

White Paper

FUJITSU Software BS2000 OSD/BC V11.0

The main emphasis in BS2000 OSD/BC V11.0 is the Net-Storage interoperability with SAM files and means to improve the concept of availability like rounding to Live Migration functionality and increase of availability on storage failure.

The supply of encryption features in the operating system BS2000 as well as support of hardware innovations and extension of diagnostic functions round the new version of the operating system.

The important functional extensions in OSD/BC V11.0 are:

Availability

- Moving to Live Migration functionality of SE servers
- Increase of availability on storage failure

Extended storage integration

- Net-Storage interoperability with SAM files

Security

- Availability of cryptographic functionality in operating system BS2000

Extension of system limits

- Support of maximum memory size in SNAP
- Extension of maximum size of SLEDFILES to 256 GB
- Support of big files on home pubset

Scaling / performance

- Improved I/O performance for NK disks
- Improved performance in VERIFY function

Manageability / ease-of-use

- Improvements in pubset management
- Equalization of saturation levels of paging area

Openness and integration ability

- New version POSIX A45

Dates to OSD/BC V11.0:

- Pilot release / T50: March 2017
- General release / B70: July 2017

The release of new versions for the SW products takes place within the timespan of OSD/BC V11.0. This document also describes the main function extensions for many of these products.

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New features in BS2000 OSD/BC V11.0

Hardware support

Support of FUJITSU Server BS2000 SE and S series

OSD/BC V11.0 supports the Server Units x86 and /390 of BS2000 SE Servers and the current released S Servers S175 and S210. The Server Units of SE Servers are supported from SE V6.1 (M2000/X2000/HNC V6.1).

OSD/BC V11.0 is released for SE Servers as part of the package OSD/XC V11.0. For S Servers OSD/BC V11.0 is only separately available and not in the OSD/XC package.

To general release of OSD/BC V11.0 SQ100 and SQ200 have reached MEK90 or will reach MEK90 promptly. Only the SQ210 will still be covered by service (MEK90 in 12.2019).

Experience has shown, that SQ server customers often remain on the BS2000 version, the server was shipped with. Therefore OSD/BC V11.0 is no longer released for SQ210.

Peripherals connection via Fibre Channel respectively SAS

Fibre Channel is now the standard connection technology for disk and tape peripherals. It can be used on all BS2000 operating system versions as of BS2000/OSD-BC V5.0B and on all current server models.

Regarding OSD/BC V11.0 BS2000 only supports disk and tape peripherals with connection via Fibre channel or SAS (disk subsystem ETERNUS JX40 and tape storage ETERNUS LT40 on SE x86).

A connection of peripherals on S servers via channel type S is thus no longer supported as of OSD/BC V11.0 (on SE servers the connection via channel type S was never supported).

The result is that SPD (shared private disk) is also no longer supported.

Support of hard disks with 4k sectors

Hard disks with 4K sector size are currently emulated as 512 byte sector size (512e Mode), for example by ETERNUS DX S3.

For the operating system this disk looks like 512 native and BS2000 currently supports it in the disk format NK2 or K2.

To be prepared for the future BS2000 supports hard disks with 4k sectors via disk format NK4 for data pubsets as of OSD/BC V11.0

Availability

Roundings to Live Migration functionality of SE servers

OSD/BC V10.0 already has a range of measures implemented in order to support Live Migration on the SE server.

To round out the LM functionality, adjustments in I/O management were conducted in OSD/BC V11.0:

The prerequisite for LM is a standardized I/O generation on the systems involved. These prerequisites must be checked before implementing Live Migration. After the system has been migrated, the path masks must be adapted to the current configuration of the target Server Unit.

Increase of availability on storage failure

Information about mirror disks in the running system are not deposited up to and including OSD/BC V10.0. Data regarding the remote mirror is located on the PUBRES disk. When the source disks are down, the information about remote mirrors is probably not available - activation is then only possible via specification of the MN. If a paging disk cannot be reached, this can result in a system abort under certain circumstances.

In order to improve the availability in OSD/BC V11.0 to all current pubsets in the system, the information regarding this and the associated mirror disks (REC, SRDF or DRV mirror disks) are recorded dynamically in the class 4 memory and regularly updated via the Resource Manager IORM.

This improves the failure handling after storage failure and successful storage switching. When one paging disk is down, the I/O can, for instance, be automatically redirected to an internally determined mirror disk (REC, SRDF). Furthermore, simplifications arise for the administrator as the attach of a pubset can happen through inserting the catid without previously determining the MN of the PUBRES mirror disk.

Extended storage integration

Extensions for Net-Storage

Net-Storage interoperability with SAM files

The new file type node file has been introduced with OSD/BC V10.0. Node-Files are on Net-Storage and can be processed by BS2000 systems and by open systems. Only PAM files are supported in OSD/BC V10.0 as Node-Files. In order to enable in future a text-based exchange between BS2000 und systems in the open world, it is realized for SE servers (from SE V6.2) in OSD/BC V11.0 to store SAM files (with the record format RECFORM=V and in the format BLKCTRL=DATA) as Node-Files in a format which can be understood by systems in the open world.

When writing or transferring a logical SAM block to Net-Storage the block control field and data length fields must be removed, or a code conversion must be made and a line feed (LF) must be inserted after each record. Vice versa, when reading the data, SAM blocks must be set up which contain, at the beginning of each logical block, a block control field and data length fields as well as the records from the node file.

Code conversion

Character sets are used within BS2000 which are usually different to those in the open world (e.g. ISO646, ISO-8859-x, UTF-8). Therefore, a conversion of the EBCDIC character sets from BS2000 applications to character sets in the open world should be offered for the exchange of text files between BS2000 and the open world and vice versa. Code conversion must be configured specifically for each file. The character sets used are defined in the catalog entry of the file. The previous CCSN describes the character set used in BS2000. The Net-Storage coded character set name (NETCCSN), which describes the character set of the file used on Net-Storage and thus in the open world, is also introduced with OSD/BC V11.0. If the user does not define a NETCCSN when creating a SAM-Node-File, a standard definition must become effective. For this purpose, a new CLASS2OPT, the Net-Storage code (NETCODE), is introduced analog to the already existing HOSTCODE.

User interface

The Net-Storage interoperability with SAM files requires enhancements on the command interface; so, for example, catalog entries for SAM-Node-Files can be created with the command IMPORT-NODE-FILE or the character set used on Net-Storage can be defined in CREATE-FILE command.

SAM-Node-Files are first supported in SYSDFILE, CRTE, EDTU, LMS, HSMS/ARCHIVE and openFT.

Identification of Net-Client

From OSD/BC V11.0 for identification of Net-Clients optionally the IP address or the BCAM name of the Net-Client can be used in commands, for example in SHOW-NET-STORAGE or MOUNT-/UMOUNT-NET-STORAGE.

LM support

Prior to moving the VM guest systems it is necessary to terminate the connections to the net server. After the move the connections to the net server should be set up via the net client (HNC/X2000) in the target Server Unit and the previously closed mounts should be configured. It must be possible to access the net clients in both computers via the same LOCLAN address.

ETERNUS DX (unified storage) as NAS storage for Net-Storage

The storing of Net-Storage files on the unified storage of ETERNUS DX should also be possible with OSD/BC V11.0. So far, only the NAS connection of ETERNUS CS8000 was released as NAS storage for Net-Storage.

Security

Cryptographic functionality in BS2000 basic configuration

From OSD/BC V11.0 cryptographic functions for customer application and internal components are provided as an element of the operating system BS2000 on all servers. In the delivery unit CRYPT the elementary operations are available for performance encryption and decryption of small amounts of data. The encryption function is realized as a software solution and is used on BS2000 CPUs. For larger amounts of data the performance is taken into account.

In the command interface the user commands ENCRYPT-FILE and DECRYPT-FILE use the CRYPT mechanism to encrypt the data.

This function replaces the openCRYPT products (openCRYPT-SERV, openCRYPT-SOFT and openCRYPT-BOX), which will be withdrawn with the release of OSD/BC V11.0.

Extension of system limits

Support of maximum memory size in SNAP

The product SNAP interrupts the operating system and ensures the contents of specific memory areas in a consistent manner. It supports - as far as OSD/BC V10.0 - main memory with a size of up to 256 GB.

The customer trend to use larger main memory is increasing. In order to enable in future the addressing of the entire main memory irrespective of the number and position of the pages, the maximum memory size of 1 TB is supported by SNAP from OSD/BC V11.0.

Extension of maximum size of SLEDFILES to 256 GB

The product SLED writes - after a DUMP-IPL - the important memory areas required for the diagnostics (in standard situation the system memory and selected TU pages) into a dump file, the so-called SLEDFILE. The size of a SLEDFILE today is limited to 32 GB. As main memory size is increasing, especially on x86 servers, the requirement for larger SLEDFILES is clear.

In OSD/BC V11.0 the maximum size of the SLEDFILES is to be extended to 256 GB.

Support of big files on home pubset

In order to optionally store the SLEDFILES on the home pubset, there must be an option of storing large files on the home pubset (files > 32 GB). Thus BS2000 supports on all pubsets large files with a capacity up to 4 TB.

Scalability / performance

Improved I/O performance for NK disks

In OSD/BC V11.0 access to NK disks is to be optimized by reducing SCSI operation tables. These measures are expected to improve performance on disk access for /390 servers by up to 10%.

Improved performance in VERIFY function

The implementation of a REPAIR-DISK-FILE command (VERIFY function) can take an extremely long time with very large ISAM files; it particularly delays the restart of applications after a system abort. In OSD/BC V11.0 various measures were implemented in order to clearly improve the runtime, e.g. use of larger data buffers when reading and avoid ISAM INSRT.

The most significant increase in performance is expected by using DAB caches. Procedure templates to frame the VERIFY functionality with DAB are provided; they must be adapted per customer. These measures reduce the duration from several hours to clearly under one hour. This additional performance increase requires the use of the billable product DAB.

Optimized sort algorithm in SHOW-FILE-ATTRIBUTES command

Improvements through the optimization of sorting algorithm are mainly obtained for large amounts of files. The most significant performance improvements appear when the files were already pre-sorted and stored in the catalogue entry, for instance when they were generated in a sorted sequence.

Optimized multi-processor performance

When there is extreme I/O load, a throughput much worse than with smaller models was observed for servers with a high multi-processor degree. The cause was basically the high number of cache-to-cache misses, due to frequent accesses to central lock fields for various CPUs on different system boards.

Further optimization of multi-processor performance was possible in OSD/BC V11.0 by minimizing the cache-to-cache conflicts via source corrections in shared-lock handling of Nucleus Lock Manager.

Modification of the maximum number of JIT big pages in the running system

Today it is only possible to reduce the limit for the maximum number of JIT big pages. From OSD/BC V11.0 the increase of the number of big pages to the original maximum size is possible in the running system, by specification of a greater BIG-PAGE-QUOTA in the command MODIFY-MEMORY-PARAMETER.

Furthermore big pages, which were cancelled as part of core saturation, are to be automatically set up again when there is sufficient memory available again.

Manageability / ease-of-use

Rectification of capacity scale in the paging area

Situations with rapidly increasing demand for pageable storage (requirement for large storage areas both from TU and TPR) can suddenly result in a bottleneck of the available free pages in the paging area. Here it was observed that the capacity levels are unfavorably distributed and communication is inadequate once a capacity level is reached.

From OSD/BC V11.0 the limits for the capacity levels of the paging area is configurable on a customer-specific basis by means of a newly introduced parameter in BS2000 parameter file.

It is also possible to set a threshold for the minimum number of free pages in the paging area by means of an additional parameter, below which a capacity report is shown at the console.

New parameter pubset ID for the paging area commands

To date it has only been possible to execute the commands for the administration of the paging area by specifying the volumes (VSN) of a pubset. Since the paging files are to be found on pubsets, the specification of the catid of a pubset in the appropriate command makes sense as an alternative. The following paging area commands should be extended in OSD/BC V11.0 to include an operand

- CREATE-PAGING-FILE
- EXTEND-PAGING-AREA
- REDUCE-PAGING-AREA
- MODIFY-PAGING-AREA-ATTRIBUTES
- DELETE-PAGING-FILE
- SHOW-PAGING-CONFIGURATION

Improvements in pubset management

New parameter ALTERNATE-MASTER

The command SET-PUBSET-ATTRIBUTES is used to define a MASTER, a BACKUP-MASTER and an ALTERNATE-BACKUP for each pubset. The BACKUP-MASTER can currently only be MASTER if the MASTER fails. This requires the BACKUP-MASTER to be active at this time. If the

BACKUP-MASTER is active when there is no MASTER for the pubset, it waits for the MASTER. It would be better if it became MASTER even if the MASTER has failed beforehand, but this would be an incompatible change of behavior.

A new parameter ALTERNATE-MASTER has thus been introduced in OSD/BC V11.0 which defines whether the BACKUP-MASTER must wait for the MASTER or whether it may execute a MASTER import even if there is no MASTER.

Improved protocol and diagnostic functions in error situations

- The FORCE-PUBSET-EXPORT command, which forces a pubset to be exported, is also logged on the console as of OSD/BC V11.0.
- The SHOW-PUBSET-IMPORT-EXPORT command informs system support about the current processing status of all the pubsets that are just being imported or exported. In future, the status in which an export and import process hangs (e.g. Net-Storage, CCOPY status) will also be shown in error situations.

Program interface for SHOW-MEMORY-POOL-STATUS

The functionality of the command SHOW-MEMORY-POOL-STATUS, which provides information about the memory pools created in the current system, is available as of OSD/BC V11.0 at program level in the form of a new macro SHOWMP. Thus it is possible to monitor the active participants of common memory pools via a program.

Furthermore, structured output in the S variable is available for the command.

New internal BS2000 command SHOW-FC-INFORMATION

The functionality of the SANCHECK statement SHOW-SAN-CONFIGURATION is also available as of OSD/BC V11.0 at BS2000 command level via the new command SHOW-FC-INFORMATION for internal use.

The information shown is required in the SE Manager for the functionality FC Networks. The installation of SANCHECK is no longer necessary for this overview.

Enhancements in Operating

Increasing the number of logical consoles

In OSD/BC V11.0 the number of logical consoles is increased as follows:

- The total number of logical consoles has been extended today from 192 to 512
- The maximum number of logical consoles with a fixed permission name has been extended from today's 64 to a future 384
- The maximum number of consoles with dynamic permission name results from the difference in the total number of logical consoles minus the number of the used logical consoles with a fixed permission name (but at least 128).

New parameter SHOW-CONSOLE-STATUS command

The selection criteria TYPE and STATE to limit the output are also offered in the command SHOW-CONSOLE-STATUS

Last Byte Pointer (LBP) – display and selection

In BS2000 a new file attribute depicting the byte-exact logical file end for PAM files was introduced. Comparable to the last page pointer, which shows the last valid page of the file, the last byte pointer points to the last valid byte of the last logical block of the file. This new file attribute in OSD/BC V11.0 is transparent for the user due to extended display and recovery functions:

- display and selection by LBP in the command SHOW-FILE-ATTRIBUTES
- delete or reset the LBP_valid file property in recovery and verify functions

Automatic setup of further system user IDs

From OSD/BC V11.0 the user IDs SYSSAG (for IMON), SYSFJAM (for openFT) and SYSDB (for BS2000 database systems) are established automatically during import of the pubset and equipped with the standard attributes.

Hardware-dependent standard value for the VM2000 version

If a value for the VM2000 version was not explicitly entered in the BS2000 startup parameter file in OSD/BC V10.0, VM2000 V11.0 was assumed as the standard value. This value was tailor-made for use on the SE server. However, VM2000 V11.0 is not released for S and SQ servers.

In OSD/BC V11.0 the default value is implemented for the VM2000 version in the BS2000 parameter file on a HW-dependent basis:

- VM2000 V10.0 for S servers
- VM2000 V11.5 for SE servers

Openness and integration ability

POSIX A45

Following functional extensions were implemented in POSIX version A45:

■ **Synchronization of POSIX on dynamic changes in BCAM**

Dynamic changes of BCAM in the configuration of local network interfaces (e.g., enabling and disabling virtual hosts) are recognized by POSIX from A45; so far this information was only available after a restart of POSIX.

■ **Tools "zip" and "unzip"**

The "zip" and "unzip" tools are provided from A45 as official POSIX tools.

■ **Support of sudo commands**

Support of sudo commands (sudo, visudo) as an official POSIX tool. Sudo is a command under POSIX which is used to start processes with rights of another user (e. g., of a superuser SYSROOT) without knowing their password.

■ **Extensions for TCP_KEEPALIVE**

With POSIX A45 the tuning of the line monitoring using the TCP protocol (TCP_KEEPALIVE) is provided by extended functionalities in POSIX and the POSIX sockets.

■ **Extension of the function sysconf()**

The sysconf() interface is extended by the parameter for output of the number of installed processors, as well as the number of processors available online.

■ **Increase of maximal values for NOSTTY**

The maximum number of possible system file terminals (STTYs), which POSIX supported so far, is a bottleneck for current applications. Therefore the maximum value for NOSTTY is increased.

Unification

NK-ISAM as the default value independent of the disk type

Up to OSD/BC V10.0, the file format was derived from the disk type, if not explicitly specified. The two fundamental ISAM file formats were K-ISAM files for K disks and NK-ISAM files for PAMKEY-less disks.

From OSD/BC V11.0 an ISAM file is always created as NK-ISAM file. A different default value can be set via a new CL-2 option "ISAM-Default" (ISBLKCTL). NK-ISAM covers the entire range of functions of K-ISAM. The user interface of the two file formats is already identical.

A K-ISAM file can still be created if the setting BLKCTRL=PAMKEY is selected explicitly.

Installation of BS2000 from standby pubset

The initial installation of BS2000 happens, in case of SE from V6.2 for SU x86 and SU /390, through IPL of standby pubset and subsequently by means of COPY procedures from the current system. Therefore, for SU x86 and SU /390 a standardized function of the standby pubset will be available – also for the BS2000 initial installation for customers.

In OSD/BC V11.0 the offline initial installation of the so-called starter tape (CD-ROM/EMFILE) on /390 servers is therefore not supported anymore. Offline initial installation is no longer required for S servers that are available in the field – all our customers have installed systems. Furthermore, a startertape is still available in OSD/BC V10.0 so that it can be used for an offline initial installation (after a total breakdown of all the storage systems). The OSD/BC V11.0 system can therefore be installed with the running OSD/BC V10.0 system. However, the relevance for this application case is extremely low.

Extensions in SWK products

Extensions in FUJITSU Software BS2000 FDDRL V20.0

New FDDRL parameter JOB-NAME for determination of the subtask's job name

So far, the jobname of subtasks was derived from the disk's VSN or from the disk set name. Exception: if the maintask's jobname is MARENTST, this name will be given to the subtask. If you want to manage tape requirements of FDDRL backups by jobname, giving a jobname to a subtask is requested.

In FDDRL V20.0 a new parameter JOB-NAME is available in the instruction MODIFY-FDDRL-PARAMETERS. This allows amongst others to choose a jobname for a subtask or to apply the maintask's name for the subtask.

Extensions in FUJITSU Software BS2000 HSMS V11.0

- In analogy to the function "Import files from backups on disk" realized in HSMS V10.0, the export of files or JVs in backup files on disk is possible from HSMS V11.0.
- The instruction MODIFY-HSMS-PARAMETERS is extended by the parameter OUTPUT. The customer will thus have the possibility to set *PRINTER or *MAIL as default output medium. The user will still be able to specify one of the non-standard values in the action command.
- Extension of storage level S1 for SM-Pubsets
So far, the S1 layer consists of a volume set. From HSMS V11.0 the S1 level is built from all volume sets of a SM-Pubset with the property S1-VOLUME-SET=*ALL-HSMS-CONTROLLED. A save-file can therefore span multiple volume sets.

Extensions in FUJITSU Software BS2000 INETSERV V3.4B

In addition to the rebasing of components of OpenSSL (version 1.0.2), Postfix (version 3.1.x), OpenSSH (version 7.3) and BIND (version 9.10.4), the previously not realized features/commands TVFS, MLSD and MLST of the RFC 3659 standard were supplemented with the correction version of INETSERV to support graphical FTP clients. Therefore, the support of the FileZilla is guaranteed.

Extensions in FUJITSU Software BS2000 MAREN V12.5

Behaviour with differing storage location adjustable

With the new version of MAREN a computer specific MAREN parameter OVERRULE-LOCATION=*YES/*REJECT is now available, which defines the behaviour for differing storage location by the user:

Contradicts the storage location of the user the storage location, identified by MAREN, so MAREN dependant of the value of the parameter changes the storage location as before or rejects the order withn output of a message.

Extension of some instructions

- The MAREN instruction EDIT does not correspond to the syntax rule of SDF and is renamed in EDIT-VOLUME-ATTRIBUTES (with the alias EDIT). This change enables implementation of further EDIT instructions in future.
- Implementation of the instruction: EDIT-MAREN-PARAMETERS
- While entering a partially qualified file name in the parameter FILENAME of MAREN instruction CHANGE-LOGGING-FILE, the file name will be complemented by a date, time and host name of the system. This new behavior enables system-specific changing of the logging files for all computers by adding the parameter HOST-NAME=*ALL.
- Change in the MAREN instruction PRINT-VOLUME-ATTRIBUTES: fields selected in the masks "SORT" or "LAYOUT" will in future be labelled equally in the following masks.
- In the future it will be checked on rlease of tapes whether catalog entries are still available to tape files and if so a mail is written. This behaviour can be adjusted via the newly introduced parameter CHECK-TSOSCAT of the instruction FREE-VOLUMES.

Adjustment of user interface

- In some screen masks a question "Continue (Y/N)" appears to query further output. If no value was entered, the further action wasn't proceed consistently. In some situations "Y" and in some "N" was supposed. This inconsistent action is repaired in MAREN V12.5 - by default the value "Y" is supposed and the output is continued.
- The instruction ADD-PRIVATE-VOLUME and EXPORT-VOLUME is used among others to create or remove archive entries for volumes unknown for the data center. The meaning of the instruction ADD-PRIVATE-VOLUME is not reflected in its name. Therefore in MAREN V12.5 a new instruction is offered instead, called ADD-FOREIGN-VOLUME. The previous instructions remain compatible for the use in procedures.
- No longer up-to-date expressions and functions were removed or adjusted to the current requirements and hardware components in instructions were updated.

Extensions in FUJITSU Software BS2000 ONETSERV V4.0

- Measures to increase performance in BCAM
 - Optimization of the receive processing
By reducing the number of signals and optimization of the validation procedure, a significant improvement was achieved in the interaction between BCAM and the applications.
 - Path shortening in Interrupt Handling (SIH)
By relocating of the accesses to connection from SIH to TPR, exclusive routes were shortened and a number of SIH locks reduced. When searching for connections no SIH lock is now required anymore
 - Improvements in error processing
The number of copying procedures in the error processing, for instance after a packet loss or sequence swap, was reduced, which enables faster restart.
- Support of long DNS names (FQDN) in the program interface
The program interface was extended in order to utilize the mapping of long DNS names (FQDN) to processor names from programs.

Extensions in FUJITSU Software BS2000 openSM2 V11.0

Functional extensions in openSM2 manager for monitoring the SE server

- Automatic analysis
openSM2 offers in V11.0 a new function to automatize regularly performed analyses. Time-controlled, the reports of a report views can be created or an export order can be arranged. The result is then made available for download as a file or sent out per e-mail. This function replaces the macro technology ANALYZER.
- Introducing new report types:
 - System tables report:
The measured values of all measures for all measured objects of one type are presented in one table. This report is available for every type of measurement object. The report type corresponds to the classic report for measures with measured objects in INSPECTOR.
 - System groups table report:
The measured values of “important” measures are presented in a table without the measured object from all systems of a system group. This report is available for every system type. The report type corresponds more or less to the table report INSPECTOR.

Extensions in FUJITSU Software BS2000 VM2000 V11.5

Support of Live Migration

Live Migration provides an uninterruptable relocation of a running BS2000 guest system from one Server Unit to another. This enables a simple relocation of the guest systems with running applications to another server, for example prior to planned maintenance work respectively updates for hardware or firmware, including the reverse relocation of the systems or changing the load distribution between two servers. Those take place without affecting the users.

With the new VM2000 command MIGRATE-VM a virtual machine (BS2000-VM) can be relocated from the local Server Unit to another Server Unit (target SU) of the same SU cluster in a running guest system operation while maintaining the operating resources.

The Live Migration of a BS2000-VM between two Server Units /390 in SE network is fully executed by VM2000. The target SU is still located in another SE server. The LM functionality of Xen/X2000 in SU x86 is encased by VM2000 commands and messages. During VM migration of an SU x86 the target SU can be located in the same or a different SE server.

In addition to the Live Migration of BS2000-VM (VM status RUNNING or INIT-ONLY/DOWN) VM2000 V11.5 supports also the migration of a VM definition (VM status DEFINED-ONLY) between two Server Units of a SU cluster using the command MIGRATE-VM-DEFINITION.

The command CHECK-VM-INTEGRATION can check if a Live Migration of a VM is currently feasible.

In addition to VM2000 V11.5 the Live Migration functionality requires SE V6.2 (M2000, X2000, HNC) and ONETSERV V4.0 on all guest systems.

Support of VM recovery

With the new command RECOVER-VM-DEFINITION a VM definition of a shutdowned or failed Server Unit of the same SU cluster can be adopted. Subsequently the VM definition can be activated on the local Server Unit and the BS2000 guest system can be booted. The command is currently supported on SU / 390. Support for x86 is carried out later.

Update of VM2000 disk configuration

Service technicians can perform configuration changes in a disk storage system during operation. The new command CHECK-VM-DISK-CONFIGURATION starts an update of VM2000 disk configuration, in order to implement appropriate configuration changes. The command is released on SU /390.

VM2000 V11.5 is released for a monitoring system OSD/BC V11.0 (or OSD/XC V11.0) and supports guest systems as of OSD/BC V10.0 (or OSD/XC V10.0).

Overview of extensions in SWK products

The following overview contains the SWK products, for which a new version is released within the time frame for the OSD/BC V11.0 with a summary of the respective new functions. If not technically linked to the version of the operating system, the new product versions are usually release from OSD/BC V10.0 (exception: VM2000).

Product	Version	New functions
CRTE	11.0	- Adaption to OSD/BC V11.0 (technically coupled product)
DAB	9.5	- Adaption to OSD/BC V11.0 (technically coupled product)
FDDRL	20.0	- New FDDRL parameter JOB-NAME
HIPLEX-MSCF	11.0	- Adaption to OSD/BC V11.0 (technically coupled product)
HSMS / ARCHIVE	11.0	- Export von files and JVs on backup files on disk - New parameter OUPUT in statement MODIFY-HSMS-PARAMETERS
INETSERV	3.4B	- Support FileZilla client - Rebase OpenSSL/OpenSSH/Postfix/BIND
JV	15.1B	- Optimization of sort algorithm in SH-JV-ATTR command
MAREN	12.5	- Revised look and feel - Improvements in various instructions
ONETSERV	4.0	- Performance improvements - Support of long DNS names on program interface
openFT	12.1	- Support of Net-Storage SAM files
openSM2	11.0	- Adaption to OSD/BC V11.0 (technically coupled product) - Automatic evaluations - Introduction of new report types
PCS	3.2	- Adaption to OSD/BC V11.0 (technically coupled product)
RFA	20.0	- Adaption to OSD/BC V11.0 (technically coupled product)
SCA	20.0	- Adaption to OSD/BC V11.0 (technically coupled product)
SPACEOPT	8.0	- Adaption to OSD/BC V11.0 (technically coupled product)
TASKDATE	20.0	- Adaption to OSD/BC V11.0 (technically coupled product)
VM2000	11.5	- Support of Live Migration on SE servers - New command for update of VM2000 disk configuration

Overview of the offered OSD/XC packages

BS2000 OSD/BC V10.0 is offered for the Server Units of the SE servers only as a part of the package OSD/XC V11.0. Products and versions contained in the OSD/XC packages:

Function area	Product name	Version in OSD/XC V11.0	Version in OSD/XC V10.0
Operating system	OSD/BC	V11.0	V10.0
Data backup	ARCHIVE	V11.0	V10.0
	HSMS	V11.0	V10.0
Job control	JV	V15.1B	V15.1
Communication and Internet	INETSERV	V3.4B	V3.4
	ONETSERV	V4.0	V3.6
	TIAM	V13.2	V13.2
Performance management	SCA	V20.0	V19.0
Print management	RSO	V3.6	V3.6
Programming systems	CRTE	V11.0	V10.0
Utilities	EDT	V17.0	V17.0

Function area	Product name	Version in OSD/XC V11.0	Version in OSD/XC V10.0
	LMS	V3.5	V3.5
	PERCON	V2.9	V2.9
	SORT	V8.0	V8.0

Overview for using OSD/XC packages:

	SE Server (SU 390 and SU x86)	S Server	SQ Server
BS2000 OSD/BC V10.0	OSD/XC V10.0	BS2000 OSD/BC V10.0	OSD/XC V10.0
BS2000 OSD/BC V11.0	OSD/XC V11.0	BS2000 OSD/BC V11.0	-

SW configuration

The current status of the SW configuration is available in the following document:

[Inform Software configuration BS2000 OSD/BC V11.0 and V10.0](#)

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