

How NetWeaver ESA Will Change (... theWorld of IT)

With the Enterprise Service Architecture (ESA) paradigm, SAP NetWeaver eventually found its true shape. NetWeaver had long been a wacky description for a kaleidoscope of seemingly random compiled applications and bold excursions into the lands of Java. While these motions left the impression of navigating without concrete goal, there is now a vision and the clear claim to be the leader in the market for the Service Oriented Enterprise. SAP conquered the arena with high self-esteem and labelling it with its own distinctive name: ESA. Currently, ESA is still a more a mirage than a real piece of software architecture, but it will change. SAPTIPS authors from the Blue Elephant League had a chance to sneak preview the new NetWeaver 2007 architecture, and for the first time after many years, they seemed to be excited by what they saw of the architecture in construction.

42. 42 is the answer. The fans of Douglas Adams' "the Hitchhiker's Guide to Galaxy" will immediately know what this means. It is an answer where the question is missing. It may well be that many IT people find themselves in a similar situation. ESA is 42. All the big gurus will tell you that ESA is this miraculous new piece of software that will propel your IT into new spheres.

But from the "Hitchhiker" we know that the answer is not enough. We need the question? So we've got ESA now...well, what did we, the SAP customers, initially ask for?

Time for Change

Innovation is the name of the game these days. Change is not only good, it is IMPERATIVE! ESA starts with a business promise: to enable enterprises to re-engineer their automated business processes on the fly. And the re-engineering would not stop at the boundaries of the administrative ERP system but would service the machine shops and pervasive computer applications equally well.

Imagine that the data of any production machinery would be transferred to the ERP central in real-time and data collected from remote workplaces would flow in as they are generated. No more manual re-typing of data, overview of stocks and batches at any time, control of commodity flow from any place on the globe. But It also means that you could combine a sales order product from vendor S with financial module from O, a production planning from M and the delivery and transport planning outsourced to the logistics service partner but yet seamlessly integrated into your ERP.

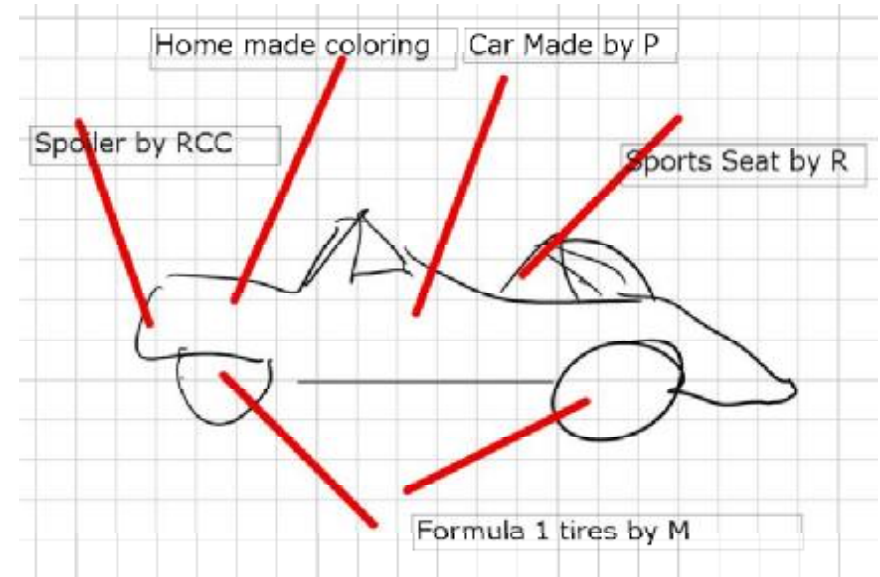


Figure 1a: Just Like Configuring Your Car to Your Liking

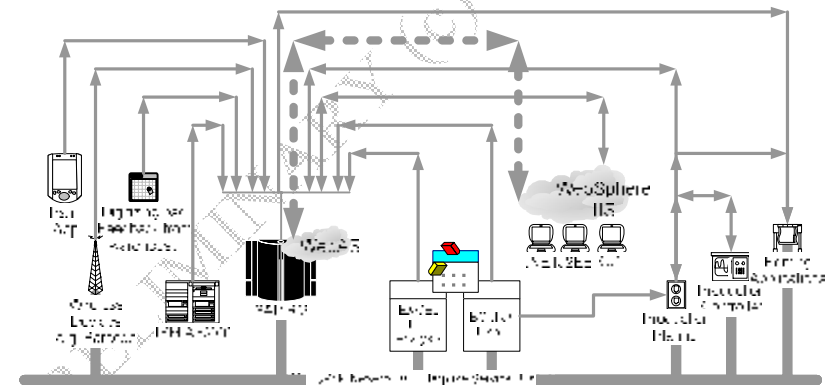


Figure 2a: ... You Can now Build Your IT from the All-Time Best Components

In order to optimize IT for service delivery and to make ESA a reality, IT needs an intelligent infrastructure that simplifies and drives service reuse and delivers reliable integration in our typical multi-vendor environment. In order to fulfil this, IT organizations are introducing an integration layer of abstraction, an Enterprise Service Architecture. This abstraction enables business processes to be exposed as services that are assembled from loosely coupled bits of business logic (that are to be consumed by other services and users). This is a framework not built for applications, but optimized for services.

ESA is new, ESA is stunning, and ESA is hype. And many are tempted to believe that XI is ESA, which is not true. XI is merely a component of ESA. It is an important component that will soon fuse with the SAP AS (Application Server¹). ***Axel/Lynton: We need a segue here?ccDid anybody notice that SAP discontinued updating the public interface repository at <http://ifr.sap.com>? Here you could find the description of the officially released BAPIs and all standard IDocs in text form as well as in web service description language WSDL. That was a great source of information for all of us who wanted to write interfaces into SAP, and now it is gone.

Douglas Adams' hitchhiker story starts with a dramatic scene in which Earth is going to be demolished to give way for a new fancy hyperspace expressway. Good old Earth, all places we were so much used to would suddenly disappear by the will of some Vogons. In the book there will be eventually relief, there is a backup of the Earth. But when the hitchhikers see their old home again they decide for the thrills of the new life they became suddenly used to.

Yes, it is true: everything you want to do with your IT can be done with your current software components. R/3 is doing the big job and if there is some interface that cannot talk directly to it, ABAP will delegate the task to some Windows or Java routine.

But with ESA your software will work quicker, will be easier to develop, and will be, above all, less error prone and much easier to maintain. How can this miracle be done?

- By delegation, reuse, and strict encapsulation of modules
- With full featured message queue functionality to allow asynchronous, but orchestrated processing
- By providing an event orchestration framework across networks

NetWeaver Today

When we speak about NetWeaver we always have to make clear that we are referring to the NetWeaver application framework. NetWeaver is also used as branding for all the new dimension applications provided by SAP AG (or third parties) and run on the NetWeaver architecture. This wider meaning is not what we are talking about here.

The known layers of the NetWeaver stack (see Figure 3) are:

- People Integration Components
 - Portal, BSP, WebDynpro
- Business Intelligence
 - BW, SRM
- Application Integration Framework
 - Exchange Infrastructure XI
- Application Server and Runtime
 - With ABAP and Java personality

The people integration components with Enterprise Portal and other front-end solutions (and the business intelligence) are applications that will benefit from ESA because it will make it easier for them to exchange data between applications.

The application integration framework is needed to control and monitor the data flow between applications: Currently the integration layer is represented by the Exchange Infrastructure which is

¹ Some may have noticed already that the "Web" disappeared from the SAP Application Server; the new official name is SAP AS

still a somehow presumptuous naming. XI is today one of many middleware products that has its main value in integrating the numerous SAP applications.

The application server is the power engine of any application. In an ESA new challenges for the application server become prominent. Monitored execution of applications will be needed both for running applications and also to implement the Enterprise Service Bus. This is the traditionally strong area of SAP. The unique and outstanding ABAP engine provides a robustness which is the reference for every other player in the arena.

So far we spoke about the status quo of the SAP architecture. Some elements of the future transformation are already visible although the architecture is still close to the hybrid conglomerate of the classic R/3. For future challenges in application design a completely revamped infrastructure will be necessary. The goal is making application development easier, allowing to write applications that are more robust and bear less errors and defects and encumber less efforts on maintenance.

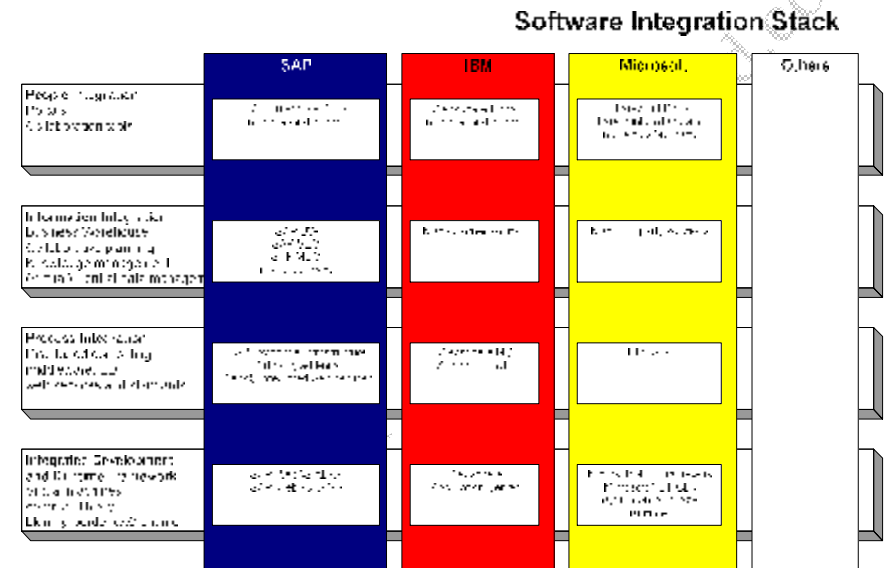


Figure 3: The Service Oriented Architecture Integration Stack

Netweaver in the future

SAP is planning the big bang. Having understood what the nucleus of an Enterprise Service Bus is and how an application server framework around it needs to be designed, SAP revamped the architecture of the AS kernel. Three elements will make the signature of the new kernel:

1. An integrated central message queue service
2. The Enterprise Service Repository
3. The Event transport framework

The Figure 4 we can see that the new NetWeaver will sit on top of a business service repository and an integrated ABAP runtime that bears a full message and event handling engine.

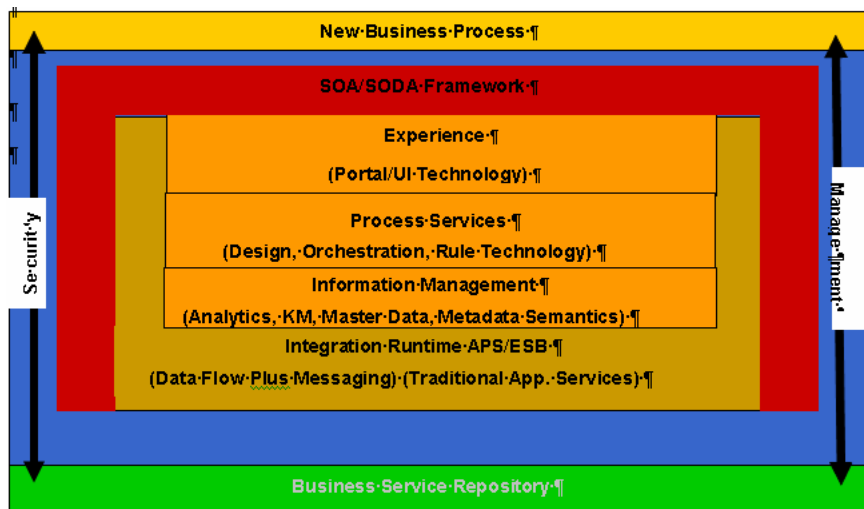


Figure 4: ESA will be based on a Business service Repository and an Integrated Event Runtime

The New NetWeaver Engine

The key to success of ESA is having an integration layer that supports dynamic interactions across services in a heterogeneous environment. Also the integration layer must accommodate the constant evolution of existing services and the rapid addition of new services, as the business grows to add new partners and customers. That way services can evolve without causing disruption in the infrastructure or the costly breaking points inherent in brittle, point-to-point, and hard-coded implementations.

SAP is doing its homework and they mean it seriously when talking about ESA. Here we talk about the power engine of ESA, the new ABAP kernel.

Characteristics of the three essential enhancements to the current SAP AS infrastructure include:

1. A genuine integrated message queue as part of the kernel

That is an overdue feature already today. A reliable and sophisticated message queue service makes an Enterprise Service Bus feasible.

2. The Business Service Repository

The BSR will be the heart of the ESA functionality. Every application running on the SAP AS infrastructure will then register its' service with the BSR. This will allow integrating any third-party Service Oriented Business Application (SOBA) into the AS platform without making modifications to the existing applications. A sophisticated event engine will build the foundation for a sophisticated Enterprise Service Bus that allows an application reacting on the results of another process.

Managing the BSR as well as the orchestrations between the different services will become an absolute necessity. Once services are connected and routing and transformation are in place to support the heterogeneous service interactions, IT needs to be able to access the health and availability of these service interactions to support reliability and performance expectations. An ESA that doesn't support management is similar to a car with no gas gauge or speedometer – risky to drive!

Management and monitoring typically go hand-in-hand. BAM (business activity monitoring) will most certainly mature over time and will be a key role player in a successful ESA implementation. BAM will help tap into ESA message streams in order to determine whether processes and composite applications are providing the best possible business value.

3. An event framework

Events are a crucial and important feature in bus architecture. They only will allow passive and anonymous communication between processes. It is one of the base principles of ESA that processes listen for events to act upon, instead of being explicitly started by a calling process.

New NetWeaver will be a Soft Transformation

Most important to stress is that the new architecture will not be a newly designed platform but be an extension of the existing ABAP development and runtime framework. NetWeaver ESA will run the old applications but provide a framework for newly designed applications to make use of all modern ESA and object oriented features. In order to cater for this ambition NetWeaver ESA will take the proven and rock-solid ABAP engine to house the Business Service Repository and the genuine Message Queue. The illustration in Figure 5 gives an idea of how the new NetWeaver can be imagined.

New business processes will come as packaged modules. Older applications will eventually be made ESA compliant by suiting them an ESA wrapper while keeping the code widely intact. And as the concept will lead into a renaissance of event based computing we shall see an event orchestration framework as a watch dog to assure benign process behaviour.

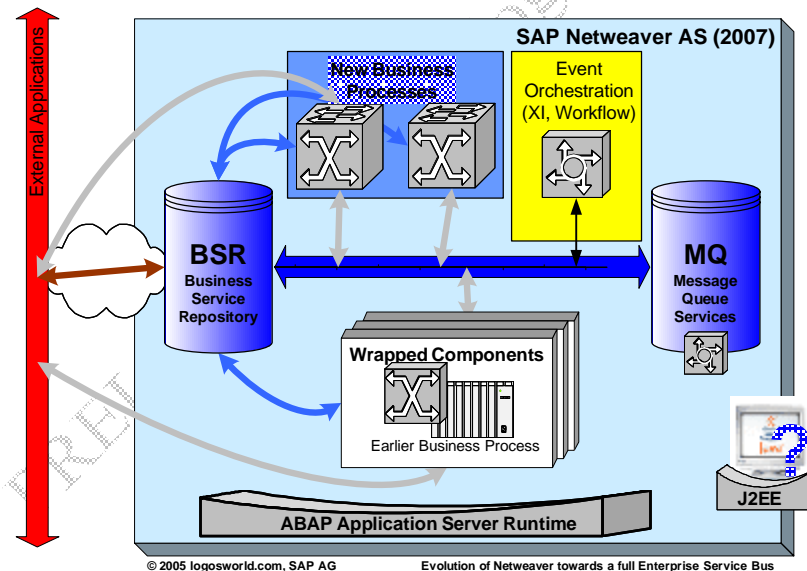


Figure 5: NetWeaver ESA (2007) will come with a genuine message queue and Business Service Repository

The Commercial Side

Something one may have picked up from the recent 2005 SAP TechEd conference in Boston is SAP's clear direction for their integration strategy. The feature that stood out in SAP's strategy was their

partner-focussed approach in building a community around NetWeaver and ESA. The original goal was for SAP to define how they would publish services. Now the goal is to determine the specific service interfaces for the community. This is a task SAP will take up with its partners. In this regard SAP will provide strong support for the "Enterprise Services Community Process" (ESCP), which is a developer's forum, focussed on de- and re-finishing enterprise services and their underlying processes. Partnerships and ESA license agreements seem to be "part and parcel" with the SAP strategy. What is nice about ESA license agreements is that vendors will certify products around SAP ESA, and will hence add credibility to SAP's technology direction. On the other end of the scale, vendors will get early access to SAP's service catalog, along with the huge array of tools to develop user interfaces, application models, security features etc.

The Outlook

ESA will be the front-runner of the new era of Enterprise Service Architecture. Although all big player like IBM, Microsoft or Oracle are heading this direction it is only SAP with its pre-dominance in today's computing centers that will have the power to drive the change with the necessary speed. For highly individual companies like found in process industries ESA will be a serious opportunity to finally come to a reasonable degree of automation that caters for coping with complexity and in consequence reduction of failures and quality leaks. Companies that won't change for ESA – be it NetWeaver or another framework – may soon loose the connection to the trail and find themselves suffering. An SOA approach will be inevitable to remain in the first league of IT. Current SAP users will face an easy upgrade path to NetWeaver thus being the premier choice for a rock-solid and strategic enterprise service bus. The first time for a long while the authors dare to make a suggestion: it is now the right time for change. Any larger IT organisation you should be ready to start a first ESA training and learning study within the first half of 2006 to be prepared for the big change to happen before the decade ends. SAP focussed IT habitats will be on a safe path to consider NetWeaver ESA as their core architecture between 2008 and 2010.