IBM VisualAge C++ Professional for AIX, V6.0 Now Supports Symmetric Multiprocessing with OpenMP

Overview

The IBM VisualAge® C++ Professional for AIX®, V6.0 compiler allows you to generate and debug high performance and efficient C and C++ software applications for AIX.

VisualAge C++ Professional for AIX includes a makefile-based, command-line C++ compiler that supports the latest ANSI/ISO 1998 C++ standard. A complete implementation of the ANSI C++ Standard Library including the Standard Template Library (STL) is also included. Both 32-bit and 64-bit architecture and optimization technologies are supported.

VisualAge C++ Professional for AIX includes a complete implementation of the latest C for AIX compiler that allows you to write both C and C++ applications or to extend an existing C application using C++. Also included in VisualAge C++ is the IBM Distributed Debugger that allows you to visually debug programs running locally, remotely, or in a client-server environment.

What’s new in V6.0?

- Support for OpenMP in C++ for symmetric multiprocessing (SMP) programming.
- Enhanced template instantiation for faster compilation and the generation of smaller objects.
- GNU C/C++ ease of portability features.
- New compiler options and pragmas.

- Special functions and support for POWER4™ architecture and PowerPC® processors.
- Enhanced integrated C for AIX compiler supports the latest C99 International Standard.

VisualAge C++ Professional for AIX continues to improve while maintaining adherence to the latest international standards and industry specifications.

Key prerequisites

- AIX V4.3.3 or AIX V5.1
- Frames-capable browser to access the HTML-based help, such as:
  - Netscape Communicator V4.04, or later

Planned availability dates

- July 5, 2002, for Electronic Software Delivery
- July 12, 2002, for Build-to-Plan (orders by part number)
- July 30, 2002, for Build-to-Order (orders by product number/feature number)

At a glance

VisualAge C++ Professional for AIX continues to get better with each release.

Enhancements in V6.0 offer:

- Improved portability through support in C++ for the OpenMP industry specification
- 32-bit and 64-bit application development
- Enhanced template handling for faster compilations and the generation of smaller objects
- Inclusion of the C for AIX compiler at the latest C99 International Standard
- Support in C++ for the latest approved clarifications of the ISO 1998 C++ Standard
- Partial GNU C/C++ portability support to ease migration of code from GCC
- Generation of highly optimized code for all RS/6000® processors including the PowerPC and POWER4 architectures
- New compiler options and pragmas
- Inclusion of an enhanced level of the IBM Distributed Debugger which support the debugging of C99

For ordering, contact:
Your IBM representative, an IBM Business Partner, or the Americas Call Centers at 800-IBM-CALL

Reference: RE001

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
Description

The VisualAge C++ Professional for AIX, V6.0 software is a highly productive and powerful development environment for building C and C++ applications.

1999 C Standard

IBM VisualAge C++ Professional for AIX, V6.0 builds on official industry standards, so your code can be ported easily. The ISO/IEC 9899:1999 International Standard (also known as C99) specifies the form and establishes the interpretation of programs written in the C programming language. This is the second edition of the standard. This update is designed to enhance the capability of the C language, provide clarifications, and incorporate technical corrections to the previous edition of the standard. Not all runtime functions and facilities required by the ISO/IEC 9899:1999 International Standard are supported on all the operating system levels that can run this version of the compiler. The availability of system header files provides an indication of the support.

The first edition, which is supported by VisualAge C++ for AIX, V6.0, is ISO/IEC 9899:1990 (also known as C89). With representation from IBM’s compiler development team on the ANSI C committee, IBM is in a position to understand the latest changes and clarifications to the C programming language standard.

The C99 Standard offers a number of additional language functions including:

- Long Long
- Bool
- Pragma operator
- Initializer allow con
- Empty new argument
- Macro with variable number of args
- Inline function specifier
- Complex

This International Standard is designed to promote the portability of C programs among a variety of implementations.

The -qlanglvl compiler option has been enhanced to support all of the available language levels that you can use to compile your code within VisualAge C++. These include the strict conformance to the latest C99 Standard, extended conformance to C99, conformance to the previous C89 Standard, or enabling of C99 with the universal character set. VisualAge C++ offers you the flexibility to compile your code to the language level that you need.

1998 C++ Standard

The ISO/IEC 14882:1998 International Standard (also known as Standard C++) specifies the form and establishes the interpretation of programs written in the C++ programming language. This International Standard is designed to promote the portability of C++ programs among a variety of implementations. ISO/IEC 14882:1998 is the first formal definition of the C++ language. In V5.0 (the previous release) of VisualAge C++ Professional for AIX, the C++ compiler supported this latest 1998 ISO/IEC Standard. In this release, V6.0, support for the approved clarifications of 1998 ISO/IEC Standard have been implemented, bringing the C++ compiler within VisualAge C++ for AIX, V6.0 to the latest level of the standard possible at this time. With representation from IBM’s compiler development team on the ISO/ANSI C++ committee, IBM is in a position to understand the latest clarifications of the ISO 1998 C++ Standard.

OpenMP

The OpenMP is an industry specification describing a common set of APIs which support multiplatform symmetric multiprocessing (SMP) programming in C, C++, and Fortran on all architectures, including UNIX® platforms and Windows NT® platforms. Jointly defined by a group of major computer hardware and software vendors, including IBM, OpenMP is a portable, scalable programming model designed to provide SMP programmers with a simple and flexible interface for developing shared-memory parallel applications for platforms ranging from the desktop to the supercomputer.

Both the C compiler (IBM C for AIX) and the Fortran compiler (IBM XL Fortran for AIX) has had support for OpenMP in previous releases. Now the C++ compiler within VisualAge C++ for AIX, V6.0 also supports the OpenMP Industry Specification. C and C++ support OpenMP Specification 1.0.

VisualAge C++ contains OpenMP pragma directives, library functions, and environment variables that exploit shared memory parallelism. OpenMP pragmas fall into four general categories:

1. Parallel Constructs

   These pragmas enable the programmer to define the parallel regions in which work is done by threads in parallel. Most of the OpenMP directives either statically or dynamically bind to an enclosing parallel region.

2. Worksharing Constructs

   This category of pragmas enables the programmer to define how work will be distributed across the threads in a parallel region.

3. Synchronization Constructs

   This category enables the programmer to control synchronization among threads.

4. Data Visibility

   This category of pragmas enables the programmer to define the private/shared context of data within a parallel region.

For more information about the OpenMP Specification, visit the OpenMP Web site at: http://www.openmp.org

Support for a subset of features related to GNU C/C++

GCC is an open-source compiler collection for C, C++, Fortran, Objective C, and other languages. In order to help with the porting of code that was originally written for GCC, a subset of features related to GNU C/C++ are supported by VisualAge C++ for AIX. Other GNU C/C++ features are recognized (accepted and ignored). This will help you minimize the number of changes that you need to make to your GCC source code to ensure that it compiles successfully using VisualAge C++ for AIX.

32-bit and 64-bit Application Development

You can use VisualAge C++ for AIX to develop both 32-bit and 64-bit applications. VisualAge C++ provides 64-bit pointer and 64-bit addressability support for SMP and serial code. High optimization levels, interprocedural analysis, and SMP are supported for 64-bit code.
Optimizations exploiting the PowerPC Architecture™

VisualAge C++ for AIX, V6.0 supports the PowerPC architecture (includes the POWER4 architecture) of the RS/6000. The new -qarch=pwr4 and -qtune=pwr4 suboptions support POWER4 architecture. The -qarch=pwr4 suboption allows the compiler to exploit the instruction set of POWER4 and generate code optimized for this latest architecture. The -qtune=pwr4 suboption instructs the compiler to tune the optimizations of the generated code to the POWER4 architecture.

VisualAge C++ for AIX, V6.0 also supports a number of special built-in functions for the PowerPC architecture.

Enhanced template handling

Template instantiation has been improved for faster compilation and the generation of smaller objects. The new options -qtemplaterecompile and -qtemplateregistry enable efficient template compilation and the generation of smaller objects. The Template instantiation has been improved for faster compilation and the generation of smaller objects.

New compiler options and pragmas

VisualAge C++ Professional for AIX, V6.0 introduces a number of new compiler options and pragmas for increased efficiency.

- New compiler options include:
  - A new -qsmp option is provided to support parallel processing.
  - The -04 optimization option is now available for both C and C++ code.
  - The -05 optimization option is now available for both C and C++ code.
  - The -qipa option, which activates interprocedural analysis, is now available for both C and C++ code.
  - The -qcacheb option, used to describe the cache configuration for a specific target execution machine, is now available for both C and C++ code.
  - The -qoptf1 and -qoptf2 options, which can be used to tune optimizations through Profile-Directed Feedback (PDF), are now available for both C and C++ code.
  - The -qalign=bit_packed suboption, used to specify that the compiler uses bit_packed aggregate alignment rules, is now available for both C and C++ code.
  - The new -qkeepinlines option instructs the C++ compiler to add the definitions of extern inline functions that are not referenced after inlining has occurred to the object file. This option may be required to maintain binary compatibility with builds done with VisualAge C++ for AIX, V5.0.
  - The new -qgoldpassbyvalue option instructs the compiler to mimic VisualAge C++ for AIX, V3.6, so that when a class containing a const or reference member is passed as a function argument it is not passed by a value.
  - The new -qlanglvl=ansiinit suboption allows the user to build shared libraries that use the same mechanism for static initialization as used in VisualAge C++ for AIX, V3.6 and earlier versions of the compiler.
  - The new options -qtemplateregistry and -qtemplaterecompile enable efficient template instantiation.

- New pragmas
  - The new #pragma execution_frequency (very_low) directive specifies infrequently executed code.
  - The new #pragma snapshot directive sets a debugging breakpoint at the point of the pragma and defines a list of variables to examine when program execution reaches that point.
  - The new #pragma pack directive allows the user to modify the alignment rule for members of structures.
  - The #pragma unroll directive, which specifies whether and how the body of a loop can be unrolled, can now be used in both C and C++ code.
  - New pragmas are provided for OpenMP parallel processing.

Withdrawal of function

VisualAge C++ Professional for AIX, V5.0 contained two C++ compilers: a traditional command-line compiler and an incremental compiler, accompanied by an associated Integrated Development Environment (IDE) and set of tools.

As of this release of VisualAge C++ Professional for AIX, IBM withdraws the following components from this product:

- Incremental C++ compiler
- IDE and the following related tools:
  - Data Access Builder (DAX)
  - Visual Builder
  - Performance Analyzer
  - LPEX editor
  - IBM resource compiler (irc)
  - IBM Open Class™ Library
C++ 1998 Standard, including the C++ Standard Library and the Standard Template Library (STL). Documentation is made available within the online information to assist migration from IBM Open Class to the C++ Standard Library.

Comprehensive help system

VisualAge C++ Professional for AIX help is online and in HTML format, so if you've browsed the World Wide Web, you already know how to use it effectively. This online help provides you with information on every component in VisualAge C++. It is optimized for fast access to information, and provides fuzzy and precise full-text search. Most information is also provided in Adobe Acrobat PDF format.

Also provided as part of the help system is transition information to assist you in migrating from the IBM Open Class Library to the C++ Standard Library.

Text help is available directly on your command line. This help will give you a quick reference for the format and argument description for all C and C++ compiler options.

Reference information

Software Announcement 202-161, dated July 2, 2002, entitled IBM C for AIX, V6.0 Now Supports the C99 Standard

Trademarks

POWER4, PowerPC Architecture, and Open Class are trademarks of International Business Machines Corporation in the United States or other countries or both. AIX, VisualAge, PowerPC, and RS/6000 are registered trademarks of International Business Machines Corporation in the United States or other countries or both. Windows NT is a registered trademark of Microsoft Corporation. UNIX is a registered trademark of the Open Company in the United States and other countries. Other company, product, and service names may be trademarks or service marks of others.
Offering information

Product information will be available through Offering Information (OITOOL) at:

http://www.ibm.com/common/ssi

Publications

No publications are shipped with this program.

Displayable softcopy publications

The publications for VisualAge® C++ Professional for AIX®, V6.0 are offered in displayable softcopy form. All unlicensed manuals are included. The files are shipped on the CD-ROM.

Technical information

Specified operating environment

Hardware requirements

IBM VisualAge C++ Professional for AIX, V6.0

- Processor: RS/6000® family of processors supported by AIX V4.3.3 or AIX V5.1
- Display: SVGA 800 x 600 (1024 x 764 recommended)
- CD-ROM drive
- Mouse or pointing device
- Memory: 96 MB (128 MB, or higher, recommended)
- Disk space: Up to 375 MB

Software requirements

IBM VisualAge C++ Professional for AIX, V6.0

- IBM AIX V4.3.3 or IBM AIX V5.1
  - On AIX V4.3.3 or AIX V5.1, Motif 1.2 compatibility libraries must be installed
- X11 required for the Distributed Debugger component
- Frames capable browser to access the HTML-based help such as:
  - Netscape Navigator V4.04, or later
- Adobe Acrobat Reader required to view and print PDF documentation; visit the Adobe Web site at:

  http://www.adobe.com

IBM VisualAge C++ Professional for AIX, V 6.0 produces applications that run in the AIX V4.3.3 and AIX V5.1 environments.

Planning information

Web information

- The IBM VisualAge C++ home page at:
  http://www.ibm.com/software/ad/vaccpp
- The IBM VisualAge Family home page at:
  http://www.ibm.com/software/ad/

Packaging

The IBM VisualAge C++ Professional for AIX, V6.0 product is distributed in a single package that includes the following:

- IBM International Program License Agreement (IPLA) multilingual booklet
- IBM VisualAge C++ Professional for AIX, V6.0 License Information (LI)
- Proof of Entitlement (PoE)
- Two CD-ROMs containing VisualAge C++ Professional for AIX, V6.0
- Memo to Users — Read Me First! multilingual document
- Customer service and support card

This program, when downloaded from a Web site, contains the applicable IBM license agreement, and LI, if appropriate and will be presented for acceptance at the time of installation of the program. The license and LI will be stored in a directory such as LICENSE.TXT for future reference.

Security, auditability, and control

VisualAge C++ Professional for AIX, V6.0 uses the security and auditability features of the AIX Operating System.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

IBM VisualAge C++ Professional for AIX, V6.0 is a workstation product that has one charge unit: Authorized User.

These are available in fixed order quantities of one user and 250 users.

Note: IBM VisualAge C++ Professional for AIX, V6.0 is licensed based on a charge unit of one authorized user. The program may be stored on more than one machine,
provided that the program is not in active use on more than one machine at the same time.

An authorized user is an individual or specific named user authorized to have access to the program or any portion of the program. The PoE for this program is evidence of your authorization. Each individual or specific named user must obtain a PoE.

**Passport Advantage**

Program name/Description | Part number
--- | ---
VisualAge C++ Pro AIX, V6 Media Package Multilingual | BA05JML
VisualAge C++ Pro AIX, V6 + USER LIC/SW MAINT 1 ANNIV | D5AHLLL
VisualAge C++ Pro AIX, V6 + USER LIC/SW MAINT 2 ANNIV | D5AHMLL
VisualAge C++ Pro AIX, V6 + USER SW MAINT RNWL 1 ANNIV | E1AHNLL
VisualAge C++ Pro AIX, V6 + USER SW MAINT AFT LIC 1 ANNIV | D5AHPLL

**Basic license:** To order the programs described in this announcement for 5765-F56, specify the type-model number and the applicable features from the tables below. Authorized users can be ordered in quantities of 1 authorized user or 250 authorized users. The medium feature (CD-ROM) need only be specified as required.

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¹ OTC = One-Time Charge
² NA = Not Applicable

**Single pallet delivery:** Single Pallet Delivery consolidates RS/6000 hardware, AIX, and selected AIX licensed program orders into a single delivery.

IBM VisualAge C++ Professional for AIX, V6.0 will be included in Single Pallet Delivery. The IBM VisualAge C++ Professional for AIX, V6.0 product will have its entitled publications and media consolidated with the RS/6000 system unit into a single delivery. The software orders affected are those ordered using the program number 5765-F56 "Built-to-Order" structure, designated as Single Pallet Delivery and tied to the same pre-installed RS/6000 system order.

IBM VisualAge C++ Professional for AIX, V6.0 is not available pre-installed. This product will be included as part of Single Pallet.

Delivery must have the feature number 3483 designated on the individual program product (5765-F56) orders.

**Passport Advantage Customer: Media Pack Entitlement Details**

Customers with active maintenance or subscription for the products listed below are entitled to receive the corresponding media pack.

**Entitled maintenance offerings Description**

VisualAge C++ Professional for AIX

**Media packs description**

Program Feature | Feature number
--- | ---
VisualAge C++ Pro AIX V6 Media Pack Multilingual | BA05JML

**Single pallet delivery feature number**

Feature description | Machine type/model | Feature number
--- | --- | ---
VisualAge C++ Professional for AIX, V6.0 Single Pallet Delivery | 5765-F56 | 3483

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

Extending coverage for a total of three years from date of acquisition may be elected. Order the program number, feature number, and quantity to extend coverage for your software licenses. If maintenance has expired, specify the After-License feature number.
Program Name
Maintenance IASP PID: 1 Year 5733-M45

Description

Use Authorizations:
(to be ordered in quantity)

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Maintenance IASP PID: 3 Year 5733-M46

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Maintenance offering customer: Media supply entitlement details

Customers with active Software Maintenance (5733-M45 or 5733-M46) for VisualAge C++ Professional for AIX, V5.0 are entitled to receive VisualAge C++ Professional for AIX, V6.0 at no additional charge. Eligible customers should add the applicable CD media supply feature number from the table below to their existing maintenance record.

Entitled maintenance offerings description
VisualAge C++ Professional for AIX

Description
VisualAge C++ Pro AIX V6
CD-ROM Media Multilingual

Medium feature number
5839

Withdrawal of previous maintenance offering feature numbers

The following medium supply feature numbers for the various national language versions of the Maintenance Offering of the previous version of the program are being withdrawn. These supply feature numbers are replaced by a single multilingual offering as described above.

Software subscription for AIX 5692-SSO

Customers who purchased protection for VisualAge C++ Professional for AIX (5765-E26) V5.0 under AIX Software Subscription 5692-SSO, are entitled to receive VisualAge C++ Professional for AIX (5765-F56) V6.0 at no charge. Eligible customers should add the applicable CD media supply feature number from the table below, to their existing 5692-SSO record.

Entitled maintenance offerings description
VisualAge C++ Professional for AIX

Description
VisualAge C++ Pro for AIX, V5 1 Yr SW Maint
5733-M45
5809
5819
5829

VisualAge C++ Pro for AIX, V5 3 Yr SW Maint
5733-M46
5809
5819
5829

Software subscription for AIX 5692-SSO

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3 Denotes billing features that a customer must have previously purchased in order to receive this upgrade at no charge. The billing features must currently be on a customer’s record as proof of eligibility.

Customization options: Select the appropriate feature numbers to customize your order with delivery options desired. These features can be specified on the initial or MES orders.

Example: If publications are not desired for the initial order, specify feature number 3470 to ship media only. For future updates, specify feature number 3480 to ship media updates only. If, in the future, publication updates are required, order an MES to remove feature number 3480; then, the publications will ship with the next release of the program.

Entitled maintenance offerings description
VisualAge C++ Professional for AIX

Description

Initial Shipments

Serial Number Only (suppresses shipment of media and documentation)
3444

Expedites Shipments

Local IBM Office Expedite
(IBM use only)
3445

Customer Expedite Process Charge
($30 charge for each product)
3446

Expedites shipments will be processed to receive 72-hour delivery from the time IBM Software Delivery and Fulfillment (SDF) receives the order. SDF will then ship the order via overnight air transportation.
Terms and conditions

Agreement: IBM International Program License Agreement. Proofs of Entitlement are required for all authorized use. Part number products only, offered outside of Passport Advantage, where applicable, are license only and do not include Software Maintenance.

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

The following agreements apply for maintenance and do not require customer signatures:

- IBM Agreement for Acquisition of Support (Z125-6011)
- Addendum for Support (Software Maintenance) for Select iSeries and pSeries Programs (Z125-6495)

License information form number: CT16XML

Limited warranty applies: Yes

Money-back guarantee: If for any reason you are dissatisfied with the program, return it within 30 days from the invoice date, to the party (either IBM or its reseller) from whom you acquired it, for a refund. This applies only to your first acquisition of the program.

Copy and use on home/ portable computer: Yes

Volume orders (IVO): Yes, contact your IBM representative.

Passport Advantage applies: Yes and through the Passport Advantage Web site at:

http://www.ibm.com/software/passportadvantage

Usage restriction: Yes

Note: Charge Unit

IBM VisualAge C++ Professional for AIX, V6.0 is licensed based on a charge unit of one authorized user. The program may be stored on more than one machine, provided that the program is not in active use on more than one machine at the same time.

An authorized user is an individual or specific named user authorized to access the program or any portion of the program. The PoE for this program is evidence of your authorization. Each individual or specific named user must obtain a PoE.

IBM Distributed Debugger Component

The program includes the IBM Distributed Debugger component. You may install the Distributed Debugger component on multiple machines within the enterprise in order to debug applications that have been generated using the VisualAge C++ Professional for AIX, V6.0 Program.

Third-Party Code

Some components provided with the Program are not governed by this IBM license agreement and are instead subject to separate license terms and conditions. The terms and conditions governing those components are provided when installing or starting them or are found in the directories containing the components. By using, installing, or starting a component, you agree to the applicable terms and conditions for that component.

Usage of components and features

The components and features of the Program, including the C++ Standard Library and UNIX® System Laboratories (USL) Class Library, are to be used only for the development of applications using this program. You may not use any components or features of this program with any other program.

Redistribution of C++ Standard Library

The following terms are in addition to those described in the Redistribution information section below.

You may distribute modules of the C++ Standard Library as part of your software program provided that you:

- Do not to alter or remove the following Copyright Notices which are embedded in the code:
  - Portions of this work are derived from “The Draft Standard C++ Library”, copyright (c) 1995 by P. J. Plauger, published by Prentice-Hall, and are used with permission.
  - Copyright (c) 1994 Hewlett-Packard Company
    Permission to use, copy, modify, distribute and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Hewlett-Packard Company makes no representations about the suitability of this software for any purpose. It is provided “AS IS” without express or implied warranty.
  - Copyright 1996 Licensed to IBM Corporation and its suppliers.

- Include the following Copyright Notice within the product that is, in the “Help/About” box:
  - Copyright 1996 Licensed to IBM Corporation and its suppliers.

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The following terms are in addition to those described in the Redistribution Information section below.

You may distribute modules of the USL Class Library (either the I/O Stream or Complex Mathematics Class Library module) as part of your software program provided that you:

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- Label each distribution copy of the I/O Stream and Complex Mathematics Class Library modules with the following Copyright Notice:
  - Copyright (c) IBM Corporation, 1991, 2002
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  - Copyright (c) AT&T 1984, 1990
  - All Rights Reserved. Copies of these modules are provided “AS IS.”

Redistribution information: The files/modules listed below or located in the directory named below, may be copied onto your media, in object code only, when your application is dependent upon them, subject to the following terms and conditions.
You agree:

1. Copies of these modules are provided “AS IS.” You are responsible for all technical assistance for your application.

2. To indemnify IBM from and against any third-party claim arising out of the use or distribution of your application.

3. Not to use IBM’s name or trademarks in connection with the marketing of your applications without IBM’s prior written consent.

4. To prohibit the recipient from copying (except for backup purposes), reverse assembling, reverse compiling, or otherwise translating the application.

5. Not to use the same path name as the original files/modules.
   - vacpp.*.rte
   - xIC.rte
   - xIC.*.rte
   - xlsmp.rte

Your application containing a copy of the above referenced files/modules must be labelled as follows:

CONTAINS IBM VisualAge C++ Professional for AIX, Version 6.0 Runtime Modules
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Software maintenance applies: Yes

Software Maintenance, previously referred to as Subscription and Technical Support, is now included in the Passport Advantage Agreement. Installation and technical support for the products announced in this letter is provided by the Software Maintenance offering of the IBM International Passport Advantage Agreement. This fee service enhances customer productivity by providing voice and/or electronic access into the IBM support organizations.

IBM includes Software Maintenance with each program acquired during the coverage period. Coverage period means the period commencing on the date you acquire the program up to the first or second anniversary date, depending on whether you acquired coverage for one or two anniversaries. The coverage period for Software Maintenance acquired in the two months preceding an anniversary date will be extended to the next applicable anniversary date.

While your Software Maintenance is in effect: IBM provides you assistance for your (1) routine, short duration installation and usage (how-to) questions; and (2) code-related questions. IBM provides assistance via telephone and, if available, electronic access, only to your information systems (IS) technical support personnel during the normal business hours (published prime shift hours) of your IBM Support Center. (This assistance is not available to your end users.) IBM provides Severity 1 assistance 24 hours a day, every day of the year. For further details consult your IBM Software Support Guide:

http://techsupport.services.ibm.com/guides/handbook.html

Software Maintenance does not include assistance for (1) the design and development of applications, (2) your use of Programs in other than their specified operating environment or (3) failures caused by products for which IBM is not responsible under this Agreement.

For more information, about the Passport Advantage Agreement refer to the IBM International Passport Advantage Agreement in Software Announcement 201-202, dated July 10, 2001, or visit the Passport Advantage Web site at:

http://www.ibm.com/software/passportadvantage

All distributed software licenses include Software Maintenance (Software Subscription and Technical Support) for a period of 12 months from the date of acquisition providing a streamlined way to acquire IBM software and assure technical support coverage for all licenses. Extending coverage for a total of three years from date of acquisition may be elected. For additional information, refer to Changes to Distributed Software Products Model for Products Outside Passport Advantage in Software Announcement 201-201, dated July 10, 2001.

AIX/UNIX upgrade protection applies: No

Entitled upgrade for current AIX/UNIX upgrade licensees: Yes

Variable charges apply: No

Educational allowance available: Yes, 15% education allowance applies to qualified education institution customers.

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**Prices**

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<tr>
<th>Program Name/Description</th>
<th>Part Number</th>
<th>OTC</th>
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202-162
Passport Advantage

For Passport Advantage and charges, contact your authorized IBM Lotus® Business Partner. Additional information is also available on the Passport Advantage Web site:

http://www.ibm.com/software/passportadvantage

Program Name: VisualAge C++ Professional for AIX, V6.0

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Note: Shipments will begin after the planned availability date.

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