
FUJITSU Software BS2000 OSD/XC

Version V10.0
June 2020

Release Notice

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1 General information

FUJITSU Software BS2000 OSD/XC V10.0 is the BS2000 Extended Configuration operating system package for the FUJITSU Server BS2000 SE Series (Server Units SU x86 and Server Units SU /390) and for the SQ series. OSD/XC consists of the operating system BS2000 OSD/BC V10.0 and a range of system-related software products.

OSD/XC V10.0 contains the current version BS2000 OSD/BC V10.0. OSD/XC completely covers the unrestricted BS2000 function for the SQ/SE Server class. Existing customer applications run on an object-compatible basis on the SQ/SE Servers with OSD/XC.

OSD/XC operates all of the relevant function complexes for data center operations:

- Advanced, typical mainframe workload management for dialog and batch loads.
- Extensive scalability of processor performance, memory and I/O bandwidth.
- Automation of data center operations and data center operating processes.
- Operability of open applications
- Support for backup scenarios.

The FUJITSU software BS2000 OSD/XC V10.0 package consists of the following software products:

Function	Product name	Version
Operating system	FUJITSU Software BS2000 OSD/BC	V10.0
Print management	FUJITSU Software BS2000 RSO	V3.6
Job scheduling	FUJITSU Software BS2000 JV	V15.1
Communication	FUJITSU Software BS2000 openNet Server	V3.6
	FUJITSU Software BS2000 interNet Services	V3.4
	FUJITSU Software BS2000 TIAM	V13.2
Programming language	FUJITSU Software BS2000 CRTE	V10.0
Performance	FUJITSU Software BS2000 SCA	V19.0
Storage management	FUJITSU Software BS2000 ARCHIVE	V10.0
	FUJITSU Software BS2000 HSMS	V10.0
Utilities	FUJITSU Software BS2000 EDT	V17.0
	FUJITSU Software BS2000 LMS	V3.5
	FUJITSU Software BS2000 PERCON	V2.9
	FUJITSU Software BS2000 SORT	V8.0

A new feature is the extension of the package OSD/XC V10.0 to include the communication software interNet Services V3.4.

This Release Notice contains a condensed form of the main extensions, dependencies and operating instructions for the delivery components in the package OSD/XC V10.0. Please read the Release Notice for BS2000 OSD/BC V10.0 which describes the main software extensions of BS2000 OSD/BC V10.0.

- *10 The release date of the contents is June 2020.
- *10 Changes to release level November 2019 are marked with *10.
- *9 Changes to release level June 2019 are marked with *9.
- *8 Changes to release level June 2018 are marked with *8.
- *7 Changes to release level October 2017 are marked with *7.
- *6 Changes to release level June 2017 are marked with *6.
- *5 Changes to release level February 2017 are marked with *5.
- *4 Changes to release level November 2016 are marked with *4.
- *3 Changes to release level May 2016 are marked with *3.
- *2 Changes to release level November 2015 are marked with *2.
- *1 Changes to release level April 2015 are marked with *1.

- *8 This and other current Release Notices are on the SoftBooks DVD and are also available online <https://bs2manuals.ts.fujitsu.com/>.

The delivery structure of the OSD/XC package for OSD/XC V10.0 is as follows:

	OSD/XC	V10.0
	BS2GA.APACHE	10.0
	BS2GA.BS2OSD	10.0
	BS2GA.BS2IDE	10.0
*2	BS2GA.CRTE-BAS	10.0
*2	BS2GA.DSSM	10.0
*2	BS2GA.IMON	10.0
*5	BS2GA.JENV	10.0
	BS2GA.LLMAM	10.0
	BS2GA.PLAM	10.0
	BS2GA.POSIX	10.0
	BS2GA.SDF	10.0
	BS2GA.SIR	10.0
*2	BS2GA.SPOOL	10.0
	BS2GA.STRT	10.0
	BS2GA.WTOSD	10.0
	CRTE	10.0
	EDT	17.0
	HSMS	10.0
	ARCHIVE	10.0
	JV	15.1
	LMS	3.5
	openNet Server	3.6
	InterNet Services	3.4
	PERCON	2.9
	RSO	3.6
	SCA	19.0
	SORT	8.0
	TIAM	13.2

The Release Notices for the technical delivery units and products supplied together with OSD/XC V10.0 must also be observed:

- *1 SYSFGM.BS2OSD.100.E
- *9 SYSFGM.APACHE.024.E
- SYSFGM.ARCHIVE.100.E
- SYSFGM.CRTE.100.E
- SYSFGM.CRTE-BAS.100.E
- SYSFGM.EDT.170.E
- SYSFGM.HSMS.100.E
- SYSFGM.IMON.033.E
- *1 SYSFGM.JV.151.E
- *7 SYSFGM.JENV.090.E
- *9 SYSFGM.JENV.081.E
- SYSFGM.LMS.035.E
- SYSFGM.INETSERV.034.E
- SYSFGM.ONETSERV.036.E
- SYSFGM.PERCON.029.E
- *1 SYSFGM.POSIX-BC.100.E
- SYSFGM.RSO.036.E
- SYSFGM.SCA.190.E
- SYSFGM.SDF.047.E
- SYSFGM.SORT.080.E
- *7 SYSFGM.SPOOL.049.E
- SYSFGM.TIAM.132.E
- *1 SYSFGM.WEBTRANS-OSD.075.E

The respective German version is available as a file with the file name suffix ".D".

Please read the current Release Notice of the base software (X2000, M2000 and HNC as of V6.0 for SE Servers) that belong to the corresponding SE Server lines.

- *8 The Release Notices are available at: <https://bs2manuals.ts.fujitsu.com/> .

If one or more of the previous upgrades are skipped when this version is used, then the information in the release notices (or README files) for these previous versions must also be taken into account.

1.1 Order

OSD/XC V10.0 can be obtained from your own distributor.

This software product is supplied to the customer under the conditions for the use of software products against a single payment or installments.

- *5 **1.1.1 Additive Order to package components of OSD/XC V10.0**
- *7 For the products HSMS and ONETSERV contained in OSD/XC V10.0 the following new product versions have been released and can be ordered additively if required:
- *7
 - ONETSERV V4.0
 - HSMS V11.0
- *7 The corresponding release notices are SYSFGM.ONETSERV.040.E and SYSFGM.HSMS.110.E.
- *9 For the products HSMS and CRTE contained in OSD/XC V10.0 the following new product versions have been released and can be ordered additively if required:
- *9
 - CRTE V10.1
 - HSMS V12.0
- *9 The corresponding release notices are SYSFGM.CRTE.101.E and SYSFGM.HSMS.120.E.

1.2 Delivery

The OSD extended configuration products (XC products) are supplied on DVD in SOLIS/IMON format.

They are as follows with the setup DVD (UNIX format):

- SETUP OSD/XC (run BS2000-EXEC as disk image)
- OSDXC 1-2 (XC products in SOLIS/IMON format)
- UPDATE OSD/XC (corrections for XC products)
- ADDON (individually ordered user software)

1.3 Documentation

The documentation for OSD/XC V10.0 comprises the following components:

- The manuals for BS2000 OSD/BC V10.0, which form the basic literature for OSD/XC V10.0 (see SYSFGM.BS2OSD.100.E).
- SE-specific manuals, which describe the SE line server concepts and operation.

The BS2000 documentation is available on DVD, in German and English, under the title **BS2000 SoftBooks**.

The SoftBooks DVD also includes the BS2000 Release Notices.

*8 The documentation is also in the Internet: <https://bs2manuals.ts.fujitsu.com/>.
README files may also be available for these manuals. They include changes and supplements to the manual for each product.

*8 README files are on the SoftBooks DVD or online at: <https://bs2manuals.ts.fujitsu.com/>.

1.4 On-site consultation and a customer workshop

In order to provide intensive consultation and training, a customer workshop with the following contents is offered:

Administration and operation

- SE Line - overview
Hardware installation of the SE Servers, interfaces, operating controls and networking of the server from an administration viewpoint.
- The operating concept of the SE Servers
Overview of all operating components in the Management Unit (MU) and the operating concept of the SE Manager (SEM) administration application.
- Remote operation via PC
SW prerequisites and configuration of the PC workplaces for remote operation of the SE Server.
- SE Manager
Web-based user interface SE Manager functions for the comprehensive administration of the installed Server Units and integrated peripherals.
- Authorization concept
SE Manager role and user concept for local and central user administration.
Handling SSL certificates when using the SE Manager interface.
- Network connection options
Overview of the NET unit and options for networking the SE Server, internally and externally.
- Operating
Configuration options for the user interface, operations for server switch on/off, to start/end the operating system, operation of the BS2000 instance.

Security concepts

- Clarify IT security guidelines (security management, action catalogs, company security guidelines, manufacturer's security information)
- Map corporate security guidelines to the role and user concept for SE Servers (role concept, permissions, person-related IDs and local/central authentication)
- Encryption of communication between Operating workplace and SE Server
- Network services and firewall, if required restriction of communication to individual workplaces
- Security of FUJITSU remote service access
- Training in using the secure administration concept for the SE Server
- If required: consultation regarding a joint security concept for SE Servers together with systems in the BS2000 environment, such as ROBAR servers and Eternus CS and their implementation.

If you are interested in this offer, please contact your sales representative.

2 Differences to previous versions

2.1 Function enhancements in OSD/XC V10.0 compared to OSD/XC V9.0/V9.5

*2 The package OSD/XC V10.0 contains OSD/BC V10.0 in contrast to the package OSD/XC
 *2 V9.5 and the corresponding version of the coupled products and is available for SE Server.
 *2 The package OSD/XC V9.5 is based on OSD/BC V9.0 and is only available for SE servers; it
 *2 already contains the products InterNet services V3.4 and openNet Server V3.6.

*2 New software versions and products:

*2 New in the package INETSERV V3.4 (contained in OSD/XC V9.5 too)
 *2 New version ONETSERV V3.6 (contained in OSD/XC V9.5 too)
 *2 New version HSMS and ARCHIVE V10.0 (contained in OSD/XC V9.5 too)
 *2 New version SORT V8.0 (contained in OSD/XC V9.5 too)
 *2 LMS V3.5 (contained in OSD/XC V9.5 too)
 *2 Modifications to current versions of the technically coupled products

Extended integration of Net-Storage

Due to the extended Net-Storage function in OSD/BC V10.0, BS2000 can detect and process by files created by UNIX and Linux systems. And vice versa, UNIX/Linux systems can process files created by the BS2000.

The new file type **Node File** has been introduced.

The new functionality is initially only available on the SE Server as it requires X2000 V6.0 and the new HNC V6.0 of the SE Server.

2.1.1 Support of the FUJITSU Server BS2000 SE Series

OSD/XC V10.0 supports the new SE Servers with the Server Units /390 and x86.

The SE Servers combine the S and SQ-Server lines.

Several Server Units can be jointly integrated in a common rack. The peripherals with the Server Unit /390 are connected via FC channel.

The monitoring, administration and operation of all SE components is via the web-based user interface of the SE Manager (SEM) which runs in the Management Unit (MU).

The following SE Servers belong to the SE Series:

- *8 - SE710 with SU /390 with 16 Gbit/s FC channel and optional
- *8 Application Units (AU) x86 *)
- SE700 with SU /390 and optional 1-2 SU x86 and
- Application Units (AU) x86 *)
- SE500 with SU /390 and optional 1-2 SU x86 and
- Application Units (AU) x86 *)
- *8 - SE310 with SU /x86 and optional Application Units (AU) x86 *)
- SE300/ SE300B with SU x86 and optional 1 or 2 additional SU x86 units and
- Application Units (AU) x86 *)

*2 *) please consider the Release Notices for M2000 and X2000

*1 SU x86 requires X2000 as of V6.0A as a carrier system.

*8 SE710 is supported as of M2000 V6.3 and HNC V6.3.

*8 SE310 is supported as of M2000 V6.3 and X2000 V6.3.

*4 SE300B is supported as of M2000 V6.2 and X2000 V6.2.

*4 The release of the SE300B was in January 2017.

*2 The release of the SE500 was in January 2016.

*9 The release of the SE710 and the SE310 was in September 2019.

BS2000 OSD/BC V10.0 is offered for the Server Units in the SE Server only as part of the OSD/XC package.

More information is in the Release Notice SYSFGM.BS2OSD.100.E and the manuals for the SE Server.

BS2000 Web-Service API: New REWAS subsystem

Communication between the SE Manager and the BS2000 components of the SE Server is via the new privileged subsystem REWAS (RESTful Web API Service) in BS2000. REWAS requires the subsystem ASTI.

Internal BS2000 components can exchange messages with the SE Manager via the Web-Service API.

Support of the new 8Gbit/s FC channel and 10 Gbit/s Ethernet controller

New 8 Gbit/s fibre channel units are available for the /390 Server Units. More than 256 devices can be connected to the same FC channel path. (up to 4096 devices for ETERNUS DX S2/S3, up to 2048 devices for SYMMETRIX systems).

Ethernet controllers with 10Gbit/s are available for network connection to HNC units and SU300.

The Concurrent Sense function (IO status and sense within the same IO) is also supported in order to improve performance. The display of the utilization as a percentage has been adapted in the products SM2 and IORM.

2.1.2 Scalability/performance

BS2000 OSD/XC V10.0 includes a range of measures to improve performance. These measures do not affect the user interface. Only the main changes are listed below.

Avoid compulsory CPU removal under Nucleus Lock

In order to reduce the effects of the lock conflicts and the associated performance losses for a large multi-processor degree of a VM, a mechanism is implemented between BS2000 and the VM2000 hypervisor via which a forced removal of a virtual CPU from a real CPU (after a time slice runout) can only occur when the virtual CPU does not have a nucleus lock.

Allocator improvements

In order to increase performance, the strategy to search allocator tables has been optimized in OSD/XC V10.0, especially for small and medium space requests.

SNAP improvements

Due to several optimizations in SNAP, the runtime period required for creating a SNAPFILE has been restricted to the basic required minimum.

Further information can be found in the Release Notice for SYSFGM.BS2OSD.100.E.

2.1.3 Peripheral support: LTO-6 MTC devices

In addition to the previous LTO device types, the device type LTO-6 is also supported in BS2000 OSD/XC V10.0. Detailed information about peripheral support is in section 4.5 Magnetic Tape Devices.

LTO-6 tape encryption support is provided in conjunction with MAREN V12.0.

The LTO-6 tape devices in the Scalar i6000 are only supported per direct connection (without I/O blade).

2.1.4 New volume type in ETERNUS CS8000

With SE Servers as of OSD/XC V10.0, ETERNUS CS8000 with LTO4 emulation and TAPE-U4 volume type supports high-capacity volumes with up to 2^{32} blocks per volume.

2.1.5 Extensions in SANCHECK V3.0

- Support of Brocade virtual fabrics
- Support of NPIV-compatible F-ports on the FC switch
- Description of SAN information on SE Manager
SANCHECK runs on the Management Unit (MU). The required configuration files are maintained on the MU; no configuration is required in BS2000. The data determined by SANCHECK is prepared for output and provided to the SE Manager. SAN topology is displayed for SU x86; for SU /390 SANCHECK can also check the configuration by comparing SAN topology with the IORSF generation.

Note:

- The execution of SANCHECK in BS2000 is not necessary on SU x86. The command START-SANCHECK is rejected with the message SAN0105.

2.2 New versions for the SW products of the OSD/XC package with function extensions.

The following function extensions are available in the new versions of the individual products:

CRTE 10.0

Adaptation to BS2000 OSD/BC V10.0 (technically coupled product)

HSMS V10.0

- Flexibilization of the storage location of backup files
- Enlarged S1 level
- Support of dedicated backup server
- Support of the SE feature BS2000 backup monitor

*1

*1

interNet Services V3.4 (INETSERV)

This product was recently integrated in the OSD/XC package.

INETSERV (interNet services) provides functions which support the interoperability of communication partners in "open" TCP/IP-based networks, e.g. FTP, TELNET and email and is a prerequisite for some functions of the operating system, such as the mail functionality

openNet Server V3.6 (ONETSERV)

- Measures to increase performance
- Simple resolution of an address conflict
- Reverse lookup functionality
- Support of the SE Server

SORT V8.0

Extension of the records to be sorted to > 2 billion

SCA V19.0

Adaptation to BS2000 OSD/BC V10.0 (technically coupled product)

LMS V3.5

Adaptation to BS2000 OSD/BC V10.0

2.3 General differences between OSD/XC V10.0 on SE (SU /390) with OSD/XC V10.0 and S-Servers with OSD-BC V9.0

- SE (SU /390) does not support channel type 2 and channel type S.
- The storage medium Global Storage is no more supported on SE Servers.
- The SKP 3970 service console processor function, required on S-Servers, is provided on the SE Server by the Management Unit (MU).

2.4 New functions in BS2000 OSD/BC V10.0 with Correction Package 2/2015

2.4.1 Last Byte Pointer (LBP) support by the concerned software products

- *1 As of correction package 2/2015 all software products support the last byte pointer (LBP).
- *1 The LBP should not be used until all systems, with which data exchange occurs, have activated correction package 2/2015.
- *1 For detailed information please refer to
- *1 <http://docs.ts.fujitsu.com/dl.aspx?id=22aafa65-9393-4a28-95fd-4959fc6aa77d>

2.4.2 New utility program C2H for the technical support

- *1 By means of C2H (Configuration to HTML) the configuration-, status- and diagnose information, as well as important system files of a BS2000 can be automatically written into a HTML-File and be displayed with a Web Browser after the transfer to a PC.
- *1 C2H is installed in the userid \$SERVICE and is intended for the use by the technical support of FUJITSU.
- *1 You will find information for the installation of C2H in release notice of BS2000 OSD/BC V10.0 in chapter "Product Installation".

2.5 New functions in BS2000 OSD/BC V10.0 with Correction Package 1/2016

- *2 Besides 2 change requests, corrections and the new subsystem CONV2PDF (up to now part
- *2 of the product SPOOLSYS) the correction package 1/2016 offers now the online backup with
- *2 Snapsets for EMC VMAX3.
- *2 For further information please refer to the corresponding Release Notice.

2.6 New functions in BS2000 OSD/BC V10.0 with Correction Package 1/2017

- *5 The correction package 1/2017 includes besides corrections and a change request in
- *5 ASTI 2.0G no further functional extensions.
- *5 For further information please refer to the corresponding Release Notice.

2.7 New functions in BS2000 OSD/BC V10.0 with Correction Package 1/2018

- *7 The correction package 1/2018 includes besides corrections and a change request in
- *7 Binder V2.8 the BS2000 delivery component CRYPT V2.0.
- *7 For further information please refer to the corresponding Release Notice.

2.7.1 Support of new hardware

- *7 Correction package 1/2018 supports new ETERNUS DX disk memory controllers.

2.8 New functions in BS2000 OSD/BC V10.0 with Service Pack 19.1

- *8 The Service Pack 19.1 includes functional extensions and corrections.
- *8 For further information please refer to the corresponding Release Notice SYS-
- *8 FGM.BS2OSD.100.E.

2.8.1 Support of FUJITSU Server SE710 und SE310

- *8 In the BS2000 OSD/XC V11.0B the SE710 and SE310 models are supported in addition to
- *8 the previous SE servers with the SE basic software V6.3. The release is planned for the 2nd
- *8 half of 2019.
- *8 The SU710 will only be released with the 16 Gbit/s FC channel.

2.8.2 Additional Peripheral Support on SU310

- *8 On SU310 new local peripheral devices FUJITSU ETERNUS DX100 and FUJITSU ETER-
- *8 NUS LT140 are supported.

2.9 New functions in BS2000 OSD/BC V10.0 with Service Pack 19.2

- *9 Service Pack 19.2 contains only corrections, no functional enhancements.

2.10 Additional Peripheral Support in BS2000 OSD/BC V10.0

- *10 New peripheral devices FUJITSU ETERNUS DX500/DX600 S5 and AF650 S3 are support-
- *10 ed since 04/2020. When SHC-OSD is used, at least SHC-OSD V14.0 is required.

3 Technical information

3.1 Resource requirements

3.1.1 Disk memory requirements

The SOLIS2 delivery for the entire OSD Extended Software Configuration requires approx. 2 500 000 PAM pages (monomodal) and 5 000 000 PAM pages (multimodal). The space requirement for the system files (PAGING area, TSOSCAT, CONSLOG, SERSLOG, etc.) must also be planned

3.2 Software configuration

3.2.1 FUJITSU BS2000 2000 SE Series servers

Software components

The following software products are part of an SE Server and are supplied together with the server without having to be ordered by the customer. They are installed by the production. Error corrections or function extensions are always installed remotely or on-site by the HW-Service.

- *4 • M2000 as of V6.0 for SE300/ SE500/ SE700 (installed on all Management Units)
- *4 • HNC as of V6.0 (only for SE with SU /390, installed on the HNC units)
- X2000 as of V6.0 for SU300 (installed on the Server Units)
- *4 • M2000 as of V6.2 for SE300B (installed on all Management Units)
- *4 • X2000 as of V6.2 for SU300B (installed on the Server Units)
- *8 • M2000 as of V6.3 for SE710/ SE310 (installed on all Management Units)
- *8 • HNC as of V6.3 for SE710 (installed on all HNC units)
- *8 • X2000 as of V6.3 for SU310 (installed on the Server Unit)
- StorMan as of V6.0 (installed on the Management Unit)
- Remote service software for AIS (installed on the Management Unit)
- BS2000 backup monitor (part of M2000)
- SANCHECK (part of M2000)

Optional extensions with SE Manager or X2000 dependencies

- openSM2 Manager (web-based user interface) from openSM2 (BS2000) V10.0 (installed on the Management Unit)
- *10 • as of ROBAR V7.0 (installed on the Management Unit)
- openUTM WebAdmin V6.3 (installed on the Management Unit)

SW prerequisites for SUs: operating system and additional SW products

- BS2000 OSD/XC V10.0 can be operated in native mode or as a guest system under VM2000 on the SE Server.
- VM2000
 - *8 ○ For SE300/SE300B/SE500/SE500B/SE700/SE700B
 - *8 ▪ as monitor system under VM2000 V11.0
 - *8 ▪ as guest system under VM2000 as of V11.0
 - *8 ○ For SE310 und SE710
 - *8 ▪ as guest system under VM2000 as of V11.5
 - *8
- If SHC-OSD is used, at least SHC-OSD V12.0 must be used.

Remark:

X2000 as of V6.0A is a prerequisite for the SE Server models with Server Unit x86 and their functionality.

3.3 Product installation

The installation must be implemented with the installation monitor IMON V3.3. The required inputs and installation process via IMON are described in the IMON manual (and readme file).

Privileged subsystems:

Privileged subsystems for OSD/XC V10.0 are supplied in all HSI versions. The appropriate version is automatically implemented when installing the delivery units with IMON and when loading the subsystems with DSSM.

Non-privileged subsystems:

Most non-privileged subsystems are supplied in the /390 variant and run on SE Servers (x86) under OSD/XC in /390 mode under the /390 firmware. Some subsystems that run as non-privileged systems are also available in HSI-dependent form and then executed directly on the CPU.

Insofar as no other default settings are installed, the HSI-dependent version is used when loading the subsystems with DSSM.

3.4 Product use

The change from BS2000 OSD/BC on S-Servers to OSD/XC on SE is described in the manual "BS2000 OSD/BC V10.0 Migration Guide".

3.4.1 Test and diagnostics

The products DAMP and AID are available for the testing and diagnosis of non-privileged customer programs.

3.4.2 Startup/shutdown

System initiation FUJITSU Server BS2000 SE Series

System initiation can be implemented via the SE Manager.

The following steps are necessary (see Manual "FUJITSU Server BS2000 SE700/ SE500/ SE300, operation and administration"):

Under "*Systems*", select the appropriate SU and then select the tab "*BS2000 operation mode*".

- The current operating mode is displayed in the work area and, if necessary, can be switched via the action icon.
- In native mode: click on the action icon "*BS2000 IPL*" in the work area under "*Server Unit ... BS2000:actions*".
- In VM2000 mode: Select the required VM under "*Systems*" and click on the action icon "*BS2000 IPL*" in the work area under "*Server Unit ...: BS2000-VMactions*".

The following also applies for the Server Unit SU /390:

Alternatively, the IPL can also be initiated on an SVP console of the Server Unit via *SVP* commands.

3.4.3 Use of VM2000

When backing up data with HSMS/ARCHIVE, please note that the CPU requirement for the local backup in BS2000 is approx. 1 RPF for a throughput of 1 MB/second. If the complete CPU performance is not available during backup, e.g. because the CPU utilization on the guest system is restricted (MAX-CPU-UTILIZATION), a low throughput to the magnetic tape device must be expected.

3.4.4 Hardware generation

The product IOGEN is available for generating I/O configuration data

The I/O configuration file is only required for the S-Servers and SU /390 of the SE server.

*1 Specifics for server units /390 of the new SE servers

- *2 - The hardware of the channel type 2 (IBL) and the channel type S (IBS) is no more supported.
- *2 - the channel numbers 00 and 01 are reserved for the internal channel FCLINK
- *2 - for the connection of MU and HNC the channels are predetermined. During the installation talk with the service, the channels needed will be reserved, dependant of the configuration of the MUs and HNCs.
- *2 - for logic controllers with identical WWPN overlapping of LUNs is allowed. The message NGC0A59 is no more displayed.
- *1 - virtual consoles at a virtual type S-channel must be defined with **MODE CNC** and channel number **FE**, if a new generation is required.
- *1
- *1
- *1

3.5 Cancelled (terminated) functions

- *6 Information can be found in the SYSFGM.BS2OSD.100.E or in the product specific
- *6 Release Notice.

3.6 Incompatibilities

Channel type S and channel type 2 are no longer supported on the Server Unit /390.

The storage medium Global Storage is not supported on SE Servers.

3.7 Restrictions

Restrictions, which affect the operating concept of the SE Server or X2000, are included in the Release Notices for X2000, M2000 and MARS.

*7 Until X2000 V6.1 for files on emulated tapes of device type BM1662FS (tape emulation in
 *1 X2000 as EMFILE (for files in Linux file system or for files on DVD/CD)) these attributes are
 *1 not allowed to be set:
 *1 - DESTOC=YES (macro FILE)
 *1 - DESTROY=YES (macro CATAL)
 *1 - DESTROY-BY-DELETE=*YES (command CREATE-FILE)
 *1 - DESTROY-OLD-CONTENTS=*YES (command ADD-FILE-LINK)
 *1 This normally causes to overwrite the tape "after the file end" but for EMFILES it starts too ear-
 *1 ly and destroys the tape content.

3.8 Procedure in the event of errors

General information about creating error documents

In order to successfully diagnose and eliminate software problems, sufficient error document-
 ation must be created and saved as early as possible.

If possible, the documentation for software problems should be supplied in the form of files
 so that it can be analyzed using diagnostics tools.

Reproducible errors are to be described by the user so that the error can be generated. If
 necessary, procedures, enter jobs, protocols, etc. must be provided in order to reproduce the
 error situation.

Diagnostic files in M2000/X2000/HNC

Exact description of the error situation and specification determining whether and how the er-
 ror can be reproduced.

*2 The service engineer can use the command `save_diag` to create diagnostic files.

*2 The administrator or operator can use the SE Manager with *Hardware* → *Server* → (MU) →

*2 *Service* → *Diagnostics* → „create new diagnostic data“.

3.9 Performance information

*8 Fundamental statements about performance are in the BS2000 performance manual. It is
 available online at <https://bs2manuals.ts.fujitsu.com/> (see Concept Descriptions)

The planned version for SE Servers will be created in the 2nd quarter of 2016 and covers the
 OSD/XC V10.0 with X2000 V6.0.

Important server information is available in the following sections:

- Section 3: Performance behavior of the server
- Section 4: Performance behavior of the peripherals
- Section 6: Performance aspects with VM2000 operation
- Appendix: Values for the BS2000 servers

4 Hardware support

*5 Released configurations always require hardware, which currently not yet reached end of
*5 maintenance.

4.1 FUJITSU Server BS2000

OSD/XC V10.0 runs on all models of the FUJITSU servers in the BS2000 SE Series. The memory configurations of the **SE models** can be found in the tables below.

4.1.1 Supported FUJITSU Server BS2000 SE Series

SE Series:

- *8 - SE710 with SU /390 with 16Gbit/s FC channel and optional
*8 Application Units (AU) x86 ¹⁾
- SE700 with SU /390 and optional 1-2 SU x86 and
Application Units (AU) x86 ^{*)}
- SE500 with SU /390 and optional 1-2 SU x86 and
Application Units (AU) x86 ^{*)}
- *8 - SE310 with SU x86 and optional Application Units (AU) x86 ¹⁾
- *4 - SE300/ SE300B with SU x86 and optional 1 or 2 additional SU x86 units and
Application Units (AU) x86 ^{*)}

*8 On SE710 and SE310 OSD/XC V10.0 is only released as guest system under VM2000
*8 V11.5.

- *) up to 20 Application Units
- 1) see Release Notice M2000

Basic configuration: SE710

Modell	BS2000-CPU ¹⁾	System-boards	Main Memory [GB] in basic configuration	Max. phys. Main Memory [GB]	number of FC-channel/ number of CHE-Box in basic configuration ^{3) 4)}	Number of IOPs
SE710 - 10A	1	1	4	128	14/2	2
SE710 - 10B	1	1	6	128	14/2	2
SE710 - 10C	1	1	6	128	14/2	2
SE710 - 10D	1	1	8	128	14/2	2
SE710 - 20A	2	1	8	128	14/2	2
SE710 - 20B	2	1	8	128	14/2	2
SE710 - 20C	2	1	12	128	14/2	2
SE710 - 20D	2	1	12	128	14/2	2
SE710 -30	3	1	24	128	14/2	2
SE710 -40	4	1	24	128	14/2	2
SE710 -50	5	1	32	128	14/2	2
SE710 -60	6	1	32	128	18/3	2
SE710 -70	7	1	48	128	18/3	2
SE710 -100	10	2	48	256	22/3	2
SE710 -120	12	2	48	256	22/3	2
SE710 -140	14	2	64	256	22/3	2
SE710 -150	15	2	64	256	22/3	2
SE710 - 160 ²⁾	16	2	64	256	22/3	2

- 1) In addition all SE710 models are equipped with a spare processor ("Hot Spare CPU").
(except SE710-160)
- 2) Available as special release only
- 3) The maximum number of FC channels is 126
- 4) Each MU and each HNC are occupying at least 1 FC

Basic configuration: SE700

Model	Number of BS2000 processors ¹⁾	Number System boards ²⁾	HSP (GB) Basic configuration	Number of channel boxes ³⁾	FC channels ³⁾
SE700 -20	2	1	12	2	14
SE700 -30	3	1	16	2	14
SE700 -40	4	1	20	2	14
SE700 -50	5	1	24	2	14
SE700 -60	6	1	32	3	18
SE700 -70	7	1	32	3	18
SE700 -100	10	2	48	3	22
SE700 -120	12	2	48	3	22
SE700 -140	14	2	64	3	22
SE700 -150	15	2	64	3	22
SE700 -160 ⁴⁾	16	2	64	3	22

1) All SE700 models are also equipped with a spare processor ("Hot Spare CPU")

2) Each system board has 2 IOPs, up to 8 BS2000 CPUs and up to 128 GB main memory.

3) Up to 8 channel modules, each with 2 FC channels can be installed in each channel box; exception: the first slot in the first channel box is used by the system. Up to 8 channel boxes and up to 126 FC channels can be configured in an SE700.

4) Available as special release only.

Basic configuration: SE500

Model	Number of BS2000 processors ¹⁾ .	Number of system boards ²⁾	Main memory (GB) in the basic configuration	Number of channel boxes ³⁾	FC channels ³⁾
SE500 -10A	1	1	2	2	10
SE500 -10B	1	1	4	2	10
SE500 -10C	1	1	4	2	12
SE500 -10D	1	1	4	2	12
SE500 -10E	1	1	6	2	12
SE500 -20B	2	1	6	2	12
SE500 -20C	2	1	8	2	14
SE500 -20D	2	1	8	2	14
SE500 -20E	2	1	8	2	14
SE500 -30E	3	1	12	2	14
SE500 -40E ⁴⁾	4	1	16	2	14

- 1) All SE500 models except SE500-40E are also equipped with a spare processor ("Hot Spare CPU")
- 2) The system board has 2 IOPs, up to 4 BS2000 CPUs and up to 64 GB main memory.
- 3) Up to 8 channel modules, each with 2 FC channels can be installed in each channel box; exception: the first slot in the first channel box is used by the system. Up to 6 channel boxes and up to 94 FC channels can be configured in an SE500.
- 4) Available as special release only.

Basic configuration: SE310

Modell	BS2000-CPU's	E/A-CPU's (Cores) in basic configuration	Processor-chips / Cores in basic configuration	Main Memory [GB] phys / only for BS2000 ¹⁾	Default Main Memory for BS2000 incl. JIT [GB] ¹⁾
SE310 - 10R	1	16	4 / 64	128 / 67	16
SE310 - 10	1	16	4 / 64	128 / 67	16
SE310 - 20	2	16	4 / 64	128 / 67	24

- 1) If several guest systems are used on SU310, the memory of the basic configuration must be suitably extended. When dimensioning a memory extension, the fact that approx. 25% of the memory, but at most 16 GB, is used by the SU310 firmware and about 40% of the rest for BS2000 guest systems is needed for the JIT should be taken into account. Thus, the BS2000 net memory is about 45% of the total memory. The really used memory (incl JIT) by BS2000 native or guest systems is configured in X2000. The model dependent default value can be found in the right column, it can be the maximum of the BS2000 memory but may not exceed the upper limit of 496 GB.

Basic configuration: SE300

Model	BS2000 CPUs	Processor chips / cores	Main memory (GB) complete / for guest systems / BS2000 without JIT	Max. total main memory ¹⁾ (GB)	PCIe Slots
SE300 -10A	1	2 / 24	32 / 24 / 14.4	736	4
SE300 -10B	1	2 / 24	32 / 24 / 14.4	736	4
SE300 -10C	1	2 / 24	32 / 24 / 14.4	736	4
SE300 -10D	1	2 / 24	32 / 24 / 14.4	736	4
SE300 -10E	1	2 / 24	32 / 24 / 14.4	736	4
SE300 -10F	1	2 / 24	32 / 24 / 14.4	736	4
SE300 -20A	2	4 / 48	64 / 48 / 28.8	1472	10
SE300 -20F	2	4 / 48	64 / 48 / 28.8	1472	10
SE300 -30F	3	4 / 48	64 / 48 / 28.8	1472	10
SE300 -40F	4	4 / 48	64 / 48 / 28.8	1472	10
SE300 -50F	5	4 / 48	64 / 48 / 28.8	1472	10
SE300 -60F	6	4 / 48	64 / 48 / 28.8	1472	10
SE300 -80F	8	4 / 48	64 / 48 / 28.8	1472	10
SE300 -100F	10	4 / 48	96 / 80 / 48	1504	10
SE300 -120F	12	4 / 48	96 / 80 / 48	1504	10
SE300 -160F	16	4 / 48	96 / 80 / 48	1504	10

- 2) If several guest systems are used on SU300, the memory of the basic configuration must be suitably extended. When dimensioning a memory extension, the fact that approx. 25% of the memory, but at most 16 GB, is used by the SU300 firmware and about 40% of the rest for BS2000 guest systems is needed for the JIT should be taken into account. Thus, the BS2000 net memory is about 45% of the total memory. Each individual BS2000 guest system can be allocated a maximum of 528 GB main memory, so that the upper limit of 512 GB is not exceeded for the BS2000 memory; the levels are reduced by 50% for guest systems with BS2000 OSD/V8.0.

*4 **Basic configuration: SE300B**

Model	BS2000 CPUs	Processor chips / cores	Main memory (GB) complete / for guest systems / BS2000 without JIT ¹⁾	Max. total main memory ²⁾ (GB)	PCIe Slots
SE300B -10A	1	2 / 36	32 / 24 / 14,4	2976	4
SE300B -10B	1	2 / 36	32 / 24 / 14,4	2976	4
SE300B -10C	1	2 / 36	32 / 24 / 14,4	2976	4
SE300B -10D	1	2 / 36	32 / 24 / 14,4	2976	4
SE300B -10E	1	2 / 36	32 / 24 / 14,4	2976	4
SE300B -10F	1	2 / 36	32 / 24 / 14,4	2976	4
SE300B -20A	2	4 / 72	64 / 48 / 28,8	2880	10
SE300B -20F	2	4 / 72	64 / 48 / 28,8	2880	10
SE300B -30F	3	4 / 72	64 / 48 / 28,8	2880	10
SE300B -40F	4	4 / 72	64 / 48 / 28,8	2880	10
SE300B -50F	5	4 / 72	64 / 48 / 28,8	2880	10
SE300B -60F	6	4 / 72	64 / 48 / 28,8	2880	10
SE300B -80F	8	4 / 72	64 / 48 / 28,8	2880	10
SE300B -100F	10	4 / 72	96 / 80 / 48	2912	10
SE300B -120F	12	4 / 72	96 / 80 / 48	2912	10
SE300B -160F	16	4 / 72	96 / 80 / 48	2912	10

- 1) If several guest systems are used on SU300B, the memory of the basic configuration must be suitably extended. When dimensioning a memory extension, the fact that approx. 25% of the memory, but at most 16 GB, is used by the SU300B firmware and about 40% of the rest for BS2000 guest systems is needed for the JIT should be taken into account. Thus, the BS2000 net memory is about 45% of the total memory.
Each individual BS2000 guest system can be allocated a maximum of 528 GB main memory, so that the upper limit of 496 GB is not exceeded for the BS2000 memory;
- 2) In the SU300B not more than 512 GB physical main memory is released at the moment otherwise it needs a special release.

4.1.2 Cancelled support

*8 Business Server SQ100, SQ200
*10 Business Server SQ210

4.2 Console / terminals

4.2.1 Supported consoles

An integrated rack console is used for local administration and operation. The SE Server remote service (with AIS Connect) is provided via the Management Unit (MU).

4.2.2 Cancelled support

- None -

4.3 Peripheral types

- **Bus peripherals**

Under OSD/XC V10.0 devices can be operated via local bus connections (bus peripherals) on SE Servers (SU x86). The devices are connected via the SAS interface (Serial Attached SCSI).

*8

The SAS interface is not supported on SE310.

- **Channel type 2 and type S**

Type 2 and type S channels are not supported on SE Servers (SU /390 and SU x86). (However virtual consoles are generated on SU /390 via a (virtual) channel type S).

- **Fibrechannel**

Peripheral connection is supported via FibreChannel on SE Servers (SU /390 and SU x86).

*3

On SU /390 the connection of disk and tape peripherals is supported only via FC switch.

4.3.1 Cancelled support

*2

Shared Private Disk (SPD) operation is not allowed.

4.4 Disk peripherals

4.4.1 Supported disk peripherals

	FC	SAS	Firmware ⁴⁾ Minimum version	BS2000 disk type ⁵⁾	Remark
*7	X		V10L55	D3435 D3475-8F	-
*7	X		V10L52	D3435 D3475-8F	-
*7	X		V10L20	D3435 D3475-8F	-
*7	X		V10L80	D3435 D3475-8F	SHC-OSD as of V13.0B as of SE base software V6.2
*10	X		V11L30	D3435	SHC-OSD as of V14.0 as of SE base software V6.2 SP1
*7	X		V10L80	D3435 D3475-8F	SHC-OSD as of V13.0B as of SE base software V6.2
*10	X		V11L30	D3435	SHC-OSD as of V14.0 as of SE base software V6.2 SP1
*8	SU310			D3435	not supported via SHC-OSD only one path connection
*2	X		5977	D3435 D3475-8F	-
*3	X		5977	D3435 D3475-8F	as of SHC-OSD V12.0A01
	X		5876	D3435 D3475-8F	-
	X		5876	D3435 D3475-8F	-
		SU x86		D3475-8F	not supported via SHC-OSD

SFG Special release

Technically not possible

X Supported on SE Servers (SU /390 and SU x86)

1) The combined RA/CA connection is not supported in BS2000.

2) The storage cluster option (Transparent FailOver (TFO)) feature requires at least FW V10L70 and SHC-OSD as of V13.0.

3) Only one SAS RAID controller can be used on the SE Server SU300/ SU300B for the connection of JX40 disk subsystems. Both ports of this SAS RAID controller may only have one JX40 box connected.

4) The firmware versions supported by SHC-OSD are included in the corresponding Release Notice.

5) Basically only disks of the format D3435 are supported on the FC. The disk type D3475-8F is intended only for SU300/ SU300B for internal disks connected via SAS.

6) Administration of mirror functions via BS2000 requires SHC-OSD as of V12.0

7) Administration of mirror functions via BS2000 requires SHC-OSD as of V13.0B

8) Administration of mirror functions via BS2000 requires SHC-OSD as of V14.0

9) BS2000 OSD/XC V10.0 requires optional fixes to use the Storage Cluster Option of ETERNUS DX / AF with SU /390: A0611672 (NKV), A0611677 (BS2000-GA), A0612287 (BS2000-GA)

FC connection of supported disk peripherals

SU /390: The FC connection is supported only via FC switch.

SU x86: The FC connection is supported only via FC switch.

Exception: The FUJITSU ETERNUS DX100 (on SU310) is only supported with a one path direct connection.

4.4.2 Cancelled support

Disk storage controllers:

- *8 ○ Dell EMC Symmetrix DMX-3, DMX-4 (Kanal Typ FC)
- *8 ○ FUJITSU ETERNUS DX8700, DX8400 (Kanal Typ FC)
- *8 ○ FUJITSU ETERNUS DX410, DX440
- *8 ○ FUJITSU ETERNUS DX410 S2, DX440 S2

4.5 Net-Storage

4.5.1 Supported Net-Storage hardware

- *8 FUJITSU ETERNUS CS8000 with NAS interface
 - *8 FUJITSU ETERNUS DX500/600 S3 Unified, NAS-Interface
- Additional Net-Storage devices, e.g. from NetApp, can be qualified on request.

4.6 Magnetic tape devices

4.6.1 Supported magnetic tape devices

Archive system	Conne- ction Drive type Man- agement	Via FC					Via SAS			File System / DVD of MU T9G	File System / DVD of SU T9G	
		LTO3	LTO4	LTO5 ¹⁾	LTO6 ²⁾	T-C4	LTO3	LTO4	LTO5			
*2	Quantum Scalar i500 ²⁾	ROBAR	X	X	X	X						
	Quantum Scalar i2000 ²⁾	ROBAR	X	X								
	Quantum Scalar i6000 ²⁾ (i2K comp.-M)	ROBAR	X	X	X							
*4	Quantum Scalar i6000 ²⁾	ROBAR	X	X	X	X						
	FUJITSU ETERNUS CS8000 ¹⁾	ROBAR		X			X					
*8	FUJITSU ETERNUS LT40 S2	BS2000/ X2000		SU300 (B)	SU300 (B)	SU300 (B)			SU300 (B)	SU300 (B)		
*8	FUJITSU ETERNUS LT140	BS2000/ X2000				SU310						
	Tape emulation Linux file	BS2000/ X2000									SU /390	SU x86
	Type emulation DVD	BS2000/ X2000									SU /390	SU x86

Remark:

X SE Server (SU /390 and SU x86)

1) **FUJITSU ETERNUS CS8000**

FUJITSU ETERNUS CS8050, CS8200, CS8400, CS8800

FUJITSU ETERNUS CS900 Entry

*8 2) No support on SE710 and SE310

*3 **FC-Connection of the supported tape peripherals**

SU /390: The FC connection is supported only via FC switch.

SU 300(B): The FC connection of an FUJITSU ETERNUS CS and the MTC archive system FUJITSU ETERNUS LT40 can be performed directly (without FC switch) and via FC switch.

*2 The connection of Quantum Scalar systems is supported only via FC switch.

*8 **SU310:** The FC connection of an FUJITSU ETERNUS CS is possible directly (without FC switch) and via FC switch. For each FUJITSU ETERNUS LT140 only one drive and only the FC direct connection is supported.

*1 **Quantum Scalar support:**

*1 Quantum Scalar i2000/i6000:

- *8 • LTO-4 – LTO-5 : Data and control path via FC to I/O blade
- *1 • LTO-6 Control path via FC to the I/O Blade, data path without I/O Blade

*1 Quantum Scalar i500:

- *8 • LTO-4 – LTO-6 Data and control path always without I/O Blade

4.6.2 Cancelled support

MB archive systems:

- *8 - Quantum Scalar 10k drive LTO-2, LTO-3, LTO-4, LTO-5 (channel type FC)
- *8 - Quantum Scalar 1000 drive LTO-2 (channel type FC)
- *8 - Quantum Scalar i2000/i6000 with LTO-2, LTO-3 (channel type FC)

Virtual archive systems

- *8 • CentricStor (channel type FC):
 - Virtual Tape Appliance VTA-xxxx
 - Virtual Tape Controller VTC
- *8 • FUJITSU ETERNUS CS HE
 - *8 FUJITSU ETERNUS CS500, CS500 DL, CS1000, CS1500,
 - *8 CS1500 DL, CS2000, CS3000, CS4000, CS5000
 - *8 FUJITSU ETERNUS CS50

4.7 Printers

4.7.1 Supported printers

*10 The printers available on the market are only supported via LAN connection. (See also Release Notice SYSFGM.BS2OSD.100.E)

4.7.2 Cancelled support

- None -

4.8 Fibre channel switches

An overview of supported FC switches is available in the Release Notice SYSFGM.BS2OSD.100.E.