FUJITSU Software BS2000 POSIX

Version V10.0A45
July 2017

Release Notice

1 General

POSIX V10.0A45 comprises the following product components:

POSIX-BC V10.0A45	POSIX subsystem and basic shell
POSPRRTS V1.4A10	Runtime system for privileged POSIX applications
POSIX-SH V10.0A45	Extended Shell
POSIX-SOCKETS V10.0A45	Socket and XTI functions
POSIX-NSL V10.0A45	TLI, RPC and XDR functions
POSIX-ADDON-LIB V2.1A30	UNIX/BS2000-specific extensions to the POSIX library functions

This Release Notice is a summary of the major extensions, dependencies and operating information with respect to POSIX V10.0A45 under the BS2000 operating system.

The release level is that of: July 2017.

This and other current Release Notices are shipped on the SoftBooks DVD and are available online at 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 also be noted.

1.1 Ordering

The product components of POSIX V10.0A45 (see above) are bunched together in a single technical supply unit. This technical supply unit cannot be ordered separately but is a component of the hardware-specific BS2000 packages BS2000 OSD/BC and BS2000 OSD/XC.

POSIX V10.0 supply unit:	BS2000 package:
BS2GA.POSIX V10.0	BS2000 OSD/BC V10.0 (S-Server) BS2000 OSD/XC V10.0 (SE and SQ-Server)

1.2 Delivery

The POSIX files are delivered via SOLIS.

Release items of the POSIX V10.0A45 supply unit:

SINDAT.POSIX-BC.100.ROOT	Generic root file system (for Initial installation)
SINENT.POSIX-BC.100	Enter procedures for POSIX-BC
SINLIB.POSIX-ADDON-LIB.021	POSIX ADDON header for POSIX file system
SINLIB.POSIX-BC.100	Installation library for POSIX-BC
SINLIB.POSIX-BC.100.INET	POSIX tools: rcp, rsh, ..
SINLIB.POSIX-BC.100.OSSW	Installation library for Open Source Software Components of POSIX-BC
SINLIB.POSIX-BC.100.ROOT	Privileged commands, shared objects, ..
SINLIB.POSIX-BC.100.SHELL	Basic shell
SINLIB.POSIX-SH.100	Extended shell
SINLNK.POSIX-BC.100	Installation library for POSIX-BC
SINPRC.POSIX-BC.100	Installation procedures for POSIX-BC
SKMLIB.POSIX-NSL.100	NSL header and modules (X86)
SKMLIB.POSIX-SOCKETS.100	Sockets header and modules (X86)
SKMLNK.POSIX-BC.100	Load library for POSIX-BC (X86)
SKMLNK.POSPRRTS.014	Load library for POSPRRTS (X86)
SKULNK.POSIX-ADDON-LIB.021	ADDON C library functions (X86)
SKULNK.POSIX-SOCKETS.100.PTH	Load library for SOCKETS PThread applications (X86)
SYSENT.POSIX-BC.100	Enter for POSIX-BC
SYSDOC.POSIX-ADDON-LIB.021.D SYSDOC.POSIX-ADDON-LIB.021.E	Readme files
SYSDOC.POSIX-BC.100.OSS	Licenses for Open Source Software Components of POSIX-BC
SYSFGM.POSIX-BC.100.D	Release Notice German
SYSFGM.POSIX-BC.100.E	Release Notice English
SYSLIB.POSIX-ADDON-LIB.021	POSIX-ADDON header
SYSLIB.POSIX-SOCKETS.100	Sockets header and modules
SYSLIB.POSIX-NSL.100	NSL header and modules
SYSLNK.POSIX-ADDON-LIB.021	ADDON C library functions
SYSLNK.POSIX-BC.100	Load libraries for POSIX-BC

SYSLNK.POSIX-BC.100.INIT SYSLNK.POSIX-BC.100.SHELL	
SYSLNK.POSIX-SOCKETS.100.PTH	Load Library for SOCKETS PThread applications
SYSLNK.POSPRRTS.014	Load library for POSPRRTS
SYSMES.POSIX-BC.100	Message file for POSIX-BC
SYSRME.POSIX-BC.100.D SYSRME.POSIX-BC.100.D SYSRME.POSIX-NSL.100.D SYSRME.POSIX-NSL.100.E SYSRME.POSIX-SOCKETS.100.D SYSRME.POSIX-SOCKETS.100.E	Readme files
SYSRMS.POSIX-BC.100	RMS delivery set for POSIX-BC
SYSSDF.POSIX-BC.100	System syntax for POSIX-BC
SYSSPR.POSIX-BC.100.POSSTAT	SDF command procedure for POSIX-BC
SYSSSC.POSIX-BC.100	Subsystem declaration for POSIX-BC
SYSSSC.POSPRRTS.014	Subsystem declaration for POSPRRTS
SYSSSI.POSIX-BC.100	Parameter file for POSIX-BC

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

1.3 Documentation

The following documentation is available for POSIX:

1 POSIX Basics for User and System Administrator
2 POSIX Commands
3 POSIX Sockets/XTI
4 POSIX BS2000 file system bs2fs
5 Loading shared objects in POSIX (PDF document)

This and other BS2000 documentation is available in German and English on DVD with the title BS2000 SoftBooks.

The documentation is also available on the internet at http://manuals.ts.fujitsu.com. Manuals which are displayed with an order number can also be ordered in printed form.

The manuals may be supplemented with README files. These contain changes and extensions to the manual of the product concerned. The README files are available on the SoftBooks-DVD or online under http://manuals.ts.fujitsu.com.

2 Software extensions

The main innovations and extensions of POSIX V10.0A45 with respect to the previous correction level (A43) are described below.

You will find a detailed description of all new functions in the POSIX manuals listed in section 1.3 respectively in the corresponding README files.

2.1 Synchronization between BCAM and POSIX

Dynamic changes to the configuration of local interfaces in BCAM are now recognized automatically by POSIX and considered in the running POSIX session. Formerly a POSIX restart was necessary therefor.

2.2 Integration of zip Tools in POSIX-BC

Now, in POSIX shell zip and unzip (including zipcloak, zipgrep, zipinfo, zipnote, zipsplit, funzip and unzipsfx) is available.

2.3 Integration of sudo Tools in POSIX-BC

Commands sudo and visudo are now supported in the POSIX shell.

2.4 New Options -h and -H for Commands df and du

Both new options are alternatively to use to known option -k and cause that sizes are printed in appropriate measurement units (KByte, MByte, GByte or TByte).

2.5 Improved close Handling of Sockets

Support of "graceful disconnect" for POSIX Sockets applications and improvement of SO_LINGER option handling.

2.6 Detection of CPU Count with sysconf Function

Extension of sysconf interface to detect the number of installed processors (_SC_NPROC_CONF), and the number of ONLINE processors (_SC_NPROC_ONLN) of the underlying BS2000 system.

2.7 Controlling TCP Keepalive Behavior

New TCP Socket options TCP_KEEPIDLE, TCP_KEEPINTVL and TCP_KEEPCNT are available to influence the TCP keepalive behavior.

2.8 Increase of maximum Number of SYSFILE Terminal Devices

Increase of maximal value for parameter NOSTTY in POSIX information file from 1024 to 2000.

2.9 New Flag MSG_NOSIGNAL for Socket Functions send, sendto and sendmsg

The new flag requests not to send a SIGPIPE signal on occurrence of error EPIPE.

3 Technical information

3.1 Resource requirements

3.1.1 Disk storage space

Approximately 100,000 PAM pages are required for the POSIX product files.
The root file system requires at least 20,000 PAM pages on the HOME pubset and at least 10,000 PAM pages are recommended for the var file system.
These sizes include an installation of the POSIX-SH extended shell.

Additional space is required for installing the following products:

POSIX product	Storage space in root file system		Comments
CRTE V10.0	approx. 3,6	MB	Installation only
POSIX-HEADER V10.0	approx. 1,1	MB	needed with program
POSIX-ADDON-LIB V2.1	approx. 0,3	MB	production in the shell
COBOL85/COBOL2000	approx. 6	KB	in /opt - " -
CPP V3.2	approx. 0,2	MB	in /opt - " -
POSIX-NSL V10.0	approx. 9,0	MB	- " -
POSIX-SOCKETS V10.0	approx. 6,1	MB	- " -
JENV V8.1	approx. 113	MB	in /opt
openNet Server V4.0	approx. 0,4	MB	
interNet Services V3.4B			
TCP-IP-SV V3.3:			
DNS-Paket	approx. 0,2	MB	in /opt
NTP-Paket	approx. 5,0	MB	in /opt
NAMED-Paket	approx. 4,6	MB	in /opt
OPENSSH-Paket	approx. 1,9	MB	in /opt
MAIL V3.4:			
Postfix-Paket	approx. 10,9	MB	in /opt
Imap-Paket	approx. 2,0	MB	in /opt
APACHE V2.2			
Basispaket	approx. 39,2	MB	in /opt
HTTPD-Paket	approx. 15,5	MB	in /opt
HTTPD-D-Paket	approx. 13,4	MB	in /opt
MODPERL-Paket	approx. 13,8	MB	in /opt
MODPRL-D-Paket	approx. 22,0	MB	in /opt
MODPHP-Paket	approx. 16,6	MB	in /opt
MODPHP-D-Paket	approx. 97,7	MB	in /opt
PERL V5.8	approx. 85,8	MB	in /opt
SNMP-Management:			
SBA-BS2 V6.2	approx. 0,8	MB	
SSC-BS2 V6.0	approx. 10	KB	
SSA-oUTM-BS2 V5.0	approx. 1	KB	
SSA-SM2-BS2 V5.0	approx. 1	KB	
WebTA V7.5B	approx. 54,6	MB	in /opt

3.1.2 Main memory requirements with a large number of POSIX processes

If a large number of processes are connected to POSIX that do not carry out any actions in POSIX, you must reckon on approximately the following requirements of resident main memory pages:

class 3: approx. 3 pages per process
class 4: approx. 2 pages per process

3.2 Software configuration

POSIX V10.0A45 will run under BS2000 OSD/BC V10.0 and BS2000 OSD/XC V10.0.

Additional software is required for using some functions:

EDT as of V17.0A
The product EDT is required for editing files in the POSIX shell on block-oriented terminals and terminal emulations requires.

NFS as of V3.0A43
NFS V3.0 as of correction version A43 is required for the sharing of bs2fs file systems for NFS clients (share command).

3.3 Product installation

POSIX is installed in two steps:

1. Installation in BS2000 using the IMON/SOLIS procedure
2. Installation in the POSIX file system

You must follow the information concerning installation in the delivery cover letter and in the "POSIX Basics" manual as well as the information in this Release Notice.

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

3.3.1 Installation in BS2000 using the IMON/SOLIS procedure

The SOLIS delivery is installed in BS2000 with the installation monitor IMON. After installing the SOLIS delivery (e.g. with the IMON-BAS //INSTALL-UNITS statement), the delivery has to be activated. You activate a new POSIX delivery as follows:

- unlock the POSIX release units (UNLOCK-PRODUCT-VERSION)
- update the subsystem catalogue
- activate the new message and SDF syntax files for POSIX-BC

Activation is then automatic when BS2000 is restarted. However, you can also do this during operation, without restarting BS2000. The IMON-BAS //ACTIVATE-UNITS statement is provided for this purpose.

Please refer to section below for activating during operation.

Activating the POSIX supply unit during operation

The IMON-BAS ACTIVATE-UNITS statement can also be used to carry out activation during operation.

In addition to the actions mentioned (remove lock, update subsystem catalog and MSG and SDF syntax files) AKTIVATE-UNITS also stops and restarts the POSIX subsystem.

In case POSIX cannot be completely stopped you are presented with a message on the console during execution of ACTIVATE-UNITS that must be acknowledged and gives you the option of stopping the POSIX subsystem. After successful POSIX termination, the message can be acknowledged with REPEAT.

Dependencies between the POSIX and CRTEBASY subsystems (supply unit BS2GA.CRTE-BAS)

The subsystem CRTEBASY is not mandatory for POSIX, but is used by most POSIX processes when it is loaded. Consequently, the CRTEBASY subsystem cannot be exchanged as long as the POSIX subsystem is running.
Prior to exchanging the CRTEBASY subsystem (e.g. by activating the supply unit BS2GA.CRTE-BAS with ACTIVATE-UNITS), the POSIX subsystem must therefore be stopped first.

3.3.2 Installation in the POSIX file system

A separate POSIX installation program is provided to set up the POSIX environment, and is started with the command
/START-POSIX-INSTALLATION. The POSIX installation program can be called either via a dialog or automatically (i.e. controlled with a parameter file).

Either a POSIX initial installation or a POSIX upgrade installation is carried out.

- With an initial installation, the POSIX root and var file systems are completely rewritten.
- The POSIX upgrade installation is required if you have already installed POSIX and wish to retain any changes made in the root and var file systems.

All the main information for installing the product in POSIX can be found in the manual "POSIX Basics", chapter 5.
Among other things, you will find information there on the POSIX installation program itself and the process steps that must be observed for an initial or upgrade installation.

Supplementary upgrade installation information

- A package installation of POSIX-BC and POSIX-SH must always be carried out.

- The POSIX loader posdbl must be deactivated for the upgrade installation! Before the upgrade installation, the new POSIX subsystem is booted with the old root file system and this maybe contains program modules that are unsuitable for the POSIX loader.
  Therefore, before starting the new POSIX subsystem the DBLSTATE parameter in the POSIX parameter file (SYSSSI.POSIX-BC.100) must be checked and if necessary reset from 1 to 0. The parameter can be set back to 1 before the POSIX subsystem is restarted after successful package installation of POSIX-BC and POSIX-SH.

- To prevent the customer-specific modifications in configuration files, the new files from an upgrade installation of POSIX-BC are stored with the FSC suffix:
  /etc/group.FSC
  /etc/sudoers.FSC
  /etc/inet/inetd.conf.FSC
  /etc/syslog.conf.FSC

- The OpenSSL libraries are installed in /usr/local only, if sufficient space is available in the file system. Otherwise a warning is displayed in the installation dialog and on the system console.

3.3.3 Automatic POSIX package installation with IMON

With IMON, the package installation into the POSIX file system can also be performed during SOLIS/IMON installation.

Prerequisite for automatic package installation of a POSIX supply unit (as for all supply units with items of type *PS or *NP) is that
1. IMON-BAS is installed in POSIX
2. “POSIX processing“ is enabled when generating the installation procedure with INSTALL-UNITS or in menu mode for the supply unit.

Please observe the information in the manual "POSIX Basics", section "Notes on the automatic POSIX package installation via IMON".

3.4 Product use

3.4.1 Changed tuning parameters

The tuning parameters for POSIX are set via the POSIX information file (SYSSSI.POSIX-BC.100). An existing POSIX information file is not overwritten after the POSIX product files have been installed with SOLIS/IMON. The supplied POSIX information file is stored under the name SYSSSI.POSIX-BC.100.NEW.

No new tuning parameters have been introduced into POSIX with respect to the previous version. The values for minimum and standard also remain unchanged.

3.4.2 Using journaling

If a file system is operated with journaling, additional disk I/O accesses are required for transferring metadata changes into the journal. This can therefore lead to minor performance degradations if there are high I/O loads.
In addition, an area of at least 1 MB is reserved on the file system for the journal.

3.4.3 BCAM dependencies when starting and stopping POSIX

The POSIX subsystem can only be started after "BCAM READY". If BCAM is restarted, the POSIX subsystem must also be stopped and restarted.

The message POS1040 on the console indicates the necessity of also having to restart the POSIX subsystem when ending and starting BCAM.

The message is shown with /SHOW-PENDING-MESSAGES (/STATUS MSG), but cannot be answered by the operator. The message is automatically answered when POSIX is ended.

3.4.4 Requirements for remote access to POSIX, at and cron

The remote computer must be known to the BCAM transport system for the commands rcp and rsh.

A default account number (POSIX-RLOGIN-DEFAULT) must be assigned to user IDs which require remote access to POSIX (access via rlogin or telnet, rsh and rcp commands) or which wish to use at, crontab or batch. This can, for instance be done with the command
/MODIFY-USER-ATTRIBUTES <userid>,ACCOUNT-ATTRIBUTES= -
/*MODIFY(ACCOUNT=<accountno>,POSIX-RLOGIN-DEFAULT=*YES)

If SECOS is used, BATCH access must be enabled for using at, crontab and batch:
/MODIFY-LOGON-PROTECTION ...,BATCH-ACCESS=*YES

3.4.5 Direct access to POSIX via TELNET

It is not possible to operate TELNET from the supply unit interNet Services ("BS2000-TELNET") and TELNET from POSIX in parallel, because the standard port number 23 is used in both cases. For this reason, TELNET under POSIX is only started if the comment character '#' is removed from in front of the "telnet" entry in the inetd configuration file /etc/inetd.

For further information, see the manual "POSIX Basics", section "Accessing the POSIX shell".

3.4.6 Setting up and mounting file systems

- While mounting file systems with the POSIX installation tool, no mount commands should be issued in parallel in the shell.
- The /usr directory should not be used as an entry point for a file system.
- The HOME directories of POSIX users should not be located in the root file system (/), to avoid an overflow caused by user files.

3.4.7 posdbl

There are two ways of activating the POSIX loader:

- Automatically when the POSIX subsystem is started up
  To do this, the tuning parameter DBLSTATE must be set to 1 in the POSIX information file (SYSSSI.POSIX-BC.100).
- Dynamically with the posdbl command
  (see also the manual "POSIX Commands")

  If the DBLSTATE parameter in the SYSSSI parameter file is set to 0, the POSIX loader can be activated with the shell command posdbl. The following command has the same effect as automatic activation: posdbl -e both

In the first case, the DBLPOOL parameter in the SYSSSI parameter file must be set to a value greater than 0. In the second case, the value can also be set dynamically with the usp command.
A value of 40 (MB) has proved successful and is to be recommended. Otherwise, the values are dependent on the available main memory and the extent of the explicit load statements (user programs).

3.4.8 POSIX package installation of add-on products when changing the main versions

If the main version of a product already installed in POSIX (POSIX-HEADER, CRTE etc.) changes (for example from 018 to 019), you must deinstall the old product version (using the function "Delete packages from POSIX" in the POSIX installation tool) before installing the new product version under POSIX.

This deinstallation is only possible with the scripts from the old product files (file SINLIB.<product>.<oldversion>). You can then delete the old product files and install the new product version in POSIX.

3.4.9 Tuning measures

For performance reasons, when working with POSIX the CRTE-BASYS subsystem should generally be preloaded. The subsystem is administered by DSSM under the name CRTEBASY.

The performance when working with the POSIX commands of the basic and extended shells can be optimized with the following measures:

- either speed up the accesses to the basic and extended shell with DAB: SINLIB.POSIX-BC.100.SHELL or SINLIB.POSIX-SH.100

- or use the POSIX loader posdbl / pdbl.

In addition, tuning parameters in the POSIX information file that affect the performance should be adjusted accordingly.
You will find further information in section "Tuning measures" in the appendix of the manual "POSIX Basics".

3.4.10 Tool for converting from 2K fragmented file systems into 4K fragmented file systems (convfrags)

For historical reasons, file systems may be in use that were generated with a fragment size of 2K instead of the standard fragment size of 4K. The new journaling and file system extension functions cannot be used with 2K fragmented file systems. For this reason, the tool convfrags (shell script under /sbin) is provided for converting 2K fragmented file systems into 4K fragmented ones.

There are two formats for the call:

convfrags –i [mountpoint]
convfrags –c mountpoint [-p pubsetid]

Format 1 outputs information about the fragment size of one or all file systems. Conversion is the carried out with format 2, where the newly created file can also be in a different pubset.

- Format 1:

  If a mount point is specified, information about the file system mounted there is output.

  If no mount point is specified, information about all mounted file systems is output.

- Format 2:

  If format 2 is used, the conversion is actually carried out, with the following sequence:

  1. A second file system is created (suffix .TEMP.CF) and mounted.
  2. The contents of the first file system is copied into the second one.
  3. The first file system is unmounted and deleted (a backup copy of the container file in BS2000 is retained with the suffix .SAVE.CF)
  4. The second file system is mounted in place of the first one. This makes a file system available with 4K fragments under the same name and device number.

Note:
Depending on the number of files, the newly created file system may be larger than the old one. This depends on how many files there are in the old container that have an uneven number of (2K) fragments.

3.4.11 Monitor job variable $.SYS.POSIXSTATUS

The attribute USER-ACCESS=*ALL-USERS must be set in order to use the monitor job variable for monitoring the POSIX subsystem. This is the default if the MONJV is implicitly set up newly when POSIX is started with the call:
/START-SUBSYSTEM POSIX,MONJV=$.SYS.POSIXSTATUS

If this MONJV was previously created explicitly, the attribute value may have to be changed with the following command:
/MOD-JV-ATTR JV=$.SYS.POSIXSTATUS,PRO=*PAR(USER-ACCESS=*ALL-USERS)

3.5 Discontinued functions (and those to be discontinued)

none

3.6 Incompatibilities

none

3.7 Restrictions

- The new journaling and file system expansion functions cannot be used for file systems with 2K fragmenting. An appropriate message is output to the console on such file systems with each mount process. A tool convfrags (see section 3.4.10) is provided for converting these file systems to standard 4K fragmenting.

- /START-POSIX-SHELL in dialog or /ENTER procedures:
  When changing into the POSIX environment within a BS2000 procedure (dialog or batch) with /START-POSIX-SHELL, I/Os to the terminal are carried out via SYSFILE mechanisms and not via POSIX. I/O via the terminal is therefore not possible for tasks created with "fork". For this reason, it is recommended that you use /EXECUTE-POSIX-CMD in BS2000 procedures as the restriction does not apply in this case.

- Shared objects in C++:
  Terminate is called if an exception is triggered when initializing a shared object under dlopen() from the constructor call for a global object. Terminate is also called if an exception is triggered when finalizing a shared object under dlclose() from the destructor call for a global object. If no special terminate handler was declared, the application terminates with abort() in these cases.

3.8 Procedure in the event of errors

Depending on the particular situation, the following documents are needed:

SLED (after a system crash)
System dump (after a system dump message)
USERDUMP
Diagnostic dump (IDIAS call: DIAG DUMP,TASK=Taskid)
SERSLOG file
CONSLOG file
SYSTEMREPFILE
/var/adm/syslog
/var/adm/messages
/var/sadm/pkg/insterr

If functional errors occur, full details of commands, program inputs, etc. are essential.

4 Hardware requirements

POSIX V10.0A45 runs on all business servers supported by BS2000 as of V10.0.

5 Firmware levels

Not relevant