UC4 for SAP NetWeaver™

Operations Manager is considered the most advanced solution available for the fast, seamless integration of SAP® systems into enterprise process management. Operations Manager offers comprehensive functionality for job scheduling in SAP, supporting the latest SAP technologies such as SAP NetWeaver.

This document discusses the integration of Operations Manager with SAP NetWeaver and provides a brief functional overview.

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Powered by SAP NetWeaver®

SAP NETWEAVER™

SAP NetWeaver is the foundation for all SAP solutions. SAP NetWeaver is an open technology platform based on standard technologies.

It provides an integration infrastructure on many levels, from people integration to application integration. In the area of asynchronous IT processes, however, SAP NetWeaver does not comprise a contemporary solution.
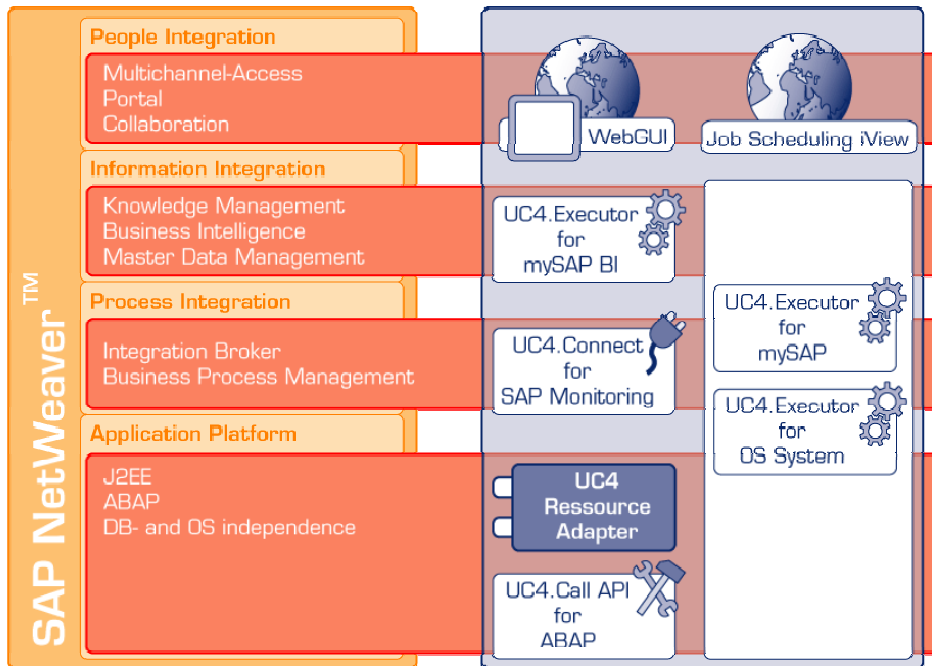
custom integration solutions Operations Manager provides APIs for both basic technologies supported by SAP NetWeaver – ABAP/4 and J2EE.

On the application platform layer the NetWeaver architecture's goal is database and platform independence. This goal Operations Manager has already achieved, thus not only fitting the NetWeaver architecture, but further supporting it in many integration tasks.

Process integration is Operations Manager's core business. Operations Manager manages all IT processes enterprise-wide, including those in SAP NetWeaver. Information about the all IT processing is delivered to SAP NetWeaver via UC4.Connect for SAP Monitoring, where it can be used for business process modeling with the SAP Solution Manager.

On the information integration level Operations Manager manages all background processes in mySAP Business Intelligence. By using Batch Application Integration, information from other applications is also transferred and processed under Operations Manager's control.

To complete the integration of Operations Manager with SAP NetWeaver, it also provides for integrating SAP users.

Figure 1: Operations Manager tightly integrates with SAP NetWeaver on all integration layers of the NetWeaver architecture.

CCMS

IT processes in SAP NetWeaver are managed by means of the CCMS – the Computing Center Management System. This component has already been part of R/3 and has changed little since then. Table 1 on page 3 shows some of the improvements Operations Manager can provide to CCMS and SAP NetWeaver.

OPERATIONS MANAGER INTEGRATION WITH SAP NETWEAVER

As shown in Figure 1 Operations Manager integrates with SAP NetWeaver on all integration levels, thus representing a fully functional xApp.

On the Application Platform level Operations Manager is tightly integrated with the SAP NetWeaver architecture. UC4 Executors™ running on all systems where SAP NetWeaver is operating provide the basic functionality for system management in SAP NetWeaver. A dedicated Executor for SAP Solutions takes care of the asynchronous processing in SAP NetWeaver. Furthermore, for

Through use of the UC4.WebGUI running on the SAP Web Application Server, operators control job scheduling operations.

JOB SCHEDULING IVIEWS

UC4 iViews for Job Scheduling even bring job scheduling information to the SAP Portal. End users can start predefined business processes via the SAP Portal and monitor the status of all their processes.

With its tight integration across the SAP NetWeaver architecture Operations Manager represents a comprehensive xApp for managing asynchronous IT processes within SAP NetWeaver. Its capabilities for SAP NetWeaver are approved by multiple certifications for this platform and by hundreds of customers using Operations Manager for managing their SAP systems management with Operations Manager.

Figure 2: Business users see the status of critical business processes via job scheduling iViews

WEB APPLICATION SERVER

The SAP Web Application Server (WAS), as the application platform for SAP NetWeaver, plays an important role for UC4. It shares with Operations Manager one of its key characteristics: both support proven ABAP technology as well as innovative open source technologies, such as Java, J2EE and Web Services.

Operations Manager provides several certified interfaces with the SAP Web Application Server. Full technological support and tight integration provide for optimized cooperation and give both SAP and UC4 users a future-proof solution. Regardless of which technology you are using – Operations Manager provides full support.

The Web Application Server does not provide a central scheduler. The J2EE standard also does not have such functionality. Even for a relatively small number of IT processes in a SAP environment, Operations Manager pays off.

ASYNCHRONOUS PROCESSING IN SAP NETWEAVER

For managing asynchronous processing SAP Net-Weaver provides several standard interfaces (see page 8). These interfaces are used by all job schedulers with SAP support. Functional differences in this area are therefore basically reduced to the job scheduler's GUI.

Operations Manager is certified for job scheduling in SAP NetWeaver, both for the standard XBP interface as well as for SAP Business Intelligence.

Operations Manager is tightly integrated with SAP NetWeaver and keeps direct connections to the SAP system at all times. While most job schedulers only connect to the SAP system during runtime for starting jobs, Operations Manager provides an online connection during design time, thus making the creation of SAP jobs easy and secure.

WEB SERVICES WITH SAP NETWEAVER

The SAP Web Application Server is fully compliant with J2EE 1.3 standards and therefore also represents the technological basis for implementing web services.

Operations Manager provides a J2EE resource adapter for application servers compliant with J2EE 1.3 and fully supports the SAP Web Application Server, but also other major application servers such as Tomcat, IBM WebSphere and BEA Weblogics.

The UC4.ResourceAdapter provides full job scheduling functionality to J2EE environments and represents the technological basis for implementing job scheduling web services.

The result of the first deployment of the UC4.ResourceAdapter is the UC4.WebGUI. This fully functional operator GUI for Operations Manager is entirely based on J2EE standards and works on the SAP Web Application Server.

JOB SCHEDULING FOR WEB SERVICES

Job scheduling has always been critical to ensuring reliable system processing. The advent of web services makes this need even more acute. While the individual web services work on the front-end, Operations Manager efficiently manages the work-load in the background, and facilitates reliable processing. The result is a tight and efficient cooperation between front-end applications and back-end applications.

	SAP	OperMan
Control		
Complex cross-system and cross-application interdependencies	no	yes
Multiple interdependencies	no	yes
Synchronizing background processes on multiple servers	no	yes
Dynamic variant management	no	yes
Secured cross-platform file transfers	no	yes
Dynamically switching operating modes	no	yes
Integration with other business applications	no	yes
Uniform management and control for processes in mySAP Basis, mySAP BI and on any operating system	no	yes
Runtime forecasts for jobs	no	yes
Controlling SAP-external jobs	no	yes
Executing jobs dependent on resource availability	no	yes
Automatically starting and stopping SAP systems	no	yes
User-specific calendars	no	yes
Monitoring single job steps	no	yes
Monitoring		
Enterprise-wide monitoring of all systems and applications	no	yes
Automatic failure management for critical events	no	yes
Automatic log file analysis	no	yes
Monitoring SAP systems' availability	no	yes

Table 1: Advanced functionality for asynchronous processing in SAP NetWeaver

JOB SCHEDULING AS A WEB SERVICE

In addition to effectively managing the background tasks for existing web service applications, Operations Manager can function as a web service on its own. Based on standard technologies such as XML, J2EE and SOAP, Operations Manager provides advanced, Internet-based job scheduling to any application that is capable of using web services.

By launching its web services functionality while other vendors are still providing mainframe-only products, Operations Manager continues to lead the way in the job scheduling market. For companies that are looking to stay ahead in their business, the logical choice for reliable, state-of-the-art job scheduling is Operations Manager.

SAP SYSTEMS MANAGEMENT WITH OPERATIONS MANAGER

Based on its tight integration with SAP Net-Weaver, Operations Manager provides a richness of functionality for managing and integrating SAP systems. The following pages provide a brief overview of Operations Manager's functionality for SAP NetWeaver.

Figure 3: Operations Manager offers a wide range of functionality for automating SAP systems management.

JOB AND PROCESS MANAGEMENT

Operations Manager integrates a large variety of jobs and processes on SAP systems into its enterprise-wide process management. Operations Manager users handle processes on these systems the same way as jobs on other platforms.

SAP NETWEAVER

As the background processing of all SAP solutions lies within SAP NetWeaver this is the component Operations Manager concentrates on. Operations Manager supports all layers of the SAP NetWeaver architecture, as far as it concerns asynchronous background processing.

By tight integration with the functionality of SAP's CCMS Operations Manager provides full control over the SAP background processing.

JOB MANAGEMENT

With Operations Manager SAP jobs are managed the same way as all other platforms' jobs. All kinds of SAP background processing can be managed with Operations Manager.

JOBS

Operations Manager retrieves job lists from the SAP system. Jobs can be selected by various criteria. These jobs can then be activated from within Operations Manager, using available or dynamically created variants (for more information about dynamic variant management see page 5).

Operations Manager monitors SAP jobs during their runtime and provides their final status, job reports and runtime statistics.

SAP jobs are integrated into enterprise-wide job networks, interdependencies between SAP jobs and processes on other platforms are resolved for reliable business processing.

After the job's execution Operations Manager can retrieve its spool list for further processing.

CHILD JOBS

Operations Manager detects and monitors child processes of invoked jobs. This way information about all relevant processing is available at one central point. This feature greatly enhances the capabilities for managing interdependencies, even if jobs are not created centrally.

JOB INTERCEPTION

Jobs that should be controlled by Operations Manager are defined within SAP. When they are created in SAP, they are marked as "intercepted". Operations Manager now takes over control and schedules these jobs according to system-wide requirements.

SAP JOB INFORMATION

Some SAP components create jobs dynamically. These can be intercepted for full Operations Manager control (see above) or Operations Manager can display information about these jobs.

REPORTS

Operations Manager also manages reports in SAP. Report generation can be integrated into the centralized process management. This way Operations Manager can ensure for example, that the data required for a certain report is available or that enough computing power is at hand.

Operations Manager's functionality goes far beyond simply starting and monitoring tasks. The centralized process management has full control over all aspects of report generation. Variants, owners, number of copies, output device and expiration data are just a few of the available parameters.

BATCH INPUT SESSIONS

Batch input sessions as the standard method for data import in mySAP systems are critical background processes. Operations Manager fully automates batch input sessions.

Operations Manager selects batch input sessions according to certain individually defined criteria and schedules them as UC4 jobs. Operations Manager's vast functionality for process management is then available for these tasks.
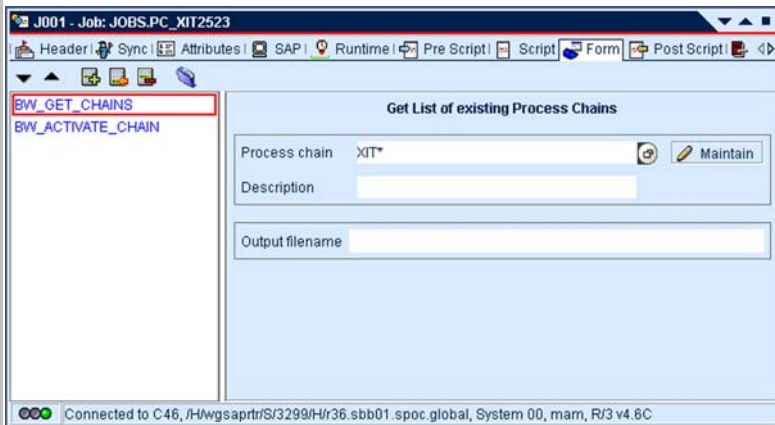
Figure 5: Processes in mySAP BI are comfortably managed via a user-friendly GUI.

Operations Manager not only activates and monitors batch input sessions, but also provides detailed failure analysis. Most schedulers abort a batch input session with the first error. Operations Manager can process such sessions even if they are partially incorrect. If an error occurs, Operations Manager logs which individual data sets failed and additionally provides the exact
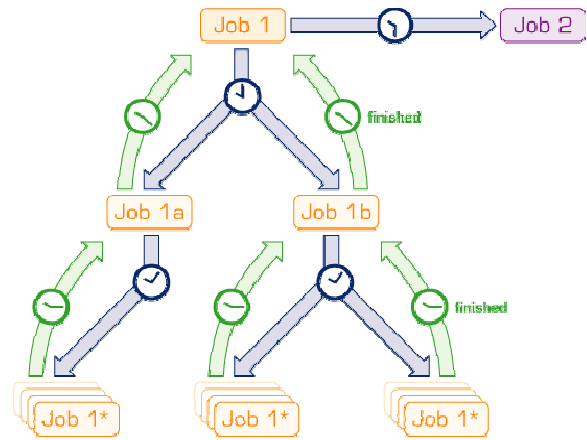
Figure 4: Complex job hierarchies are centrally managed by Operations Manager

incorrect data field. This information is logged for each batch input session for post-processing. These logs can also be sent to the appropriate user(s) automatically.

DYNAMIC VARIANT MANAGEMENT

With Operations Manager there is no need to create the required variants in SAP before activating a job. Operations Manager can dynamically create and modify variants, thus ensuring that jobs get exactly the required data.

UC4.global retrieves existing variants from the SAP system. The variant data can be modified and saved, either in the same variant or in a copy.

AUTOMATING ONLINE TRANSACTIONS

For full automation Operations Manager automates online transactions if required. In SAP many tasks consist mainly of background jobs, but also require user input at a certain stage.

Operations Manager can "fill in" the field of an online transaction, thus simulating user input. Tasks like SAP archive administration can be fully automated from end-to-end.

SET PRINTER DEFAULT SETTINGS

For determining a background process's output, Operations Manager can set the default printer settings.

SAP BUSINESS INTELLIGENCE

SAP Business Intelligence is a mySAP component with its own facilities for managing background processes. Operations Manager integrates the BI background processing into its centralized process management.

InfoPackages that contain information about the required data sources and processing instructions are managed as UC4 jobs. Operations Manager selects InfoPackages according to freely definable criteria and manages them as UC4 jobs. Unlike the

SAP system Operations Manager provides information about the real end of the load data process, which also includes sub tasks of the initial InfoPackage.

Besides InfoPackages Operations Manager also manages process chains in SAP BI. With Operations Manager they run fully automatically and can be coordinated with any kind of interdependencies with other processes and systems.

SAP FOR BANKING (BCA-AM)

SAP Banking's component for account management, i.e. transaction banking, has been developed with two SAP customers.

UC4 Software integrated this component with Operations Manager. In cooperation with SAP and the German Postbank, a highly satisfied UC4 customer, the UC4 Executor (more about the UC4 Executor technology on page 7) was developed during the first project phase.

EVENT AUTOMATION

SAP MONITORS

Operations Manager can read custom SAP monitors. The retrieved values can be used for many different purposes. From simple display to dynamic process management Operations Manager can use this data in a large variety of ways.

A special and often used feature is to switch the SAP system's operating mode according to the current workload, thus providing optimized system performance to the end users. (for more about switching operating mode see Performance management for SAP systems).

LOG ANALYSIS

Operations Manager can retrieve data from various SAP log files. These log files are automatically analyzed, i.e. searched for certain key words or phrases. Based on the result of this analysis Operations Manager takes certain actions – scheduling objects can be activated, administrators can be informed.

JOB LOGS

Operations Manager retrieves job logs of jobs that have not been managed by Operations Manager. Thus information about all SAP processing is available in Operations Manager and can be used for successive processing.

APPLICATION LOG

The SAP application log can be searched for messages by criteria like object, sub object, date, time, user, transaction, program and message class. Found messages can be stored in a UC4 report or a separate file.

This feature is very useful for analyzing processes that are not managed by Operations Manager. For jobs started by Operations Manager this information can also be used.

SYSTEM LOG

Operations Manager also retrieves SAP system logs, either the central system log or a specified application server's log. The log information can be used for determining the system's status and events can be raised based on this information.

SPOOL LISTS

In the same way that Operations Manager retrieves and analyzes various log files, it can also process spool lists generated by SAP reports.

SAP EVENTS

Operations Manager integrates SAP events into its event automation. They can be used for scheduling in Operations Manager just like in SAP.

Operations Manager can monitor SAP events and integrate them into its process management. When a SAP event occurs, Operations Manager, and the processes it controls, react accordingly.

Furthermore Operations Manager can trigger SAP events. This feature is useful, if not all background processing is managed directly by Operations Manager. In this case Operations Manager can still control the SAP background processing by means of SAP events and the various analysis tools described above.
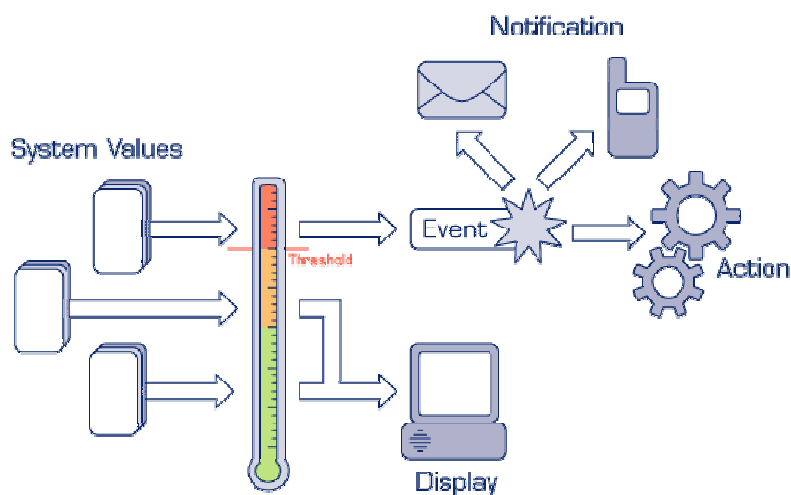

Figure 6: Based on system values Operations Manager manages the entire processing and distributes the workload.

EVENT-DRIVEN SCHEDULING

Through a combination of its functionality in the areas of job scheduling and event automation Operations Manager provides state-of-the-art event-driven job scheduling. Depending on system events in SAP NetWeaver and in all other applications enterprise-wide, the next processing step is determined.

With its event-driven job scheduling capability Operations Manager provides the framework for batch application integration. All applications are integrated on the basis of events and time, avoiding costly real-time environments where data exchange within seconds or minutes is sufficient.

PERFORMANCE MANAGEMENT FOR SAP SYSTEMS

Based on the information collected from SAP monitors, system statuses and various log files Operations Manager evaluates the current system load of SAP systems. With this information the SAP system's performance can be optimized.

By means of switching operating modes dynamically – SAP itself does this only through a time-controlled mechanism - Operations Manager can set the number of available online background processes in the SAP system. Dynamically reacting to workload peaks Operations Manager provides additional online processes for dialog users. Immediately after the workload has declined, computing power is returned to background processing.

SAP SOLUTION MANAGER

Since December 2002 SAP provides the Solution Manager for mySAP solutions. Operations Manager provides an interface for integrating with the Solution Manager.

System status information and the UC4 process management is displayed in the Solution Manager, thus providing a centralized view of all business processes within the SAP system.

GUI FOR SAP JOBS

Managing SAP jobs with Operations Manager does not require any knowledge of the involved systems or of a script language. The vast functionality for managing SAP background processing can be accessed via a user-friendly GUI.

With Operations Manager this GUI was integrated into the UC4.DialogClient. This is directly integrated into the job object, making all necessary information available in one view. For highly customized tasks it is still possible to enhance SAP processing with individual scripts.

TECHNICAL FOUNDATION

EXECUTOR TECHNOLOGY

For managing systems and applications Operations Manager uses thin agent programs, called Executors. Their thin design makes them not only easily portable to new systems and application versions but also provides the advantage of minimal footprints on the target systems. UC4 Executors virtually do not need any resources.

UC4 CALLAPI

Operations Manager provides APIs for all supported platforms and applications including SAP NetWeaver. The Operations Manager process management can be directly managed from mySAP by means of custom ABAP applications. Scheduling objects can be activated and information about the current status of systems and objects can be retrieved.
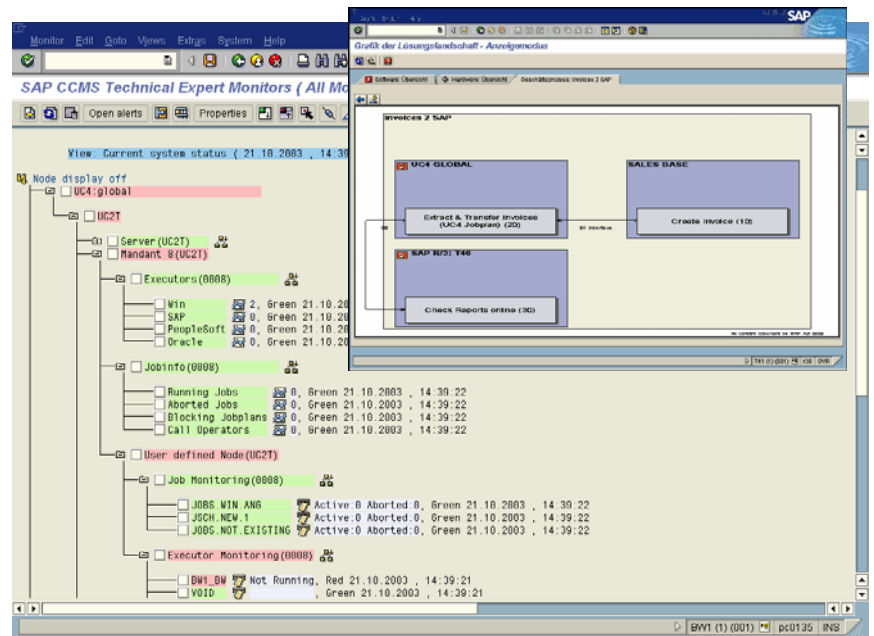

Figure 7: Comprehensive UC4 processing information is available in SAP NetWeaver and can be used for modelling business processes.

For using Operations Manager in the J2EE environment of the SAP Web Application Server, a resource adapter provides access to the entire functionality of Operations Manager for use in custom applications.

SAP INTERFACES

XBP 1.0

Operations Manager supports the standard SAP interface for background processing since its first release and was the first European job scheduler to be certified for this interface.

XBP 6.10(2.0)

XBP 6.10 provides some additional functionality for external background processing in SAP Net-Weaver. Operations Manager is certified for this latest interface.

SBB

For extended process management functionality beyond the limitations of XBP Operations Manager additionally provides its own interface, called SBB. This interface provides some functionality that is unique in the job scheduling market and uses its own namespace in the SAP system.

Figure 8: For administrating SAP jobs Operations Manager provides a GUI with online connection to the SAP system.

CUSTOM SOLUTIONS

Besides Operations Manager's standard functionality the UC4 Global Service Organization has realized several custom solutions for integrating Operations Manager and SAP solutions.

SAP DIALOG FOR OPERATIONS MANAGER

By means of custom ABAPs and the UC4 CallAPI a basic client functionality for UC4 was realized in SAP. Tasks like initiating a job are possible from within SAP.

This solution cannot replace the UC4.DialogClient and never was designed to do this. It is however quite useful, if SAP users can perform routine tasks without specific UC4 knowledge.

SAP DATA ARCHIVING (SARA)

Operations Manager entirely automates the archiving process. Operations Manager performs the foreruns and subsequently initiates the step "Creating archiving files". The next steps are automated within the SAP system by certain customizations. Operations Manager detects when the archiving process is finished, as well as when single sub-steps fail.

CLIENT COPIES WITH OPERATIONS MANAGER

Operations Manager makes periodical creation of client copies easier and more secure.

The test run and copy process can be automated. Normal operation is not interrupted.

MASS DATA PROCESSING IN SAP INDUSTRY SOLUTIONS

For individual business processes like reconciliation of clearing accounts, balancing of billing data, payment and dun runs or master data update, job nets can be implemented in Operations Manager. Existing dependencies between these processes are taken into account. SAP can split large amounts of data according to different criteria. Operations Manager processes the resulting smaller data units in parallel. After processing, Operations Manager can search the job logs for booking errors and logical data errors and can automatically start further processing if required.
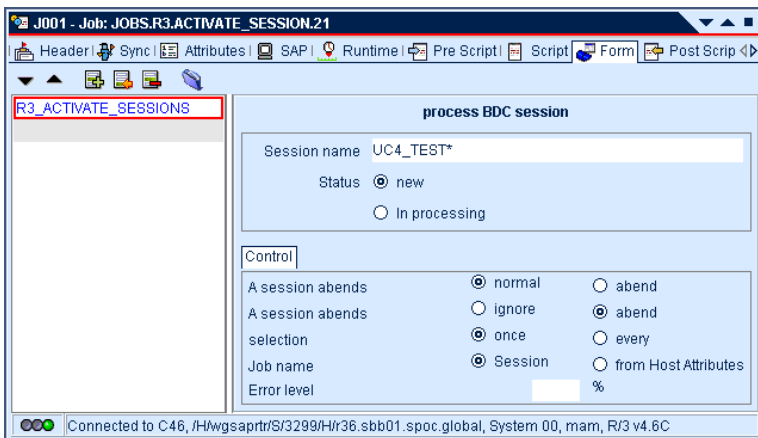
BENEFITS

COST REDUCTION

- Complete automation
- Optimized resource usage
- Reliable enterprise-wide processing

RELIABILTY

- Nonstop availability
- Centralized overview
- Full audit trail

FUTURE-PROOF

- Broad system support
- Flexible architecture
- Modern standard technologies

USABILITY

- Full GUI support
- SAP integration at design time and runtime
- Custom implementations with cross-platform scheduling language

TECHNOLOGICAL ADVANTAGES

- Modern technological basis
- Support for standard technologies
- Low resource usage
- Support for all SAP systems and solutions
- Comprehensive functionality for SAP and all other business applications

PROVEN SOLUTION

- More than 50% of all UC4 installations control SAP
- Reference customers at http://www.uc4.com/customers.htm
- Multiple certifications for SAP NetWeaver

PROFESSIONAL SUPPORT

- SAP-certified consultants
- 24x7 support
- Multi-lingual support

ABOUT UC4 SOFTWARE

UC4 Software is a leading provider of workload automation and IT process optimization solutions that ensure core business processes and enterprise information systems run faster, more accurately and without interruption. More than 1,500 companies worldwide have successfully enhanced application processing performance and improved IT efficiency using UC4's business acceleration solutions. Customers include American Suzuki Motor Corporation, Cadbury Schweppes, eBay, Eastman Kodak, General Electric, Mattel, McGraw Hill, Panasonic, Robert Bosch, Sun Microsystems, Symantec, T-Systems and Verizon. For more information, please visit **WWW.UC4.COM**.

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