Telewindows

User's Guide

Version 2015

Telewindows User's Guide, Version 2015

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Contents Summary

Contents

Preface

Describes this document and the conventions that it uses.

About this Guide

This guide describes Telewindows, a client application that allows more than one user to access a G2 knowledge base (or KB) remotely. The guide provides these parts and chapters:

- Part I, Using Stand-Alone Telewindows
  - Introduction to Telewindows describes the features of Telewindows.
  - Running Telewindows describes how to start and stop Telewindows, configure the appearance of the window, and log into and log out of a secure G2.
  - Using Telewindows describes how to use Telewindows, which includes a standard selection-style user interface with a developer menu bar, a multiple document interface (MDI), standard mouse gestures, key bindings, and shortcut keys.
  - Rerouting Telewindows describes how to connect to a different G2 KB while it is running.

- Part II, Using Embedded Telewindows
  - Using the Telewindows Netscape Plugin describes how to run Telewindows inside a Web browser.
  - Using the Telewindows ActiveX Control describes how to run Telewindows inside any Microsoft COM-compliant container, such as Internet Explorer or Visual Basic.
  - Using the WorkspaceView ActiveX Control describes how to display workspace views inside any Microsoft COM-compliant container, such as Internet Explorer or Visual Basic.
- Part III, Appendix and Glossary
  - Appendix A, Launching a Telewindows Process describes how to use command-line options to start Telewindows.
  - Glossary

Audience

This guide is written for anyone that uses Telewindows. This includes users of G2-based applications, who use Telewindows to access the G2 that runs the application. This also includes G2 developers, who use Telewindows to access and operate the developer's environment of a G2.

Conventions

This guide uses the following typographic conventions and conventions for defining system procedures.

Typographic

Convention Examples	Description
g2-window, g2-window-1, ws-top-level, sys-mod	User-defined and system-defined G2 class names, instance names, workspace names, and module names
history-keeping-spec, temperature	User-defined and system-defined G2 attribute names
true, 1.234, ok, "Burlington, MA"	G2 attribute values and values specified or viewed through dialogs

Convention Examples	Description
Main Menu > Start KB Workspace > New Object create subworkspace Start Procedure	G2 menu choices and button labels
conclude that the x of y ...	Text of G2 procedures, methods, functions, formulas, and expressions
new-argument	User-specified values in syntax descriptions
text-string	Return values of G2 procedures and methods in syntax descriptions
File Name, OK, Apply, Cancel, General, Edit Scroll Area	GUIDE and native dialog fields, button labels, tabs, and titles
File > Save Properties	GMS and native menu choices
workspace	Glossary terms
c:\Program Files\Gensym	Windows pathnames
/usr/gensym/g2/kbs	UNIX pathnames
spreadsh.kb	File names
g2 -kb top.kb	Operating system commands
public void main() *gsi_start*	Java, C and all other external code

Note Syntax conventions are fully described in the *G2 Reference Manual*.

Procedure Signatures

A procedure signature is a complete syntactic summary of a procedure or method. A procedure signature shows values supplied by the user in *italics*, and the value (if any) returned by the procedure *underlined*. Each value is followed by its type:

g2-clone-and-transfer-objects
(*list*: class item-list, *to-workspace*: class kb-workspace,
delta-x: integer, *delta-y*: integer)
-> *transferred-items*: g2-list

Related Documentation

G2 Core Technology

- *G2 Bundle Release Notes*
- *Getting Started with G2 Tutorials*
- *G2 Reference Manual*
- *G2 Language Reference Card*
- *G2 Developer's Guide*
- *G2 System Procedures Reference Manual*
- *G2 System Procedures Reference Card*
- *G2 Class Reference Manual*
- *Telewindows User's Guide*
- *G2 Gateway Bridge Developer's Guide*

G2 Utilities

- *G2 ProTools User's Guide*
- *G2 Foundation Resources User's Guide*
- *G2 Menu System User's Guide*
- *G2 XL Spreadsheet User's Guide*
- *G2 Dynamic Displays User's Guide*
- *G2 Developer's Interface User's Guide*
- *G2 OnLine Documentation Developer's Guide*
- *G2 OnLine Documentation User's Guide*

- *G2 GUIDE User's Guide*
- *G2 GUIDE/UIL Procedures Reference Manual*

G2 Developers' Utilities

- *Business Process Management System Users' Guide*
- *Business Rules Management System User's Guide*
- *G2 Reporting Engine User's Guide*
- *G2 Web User's Guide*
- *G2 Event and Data Processing User's Guide*
- *G2 Run-Time Library User's Guide*
- *G2 Event Manager User's Guide*
- *G2 Dialog Utility User's Guide*
- *G2 Data Source Manager User's Guide*
- *G2 Data Point Manager User's Guide*
- *G2 Engineering Unit Conversion User's Guide*
- *G2 Error Handling Foundation User's Guide*
- *G2 Relation Browser User's Guide*

Bridges and External Systems

- *G2 ActiveXLink User's Guide*
- *G2 CORBALink User's Guide*
- *G2 Database Bridge User's Guide*
- *G2-ODBC Bridge Release Notes*
- *G2-Oracle Bridge Release Notes*
- *G2-Sybase Bridge Release Notes*
- *G2 JMail Bridge User's Guide*
- *G2 Java Socket Manager User's Guide*
- *G2 JMSLink User's Guide*
- *G2 OPCLink User's Guide*
- *G2 PI Bridge User's Guide*
- *G2-SNMP Bridge User's Guide*

- *G2 CORBALink User's Guide*
- *G2 WebLink User's Guide*

G2 JavaLink

- *G2 JavaLink User's Guide*
- *G2 DownloadInterfaces User's Guide*
- *G2 Bean Builder User's Guide*

G2 Diagnostic Assistant

- *GDA User's Guide*
- *GDA Reference Manual*
- *GDA API Reference*

Customer Support Services

You can obtain help with this or any Gensym product from Gensym Customer Support. Help is available online, by telephone, by fax, and by email.

To obtain customer support online:

➔ Access G2 HelpLink at `www.gensym-support.com`.

You will be asked to log in to an existing account or create a new account if necessary. G2 HelpLink allows you to:

- Register your question with Customer Support by creating an Issue.
- Query, link to, and review existing issues.
- Share issues with other users in your group.
- Query for Bugs, Suggestions, and Resolutions.

To obtain customer support by telephone, fax, or email:

➔ Use the following numbers and addresses:

	Americas	Europe, Middle-East, Africa (EMEA)
Phone	(781) 265-7301	+31-71-5682622
Fax	(781) 265-7255	+31-71-5682621
Email	`service@gensym.com`	`service-ema@gensym.com`

Part I

Using Stand-Alone Telewindows

1

Introduction to Telewindows

Describes the way Telewindows interoperates with a G2 application, including licencing.

Introduction

Gensym's Telewindows product allows you to open a window into a running G2 process. Opening a window into a G2 means that a Telewindows user can view and work with the contents of the knowledge base (KB) that the G2 contains.

Telewindows and G2 interoperate in a client-server relationship. When you use Telewindows to access a G2 KB, the G2 process is the server and your Telewindows is its client.

Each of several Telewindows users with sufficient privileges can independently and simultaneously open and close windows into the same G2. In addition, a *Telewindows-compliant*, G2-based application can offer each Telewindows user a distinct view of the G2's KB, that is, a distinct look-and-feel.

For instance, a Telewindows-compliant, G2-based application can offer a simple partitioning of the KB, where each user can access only certain workspaces in the KB. However, a more sophisticated application strategy might use G2's capability to display text to each Telewindows user in a different, G2-supported natural language, and at the same time provide different categories of functionality to users in different groups.

Telewindows and G2 do not impose any particular scheme for categorizing users of your application. For instance, your application can categorize its users by access level or by operational group, or by a combination of the user's role in an organization, point of access, and required application function.

Tip The techniques required to develop and deliver a Telewindows-compliant, G2-based application are described in G2-Windows and Telewindows Support in the *G2 Reference Manual*.

The Telewindows and G2 client-server combination offers more than a remote window into the contents of the application. Combining Telewindows and G2 provides a powerful client-server platform for running distributed, real-time applications over a network.

Telewindows Executables

Telewindows provides two executables:

- Telewindows Next Generation (`twng.exe` on Windows only)

  Telewindows Next Generation uses a multiple document interface (MDI) in which workspaces appear in their own windows. It provides a developer menu bar and standard popup menus, which have a different look from standard Telewindows. Telewindows Next Generation includes all G2 functionality. This executable is only available on Windows platforms and supports the `-ui multiwindow` command-line option only.

- Standard Telewindows (`tw.exe` on Windows and `tw` on UNIX)

  By default, standard Telewindows uses a single document interface (SDI) in which workspaces appear in a single G2 window. You can also run standard Telewindows in classic mode, which uses the classic G2 user interface. Standard Telewindows includes a subset of G2 functionality. This executable is available on Windows and UNIX platforms, and it supports the `-ui standard` and `-ui classic` command-line options.

For information on the features supported in Telewindows Next Generation only, see Telewindows Next Generation Only Features in the *G2 Bundle Release Notes*.

For details on these command-line options, see `ui`.

Note This guide assumes you are running *twng.exe* unless otherwise stated. Also, all references to "Telewindows" implies *twng.exe*.

Telewindows exists as two separate executables to provide maximum compatibility with existing applications.

Connecting Your Telewindows to a Running G2

You start your Telewindows because you want to connect to a running G2 process. Your Telewindows must run on a computer that is connected to a network via a TCP/IP network protocol. The computer that runs G2 must also be connected to the same network in the same manner.

A running G2 process is one that resides in the computer's memory and whose execution is not currently suspended by the computer's operating system. It does not matter whether the G2's current KB is running, paused, or reset: the G2 process itself runs independently of the current KB's run status.

Thus, starting Telewindows is an attempt to establish a dynamic connection to a G2 process. This dynamic connection uses the physical network connection between your computer and the computer running G2.

After your Telewindows establishes a connection with a G2, the G2 process determines what you see in your Telewindows' window. Each keystroke and mouse click that you initiate within the Telewindow is sent to the connected G2.

The maximum number of TCP/IP network connections to or from a single G2 process on Windows platforms is 2048.

Displaying the Same KB in Different Windows

When you start Telewindows, your computer begins running a Telewindows process that displays its own visible window. If the Telewindows has successfully connected with a G2 process, all information displayed in the Telewindow is sent by that process.

From the point of view of a G2 process, each Telewindows with which it establishes a connection acts as a **remote window**. A G2 can also have a **local window**, which typically displays on the screen of the computer that runs the G2.

For a G2 process that has a local window and at least one remote window, each window:

- Can display a distinct set of the KB workspaces of the current KB, each at a position and scale that is distinct for this window
- Has its own Scrapbook workspace

- Has its own Text Editor and Inspect workspaces

Otherwise, each of a G2's local and remote windows displays the same instance of the Operator Logbook and Message Board, and of everything else contained in the G2's KB.

This means that two or more Telewindows users connected to the same G2 can display any of the G2 KB's workspaces, and can do so independently of which of the KB's workspaces the other Telewindows users are displaying.

The figure below shows two workspaces that illustrate the relationship between:

- A G2 process, running on one computer connected to a network
- Three Telewindows processes running on different computers connected to the same network and each connected to the G2

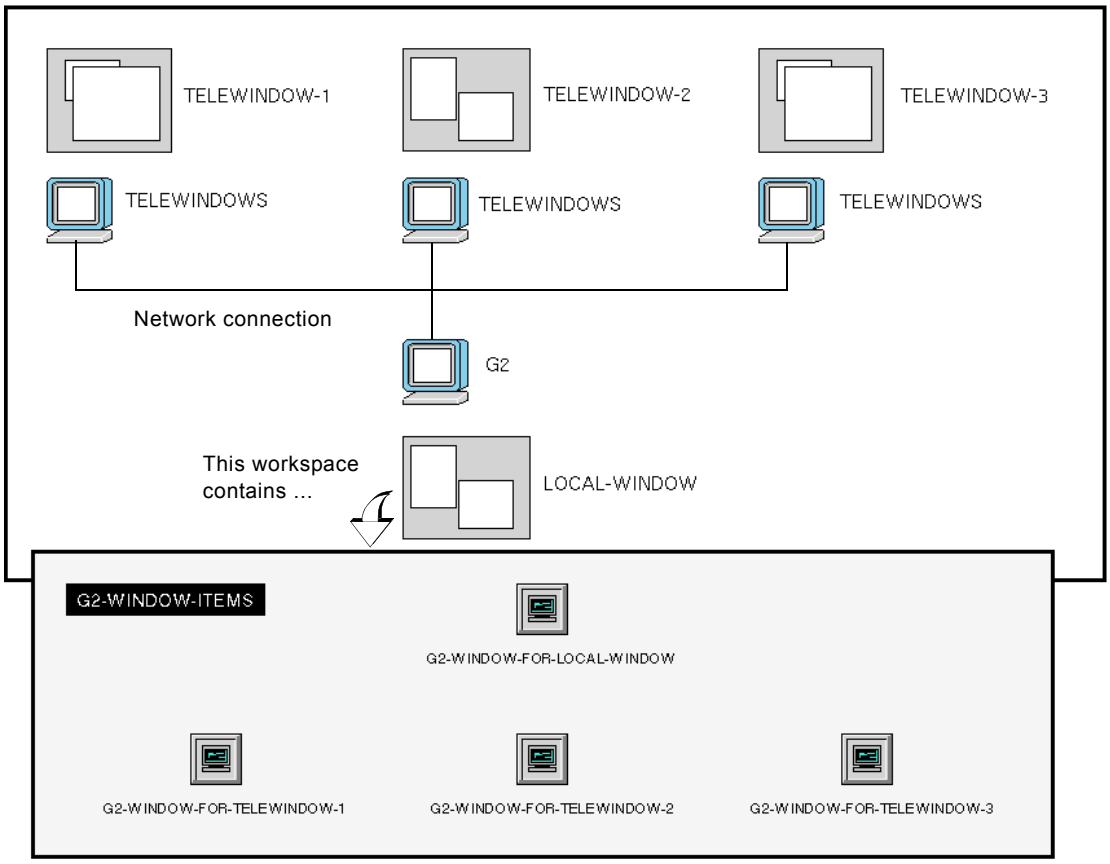
The diagram's top workspace shows:

- The G2's local window, which displays its own view of the current KB
- Each Telewindows' window, which simultaneously displays its own view of the G2's KB

In the diagram's top workspace, note that the display in the windows telewindow-1 and telewindow-3 are the same, and the display in telewindow-2 and in the G2's window are the same. This reflects the fact that a G2 can display a different set of the current KB's workspaces in each window that is services. The diagram's bottom workspace represents one of the workspaces contained in the G2's KB.

This figure shows is a schematic diagram of a G2's local and remote windows:

Schematic Diagram of a G2's Local and Remote Windows



Displaying the Same Workspace in Different Windows

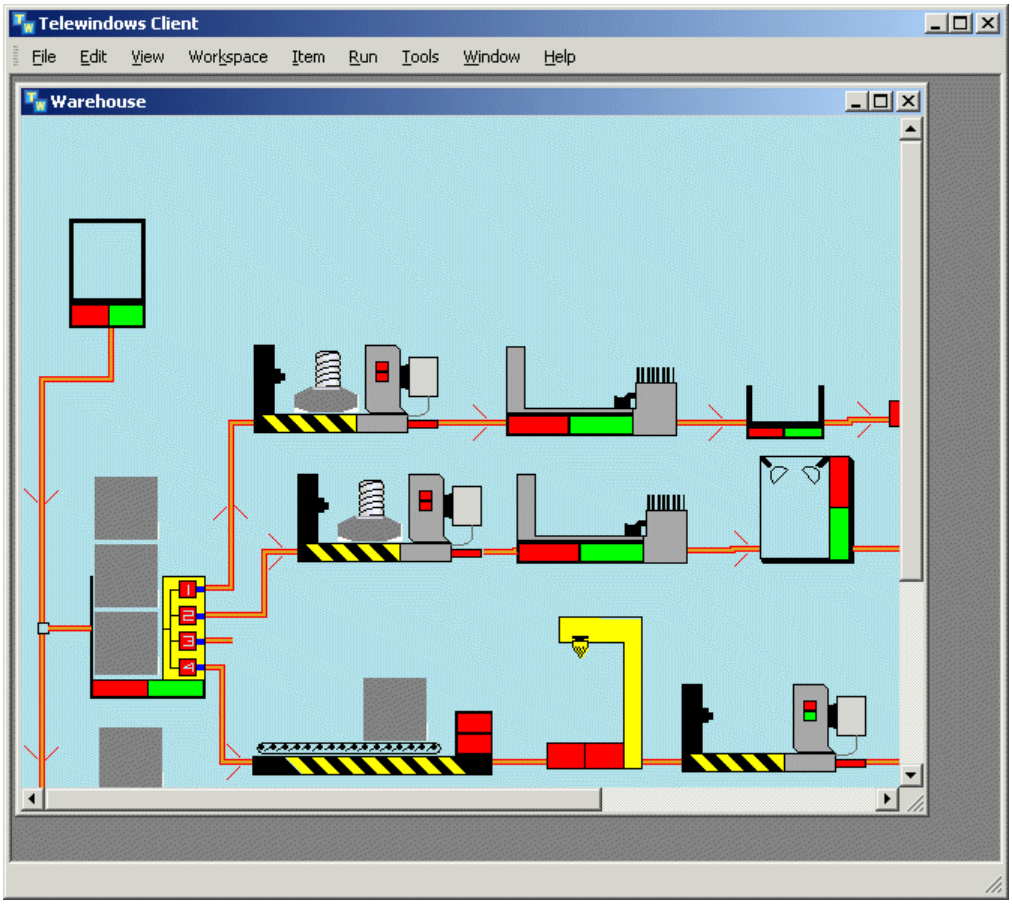
A G2 services both its local window and the remote windows resulting from Telewindows connections. If the same KB workspace is visible in more than one of those windows, the items upon that workspace appear exactly the same in all: the same color, same x, y locations upon the workspace, and so on. Further, G2 can display a given workspace at a unique location and at a different scale within each window that it services.

To illustrate, the following figures shows the Telwindows client window and the G2 server window for the same application. The G2 window shows two workspaces found in the G2's current KB: one that shows a top-level schematic representation of a factory floor and another that provides controls. The Telewindows window displays only one workspace, the top-level schematic.

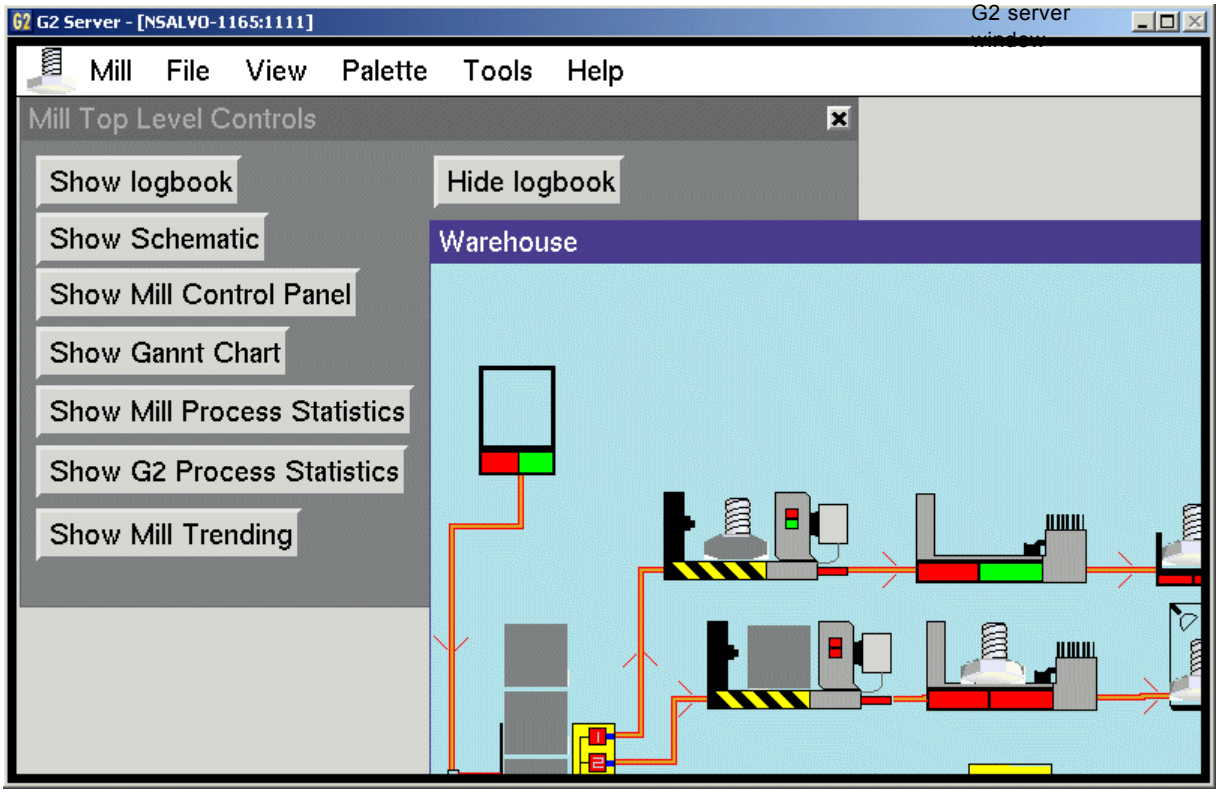
For the Telewindows window, notice that:

- The Telewindows window provides a Windows menu bar and workspace view with scroll bars.
- The Telewindows user has changed the size and shape of the Telewindows' window from its default. The user accomplished this using the window's own controls, as provided by the computer's window manager software.
- The Telewindows user has used a G2 keystroke command (Control + s) to decrease the scale at which the top-level schematic workspace appears in the Telewindows' window.

In addition, note that when the G2 user or Telewindows user at one window updates an item's knowledge, that change is also visible in the other windows.

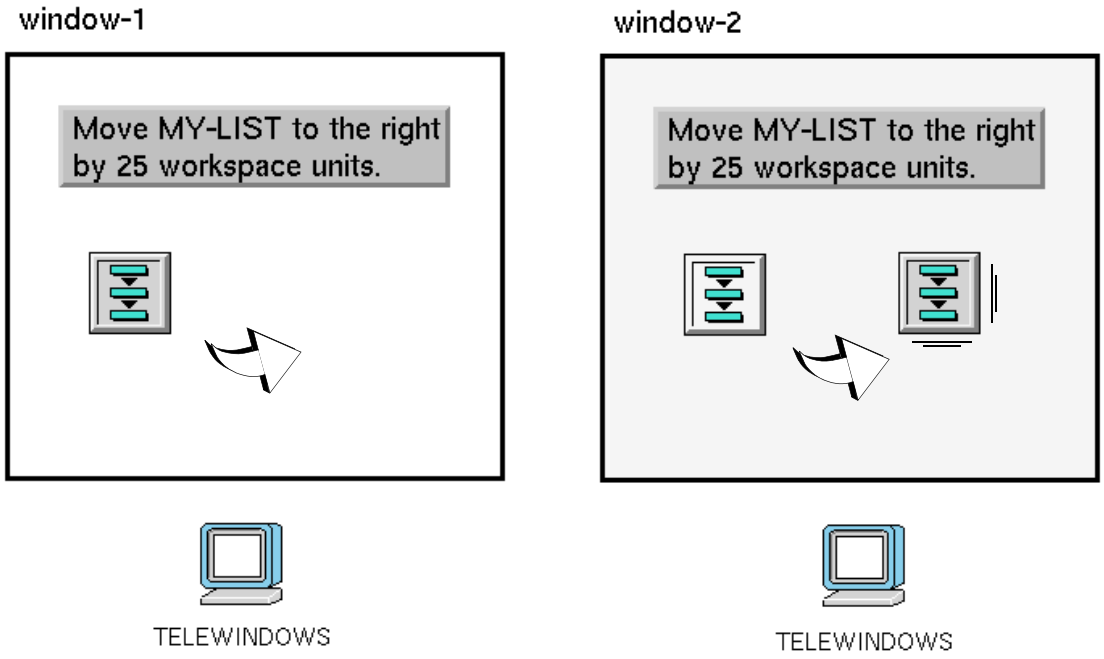


Telewindows client window


G2 Server - [NSALVO-1165:1111]
G2 server window
Mill
File
View
Palette
Tools
Help
Mill Top Level Controls
Show logbook
Hide logbook
Show Schematic
Warehouse
Show Mill Control Panel
Show Gannt Chart
Show Mill Process Statistics
Show G2 Process Statistics
Show Mill Trending

In the next figure, two Telewindows connected to the same G2 display the same workspace.

Changes to Items on a Displayed Workspace Appear in All Windows



When the user interacting with the first window performs an operation that moves the list object's icon, that object also appears to move in the second window. Thus, two or more Telewindows users connected to the same G2 can view the same dynamic state of that G2's KB.

How G2 Manages Communications with Telewindows

After your Telewindows establishes a connection with a running G2 process, you no longer operate the Telewindows process directly. Rather, all of your Telewindows' behavior is determined by the information it receives from the connected G2. Also, your Telewindows forwards each operation (that is, keyboard entry or mouse clicks) that you initiate within its window to the connected G2.

Your Telewindows and the connected G2 communicate with each other by sending messages to each other. Each message from the G2 to your Telewindows directs the Telewindows to update the display in its window. Each message from your Telewindows to the connected G2 is the result of a user-initiated operation on or within the Telewindows window.

Your Telewindows may become unable to receive information from the connected G2 as quickly as the G2 sends it. Also, operations you initiate within the Telewindows window may not be received by the connected G2 as quickly as possible. For example, if the G2 sends many messages to your Telewindows that direct it to update the display in its window (such as alternating requests to show and hide workspaces every second), the Telewindows may not react to those messages as quickly as the G2 requires.

This can occur when:

- Applications and processes running on your computer require enough resources to starve your Telewindows of the computer's resources
- The network communication link is too slow to pass the information as quickly as the G2 requires.

When a G2 notices that your Telewindows is not accepting the information that the G2 is transmitting as quickly as the G2 requires, the G2 stops sending new information to the Telewindows. This allows the Telewindows extra time to receive and react to the messages that it has already received from the G2, or that are in transit across the network. When this situation occurs, the G2 places this message on its Operator Logbook:

```
#81   8:41:30 p.m.   The telewindows connection
  for G2-WINDOW-XXX-153 is clogged.
```

After the communication link again becomes clear, the G2 resumes communication with your Telewindows and refreshes the contents of the Telewindows' window. When this occurs, the G2 places this message on its Operator Logbook:

```
#82   8:42:54 p.m.   The telewindows connection
  for G2-WINDOW-XXX-153 is now unclogged.
```

When a G2 temporarily suspends its communication with your Telewindows, some messages to the Telewindows may be lost. However, because the G2 automatically refreshes the display in your Telewindows' window, missing messages should not generally be a problem for the Telewindows user.

If the link between a G2 and your Telewindows regularly becomes overloaded, or if your Telewindows' response to user input is regularly sluggish, notify your system administrator.

Telewindows Licensing

Gensym offers two distinct Telewindows license options:

- Floating
- Dedicated

Floating Telewindows Licenses

A floating Telewindows license is authorized at run-time by the target G2. You can purchase a G2 license that authorizes a certain number of floating Telewindows licenses. The G2 authorization file (the `g2.ok` file) specifies the maximum number of floating Telewindows that can connect to it simultaneously.

After you install the Telewindows product on all computers that access a particular G2, that G2 accepts as many concurrent floating Telewindows connections as it is licensed to receive. After G2 reaches its limit for concurrent floating Telewindows connections, it rejects further connection requests until at least one floating license connection becomes available.

Dedicated Telewindows Licenses

A dedicated Telewindows license provides authorization to use your Telewindows product on a particular computer. Each dedicated Telewindows license has a particular authorization level—Development or Deployment.

A Dedicated Telewindows can always connect to any G2, whether or not that G2 is licensed to receive connections from any floating Telewindows. However, a Deployment Telewindows cannot connect to a Development G2.

For more information about G2 and Telewindows license options, see Licensing and Authorization in the *G2 Reference Manual*.

2

Running Telewindows

Shows you how to connect Telewindows to a G2 process.

Introduction

You use Telewindows to open a window into a running G2 for either of two reasons:

- You are an end user who wants to interact with a running G2 application.
- You are a developer who wants to access G2's development environment.

If you want to open a window on a **secure G2**, you must also login to that G2. Logging in to the G2 means that you supply a user name and password (and optionally a user mode, default language, and g2-window), either in the command-line that starts your Telewindows or in a login dialog that the G2 displays.

After you login, the KB's own restrictions determine which parts of the KB you can view and interact with during a Telewindows connection.

This chapter explains how to:

- Obtain the network address or port name of the G2 server.
- Start Telewindows.
- Configure window properties.
- Log into a secure G2.
- Log out of a secure G2.
- Close a Telewindows process.

For general information on how to interact with the Telewindows interface, see Using Telewindows.

Obtaining the Network Address or Port Name of the G2 Server

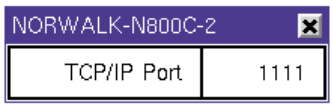
Because a Telewindows user cannot reliably anticipate the network address and port name of a particular G2 process on your network, you must obtain this information from your G2 system administrator. You need to obtain the name of the host computer and the port number.

The general practice for managing multiple G2s running on a group of networked computers is for each G2 to use the same port number or port name. For platform-specific details about configuring your network environment for a G2-based, Telewindows-compliant application, refer your network administrator to the *readme-g2.html* file in your G2 installation directory.

By default, a new G2 process running on a computer connected to a network uses the TCP/IP port number 1111.

However, the G2 system administrator can start a G2 process so that it uses any available port number or port name.

If you have access to the G2 server, you can obtain the network address by choosing Main Menu > Miscellany > Network Info. The table that appears shows the host name in the title bar and the port number for the given protocol, for example:



You can also start G2 with the *-netinfo* command-line option to display the network information in the title bar of the G2 server window.

On Windows platforms, starting G2 from the Start menu displays the network information in the title bar. On Windows platforms, when the G2 server is running, an icon appears in the taskbar notification area ( ). The tooltip shows the host and port of the G2 server, for example, MY-HOST:host:1111.

Starting Telewindows

You start a new Telewindows by executing an operating system command that invokes the Telewindows executable image. Telewindows has these default executables, depending on the platform:

Windows:	*twng.exe* and *tw.exe*
UNIX:	*tw*

For details on the differences between these executables, see Telewindows Executables.

If you invoke the Telewindows image from a current directory that is not the Telewindows installation directory, you must also specify certain command-line options. See Specifying Command-Line Options.

Each Telewindows that you start is a separate process. Each Telewindows process attempts to connect with a G2 process. When connected, it communicates with that process exclusively: one Telewindows process does *not* directly communicate with other Telewindows processes.

Multiple G2s running on the same network can communicate with and interface with each other in a distributed manner. Only Telewindows is restricted to connecting with one G2 at a time.

For details on command-line options for starting Telewindows, see Appendix A, Launching a Telewindows Process.

Entering the Command Line

During its startup, a new Telewindows process attempts to establish a network connection with a running G2 process running on the local host at port 1111.

If the G2 server is running on a different host or port, include these two arguments in the command that starts Telewindows:

- The network host name of the computer where the G2 is running. Your network administrator assigns network host names to each computer connected to your network.
- The TCP/IP port number that uniquely identifies the G2 process on that computer. This port number or port name indicates the network channel on which the G2 process listens for connections from other processes.

Note The host name cannot contain underscores.

To enter the command line:

➔ In a command window or shell, connect to the *g2* directory of your G2 installation directory and enter the following command, depending on your platform:

Windows:	*install-dir*\g2\twng.exe **or** *install-dir*\g2\tw.exe
UNIX:	*install-dir*/g2/tw

For example, the following Windows operating system command starts a new Telewindows Next Generation process that attempts to establish a network connection with the G2 process that is running at TCP/IP port number *1111* on the computer whose network host name is *central*:

```
twng.exe central 1111
```

This command starts a standard Telewindows process on UNIX:

```
tw central 1111
```

Tip You can save the command line that starts your Telewindows session in an alias (on UNIX platforms) or in a command file or batch file (on Windows platforms).

Starting Telewindows on Windows Platforms

If you are running Telewindows on a Windows platform, you can start it from the Start menu to connect to a G2 process running on the local host at port 1111. You can also connect Telewindows directly to the G2 server, running on any port, from the icon in the task notification area.

To start Telewindows on Windows platforms:

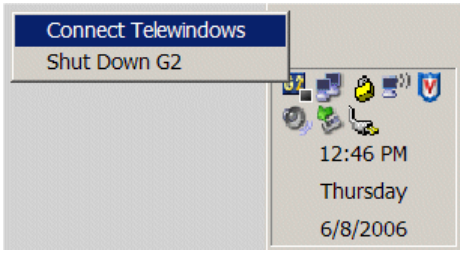
➔ Choose Start > Programs > Gensym G2 2015 > Telewindows Next Generation.

or

➔ Choose Start > Programs > Gensym G2 2015 > Telewindows (Standard).

or

➔ Mouse right on the G2 icon in the notification area and choose Connect Telewindows:



Connect Telewindows locates Telewindows in the registry and automatically connects a Telewindows session to the G2 server. If Telewindows Next Generation is registered, the Connect Telewindows menu choice uses that. If it cannot find Telewindows Next Generation, it uses the registry location of Telewindows.

Telewindows Next Generation and Telewindows are both registered automatically when you install the G2 Bundle. However, if G2 cannot find either Telewindows for some reason, you can run the `-regserver` command-line option.

To connect Telewindows instead of Telewindows Next Generation when using the Connect Telewindows menu choice, you can run the `-unregserver` command-line option to unregister Telewindows Next Generation. For details, see regserver.

Capturing Messages in a Log File

By default, Telewindows logs all output messages to a log file. The log file is saved to a unique name in the directory location of your *TEMP* environment variable.

You can also specify your own log file by starting Telewindows with the *-log* command-line option. If you want to see the output messages in the command window, start Telewindows with the *-no-log* option. For details, see Writing Standard Output Messages to a Log File.

Establishing a Connection to G2

A Telewindows and a G2 that run on the same computer can establish a connection, and a Telewindows and a G2 that run on different computers and that are connected to the same network via the TCP/IP network protocol can also establish a connection.

As a new Telewindows starts up and establishes a connection with the target G2, Telewindows generates this message in its default output window or log file:

```
[Telewindows: connecting to host "laos" at port 1111 via protocol TCP-IP]
```

If a new Telewindows cannot establish a connection with the specified G2, Telewindows generates this message and automatically shuts down.

```
Unable to connect to host "laos" at port 1111 via protocol TCP-IP
```

After your Telewindows starts and successfully connects to a running G2, if at any time the connection between the two is broken before Telewindows shuts down, Telewindows generates this message:

```
Telewindows TCP-IP connection to host "laos" at port 1111 broken while receiving data.
```

Considering the Compatibility of Telewindows and G2 Licenses

To start Telewindows on your computer, your Telewindows' license must be compatible with the license of the installed G2 product with which you want to establish a connection. This compatibility must be part of the design of any G2-based, Telewindows-compliant application.

The target G2's license is compatible only with Telewindows of the same license option level or higher. The target G2's license also determines the maximum number of simultaneous Telewindows connections that it can accept. For more information, see Licensing and Authorization in the *G2 Reference Manual*.

Specifying Command-Line Options

When you start Telewindows, you can optionally include options in the command line. These options allow you, for instance, to pass login information to

a target secure G2, to specify the size and display characteristics of the Telewindows window, and to override the timeout interval during which Telewindows attempts to connect with the target G2.

To specify a command-line option, include it in the command that starts Telewindows. For example:

```
twng.exe central 1111 -height 1000 -width 500 -icon Factory
  -name "Factory Productivity Application"
```

or

```
tw central 1111 -height 1000 -width 500 -icon Factory
  -name "Factory Productivity Application"
```

This command line starts Telewindows with a window that appears 1000 pixels high and 500 pixels wide and that displays the name "Factory Productivity Application" in the window's title bar. Also, when you iconize this Telewindows process's window, the name under the icon displays the word "Factory".

For a complete description of the command-line options that Telewindows supports, see Appendix A, Launching a Telewindows Process.

Configuring Window Properties

Telewindows displays its window with these default properties:

- *Height in pixels* of 90% of the screen's height in pixels, and *width in pixels* of 90% of the screen's width in pixels
- *Resolution* of 75 pixels per inch
- *Magnification* of one G2 workspace unit per pixel

You can initialize these attributes by specifying command-line options when you launch a new G2 process or Telewindows process.

Specifying the Resolution and Magnification

The `-resolution` command-line option informs the connected G2 about the resolution (in pixels per inch) of the monitor on which the window appears. The `-magnification` command-line option specifies the default magnification at which Telewindows' window displays the connected G2's KB workspaces at full scale. Together, these options determine the absolute size at which Telewindows displays a window on a given display device for a given platform.

By combining the settings of these two options properly, you can launch Telewindows on different computers having display devices of different resolutions and also display the same KB at the same (or very nearly the same) absolute size. Alternatively, by specifying other settings in these options, you can

launch a Telewindows that displays a KB at the highest resolution allowed on a particular display device.

For a description of the *-resolution* and *-magnification* command-line options, see resolution and magnification, respectively.

For example, if you use this command to launch a Telewindows process:

```
twng.exe sitenode 1311 -resolution 75 -magnification 1.0
```

or

```
tw sitenode 1311 -resolution 75 -magnification 1.0
```

it is equivalent to this command line:

```
twng.exe sitenode 1311 -resolution 100 -magnification 0.75
```

or

```
tw sitenode 1311 -resolution 100 -magnification 0.75
```

Tip For best results, consider the dot pitch (that is, the ratio of width to height) of the pixels produced on the display devices on your Telewindows platform.

You can separately initialize either the horizontal or vertical resolution for your Telewindows' window by using the *-x-resolution* and *-y-resolution* pair of command-line options. See x-resolution and y-resolution for more information about these options.

You can also separately initialize either the horizontal or vertical magnification for your Telewindows' window by using the *-x-magnification* and *-y-magnification* pair of command-line options. See x-magnification and y-magnification for more information about these options.

Specifying the Window's Dimensions

You can initialize the height and width in pixels of your Telewindows' window by using the *-height* and *-width* command-line options. For more information about these options, see height and width, respectively.

When you launch a Telewindows process, you can specify the *-fullscreen* command-line option to display its window at full-screen size.

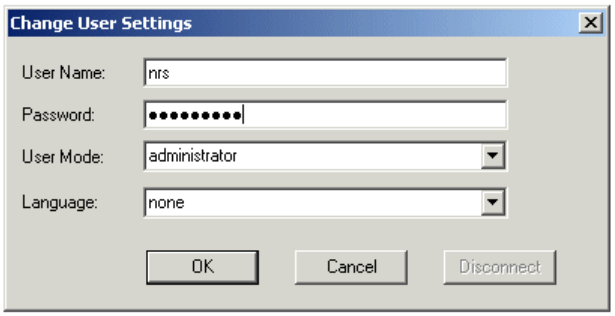
Logging in to a Secure G2

If your Telewindows establishes a connection with a secure G2, before the G2 allows you access to its KB, you must use Telewindows to log in to the G2. Logging in to a secure G2 means that you must enter in the G2 login dialog a user name and password, and optionally a user mode, g2-window item or class name,

and window-specific language. Alternatively, you must provide the same information as options in the command line that starts your Telewindows.

Using the G2 Login Dialog to Login

After your Telewindows establishes a connection with a running G2 that is secure, G2 displays the **G2 login dialog**. This figure shows the default G2 login dialog:



The default values in the fields of the login dialog that your G2-based application presents are probably different from those shown in the figure above. This is because the application can set the default values of each login dialog field, except the Password field.

The fields in the login dialog have these purposes:

- **User name:** Name that is associated with an entry in the secure G2's authorization file, also known as the *g2.ok* file.
- **Password:** Series of characters associated with a user name.
- **G2 user mode:** A kind or access, or level of access, to the secure G2's KB. A user can be assigned one or more user modes.
- **G2 window name or class:** Name of an item of the g2-window class, or the name of a subclass of the g2-window class, or the name of an item whose class is a subclass of the g2-window class.
- **G2 window specific language:** Name of the natural language in which the G2-based application displays the application's user-interface text, for this Telewindows session.

Entering a User Name, Password, and User Mode

To respond to the G2 login dialog, you must enter at least the user name and password that the system administrator of your G2-based application has assigned to you. If the G2 user mode (or alternative user modes) that has been assigned to you is different from the default value that appears in the login dialog, you must also enter your assigned user mode. To obtain your assigned

user name, password, and user mode (or alternative user modes), speak with the system administrator of your G2-based application.

When you enter your password, your Telewindows does not display the password's characters on your computer's screen.

Entering a Window Name or Class Name

Enter the name of a g2-window item or of a subclass of G2's g2-window class. If you do so, after you login to G2, the application associates your Telewindows session with an object in the G2's KB that is under the application's control.

Entering a Window-Specific Language

Enter the name of one of the alternative natural languages that the application supports for displaying the text portions of the application's user interface.

If you leave this field's value as none, then your Telewindows session displays the application's user-interface text in the application's own default natural language.

Note When connecting Telewindows to a G2 server that is using the Japanese language facility, you must install the Japanese-capable Windows fonts. For more information, visit *www.declan-software.com/japanese_ime/*.

For more information on the natural language facilities available in G2 and Telewindows, see Natural Language Facilities in the *G2 Reference Manual*.

Correcting a Login

If the G2 accepts your login, you can access its KB. If not, G2 displays the login again, so that you can correct your login information. A secure G2 allows only a few additional attempts to correctly login before breaking its connection with your Telewindows and shutting it down.

Using Telewindows Command-Line Options to Log In

If you repeatedly login to a G2-based application that runs on a secure G2, you can optionally specify your login information in the command line that starts your Telewindows, rather than interact with the G2 login dialog each time. When you do so, after your Telewindows establishes a connection with the secure G2, the G2 does not present the G2 login dialog.

The following Telewindows command-line options correspond to the fields in the G2 login dialog:

- *-user-name* corresponds to the User Name field.

- *-password* corresponds to the Password field.
- *-user-mode* corresponds to the G2 User Mode field.
- *-window* corresponds to the G2 Window Name or Class field.
- *-language* corresponds to the G2 Window Specific Language field.

To cause a secure G2 to avoid presenting the login dialog, you must specify valid *-user-name* and *-password* options in the command that starts Telewindows. Specifying the other command-line options is optional.

For example, this Telewindows command line specifies the user's user name, password, and user mode:

```
twng.exe central 1111 -user-name george -password george
  -user-mode supervisor
```

or

```
tw central 1111 -user-name george -password george
  -user-mode supervisor
```

To avoid including your password in a command line that is stored in a file, you can instead start Telewindows with this command line:

```
twng.exe central 1111 -user-name george -user-mode supervisor
```

or

```
tw central 1111 -user-name george -user-mode supervisor
```

When your Telewindows passes this login information to the secure G2, the G2 presents the login dialog, but you must enter only your login password in the login dialog's Password field. The secure G2 automatically sets the values of the other login dialog fields from the options included in the command line that started your Telewindows.

For a complete description of each Telewindows command-line option, see Appendix A, Launching a Telewindows Process.

Logging Out of a Secure G2

After you have successfully logged into a secure G2, you can stop using the G2-based application by disconnecting your Telewindows from the application, as described under Closing a Telewindows Connection. However, the application might also offer you the option of logging out without breaking the connection, so that you can log in again later without restarting Telewindows.

You can log out from the developer menu bar or from the popup menu for the overall Telewindows window.

For information on the developer menu bar, see Using Telewindows to Interact with G2.

To log out of a secure G2:

➔ Choose File > Log Out from the developer menu bar.

or

➔ Choose Miscellany > Logout from the popup menu for the overall Telewindows window.

When you log out, the G2-based application again displays the G2 login dialog. Your Telewindows continues to run, although it is no longer associated with a g2-window item in the secure G2's KB.

Closing a Telewindows Connection

This section describes the default techniques for closing a Telewindows connection. Your KB might also define application-specific techniques for closing a Telewindows connection.

Closing a Telewindows connection logs out of the Telewindows process and closes the window. Closing a Telewindows connection does not stop the G2 process. You can also shut down G2 from Telewindows.

Tip To close a Telewindows connection programmatically, use the g2-system-command system procedure. For details, see System Commands in User Interface Operations in the *G2 System Procedures Reference Manual*.

You can close a Telewindows connection from the developer menu bar or from the popup menu for the overall Telewindows window.

For information on the developer menu bar, see Using Telewindows to Interact with G2.

The following options display a confirmation dialog before closing the connection.

To close a Telewindows connection:

➔ Choose File > Disconnect from the developer menu bar.

or

➔ Choose Miscellany > Close Telewindows Connection from the popup menu for the overall Telewindows window.

The following options exit Telewindows immediately, without confirmation.

➔ Choose File > Exit from the developer menu bar.

or

➔ On Windows platforms, click the close button in the upper-right corner of the window.

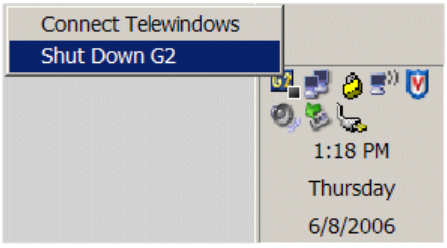
The following options display a confirmation dialog before disconnecting Telewindows and shutting down G2. The confirmation dialog indicates whether unsaved changes exist in the KB.

To close a Telewindows connection and shut down G2:

➔ Ensure that G2 is paused, then choose File > Shut Down G2 from the developer menu bar.

or

➔ Mouse right on the G2 icon in the notification area and choose Shut Down G2:



3

Using Telewindows

Describes how to interact with the standard Telewindows user interface.

Introduction

Telewindows provides a **standard user interface** for G2 developers and end users. The standard user interface is available by running Telewindows on a Windows platform and connecting to G2. The standard interface provides various standard Windows user-interface controls, including a developer menu bar, popup menus, and certain standard dialogs. In addition, workspaces can appear in their own window with scrollbars.

The standard user interface is selection-style, whereby menu choices apply to the currently selected object. The user interface also uses standard mouse gestures, key bindings, and shortcut keys. These features are available in both G2 and Telewindows, and on both Windows and UNIX platforms, except where noted.

For more information, see Appendix C, Mouse Gestures, Key Bindings, and Shortcut Keys in the *G2 Reference Manual*.

This chapter describes how to:

- Use the standard user interface demo, which demonstrates the Telewindows standard Windows user interface.
- Use Telewindows to interact with G2 by using the developer menu bar, standard popup menus, and standard dialogs.
- Control the user interface mode to run Telewindows in multiwindow mode, standard mode, and classic mode.

Note The term "standard" refers to the user interface that you get when you run Telewindows on a Windows platform, and the term "classic" refers to the G2 6.x user interface. Unless otherwise specified, the term "Telewindows" refers to Telewindows Next Generation (`twng.exe`).

For information on creating standard user interfaces, see these chapters in the *G2 Reference Manual*:

- Chapter 41, Windows Menus
- Chapter 42, Windows Dialogs
- Chapter 43, Custom Windows Dialogs
- Chapter 44, Windows Views, Panes, and UI Features

Note The maximum number of allowable icons in Telewindows on the Windows XP platform is 131000. This limit applies to all native Windows widgets, including menus, toolbars, and dialogs.

Standard User Interface Demo

G2 provides a metal milling demonstration that features the Telewindows user interface. This demo is only available on Windows platforms.

To run the demo:

➔ Choose Start > Programs > Gensym G2 2015 > Examples > G2 > Mill Demo.

Background

The Mill knowledge base illustrates several of G2's powerful capabilities for applying expertise in real time and for rapid development. The example was built for demonstration purposes only; it should does not represent a fully deployed G2 application.

The scenario is a metal milling operation for manufacturing bolts from metal forgings. This application models and simulates the flow of work-in-process raw materials as they are processed through various workstations, including distribution stations, conveyers, machine tools and surface treatment stations. Through the use of G2's object modeling, rules, and procedures, the work-in-process is efficiently moved through the network of workstations and performance metrics for the operation are determined and displayed.

Key G2 Capabilities

Here are a few of G2's capabilities to explore through the Mill Demonstration:

- *Object modeling* — G2 expressions understand when objects, such as individual workstations in this example, are related to each other, such as via graphical connections. Through this understanding, logic can be represented that applies generically across networks of connected objects. This capability is extremely valuable for modeling complex operational systems. To illustrate this power, try cloning all of the equipment in one of the production lines, connecting them together, and connecting the group to the discrete-event-splitter to the left of the Warehouse workspace and then to the finished goods warehouse object to the right of the workspace, then restart the application. If you have connected everything correctly, the new line should just start working.
- *Object-oriented representation* — G2 is an object-oriented environment that takes full advantage of the reusability of object properties and behaviors. G2's objects are graphical, which adds to their ease-of-use. For example, create a new machining production line from scratch by opening up the machine palette, cloning some machines on the warehouse workspace, then connecting them together and to the discrete-event-splitter and to the warehouse object. Restart G2 to see the new line producing product.
- *Animation* — G2 readily enables animation of objects, such as the movement of materials in the Mill demonstration. The Gantt chart is also an example of an animation. Each object image can also be animated through manipulation of layers and through formulas that dynamically change dimensions. The bolts and the drilling stations are examples of this type of animation. The animations are valuable to communicate the state of an operation to both end users and to application builders. To move the animation from real-time mode to simulation mode, change the scheduler mode, in the Timing Parameters system table from real time to as fast as possible.
- *Rule- and procedure-based logic* — G2's powerful rule and procedural languages represent application logic by using an intuitive, structured natural language. The language offers a rich set of expressions for reasoning about objects, their relationships, and time-based events. This application particularly takes advantage of the language's capabilities to represent the coordination logic needed to rout the movement of materials through a network of workstations.

G2 is often used for these types of applications. To examine samples of the rules and procedures in this application, go to the Mill Top Level workspace, then navigate to the workspaces for Mill Rules and Formulas and Mill Procedures.

Try experimenting by writing your own simple rules to monitor the milling operation. For example, on a new workspace create the following rule:

```
whenever the total-part-processed of any mfg-equipment receives a value
and when the total-part-processed of the mfg-equipment > 50000
    then inform the operator for the next 20 seconds that
    "The [the name of the mfg-equipment] has processed [the value of the
    total-part-processed of the mfg-equipment ] parts.  Please schedule
    preventative maintenance as soon as possible."
```

Obviously, this rule is very simple for illustration purposes. However, it shows several powerful capabilities of G2 rules including:

- Understandability by non-programmers.
- Working generically across entire object classes, in this case any mfg-equipment.
- Understanding time-based events, for example, whenever … receives a value…
- Representation of time, for example, for the next 20 seconds.

- *Data visualization* — G2 has built-in trend charts for visualizing data. For example, open the Mill Statistics workspace to see two configured trend charts that display the machine capacity utilization, the percent of run time, and the percent of nodes on line. Experiment by editing the properties of these charts.

Using Telewindows to Interact with G2

To interact with G2, using a standard user interface, you must run Telewindows on a Windows platform; you cannot run G2 stand-alone with a standard user interface.

Once Telewindows is connected to G2, the G2 developer can use the default top-level menu bar, also known as the **developer menu bar**, which includes standard File, Edit, View, Window, and Help menus. The developer menu bar also includes menus for interacting with workspaces, items, and the overall KB, as well as a menu of user menu choices.

Telewindows displays the following menus as standard popup menus:

- Item popups, including user menu choices.
- G2 Main Menu.

- KB Workspace menu.
- Popups on a selected group of items.

Dialogs for file interactions such as Load KB and Save KB are standard Windows dialogs, as are a number of message dialogs.

Telewindows uses a standard selection-style user interface, and standard mouse gestures, key bindings, and shortcut keys to interact with workspaces, items, and selections. Telewindows also uses a multiple document interface (MDI) as its default interface, where each KB workspace appears in its own window.

Starting Telewindows

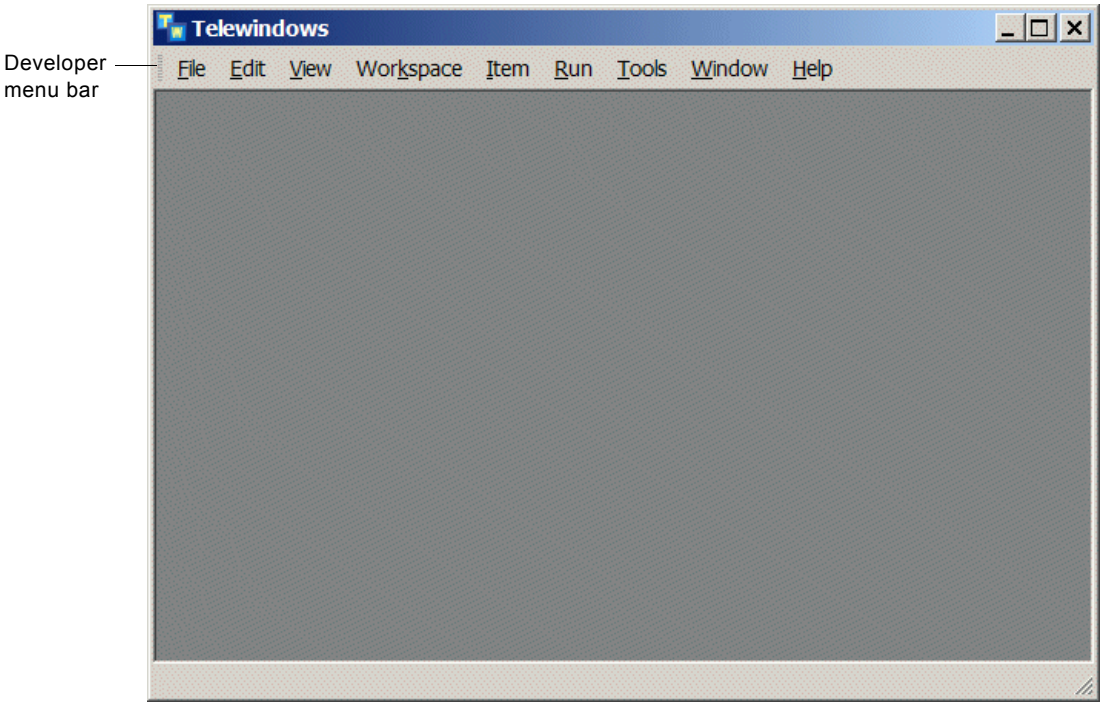
You start Telewindows, using command-line options that connect to a G2 server running on a particular host and port. You can log into a secure G2 as a particular user, using command-line options.

For information on starting Telewindows, configuring window properties, logging into a secure G2, logging out of a secure G2, and closing a Telewindows connection, see Chapter 2, Running Telewindows on page 13.

To start Telewindows:

1. Start G2 on either a UNIX or Windows machine.
2. Start Telewindows on a Windows machine, with command-line options to connect to a specific host and port, as needed.

You are now running Telewindows:



Interacting with Workspaces

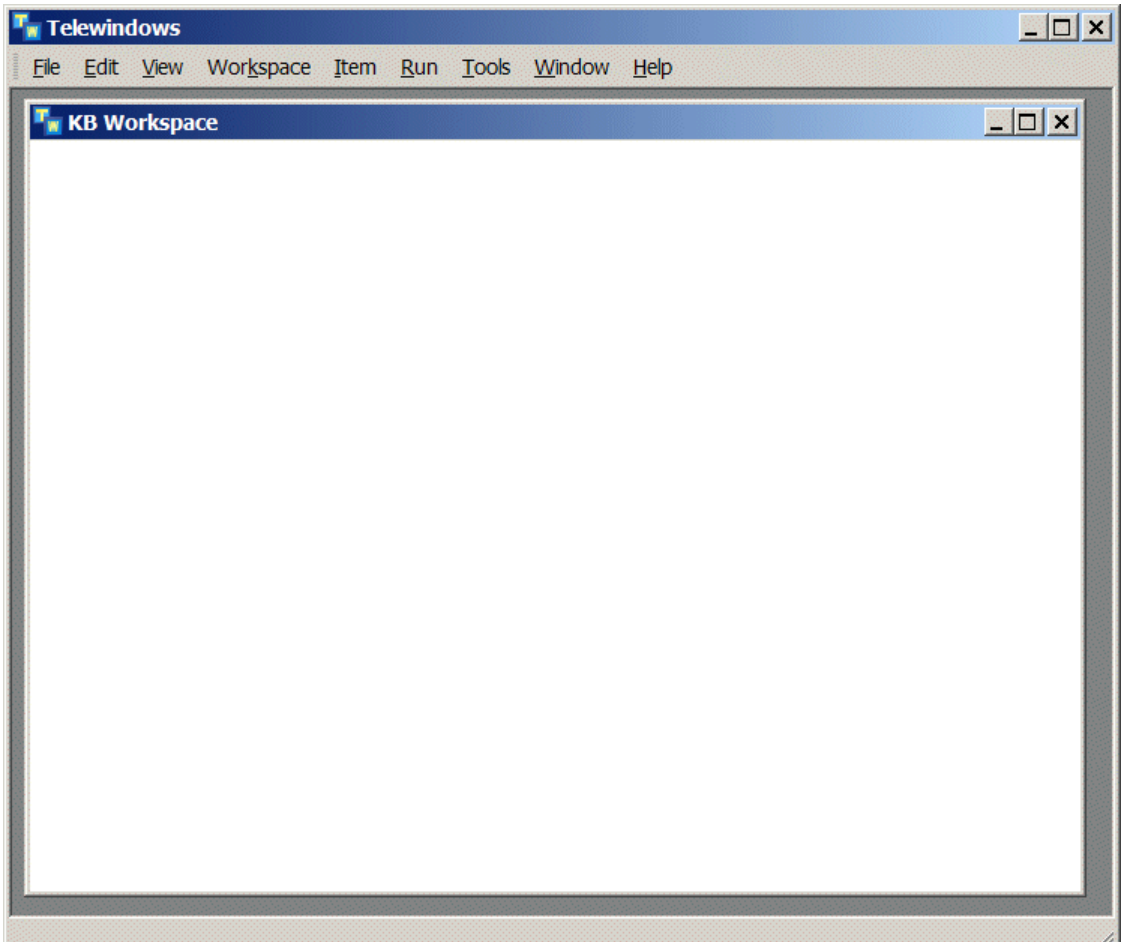
You interact with workspaces, using a standard selection-style user interface, whereby menu choices in the menu bar apply to the current selection. You use standard popup menus to interact with workspaces. The popup menu associated with a workspace is equivalent to the KB Workspace menu in classic G2. Workspaces that appear in the window are classic KB workspaces.

When you create a new workspace, Telewindows centers the workspace in the overall window. If the size of the window is smaller than the dimensions of the workspace, the workspace is positioned such that it's title bar is hidden, thus requiring you to move the workspace down to see the title bar.

To interact with workspaces:

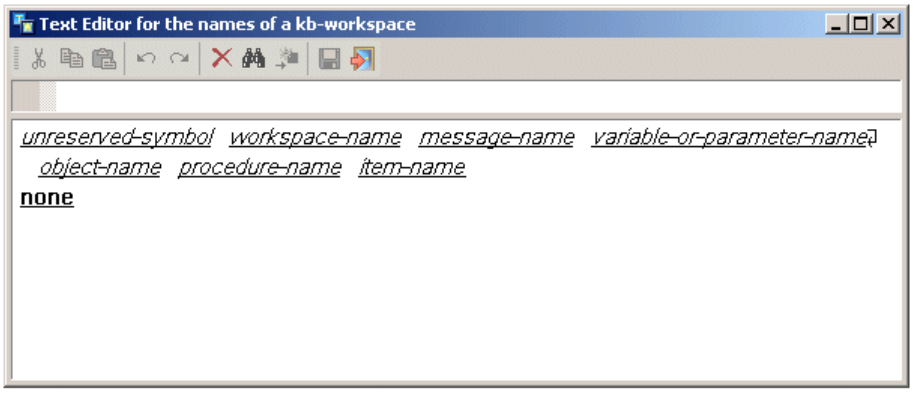
1 Choose Workspace > New Workspace to create a new workspace.

The workspace appears in its own window:

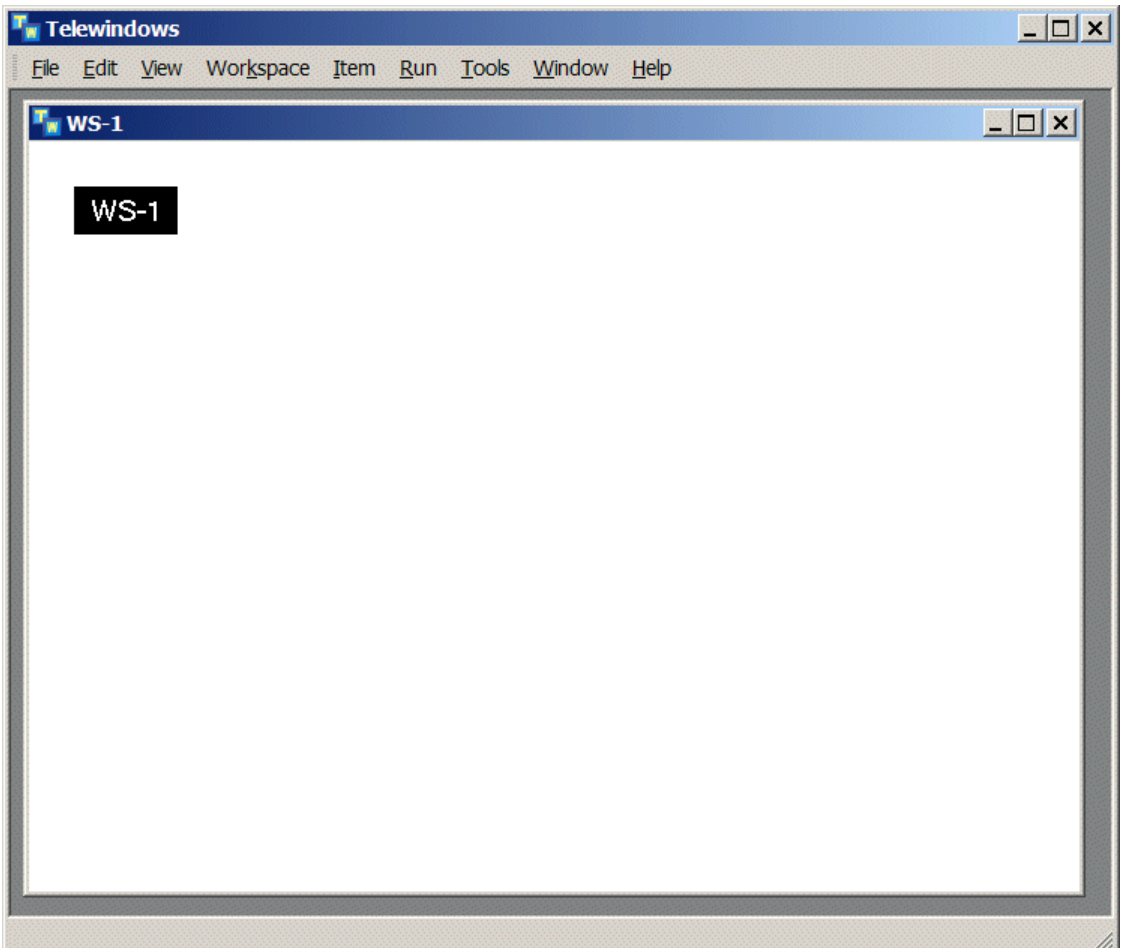


2 Choose Workspace > Name to name the workspace.

The G2 text editor appears in its own window:



The named workspace looks like this:



3 Create and name another workspace.

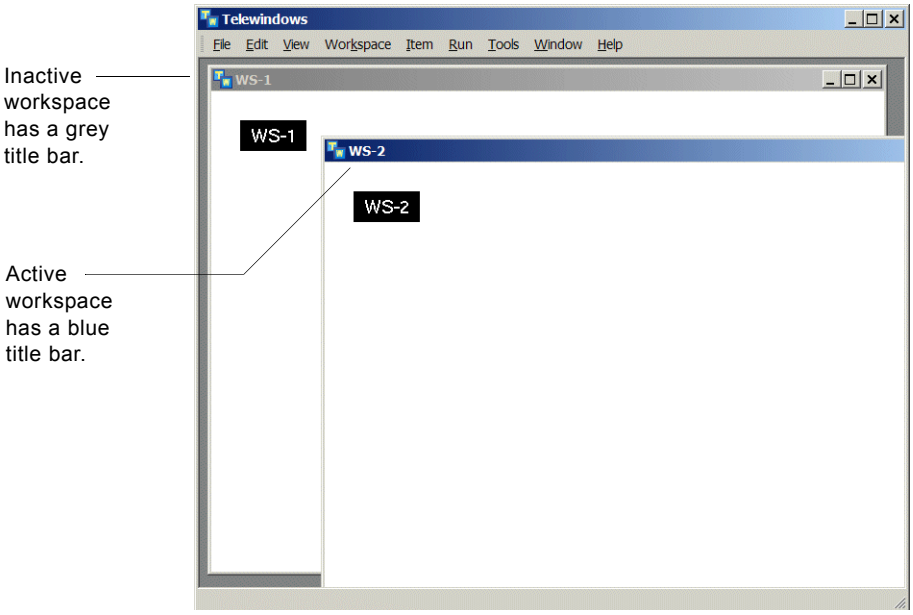
The new workspace is now the selected workspace.

4 Move the workspaces so both are visible in the window, using these techniques:

- Drag the workspace title bar.
- Right-click the open area of the workspace and drag the workspace.
- Hold down the CTRL key, then drag the open area of the workspace, using the left mouse button.

5 Click anywhere in the second workspace or click the title bar to select it.

The second workspace is now selected, as indicated by its blue title bar, and the other workspace is now inactive, as indicated by its grey title bar:

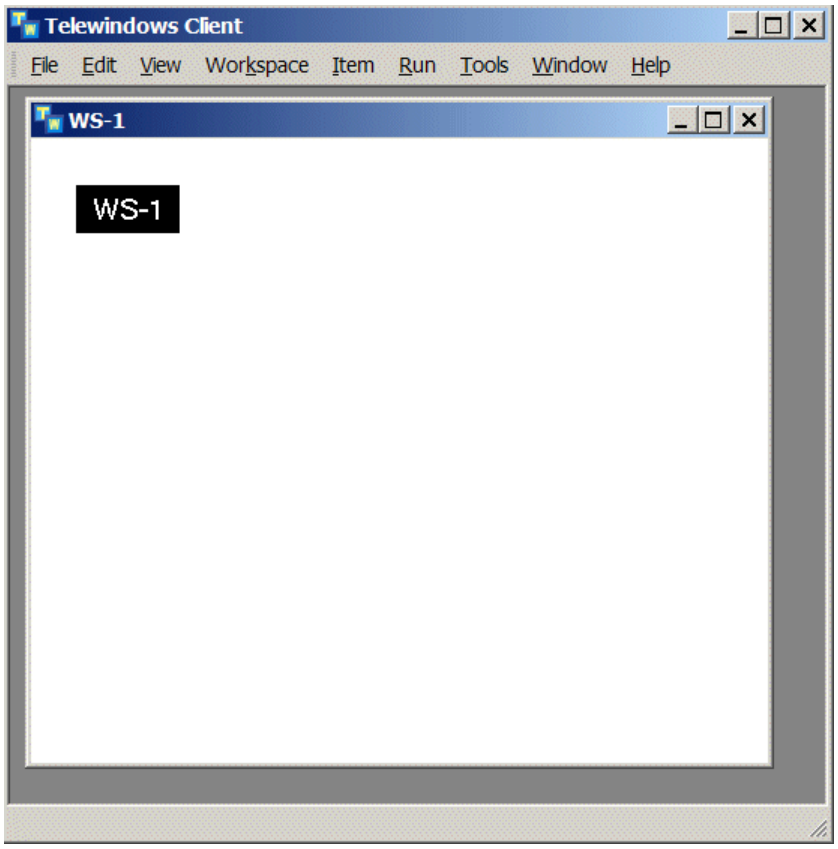


6 Choose Workspace > Drop to Bottom to drop the selected workspace to the bottom of the stack.

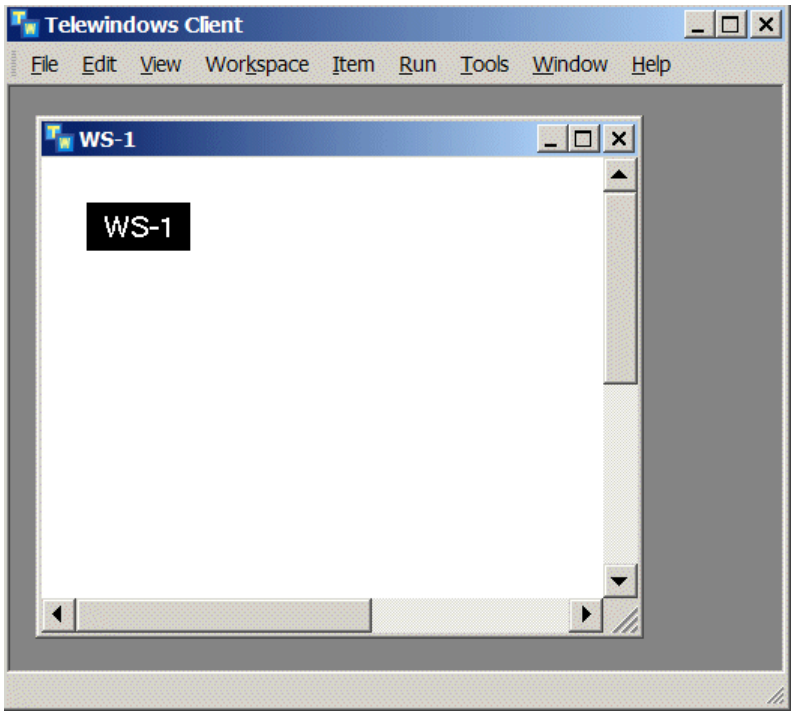
Showing Workspaces

By default, when you initially show a workspace, it appears in the upper-left corner of the window, and the window just fits the workspace. If the workspace fits entirely in the overall Telewindows window, then no scrollbars appear.

This figure shows Telewindows with one workspaces visible where the entire contents of the workspace fits within the visible window, so no scrollbars appear:



If the workspace does not fit entirely in the overall Telewindows window, then scrollbars appear. This figure shows a workspace with scrollbars, which is too big to fit in the overall window:

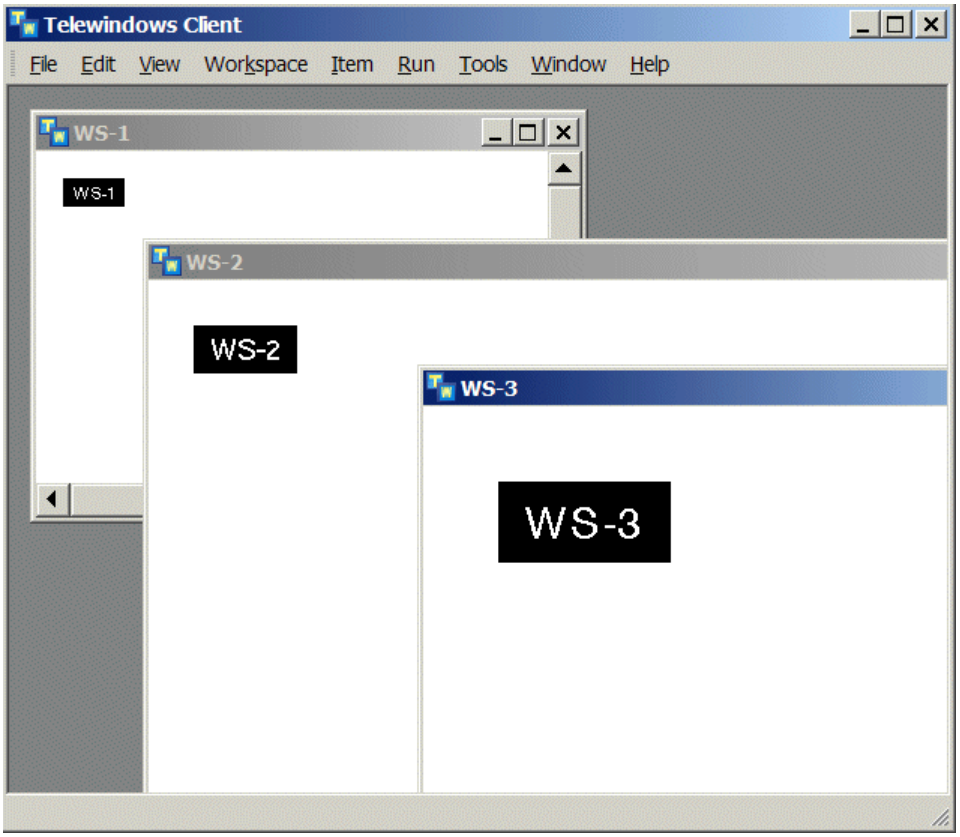


Note When viewing workspaces in Telewindows Next Generation, the show action on minimized workspace views automatically restores the workspace view if the action also lifts the workspace to the top. For example, show ws-1 restores ws-1 if the workspace is minimized, but show ws-1. . . preserving workspace layering does not. Similarly, entering go to ws-1 in Inspect for a minimized workspace view restores the view, but Control + - does not.

Scaling Workspaces

By default, scaling a workspace (using CTRL+B and CTRL+S, for example) resizes the window to just fit the workspace. If the window has no scrollbars initially, scaling the workspace pushes the workspace off screen; it does not add scrollbars. If the window already has scrollbars, scaling the workspace adjusts the position of the scrollbars in the window.

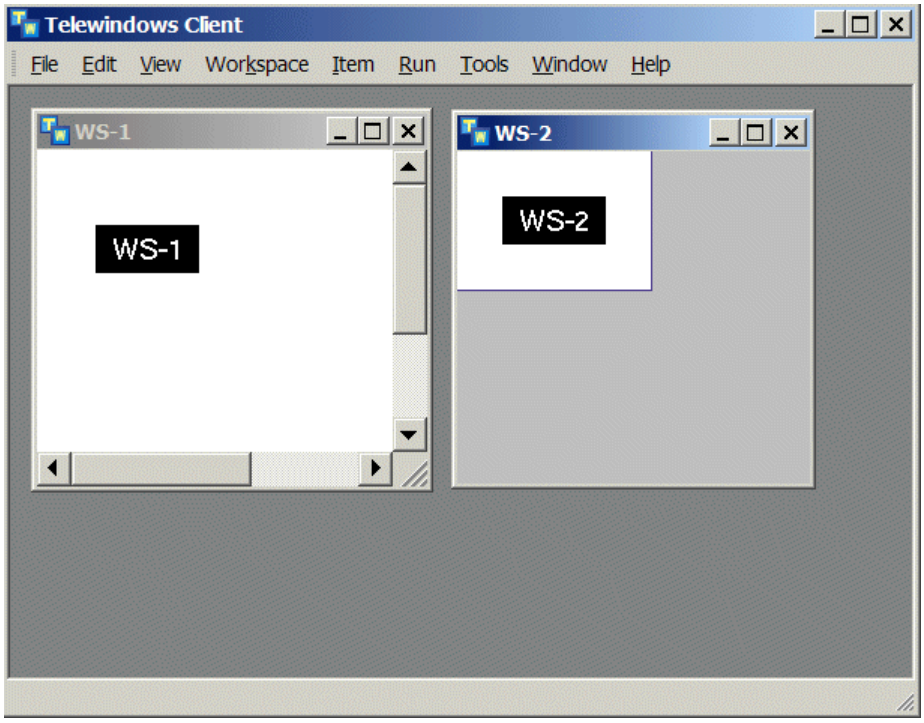
This figure shows three workspaces at different scales. Ws-1 is reduced in scale, and ws-2 is enlarged and partially off screen. Neither of these workspaces had scrollbars initially. Ws-3 had scrollbars initially and is enlarged.



Resizing Windows

Resizing a window maintains the current scale of the workspace, adding scrollbars as needed if the window becomes smaller than the workspace. If the window becomes larger than the workspace, a gray area appears around the workspace.

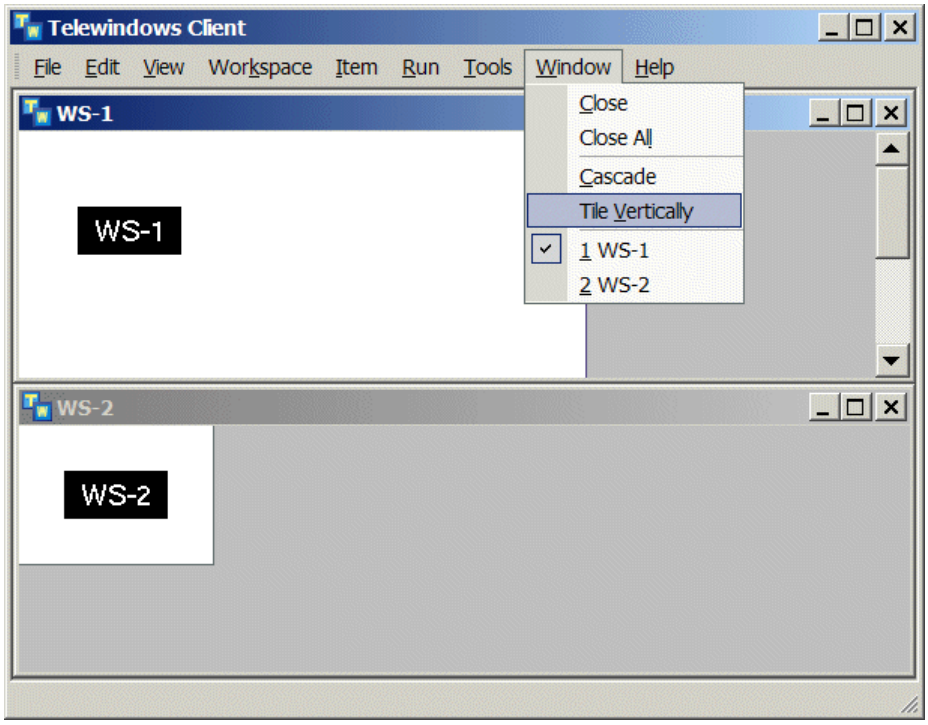
This figure shows the result of resizing two windows. Ws-1 has been resized to be smaller than the workspace, which adds scrollbars. Ws-2 has been resized to be larger than the workspace, which shows a gray area around the workspace.



Using the Window Menu

The Window menu provides standard choices for closing individual and all windows, showing individual windows by name, and cascading and tiling windows. When cascading or tiling windows, scrollbars and a gray area around the workspace might appear, depending on the workspace size.

This figure shows the Window menu and two windows tiled vertically:



Using Standard Key Bindings for Scrolling Workspaces

When running Telewindows Next Generation, you can use these standard key bindings for scrolling workspaces:

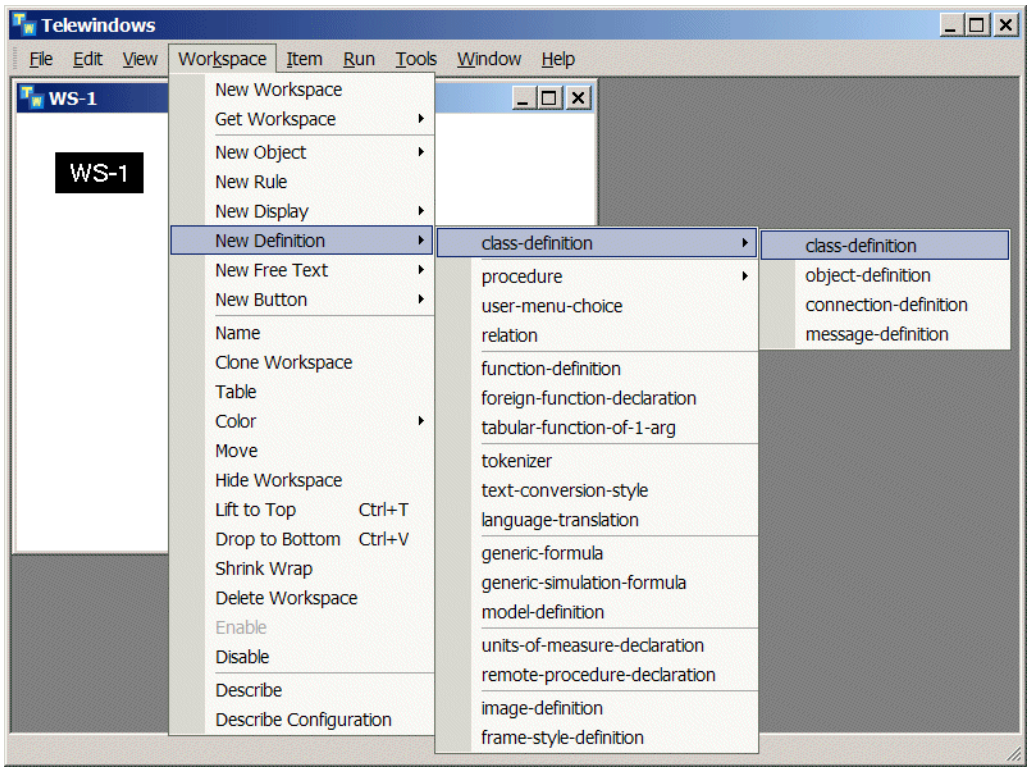
- Press HOME and END to scroll the workspace view to the top-left and bottom-left corner.
- Press CTRL+HOME and CTRL+END to scroll the workspace view to the top-right and bottom-right corner.
- Press PAGE UP and PAGE DOWN to scroll the workspace view up and down.
- Press CTRL+PAGE UP and CTRL+PAGE DOWN to scroll the workspace view left and right.
- Press the arrow keys to scroll the workspace view in the direction of the arrow.

Creating Items on Workspaces

You create items on workspaces from the Workspace menu or from the popup menu for the workspace.

To create items on workspaces:

1 Select a workspace, then choose Workspace > New Definition > Class Definition > class-definition:

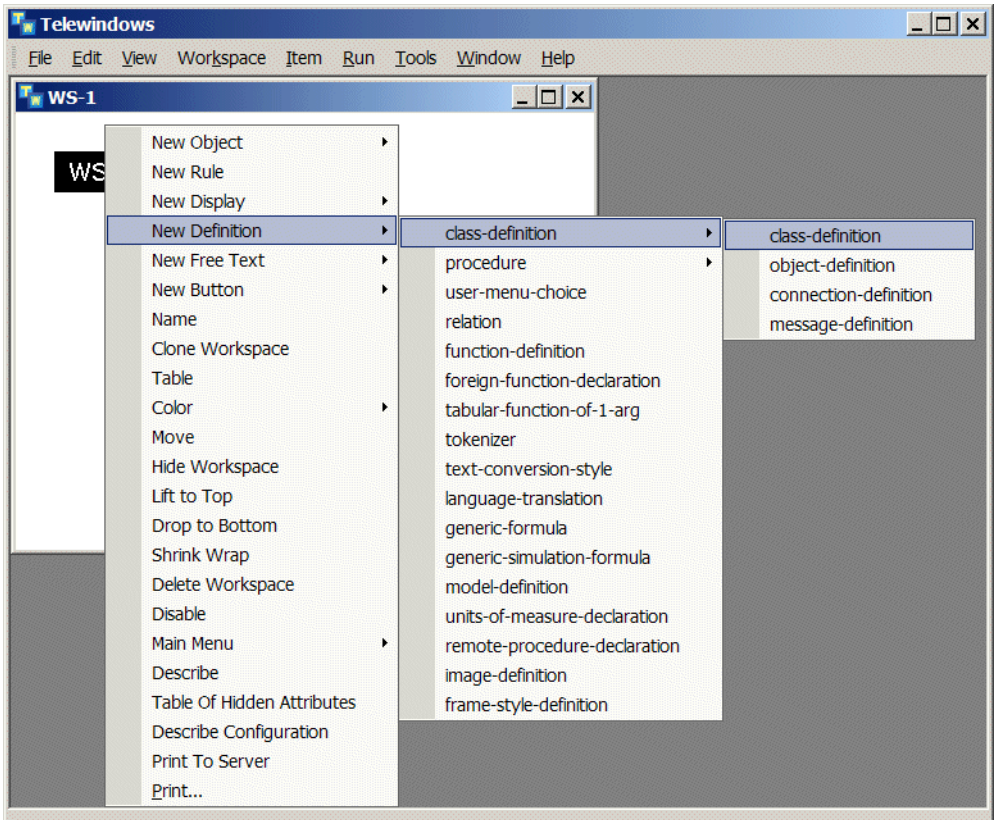


The Workspace menu includes most of the options available in the KB Workspace menu in classic G2.

Shortcut You can navigate around the menus in the menu bar by using the arrow keys and select a menu choice by pressing Return.

2 Click anywhere in the selected workspace to place the class definition on the workspace, which is now selected.

3 Right-click the open area of the other workspace to select it and display its popup menu, then choose New Definition > class-definition > class-definition to attach the object to the mouse:

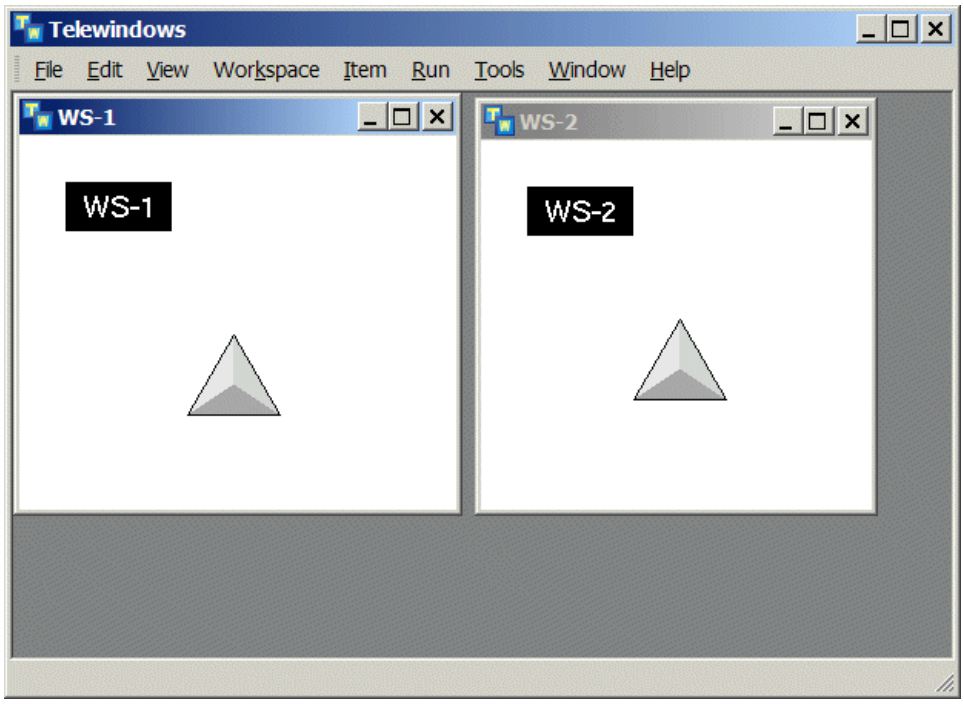


The popup menu for a workspace is equivalent to the KB Workspace menu in classic G2.

4 Click anywhere in the workspace to place the class definition on the workspace.

5 Shrink wrap each workspace, using either the popup menu or the Workspace menu, then adjust the windows so both are visible.

The window should look something like this:



Interacting with Items

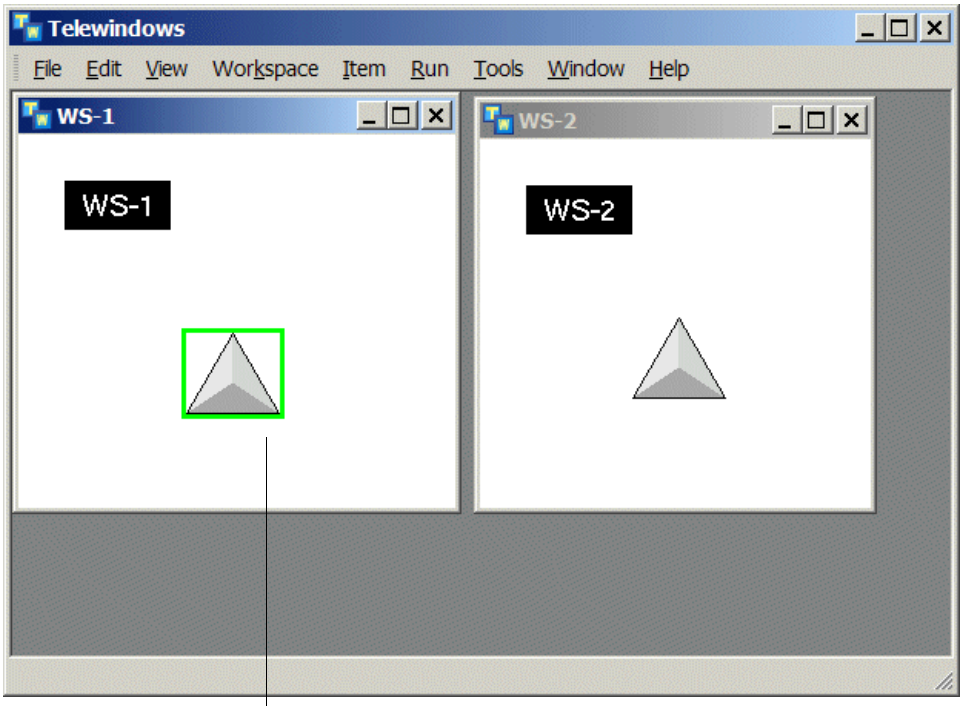
Similar to interacting with workspaces, you interact with items, using a standard selection-style user interface, whereby menu choices in the developer menu bar apply to the selected item. You can also use popup menus to interact with items. The popup menu associated with an item is equivalent to the G2 item menu in classic G2. Popups on items include user menu choices defined for the class. The User menu in the developer menu bar also includes user-defined menu choices.

For more information on interacting with items, see Appendix C, Mouse Gestures, Key Bindings, and Shortcut Keys in the *G2 Reference Manual*.

To interact with items:

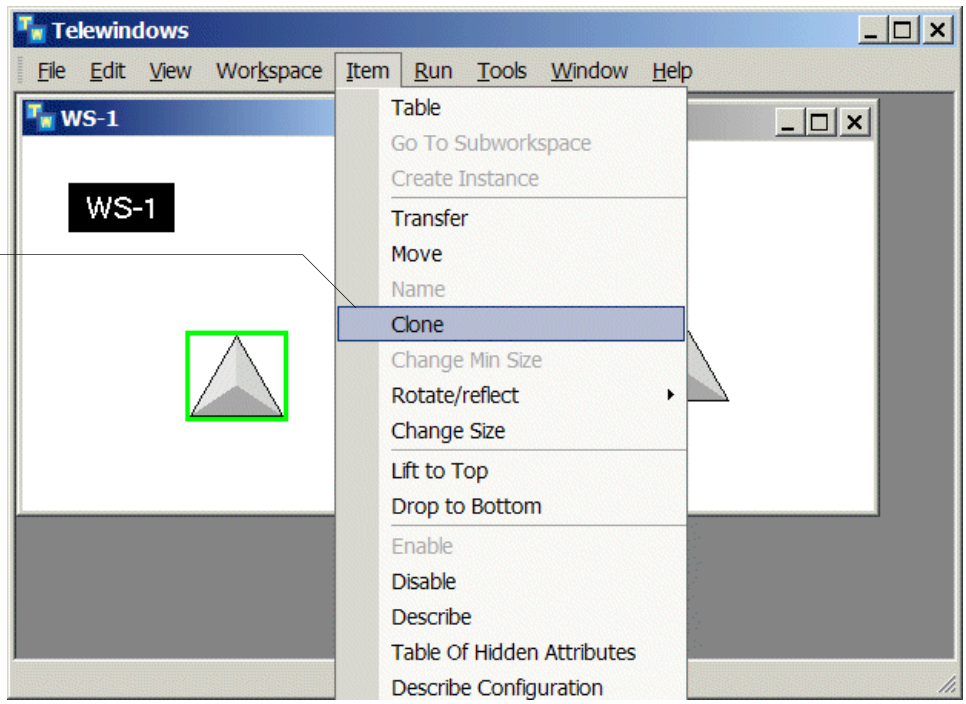
1 On the first workspace, left-click the item to select it.

A green box around the item indicates selection:



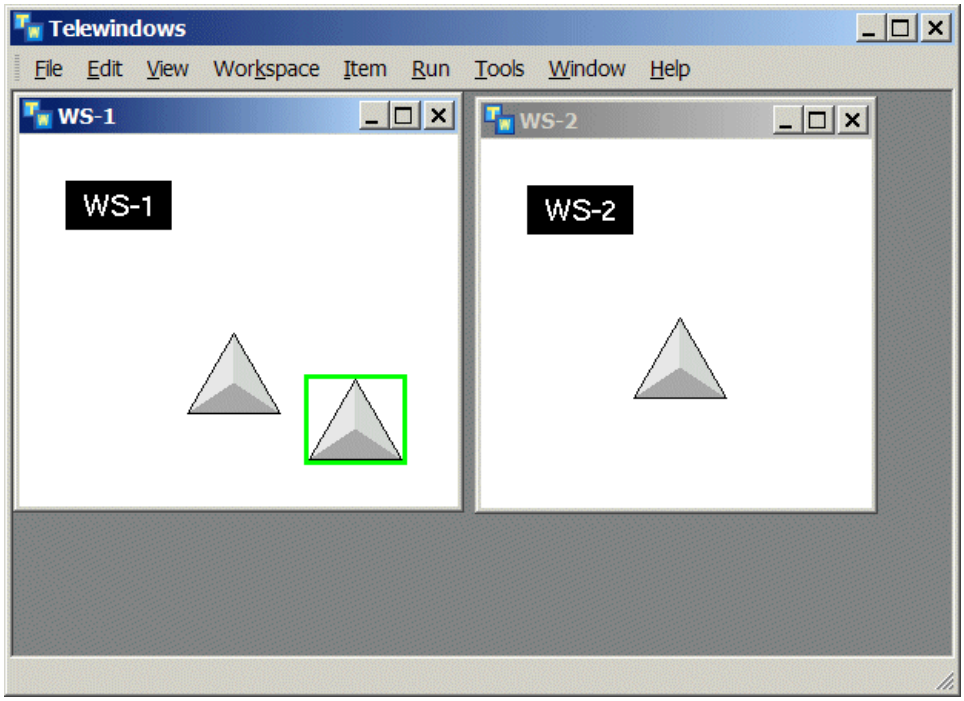
Note You can edit the colors used for primary and secondary selections by editing attributes in the Drawing Parameters system table. For more information, see Chapter 6, System Tables in the *G2 Reference Manual*.

2 With the item selected, choose Item > Clone:

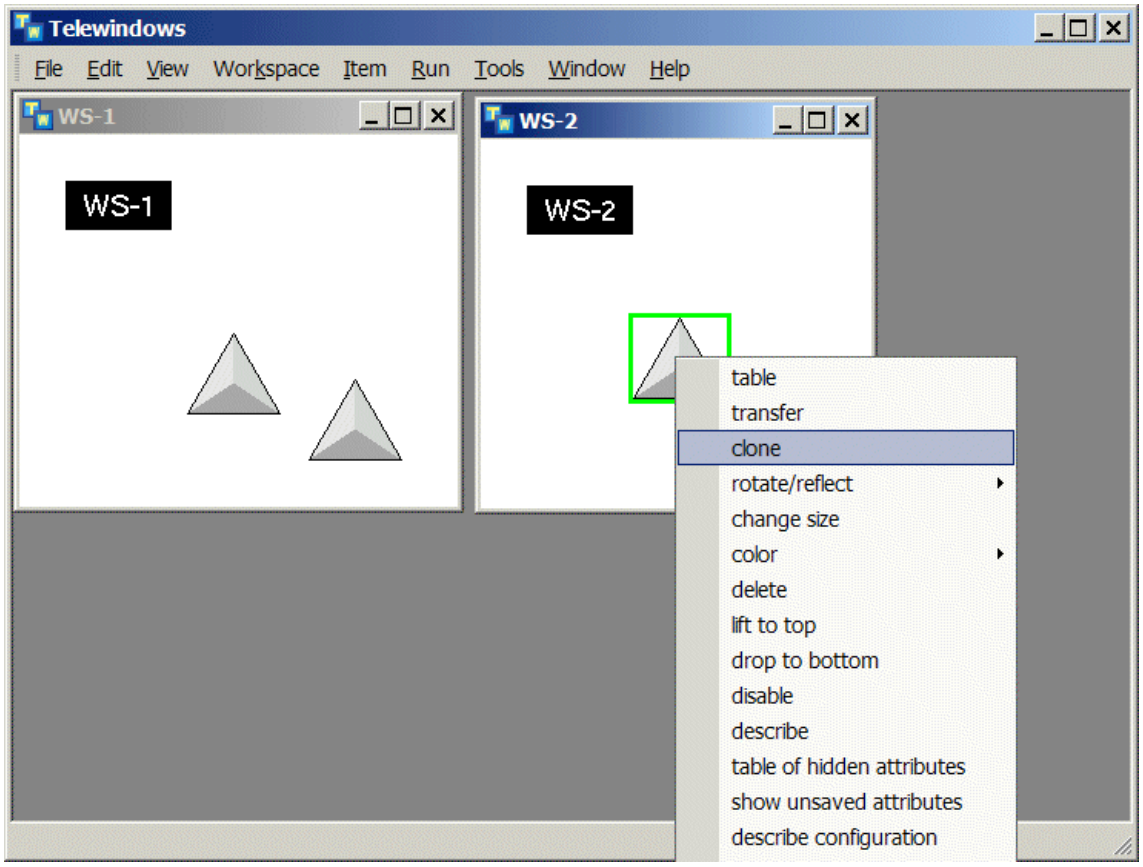


Menu choice applies to the selected item.

3 Click anywhere in the workspace to place the cloned item, which is now the selected item:



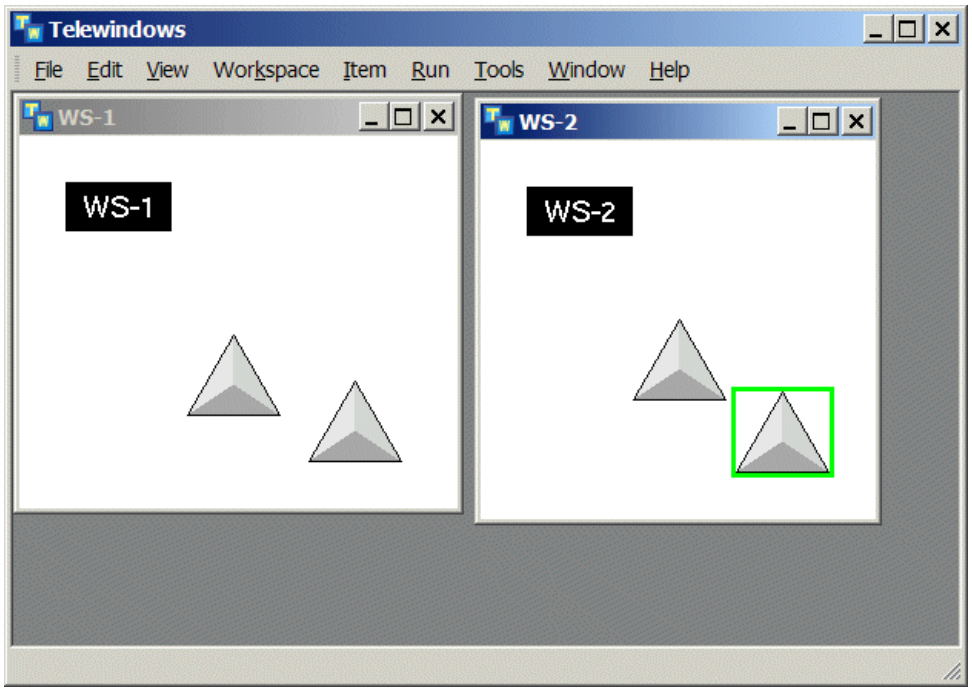
4 Right-click the class definition on the second workspace to select the workspace and display the item popup menu, then choose clone:



Popup menu on an item is equivalent to the classic G2 item menu.

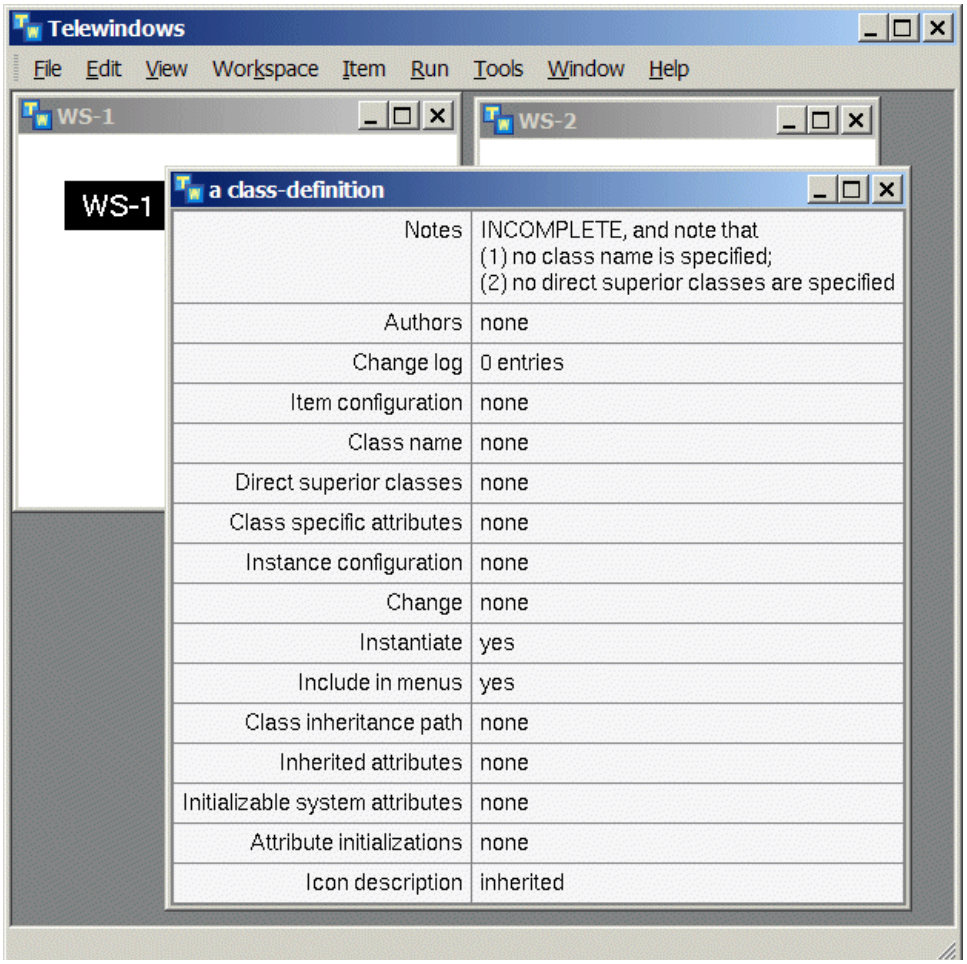
The popup menu on an item is equivalent to the item menu in classic G2 and includes user menu choices.

5 Click anywhere in the workspace to place the cloned item:



6 With the current item selected, choose Item > Table, choose Table from the item popup menu, or double-click the item.

The G2 attribute table appears in its own window:



7 Double-click an attribute value in the table to select the cell and display the standard text editor for editing the attribute value.

For details, see Editing Text on page 49.

8 Cancel the Text Editor and hide the table.

Editing Text

Telewindows provides a Windows text editor that:

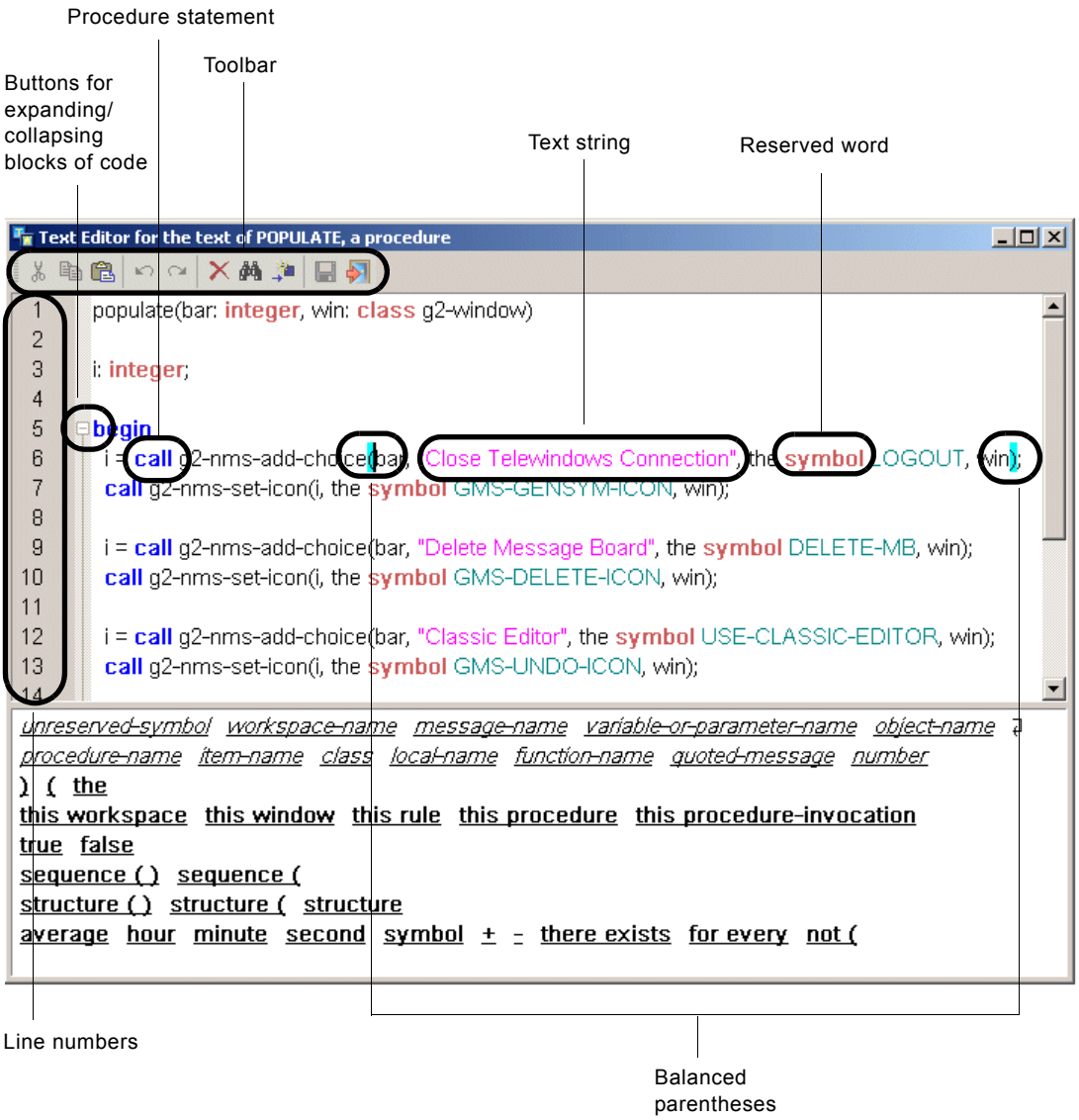
- Shows line numbers.
- Uses color to indicate procedure syntax, reserved words, and user-defined text.
- Balances statements by highlighting parentheses.
- Supports word completion.
- Displays signatures for G2 procedures and functions.
- Displays text in fixed and proportional fonts.
- Allows zooming in and out to change the font size.
- Provides toolbar buttons for cut, copy, paste, undo, redo, delete, find and replace, go to item, save, and exit.
- Supports standard Windows keyboard shortcuts.

Using the Windows Text Editor

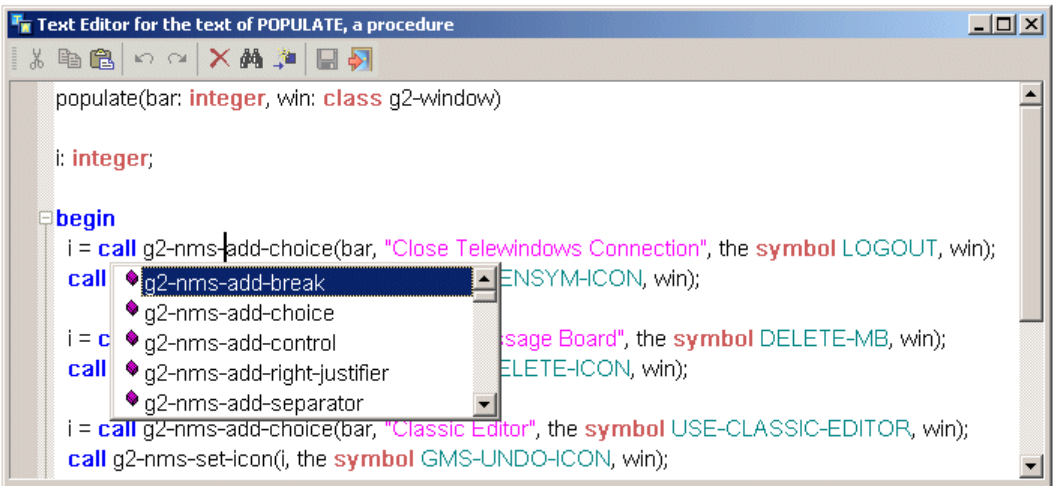
To use the Windows text editor:

➔ Choose edit on a procedure, method, or rule, or edit an attribute in a table.

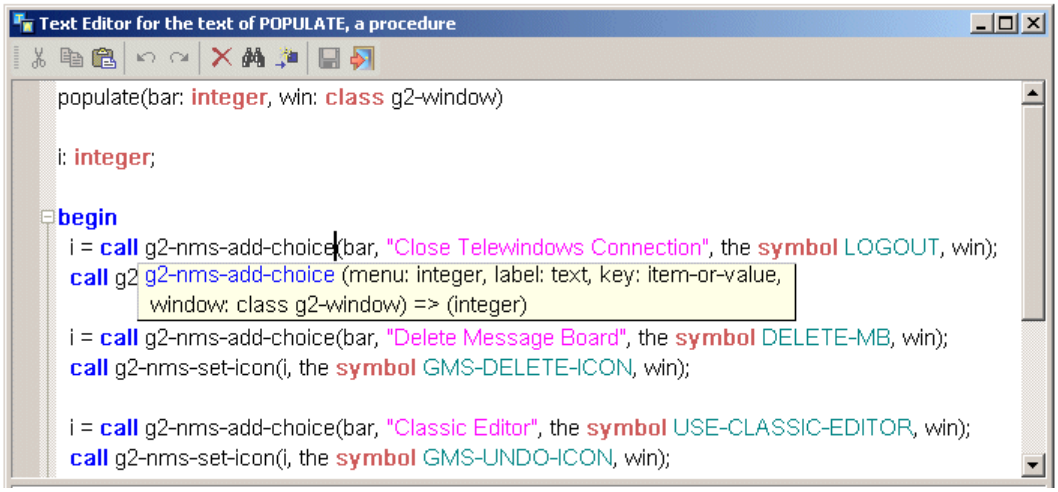
For example, here is the Windows text editor for a user-defined procedure. Notice that the procedure statements appear in blue, reserved words appear in brown, and text strings appear in magenta. Also notice that when the cursor is on the parenthesis at the beginning or end of a statement, the corresponding parenthesis is also highlighted. The area at the bottom of the editor provides grammar prompts for entering code.



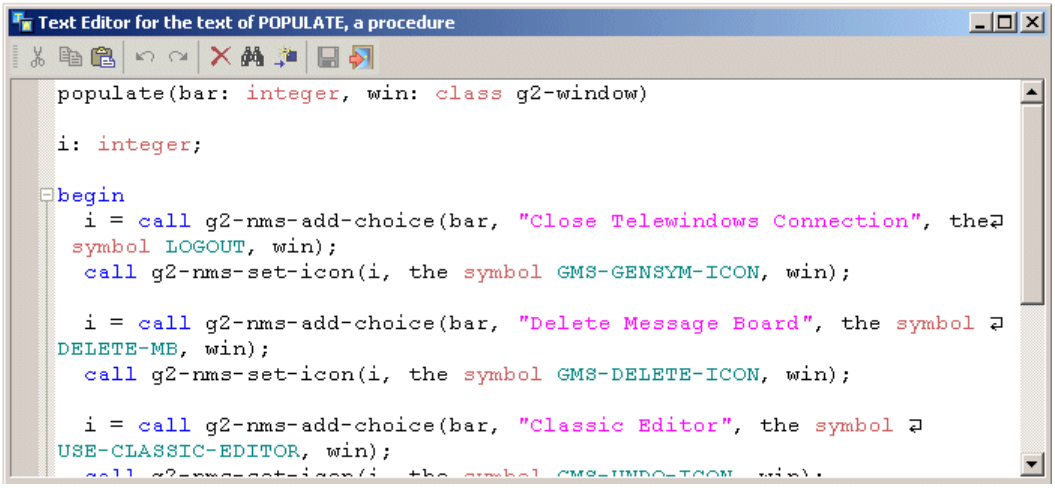
Here is the result of entering Ctrl+Space with the cursor on the word g2-nms to use word completion:



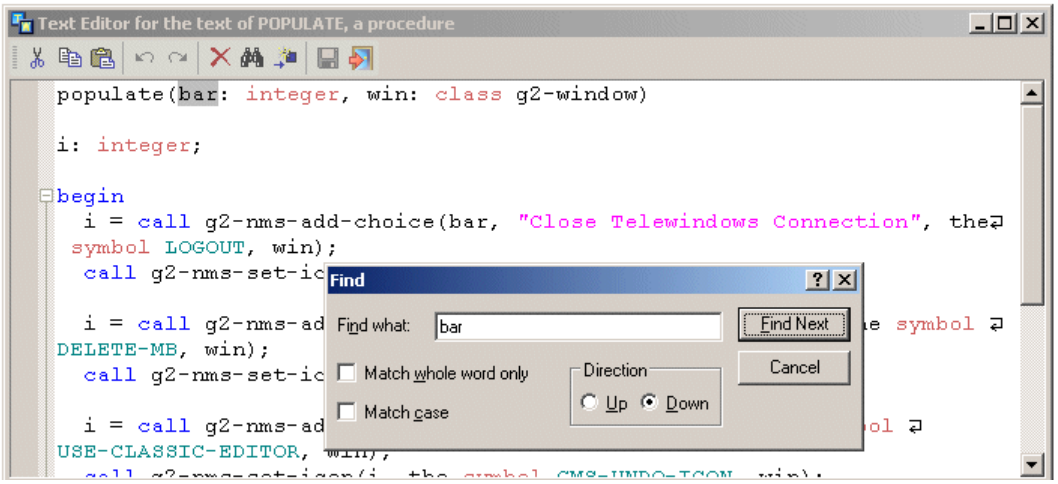
Here is the result of entering Ctrl+Shift+Space with the cursor on the word g2-nms-add-choice to display its signature:



Here is the result of entering Ctrl+F2 to view the text in a fixed as opposed to proportional font, then entering Ctrl+- (minus) twice to zoom the view in to use a smaller font:



Here is the result of entering Ctrl+F to display a dialog for finding words, with options of matching whole words and case:



Using the Classic Text Editor

To use the classic text editor, you must configure an attribute in the Editor Parameters system table.

To use the classic text editor:

➔ Specify the prefer-native-editor attribute in the Editor Parameters system table to be no.

Using Keyboard Shortcuts

The text editor supports the following standard and G2-specific keyboard shortcuts:

Shortcut	Description
Shortcuts Specific to G2 Editor	
Ctrl+Space	Display word completions for the current word.
Ctrl+Shift+Space	Display signature for the current G2 procedure or function.
Ctrl+Return	Accept edits and end session.
Ctrl+F2	Toggle between fixed and proportional fonts.
Ctrl+F	Find.
Ctrl+H	Replace.
F3	Find again.
F12	Go to item.
Standard Editor Shortcuts	
Down	Move cursor down one line.
Shift+Down	Move cursor down one line selecting text.
Ctrl+Down	Scroll down one line without moving the cursor.
Up	Move cursor up one line.
Shift+Up	Move cursor up one line selecting text.
Ctrl+Up	Scroll up one line without moving the cursor.
Left	Move cursor left one character.
Shift+Left	Move cursor left one character selecting text.
Ctrl+Left	Move the cursor left one word.
Ctrl+Shift+Left	Move the cursor left one word selecting text.
Right	Move cursor right one character.
Shift+Right	Move cursor right one character selecting text.

Shortcut	Description
Ctrl+Right	Move the cursor right one word.
Ctrl+Shift+Right	Move the cursor right one word selecting text.
Ctrl+[	Move cursor up one paragraph, where a new paragraph begins after a blank line.
Ctrl+Shift+[	Move cursor up one paragraph selecting text.
Ctrl+]	Move cursor down one paragraph, where a new paragraph begins after a blank line.
Ctrl+Shift+]	Move cursor down one paragraph selecting text.
Ctrl+/	Move cursor left to next space, hyphen, parenthesis, or other separator.
Ctrl+Shift+/	Move cursor left to next space, hyphen, parenthesis, or other separator, selecting text.
Ctrl+\	Move cursor right to next space, hyphen, parenthesis, or other separator.
Ctrl+Shift+\	Move cursor right to next space, hyphen, parenthesis, or other separator, selecting text.
Home	Move the cursor to the beginning of the current line.
Shift+Home	Move the cursor to the beginning of the current line, selecting text.
Ctrl+Home	Move cursor to the start of the page.
Ctrl+Shift+Home	Move cursor to the start of the page, selecting text.
Alt+Home	Move cursor to the beginning of the line.
Alt+Shift+Home	Move cursor to the beginning of the line, selecting text.
End	Move the cursor to the end of the current line.
Shift+End	Move the cursor to the end of the current line, selecting text.

Shortcut	Description
Ctrl+End	Move cursor to the end of the page.
Ctrl+Shift+End	Move cursor to the end of the page, selecting text.
Page Up	Move cursor up one page.
Shift+Page Up	Move cursor up one page selecting text.
Page Down	Move cursor down one page.
Shift+Page Down	Move cursor down one page selecting text.
Delete	Delete character to the right of the cursor.
Shift+Delete	Cut selected text to the clipboard.
Ctrl+Delete	Delete the word to the right of the cursor.
Ctrl+Shift+Delete	Delete line to the right of the cursor.
Backspace	Delete character to the left of the cursor.
Alt+Backspace	Undo last input.
Ctrl+Backspace	Delete the word to the left of the cursor.
Ctrl+Shift+Backspace	Delete the line to the left of the cursor.
Alt+Backspace	Undo last command.
Ctrl+Z	Undo last command.
Ctrl+Y	Redo last command.
Ctrl+A	Select all.
Ctrl+X	Cut selected text to the clipboard.
Ctrl+C	Copy from the clipboard.
Ctrl+V	Paste from the clipboard.
Insert	Toggle insert/overtype mode.
Shift+Insert	Paste from the clipboard.
Ctrl+Insert	Copy from the clipboard.
Tab	Insert a tab character.

Shortcut	Description
Shift+Tab	Move cursor back one tab.
Return	Enter a new line character.
Shift+Return	Enter a new line character.
Escape	If text is selected, cancel current selectio; otherwise, display a configrmation dialog for cancelling the editor session.
Ctrl+= (equals)	Zoom in.
Ctrl+- (minus)	Zoom out.
Ctrl+0	Set zoom scale to normal.
Ctrl+L	Cut the current line to the clipboard.
Ctrl+Shift+L	Delete the current line.
Ctrl+Shift+L	Copy the current line to the clipboard.
Ctrl+T	Transpose the current line with the line above.
Ctrl+D	Duplicate the current line.
Ctrl+U	Lowercase the current selection.
Ctrl+Shift+U	Uppercase the current selection.

Configuring the Grammar Prompts that G2 Displays

You can use the g2-ui-launch-editor system procedure to configure the prompts that appear in the text editor, both the classic G2 text editor and the Windows text editor available through Telewindows.

For details, see Editor Operations in Chapter 33, User Interface Operations in the *G2 System Procedures Reference Manual*.

Working with Selections

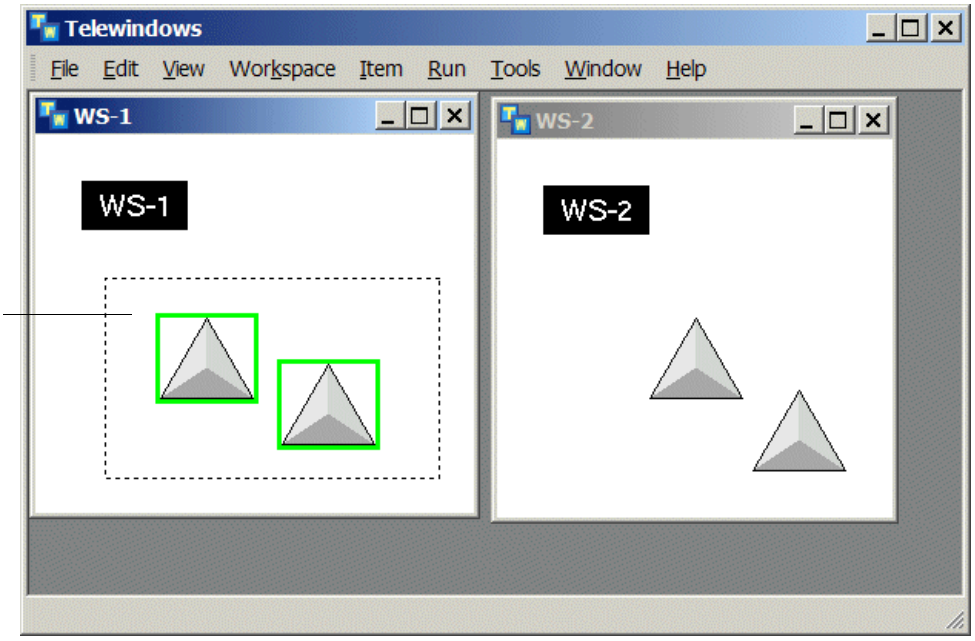
You use standard mouse gestures to work with selected items, both in Telewindows and in G2.

For a complete list, see Appendix C, Mouse Gestures, Key Bindings, and Shortcut Keys in the *G2 Reference Manual*.

To work with selections:

1 Select the first workspace and click in the open area of the workspace to cancel the selection.

2 Drag in the open are of the workspace to select multiple items in the rectangle:



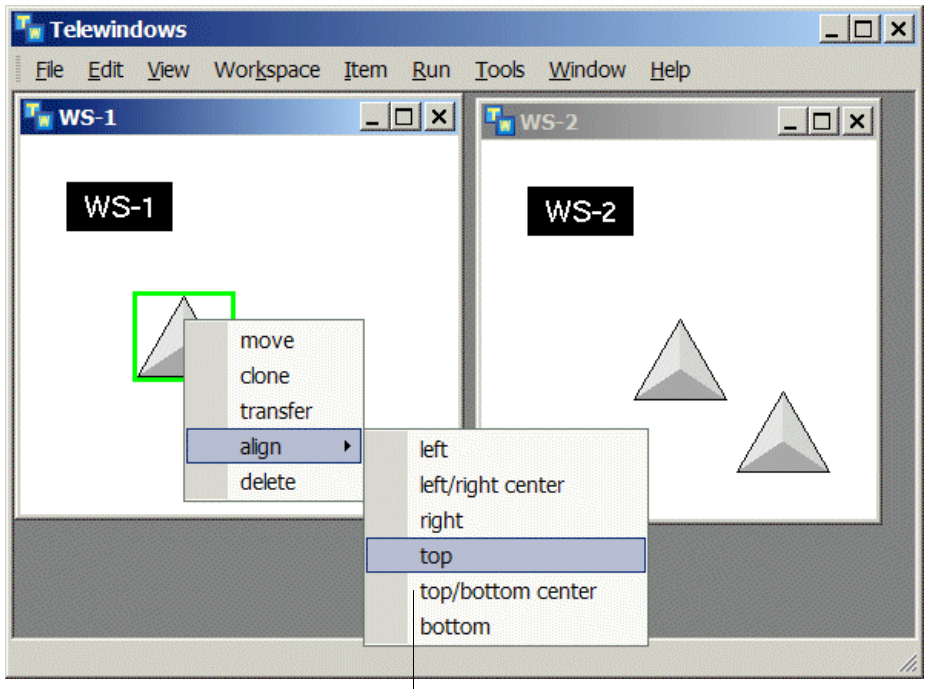
3 With both items selected, move the mouse over one of the items and drag to move the entire selection.

4 Left click the open area of the workspace to cancel the selection.

5 Press CTRL+A to select all items on the workspace, including the name box.

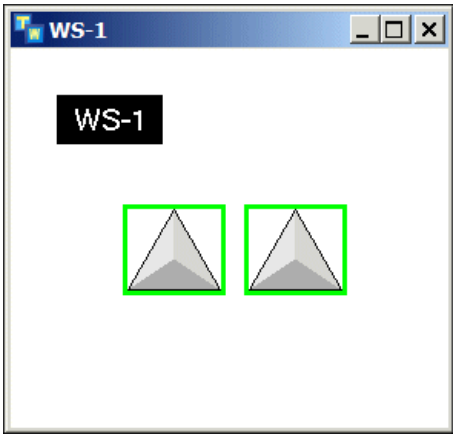
6 Hold down the SHIFT key and click the name box to toggle it's membership in the selection.

7 With just the two class definitions selected, right-click one of the selected items to display a popup for interacting with the selection, then choose Align > Top to align the items:



Right-click a selection to display a popup for interacting with all items in the selection.

The workspace should look something like this:



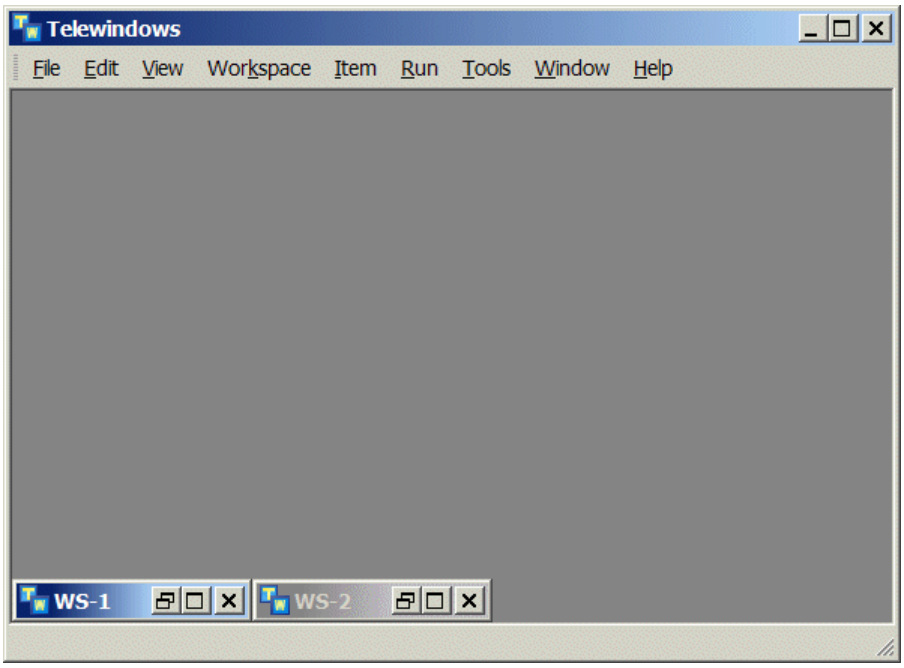
When three or more items are selected, you can distribute the items horizontally or vertically.

Interacting with the KB

You interact with the KB, using the File, Edit, Run, and Tools menus. You can also use the G2 Main Menu, which appears as a popup menu in the overall window.

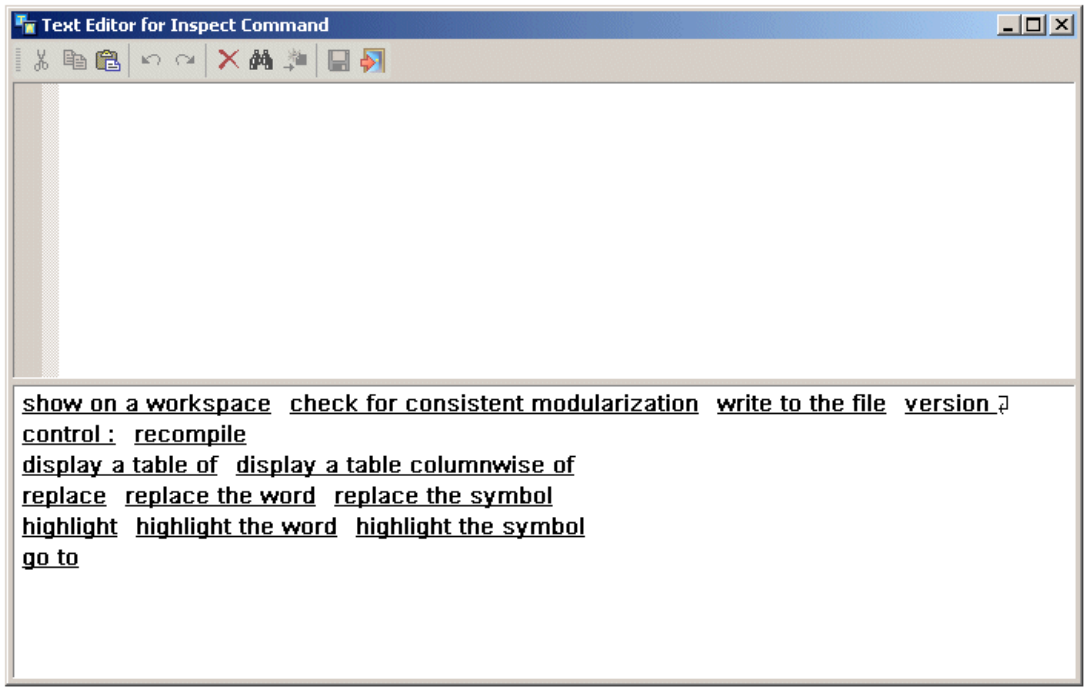
To interact with the KB:

1 Minimize both workspaces in the window:

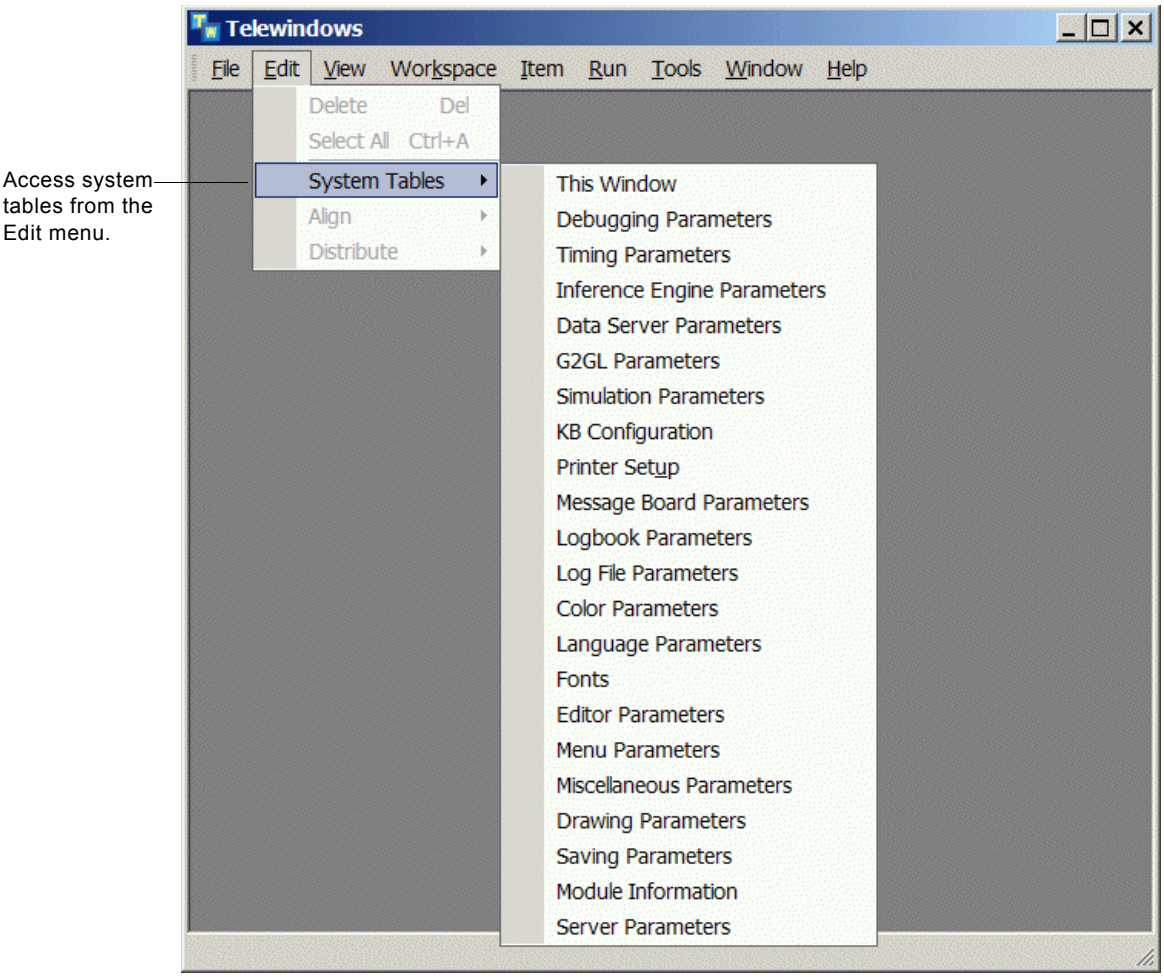


2 Click the close buttons on both workspaces to close them.

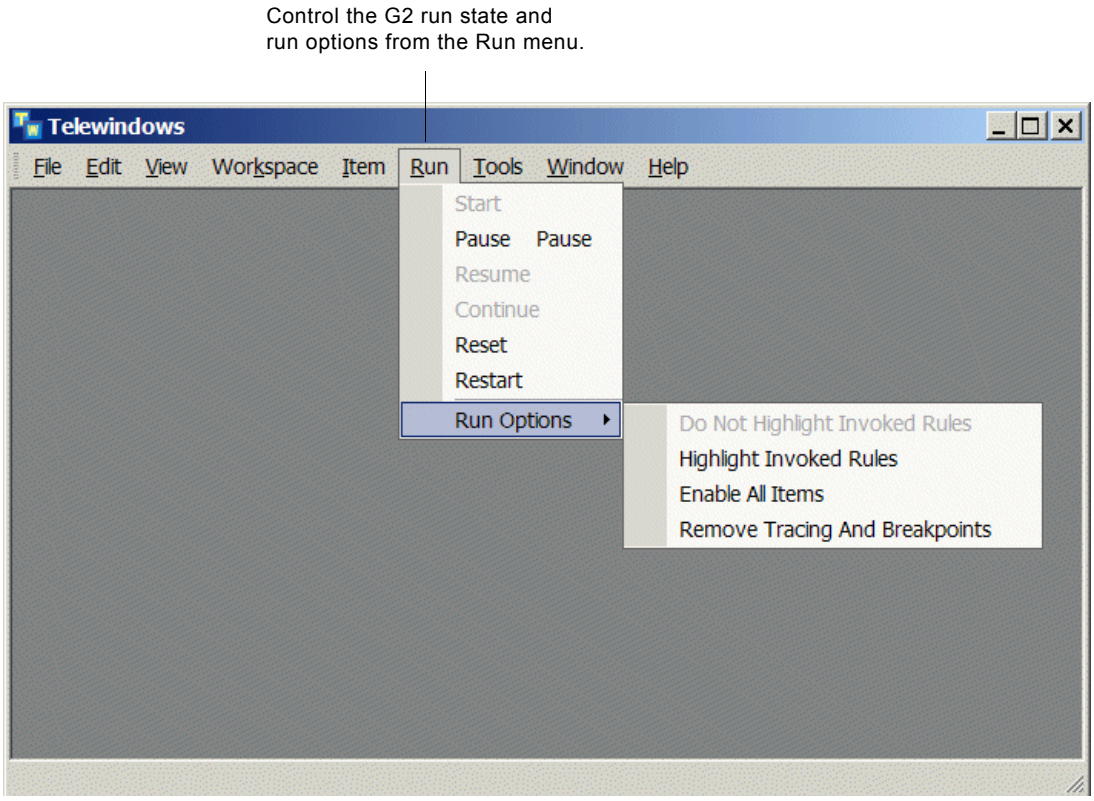
3 Choose Tools > Inspect to display the G2 Inspect workspace:



4 Choose Edit > System Tables to display a cascade menu of G2 system tables:

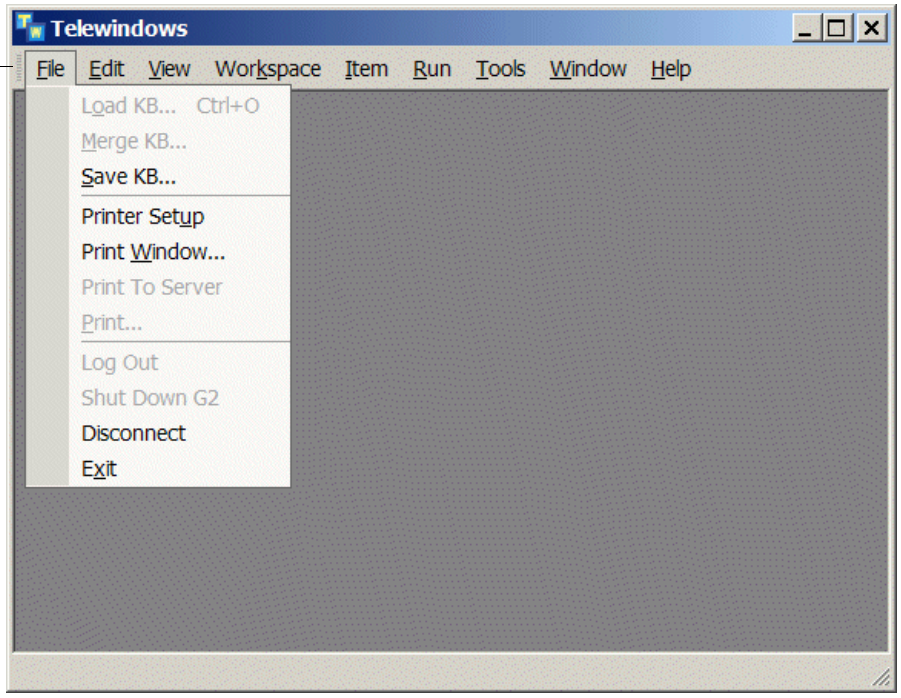


5 Choose Run to view the choices for controlling the G2 run state:

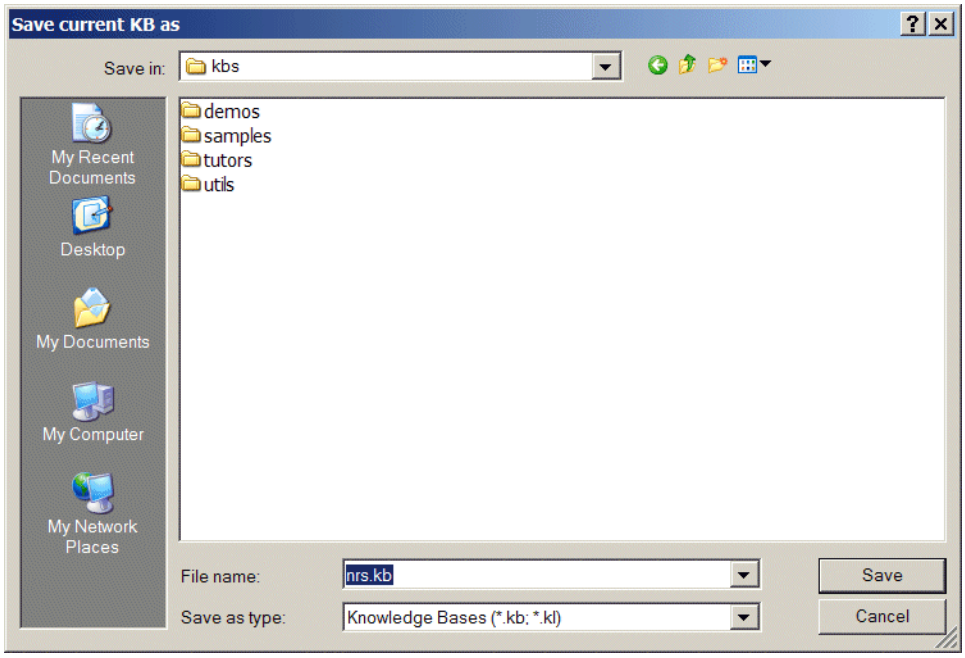


6 Choose File to view the choices for loading, merging, and saving KBs, and exiting G2 and Telewindows:

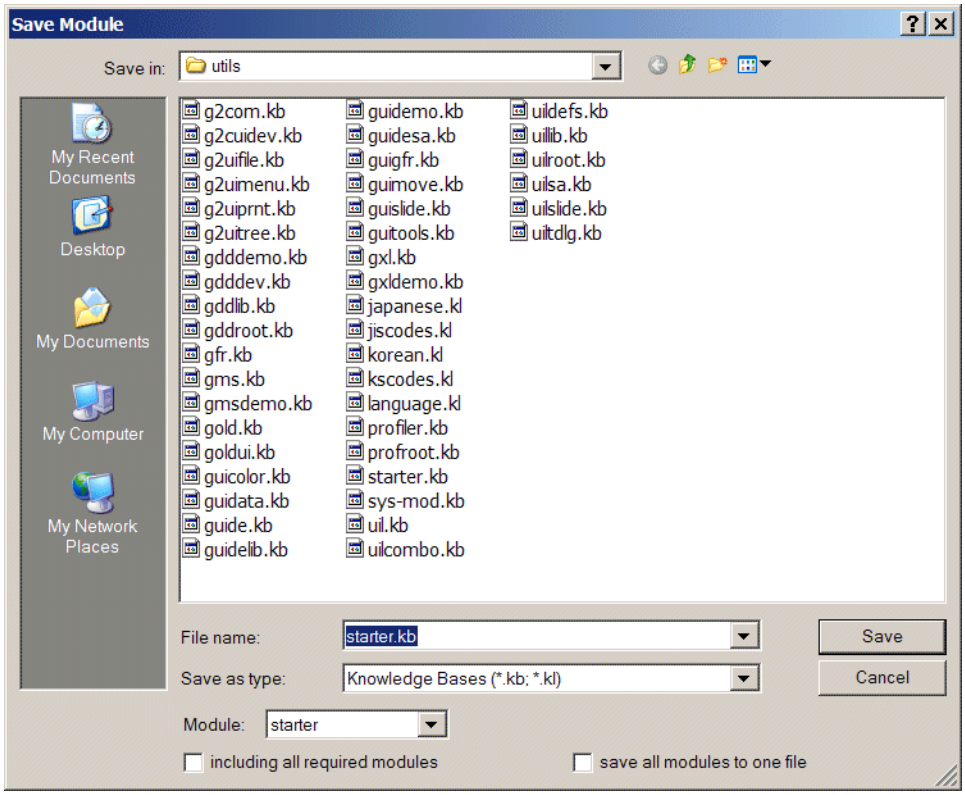
Load, save, and merge KBs, using the File menu.



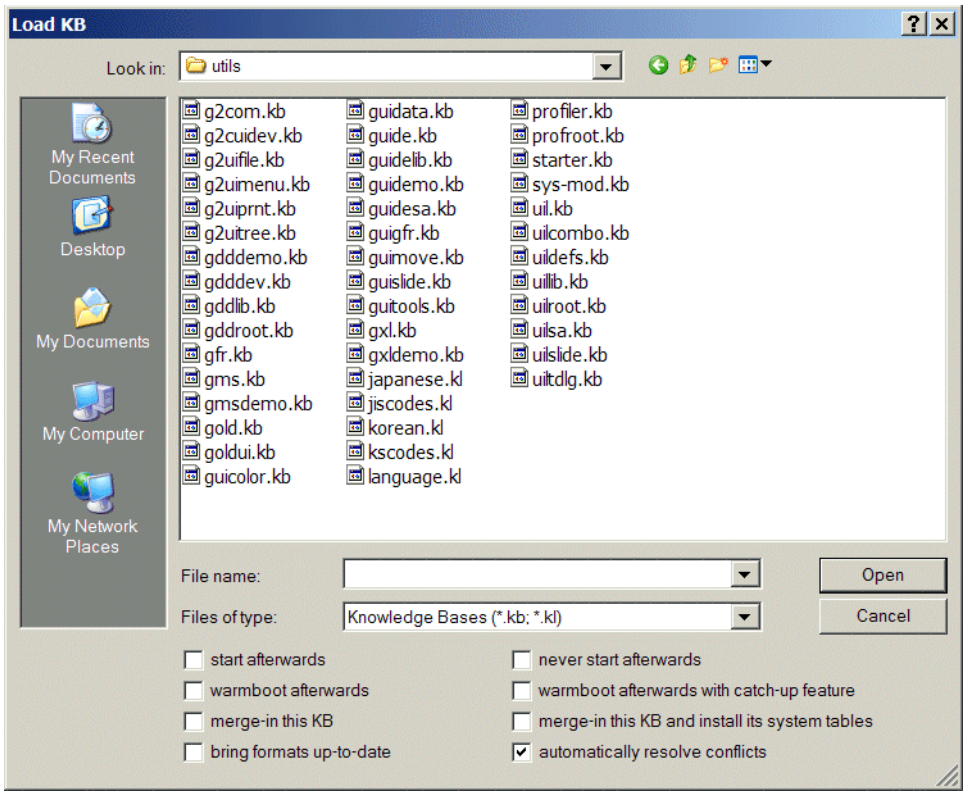
7 Choose Save KB to display the Save dialog:



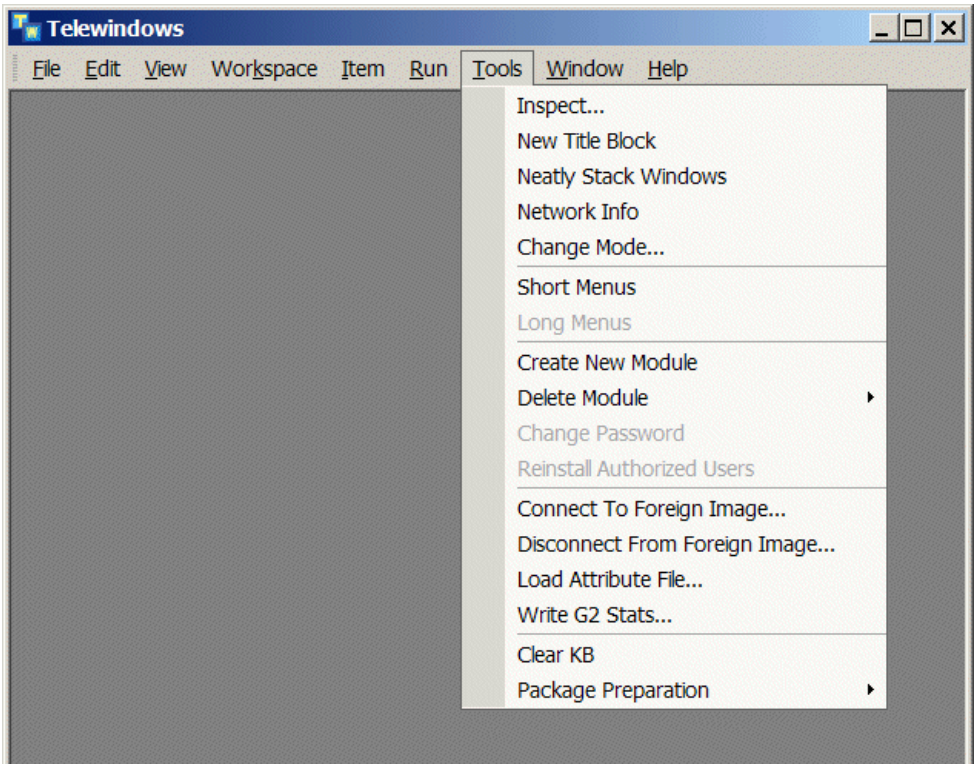
When the KB is modularized, the Save KB dialog has additional options for saving specific modules, as follows:



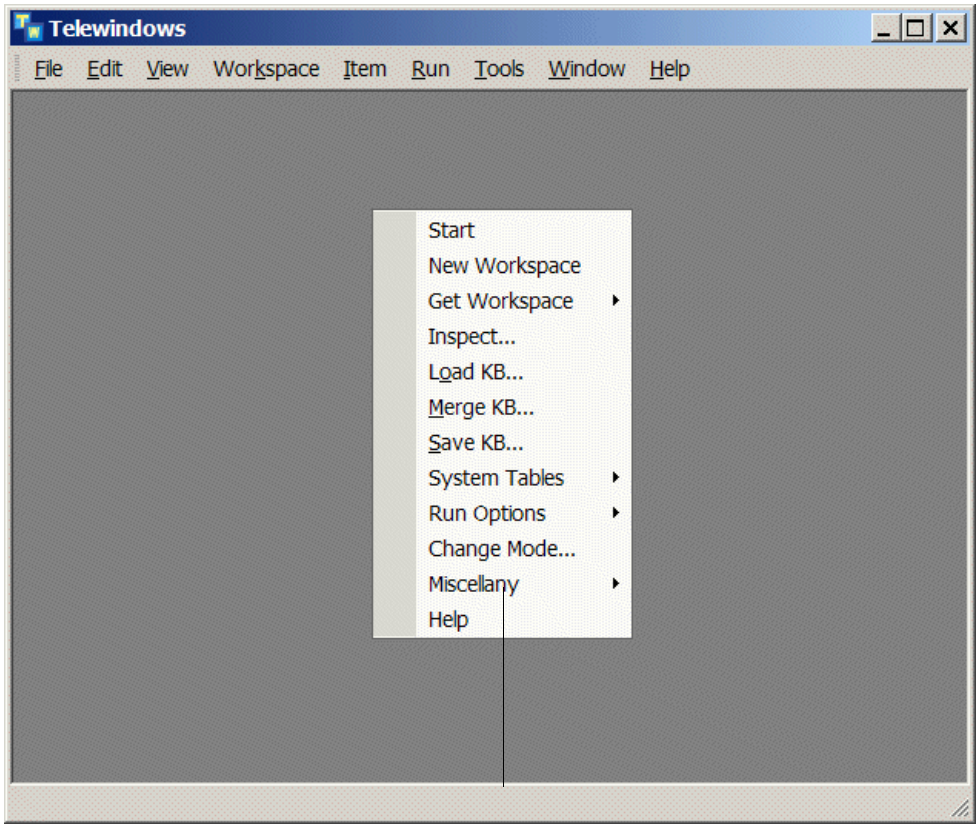
8 Pause G2, then choose File > Load KB to display the Load dialog, which includes G2 load options:



9 Choose Tools to show additional choices for interacting with the KB, which are equivalent to the choices in the Miscellany submenu of the G2 Main Menu in the classic user interface:



10 Right-click the background of the window to display a popup menu, which is equivalent to the G2 Main Menu in classic G2:



Popup on the overall

Printing

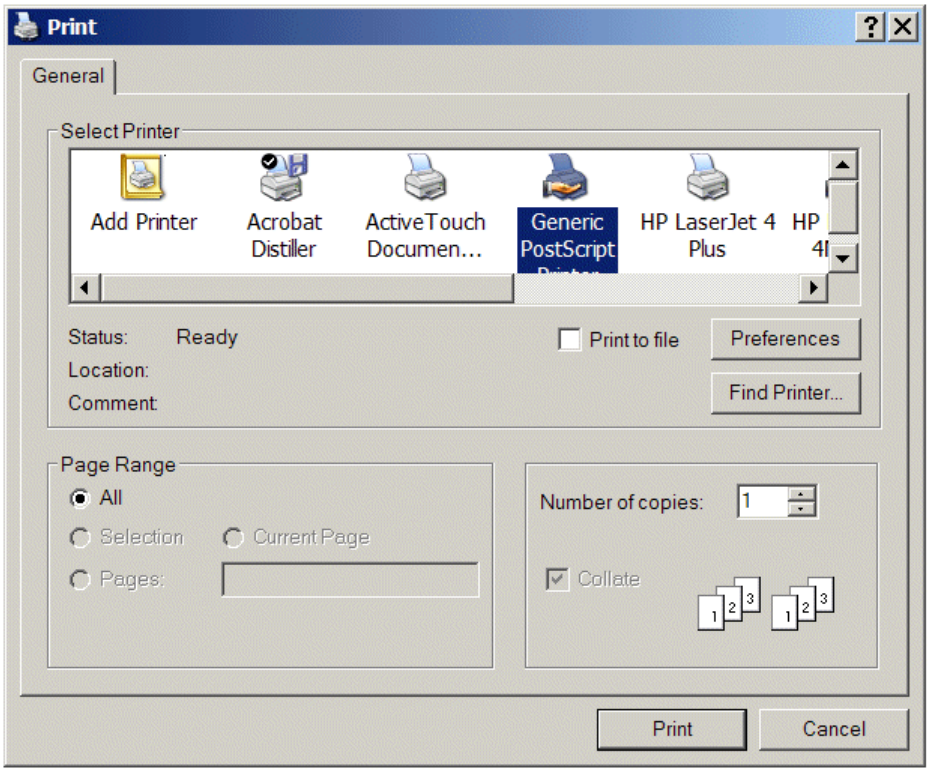
You can print the G2 window or selected workspace directly to any printer on the Telewindows client. You can also print the G2 window to a postscript file on the server from the client.

For optimal printing of all international and special Unicode characters, we recommend that you install the Arial Unicode MS font, which is distributed with all Microsoft Office 2000 products. The name of the font file is `arialuni.ttf`. If this font is not available, G2/TW uses the default system Arial font, which might not have optimal character spacing and might be missing some characters.

To print the G2 window:

➔ Choose File > Print Window.

The standard print dialog appears for choosing a printer and configuring printer preferences:



To print the selected workspace:

➔ Choose File > Print.

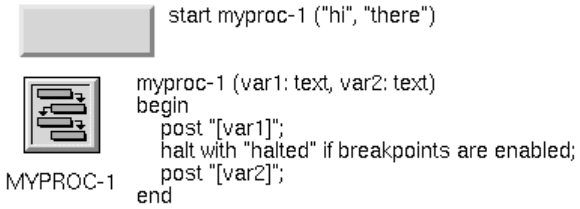
To print to a postscript file on the server:

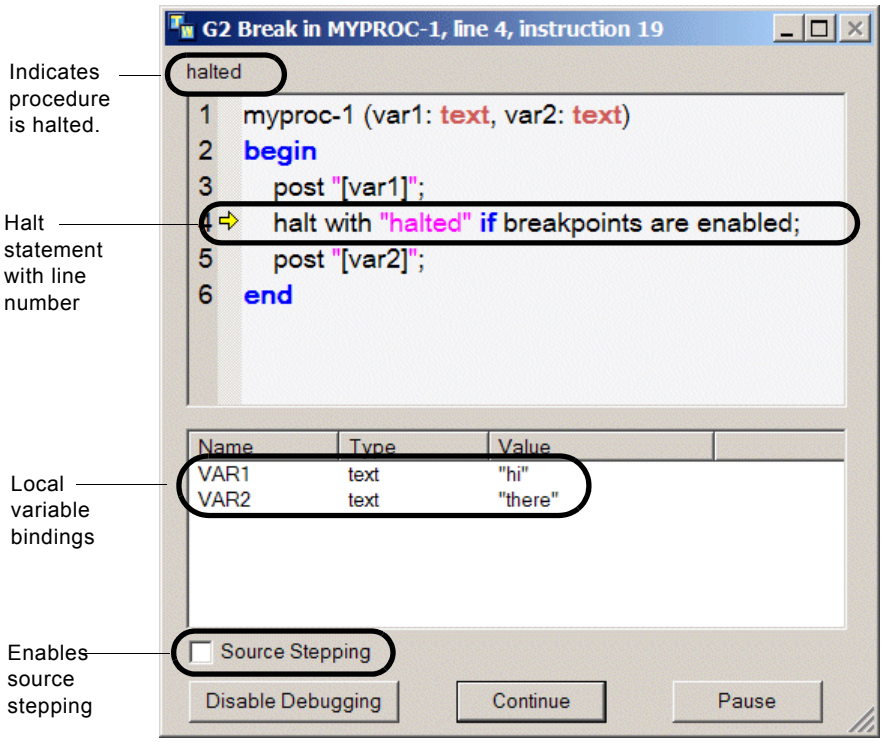
➔ Choose File > Print to Server.

Using the Windows Debugger

Telewindows provides a Windows debugger, similar to the text editor, which shows procedure source code in a scroll area, line numbers, the procedure stack, and local variable bindings. The debugger shows the current line of source code being executed with an arrow. It includes the same buttons that appear in the dialog in the server dialog during debugging: Disable Debugging, Continue, and Pause.

For example, here is the Windows debugger that results when using the halt statement:





From this point, you can click Continue to continue executing the procedure, Pause to pause G2, or Disable Debugging to disable debugging in the Debugging Parameters system table. To continue after pausing, choose Main Menu > Continue From Breakpoint.

You can enable the Source Stepping option and continue executing the procedure.

You can set a temporary breakpoint by clicking in the column to the right of the line number on which you want to set a breakpoint.

For information on the text editor, see Editing Text on page 49.

Controlling the User Interface Mode

You can use the following command-line options to start Telewindows. These options apply only to Telewindows (`tw.exe`). Telewindows Next Generation (`twng.exe`) only runs in multiwindow mode.

User Interface Mode	Description
`-ui standard`	Single document interface mode, where multiple workspaces appear in the same G2 window, like G2 classic, but where various other user interface features use the Windows standard, such as selection, top menu bar, and popup menus. To start Telewindows in standard mode: • Windows: Choose Start > Programs > Gensym 2015 > Telewindows (Standard). or • UNIX: Enter `tw` from a command shell. The `-ui standard` command-line option is the default for standard Telewindows (`tw.exe` and `tw`).
`-ui classic`	Classic G2 user interface with no standard Windows user interface features. To start Telewindows in classic mode: • Windows: `tw.exe -ui classic` • UNIX: `tw -ui classic` The `-ui classic` command-line option is only supported for standard Telewindows (`tw.exe` and `tw`); it is not supported for Telewindows Next Generation (`twng.exe`).

4

Rerouting Telewindows

Shows you how to operate the sample knowledge base that demonstrates rerouting Telewindows.

Introduction

Developers can organize a G2-based application so that the Telewindows running on the user's computer provides a front-end interface to one or more running G2s, each of which has loaded KBs whose collective knowledge is distributed, perhaps using G2-to-G2 data-service techniques.

G2 can switch, or reroute, a Telewindows connection from itself to another G2. That is, the KB loaded in one G2 can pass the information associated with a Telewindows connection to another KB loaded in another G2, where a new Telewindows connection is attempted. The host names are looked up on the Telewindows (client) side, not on the G2 (server) side.

For information on rerouting Telewindows, see G2-Windows and Telewindows Support in the *G2 Reference Manual*.

The sample knowledge base (or KB) named `twtour.kb` illustrates how a G2 application can reroute, or switch, a Telewindows connection. Find `twtour.kb` in the `g2\kbs\samples` or `g2/kbs/samples` subdirectory of your G2 installation directory, depending on your platform.

What twtour.kb Does

The only programmatic operation specifically required to reroute a Telewindows connection is the G2 system procedure g2-reroute-window. However, *twtour.kb* uses GUIDE dialogs (developed using the G2 GUIDE product), a history-keeping mechanism, and other features to provide a more complete user interface.

The *twtour.kb* also provides a go-back-to-previous-window feature, a site map, a site system display, a dialog supporting a manual Telewindows connection, and a list of current logins accomplished by Telewindows sessions.

Once *twtour.kb* initiates a reroute-window operation, it passes a text string to the next G2 process. This text string, contained in the g2-window-initial-window-configuration-string attribute of the reroutable g2-window item, includes information about the current G2 process and any other G2 processes this Telewindows connection was previously connected to. The *twtour.kb* also uses an encoding scheme to encode more than one individual string into one string, and passes the single string to the next G2 process visited by the rerouting operation. After the connection is rerouted, the next G2 process decodes the string, then uses its contents to build the appropriate dialogs for a particular Telewindows user.

The *twtour.kb* example includes GUIDE, UIL, and other UIL-related modules, which load automatically from their respective modularized KB files. Use GUIDE to change or extend the capabilities of *twtour.kb*. See the *G2 GUIDE User's Guide* and the *G2 GUIDE/UIL Procedures Reference Manual*.

Setting up twtour.kb

To set up *twtour.kb*, you must:

- Save a backup copy of the *site-map.txt* file under a new name, such as *site-map.sav*. This file is located in the *g2\kbs\utils* or *g2/kbs/utils* subdirectory of your G2 installation directory.
- Edit the *site-map.txt*, as described below.
- Start a G2 process on one or more computers, whose network host names and network ports are identified in *site-map.txt*, then load and start *twtour.kb* on each of these G2s.
- Start a Telewindows process that connects to one of the G2s you just started.

You must edit the ASCII file *site-map.txt* so that it contains the correct information for your site. Each line describes a G2 process running on your network that a Telewindows user can access via the mechanisms provided in *twtour.kb*.

Four pieces of information must be specified on each line in the *site-map.txt* file:

- Network host name for the computer
- Port number for the G2 process, up to four characters long
- Connection type (*TCP_IP*)
- Description, up to 20 characters long

A sample layout of this file is:

```
      1         2         3         4         5
12345678901234567890123456789012345678901234567890
----+----+----+----+----+----+----+----+----+----+

sdev7          1111  TCP_IP   Mfg. Line #1
sdev9         1112  TCP_IP  Assy. Line #2
```

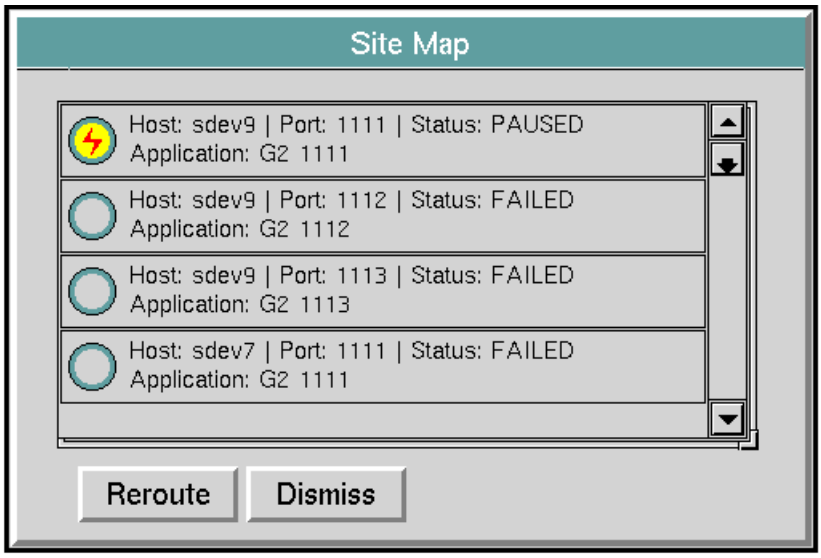
Using the Controls Dialog

The Controls dialog shows the various options that you have for accessing the KB's operations. The Controls dialog displays a button for each of its major dialogs and operations:

- Site map
- Describe
- Windows
- Go Back
- Manual
- History
- Close TW

Using the Site Map Dialog

The *twtour.kb* example builds the display for the Site Map dialog from the contents of the *site-map.txt* file, which describes each accessible G2 process.



Each message in the scroll area of the Site Map dialog describes one G2 process on your network. The icon in each message indicates the state of the G2 process: running, paused, not available, and so on, as follows:

- A green icon means the G2 process is running and available.
- A red icon means that the G2's KB is presently reset.
- A grayed icon means the G2 process is either not present, or not visible on the network.

The text in each message also provides more detail about the state of that G2 process.

To switch to another G2 process, select its message from this list. In a few seconds, *twtour.kb* reroutes your Telewindows connection to the selected G2.

Using the Describe Dialog

The Describe dialog displays information about the g2-window item in the connected G2's KB that represents your present Telewindows connection.

Using the Windows Dialog

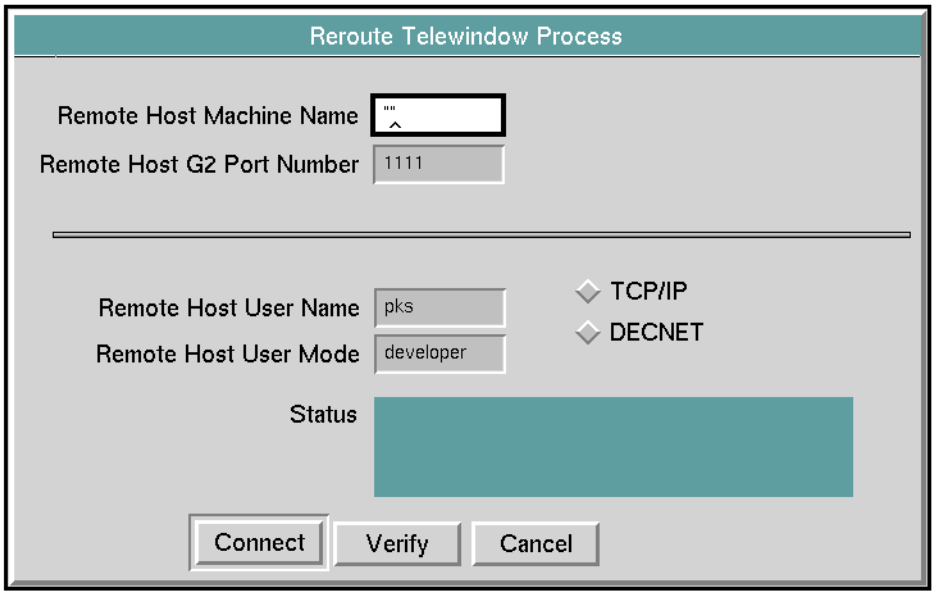
The Windows dialog lists information about each connected Telewindows process (that is, represented as a g2-window item in the connected G2's KB) that is logged in to the G2 where your Telewindows is also connected.

Using the Go Back Operation

Press the Go Back Operation button to reroute your Telewindows connection to the G2 where it was previously connected. If there was no previous G2 connection, this button appears dimmed.

Using the Manual Dialog

In the Manual dialog you can reroute your Telewindows connection to the computer and the network port that you enter, in the Remote Host Machine Name and Remote Host G2 Port Number fields, respectively.



The Manual dialog demonstrates the kinds of information that the connected G2 requires to reroute the information in a g2-window item to the next G2.

After the Manual dialog determines that the status of the specified G2 process is OK (and the status is displayed in the Manual dialog's Status box), the Manual dialog's Connect button reroutes your Telewindows connection to that G2.

Using the History Dialog

Using the History dialog lists, you can reroute your Telewindows connection to another G2 by selecting from a list of the G2s already visited during this Telewindows session. Select one of the displayed messages and press the Reroute button.

Using the Close TW Dialog

The Close TW dialog lets you confirm that you want to end your Telewindows connection.

Part II

Using Embedded Telewindows

Chapter 5: Using the Telewindows Netscape Plugin

Describes how to embed Telewindows as a plugin application that you can access from a Web page.

Chapter 6: Using the Telewindows ActiveX Control

Describes how to use the Telewindows ActiveX control.

Chapter 7: Using the WorkspaceView ActiveX Control

Describes how to use the WorkspaceView ActiveX control.

5

Using the Telewindows Netscape Plugin

Describes how to embed Telewindows as a plugin application that you can access from a Web page.

Introduction

You can embed Telewindows as a Netscape plugin on both Windows and UNIX platforms, presenting a live Telewindow that is displayed as part of a Web page. Once such a Web page is visible, use the embedded Telewindow to accomplish any tasks you would otherwise complete through a standard Telewindows connection. G2 must already be running to use a Telewindows plugin.

The plugin logs its output to a unique log file, whose name begins with *ntw*. The plugin creates the log file in the directory declared by the *TMPDIR* environment variable, if it exists; otherwise, it creates it in the */tmp* directory.

The Telewindows plugin requires Netscape Navigator Version 4.0 or higher. For further information on plugins, refer to your Netscape documentation.

Additional Requirements and Issues

For a Telewindows plugin to operate correctly:

- The Telewindows process must be able to create TCP/IP connections freely. In an Internet environment, certain firewall security restrictions could prevent socket connections.
- The G2 process to which the Telewindows plugin is connecting must be up and running to prevent Telewindows from hanging until the connection attempt times out.

Printing Telewindows from Netscape

If you can print through a standard Telewindows connection on your system, you can also print when you access an embedded Telewindows on a Web page.

Note You cannot print the contents of an embedded Telewindows' window through the Netscape print facility.

Configuring the Netscape Plugin

Use the following instructions to embed Telewindows into Netscape, using the *nptwplug.dll* plugin. The Netscape plugin is installed in the same directory as the *tw.exe*. The Telewindows Netscape plugin runs in Netscape Version 4.x and 6.x.

Note When running Netscape 4, you do not need to copy the *nptwplug.dll* file to the *Plugins* directory, as specified in the instructions. Instead, you can specify any directory to hold plugins by using the *NPX_PLUGIN_PATH* environment variable; however, you should specify a directory that contains only plugins. Note that this environment variable is deprecated in Netscape 6.2.

To configure the Netscape plugin for Telewindows:

1. Copy and paste the *nptwplug.dll* file from the *g2* directory of your G2 product directory to the *Plugins* directory in your Netscape product directory.
2. Configure the *TW_HOME_FOR_PLUGIN* environment variable to point to the directory location of the Telewindows executable.

   The directory location for a typical installation is:

   Windows: *c:\Program Files\Gensym\g2-2015\g2*

   UNIX: */usr/gensym/g2-2015/g2/*

You can specify just a directory or a complete path to the executable itself. In either case, the value of the variable must be an absolute path. If you do not specify a file name, the environment variable assumes the executable is named *tw.exe* on Windows and *tw* on UNIX.

If you do not configure this environment variable, the plugin looks for the first occurrence of the Telewindows executable in your *PATH* environment variable.

3 Launch a text editor and enter the following text exactly as written (the file format is case sensitive), substituting values for the arguments to the *embed* and *tw_cmd_line* commands:

```
<html>
<head>
</head>
<body>
<p>
<H1> Heading here if desired. </h1>
</p>
<hr>
<center>
<embed type=application/x-telewindows width="pixels"
height="pixels" tw_cmd_line="g2-machine-name g2-port-number
-log filename">
</center>
</body>
</html>
```

The *width* and *height* arguments to the *embed* command determine the dimension of the window that Netscape creates on the page, as well as the dimensions of the Telewindows plugin within that page.

Note For backward compatibility, on Windows platforms, you can specify *-width* and *-height* command-line arguments to the *tw_cmd_line* command to determine the width of the Telewindows plugin within the page. However, this practice is not recommended and has been superseded; the plugin is now always the same size as the window. These arguments are not supported on UNIX platforms.

Tip Specifying the *-log* command-line argument is for Windows platforms only and prevents the command window from appearing in front of the Web page while each embedded Telewindows' window is launched.

You can provide any Telewindows command-line options following the *tw_cmd_line* command, for example, *-mag 0.5*, which displays workspaces at half scale. For more information, see Appendix A, Launching a Telewindows Process.

For example, here is a sample *embed* command, which connects to a G2 process running on the Windows machine named *helpdesk* at port *1300*:

```
<embed type=application/x-telewindows width="600" height="400"
tw_cmd_line="helpdesk 1300 -log c:\temp\twlog.log -mag 0.75>
```

4. Save the file as an *.htm* file with whatever name you want, to the directory location of the Netscape executable, for example, *tw.htm*.
5. Launch Netscape and enter "about:plugins" in the Location field to confirm the existence and location of the Telewindows plugin named *nptwplug.dll*.
6. Choose Open Page from the File menu and open the file created in step 4.

The Telewindows should launch. You can make a bookmark for this page.

6

Using the Telewindows ActiveX Control

Describes how to use the Telewindows ActiveX control.

Introduction

You can run the Telewindows ActiveX control inside of any Microsoft COM-compliant container, such as Internet Explorer or Visual Basic.

Note The Telewindows ActiveX control only works with Microsoft Internet Explorer, Version 4.0 or higher. We recommend that you use Version 5.5 or higher.

When embedded in a browser, the Telewindows ActiveX control automatically registers the control and determines the location of the Telewindows executable. When viewed through a browser or any COM-compliant container, the control appears as a single window in which you can display multiple workspaces. The control uses standard popup menus, a standard selection-style user interface, and standard mouse gestures, key bindings, and shortcut keys.

Note Unlike Telewindows, the Telewindows ActiveX control does not provide a developer menu bar or status bar. Otherwise, the control behaves exactly like Telewindows, as described in Using Telewindows.

The control provides properties and methods that allow you to:

- Connect to a G2 running at a particular host and port.
- Set the user mode, user name, and password.
- Provide an initialization string as a command-line argument.
- Specify the window class to use for displaying workspaces.
- Explicitly specify the location of the Telewindows executable, if needed.
- Specify a standard or classic user interface.
- Create the connection.

For example, to run Telewindows in Internet Explorer, you could create an HTML page that defines the ActiveX control as an object, sets its properties, then calls a method to connect to G2. Once you have written the HTML page, you would start G2 on the specified host and port, then open the HTML page to create the connection. Similarly, you could embed the Telewindows control within a Visual Basic form, then create text boxes for specifying the properties of the control and a button that establishes the connection. Once the connection exists, you can run Telewindows from within the container, just as you would any normal Telewindows.

Using the Telewindows ActiveX Control in Internet Explorer

To use the Telewindows ActiveX control in Internet Explorer, the control must be registered. Registration happens automatically the first time you launch an HTML file that references the control.

Gensym provides an HTML file that you can use to register the control initially. You can also write your own HTML file that registers the control, using a URL. If necessary, you can also register and unregister the control manually.

Caution Depending on your security settings, Microsoft displays a Security Warning dialog the first time you display the control in a Browser, which indicates that Gensym asserts that the contents are safe. However, because G2 provides the ability to spawn any command on the command line, you should only use the control to run G2 applications that you know are safe.

Registering the Control Initially

Gensym provides an HTML file that automatically registers the ActiveX control. This file registers the newest version of the *TwControl.cab* file from the default installation directory.

To use the Telewindows ActiveX control in Internet Explorer:

➔ Launch the *install.html* file, which is located in your Telewindows product installation directory.

For a description of this file, see Installing the Telewindows ActiveX Control.

Registering the Control from a URL

Typically, you write your own HTML code that registers the control from the internet, from a local intranet, or from a local file system. Here are some examples:

http://www.mycompany.com/plugins/TwControl.cab

ftp://ftp.mycompany.com/plugins/TwControl.cab

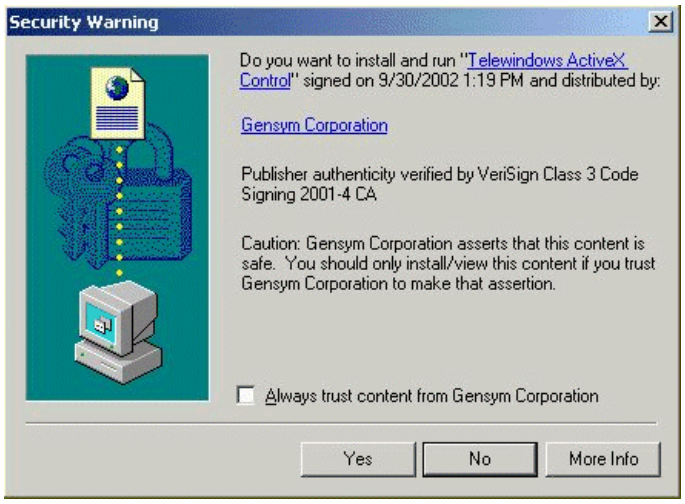
c:\Program Files\Gensym\g2-2015\g2\TwControl.cab

..\..\TwControl.bat

TwControl.cab

You refer to the URL or file when specifying the *codebase* in your Web page, which registers the control. For examples, see Sample HTML Pages.

Depending on the security settings in your browser, the following dialog appears when you launch the HTML file:



To register the control, click the Yes button.

If the control is already registered, Microsoft displays a confirmation dialog asking if you want to register the newer version of the control. This confirmation only appears when registering the control from the internet or from an intranet; it does not appear when registering the control from the local file system.

Note If you have an earlier version of the control registered that you prefer to use, edit the version number of the control in the HTML file. For details, see Install.html Code.

Registering the Control Manually

If necessary, you can register the control manually, using a batch file. This file registers the *TwControl.ocx* file from the default installation directory.

To register the Telewindows ActiveX control manually:

➔ Run this file, located in your Telewindows product installation directory:

registerTwControl.bat

Unregistering the Control

If necessary, you can unregister the control manually, using a batch file. You might need to do this for testing the registration of the control from a new location, such as an FTP site.

To unregister the Telewindows ActiveX control:

1. Close all clients that are currently displaying the control.
2. Run this file, located in your Telewindows product installation directory:

   unregisterTwControl.bat

Specifying the Location of the Telewindows Executable

The Telewindows ActiveX control automatically creates an entry in the registry for the location of the Telewindows executable. You can also specify the location of the executable manually, using a property of the control or an environment variable. You might need to specify the location if you have moved the Telewindows executable to a different location, or if you want to test a different version of Telewindows with the control.

The Telewindows ActiveX control works only with Telewindows (*tw.exe*); it does not work with Telewindows Next Generation (*twng.exe*).

The control looks for the Telewindows executable in these locations, in this order:

1. *TwLocation* property of the control, described in Properties.
2. *TW_HOME_FOR_ACTIVEX* environment variable, for example:

   ```
   c:\Program Files\Gensym\g2-2015\g2\
   ```

   You can specify just a directory or a complete path to the executable itself.
3. If you are registering the control through a Web page, the directory in which the *TwControl.cab* file is installed.
4. The following hard-coded path:

   ```
   c:\Program Files\Gensym\g2-2015\g2\tw.exe
   ```

Properties

The Telewindows ActiveX control uses the following properties when the *ConnectToG2* method is called. Although you can set these properties when Telewindows is connected, they have no effect on the current Telewindows connection. For example, resetting the port when a connection already exists does not reroute the Telewindows connection to the new port. Instead, the new port would be used the next time a connection is attempted.

Property	Description
InitString	The value of the *-init-string* command-line argument to use when launching Telewindows, as a string. This argument is assigned to the g2-window-initial-window-configuration-string attribute of the g2-window item that is created when the connection is made. G2 can use this argument, as needed, to identify the Telewindows connection. For example: "*twcontrol*" See Refresh Behavior.
LaunchBackground	The background color of the Telewindows window.

Property	Description
LaunchHost	The host name of the G2 to which to connect, as a string, for example: "*myhost*" The host name can also be an IP address, for example: "*1.0.0.1*"
LaunchPassword	The password to use when logging in to G2, as a string, for example: "*112760*"
LaunchPort	The port at which G2 is running, as a string, for example: "*1234*"
LaunchUi	The type of user interface to use, specified as a string. The options are: • *standard* • *classic* By default, the control uses standard popup menus, standard selection behavior, and standard mouse gestures, key bindings, and shortcut keys. This behavior corresponds to a *LaunchUi* of *standard*. The *classic* option uses G2 classic popup menus, and classic mouse gestures, key bindings, and shortcut keys. The *LaunchUi* property has no default value.
LaunchUserMode	The user mode to use when logging in to G2, as a string, for example: "*user*"
LaunchUserName	The user name to use when logging in to G2, as a string, for example: "*tasha*"

Property	Description
LaunchWindow	The class of window to use for the control, specified as a string. The options are: • *g2-window* • Any g2-window subclass defined in the G2 to which the control is connecting By default, the control uses a G2 window, whereby multiple workspaces appear in a single window, without scrollbars. This behavior corresponds to a *LaunchWindow* of *g2-window*. The *LaunchWindow* property has no default value.
LogFile	The directory location of the log file to use, or *false*, to disable logging, for example: "*c:\Program Files\Gensym\g2-2015\g2\tw-control-log.txt*" You can specify an absolute or relative path.
Splashtime	The minimum number of seconds to display the Telewindows splash screen before connecting to G2, as an integer. By default, the splash screen always appears. To eliminate it, set this property to *0*.
TwLocation	The directory location of *tw.exe*, the Telewindows executable, as a string, for example: "*c:\Program Files\Gensym\g2-2015\g2*" You can specify just a directory or a complete path to the executable itself. **Note**: In some applications, you might need to use a backslash as an escape character, for example: "*c:\\Program Files\\Gensym\\g2-2015\\g2*" See Specifying the Location of the Telewindows Executable.

Methods

The *ConnectToG2* method establishes a connection to G2 at the network address specified by the *Host* and *Port* properties.

Visual Basic Syntax

ConnectToG2

Sample HTML Pages

Following are sample HTML pages that display the Telewindows ActiveX control.

The *install.html* file is located in the *g2* directory of your G2 installation directory and installs the control from its default location in the *g2* directory. This is the only HTML file that registers the control. For details, see Registering the Control Initially.

The other HTML files are located in the *g2\examples\html* directory. Once you have registered the control, you can launch the sample Web pages, *sample.html*, *classic.html*, and *twloc.html*. The sample Web pages require that you are running *g2\examples\kbs\twcontrol.kb* on the local host at port 1111.

Note that these sample pages provide a placeholder for the actual URL that you would use to register the control for your application. For details, see Registering the Control from a URL.

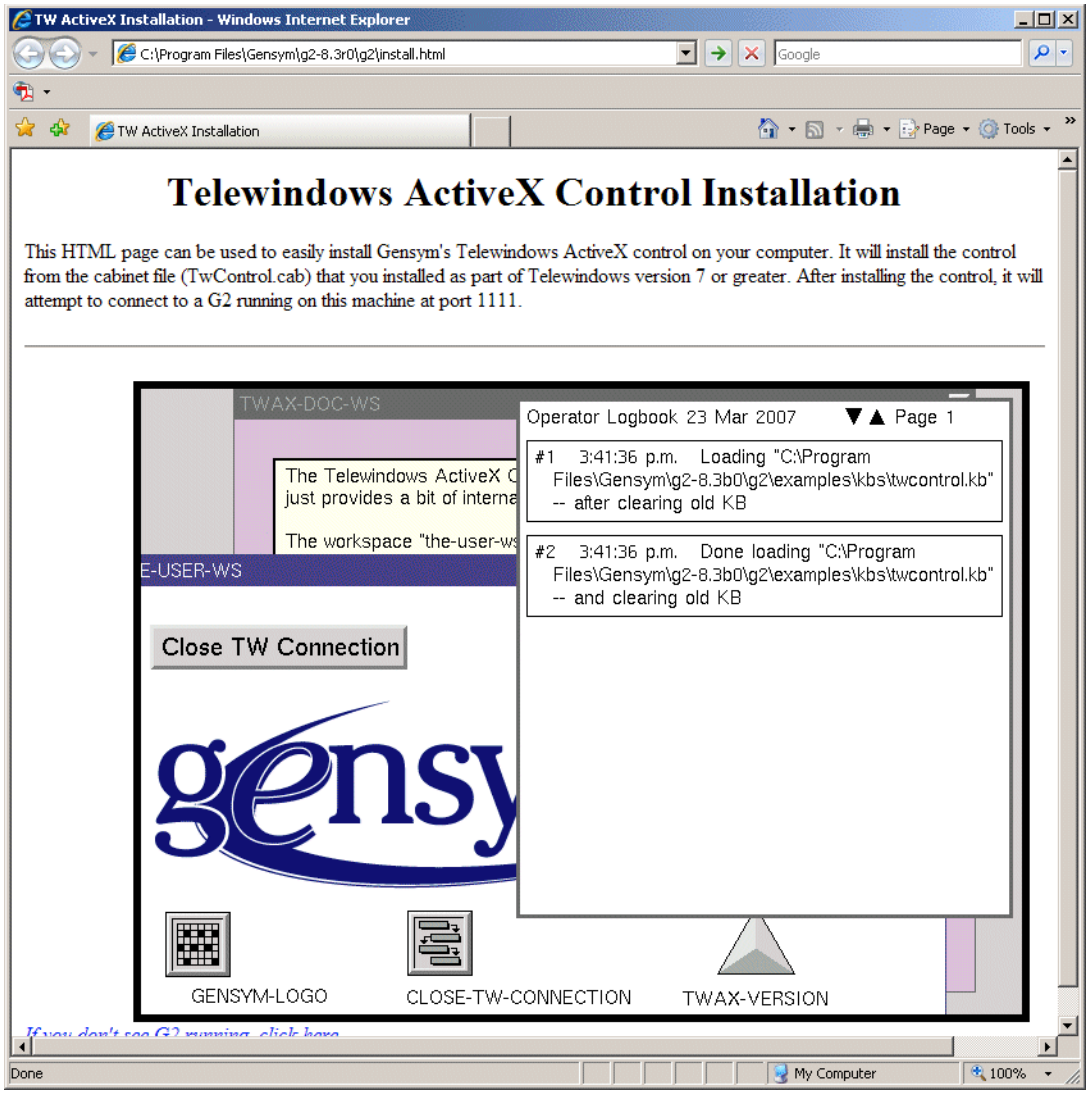
To run these examples, you must first start G2 on the local machine.

Sample HTML Page	Description
install.html	Installs the control from its default location and displays it in Internet Explorer. See Installing the Telewindows ActiveX Control.
sample.html	Displays the control, using the default G2 window. See Using a Default G2 Window.
classic.html	Displays the control, using the classic user interface. See Using Classic Telewindows.

Sample HTML Page	Description
twloc.html	Displays the control, specifying the location of the Telewindows executable explicitly. See Specifying the Telewindows Location.
diag-exe.html	Provides online help diagnosing problems when installing the control.

Installing the Telewindows ActiveX Control

This example shows the result of launching *install.html*, which registers the control from its default installation directory and displays the control in Internet Explorer. When the control is connected, it appears as a gray box with a thick black border. The control uses the default window type, which is equivalent to specifying the *LaunchUI* property as *standard*.



Install.html Code

Below is the HTML code that creates the Telewindows control in a Web page and connects to a G2 running on the local host at port 1111.

The elements of the code are:

- *CLASSID* specifies a unique ID for the control, using the *clsid* keyword. Your HTML file would use the same unique ID as the example:

  ```
  CLASSID="clsid:EC99E4EE-F5F1-4323-9829-06E9B0AFB934"
  ```

- *ID* identifies the instance of the Telewindows control, using any symbol, in this case, *WorkstationView*.
- *HEIGHT* and *WIDTH* define the number of pixels allocated for the control in the page.
- *HSPACE* defines the offset from the left side of the page, in pixels, for the control.
- *codebase* defines the URL of the control for registering on the local machine. You can provide a URL to a location on the internet, on your local intranet, or on your local file system. For examples, see Registering the Control from a URL.

  If the control is not already registered, Microsoft locates the control from the URL specified in the *codebase*, then registers and runs it locally. If the control cannot be found, it does not run in the Web page. If the control is already registered, Microsoft automatically registers the new version of the control.

  Your HTML code should refer to the control exactly as it is written in the example:

  ```
  codebase="TwControl.cab#Version=8,3,128,0"
  ```

  To use an earlier version, edit the version number in the HTML file.

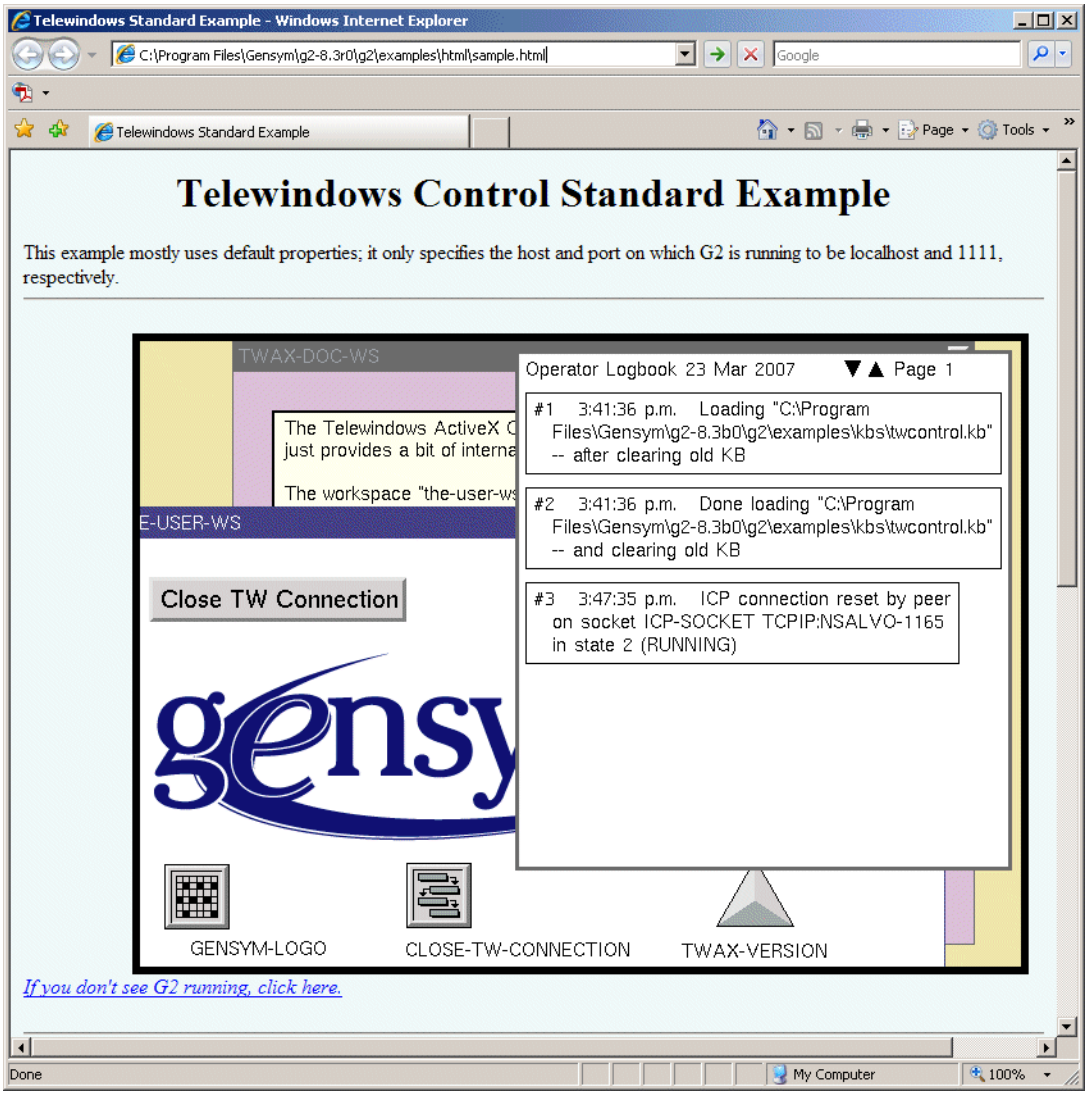
- *SCRIPT LANGUAGE* is always *VBScript*.
- *WorkstationView.LaunchHost*, *LaunchPort*, and *LaunchUI* set properties of the control.
- *WorkstationView.ConnectToG2* establishes the connection to G2 by calling a method on the object.

The portion of the HTML code that registers and launches the control looks like this:

```
<OBJECT CLASSID="clsid:EC99E4EE-F5F1-4323-9829-06E9B0AFB934"
   ID=WorkstationView HEIGHT=500 WIDTH=700 HSPACE=85
   codebase="TwControl.cab#Version=8,3,128,0">
</OBJECT>
<br><a href="examples/html/diag-exe.html"><i>If you don't see G2
running, click here.</i></a>

<SCRIPT LANGUAGE=VBScript>
WorkstationView.LaunchHost = "localhost"
WorkstationView.LaunchPort = "1111"
WorkstationView.LaunchUI = "standard"
WorkstationView.ConnectToG2()
</SCRIPT>
<!-- End TW code -->
```

Using a Default G2 Window

This example shows Telewindows running as a Web page inside of Microsoft Internet Explorer. The background of the control is *pale-goldenrod*, which you specify by using *LaunchBackground*. The figure shows the popup menu for the overall window.



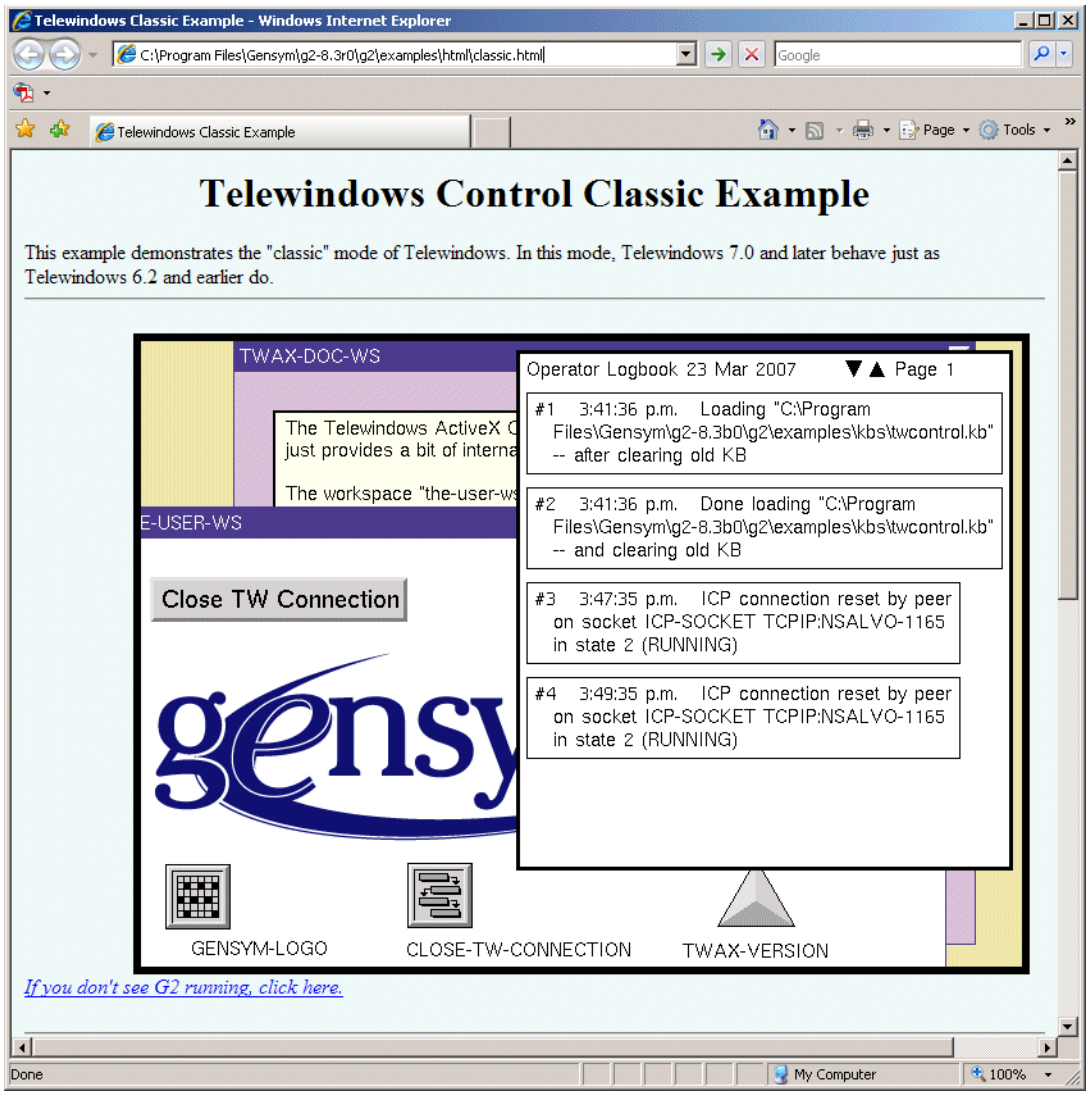
Sample.html Code

This code provides a placeholder URL for registering the control, which looks like this: *http://download.example.com/gensym/TwControl.cab#Version=8,0,128,0*. You would provide your own URL that points to the location of the control in your application. The code specifies *pale-goldenrod* as the background, using *LaunchBackground*.

```
<!-- Begin TW code -->
<!-- <text goes here>-->
<OBJECT CLASSID="clsid:EC99E4EE-F5F1-4323-9829-06E9B0AFB934"
   ID=WorkstationView HEIGHT=500 WIDTH=700 HSPACE=85
   codebase="http://download.example.com/gensym/
TwControl.cab#Version=8,3,128,0">
</OBJECT>
<br><a href="diag-exe.html"><i>If you don't see G2 running, click
here.</i></a>

<SCRIPT LANGUAGE=VBScript>
WorkstationView.LaunchHost = "localhost"
WorkstationView.LaunchPort = "1111"
WorkstationView.LaunchBackground = "pale-goldenrod"
WorkstationView.ConnectToG2()
</SCRIPT>
<!-- End TW code -->
```

Using Classic Telewindows

This figure shows Telewindows running in a Web page, using its classic user interface. Notice that the G2 Main Menu is classic G2.



Classic.html Code

This code specifies the *LaunchUI* property as *classic* which launches the control, using classic Telewindows.

```
<!-- Begin TW code -->
<!-- <text goes here>-->
<OBJECT CLASSID="clsid:EC99E4EE-F5F1-4323-9829-06E9B0AFB934"
   ID=WorkstationView HEIGHT=500 WIDTH=700 HSPACE=85
   codebase="http://download.example.com/gensym/
TwControl.cab#Version=8,3,128,0">
</OBJECT>
<br><a href="diag-exe.html"><i>If you don't see G2 running, click
here.</i></a>

<SCRIPT LANGUAGE=VBScript>
WorkstationView.LaunchHost = "localhost"
WorkstationView.LaunchPort = "1111"
WorkstationView.LaunchBackground = "pale-goldenrod"
WorkstationView.LaunchUI = "classic"
WorkstationView.ConnectToG2()
</SCRIPT>
<!-- End TW code -->
```

Specifying the Telewindows Location

Normally, the control locates the Telewindows executable automatically, as described in Specifying the Location of the Telewindows Executable. To specify the location explicitly, set the *TwLocation* property to the directory location of the *tw.exe* file.

To run this example, you must place a copy of the executable in the location specified in the example: *c:\tw-2015\tw.exe*.

```
<!-- Begin TW code -->
<!-- <text goes here>-->
<OBJECT CLASSID="clsid:EC99E4EE-F5F1-4323-9829-06E9B0AFB934"
   ID=WorkstationView HEIGHT=500 WIDTH=700 HSPACE=85
   codebase="http://download.example.com/gensym/
TwControl.cab#Version=8,3,128,0">
</OBJECT>
<br><a href="diag-exe.html"><i>If you don't see G2 running, click
here.</i></a>

<SCRIPT LANGUAGE=VBScript>
WorkstationView.TwLocation = "c:\tw-2015\tw.exe"
WorkstationView.LaunchBackground = "wheat"
WorkstationView.ConnectToG2()
</SCRIPT>
<!-- End TW code -->
```

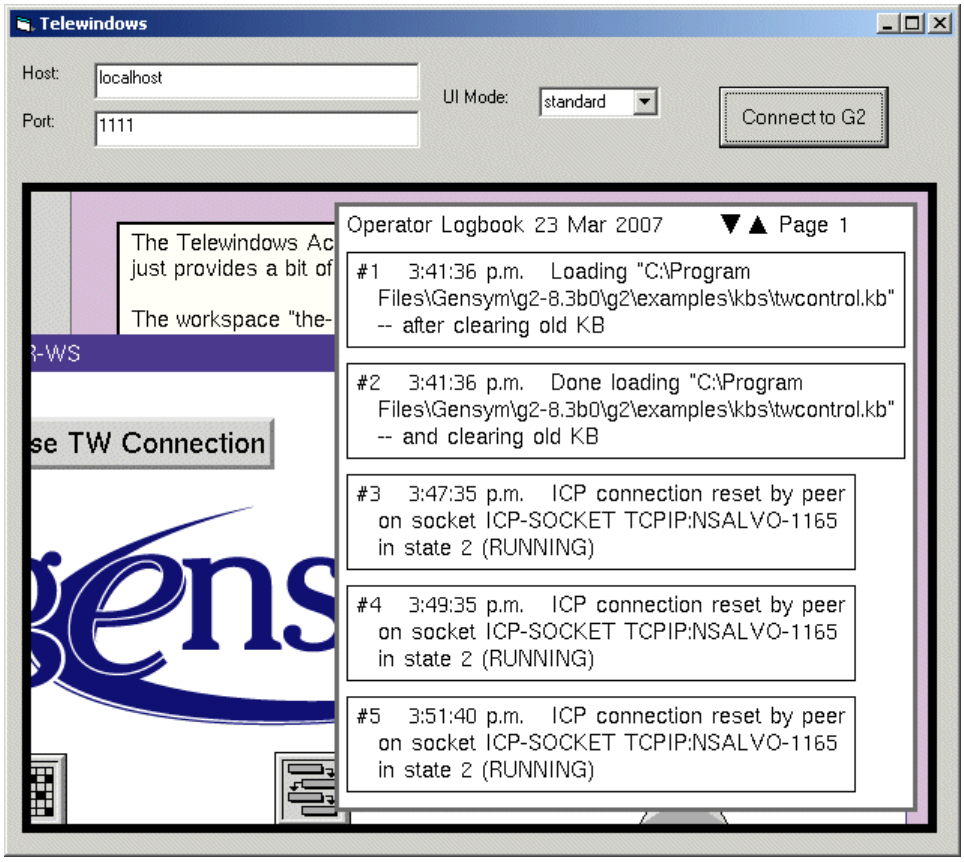
Refresh Behavior

When you refresh the HTML page, the Telewindows control is unloaded and reloaded, which creates a new Telewindows process, using the launch properties defined in the HTML file. While this behavior is consistent with the way any ActiveX control would behave, it may not be desirable.

You can use the *InitString* property as a way of showing the same workspaces when a Telewindows connection is disconnected and then reestablished. To do this, in G2, you would identify the connection by its init string, which G2 assigns to the g2-window-initial-window-configuration-string attribute of the g2-window, then show the same workspaces when a connection is reestablished, using the same init string.

Sample Visual Basic Form

This figure shows the Telewindows ActiveX control running inside of a Visual Basic form. The form allows you to set the host, port, and UI mode. The Connect to G2 button connects the control to the G2 running on the specified host and port, which is running *\g2\examples\kbs\twcontrol.kb*.

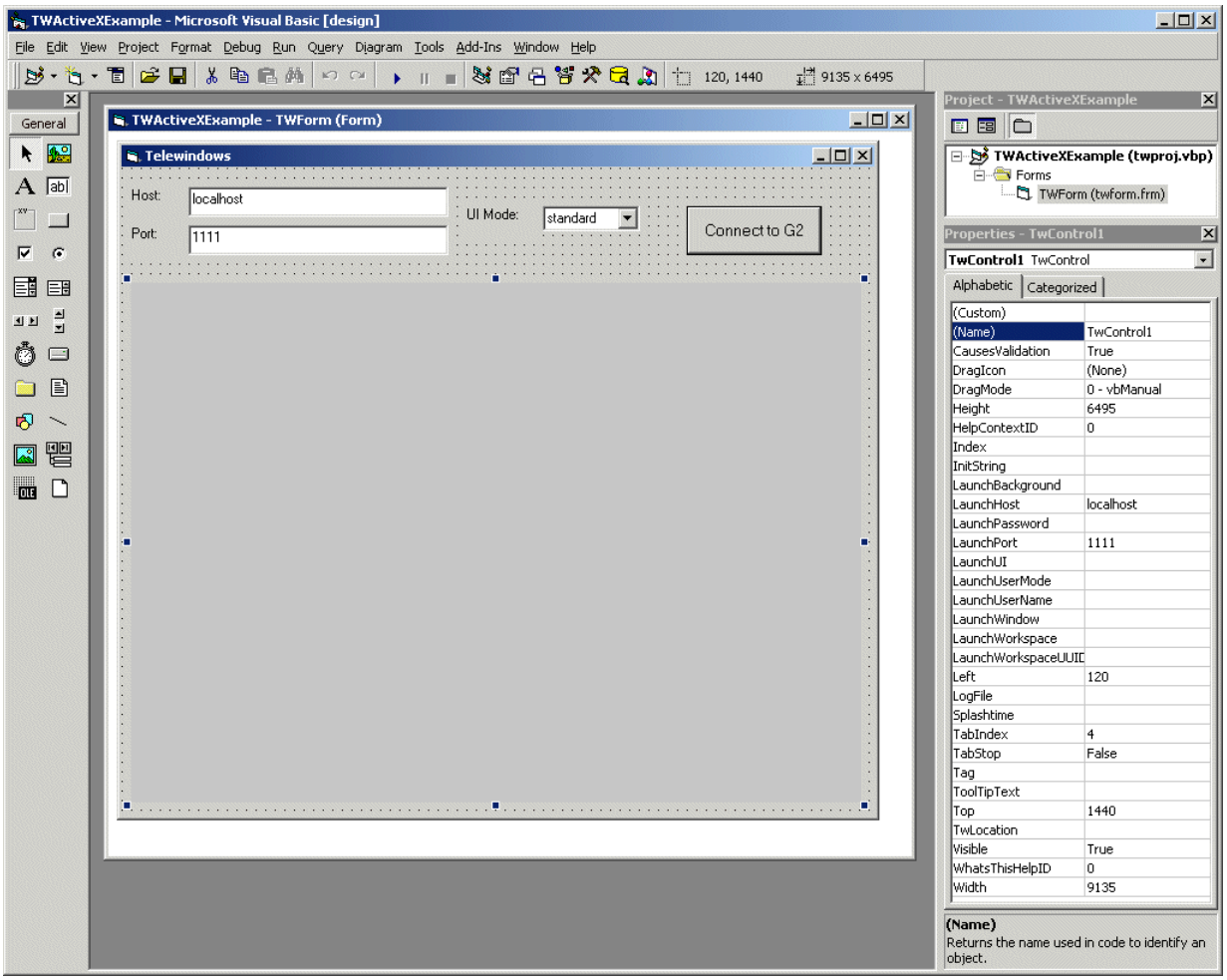


Following is a sample Visual Basic form that displays the Telewindows ActiveX control. You can access these examples in the *g2\examples\vb* subdirectory of your G2 installation directory:

Sample Files	Description
twform.frm *twform.frx* *twproj.vbp* *twproj.vbw*	Displays the control in a Visual Basic application. See Sample Visual Basic Form.

Visual Basic Form

Here is the Visual Basic project that places a *TwControl* control on the form. The form provides text boxes for specifying the *LaunchHost*, *LaunchPort*, and *LaunchUi* properties. It also provides a button that calls the *ConnectToG2* method on the control. The figure shows the properties table for the *TwControl*. G2 must be running before you can connect.



Visual Basic Code

Here is the code for the form, with the Telewindows ActiveX control properties:

```
Private Sub ConnectButton_Click()
  TwControl1.LaunchUI = UiComboBox.Text
  TwControl1.ConnectToG2
End Sub

Private Sub HostTextBox_Change()
  TwControl1.LaunchHost = HostTextBox
End Sub

Private Sub PortTextBox_Change()
  TwControl1.LaunchPort = PortTextBox
End Sub
```

7

Using the WorkspaceView ActiveX Control

Describes how to use the WorkspaceView ActiveX control.

Introduction

The `WorkspaceView` ActiveX control allows you to view KB workspaces inside Microsoft COM-compliant containers, such as Internet Explorer or Visual Basic.

Note The `WorkspaceView` ActiveX control only works with Microsoft Internet Explorer, Version 4.0 or higher. We recommend that you use Version 5.5 or higher.

The *WorkspaceView* control connects to the G2 server through a *G2Gateway* ActiveX control, which is available as part of G2 ActiveXLink. Before you can use the *WorkspaceView* control, you must register the *G2Com* DLL. You must also register the control.

Each *G2Gateway* connection that displays a workspace view starts an embedded Telewindows, without a top-level window, and, therefore, consumes a Telewindows license. Each *G2Gateway* can display multiple workspace views. You are restricted as to the number of connections you can make, based on the number of Telewindows licenses you have.

The control provides properties and methods that allow you to:

- Connect to a *G2Gateway* instance.
- Specify the name or UUID of a KB workspace to show in the view.

Registering the G2Com DLL

Because the *WorkspaceView* control communicates with the G2 server through G2 ActiveXLink, you must register the *G2Com.dll*.

To register the G2Com DLL:

➔ Run this file, located in the *activexlink* directory of your G2 Bundle installation directory:

runme.bat

Registering the Control

If necessary, you can register the control manually, using a batch file. This file registers the *WorkspaceView.ocx* file from the default installation directory.

To register the WorkspaceView control manually:

➔ Run this file, located in your Telewindows product installation directory:

registerWSV.bat

Unregistering the Control

If necessary, you can unregister the control manually, using a batch file. You might need to do this for testing the registration of the control from a new location, such as an FTP site.

To unregister the WorkspaceView control:

1. Close all clients that are currently displaying the control.
2. Run this file, located in your Telewindows product installation directory:

   unregisterWSV.bat

Specifying the Location of the Telewindows Executable

The *WorkspaceView* ActiveX control automatically creates an entry in the registry for the location of the Telewindows executable. You can also specify the location of the executable manually, using a property of the control or an environment variable. You might need to specify the location if you have installed Telewindows in a directory other than the default, if you have moved the Telewindows executable to a different location, or if you want to test a different version of Telewindows with the control.

The control looks for the Telewindows executable in these locations, in this order:

1. *TwLocation* property of the control, described in Properties.
2. *TW_HOME_FOR_ACTIVEX* environment variable, for example:

   c:\Program Files\Gensym\g2-2015\g2

   You can specify just a directory or a complete path to the executable itself.
3. In the Windows registry under this registry key:

   HKEY_LOCAL_MACHINE\SOFTWARE\Gensym\Telewindows
   8.3 Rev 0\installDir

   The value for this entry must be a directory, not a complete path to the executable itself.
4. The following hard-coded path:

   c:\Program Files\Gensym\g2-2015\g2\twng.exe

Properties

The *WorkspaceView* ActiveX control defines the following properties:

Property	Description
G2Gateway *As G2Gateway*	The *G2Gateway* control that establishes the connection to G2. The value of the property must be an instance of *G2Gateway*. See also the description of *ConnectToG2Gateway* in Methods.
LaunchUserMode	The user mode to use when logging in to G2, as a string, for example: "*user*"
LaunchUserName	The user name to use when logging in to G2, as a string, for example: "*tasha*"
LaunchPassword	The password to use when logging in to G2, as a string, for example: "*112760*"
LaunchWindow	The class of window to use for the control, specified as a string. The options are: • *g2-window* • Any g2-window subclass defined in the G2 to which the control is connecting By default, the control uses a G2 window, whereby multiple workspaces appear in a single window. This behavior corresponds to a *LaunchWindow* of *g2-window*. The *LaunchWindow* property has no default value.

Property	Description
TwLocation As String	The directory location of *twng.exe*, the Telewindows executable, as a string, for example: "*c:\Program Files\Gensym\g2-2015\g2*" You can specify just a directory or a complete path to the executable itself. **Note**: In some applications, you might need to use a backslash as an escape character, for example: "*c:\\Program Files\\Gensym\\g2-2015\\g2*" See Specifying the Location of the Telewindows Executable.

Property	Description
WorkspaceName As String	The named KB workspace to show when the control connects to the server, specified as a string. The workspace appears with its top-left corner in the top-left corner of the control. You can also use this property to show a workspace dynamically after the connection to the server has been established. If the workspace name is not known or the workspace is restricted, no workspace view is shown. Use either *WorkspaceName* or *WorkspaceUUID*, but not both. See also the description of *ShowWorkspaceWithName* in Methods.
WorkspaceUUID As String	The UUID of the KB workspace to show when the control connects to the server, specified as a string. The workspace appears with its top-left corner in the top-left corner of the control. You can also use this property to show a workspace dynamically after the connection to the server has been established. To determine the UUID of a workspace, set the show-uuids-in-attribute-tables attribute of the Miscellaneous Parameters system table to yes, then show the table of the workspace to show, or refer to the uuid attribute directly. The UUID is a string composed of 32 consecutive hexadecimal digits (0-9, a-f, A-F) with no internal punctuation except hyphens. The UUID is not case sensitive. If the UUID is not known or if the workspace is restricted, no workspace view is shown. Use either *WorkspaceName* or *WorkspaceUUID*, but not both. See also the description of *ShowWorkspaceWithUUID* in Methods.

Note The launch properties of the first workspace view to make a connection determine the user name, user mode, password, and window to use when making the connection. To ensure that certain launch properties are used for all connections, specify the same launch properties in all workspace views.

Note When using the *WorkspaceView* ActiveX control in a COM application, such as a Visual Basic dialog, the workspace view does not repaint when it is dragged outside of the visible screen area and then back. The workspace view shows gray areas and lines instead of a G2 workspace. To fix this problem, set the *ClipChildren* property to *true* in the container in which the *WorkspaceView* control appears.

Methods

The *WorkspaceView* control supports these methods:

ConnectToG2Gateway ***G2Gateway***

Establishes a connection to G2 through an instance of a *G2Gateway* control and sets the *G2Gateway* property.

If multiple workspace views make a call to *ConnectToG2Gateway*, the first workspace view that tries to connect starts Telewindows. Subsequent calls to *ConnectToG2Gateway* use the existing Telewindows.

For information about the *G2Gateway* control, see the *G2 ActiveXLink User's Guide*.

ShowWorkspaceWithName ***WorkspaceName***

Shows a named KB workspace in the *WorkspaceView* control and sets the *WorkspaceName* property. ***WorkspaceName*** is a text string that names an existing workspace in the connected G2.

ShowWorkspaceWithUUID ***WorkspaceUUID***

Shows a workspace in the *WorkspaceView* control and sets the *WorkspaceUUID* property. ***WorkspaceNUUID*** is a text string that provides the UUID of an existing workspace in the connected G2.

System Procedures

A *WorkspaceView* control is associated with a GSI interface through its connection with G2 ActiveXLink, as well as a G2 window through its connection with Telewindows.

You use the following API procedures to get the G2 window and GSI interface associated with the *WorkspaceView* control. These procedures appear on the g2-dialog-api subworkspace of the user-interface-operations-procedures workspace of G2 System Procedures.

g2-ui-get-associated-g2-window
(*gsi-interface*: class gsi-interface)
-> *g2-window*: class g2-window

Returns the g2-window associated with the gsi-interface for the *WorkspaceView* control.

g2-ui-get-associated-gsi-interface
(*g2-window*: class g2-window)
-> *gsi-interface*: class gsi-interface

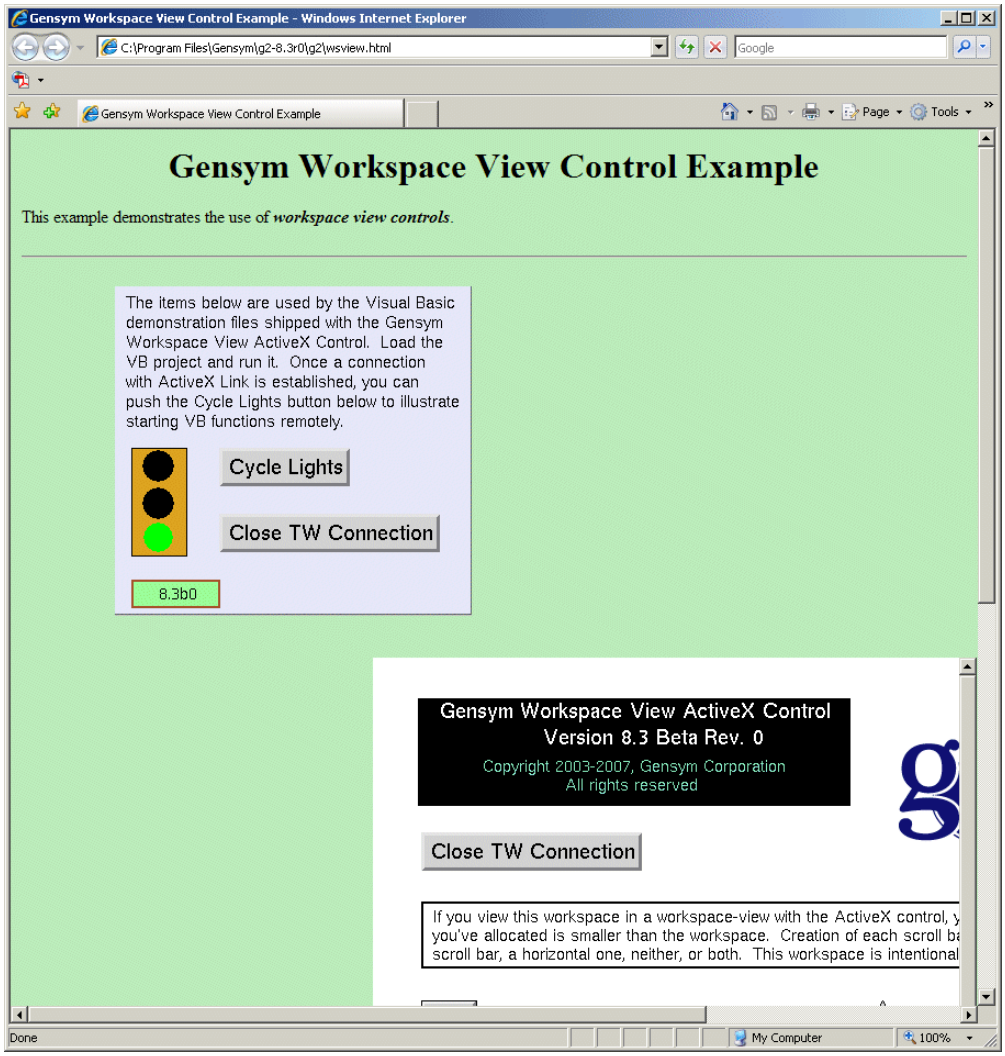
Returns the gsi-interface associated with the g2-window for the *WorkspaceView* control.

Sample HTML Page

This figure shows two workspace views as ActiveX controls inside a web page. The HTML page connects to G2 running on the local host at port 1112 through a `G2Gateway`. Each workspace view connects to G2 through the `G2Gateway` and displays a workspace.

Opening the HTML page creates a connection to Telewindows, which you can close by clicking one of the Close TW Connection buttons.

The HTML page requires that the `wsvdemo.kb` be running on the local G2 on port 1112. The HTML page is called `wsview.html`. Both files are located in the `g2` directory of your G2 Bundle installation directory.



Notice that the lower workspace view contains scrollbars because the workspace is larger than the specified height and width.

HTML Code

Here is the relevant HTML code with the *WorkspaceView* control class ID and related properties. *Gateway1* is the *G2Gateway* instance, which connects to the G2 running on the local host at port 1112.

WorkspaceView1 and *WorkspaceView2* are instances of the *WorkspaceView* control, as identified by the unique class ID:

```
CLASSID=clsid:AC4C85D0-B16C-11d1-A718-006008C5F933"
```

WorkspaceView1 sets the *WorkspaceName* property to the KB workspace named *ACTIVEX-DEMO-WS*. *WorkspaceView2* sets the *WorkspaceUUID* property to the KB workspace with the given UUID.

Each workspace view calls the *ConnectToG2Gateway* method with *Gateway1* as the *G2Gateway* argument.

This HTML code requires that *wsvdemo.kb* is loaded on the local G2 running on port 1112. The HTML code is located in *wsview.html*. Both files are located in the *g2* directory of your G2 Bundle installation directory.

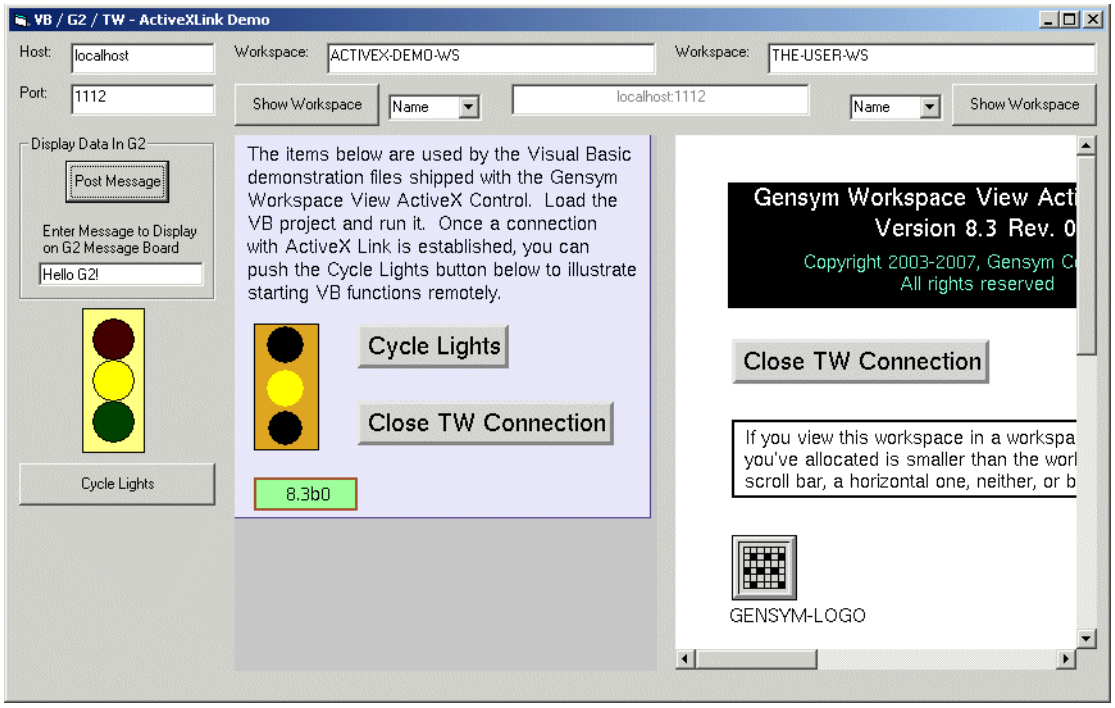
```
<!-- Begin Gensym code -->
<OBJECT CLASSID="clsid:AC4C85D0-B16C-11d1-A718-006008C5F933"
ID=Gateway1>
</OBJECT>

<OBJECT CLASSID="clsid:A02C8A0F-46E9-450f-B173-FBC85F1F5E91"
   ID=WorkstationView1 HEIGHT=300 WIDTH=325 HSPACE=85>
</OBJECT>
<P>
<br>

<OBJECT CLASSID="clsid:A02C8A0F-46E9-450f-B173-FBC85F1F5E91"
   ID=WorkstationView2 HEIGHT=650 WIDTH=550 HSPACE=320>
</OBJECT>

<SCRIPT LANGUAGE=VBScript>
Gateway1.G2Location = "localhost:1112"

WorkstationView1.WorkspaceName = "ACTIVEX-DEMO-WS"
WorkstationView2.WorkspaceUUID =
"98136ed72a6211d68ff80080e9028c67"

WorkstationView1.ConnectToG2Gateway(Gateway1)
WorkstationView2.ConnectToG2Gateway(Gateway1)
</SCRIPT>
<!-- End TW code -->
```

Sample Visual Basic Form

This figure shows two *WorkspaceView* controls running inside of a Visual Basic form. The VB form connects to G2 running on the specified host and port through a *G2Gateway*. Each workspace view connects to G2 through the *G2Gateway* and displays a workspace either by name or by UUID.

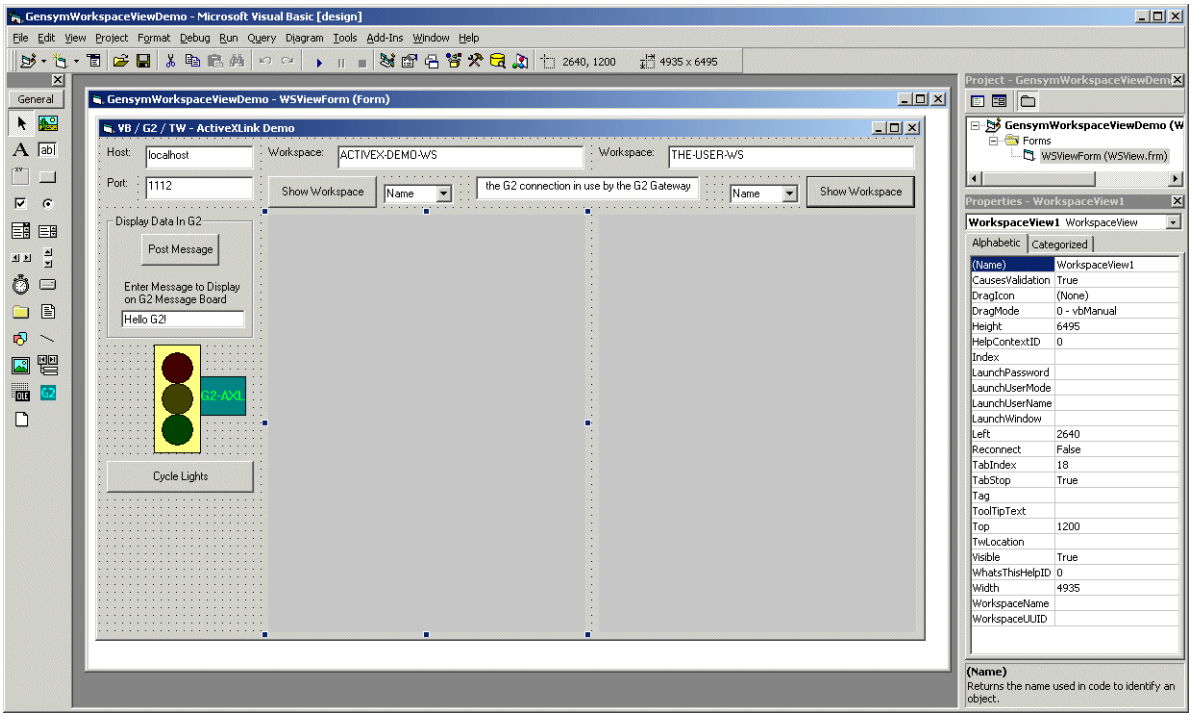
Displaying the form creates a connection to Telewindows, which you can close by clicking one of the Close TW Connection buttons.

To run the VB form requires that *wsvdemo.kb* be running on the local G2 on port 1112. The VB project is called *WorkspaceViewDemo.vbp* and the corresponding executable is called *WorkspaceViewDemo.exe*. All files are located in the *g2* directory of your G2 Bundle installation directory.



Visual Basic Form

Here is the Visual Basic form that places the *WorkspaceView* controls on the form. The properties of the *WorkspaceView* control appear in the properties window to the right.



Visual Basic Code

Here is code that establishes the *G2Gateway* connection for each workspace view by setting the *G2Gateway* property of each workspace view to *G2Gateway1*. It also loads a default workspace for each workspace view by setting the *WorkspaceName* property for each workspace view to the value of the associated text box.

```
Private Sub Form_Load()
    ...
    GatewayConnection.Text = HostTextBox.Text + ":" + PortTextBox.Text
    G2Gateway1.G2Location = GatewayConnection.Text
    WorkspaceView1.WorkspaceName = WSNameBox1.Text
    WorkspaceView2.WorkspaceName = WSNameBox2.Text
    WorkspaceView1.G2Gateway = G2Gateway1
    WorkspaceView2.G2Gateway = G2Gateway1
    ...
End Sub
```

```
Private Sub WSNameBox1_Change()
  If PreferUUID1.Text = "UUID" Then
    WorkspaceView1.WorkspaceUUID = WSNameBox1.Text
  Else
    WorkspaceView1.WorkspaceName = WSNameBox1.Text
  End If
  ConnectWS1.Default = True
```

```
End SubPrivate Sub WSNameBox2_Change()
  If PreferUUID2.Text = "UUID" Then
    WorkspaceView2.WorkspaceUUID = WSNameBox2.Text
  Else
    WorkspaceView2.WorkspaceName = WSNameBox2.Text
  End If
  ConnectWS2.Default = True
End Sub
```

This code sets the *WorkspaceUUID* or *WorkspaceName* property of the *WorkspaceView1* control to the value given in the associated text box:

```
Private Sub PostMessageBtn_Click()
  G2Gateway1.PostMessage MessageToPost.Text
End Sub
```

```
Private Sub WSNameBox1_Change()
  If PreferUUID1.Text = "UUID" Then
    WorkspaceView1.WorkspaceUUID = WSNameBox1.Text
  Else
    WorkspaceView1.WorkspaceName = WSNameBox1.Text
  End If
  ConnectWS1.Default = True
End Sub
```

This code dynamically shows the workspace specified in the associated text box when the user clicks the associated Show Workspace button:

```
Private Sub ConnectWS1_Click()
  If PreferUUID1.Text = "UUID" Then
     WorkspaceView1.ShowWorkspaceWithUUID WSNameBox1.Text
  Else
     WorkspaceView1.ShowWorkspaceWithName WSNameBox1.Text
  End If
End Sub
```

```
Private Sub ConnectWS2_Click()
  If PreferUUID2.Text = "UUID" Then
     WorkspaceView2.ShowWorkspaceWithUUID WSNameBox2.Text
  Else
     WorkspaceView2.ShowWorkspaceWithName WSNameBox2.Text
  End If
End Sub
```

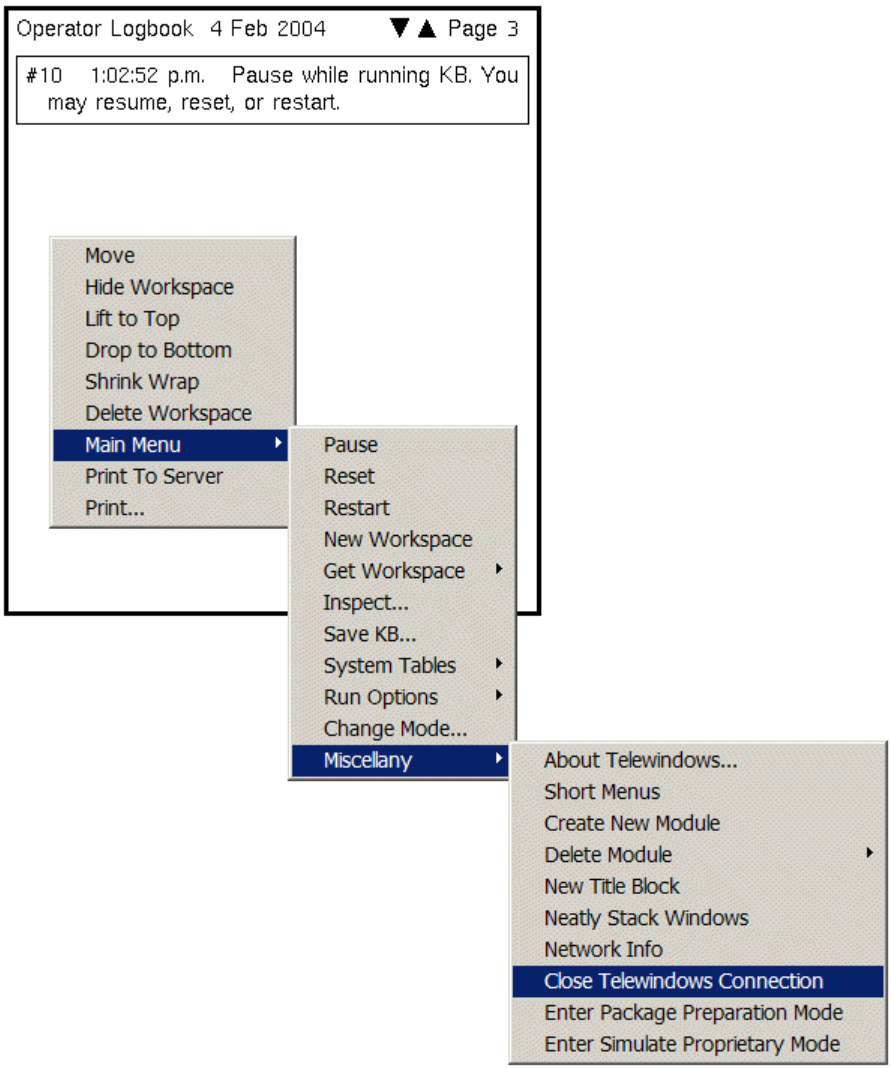
Disconnecting from Telewindows

When a *WorkspaceView* control shows a workspace by connecting to G2 through a *G2Gateway*, it launches an embedded Telewindows without a top-level window.

You disconnect from Telewindows by shutting down the process that displays the workspace view control or by shutting down the server. You can also provide a button in your application or web page that disconnects from Telewindows. For an example, see Sample HTML Page.

Because Telewindows runs without a top-level window and workspace views can contain a single workspace only, other workspaces, such as an attribute table, the Text Editor, G2 logbook pages, the Message Board, and Inspect, all appear as top-level windows in the Windows task bar. You can configure your application so that the logbook and message board do not appear when running Telewindows without a window.

For example, to disconnect Telewindows from a G2 Logbook page, choose Main Menu > Miscellany > Close Telewindows Connection on the top-level logbook page, as follows:



A

Launching a Telewindows Process

Describes techniques and command-line options for launching a Telewindows process.

Introduction

This appendix contains reference information about starting Telewindows and specifying arguments that configure its startup and execution. This information is essentially the same for all platforms; minor variations between platforms are noted where appropriate.

Some techniques for starting Telewindows are platform dependent. For details on such techniques, see the `readme-g2` file and the *G2 Bundle Release Notes*. Be sure to consult these documents if you have any trouble starting.

You can use this information to:

- Start Telewindows.
- Identify the operating system environment within which executes.
- Specify how utilizes certain of the computer's resources, such as the initial size of memory pools.

- Configure execution in various other ways.

Note In this appendix, the term Windows refers to any version of Microsoft Windows on which runs.

Starting the Telewindows Process

You can start a Telewindows process by entering an appropriate operating system command, using a command window or any other interface available on your platform. The default name of the executable file is:

- Windows: *twng.exe* (Telewindows Next Generation) or *tw.exe* (Telewindows)
- UNIX: *tw* (Telewindows)

See the *readme-g2.html* file for information about platform-dependent techniques for starting Telewindows.

Writing Standard Output Messages to a Log File

As a new process starts up, it creates standard output messages, which describe:

- The initial allocations for memory regions.
- Errors encountered while processing an authorization (OK) file.
- Errors that occur while trying to make contact with G2.

A process also displays standard output messages when it must attempt to allocate additional memory and when it detects an internal error. The location of the messages depends on the platform:

- Under UNIX, standard output messages are displayed in the command window from which you launched Telewindows. You can launch Telewindows with the *-log* command-line option to write standard output messages to the log file you specify. See *log*.
- Under Windows platforms, standard output messages are written to a log file. You have three options:
  - Launch Telewindows with the *-log* command-line option to write standard output messages to the log file you specify. See *log*.
  - Launch Telewindows without the *-log* command-line option to create a uniquely named log file in the directory specified by your *TEMP* environment variable.

- Launch Telewindows with the *-no-log* command-line option to write standard standard output messages to the command window and not in a log file. See *no-log*.

Using Command-Line Options

You can include one or more **command-line options** in the command that starts Telewindows. The syntax is:

```
tw [[hostname] [portname | portnumber] [option]...]
```

In command-line syntax summaries, brackets *[]* indicate optional elements, braces *{}* group elements, a vertical bar | separates alternatives, and an ellipsis (. . .) indicates zero or more repetitions of the preceding element.

The *hostname* and *portname* | *portnumber* indicate to Telewindows the G2 to which it is to connect. If you invoke Telewindows with no arguments, the default values are *localhost* and *1111*. These values connect Telewindows to a G2 running at the default port number on the same machine as the Telewindows.

If a *hostname* and/or a *portname* | *portnumber* are specified, they must appear before any command-line options.

Command-line options pass various kinds of information to a new process. Regardless of your computer's operating system, each command-line option must begin with the - (hyphen) character, as in this sample command line:

```
tw central 1111 -rgn1lmt 7500000
```

The command-line options can appear in any order. Some options require or allow an *argument*: a keyword, pathname, expression, or other value that specifies the exact meaning of the option.

Note When referring to pathnames with spaces on Windows platforms, you must surround the pathname with double quotes, for example, "*c:\Program Files\Gensym\g2-2015\g2*".

Supported Command-Line Characters

When you launch from the command line, interprets the command line as a string of 8-bit bytes representing Latin-1 characters. Any two-byte Unicode characters, such as Korean or Japanese characters, therefore become pairs of Latin-1 characters, and the command line is processed accordingly.

Using Environment Variables

Many command-line options have as counterparts a similarly named environment variable. For example, the *-v8ok* command-line option has a counterpart *TWV8_OK* environment variable.

If you start processes many times for similar purposes, setting environment variables once can be more convenient than specifying the same options in each command line.

Note If you specify a command-line option when its counterpart environment variable is already set, the command-line option setting takes precedence.

Dictionary of Command-Line Options

The rest of this chapter describes all command-line options in alphabetical order.

The description of each command provides the following sections.

Summary

A brief description of the option, to allow you to determine quickly whether it relates to your needs.

Platforms

The platforms on which the option is available. Most are available on all platforms.

Syntax

The syntax to use when specifying the option on the command line. In command line syntax summaries, brackets *[]* indicate optional elements, braces *{}* group elements, a vertical bar | separates alternatives, and an ellipsis (. . .) indicates zero or more repetitions of the preceding element.

Equivalent Environment Variable

You can also specify many options using environment variables. An environment variable automatically applies each time you start, obviating the need to specify a command-line option.

Description

A detailed description of the option and its effects.

Special Considerations

When needed, additional information to keep in mind when using the option.

Example

One or more applications of the option in a typical command line.

background

Changes the gray background of your local Telewindows window to a solid color or to a gray-and-white tiling pattern derived from a GIF or XBM image file you specify.

Platforms

All platforms

Syntax

`-background { color | file-path | gensym }`

color: A symbol that represents a supported G2 color.

file-path: A full pathname to a `.gif` or `.xbm` file to use as the background. If the pathname contains spaces, surround it with double quotes.

`gensym`: The G2 "bricks" background, which G2 used as background until Version 8.1.

Equivalent Environment Variable

None

Description

For a list of supported G2 colors, see "Identifying the G2 Color Palette" in Chapter 10 "G2 Items in the *G2 Reference Manual*.

For information on customizing the background pattern, see "Customizing the Gensym Background Pattern" in Chapter 2 "The Developer's Environment" in the *G2 Reference Manual*.

The image file must contain no more than 128x128 pixels.

On Windows platforms, you can specify a UNC network path as the *file-path*, such as `\\my-server\my-dir\`.

Examples

```
tw sitenode 1311 -background red
```

```
tw sitenode 1311 -background
"c:\Program Files\Gensym\g2-2015\tile.gif"
```

closebox

Controls whether the close box in the Telewindows window is enabled or disabled.

Platforms

Windows

Syntax

```
-closebox {enable | disable | default}
```

Description

When running Telewindows in the standard user interface mode (`-ui standard`), the close box in the upper-right corner of the Telewindows window is enabled. When running Telewindows in classic mode (`-ui classic`), the close box is disabled.

You can use this command-line option to disable or enable the close box, depending on the user interface mode.

The default value is `default`, which has the behavior described above.

cjk-language

Directs the new Telewindows process to use your specified Han character-style when displaying and printing ideographic, historically Chinese, Han characters.

Platforms

All platforms

Syntax

```
-cjk-language { chinese | japanese | korean }
```

Equivalent Environment Variable

None

Description

For documentation on the G2 Chinese-Japanese-Korean (CJK) language preference, see “Specifying a Han Character-Style Preference” in Chapter 40 “Natural Language Facilities” in the *G2 Reference Manual*.

Example

```
tw sitenode 1311 -cjk-language chinese
```

discard-user-settings

Directs Telewindows to discard any user information when it is rerouted.

Platforms

All platforms

Syntax

```
-discard-user-settings
```

Equivalent Environment Variable

None

Description

You can specify user information—user name, password, user mode, and language—in the Telewindows command line, obviating the need to type it into a login dialog. You can also edit the user information in the login dialog. By default, Telewindows retains the most recent settings even if it is rerouted, so that the user does not have to retype the information.

Specifying `-discard-user-settings` on the Telewindows command line causes Telewindows to discard all user information when it is rerouted, so that you must type the user information as required into a login dialog before Telewindows can connect to a secure G2.

Example

```
tw sitenode 1311 -discard-user-settings
```

display

Directs the new process to display its window on a platform running an X Windows server.

Platforms

UNIX

Syntax

To route the display to a platform via a TCP/IP network connection:

`-display` *machine-name :server-number .screen-number*

machine-name: Identifier of a machine running an X Windows server that communicates via a TCP/IP network connection.

server-number: Identifier of an X Windows server process on *machine-name*.

screen-number: Identifier of an X Windows virtual screen managed by X Windows server process *server-number* on *machine-name*.

Equivalent Environment Variable

`DISPLAY`

The `DISPLAY` environment variable for most window managers is usually configured, by default, to be "local host", server `0`, screen `0`. See your X Windows documentation for more information.

Description

This option allows you to display a process's window on a specific machine that runs an X Windows server, specified by its *machine-name*. Note that *machine-name* must already be assigned for each machine connecting to a network using TCP/IP transport protocol.

If you omit *machine-name*, the process assumes the local node is the destination. If you omit *screen-number*, it assumes screen `0`.

For more information see your platform's X Windows reference documentation.

Example

This command directs the new process to display its window on the X Windows server *1*, screen *1* running on machine *mynode*, reached via a TCP/IP network connection:

```
tw sitenode 1311 -display mynode:1.1
```

do-not-catch-aborts

When fetal errors happen, do not catch aborts and let Operating System take over.

Platforms

All platforms

Syntax

To stop catching aborts on TW startup:

```
-do-not-catch-aborts
```

Description

This option will disable all internal error trappings and let Operating System take over when fetal errors happen. This option could be useful if user need to generate core dumps for sending to G2 support team.

fonts

Identifies the directory that contains standard font files.

Platforms

All platforms

Syntax

```
-fonts fonts-directory-path
```

fonts-directory-path: Path, with trailing delimiter character, of a directory that contains standard font files.

Equivalent Environment Variable

```
FONTS
```

A directory path, with trailing delimiter character.

Description

Telewindows includes a set of standard font files. When a new process starts up, it expects by default to find the standard font files in a subdirectory named `fonts` under the home directory, that is, the directory where the executable is installed.

Use the `-fonts` option to direct to look for its standard font files in a custom location.

Special Considerations

The directory delimiter character to use as a trailing character depends on the platform:

- On UNIX platforms, include a trailing / (slash) character.
- On Windows platforms, include a trailing \ (backslash) character.

On Windows platforms, you can specify a UNC network path as the *fonts-directory-path*, such as `\\my-server\my-dir\`.

Example

On a Windows platform, this command starts a process and directs it to finds its standard font files in the directory `c:\fonts\custom-tw\fonts\`:

```
tw sitenode 1311 -fonts c:\fonts\custom-tw\fonts\
```

On a UNIX platform, this command starts a process and directs it to finds its standard font files in the directory */usr/kmm/custom-tw/fonts/*:

```
tw sitenode 1311 -fonts /usr/kmm/custom-tw/fonts/
```

fullscreen

Directs the new process to display its window so that it is the same size as the screen where it displays.

Platforms

All platforms

Syntax

```
-fullscreen
```

Equivalent Environment Variable

None

Description

If this option is omitted, the new process opens a window that is, by default, 90% of the size of the screen.

In contrast, on a Windows platform, the `-screenlock` command-line option displays window so that it is the same size as the screen *and* so that it cannot appear behind any other open window. See `screenlock`.

Special Considerations

Use of the `-fullscreen` option prevents viewing the window border and its selectable components that are managed by your platform's window manager that is, X Windows, DECwindows, or Windows.

Example

This command starts a process and displays its window so that its extent is the same size as the screen where it displays:

```
tw sitenode 1311 -fullscreen
```

geometry

For the window of a new process, specifies the dimensions in pixels and position as an offset in pixels from the upper-left corner of the screen.

Platforms

All platforms

Syntax

-geometry widthxheight {+|-}x-offset {+|-}y-offset

width: Width of the window in pixels.

height: Height of the window in pixels.

+x-offset: Pixels from the left of the screen.

-x-offset: Pixels from the right of the screen.

+y-offset: Pixels from the top of the screen.

-y-offset: Pixels from the bottom of the screen.

Equivalent Environment Variable

None

Description

This option specifies the height and width in pixels of your window, which is stored in the g2-window-height and g2-window-width attribute of the g2-window.

On platforms that runs the X Windows window manager, if you omit any values in the geometry string, the process takes the missing values from defaults used by the X Windows resource manager.

On all platforms, you must provide the *widthxheight* argument and the *x-offset* and *y-offset* if you want to specify an offset; otherwise, the offset arguments are ignored.

You can also use negative offsets.

For more information see the X Windows reference documentation for your platform.

Example

This command launches the Telewindows process with a window that is 800 pixels wide, 600 pixels high, and is offset from the upper-left corner by 20 pixels in each dimension.

```
tw sitenode 1311 -geometry 800x600+20+20
```

height

Specifies the height in pixels of the new window.

Platforms

All platforms

Syntax

```
-height number-of-pixels
```

number-of-pixels: A positive integer from 1 to 32,767

Equivalent Environment Variable

None

Description

This option specifies the height in pixels of your window, which is stored in the g2-window-height attribute of the g2-window.

By default, Telewindows displays a window whose height is 90% of the height of the screen.

On Windows platforms, the height refers to the entire window, including the title bar and the black frame around the window. On UNIX platforms, the height refers to the client window area only; it does not include the height of the title bar and window frame.

Example

This command starts a process with a window whose height in pixels is 1000 and whose width in pixels is equivalent to 90% of the width of the screen, the default:

```
tw sitenode 1311 -height 1000
```

help

Directs the new process to output text that shows the syntax of all command-line options.

Platforms

All platforms

Syntax

```
-help
```

Equivalent Environment Variable

None

Description

After issuing this command-line option, the process exits.

Telewindows writes the help text as follows:

- On UNIX platforms, to the launch window.
- Under Windows, to the console window that appears when Telewindows is launched, unless the *-log* command-line option is given, in which case the help text is logged to the log file.

Since the console window disappears when Telewindows exits, you can specify a log file to preserve the help text for future use.

Example

This command directs Telewindows to output text that shows the syntax of all command-line options, then exit:

```
tw -help
```

icon

Specifies the text that appears below the icon that appears when you iconize the new window.

Platforms

All platforms

Syntax

`-icon` *icon-text*

icon-text: Text of the name of the icon for the process.

Equivalent Environment Variable

None

Description

When you iconize a window, your platform's window manager hides the window and displays a named icon instead. The `-icon` option specifies the name that appears below that icon.

The text must conform to the requirements for icon names, in terms of the length in characters, the case of alphabetic characters, and so on, established by your platform's window manager.

Special Considerations

To embed a blank in *icon-text* or to specify a mixed case *icon-text* on a platform that does not support commands in mixed-case characters, surround *icon-text* with double quotes, such as:

```
g2 -icon "OpAsst"
```

Example

This command starts a new process and causes the text "OPA" to appear below the icon whenever you minimize the window:

```
tw sitenode 1311 -icon OPA -name "Operator`s Assistant"
```

This command also causes the text "Operator's Assistant" to appear in the title bar of the Telewindows window. See *name*.

init-string

Passes a text value that assigns into the g2-window-initial-window-configuration-string attribute of the g2-window item in the connected G2's KB that is associated with this window.

Platforms

All platforms

Syntax

`-init-string` *init-string-text*

init-string-text: An unquoted, blank-delimited string of characters.

Equivalent Environment Variable

None

Description

By default, after Telewindows successfully connects to a G2 process, that G2 process creates a new g2-window item and associates it with the Telewindows window. It then assigns the text value specified as the argument to the `-init-string` option to the g2-window-initial-window-configuration-string attribute of the new window.

Before assigning the specified text into the g2-window-initial-window-configuration-string attribute, Telewindows first normalizes the string as a symbol. That is, it converts all lowercase characters to uppercase, except for any character that follows an @ (at sign) quoting character.

You can provide user-defined command-line arguments when starting G2, using the `-init-string` command-line option, then use the g2-get-command-line-arguments-from-launch system procedure to access those user-defined arguments in G2. The information is stored in the window object inside G2. For example, you can use this argument when displaying Telewindows as an ActiveX control inside of a COM-compliant container. For an example, see the *Telewindows User's Guide*.

Example

This command starts a Telewindows process and attempts to connect to a G2 process running on the machine whose ID is `sitenode` via its TCP/IP port 1311. The Telewindows process passes to the target G2 the value "Manager", which G2

assigns to the g2-window-initial-window-configuration-string attribute of the Telewindows' g2-window object in the G2:

```
tw sitenode 1311 -init-string Manager
```

language

Specifies a window-specific G2 natural language facility or language-translation item for the g2-window item that is associated with the window.

Platforms

All platforms

Syntax

-language language-name

language-name: Name of a standard G2 language facility—english, japanese, korean, or russian—or name of an existing language-translation item—francais, italiano, or any other symbol—in the G2 KB.

Equivalent Environment Variable

None

Description

Each Telewindows connected to a G2 process can specify a distinct window-specific language. Use the *-language* option to specify a standard G2 natural language facility (english, korean, japanese, or russian) or a language-translation item in the G2 KB. This option determines how system-defined menu choices, Text Editor buttons, and so on appear in your Telewindows window.

Using the *-language* option sets the g2-window-specific-language attribute in the g2-window item (in the G2 KB) that is associated with this Telewindows connection. Specifying this command-line option is equivalent to specifying the G2 Window Specific Language in the login dialog. If you don't specify the *-language* option, the default value of the g2-window-specific-language attribute of this g2-window is none, and the language-translation item used to translate text in your window is determined by the current language of the G2 KB.

Example

This command starts a new Telewindows process that connects to a secure G2, specifying a language and other information necessary to connect to the process. The command assigns the symbol korean into the g2-window-specific-language attribute of the g2-window associated with your Telewindows window:

```
tw sitenode 1311 -window viper -user-name howard
   -password fearnoevil -user-mode manager -language korean
```

The result is that your window displays the text of G2 system-defined menu choices, and so on, based on the language-translation item named korean found in the G2 KB.

local-window

Explicitly starts G2 with a local window.

Platforms

All platforms

Syntax

```
-local-window
```

Equivalent Environment Variable

None

Description

Currently, this command-line option is redundant, because G2 starts with a local window, by default. However, in a future release, G2 will start without a window, by default. Therefore, we recommend that you explicitly add this option to your startup scripts now if you want G2 to start with a local window, so that in the future, you will not have to change your scripts.

log

Specifies a particular pathname to which standard output messages should be written.

Platforms

All platforms

Syntax

`-log` *log-file-path*

log-file-path: Location and name of a file to which the new process writes standard output messages.

Equivalent Environment Variable

None

Description

If the specified *log-file-path* names an existing file, Telewindows overwrites the existing file. Telewindows does not append version information to user-defined log file names.

On Windows platforms, in the absence of the `-log` command-line option, Telewindows creates a uniquely named log file in the directory specified by your `TEMP` environment variable. The log file name consists of these components:

productname-date-unique-id`.log`

For example, for a log file created on January 1, 2002, which is the fifth log file generated during the Telewindows session, Telewindows would use this file name:

`%PATH%\TW-000101-5.log`

To avoid writing a log file on Windows platforms, use the `-no-log` command-line option. See `no-log`. This is the default on UNIX platforms.

On Windows platforms, you can specify a UNC network path as the *log-file-path*, such as `\\my-server\my-dir\`.

Example

This command starts a new process and routes its standard output messages to the file *c:\tw\logs\TW-000410-4.log*:

```
tw sitenode 1311 -log c:\tw\logs\G2-000410-4.log
```

magnification

Specifies the new process's default ratio of magnification, that is, pixels per G2 workspace unit, for workspaces displayed at full scale.

Platforms

All platforms

Syntax

`-mag[nification]` *magnification-ratio*

magnification-ratio: A decimal value from 0.50 to 2.66.

Equivalent Environment Variable

None

Description

If you specify neither the `-magnification` option nor the `-x-magnification` or `-y-magnification` options, the new process uses a `-magnification` setting of 1.0. For more information about using the `-magnification`, `-x-magnification`, and `-y-magnification` options, see the Specifying the Resolution and Magnification.

Special Considerations

Alternatively, for a display device that supports distinct settings for horizontal and vertical resolutions, you can use the `-x-magnification` and `-y-magnification` command-line options to specify distinct horizontal and vertical magnifications. However, don't combine the `-magnification` argument with either the `-x-magnification` or `-y-magnification` options. See `x-magnification and y-magnification`.

Example

This command starts a process that displays workspaces at full scale at the magnification of two pixels per G2 workspace unit:

```
tw sitenode 1311 -magnification 2.0
```

minimize

Controls whether the minimize box in the Telewindows window is enabled or disabled.

Platforms

Windows

Syntax

```
-minimize {enable | disable}
```

Description

You can use this command-line option to disable or enable the minimize box.

The default value is *enable*, which has the normal behavior.

print-menu-on-custom-dialog

Controls whether a “Print...” right-click menu appears on TWNG custom dialog.

Platforms

Windows

Syntax

```
-print-menu-on-custom-dialog
```

Description

You can use this command-line option to enable the print menu for TWNG custom dialog. By default it’s disabled, as in G2 8.3r1.

name

Specifies the text that appears in the title bar of the new Telewindows window.

Platforms

All platforms

Syntax

```
-name window-title-text
```

window-title-text: A string of characters; must conform to the requirements of your platform's window manager for title bar text.

Equivalent Environment Variable

None

Description

The location, appearance, allowable characters, and allowable length of the title text are determined by the requirements of your platform's window manager.

Special Considerations

To use this option with Japanese, use 8-bit characters; 16-bit characters do not display correctly.

To embed a blank in *window-title-text* or to specify a mixed case *window-title-text* on a platform that does not support commands in mixed case characters, surround *window-title-text* with double quotes, such as:

```
g2 -name "Operator`s Assistant"
```

Example

This command starts a new process and specifies the text "Operator's Assistant" to appear in the title bar of its window:

```
tw sitenode 1311 -name "Operator`s Assistant" -icon OPA
```

This command also causes the text "OPA" to appear below the process's icon, when it is minimized.

network

Specifies the network transport protocol that Telewindows uses to connect to a G2 process.

Platforms

All platforms

Syntax

```
-network { tcpip }
```

tcpip: Listen for network connections that use the TCP/IP transport protocol.

Equivalent Environment Variable

None

Description

The *-network* option should appear no more than once on a Telewindows command line, since Telewindows establishes only one connection to its G2.

Example

This command starts a new Telewindows process that attempts to connect to the G2 process running on the computer whose network host name is *sitenode* at TCP/IP port 1311:

```
tw sitenode 1311 -network tcpip
```

no-backing-store

Disables the use of the default backing-store facility.

Platforms

UNIX

Syntax

```
-no-backing-store
```

Equivalent Environment Variable

None

Description

Using an X-Server Backing-Store

By default, with backing-store in effect, the X-server caches a window image in its own memory each time a window is obscured or iconized. Then, whenever a window, or part thereof, is redrawn, the X-server simply redraws the window from memory, rather than requesting an update from the G2 server.

The advantage of this facility is for Telewindows users, especially those connecting to G2 across a slow network. Using this default option precludes the need for a Telewindows client to make G2 redraw requests each time a window, or any portion of a window, must be redrawn after being iconized or obscured in any way. Caching the window on the X-server in such an environment can then significantly improve window redraw performance.

Two disadvantages exist when using the backing-store option:

- The X-server may require more memory.
- If the server stops responding, redrawn windows may not be current.

X-Server Memory Requirements

The X-server can potentially require more memory when using the backing-store feature. The amount of memory required depends on:

- The size of the window being cached
- The number of colors in use

If the X-server has sufficient memory when you start G2 or Telewindows, it uses what is available to cache the window. If more memory is required for backing-

store, the X-server allocates whatever it needs. Additionally allocated memory for backing-store then remains in use for the duration of the G2 or Telewindows process.

Updating Cached Windows

Using backing-store does not affect regular window updates from the G2 server. For example, G2 continually updates display items, such as readout-tables and trend-charts, even if a window is obscured. Thus, when the X-server redraws a window containing display items, its data is always current.

An obscured or iconized window can potentially become out of date if the G2 server stops responding to the client. In this case, with backing-store in effect, the X-server redraws the window from its previous state, even if that state is no longer current. Conversely, if backing-store is *not* in use (G2 was launched with the `-no-backing-store` command-line option), attempting to redraw an obscured window results in an entirely blank window that remains until the G2 server responds once more.

Example

This command starts a new process and disables the use of the backing-store facility:

```
tw -no-backing-store
```

no-log

Specifies that Windows should not write a log file for the Telewindows process.

Platforms

Windows

Syntax

```
-no-log
```

Equivalent Environment Variable

G2_NO_LOG

Description

By default, if you launch Telewindows without the *-log* command-line option, Windows creates a uniquely named log file in the *TEMP* directory, as described in Writing Standard Output Messages to a Log File.

The only way to avoid generating a log file is to use the *-no-log* option.

G2 accepts the *G2_NO_LOG* environment variable, which causes G2 not to generate a log file, as if you had started G2 with the *-no-log* command-line option. To use the variable, set it to a value of *1*.

Example

This command starts a new Telewindows process with no log file:

```
tw sitenode 1311 -no-log
```

ok

Specifies the location of the Telewindows authorization file.

Platforms

All platforms

Syntax

-ok ok-file-path

ok-file-path: Location and name of the authorization file; you can specify a file with any name and location.

Equivalent Environment Variable

TW_OK

Same as *ok-file-path*.

Description

The default name of the authorization file is *tw.ok*.

If the file *TNOCMD.OK* is stored in the root directory, Telewindows checks whether the authorization file name specified by *ok-file-path* is listed in *TNOCMD.OK*. Telewindows loads the file only if it is listed there. The root directory is the directory / on UNIX platforms or the directory \ on Windows platforms.

If you omit the *-ok* option, the new process looks for the authorization file in the directory from which you launched Telewindows.

On Windows platforms, you can specify a UNC network path as the *ok-file-path*, such as *\\my-server\my-dir*.

Special Considerations

You can also use the *-v11ok* command-line option, the *TWV11_OK* environment variable, and the *twv11.ok* file to specify the location of the authorization file. The order of precedence for identifying the authorization file to use is:

1. The *-v11ok* command-line option.
2. The *-ok* command line arg.
3. The *TWV11_OK* environment variable.
4. The *G2_OK* environment variable.

5 A file named *twv11.ok* in the G2 home directory.

6 A file named *g2.ok* in the G2 home directory.

For more information, see v11ok.

Example

On a Windows platform, this command starts a new process and identifies *c:\Program Files\Gensym\g2-2015\g2\my.ok* as the authorization file:

```
tw sitenode 1311 -ok "c:\Program Files\Gensym\g2-2015\g2\my.ok"
```

On a UNIX platform, this command starts a new process and identifies */usr/gensym/g2-2015/g2/my.ok* as the authorization file:

```
tw sitenode 1311 -ok /usr/gensym/g2-2015/g2/my.ok
```

password

Specifies the password for logging into a secure G2 process.

Platforms

All platforms

Syntax

-password password-string

password-string: A series of characters that constitute a password.

Equivalent Environment Variable

None

Description

Specifying the *-password* option corresponds to filling in the Password field in the login dialog.

Special Considerations

When you use the *-password* option, Telewindows transmits the password string *as is* to the target G2 process. Be sure to consider your risk in transmitting your application password in an unencrypted manner.

Example

This command starts a new Telewindows process that connects to a secure G2, specifying a password and other information necessary to connect to the process:

```
tw sitenode 1311 -window viper -user-name howard
   -password fearnoevil -user-mode manager -language korean
```

private-colormap

Causes Telewindows to request a dedicated colormap from the X server. The default is to use the standard colormap, which is shared by all applications.

Platforms

UNIX

Syntax

```
-private-colormap
```

Equivalent Environment Variable

None

Description

Although most color X workstations are capable of displaying many more than 256 colors, most X servers can represent only 256 colors at a time. What those colors are depends on the applications that access the X server and sometimes on the order in which they are run.

When an application wants to display a pixel in a certain color, it asks the X server to map the color to an index in the colormap. If the color is not already present in the colormap, the X server adds it, using up one more slot in the colormap. If this continues, the colormap becomes full. When an application asks for a new mapping and the colormap is full, the X server responds by using the closest available color to the one requested. The result may not be an acceptable color.

Applications, such as Web browsers, which display images (GIFs, JPEGs, and so on) typically need many colors, increasing the chance that the colormap will become full. For example, if you run Netscape on your UNIX machine before running Telewindows, there is a chance that Telewindows will not be able to find space in the colormap for even its 64 basic colors, and the display will look wrong.

The alternative is to use a private colormap. When a private colormap is in use, no other applications can fill up the slots. In the case of Telewindows, this guarantees that the 64 basic colors will always be available.

An additional benefit to using a private colormap is that more color cells will be available should Telewindows need them. In fact, Telewindows does need them to display GIFs well. If you change the image-palette attribute in the Color Parameters system table to Custom colors from *my-image-def*, Telewindows displays the GIF rendered better than it has been able to before under X.

Special Considerations

The disadvantage of using a private colormap is that the X server has to actively switch between color maps. It does this based on focus. If Telewindows is using a private colormap and some other application has the focus, the colors in Telewindows will appear obviously wrong. When Telewindows is given focus, the X server installs its colormap, and the Telewindows window looks fine. However, the colors of all other applications, as well as icons and other items drawn by the X server and the window manager, will be wrong. They are still using the same indices into the colormap as they were before, but those indices no longer make sense because a different colormap is in use.

Since users may find this color change problem disconcerting, the *-private-colormap* flag is off by default.

Note This option will be ignored if you are using 24-bit display because the colormap would be too large.

Example

This command starts a new process and requests a private colormap from the X server:

```
tw -private-colormap
```

regserver

Registers Telewindows.

Platforms

Windows

Syntax

```
-regserver
```

Equivalent Environment Variable

None

Description

When you install the G2 Bundle, Telewindows automatically calls *-regserver* to register both Telewindows Next Generation (*twng.exe*) and Telewindows (*tw.exe*).

Telewindows looks in the registry when connecting to G2, as follows:

When connecting...	Telewindows connects...
Using the Connect Telewindows menu choice on the G2 server icon	Telewindows Next Generation, if it can find it in the registry; otherwise, Telewindows
Telewindows ActiveX control	Telewindows
WorkspaceView ActiveX control	Telewindows Next Generation

To use Telewindows instead of Telewindows Next Generation when using the Connect Telewindows menu choice, unregister Telewindows Next Generation. See *unregserver*.

The command-line option supports an optional argument, *-s*, to suppress the dialog that appears when you successfully register Telewindows.

Note You can specify the command-line option by using *-regserver* and *-s*, or you can use the Windows style command-line options, */regserver* and */s*.

Telewindows writes its location is these Windows registry keys, depending on the executable:

Executable	Registry Key
twng.exe	*installDir*
tw.exe	*installDirClassic*

The location in the registry for both keys is:

HKEY_LOCAL_MACHINE\SOFTWARE\Gensym\Telewindows\version

where *version* is the Telewindows version and revision, including *Beta*, if appropriate. For example, the location for Telewindows Version 2015 Rev. 0 is:

HKEY_LOCAL_MACHINE\SOFTWARE\Gensym\Telewindows\8.3 Rev. 0

resolution

Specifies the resolution of the monitor on which the Telewindows window appears.

Platforms

All platforms

Syntax

`-resolution` *dots-per-inch*

dots-per-inch: An integer in the range 36 to 200.

Equivalent Environment Variable

None

Description

This option specifies the resolution, in pixels per inch, at which the new process displays its window. Use this option to adjust the absolute size of window to the resolution characteristics of your display device. For more information see Specifying the Resolution and Magnification.

By default, displays its window at 75 dots per inch (dpi).

Special Considerations

For a display device that supports distinct settings for its vertical (y-axis) resolution and horizontal (x-axis) resolution, you can specify separate default vertical and horizontal resolutions, as follows:

```
tw sitenode 1311 -x-resolution 75 -y-resolution 100
```

Do not combine the `-resolution` option with either the `-x-resolution` or `-y-resolution` options. If you specify the `-x-resolution` option, you should also specify the `-y-resolution` option, and vice versa. See `x-resolution and y-resolution`.

Example

This command starts a new Telewindows process that displays its window at a resolution of 150 dots per inch:

```
tw sitenode 1311 -resolution 150
```

rgn1lmt

Specifies the initial supply of available memory for data other than symbols and graphics images.

Platforms

All platforms

Syntax

`-rgn1lmt` *number-of-bytes*

number-of-bytes: The integer 800000 or higher, up to the maximum per-process allocation determined by your platform's operating system settings.

Note Do not include commas when specifying *number-of-bytes*.

Equivalent Environment Variable

`G2RGN1LMT`

Same syntax as *number-of-bytes*.

Description

Telewindows maintains its supply of available memory in three regions. This option controls the initial supply of available memory in its Region 1 memory pool. Telewindows uses its Region 1 memory pool to store all data other than symbols and graphics images.

The new process allocates Region 1 memory when it is launched. Telewindows standard output messages at startup indicate the memory allocation.

The default amount of Region 1 memory is 1,400,000 bytes.

Special Considerations

If your `-rgn1lmt` option specifies less than the minimum number of bytes, Telewindows displays a warning standard output message and supplies the minimum amount.

For information about G2 memory management, see the chapter on memory management in the *G2 Reference Manual*.

Example

This command starts a new process and directs it to allocate 1,200,000 bytes as its initial supply of Region 1 memory:

```
tw sitenode 1300 -rgn1lmt 1200000
```

Telewindows attempts to allocate more Region 1 memory as is required by the connected G2's processing.

rgn2lmt

Specifies the initial supply of available memory for symbol data.

Platforms

All platforms

Syntax

`-rgn2lmt` *number-of-bytes*

number-of-bytes: The integer 800000 or higher, up to the maximum per-process allocation determined by your platform's operating system settings.

Note Do not include commas when specifying *number-of-bytes*.

Equivalent Environment Variable

`G2RGN2LMT`

Same syntax as *number-of-bytes*.

Description

Telewindows maintains its supply of available memory in three regions. This option controls the initial supply of available memory in its Region 2 memory pool. Telewindows uses its Region 2 memory pool to store symbols and related internal data.

The new process allocates Region 2 memory when it is launched. Telewindows standard output messages at startup indicate the memory allocation.

The default amount of Region 2 memory is 800,000 bytes.

Special Considerations

If your `-rgn2lmt` option specifies less than the minimum number of bytes, Telewindows displays a warning standard output message and Telewindows supplies the minimum amount.

For information about G2 memory management, see the chapter on memory management in the *G2 Reference Manual*.

Example

This command starts a new process and directs it to allocate 900,000 bytes as its initial supply of Region 2 memory:

```
tw sitenode 1311 -rgn2lmt 900000
```

Telewindows attempts to allocate more Region 2 memory as is required by the connected G2's processing.

rgn3lmt

Specifies the *maximum* memory used by to render the background images of workspaces.

Platforms

All platforms

Syntax

`-rgn3lmt` *number-of-bytes*

number-of-bytes: The integer 400000 or higher, up to the number of bytes of memory actually available to the target platform's window manager.

Note Do not include commas when specifying *number-of-bytes*.

Equivalent Environment Variable

`G2RGN3LMT`

Same syntax as *number-of-bytes*.

Description

Telewindows maintains its supply of available memory in three regions. This option controls the *maximum* memory that a new process can allocate for its Region 3 memory pool. Telewindows uses its Region 3 memory pool to manage the graphics image data that displays as the background images of workspaces and icons.

The new process does *not* allocate Region 3 memory when it is launched. Instead, Telewindows allocates Region 3 memory at the time that the connected G2 must display a background image.

The default maximum amount of Region 3 memory is 2,500,000 bytes. If you specify a *number-of-bytes* larger than 2,500,000 bytes, the new process can manage more precomputed image renderings, which, in turn, means that background images can display more quickly.

Special Considerations

If your `-rgn3lmt` option specifies less than the allowable minimum (400,000), Telewindows displays a warning standard output message and substitutes the minimum specification.

For information about G2 memory management, see the chapter on memory management in the *G2 Reference Manual*.

Example

This command starts a new process and restricts it to allocating at most 500,000 bytes of Region 3 memory:

```
tw sitenode 1311 -rgn3lmt 500000
```

Telewindows attempts to allocate Region 3 memory as is required by the connected G2's processing.

screenlock

Displays the new window so that it occupies the entire screen.

Platforms

Windows

Syntax

```
-screenlock
```

Equivalent Environment Variable

None

Description

On Windows platforms, this option displays the new window at the top of the window hierarchy and prevents any other application window from being on top.

In contrast, on any supported platform, the `-fullscreen` command-line option displays the window so that it is the same size as the screen *and* so that the window can appear behind any other open window.

Example

This command starts a new process and directs it to display its window so that its extent occupies the entire screen:

```
tw sitenode 1311 -screenlock
```

After executing this command, the user also cannot cause any other application's window to appear on top of the window that displays.

secure

Encrypts communication.

Platforms

All platforms

Syntax

```
-secure
```

Equivalent Environment Variable

None

Description

This command-line option causes G2 and Telewindows to use SSL on all TCP/ICP connections. G2 uses SSPI on Windows and OpenSSL on UNIX.

When the connection is encrypted, the padlock icon appears in the status bar.

splashtime

Specifies the number of seconds Telewindows should display the splash screen before it displays the Telewindows window while connecting to G2.

Platforms

All platforms

Syntax

```
-splashtime seconds
```

seconds: A positive integer from 0 to 30.

Equivalent Environment Variable

None

Description

A value of 0 seconds specifies that Telewindows should not delay the display of its window. Non-zero values specify the number of seconds to delay before displaying the Telewindows window during which time it displays the splash screen.

Example

This command starts a new Telewindows process and waits 10 seconds before displaying the Telewindows window:

```
tw sitenode 1111 -splashtime 10
```

tcptimeout

Specifies the time interval during which the new Telewindows process attempts to make a TCP/IP network connection to the target G2 process.

Platforms

All platforms

Syntax

`-tcptimeout` *interval-in-milliseconds*

interval-in-milliseconds: A positive integer from 1 to 20,000.

Equivalent Environment Variable

None

Description

This option specifies the time interval during which the new Telewindows process attempts to make a TCP/IP network connection to the target G2 process. If Telewindows cannot make a connection after that interval, Telewindows writes an error message to standard output and exits.

By default, Telewindows attempts to make a connection for one-half second (500 milliseconds). You can specify an interval as high as 20 seconds (that is, 20,000 milliseconds).

Specify the *interval-in-milliseconds* without punctuation, such as commas or periods.

Example

This commands starts a new Telewindows process that attempts to make a TCP/IP network connection with the G2 process on the computer whose network host name is `sitenode` at port 1311 for as long as 5 seconds (5000 milliseconds):

```
tw sitenode 1311 -tcptimeout 5000
```

ui

Specifies the user interface style when starting Telewindows.

Platforms

All platforms

Syntax

```
-ui standard | classic
```

Equivalent Environment Variable

None

Description

The *-ui standard* command-line option runs Telewindows with a single document interface (SDI). This option is available on Windows for *tw.exe* and on UNIX for *tw*. *Twng.exe* does not support *-ui standard*. Standard UI mode is the default for *tw.exe* on Windows and *tw* on UNIX.

Both options provide a standard user interface, where "standard" implies the Windows standard, which includes standard selection-style, mouse gestures, keystrokes, and key bindings. On Windows platforms, the standard user interface also includes a top-level menu bar, called the developer menu bar, standard popup menus, and standard file, print, and notification dialogs. On UNIX platforms, you get as many native features as the platform supports.

For backward compatibility, you can also run Telewindows with its classic user interface, where "classic" implies G2 6.x behavior. The classic user interface uses a single document interface (SDI), and classic G2 selection-style, menus, and mouse gestures, keystrokes, and key bindings. On Windows platforms, the classic user interface does not include a developer menu bar.

This table summarizes which command-line options are supported for which Telewindows executables on which platforms, where the asterisk (*) indicates the default:

-ui	*twng.exe* **(Windows)**	*tw.exe* **(Windows)**	*tw* **(UNIX)**
standard	no	yes*	yes*
classic	no	yes	yes

For a description of the differences between the two Telewindows executables, see Telewindows Executables.

Examples

On Windows platforms, to start Telewindows Next Generation, use this command:

```
twng
```

To start standard Telewindows with its default user interface, use this command:

```
tw
```

Starting Telewindows with no command line options is equivalent to:

```
tw -ui standard
```

To start Telewindows with its classic user interface:

```
tw -ui classic
```

unregserver

Unregisters Telewindows.

Platforms

Windows

Syntax

```
-unregserver
```

Equivalent Environment Variable

None

Description

When you install the G2 Bundle, Telewindows automatically calls *-regserver* to register both Telewindows Next Generation (*twng.exe*) and Telewindows (*tw.exe*). See *regserver*.

Telewindows looks in the registry when connecting to G2, as follows:

When connecting...	Telewindows connects...
Using the Connect Telewindows menu choice on the G2 server icon	Telewindows Next Generation, if it can find it in the registry; otherwise, Telewindows
Telewindows ActiveX control	Telewindows
WorkspaceView ActiveX control	Telewindows Next Generation

To use Telewindows instead of Telewindows Next Generation when using the Connect Telewindows menu choice, unregister Telewindows Next Generation.

The command-line option supports an optional argument, *-s*, to suppress the dialog that appears when you successfully unregister Telewindows.

Note You can specify the command-line option by using *-unregserver* and *-s*, or you can use the Windows style command-line options, */unregserver* and */s*.

Telewindows writes its location is these Windows registry keys, depending on the executable:

Executable	Registry Key
twng.exe	*installDir*
tw.exe	*installDirClassic*

The location in the registry for both keys is:

HKEY_LOCAL_MACHINE\SOFTWARE\Gensym\Telewindows\version

where *version* is the Telewindows version and revision, including *Beta*, if appropriate. For example, the location for Telewindows Version 2015 Rev. 0 is:

HKEY_LOCAL_MACHINE\SOFTWARE\Gensym\Telewindows\8.3 Rev. 0

user-mode

Specifies the user mode for logging into a secure G2 process.

Platforms

All platforms

Syntax

-user-mode user-mode-string

user-mode-string: Series of characters that names a user mode.

Equivalent Environment Variable

None

Description

Specifying the *-user-mode* option corresponds to filling in the User Mode field in the login dialog and sets the g2-user-mode attribute of the current g2-window.

Example

This command starts a new Telewindows process that connects to a secure G2, specifying a user mode and other information necessary to connect to the process:

```
tw sitenode 1311 -window viper -user-name howard
   -password fearnoevil -user-mode manager -language korean
```

user-name

Specifies the user name under which to log into a secure G2 process.

Platforms

All platforms

Syntax

-user-name user-name-string

user-name-string: A user name defined in the authorization file for the target G2.

Equivalent Environment Variable

None

Description

Specifying the *-user-name* option corresponds to filling in the User Name field in the login dialog and sets the g2-user-name attribute of the current g2-window.

Example

This command starts a new Telewindows process that connects to a secure G2, specifying a user name and other information necessary to connect to the process:

```
tw sitenode 1311 -window viper -user-name howard
   -password fearnoevil -user-mode manager -language korean
```

v11ok

Specifies a custom location for an authorization file that is specific to G2 Version 2015.

Platforms

All platforms

Syntax

`-v11ok` *v11-ok-file-path*

v11-ok-file-path: Location and name of the authorization file for Version 2015; you can specify a file with any name and location.

Equivalent Environment Variable

`TWV11_OK`

Same syntax as *v11-ok-file-path*.

Description

Like the `-ok` option, the `-v11ok` option specifies the path of an authorization file for this process.

Specifying the `-v11ok` option allows the site manager to configure a system environment so that processes launched using a previous version authorize using an authorization file for that previous version, while processes launched using Version 2015 authorize using a separate authorization file.

If the file `TNOCMD.OK` is stored in the root directory, Telewindows checks whether the authorization file name specified as *v11-ok-file-path* is listed in `TNOCMD.OK`. Telewindows loads the file only if it is listed there. The root directory is the directory / on UNIX platforms or the directory \ on Windows platforms.)

On Windows platforms, you can specify a UNC network path as the *v11-ok-file-path*, such as `\\my-server\my-dir\`.

Special Considerations

You can also use the *-ok* command-line option, the *TW_OK* environment variable, and the *tw.ok* file to specify the location of the authorization file. The order of precedence for identifying the authorization file to use is:

1. The *-v11ok* command-line option.
2. The *-ok* command line arg.
3. The *TWV11_OK* environment variable.
4. The *G2_OK* environment variable.
5. A file named *twv11.ok* in the G2 home directory.
6. A file named *g2.ok* in the G2 home directory.

For more information, see ok.

Example

On a Windows platform, this command starts a new process and identifies *c:\Program Files\Gensym\g2-2015\g2\my-g2.ok* as the Version 2015 authorization file:

```
tw sitenode 1311 -v11ok "c:\Program Files\Gensym\g2-2015\g2\my-g2.ok"
```

On a UNIX platform, this command starts a new process and identifies */usr/gensym/g2-2015/g2/my.ok* as the Version 2015 authorization file:

```
tw sitenode 1311 -v11ok /usr/gensym/g2-2015/g2/my-g2.ok
```

verbose

Prints information about the current G2 to the console or log file, such as the location of the G2 OK file.

Platforms

All platforms

Syntax

```
-verbose
```

Equivalent Environment Variable

None

Description

Example

```
tw sitenode 1311 -verbose
```

width

Specifies the width in pixels of the window.

Platforms

All platforms

Syntax

```
-width number-of-pixels
```

number-of-pixels: A positive integer from 1 to 32,767.

Equivalent Environment Variable

None

Description

This option specifies the width in pixels of your window, which is stored in the g2-window-width attribute of the g2-window.

By default, Telewindows displays a window whose width is 90% of the height of the screen.

On Windows platforms, the width refers to the entire window, including the title bar and the black frame around the window. On UNIX platforms, the width refers to the client window area only; it does not include the width of the title bar and window frame.

Example

This command starts a process with a window whose width in pixels is 1000 and whose height in pixels is equivalent to 90% of the height of the screen, the default:

```
tw sitenode 1311 -width 1000
```

window

Specifies the window name or class of g2-window that a target secure G2 associates with a Telewindows window.

Platforms

All platforms

Syntax

-window window-name-or-class

window-name-or-class: Name or class of a g2-window item or of an item whose class is a subclass of g2-window.

Equivalent Environment Variable

None

Description

Specifying the *-window* option corresponds to the G2 Window Name or Class field in the login dialog.

Examples

This command starts a new Telewindows process that connects to a secure G2, specifying a window and other information necessary to connect to the process:

```
tw sitenode 1311 -window viper -user-name howard
   -password fearnoevil -user-mode manager -language korean
```

window-style

Specifies the window style that Telewindows uses.

Platforms

All platforms

Syntax

```
-window-style {default | standard-large | g2-5.x | standard}
```

Equivalent Environment Variable

None

Description

This command-line option allows you to choose a larger version of the standard window style or the traditional G2 window style. By default, uses the `standard` window style in which workspaces have editable title bars and close buttons. Specifying `default` as the window style is the same as specifying `standard`.

For examples of each of these window styles, see "G2 Window Styles" in Chapter 2 "The Developers Environment" in the *G2 Reference Manual*.

Example

This command starts a Telewindows process, using a larger version of the standard window style:

```
tw sitenode 1311 -window-style standard-large
```

x-magnification and y-magnification

Specifies the window's default ratio of horizontal (x-axis) or vertical (y-axis) magnification, in pixels per G2 workspace unit, for workspaces displayed at full scale.

Platforms

All platforms

Syntax

`-x-mag[nification]` *magnification-ratio*
`-y-mag[nification]` *magnification-ratio*

magnification-ratio: A decimal value from 0.50 to 2.66.

Equivalent Environment Variable

None

Description

For a display device that supports distinct settings for vertical and horizontal resolutions, you can use the `-x-magnification` and `-y-magnification` options to specify distinct horizontal and vertical magnifications.

These options specify the ratio of pixels per workspace unit at which the new window displays workspaces. For either option, specify a decimal value in the range 0.50 to 2.66.

If you do not specify the `-x-magnification` or `-y-magnification` options or the `-magnification` option, the new window uses a `-magnification` setting of 1.0; this is equivalent to a `-x-magnification` setting of 1.0 and a `-y-magnification` setting of 1.0.

By specifying different combinations of `-x-magnification` and `-y-magnification` settings, you can display workspaces in the process's window at an effectively equivalent absolute size on different display devices.

For more information about using the `-magnification`, `-x-magnification`, and `-y-magnification` options, see Specifying the Resolution and Magnification.

Special Considerations

Alternatively, you can use the *-magnification* option to specify the same setting for both the horizontal and vertical axes. However, do not combine the *-magnification* argument with either the *-x-magnification* or *-y-magnification* options. See *magnification*.

Example

This command starts a process whose window displays full-scale workspaces with a horizontal magnification of two pixels per G2 workspace unit and with a vertical magnification of one and a half pixels per G2 workspace unit:

```
tw sitenode 1311 -x-magnification 2.0 -y-magnification 1.5
```

x-resolution and y-resolution

Specifies the horizontal (x-axis) and vertical (y-axis) resolution of the monitor on which a window appears.

Platforms

All platforms

Syntax

`-x-res[olution]` *dots-per-inch*
`-y-res[olution]` *dots-per-inch*

dots-per-inch: An integer in the range 36 to 200.

Equivalent Environment Variable

None

Description

For a display device that supports distinct settings for its horizontal and vertical resolution, you can use the `-x-resolution` and `-y-resolution` options to specify separate default horizontal and vertical resolutions.

These options specify the resolution as the number of dots per inch (dpi). By default, displays a window at a default resolution of 75 dpi.

These values are stored in the g2-window-x-resolution and g2-window-y-resolution attributes of the g2-window.

By specifying different combinations of `-x-resolution` and `-y-resolution` settings, you can display workspaces on a window at an effectively equivalent absolute size on different display devices.

For more on the `-resolution`, `-x-resolution`, and `-y-resolution` options, see Specifying the Resolution and Magnification.

Special Considerations

Alternatively, you can use the `-resolution` option to specify the same setting for both the horizontal and vertical axes. However, do not combine the `-resolution` option with either the `-x-resolution` or `-y-resolution` options. See `resolution`.

Example

This command line starts a process that displays its window at a horizontal resolution of 150 dpi, and a vertical resolution of 175 dpi:

```
tw sitenode 1311 -x-resolution 150 -y-resolution 175
```

Glossary

A

allocation message: A message that Telewindows prints on the console when it allocates more memory during KB loading or execution.

allocation report: An allocation table or message.

allocation table: A table that Telewindows prints on the console when it starts up. The table describes memory requirements, defaults, requests, and initial allocations.

argument: A value or item that is passed to an invoked procedure or function.

attribute: A characteristic or property of an item (any object, connection, workspace, and so on) in a G2 knowledge base. An item's set of attributes is defined by the item's class.

attribute table: A two-column table that shows the name and value of each attribute of an item.

authorization file: Also known as the *tw.ok* file. This file identifies each authorized user and optionally associates each user name with a user mode.

authorization level: A method for managing G2 license options with Gensym's Telewindows license options.

B

background: In your Telewindows's window, the visible pattern upon which Telewindows displays the current KB's workspaces. (Clicking the mouse on this background displays the Main Menu.) In a workspace, the visible color or image upon which the workspace's items appear to reside. (Clicking the mouse on this background displays the KB Workspace menu.)

C

class: A group of items that have the same icon, attributes, and behavior. Classes are organized into a hierarchy, in which each class inherits the attributes of its superior class, but may have additional attributes of its own.

class hierarchy: A hierarchical structure of class definitions that is built into G2, but can be extended by the user.

class-specific attribute: An attribute that is specified by a class's definition, rather than inherited from the definitions of its superior classes.

classic user interface: The user interface provided for backward compatibility. Classic Telewindows always uses a single G2 window for displaying workspaces. It has no developer menu bar, classic G2 popup menus, classic dialogs, and G2 6.x mouse gestures, key bindings, and shortcut keys, with no selection.

color attribute: A named portion of an item's knowledge that can have a color value, such as the background-color color attribute of workspaces. Color attributes do not appear in the attribute tables of items.

command-line option: Included in the operating system command that launches a new Telewindows process, this keyword affects how the new Telewindows starts and runs.

configuration: A declaration that changes the default behavior of items.

current KB: The items contained in the memory of a running G2 process.

current language: An existing language translation item (or the symbol english) that G2 uses to display the names of menus and menu choice text (and for some languages, a custom Text Editor interface) in the G2 developer's environment. *Contrast with* default language.

current scale: For a workspace, the scale at which Telewindows displays that workspace, which is a factor of its default scale. By specifying a new current scale, you can interactively or programmatically change the displayed size of a workspace. *Contrast with* default scale.

D

dedicated license: One type of G2 license for Telewindows. In a dedicated Telewindows environment, each license is authorized for a specific level of access to the server.

default language: The language translation item (or the symbol english) that Telewindows uses to display the names of menus and menu choice text (and for some languages, a custom Text Editor interface) in the G2 developer's environment. *Contrast with* current language.

default scale: By default, a new workspace's current scale is the *normalized* scale for the Telewindows process, which Telewindows determines by calculating the ratio of workspace units per pixel of resolution on your computer's display device.

developer menu bar: On Windows platforms, the default menu bar that appears when you launch Telewindows, using its standard user interface. The developer menu bar provides all the menu choices developers need to build and run G2 applications.

direct superior class: The class or classes from which a class inherits directly. A class also inherits indirectly from all the superior classes of its direct superior class or classes.

E

error condition: An unexpected discrepancy that occurs while G2 is handling information.

error handler: The portion of an application that responds to error conditions. G2 provides a default error handler, which responds to an error condition by placing a message on the Operator Logbook. You can write a custom error handler in a G2 procedure by coding an on error statement whose block of statements respond to error conditions that arise within that procedure.

event: A system-defined occurrence. The antecedent of a whenever rule can refer to events.

expression: A phrase that G2 evaluates to produce a value or a reference to an item.

extent: The visible, rectangular portion of a workspace's region. Also, the visible, rectangular region within which Telewindows displays an item's representation.

F

floating license: One type of G2 license for Gensym's Telewindows product. Floating Telewindows licenses are G2-server based; that is, the G2 license includes a finite number of floating Telewindows connections.

G

G2 GUIDE: *See* GUIDE.

Gensym character set: The characters that are valid to specify in a symbol or text value in G2. G2 provides facilities for its Text Editor that allow you to enter any character in the Gensym character set. When inputting or outputting symbol and text values, G2 also observes rules for translating those values to and from the character codes of standard character sets.

GUIDE: A Gensym product, also known as G2 GUIDE. A knowledge base that allows you interactively to create the user-interface components for a G2-based application. Objects created using GUIDE are a permanent part of your knowledge base.

H

hierarchy of classes: An organization of classes into superior and subclasses to allow for inheritance of attributes and other knowledge. Each class inherits the attributes of its superior classes.

I

icon: The graphic representation of objects and items of other system-classes with an iconic representation style. In G2, items of many system-defined classes appear as icons. Use the Icon Editor to define the icon for user-defined classes.

ICP (Intelligent Communications Protocol): Gensym's proprietary communications protocol, which allows G2s, GSIs, and Telewindows to share information and distribute control among one or more G2 processes. ICP is a layer built on top of the TCP/IP networking protocols, depending on which platforms you are using in your network.

image: A bitmap or other graphical image created outside G2. You can use an external image as part of an icon, or as the background of a workspace.

inference engine: The G2 component that monitors events and reasons about changing conditions while invoking rules by means of forward chaining, backward chaining, event detection, focusing, and scanning.

inheritance: An important property of object-oriented development environments. A class inherits the attributes of its superior. Inheritance facilitates rapid development, eliminates redundancy in an application, and builds reusable application components.

inherited attributes: Attributes that a class has by inheriting them, rather than by defining them in the class's definition.

installed system tables: The system tables whose values are in effect for the current KB. In a modularized KB, there are as many sets of system tables as there are modules; however, only one set of system tables is installed at a time.

instance: One of a class of items, for example, pump-1 is instance of the PUMP class.

Intelligent Communications Protocol: *See* ICP.

item: An entity in G2 that represents a set of knowledge that has identity and that persists. Each item represents a set of information that is distinct from other information and that you can reference directly or indirectly.

item layering: Whether items upon the same workspace appear on top of or beneath each other.

K

KB: *See* knowledge base.

KB file: The file that G2 writes when you save the current KB. This file contains only ASCII characters, and thus is portable to any G2 of a compatible version or earlier that runs on any supported platform. By default, a KB file's name has the extension *.kb*.

KB workspace: An item of the KB-WORKSPACE class, which is the only kind of workspace in G2 that the current KB can work with programmatically. *Contrast with* workspace.

keystroke: Pressing a key on your computer's keyboard, or pressing at the same time more than one key on your computer's keyboard that includes any combination of the Alt, Control, and Shift keys.

knowledge base: A set of items that is either contained in G2's memory (the current KB) or stored in a KB file.

L

literal value: In an expression, a series of characters that literally signifies a value of type integer, float, truth-value, text, or symbol.

local window: The visible window that is a client of a G2 process. Among computers running the X Windows window manager, a G2 process's local window can be displayed either on the screen of the computer where G2 is running or on another computer's screen. *Contrast with* remote window.

log file: A file to which G2 can optionally write informational messages.

M

margin: The distance in workspace units between the outermost items upon a workspace and the workspace's border. Each workspace's margins are automatically maintained by G2. Set the default margin for all new workspaces in the Miscellaneous Parameters system table.

memory leak: A loss of usable storage space caused by the application's failure to correctly reclaim the memory occupied by the current KB's transient items.

menu: A list of choices that Telewindows displays when you click the mouse on the Telewindows window's background or on an item. Selecting some menu choices causes Telewindows to display another menu, called a submenu.

Message Board: A named KB workspace that can be the destination of messages from an inform action.

metacharacters: Special characters that let you specify a wildcarded name expression. For example, the * (asterisk) matches zero or more characters.

mouse click: The act of pressing and releasing any button on the hand-held mouse.

N

Native Menu System (NMS): A set of tools for creating standard end-user interfaces for G2 applications when viewed through Telewindows. These tools allow you to create custom pulldown menus and popup menus, using one of two techniques. You can use the G2 Menu System (GMS) to create custom menus, using a graphical user interface, which automatically render as native Windows menus when viewed through Telewindows. You can also use the NMS API to create and manipulate Windows menus, using G2 system procedures.

natural language prompts: In the Text Editor, the prompts that G2 displays below the edit area to guide you through the statement syntax and available options.

normalized scale: The ratio of workspace units per pixel for a Telewindows process. By default, the current scale of a new workspace is this Telewindows's normalized scale.

O

object: An abstract or concrete thing of interest in your application, such as a product, space station, bottle, event, or workstation. Every object has an attribute table, and may have an icon and connection stubs. Every object is an instance of a class, which is defined through an object class definition.

Off-line license: A fundamental G2 license type providing G2 for a stand-alone system.

On-line license: A fundamental G2 license type providing the capability to communicate or access other systems.

Operator Logbook: A special workspace for displaying informational messages and signalling G2 errors. You control the placement and other properties of the logbook workspaces using the Logbook Parameters system table.

P

palette: A menu that presents G2's default colors. Also, a workspace that contains each type of object that you can create in a knowledge base. You can create new objects by cloning from the palette.

platform: A combination of a brand of computer and a brand of operating system. Telewindows runs on several UNIX and Windows platforms.

protocol: A specification of the format and content of information sent between one process and another, such as between G2 and Telewindows.

Q

qualified filename: A filename that includes an extension.

R

Region 1: A block of memory used by Telewindows to hold items and non-symbolic values.

Region 2: A block of memory used by Telewindows to hold symbols and related internal data.

Region 3: A block of memory used by Telewindows to hold any external images used in icons and as the backgrounds of workspaces.

remote window: The visible window that is a client of a Telewindows process connected to a running G2 process. *Contrast with* local window.

reserved symbol: A symbol that cannot serve as a user-defined name in G2. In the Text Editor, the prompt any unreserved-symbol indicates where you must enter a user-defined name.

run-state: Whether the connected G2's KB is running, paused, or reset. Changing the KB's run-state affects the KB's knowledge.

running G2: A G2 process that resides in the computer's memory and whose execution is not currently suspended by the computer's operating system. It does not matter whether the G2's current KB is running, paused, or reset.

S

schematic: A picture of the application; consists of objects and their connections.

secure G2: A G2 process that requires its users to log in. If the installed G2 product has a valid license, then from that licensed image you run a secure G2 by creating an authorization file (the *g2.ok* file) and including it in user items that authorize each user of this G2's KB.

shrink wrapping: For a workspace, the operation of decreasing its extent by moving its borders inward; after shrink wrapping, the workspace's borders are just outside the workspace's items that are farthest apart vertically and horizontally.

standard output messages: A report of the initial allocations for Telewindows's memory regions and network port numbers. As a new Telewindows process starts up, it displays standard output messages. A Telewindows process also produces standard output messages when it must attempt to allocate additional memory allocations and when it detects an internal error.

standard user interface: The default user interface style for Telewindows, which provides various standard Windows user-interface controls, including a

developer menu bar, popup menus, and certain standard dialogs. In addition, can workspaces appear in their own window with scrollbars. The standard user interface is selection-style, whereby menu choices apply to the currently selected object. The user interface also uses standard mouse gestures, key bindings, and shortcut keys.

subclass: A class subordinate to another in the hierarchy of classes. A class can have any number of subclasses.

superior class: A class that is at a higher level than another in the hierarchy of classes. Classes inherit attributes from their superiors.

T

table: *See* attribute table.

TCP/IP: A transport layer protocol for communications between computers. TCP/IP is one of two communication protocols supported by G2 and related Gensym products.

Telewindows: A Gensym product. When running, allows a user to connect to a running G2 process and view a window that displays the contents of the G2's current KB. Multiple Telewindows users can access one G2.

title block: The workspace that G2 displays at start-up in its local window. The title block reports: the G2 version, the platform, network ID (or hostname) of this computer, and the TCP/IP port number on which this process listens for network connections.

U

unqualified filename: A filename without an extension.

user mode: A non-reserved symbol that represents a category of usage or level of access to the current KB's knowledge. Declare a user mode simply by naming it in at least one configuration statement in at least one item in your KB. A G2 authorization file associates each authorized user name with a user mode.

V

value: A number, series of characters, or truth-value that conforms to the definition of a type.

W

warmboot: The activity of resuming execution of the current KB after loading its knowledge from a snapshot file.

wildcard: When specifying an operating system directory to search or a KB file to load or merge, use a wildcard, or reserved character, to signify one or more other characters in a specified directory name and/or filename. G2 uses wildcard characters and conventions that are independent of the operating systems of the platforms on which G2 runs.

window: A display on a computer screen that is a client of a process, such as G2 or Telewindows. A window's user interface (for example, whether and how it can be moved, resized, or iconized) is determined by the window manager software in use on your computer.

workspace: An item in G2 that organizes a set of items within an abstract, three-dimensional region. A workspace appears in a G2 window or Telewindows window as a bounded rectangle. A workspace both contains items and arranges them schematically with respect to each other. A workspace can be the inferior item of another item; thus, your KB can contain a hierarchy of workspaces. *Contrast with* KB workspace.

workspace unit: A unit of measure within a workspace that is equivalent to one pixel (one screen dot) when the workspace is shown at full size, which is proportionately larger or smaller as the workspace's scale is increased or decreased, respectively.

workspace view: A subclass of g2-window. When viewed through Telewindows, a workspace view appears in its own window with scrollbars, as needed, as the window and/or workspace size changes. You use standard scrollbars, mouse gestures, and shortcut keys to scroll a workspace view.

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