

FUJITSU Software BS2000 JENV

Version 9.0A  
June 2018

Release Notice

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# 1 General

This Release Notice is a summary of the major extensions, requirements and operating information with respect to FUJITSU Software BS2000 JENV V9.0A which runs under the BS2000 operating system.

The release level is that of: June 2018.

This and other current Release Notices are shipped on the Soft Books 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 be noted.

Please note: Since V8.1A JENV is Open Source Software. JENV V9.0A is based on a OpenJDK 9.0.4+11 source release. All relevant license information can be found in SYSDOC.JENV.090.OSS or on the internet at [License Information](#).

FUJITSU Software BS2000 JENV V9.0A is an implementation of the Java Platform, Standard Edition (Java SE) based on a port of OpenJDK 9 for FUJITSU Software BS2000 and its full name is "BS2000 Environment for Java™ V9.0A".

The HotSpot client VM is implemented in JENV V9.0A.

To ensure high performance execution on SQ systems and x86-based Server Units of BS2000 SE series, a special version is available that is optimized for this platform. The HotSpot Client VM included with this package generates X86E native code directly.

JENV V9.0A comprises a runtime environment (JRE) and a development environment (JDK).

The following are part of the runtime environment:

- The Java interpreter (java, also known as Java Virtual Machine JVM)
- The Java classes
- Various utility programs

The runtime environment (JRE) fulfills the following relevant specifications:

- [The Java™ Language Specification, Java SE 9 Edition](#)
- [The Java™ Virtual Machine Specification, Java SE 9](#)
- [Java™ Platform, Standard Edition 9, API Specification](#)

Various development tools are part of the development environment:

- the Java Compiler (javac)
- the Java Debugger (jdb)
- further Java classes
- the program for Java archive files (jar), the appletviewer and other utility programs

These tools can be used to develop applications or applets that conform to the above API specifications.

## 1.1 Ordering

JENV V9.0A can be ordered from your local distributors as a component of the operating system.

JENV V9.0A is shipped as part of the BS2000 operating system OSD/BC as of V10.0 and OSD/XC as of V10.0.

JENV V9.0A is supplied to the customer under the conditions laid down in our system contract.

## 1.2 Delivery

The JENV V9.0A files are supplied via SOLIS.

The product JENV V9.0A is split into several functional packages as listed below:

- Basic package: platform-independent, must always be installed
- S390 package : platform-dependent, optimized for /390 systems
- X86 package: platform-dependent, optimized for SQ systems and x86-based Server Units of BS2000 SE series

The S390 package will also run on x86 systems. However, the performance is not as good as that of the X86 package.

The following delivery components are needed independently of the HSI:

SYSSII.JENV.090	IMON-Description of product
SINLIB.JENV.090	POSIX installation of the basic package
SINPRC.JENV.090	Installation procedures for private installation
SYSPRC.JENV.090	Procedures for calling java tools from BS2000
SYSDAT.JENV.090.D	Configuration data
SYSFGM.JENV.090.D	Release Notice German
SYSFGM.JENV.090.E	Release Notice English
SYSDOC.JENV.090.OSS	Licensing Information

The following delivery components are needed additionally on /390 systems:

SINLIB.JENV.090.S390	POSIX installation of the S390 package
SYSLNK.JENV.090.GREEN	Modules (shared objects) for the S390 package
SYSLNK.JENV.090.GREEN-JAVA	Runtime adapter for Java Interpreter in optimized form for S390 package
SYSLNK.JENV.090.GREEN-TOOLS	Java commands and tools for S390 package

The following delivery components are needed only on x86 systems:

SINLIB.JENV.090.X86	POSIX installation of the X86 package
SKULNK.JENV.090.GREEN	Modules (shared objects) for the X86 package
SKULNK.JENV.090.GREEN-JAVA	Runtime adapter for Java Interpreter in optimized form for X86 package
SKULNK.JENV.090.GREEN-TOOLS	Java commands and tools for the X86 package

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

### 1.3 Documentation

The BS2000 documentation is available in German and English on DVD with the title "BS2000 SoftBooks".

The following documentation is available for JENV V9.0A:  
"JENV V9.0A, Development and Runtime Environment".

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 file names are made up as follows:

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

The README files are available on the SoftBooks-DVD or online under <http://manuals.ts.fujitsu.com>.

## **2 Software extensions**

A summary of the new features of JENV V9.0A is available on the internet at <https://docs.oracle.com/javase/9/whatsnew/toc.htm>.

A summary of the new features in JENV V9.0A is also included in the manual "JENV V9.0A", chapter "New Features of JENV V9.0A".

## 3 Technical information

### 3.1 Resource requirements

The following memory range in system and user address space is required for operation: 512 MB. These values represent a minimum requirement that may increase depending on the amount of data and the application used.

The disk storage space required by JENV V9.0A is made up of that required for the basic package plus that required by one of the platform-dependent packages (S390 or X86) and is as follows:

- for the basic package      approximately 108,000 PAM pages
- for the S390 package      approximately 63,000 PAM pages
- for the X86 package      approximately 64,000 PAM pages

JENV V9.0A additionally occupies the following space in the installation directory of the POSIX file system:

- for the basic package approximately 211 MB
- for the S390 package < 1 MB
- for the X86 package < 1 MB

### 3.2 Software configuration

JENV V9.0A is delivered with the following versions of the system:

- OSD/BC as of V10.0
- OSD/XC as of V10.0

The following versions/correction levels are required for executing JENV V9.0A:

- POSIX-BC                      as of correction level A43
- POSIX- SOCKETS              as of correction level A43
- BLSSERV                      as of V2.8
- CRTE-BASYS                  as of V10.0B, or V11.0B

Optional are needed:

- for use native method:  
C/C++ as of V3.2E40 and CRTE as of V10.0B, or V11.0B (depending on operating system version).
- for use multicast sockets: BCAM as of V20
- for private Installation: LMS

POSIX-HEADER must be installed in POSIX. Please also note the software requirements of these products.

### 3.3 Product installation

The installation of the product JENV must be accomplished with the installation monitor IMON. For the installation of the product are having to be considered information for installation in the SOLIS2 delivery cover letter as well as in the references in the available release notice.

Before the call of IMON the activities specified in the delivery writing have to be accomplished.

The POSIX parts of JENV V9.0A have to be installed manually if IMON as of V2.8 is not used.

JENV V9.0A supports the following types of installation:

- automatic public installation (with SOLIS/IMON)
- manual public installation (with POSIX installation tool) with and without IMON
- private installation (with scripts from the SINPRC library)

If a JENV product with a different version or correction level is installed a parallel installation may be made with manual public installation or with private installation. In this case, you must ensure that the product files for each installation are present separately. Versions that only differ in the correction level must be stored under different user IDs. The POSIX part of the installation must have a different installation directory from all other installations.

Update installation is not supported.

### 3.3.1 Automatic public installation

This type of installation can be made on systems with IMON as of V2.8 and is there the preferred form of installation. The POSIX installation of JENV is carried out automatically in this case with the SOLIS/IMON installation of the product. Please consult the IMON V2.8 documentation for the procedure required to initiate automatic POSIX installation.

This form of installation has the following restrictions:

- The product is always installed using the standard configuration for the system concerned, i.e. the basic package and the S390 package are installed on /390 systems and the basic package and the X86 package are installed on SQ systems and x86-based Server Units of BS2000 SE series.
- The installation path cannot be selected. The product is always installed in POSIX under the standard path /opt/java/jdk-9.0.4.
- Before installation, all public installations of JENV in POSIX are uninstalled, regardless of the version or installation location. It is therefore not possible to carry out parallel installations with this type of installation.

### 3.3.2 Manual public installation

The Installation is done according to the manual "POSIX Basics", chapter "Installing POSIX", section "POSIX Installation Program in interactive mode". This is the recommended installation type for all systems without IMON as of V2.8.

JENV V9.0A comprises several POSIX installation packages: Basic, S390 and X86. With a manual POSIX installation, these packages have to be installed separately.

The following must thereby be noted:

- It is imperative that the basic package is installed first.
- The same installation directory must be selected for all packages.
- The installation directory should not already be occupied by other products or installations.

Requirements:

- Installation must be made under the user ID TSOS.
- The release items can be installed in any user ID.
- For an installation with IMON, the release items must be installed with IMON, i.e. registered in the Software Configuration Inventory (SCI).

The installation is done with the POSIX installation tool with "Install packages on POSIX".



The installation can be done with or without IMON.

Inputs for an installation with IMON:

IMON:	Y
Product:	JENV
Package:	empty for basic package or Name of package (S390, X86)
Version:	V09.0 (optional)
Correction level:	(optional)

You only have to enter version and/or correction level if multiple versions of the product are registered with IMON.

Inputs for an installation without IMON:

IMON:	N
Product:	JENV
Package:	empty for basic package or Name of package (S390, X86)
Version:	090
Correction level:	(optional)
Userid:	name of user ID with the release items

In the next mask it is possible to modify the displayed default installation directory `/opt/java/jdk-9.0.4`. This is particularly required if you want to install multiple Java product or correction versions. The user must make sure that the installation directories of different products or versions do not conflict, since the installation may otherwise be destroyed or made unusable.

The same installation directory must be selected for all packages.

The installation script outputs are not shown on the screen. If an error occurs, the file `/var/tmp/inst.JENV` for the basic package or `/var/tmp/inst.JENV.<package>` for the other packages may contain information on the cause of the error. Please observe any error messages on the BS2000 console.

If an error occurs, the POSIX installation tool does not stop the installation. The user must therefore uninstall the faulty product installation manually before trying a new installation.

After installation in the POSIX file system is completed, the Java files are stored in the installation directory. Symbolic links to the Java tools are created in `/opt/bin`, if they were not already created by another installation.

Please note:

The Java commands are available via `/opt/bin` if there is only one Java installation. If several Java products or versions are installed, only one can possess the public links in `/opt/bin`. This is normally the first Java installation. The commands of the other Java installations are obtained by specifying the explicit command paths in the call or by entering the relevant path `<install-path>/bin` in the command search path of the caller.

A public installation can be uninstalled with the POSIX installation tool by calling "Delete packages from POSIX". This must be executed for each package of the product. It is imperative that the basic package is uninstalled last.

If the release items were installed with IMON, you must make sure that the Software Configuration Inventory (SCI) stays consistent after uninstall of the POSIX part.

### 3.3.3 Private installation

A private installation makes it possible to perform the installation in the POSIX file system without administrator rights. The JENV libraries can be stored in any user ID and installation does not have to be under this user ID.

Requirements:

- The JENV libraries must be accessible for the caller and the caller must, in particular, also have write rights for the library SYSPRC.JENV.090.
- The installation user ID must be registered as a POSIX user and there must be sufficient free space in the relevant POSIX file system.

The Installation is made using procedures supplied with the Java distribution. It must be made separately for each package, whereby it is imperative that the basic package is installed first.

The installation path in the POSIX file system can be selected, but it must be the same for all packages.

The basic package can be installed with the command:

```
/CALL-PROCEDURE (SINPRC.JENV.090,INSTALL),-
/                (INSTDIR='<instdir>')
```

Subsequently, the platform-dependent S390 package or X86 package can be installed with the command:

```
/CALL-PROCEDURE (SINPRC.JENV.090,INSTALL.<package>),-
/                (INSTDIR='<instdir>')
```

If the product files are in an user ID other than that of the caller, the basic package can be installed with the command:

```
/CALL-PROCEDURE ($<userid>.SINPRC.JENV.090,INSTALL),-
/                (INSTDIR='<instdir>',INSTUID=<userid>)
```

Subsequently, the other packages can be installed with the command:

```
/CALL-PROCEDURE ($<userid>.SINPRC.JENV.090,INSTALL.<package>),-
/                (INSTDIR='<instdir>',INSTUID=<userid>)
```

where the appropriate package name (S390, X86) must be inserted for <package> and the name of the user ID with the product files must be inserted for <userid>.

It is not mandatory to specify the installation directory '<instdir>'. If it is not specified, installation is made to the default directory \$HOME/jdk-9.0.4.

You must note the following if you specify the installation directory:

- The <instdir> specification is case sensitive.
- '<instdir>' is a complete path name, or it is interpreted as a subdirectory to the home directory of the caller.
- The caller must have the right to create this directory and to write to it.
- The length of the resulting path name must not exceed 120 characters.

The file containing the messages output during private installation is displayed on the screen after completion and then deleted. Please observe also any error messages output to the BS2000 console.

After installation, the Java programs are available under '<instdir>/bin'. It is recommended that the Java user enters this directory in the PATH environment variable.

Private JENV installations can be uninstalled from the POSIX file system by simply deleting the installation directory:

```
rm -r <instdir>
```

It is not possible to uninstall single packages.

### 3.4 Product use

JENV V9.0A can be installed on /390 and x86 systems and will run on these platforms.

At least the basic package and either the S390 or X86 package must be installed on a system for an executable Java. You are recommended to install the basic package and the S390 package on /390 systems and the basic package and X86 package on x86 systems.

The S390 package will also run on x86 systems. However, the performance is not as good as that of the X86 package.

Note on RMI applications:

On systems with multiple IP addresses, it is possible to select the IP address to be used for communication with the client, when an RMI server is started with:

```
java -Djava.rmi.server.hostname = <ip-addr> ...
```

or when the rmid is started with:

```
rmid -J-Djava.rmi.server.hostname = <ip-addr>  
-C-Djava.rmi.server.hostname = <ip-addr> ...
```

Note on the JNI interface:

C programs that are called via the JENV JNI interface cannot use any DCE threads or pthreads.

### 3.5 Obsolete functions (and those to be discontinued)

Canceled Java packages:

The packages com.fsc.java.bs2000, com.fsc.java.io and com.fsc.jrio are supported for the last time in JENV V9.0A. Its functionality has been replaced by the corresponding packages com.fujitsu.ts since JENV V7.0A.

The affected Java sources were marked as "deprecated and marked for removal" by a tightening of the @Deprecated annotation.

### 3.6 Incompatibilities

#### 3.6.1 General

A description of the incompatibilities between OpenJDK 9 and earlier versions can be found at:

<http://www.oracle.com/technetwork/java/javase/9-relnote-issues-3704069.html>.

#### 3.6.2 Modular Concept

The packages com.fujitsu.ts.java.bs2000 and com.fujitsu.ts.java.io are included in the java.base module. The com.fujitsu.ts.jrio package is included in the jdk.jrio module.

### 3.6.3 Differences to OpenJDK 9

The audio features include Java Direct Graphic Access (JDGA), Class Data Sharing, Oracle Java Mission Control, Java Flight Recorder, Advanced Management Console, Usage Tracker, Java Web Start, Java Plug-in for Web browsers, and Modules `jdk.hotspot.agent` and `jdk.internal.vm.ci` are not supported.

JENV V9.0A also contains font files from the DejaVu Fonts package.

As VM technology, only the HotSpot client VM is used.

The demo programs from OpenJDK are not included in the product.

## 3.7 Restrictions

### 3.7.1 Using a BS2000 block terminal

Java applications cannot read from standard input, if the entry is made on a BS2000 block terminal. This causes an error message or an `IOException`, and can cause the end of the application. The problem can be avoided, if all required arguments are specified when calling the application or the standard input is redirected to a file. This concerns inter alia the tools: `jarsigner`, `jdb`, `jshell`, `jjs`, `keytool` and `servertool`.

The method call `System.Console()` returns null if the standard input is connected to a block terminal.

### 3.7.2 IMON

IMON is not used to dynamically determine the installation location of single components of JENV. The restrictions specified in the section "Installation" must therefore be adhered to.

### 3.7.3 jlink

The so-called apps generated with the `jlink` tool are only executable if they were created with a JENV installed under `$TSOS` and run with a JENV installed under `$TSOS`.

## 3.8 Procedure in the event of errors

If an error occurs, the following error documentation will be required for diagnostic purposes:

- A detailed description of the error condition, indicating whether and how the error can be reproduced.
- Depending on the error condition, data concerned or leading to the error (example program, dump, etc.).
- Exact designation of the hardware and software used.
- The error must be reported to the appropriate service provider.  
A PERLE error report will be opened for Second Level Support.

A Teleservice connection with callback option is essential for diagnostics.

## 4 Hardware requirements

JENV V9.0A is executable on all

- S series Business Servers (/390 architecture)
- SQ series Business Servers (x86 architecture)
- SE series Business Servers (/390 and x86 architecture)

that are supported by the operating system versions listed in section 3.2.

## **5 Firmware levels**

Not applicable