

Datasheet

FUJITSU Software BS2000 C/C++ V3.2

C/C++ Compiler

SHORT DESCRIPTION

The C/C++ compiler supports object-oriented programming (OOP) with C++ on BS2000 business servers.



Topic

Product Characteristic

Depending on the selected language mode, the C/C++ V3.2 compiler in BS2000 supports:

- C code conforming to the Kernighan & Ritchie C definition,
- C code conforming to the ANSI/ISO C Standard 9899:1990 with Amendment 1:1994(E),
- C++ code conforming to the Stroustrup C++ definition (C/C++ V3.0B or later),
- C++ code conforming to the ANSI/ISO C++ Draft.

C++ is a powerful programming language which supports the principles of object-oriented programming, such as encapsulation, inheritance and polymorphism. C++ is particularly suitable for use in the development of reusable software building blocks in the form of class libraries.

C/C++ permits selective use of the advantages of object-oriented programming. The C language set is also available.

The C/C++ V3.2 programming system is available in the following selectable units:

C/C++ full configuration for OSD /390:

- with AID support,
- with /390 code generator,
- without x86 code generator.

The language set of the C++ compiler supports the following elementary functions for object-oriented programming:

- Templates
- Exception handling
- Run-time type information
- New-style casts
- Abstract data types
- Hidden information
- Classes
- Overloading
- Multiple inheritance.

C/C++-RS (shipment via special release only):

Full configuration for business servers with x86 processor architecture:

- with AID support,
- with /390 code generator,
- with x86 code generators for business servers with x86 processor architecture (SQ- and SE-series).

C/C++ V3.2 supports the POSIX functionality and the POSIX file system in BS2000.

CRTE is the common runtime environment for C/C++, COBOL85 and COBOL2000. CRTE is a software requirement for use of the C/C++ compiler and for running C/C++ applications.

CRTE is not shipped in combination with the C/C++ compiler and must be ordered separately.

Functional Description

C++ supports object-oriented programming, which is based on the following principles:

Encapsulation:

Objects encapsulate states and functions. In C++, objects are described by means of class definitions. A class definition collectively defines data and the functions that operate on this data.

Software produced according to this principle is more robust, easier to maintain and easier to extend, since there are fewer dependencies between the modules and the details of the implementation are encapsulated in classes.

Inheritance:

Classes can inherit attributes from other classes. Inheritance permits better structuring of the software and helps reduce the amount of code, as common sections of code can be reused.

Polymorphism:

Objects of different types can share a common function interface, enabling a developer to use the various objects without needing to know their type. The use of polymorphism produces software that is more general-purpose, more flexible and more reusable.

C++ supports the creation of class libraries. Class libraries are reusable software building blocks.

C++ avoids runtime errors by strict type checking. This greatly improves the stability of the programs.

C/C++ supports the POSIX functionality in BS2000 OSD/BC V2.0 or higher.

The C/C++ compiler can be invoked under the POSIX shell in accordance with XPG4 specifications. Sources and includes can be read from the POSIX file system UFS. Generated objects and compiler listings can be stored in UFS.

Input/output operations on UFS files are possible via the C/C++ POSIX RTS. This is particularly useful for processing unstructured data streams, which are a common feature in UNIX-systems environments. AID can be used for symbolic and non-symbolic debugging of C++ programs in BS2000.

This provides the same test environment for C/C++ that many developers are familiar with from ASSEMBH, COBOL85, COBOL2000, FORTRAN or PLI1.

Program Description

The C/C++ development system comprises the C/C++ compiler and the Common Runtime Environment CRTE.

The C/C++ compiler supports the language set of the ANSI/ISO C++ Draft 1996 as defined in the "Working Paper for Draft Proposed International Standard for Information Systems Programming Language C++, Doc.No.: X3J16/96-0219R1 or ISO WG21/N1037 dated 2.12.1996".

This includes templates, exception handling, new-style casts, namespaces and run-time type information (RTTI).

The C language set as defined by Kernighan & Ritchie and C ANSI/ISO incl. Amendment 1 is also supported.

Code is generated directly as machine code for business servers with /390 instruction architecture.

The generated /390 format guarantees object compatibility for the execution of BS2000 customer applications even in the event of future changes in architecture.

CRTE includes language-specific and language-neutral libraries, e.g. for program linking, mathematics, standardized event and error handling, as well as for storage and I/O management.

The header files for the C and C++ library functions are also included in CRTE. Some CRTE libraries are shareable and can be preloaded as a subsystem.

With CRTE the standard C++ library conforming to the ANSI C++ Draft and the Tools.h++ © Rogue Wave library are also shipped.

The standard C++ library includes a string class, container classes, iterators, generic algorithms, numeric classes and operations, as well as input/output classes.

The Tools.h++ © library contains general-purpose "Foundation Classes". These include string classes with pattern matching mechanisms, classes for handling date and time, virtual streams, container classes and internationalization classes.

The following functions can be used in BS2000 versions in which a POSIX subsystem is available:

- Input/output of POSIX files during compilation
- Use of POSIX library functions conforming to XPG4
- Control of the C/C++ compiler via the POSIX shell

CRTE is required as the runtime environment for the C/C++ compiler and programs generated with it. CRTE is the common runtime environment for C/C++, COBOL85 and COBOL2000 programs.

Technical Details

Requirements

Technical Requirements Hardware	BS2000 Business Server
Technical Requirements Software	OSD/BC V10.0 or higher OSD/XC V10.0 or higher CRTE V10.0B or higher SDF V4.1 or higher BINDER V2.3 or higher BUILDER V1.0 or higher LLMAM V3.4 or higher PLAM ab V3.1 or higher Optional software: EDT V16.6 or higher AID for symbolic debugging POSIX-BC for the C/C++ compiler under POSIX DAB to speed up load times
User Requirements	Knowledge of C, C++ and BS2000

Installation

Betriebsart	Batch and interactive dialog
Implementation Language	C/C++, SPL4 and Assembler
User Interface	Commands in English Messages in English or German
Installation	Please refer to the relevant release notices.

Documentation and Training

Documentation	<p>Documentation in English and German: C/C++ Compiler User Guide POSIX Commands of the C/C++ Compiler User Guide CRTE User Guide AID Debugger for C/C++ User Guide BS2000 C Libraries Reference Manual BS2000 C++ Libraries Reference Manual POSIX C Libraries Reference Manual</p> <p>Documentation in English only: Standard C++ Library User Guide and Reference Tools.h++ © User Guide Tools.h++ © Class Reference Tools.h++ Copyright © Rogue Wave Software, Inc..</p> <p>The documentation is available as online manuals, see http://manuals.ts.fujitsu.com/mainframes.html, or in printed form which must be paid for and ordered separately at http://manuals.ts.fujitsu.com .</p>
---------------	--

Training	See course offer
----------	----------------------------------

Bezug und Lieferung

Conditions	This software product is provided to the customer on the terms and conditions for the use of software products against current or one-time payment.
Order and Delivery	The software product can be obtained from the regional headquarters of Fujitsu Technology Solutions GmbH.

More information

Fujitsu products, solutions & services

In addition to BS2000, Fujitsu offers a full portfolio of other computing products.

Products

www.fujitsu.com/global/products/

Computing products

- Storage systems: ETERNUS
- Server: PRIMERGY, PRIMEQUEST, Fujitsu SPARC M10, BS2000/OSD Mainframe
- Client Computing Devices: LIFEBOOK, STYLISTIC, ESPRIMO, FUTRO, CELSIUS
- Peripherals: Fujitsu Displays, Accessories
- Software
- Network

Product Support Services with different service levels agreements are recommended to safeguard each product and ensure smooth IT operation.

Solutions

<http://www.fujitsu.com/global/solutions>

The Fujitsu solutions combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships. Fujitsu's Solutions include parts of one or more activity groups (e.g., planning, implementation, support, management, and training services) and are designed to solve a specific business need.

Infrastructure Solutions are customer offerings created by bringing Fujitsu's best products, services and technologies together with those from partners to deliver benefit to our customers' businesses.

Industry Solutions are tailored to meet the needs of specific verticals.

Business and Technology Solutions provide a variety of technologies developed to tackle specific business issues such as security and sustainability, across many verticals.

More information

Services

www.fujitsu.com/global/services/

Several customizable Fujitsu Service offerings ensure that IT makes a real difference and delivers true business value. We do this by leveraging our extensive experience in managing large, complex, transformational IT programs to help clients in planning, delivering and operating IT services in a challenging and changing business environment.

Application Services support the development, integration, testing, deployment and on-going management of both custom developed and packaged applications. The services focus on delivering business and productivity improvements for organizations.

Business Services respond to the challenge of planning, delivering and operating IT in a complex and changing IT environment.

Managed Infrastructure Services enable customers to deliver the optimal IT environment to meet their needs – achieving high levels of IT service quality and performance for data center and end user environments.

Fujitsu green policy innovation

www.fujitsu.com/global/about/environment/

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at:



More information

Learn more about Fujitsu, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.

<http://www.fujitsu.com/fts>

Copyright

© 2018, Fujitsu Technology Solutions GmbH, Fujitsu and the Fujitsu logo are trademarks or registered trademarks of Fujitsu Limited in Japan and other countries. PRIMERGY, PRIMEQUEST and BS2000 are trademarks or a registered trademarks of Fujitsu Technology Solutions GmbH in Germany and other countries. Other company, product and service names may be trademarks or registered trademarks of their respective owners.

Disclaimer

Technical data subject to modification and delivery subject to availability. Any liability that the data and illustrations are complete, actual or correct is excluded. Designations may be trademarks and/or copyrights of the respective manufacturer, the use of which by third parties for their own purposes may infringe the rights of such owner.

Contact

Fujitsu Technology Solutions GmbH
Mies-van-der-Rohe-Str. 8, 80807 München, Deutschland
Website: www.fujitsu.com/de
April 30th 2018 EN