THE BEST-RUN E-BUSINESSES RUN SAP

Manage Production Planning in SAP APO (3.x) / mySAP SCM (4.x)

Best Practice for Solution Management

Version Date: May 2004

This version is valid for SAP APO 3.0, 3.1 and mySAP SCM 4.0, 4.1

The newest version of this Best Practice can always be obtained through the SAP Solution Manager

Contents

Applicability, Goals, and Requirements

To ensure that this Best Practice is the one you need, consider the following goals and requirements.

Goal of Using this Service

This Best Practice enables you to set up a business process management and monitoring concept for the business process **Production Planning and Detailed Scheduling (PP/DS),** which is part of the mySAP **Supply Chain Management (SCM)** solution using **SAP R/3** and the SAP **Advanced Planning and Optimization (APO)**.

This business-process management and monitoring concept aims to:

- Define procedures for business process oriented monitoring, error handling, and escalation management for *Production Planning and Detailed Scheduling*
- Define the roles and responsibilities for all persons involved in the customer's support and monitoring organization with respect to *Production Planning and Detailed Scheduling*

These procedures ensure the smooth and reliable flow of the core business process in order to meet your business requirements.

Alternative Practices

You can get SAP experts to deliver this Best Practice onsite if you order the Solution Management Optimization (SMO) service SAP Business Process Management.

Staff and Skills Requirements

To implement this Best Practice, you require the following teams:

Application Management Team

The SCM / APO business process management concept (which this Best Practice aims to produce) should be created by the application management team. This team combines experts from your company:

- ❑ Business department
- ❑ Solution support organization (for example, the IT department and the Help Desk)
- ❑ Implementation project team

Execution Teams

The execution teams are the following groups, which are taken together form the customer's Solution Support Organization:

- ❑ The business process champion for each business process
- ❑ Application support
- ❑ Development support
- ❑ Program scheduling management
- ❑ Software monitoring team
- ❑ System monitoring team

More information about roles and responsibilities of these teams can be found in the superordinated Best Practice *General Business Process Management*, which you can obtain through the SAP Solution Manager.

Necessary or Useful Training Courses:

- ADM355 APO System Administration
- SCM210 Core Interface APO
- SCM240 Production Planning Part 1
- SCM242 Production Planning Part 2 (APO-PP/DS)
- SCM244 Production Planning Part 2 (R/3- MRP)

System Requirements

This document applies to mySAP APO releases 3.0A and 3.1 and to mySAP SCM release 4.0.

Duration and Timing

Duration

Creating a business process management concept can take around one week per business process.

Implementing the business process management concept can take around one additional week.

Timing

The best time to apply this Best Practice is during the planning phase or during the implementation phase for your mySAP solution.

How to Use this Best Practice

In advance, read the whole document to get an overview about its structure, contents, and details.

Determine your APO PP/DS core business process to be monitored. If you use the APO Core Interface (CIF) within this process, also get the respective Best Practice document dedicated to CIF. Record all relevant steps of your core business process; use the example business process as template. Exclude template process steps that you do not perform.

For every process step, take the monitoring elements from the tables and insert them into your own template. Complete the information according to your specific requirements, e.g. frequency and time of monitoring activity. If the process step includes CIF data transfer, add the information from the CIF document, section Operation and Monitoring of the APO CIF.

Don’t forget to include the respective information for other interfaces than CIF and for business process steps performed with your own (Y-, Z-) programs. Determine the related monitoring activities, tools, and responsible teams and fill in the table accordingly.

For activities that are not directly related to a business process step, like those mentioned in section System Administration Related to the APO CIF in the CIF best practice, create a separate table.

Proceed in the same way with all your other core business processes and other activities you want to monitor.

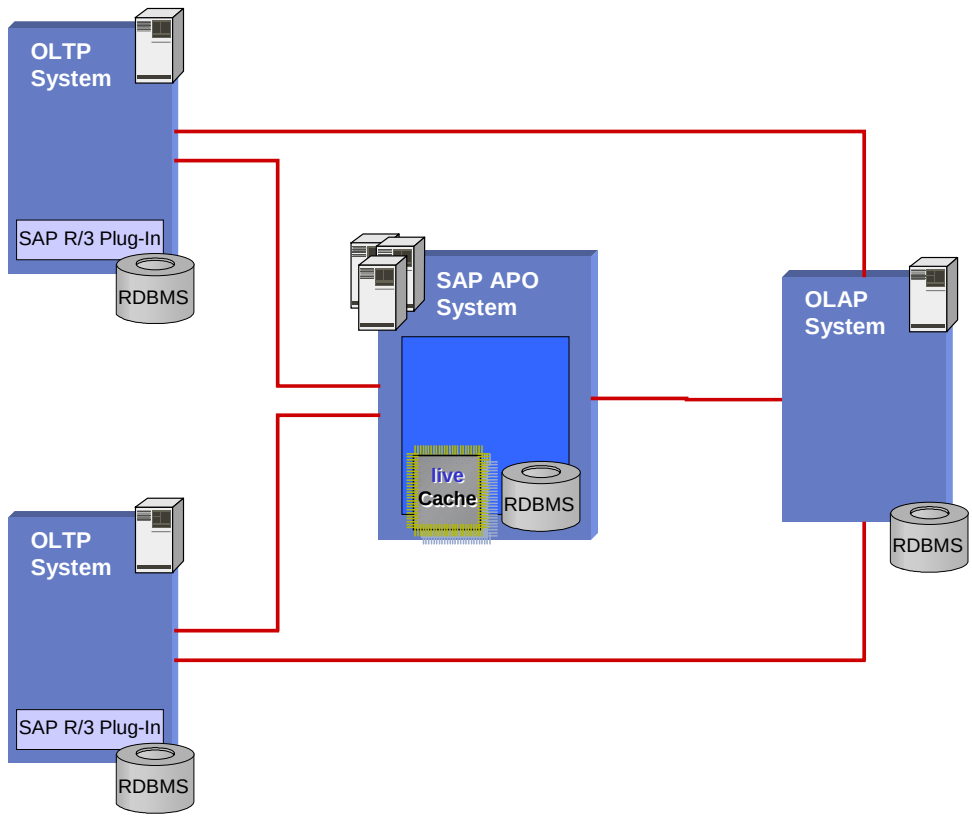
Best Practice Procedure and Verification

Preliminary Tasks

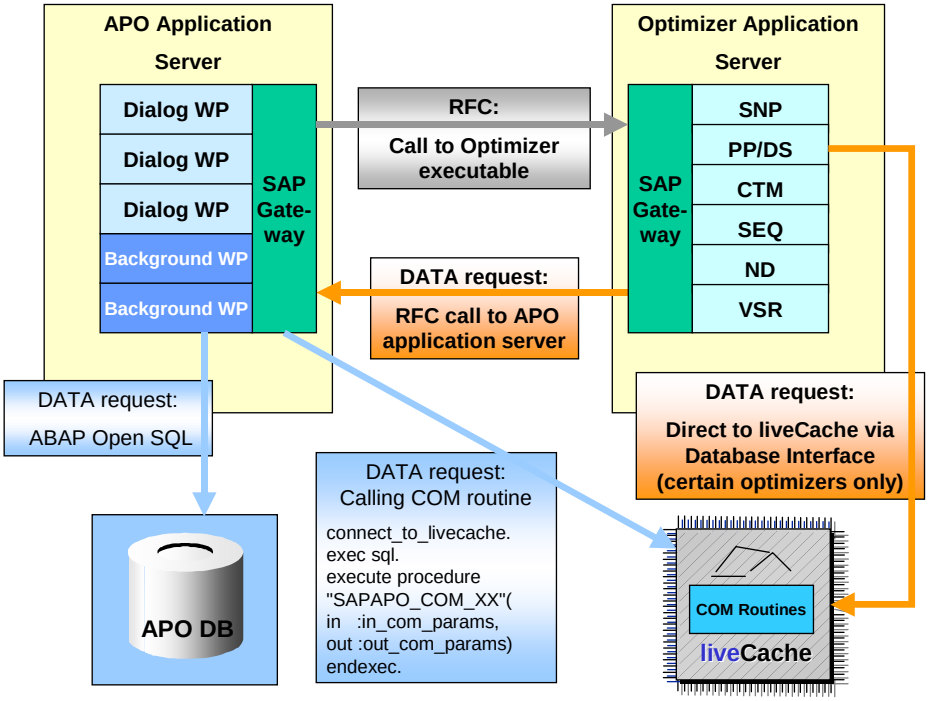
The SCM System Landscape

The substantial components of an SAP SCM system landscape are summarized in the following table and shown schematically in the subsequent illustration.

SAP APO System	The SAP Advanced Planning and Optimization system facilitates the strategic, tactical, and operational planning processes. APO consists of several software components: a relational database system (RDBMS) as in any R/3 system, known as the APO DB; a SAP Web AS (or up to APO 3.1 an R/3 Basis); the APO application programs; a separate, very fast object-oriented SAP DB database called liveCache; application programs running in liveCache – the COM routines; and a number of programs that execute elaborated optimization algorithms, called the optimization engines. These components can run on the same or on different servers.
OLTP System	The Online Transaction Processing system covers functionality for sales and distribution, material and inventory management, controlling, shop floor control, logistic execution, and so on.
OLAP System	An Online Analysis Processing system, such as SAP Business Information Warehouse (BW), provides cumulated historical data as a basis for future extrapolation purposes in APO Demand Planning.



The following diagram shows the relationship between APO application software components and the databases:



The various strategies for using R/3 and APO in combination are called integration scenarios.

This Best Practice is based on the most common integration scenario for setting up a mySAP Supply Chain Management solution using SAP APO. The SAP APO system is connected to one or more SAP R/3 OLTP systems via the APO Core Interface (CIF), which transfers all relevant data between them. The CIF uses queued remote function calls (qRFCs) to ensure the desired sequence and transactional security of data transmissions. For information about solution management for APO CIF, refer to the respective Best Practice document.

You may also use other OLTP systems than SAP R/3. These systems cannot use the CIF for a connection to the APO system, but SAP provides BAPIs (Business Application Programming Interfaces) for programming data supply between third party systems and APO. This scenario is not covered by the present Best Practice document.

SAP Advanced Planning and Optimization (APO) is the planning component of mySAP SCM, the Supply Chain Management solution provided by SAP. SAP APO is used to make strategic, tactical, and operational decisions and supports you in performing the following planning activities:

- Demand Planning (DP)
- Supply Network Planning (SNP)
- Production Planning (PP)
- Detailed Scheduling (DS)
- Deployment
- Transport Load Builder (TLB)
- Transport Planning and Vehicle Scheduling (TP/VS)
- Global Available-to-Promise (gATP)

SAP APO is primarily a planning tool, although some industry-specific execution functions are available (such as production backflush for repetitive manufacturing).
In standard business scenarios, execution functions, such as confirmations, goods receipt, purchasing, and so on are performed in the SAP R/3 OLTP system, which contains all functionality for

(among many others) Material Management MM, Sales and Distribution SD, Production Order Processing PP-SFC, Process Order processing PP-PI, Logistics Execution LES, Controlling CO.

The online transaction processing (OLTP) system – provided by SAP R/3 – also provides relevant planning data (master data and transaction data) for the APO system. Products are planned in the APO system, and the planning results are transferred back to the OLTP system. If necessary, the planning can be completed in the OLTP system, for example, if not all components of a BOM structure are planned in the APO system. If necessary, these planning results completed in SAP R/3 can then be transferred back to the SAP APO system.

In general, we recommend that you plan critical products and critical components in APO and non-critical products and components in the OLTP system. However, if you plan a component in APO, you also must plan all components in the BOM structure up to the BOM header product in APO. Conversely, if you plan a component in the OLTP system, you also must plan all subcomponents in the OLTP system.

The APO component *Production Planning and Detailed Scheduling* (PP/DS) enables you to plan multi-site production while taking product and capacity constraints into account with the goal of reducing lead times and increasing due date performance. PP/DS is designed to plan critical products, for example, products with long replenishment lead times or products that are produced with bottleneck resources.

Additional information can be found in the SAP Documentation.

Production Planning and Detailed Scheduling

The core business process you run in your company for planning your production, though it is also based on the mySAP SCM solution, may differ in various ways from the canonical process described here and illustrated on the next page.

Planned independent requirements are created either in SAP R/3 Demand Management (and transferred to the APO system) or in the APO Demand Planning component. Additional independent requirements resulting from sales orders entered in the R/3 OLTP system are transferred to the APO system, where planned orders are created in a production planning run to cover the requirements. Planned orders are also created within SAP R/3, triggering the replenishment process for those materials that are not planned within APO. The order numbers given to the R/3 planned orders are retransferred to the APO system. Planning is refined and supplemented manually by interactive planning, for example, on the Detailed Scheduling Planning Board. Here you can perform functions such as schedule sequence and setup time optimization.

Subsequently, the planned orders are converted into production orders and transferred to SAP R/3, where the respective order conversion occurs automatically. The production execution process is performed within SAP R/3, and all necessary information is transferred to the APO system to keep it consistent with the R/3 System.

Eventually, production orders are released, components withdrawn and their goods issue posted, and operations and orders are confirmed. The goods receipt for the produced goods is posted, and the production orders are settled. The corresponding APO object is deleted when the production order is closed. The goods issue posting of the goods shipped in accordance with the delivery document closes the planning cycle with the respective increase or decrease of supply and demand.

Normally, if the following settings for the Core Interface (CIF) are compliant with the implemented business process and functionality, they should be used to ensure a high-performance, smooth running APO system landscape:

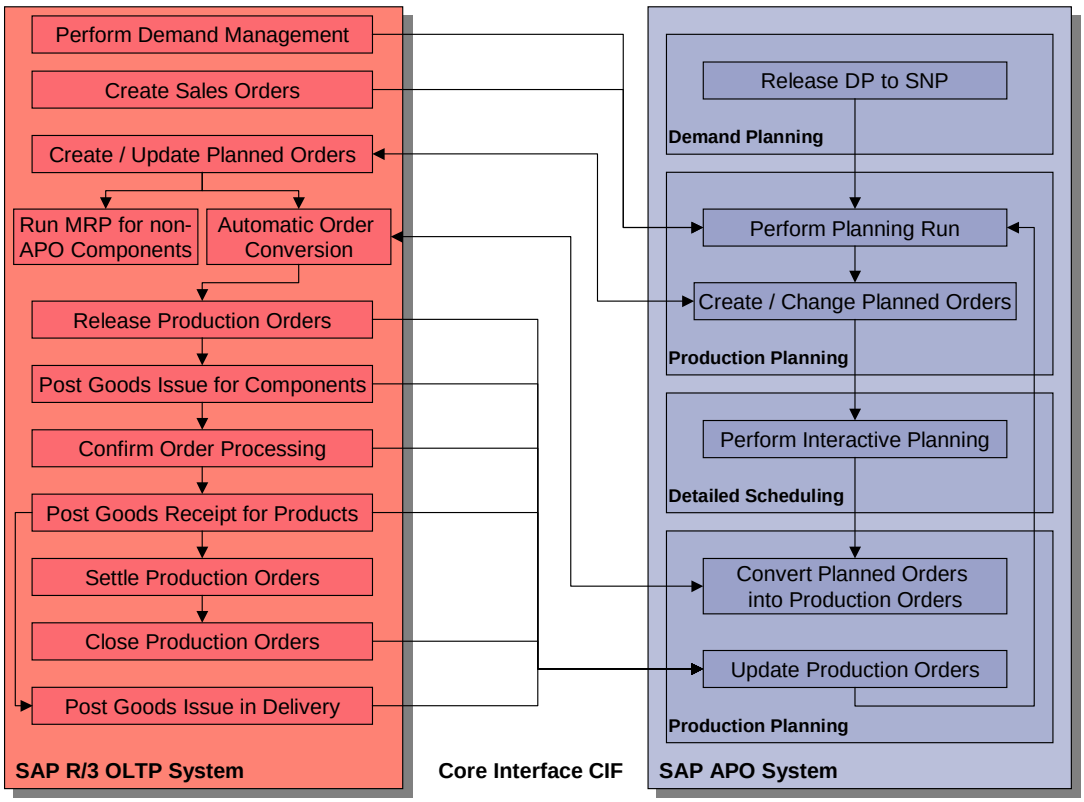
- Transfer changed master data (Material, Customer, and Vendor Masters) *periodically* via ALE change pointers, not immediately via Business Transaction Events (BTEs).
- Publish PP/DS planning results to R/3 *periodically*, not immediately.
- Set the PP/DS settings in the Product Master to *Manual Planning* or *Planning in Planning Run* (up to APO 3.0A called *Automatic Planning in the Planning Run*) but not to *Cover Dependent Requirements Immediately* (formerly *Automatic Planning Immediately).*

Important Note

As the CIF is an essential component of SAP APO and its business processes, its monitoring and administration is of critical importance for the performance and reliability of any business process that exchanges data between APO and the R/3 Systems connected to it.

Therefore, it is extremely important that you follow the business process management procedure described in the Best Practice document dedicated to CIF.

The following diagram shows all the business process steps whose monitoring is defined by this Best Practice.



Monitoring Procedure

In applying this Best Practice procedure, you create a company-specific process-oriented monitoring concept. This concept consists of monitoring activities to be performed for each **business process step** and its respective monitoring objects.

When adapting this concept for your company, you must specify the times, responsible teams, and escalation paths (teams) for the monitoring activities associated with each business process step and its monitoring objects.

In the following, under each business process step you will find the following information:

- A detailed functional description of the process step
- Monitoring activities for the process step
- Error handling, restartability, and escalation
- A monitoring object table, listing each relevant monitoring object, showing the:
  - Monitoring object
  - Monitoring transaction or tool
  - Monitoring frequency
  - Monitoring time (intentionally left blank, to be filled in according to your schedule)
  - Indicator or error

- Monitoring activity or error handling procedure
- Responsible team
- Escalation procedure

As the frequency of PP/DS planning processes may vary depending on your business, the monitoring frequency in these monitoring object tables is partly only a rough estimate and has to be adapted to your particular business process. During the GoingLive and stabilization phase of your APO implementation project, all items listed in this document should be monitored tightly. After getting more experienced with system behavior, error occurrences, and application operations, the monitoring frequency can be decreased, but should never be reduced to zero (unless you do not use the respective function at all). Important planning jobs usually have to be monitored after each run. Regular jobs of minor priority (e.g. certain clean-up jobs) can be checked whether or not they run as scheduled less frequently as they are supposed to run, e.g. daily jobs can be checked weekly.

The following seems obvious but should nevertheless be mentioned: Besides the monitoring of jobs described in the business process steps below, it is essential that you check all jobs that are running in your system at least several times per day for abnormal terminations (status “cancelled”, see Error Handling, Restartability and Escalation) and that you investigate and correct these terminations appropriately. This check can be done easily, for instance, with transaction SM37 by entering the time interval since the latest check and selecting all jobs with status “cancelled”. If you have no automatic notification in place that informs the people responsible for Program Scheduling Management in your Support Organization of abnormally terminated jobs, you need to take measures to ensure that this is done manually in a reliable and timely manner.

A number of jobs must run periodically in a live R/3 installation, for example, the jobs for deleting outdated jobs or spool objects. For details and comments, see SAP Note 16083.

Business Process Step 1: Release DP to SNP (APO)

Independent requirements can either be created in Demand Management in R/3 or in the APO component Demand Planning (DP).

If DP is used, independent requirements are created from the completed DP forecasts using the function “Release DP to SNP”. This function transforms the DP time series objects into order objects with a specified ATP category (in this case “FA” = independent requirements) stored in liveCache. SNP denotes Supply Network Planning. The name “Release DP to SNP” is a little misleading, since you may not be using SNP. You may equally be releasing DP to Production Planning.

This release function can be performed online with transaction /SAPAPO/MC90 or in the background by report /SAPAPO/TS_BATCH_RUN with planning activity “Release to SNP” using an appropriate release profile. The settings and background jobs needed need to be defined in the transactions /SAPAPO/MC8x.

Planned independent requirements can also be created manually in PP/DS transaction /SAPAPO/RRP1 “Requirements View”.

Monitoring Activities

Apart from safeguarding the general availability and consistency of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the following table in order to safeguard this business step.

Jobs for Running and Monitoring Release DP to SNP (APO)

To ensure a thorough and accurate release of forecasts to production planning, schedule the following job to run on a regular basis:

- **Demand Planning in the Background** with report /SAPAPO/TS_BATCH_RUN. As well as executing other DP planning functionality in the background, this report can release chosen DP forecasts to order objects, in this case planned independent requirements. This mass processing job is created with its necessary settings and scheduled using transactions /SAPAPO/MC8x.

To check the results of a DP mass-processing job, use the DP job log. To generate a job log, select *Generate log* when you create a job. To view the job log, call transaction /SAPAPO/MC8K. The job log

shows whether the job completed successfully (green traffic light), with warnings (yellow traffic light), or with errors (red traffic light), and includes a message for every characteristic value combination that was processed in the job, forecast error messages if the job included a forecast, and other details. Normally, a release of the forecasts to production planning is performed periodically at long intervals, such as once a quarter or once a year, but not daily or weekly. Set the frequency of monitoring and deleting the DP job logs depending on how often you run this function.

Error Handling, Restartability, and Escalation

See general issues of Error Handling, Restartability, and Escalation, below.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/TS_BATCH_RUN This report performs specified DP mass processing, in this case “Release DP to SNP”	SM37	Depending on your needs		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support
DP job log	/SAPAPO/MC8K	After each run of /SAPAPO/TS_BATCH_RUN.		Red or yellow traffic lights shown	According to the warning or error reported (see message long text)	Application support	Contact process champion
APO report /SAPAPO/TS_BATCH_LOGFILE This report deletes old DS job logs	SM37	Depending on your needs		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact software monitoring team

Business Process Step 2: Perform Demand Management (R/3)

Alternatively to using APO Demand Planning (business process step 1 above), you can perform demand management for make-to-stock production in the R/3 System. This can be performed manually (for example in transactions MC87, MC74), based on a forecast, or by means of different functions in Sales and Operations Planning (SOP).

As a result of performing demand management, planned independent requirements are created and transferred via the CIF into the production planning application of the APO system. Therefore, planned independent requirements must be added to an active CIF integration model.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects related to the Core Interface (CIF) in order to safeguard this business process step.

It is extremely important that you follow the business process management procedure described in the Best Practice document dedicated to CIF.

Business Process Step 3: Create Sales Orders (R/3)

As further independent requirements, sales orders (created with VA01) are transferred to the APO System both to perform planning for make-to-order production and to increase or consume planned independent requirements. This step is independent of whether you take planned independent requirements from R/3 or from APO Demand Planning (DP).

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 4: Perform Planning Run (APO)

The *planned independent requirements* are the starting point for production planning in APO. Existing storage location stocks are also considered in the planning. Whether or not automatic planning applies for a certain product-location can be set in the PP/DS tab of the product master. Products can be planned immediately or in a planning run.

The standard setting that should be used for most scenarios is *"planning in planning run"* (up to APO 3.0A called *automatic planning in planning run*) to plan products using heuristics that you have defined for each product. You can use your own heuristics or you can use heuristics provided by SAP. A large variety of heuristics are available to plan products that address particular planning problems, including various lot-sizing heuristics and purchase order quantity optimization.

When "*planning in planning run"* is selected as planning procedure for a product-location, a planning file entry is created every time a planning-relevant event occurs (e.g. change of requirements or stock). These products are then planned in the next net-change planning run. Compared with immediate planning, planning products in the production planning run (with report /SAPAPO/BACKGROUND_SCHEDULING) has the advantage that you can control when and how often products are planned, so you can improve system performance by executing planning runs at less busy times of the day. Please refer to SAP Note 513827 for details on the settings and parallel processing in the PP/DS planning runs.

Caution: Other settings than *planning in planning run* should be used only if the business scenario and the APO functionality used require it:

- Setting *"cover dependent requirements immediately"* (up to APO 3.0A called *automatic planning immediately*) can be very performance-critical. Also, the planning results depend strongly on the sequence of planning activities – see SAP Note 459694. Normally, it is only needed for a Capable-to-Promise scenario, where production is triggered by an availability check (gATP) performed by a sales order – see SAP Note 426563.
  If you do not require this special feature, we recommend using *manual planning* or *planning in a planning run*.
- You can use *"cover dependent requirements immediately"* to plan products that use lot-for-lot order quantity or fixed lot-sizing procedures. You use *"planning in planning run"* to plan products using other lot-sizing procedures that are available as heuristics, such as period lot-sizing or purchase order optimization heuristics.

Both types of automatic planning are triggered when new requirements are transferred to PP/DS, requirements are changed, stocks are moved, product master data is changed, the production process model (PPM) is changed, or other changes relevant to planning occur. Planning activities should not take place in parallel with (initial) data supply, but rather in a subsequent planning run based on the planning files entries. This generally applies to SNP, CTM, and PP/DS planning runs performed on the active planning version – inactive versions are not affected by CIF activities. Please refer to SAP Notes 528913 and 606320 for detailed background information.

Planning runs that run in different planning levels should not publish the results between each planning run but after the last planning run is finished. Otherwise locking problems may occur. Please refer to SAP Note 307336 for details.

The planning log in PP/DS contains messages that the system creates during interactive planning or in background planning. You can use the planning log to analyze planning problems and identify the causes of the problems. The system only displays a log if it contains messages that belong to the specified exception groups. Use transaction /SAPAPO/RRPLOG1 to browse the PP/DS planning log. As of SAP SCM release 4.0, you can call the planning log for the planning run in which a selected product was last planned. The function is available for production planning runs with procurement planning heuristics. In the *Log for Last Planning Run* view (/SAPAPO/RRPEVAL), the system displays the message with the highest priority for the log number instead of showing all messages that occurred during product planning. You can double-click on the log number to branch to the planning log. You can also navigate in the product view, the product overview, or in the product planning table.

The usage of the PP/DS optimizers is fully integrated into the background PP/DS planning runs. You simply have to use the function “Optimization” as processing step in a variant of /SAPAPO/BACKGROUND_SCHEDULING and provide an appropriate optimizer profile. Usually the optimizer is invoked after the MRP planning and a preliminary scheduling of activities.

For the PP/DS Sequencing Optimizer (SEQ01) (as well as for CTM, ND, and TP/VS (VSR) optimizers), SAP recommends to have a minimum of 512 MB of memory and one CPU on the optimization server, because these optimizers (= optimizer processes) can only make use of one CPU. If the business process allows you to split the optimizer model into smaller parts and you have more than one CPU available, you can perform the optimizer runs in parallel to make use of more than one CPU. To improve performance when you are dealing with larger scheduling problems, you can use decomposition to divide up the optimization range into several smaller problems. From the hardware side the CPU speed is the principal factor that determines the optimizer runtime.

The DPS optimizer for PP/DS (DPS01) can be configured to make use of more than one CPU (Multi Agent Optimization). During multi-agent optimization, the system uses several processors (agents) in parallel for the optimization; it can execute the optimization on each processor using a different (user-defined) objective function. In each optimization step, the agents notify each other of their previously targeted solutions and exchange good partial solutions.

Depending on the data volume and the optimization scenario, the performance of the PP/DS Optimizer is different. To check the feasibility of a PP/DS optimization problem in terms of performance a dedicated sizing sheet exists: See http://service.sap.com/scm >>mySAP SCM technology >> Performance and Configuration >> Summary and Content Overview >> System Requirements for the SAP APO 3.x/SAP SCM 4.0 Optimizer >> PP/DS Optimizer Sizing Calculator.
Please fill in the Excel sheet and check the result directly. This should be done in an early phase of the project (Blueprint). If necessary (depending on the output of the Excel Sheet), please ask for the dedicated consultancy service for optimization mentioned on this page, too.

You need to verify the optimization time required and the results of the optimization run with a realistic data sample 4-8 weeks in advance of going live. For checking the runtime and an overview over activities, planned data, and errors occurred you use the application log (transaction SLG1, object APO, sub-object PPDS) or better optimizer monitoring transaction /SAPAPO/OPT11. A detailed technical trace file is available also in /SAPAPO/OPT11 or (as of SAP SCM 4.0) in /SAPAPO/PERFMON.

In the event of a short dump during the optimizer run, the optimizer run must be manually deleted in transaction /SAPAPO/OPT03 before another run can be started. See SAP Note 393634 for details. They are also deleted by report /SAPAPO/OM_REORG_DAILY, which should be run once a day, but *never* concurrently with optimizer runs. In addition, if you ever run two optimizer runs simultaneously be sure to set the parameter enque/delay_max in transaction RZ11 as described in consulting SAP Note 572996 to avoid lock problems. You use SAPAPO/OPT03 also to check the active optimizer tasks with user and start time information.

Use report /SAPAPO/OM_TB_LCHECK_CDPSOPT to check whether the PP/DS optimizer works technically ok (see SAP Notes 435130 (APO release 3.1), 603828 (4.0), 703774 (4.1)). Execute the report with default settings and check the log being displayed. If all messages have a green light, everything is ok.

Please note that you should upgrade your optimizer in parallel with support package upgrades to ensure optimal functionality and performance.

Monitoring Activities

Apart from safeguarding the general availability and consistency of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the monitoring object table for this business process step.

The most important high-level tool for monitoring the planning situation and an exception-driven application management is the APO Alert Monitor.

Jobs Necessary to Run and Monitor Automatic Production Planning (APO)

To ensure correct and current production planning, certain jobs must be scheduled on a regular basis. These jobs are:

- **Production Planning Run** with report /SAPAPO/BACKGROUND_SCHEDULING. This report performs the different processing steps in the production planning run, that is, it applies the chosen functions and heuristics to the selected orders, products, and so on.
- **Delete PP/DS logs** with report /SAPAPO/SAPRRPLOG_DELETE. Old logs from planning activities must be deleted regularly to maintain high performance for the related transactions. The PP/DS log is a filtered view of messages stored in the application log, which is a Basis component. The application log is similar to the system log: system event information is logged in the system log, relevant application events are logged in the application log.
- **Send Alert Monitor mails** with report /SAPAPO/AMON_MAIL_BROADCAST. Depending on user profiles, mails are sent with an overview over existing alerts. The responsible persons should then call the APO Alert Monitor, investigate the reasons for the alerts, and take corrective actions in order to keep the production plan close to the needs of your company.
- **Delete Alert Monitor alerts** with report /SAPAPO/AMON_REORG. Deletes alerts being older than a specified age.
  Up to APO release 3.1 required for other APO applications but not for APO PP/DS, because PP/DS alerts are dynamic and are not stored in the database. As of SCM release 4.0 also relevant for PP/DS as far as database alert types are being used (see APO Alert Monitor, below).

Jobs for the Maintenance of the Application Log

The application log entries are stored on tables with name prefix BAL*. As there are very many applications that use this basis component and often many table entries are made, it is important to delete obsolete application logs from the database regularly in order to prevent these tables from overflowing and to help ensure that the applications and log retrieval run smoothly. You can delete them using transaction SLG2 or in background by the appropriate report:

- **Delete Obsolete Application Logs** with report SBAL_DELETE. A log can only be deleted when it has reached its expiry date or if it has the "Deletion before expiry" attribute. For more information, see SAP Note 195157.

Jobs for the General APO System Maintenance

There are a lot of general house-keeping jobs that have to be run regularly on an APO system and which are not mentioned in this document as they are not specific for the usage of PP/DS. For the use of optimizers (not only PP/DS), the following is of particular importance.

- **Delete old optimizer log files and lock entries** with report /SAPAPO/OM_REORG_DAILY. The report should be run once a day on every client with APO data, even if optimization is not used at all, as it also cleans up various liveCache data (please refer to SAP Note 679118). It must never be run concurrently with optimizer runs.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/BACKGROUND_SCHEDULING This report performs the different production planning runs. It usually runs several times a day (possibly with different scopes and goals)	SM37	Depending on your needs, daily or at least once a week		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support
Output of APO report /SAPAPO/BACKGROUND_SCHEDULING	SM37 or SP01	After each planning run		Red traffic light	Application support and / or process champion must decide if planning run must be repeated or performed interactively Instead of checking this list, you can check the PP/DS log	Application support	Contact process champion
APO PP/DS log for a specified planning run	/SAPAPO/RRPLOG1	After each planning run, after Planning board activities		Yellow or red indicators	Read diagnosis and system response of the message long texts and follow the described procedure Application support and / or process champion must decide whether: - Planning job results are as desired - They must be corrected interactively - Planning run must be repeated	Application support	Contact process champion
APO PP/DS log for a specified product	/SAPAPO/RRPEVAL	As required		Yellow or red indicators	Read diagnosis and system response of the message long texts and follow the described procedure Application support and / or process champion must decide whether: - Planning job results are as desired - They must be corrected interactively - Planning run must be repeated	Application support	Contact process champion
APO report /SAPAPO/SAPRRPLOG_DELETE This report deletes PP/DS logs	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run once a day and delete logs older than a couple of days	Program scheduling management	Contact software monitoring team

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO Alert Monitor	/SAPAPO/AMON1	At least daily			Check for PP/DS alerts and correct the planning and scheduling for the reported object appropriately	Application support	Contact process champion
APO report /SAPAPO/AMON_MAIL_BROADCAST This report ensures sending of mails about existing alerts	SM37	Daily		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run every hour to at least daily, depending on your requirements	Program scheduling management	Contact software monitoring team
Alert Monitor mails	SO01 (or respective e-mail system)	Depending on your requirements, at least daily			Check if the mail lists alerts that are important for you. Go to APO Alert Monitor and process the alerts appropriately	Application support	Contact process champion
APO report /SAPAPO/AMON_REORG This report deletes Alert Monitor alerts	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled to run regularly, schedule it to run once a day	Program scheduling management	Contact software monitoring team
APO report SBAL_DELETE This report deletes obsolete Application Logs.	SM37	Weekly		Status	Check if job is running as scheduled. If the job is not scheduled as provided by Application Support, schedule it to run weekly.	Program scheduling management	Contact Application Support
APO Optimizer Log	/SAPAPO/OPT11	After each optimizer run		Exception	Check whether the log file is flagged yellow or red. In this case investigate the messages in more detail.	Software monitoring team	Contact application support or system monitoring team, depending on error
APO performance monitor	/SAPAPO/PERFMON	From time to time; if you experience long runtimes or problems with the optimizer		Log entries	Analyze optimizer trace file and identify problem cause. If in doubt, open a customer message in SAPNet R/3 frontend.	Application support	Contact system monitoring team or SAP, depending on the problem
User list for optimizers	/SAPAPO/OPT03	In case of problems		Active optimizer users	Identify long running or cancelled users.	Software monitoring team	Contact application support

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/OM_REORG_DAILY This report deletes old optimizer log files and lock entries.	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run daily.	Program scheduling management	Contact application support
APO report /SAPAPO/OM_TB_LCHECK_CDPSOPT This report checks the PP/DS optimizer interface.	SLG1	After installation or upgrades; if problems arise or the optimizer does not answer		Yellow or red light	Execute the report in transaction SA38 with default settings and check the application log being displayed (or go to transaction SLG1). If all messages have a green light, everything is ok.	Software monitoring team	Contact system monitoring team

See general issues of Error Handling, Restartability, and Escalation, below.

Business Process Step 5: Create/Change Planned Orders (APO)

As a result of the APO production planning run, planned orders are created. The APO system explodes the production data structure (PDS) or the production process model (PPM) and performs order and operation scheduling. The scheduled planned orders can then be transferred to SAP R/3. There, they can be used to trigger the dependent requirements for those materials that are not planned within APO (in a standard MRP run, see below), or to perform repetitive manufacturing in R/3. However, if planned orders are not needed in the R/3 System for these purposes, they should be restrained in APO until they are released into production (or process) orders.

Note: As the transfer of planned orders to R/3 is extremely performance critical, this should be done in exceptional cases and if really needed by the business process only. The same applies to purchase requisitions. These settings have to be done in APO customizing, Global Parameters and Default Values (transaction /SAPAPO/RRPCUST1): Set fields “Transfer to R/3 In-House Production” and “Transfer to R/3 Ext. Procurement” to “Create Transfer Events from Conversion Indicator”.

For CIF integration with R/3 you need a special strategy profile for integration that has to be entered in the Global Parameters and Default Values. The recommended settings are described in SAP Note 394113. This setting is especially important if you are using the conversion of planned orders in R/3. Profile SAPINTR3 also contains these settings and is available as of SAP APO 3.1, but has to be selected manually. As of SAP SCM 4.0, SAPINTR3 is the default integration profile.

In contrast to Demand Planning (DP) and Supply Network Planning (SNP), it is default setting for Production Planning and Detailed Scheduling (PP/DS) to publish planning results to R/3 immediately. However, we also recommend collecting and transferring the planning results periodically for PP/DS, at least while background planning is active. To do this, the setting in transaction /SAPAPO/C4 is user specific. Use different users with specified settings for background planning and for online activities. (Note that you cannot use wild cards here but must specify either the full user ID or use entry ‘*’ for all other unspecified users.) In particular, if you have several subsequent planning runs with different scopes and goals, you can decide when planning results are ready for publishing. See also SAP Note 307336 for details.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the monitoring object table for this business process step.

Jobs Necessary to Publish Planning Results to R/3 OLTP System (APO)

To ensure that the planning results are published to R/3 and that the relevant data is consistent in both systems, certain jobs must be scheduled on a regular basis. These jobs are:

- **Publish Planning Results** with report /SAPAPO/RDMCPPROCESS. This report evaluates the APO change pointers (not the same as ALE change pointers!) that are written during planning activities. The corresponding objects, such as planned orders, are sent to R/3.
- **Check Processing of APO Change Pointers** with report /SAPAPO/RDMCPPROCESS. This report verifies that all change pointers are processed by checking that the list displayed in report /SAPAPO/RDMCPPROCESS is empty. If change pointers remain unprocessed, contact the application support team to clarify whether these change pointers are needed and why they are not processed. **Note:** Deleting change pointers may cause inconsistencies, as the corresponding order changes are not transferred to R/3.
- The jobs mentioned in the Best Practice document dedicated to CIF, section *Operation and Monitoring of the APO Core Interface*.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/RDMCPPROCESS This report publishes the results of automatic and interactive planning to R/3	SM37	Depending on your needs, daily or at least once a week		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support
APO report /SAPAPO/RDMCPPROCESS to display change pointers	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis and periodic publishing of planning results is used, schedule it to run once a day	Program scheduling management	Contact software monitoring team

See general issues of Error Handling, Restartability, and Escalation, below.

Business Process Step 6: Create/Update Planned Orders (R/3)

A planned order is opened in the APO system with an APO order number and transferred to SAP R/3. The planned order is then created in the R/3 System on the basis of the respective R/3 number range, and the R/3 planned order number is retransferred to APO. This process is called *key completion* and allows the respective orders to be displayed in both systems with the same unique number. (This applies also to other order types such as production or purchase orders.)

The process flow for changing an APO planned order is similar. Changes can also be made in R/3 planned orders originating from APO and these changes are then communicated to APO via the CIF.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 7: Run MRP for Non-APO Components (R/3)

For materials that do not need to be planned in APO (and all their BOM components), dependent requirements can be created in the standard MRP run. Materials with demand driven replenishment are handled there. The classic R/3 production planning and shop floor control functions for non-APO components follow on from this, but these are not explained in this Best Practice, as they have no influence on data managed in APO.

You should decide carefully when determining whether or not to plan a material in APO. This is because resources that are included in APO must be planned with **all** the products that are manufactured using them, otherwise capacity requirements are not considered correctly.

Components of non-APO materials cannot be planned by APO. For a material planned in APO, all the supplies and demands must be transferred to APO. If they are not, there is a planning discrepancy between R/3 and APO.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the monitoring object table for this business process step.

Jobs Necessary to Run MRP for non-APO Components (R/3)

The following job must be scheduled on a regular basis to ensure the execution of replenishment for component materials that are not planned within APO (for example, because they are not time-critical, not produced using bottleneck resources, or purchased using demand driven purchasing):

- **Material Requirements Planning (MRP)** with report RMMRP000 (or RMMRP010 for long term planning). This report reads the new and changed requirements, explodes the bills of materials (BOM) of the corresponding finished, semi-finished, and raw materials, and creates receipts in form of planned orders. Normally, this report runs with a frequency between daily and weekly, for example, every night from Monday to Friday with processing key "NETPL" (net change planning within the planning horizon) and once at the weekend with "NETCH" (net change planning without time restriction).
  Results and any planning problems in the form of exception messages can be reviewed in the MRP list, and any required corrective action initiated.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
R/3 report RMMRP000 and / or RMMRP010	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support
R/3 MRP List	MD05 or MD06	After each run of RMMRP000 / RMMRP010		Red or yellow traffic light	Check for exception messages (displayed with traffic lights as customized)	Business process champion	Contact application support

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
R/3 MRP runtime statistics	SP01	Weekly		Statistic summary	Check spool file of the MRP run for runtime shares, number of planned objects, and top ten materials with longest runtimes.	Application support	Contact business process champion
Technical statistics of the MRP run	Report RMMD MONI	From time to time and if problem s occur		Key figures	Compare key figures of planning runs, determine most important runtime shares, and identify influencing factors for runtime. Gain insight into change of figures over several weeks.	Application support	Contact business process champion

See general issues of Error Handling, Restartability, and Escalation, below.

Business Process Step 8: Perform Interactive Planning (APO)

In APO, you can manually and interactively plan products to improve the planning situation. Manually planned products are usually critical products that require particular attention when planning. The tools Detailed Scheduling (DS) planning board (/SAPAPO/CDPS0), product planning table (/SAPAPO/PPT1), product view (/SAPAPO/RRP3), heuristics, and optimizers are available to improve the planning situation. To plan any products manually, you can create orders and change dates and quantities directly in APO. Since the planning is constantly changing, you must regularly check the planning situation to solve new planning problems and to process the interactive planning tasks. When problems or unusual situations arise during planning, the system generates alerts to inform the planner. These can be displayed using the APO Alert Monitor. One of the most important responsibilities of an APO planner is the investigation and elimination of alerts, which comprises all planning tasks, methods, and tools.

As of SAP APO release 4.0, the *product overview* provides you with an overview of either several products, or of planning segments for individual products. It provides information on the availability situation of a product, as well as on the alerts and days' supplies for a product. You can access the product overview either as a subscreen in the product planning table or in a separate transaction (/SAPAPO/POV1). You can access both the product planning table and the product view from the product overview.

In the production planning run or in the Detailed Scheduling planning board, several heuristic methods can be applied to a selected set of order operations in order to schedule these operations in a particular sequence, dissolve backlogs, reduce lead time, schedule de-allocated operations, and so on. In the DS planning board, you can also execute optimization algorithms and optimize the schedule for the current simulation version.

Optimizers and heuristics are used to optimize the production dates, order sequences, and resource assignment for existing operations, which were generated by the production planning run or manual planning. The optimizers do not create or delete orders.

The purpose of optimization is to generate feasible production plans and increase the efficiency of production. Several optimization parameters (such as setup times or due date violations) can be weighted in such a way that the optimized schedule comes as close as possible to the desired results (for example, minimum setup times).

You can use the Plan Monitor (transaction /SAPAPO/PMON) to compare the results of various scheduling or optimization runs stored in different planning versions. Based on the key figures defined (like day's supply, total order delay time, scrap quantity, etc.) you can measure the performance of your supply chain and evaluate the planning situation from a business perspective. You can also call the plan monitor as chart in the product planning table /SAPAPO/PPT1.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, in order to safeguard this business step SAP recommends that you monitor the objects listed under Monitoring the APO Planning Activities and the Planning Situation and Publishing of APO Planning Results to R/3.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO product overview	/SAPAPO/POV1	Typically several times a day			Check the planning situation for products with alerts, violated restrictions, values of specified characteristics.	Business process champion	Contact application support
APO Plan Monitor	/SAPAPO/PMON	Depending on your business needs		Key figure values	Check key figure values whether they are inside the desired value range. Eventually compare active version with simulation version(s).	Business process champion	Contact application support

See general issues of Error Handling, Restartability, and Escalation, below.

Business Process Step 9: Convert Planned Orders into Production Orders (APO)

Planned orders are converted into production orders within the APO system by setting the conversion indicator (individually or collectively). The changed in-house production orders are then transferred to the connected SAP R/3 OLTP system(s).

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF and those listed in the following table in order to safeguard this business process step.

Jobs Necessary to Convert Planned Orders into Production Orders (APO)

The following job must be scheduled on a regular basis in order to ensure that, after reaching the opening period, planned orders are converted into production orders:

- **Mass conversion of orders in the active planning version** with APO report /SAPAPO/RRP_ORDER_CONVERSION. You can limit the selection of orders to be converted by entering the product, location, production planner, and an offset to the opening period. The opening period is defined in the tab "PP/DS" in the Product Master maintenance screen and is used to control which orders will be converted. The opening period is a number of workdays from the current date. The APO system will only set a conversion indicator for the orders that have an order start date within this period.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/RRP_ORDER_CONVERSION	SM37	Daily		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support

See general issues of Error Handling, Restartability, and Escalation, below.

Business Process Step 10: Automatic Order Conversion (R/3)

Triggered by the conversion in APO, the relevant planned orders are converted automatically into production orders in the R/3 System – or into process orders, when using Production Planning for the Process Industry (PP-PI).

In R/3, the usual steps are performed: the components are copied from the R/3 planned order, the R/3 routing is re-determined, R/3 lead time scheduling occurs (which is important for generating a standard cost estimate even when using APO). In an R/3 standard cost estimate, the operations are scheduled according to the R/3 scheduling parameters you have set. Components are scheduled based on the component assignment in the R/3 routing. One result of this temporary production order (which was not yet saved) is that the operation dates do not correspond with the scheduling situation of the APO order.

Therefore, as a last step before saving the production order in R/3, a *mapping* process occurs to adjust the operations in the R/3 production order to the dates of the APO operations. This is known as midpoint scheduling. To ensure that the order duration is the same in R/3 and in APO, ensure that all R/3 routing operations are transferred to the APO PPM in the R/3-APO interface.

Finally, converted orders (with status "created") are sent back to the APO system along with the production order number and the changed ATP category (ATP category for production order instead of planned order). Only components that are contained in an active integration model are transferred. In addition, only those operations executed for resources contained in an active integration model are transferred.

Conversion of planned orders can also be done directly within the R/3 System, but then the APO-planned start and end data of the operations are not taken over to R/3 and are also lost in APO afterwards.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 11: Release Production Orders (R/3)

Changes of scheduling data, quantities, resource allocations, and so on within APO are transferred to the respective R/3 production orders.

In addition, changes to production orders performed in R/3 will be retransferred to APO. These include changes of quantities, release order or operation, delete order, set final issue indicator or deletion flag, change work center, batch determination, goods issue and goods receipt, (and many more).

The most important change is the release of production (or process) orders, which occurs in R/3 in the usual way – single (CO02) or collective release (CO05N) – or automatically at creation or conversion of orders by CIF transfer.

Afterwards, shop floor control documents (production order, picking list, material staging pull list) can be printed from R/3.

Changes to R/3 orders may lead to scheduling changes in the corresponding APO orders even if these changes were not scheduling relevant. Therefore function ‘Retention of APO Activity Dates’ exists. This function is standard as of SCM 4.0. In prior APO releases this function needs to be activated by the user. For details please refer to SAP Notes 572644 and 579758.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 12: Update Production Orders (APO)

In CIF, releasing orders is treated in the same way as changing orders in R/3. That is, the changed orders are again transferred to APO where their ATP category is changed to that of a released production order. Similarly, other changes to R/3 production orders are reproduced in APO.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, there are no special objects to be monitored in order to safeguard this business step.

Business Process Step 13: Post Goods Issue for Components (R/3)

The goods issues for the material components of the order are posted in R/3, and the stocks and the order reservations are reduced in R/3 and transferred to APO. For reduction of the order reservation there needs to be an active integration model for manual reservations.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 14: Confirm Order Processing (R/3)

Order confirmations occur in R/3 and may reduce operation quantities and remaining operation duration in both R/3 and APO. In CIF, all order confirmations are transferred as individual operation confirmations.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 15: Post Goods Receipt for Products (R/3)

With posting of the goods receipt for the manufactured product in R/3, the order quantity for the receipt is reduced and the stock is increased in both R/3 and APO. Using the total goods receipt for the production order, the quantity in the APO order is set to zero. To allow posting reversals, the order is not deleted.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 16: Settle Production Orders (R/3)

Variance determination and settlement of orders occur in R/3 only and do not influence APO.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, there are no special objects for monitoring in this business step.

Business Process Step 17: Close Production Orders (R/3)

If you close a production order after settlement by setting the status technically closed or by setting the deletion flag in R/3 (with individual or collective processing), the production order is deleted in APO (but not in R/3). To maintain performance, you must ensure that the APO orders are regularly deleted, and that R/3 orders are regularly archived.

To archive production orders, only one archiving object (PP_ORDER) is required. The settings for an archiving object and the scheduling of the archiving jobs are made in transaction SARA. Production orders can be archived independently of other archiving programs. The reorganization of orders is divided into three steps in the R/3 System:

- Activate a deletion flag in the order
- Activate a deletion indicator in the order
- Execute an archiving session

Orders that have already been archived can be displayed again in the R/3 System using a fourth step, called the retrieval function.

An order can only be archived after a deletion flag has been activated for it, either manually or automatically via a background report. After an initial residence time has passed, the orders that have been flagged for deletion are assigned with deletion indicators in a background run. After a second residence time, the orders are archived and simultaneously deleted from the database.

Important note: PP/DS orders may not be deleted in a productive APO system any other way than described above. Up to APO release 3.1, it is possible to delete SNP orders and PP/DS orders using report /SAPAPO/RLCDELETE. As of SCM 4.0, this report only affects SNP orders and for PP/DS orders there is /SAPAPO/DELETE_PP_ORDER. However, these reports are designed for use in a test environment only and should not be used on productive APO systems. For exceptions see SAP Note 644676. For some detailed information please read SAP Notes 660194 and 690887 carefully.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF in order to safeguard this business process step.

Business Process Step 18: Post Goods Issue in Delivery (R/3)

After selling a product to a customer, the stock is reduced by posting the goods issue in the R/3 delivery document (VL02) and communicated to APO. Like all demand and supply information for APO-relevant products, the new stock is considered in the next planning run. Thus the planning circle is closed.

Monitoring Activities

Apart from safeguarding the general availability of the system components SAP APO and SAP R/3 OLTP, SAP recommends that you monitor the objects listed in the Best Practice document dedicated to CIF and those listed in the following table in order to safeguard this business process step.

Jobs Necessary to Clean Up Obsolete Data (APO)

The following job must be scheduled on a regular basis in order to ensure that obsolete data is removed from liveCache and APO database:

- **Delete obsolete pegging areas** with APO report /SAPAPO/PEGKEY_REORG (for SAP APO releases 3.x) or /SAPAPO/DM_PEGKEY_REORG (as of SAP APO release 4.0), respectively. In a make-to-order scenario, new pegging areas are created for every new sales order. These pegging areas are no longer needed after the goods issue in the delivery is posted. Not deleting these obsolete data may result in performance problems e.g. in transaction /SAPAPO/RRP3. See also SAP Notes 693767 and 661944.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/PEGKEY_REORG or /SAPAPO/DM_PEGKEY_REORG, resp. This report deletes obsolete pegging areas.	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly.	Program scheduling management	Contact application support
Output of report /SAPAPO/DM_PEGKEY_REORG. (As of APO 4.0)	SM37 or SP01	After every run		Messages	Check for number of reorganized objects and possible error messages.	Application support	Contact process champion

See general issues of Error Handling, Restartability, and Escalation, below.

Alternative Processes

In this section, we discuss two alternative processes in case the APO system is not available for some unplanned reason. These processes are:

- Perpetuation of Production Execution – to determine how long production can continue if the APO system is not available
- Perpetuation of Planning – to switch to R/3 planning as fallback

Perpetuation of Production Execution

Prerequisites and Assumptions

There are two cases to distinguish:

1. Conversion of planned orders to productions orders in APO
2. Conversion of planned orders to production orders in R/3

The same is also valid for purchase requisitions and purchase orders.

In general, we recommend case 1, because otherwise an R/3 integration of planned orders is necessary, which can be very performance critical.

Functional Limitations

You can extend the time for continued production execution without APO by increasing the production horizons.

You can only continue planning when APO is available again.

Detailed Process Description

Case 1 (order conversion in APO): The buffer of available production orders to continue production in R/3 depends on the number of production orders converted from planned orders in APO.

The opening period is the product-specific time period during which a planned order or a purchase requisition should be converted into a production order or a purchase order. The longer the opening period in APO, the more production orders should be available in the queue on the R/3 side. A longer opening period extends the time buffer to continue with production in case of emergency.

Case 2 (order conversion in R/3): Production can continue with all planned orders available in R/3. It depends on the planning result transferred to R/3.

Restart Regular Business Process

System Clean-Up Activities

Before the system can be cleaned up, the recovery of the APO system must be completed. The following steps can be taken in a system clean-up:

- Consistency check with transaction /SAPAPO/OM17
- Restarting the queues
- Delta report /SAPAPO/CIF_DELTAREPORT3
- New planning run within APO
- Initial data load from R/3
- Navigation from the alert monitor to the product view and running a heuristics
- A combination of
  - Initial load of sales orders and re-planning within APO
  - Recovery and handling the CIF queues

Validation

The following activities can be performed to monitor the system:

1. Check dump analysis (transaction ST22)
2. Check/restart Inbound/Outbound Queues (transaction SMQ1/SMQ2)
3. Check background tasks (tRFC; transaction SM58)
4. Check posting tasks using transaction SM13
5. Start delta report APO - R/3
6. Check the planning file (/SAPAPO/RRP_NETCH)
7. Check the applications log (for CIF, transaction /SAPAPO/C3; for PPDS, /SAPAPO/RRPLOG1)
8. Check the result of the APO alert monitor /SAPAPO/AMON1 (replanning in case of deficits)
9. Check the trace file (current COM trace)
10. Check DB Syslog
11. Check locks (transaction SM12)

12. Perform the consistency report /SAPAPO/OM17

Process Start

Restart the CIF queue

Perform a re-planning based on the alert situation

Follow-Up Activities

Monitor the planning (see above)

Perpetuation of Planning

Prerequisites and Assumptions

We consider this a viable solution only if you have used R/3 production planning and switched to APO PP/DS only a short time ago.

Functional Limitations

In case of planning in R/3, not all APO features are available. Examples in PP/DS are: dynamic setup, PP/DS optimization, finite planning, many features of the DS planning table.

Detailed Process Description

This has to be defined in a major implementation project that includes the steps of a normal implementation project, including separate customizing and detailed validation of the process (only master common in APO and R/3 data can be reused).

Restart Regular Business Process

System Clean-Up Activities

Before the system can be cleaned up, the recovery of the APO system must be completed. The following steps can be taken in a system clean-up:

- Consistency check with /SAPAPO/OM17
- Restarting the queues
- Delta report
- New planning run within APO
- Initial data load from R/3
- Navigation from the alert monitor to the product view and running a heuristics
- A combination of
  - Initial load of sales orders and re-planning within APO
  - Recovery and handling the CIF queues

Validation

The following activities can be performed to monitor the system:

1. Check dump analysis (transaction ST22)
2. Check/restart Inbound/Outbound Queues (transaction SMQ1/SMQ2)
3. Check background tasks (tRFC; transaction SM58)
4. Check posting tasks using transaction SM13
5. Start delta report APO - R/3
6. Check the planning file

7. Check the applications log (for CIF, transaction /SAPAPO/C3; for PPDS, /SAPAPO/RRPLOG1)
8. Check the result of the APO alert monitor (replanning in case of deficits)
9. Check the trace file (current COM trace)
10. Check DB Syslog
11. Check locks (transaction SM12)
12. Run the consistency report /SAPAPO/OM17

Process Start

Restart the CIF queue
Perform a re-planning based on the alert situation

Follow-Up Activities

Monitor the planning (see above)

Related Tools and Activities

This Appendix explains:

1. APO Alert Monitor
2. Monitoring APO Planning Activities and the Planning Situation
3. Publishing of APO Planning Results to SAP R/3
4. Maintenance of PP/DS related Master Data
5. Fixed Pegging

APO Alert Monitor

The APO Alert Monitor allows a management-by-exception strategy, so it is of special concern in this and other APO business process scenarios. The Alert Monitor (transaction /SAPAPO/AMON1) is a standalone component of APO that enables you to have a unified approach to handling problem situations. It notifies you if a problem occurs during an ATP check or SNP run, or when production plans, demand plans, or vehicle schedules are being generated in one of the APO applications.

The Alert Monitor is a tool with which planners can monitor the state of a plan. The monitoring results can be used to readjust the plan whenever necessary. The purpose of the Alert Monitor is to inform planners if a condition of a plan has been violated. The Alert Monitor belongs to the suite of supply chain monitoring components in APO, together with the Supply Chain Cockpit (/SAPAPO/SCC01, which also can display alerts) and the Plan Monitor (/SAPAPO/PMON). It can be used by any supply chain manager or planner who practices exception-based management in the following areas:

- Demand Planning (DP)
- Supply Network Planning (SNP)
- Production Planning/Detailed Scheduling (PP/DS)
- Available-to-Promise (ATP)
- TLB/Deployment
- Vehicle Scheduling (VS)

The Alert Monitor is a fully integrated APO application transaction that you can adapt to your needs by setting up profiles for all of the above APO areas.

To track PP/DS alerts in APO, maintain the **PP/DS Alert Profile**. The profile allows you to maintain a user-specific selection of alerts corresponding to your area of responsibility. You can set it up to track alerts of interest to individual planners, or to track alerts by specific locations, products, or resources.

The PP/DS Alert Monitor profile contains a number of alerts specific to production planning and detailed scheduling. PP/DS alert types are divided into the following groups (valid as of APO release 4.0):

- Alerts on relationships between orders or operations, for example:

    - On dynamic pegging
    - On time relationships
- Alerts on orders, for example:
    - On shortages
    - On days' supplies
- Alerts that occur during planning using a procurement planning heuristic (*Exception for Procurement Planning*)
- Alerts for resources, for example:
    - On resource capacity usage
    - On container resources
- Alerts for campaigns
- Alerts for container resources

PP/DS alerts - with the exception of the alert type *Exception for Procurement Planning* - are dynamic alerts. This means that they only exist in the SAP liveCache and are not stored in the database.

Alert priorities are identified by icons displayed in the profile or in the monitoring slots of the Supply Chain Cockpit control panel. The three possible priority levels in the Alert Monitor are:

1. Error
2. Warning
3. Information

Alert types are automatically assigned certain priority levels, but they can be changed in APO Customizing. To further refine the priority of alerts, you can define threshold values in cases where they make sense. An example of variants for a *capacity overload* alert is:

- *Info alert* if the overload is between 100 and 120%
- *Warning alert* if the overload is between 120 and 150%
- *Error alert* if the overload exceeds 150%

The system generates alerts for those items and alert types you included in your selection for the time frame and planning version you defined in the initial settings screen. You can view the alerts in the Alert Monitor window (*Alert Monitor >> Display alerts*). You can take action on alerts in the Alert Monitor window (right-click for the context menu).

To track the R/3 MRP alerts in APO, you must maintain the **R/3 MRP Alert Profile**. MRP alerts refer to the results of a materials requirements planning run. In the Alert Monitor, you see a frozen display of the latest MRP run. This profile contains an automatically generated list of R/3 Systems connected to your APO system. In order to see the alerts in APO, you must create a user view in the R/3 System in which you want to track MRP alerts.

To support the Alert Monitor's function as a tool for exception-based management, you can send messages via email to other planners to inform them of the alert situation. You can also have messages sent automatically to your own inbox to inform you of alerts in your area.

You can maintain a list of favorite Alert Monitor profiles so you can switch back and forth easily between various profiles. For example, you may have an alert profile for your own area of responsibility, but you may also want to look at alerts in other areas.

Most PP/DS alerts are not stored in the database. Alerts that are stored in the database include ATP, Forecast, SDP, VS and TLB/Deployment: when these alerts are no longer in use they must be deleted regularly from the database using report /SAPAPO/AMON_REORG. As of SAP APO 4.0 there are also PP/DS database alerts (only alert type *Exception for Procurement Planning*). These are only possible for messages that have a reference to a pegging area (product, location, and so on; e.g. message /SAPAPO/RRP_HEUR 032: Product x in location y could not be planned).

Keep alerts to a minimum. Too many alerts slow performance and may cause you to overlook the really important ones.

You can find more information concerning this tool on the SAP APO documentation CD under "Supply Chain Monitoring – Alert Monitor".

Monitoring the APO Planning Activities and the Planning Situation

Monitoring Activities

Depending on the type of planning activity (production planning run, interactive production planning, product planning table, detailed scheduling planning board, product view, …), the success or failure of the activity is logged in the PP/DS planning and scheduling logs and can be displayed using transaction /SAPAPO/RRPLOG1. You will find scheduling-relevant information in the scheduling log, for example, for scheduling problems on the resources, and quantity and product-related information, such as missing components, in the planning log.
As of SAP SCM release 4.0, you can call the planning log for the planning run in which a selected product was last planned. The function is available for production planning runs with procurement planning heuristics. In the *Log for Last Planning Run* view (/SAPAPO/RRPEVAL), the system displays the message with the highest priority for the log number instead of showing all messages that occurred during product planning. You can double-click on the log number to branch to the planning log. You can also navigate in the product view, the product overview, or in the product planning table.

To be able to react fast to planning exceptions and problems, it is important to get to know and use the APO Alert Monitor.

Jobs Necessary to Monitor APO Planning Activities and the Planning Situation (APO)

To ensure timely information of planners on the current planning situation and for performance reasons, certain jobs must be scheduled on a regular basis. These jobs are:

- **Delete PP/DS logs** with report /SAPAPO/SAPRRPLOG_DELETE. Delete old logs from planning activities regularly to keep up the performance of the related transactions.
- **Send Alert Monitor mails** with report /SAPAPO/AMON_MAIL_BROADCAST. Depending on user profiles, mails are sent with an overview over existing alerts. The responsible persons then should call the APO Alert Monitor, investigate the reasons for the alerts, and take corrective actions in order to keep the production plan close to the needs of your company.
- **Delete Alert Monitor alerts** with report /SAPAPO/AMON_REORG. Deletes old alerts.
  Up to APO release 3.1 required for other APO applications but not for APO PP/DS, because PP/DS alerts are dynamic and are not stored in the database. As of SCM release 4.0 also relevant for PP/DS as far as database alert types are being used (see APO Alert Monitor, below).

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO PP/DS log	/SAPAPO/RRPLOG1	After each planning run, after Planning board activities		Yellow or red indicators	Read diagnosis and system response of the message long texts and follow the described procedure Application support and / or process champion must decide whether: - Planning job results are as desired - Results must be corrected interactively - Planning run must be repeated	Application support	Contact process champion

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO PP/DS log for a specified product	/SAPAPO/RRPEVAL	As required		Yellow or red indicators	Read diagnosis and system response of the message long texts and follow the described procedure Application support and / or process champion must decide whether: - Planning job results are as desired - They must be corrected interactively - Planning run must be repeated	Application support	Contact process champion
APO report /SAPAPO/SAPRRPLOG_DELETE This report deletes PP/DS logs	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run once a day and delete logs older than a couple of days	Program scheduling management	Contact software monitoring team
APO Alert Monitor	/SAPAPO/AMON1	At least daily			Check for PP/DS alerts and correct the planning and scheduling for the reported object appropriately	Application support	Contact process champion
APO report /SAPAPO/AMON_MAIL_BROADCAST This report ensures sending of mails about existing alerts.	SM37	Daily		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run every hour to at least daily, depending on your requirements	Program scheduling management	Contact software monitoring team
Alert Monitor mails	SO01 (or respective e-mail system)	Depending on your requirements, at least daily			Check if the mail lists alerts that are important for you Go to APO Alert Monitor and process the alerts	Application support	Contact process champion
APO report /SAPAPO/AMON_REORG This report deletes Alert Monitor alerts.	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run once a day	Program scheduling management	Contact software monitoring team
APO report SBAL_DELETE This report deletes obsolete Application Logs.	SM37	Weekly		Status	Check if job is running as scheduled. If the job is not scheduled as provided by Application Support, schedule it to run weekly.	Program scheduling management	Contact Application Support

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO Optimizer Log	/SAPAPO/OPT11	After each optimizer run		Exception	Check whether the log file is flagged yellow or red. In this case investigate the messages in more detail.	Software monitoring team	Contact application support or system monitoring team, depending on error
APO performance monitor	/SAPAPO/PERFMON	From time to time; if you experience long runtimes or problems with the optimizer		Log entries	Analyze optimizer trace file and identify problem cause. If in doubt, open a customer message in SAPNet R/3 frontend.	Application support	Contact system monitoring team or SAP, depending on the problem
User list for optimizers	/SAPAPO/OPT03	In case of problems		Active optimizer users	Identify long running or cancelled users.	Software monitoring team	Contact application support
APO report /SAPAPO/OM_REORG_DAILY This report deletes old optimizer log files and lock entries.	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis, schedule it to run daily.	Program scheduling management	Contact application support
APO report /SAPAPO/OM_TB_LCHECK_CDPSOPT This report checks the PP/DS optimizer interface.	SLG1	After installation or upgrades; if problems arise or the optimizer does not answer		Yellow or red light	Execute the report in transaction SA38 with default settings and check the application log being displayed (or go to transaction SLG1). If all messages have a green light, everything is ok.	Software monitoring team	Contact system monitoring team

Error Handling, Restartability and Escalation

Error Handling Procedures

Error handling for background jobs is explained in detail in the SAP R/3 documentation CD, component BC-CCM, under *Background Processing*.

If a scheduled job fails, a necessary job is not scheduled, or a scheduled job has status *Finished*, you may need to take action. Consider the status of the job and proceed as follows:

- In case of status **scheduled**, the job steps have already been defined, but the start condition has not yet been defined. Contact the program scheduling management to clarify when the job will be fully defined.

- In case of status **released**, the job has been fully defined with a start condition and will wait for that condition to be fulfilled.
- In case of status **ready**, the start condition of a released job has been fulfilled. A job scheduler has put the job in a queue to wait for an available background work process.
- In case of status **active**, the job is currently running and can no longer be modified or deleted. Check if the job is within the given timeframe. Check for dependencies on other jobs. If the job exceeded the given timeframe, contact the software monitoring team.
- In case of status **finished**, all steps that make up this job have completed successfully. Program scheduling management must check whether the job ran in the given timeframe, and software monitoring team and / or application support must check the respective job results, such as spool output lists, message logs, and updates.
- In case of status **canceled**, the job has terminated abnormally. This can happen in two ways. If an administrator intentionally canceled the job, find out why, and if and when the job must be re-run. Alternatively, if a program in a job step produced an error such as issuing an "E" or "A" error message, contact the software monitoring team and investigate why the error occurred. If the program is an SAP standard program, search for appropriate messages in SAPNet and create a customer message if you cannot solve the problem.
- If there are problems with the CIF or with data missing in either R/3 or APO, see the **Troubleshooting Guide Integration R/3 – APO,** R/3 Plug-In homepage, Literature Center.

Process Step Restartability

If a background job is canceled, consider any following jobs or dependencies on other jobs when deciding whether to restart the aborted job. The aborted job may also delay the start of following jobs.

Escalation Procedures

- In general, we recommend that you search for related SAP Notes in SAPNet R/3 Frontend for any unknown problems or errors.
- If you have questions or problems that cannot be solved, forward the issue to the next support level. If the corresponding escalation path is not well defined, contact application support.
- If none of the defined support levels can provide a solution for some problem, we recommend that you create a customer problem message in SAPNet R/3 Frontend.

Publishing of APO Planning Results to R/3

Monitoring Activities

These are basically the same as for the data transfer from R/3 to APO (see the Best Practice document dedicated to CIF), and additionally the surveillance of the publishing report itself.

Jobs Necessary to Publish Planning Results to R/3 OLTP System (APO)

To ensure that the planning results are published to R/3 and that the relevant data is consistent in both systems, certain jobs must be scheduled on a regular basis. These jobs are:

- **Publish Planning Results** with report /SAPAPO/RDMCPPROCESS. This report evaluates the APO change pointers (not the same as ALE change pointers!) that are written during planning activities. The corresponding objects, such as planned orders, are sent to R/3.
- **Check Processing of APO Change Pointers** with report /SAPAPO/RDMCPPROCESS. This report verifies that all change pointers are processed by checking that the list displayed in report /SAPAPO/RDMCPPROCESS is empty. If change pointers remain unprocessed, contact the application support team to clarify whether these change pointers are needed and why they are not processed. **Note:** Deleting change pointers may cause inconsistencies, as the corresponding order changes are not transferred to R/3.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/RDMCPPROCESS This report publishes the results of automatic and interactive planning to R/3	SM37	Depending on your needs, daily or at least once a week		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support
APO report /SAPAPO/RDMCPPROCESS to display change pointers	SM37	Weekly		Status	Check if job is running as scheduled If the report is not scheduled on a regular basis and periodic publishing of planning results is used, schedule it to run once a day	Program scheduling management	Contact software monitoring team

See general issues of Error Handling, Restartability, and Escalation, above.

Maintenance of PP/DS related Master Data

Monitoring Activities

Besides the maintenance of master data resulting from business requirements, e.g. creation of new and de-activation or deletion of obsolete data, updates of texts or planning settings that effect APO master data, there is also the need of technical maintenance for certain objects.

Jobs Necessary to Maintain APO Master Data

To ensure that the planning relevant master data is technically ok and does not cause planning runs to end in error, certain jobs must be scheduled on a regular basis. These jobs are:

- **Extend the available capacity of a resource** with report /SAPAPO/CRES_CREATE_LC_RES (up to APO release 3.1) or /SAPAPO/CRES_CAPACITY_LENGTHEN (as of SCM release 4.0), resp.
  For performance reasons, you should only generate the available capacity for the time period for which you want to schedule the resource. Since the planning-relevant data of a resource is not changed regularly, as a rule, the available capacity that reaches into the future and that can be used for planning, gets shorter and shorter as time progresses, while the part that reaches into the past gets longer and longer.
  The report determines the validity period of the resource relative to the point in time at which it is executed. It then deletes the part of the available capacity that is outside the validity period in the past for the selected resources, and extends the available capacity into the future until the end of the validity period. Note that manual changes to the available capacity (e.g. additional shifts) that are in the past outside the newly generated validity period are also deleted by the report without any warning. If messages appear while report /SAPAPO/CRES_CAPACITY_LENGTHEN is being executed in the background, the person responsible (that is, the user who is logged on in the background job!) receives an express document.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO report /SAPAPO/CRES_CREATE_LC (rel. 3.x) or /SAPAPO/CRES_CAPACITY_LENGTHEN (as of rel. 4.0). This report extends the available capacity of a resource.	SM37	Weekly or monthly, depending on your business process		Status	Check if job is running as scheduled If the report is not scheduled as provided by Application Support, schedule it accordingly	Program scheduling management	Contact application support
APO application log	SLG1	After each run		Log entries existent	Check if there are log entries for object 'RESOURCE'.	Application support	Contact process champion
APO SAPoffice inbox (as of release 4.0)	SO01	After each run		Express message	Check whether there are messages being sent by the report in background (see above). There is no detailed information in this message; you have to check the application log instead.	Application support	Contact process champion
APO spool output (as of release 4.0)	SP01	After each run			Check displayed statistic for completeness and plausibility.	Application support	Contact process champion

See general issues of Error Handling, Restartability, and Escalation, above.

Fixed Pegging

The fixed pegging functions have been enhanced for release SAP SCM 4.1. Until now, the system was not able to retain fixed pegging relationships after a document change in R/3. If, for example, you created fixed pegging relationships between a sales order and a planned order, this fixed pegging relationship disappeared after converting the planned order into a production order.

In SAP SCM 4.1, the system now transfers the existing fixed pegging relationships from a preceding document (for example, a planned order) to the successor document (for example, a production order). Fixed pegging relationships are preserved on document changes or document flows in SAP APO if triggered in SAP APO or SAP R/3. This ensures that the fixed pegging relationships between the receipt and requirement elements remain intact in production planning and during production execution.

For detailed information read SAP Notes 698427 and 704583 carefully to get an overview about supported document changes and document flows.

Monitoring Activities

As of SAP SCM release 4.1, you can call the pegging overview for the product that was last planned. The pegging overview offers all monitoring functionality to display fixed pegging relationships for a product. Alternatively, the context view can be used to display fixed pegging for a selected order.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO pegging overview (rel. 4.1)	/SAPAPO/PEG1	depending on your business process		Status	Check, create, change or delete fixed pegging relationships.	Business process champion	Contact application support

Error Handling, Restartability and Escalation

Besides monitoring functions of fixed pegging, APO application log displays appropriate warnings or error messages with regard to fixed pegging relations. Use APO pegging overview to change or correct fixed pegging in SAP APO, if necessary.

Monitoring Object	Monitor TA/Tool	Monitor Freq.	Monitor Time	Indicator or Error	Monitoring Activity or Error Handling Procedure	Respon-sibility	Escalation Procedure
APO pegging overview (rel. 4.1)	/SAPAPO/PEG1	On error		Status	Repair fixed pegging relationships.	Business process champion	Contact application support
APO application log	/SAPAPO/C3	On error		Status	Check whether reduced or deleted fixed pegging relationships are listed in application log. Repair them if necessary using APO Pegging overview /SAPAPO/PEG1	Business process champion	Contact application support

Further Information

Dependencies

There are dependencies (date and time, logical sequence) between business processes and process steps that are not mentioned in this Best Practice. For example, these may comprise:

- General SAP R/3 system administration, (this also applies to the SAP R/3 Basis of the APO system) such as:
  - Reorganization of jobs, spool entries, and so on
  - DB offline backup – During an offline database backup, no online or background activity is possible. Therefore, times for such backups must be scheduled carefully.
  - Archiving of DB transaction logs
  - Updating table statistics for the DB cost based optimizer – You should not run this activity at times when application programs are likely to be creating, deleting, or updating many table entries.
- General APO-specific system administration:
  - Checkpoint writing for liveCache – You should not start a checkpoint during long running background or online planning activities because the checkpoint has to wait for the completion of the planning activity. In addition, all other users that require liveCache data have to wait for the completion of the checkpoint. This restriction applies only for liveCache 7.2.x. We recommend that you write checkpoints before and after long running planning jobs, rule of thumb 4 to 6 times per day in total. This guarantees that no checkpoint has to wait for the planning run to finish and thus causing all other transactions to wait. Second, it is warranted that the results from the planning run are safely stored away in a consistent manner with the other data in liveCache.
  - Checking internal (liveCache – APO DB) and external (APO – R/3) data consistency
  - Backup for liveCache

    - Reorganization of COM objects and optimizer application logs with report /SAPAPO/OM_REORG_DAILY
- Transfer of master data from SAP R/3 to APO:
    - Initial transfer of master data records
    - Delta transfer of new master data records
    - Transfer of changes made to existing master data records. You should not transfer large packages of master data to APO when CIF is needed for the transfer of transactional data, because this can overload CIF and cause an undesirable communication delay.

Because of these dependencies, online and background application system activity cannot always occur whenever desired, but may need to wait, for example, for the completion of administration activity. Especially in APO, long-running planning activities should not collide with APO checkpoint writing, because this can cause long waits for online users (with liveCache 7.2.x only).

Therefore, program scheduling management and the software monitoring group should plan and schedule system maintenance activities to run at appropriate times, for example, overnight or over a weekend. Then, all the work necessary for the company's core business process can be performed in the time frames determined by the business process champions. Also, certain activities – such as background jobs – should be started only after the respective preceding activity has finished.

Troubleshooting

If executing this Best Practice did not produce the desired results, proceed as follows:

- See the **Troubleshooting Guide Integration R/3 – APO**, which you can find in SAPNet, R/3 Plug-In homepage, Literature Center.
- Search for related SAP Notes
- Open a SAP Customer message describing your problem

Literature

For more detailed information about how to administer an SAP R/3 System, see:

- Liane Will, *SAP R/3 System Administration*, 2000

For information about the administration of SAP APO systems, see:

- Liane Will, *SAP APO System Administration*, 2002

For information about how to monitor and tune general system performance, see:

- Thomas Schneider, *SAP R/3 Performance Optimization*, 2001

For background information on administrative tasks with emphasis on system planning and setup, see:

- Hartwig Brand, *SAP R/3 Implementation with ASAP*, 1999

Other Best Practice Documents

In SAP Service Marketplace, quick link /scm >> *Related Topics / Best Practices for Solution Management: mySAP SCM*, you can find several Best Practice Documents for Solution Management like this one. In particular, there is **Monitoring and Administration for SCM / APO**, which helps you analyzing the workload and performance on liveCache and the APO database.
Furthermore, there is **Manage APO Core Interface in mySAP SCM**, which deals with the Business Process Management of the APO Core Interface CIF and is an essential enhancement to this document. All the jobs and monitoring activities listed in the CIF document have to be considered in every business process step listed above that sends or receives data through CIF.
If you use the APO availability check (gATP) within your PP/DS process, **Manage Global ATP** will be of particular interest for you.
Document **Manage Supply Network Planning in mySAP SCM / SAP APO** deals with the operation procedures related to the APO Supply Network Planning component. **Manage Demand Planning in mySAP SCM / SAP APO** accordingly discusses the operation of Demand Planning processes. Please also pay special attention to **Internal and External Consistency for SAP APO / mySAP SCM**, which contains information about master data consistency as well as internal consistency between APO DB and liveCache.

Background Information and References

SAP Documentation

SAP **APO 4.1** documentation is available on CD or in the SAP Help Portal in German or English.

SAP **APO 4.0** documentation is available on CD or in the SAP Help Portal in German or English.

SAP **APO 3.1** documentation is available on CD or in the SAP Help Portal in German or English.

SAP **APO 3.0** documentation is available on CD or in the SAP Help Portal in German or English.

Print files (PDF format) of several chapters in both languages are available in the Media Center of the SAP Marketplace for SCM.

Several functions that have been documented in the SAP Library for SAP APO Release 3.1 are also available in Release 3.0. Please refer to SAP Note 514971 for details.

For some more detailed information, current events, news and so on, please see the PP/DS homepage in the SAP Marketplace for SCM: http://service.sap.com/scm >> Planning >> Production planning.

SAP Notes

See also http://service.sap.com/notes.

The following SAP Notes contain useful information on the performance of SAP APO:

- **426705: Guidelines for note searching in APO-PPS**
- 370601: Collective note: Performance APO 30
- 303743: Support Packages for APO Release 3.0A
- **370601: Composite SAP Note: APO 3.0 and 3.1 performance: See http://service.sap.com/~form/sapnet?_FRAME=CONTAINER&_OBJECT=011000358700002439142002 or http://service.sap.com/scm >> mySAP SCM Technology >> Performance and Configuration**
- 438712: Support Packages for APO Release 3.1
- 420669: Collective note: General Performance Improvement APO

See the Best Practice document dedicated to CIF for SAP Notes with information on qRFC and CIF.

The following SAP Notes contain useful information on PP/DS:

- 134164: Optimizer RFC connection error
- 143314: APO - R/3 Integration in Production Planning
- 195157: Application log: Deletion of logs
- 307336: Object locked by user
- 331664: APO PP/DS: Material status
- 358833: APO planned order conversion: Check on material status
- 362208: Creating deallocated orders in APO
- 379567: Performance: Creating the detailed scheduling planning board
- 385602: Validity in APO (Documentation)
- 390850: Scrap in APO and R/3 (documentation)
- 393437: Pegging in APO: Background information
- 393634: Release of the optimization server after terminations
- 394113: Date shift between R/3 and APO
- 394184: No subsequent processes after LiveCache initialization
- 397989: PP/DS: Scheduling (Documentation)
- 403050: Consulting DP 3.0: Release from DP to SNP
- 413822: Safety stock in APO PP/DS (documentation)
- 417461: Scheduling error transferring orders to APO
- 426563: CTP: Settings, system behavior and performance (documentation)
- 431171: Quota heuristic: planning of shortage/excess quantities

- 435130: APO 3.1: Importing an optimizer version
- 435366: BAdI for additional checks when converting orders
- 439596: Notes on Customizing planning processes
- **441102: Consulting notes in PPDS**; see also http://service.sap.com/~form/sapnet?_SHORTKEY=01100035870000335884&_OBJECT=011000358700008237142002E
- 441740: Planning time fence in APO: Documentation
- 445899: Problems in planning with sequence-dependent setup times
- 448960: Net requirements calculation (documentation)
- 449565: Integration with CDP in APO (Characteristics Dependent Pl.)
- 457723: Planning period with PP heuristics
- 458996: Fixed pegging in SAP APO (documentation)
- 459694: Finite scheduling with CTP or SAP_MRP_002 (documentation)
- 460107: Fallback strategy to avoid scheduling errors
- 481906: SNP - PP/DS integration (documentation)
- 495166: Tips and Tricks for Handling Alert Monitor
- 507469: Why a maximum of 500 receipt elements per product?
- 513827: Settings/parallel processing in the PP/DS planning
- 517178: Relationship violations
- 518556: Using heuristics in the production planning run
- 519070: Planning without final assembly
- 520561: Maintaining product master in R/3 or in APO?
- 525571: MOP: Function restrictions
- 528913: Lock R/3 data transfer during SNP, CTM, PP/DS planning
- 532979: Pegging in optimization
- 551124: APO: Finite scheduling with MRP heuristic (documentation)
- 557731: Planning file entry + reuse mode (documentation)
- 560683: Resource selection for the PP/DS optimization
- 560969: Rescheduling: Bottom-Up (SAP_PP_009)
- 565972: FAQ: External procurement in PP/DS
- 572003: SCM operating concept
- 572644: Retaining activity dates: Implementation
- 572996: Simultaneously started optimization runs
- 575624: Locking concept in APO PP/DS (documentation)
- 577158: Withdrawal from alternative plant in APO (documentation)
- 578044: Additional parameters for optimization
- 579758: R/3->APO: Retaining APO scheduled activity dates
- 582212: External planning (Documentation)
- 584051: Multiresource planning (primary resource) (documentation)
- 584204: Planning standard lots for continuous I/O (SAP_PP_C001)
- 591115: MRP areas in APO (documentation)
- 594982: Push production (documentation)
- 601990: External relationships (documentation)
- 603828: APO 4.0: Importing an optimizer version
- 605855: Enqueue queue time in the syslog for parallel MRP
- 606320: R/3 data transfer during PP/DS optimization run
- 606334: Overlap of activities after PP/DS optimization run

- 607428: Product planning table – FAQs
- 613189: Documenting heuristics
- 613601: Scope of ATP check of production orders
- 615877: Integration/delta report manufacturing orders: Performance
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Feedback and Questions

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