CA Gen is a proven model-driven development environment for designing, deploying, and maintaining high-performance, scalable enterprise applications. Integrated modeling and code generation enable you to deliver platform-independent applications to run your mission-critical processes. It also enables you to use agile development methods to design and implement reusable software components, Web-enable applications, modernize legacy applications, and integrate systems. A single CA Gen application design can be used to generate native code and deploy to multiple platforms and architectures using a single developer skill set.

Product Overview

CA Gen provides an integrated modeling environment to capture application requirements along with design tools, code generators, deployment wizards, and test harnesses to realize a solution based on those requirements. CA Gen enables you to create and maintain large-scale business applications for multiple platforms, including mainframe, Linux on System z, UNIX, Non Stop on S-Series, distributed Linux, Java EE, Windows, and .NET. Quickly deploy your applications to these different platforms, as well as new architectures such as SOA, without rewriting your code.
Business Value

Organizations need cost effective and agile business applications to effectively compete in today’s ever-changing business and technical climate. Whether the change is driven by acquisition, regulatory mandates, or advancing technology, CA Gen helps reduce the time, cost, and risk of building new enterprise scale applications or modernizing your existing legacy applications. CA Gen supports the end-to-end application development lifecycle—from design and specification to code generation, testing, deployment, and ongoing maintenance. Be more reactive to change and lower your software costs, because with CA Gen, design changes are made in a model, not in the generated code.

Features

CA Gen 8.0 includes numerous strategic features that significantly enhance the way you use CA Gen and improve the applications it generates.

- CA Gen Studio – modern developer tool framework
- Web View – Web 2.0 application support
- Expanded Web services and SOA support
- Support for CA Mainframe Software Manager™ (CA MSM)

CA Gen Studio: a modern developer tool framework

CA Gen Studio is a new framework for a collection of designers and tools and provides a modern user interface for the current toolset capabilities. CA Gen Studio is implemented on top of the Eclipse framework, and specifically as an Eclipse Rich Client platform. The Eclipse platform provides a rich set of capabilities that, by extension, become part of CA Gen Studio. Those capabilities include a standard set of user interface controls and behaviors, and extensive end user customization of fonts, colors, window size, selection, and position. Within CA Gen Studio, multiple designers provide functionality that is analogous to the diagrams of the current toolset. CA Gen Studio designers share a common default user interface with a common set of controls. Each designer provides the user with a tree-control-based navigator for traversing a model. A designer has one or more main views available in a tab control. Each designer also provides a property sheet window for the display and editing of attributes of a selected object. Property sheets are easier and more efficient to use than the dialog box equivalents in the existing toolset. Related to the main view window is an overview window to provide contextual information for the main views displayed information. CA Gen Studio itself provides each of the designer’s common functionality: file/model operations, printing commands, and help facility.
Designers may be added to CA Gen Studio using a plug-in; additional functionality may be added to CA Gen Studio outside of release cycles.

Three new designers have been introduced with CA Gen 8.0:

- Web View UI Generation
- PStep Interface Designer
- Web Service Access Designer

**Web View UI generation: Web 2.0 application support**

Web View is a new type of generated Web application that uses new technologies, e.g., Ajax, Web services, etc. It is analogous to, but more capable than, the existing CA Gen Web Generation product.

Web View enables you to create a Web 2.0 application using:

- A design component from the toolset to create your brand-new Web UI and Logic
- Customized Web UI pages external to CA Gen

**Expanded Web services and SOA support**

The trend in application development is toward service-oriented architectures (SOA), where servers publish one or more services that are exposed in a platform-independent format. Consumers can combine services from any number of different sources to create an application.

CA Gen supports SOA via Web services. The CA Gen proxies can be wrapped to provide services for any new or existing transaction. The CA Gen Web Services Wizard can speed the wrapping of the Java Proxy. CA Gen 8.0 features ASP.NET proxy-based Web services and EJB Web services. In addition, CA Gen business partners provide additional capability to help with using Web services and CA Gen.

Web services can be consumed by a CA Gen application via OLE, EABs, and HTML controls. In CA Gen 8.0, the Web Service Access Designer option will also allow you to consume both CA Gen and third-party Web services. Our business partners have created additional capability to assist with the consumption of Web services.

- **Web service publication:** The new PSTEP Interface Designer allows you to create a WDSL from an existing CA Gen PSTEP by selection of the desired data views and customizing the names as presented in the WSDL. The selection of the desired data views helps enable efficient Web service exposure by forgoing unneeded data transfers. The customized naming permits exposing the view data names in user-friendly form, free of the context of the originating procedure.
- **Web service consumption:** With the introduction of the Web Service Access Designer, CA Gen allows you to create and customize the Web interface of your Web applications using an industry standard web authoring tool such as Dreamweaver. The interface uses Web services technologies to retrieve data asynchronously and seamlessly from CA Gen-generated or third-party Web services.

**Mainframe 2.0**

CA Gen has adopted key Mainframe 2.0 features that are designed to enable your staff to install, deploy, and maintain the CA Gen mainframe products more effectively and quickly.

- **CA Mainframe Software Manager:** CA Mainframe Software Manager automates CA Gen Mainframe products installation, deployment, and maintenance and removes SMP/E complexities.
  - The **Software Acquisition Service** enables you to easily move product installation packages and maintenance from CA Support Online directly to your mainframe environment and prepare them for installation.
  - The **Software Installation Service** standardizes CA Gen Mainframe installation, which includes a new, streamlined Electronic Software Delivery (ESD) method that allows CA Gen to be installed using standard utilities. This service also provides standardized SMP/E product installation and maintenance via APARs and PTFs, and simplifies SMP/E processing through an intuitive graphical user interface and an intelligent Installation Wizard.
  - The **Software Deployment Service** enables you to easily deploy CA Gen in your mainframe environment.
  - **CA MSM Consolidated Software Inventory (CSI)** updates and infrastructure improvements add flexibility to CA MSM processing of CSIs and enable CA MSM to more effectively utilize CPU and system memory.

- **Installation Verification Program (IVP) and Execution Verification Program (EVP):** As part of qualification for inclusion in the set of CA Technologies mainframe products released every May, CA Gen has passed stringent tests performed through the IVP and the EVP to find and resolve interoperability problems prior to release. These programs are an extension of our ongoing interoperability certification initiative, launched in May 2009.

- **Best Practices guide:** This guide provides information on CA Gen installation, initial configuration, and deployment to shorten the learning curve for staff who are responsible for the installation and management of this product.
Simplify upgrades and migrations

In CA Gen 8.0 we provide side-by-side support of the toolset. You no longer need to uninstall your existing release of CA Gen on your workstation before installing the new release. You can compare and maintain different models in two releases—and have them open at the same time.

Additional 8.0 enhancements

- **64K object count expansion**: The workstation developer toolset object count changed from 64K for all objects to ~1M objects of any type, thus greatly increasing the size of subsets/models you may download to the Developer Toolset. The change is also reflected in the Encyclopedias.

- **Z/OS dynamic link of RI triggers**: CA Gen’s dynamic linking enables CA Gen developers to package their z/OS apps such that the applications’ RI Triggers components are dynamically linked at runtime. This will simplify upgrading to the new version of CA Gen.

- **Auto number attributes**: This feature allows you to use identity columns in DBMSs where supported. Auto Number Attributes automatically generate a unique identifying numeric value for each row in a table.

- **Multi-Row Fetch/Block Fetch**: Support for DB2 Multi-Row Fetch/Block Fetch features, as well as similar capabilities on other DBMS products which support this feature, helps you realize higher performance due to the efficiency provided by these DBMS operations.

- **Custom cascading style sheets for Web generation**: Within Java Web Generation you can now use custom-written CSS defined on the level of the Business System. Your CSS can be associated to controls at design time or at runtime using application logic.

- **ASP.net Web client enhancements**: ASP.NET Web client applications have been enhanced to improve their performance and user interface. Ajax is used to asynchronously update controls such as list-boxes. You can use customized themes to change the user interface characteristics of applications on the fly.

- **Web tabs feature**: Web Generation and ASP.NET Web client applications can now operate independently in different tabs from within a single browser instance. CA Gen 8.0 supports both Internet Explorer 7+ and Mozilla Firefox 2.x, which feature tabbed browsing as one of their prominent features. Thus, data contained in a CA Gen 8.0 Web application in a browser tab is not affected by the presence of another CA Gen 8.0 application in another tab on a supported browser.
Key capabilities

- **Model-driven architecture:** Modeling enables business requirements to be defined independently of technical specifications. Changes to business requirements can be easily implemented in applications by making a change in the model that propagates through the generated application; no manual code updates are required. Each CA Gen developer workstation provides integrated, full life cycle application modeling capability, local model storage, model consistency check tools, and optional code generators. CA Gen automatically transforms entity-relationship diagrams to database definition language (DDL) and deploys to the target database management system. Code generators use high level action language and application architecture information (Web-based, distributed, batch, etc.) to generate native languages for the target platforms. The generated code is compiled and deployed to the target environment(s).

- **Full life cycle support:** The CA Gen modeling environment provides support for the end-to-end application development lifecycle—from design and specification to code generation, testing, deployment, and ongoing maintenance.

- **Simplified maintenance:** Time and cost of application maintenance can be reduced because changes are made to the model, not to the code. Simply make appropriate changes in the model, then regenerate, test and deploy the updated application. In CA Gen, elements of the model are stored once. When the model is changed, that change will be consistently and instantly mirrored in all aspects of an application upon deployment. For example, a change to an entity attribute will be reflected in an updated DDL and in all accesses to the attribute throughout the application.

- **100% code generation:** Consistently generate code for a robust solution. Application logic, communications infrastructures, database definitions, referential integrity triggers, Web servers, and browser interfaces are automatically generated, packaged, and ready for immediate deployment. The CA Gen model represents the complete application, including all logic, data, and user interface definitions; therefore, the generators are designed to produce a complete, working, syntactically correct application.

- **Platform independent modeling:** This feature shields your developers from technological specifications and enables the focus of application development to be on business requirements. High-level models are transformed into a selected source language (Java, C, COBOL, or C#) and DDL for industry-leading database servers. Because CA Gen generates 100% of the code, the programmer needs no extensive training in either the target languages or operating systems. Migrating from one platform to another—whether that be the mainframe, Java EE, or .NET—is as simple as regenerating the code.
• **.Net framework support:** CA Gen delivers comprehensive .NET solutions, providing automated generation of:
  — ASP.NET Web Clients for IIS
  — .NET Servers executing under Component Services
  — Communication calls between ASP.NET Web Clients and .NET Servers using .NET Remoting
  — .NET Proxy code, enabling integration of .NET applications with backend mainframe, Java EE, and Unix servers
  — SQL Server database
  — DBMS access via ADO.NET provides access to Microsoft SQL Server, Oracle, and DB2 so you can transition your existing CA Gen client/server model to an N-Tiered .NET application with no mandatory modifications. All you need to do is select the .NET platform options and regenerate the code.

• **Java EE framework support:** CA Gen delivers comprehensive Java EE solutions by automatically generating HTML for the browser, Java Server Pages (JSPs) on the Web server, and Enterprise JavaBeans (EJBs) on the application server. You get the best of both worlds——the flexibility of Java EE combined with the proven performance of automated code generation. You can implement pieces of the Java EE architecture as you are ready, reducing the risks of this technology transformation. CA Gen generation of Java is integrated with all traditional generation capability, allowing, for example, the Java-based browsers and Web servers to access generated CICS transactions, or a Windows-based client to access transactions implemented as EJBs.

• **EJB generation:** This feature provides a server alternative for applications you wish to move to a Java EE environment. EJBs generated by CA Gen may replace and/or coexist with traditional generated servers running on CICS, UNIX, Linux on System z, distributed Linux, or in Windows. EJBs generated by CA Gen are targeted at any Java EE 5-compliant environment regardless of underlying platform, use JDBC for database connectivity, and support multiple databases.

• **Application integration:** The open, extensible environment enables you to integrate existing legacy applications and multiple client technologies with CA Gen servers. The CA Gen proxy options support the integration of systems built to different standards. Components are exposed or viewed as COM, Java, or .NET objects, enabling integration with multiple application sources. Therefore, applications built in either a Java- or Microsoft-centric environment can tap into generated servers. CA Gen proxies also include methods that support XML data interchange. A powerful wizard transforms the proxy into a Web service that can easily integrate with other applications inside or outside the firewall.
- **Web services wizard**: Web services are quickly created using an easy-to-follow wizard to automatically wrap the Java proxy. This powerful wizard allows any existing server generated by CA Gen (mainframe, UNIX, Linux, and Windows) to be exposed as a Web service.

- **Web generation**: Implement comprehensive Web-based applications using the CA Gen development environment. With few modifications, your existing CA Gen applications can be quickly ported to the Web. The Web Generation feature delivers an Internet-based client by generating HTML and JSPs directly from the CA Gen model. HTML, JSPs, and JavaScripts are generated for the browser. These can be customized and the changes will be saved in the CA Gen model and available when the system is regenerated. CA Gen generates Java for the middle tier (the Web server). You can deploy applications to any Java EE 5-compliant Web application server. This middle tier could be running on z/OS, a UNIX or Linux server, or in Windows. If desired, a comprehensive Java-based solution running on a Web server with a browser front end could be implemented (similar to how “fat client” systems used to be built). Another, more widely implemented solution is to tie a Web front-end to back-end transaction-processing servers. This includes both existing CA Gen servers and legacy servers outside of CA Gen. All of the code necessary to provide communication between each of these application layers is automatically generated.

- **Multi-level repository**: Your development teams can choose from mainframe, UNIX, Windows, or a combination of these repository environments. CA Gen keeps them all synchronized and enables multiple developers to work on the same project simultaneously. Security, version control, and branch setting features can provide improved project control, extensive reuse, increased productivity, and enhanced system quality.

- **Support for CA Datacom®/DB**: Provides data modeling support, generation of DDL, and embedded SQL in a COBOL-generated application to allow CA Gen-generated CICS applications to access CA Datacom/DB databases.

- **Database schema import facility**: A toolset plug-in that automates the creation of the CA Gen data model corresponding to an existing CA Datacom/DB database.

- **Z/OS compatibility option**: This option allows the selection of “Compatibility” during packaging for Action Blocks, Procedure Steps, and Screens. It will allow the loading and execution of DYNAM and non-DLL modules and is intended as a migration aid for existing modules and external action blocks.

- **Cross-context flows**: This feature allows fine-grained deployment of components in large CBD applications vs. deploying the entire application. It provides more efficient use of time and computer resources during development and QA.
- **Diagram trace utility**: An Eclipse-based utility to trace Action Diagrams generated in Java, C#, and C. It includes the following features (and more):
  - Execution control
  - Conditional breakpoints
  - Watch window
  - Action diagram viewer
  - Step features, including events and customizable syntax coloring

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### Delivery approach

CA Services provides a portfolio of mainframe services delivered through CA Technologies internal staff and a network of established partners chosen to help you achieve a successful deployment and get the desired business results as quickly as possible. Our standard service offerings are designed to speed deployment and accelerate the learning curve for your staff. CA Technologies field-proven mainframe best practices and training help you lower risk, improve use/adoptions and ultimately align the product configuration to your business requirements.

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### Benefits

In today’s business climate, organizations must have business applications that help improve customer service, reduce costs, increase profits, get to market faster, and respond more rapidly to competitive challenges. Business systems should reflect not only an organization’s core business strategy, but also adapt to ongoing changes as they occur. Attaining this can be complex, exacerbated by mergers, acquisitions, and partnerships which dictate that key applications and data must integrate across multiple platforms and computing environments. Newer technologies such as Web services help address these requirements, but the ability for organizations to readily take advantage of emerging technology while still meeting age-old requirements of increased productivity, enhanced quality, and reduced costs is challenging. In today’s tactically driven IT environment, organizations must balance the benefits of short-term speed with long-term benefits of agility and reuse. In addition, legacy applications need to be integrated and modernized to ensure that they are change-tolerant and continue providing value to the organization. CA Gen addresses all these challenges with a single, integrated development environment that allows development teams to create and maintain large-scale
business applications for multiple platforms. CA Gen can be used to build new enterprise applications or modernize your existing legacy applications. Be more reactive to change and lower your software costs, because with CA Gen, design changes are made in a model, not in the code.

The CA Technologies advantage

CA Technologies has 30 years of recognized expertise in robust, reliable, scalable, and secure enterprise-class IT management software. CA Gen is a key component of the Mainframe 2.0 initiative from CA Technologies to change the way the mainframe is managed forever by helping you maximize the value of our mainframe products and by providing a simplified experience and innovative solutions that deliver value quickly and flexibly.