

**Introducing 2G Builder &
framework, the new SOA
platform for business
application development.**

**From Delphi applications to
web 2.0 service oriented
architectures.**



Overview



Jun 2013

2G is the name of the new GESINF platform to quickly design, develop and distribute robust multi-tier applications using your Delphi skills and code, leading your software team into the most recent Web technologies and SOAP standards. 2G is the first solution based on the concept of comprehensive modeling, where data virtualization, basic business logic and user interface are stored as information into a unique repository, allowing you to build reliable business services and Rich Internet Applications with enterprise-level features, ready to be delivered.

Both Server platform, totally scalable and extendible, and designing tools are Delphi coded; Front-end is based on Adobe Flex ready-to-use interface, easily deployable and customizable. 2G is the best way to leverage your Delphi expertise developing Web 2.0 solutions, migrating existing client/server applications or building state-of-the-art enterprise platforms with a powerful and innovative user experience.

2G introduces a new technical and conceptual architecture aligned with the latest computer technology; such an architecture is defined as SOA (service-based) and RIA (based on web 2.0 interfaces). An important characteristic of new applications based on 2G is that, while introducing the most innovative technologies that ICT market can offer today, they can co-exist with actual software applications within the same environment; this means that existing applications can be used at same time using 2G interface modules, that can be implemented gradually.

2G is the first solution based on the concept of global modeling.

Coupling web and service oriented architecture



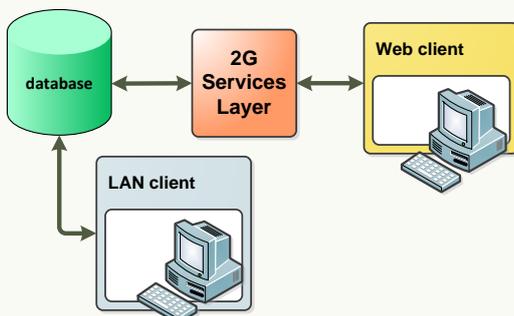
The advantages of using the Web for software application are known, less known are the disadvantages that users experiment with traditional systems. In particular, the most used techniques, which today go under the name of Web 1.0, have proved to be very effective for applications-oriented portals, such as home banking or e-commerce, but much less effective in enterprise resource planning and LOB applications, where the amount of information managed by users requires a deeper interaction with the system, like overlapping windows, and a more

general data organization which hardly fits into a sequence of individual web forms. A further limitation, less familiar to users, which also has slowed the development of complex web based applications, is the higher cost of software production, due to a less efficient architecture and compatibility issues with different web browsers, one of the most critical aspect in the maintenance of existing Internet applications. To solve these problems and provide a more interactive and rich user interface, come the concepts of Web 2.0 and Rich Internet Applications, an innovation which enables a web user experience really comparable with typical desktop applications the user is accustomed to use on a PC with a high degree of interactivity, making possible to use the Web as part of interactive graphics applications. GESINF, conscious of the importance of user interface in management systems, has taken up the challenge of Web 2.0 and has developed a platform entirely based on RIA, which goes beyond the traditional concepts of web-application using the best features of traditional web without giving up usability and performance.

The concepts of Web 2.0 and Rich Internet Applications were born to provide a more interactive and rich user interface.

Business objects and multi-tier

GESINF decided to combine an effective RIA interface with the most suitable server architecture to manage complex business processes, such as typical ERP systems, resulting in the implementation of a native SOA architecture (service oriented architecture) based on web services, actually considered



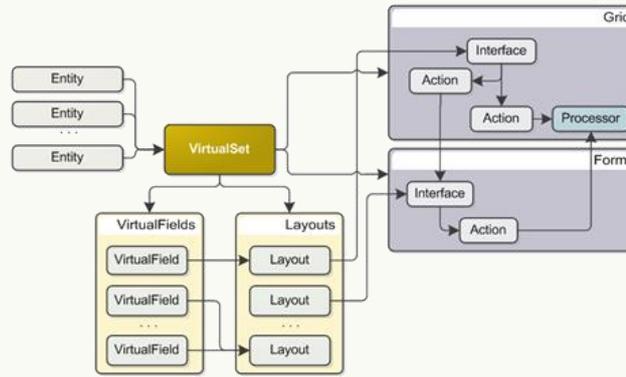
the most advanced technologies for such systems. 2G applies this concept to its services architecture, using a separate application layer to isolate, manage and publish business objects: this service layer (so called) provides to external applications a range of services to interact with business objects, translating the received commands (methods) in the activity of reading / writing data according to the application rules.

Business objects represent "black boxes" which expose data and tools closely related to application functionality and directly employable.

Less visible advantages: software quality

The above aspects are just one of the many advantages, some of them are less visible like the drastic improvement of the software production process and the significant increase in software quality. In a nutshell: this architecture allows for more economical, more reliable, more open solutions without having to give up the user experience. Given the undisputed advantage of Web services, many commercial applications offer

just partial solutions, i.e. web services layers introduced in a traditional architecture to compensate the lack of interoperability with outside world. With 2G, SOA is the solution itself, i.e. it is the only way to interface with 2G functionalities, both when they are accessed by GESINF solutions, via RIA interface, or by other applications (traditional or web-based).

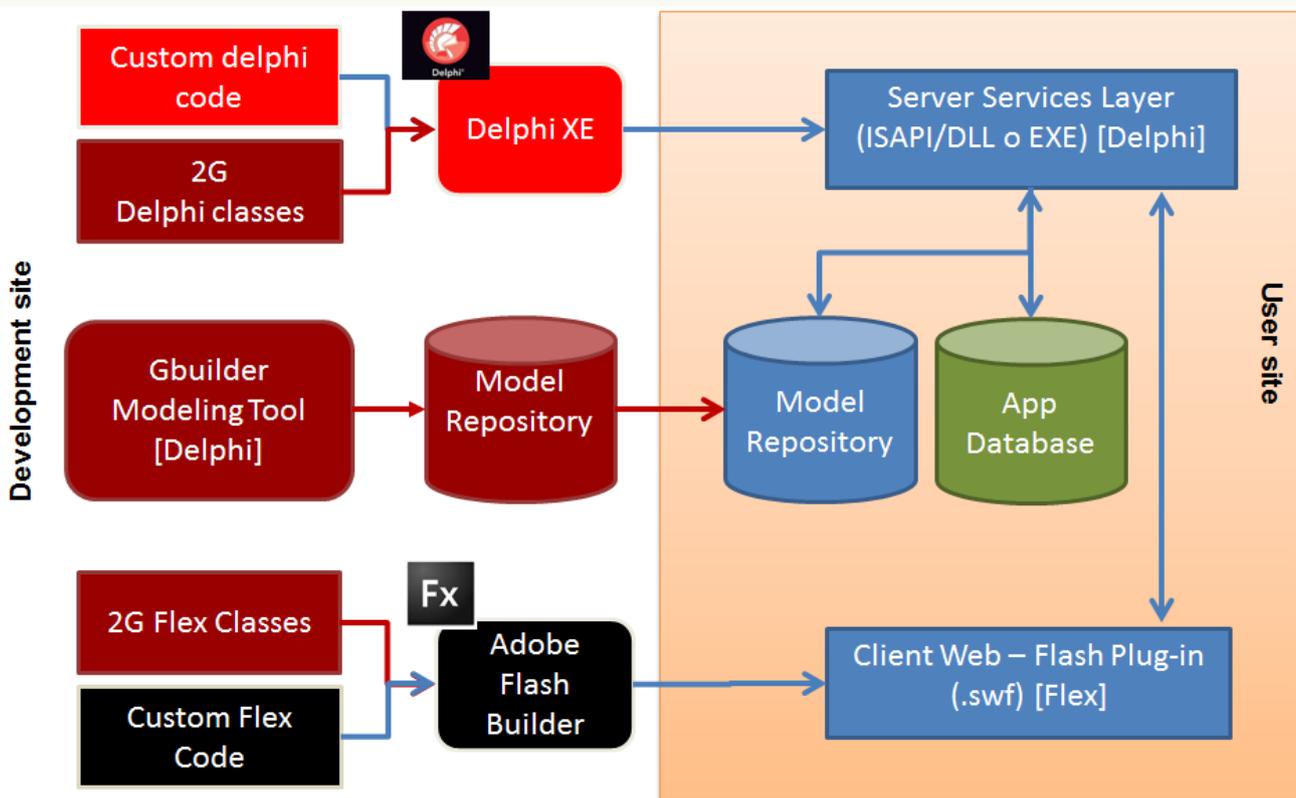


2G architecture allows for more economical, more reliable, more open solutions without having to give up the user experience.

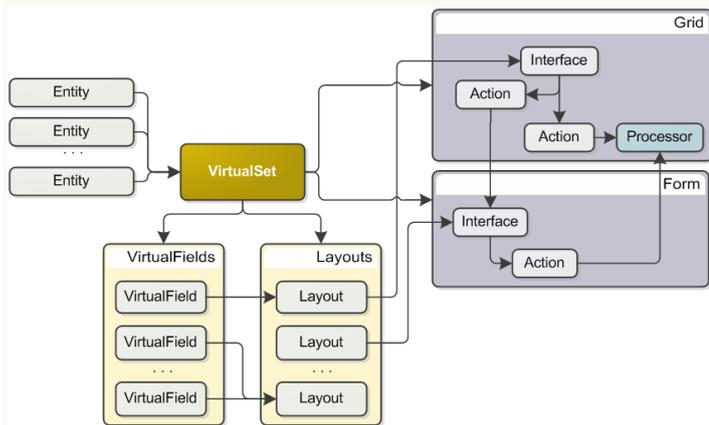
Modeling

GBuilder is the tool for modeling a 2G application. An application model includes the definition of business objects, their properties and relationships, and user interface specifics, as well as messages, parameters, rules and all the necessary to achieve the basic infrastructure servers and clients. All project information are recorded in the production database.

A function of GBuilder allows you to update the model database at the site user based on the model database content. The model database is used by 2G classes to expose web services and business objects, as well as to dynamically generate the interface definitions that Flex application is able to read and interpret. If business objects do not require specialized application logic, 2G standard classes are able to expose all services required by client-side to manage and manipulate data and interfaces, without writing a single line of code. However, items that require special treatment, such as updating multiple entities or other objects according to application logic, can be implemented using custom Delphi code and/or Flex code, inheriting the standard classes created by the framework. Standard interface classes include : Ribbon-based and tree menu; Advanced and basic editable datagrids; tree-view; data oriented view and edit forms as well as a complete set of configuration and administration tools.



Elements

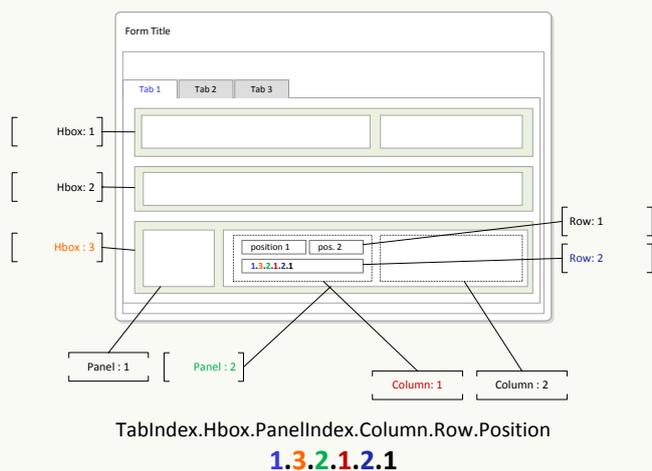


A 2G model is based on elementary elements called VirtualSet. A Virtualset represents a business object when it's based on persistent data (one or more database entities or a result of a parametric query), a set of parameters when it is referred to an object descriptor. A database related VirtualSet can be used the same way as a dataset; its definition includes a list of fields, called VirtualFields, each one with its own properties, managing rules and visual appearance, and one or more interface definitions, to view and manipulate data on client side. A descriptor-type Virtualset is not based on data, it can be used to gather parameters on a form to execute server side tasks, as a report or a remote procedure. 2G framework is responsible for the publication of the

methods for the insertion, modification and deletion of data in virtualsets, as well as the methods to instruct the client in the design of management form. A virtualset interface, grid or form, may include standard editing toolbar and/or specific controls, called Actions; an action can call other interfaces or remote procedures, called processor, passing one or more parameters. A processor is a Delphi class hard coded and compiled within server side application; 2G exposes automatically standard insert/update processor for modeled virtualset, based on designed business logic, but new and/or custom processors can be written in Delphi to implement custom procedures or complex logics.

User Interface

One of the most interesting 2G features is the ability to design and deploy a complete application, client and server side, without writing a single row of code. User menus, grids and forms can be easily defined within GBuilder modeler, their visual properties and appearance are stored inside model repository, and managed using Gbuilder tool. No code is required to produce a new menu item or a data-aware form, no Flex procedures are needed to implement it; 2G flex framework reads, interprets and runs dynamically server-side defined form specifics, using ad-hoc web services. Interactive designing tools are so flexible that developers can simply ignore even basic Flex programming techniques, being able to produce robust and reliable multi form application in a matter of hours.



An application in the repository

Another great advantage using 2g framework is that most of the application structures, specifics and features are stored inside a database. This allows the programmers to search, analyse and operate on application objects through sql tools, even in massive mode, and allows analysts to navigate quickly the application features. For example programmers can decide to extract every form including a specific fields, to change its label and representation behavior, applying these changes with a single operation. In addition an abstract repository can permit a future technology migration of the client and/or server side: since business objects and their relations are stored separately from code, a different RDBMS, server framework or client framework could be written in the future, in other languages or platforms, allowing the migration of an entire application with minimal or null changes. Even a real coexistence of the same model for different platforms could be possible.

2G model repository includes reports and remote procedures definition; this allows a complete centralization of application elements, and the ability to produce automatic documentation, for internal or external use. Delphi classes can be automatically read from sources and stored in the repository, they can be easily associate to 2g procedures, improving system documentation and maintenance capabilities.

Framework and application messages, as well as captions are stored the same way, allowing an easily translation to produce end-users applications based on specific languages.

A repository versioning tools is available; every change in the model definition, even a label correction, can be traced and used to arrange version documentation.

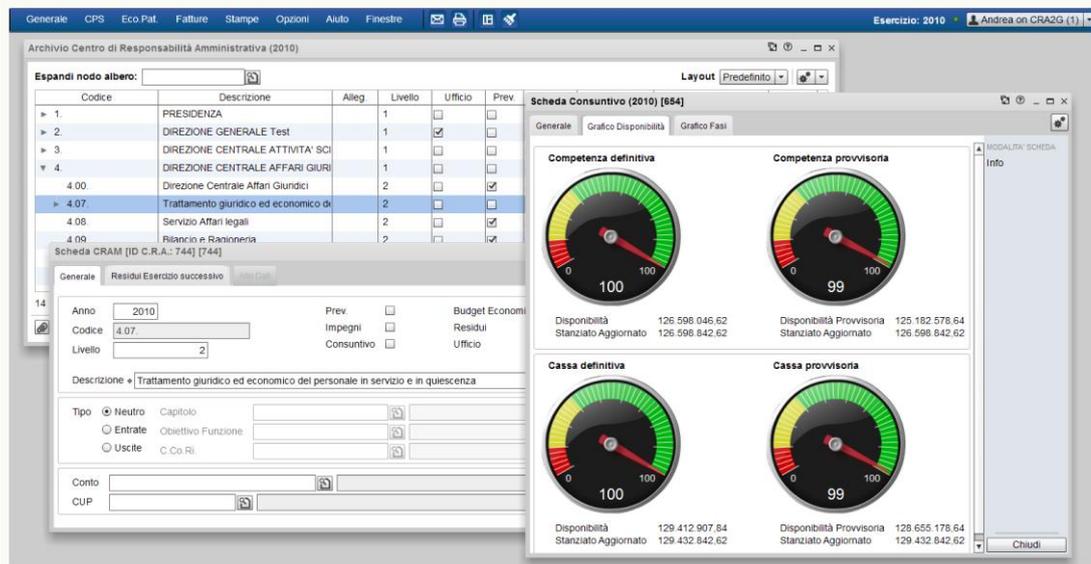
2G, main features and built-in functionalities

2G-based applications, besides all the advantages offered by new technologies, natively implements a wide range of features and techniques that provide a great support not only to the final users, but also in terms of administration, monitoring, configuration and system interoperability. Taking advantage of these features, analysts and programmers can focus on application-level features, object modeling and business logic development; no time is wasted in implementing multi-windows environment, basic interface classes, messaging, reporting and administration tools.

Web and User Interface

The Web without compromise

RIA technology allows users to move easily in a multi-windows application, analogous to typical desktop programs, without the typical delays of web applications. In a 2G based application windows can be moved, resized, iconized, rearranged and overlapped with the typical functions available in modern operating systems; accessing the sub-windows is immediate and, where useful, the foreground window prevents operating outside, thus preventing the user to leave the current workflow. Transparency, shadows and visual effects make workspace comfortable, clear and easy to use. Moreover, the application stores the size and position of the windows as defined by the user, retrieving them during subsequent accesses, without the need for continuous adjustments; when the work area is particularly crowded, it is possible to rearrange the windows through the classic instruments "overlay" and "hide", quite rare features in a typical web application.



Powerful user tools

When managing large archives, 2G applications provide a powerful interface for efficient data management :

- Search data about any information contained in the archive and with any conditions.
- Create user defined library of layouts, choosing which fields to show;
- Sort rows according to user needs, even on multiple fields;
- Create navigable groupings of data, based on an element defined by the user;
- Create personal data sets, based on user selection (current data);
- Export to Microsoft Office in real-time.

No more expired sessions

The unique method for automatic session refreshing safeguards against the risk that the web session expires if not used for a while by the end user, as happens in most Internet applications, also retaining that characteristic in case of crash of the operator station or network communication. For the user this means avoiding the risk of losing information after a pause, while the system administrator knows the actual status of the connected user.

Messaging

2G applications can display system messages asynchronously (without interruption of service) through practical popup windows, and allows to exchange messages between users or user groups. The messages are forwarded to the first command executed by the user and are logged on a history page where it's possible to retrieve them later.

Customizable characters and Appearance

Each user has the ability to customize its own application interface, in terms of themes, type and size of the characters, to suit his own taste and needs in terms of text visibility. With the advent of large

2G can exploit the web through a user interface feature-rich and highly interactive multi-window, a considerable step forward compared to static web pages and their continuous need to refresh.

The applications are compatible with all internet browsers on the market, and do not change in appearance or layout moving from one browser to another.

monitors with high resolution, this feature is critical to make daily operations more restful.

Native electronic attachments

2G applications natively integrate the capability of handling electronic attachments. The upload and download are immediate and occur via streaming services, to make communication extremely safe. Attachments can be routed to a separate database or a separate storage, to facilitate the management of large amounts of data by system administrators.

Performances and Scalability

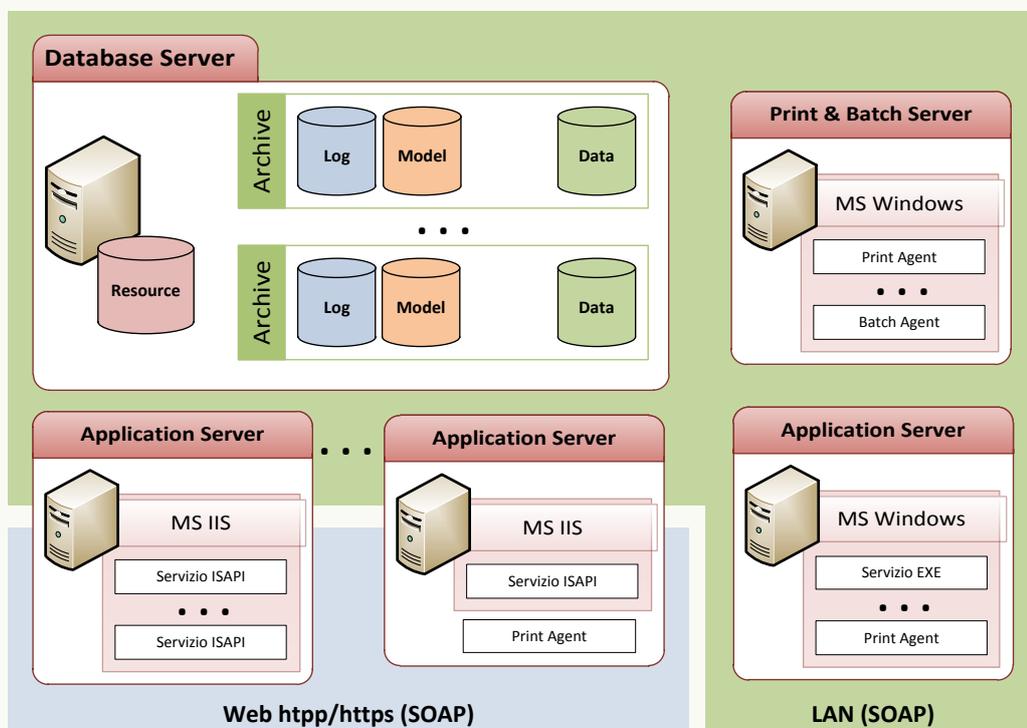
Smarter Client and Services

GESINF paid particular attention to performance in case of complex configurations with large numbers of users and transactions; with 2G it was possible to exploit the benefits of multi-tier architecture, such as pre-processing commands to determine the best way to access the database. A major advantage considering that an optimized service can reduce by 90% the workload of database server and the network traffic compared to traditional client / server solutions.

Transparent scalability for large installations

2G applications allow the usage of multiple application servers wherever higher performance is required, in areas with large data volumes or transactions. The server scalability is immediate and transparent, with no configuration needs, and it is particularly easy to build load balancing systems. Thanks to this technology, it is possible to ensure optimum performance even in case of thousands of users and millions of transactions.

2G exploits the benefits of multi-tier architecture, which optimized logic and the usage of parallel servers. A major advantage considering that an intelligent service can reduce by 90% the workload of database server and the network traffic compared to traditional client / server solutions.



Background Reports

Reports are managed through separate print servers, automatically scalable; print queues management produces reports without interrupting the user operation, informing it when the reports are ready. An advantage both in operational terms, with transparent background computation and report storage for future reference, and in terms of performance, with the ability to configure the number of parallel processes and balance the workload of the database server.

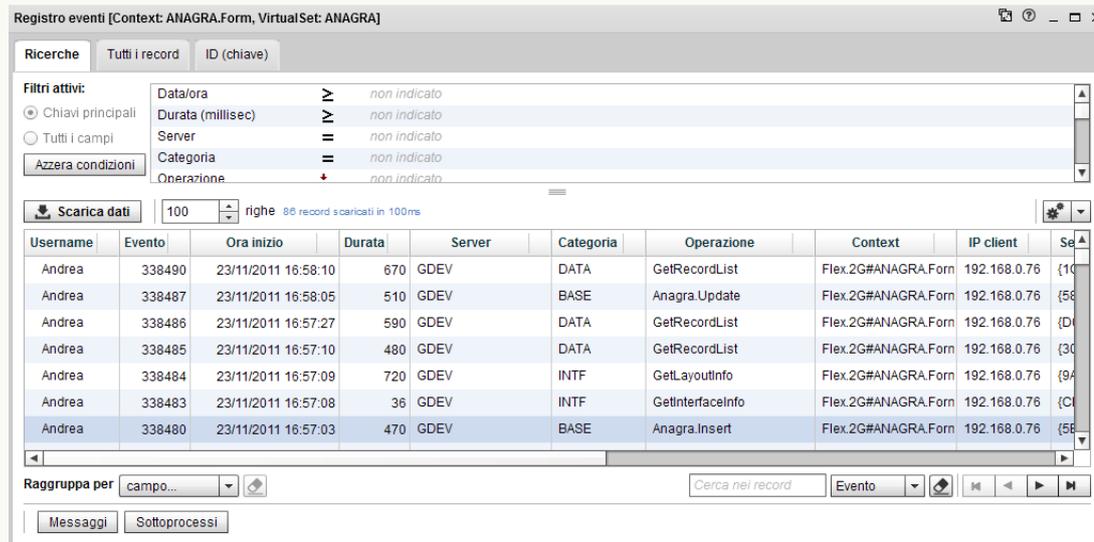
Optimized performances

A sophisticated multi-level cache system, active on both the server and the client, allows to minimize disk usage and data exchange during application usage. Furthermore, the search mode and the simplified commands allow the server to optimize database workload, using just the data necessary to processing requests. The communication on the web is constantly visualized by a virtual led on the client indicating the actual activity.

Monitoring and Debugging

Global activities tracking

A 2G based application, thanks to its SOA architecture, is able to store every single activity done by both 2G clients and external applications, in terms of request and respond data. Each activity is classified in a specific category and it is matched with the information needed to trace "when", "who", "what"; it's also possible to log any information accessed, field by field, and the internal states of the server on requests. The history of activities is stored in a separate database, which can be subject to periodic backup and cleaning, and is directly accessible by the client application for users with administrative rights. One of the stored information is the duration of the command, making it possible to monitor application performance in real time. The comprehensiveness and flexibility of 2G tracking are great plus in environments where data access is critical, e.g. environments which handle monetary transactions or manage sensitive data.



The screenshot shows a web application window titled "Registro eventi [Context: ANAGRA.Form, VirtualSet: ANAGRA]". It features a search bar, filter options, and a table of event records. The table columns include Username, Evento, Ora inizio, Durata, Server, Categoria, Operazione, Context, and IP client. The data shows several records for user "Andrea" with various operations like "GetRecordList", "Anagra.Update", and "Anagra.Insert".

Username	Evento	Ora inizio	Durata	Server	Categoria	Operazione	Context	IP client	Se
Andrea	338490	23/11/2011 16:58:10	670	GDEV	DATA	GetRecordList	Flex.2G#ANAGRA.Forn	192.168.0.76	{10
Andrea	338487	23/11/2011 16:58:05	510	GDEV	BASE	Anagra.Update	Flex.2G#ANAGRA.Forn	192.168.0.76	{58
Andrea	338486	23/11/2011 16:57:27	590	GDEV	DATA	GetRecordList	Flex.2G#ANAGRA.Forn	192.168.0.76	{D
Andrea	338485	23/11/2011 16:57:10	480	GDEV	DATA	GetRecordList	Flex.2G#ANAGRA.Forn	192.168.0.76	{30
Andrea	338484	23/11/2011 16:57:09	720	GDEV	INTF	GetLayoutInfo	Flex.2G#ANAGRA.Forn	192.168.0.76	{94
Andrea	338483	23/11/2011 16:57:08	36	GDEV	INTF	GetInterfaceInfo	Flex.2G#ANAGRA.Forn	192.168.0.76	{C
Andrea	338480	23/11/2011 16:57:03	470	GDEV	BASE	Anagra.Insert	Flex.2G#ANAGRA.Forn	192.168.0.76	{56

The activities tracking system in 2G does not accept compromises. At the highest level of detail, it allows to reconstruct in detail the commands sent to the application server, and any information transferred to the Client.

Access to internal information

System administrators may access internal information directly from the applications interface, in "profile" mode; business objects and their properties can be inspected in real time simply from the web masks; this allows real time inspection of what the client is processing.

Profiling and Configuration

User profiling at maximum detail

2G incorporates powerful tools for defining user profiles, in order to modify the behavior of individual objects in a specific application. User profiles, one or more for each user, can be defined in real time and ensure a customization level almost unique in the ERP market in a web environment. So it's possible to determine the presence / absence of any element (such as menu items, masks, or individual buttons) and the characteristics of individual fields of business objects (mandatory, visibility, default value, ...); user rights automatically affect the read / write services of business objects and the user interface which, from a user perspective, changes dynamically.

Real Time Definition of User Rights and Restrictions

With the ability to inspect client objects in real-time, the system administrator can define user profiles operating directly from the client. This is an easy way to limit the functions based of what is presented on screen, without the need to browse through hundreds of names of objects and properties.

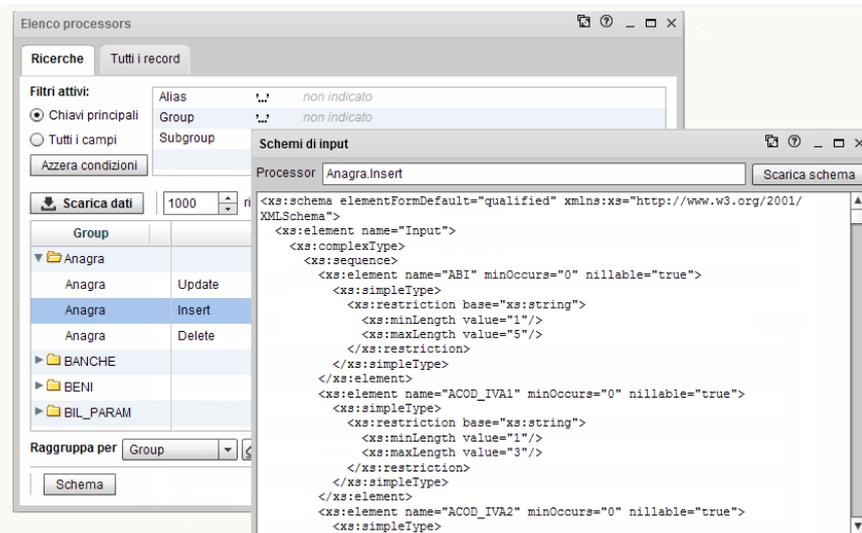
New powerful ability to define user profiles, with control at the individual field, label, or button, with ability to define multiple profiles for each user, interactively via the exclusive profile mode.

Opening to the external world

Established standard for external access

2G communicates through a standard protocol independent from database and external software; it automatically provides online documentation about the format of the messages, and external software usually use such information in a driven way. The services are independent from any structural changes of the database, so the third-party applications may exchange data with self-documented formats, which do not disrupt the functioning of the same information necessary to the service (this means, for example, that the data exchange isn't influenced by technical updates to the database). 2G integrates the rules for updating the business objects in the layer of the services, and is able to verify that the calls from third-party applications are consistent before writing in the database. 2G can also transform the received data before writing, based on specific rules.

With the architecture adopted, thanks to open standards and business rules sharing, 2G is the ideal solution for managing



Access configuration

Thanks to the remarkable profiling capacity, a 2G application allows quick configuration of external applications, in terms of rights and restrictions, in an easy and self-documented way.

Warranties and Liability.

The global tracing

makes possible the comprehensive monitoring of transactions involving external applications, and the analysis of historical transactions. The access information is classified by importance and historicized on a separate database, enabling the backup and periodic cleaning of it.

application interoperability.

Administration Tools

Application Configuration

An appropriate tool is available to control and manage configuration parameters, within an interface which supplies also the necessary on-line help for their manipulation. Administrators of a 2G application may constantly monitor the status of the active licenses on the system, based on digital certificates, and establish their distribution to various users by themselves. It's possible to base the licensing on physical users, separately from user accounts, to let a single physical user login to the application with more than one account or allow multiple sessions per user in departmental systems.

Updates

2G provides an automatic update features; installation of new application versions does not require technical skills as they are immediately available for users to download via the web.

Standard functions and interactive tools make system administration easy and immediate.

General Requirements

2G is an integrated environment for application modeling and deploy in a Web 2.0 environment. The technical requirements for using 2G-based applications are:

- Application Server (32 and 64-bit) based on Microsoft IIS* (ISAPI/DLL) and other Microsoft Windows* Server services.
- Database Server based on Microsoft SQL Server 2005* or higher (32 and 64-bit).
- Desktop client with latest web browser and Adobe Flash Player* plug-in v 11.x or higher and Adobe PDF Reader.

* Registered trademarks of respective owners.

Gesinf S.r.l.
Via Olindo Guerrini, 20
00137 Roma – ITALY
www.gesinf.it
info@gesinf.it