IBM Rational Developer for Power Systems Software

Powerful, integrated development tools for application development on AIX, IBM i and Linux

Highlights

- Provides integrated search, edit, analysis, build and debug development tools that can help simplify and accelerate code development and maintenance

- Provides capabilities for streamlining application development that can help improve developer productivity.

- Provides a common development environment between platforms and technologies

- Optimize applications to maximize your return on investment (ROI) in IBM® Power® and PureSystems™ infrastructure

Software plays a key role in facilitating innovative business services and products and is a strategic business asset for organizations that want to remain competitive. It is important for organizations to get better value from their software applications and development teams. So developers cannot continue to use older, less productive, text-based editors and debuggers.

In addition to using modern development tools and processes to optimize productivity, organizations must attract and retain new talent to build teams of developers that are capable of working in different projects and in different languages. They need to make sure that their development teams have the skills required to create applications to meet today's business challenges.

To help address these challenges, IBM offers IBM Rational® Developer for Power Systems™ Software, which is designed for developing, modernizing and maintaining applications for IBM Power Systems Software and PureSystems infrastructure.

Overview

IBM Rational Developer for Power Systems Software is a family of Integrated Development Environments (IDEs) that are optimized for creating, modernizing and maintaining IBM AIX®, IBM i® and Linux applications on IBM Power Systems.

The software features:

- Rich source editing
- Visual design and analysis tools
- Integrated search and compile error feedback
- Performance and porting advisors
- Multi-platform/multi-language debugging tools

Rational Developer for Power Systems Software is based on the Eclipse tooling framework and is designed to run on developers' workstations (Microsoft Windows or Linux on x86 machines) and from there interact with server-side agents on Power systems to support file/object/library management (searching, editing, refactoring, analyzing, building and debugging) on the server. By synchronizing the contents of server projects or directories with the desktop Eclipse workspace, you can also work while not connected to a Power server.

Role in the IBM portfolio

IBM Rational offers a robust solution for addressing application development challenges. It covers the entire lifecycle from portfolio strategy and management through Application Lifecycle Management (ALM), application development and modernization, security and compliance management, to quality management and testing. The IBM Rational Developer for Power Systems Software IDEs are part of the application development and modernization dimensions of this solution.

These IDEs are tightly integrated with IBM's optimizing compilers for Power systems and the Rational Collaborative Application Lifecycle Management solution. These are also integrated with the broader set of Rational solutions for portfolio management and strategy, test and test virtualization and security and compliance. The IDE brings together the benefits of the Power and PureSystems platforms, the optimizing compilers and the total Rational solution.

Additionally, these IDEs are based on Eclipse, as are the other IBM Rational IDEs for System z® (IBM Rational Developer for System z) and for distributed systems and WebSphere® (Rational Application Developer for WebSphere Software). This enables you to create IDE environments that support optimized development for multiple platforms and languages. It also helps provide a tooling experience that is designed to make developers' skill sets more transferable when needs arise to shift resources from one platform or language to another.

Rational Developer for Power Systems Software supports all three Power operating systems: IBM AIX, IBM i and Linux and offers development tools covering a wide range of programming languages:

- RPG, COBOL, DDS, CL, C/C++ and Java on IBM i
- C/C++ and Java on Linux
- C/C++, COBOL and Java on AIX
- Java Enterprise Applications and web development

A flexible packaging structure allows you to purchase only the components you need. For details see the Packaging and Related Products sections of this data sheet.
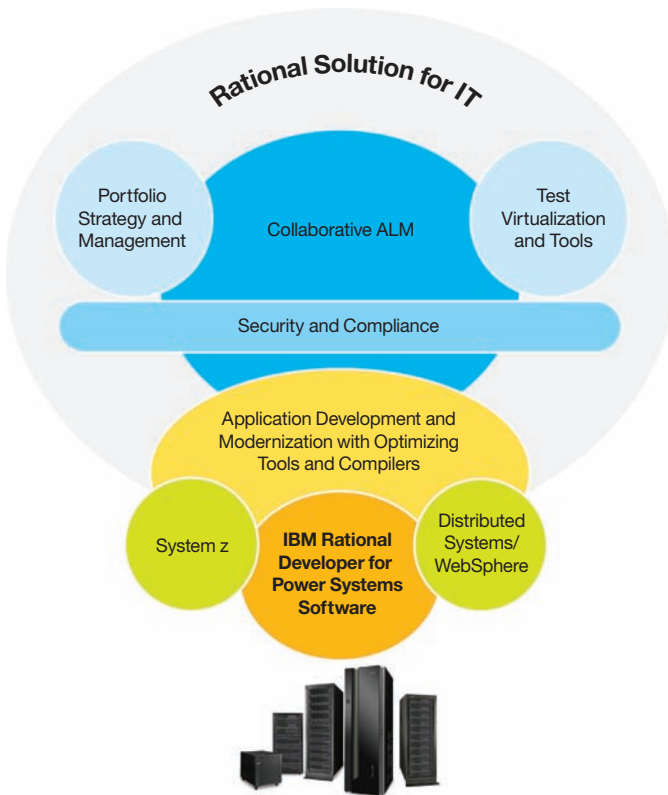
Figure 1. Rational Application Developer for Power Systems Software is part of the Application Development and Modernization aspect of the Rational solution, optimized for Power Systems and PureSystems platforms.

Business value proposition

An overview of the IBM Rational Developer for Power Systems Software business value proposition:

- **For all platforms.** Help optimize developer skills portability common user experience through Rational's broader portfolio of IDEs.
- **For IBM i**. Help gain individual developer productivity instead of using traditional "green screen" development tools such as SEU and PDM.
- **For IBM i.** Help attract new talent as you encounter the need to back-fill retiring RPG and COBOL developers, by affording the opportunity to work in a modern, Eclipse-based IDE; also lower initial training costs for new developers (as many will already be familiar with Eclipse).
- **For IBM i.** Use specialized tools to help modernize RPG and COBOL applications with services interfaces and web and mobile user interfaces.
- **For C/C++ development for AIX and Linux on Power:** Help optimize gains in individual developer productivity instead of using traditional tool stacks comprising components like vi, emacs, putty, gdb and myriad shell scripts and macros.
- **For C/C++ development for AIX and Linux on Power:** Optimize your ROI in the AIX platform's price-performance profile and Qualities-of-Service with the Performance Advisor.
- **For C/C++ development for AIX and Linux on Power:** Help raise porting speed and quality outcomes (not only development but also in DevOps and testing aspects) with porting and migration advisors and built-in support for maintaining multiple build specifications per project.
- **For COBOL development on AIX:** Help attract new talent to back-fill retiring COBOL development staff, by affording the opportunity to work in a modern, Eclipse-based IDE; also, lower initial training costs for new developers (as many will already be familiar with Eclipse).

Product capabilities
Capabilities to help improve developer productivity

Rational Developer for Power Systems Software is designed to work in a tightly integrated manner and can help improve programming productivity by:

- Helping to make it less difficult and error-prone to write source code.
- Helping reduce time required to understand sections of code, applications and entire solutions.
- Enabling faster context and task switching.
- Placing information about multiple aspects of an application together into one graphical view, enabling faster decision-making.

At a high level and for all platforms and languages the capabilities that enable these dynamics are:

- Remote System Explorers for accessing Power server-side (remote) files, objects, libraries, processes and shells.
- Rich desktop source editing support with content assist, outline views, color tokenizing, quick navigation, syntax checking and refactoring agents.
- Code templates and snippets.
- Tightly integrated search, edit, analysis, build and debug capabilities.
- Graphical views for visualizing application structure, dependencies and other relationships.
- Build support and tight integration with optimizing Power Systems compilers with error feedback and auto-correction support.
- Rich multi-view graphical debugging with support, including support for multiple threads and real-time monitoring of variable changes.
- Ability to debug across entire multi-platform/multi-language applications.
- Ability to attach debuggers to core files for postmortem analysis.
- Integration with IBM Rational Team Concert™ software for planning, team collaboration, change management, source control and build automation.

The following capabilities are designed for developing native RPG and COBOL applications in the IBM i environment:

- Language-aware editors for RPG, COBOL, CL and DDS applications that are tightly integrated with the ILE compilers, provide an "SEU similarity" mode and support both structured and free-form RPG syntax
- Pre-defined RPG and COBOL source snippets
- Visual DDS screen and report designers with design, source and WYSIWYG preview views
- Analyze program calls and ILE bindings

The following capabilities are designed for developing C/C++ applications in the AIX and Linux on Power environments:

- Language-aware editors for C and C++ that are tightly integrated with the IBM XL compilers
- Visualize the include hierarchy for a header file using the new Remote Include Hierarchy view
- Automatically generate make files during a remote managed build

The following capabilities are designed for developing COBOL applications in the AIX environments:

- Identify code problems early through live syntax checking that includes color tokenizing and syntax checking of embedded CICS® and SQL statements
- Content assist for embedded SQL statements
- Predefined COBOL source snippets
- A pull-up refactoring tool for selecting and extracting source into a new paragraph

Capabilities to help optimize the value of AIX and Linux on Power platforms

The AIX and Linux-focused editions of IBM Rational Developer for Power Systems Software include several capabilities designed to help you derive benefit and ROI from your investments in the market-leading price/performance profile and other Qualities of Service of the Power platform. These capabilities are focused on:

- Optimizing the performance of your AIX application workloads
- Helping increase the efficiency and quality outcomes of your porting work in scenarios where you develop your AIX workloads on other platforms (for example on x86 Linux) and port them to AIX, or where you develop on AIX and port the workload to multiple production platforms (for example x86 Linux + Solaris + HPUX)
- Helping increase the efficiency of testing efforts and raising application quality

The capabilities that enable these dynamics are:

- Performance Advisor
- Code Analysis
- Code Coverage Analysis

- **Performance Advisor.** It combines dynamic code analysis and profiling capabilities with performance management features and expert guidance—all in a workflow-driven framework that helps you optimize the performance of C and C++ workloads as deployed to AIX and to Linux on Power. Performance Advisor is designed to help deliver value when wielded by any application developer, instead of relying on specialized performance engineering skills. It meets this requirement by embedding systems knowledge from IBM development teams that create the Power hardware architecture, the AIX and Linux (for Power) operating system and the IBM optimizing compilers.

A Performance Scorecard view provides detailed recommendations to help improve the performance of the application.

The Performance Advisor also adds elements of performance management. Each recommendation in the Scorecard view is shown together with a confidence indicator that suggests the probability that following the recommendation will yield a measurable gain. So the framework can help you decide how to prioritize performance work. The Performance Advisor also supports comparisons of multiple profiles of the application to detect regressions in performance through builds.

- **Code Analysis.** This capability combines static code analyses with system rules that work together in a framework to help you migrate or port your C/C++ and COBOL applications to AIX and Linux on Power. It is designed to deliver guidance on how to avoid a variety of potential migration and porting issues. Code Analysis can help you to properly address a variety of platform differences that can result in issues that are difficult to detect (for example: handling big-endian versus little-endian data, or moving between 32b and 64b architectures).

- **Code Coverage Analysis.** This capability enables you to view which sections of your C/C++ and COBOL code are in use when applications run during unit testing or debugging. The analyses also provide coverage statistics you can use in your quality and risk management processes. The Rational capability differs from other coverage tools by using technologies that enable it to scale so that analysis can be done routinely with very little impact on application execution time. This makes it practical for routine use with very large applications and also for very high percentages of test coverage.
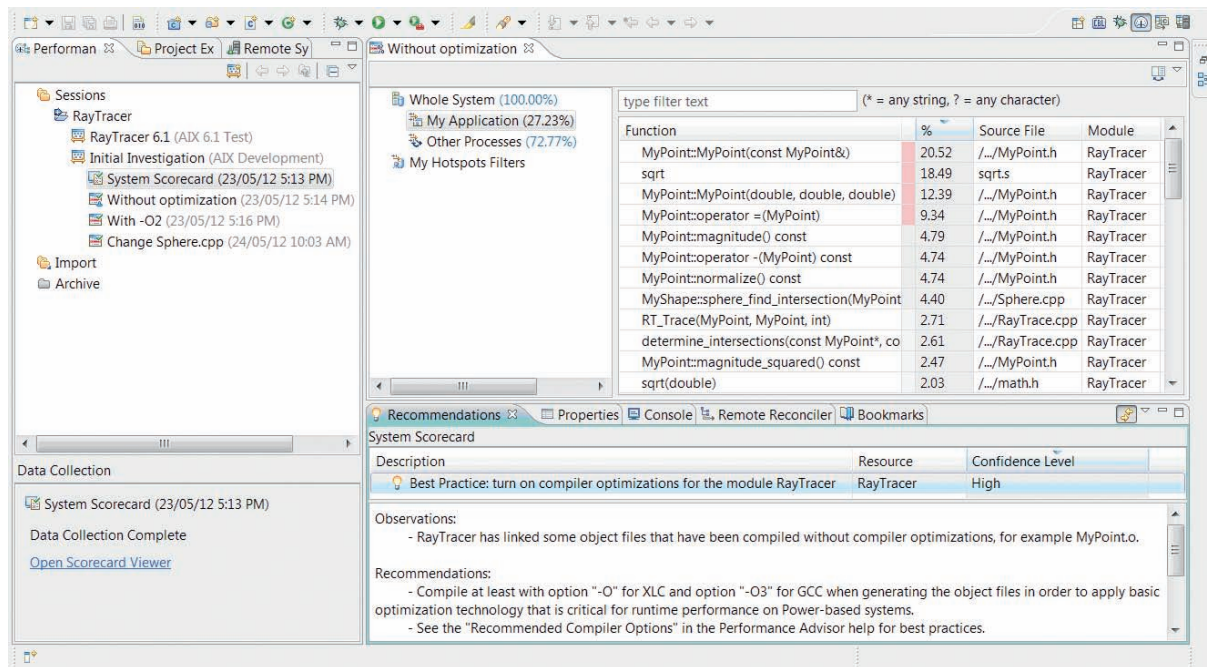
Figure 2. The Performance Advisor provides Power Systems performance engineering capabilities to your team of developers.

Capabilities to help modernize IBM i applications

If you work on the IBM i platform, your native RPG and COBOL applications will be your most valuable business assets. They represent significant investments over the years and are designed to provide optimal performance. And yet, they may also make innovation difficult and present a challenge to your business. For example they often reflect an inflexible single-tier architecture that tightly couples UI, business logic and data access. This makes it difficult to externally access and extend them, whereas some application users may find the native 5250 user interfaces non-intuitive. In addition, the limited availability of RPG and COBOL skills may be a business risk issue.

A number of approaches are available to modernize and extend the native applications. For example you could use Host Access Transformation Services (HATS) when the primary (or only) need is to quickly expose a modern graphical user interface, or expose business logic as services, without taking the time to refactor the existing native application architecture. In other cases, the business goals may suggest that the native application must be restructured to isolate the business logic, so that it can be exposed as Services and accessed by custom-built user and system interfaces (including external Services) and used in business process automation.

The IBM i editions of Rational Developer for Power Systems Software help provide the tooling foundation for conducting your modernization efforts, with capabilities such as being able to simply select a business logic procedure in the explorer and generate an externally accessible service interface for it.

IBM also invests to address the skills availability issue with the introduction of Rational Open Access which opens the RPG language to external resources (i.e. outside of the IBM i environment).

Packaging

Rational Developer for Power Systems Software supports all three Power operating systems: IBM AIX, IBM i and Linux. It offers development tools that cover a wide range of programming languages:

- RPG, COBOL, DDS, CL, C/C++ and Java on IBM i
- C/C++ and Java on Linux
- C/C++, COBOL and Java on AIX
- Java Enterprise Applications and web development
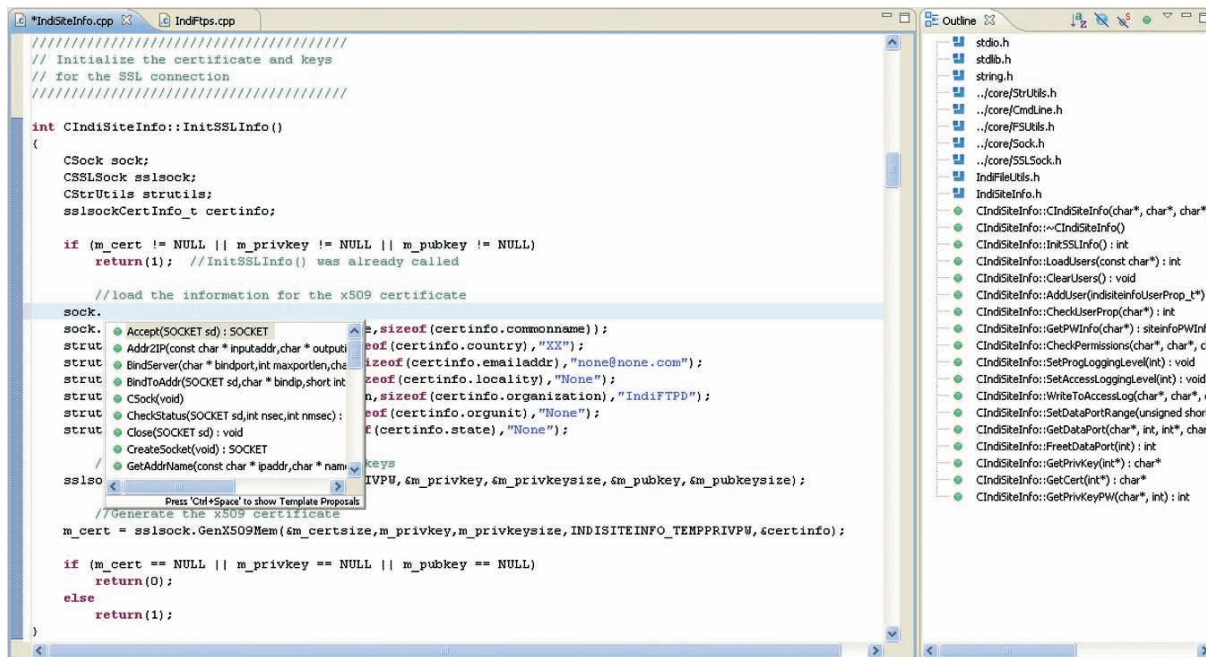
Figure 3. Rich source editing features such as "content assist" help developers read, understand and write source code.

A flexible packaging structure enables you to purchase only the required components. The packaging defines ten offerings that are of three general forms:

- Four are single-IDE offerings that match a particular Power operating system and/or set of programming languages.
- Three are Studio bundle offerings that combine a single IDE with corresponding compilers.
- Three are multiple-IDE bundle offerings that are designed to support multiplatform development and application modernization efforts.

Offerings for AIX development:

- Rational Developer for Power Systems Software C/C++ Development Tools for AIX
  - A single-IDE offering for developing C and C++ applications on AIX.
- Rational Developer for Power Systems Software Power Tools for AIX
  - A multiple-IDE bundle that combines the C and C++ Developer Tools for AIX (one of the single-IDE offerings) with a significant subset of the Java. JEE, Web, Portal, mobile and other capabilities of Rational Application Developer for WebSphere Software. This bundle is designed to support multi-platform and multi-language development scenarios that include some C/C++ develop-ment on AIX or C/C++ porting to AIX.
- Rational Developer for Power Systems Software C/C++ Development Studio for AIX
  - A bundle that combines the C/C++ Development Tools for AIX single-IDE offering with the XL C/C++ for AIX compilers.

- Rational Developer for Power Systems Software COBOL Development Tools for AIX
  - A single-IDE offering for developing COBOL applications on AIX.
- Rational Developer for Power Systems Software COBOL Development Studio for AIX
  - A bundle that combines the COBOL Development Tools for AIX single-IDE offering with the COBOL for AIX compilers.

Offerings for Linux on Power development:

- Rational Developer for Power Systems Software C/C++ Development Tools for Linux
  - A single-IDE offering for developing C and C++ applica-tions on Linux on Power (LoP).
- Rational Developer for Power Systems Software C/C++ Development Studio for Linux
  - A bundle that combines the C/C++ Development Tools for Linux single IDE offering with the XL C/C++ for Linux compilers offering.

Offerings for IBM i development and application modernization:

- Rational Developer for Power Systems Software RPG and COBOL Development Tools for i
  - A single-IDE offering for developing RPG, COBOL, C, C++, CL, DDS applications on IBM i.

- Rational Developer for Power Systems Software Power Tools for i
  - A multiple-IDE bundle that combines the RPG and COBOL Developer Tools (one of the single-IDE offerings), with a significant subset of the capabilities of Rational Application Developer for WebSphere Software. This bundle is designed to support scenarios where IBM i RPG and COBOL applications are modernized using techniques such as refactoring and Service-wrapping RPG or COBOL applications to expose the business logic for access from modern user interfaces or other Services that you create, using Java, JEE, Web, Portal and mobile development capabilities of Rational Application Developer for WebSphere Software.
- Rational Developer for i for SOA Construction
  - A multiple-IDE bundle that combines the RPG and COBOL Developer Tools for i (one of the single-IDE offerings) with IBM Rational Business Developer (a second IDE that is designed for developing in the EGL language—see **Related Products** section) and IBM HATS Toolkit. This bundle is designed to support IBM i RPG and COBOL applications being modernized using these techniques:
    - ○ Refactoring and Service-wrapping the RPG or COBOL applications so that their business logic can be accessed from modern user interfaces or other Services that you create using EGL
    - ○ Re-facing RPG and COBOL applications using IBM Host Access Transformation Services (HATS)*
    - ○ Service-enabling RPG and COBOL applications using HATS*

*Note that when using HATS, separate HATS runtime licenses are required.

Related products

The development tools in Rational Developer for Power Systems Software are designed to complement IBM's compiler offerings for Power Systems. These compilers include:

- XL C for AIX and XL C/C++ for AIX
- XL C/C++ for Linux
- COBOL for AIX
- Rational Development Studio for i (formerly WebSphere Development Studio for i)

The multiple-IDE bundles that comprise part of the Rational Developer for Power Systems Software packaging include the following related IDE products (which are also available for purchase separately):

- **Rational Application Developer for WebSphere Software** is an integrated development environment for developing Java, Enterprise Java, Web, Portal, mobile, SCA and other kinds of applications for any platform (including System z, IBM i and distributed platforms such as Windows, Linux and AIX). It can be used to develop applications targeting any standards-conformant middleware stack but is optimized for WebSphere runtimes and is built with local test environments for WebSphere Application Server and WebSphere Portal Server.
- **Rational Business Developer** is an integrated development environment for EGL, a programming technology designed to simplify multi-platform application development. With EGL, developers can focus more on implementing the needs of the business and less on the intricacies of underlying frameworks and middleware. EGL provides a common programming language and model across all parts of an application, complements popular languages like Java, JavaScript and COBOL and deploys to popular platforms such as WebSphere Application Server, IBM Power Systems and CICS.

- **HATS Toolkit** is a set of IDE plugins for developing Host Access Transformation Services (HATS) interfaces and services. It can be installed into the same package group (Eclipse workbench instance) as Rational Developer for Power and Rational Business Developer versions 8.5. With HATS, you can rapidly transform the end user experience of your 5250 applications running on IBM i without modifying those applications. Using the HATS rules-based transformation technology, the screens of your applications can be rendered with intuitive user interfaces. You can further improve the appearance, usability and navigation of your applications by creating screen transformations and skip-screen macros.

Two more important development tools are:

- **IBM Data Studio** is a freely downloadable set of integrated data development tools that can be co-installed into the same Eclipse instance with Rational Developer for Power Systems Software, to provide a complete integrated software and data development environment.
- **IBM Worklight Studio** is a freely downloadable IDE for developing mobile applications that can complement Rational Developer for Power Systems Software as you add mobile interfaces to your back-end enterprise applications.
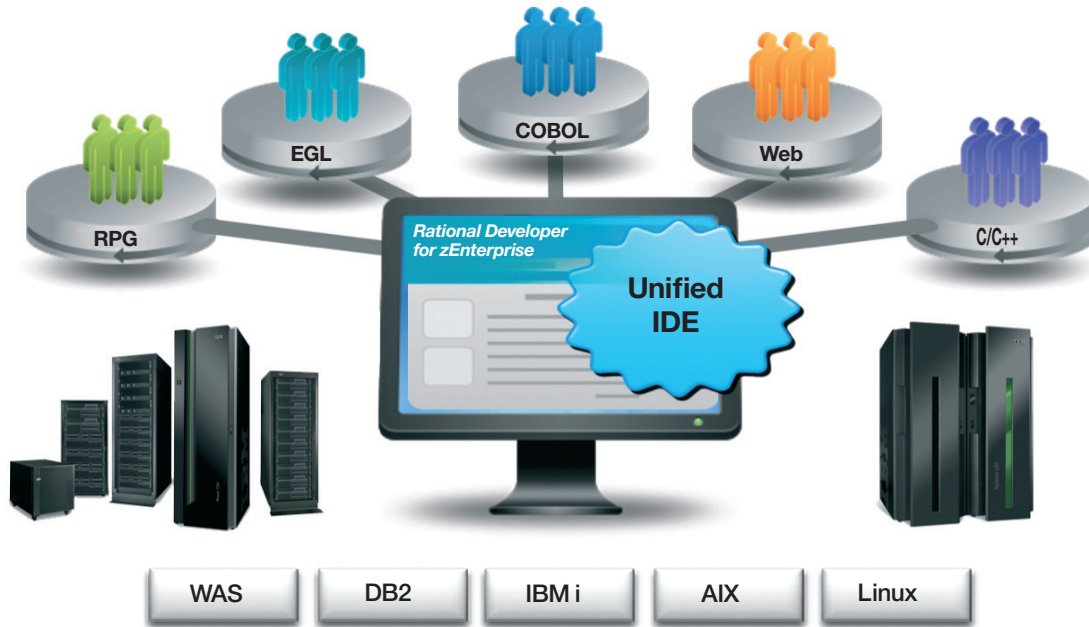
Figure 4. Rational Developer for Power Systems Software and related IBM IDEs are a rich set of integrated tools for developing applications on IBM Power Systems as well as other platforms.

Summary

IBM Rational Developer for Power Systems Software offers a comprehensive solution that addresses a number of IT challenges. Rational Developer for Power Systems Software is designed to provide a family of rich desktop Integrated Development Environments (IDEs) based on Eclipse for creating, maintaining, enhancing, modernizing, optimizing and porting applications for deployment on IBM Power Systems and PureSystems.

IBM Rational Developer for Power Systems Software IDEs is based on Eclipse, as are the other IBM Rational IDEs for System z (IBM Rational Developer for System z) and for distributed systems and WebSphere (Rational Application Developer for WebSphere Software). This enables you to create unified IDE environments that support optimized development for multiple platforms and languages. It also provides a consistent tooling experience so you can use your developers' skill sets more effectively when shifting resources from one platform or language to another.

These development tools can help you realize the productivity gains of moving from older text-based, command line development tools to a rich, integrated development environment. Offering a modern development environment also helps to attract and retain new talent, many of whom are already familiar with Eclipse tools, thereby helping lower training costs for new hires.

Rational Developer for Power Systems Software supports all three Power operating systems; AIX, IBM i and Linux and offers development tools covering a wide range of programming languages:

- RPG, COBOL, DDS, CL, C/C++ and Java on IBM i
- C/C++ and Java on Linux
- C/C++, COBOL and Java on AIX
- Java Enterprise Applications and web development (in the Power Tools bundles)
- A flexible packaging structure allows you to purchase only the components you need

When used in combination with IBM Compilers on Power Systems and Rational Team Concert, Rational Developer for Power Systems Software provides a comprehensive application development environment, including compilers, development tools and collaborative application lifecycle management.

For more information

To learn more about the IBM Rational Developer for Power Systems Software, contact your IBM representative or IBM Business Partner, or visit:
ibm.com/software/rational/products/rdp

Get started today by downloading a trial version of Rational Developer for Power Systems Software at:
ibm.com/software/rational/products/rdp

Or try it in a hosted environment at the IBM Enterprise Modernization Sandbox for Power Systems:
ibm.com/developerworks/downloads/emsandbox_power

Additionally, IBM Global Financing can help you acquire the software capabilities that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize a financing solution to suit your business and development goals, enable effective cash management, and improve your total cost of ownership. Fund your critical IT investment and propel your business forward with IBM Global Financing. For more information, visit:
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