IBM Enterprise PL/I for z/OS, V5.1

Enable the integration of business-critical PL/I applications with modern web technology

Highlights

Enterprise PL/I for z/OS®, V5.1 delivers the following enhancements:

- Enablement of PL/I applications to handle big data requirements with 64-bit support
- Increase in programmer productivity and application modernization with XML enhancements
- Improvements in middleware functionality with additional SQL support for DB2® applications
- Over 20 additional customer requested enhancements

Enablement of PL/I applications to handle big data requirements

- The compiler now supports 64-bit applications with the LP(64) option. This means that under this option, POINTER and HANDLE can be eight bytes in size, structures and arrays can be larger than 2G in size, and many built-in functions (such as PLIMOVE) can take 8-byte integer arguments and return 8-byte integer results.
- The new OFFSETSIZE compiler option determines the size of OFFSET variables in 64-bit applications.

Increase in programmer productivity and application modernization

With Enterprise PL/I for z/OS, V5.1, you can take advantage of more than 50 years of IBM® experience in compiler development. This compiler can help facilitate your new on-demand business endeavors by helping to integrate PL/I and web-based business processes in web services, XML, Java™, and PL/I applications. This interoperability of the compiler helps you capitalize on existing IT investment while more smoothly incorporating new, web-based applications as part of your organization's infrastructure.

Enterprise PL/I for z/OS is an integral part of the comprehensive application development environment delivered with IBM Rational® Developer for System z® software - providing a robust, integrated development environment (IDE) for PL/I and connecting web services; Java Platform, Enterprise Edition (Java EE) applications; and traditional business processes.

Enterprise PL/I for z/OS, V5.1 underscores the continuing IBM commitment to the PL/I programming language on the z/OS platform.

In Enterprise PL/I for z/OS, V5.1, new JSON attributes JSONNAME and JSONOMIT provide more ways of handling JSON data.

The new XMLCONTENT attribute provides the capability to generate tagless XML text.

The following built-in functions are introduced to improve programmer productivity:

- The new ALLOC31 built-in function allocates storage of the specified size in below-the-bar heap.
- The new BETWEENEXCLUSIVE, BETWEENRIGHTEXCLUSIVE, and BETWEENLEFTEXCLUSIVE built-in functions make it easier to write code that tests whether a variable is in between two specified values.
- The new CHECKSUM built-in function can be used to get the checksum value for a buffer of data.
- The new HEXDECODE and HEXDECODE8 built-in functions make it easy to translate character data that contains a hexadecimal representation of data into data with the corresponding value.

- The new ICLZ built-in function provides a quick way to count the number of leading zeroes in an integer value.
- The new MAINNAME built-in function returns the name of the MAIN function on the current calling chain.
- The new PLIATTN built-in subroutine provides explicit control over where the compiler sets attention breakpoints.
- The new ONSUBCODE2 built-in function gives a program more information about VSAM failures.
- The new TIMESTAMP built-in function returns the current date and time in the z systems format of YYYY-MM-DD-HH.MI.SS.999999. This format is now one of the valid date-time patterns that are supported in the various date-time built-in functions.
- Two new UTC date-time built-in functions UTCDATETIME and UTCSECS return the UTC date and time as a string and as a number of Lilian seconds.
- The new UTF8STG built-in function makes it easier to write code that parses UTF-8 text.
- The new UUID built-in function can be used to obtain a universally unique identifier.

Improvements in middleware functionality

IBM Enterprise PL/I is a leading-edge, z/OS-based compiler that maximizes middleware by providing interoperability with IBM DB2, CICS®, and IMS™ systems.

The following SQL enhancements are introduced:

- The INDFOR attribute makes it easy to declare a structure of indicator variables to match another PL/I structure.
- If the NULLDATE compiler option is specified, the SQL null date, with year, month, and day all equal to 1, is accepted as a valid date in some of the date-time built-in functions.
- The SQL preprocessor now parses the DEFINE ALIAS, DEFINE ORDINAL, and DEFINE STRUCTURE statements.
- To make it easier to change the severity of the DSNH030 SQL preprocessor message, DSNH030 is now given its own preprocessor message IBM3317.

Performance and usability enhancements

- Enterprise PL/I now further exploits the vector facility features.
- Some fixed decimal divisions with large precision are now done using the Decimal Floating-Point (DFP) facility.
- Support date and time of '00010101' for YYYYMMDD.
- Enhanced flagging to help customers improve code quality.
- Produce an expression decomposition listing.
- I/O VSAM enhancement.
- Additional compiler messages to help with problem diagnosis.
- Coordinated Universal Time (UTC) date-time built-in functions.
- New compiler options to help with enforcing and establishing coding standards.

Other Enterprise PL/I for z/OS features

Use of System Management Facilities records to ease administration

A new level of z/OS System Management Facilities (SMF) tracking support within Enterprise PL/I for z/OS, V5.1 allows you, when you have implemented sub-capacity tracking, to reduce your administrative reporting overhead.

SMF collects and records system and job related information that is used by the Sub-Capacity Reporting Tool (SCRT) to report on sub-capacity products.

With Version 5.1, Enterprise PL/I for z/OS is instrumented so it can be tracked by SMF89 records. If you have enabled the collection of SMF70 and SMF89 records on your machine and you are using SCRT to report the usage of the PL/I compiler, you will no longer have to tell SCRT where your PL/I compiler runs. Enterprise PL/I for z/OS, V5.1 can now automatically be tracked by SMF89 records and is supported by SCRT Java release V23.13.4 and SCRT Classic release V23.7.4. You must use SCRT Java release V23.13.4 or SCRT Classic release V23.7.4, or a later release, whenever you use Enterprise PL/I for z/OS, V5.1.

In conjunction with the SMF record support, system administrators can now define a disablement policy through the SYSx.PARMLIB(IFAPRDxx) parameter library. This client-requested feature can be used to disable the use of the Enterprise PL/I for z/OS, V5.1 compiler within a specific z/OS system.

You continue to gain the benefits of implementing sub-capacity for Enterprise PL/I for z/OS, V5.1 while reducing your administrative overhead.

Provides compatibility for PL/I programs and Java components

Because it supports the Institute of Electrical and Electronics Engineers (IEEE) decimal floating point standard, the Enterprise PL/I for z/OS compiler can receive, manipulate, and send Java data without any translation.

Built-in functions provide support for UTF-8 and UTF-16. One example is the ULENGTH function, which returns the number of UTF-8 or UTF-16 characters in a CHAR or WIDECHAR string, respectively. A second important example is the USUBSTR function which returns the UTF-sensitive substring of a CHAR or WIDECHAR string.

To further improve Java interoperability, Enterprise PL/I for z/OS provides a thread-safe PL/I library and multithreading statements (ATTACH, WAIT, DETACH) as part of the PL/I language supported by the compiler.

Easier migration

Enterprise PL/I for z/OS gives you a migration path from OS PL/I V2 and PL/I for MVS™ and VM compilers. The Enterprise PL/I for z/OS Compiler and Runtime Migration Guide provides you with all the information that you might need to move your applications to a new runtime environment (runtime migration) and to compile your source programs with the new compiler (compiler migration). Migrating to the new compiler allows your existing applications to take advantage of new functions.

Workstation-based development

Rational Developer for System z provides an interactive, workstation-based environment to help you create, maintain, and reuse applications. Rational Developer for System z includes support for traditional development using PL/I, but also has the ability to generate web services interfaces from PL/I constructs to ease creation of web services from existing PL/I applications.

Rational Developer for System z provides a workstation interface to Debug Tool, and is also integrated with IBM File Manager and Fault Analyzer. File Manager integration enables you to access Keyed Sequence Data Set (KSDS) files from the Rational Developer for System z workbench, and gives you the ability to browse and update data sets. By integrating with Fault Analyzer, Rational Developer for System z enables you to browse Fault Analyzer ABEND reports on CICS, IMS, batch, Java, WebSphere®, and other run times. Rational Developer for System z supports

Enterprise PL/I and helps improve the productivity of PL/I developers. Within the workbench, you can show the context-sensitive editor, as well as a compiler listing that indicates errors from a compilation. A simple click on a diagnostic message takes you to the line of source code in error.

IBM Rational Team Concert™ for System z, an Eclipse-based offering, allows you to boost programming productivity with a collaborative team environment that makes it easy to manage your distributed software projects and teams.

PL/I across platforms

Enterprise PL/I for z/OS is part of a family of compatible compilers, application development tools, and maintenance tools. Along with Enterprise PL/I for z/OS, IBM offers PL/I compilers for multiple platforms as well as IBM File Manager, IBM Fault Analyzer, and Debug Tool. As mentioned previously, the recommended workstation-based development environment is Rational Developer for System z.

System requirements

The following table presents the system requirements for Enterprise PL/I for z/OS, V5.1.

Table 1. System requirements

Operating system	Software	Hardware
z/OS	Required licensed programs • z/OS V2.1 (5650-ZOS), or later Optional licensed programsDepending on the functions used, one or more of the following programs may be required: • CICS Transaction Server for z/OS, V5 (5655-Y04) • CICS Transaction Server for z/OS, V4 (5655-S97) • CICS Transaction Server for z/OS Value Unit Edition, V5 (5722-DFJ) • DB2 11 for z/OS (5615-DB2) • DB2 10 for z/OS (5605-DB2) • DB2 11 for z/OS Value Unit Edition (5697-P43) • DB2 10 for z/OS Value Unit Edition (5697-P31) • IMS V14 (5635-A05) • IMS V13 (5635-A04) • IMS V12 (5635-A03) • IMS Transaction Manager Value Unit Edition V14 (5655-TM3) • IMS Transaction Manager Value Unit Edition V13 (5655-TM2) • IMS Transaction Manager Value Unit Edition V12 (5655-TM1) • IMS Database Value Unit Edition V14 (5655-DSE) • IMS Database Value Unit Edition V13 (5655-DSM) • IMS Database Value Unit Edition V12 (5655-DSQ) • DFSORT element of z/OS (5650-ZOS) • High Level Assembler/MVS and VM and VSE (5696-234) • Debug Tool for z/OS, V13.1 (5655-Q10) • Debug Tool for z/OS, V12.1 (5655-W70) • Fault Analyzer for z/OS V13.1 (5655-Q11) • Fault Analyzer for z/OS V12.1 (5655-W69) • File Manager for z/OS V13.1 (5655-Q12) • File Manager for z/OS V12.1 (5655-W68) • Application Performance Analyzer for z/OS, V13.1 (5655-Q09) • Application Performance Analyzer for z/OS, V12.1 (5655-W71) • Rational Developer for System z, V9 (5724-T07) • Rational Developer for System z, V8 (5724-T07) • Enterprise COBOL for z/OS, V6 (5655-EC6) • Enterprise COBOL for z/OS, V5 (5655-W32) • Enterprise COBOL for z/OS, V4 (5655-S71) • Enterprise PL/I for z/OS, V4 (5655-W67) • For XL C/C++ with Enterprise PL/I - You must use the XL C/C++ feature of z/OS, V2.1 (5650-ZOS), or later • IBM VS FORTRAN, V2 (5668-806, 5688-087)	The Enterprise PL/I for z/OS, V5.1 compiler runs on the following IBM servers: • z13™ • zEnterprise® EC12 (zEC12) or zEnterprise BC12 (zBC12) • zEnterprise 196 or zEnterprise 114 • z10™ Enterprise Class or z10 Business Class • System z9® Enterprise Class or z9 Business Class The Enterprise PL/I for z/OS, V5.1 compiler generates code that runs on the following IBM servers: • z13 • zEnterprise EC12 (zEC12) or zEnterprise BC12 (zBC12) • zEnterprise 196 or zEnterprise 114 • z10 Enterprise Class or z10 Business Class • System z9 Enterprise Class or z9 Business Class

Ordering information

Upgrade to the latest Enterprise PL/I compiler and get more out of your z Systems™ investment and stay ahead of competitors on the technology curve. 5655-PL5 is the ordering Product ID (PID) for Enterprise PL/I for z/OS, V5.

Enterprise PL/I for z/OS is available through the Shopz website:

www.ibm.com/software/shopzseries

For more information

To learn more about IBM Enterprise PL/I for z/OS, V5.1, contact your IBM representative or IBM Business Partner, or visit: www.ibm.com/software/products/us/en/plizos.

To learn more about IBM Rational Developer for System z software, visit: ibm.com/software/rational/products/developer/systemz/

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