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Fujitsu Technology Solutions

VM2000 (BS2000/OSD)
Version V9.0B
May 2009

Release Notice

*1 Release Notice VM2000 V9.0B

1 General

VM2000 is a virtual machine system that allows different, completely encapsulated system environments to be operated simultaneously on one system with a performance comparable to the "native" mode. Up to 15 BS2000/OSD *) operating systems with the corresponding self-loading systems (SLED, FIRST) or LINUX operating systems can be used simultaneously as guest systems, depending on the system type.

This Release Notice is a summary of the major extensions, requirements and operating information with regard to VM2000
*1 V9.0B under the BS2000/OSD *) operating system.

*1 The release level is that of: May 2009.
*1 Changes to release level May 2007 are marked with *1.

This Release Notice is supplied as a file in uppercase and lowercase. Customers will receive an updated version of this file should any subsequent changes be made. To print this file, use

```
/PRINT-DOCUMENT FROM-FILE=SYSFGM.VM2000-MON.090.E, -
/  DOC-FORM=*TEXT (LINE-SPACING=BY-EBCDIC-CONTR)
```

(English version).

This Release Notice is also available online under
*1 http://manuals.ts.fujitsu.com.

If one or more previous versions are skipped when this product version is used, the information from the Release Notices (and README files) of the previous versions must be noted.

1.1 Ordering

*1 VM2000 V9.0B can be ordered from your local distributors and is subject to the general terms and conditions of the software product use and service agreement.

1.2 Delivery

*1 The VM2000 V9.0B files are supplied via SOLIS.

The following delivery groups are part of the delivery scope of
*1 VM2000 V9.0B:
VM2000-HPV, VM2000-MON and VM2000-UTIL.

The following delivery components are required regardless of the HSI:

SYSRMS.VM2000-HPV.090	RMS delivery set for VM2000 Hypervisor
SYSFGM.VM2000-MON.090.D	Release Notice (German)
SYSFGM.VM2000-MON.090.E	Release Notice (English)
SYSMES.VM2000-MON.090	Message file for VM2000
SYSRMS.VM2000-MON.090	RMS delivery set for VM2000 Monitor

*) BS2000/OSD (R) is a registered trademark of Fujitsu Technology Solutions

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SYSSDF.VM2000-MON.090       SDF syntax file for VM2000 Monitor
SYSSSC.VM2000-MON.090       Subsystem catalog for VM2000 Monitor
SYSENT.VM2000-UTIL.090      Enter file for VMDUMP
SYSLNK.VM2000-UTIL.090      Load library for VMDUMP
SYSMES.VM2000-UTIL.090      Message file for VMDUMP
SYSPRG.VM2000-UTIL.090      Program file for VMDUMP
SYSRMS.VM2000-UTIL.090      RMS delivery set for VMDUMP
SYSSII.VM2000-HPV.090       Structure and installation
SYSSII.VM2000-MON.090       information files for
SYSSII.VM2000-UTIL.090      installation with IMON
```

The following delivery components are only required on S servers:

```
SYSPRG.VM2000-HPV.090       Program file for VM2000 Hypervisor
SYSLNK.VM2000-MON.090       Load library for VM2000 Monitor
```

The following delivery components are only required on SX servers:

```
SPMPRG.VM2000-HPV.090       Program file for VM2000 Hypervisor
SPMLNK.VM2000-MON.090       Load library for VM2000 Monitor
```

The current file and volume characteristics are listed in the SOLIS2 delivery cover letter.

1.3 Documentation

*1 The following documentation is available for VM2000 V9.0B:

User Guide:

VM2000 V9.0A	Order number: U5183-J-Z125-10	German
VM2000 V9.0A	Order number: U5183-J-Z125-10-76	English

The BS2000/OSD basic configuration manuals are also required for operating VM2000.

To use the peripheral devices you will need the corresponding hardware manuals.

The BS2000/OSD documentation is also available on CD-ROM in German and English under the title BS2000/OSD SoftBooks.

The documentation is available as an online manual under
*1 http://manuals.ts.fujitsu.com or can be ordered at extra cost
*1 under http://manualshop.ts.fujitsu.com.

There may also be additional README files for these manuals. They contain changes and extensions to the manual. The file names have the following structure:

```
SYSRME.<product>.<version>.D     (file with German text)
SYSRME.<product>.<version>.E     (file with English text)
```

When printing these files, the CONTR-CHAR=EBCDIC operand should be specified in the PRINT-FILE command.

2 Software extensions

Only the extensions and enhancements over the previous version VM2000 V8.0A are described below.

VM assignment of pubsets

The assignment of the devices of a pubset to a VM has been appreciably simplified. Pubset reconfigurations (e.g. extending) are taken automatically into account. Command procedures for setting up VMs are shorter and less cluttered and no longer need to be adapted, particularly when using the new provisioning tool SPACEPRO in BS2000/OSD-BC V7.0.
The explicit assignment or the definition of options for implicitly assigning a pubset are made via specification of the pubres device or the pubset ID.
With pubset reconfiguration, the VM assignment and the attributes of the implicit assignability for the devices concerned are adapted automatically.

Finer privileging for the implicit assignment of devices

The implicit assignment of devices to a VM (via ATTACH-DEVICE for the device in the guest system) requires the VM privileging and that the device is released for the function.

VM2000 V9.0 allows the devices to be split into so-called assignment sets for the implicit assignment and for granting corresponding VM privileges.

This function opens multiple usage scenarios:
An exclusive set of devices/pubsets can now be defined for implicit assignment to a VM or a VM group.
The VM assignment for pubsets from which the tool SPACEPRO serves itself is implicit. Such a pool pubset can therefore only be released for a selected set of VMs.

Support for SNAP units

For the first time, BS2000/OSD-BC V7.0 supports snap techniques for disks in Symmetrix DMX configurations, in the form of so-called SNAPSETs and SNAP sessions based on the functions for TimeFinder/snap control of SHC-OSD as of V6.0. VM2000 V9.0 shows snap units in its SHOW commands and offers automatic assignment for a VM with corresponding privileges without having to make preparations for this device in VM2000.

Extended support of the I/O resource manager (IORM)

The I/O Resource Manager (IORM) offers functions for autonomous, dynamic control of I/O resources (devices, controllers, channels, paths).
In VM2000 operation, IORM should be in use on the monitor system and on all guest systems. The IORM DPAV function is controlled in the monitor system. The IORM DDAL and IOLVM functions are intended specially for optimizing the VM2000 operation.
The I/O limiting of VMs with IOLVM can be controlled in VM2000 V9.0 via the VM2000 user interface.

Enhanced support for very large configurations

Larger main memory for VMs.

A VM can be assigned main memory > 32 GB with VM2000 V9.0. This also applies for the VM1 that was previously limited to 2 GB. The main memory of the VM1 can from now on be dynamically expanded and reduced.

HIPLEX-MSCF coordinated moving of a VM

A VM is halted while it is being moved in main memory. For VMs that are several GB in size and are part of a HIPLEX-MSCF network, the process leads to a critically long drop-out time. VM2000 V9.0 informs the HIPLEX-MSCF partner of this in advance, thus effectively preventing automatic reconfiguration due to partner drop-out.

Enhanced support for very small VMs

VM2000 V9.0 supports operating VMs with an allocated performance (CPU-QUOTA and MAX-CPU-UTILIZATION) that lies in the area of a thousandth of the server performance. This makes VMs with single-digit RPF performances possible, even on very large S servers. In addition, the VM scheduling for small VMs has been enhanced: smaller time slices ensure more heavily limited but sufficiently frequent CPU accesses.

Combinability of VM groups and CPU pools

VM groups allow service level management for customers with several VMs. Splitting a server into CPU pools improves the VM2000 performance for servers with higher MP grading. VM2000 V9.0 allows VM groups unlimited combination options instead of just the setup in one particular CPU pool.

VM shutdown and coordinated VM2000 shutdown

The VM2000 administrator now has the option of initiating shutdown for single VMs. It is now possible to initiate a "shutdown" enter job in addition to executing the SHUTDOWN command. Another new function is the option of VM2000 shutdown that is coordinated between guest systems and the monitor system. An automatic shutdown is first initiated in all OSD V7 guest systems and after the guest systems have terminated, VM2000 is also stopped via shutdown in the VM1.

Enhanced performance monitoring with SHOW-VM-STATUS

The VM2000 SHOW-VM-STATUS command supplies CPU utilization data and internal performance parameters in a periodic output. From now on, the command also offers the one-time, synchronous output of the measurement data from the immediate past. In contrast to the periodic output, this function is not restricted to just one workstation.

New commands

ASSIGN-VM-GROUP-TO-CPU-POOL, CREATE-VM-ASSIGNMENT-SET, DELETE-VM-ASSIGNMENT-SET, SHOW-VM-ASSIGNMENT-SET, SHUTDOWN-VM.

Extended commands

ADD-VM-DEVICES, ADD-VM-TO-VM-GROUP, ASSIGN-VM-TO-CPU-POOL, CREATE-VM, CREATE-VM-GROUP, EXTEND-VM-MEMORY, MODIFY-VM-ATTRIBUTES, MODIFY-VM-DEVICE-ATTRIBUTES, MODIFY-VM-DEVICE-USAGE, MODIFY-VM-GROUP-ATTRIBUTES, MOVE-VM, REDUCE-VM-MEMORY, REMOVE-VM-DEVICES, REMOVE-VM-FROM-VM-GROUP, SHOW-VM-ATTRIBUTES, SHOW-VM-CPU-POOL, SHOW-VM-DEVICE-STATUS, SHOW-VM-RESOURCES, SHOW-VM-GROUP, SHOW-VM-RESOURCES, SHOW-VM-STATUS, SWITCH-VM-DEVICES.

3 Technical information

3.1 Resource requirements

The following memory space is required at runtime:

Real address space	static for the VM2000 Hypervisor as of 4 MB, depending on the IO peripherals. Up to 255 MB can be set via the parameter service.
	static for the monitor system at least 32 MB (S servers) at least 128 MB (SX servers)
	static for the main memory required by the guest systems
Virtual address space: (in monitor system)	approx. 0.8 MB static approx. 0.3 MB dynamic, depending on the number of VM administration dialogs ($VMCONS)
Static disk storage space:	less than 10 MB
Dynamic disk storage space:	approx 2-3 MB on the SYSDUMP ID per automatically created VMDUMP

3.2 Software configuration

*1 VM2000 V9.0B will run in a monitor system with BS2000/OS-BC
*1 Version V6.0, V7.0 or V8.0 (in software package OSD/XC as of V2.0 for SX servers).

The following are supported as guest systems:
- BS2000/OSD-BC V5.0, BS2000/OSD-BC V6.0, BS2000/OSD-BC V7.0 and BS2000/OSD-BC V8.0 (in software package OSD/XC as of V1.1 for SX servers.
- The associated self-loading systems (FIRST, SLED)
- Linux systems (on S severs, using VM2000-Linux V9.0)

*1 SX servers SX160 and SX100-D support monitor and guest systems
*1 BS2000-OSD/BC as of V7.0 (OSD/XC V3.0).

OMNIS as of V6.2 or an appropriate DCAM application is required for connecting to $VMCONS.
As of OMNIS V8.1, the color control and message table functions are also available for dialog via virtual consoles.

3.3 Product installation

Installation of the product VM2000 with the Installation Monitor IMON is mandatory. The installation information in the delivery cover letter and the product manual must be observed.

The necessary inputs and the sequence of the installation with IMON are described in the IMON documentation.

3.4 Product use

You will find information on using VM2000 V9.0B in the VM2000 V9.0A manual.

If monitor system BS2000/OSD V6.0 is in use, the version must be
*1 set to V09.0A or V9.0B in the parameter service, otherwise default version V08.0A is selected.

*1 Courses on VM2000 V9.0B are offered by Fujitsu Technology
*1 Solutions (http://www.ts.fujitsu.com/services).

3.5 Obsolete functions (and those to be discontinued)

The following functions are no longer supported as of this version:
Support for guest systems BS2000/OSD-BC to V4.0 (on S servers).
The sub-operand value CHANNEL-TYPE=*1 in operand TYPE = *VC is no longer offered with the ADD-VM-DEVICES command.

3.6 Incompatibilities

*1 VM2000 V9.0B is fully compatible to VM2000 V8.0A apart from the following restrictions:
The output format of the information commands has been changed.
The previous data structures in VM accounting and the monitor JV for memory reconfiguration no longer supply the correct values for VMs with main memory greater than 32 GB.
The values are stored in new or extended fields.

3.7 Restrictions

The boundary conditions required for operating VM2000 are described in the VM2000 V9.0A manual, section 2.5.

On SX servers with X2000 V3.0A, the SNAP display for disk peripherals on the FC is not set correctly and SNAP units can therefore not be assigned automatically. Workaround via explicit/implicit assignment, use of optional correction A0556330-001 or use of the X2000 correction level V3.0A0903.

If MOVE-VM is used to move a VM on SX servers with X2000 V3.0A, a global I/O block for disks and communications devices is set on the FC. If VMs larger than 4GB are moved, this can lead to the communication connections being broken off and to error messages or disk I/Os (MSCF network) in the other guest systems. This problem does not occur on SX servers with X2000 V4.0A.

3.8 Procedure in the event of errors

If an error occurs, the following documentation is required for diagnostic purposes (see chapter 7 "Error handling in VM2000" in the VM2000 V9.0A manual):

- With VM2000 startup errors and Hypervisor system crashes, the console log and a SLED of the entire system.

- With a monitor system crash, the console log and a SLED of the monitor.

- With a monitor or $VMCONS error (task VM2M, VM2G, VM2P and VM2C) the CONSLOG file, the system dump and, if available, the automatic VM2000 dump.

- With errors involving devices, the CONSLOG file and a VM2000 dump of the running system.

- With a system crash or hangup in the guest system, a SLED of the guest system and, possibly, the automatic VM2000 dump.

You should also always include a detailed description of the error condition and information as to whether and how the error can be reproduced.

4 Hardware support

*1 VM2000 V9.0B is executable on all current S servers and SX servers (as of X2000 V3.0 co-system) at all configuration levels.

All peripheral devices are supported that can be connected to the hardware and are supported as of BS2000/OSD-BC V5.0 (S servers) or as of X2000 V3.0 and OSD/XC V1.1 (SX servers).