VisualAge Generator Server for AS/400 Version 4
Release 4 — Maintenance Update and Name Change

Overview

VisualAge® Generator is IBM’s powerful high-end, rapid application development environment for building and deploying e-business, multitier, and server-centric applications. It offers versatile solutions with scalable, multiplatform exploitation across networked systems. This powerful application development solution gives you the productivity of component-based visual development and meets your most demanding transactional enterprise requirements.

VisualAge Generator consists of a family of products.

- VisualAge Generator Developer for OS/2® and Windows NT™ — provides the development workbench to define, test, and generate traditional, as well as Web-based systems. Standard templates are included to allow a highly productive model-driven approach to programming.

- VisualAge Generator Templates Customizer — provides the ability to tailor the standard templates, or create new templates to meet unique business requirements.

- VisualAge Generator Server for OS/2, AIX®, Windows NT, HP-UX, and Sun Solaris — provides a set of runtime libraries invoked by VisualAge Generator programs generated for workstation platforms.

- VisualAge Generator Server for MVS™, VSE, and VM — provides a set of runtime libraries invoked by VisualAge Generator programs generated for System/390® platforms.

- VisualAge Generator Server for AS/400® — provides a set of runtime libraries invoked by VisualAge Generator programs generated for the AS/400 platform.

This product has also been renamed and a new product ID (PID) has been assigned. It was previously named VisualGen® Host Services for OS/400®.

Key Prerequisites

The prerequisites for VisualAge Generator Server for AS/400 V4R4 are:

- OS/400 V4R4, or later
- ILE COBOL for AS/400 V3R7, or later
- DB2® for AS/400 V3R6, or later

Planned Availability Date

August 2000

At a Glance

IBM’s VisualAge Generator makes traditionally skilled developers more productive as they build high-volume transaction-processing applications in multiplatform environments. Scaleable and flexible, VisualAge Generator is perfect for today’s changing business environments. VisualAge Generator Server for AS/400 Version 4 Release 4 is a maintenance update of the runtime environment. Functional enhancements to the VisualAge Generator programming language improve programmer productivity and enable greater reuse of code. These enhancements were previously available as PTFs.
VisualAge Generator is IBM’s VisualAge offering focused on bringing productivity to organizations. It is a powerful, integrated development workbench used by programmers to fully define, test, build, and deploy traditional, as well as Web-ready enterprise level systems on a variety of platforms in a minimum of time.

With VisualAge Generator, applications are defined, from a productive desktop environment, using easy to learn, powerful, high-level specifications that are completely independent from the target runtime environment, and hide the complexity of the system software infrastructure (transactional and DBMS APIs, Web-server complexity, and communications protocols).

A powerful simulation and test environment enables the programmer to fully test the system without compiling or deploying to the final target system. This environment, built and integrated into the development workbench, allows rapid iteration between specification and verification. Once the application is fully verified, a code-generation facility can be invoked to transform the high level environment-neutral specifications into native 3GL source code optimized for the selected execution systems for compilation and deployment in production.

The solution combines the best of both worlds — all the productivity of an iterative desktop development environment with the scalability and the performance of a compiled and optimized 3GL production application.

To fully understand the power of VisualAge Generator, the rest of this description will review the following primary design points of this technology:

- Provide the highest level of programmer productivity

- Fulfill the demands of an enterprise environment

- Enable rapid deployment of Web-enabled e-business solutions

**Programmer Productivity**

To address the first primary design point of programmer productivity, VisualAge Generator has been equipped with four core facilities:

- Data model driven automatic code generation

  Industry research has shown that the majority of the code written to implement business applications has nothing to do with the business problem, but it is necessary to establish the "mechanical" infrastructure of the system providing functions such as handling error conditions, and keeping track of positioning within an array of data.

  Using the VisualAge Generator Templates facility, developers can have the application infrastructure (framework) automatically generated by the system, dramatically reducing the coding requirements and allowing the developer to build a fully functional database manipulation application in a matter of minutes!

  Programmers will build the bulk of their application by simply defining instances of the template’s Information Model. This consists of choosing the data to be manipulated (tables, views and columns), and selecting how it will be displayed. This set of intuitive, and seemingly simple specifications, allows VisualAge Generator Templates to automatically generate surprisingly comprehensive application code to:

- Access and manipulate database (Create, Read, Update, Delete)

- Present the data to the end user in different ways (Java™ or traditional GUI, JSP or TUI)

- Manage navigation among multiple windows and session state

- Manage multi-user data access concurrency

- Manage paging when data result set is larger than page size

- Manage error conditions

- Provide window and field-level online help

Once this application framework is generated, developers simply add the business logic using the standard VisualAge Generator specification facilities to complete the creation of the system.

- Visual construction from components

  VisualAge Generator includes IBM’s award winning visual, component-based construction architecture. This facility is much more than a User Interface (UI) layout builder: programmers can build their own components and make them available for reuse, or they can take advantage of pre-built, pre-tested components sold by IBM or third parties, visually assembling them to meet their system specifications.

  Hundreds of reusable components are already available, and with the growth of popularity of JavaBean and Enterprise JavaBean component models, thousands more will become available, allowing IT shops to implement a “Buy and Integrate” application development strategy instead of the traditional “develop from scratch” approach.

- High level 4GL specification facility

  VisualAge Generator provides a simple and yet powerful specification language. This language includes a set of high-level and polymorphic constructs, such as I/O verbs, Unit of Work (UOW) management verbs, and Remote Procedure Call (RPC), and hides the complexity of underlying target execution environment. The programmer, therefore, can focus on the business problem rather than on writing to complex APIs. An example of the power of the abstraction level of such specifications is the Web Transaction Rapid Development facility. Using a logical data structure definition and simple logical verbs, such as CONVERSE, traditional programmers can build and test fully functional multitiered e-business systems without the need to learn and master complex Web technologies such as Java servlets and JSP.

  Beyond the abstraction provided in the language, VisualAge Generator includes many aids to make 4GL programming even more productive. These include powerful utilities such as language-sensitive editors, wizards, and graphical assistants. Each is fully integrated and designed to speed the programming effort and help to prevent or eliminate errors.

- Interactive Test Facility (ITF) integrated with the development facilities

  The most powerful feature of the development workbench is the ITF. This facility is tightly integrated with the specification environment, allowing programmers to easily specify, animate and verify the application without leaving the development.
Delivering enterprise IT assets to the Web

Ease the integration with existing legacy systems, deliver systems that can scale up to the highest performance and transaction volumes, and reach a variety of legacy platforms and transaction servers which must provide high performance and transaction response. VisualAge Generator allows you to develop and test Java clients (applications, applets or servlets) using either Java or 4GL specifications, or a mix of both, easily exchange data content between servlets using either Java or 4GL specifications, or a mix of both, easily exchange data content between servlets and JSP that manage and contain business logic. The development of new third-tier transactional servers must provide adequate response and availability can be more damaging than not entering the market at all.

Delivering e-business Solutions

Developing e-business solutions is quickly becoming the next strategic direction as companies see the potential for cost saving, better customer service, and streamlined business processes. This will be possible only if the enormous value of the existing IT assets can be easily brought into a Web-centric world. But the Web is an unforgiving new market, where your competitor is just one click away: building self-serve systems that do not provide adequate response and availability can be more damaging than not entering the market at all.

IBM is leveraging its experience in delivering highly available, scalable and secure systems to equip this new world with the correct infrastructure and tools. The result is a set of products and architectures that will support the creation and deployment of end-to-end multitiered e-business systems. If we think of an e-business system as a logical 3-tier solution, WebSphere Application Server provides the runtime environment for tier-2, WebSphere Studio provides the tools for Web-site management and page composition, and the VisualAge products allow professional programmers to rapidly create transactional data servers and business logic. In this context, VisualAge Generator plays a central role for the development of new third-tier transactional servers which must provide high performance and transaction volumes, and reach a variety of legacy platforms and data, automatically generating the code necessary to use their services in a servlet/JSP component dynamic HTML context. This is possible today through three facilities.

Web Transaction Rapid Application Development (RAD)

The Web Transaction RAD facility is an innovative and simple methodology that allows traditionally skilled programmers to develop, test and deploy multitiered Web systems without having to deal with the complexities of tier-2. This includes designing and developing servlets and JSP that manage and contain data provided by tier-3 servers (mapping data between Java objects and flat data structures, understanding API for host connectivity, and so forth), and manage sessions and state. Using this approach, developers can specify their system at a logical level, and let VisualAge generate both tier-2 (Java and JSP component) and tier-3 (C++ or Cobol) code that implements those specifications.

Integration with VisualAge for Java

The VisualAge Generator Developer workbench is seamlessly integrated with the award winning VisualAge for Java workbench to provide the most powerful e-business Integrated Development Environment (IDE) in the industry. Programmers can develop and test Java clients (applications, applets or servlets) using either Java or 4GL specifications, or a mix of both, easily exchange data content between Java variables and VAGen data items, cross invoke business logic implemented in the two languages, and animate both source definitions in a seamless development environment. This rapid iteration between specification and verification, frees the developers from costly generation/compilation and deployment steps, and facilitates an evolutionary prototyping development approach.

Fulfilling the Enterprise Requirements

An “enterprise-class” application development solution must be capable of fulfilling the following key requirements:

• Provide a robust development workbench that can scale up to large development teams

VisualAge Generator is equipped with integrated repository services that facilitate software configuration management and version control. In addition, it is possible to transfer VisualAge Generator source specifications between the integrated repository and external SCM tools, such as VisualAge TeamConnection™. This enables these source specifications to be managed along with other application development components, participating in the enterprise-wide problem and change tracking, and development process management.

• Deliver systems that can scale up to the highest available transactional throughputs

VisualAge Generator generates COBOL and C++ source that can be compiled and run under the control of TXSeries™, CICS/ESA®, and IMS™/TM transaction managers. This native support of the most proven TP monitors in the industry provides the transactional scalability required by the most demanding business-critical systems.

• Produce systems that can run on a wide variety of platforms

The code generated by VisualAge Generator can run on a variety of client and server platforms, including Windows™ 95, Windows 98, Windows NT, Sun Solaris, OS/2, AIX, HP-UX, OS/390®, OS/400, as well as other 390 systems such as VSE and VM.

• Ease the integration with existing legacy systems, allow access to legacy data

VisualAge Generator systems can easily reuse existing legacy programs through a simple CALL API, and can also be invoked by hand-crafted existing COBOL or other 3GL programs. In addition, VisualAge Generator programs can access not only the most popular relational databases such as DBMS, the DB2/UDB family, Oracle and others, but can easily manipulate legacy file systems, such as VSAM, and nonrelational IBM databases, such as IMS/DB and DL/I. This allows the programs to easily integrate new applications into existing IT infrastructures maximizing the protection of the previous investments.

• Deliver enterprise IT assets to the Web

As explained in more detail in a separate section of this description, VisualAge Generator allows you to develop end-to-end multitier systems with Java servlet/JSP component dynamic HTML front-ends, transparently connected to transactional servers running on any of the supported server platforms and transactional systems mentioned earlier.

• Be usable by traditionally-skilled programmers

Although VisualAge Generator is tightly integrated with a pure Object Oriented (OO) programming environment (Smalltalk or Java), the programmer can exploit these technologies without the need to learn OO programming, and simply use the procedural 4GL specifications. The power of the underlying OO technology, however, can be gradually unleashed as the developer becomes more familiar with the component architecture and begins to explore and exploit the additional facilities.
interactive debugging environment. Tier-3 server logic, specified in 4GL, can be defined and tested together and seamlessly with the client prior to the generation of C++ or COBOL for the target runtime. A full end-to-end multitiered Java-to-any-server solution can easily be developed, rapidly and without necessarily having to learn deep Java skills, in an iterative and dynamic environment that does not require lengthy runtime software setup.

- Generation of JavaBean and Enterprise JavaBean Components

This facility allows you to automatically generate, from VisualAge Generator server programs specifications, JavaBean and Enterprise JavaBean components that can be used within any Java program (applet, application or servlet) to connect to and exchange data with a VisualAge Generator server program. Selecting the Enterprise JavaBean (EJB) component generation option allows you to reach tier-3 VisualAge Generator programs within Enterprise Server for Java (ESJ) runtime environment, such as that provided by IBM WebSphere Application Server Enterprise Edition. The generated bean and the gateway program automatically perform all the data marshaling and conversion necessary to map Java to traditional back-end transactions.

Year 2000

These products are Year 2000 ready. When used in accordance with their associated documentation, they are capable of correctly processing, providing, and/or receiving date data within and between the twentieth and twenty-first centuries, provided that all products (for example, hardware, software, and firmware) used with the products properly exchange accurate date data with them.

The service end date for these Year 2000 ready products is July 31, 2002.

Euro Currency

These programs are EuroReady.

For more information on the implications of the euro, visit the IBM euro Web site at:

http://www.ibm.com/euro

EuroReady Products

IBM considers an IBM product to be EuroReady if the product, when used in accordance with its associated documentation, is capable of correctly processing monetary data in the euro denomination and of respecting the euro currency formatting conventions (including the euro sign). This assumes that all other products (that is, hardware, software, firmware, and so forth) that are used with this product are also EuroReady. IBM hardware products that are EuroReady may or may not have an engraved euro sign key on their keyboards.

Currently, EuroReady status applies primarily to IBM products specific to the EMU countries. Products that are not specific to these countries are deemed to be “not ready” for euro unless otherwise stated in the product’s country-specific specifications.

IBM Hardware Ready

IBM supplies certain IBM products which include third party software (pre-loaded or not) and/or third party attached hardware. In these instances IBM is not in a position to assert that these third party products are, in themselves, EuroReady.

Therefore, such IBM products will be designated as Hardware ready.

EuroReady Solutions

IBM considers a solution to be EuroReady when the solution providers have:

- Analyzed the euro requirements, including the need to comply with relevant EC rules
- Built in appropriate function and can clearly demonstrate this by:
  - Detailing euro related requirements
  - Describing how these will be implemented in the solution
  - Declaring when the implementation will be generally available

The euro capabilities of a EuroReady solution will be clearly identified as features of the Solution specification as described in the contracts document.

Reference Information

Refer to Software Announcement 200-168, dated June 12, 2000 (AS/400 Terms, Conditions and Charges).

Trademarks

MVS, TeamConnection, TXSeries, IMS, and WebSphere are trademarks of International Business Machines Corporation in the United States or other countries or both. VisualAge, OS/2, AIX, System/390, AS/400, OS/400, VisualGen, DB2, CICS/ESA, and OS/390 are registered trademarks of International Business Machines Corporation in the United States or other countries or both. Windows NT and Windows are trademarks of Microsoft Corporation. Java is a trademark of Sun Microsystems, Inc. Other company, product, and service names may be trademarks or service marks of others.
Offering Information

Product information will be available on day of announcement through Offering Information (OITOOL) at:

http://www.ibm.com/wwoi

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Technical Information

Specified Operating Environment

**Hardware Requirements:** The following shows the minimum hardware requirements for VisualAge Generator Server for AS/400 V4R4.

- **Processor** — AS/400 capable of supporting OS/400 Version 4.4 or 4.5.
- **CD-ROM Drive** — Any CD-ROM drive supported by the operating system (required for installation and maintenance).
- **Disk space** — 2 MB disk space in addition to that required for the operating system and other applications.
- **Memory** — 16 MB memory.

**Software Requirements:** The following shows the minimum software requirements for the VisualAge Generator Server V4R4 for the AS/400 environment.

- **Operating system**
  IBM OS/400 V4R4, or later (program number 5769-SS1).
- **Languages**
  For compiling the VisualAge Generator AS/400 program, ILE COBOL/400® Version 4R4, or later (#5769-CB1).

The following shows the optional software requirements for VisualAge Generator Server for AS/400 V4R4.

- **Relational database access**
  - For compilation with relational tables, DB2®/400 Query Manager and SQL Development Kit V4R4 (#5769-ST1).

Planning Information

VisualAge Generator Server for AS/400 V4R4 is distributed in one package with the following:

- IBM International Program License Agreement and its License Information
- Proof of Entitlement
- One CD-ROM program media
- IBM Publication SH23-6549

This program when downloaded from a Web site, contains the applicable IBM license agreement, and License Information (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 for future reference.

Security, Auditability, and Control

Security data with respect to user access is to be enabled by the 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

For ordering information, refer to Software Announcement 200-168, dated June 12, 2000, (AS/400 Terms, Conditions and Charges).

An upgrade to VisualAge Generator Server for AS/400 V4R4 is available in either 5716-VG1 or 5763-VG1.

Terms and Conditions

For terms information refer to Software Announcement 200-168, dated June 12, 2000 (AS/400 Terms, Conditions and Charges).


AIX®/UNIX® Upgrade Protection Applies: No
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Year 2000 Readiness Disclosure