

Introduction to SAP Virtual Machine Container (VMC)

Contents

- What is the Virtual Machine Container (VMC)?
- What applications run on the VMC?
- Turn on the SAP VMC.
- VMC Administration

What is the Virtual Machine Container?

Virtual Machine Container (VMC) is a truly innovative technology introduced by SAP to bring the robustness of ABAP applications to Java EE applications. The Achilles' heel of any Java application is the fact that it shares the Java Virtual Machine (VM) with other applications. If these applications misbehave (go into an infinite loop or somehow trigger a VM crash), our application goes down with them.

Running each application in a completely separate Java virtual machine is feasible, but not very practical as a lot of memory is wasted for all the separate VM copies.

VMC provides a solution that combines the benefits of separate VMs with the ability to share memory. VMC is built on top of Sun Java Micro Edition (ME) and this allows it to provide a separate light-weight Java VM for each process. Behind the scenes, VMC manages memory allocation so that separate VMs can share a common memory pool. At any given time, only a single user is in a given VM process, so a crash will not affect other users.

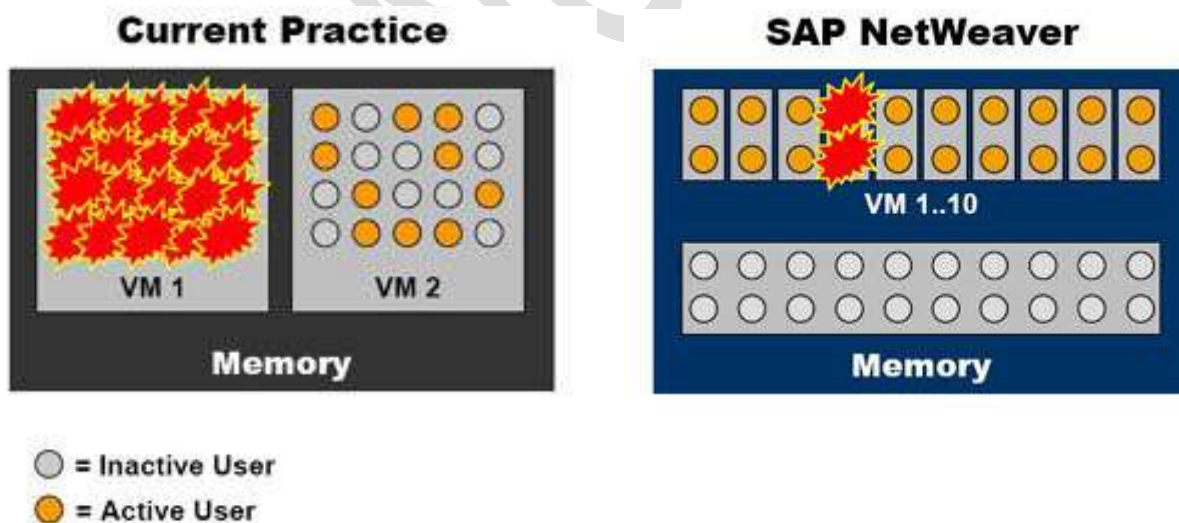


Figure 1: How VMC isolates VM application crashes

The VMC is built into the ABAP application server to take advantage of its management, logging and monitoring tools. SAP apparently decided it is better done this way than attempting to integrate the ABAP stability features into its Java EE server instead.

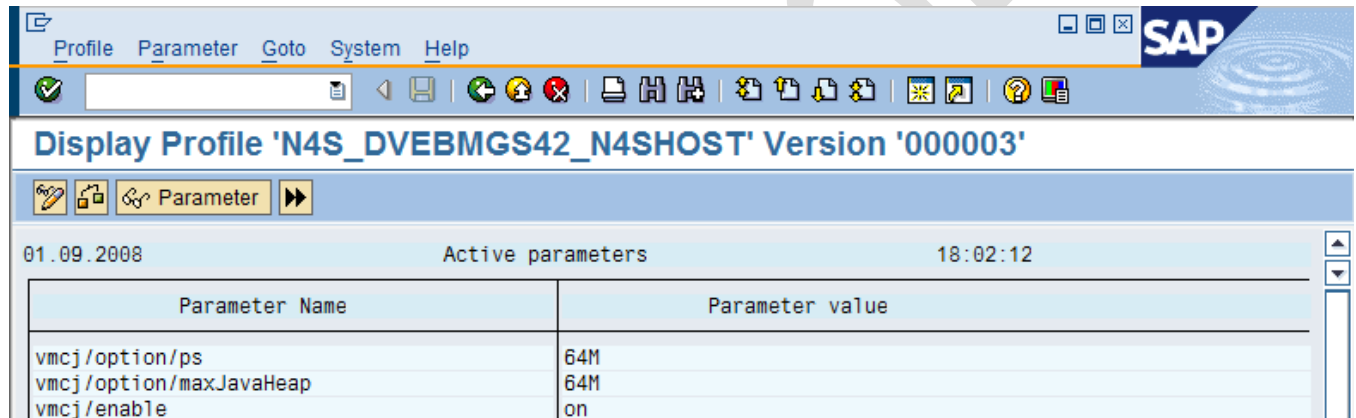
What applications run on the VMC?

Unfortunately, the original grand vision of SAP VMC running many enterprise Java applications and providing seamless integration with ABAP has not materialized yet. For reasons that we can only guess at, SAP decided very early on to close the VMC and not open it up to customer applications. Also, instead of aggressively porting its own growing portfolio of Java applications to the VMC (SAP portals, etc), **SAP ported only ONE application to the VMC**. Would you venture a guess as to which?

Turn on the fun (VMC)

By default, the VMC is deactivated in all SAP NetWeaver based products and needs to be turned on. This is done using the following instance profile parameters:

- **vmcj/enable** - enabling the VMC
- **vmcj/options/maxJavaHeap** – setting the amount of Java heap per each VM
- **vmcj/options/ps** – setting the amount of shared pool memory



The screenshot shows the SAP Display Profile tool interface. The title bar reads 'Display Profile 'N4S_DVEBMGS42_N4SHOST' Version '000003''. Below the title bar, there is a toolbar with various icons. The main content area shows a table of active parameters for the profile 'N4S_DVEBMGS42_N4SHOST' as of 01.09.2008 at 18:02:12. The table has two columns: 'Parameter Name' and 'Parameter value'. The parameters listed are vmcj/option/ps (64M), vmcj/option/maxJavaHeap (64M), and vmcj/enable (on).

Parameter Name	Parameter value
vmcj/option/ps	64M
vmcj/option/maxJavaHeap	64M
vmcj/enable	on

Figure 2: VMC Instance Activation Parameters



More information about how to activate the VMC is provided in OSS note OSS note 854170. VMC itself is upgraded together with the ABAP kernel which is done by the basis team and not covered in this training.



How much memory to allocate to each VM? The default value of 64M is too low for any practical use and you will get various out of memory errors for even the most simple models (NativeOutOfSharedMemoryError and such). A reasonable value is somewhere between 128M and 512M based on your VC model complexity.

VMC Administration

Once activated, VMC is administered using the **SM53** transaction

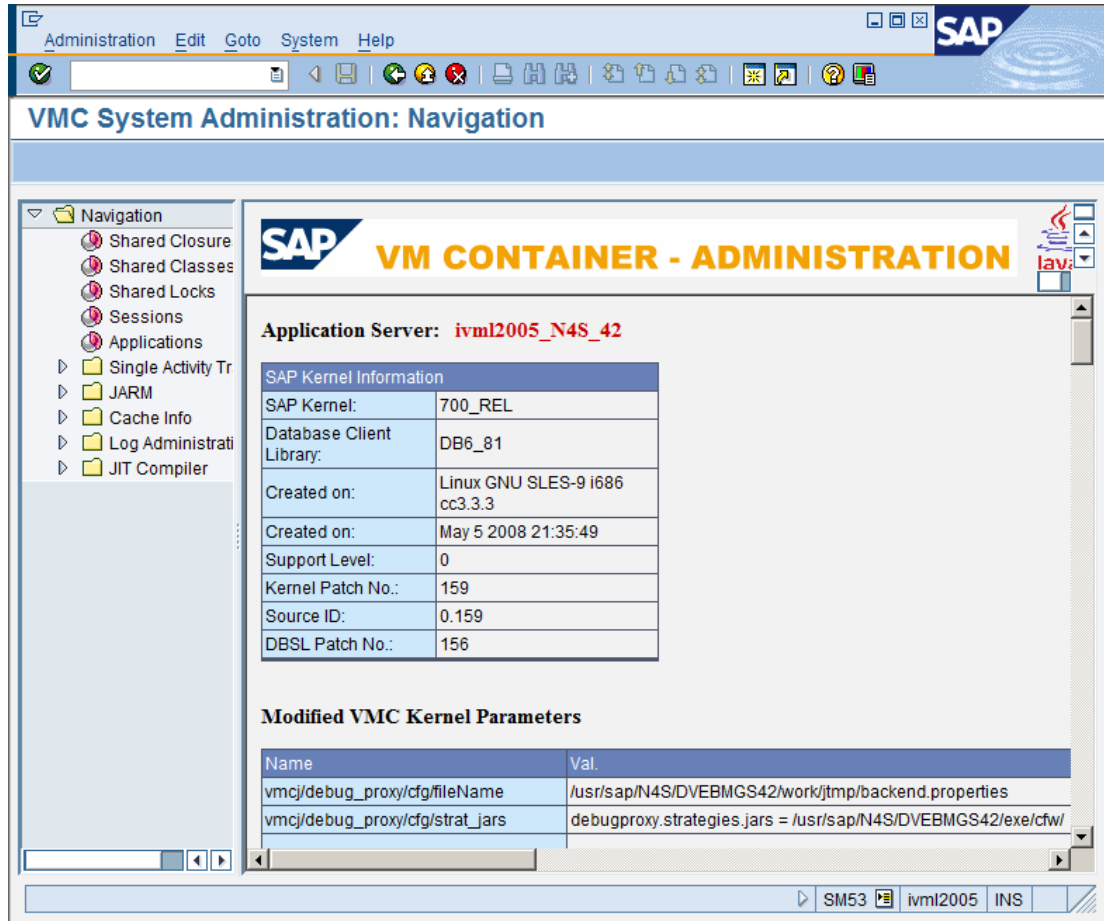


Figure 3: VMC Administration Transaction SM53

The overview of active virtual machines is available in transaction **SM52 – Virtual Machine Overview**.

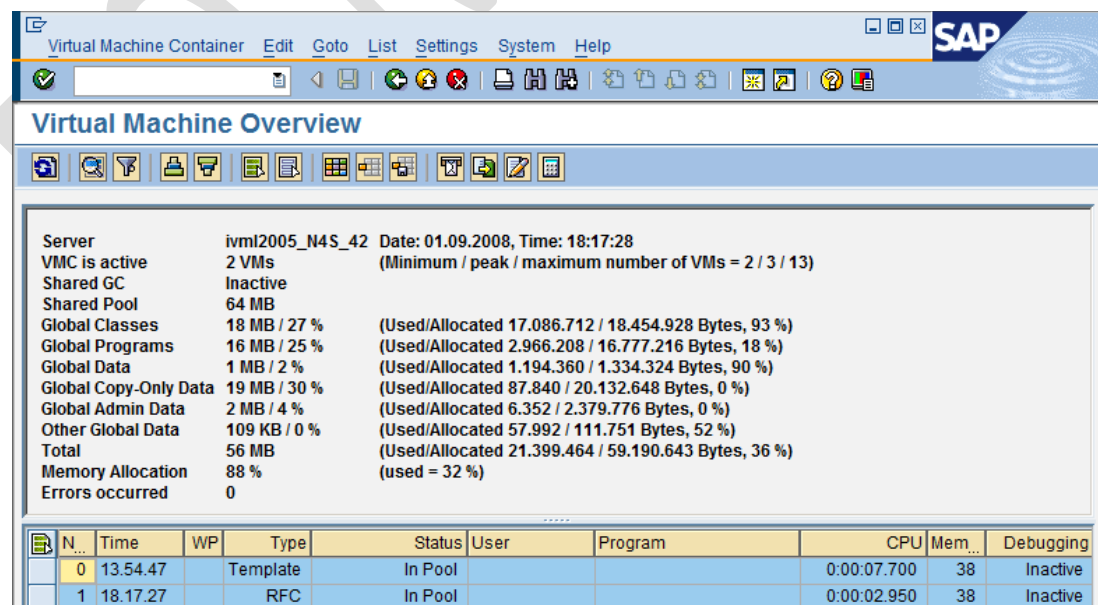


Figure 4: Virtual Machine Overview Transaction SM52

The transactional workload put on the system by VMC is best analyzed through transaction **ST03** (Workload and Performance Statistics) – see the VMC Statistics section.

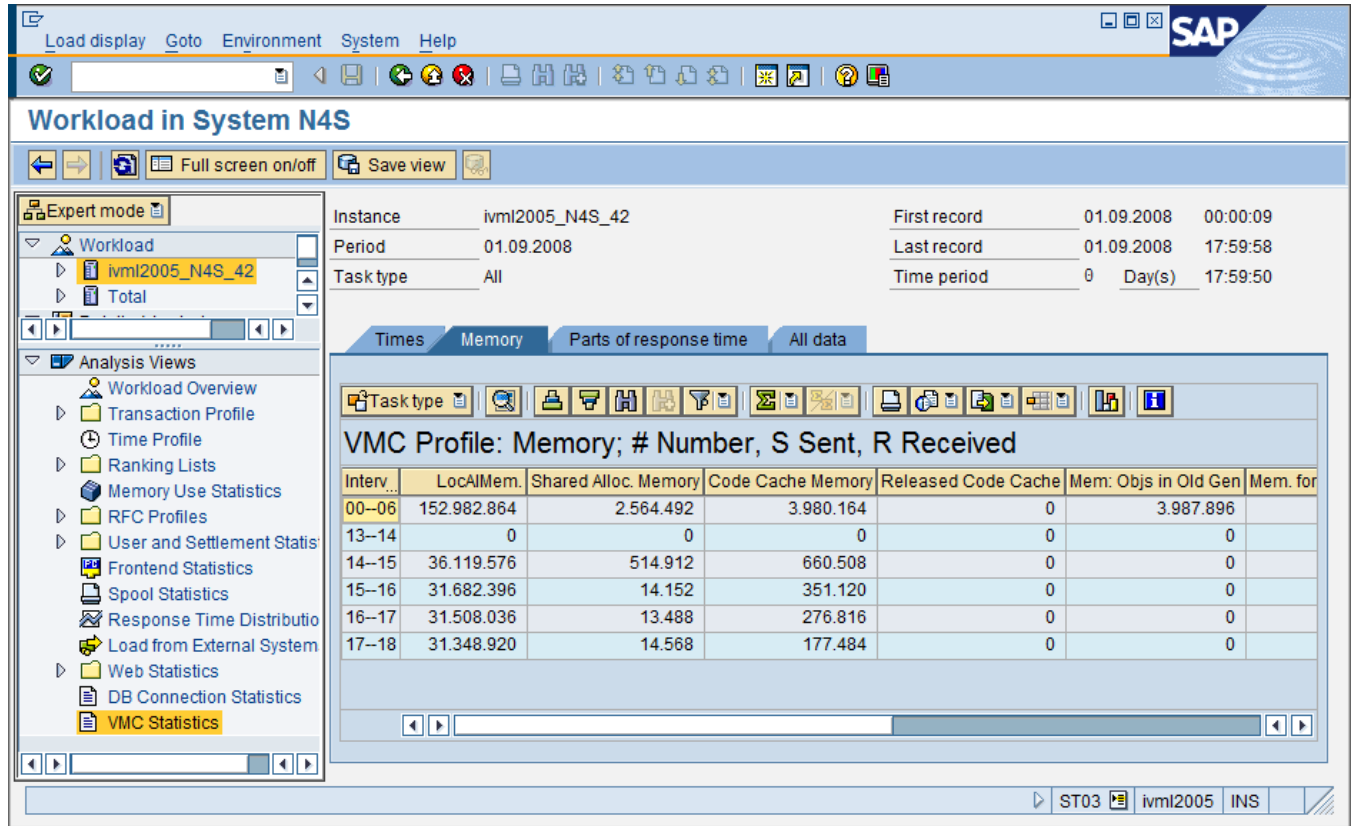


Figure 5: VMC System Workload Monitor

A helpful “health-check” test of the VMC is done through the report **RSVMCRT_HEALTH_CHECK**:

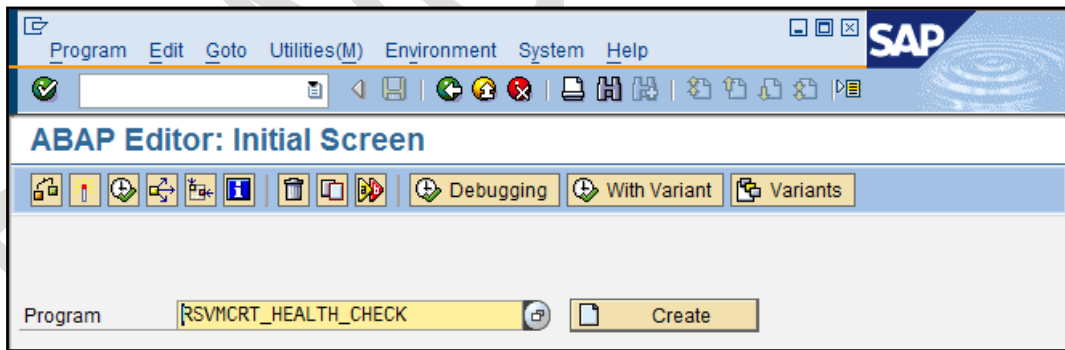


Figure 6: VMC Health Check Report



Figure 7: Results of VMC Health Check