

## SAP - The Business Application Use Case

*With this use case, SAP brings in the perspective of today's business applications, which have to provide unprecedented flexibility to meet business and deployment demands. However, today's execution environments do not address flexible provisioning or deployment methods, nor do they support flexible, Service Level Agreement (SLA)-driven execution. Current infrastructures can neither deal well with rapid, large changes in utilisation (e.g. spikes), nor can they support on-demand provisioning and the secure operation of multiple instances. So future, new on-demand services and business applications, as well as multi-tenant service delivery are the focus of this use case.*

### Description

The business application use case driven by SAP ([www.sap.com](http://www.sap.com)) is about legacy applications in the datacenter. Its focus is rapid provisioning, flexible and effective operations in the datacenter with the goal of reduced TCO. The direction of operational flexibility by virtualization of legacy applications is gaining momentum and is subject of great interest inside SAP and among its customers. The enhanced flexibility given by virtualization technology for provisioning and maintenance of SAP systems is the only effective means for datacenter operations for large-scale enterprise IT landscapes.

In the rapid provisioning scenario we demonstrated a completely unattended and fully automated deployment of a production-grade SAP ERP 6.0 system starting from an OVF descriptor and KVM images. The challenge in this scenario is to demonstrate the flexibility provided by using OVF descriptor as datacenter independent template.

In elasticity scenario we dynamically added or removed VMs hosting SAP components as the load increased and respectively decreased. This scenario makes use of the elasticity rules in the OVF descriptor developed by RESERVOIR as well as leveraging the RESERVOIR monitoring framework in order to enforce these rules.

In the live-migration scenario we actually advanced the state of the art by devising techniques for migrating VMs with very large main memory footprint (such as SAP business applications). As a result of this scenario, an extension to QEMU-KVM was developed and contributed to the KVM open source.

### Scenario

SAP brought in a three-tier business application, which was not designed for deployment on the cloud. In today's world, customers running a SAP application need to overprovision hardware in anticipation of spikes in demand. In this scenario, the advantages of using an elastic, pay-as-you-go RESERVOIR cloud are illustrated as follows:

The SAP customer anticipates a period of peak load that will be beyond the capacity of his on-premise resources. He therefore negotiates an agreement with an Infrastructure Provider in advance such that before and during the surge, part of the load will be directed to the external provider's site, where newly created Dialog



Instances (DI) of the SAP application will handle the demand. Scale-out happens without disrupting the on-line users of the application. There are a few variants to this use case:

- The SAP customer cannot migrate the storage used by the SAP application. In this variant, only components of the application layer are off-loaded to the provider site. The fact that DIs may run in a different site should not impact the response times of the application.
- Since the application is composed of independent DIs, it is possible to off-load complete DIs (including DBMS and storage) to the infrastructure provider. This variant may be enabled when the infrastructure provider already plays the role of a disaster recovery site for the customer and holds a replica of the storage.

Once the surge is over, as indicated either by the actual load or according to a pre-defined schedule, the application setup is reverted to its original state.

### Outcomes

The SAP use cases posed many challenges due to the inherent size and complexity of enterprise applications.

As we overcame the technical obstacles and the business aspects, and as we increased our expertise in the field, we were able to develop and refine the SAP strategy for cloud. We proposed a middle path solution enabling enterprises to adopt a hybrid model between on-premise and on-demand models in order to fully leverage the benefits of the cloud computing paradigm while maintaining their current investment. The advances we made in RESERVOIR, namely rapid provisioning and elasticity based on OVF for complex enterprise applications and the improvements in the KVM hypervisor aim to support both SAP's hybrid applications as well as its cloud-native business applications in order to increase the cloud adoption within the current enterprise IT ecosystem.

*“Participating in RESERVOIR was a strategic natural investment for SAP. From a business perspective, the partnership has been key in the shift towards on-demand Software as a Service, which is crucial in today’s economy. The market trend is the shift away from large, on-premise and expensive licenses to cloud as a service over the net. SAP legacy applications are the heaviest on-premise products so it is crucial to take the lead in this trend. New services are based on subscription fees, reducing operational costs. The economics are clear on-demand and Software-as-a-Service driven by the increasing need to be as efficient and flexible as possible. Cloud offers opportunities to reduce costs as part of a strategic process. The customer and the company both have much to gain from this game-changing technology.”* Eliezer LEVY, PhD, Director, SAP Research Israel

Further information on RESERVOIR can be found at [www.reservoir-fp7.eu](http://www.reservoir-fp7.eu)

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For more information, please contact [reservoir@cetic.be](mailto:reservoir@cetic.be)

