



IBM Rational Development Studio for i 7.2 continues to deliver tools and programming languages to create modern IBM i solutions

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Overview

IBM® Rational® Development Studio for i provides the compilers and the text-based (5250) application development tools for IBM i. Before Version 7.1, the product was known as IBM WebSphere® Development Studio. The product is structured as three priced features that are licensed per user and per system:

- IBM i Integrated Language Environment® (ILE) Compilers, the current generation of compilers for RPG, COBOL, and C/C++ that are based on modern, cross-language technology
- Heritage Compilers
- Application Development ToolSet (ADTS), the text-based application development tools

Ongoing maintenance and support costs for Rational Development Studio for i are included in the IBM i system Software Maintenance Agreement (SWMA).

Version 7.2 delivers significant enhancements to the IBM i ILE compilers. A partial list includes:

ILE RPG

- Support for free-form Control, File, Definition, and Procedure statements
- Several enhancements related to Coded Character Set Identifiers (CCSIDs)
- Increased precision for timestamp data
- Ability to control the length of the value returned by %SUBDT
- New XML-INTO options to support XML namespaces
- An optimization option to improve the performance of date, time, and timestamp operations by skipping the validation step
- Program Call Markup Language (PCML) support for date, time, timestamp, and 8-byte unsigned integers

ILE COBOL

- Increased precision for timestamp data
- XML PARSE support for XML files greater than 16MB in size
- Improved support for PCML generation of OCCURS DEPENDING ON items and filler items
- Several enhancements for National data (Unicode)
- Options to help improve the accuracy of some numeric operations
- New PROCESS options NOCHGFLTRND and ALWCHGFLTRND to specify how COBOL will use the floating-point rounding mode specified by the SETCA machine interface (MI) instruction

The Heritage compilers are stabilized as of Version 5 Release 4. It is recommended that their use be discontinued and ILE compilers be adopted.

ADTS is stabilized as of Version 6.1. In particular, ADTS does not support new language capabilities that were introduced in the ILE Compilers as of Version 6.1. It is recommended that use of ADTS be discontinued and that Rational Developer for i, a modern graphical Integrated Development Environment (IDE), be adopted.

Rational Application Management Toolset for i (AMTS) is a subset of ADTS that is suitable for use by system administrators, application testers, release engineers, and other technical users who are not actual application developers. For example, it provides tools for working with library file system objects and for creating and maintaining Command Language (CL) programs. It is licensed per system for unlimited use on that system. Version 7.2 is delivered as continuance of support, as the capabilities of ADTS. Therefore the capabilities of AMTS are stabilized as of Version 6.1. Ongoing maintenance and support costs for Application Management Toolset for i are included in the IBM i system Software Maintenance Agreement (SWMA).

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: AE001).

Key prerequisites

The products in this announcement support all the hardware models that support IBM i 6.1, 7.1, and 7.2; and IBM i 7.2 (5770-SS1). For details, refer to the [Hardware requirements](#) and [Software requirements](#) sections.

Planned availability date

May 2, 2014

Description

IBM Rational Development Studio for i

Rational Development Studio for i 7.2 delivers significant enhancements to the IBM i ILE compilers as detailed here:

New in ILE RPG

Support for free-form Control, File, Definition, and Procedure statements. An ILE RPG program can now be written entirely in free form. File definitions and data definitions can be intermixed. The /FREE and /END-FREE directives are no longer required to separate free-form statements and fixed-form statements.

Here is an example of free-form code:

```
CTL-OPT OPTION(*SRCSTMT : *NODEBUGIO);
DCL-S total PACKED(7:2);
DCL-F orders USAGE(*UPDATE);
DCL-DS orderData LIKERECD(orderFmt);

READ orders orderData;
DOW NOT %EOF;
  READ orders orderData;
  total += processOrder(orderData);
ENDDO;
*INLR = '1';

DCL-PROC processOrder;
  DCL-PI *N PACKED(7:2);
  data LIKERECD(orderData);
  END-PI;
  IF data.quantity > 1000;
    data.price *= data.discount;
    UPDATE orderFmt data;
  ENDIF;
  RETURN data.price * data.quantity;
END-PROC;
```

Several CCSID enhancements include:

- The default alphanumeric CCSID for the module can be set to a CCSID other than the job CCSID.
- Alphanumeric data can be defined with a CCSID. Supported CCSIDs include:
 - Single-byte and mixed-byte EBCDIC CCSIDs
 - Single-byte and mixed-byte ASCII CCSIDs
 - UTF-8
 - Hexadecimal
- CCSID conversion is not performed for hexadecimal data, which includes:
 - Hexadecimal literals
 - Alphanumeric and graphic data defined with CCSID(*HEX)
 - Alphanumeric and graphic data in I/O buffers for externally-described files when the DATA keyword is in effect for the file and the CCSID of the field in the file is 65535
 - Alphanumeric and graphic data in externally-described data structures that are defined with CCSID(*EXACT) when the CCSID of the field in the file is 65535
- Open database files without conversion to the job CCSID. Use Control keyword OPENOPT(*NOCVTDATA) or File keyword DATA(*NOCVT) to specify that a database file will be opened so that alphanumeric and graphic data will not be converted to and from the job CCSID for input and output operations.
- Ability to use the /SET and /RESTORE directives to set defaults for definitions that do not explicitly specify date formats, time formats, and CCSIDs.
- Support for implicit conversion between alphanumeric, graphic, and UCS-2 data for concatenation expressions.
- Support for CCSID conversions that causes a loss of data when a source character does not exist in the target character set.
 - Use CCSIDCVT(*EXCP) to get an exception, if a CCSID conversion loses data due to the source character not having a match in the target character set.
 - Use CCSIDCVT(*LIST) to obtain a listing of every CCSID conversion in the module, with a diagnostic message that indicates whether the conversion has the potential of losing data.

Increased precision for timestamp data: Timestamp data can have between 0 and 12 fractional seconds.

Control the length that is returned by %SUBDT:

- An optional third parameter for %SUBDT allows you to specify the number of digits in the result. For example, you can return the value of the years as a four-digit value: %SUBDT(MyDate : *YEARS : 4).
- An optional fourth parameter allows you to specify the number of decimal places when returning the number of seconds from a timestamp. For example, you can return the number of seconds as a five-digit value with three decimal places: %SUBDT(MyTimestamp : *SECONDS : 5 : 3);.

Additional data types are supported for PCML generation:

- Date, time, and timestamp
- 8-byte unsigned integers

New XML-INTO options include:

- XML namespaces are supported by the "ns" and "nsprefix" options.
- XML names with characters that are not supported by RPG for subfield names are supported by the case=convert option.

Option to skip the validation step of date, time, and timestamp operations, which may improve performance

- Use Control-specification keyword VALIDATE(*NODATETIME) to allow the RPG compiler to treat date, time, and timestamp data as character data, without performing the checks for validity.

New in ILE COBOL

A timestamp item can now have between 0 and 12 fractional seconds.

- The following intrinsic functions now allow PICOSECONDS as a duration when specified for a timestamp item: ADD-DURATION, EXTRACT-DATE-TIME, FIND-DURATION, and SUBTRACT-DURATION.
- The SIZE keyword is allowed with FORMAT TIMESTAMP. The size can be 19 indicating zero fractional seconds or a value between 21 and 32, which indicates between 1 and 12 fractional seconds.

XML PARSE now has the capability to parse XML files that are greater than 16MB in size.

- No individual document piece passed to the processing procedure is greater than 16 MB. The following new XML-CODE values are associated with this change:
 - XML-CODE 62 indicates that the XML document exceeds 16,000,000 bytes.
 - XML-CODE 170 indicates that an XML event exceeds 16,000,000 bytes.

PCML generation enhancements

- PCML generation provides improved handling for an OCCURS DEPENDING ON array with the addition of a new "init" keyword set to the maximum size of the array.
- PCML generation provides automatic data-item naming in generated PCML for filler data items and unnamed items in a data structure, helping to enable web services to use generated PCML without first modifying it. The names for these data items will be _filler_1, _filler_2, and so on.

National data (Unicode) enhancements

- Numeric national datatype is supported.
- A numeric literal can be specified on the VALUE clause for a numeric national data item.
- The figurative constant ZERO/ZEROS/ZEROES represents one or more national zero digits when used with national data items.
- National 'N' literals are supported when new PROCESS option NATIONALPICNLIT is specified.

Options to help improve the accuracy of some numeric operations

- Compiler option ARITHMETIC(*EXTEND31) or PROCESS option EXTEND31 can increase the accuracy of NUMVAL and NUMVAL-C to 31 digits.
- Compiler option ARITHMETHC(*EXTEND31FULL) or PROCESS option EXTEND31FULL can increase floating-point accuracy for several numeric intrinsic functions and can increase fixed-point accuracy for fixed-point intermediate results.

Floating point rounding mode

- Use NOCHGFLTRND / ALWCHGFLTRND to control whether or not COBOL will use the floating point rounding mode computational attribute specified by MI instruction SETCA. SETCA allows you to set the rounding mode of the result of a floating-point calculation to either round or truncate.

IBM Rational Application Management Toolset for i

Rational Application Management Toolset for i provides IBM i system administrators and other advanced users with a lightweight set of tools for the common tasks of working with library file system objects and scripting with Command Language (CL). To meet a common need of IBM i system administrators and advanced users, this new offering features simple, per-processor licensing at an affordable price.

Functionally, Application Management Toolset for i is a subset of the venerable Application Development ToolSet (ADTS) which is sold as part of WebSphere Development Studio for i 6.1 or as part of Rational Development Studio for i 7.1 and 7.2. Two of the key components of ADTS are Programming Development Manager (commonly known as PDM) and Source Entry Utility (commonly known as SEU). The new Application Management Toolset for i includes these two components, in modified form. Specifically:

The version of SEU, that is included in Application Management Toolset for i, only supports editing of CL source. It does not support editing of source members written in other languages such as RPG, COBOL, C, C++ or DDS. Like SEU, this editor provides language-sensitive features such as syntax checking and prompting for CL source members.

- Application Management Toolset for i supports the operating system member types: CL, CLLE, CLP, TXT, and CMD in the EDTCLU (same as STRSEU) command.
- Application Management Toolset for i does not support the following member types in the EDTCLU command:
 - Operating system types: BAS, BASP, BND, C, CBLLE, CBL, CICSCBLL, CICSCBL, CICSSQLCBL, CICSC, CICSMAP, CLD, CPP, DFU, DSPF, FTN, ICF, LF, MENU, MNU, MNUCMD, MNUDDS, PAS, PF, PL1, PNLGRP, PRTF, QRY, REX, RMC, RPG, RPGLE, RPT, SPADCT, SQLC, SQLCLE, SQLCBL, SQLCBLLE, SQLFTN, SQLPLI, SQLRPG, SQLRPGLE, SRT, TBL
 - System/38 types: BAS38, BASP38, BSCF38, CBL38, CL38, CLP38, CMD38, CMNF38, DFU38, DSPF38, LF38, MXDF38, PF38, PLI38, PRTF38, QRY38, RPG38, RPT38, SRT38, TXT38
 - System/36 types: ARS36, ASM36, BAS36, BASP36, BGC36, BGD36, BGF36, CBL36, DFU36, DSPF36, DTA36, FOR36, MNU36, MSGF36, PHL36, OCL36, RPG36, RPT36, SRT36, TXT36, UNS36, WSU36

The version of PDM that is included in Application Management Toolset for i can be used to browse, move, filter and otherwise manipulate objects of any type, but it only enables software development options (such as Edit and Compile) for CL objects.

Application Management Toolset for i supports the following functions from PDM:

- All the menu functions of STRPDM (new command STRAMT)
- All the functions of WRKLIBPDM (new command WRKLIBAMT)
- All the functions of WRKOBJPDM (new command WRKOBJAMT) including FNDSTRPDM (new command FNDSTRAMT) with the exception of:
 - No option 18 to call DFU
 - No option 34 to call ISDB
 - No option 54 to call CMPPFM
- All the functions of WRKMBRPDM (new command WRKMBRAMT) including FNDSTRPDM (new command FNDSTRAMT) with the following exceptions:
 - Option 2 (Edit) uses new command EDTCLU which will only support the member types that are listed above
 - No option 17 to call SDA
 - No option 19 to call RLU
 - No option 54 to call CMPPFM
 - No option 55 to call MRGSRC

None of the other components from ADTS are included with Rational Application Management Toolset for i. The excluded components are:

- Screen Design Aid (SDA)
- Report Layout Utility (RLU)
- Date File Utility (DFU)
- File Compare and Merge Utility (FCMU)
- Interactive Source Debugger (ISDB)
- Advance Printer Function (APF)
- Character Generator Utility (CGU)
- Application Development ToolSet Client Server (ADTS CS)

The other key difference between Rational Application Management Toolset for i and ADTS is the way they are licensed and priced.

- ADTS, as a part of WebSphere Development Studio for i or Rational Development Studio for i, is licensed per user per system. (A license must be purchased for every individual who might browse the file system with PDM, edit a program with SEU, or compile a program with one of the heritage or ILE compilers. If an individual user does such work on multiple systems, that user must have a separate license to use the program on each system). The price per license remains the same regardless of the type or software tier of the machine on which it is used.
- Application Management Toolset for i is licensed per processor, for unlimited use on that processor by any number of persons. The license is priced according to the software tier of the machine on which Application Management Toolset for i is used.

Like WebSphere Development Studio for i and Rational Development Studio for i, ongoing maintenance and support costs for Application Management Toolset for i are included in the IBM i system Software Maintenance Agreement (SWMA).

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Section 508 of the US Rehabilitation Act

The products in this announcement are capable as of May 2, 2014, when used in accordance with associated IBM documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A US Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via the website

http://www.ibm.com/able/product_accessibility/index.html

Program number

Program number	VRM	Program name
5770-WDS	7.2	Rational Development Studio for i
5770-AMT	7.2	Rational Application Management Toolset for i

Product identification number - PID number

Subscription and Support PID number	Description
5733-SPN	3 months SWMA for i5/OS
5733-SPM	3 months SWMA for i5/OS™ 1 year extension
5733-SPO	3 months SWMA for i5/OS 3 years extension
5733-SPP	1-year SWMA for i5/OS registration
5733-SPE	3 years SWMA for i5/OS extension
5733-SP3	3 years SWMA for i5/OS registration

Offering Information

Product information is available via the Offering Information website

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

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=214-129>

Publications

No publications are shipped with these programs.

The IBM Publications Center

<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. Payment options for orders are via credit card (in the US) or customer number for 20 countries. A large number of publications are available online in various file formats, and they can all be downloaded by all countries, free of charge.

Technical information

Specified operating environment

Hardware requirements

The products in this announcement support all the hardware models that support IBM i 6.1, 7.1, and 7.2.

Software requirements

The products in this announcement require IBM i 7.2 (5770-SS1).

For Rational Development Studio for i, the C and C++ compilers require the "System Openness Includes" (option 13 of 5770-SS1). Installing the "System Openness Includes" is optional for RPG and COBOL. The C++ compiler requires the Portable Application Solutions Environment or PASE (option 33 of 5770-SS1). To use the ixlc shell command, the Qshell interpreter (option 30 of 5770-SS1) must be installed.

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

Planning information

Packaging

The products in this announcement are shipped on DVDs and also available for download using the Entitled Software Support website

<http://www.ibm.com/servers/eserver/ess>

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

Security, auditability, and control

The products in this announcement use the security and auditability features of the IBM i 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.

Software Services

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Ordering information

Rational Application Management Toolset for i

5770-AMT charge features

	Feature number
5770-AMT Charge features	
P05 Application Management Toolset for i OTC	1810
P10 Application Management Toolset for i OTC	1812
P20 Application Management Toolset for i OTC	1815
P30 Application Management Toolset for i OTC	1819
P40 Application Management Toolset for i OTC	1820
P50 Application Management Toolset for i OTC	1828
P60 Application Management Toolset for i OTC	1832
P05 to P10 Application Management Toolset for i Upgrade	1811
P05 to P20 Application Management Toolset for i Upgrade	1813
P05 to P30 Application Management Toolset for i Upgrade	1816
P05 to P40 Application Management Toolset for i Upgrade	1821
P05 to P50 Application Management Toolset for i Upgrade	1830
P05 to P60 Application Management Toolset for i Upgrade	1833
P10 to P20 Application Management Toolset for i Upgrade	1814
P10 to P30 Application Management Toolset for i Upgrade	1817
P10 to P40 Application Management Toolset for i Upgrade	1822
P10 to P50 Application Management Toolset for i Upgrade	1825
P10 to P60 Application Management Toolset for i Upgrade	1834
P20 to P30 Application Management Toolset for i Upgrade	1818
P20 to P40 Application Management Toolset for i Upgrade	1823
P20 to P50 Application Management Toolset for i Upgrade	1826
P20 to P60 Application Management Toolset for i Upgrade	1835
P30 to P40 Application Management Toolset for i Upgrade	1824
P30 to P50 Application Management Toolset for i Upgrade	1827
P30 to P60 Application Management Toolset for i Upgrade	1836
P40 to P50 Application Management Toolset for i Upgrade	1829
P40 to P60 Application Management Toolset for i Upgrade	1837
P50 to P60 Application Management Toolset for i Upgrade	1831
Upgrade from 5761-AMT OTC Processor Group P05	1838
Upgrade from 5761-AMT OTC Processor Group P10	1839
Upgrade from 5761-AMT OTC Processor Group P20	1840
Upgrade from 5761-AMT OTC Processor Group P30	1841
Upgrade from 5761-AMT OTC Processor Group P40	1842
Upgrade from 5761-AMT OTC Processor Group P50	1843
Upgrade from 5761-AMT OTC Processor Group P60	1844

5770-AMT other chargeable features

Expedite - Customer Expense 5770-AMT	3446
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5770-AMT no-charge features

Electronic SW Delivery 5770-AMT	3450
Logical partitioning 5770-AMT	3441
Electronic Delivery Only	3453
Delivery without Publications 5770-AMT	3470
Delivery without Machine Readable Material 5770-AMT	3471

5770-AMT language feature

Multilingual 5770-AMT 2935

5770-AMT supply feature

5770-AMT 7.2 supply feature 5819

5770-AMT other features

ePOE registration P05 5770-AMT 6005
ePOE registration P10 5770-AMT 6010
ePOE registration P20 5770-AMT 6020
ePOE registration P30 5770-AMT 6030
ePOE registration P40 5770-AMT 6040
ePOE registration P50 5770-AMT 6050
ePOE registration P60 5770-AMT 6060
Dev demo system SW registration 5770-AMT 6485
Physical media registration 5770-AMT 6486

5733-NKY features to remove key and ePOEs

Application Management Toolset for i
(5770-AMT) 2708

Charge metric

Program name	PID number	Charge metric
IBM Rational Development Studio for i	5770-WDS	Processor-based and Per named user
IBM Rational Application Management Toolset for i	5770-AMT	Processor-based OTC

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License Information number

The License Information number for Rational Development Studio for i 7.2 is L-JWOG-97PQ7T.

The License Information number for Rational Application Management Toolset for i 7.2 is L-JWOG-97PQA2.

The program's License Information will be available for review on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

Limited warranty applies

Yes

Limited warranty

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

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For clarification, note that for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

Volume orders (IVO)

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Passport Advantage applies

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Usage restriction

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IBM Operational Support Services - SoftwareXcel

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System i® Software Maintenance applies

Yes

Variable charges apply

No

Educational allowance available

Yes. A 15% education allowance applies to qualified education institution customers.

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective. IBM does not warrant that systems and products are immune from the malicious or illegal conduct of any party.

Prices

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