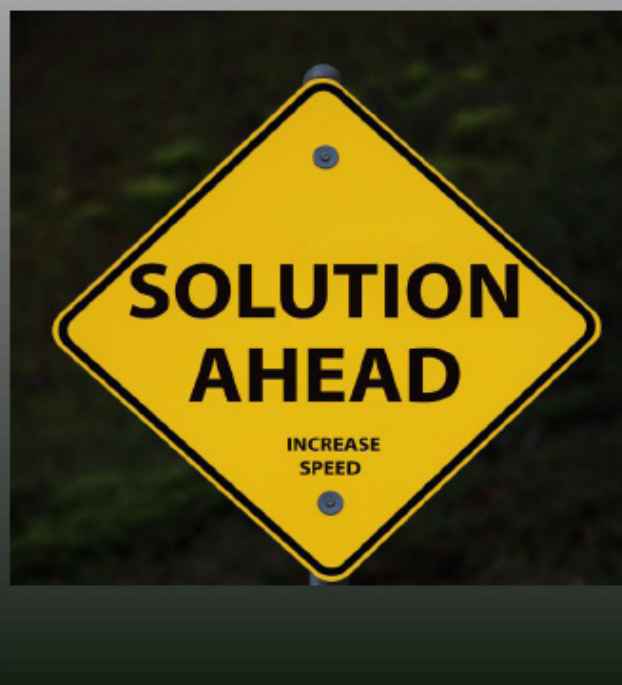
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