Resource Management in SOA Environments with Adaptive Computing Virtualization

Applies to:
Adaptive Computing Controller in SAP NetWeaver 7.1. For more information, visit the Portal and Collaboration homepage.

Summary
Combining SOA management with Adaptive Computing virtualization technology optimizes the management of large SOA Landscapes. This article outlines benefits and demonstrates a showcase how the management of SAP systems using SOA architectures can be optimized.

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Author Bio
Gunther Schmalzhaf has worked for SAP AG in the area of Adaptive Computing and Virtualization since 2003. As a product manager, he focuses on rolling out information and concept to customers and partners, on the technical implementation and strategic development of Adaptive Computing and Virtualization concepts. He is also responsible for the relationship with SAP technology partners. Before that, he gained 10 years’ experience in working with ERP systems for customers and was a technical consultant in Hewlett-Packard's SAP Competence Center.
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**Introduction**

SAP and SAP Partners offer a lot of functionalities to manage SAP system landscapes. To have these management capabilities available is even more important since customers move more and more in the SOA world. In publications you can sometimes read about that a Service Oriented Architecture (SOA) requires also a Service Oriented Infrastructure (SOI).

The challenge in SOA landscapes is often that the performance requirements are hard to predict. Imagine an employee self service (e.g. users enter working hours to the system) is implemented as web service. In certain situations when a large number of users access the system in parallel, the systems run into performance peaks. Customers have two options to react on this situation:

- **Option 1:** Provide enough server capacity to manage all peaks. The result is in average underutilized servers since the peak time exists e.g. just at month or year end.
- **Option 2:** Size the servers for the average load, resulting in a slow response time during peak time and at the end complaining users.

This showcase shall demonstrate how customers can combine SOA management with Adaptive Computing virtualization technology and with that reduce complexity, increase the flexibility and at the end reduce costs in the management of their SAP datacenter. This could be a first step into an optimized management of SOA landscapes. This showcase was built by Peter McNulty NetWeaver Product Manager for Development Tools and me.

**Showcase Description**

This showcase demonstrates how a solution could look like:

- A SOA management tool monitors quality of the enterprise services.
- When predefined thresholds (Warnings / Violations) are reached, the administrator is notified.
- The administrator can take corrective actions by using Adaptive Computing Controller (ACC) to provide additional resources to ensure that the service stays in target thresholds. Additional information to the ACC can be found on [https://www.sdn.sap.com/irj/sdn/adaptive](https://www.sdn.sap.com/irj/sdn/adaptive).
- With the ACC the administrator provides additional application resources via starting an additional dialog instance.

**Used Components in the Showcase**

The used components used in this showcase are (See Figure 1):

- **Adaptive Computing Controller:**
  It provides the central point of control for flexibly assigning computing resources and managing application services in the SAP system landscape. In our case, ACC 7.1 manages a landscape with 5 Linux servers and a SAP system (SAP ERP).

- **SOA Management:**
  The SOA Management tools used in this showcase is the Amberpoint SOA Management System. For this showcase any kind of SOA Management solution can be used which is able to monitor web services and is able to send alerts when thresholds are reached. The use of SOA management enables the administrator to effective manage an SOA implementation during deployment and runtime phases. It provides the capabilities to safeguard, operate, and evolve your SOA deployment so that you can fully leverage the benefits of service orientation for the business. In our case, Amberpoint SOA Management tool can monitor the web-service connected to the SAP system. When predefined thresholds are reached, the SOA management tool will alert the administrator via a warning e-mail.

- **SAP Web Dispatcher:**
  The SAP Web Dispatcher lies between the Internet and the SAP System. Its function is to distribute the user load between SAP instances. In this showcase the distribution is done between the Central Instance and the Dialog Instance.
- SAP ERP:
  Consists of a database with MaxDB, the Central Instance (CI) with 3 dialog work processes and Dialog Instance (DI) 6 dialog work processes. This system contains the web service.

- soapUI tool simulating SAP-User:
  soapUI is a tool for web service testing. In the showcase this tool simulates a high number of users calling the web service in parallel.

**Showcase Overview**

In Figure 1 can be seen that every system works normally. Only the SAP Central Instance is up and running and the SOA Management is always monitoring the web-service to check if the predefined thresholds of the response time are reached.

![Figure 1](image-url)
Figure 2 shows that the SAP users have started to access the web service. This user traffic in the showcase is represented by two soapUI instances to create the required load.

In Figure 3 can be seen that after the users have started using the web service the SOA Management tool recognizes increasing response times. Soon, the values exceed the thresholds, resulting in a slow response time. That means that the Central Instance does not have enough resources to deliver enough performance.
After the predefined thresholds are reached, the SOA Management tool via an alert functionality notifies the SAP system administrator that some corrective action needs to be taken. To overcome this problem, the administrator starts an additional Dialog Instance by using the Adaptive Computing Controller (See figure 4).

Figure 4

After the Dialog Instance is up and running, Figure 5 shows now that the SAP Web Dispatcher starts directly distributing the load across the two SAP instances. The Central Instance and the Dialog Instance are running together, now they can meet the large needs when a large number of users access the system in parallel.

Figure 5
Meanwhile as it can be seen in Figure 6, the SOA management tool shows that the violated thresholds have been recovered again, although the user load is still on that high level. That means that the response times of the web service went down to an acceptable level. The administrator is then be notified by the SAP management tool via an additional e-mail that the systems work normally again.

**Figure 6**

**Showcase Recording**

Last but not least, below you can find the link to the recording of this showcase on SDN:

https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/f07da335-ca5e-2b10-d786-fab7a19af9ba
Related Content

https://www.sdn.sap.com/irj/sdn/adaptive

https://www.sdn.sap.com/irj/sdn/virtualization

For more information, visit the Portal and Collaboration homepage.