Fujitsu Software BS2000 CRTE

Version 11.1A
July 2020

Release Notice

1   General

The Common Run-Time Environment CRTE V11.1A is the common runtime system for all variants of the following compilers:
COBOL85 as of V2.1, COBOL2000 as of V1.0, C and C++ as of V2.1 or C/C++ as of V3.0 in OSD/BC as of V11.0 and OSD/XC as of V11.0.

CRTE comprises language-specific and non-language-specific libraries, e.g. for program linking, mathematics and uniform event and error handling as well as memory and I/O management. The header files of the C and C++ library functions are also part of the CRTE.

The CRTE is software prerequisite for COBOL85, COBOL2000, C and C++ applications and for the above-mentioned versions of the compilers for the languages COBOL, C and C++. CRTE is also a prerequisite for applications with a "foreign" language mix. CRTE also supports the COBOL85, COBOL2000, C and C++ compilers and their applications in POSIX.

Some of the CRTE libraries are shareable and can be preloaded as a subsystem.

This Release Notice is a summary of the major extensions, requirements and operating information with regard to CRTE V11.1A under the operating system OSD/BC as of V11.0 and OSD/XC as of V11.0.

*1   The release level is that of July 2020.

*1   Changes to release level December 2019 are marked with "*1".

This and other current Release Notices are shipped on the SoftBooks DVD and are available online at https://bs2manuals.ts.fujitsu.com/.

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

1.1   Ordering

CRTE V11.1A can be ordered from your local distributors.

CRTE V11.1A can be purchased from your local distributors and is subject to the general terms and conditions of the software product use and service agreement.

*1   CRTE V11.0A is included in OSD/XC as of V11.0 (see section 3.2 "Software configuration" for details).

1.2 Delivery

The CRTE V11.1A files are supplied via SOLIS.

The following delivery components are required, regardless of the hardware type (HSI):

SINLIB.CRTE.111	Library for installation in POSIX
SINPRC.CRTE.111	Library with installation procedures
SKULNK.CRTE.111	C runtime system including macros (X86)
SKULNK.CRTE.111.COMPL	Modules for complete partial bind (X86)
SKULNK.CRTE.111.CPP-COMPL	Modules for complete partial bind of ANSI-C++ programs (X86)
SKULNK.CRTE.111.PARTIAL-BIND	Modules for standard partial bind (X86)
SKULNK.CRTE.111.POSIX	POSIX link switch (X86)
SKULNK.CRTE.111.RTSCPP	Standard-C++ runtime system for C/C++ V3.2 (X86)
SKULNK.CRTE.111.STDCPP	Standard-C++ library for C/C++ V3.2 (X86)
SKULNK.CRTE.111.TIME	Time link switch (X86)
SKULNK.CRTE.111.TIMESHIFT	Timeshift link switch (X86)
SKULNK.CRTE.111.TIME38	Time functions for special applications (X86)
SKULNK.CRTE.111.TIME50	Timeshift link switch (X86)
SKULNK.CRTE.111.TOOLS	C++ library Tools.h++ for C/C++ V3.2 (X86)
SKULNK.CRTE.111.CXX01	Module library for C/C++ Compiler as of V4.0 (C++-2017) (X86)
SYSFGM.CRTE.111.D	Release Notice (German)
SYSFGM.CRTE.111.E	Release Notice (English)
SYSLIB.CRTE.111	Header and macros for C, C++, Tools.h++
SYSLIB.CRTE.111.CPP	Headers and macros for C++-Cfront mode
SYSDOC.CRTE.111.CXX01.OSS	Readme files and licences of the Open Source Licences contained in the runtime system for C++-2017

SYSLNK.CRTE.111	C/COBOL runtime system including macros
SYSLNK.CRTE.110.CFCPP	Macro/module library for C/C++ compiler as of V3.0B (Cfront)
SYSLNK.CRTE.111.CXX01	Module library for C/C++ Compiler as of V4.0 (C++-2017)
SYSLNK.CRTE.111.COMPL	Modules for complete partial bind
SYSLNK.CRTE.111.COMPV1	Compatibility library C V1.0
SYSLNK.CRTE.111.COMPV2	Compatibility library C V2.0
SYSLNK.CRTE.111.CPP	Macro/module library for C++ compiler as of V2.1 (Cfront)
SYSLNK.CRTE.111.CPP-COMPL	Modules for complete partial bind of ANSI-C++ programs
SYSLNK.CRTE.111.PARTIAL-BIND	Modules for standard partial bind
SYSLNK.CRTE.111.POSIX	POSIX link switch
SYSLNK.CRTE.111.RTSCPP	Standard C++ runtime system for C/C++ as of V3.0
SYSLNK.CRTE.111.SHARE	Shareable components
SYSLNK.CRTE.111.STDCPP	Standard C++ library for C/C++ as of V3.0
SYSLNK.CRTE.111.TIME	Time link switch
SYSLNK.CRTE.111.TIMESHIFT	Timeshift link switch
SYSLNK.CRTE.111.TIME38	Time functions for special applications
SYSLNK.CRTE.111.TIME50	Timeshift link switch
SYSLNK.CRTE.111.TOOLS	C++ library Tools.h++ for C/C++ as of V3.0
SYSSSC.CRTE.111.C SYSSSC.CRTE.111.C.LOW	Subsystem declarations (CRTEC)
SYSSSC.CRTE.111.COBOL SYSSSC.CRTE.111.COBOL.LOW	Subsystem declarations (CRTECOB)
SYSSSC.CRTE.111.COB-PART SYSSSC.CRTE.111.COB-PART.LOW	Subsystem declarations (COBPART)
SYSSSC.CRTE.111.PARTIAL SYSSSC.CRTE.111.PARTIAL.LOW	Subsystem declarations (CRTEPART)
SYSSSC.CRTE.111.SIS SYSSSC.CRTE.111.SIS.LOW	Subsystem declarations (CRTESIS)
SYSSII.CRTE.111	IMON information file

The files identified as X86 can only be used for producing applications for X86 hardware. They are not needed for normal operation, but are supplied for optimizing availability if required. Their use is not generally released.

*1   The following delivery components are only required on a x86 server unit in SE Servers:

    SKUSSC.CRTE.111.PARTIAL   Subsystem declarations (CRTEPARK)
    SKUSSC.CRTE.111.SIS   Subsystem declarations (CRTESIK)

POSIX-HEADER and the message files for CRTE are component parts of OSD/BC and OSD/XC (see section 3.2 "Software configuration" for details).

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

1.3   Documentation

You will find a description of the language-specific application options in the user guides and in the language reference manuals for each compiler as well as in the descriptions of the C and C++ library functions.

The following documentation is available for CRTE as of V11.1A:

   CRTE V11.1A Common Runtime Environment
   Benutzerhandbuch

   CRTE V11.1A Common Runtime Environment
   User Guide

The following documentation is available for the C library functions:

   C-Bibliotheksfunktionen
   Referenzhandbuch

   C Library Functions
   Reference Manual

The following documentation is available for the C library functions in POSIX:

   C-Bibliotheksfunktionen für POSIX-Anwendungen
   Referenzhandbuch

   C Library Functions for POSIX Applications
   Reference Manual

The manuals of the BS2000 basic configuration are additionally required for operating CRTE.

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

The documentation is also available on the internet at
https://bs2manuals.ts.fujitsu.com/.

2 Software extensions

2.1 Support of C standard ISO/IEC 9899:2011

*1   CRTE V11.1A contains the components to use the functions of the C standard
            ISO/IEC 9899:2011.

2.2 Support of C++ standard ISO/IEC C++ 2017

*1   CRTE V11.1A contains the C++ libraries to use the functions of the C++ standard
            ISO/IEC C++ 2017.

3   Technical information

3.1   Resource requirements

Depending on the application concerned, CRTE V11.1A requires
approx. 1 MB static virtual address space.

The files supplied with the product occupy
approx. 94,000 PAM pages

where
approx. 47,000 PAM pages
are occupied by files that are provided exclusively for producing X86 applications for
X86 hardware.

*1   The later files can be deleted to save hard disk space, as long as the production of
X86 applications is not intended.

The following space is required in class 4 memory for loading the subsystems:

CRTEC	1946 KB
CRTECOB	242 KB
CRTESIK	3183 KB (only for X86 systems)
CRTESIS	979 KB
CRTEPARK	5438 KB (only for X86 systems)
CRTEPART	2346 KB
COBPART	193 KB

All subsystems are loaded by default into the class 4 memory above 16 MB.

3.2   Software configuration

*1   CRTE V11.1A is released for OSD/BC as of V11.0.

The POSIX subsystem must be loaded for the CRTE V11.1AB POSIX support. POSIX
applications produced with CRTE V11.1A require the version of POSIX-BC that is re-
leased for the OSD version concerned.

*1   CRTE V11.1A requires:

*1   CRTE-BAS V11.1 (contained in OSD/BC V11.0 as of Service Pack 19.2)

Among other things, this delivery unit includes release of CRTE-MSG V11.1A and
POSIX-HEADER V11.1A.

3.3   Product installation

Installation of the product CRTE with the installation monitor IMON is mandatory. The information concerning installation in the delivery cover letter and in the product documentation must be followed as well as the information in this Release Notice.

The necessary inputs and the sequence of the installation are described in the IMON documentation. You will find all important information on product installation in the CRTE V11.0A User Guide.

The standard installation of CRTE in the POSIX file system is made either directly with IMON or with the POSIX installation tool after installation with IMON.

The following additional installation forms are also described in the manual:
- Installation to a non-standard ID
- Private installation
- Installation of header files and link switches in any desired POSIX directory

3.3.1 Important information regarding upgrades

CRTE V11.1 is the subsequent version of CRTE V11.0.

Upgrading from previous CRTE versions:

The headers from an earlier CRTE version installed in POSIX must first be removed. For this, refer to the information in the CRTE V11.1A User Guide.

Subsequently, all files from previous CRTE versions can be deleted.

Any preloaded CRTEC, CRTECOB, CRTESIS, CRTEPART, CRTEPARK, COBPART subsystems from a previous version may not be accessed while or after installing CRTE V11.1A. These subsystems should be stopped before CRTE V11.1A is installed, and either replaced by the new version of the subsystem concerned (in the case of a standard installation, IMON automatically generates the appropriate entries in the subsystem catalog) or removed from the subsystem catalog.

CRTE replaces ILCS. Parallel operation of CRTE and ILCS will result in undefined program behavior. Therefore, you should take note of the following:

You may not access an existing ILCS subsystem while or after installing CRTE V11.1A. ILCS must be stopped and removed from the subsystem catalog before CRTE V11.1A is installed.

If ILCS is supplied with another product, you cannot install this ILCS as long as CRTE is installed.

3.4   Product use

The CRTE V11.1A User Guide contains all the main information on using the product.

The libraries (SKULNK...) and subsystems (SKUSSC...), supplied exclusively for use on X86 systems are not released for use. If necessary, these files can be deleted (see section 3.1 "Resource requirements" for details).

Note on optional REP A0434953-294:
This optional REP ensures that page 0 is not allocated after ILCS initialization. This REP should only be used in debug operation to detect erroneous access to page 0.

3.5   Discontinued functions (and those to be discontinued)

The following functions are no longer supported as of this version:

The following functions are supported for the last time in this version:

3.6   Incompatibilities

3.7   Restrictions

3.8   Procedure in the event of errors

If an error occurs, the following error documents are needed for diagnostics:

- a detailed description of the error condition
- indication as to whether and how the error can be reproduced
- options, source and error listing including expansion of the COPY and IN-CLUDE elements (LISTING option)
- execution log
- source including the COPY and INCLUDE elements and COSSD if required
- linker listing
- input/output files
- expected result
- brief description of execution
- product version number
- Rep files used
- CONSLOG (in special cases)
- DUMP, if available
- subsystems used

4 Hardware requirements

CRTE V11.1A will run on all business servers supported by

- OSD/BC as of V11.0 and
- OSD/XC as of V11.0

5   Firmware versions

not applicable