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The SAP NetWeaver AS Infrastructure: **New Innovations** for Developers and Administrators

by Karl Kessler, SAP AG

SAP NetWeaver Application Server (SAP NetWeaver AS) is the foundation and runtime environment for nearly 90% of SAP solutions, including SAP ERP and SAP Business Suite. SAP NetWeaver AS provides the abstraction layer that is needed to both develop and run applications, whether they are written in ABAP or Java, giving customers the flexibility to innovate based on their business needs (see sidebar on the next page).

In the classical sense, the application server abstracts the application layer from the underlying operating system and database platform. Accordingly, a developer can write an ABAP or Java application that runs on all major enterprise platforms supported by SAP. This gives customers the flexibility to move freely from one platform to another and reduces the total cost of development for SAP partners because applications and application extensions can be deployed on a wide range of platforms.

 The application server foundation is an extensible platform built on industry-accepted standards and complemented by various partner solutions. For examples of partner extensions that are used with the application server, please see the online version of this article at sapinsider.wispubs.com.

What makes SAP NetWeaver AS unique is its infrastructure capabilities, which go far beyond those of a simple portable platform and offer services for almost any purpose. In this article, I will discuss some of the key features of SAP NetWeaver AS that address customer needs in the areas of TCO, lifecycle management, user interface strategy, embedded analytics, development, administration, and security, with a focus on the enhancements that help developers and administrators support SAP Business Suite users.

New SAP NetWeaver AS Innovations Offered with SAP NetWeaver 7.02 and SAP NetWeaver 7.30

In 2010, two important product launches occurred. First, SAP released SAP NetWeaver 7.30, the first complete and integrated SAP NetWeaver shipment since SAP NetWeaver 2004s. With SAP NetWeaver 7.30, innovative new versions of SAP NetWeaver Business Warehouse (SAP NetWeaver BW) and SAP NetWeaver Portal became available.¹

Second, in December 2010, SAP released SAP Business Suite 7 Innovations 2010, which builds on SAP NetWeaver 7.02 and contains enhanced security and other support features, such as performance, accessibility, and lifecycle management capabilities, along with new business functions.

Let's take a more detailed look at the technological capabilities relevant to the application server that are available with the 7.02 and 7.30 releases.

¹ In 2011, new portal content is planned for both SAP Business Suite 7 and SAP Business Suite 7 Innovations 2010.



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ABAP, Java, and the Move from the Dual Stack to Separated Stacks

SAP solutions originally were written in ABAP and therefore executed on SAP NetWeaver AS ABAP. With the advent of Java and its adoption in SAP's solution space, some infrastructure elements were written in Java and executed on SAP NetWeaver AS Java, most notably SAP NetWeaver Portal and its early content. Today, SAP NetWeaver AS Java is mainly used as the infrastructure for SAP NetWeaver Business Process Management (SAP NetWeaver BPM) and SAP NetWeaver Process Integration (SAP NetWeaver PI) with its advanced adapter engine.

SAP has offered deployment options such as the dual stack to allow shared use of some infrastructure components between the ABAP and Java application servers. Now, the trend is moving to separated deployment of the ABAP and Java stacks to support flexible innovation schemes. SAP understands that typical SAP Business Suite customers now want to innovate at a speed based on their own business needs rather than on the technological constraints of their underlying architecture.

For example, consider a typical SAP ERP implementation: An IT manager decides to apply enhancement package 5 for SAP ERP 6.0 and wants the freedom to stay with the portal on SAP NetWeaver 7.0 or upgrade to SAP NetWeaver Portal 7.02, depending on what is best from a business perspective. In general, separate SAP NetWeaver hub deployments, such as SAP NetWeaver Portal or SAP NetWeaver Business Warehouse (SAP NetWeaver BW), give customers the flexibility to innovate without disruption. In many cases, the upgrade and update strategies of SAP Business Suite components and SAP NetWeaver hubs are independent of each other.

TCO Reduction and Lifecycle Management

SAP has heard from many customers that most of their current SAP-related investments are focused on reducing TCO, particularly by optimizing the software life cycle and streamlining everyday operating tasks. To achieve lower TCO, customers are seeking *landscape simplification* and *business continuity*, two goals that the application server can help them reach.

Many SAP NetWeaver and SAP Solution Manager innovations, such as smaller footprints, better performance and scalability, and reduced deployment and startup times, are targeted toward simplifying the system landscape. As of SAP NetWeaver 7.30, customers can reduce their hardware needs as a result of common deployment options for all Java usage types, including enterprise portals, SAP NetWeaver BW, and SAP NetWeaver Composition Environment (SAP NetWeaver CE), with one unified Java application server. And, in the process integration area, a

Java-only, lightweight advanced adapter engine is now available, eliminating the need to run SAP NetWeaver Process Integration (SAP NetWeaver PI) as a dual stack.

To enable business continuity and help customers manage complex landscapes efficiently, SAP is providing near-zero downtime capabilities for patching SAP NetWeaver Portal and SAP NetWeaver PI. In addition, several modifications to the enhancement package implementation process allow customers to introduce new functionality without disrupting the business.²

For example, landscape verification and awareness capabilities were introduced to cleanse data in SAP Solution Manager before enhancement package files are installed. The landscape-aware Maintenance Optimizer within SAP Solution Manager relies on the accuracy of data and can now suggest useful update strategies based on a customer's current landscape and innovation needs. Then, when using the SAP enhancement package installer, the tool's observer mode can be activated to allow several administrators to work on an update process collaboratively, making the whole update process transparent to the team to enable them to make informed decisions.

To better manage the software life cycle, a central change and transport system (CTS) for the SAP NetWeaver platform was introduced to synchronize transport between systems handling both ABAP- and Java-related artifacts. For example, consider a simple SAP NetWeaver Portal scenario: You would like to transport an application's user interface (UI) in Web Dynpro, the logic in ABAP, and the corresponding roles and worksets in the portal to arrange and launch the application. You can only achieve this by linking the transports in one logical step facilitated by the central CTS. The change then takes place on the target application server.

User Interface and Embedded Analytics

The user interface is an integral part of the SAP NetWeaver AS architecture because most modern web UIs are rendered on the server side to

² For an overview of the enhancement package installation process, see "Bring Innovations to Complex Landscapes, Quickly and Easily: How to Implement Enhancement Packages to Fulfill Your Company's Application and/or Technical Needs" by Willi Petri in the October-December 2010 issue of *SAPinsider* (sapinsider.wispubs.com).

provide fast, web-based access for end users.³ The UI strategy for SAP Business Suite is aligned toward the adoption of Web Dynpro ABAP and Floorplan Manager; SAP NetWeaver 7.02 delivered numerous UI capabilities for both design and runtime for use by many innovative SAP Business Suite scenarios.⁴

In addition to UI capabilities, many SAP Business Suite investments leverage the benefits of SAP BusinessObjects solutions in the form of embedded analytics. The idea is simple but powerful: Use the latest and greatest SAP BusinessObjects tools, such as SAP BusinessObjects Web Intelligence or SAP BusinessObjects Explorer, on top of SAP NetWeaver BW.

Users can go a step further and work in near-real time by using the OLTP data and tables stored in SAP ERP to implement Operational Data Providers (ODPs), which are software components within the application server. As transient information providers, ODPs don't extract data and replicate it in SAP NetWeaver BW; they simply provide a transient implementation to the business intelligence (BI) query interface. SAP BusinessObjects tools can then

browse the available BI queries provisioned by ODPs and build applications and reports. Users are also able to link ABAP list viewer (ALV) reports to SAP Crystal reports.

Openness and Development Infrastructure

With SAP NetWeaver 7.30, SAP NetWeaver AS Java tooling fully supports the latest development standards — such as Java Development Kit (JDK) 6; Java Platform, Enterprise Edition (Java EE) 5; and SAP NetWeaver Developer Studio based on Eclipse 3.5 — thereby allowing developers to

³ Applications can also be efficiently delivered over wide area networks; accelerated application delivery for SAP NetWeaver (AccAD) can optimize performance. To learn more, see “Don't Let Latency Problems Reduce Productivity: AccAD Quickly and Seamlessly Delivers Applications to Users” by Jana Richter in the October-December 2009 issue of *SAPinsider* (sapinsider.wispubs.com).

⁴ For more details, see “Paving the Way for UI Enhancements: New Web Dynpro Capabilities Available with SAP NetWeaver 7.0 Enhancement Packages 1 and 2” by Karl Kessler in the January-March 2011 issue of *SAPinsider* (sapinsider.wispubs.com).

work with more modern tools.⁵ From an infrastructure perspective, SAP NetWeaver 7.30 supports IPv6 and includes enhanced globalization, monitoring, and tracing support, which allow for better integration with third-party software and ease the consumption of open-source products in the context of SAP NetWeaver.

While Java development focuses on interoperability, ABAP is optimized for developer productivity, efficiency, and reuse among large teams. To that end, the two codelines — the SAP NetWeaver 7.30 codeline mainly present in SAP NetWeaver PI, and the SAP NetWeaver 7.02 codeline — have been significantly aligned. In fact, the new downward-compatible kernel (SAP NetWeaver 7.20) is applicable to both codelines; these codelines run with the same kernel, enabling SAP to downport many ABAP language and tooling capabilities to benefit SAP Business Suite developers. Several ABAP and Web Dynpro tools have also been enhanced to improve developer productivity.⁶

Administration and Maintenance

Looking at SAP NetWeaver AS from an administrative and operations perspective, there are a few improvements that will ease daily work. With SAP NetWeaver 7.30, the deploy service is now integrated into SAP NetWeaver AS Java, which means that the serialization of the former software deployment manager, and thus a single point of failure, has been completely eliminated. What's more, SAP NetWeaver AS Java supports SAP's Java Virtual Machine (VM) 6, enabling sophisticated features such as on-the-fly debugging and harmonized heap parameterization.

A new configuration tool supports dynamic calculation of formulas for parameters rather than static values to increase consistency as well as to enable “zero administrative capabilities” — that is, to reduce the number of manual administrative steps. Regarding the JDK, SAP's Java VM has been downported to support the

⁵ SAP is also now present in many standards bodies and contributes to various Java communities and standards, such as JCA, JPA, and OSGi.

⁶ See the article referenced in footnote 4, as well as “New Tools and Time Savers for Developers: The Latest from SAP NetWeaver Enhancement Packages” by Karl Kessler in the October-December 2009 issue of *SAPinsider* (sapinsider.wispubs.com).

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JDK 1.4 standard because partner VMs will soon run out of maintenance.

With SAP NetWeaver AS ABAP, a soft shutdown now prevents new users from logging into a server to execute maintenance and related tasks. In addition, some of the well-known system parameters have been “dynamized”—the parameters do not require a system restart after changes are made.

With SAP NetWeaver 7.30, both the ABAP and the Java stacks now have a harmonized instance layout in common to better support high availability scenarios and a homogeneous system layout. The SAP start service has been improved, and the management console has been introduced for better interoperability of ABAP and Java systems.⁷ In addition, the SAP host agent infrastructure is now in place to consolidate the former agent software (SAPOCOL and SAPCCMS).

Security and Identity Management

Security and identity management are increasingly gaining importance in today’s SAP Business Suite implementations. As of the 7.30 release, SAP NetWeaver AS Java fully supports the latest security standards, such as the SAML 2.0 protocol.

To better ensure business-driven, compliant identity management, major recent achievements include the successful delivery of an identity provider and a secure token service. What’s more, Central User Administration (CUA) is now completely replaced by SAP NetWeaver Identity Management (SAP NetWeaver ID Management), and the integration with SAP BusinessObjects Access Control has been enhanced. (Note that security features are part of SAP NetWeaver AS, while SAP NetWeaver ID Management is a separate solution.)

Planned Innovations and Outlook

Looking at the rest of 2011 and beyond, the road of infrastructure innovation at SAP will continue. We plan to keep updating SAP NetWeaver in line with the next SAP Business Suite release and to further innovate in the areas of business process management and process integration. To further support SAP Business Suite, the Operational Data Providers will be equipped with authorization

and hierarchy support for full productive usage, and Web Dynpro applications will benefit from enhanced configuration with easy-to-use tools that work in an ad hoc fashion.

On the development side, SAP will extend the switch framework to cover Switch Business Configuration (BC) Sets, which will allow customers to attach configuration and customization data to a switched business function. On the life-cycle side, the need to split the dual stack into separate ABAP and Java stacks will become more important as customers seek more flexibility to implement new functionality depending on their business needs (please refer back to the “ABAP, Java, and the Move from the Dual Stack to Separated Stacks” sidebar).

And, customers have requested more support for business continuity in the area of enhancement package implementations. We have received positive feedback about the SAP NetWeaver PI and SAP NetWeaver Portal approaches to these implementations and would like to see these scenarios extended to the ERP space.

Overall, SAP NetWeaver Application Server and its surrounding infrastructure are key to running SAP solutions better. The application server in both the ABAP and the Java forms plays a crucial role in fulfilling SAP’s promise to deliver innovation without disruption.

For more details, visit <http://service.sap.com/erp-ehp>, www.sdn.sap.com/irj/sdn/nw-73, and www.sdn.sap.com/irj/sdn/nw-70ehp2. ■

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Additional Resources...

- *SAP NetWeaver Application Server Upgrade Guide* by Bert Vanstichelman, Mark Mergaerts, and Dirk Matthys (SAP PRESS, www.sap-press.com)
- “Define Secure Connections with the Destination Service in SAP NetWeaver AS Java” by Robert Heidasch (SAP Professional Journal, Volume 12, Update 4, www.SAPpro.com)

⁷ The SAP start service and the management console are built into the application server.