



GLINK™ ***FOR JAVA***

Installation

&

Configuration

<http://www.glink.com/glink/>



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Glink overview

Introduction to Glink for Java

Glink for Java is a Java version of Gallagher & Robertson's popular Glink for Windows, with proven and reliable terminal emulations and communications. Glink for Java gives you access to Bull or IBM mainframe applications that support VIP7800, VIP7760, VIP7700, DKU7107/7211/7102, IBM3270 or IBM5250 emulations. It also gives you access to systems that support DEC VT320, VT220, VT102 and ANSI 3.64 emulations. This includes UNIX/Linux and DEC VMS mainframes. Minitel and Prestel mainframes are supported over TCP/IP connections.

Glink for Java supports G&R/Ggate, Bull DSA, TN3270, TN5250, TNVIP and Telnet communication protocols.

Glink for Java versions and modes

Glink for Java is available in several versions, and can be run in several different modes. The following short definitions will help you to understand the versions and possibilities.

Glink as an applet

Glink for Java can be run as an applet. This requires a server mode installation, and means that the user starts by accessing web pages from a browser, and downloads the Glink for Java applet from a web page as needed to make a mainframe connection. The applet downloaded is always the latest version. The Glink applet that is downloaded will by default connect to a Glink for Java server running on the same system as the Web server, and obtain a license and configuration files from it.

Glink as a Java Web Start application

Glink for Java can run as a Java application using the Java Web Start technology. This mode is quite similar to the applet mode and requires a server mode installation. In addition the clients must have Java Web Start installed. Java Web Start is shipped as part of the Java 2 Platform, Standard Edition. The user starts by accessing web pages from a browser, and on the very first access downloads the Glink for Java application from a web page as needed to make a mainframe connection. Thereafter the application is only downloaded if the user does not have the latest version. The Glink application downloaded will by default connect to a Glink for Java server running on the same system as the Web server, and obtain a license and configuration files from it.

The main difference from the applet mode is that a Java Web Start Glink runs independently of the browser, which can be terminated or used for other purposes, leaving Glink running. Web Start also gives you the option of making start up icons for Glink that Web Start Glink without using the browser.

Glink as an application

Glink for Java can be installed as a Java application. The application version may be installed stand-alone, using its own license and configuration information or be configured to obtain licenses and configuration information from a Glink for Java server.

Glink Desktop Manager

Glink is delivered with a Desktop Manager that lets you organize multiple Glink instances within the same window using a tabbed pane. You switch to a particular Glink instance by clicking its tab. A menu option lets you start new Glink instances on demand.

The Glink Desktop Manager is available in all Glink modes, Applet, Web start and Application. A Glink start up icon, GlinkDesktop, is added and can be used as an alternative to the standard Glink start up icon

Please note that the Glink Desktop Manager is an application that uses the Glink API. A Glink Professional or Enterprise Edition license is therefore required.

Glink Application Programming Interface

Glink for Java Professional and Enterprise Edition licenses enable an integrated Application Programming Interface (API), allowing you to control the emulator from your own Java servlets, JavaBeans, Java applets or applications. Your programs can engage in dialog with the mainframes and extract data to be combined and displayed using your own presentation format. A Professional Edition license enables 5 simultaneous sessions for workstation applications or applets. An Enterprise Edition license enables as many simultaneous sessions as are licensed for use by server side applications.

Include the Glink screen within your own application window

You can include the Glink emulator screen within your own application window using the GlinkApi method **getGlinkContainer()**. This method lets you add the Glink screen to a panel within your application frame. The Glink Desktop Manager, Gargen and the GlinkWeb Forms Assistant are examples of applications that add Glink instances to a tabbed pane.

GlinkWeb, Glink in web mode

GlinkWeb, Glink as a web server application, is an extension to the Glink product family that gives web users access to mainframe applications from their browsers, without the need for additional software on the client workstation. GlinkWeb is available in ASP.NET and Java versions. The ASP.NET version is deployed on Web server such as the Internet Information Services and the Java version is deployed on a web server with support for Java servlets such as the Tomcat Web server. It requires an Enterprise Edition license. GlinkWeb allows you to facelift the mainframe screens, and includes a *Forms Assistant* that helps you to identify and catalog the screens.

GlinkWeb Forms Assistant

This is included in the Enterprise Edition license. It is a tool for facelifting the screens presented by GlinkWeb using Web Pages (ASP.NET version) or Java Server pages (JSP). Using the GlinkWeb Forms Assistant you can step through your business application and identify screens that you would like to facelift. The Assistant generates a Web Page (or JSP) for each screen identified. The Web Page (JSP) then becomes responsible for generating HTML output to the client. The Web Page (JSP) can be modified to give a custom view of the application, quite divorced from the look and feel of the original screens.

Glink for Java server

Central configuration and license management require a Glink for Java server. The server must be running in order to be able to start Glink clients configured to use the server. Clients can be Glink clients (running as applets or applications), GlinkWeb clients and user applications using the Glink API. The configurations that are distributed to the clients are built using the Glink Administration program. The Glink client itself can also be used to build configurations.

Glink Administration program

The administration program is available in all the same modes as Glink: applet, Web Start application and application. The administrator uses the administration program to configure Glink for Java for end-users. There are two main processes involved: creating and managing users and groups, and creating and managing configuration profiles. When users log in to Glink for Java they receive a dialog box that lists all the configurations available to them, and they select one for their session.

It is also possible for users with administrative privileges to generate, modify and delete configurations directly from Glink, without using the administration program. In the connection dialog box that shows available sessions there is a button for **New** and a button for **Remove**.

Gargen

Gargen is a separately licensed JavaBean Generator that allows the user to step through existing mainframe transactions, and then automatically generate either Standard JavaBeans, or Enterprise JavaBeans that encapsulate the transactions.

Gconnect

Gconnect is a separately licensed J2EE compliant Connector that connects e-business applications to existing mainframe applications. It handles multiple mainframe types, and mainframe transactions written for multiple terminal types.

Glink product licensing

Server mode installations are always by number of simultaneous sessions.

Application mode installations are licensed by number of workstations if they are installed stand-alone with a license on each workstation. They can be configured to obtain licenses from a server mode installation, and then share the total number of sessions available under the server mode license.

Application mode installations that will be running server-side applications can have their own license, but can be configured to obtain licenses from a server running on another system, sharing the number of simultaneous sessions totally available.

Glink Professional Edition

The Professional Edition license allows Glink to be used as a terminal emulator running as an applet or as an application running on your desktop. It also enables a Java Application Programming interface (API) that allows your own Java applets or applications to start up and control up to five simultaneous Glink sessions with mainframe applications.

Glink Enterprise Edition

The Enterprise Edition license enables exactly the same API as the Professional Edition above, but allows simultaneous sessions restricted only by license. The Enterprise Edition license is used on server systems to provide Glink API to e-business applications. The Enterprise Edition license can be used by a server mode installation where the sessions covered by the license can be shared between server-side applications and Glink applets and applications running on workstations. The Enterprise Edition license also enables GlinkWeb, Glink for Java in web mode, as described above.

Host Links

G&R Host Links is a set of integrated products providing inexpensive Bull and IBM mainframe access to users in Open Systems networks. The Glink for Java server is an independent program, but part of the G&R Host Links product set. The Glink Server mode delivery is a tailor-made Host Links delivery that includes, in addition to the Glink for Java server, a simple Web server and some utilities to facilitate the administration of Host Links server products.

Glink for Java server

Central configuration and license management require a Glink for Java server. The server must be running in order to be able to start Glink clients configured to use the server. Clients can be GlinkWeb clients, Glink applets, Glink application versions (Web Start or installed) or user applications using the Glink API and running on workstations or an application server.

Gweb Server

The G&R Web server is a lightweight server, geared to efficiently meeting the specific needs of the G&R web products. It is an alternative to a heavyweight, general purpose Web server that would require more disk space, time and expertise to install and configure.

Host Links administration utilities

The Host Links product set consists of various servers and tools. Even though the Glink for Java installation is just a small subset of Host Links, it contains the general Host Links tools for configuring and administrating the various G&R servers. The server in question here is the Glink for Java server and optionally the GwebS web server. A brief description of these tools follows.

Gmanager

Gmanager is an application for monitoring and administrating Host Links server programs. Gmanager displays a constantly updated list of all active servers and their current activity and/or progress. For detailed information, you can view a server's log file and debug file. From Gmanager you can also terminate servers, launch new background servers, issue server-specific commands to the servers, test host connections and connect to web pages belonging to the servers.

Gservice

Server applications that are designed to run in the background under Windows are called 'Services'. All the Host Links servers may run as Windows Services and are then controlled by a single utility, Gservice. At start-up Gservice starts the configured Host Links servers and when stopped it stops the active Host Links servers.

Gservice is itself a Windows Service and runs in the background. The user interface to Gservice is a foreground utility, GserviceW, started as needed.

Gconfig

The Gconfig utility is a Host Links configuration utility that is used to configure Host Links servers to be managed by Gservice. Gconfig offers the Host Links administrator a menu driven interface to the Gservice configuration file to minimize the need for detailed knowledge of the various servers' parameters.

Ggate

G&R/Ggate is a transparent gateway to the Bull primary network. It is a Host Links server, but is not included as a part of the standard Glink Server mode delivery. Ggate gives Glink clients full Bull primary network functionality without the need for a Bull communications stack on the workstations. The communication from Glink clients to the Ggate gateway is commodity TCP/IP. From Ggate to the Bull mainframes Ggate uses Bull's primary network session protocol over either RFC1006 in a TCP/IP network, or OSI transport if an older Bull mainframe hasn't got RFC1006 support. If the Bull mainframe needs OSI transport, it possible to centralize the expensive and difficult to configure OSI stack on one or more Ggate gateways close to the Bull mainframes.

Direct GCOS Access (DGA)

This is an optional line protocol that can be delivered with Glink for Java to put Bull primary network functionality on the Glink for Java platform, and eliminate the need for Ggate. It gives all the functionality of the primary network session protocol, but is restricted to RFC1006 connections.



Installation

Installation types

There are two types of Glink for Java installations, Glink Server mode and Glink Application mode. For both types, there are installation packages for various platforms. In addition, there are installation packages for GlinkWeb, Gconnect and Gargen.

Glink Server mode installation

Glink Server mode packages are installed on a system with a Web server. They contain the Glink for Java configuration server, the Glink Administration and the Glink client programs. They also include HTML pages with information about configuration and usage, as well as working examples for starting Glink clients. They install a basic Host Links system, including the G&R Web server as an alternative to a third party Web server.

Server mode installation allows Web users to start the Glink terminal emulator as a Java applet or as a Web Start application from a HTML page. The applets and Web Start applications get the configuration they need from the Glink for Java server.

The configuration database and the licensees are managed by the Glink for Java server can be shared by both Glink applets and Glink applications. If the license is for the Enterprise Edition the configuration and license can also be shared by GlinkWeb and server side applications using the API.

Glink Application mode installation

The Glink Application installer packages contain only the Glink for Java terminal emulator, and optionally the Glink Administration program. They default to be started as with their own stand-alone license and configuration files maintained locally with the Glink Administration program or Glink itself.

An application mode installation can be configured to obtain a license and configuration files from a Glink for Java server.

The package can also be used for sites that will be running server-side applications or servlets using the GlinkApi. The license then needed is an Enterprise Edition license that allows the appropriate number of simultaneous sessions needed by the server-side application.

GlinkWeb installation

The GlinkWeb installation packages contain a GlinkWeb deployment utility (Java version only), the Forms Assistant facelifting utility, and a standard Glink and Administration program. Configuration of host applications is done with the Administration program or the Glink client and checked with the Glink client before use from GlinkWeb. GlinkWeb requires an Enterprise Edition license. GlinkWeb can be configured to obtain the license from another system running a Glink for Java server.

Gargen installation

The Gargen installation packages contain the Gargen program together with a standard Glink and Administration program. Configuration of host applications is done with Glink Administration program or the Glink client and checked with the Glink client before use from Gargen. If you have a Glink server with central configuration and license management, Gargen can share the same server.

Installation instructions

Server mode installation

A server mode installation enables the use of Glink applets and Glink Web Start applications, with centralized configuration and license management. It must be installed on a machine that runs a Web server, or will use the G&R Web server, *GwebS*. The machine can run Linux, UNIX or Windows, and can run any Web server available for the OS. *GwebS* runs on all three OS platforms. Nothing has to be installed on the client side. The browser clients will download Glink from the Web server on demand and start it as an applet or as a Web Start application

If the server already runs Gallagher & Robertson's Host Links software release 6.3 or newer then the Glink Server mode package may be installed into the directory already used for G&R software. If an older version is installed then the Host Links release must be upgraded first. The username created for Host Links administration must also be used for Glink. The delivery includes working examples that are stored in the directory structure. The HTML files are used for demonstrations and the text versions of some of them are referenced in the documentation.

If you use the HTML files delivered as a basis for your own Glink web pages, please copy them to another directory or to differently named files, leaving the demonstrations intact.

If you simply modify the files, these modifications will be lost when the next release updates our demonstrations by overwriting the files.

Server mode installation on Windows

The Glink Server mode package is delivered as two self-installing executables:

```
386pc_660en_GlinkJavaServer.exe  
680_GlinkJ_ServerMode.exe
```

The first executable installs a basic Host Links system, including the Glink for Java server and the G&R Web server. The second executable installs all the Glink Web pages necessary to start and run the Glink terminal emulator or the Glink Administration program from a remote client as a Java applet or Java Web start application. It also includes HTML pages with information about configuration and usage.

You must also obtain a license file from your distributor. If you already have Glink for Java, Host Links or Gmail running on the system, please close all of these applications before you start the new installation. You can use the Gservice administration program in the G&R program group to terminate Gservice and all the G&R background server programs. You must terminate any client programs manually. Please make sure that you are logged in as a Windows administrator. Follow the installation steps below for each executable. Install the *386pc_660en_GlinkJavaServer.exe* first.

Installation steps:

1. Double-click the installer executable.
2. You will be prompted for a destination directory and a default will be suggested. The directory will be created if it doesn't exist.
3. You will be asked to choose a 'Full' or 'Custom' installation. Please choose a full installation unless you have received specific instructions for making a custom installation.

If you are not updating an existing installation you will be asked for the license file. Contact your distributor if you don't have a license file.

The main Glink Server mode installation is now done. To run Glink for Java, clients must have Java Runtime Environment (JRE) installed. If not already installed, users will be asked to install the JRE first.

Server mode installation on UNIX

Supported platforms R6.8

Code	Description
386I2	Intel 32bit x86 Linux kernel 2.x
x64I2	Intel 64bit x64_86 Linux kernel 2.*
ppca5	AIX 32bit for PowerPC

Delivery

A server mode installation is delivered as two sets of installation files. The first set installs a basic Host Links system, including the Glink for Java server and the G&R Web server. The second set installs all the Glink Web pages necessary to start and run the Glink terminal emulator or the Glink Administration program from a remote client as a Java applet or Java Web start application. It also includes HTML pages with information about configuration and usage.

To install the Glink Java server together with the basic Host Links system, download or copy the following files into an empty temporary directory, e.g. /tmp/hostlinks.

Name	Description
install.660	Installation script
gjsXXXXXX.660	A ZIP of the GlinkJ server and G&R Web server
basXXXXXX.660	Basic Host Links system
unzXXXXXX	Unzip program
licenses	License file (supplied by distributor)
install.txt	Installation instructions in ASCII format

To install the Glink Web pages necessary to start and run the Glink terminal emulator or the Glink Administration program from a remote client as a Java applet or Java Web start application, download or copy the following files into an empty temporary directory, e.g. /tmp/glink.

Name	Description
install.680	Installation script
gljXXXXXX.680	A ZIP archive containing the Glink software
unzXXXXXX	Unzip program
srbglj.680	Software Release Bulletin
licenses	License file (supplied by distributor)
install.txt	Installation instructions in ASCII format

The XXXXXX matches the supported platform codes in the previous tables.

Glink requires a license key to run. If your distributor delivered a licenses file separately then copy it into the installation source directory together with the distribution files above.

Preparing for the installation

If you already have G&R products installed on your system, you'll already have a G&R user id and group id.

If this is the case, please proceed to *Installing the software* section below, but note that your current release must be R6.3 or newer, otherwise you must update your other G&R products first.

If no G&R products are already installed, you should create a user id and group id for administration of G&R products before installing Glink. Create a new user id gar and group id gar on your UNIX Server:

```
username=gar
groupname=gar
```

To make your installation as simple as possible we suggest that you log in or su to the root user, create the directory `/usr/gar` and make the gar user and gar group the owner of it with the `chown` and `chgrp` commands before you run the installation script.

Installing the software

If you are already using G&R products on the system, you must close all of them before starting the installation.

After logging in as, or su-ing to, the user id for administrating the G&R products:

1. cd to the directory that contains the delivery files for Basic Host Links (`/tmp/hostlinks`)
2. Start the installation script with the command: `sh install.660`

You will be prompted for a destination directory and the default `/usr/gar` will be suggested. Unless you are running Host Links or Gmail on the same system, and have an existing system directory for G&R products please use the default. If you select another directory you must define a `GAR_SYSDIR` environment variable that points to it.

3. `cd` to the directory that contains the delivery files for Glink for Java (`/tmp/glink`)
4. Start the installation script with the command: `sh install.680`

Again you will be prompted for a destination directory and the default `/usr/gar` will be suggested.

Glink Application mode installation

Glink for Java and the Administration program can be installed as desktop Java applications. There are several installers for various platforms. Some of the installers include a Java VM (JRE). If you already have a JRE installed, choose the installer without a JRE which is much smaller.

Installers	Platform
<code>gja680.win64_novm.install.exe</code>	64bit Windows, no JRE
<code>gja680.win_novm.install.exe</code>	32bit Windows, no JRE
<code>gja680.macosx.install.zip</code>	Mac OS X
<code>gja680.aix.install.bin.gz</code>	AIX on PowerPC
<code>gja680.linux.intel.install.bin.gz</code>	LINUX on Intel
<code>gja680.unix.install.bin.gz</code>	All Java 2 enabled UNIX platforms, no JRE included
<code>gja680.other.install.jar</code>	Other Java 2 enabled platforms, no JRE included

Licensing issues

In order to run the Glink product you need a license file that you must obtain from your distributor. During Glink Server mode installation you are asked for the path to this license file.

Glink running as an applet or a Web Start application obtains a license from the Glink Java server.

Glink running as an application may obtain a license from a Glink for Java server or can be configured to use its own freestanding license file. You don't need a license file to do a Glink application mode installation. But if Glink is configured to use its own license file, you must put this file in the `\glinkj\config` directory.

Configuration

The Glink for Java server

For all installations other than freestanding application mode installations using their own license you will need to start the Glink server.

Glink for Java server on Windows

Start the Glink for Java server as a Windows service using Gmanager, which you start from the icon in the G&R program group. It will require you to initialize Gservice the first time you use it.

1. Verify that the user id displayed by Gservice is correct and add your password for your Windows account. You must have Administrator privileges.
2. If you want to the Glink for Java server to be started automatically on reboot, select startup type **Automatic**.
3. Click the **Add** button to add Gservice to the services on your Windows system. Gservice will start.
4. From Gmanager select **Gconfig** in the **Configuration** menu.
5. In the Gconfig window select **GlinkJ Server** and click the + button to add a new server.
6. In the GlinkJ server configuration box click **OK** to accept the defaults in the first case (they can be changed later).
7. In the Gconfig window select **Save** in the **File** menu.
8. In the Gmanager window select **Restart all servers** in the **Servers** menu.

The Gmanager status display will confirm when the GlinkJ server starts.

Glink for Java server on UNIX/Linux

To start the Glink for Java server do the following:

1. Log on as, or su to, user id **gar**.
2. Run the program: `/usr/gar/bin/glinkjs`
3. Configure this command to be run each time the server reboots.

Glink for Java server parameters

All the parameters for the Windows version are set using the GlinkJ Server configuration window from Gconfig. For the UNIX/Linux version you include parameters in the command line that starts the Glink Java server, for example:

```
/usr/gar/bin/glinkjs -dbg
```

The following parameters are available:

Parameter	Description
<code>-cdir configdir</code>	Specifies an alternative parent directory of the Glink server's configuration directory, defaults to <gar>/glinkj
<code>-ci nnn/10</code>	Check interval. Seconds between each status check
<code>-dbg</code>	Turns on a debug trace and the verbose log
<code>-dbl nnn</code>	As debug, but truncates the debug records to nnn bytes
<code>-lli nnn</code>	License lease interval, defaults to 30 minutes
<code>-log</code>	Turn on a verbose log, rather than the default minimum log
<code>-lp nnnnn</code>	Glink server port, defaults to 30842
<code>-mod XXX</code>	Mode/ID. Default DEF. Identifier if using multiple servers
<code>-na IP IP</code>	Send load-balancing information to specific instances of Gprox. Up to 4 IP addresses, separated by space
<code>-nb on/off</code>	Default broadcast load-balancing information to all Gprox
<code>-redir</code>	Enables the Glink server redirection capability
<code>-ro</code>	Read only permission for remote administration programs

License lease interval

If a client shuts down without closing the session the license remains in use until the lease expires. Decrease the interval to detect defunct sessions sooner. Increase the interval to reduce the traffic between clients and license server. Defunct licenses are released on the next status check (`-ci`).

Glink server port

This must be changed if using *Gproxy* load balancing. If changed for other reasons the corresponding change must be made in the applet or application configuration files so that they connect to the alternative port.

Load balancing (Gproxy)

If you are using *Gproxy* for load balancing across multiple *Glink* servers you must either broadcast load-balancing information (default) or address it to specific instances of *Gproxy* every `-ci` seconds. See the *Gproxy* manual.

Redirection

When configuring *Glink* sessions the host configuration dialog box has an option for connecting via the *Glink* server, rather than directly to the mainframe application. This is used in situations where the mainframe is protected by a firewall, but the *Glink* sessions are to be allowed through, via the system on which the *Glink* server is running. For security reasons this is only allowed if the `-redir` option has been set for the server.

Read only

If set the *Glink* server allows remote administration programs to browse in the *Glink* configuration database, but does not allow changes to be saved. Changes to the configuration can only be made using the administration program in application mode on the same system as the database.

SSL configuration

You can secure communication between the *Glink* clients and the server using Secure Socket Layer. The parameters are set in the configuration dialog box for Windows servers, and on the command line for UNIX/Linux servers. See the G&R/SSL manual for details of the parameters.

Glink for Java server log

As with all other Host Links server programs, the Glink server writes an event log in a product specific directory under the `servers` directory in the G&R system directory.

Windows server	<code>\gar\servers\<scid>.glj< code=""></scid>.glj<></code>
UNIX/Linux	<code>/usr/gar/servers/<scid>.glj</code>

The log file name is `_logfile.def` (unless `-mod` has been used).

e.g. `\gar\servers\ljg1.glj_logfile.def`

```
[2005/01/10 11:14:34] G&R/GlinkJS 6.2.0/m32pc 2005-01-05 15:49:03 started
[2005/01/10 11:14:34] LicReset, resetting license gljsrv, 0 cleaned
[2005/01/10 11:14:34] Local port used:30844, parameters supplied: -log -nb -lp 30844
```

The event logs are 64k long, and the last three generations are kept for reference.

Directory: `\gar\servers\ljg1.glj`

```
file  _log_001.def
file  _log_002.def
file  _logfile.def
```

Glink for Java server trace

Use the `-dbg` parameter in the UNIX/Linux command line or 'Enable tracing' in the Windows configuration dialog box.

The trace information is written to a file in the following directory:

Windows server	<code>\gar\debug\NODE</code>
UNIX/Linux	<code>/usr/gar/debug/NODE</code>

NODE is the local DSA node name if G&R/DSA is installed, otherwise the system name.

The name of the trace file is `glj.dbg`.

Glink Server mode configuration

Web server

You must configure your Web server to make the Glink HTML pages visible to users accessing the Web server. You do that by configuring your Web server with an alias or link to the `\gar\html\glinkj` directory. Check your Web server's documentation on how to set up such an alias. The general procedure is as follows:

1. Assuming that you installed Glink in `c:\gar`, create an alias, **glinkj**, pointing to `c:\gar\html\glinkj`.
2. Set up your Web server to accept **index.html** as a default page in this directory.
3. Set **Read** and **Script** access, but not **Write** access. Depending on your Web server you might also need **Execute** access.

HTML pages

The HTML pages delivered with Glink are located in `\gar\html\glinkj`. The most important ones are:

The **applet.html** page contains various links to HTML pages that start Glink. These are working examples that you can copy as a basis for your own pages.

The **glink.html** page is called from `applet.html` to start Glink as an applet.

The **gladm.html** page is called from `applet.html` to start the Administration program as an applet. This is a working example.

The **plugin\index.htm** is displayed if a Java Runtime Environment (JRE) is not detected on the client trying to start a Glink for Java applet. It contains information about the JRE needed by each browser and a link to where it can be downloaded.

With the Glink for Java server running, you can now start your Web browser and point it at the URL:

```
http://www.yourdomain.com/glinkj/
```

Here you will find HTML pages for starting Glink and the Glink Administration program as applets or Web Start applications.

Glink Application mode configuration

Glink for Java running as an application can either read the configuration and license files directly from the disk or can be instructed to obtain the configuration and license from a Glink for Java server. This is configured with the startup parameter **configserver** in the **glink.ini** file located in the **glinkj** directory. The default value is **configserver=none**, which means that Glink for Java should read the configuration and license files directly from the disk. In this case Glink will ask for a license file when started.

If you want Glink to obtain the configuration and license from a Glink for Java server, modify the **configserver** parameter. For example:

DNS name of server machine:

```
configserver=mainframename.yourcompany.com
```

Server running on this machine:

```
configserver=localhost
```

See also the *Glink start up parameter* section.

Glink for Java is initially set up with two users; **admin** and **demo** with the same password as the user name. You may either enter the user name at Glink start up or configure the user in the `glink.ini` file with the following parameters:

```
user.name=admin  
user.password=admin
```

You can change the user names and passwords with the Glink Administration program.

If several mainframe applications are configured, you may select a specific mainframe application with the parameter:

```
config.name=My Mainframe Application
```

where **My Mainframe Application** is a mainframe session profile configured with the Administration program and given that name. With this parameter set, Glink in a multiple mainframe configuration will skip the mainframe selection list at start up and connect directly to this application.



Configuring connections

If you have done a Server mode installation, done the necessary configuration and both the Web server and Glink for Java server are running, you should be able to access the Glink HTML pages from your browser, start Glink as an applet or Web Start application and select one of the preconfigured mainframe applications (sessions) to verify your installation with the working examples.

Similarly, if you have done an Application mode installation and the necessary configuration, you should be able to start Glink as an application and select one of the preconfigured sessions to verify your installation with the working examples.

You can now configure your own sessions either with the Glink client program or the Glink Administration program. The Glink client program let you configure new configurations quick and easy. More advanced configuration is done with the Glink Administration program.

Glink client program

You can generate, modify and delete session configurations directly from the Glink client, without using the administration program. In the Sessions dialog box that shows available sessions there is a button for **New** and a button for **Remove**.

In the **New** session dialog box you specify a name and select the emulation type and communication protocol type. There are several profile templates to choose from. In the following dialog box the address to your host application is specified. Then Glink should be ready to start up and connect to your application. If needed, you can modify any parameter after Glink has started. The configuration parameters are found in the menu option **Settings**. The configuration is saved when you exit Glink or switch to another session.

Glink is delivered with a set of profile templates used by the **New** session dialog box. These templates can, if needed, be modified by the Glink Administration program. A profile is recognized as a template if an asterisk precedes the name, for example *VT320. If you create a new profile with the Administration program using this naming convention, it will be treated as a template by the **New** session dialog box.

Glink Administration program

The Administration application can obtain mainframe configuration information from a Glink for Java server or, for a freestanding application mode installation, have its own configuration files, but configuration of mainframe sessions is done in the same way.

The administrator uses the administration program to configure Glink for Java for end-users. There are two main processes involved: creating and managing users and groups, and creating and managing configuration profiles.

Users & groups work just as they do in any other context. You can create user accounts and arrange them into groups as needed. You can control access to various advanced features, such as scripting and configuration, on the group and/or individual user level.

Configuration profiles each define the configuration of a single part of Glink. Separate profiles can be made to describe mainframe connection options, emulation options, keyboard layout, toolbar setup, screen colors and printer configuration. These profiles, once created, can be mixed & matched into complete configurations. A configuration is a collection of profiles used to connect to a given mainframe application. These configurations can be made available to specific groups, individual users, or everyone.

When users log in to Glink for Java they receive a dialog box that lists all the configurations available to them, and they select one for their session.

When setting up Glink for Java for the first time, you will generally first create the users and groups you need, then create new profiles (using the sample profiles provided as templates), and finally create the configurations that bind sets of profiles together to make them available to users.

Setting up users and groups

Initially, Glink is shipped with a user database containing two users and one group: user **admin** with password **admin**, belonging to group **Admins**, and user **demo** with password **demo**, not belonging to any group.

The first thing you should do is to change the password for user **admin**. Select the line for user **admin** and click **Modify User** on the toolbar. The password will be shown as a sequence of asterisk characters. Change it and click OK.

Next, you need to create users and groups to reflect your organization. There is no ‘right answer’ here. One way of doing it is to create groups to reflect your organizational structure; another is to create groups that share the same mainframe access requirements.

It is important to realize that in large organizations it may not be practical to create a user in Glink for each and every person. Rather, users in Glink should be thought of as ‘roles’, or ‘subgroups’. Glink allows several users to connect simultaneously using the same user name and password; thus a user is more a collection of privileges and resources than a means of personal identification. The Glink for Java server takes care of licensing issues.

Once you’ve decided on your group and user structure, create the corresponding entries using the Administration program. Select **Users and Groups** in the left pane, and use the toolbar buttons to do the job. Each toolbar button has a tool tip explaining its function; move the mouse pointer to a button and let it rest there, the tool tip will appear after 1-2 seconds.

Privileges and resources are ‘inherited’ in the sense that settings for a group apply to all its members. Some resources are global, meaning that all users, regardless of group membership, inherit them. Every Glink user can be a member of up to 2 groups.

When you're done, click the **Save** button on the toolbar to save your work.

Configuring mainframes

Select **Hosts** in the left pane of the Administrator program. A Host profile is a collection of information needed to connect to a specific mainframe. Folders for your groups and users should appear in the right pane. Double-click on the folder icons to see what mainframe profiles are already configured for the groups or users. In the Global folder you should see a set of demo mainframe profiles that were shipped with Glink.

To view or modify a profile, double-click on it or select it and click the **Modify Host** button on the toolbar. Browse the demo profiles to get an idea of how they are configured.

Now you're ready to create your own mainframe profiles. Select the folder in which you want to place the new profile (the Global, a Group or a User folder), and click the **New Host** button on the toolbar. If you'd like to use one of the demo profiles as a template: select it, click **Copy** on the toolbar, select the destination folder (Global, Group or User) and click **Paste** on the toolbar.

A dialog box will appear, guiding you through the configuration process. If you pasted a template from one of the demo profiles, you simply modify the settings to match your mainframe; otherwise you'll have to enter the information from scratch. Note that you'll have to rename a pasted profile.

As a general rule, you should seek to place your resources - including host profiles - as high as possible in the hierarchy of groups and users. The higher you place it, the more users will have access to it. If more than one user needs access to a specific resource, do not duplicate the profile for all the users, but place it in a group to which these users belong.

Once you're done, click the **Save** button to save your work.

Configuring terminal emulations

An Emulation profile describes the characteristics of a particular terminal type. Emulations are configured in the same way as host profiles. Click on Emulations in the left pane, and double-click on the folder icons in the right pane.

As for host profiles, Glink comes with a predefined set of terminal type descriptions, found in the Global folder.

If the Global emulations don't suit your needs, repeat the procedure used for host profiles to create your own.

Remember to save your work by clicking the **Save** button.

Setting up Configurations

A Configuration profile (session) is a special profile that groups a Host profile, an Emulation profile and one each of the other profile types that appear in the left pane of the Administrator program.

Users who start Glink are presented with a list of sessions from which they can choose.

To add a configuration, click on **Configurations** in the left pane to display the folders in the right pane, and double-click the folders to expand them as before. You'll see a list of predefined configurations under the Global folder.

Browse these configurations to see how they're built. The procedure is extremely simple: you pick one each of all the other profiles, and these are grouped as a Configuration (session). When a user picks a session, all aspects of Glink will be configured from the information stored in the profiles that make up the Configuration.

You can now build your own Configurations, following exactly the same procedure as for hosts and emulations.

Finishing touches

In a similar way you can create custom profiles for keyboards, printers, screen look & feel, toolbars and menus. The predefined profiles are sufficient to get you started. For special needs, the Administration program allows you to fully re-configure most aspects of these items. For more information on specific topics, click the Help buttons in the configuration dialog boxes.



Starting Glink

Glink for Java may be started as an applet, a Web Start application or as an application. Once started, they are very similar. Note that the delivery also includes the Glink Desk Top Manager. This is a Glink API application that allows multiple Glink instances to be run as tabbed panes in a single window. The Desk Top Manager can be started in all the same modes as Glink itself, but because it is a Glink API application you must have a Professional or Enterprise Edition license in order to use it.

HTML pages for starting Glink

The Server mode installation is delivered with several HTML pages that demonstrate how to start Glink as an applet or as a Web Start application, and how to add extra parameters that instruct Glink to connect directly to a specific application. These HTML pages are all found in the `/gar/html/glinkj` directory.

As an applet

The page `glink.html` is an example of starting Glink as an applet.

If you look at the HTML source for this page you will note that it no longer uses the `<APPLET` tag. After introduction of Sun's Java 2 Runtime Environment (JRE), applets are declared using the `<EMBED` or `<OBJECT` tag. Our page defines both, and uses a Java script to test the browser type. If the browser is of the 'Netscape' type (it is either Netscape, or identifies itself as being Netscape) we use `<EMBED`. Otherwise we assume an 'Internet Explorer' type, and use `<OBJECT`.

When you make your own applet start pages you can copy the examples, and add any parameters you might need for your own applets.

Detailed information on parameters is provided in the *Glink start up parameters* section.

As a Web Start application

The links reference files with **jnlp** as extension, and your Web server must be configured to return the proper MIME type for the JNLP content. The G&R supplied Web server, *GwebS*, is already configured, as is Tomcat.

```
<mime-mapping>
<extension>jnlp</extension>
<mime-type>application/x-java-jnlp-file</mime-type>
</mime-mapping>
```

The page **glink.jnlp** is an example of starting Glink as a Web Start application.

```
<?xml version="1.0" encoding="utf-8"?>
<!-- JNLP File for Glink for Java -->
<jnlp
  codebase="http://www.gar.no/glinkj"
  href="glink.jnlp">
  <information>
    <title>Glink for Java</title>
    <vendor>Gallagher & Robertson</vendor>
    <description>Glink for Java</description>
    <description kind="short">Glink for
Java</description>
    <homepage href="webstart.html"/>
    <icon href="imgs/glinkicon.gif"/>
  </information>
  <security>
    <all-permissions/>
  </security>
  <resources>
    <j2se version="1.5+"/>
    <jar href="glink.jar"/>
  </resources>
  <application-desc main-class="no.gar.glink.Loader">
    <argument>configserver=glinkj.gar.no</argument>
  <argument>filebase=http://www.gar.no/glinkj</argument>
  </application-desc>
</jnlp>
```

Please note that you **must** replace `www.gar.no` with the address of your web server and replace `glinkj.gar.no` with the address of your Glink Java server.

As an application

Glink for Java may be delivered with or without a Java Runtime Environment (JRE). If you already have a JRE installed, choose the installation package without a JRE, it is much smaller. When you start a Java application you really start a JRE with a parameter specifying the application's class archive and another specifying the application's start up class. For the Glink application you may use the following command:

```
\Java\jre\1.6.x\bin\java.exe -classpath glink.jar no.gar.glink.Loader
```

On a Windows client, Glink for Java is installed with icons to both Glink and the Glink Administration program, hiding the start up commands.

Glink start-up parameters

You can add various start-up parameters to Glink, running as an applet, as a Web Start application and as an application. You supply the parameters differently for the different modes, but the parameters are the same.

For applet mode, the parameters are added to the HTML page that starts Glink by adding PARAM tags within the APPLET tag, for example:

```
<PARAM NAME = config.name VALUE ="DKU to TP8 test">
<PARAM NAME = user.name VALUE ="demo">
<PARAM NAME = user.password VALUE ="demo">
```

For Web Start application mode the parameters are added to the JNLP page by adding ARGUMENT tags within the APPLICATION-DESC tag, for example:

```
<argument>config.name=DKU to TP8 test</argument>
<argument> user.name=demo</argument>
<argument> user.password=demo</argument>
```

For application mode, the parameters are added to the `glink.ini` file located in the installation directory of the Glink application, for example:

```
configserver=glinkj.gar.no
```

```
config.name=DKU to TP8 test
user.name=demo
user.password=demo
```

Startup Parameter overview

Name	Description
configserver	<p>This option specifies the name of the machine on which the Glink server is running. If you don't specify it, Glink assumes that the server is running on the same machine as the Web server from which you loaded Glink. Syntax:</p> <pre>configserver=machine.domain.xxx</pre> <p>example:</p> <pre>configserver=myserver.acme.com</pre>
server.port	<p>This option specified an alternate port number for the Glink server. The default port number is 30842. Syntax:</p> <pre>server.port=decimal port number</pre> <p>for example:</p> <pre>server.port=30847</pre>
backupserver	<p>This option specifies the name of the machine on which a backup Glink server is running. If you don't specify it, and if the primary config server is not running, Glink won't start. Syntax:</p> <pre>backupserver=machine.domain.xxx</pre> <p>for example:</p> <pre>backupserver=mybackup.acme.com</pre>
backup.port	<p>This option specified an alternate port number for the server specified by the backup.server option. The default port number is 30842. Syntax:</p> <pre>backup.port=decimal port number</pre> <p>for example:</p> <pre>backup.port=30847</pre>

Name	Description
user.name	Specifies the default user name for login. Can be used together with user.password to automate login completely.
user.password	If this option is defined together with user.name, Glink for Java™ will automatically log in to the server using the specified user. If the user name or password is invalid, the normal login dialog will be displayed.
config.name	If this option contains the name of a valid configuration profile, Glink will bypass the normal Sessions menu and automatically load and connect to the specified configuration.
config.language	<p>XX. Default is us, which specifies the United States language glink_us.txt file. Glink loads all of its texts from a file stored on the web server:</p> <pre data-bbox="389 703 983 730">/gar/html/glinkj/no/gar/data/glink_XX.txt</pre>
config.screensize	<p>The default screen size is a compromise of 132 columns and 32 rows. If you are using a terminal emulation with a smaller screen, you can optimize memory usage by setting the correct dimensions (80,24). If you are using the VIP7800 emulation with 132 columns and 72 lines, then you must set this correctly:</p> <pre data-bbox="389 943 776 970">config.screensize=132,72</pre> <p>NB! No space between columns and rows, just comma.</p>
server.usessl	<p>This parameter lets you configure Glink to use a secure connection to the Glink config server. Specify either 1 or 2. A value of 1 means use SSL without authenticating the server certificate. A value of 2 means use SSL and authenticate the server certificate. In most cases, you don't need additional SSL parameters. For example:</p> <pre data-bbox="389 1246 639 1273">server.usessl=2</pre>
server.valname	<p>SSL optional parameter. If this option is used, Glink will in addition to authenticating the server certificate, verify that the server name (CN=) value contained in the received certificate corresponds to this value.</p>



Name	Description
server.clientcert	SSL optional parameter. Specify the file path to the Key store that contains your client certificate. Necessary if the Glink server requests a client certificate.
server.clientcertpw	SSL optional parameter. Supply the password for the given Key store.
server.sslprotocol	SSL optional parameter. Sets the protocol to be used for the SSL connection, default value is TLS. Options: SSL Supports some version of SSL SSLv2 Supports SSL version 2 or higher SSLv3 Supports SSL version 3 TLS Supports some version of TLS TLSv1 Supports TLS version 1
server.keystoretype	SSL optional parameter. Specifies the Key store type. The default value is JKS. The other type supported is PKCS12.
usepersonaldir	The concept of user-specific modifications to configurations has been removed. It can be restored by setting usepersonaldir=true

Glink API usage

Control Glink from a Java program

Glink for Java is delivered with an Application Programming Interface (API) for customers who wish to control the emulator from their own Java servlets, JavaBeans, Java applets or applications. The API is implemented as a set of Java classes packed with the `glink.jar` and `glinkee.jar` files. To use the Glink API, simply add to the Java class path the full path to either the `glink.jar` or `glinkee.jar` file.

There are two versions of Glink, standard Glink, packed as `glink.jar` and an optimized version, `glinkee.jar`. The latter has no screen display, and can only be used from a Glink API application that provides the user interface itself. The Glink API is the same, except for the display calls that are ignored by the `glinkee.jar` version.

When developing a Java applet or application, use the `glink.jar` file, even if you supply your own user interface, since you can then see the actual mainframe dialog and quickly spot unexpected situations. Switch to the `glinkee.jar` when the application is completed.

To enable the API you must license the Professional or Enterprise Edition of Glink for Java. If you find that you are unable to use the API you should get an error notification; get more information by displaying the available error text. See the `GlinkEvent` class for details.

The Professional Edition allows your application to open up to 5 simultaneous mainframe sessions. The Enterprise Edition has no limit, other than the total number of licenses available.

The API classes and methods are documented in HTML files:

```
\gar\html\glinkj\help\api\index.htm (server mode)
\glinkj\help\api\index.htm (application mode)
```

Include the Glink screen within your own application window

You can include the Glink emulator screen within your own application window using the GlinkApi method `getGlinkContainer()`. This method lets you add the Glink screen to a panel within your application frame. The Glink Desktop Manager, Gargen and the GlinkWeb Forms Assistant are examples of applications that add Glink instances to a tabbed pane.

Compile and run Java applications

The following procedure describes how to compile and run an application using the Glink for Java API:

1. Install Glink using the Glink application mode installation package.
2. Configure the mainframe application you want to access using the Glink Administration program.
3. Verify that you can log on to the mainframe application using Glink.
4. Install Sun's JDK 1.5.0 or later.

Type the following command to compile your application named MyApp:

```
javac -classpath ".;c:\glink\glink.jar" MyApp.java
```

To run the MyApp application, type:

```
java -classpath ".;c:\glink\glink.jar" MyApp
```

If you're using a Java IDE, such as JBuilder, Visual J++ or Café, you must include `c:\glink\glink.jar` in your project's CLASSPATH. Consult your IDE documentation for instructions on how to do this.