

# | **FactoryLink 6.6.0**

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## ***WebClient User Guide***

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# *Preface*

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## **PURPOSE**

FactoryLink WebClient gives users the capability to remotely monitor and control FactoryLink applications using the Microsoft Internet Explorer browser or any other ActiveX-enabled application. Using Internet standard technology, application information is communicated across internet or intranet connections, allowing either full-control bi-directional connections or secure view-only connections.

This guide presents the technical information necessary to install, configure, and administer WebClient.

## **AUDIENCE**

The primary audience of this manual is application developers, programmers, or administrators who are involved in providing WebClient access to remote users of FactoryLink applications. In general terms, this manual addresses:

- Adding WebClient to an existing FactoryLink application.
- Creating a new FactoryLink application that incorporates WebClient functionality.

## **STRUCTURE OF THE *WEBCLIENT USER GUIDE***

The *WebClient User Guide* is currently part of the Additional Manuals area in the overall FactoryLink Documentation Set. Refer to the Preface in *Fundamentals* for the structure of the entire Documentation Set.

This manual is divided into ten chapters:

- Overview
- Installation
- Configuration
- Running WebClient
- FactoryLink application considerations
- Troubleshooting
- WebClient HTML pages
- ActiveX control events, properties, and methods
- WebClient minimum tag list
- Command line switches

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- *How To Use This Manual*
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## HOW TO USE THIS MANUAL

The material in this manual is presented sequentially in performance order. We recommend you read the entire manual to familiarize yourself with the complete procedure before you proceed to develop your application.

### ... at a Glance

Located at the beginning of this manual is a section named ... at a Glance. This section provides a quick key to locations to find information to perform the procedures detailed in that part with hypertext links to those locations.

## CONVENTIONS

The material in the Documentation Set adheres to the guidelines published in *The Digital Technical Documentation Handbook* by Schultz, Darrow, Kavanagh, and Morse; *Developing International User Information* by Jones, Kennelly, Mueller, Sweezy, Thomas, and Velez; and corporate style guidelines.

This manual uses the following conventions.

Convention	Description
...	Horizontal ellipsis points indicate the omission of material from an example. The information is omitted because it is not important to the topic being discussed.
. . . . . .	Vertical ellipsis points indicate the omission of information from an example or command format. The information is omitted because it is not important to the topic being discussed.
<i>italic type</i>	Italic type is used to denote user-supplied variables in command examples. Italic type also sets off references to specific documents.
monospace type	Monospace type is used to denote command names and code examples or example output.
bold monospace type	Bold monospace type is used in command examples to indicate words that must be typed literally.



<b>Convention</b>	<b>Description</b>
sans serif type	Sans Serif type is used to set off field names, button names, and keys on the keyboard.
press nnnnn	Press is used to denote a key on the keyboard. The key name will appear in a sans serif type.
click on nnnnn	Click on is used to denote a button on the screen. The button name will appear in a sans serif type.
Shift+F1	The + indicates the keys must be pressed simultaneously. Shift+F1 indicates you hold down the Shift key while you press another key or mouse button (indicated here by F1). Other key combinations are presented in the same manner.
F1 F2 F3	The space between the key callouts indicates press and release. The key sequence F1 F2 F3 indicates you press and release F1, then F2, and then F3. Other key combinations are presented in the same manner.
File>Open	The > indicates a progression through a menu sequence. File>Open indicates you choose Open from the File menu to perform the required action. Other menu sequences are presented in the same manner.
FLAPP\user\drw\mydrw.g	The \ indicates the directory structure for the listed file. FLAPP\user\drw\mydrw.g indicates the drawing file mydrw.g is located in the drw sub-directory of the user sub-directory to the FLAPP directory. Other directory structures are presented in the same manner.

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- Getting Help
- 
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Convention	Description
[ ]	Brackets indicate an optional argument. You can choose none, one, or all of the options.
{ } and	Braces indicate a choice. You must choose one of the elements. The vertical bar separates choices within braces.

### Example Syntax

Example syntax using these conventions is provided below:

command *input\_file* [*input\_file...*] {*a/b*} *output\_file*

where

*command* is typed as it is displayed in the syntax.

*input\_file* indicates a variable the user supplies.

[*input\_file...*] indicates the user can optionally supply multiple input file names, each name separated by a space.

{*a/b*} indicates either the a or b must be specified as an argument.

*output\_file* indicates the user must specify an output file.

## GETTING HELP

Contact your Sales or Customer Support Representative for help with troubleshooting problems.

Also, help files are included for each configuration panel. Click on Help on the panel menu bar to access these files.

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# ***WebClient User Guide At A Glance***

## **Using WebClient**

<b>For details on performing the following steps...</b>	<b>Go to...</b>
<b>1. An overview of WebClient</b>	<b>Chapter 1, “Overview</b>
<b>2. Installing the WebClient components</b>	<b>Chapter 2, “WebClient Installation”</b>
<b>3. Configuring WebClient</b>	<b>Chapter 3, “Configuration”</b>
<b>4. Running WebClient</b>	<b>Chapter 4, “Running WebClient”</b>
<b>5. Modifying existing FactoryLink applications for WebClient</b>	<b>Chapter 5, “WebClient and FactoryLink Applications”</b>
<b>6. Troubleshooting your WebClient installation</b>	<b>Chapter 6, “Troubleshooting”</b>
<b>7. Creating WebClient HTML pages</b>	<b>Chapter 7, “WebClient HTML Pages”</b>
<b>8. WebClient ActiveX control events, methods, and properties</b>	<b>Chapter 8, “WebClient ActiveX Control Properties”</b>
<b>9. The WebClient minimum tag set</b>	<b>Chapter 9, “WebClient Minimum Tags”</b>
<b>10. WebClient data logging and command line switches</b>	<b>Chapter 10, “WebClient Command Line Switches”</b>

- **WEBCLIENT USER GUIDE AT A GLANCE**
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## *Overview*

### INTRODUCTION

FactoryLink applications use the Graphics task to display information. When you access the application, a unique instance of the Graphics task is created.

WebClient adds to the FactoryLink architecture, allowing the graphics task to be executed on a remote workstation or client. Using WebClient, remote users can display all FactoryLink windows and, if configured for full-control, can control the application. Where user control is not required or not prudent, the remote users can be configured as view-only, making them unable to write information to the real-time database.

The client software consists of an ActiveX control, which enables the graphics task to display information to you in the Microsoft Internet Explorer browser. You load a standard HTML page containing the codes required to start the ActiveX control and connect to the server. Included with the client software is a FactoryLink task used to connect to a FactoryLink server from a remote node, executing outside the ActiveX control or a container application, such as Internet Explorer.

On the server side, two tasks manage the functions associated with WebClient. The Connection Server task controls WebClient connections to the application, starting user instances for incoming connections and terminating connections as you close WebClient. On start-up, the Connection Server starts USER domain instances for each of the configured WebClient connections. These Data Server instances are put into a dormant mode until a remote user makes connection with the server.

As remote users request connection to the server, the Connection Server activates an instance of the Data Server task, which interfaces with the real-time database, performs file transfer functions, and manages application security operations. The Data Server task also prevents unauthorized real-time database writes, based on who is connected.

The WebClient server tasks are installed with the FactoryLink base system. The client-side components of WebClient can be installed from distribution CD or over a network. Refer to “Client-side Installation” in Chapter 2 for information on installing these components.

- **OVERVIEW**
- *Access and Security Options*
- 
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Once installed, the server tasks must be configured. Refer to Chapter 3, “Configuration” for information on configuring the server tasks.

You must create and load a special HTML page that activates the connection to begin using the WebClient ActiveX control to access your FactoryLink application. Refer to Chapter 7, “WebClient HTML Pages” for information on creating a WebClient HTML start page.

## **ACCESS AND SECURITY OPTIONS**

WebClient provides several configuration options to provide varying levels of security for your FactoryLink application. This is in addition to standard security measures built into the application, for example supervisor passwords. All configuration and enforcement of these levels of control occurs on the server side.

### **View-Only Connections**

View-only WebClient connections provide the maximum level of security for FactoryLink applications. Remote users configured as view-only can write only to a small subset of tags in the FactoryLink real-time database as specifically configured on the server. The FactoryLink application developer has some flexibility in defining the set of tags view-only connections can write to.

The remote user can view the application in exactly the same manner as a local user, changing windows and navigating to different views; however, control of the application via buttons, sliders, input text, and other controls is limited.

### **Full-Control Connections**

In a default full-control connection you have access to all the features and controls of the FactoryLink application. Remote full-control users can alter set-points, adjust controls, and respond to alarms just as if connected over the local network.

## **User-Defined Connections**

You can establish degrees of control by further defining what is meant by a full-control connection. Using Configuration Manager, you can limit remote users' ability to write to tags in the real-time database. You accomplish this by specifically listing all tags accessible to WebClient, or on a broader scale, by defining the ability or inability to write tags of an entire domain (USER or SHARED).

## **Allocating Access to Specific Nodes**

You can specify the type of access a node receives through either a default or a defined list of nodes. Specific nodes can be allowed view-only, full-control, or a custom user-defined access, or they can be denied access altogether.

- **OVERVIEW**
- *Access and Security Options*
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# ***WebClient Installation***

This chapter provides installation procedures for the components of FactoryLink WebClient. WebClient is installed as an optional part of FactoryLink version 6.0.4 or later.

## **SERVER INSTALLATION**

The components of WebClient are part of the base FactoryLink installation. The Connection Server and Data Server tasks are installed automatically with the basic FactoryLink files, if you have purchased them. Refer to *Windows NT and Windows 95 Installation Guide* for more information on installing FactoryLink.

## **CLIENT-SIDE INSTALLATION**

Perform the following steps to install the client-side WebClient software on a workstation:

- 1** Copy the WEBCLIENT.EXE program file to your local hard disk.
- 2** Run WEBCLIENT.EXE by locating it in Windows Explorer and double clicking the file name or by clicking on Start>Run on the Taskbar and entering `webclient.exe` in the Open dialog.
- 3** Follow the instructions displayed by the installation program.
- 4** Once installation is complete, you may delete WEBCLIENT.EXE from your hard disk.

Once the WebClient software installation is complete, run Microsoft Internet Explorer and connect to the server to access the FactoryLink application by loading HTML pages with the appropriate codes to start the ActiveX control and initiate the connection. Load the default WebClient HTML page by clicking on the Start WebClient icon in the WebClient program group.

Refer to Chapter 7, “WebClient HTML Pages” for more information on creating these HTML pages.

- **WEBCLIENT INSTALLATION**

- *Browser Installation*

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## **BROWSER INSTALLATION**

WebClient uses the standard version of Microsoft Internet Explorer; it is not modified or customized in any way to work with WebClient.

If you do not already have Internet Explorer installed, install it from the distribution CD-ROM. The CD-ROM includes versions for both Windows NT and Windows 95.

Perform the following steps to install the browser:

- 1** On the Taskbar, click on Start>Run and enter the following path and file name in the Open field:

For Windows NT - [D]:\WEBCLNT\MSIE302MNT.EXE

For Windows 95 - [D]:\WEBCLNT\MSIE302M95.EXE

Where

[D] Is the drive letter for your CD-ROM drive.

- 2** Follow the instructions on the screen to install Explorer.

# *Configuration*

This chapter provides instructions for configuring the WebClient tasks in FactoryLink. Three main topics are covered in this chapter:

- Set up and definition of remote access types and the security enforced for those access types by using the FactoryLink Configuration Manager.
- Network configuration
- On-line configuration

- **CONFIGURATION**
- *Configuring WebClient*
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## CONFIGURING WEBCLIENT

### WebClient Application Preparation Utility

Use the WebClient application preparation utility `cv_wcapp.exe` provided to assist in preparing your FactoryLink application for use with WebClient. This application simplifies the process of configuring your application by performing the following functions:

- Checks/adds the Connection Server task to the SHARED domain of the system table.
- Checks/adds the Data Server task to the USER domain of the system table.
- Checks/adds the Graph task to the USER domain of the system table.
- Sets the tasks flag for the RUNMGR task in the USER domain to FR.
- Configures the WebClient Connections panel for one WebClient connection.
- Configures the VIEW-ONLY access security with the required minimum set of graphics tags.
- Configures the FULL-CONTROL access security with write privileges to both USER and SHARED domains.
- Adds entries to TCP/IP services file to support one WebClient connection.

Use of the utility is not required, but it is recommended. This utility assumes FLCONV has updated the global database.

**Note:** An existing FactoryLink application must be converted to FactoryLink version 6.0.3 or later before you can use the WebClient conversion utility. Refer to the FactoryLink *Fundamentals* manual for information on using FLCONV to update your application.

Perform the following steps to start the utility:

- 1 Click on Start>Run in the Windows Taskbar.
- 2 Enter `{FLINK}\bin\cv_wcapp {FLAPP}` at the prompt, where
  - {FLINK} Is the path to your FactoryLink installation
  - {FLAPP} Is the path to your application.

The utility executes and performs the initial configuration, completing the Configuration Manager panels with the default values for one WebClient remote connection. No other configuration is required for a basic installation (one remote user, default access security).

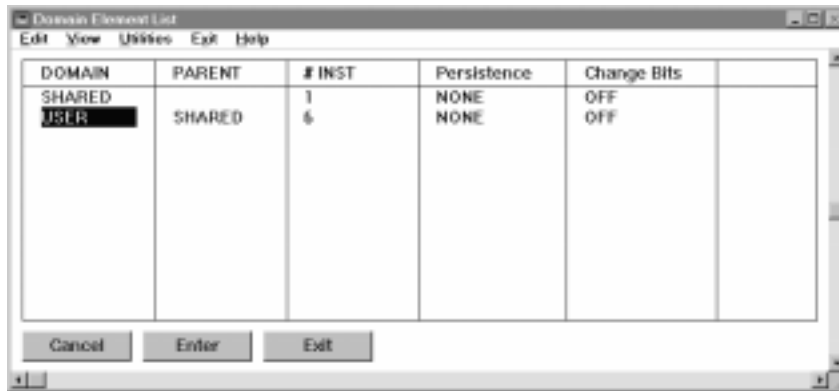
To configure FactoryLink for additional remote connections, the Domain Element List must be modified, the WebClient Connections panels must be completed, and additional entries must be made in the TCP/IP services file.

## DOMAIN ELEMENTS LIST PANEL

You must modify the Domain Elements list to reflect the number of WebClient connections you have purchased.

Perform the following steps to configure the Domain Elements List panel:

- 1 Start the Configuration Manager and select View>Domain List to display the Domain Element List panel.



- 2 Change the number of USER instances to one more than the number of WebClient connections you are setting up. This configures the remote users and one instance for running the Graphics task on the server. For example, if you are configuring for five simultaneous WebClient connections, you should enter 6 in this field.
- 3 Click on Enter to save the information.
- 4 Click on Exit to return to the Main Menu.

- **CONFIGURATION**
- *Adding WebClient to the System Configuration Panels*
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## ADDING WEBCLIENT TO THE SYSTEM CONFIGURATION PANELS

As with any other FactoryLink task, the WebClient Data Server and Connection Server tasks must be entered in the System Configuration Information panels within the Configuration Manager.

The easiest way to accomplish this is to use the CV\_WCAPP.EXE utility (see “WebClient Application Preparation Utility” on page 20). The utility enters all the necessary information in the System Configuration Information panels as well as sets up the minimum required information in the WebClient Configuration panels.

Refer to the FactoryLink *Fundamentals* manual for a full discussion of the procedure if you wish to complete the System Configuration Information panels manually. The following list shows default values required to configure the Connection Server and Data Server for the table.

**Note:** These are the values CV\_WCAPP.EXE enters. In the following examples, [n] indicates the counter of the particular task, where the tasks are numbered, beginning with 0.

### Connection Server System Configuration Information

Domain	SHARED
Flags	FR
Task Name	CONNSRV
Description	WebClient(R) Connection Server
Start Trigger	TASKSTART_S[n]
Task Status	TASKSTATUS_S[n]
Task Message	TASKMESSAGE_S[n]
Display Status	TASKDSTATUS_S[n]
Display Name	TASKNAME_S[n]
Display Description	TASKDESC_S[n]
Start Order	1
Priority	201
Executable File	bin\connsrv

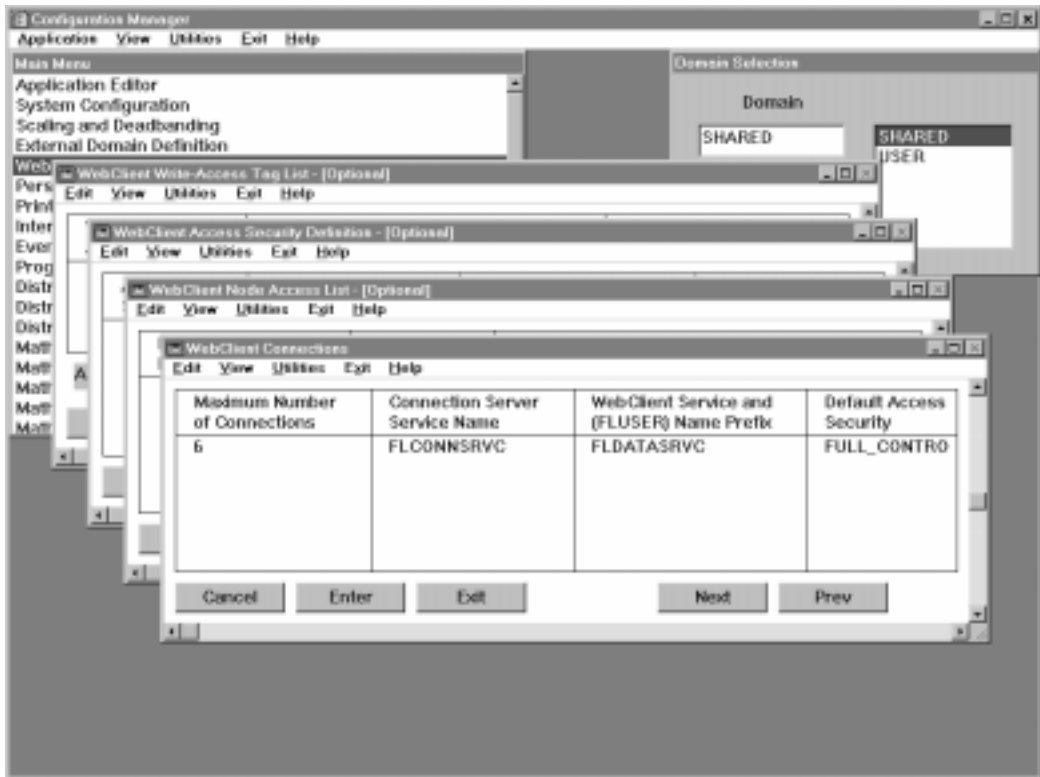
**Data Server System Configuration Information**

Domain	USER
Flags	FH
Task Name	DATASRV
Description	Data Server
Start Trigger	TASKSTART_U[n]
Task Status	TASKSTART_U[n]
Task Message	TASKMESSAGE_U[n]
Display Status	TASKDSTATUS_U[n]
Display Name	TASKNAME_U[n]
Display Description	TASKDESC_U[n]
Start Order	1
Priority	201
Executable File	bin\datasrv

- **CONFIGURATION**
- *Completing the WebClient Configuration Panels*
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## COMPLETING THE WEBCLIENT CONFIGURATION PANELS

You configure WebClient using four data entry panels included in the Configuration Manager. These panels define the number and type of remote connections, define access for specific nodes, and determine specific tags that can be written by user-defined access types. Choose WebClient Services on the Configuration Manager Main Menu to display the four WebClient configuration panels.



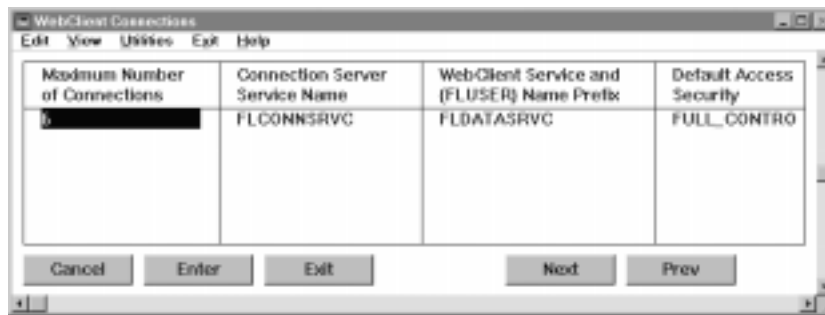


## WEBCIENT CONNECTIONS PANEL

The WebClient Connections panel contains the basic configuration information required to allow remote client connections to the FactoryLink application. The information entered in this panel applies to both the USER and SHARED domains.

Perform the following steps to configure the WebClient Connections panel.

- 1 Double click on WebClient Services in the Configuration Manager Main Menu to display the WebClient Connections panel



- 2 Specify the following information for the panel.

- |                                |  |
|--------------------------------|--|
| Maximum Number of Connections  | <p>This field defines the maximum number of remote WebClient users who can simultaneously access the application. This is a required numeric field with value range of 1 to 50.</p> <p>It defines the number of user instances to invoke. The entry is typically one less than the number of USER instances entered in the Domain Element List (see Step 2 of “Completing the WebClient Configuration Panels”). The extra USER instance is for a local Graph task.</p> <p>For a basic configuration, enter the number of remote client connections desired and click on Enter.</p> |
| Connection Server Service Name | <p>This field defines the service name for the Connection Server as defined in the services file. This is a required character field with a length of 16 characters. The default entry is FLCONNSRVC. Unless you have a specific reason to change this, we recommend you use the default.</p>  |

- **CONFIGURATION**

- *WebClient Connections Panel*

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An entry in the TCP/IP Services file must be made for this name. See “Modifying the TCP/IP Services File” on page 34 for more information on modifying the services file.

WebClient Service  
and {FLUSER}  
Name Prefix

This field defines the user name prefix for launched USER domain instances. For example, using the default entry of FLDATASRVC, the first launch creates a service/user name of FLDATASRVC001. This is a required field and is limited to 12 characters. Unless you have a specific reason to change this, we recommend you use the default.

Default Access  
Security

This field defines what the default access type is for WebClient connections for nodes not listed in the WebClient Node Security Panel (see below). Four values are valid for this required field:

NO\_ACCESS No access to the application (connection denied).

VIEW\_ONLY Reads all tags; Writes tags to a maximum of 76 tags. These tags are specifically listed in the corresponding access definition.

FULL\_CONTROL

Reads all tags; Writes tags as in accordance with the FULL\_CONTROL access definition. The default is write access to all shared and user tags.

<user defined> User-entered string referring to a custom access security type. There may be multiple user-defined custom access types. These custom access types are defined in the WebClient Access Security Definition panel (see page 29).

The default level of access is FULL\_CONTROL.

WebClient Service  
Description

This field is a brief description of this FactoryLink application/server. This description is available to the WebClient ActiveX control as the LocationName property and can be displayed to the remote user. The field is limited to 32 characters and the default is FactoryLink WebClient Service.

- 3 Click on Enter to save the information.
- 4 Click on Exit to return to the Main Menu or click on Next to configure the optional WebClient Node Access List (see page 27).

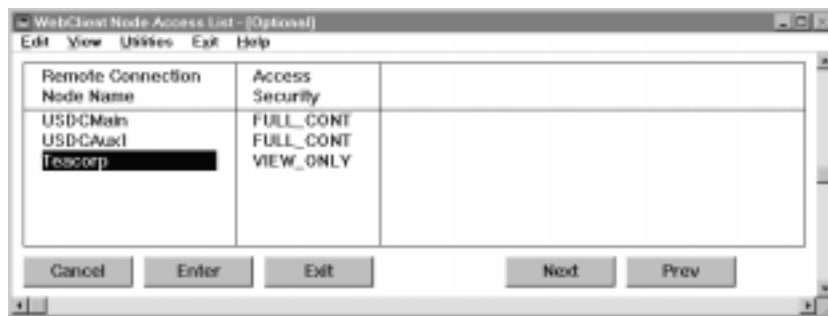
## WEBCIENT NODE ACCESS LIST PANEL

The WebClient Node Access List panel establishes FactoryLink security based on the remote node's host name. Nodes not listed are connected as defined by the Default Access Security entry in the WebClient Connections panel. The contents of this panel apply to all domains.

This panel should be configured after the WebClient Connections panel (see page 25).

Perform the following steps to configure the WebClient Node Access List panel:

- 1 In the WebClient Connections panel click on Next to display the WebClient Node Access List.



- 2 Specify the following information for all remote nodes you are configuring:

Remote Connection Node Name	This required character field specifies a remote node name or IP address for which an explicit security setting is being set.
Access Security	This field associates a specific type of access with the remote node.
NO_ACCESS	No access to the application (connection denied).
VIEW_ONLY	Reads all tags; Writes tags to a maximum of 76 tags. These tags are specifically listed in the corresponding access definition.
FULL_CONTROL	Reads all tags; Writes tags as in accordance with the FULL_CONTROL access definition. The default is write access to all shared and user tags.

- **CONFIGURATION**

- *WebClient Node Access List Panel*

- 
- 

<user defined> User-entered string referring to a custom access security type. There may be multiple user-defined custom access types. These custom access types are defined in the WebClient Access Security Definition panel (see page 29).

The default level of access is FULL\_CONTROL.

- 3 Click on Enter to save the information.
- 4 Click on Exit to return to the Main Menu or click on Next to configure the optional WebClient Access Security Definition Panel.

## WEBCIENT ACCESS SECURITY DEFINITION PANEL

The WebClient Access Security Definition defines what is meant by view-only, full-control, and custom access security connections. The default contents of the table are two rows:

- One row defining VIEW\_ONLY access
- One row defining FULL\_CONTROL access.

**Note:** This panel must be configured in the USER domain

For VIEW\_ONLY, the only valid entries for both USER and SHARED write privileges are NO. Defaults for FULL\_CONTROL are YES and YES. You can define your own access types, each with unique domain writing privileges and tag lists. User access types are considered full-control connections by the software licensing.

This panel should be configured after the WebClient Node Access List panel (see page 27).

Perform the following steps to configure the WebClient Access Security Definition panel:

- 1 Ensure the current domain selected is USER in the Configuration Manager Domain Selection List.
- 2 In the WebClient Node Access List panel click on Next to display the WebClient Access Security Definition panel:



- 3 Specify the following information for this panel:

Access Security This field selects the access security type being defined. Entries in this field are limited to the following:

- **CONFIGURATION**

- *WebClient Access Security Definition Panel*

- 
- 

VIEW\_ONLY Reads all tags; Writes tags as listed in the  
WebClient Write Access Tag List panel.

FULL\_CONTROL  
Reads all tags; Writes tags as per its access  
definition.

<user defined> User entered string for custom access security  
types. Limited to 16 characters.

Allow USER Domain Tag Writes This field requires a Boolean entry (YES or NO) to define whether  
the corresponding access type can write to USER domain tags.

Allow SHARED Domain Tag Writes This field requires a Boolean entry (YES or NO) to define whether  
the corresponding access type can write to SHARED domain tags.

**4** Click on Enter to save the information.

**5** Click on Exit to return to the Main Menu or click on Next to configure the optional  
WebClient Write-Access Tag List panel.

## WEBCIENT WRITE-ACCESS TAG LIST PANEL

The WebClient Write-Access Tag List panel lists explicitly the tags a remote connection can write to. This panel is related directly to the access security type currently selected in the WebClient Access Security Definition panel.

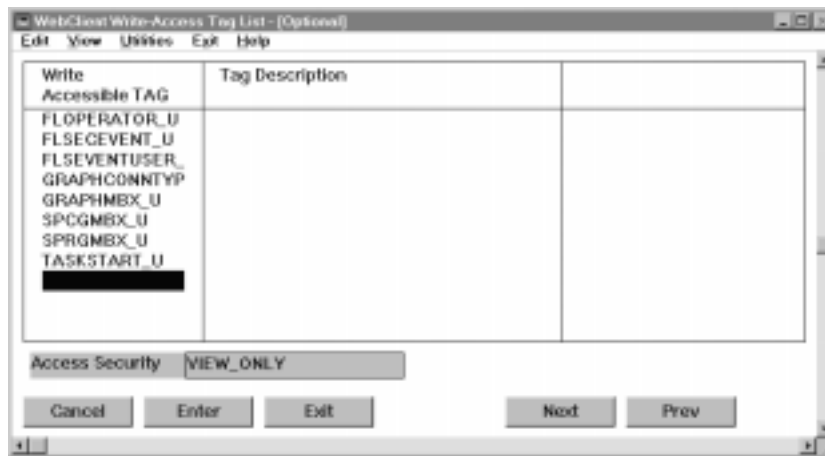
This panel must be configured in the USER domain.

For a fully functional configuration, this panel must, at a minimum, contain the tags required for basic Graphics task functionality (See “WebClient Minimum Tags” on page 97). In addition to this minimum set of 12 tags, you may add tags, up to a total of 76, which remote users may be write.

**Note:** If either Allow USER Domain Tag Writes or Allow SHARED Domain Tag Writes are set to YES in the previous panel, it is not necessary to list any tags for the corresponding domain in this panel.

This panel should be configured after the WebClient Access Security Definition panel (see page 29).

- 1 Ensure the current domain selected is USER in the Configuration Manager Domain Selection List.
- 2 In the WebClient Node Access List panel click on Next to display the WebClient Access Security Definition panel:



- **CONFIGURATION**

- *WebClient Write-Access Tag List Panel*

- 
- 

**3 Specify the following information for this panel:**

Write Accessible Tag	This required field lists the name of the tag a remote connection might write.
Tag Description	This field contains the Description for the tag entered into the Write Accessible field and is the same as the description in the object database. It is filled in automatically.



## **CONFIGURATION EXAMPLES**

The following paragraphs provide some typical access and security configurations and describe the entries required to achieve them.

### **Specifying Access for Remote Users on All Nodes**

To enable remote access from any node on the network, but limit all users to view-only mode, you only need to complete only the initial panel, WebClient Connections. To configure ALL remote users for view-only, the Default Access Security column should read VIEW\_ONLY. Likewise, to allow full-control for all remote users, the Default Access Security field should read FULL\_CONTROL.

While the remaining columns in this panel must be configured, no information in the optional panels is required.

### **Limiting Access to Specific Nodes**

If you wish to limit remote access to your FactoryLink application to specific nodes on the network, you need to supply additional information in two of the WebClient panels in Configuration Manager.

In the WebClient Connections panel, the Default Access Security field should be set to NO\_ACCESS. This denies access to any nodes on the network except for nodes listed in the second panel, WebClient Node Access List.

In the WebClient Node Access List, enter the IP addresses or host names of all the nodes you wish to allow access. In the second column, you enter the type of access (VIEW\_ONLY, FULL\_CONTROL or a user-defined custom access) that would be allowed for the corresponding node.

### **Creating a User-Defined Custom Access Level**

You may wish to allow limited access to some or all of the remote users. For example, you would like to allow access to some controls, but disable others. In this situation, you need to create a user-defined custom access level. If you wish to make this custom access level the default, enter the name (maximum of 16 characters) in the Default Access Security column of the WebClient Connections panel. If you wish to associate this access level with a specific node on the network, enter the name in the Access Security column of the WebClient Node Access List.

- **CONFIGURATION**
- *Network Configuration*
- 
- 

For each custom access level you determine specifically which tags in the FactoryLink real-time database can be manipulated, which will, in turn, define the functionality available to users with this level of access. These tags must then be listed in the WebClient Write-Access Tag List panel.

If Allow USER Domain tag writes is set to NO, all the tags required for basic Graphics task functionality must be entered. Then, any additional tags that must be manipulated to enable the desired level of access must be added. All user-defined access types are considered full-control for licensing purposes.

## NETWORK CONFIGURATION

To enable WebClient to operate over your network, the TCP/IP services file on the server running the FactoryLink application must be modified and the appropriate ports must be opened.

### Modifying the TCP/IP Services File

The TCP/IP services file location varies depending on your operating system. For Windows NT, the services file is in the \system32\drivers\etc\ subdirectory below the main Windows directory which may be c:\windows, c:\win or something similar. In Windows 95, it is in the main Windows directory, which may be c:\windows, c:\win, c:\win95, or something similar. The services file is an ASCII file and can be edited with any text editor.

**Caution:** Exercise caution when making changes to the services file. Errors in the file can cause WebClient or other network-related resources to fail.

In the TCP/IP services file, add the name(s) assigned to each WebClient service running on the node. The FactoryLink Connection Server task must have one entry, and there must be entries for each instance of the Data Server task. For example, if you are licensed for five simultaneous WebClient connections, there should be one entry for the Connection Server and five Data Server entries in the services file. Refer to the appropriate vendor documentation for more information on configuring services.

It is possible to run more than one WebClient server application on a computer, system resources permitting. Each FactoryLink application must have a separate set of services entries with unique names and port numbers. Each instance of WebClient must use a unique service name if more than one application running WebClient exists on a node.

The format of services file entries follows. Note that any comments in the services file must begin with the # character.

*SERVICE port\_num alias*

where

*SERVICE* Is the uppercase specification of the name assigned to the service running on the node. This name can be from 1 to 16 characters and must be unique for each service defined for a single node. For the Connection Server, the default name is FLCONNSRVC. For the Data Server, the default names are FLDATASRVC001, FLDATASRVC002, and continuing for each licensed WebClient remote connection.

*port\_num* Is a unique number assigned to reference the port number to TCP/IP. This number must be unique for each service defined for a single node. We recommend you use 6096 for the Connection Server. For the Data Server, we recommend you use consecutively numbered ports beginning with 6097, however, any number can be used as long as it does not conflict with any other services.

*alias* Is the lowercase specification of the name assigned to the service running on the node.

For example, the following excerpt from a services file identifies the services for an installation with a license allowing up to five simultaneous WebClient connections using the following default values:

```
FLCONNSRVC 6096/tcp flconnsrvc
FLDATASRVC001 6097/tcp fldatasrvc001
FLDATASRVC002 6098/tcp fldatasrvc002
FLDATASRVC003 6099/tcp fldatasrvc003
FLDATASRVC004 6100/tcp fldatasrvc004
FLDATASRVC005 6101/tcp fldatasrvc005
```

## INFORMATION FOR ADVANCED USERS

The following information is provided for advanced users and not necessarily relevant to a basic installation.

- **CONFIGURATION**
- *Using WEBFILES.LST*
- 
- 

## USING WEBFILES.LST

It may be desirable or necessary for additional files (for example, application help files) to be transferred to the client upon initialization in some FactoryLink applications. To do this, create a text file named WEBFILES.LST. This file must be located in the {FLAPP} directory.

**Note:** An easy way to create WEBFILES.LST is to copy the file of the same name from the WebClient\bin directory of a client installation, and modifying it to add the additional files you wish to transmit.

The files you wish to transfer should be listed, including the path relative to the {FLAPP} directory. List one file per line. Wildcards are allowed. You can include comments in the file if the line is preceded by the # character.

The example below illustrates the structure of WEBFILES.LST:

```
#
# FactoryLink WebClient(R)
# Sample WEBFILES.LST
# Application Files for Download
#
user\ct\g_ndisp.ct
user\ct\global.ct
shared\ct\global.ct
ct\domain.ct
ct\object.ct
user\ct\gconfig.ct
ct\gclasses.ct
ct\uclasses.ct
msg\graph.txt
user\drw\*.gc -d
user\drw\*.g -d
user\drw\*.plc -d
user\drw\*.bmp -d
```

**Note:** The -d switch indicated the file is transferred on demand. This is not applicable for custom user files, only for drawings.

The following is a summary of how the wbfile.lst is used:

When starting WebClient graph, one of the following methods should be used:

- 1 Set up a shortcut icon with the absolute path:  
Target: {drive}:\webclient\bin\graph -h<hostname>  
Start in: {drive}:\webclient\bin
- 2 Start from a command prompt with an absolute path name:  
{drive}:\webclient\bin\graph -h<hostname>

Then when Graph starts, it searches for and uses the webfiles.lst as follows:

- 1 It looks for the default list in the directory of the graph.exc file. If it does not find one, it will send an error message.
- 2 It looks for a custom list in the {FLAPP} directory.
- 3 If it finds one or more, it APPENDS them to get a file list. Therefore, do not duplicate files to be read in the custom list from the {FLAPP}, because it will take longer to cache the files.
- 4 If it does not find either file, it uses an external short list.
- 5 Then it copies these files to the cache directory.

### **WEBCLIENT.OCX**

The WebClient OCX control can be used in applications other than Internet Explorer. It should be noted, however, that the control requires additional files. You should use the WebClient install program (WEBCLIENT.EXE) to install the control for use with other applications.

### **VisualBasic Usage**

A file named WCCONST.BAS in the WebClient\Sample HTML directory defines constants for several properties, events, and methods. This file can be added to a VisualBasic project so these constants can be used instead of numerical values. You can also copy the contents of this file into an existing module.

- **CONFIGURATION**
- *On-line Configuration*

- 
- 

## ON-LINE CONFIGURATION

Beginning with FactoryLink 6.6.0 it is possible to implement changes in a running application. This on-line configuration capability is not intended for use in the production environment. It is provided to reduce application development time by reducing the number of application restarts required.

The following paragraphs describe some of the WebClient-specific implications of on-line configuration. A complete explanation of online configuration can be found in the *FactoryLink Fundamentals* manual.

Unlike GRAPH, WebClient Connection Server and Data Server tasks must be bumped in order for changes to be activated.

**Note:** When PowerVB library changes are implemented, a dialog box is displayed to WebClient users informing them that changes to the libraries have occurred and the connection will be terminated. Users must reconnect manually.

The Connection Server Task (CONNSRV) will be signaled to process on-line updates instead of being bumped. Bumping CONNSRV would cause all WebClient user instances to shut down, disrupting the users. The Connection Server task responds to most on-line changes to its configuration. The following items can be configured on-line:

- Default access security.
- Host access list (add, delete, modify).
- Access security definitions (add, delete, modify).

Upon receiving the new configuration signal, the Connection Server reloads its configuration table and applies the new configuration to any subsequent connection requests. Errors in configuration that are fatal at startup are fatal at reload as well, and the task will shut down.

The following on-line configuration changes are not allowed:

- CONNSRV service name.
- DATASRV service name prefix.
- Number of remote users.

Connection Server reports warnings if any of these configuration items are changed and then ignores them as it processes the rest of the configuration. The Connection Server can be manually restarted if the user must change these values.

The Data Server task (DATASRV) will be signaled to process on-line updates instead of being bumped. Restarting DATASRV causes its user instance to shut down, disrupting users. The Data Server task responds to most online changes to its configuration. The following items can be configured on-line:

- Default access security.
- WebClient service description.
- Host access list (add, delete, modify).
- Access security definitions (add, delete, modify).

Upon receiving the new configuration signal, the Data Server task reloads its configuration table and applies the new configuration to any current and subsequent connections.

For example, if a currently attached client has its security changed from FULL\_CONTROL to READ\_ONLY, the client can no longer write to tags it was once able to modify. Furthermore, if a currently attached client has its security changed to NO\_ACCESS, the client is immediately disconnected.

On-line configuration changes to the DATASRV service name prefix are not allowed.

Data Server reports warnings if any of these configuration items are changed and then ignores them as it processes the rest of the configuration.

- **CONFIGURATION**
- *On-line Configuration*
- 
-



# *Running WebClient*

This chapter provides information on operating a WebClient installation. Before running WebClient, complete the Installation (Chapter 2) and Configuration (Chapter 3) for both the server and clients. In addition, modifications to your FactoryLink application may be required for it to function properly. Refer to Chapter 5, “WebClient and FactoryLink Applications” for more information.

## SERVER STARTUP

If properly configured, the server tasks associated with WebClient start automatically when your FactoryLink application begins running. The following list is a quick review of the steps necessary to prepare your FactoryLink server installation for use with WebClient:

### **1 Installation.**

Assuming you have purchased the WebClient option and correctly entered your configuration sequence upon installation, the Connection Server and Data Server tasks were automatically added as part of your base FactoryLink installation.

### **2 Convert your FactoryLink application.**

If you are upgrading your version of FactoryLink and adding WebClient to an existing FactoryLink application, you must use the FLCONV utility to convert the application to version 6.0.4. See the FactoryLink *Fundamentals* manual for more information on FLCONV.

### **3 Analyze your application.**

There are some differences in the way applications operate on remote clients. You may wish to modify your application to best utilize the functionality WebClient added. See Chapter 5, “WebClient and FactoryLink Applications” for more information.

### **4 Add the WebClient tasks to the System Configuration.**

The Connection Server task must be added to the System Configuration in the SHARED domain and the Data Server task must be added in the USER domain. If you ran CV\_WCAPP.EXE previously, this has been accomplished. See “Adding WebClient to the System Configuration Panels” on page 22.

- **RUNNING WEBCLIENT**

- *Client Startup*

- 5 **Modify the Domain Elements List.**

You need to change the number of USER instances to match the number of licensed WebClient you have. See “Domain Elements List Panel” on page 21.

- 6 **Configure the WebClient Connections panels.**

You need to supply information regarding default access types, node-specific access information, and specific tags write information in the WebClient Connections panels. The best way to get started with this is to use the CV\_WCAPP.EXE utility. See “Completing the WebClient Configuration Panels” on page 24.

- 7 **Modify the TCP/IP services file**

You need to add WebClient related entries to the TCP/IP services file. See “Modifying the TCP/IP Services File” on page 34.

- 8 **Check the clients’ network access.**

Verify your remote users have proper access to the server on the network. If applicable, contact your network administrator to verify that the firewall is properly configured to enable clients to connect.

Once the previous steps are completed, your FactoryLink server is ready to begin accommodating remote users when the application is running.

## CLIENT STARTUP

Once WebClient is installed and configured on the client, you must use Internet Explorer to load the startup page for your FactoryLink application. The following list is a quick review of the steps necessary to prepare your installation for use with WebClient.

- 1 **Installation.**

Assuming you are using WebClient in Internet Explorer, you must use WEBCLIENT.EXE to install the remote Graph task on the client. See Chapter 2, “WebClient Installation”.

- 2 **Install Internet Explorer.**

If you do not already have Microsoft Internet Explorer installed, you can install it from the WebClient distribution CD (see “Browser Installation” on page 18). If you already have Internet Explorer (version 3.02 or later) installed on your machine, use your existing copy.

- 3 **Obtain or create HTML startup page.**

Your FactoryLink administrator may have already created a custom HTML startup page containing the code required to connect to your server. If not, you can

use the samples provided with the WebClient installation as a basis for creating your own. You need to know the host name or IP address and port number for your server. See Chapter 7, “WebClient HTML Pages” for more information.

Once the previous steps are completed and the FactoryLink server is configured and running, connect by loading the HTML startup page. The startup page can be located on your local hard drive, on a shared drive on your network, on a corporate intranet server, or on an internet server.

Perform the following steps to load the startup page for your WebClient installation:

- 1 Start Microsoft Internet Explorer.
- 2 Load the startup page using one of the following methods:
  - Click on File>Open and enter the path and file name of your HTML startup page.
  - Enter the URL of your HTML startup page in the Address box.
  - Click on a link to your HTML startup page from another page. Your system administrator may have established a central location to manage remote access.

Internet Explorer loads the page, activating the WebClient control. The control displays as a gray box in the page and establishes a connection with the server.



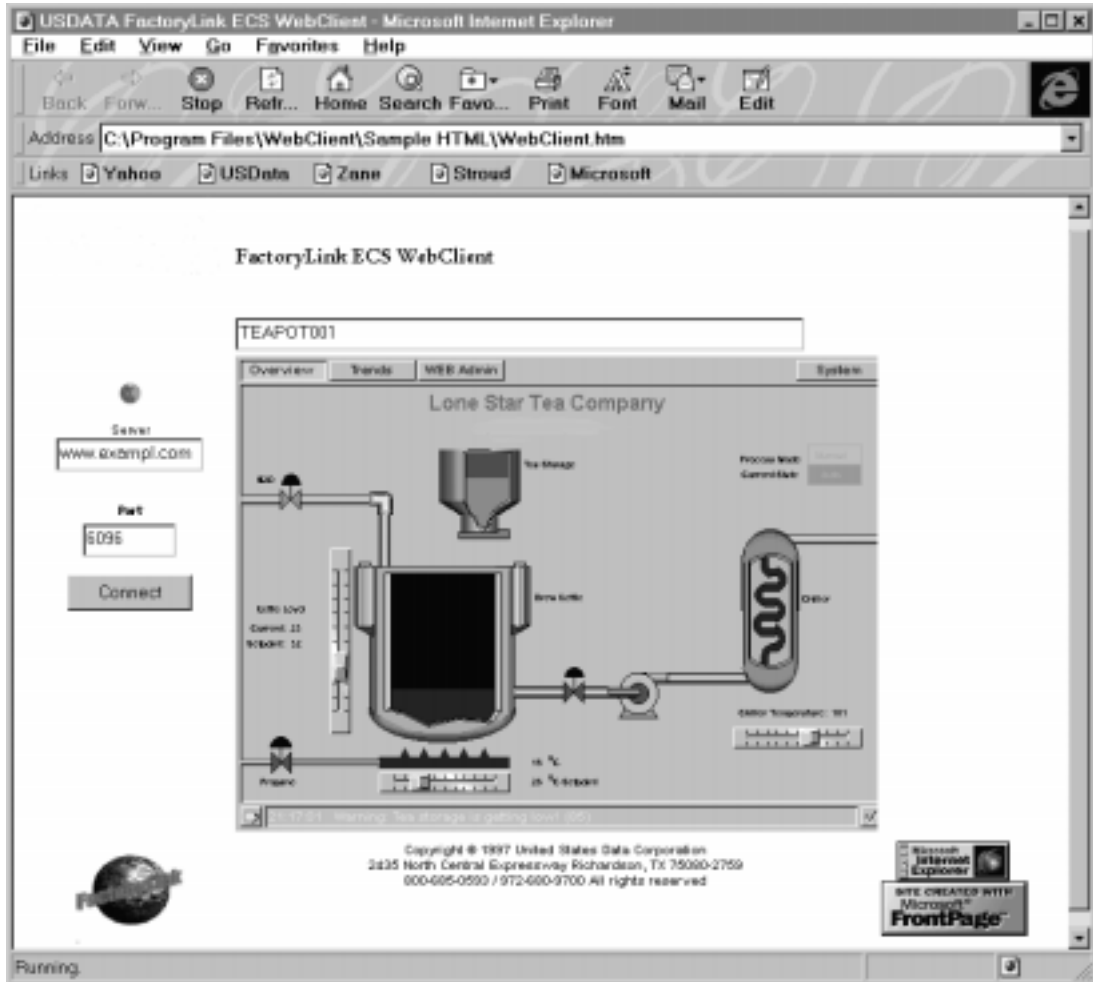
ActiveX Control Window

- **RUNNING WEBCLIENT**

- *Client Startup*

- 
- 

Once the connection is established, there may be a pause of several seconds while the initial files for the FactoryLink application transfer over the network. When the files are transferred, your FactoryLink application displays in the WebClient window as in the following example.



This example has text entry fields to change the server and ports, enabling you to connect to another application without modifying the underlying HTML page. See Chapter 7, “WebClient HTML Pages” for more information.

## WEBCLIENT CONTROLS

Access the WebClient controls menu by clicking on the right mouse button inside the WebClient ActiveX control window.



**Note:** The controls menu is available only when WebClient is not connected to a server. If you need to access the controls menu while connected, close your Graph task using the Run Manager within your FactoryLink application. See the FactoryLink *Fundamentals* manual for more information.

The following choices are available.

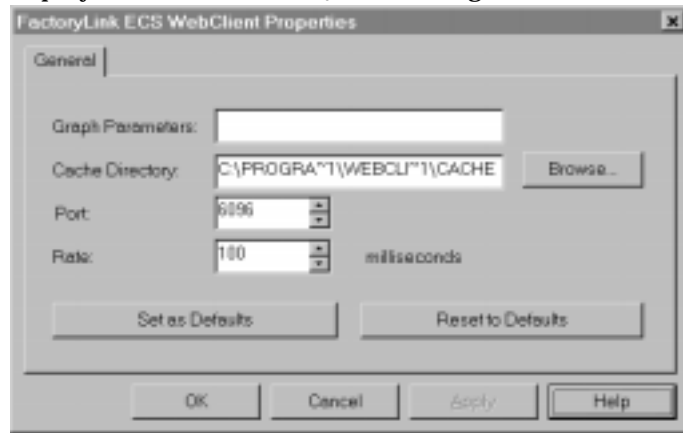
Navigate Displays the Navigate dialog.



Here you enter another server name. Click on OK to cause WebClient to establish a connection to the server named in the text entry box.

- **RUNNING WEBCLIENT**
- *WebClient Controls*
- 
- 

Properties **Displays the WebClient Properties dialog.**



The following options are available.

#### Graph Parameters

Under Graph Parameters, you can enter the command line switches that modify the way WebClient operates, including activating logging operations. If the Graph Parameters field is left blank, the settings defined for the Graph task on the server are used by default. We recommend this field be left blank unless you have a specific reason to change it. See Chapter 10, “WebClient Command Line Switches” for more information.

#### Cache Directory

The Cache Directory box enables the user to change the location of the WebClient cache directory. The default directory for the WebClient cache is c:\Program Files\WebClient\cache. If a different directory is specified, ensure that it is used only for WebClient cache files. You must have write privileges to this directory and you cannot specify the root directory of a drive.

**Port** The Port box enables the user to specify a different default port. This port value is used if none is specified in the LocationURL property or Navigate method, or in the command line when running Graph in stand-alone mode.

This port value corresponds to the services file entry for the Connection Server task on the FactoryLink server. See “Modifying the TCP/IP Services File” on page 34 for more information.

**Rate** The Rate box allows the user to change the rate tag changes are updated at on the client side. The setting is calibrated in milliseconds, so an entry of 100 would update tag values every one-tenth of a second.

Increasing this value can reduce network load by reducing the polling rate but results in less frequent tag updates for the remote user.

**Set as defaults** Clicking on Set as defaults saves the current values so they are used for all connections.

**Reset to defaults** Clicking on Reset to defaults restores all parameters to previously saved default values.

**Clear Cache** Deletes all files and subdirectories in the WebClient file cache.

**About** Displays version information about the WebClient ActiveX control.

## **RUNNING GRAPH AS A DEDICATED CLIENT**

A special version of the FactoryLink Graphics task is included with WebClient that can be run as a dedicated client. In this mode, the FactoryLink Graphics task runs as a standalone application on the desktop rather than inside a container application like Internet Explorer.

To run GRAPH in standalone mode, click on Start>Run from the Windows task bar and enter the GRAPH command in the Open field of the Run dialog.

**Note:** GRAPH.EXE is located in the WebClient bin directory, which is not ordinarily in the path, so the full path, including drive letter, must be specified.

- **RUNNING WEBCLIENT**
- *Running GRAPH as a Dedicated Client*
- 
- 

The syntax for running GRAPH is as follows.

```
graph -hremotenodename[:port]
```

Two parameters are used with GRAPH. The `remotenodename` parameter is the host name or IP address of the server. The `port` parameter is the port defined for the FactoryLink Connection Server task in the services file on the server. See “Modifying the TCP/IP Services File” in Chapter 3, “Configuration” for more information. If no port is specified, the default port is used.

**Note:** You may wish to create a shortcut icon on the Windows desktop to simplify running WebClient as a dedicated client. Refer to Microsoft Windows Help for instructions on creating shortcuts.

## Limitations of Standalone Graph

There are some functionality differences when running GRAPH as opposed to using the ActiveX control in Internet Explorer:

- The properties, events, and methods cannot be used except those accessible using the GRAPHSET utility. See “GRAPHSET” on page 49 for more information.
- Property changes made using GRAPHSET during an active connection are not applied until GRAPH is restarted.
- The FactoryLink application should provide a mechanism for shutting down the USER domain to close the application on the client. Refer to the FactoryLink *Fundamentals* manual for more information. Unlike the ActiveX version, there is no mechanism for closing GRAPH when running in stand-alone mode.
- No integrated ability exists to delete cache files. You can do this manually by double clicking the Remove Cache icon in the WebClient program group.



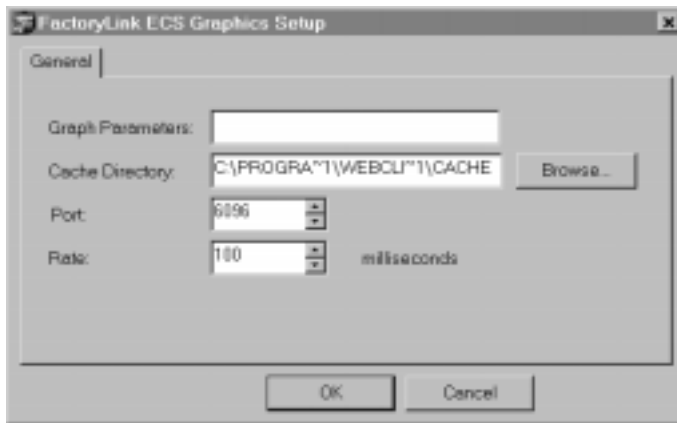
**GRAPHSET**

The GRAPHSET utility allows you to modify graph properties if you are running remote standalone graph.exe. GRAPHSET brings up the same dialog that modifies properties for WebClient, so any values entered become the default for networked WebClient if running as well as the standalone graph executable.

Like GRAPH, GRAPHSET must be run from the command line.

**Note:** GRAPHSET.EXE is located in the WebClient bin directory, which is not ordinarily in the path, so the full path, including drive letter, must be specified.

Click on Start-Run from the Windows task bar and enter graphset in the Open field of the Run dialog to display the USDATA FactoryLink 6.6.0 Graph Setup dialog.



**Note:** You may wish to create a shortcut icon on the Windows desktop to simplify running WebClient as a dedicated client. Refer to Microsoft Windows Help for instructions on creating shortcuts.

The entries for Graph Parameters, Cache Directory, Port, and Rate are the same as for the ActiveX control. Refer to the description of Properties in “WebClient Controls” on page 45 for details on these settings.

- **RUNNING WEBCLIENT**
- *Running GRAPH as a Dedicated Client*
- 
-

# *WebClient and FactoryLink Applications*

## OVERVIEW

This chapter provides information for developers of FactoryLink applications. Anyone designing a new FactoryLink application or modifying an existing one to take advantage of WebClient functionality should be aware of the information in the following paragraphs.

## WEBCLIENT TAGS

Three system tags in FactoryLink may be useful with WebClient. The table below provides information on these tags.

**Table 5-0** Useful WebClient Tags

Tag Name	Domain	Type	Description
CONNSRVACTIVE	SHARED	ANALOG	Number of remote users currently connected to the FactoryLink server.
CONNSRVTOTAL	SHARED	ANALOG	Total number of Connection Server task instances available for remote connections.
GRAPHCONNTYPE	USER	ANALOG	Indicates type of connection.

GRAPHCONNTYPE has five different values:

- 0 Inactive
- 1 Local connection, FULL\_CONTROL
- 2 Local connection, VIEW\_ONLY (not implemented at this time)
- 3 Remote connection, VIEW\_ONLY
- 4 Remote connection, FULL\_CONTROL or user-defined security type

- **WEBCLIENT AND FACTORYLINK APPLICATIONS**

- *FactoryLink Application Design Considerations*

- 
- 

## **FACTORYLINK APPLICATION DESIGN CONSIDERATIONS**

WebClient enables users to access a FactoryLink application over a network using standard Internet technology. While WebClient provides much of the same functionality a local user would enjoy, it has some limitations. Certain capabilities related to PowerVB, security, and other FactoryLink functions are slightly limited. FactoryLink application design can also affect performance. The following paragraphs provide some general information on how FactoryLink applications can be designed or modified to best utilize the unique capabilities of WebClient.

### **Functionality Issues**

While WebClient provides control and monitoring of a FactoryLink application by a remote user, a number of FactoryLink tasks and functions exist only on the server side. The following paragraphs provide specific information for these tasks.

#### **General**

When access to a FactoryLink application is defined as view-only, only tags specifically listed in the Write-Access Tag List panel are allowed to be written by remote users. All tags can be read. Depending on how your application is configured, it may be necessary to allow additional tag writes to provide basic functionality.

For example, your animation actions can affect window drawing and navigation. If the animation action is DRW or TOP, it is available to remote users. If the animation action is SET to the window's drawing tag remote users will not be allowed writes to that tag unless allowed in the Write-Access Tags List panel.

You may wish to allow writes to any control tags the Database Browser uses by specifically listing them in the Write-Access Tag List panel.

You may wish to allow writes to control tags a chart animation uses by specifically listing them in the Write-Access Tag List panel.

You may wish to allow writes to any Window Enable control tags as defined under Window Attributes in Application Editor.

### **Window Management**

You should be aware that only the first window drawn is displayed in Internet Explorer. The first window is determined by the value in the Window Management panel of the Configuration Manager. The size and location of this window is controlled by the container application, usually Internet Explorer.

Secondary windows are opened outside the container application on the desktop. Often, they open behind the Internet Explorer window, which can be disorienting for users. Some window manipulation may be required to view your application.

For best results with WebClient, your application should use one primary window. Use of secondary windows should be limited to pop-ups or status windows.

### **PowerVB**

For a WebClient remote user, all PowerVB code is executed on the local (client) side of the connection; therefore, features accessing files or performing DLL calls cannot access resources on the server. If you need to access files in the {FLAPP} directory (for example, application help files), you can add them to the WEBFILES.LST file. See “” on page 35 for more information.

### **Persistence**

Persistence for USER domain tags is not implemented for WebClient connections. This is because persistence is associated with each USER instance. Since WebClient USER instances are dynamically managed by the Connection Server task, no method for correlating saved data to a particular user is available.

### **FactoryLink File Manager**

While the FactoryLink File Manager task can be accessed on a remote node, its functionality is limited to viewing the data available. File operations occur on the server; so, while a file may be viewed on a remote node, the file itself still resides on the server.

### **FactoryLink Print Spooler**

The Print Spooler task runs on the server, so all printing must be done to a printer attached to the server. Remote users can initiate printing operations, but the output is tied to the server.

- **WEBCIENT AND FACTORYLINK APPLICATIONS**

- *FactoryLink Application Design Considerations*

- 
- 

### **Report Generator**

As with Print Spooler, the Report Generator task runs on the server. Report generation may be initiated by remote users, but the report files reside on the server.

### **Database Operations**

All database operations occur on the server. Remote users can access databases only by writing to FactoryLink tags. This applies to the Browser, Database Logger, and Historian tasks.

### **OLE/DDE Access**

FactoryLink applications that use OLE or DDE cannot access resources on a remote node.

### **Security**

All security authentication actions occur on the client; however, configuration and modification of these security activities can be done only on the server. Changes to security configurations are dynamically updated on remote nodes.

If your FactoryLink application employs Windows NT system level security and passwords, any drawings or windows that are password protected are unavailable to remote users. We recommend you use FactoryLink security when using WebClient.

### **Multiple WebClient Controls**

You cannot embed two WebClient controls in a single HTML page or in any single instance of an ActiveX container application. You can simultaneously operate two instances of the container application, each with a WebClient connection.

### **Miscellaneous Items**

- FactoryLink window attributes, such as Size Border, Maximize Button, Title Bar, and System Menu, are ignored for windows displayed within a container application. The container application controls window sizing and placement.
- The WebClient ActiveX control is activated within a standard, static HTML page; therefore, the window displayed within the HTML page is not dynamically resizable in Microsoft Internet Explorer.

- Keystrokes reserved for use by the container application are not passed through to the FactoryLink application. For example, F1, F5, and Esc within Internet Explorer are not sent to the application; therefore, these keys are not available for use with button or function key animations.
- Run-Time Monitor (RTMON) and other custom FactoryLink tasks that utilize non-FactoryLink graphics cannot be used with WebClient on the client.

### Performance Issues

A number of factors influence the performance of the remote graphics displayed by WebClient. The most significant factor that affects remote users accessing a FactoryLink application is the speed of the network connection. Many factors influence connection speed. For best results, ensure your remote system meets the minimum requirements with respect to modem speed, CPU speed, and memory. Contact your system administrator or service provider for suggestions on improving the speed of your connection if performance is not satisfactory.

Another factor is the inherent design of the FactoryLink application itself. Applications using a large number of windows do not perform as well as applications using fewer windows. In particular, having a number of concurrently open windows degrades performance. Loading a new window requires the transmission of more data than merely replacing the drawing within an existing FactoryLink window. Optimally, your FactoryLink application should be designed to use one primary window. Secondary windows should be limited to pop-ups or small status windows.

The number of tags represented on a given drawing also affects performance. Animations, especially charts, that require a large number of tags that are frequently updated require more data transmission. In general, any modification to a FactoryLink application that reduces the number of tags displayed on a given screen improves performance for WebClient remote users.

For existing FactoryLink applications, it may not be feasible to make major modifications specifically to accommodate WebClient. An alternative is to create additional drawings or views providing an alternative way to view information. You can design these new items for WebClient and improve performance.

- **WEBCLIENT AND FACTORYLINK APPLICATIONS**
- *FactoryLink Application Design Considerations*
- 
-



# ***Troubleshooting***

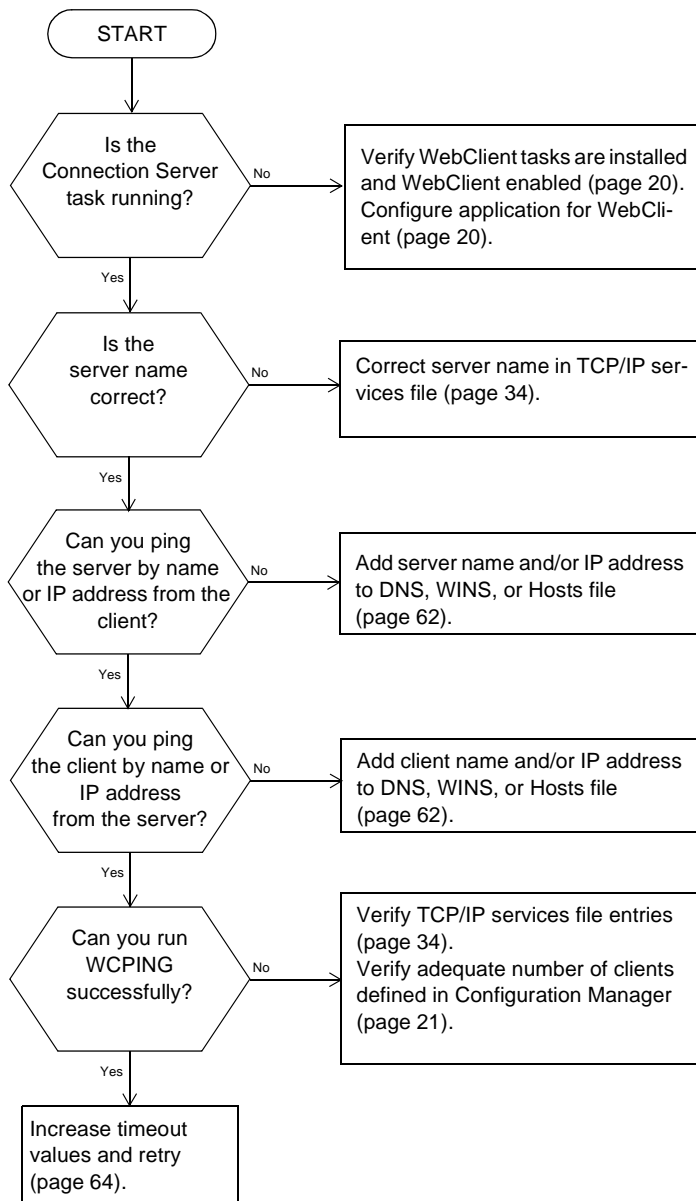
## **OVERVIEW**

This chapter provides troubleshooting procedures for WebClient. Many of the problems encountered installing WebClient are network related. For this reason it is recommended that your company's IT/MIS department be involved in the process. The procedures in this chapter are not comprehensive, but are intended to address the errors most commonly encountered.

## **TROUBLESHOOTING FLOWCHART**

Below you will find a flowchart to assist you in troubleshooting your WebClient installation. The troubleshooting flowchart assumes you have installed WebClient and have been unable to connect from a remote terminal.

- **TROUBLESHOOTING**
- *Troubleshooting Flowchart*
- 
- 



## **TROUBLESHOOTING PROCEDURES**

### **Is the Connection Server task running?**

The Connection Server task is found in the SHARED domain Run-Time Manager. This task brokers the connections to the FactoryLink server from WebClient users and must be running in order for remote users to connect to the server.

To verify that the Connection Server task is running, go to the server and navigate within the FactoryLink application to the SHARED domain Run-Time Manager drawing.

**Note:** This screen may be password protected, requiring administrator privileges to access.

A green check next to the task name (look for name: CONNSRV) indicates the task is running. If the task is showing an error (as indicated by a red “X”), refer to “Error Messages” on page 71 and follow the corresponding instructions.

The Data Server task should not be running for the console user. The Data Server task is started automatically for all other USER domains not running on the console.

- **TROUBLESHOOTING**
- *Troubleshooting Procedures*
- 
- 

If Connection Server is not running, you should first verify that it has been installed and configured. Open the FactoryLink Configuration Manager and verify that the WebClient Services entry appears in the task list.

Flags	Task Name	Description	Start Trigger	Task Status
FSR	RUNMGR	Run-Time Manager	TASKSTAR	TASK
F	PERSIST	Persistence	TASKSTAR	TASK
FR	SCALE	Linear Scaling and Deadbanding	TASKSTAR	TASK
FR	TIMER	Interval and Event Timer	TASKSTAR	TASK
F	IML	Interpreted Math and Logic	TASKSTAR	TASK
FR	AL_LOG	Distributed Alarm Logger	TASKSTAR	TASK
F	RPT	Report Logger/Generator	TASKSTAR	TASK
F	RECIPE	Recipe Save and Load	TASKSTAR	TASK
F	COUNTER	Programmable Counter	TASKSTAR	TASK
F	EDI	External Device Interface	TASKSTAR	TASK
FR	DB4_HIST	Historian for dBASE IV (R)	TASKSTAR	TASK
F	DBLOG	Database Logger	TASKSTAR	TASK
FR	DPLOGGER	Data Point Logger	TASKSTAR	TASK
F	SPCDATA	Power SPC Data Collection & Calculation	TASKSTAR	TASK
F	SPOOL	Spooler	TASKSTAR	TASK
F	POWERNET	Client/Server RTDB Network Interface	TASKSTAR	TASK
F	FLFM_SERV	File Manager Remote Server	TASKSTAR	TASK
F	FLLANSND	Local Area Network Send	TASKSTAR	TASK
F	FLLANRCV	Local Area Network Receive	TASKSTAR	TASK
F	RTMON	Real-Time Database Monitor	TASKSTAR	TASK
FR	CONNSRV	WebClient(R) Connection Server	TASKSTAR	TASK

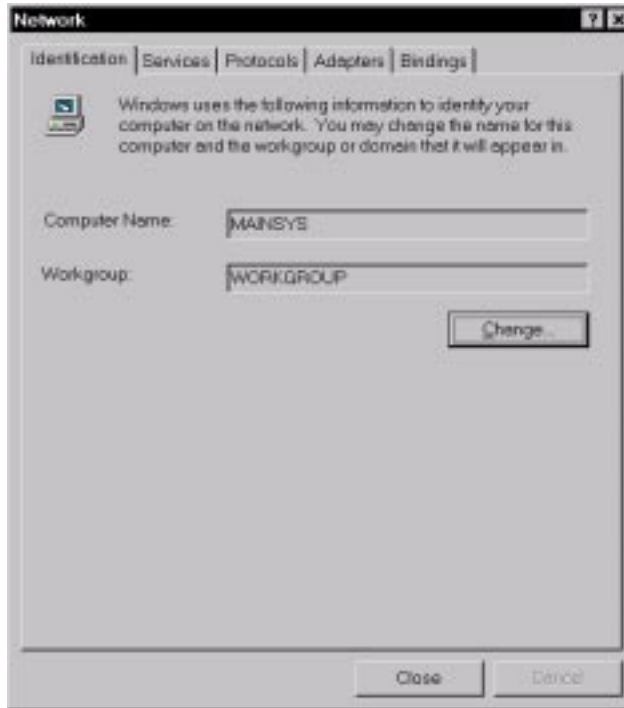
Buttons: Cancel, Enter, Exit

If not, you may need to run the CV\_WCAPP utility to configure your application for WebClient. See “WebClient Application Preparation Utility” on page 20 for more information.

## Is the server name and/or IP address correct?

A common error in WebClient networking is using the wrong server name or IP address. This is the TCP/IP node name of the server. The node name is determined by looking at the properties of network setup in the Control Panel.

Click Start > Settings > Control Panel > Network to access the Network property page:



The Computer Name: field shows the node name that must be used by remote users to access the FactoryLink server.

Refer to “Network Configuration” on page 34 for more information on modifying the server name in the TCP/IP services file.

**Note:** You must have administrator access to the FactoryLink 6.6.0 server computer to find the TCP/IP node name of the server.

- **TROUBLESHOOTING**
- *Troubleshooting Procedures*
- 
- 

### **Can you ping the server by name or by IP address from the client?**

The ping utility is installed with the OS networking. Ping is run from the command line:

```
Ping ServerNodeName
```

A successful ping returns packets of data. A failed ping reports a timeout.

The client computer needs to see the server by name or by IP address. The ping utility is used to test this capability.

Searching the network for a node name can sometimes take more than a minute. The same delays that ping encounters are reflected in the elapsed time for the WebClient timeout. If the ping utility fails to locate the server, refer to “Increasing WebClient Connection Timeout Values” on page 64 and increase the timeout values for the client.

If increasing the timeout values fails to correct the problem, contact your network administrator to make sure the server name is listed in the DNS, WINS and/or hosts file.

**Note:** The hosts file is a text file similar to the network services file. On Windows NT systems, it is typically located in the c:\WINNT\SYSTEM32\DRIVERS\ETC\ directory. On Windows 95 systems, it is in the Windows directory.

### **Can you ping the client by name or by IP address from the server?**

The ping utility is installed with the OS networking. Ping is run from the command line:

```
Ping ClientNodeName
```

A successful ping returns packets of data. A failed ping reports a timeout.

Because a WebClient connection actually creates two independent TCP/IP paths, each computer needs to see the other by name. The ping utility is used to test this capability.

Searching the network for a node name can sometimes take more than a minute. The same delays that ping encounters are reflected in the elapsed time for the WebClient timeout. If the ping utility fails to locate the client, contact your network administrator to make sure the client name is listed in the DNS, WINS, and/or hosts file.

**Note:** The hosts file is a text file similar to the network services file. On Windows NT systems, it is typically located in the c:\WINNT\SYSTEM32\DRIVERS\ETC\ directory. On Windows 95 systems, it is in the Windows directory.

### Can you run WCPING successfully?

The wcping utility is run the same way as the standard ping utility to test the ability of the remote user to connect to the server:

```
C:\Program files\WebClient\bin\wcping ServerNodeName:Socket#
```

The wcping utility is different from ping in that it actually connects to the server to test all of the communications. See “WCPING” on page 70 for more information.

If wcping fails to connect to the server, it may indicate incorrect entries in your network services file. The socket number is the socket number assigned to the Connection Server. The default service number is 6096 used by the cv\_wcapp utility. See “Modifying the TCP/IP Services File” in Chapter 3, “Configuration” for more information.

Secondly, verify that your WebClient server is correctly configured for the correct number of remote users in the Domain Elements List panel. See “Domain Elements List Panel” on page 21 for more information.

If the wcping works, WebClient should connect. If not, it is possible your connection is timing out before the initial data transfer is complete.

Refer to “Increasing WebClient Connection Timeout Values” on page 64 for information on increasing your timeout values.

- **TROUBLESHOOTING**
- *Increasing WebClient Connection Timeout Values*
- 
- 

## INCREASING WEBCLIENT CONNECTION TIMEOUT VALUES

Under normal circumstances, it should not be necessary to modify the WebClient default timeout values. If you have one of the following situations, it may be necessary for remote users to increase the timeout values:

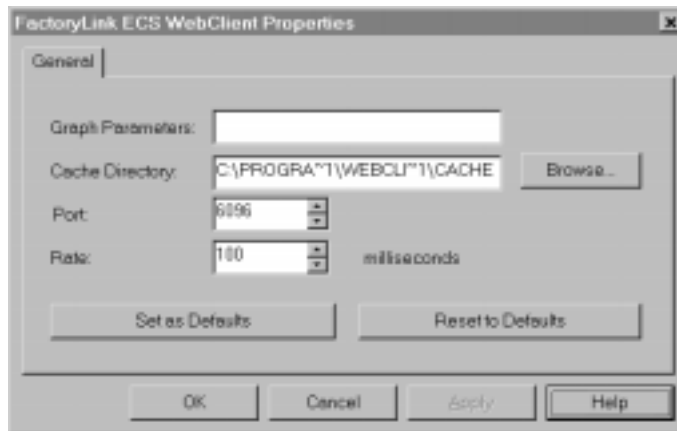
- Modem connections
- Satellite connections
- Very large corporate networks
- Slow DNS or WINS servers
- Complex networks with multiple bridges/routers/hubs.

The following paragraphs provide instructions for increasing the timeout values for WebClient when operating in Internet Explorer and when using the GRAPH standalone client.

### Modifying Timeout Values for Browser Users

Perform the following steps to increase the timeout values when using WebClient in Internet Explorer:

- 1 Refer to “WebClient Controls” on page 45 for instructions on accessing the WebClient Properties dialog.





- 2 In the Graph Parameters field, add the following parameters (with no spaces):

-n-m30-r30

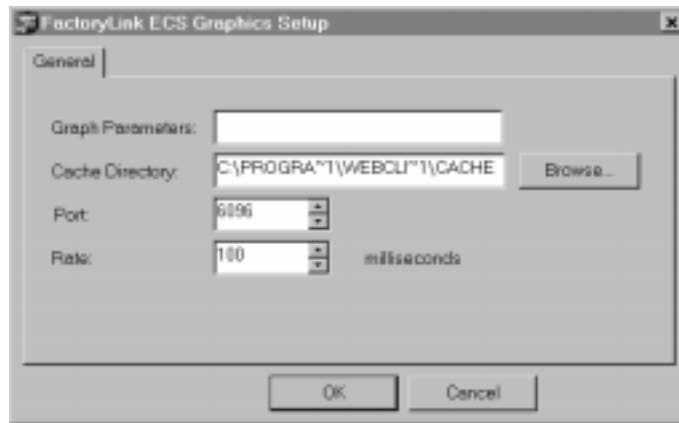
The -r parameter increases the connection timeout value to 30 seconds from the default of 5 seconds. The -m parameter increases the data transfer timeout (after connection is established) to 30 seconds from the default of 15 seconds.

- 3 Click OK.

### Modifying Timeout Values for GRAPH (Standalone Client) Users

Perform the following steps to increase the timeout values when using WebClient as a standalone client:

- 1 Refer to “GRAPHSET” on page 49 for instructions on accessing the Graphics Setup dialog.



- 2 In the Graph Parameters field, add the following parameters (lower case, separated by commas with no spaces):

-n-m30-r30

The -r parameter increases the connection timeout value to 30 seconds from the default of 5 seconds. The -m parameter increases the data transfer timeout (after connection is established) to 30 seconds from the default of 15 seconds.

- 3 Click OK.

- **TROUBLESHOOTING**
- *Increasing WebClient Connection Timeout Values*
- 
- 

### **Increasing Data Transmission Timeouts for Slow Connections**

In some instances WebClient will timeout while waiting for a complete data packet. FactoryLink has an environment variable, `SELECT_TIME`, that controls this type of timeout. The syntax is

```
SELECT_TIME=xx
```

where *xx* is the timeout in seconds. See *FactoryLink Fundamentals* for more information on environment variables.

## GENERAL TROUBLESHOOTING

### WebClient Won't Load in Explorer

- If Internet Explorer fails to display anything after loading the HTML startup page, it could be an indication of low disk space. When WebClient connects with the server, it downloads data that must be cached on the local hard drive.
- If your WebClient ActiveX control does not display in Internet Explorer, verify Microsoft Internet Explorer is configured to enable ActiveX controls. Go to View-Options and click on the Security tab to display the Security property sheet.



Verify the Enable ActiveX Controls and plug-ins item is checked.

- If you are unable to connect to the FactoryLink server using WebClient in Internet Explorer, test the connection using the standalone GRAPH utility. If you can connect using standalone GRAPH, the problem is with your Internet Explorer setup. See “Running GRAPH as a Dedicated Client” on page 47 for more information.

- **TROUBLESHOOTING**

- *General Troubleshooting*

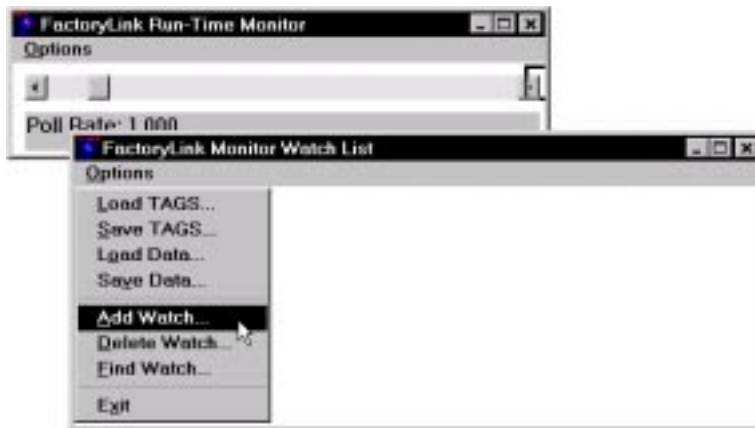
- 
- 

- If you still have problems connecting, your installation may not be properly configured with the firewall protecting the FactoryLink server. Contact your system administrator. Additional information on firewalls, security, and connection configurations is available from Customer Support.
- Other functionality on your HTML page may use VBScript. If these functions are not working correctly, verify the Run ActiveX scripts item is checked.

### Unable to Achieve Expected Number of Connections

If you can make at least one WebClient connection but cannot connect as many as expected, perform the following procedures.

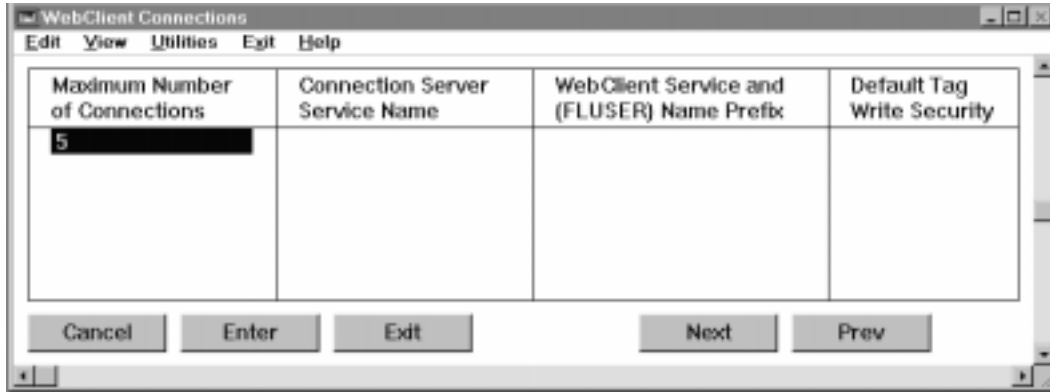
- 1 In your FactoryLink application, navigate to the Run-Time Manager screen.
- 2 Click the RTMON button to start the Run-Time Monitor.
- 3 On the Run-Time Monitor menu, select Options>Watch to display the FactoryLink Monitor Watch List.



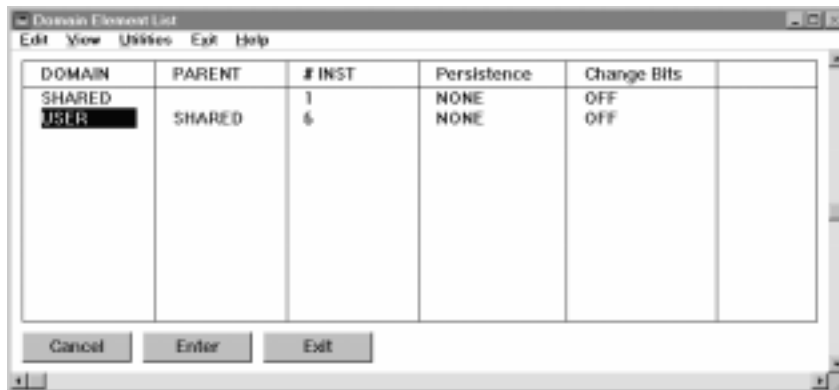
- 4 From the FactoryLink Run-Time Monitor Watch List select Options>Add Watch and enter CONNSRVTOTAL in the dialog to check the total number of connections currently configured. This number should be equal to the number of FactoryLink connections licensed.

**Note:** If this number is correct, your problem is not with the WebClient configuration. If the number is incorrect proceed with the following steps.

- 5 Open FactoryLink Configuration Manager and select WebClient Services to display the WebClient Connections panel.



- 6 Verify the maximum number of connections is entered properly.
- 7 In FactoryLink Configuration Manager and select View>Domain List from the main menu to display the Domain Element List.



- 8 Verify that the number of user instances (# INST) is entered properly.  
**Note:** The number of user instances should be one more than the total number of WebClient licensed connections.
- 9 Refer to “Modifying the TCP/IP Services File” on page 34 for information on modifying the TCP/IP services file. Verify that the number of FLDATASRVC entries in the file is the same as the number of WebClient licensed connections.

- **TROUBLESHOOTING**

- *WCPING*

- 

- 

## **WCPING**

The **WCPING** utility attempts to connect to a server. It displays information about the server if the connection is successful and displays an error message if the connection is not successful. Use **WCPING** if you cannot connect to a server and you want to verify it is running.

The command line is

```
wcping <servername>[:port number]<options>
```

**where**

<servername> **Is the name or IP address of the server being connected to.**

port number **Is the port number of the server. If the port is not specified, the default is assumed.**

<options> **Any network parameters used for GRAPH (see Chapter 10, “WebClient Command Line Switches”).**

## ERROR MESSAGES

If a problem occurs with the WebClient connection, an error message is displayed to the remote user. The errors can be divided into three categories:

- Network errors
- Remote Graphics task errors
- Connection Server/Data Server task errors.

The following paragraphs list these error messages and provide causes and remedial actions.

### Remote Graphics Task Errors

#### **Connection attempt timed out. <host name> <port>**

**Cause:** The requested <host name> <port> combination is not responding. This could be because of incorrect <host name> <port> entries or a slow network connection.

**Action:** Verify the Connection Server task is running on the FactoryLink server. Increase the connection time-out value using the -r parameter and try again. See “Graphics Task Command Line Switches” on page 104 for more information.

#### **Connection rejected. Exceeded total licensed full-control connections.**

**Cause:** The number of full-control clients connected is at the licensed limit.  
You cannot resolve this problem remotely.

**Action:** Purchase more full-control connections from your vendor.

#### **Connection rejected. Exceeded total licensed view-only connections.**

**Cause:** The number of view-only clients connected is at the licensed limit.  
You cannot resolve this problem remotely.

**Action:** Purchase more view-only connections from your vendor.

- **TROUBLESHOOTING**

- *Error Messages*

- 
- 

**Connection rejected. Host lacks access privileges.**

**Cause:** The client is refused access because the FactoryLink Configuration Manager has configured the security type for this host to NO\_ACCESS.  
You cannot resolve this problem remotely.

**Action:** Contact the FactoryLink administrator to change the access type assigned to your host.

**Incompatible client version. Connection refused. <client version>**

**Cause:** The client version is not compatible with the server version.

**Action:** Update the client or server or both to sync the versions.

**Out of memory.**

**Cause:** Insufficient RAM on the client.

**Action:** Check system resources.

**Error creating file. <filename>**

**Cause:** File creation failure on the client.

**Action:** Check cache disk space on client. Move or delete files to create space. Check file permissions on the client.

**Error reading file. <filename>**

**Error reading file statistics. <filename>**

**Error opening file. <filename>**

**Cause:** Unable to open <filename> on server.  
You cannot resolve this problem remotely.

**Action:** Check file permissions on the server.

**Error setting file's time. <filename>**

**Cause:** File time setting failure.

**Action:** Check file/directory write privileges in the cache directory.

**Error writing to file. <filename>**

**Cause:** File write failure on client.

**Action:** Check cache disk space on client. Move or delete files to create space.



**Unable to attempt a connection.**

Cause: Unrecognized host name specified.

Action: Check the host name.

**Unable to enable network client.**

Cause: Unable to attempt a connection.

Action: Check host and port syntax. Check TCP/IP installation.

**Webfile.lst file not found.**

Cause: Unable to resolve path to file.

Action: Refer to Using Webfiles.lst on page 36.

**Network Errors**

In addition to the previous error messages a variety of network errors may display. There are many reasons why a network transaction might fail. The following error message will be displayed for network errors:

**Network transaction failed <cause attachment message>**

The following is a list of the <cause attachment messages> and, where applicable, remedial actions.

**Out of memory**

Cause: The client can not allocate sufficient memory.

Action: Close any unused applications running in the background and retry.

**Session connection remotely terminated.****NULL connection handle. Connection possibly lost.****Attempt to send packet failed. Connection possibly lost.**

Cause: The connection to the server is lost. This can be caused by an abnormal server shutdown or by errors on the network causing the connection to be lost.

Action: Attempt to reconnect.

**Return packet for remote procedure call timed out.**

Cause: The server did not respond to a request within the specified time.

- **TROUBLESHOOTING**

- *Error Messages*

- 
- 

**Action:** Retry the connection. If necessary, increase the value of the -m command line switch (see Chapter 10, “WebClient Command Line Switches”).

The following error messages are commonly associated with network transactions that fail because of problems with the network connection. Contact your network administrator or service provider to check the network connection quality.

**Corrupted network message. No begin signature.**

**Corrupted network message. No end signature.**

**Corrupted network message. Invalid header.**

**Corrupted network message. Message item value truncated.**

**Corrupted network message. Tried to set network message item to an invalid type.**

Others are unexpected failures that you cannot usually resolve remotely. When the cause of the error can be determined, the following explanations are attached to the Network transaction failure error message. Report the following error messages to Customer Support to help in the diagnosis of your problem:

**"Network transaction failed" cause attachment message - internal  
Internal data service/client error.**

**No session opened.**

**Must execute ConnectInfo( ) RPC before any other RPC.**

**Unknown Remote Procedure ID received by data service.**

**Internal file transfer error.**

**Function params contained bad tag type.**

**Internal file transfer error.**

**Bad argument given to FTP function.**

**Network transaction failed.**

**Unknown file transfer RPC ID received.**

**Internal broker service/client error.**

**Bad argument given to Broker function.**

**No session opened.**

**Unknown Remote Procedure ID received by broker service.**

**Internal network message error.**

**Invalid parameter given to network message func.**

**Network message export failed. Target buffer too small.**

**Type mismatch when getting net message item.**

**Count mismatch when getting net message item.**

**Cannot find requested net message item.**

**Internal networking error.**

Invalid parameter given to network func.  
Ill-formed network packet received.  
Contents missing from received network packet.  
Unknown network packet received.  
Unknown contents in network packet received.  
Return packet for remote procedure call timed out.  
Internal networking error....

#### Network Transaction Timeout <RTDB LOCK-UNLOCK not supported>

- Cause:** A deadlock situation occurs if the PowerVB has the lock imposed while the DataServer polls the RTDB for tag changes.
- Action:** PowerVB Logic using LOCK-UNLOCK cannot be used over WebClient.

### Connection Server and Data Server Task Errors

#### Cannot find CT file

- Cause:** The CT file associated with the WebClient tasks on the FactoryLink server cannot be found. Usually indicates improper configuration on the server.  
You cannot resolve this problem remotely.
- Action:** Check the configuration of the WebClient panels in the FactoryLink Configuration Manager and run the `ctgen` utility.

#### Cannot open log file

- Cause:** Cannot open the log file to write or cannot create the path for the file.  
You cannot resolve this problem remotely.
- Action:** Check the validity of the path:  
{FLAPP}\{FLNAME}\{FLDOMAIN}\{FLUSER}\log. If a log file already exists, try to move or delete it.

#### Error initializing mailbox

- Cause:** The mailbox tag is not defined. This is an indication the FactoryLink application may not have been converted to implement WebClient.  
You cannot resolve this problem remotely.

- **TROUBLESHOOTING**

- *Error Messages*

- 
- 

Action: Convert the application using “FLCONV” and “CV\_WCAPP” (See Chapter 3, “Configuration”).

**Error initializing network**

Cause: The network initialization failed.  
You cannot resolve this problem remotely.

Action: Check the network service name in the FactoryLink Configuration Manager panel and in the TCP services file (See Chapter 3, “Configuration”).

**Exceeded <num> total licensed connections.**

Cause: The number of connections configured is more than <num>, which is the sum total of full-control and view-only licensed connections. Only <num> connections are enabled.

Action: Reduce the number of connections configured in the FactoryLink Configuration Manager (See Chapter 3, “Configuration”).

**FLCM panel not configured**

Cause: The WebClient Services panel in the FactoryLink Configuration Manager is not configured.  
You cannot resolve this problem remotely.

Action: Configure panel (See Chapter 3, “Configuration”).

**Incorrect CT record size.**

Cause: CT file records are not in the expected format.

Action: Run `ctgen web_clnt` and look for errors, or delete `web_clnt.ct` and regenerate the ct tables.

**No licensed connections.**

Cause: Your FactoryLink configuration does not allow any WebClient connections.  
You cannot resolve this problem remotely.

Action: Contact your vendor to purchase WebClient connections.

**Task not purchased, lacks configuration sequence bit.**

Cause: WebClient task has not been purchased.  
You cannot resolve this problem remotely.

Action: Contact your vendor.

**Too many tags for View-Only. Extra tags ignored.**

Cause: More than 76 tags defined in Write-Access Tag List for VIEW\_ONLY connection type. Only the first 76 tags are allowed to be written.  
You cannot resolve this problem remotely.

Action: Reduce the number of tags in the list.

**Unable to enable network client.**

Cause: Unable to attempt a connection.

Action: Check host name and port number.

**Undefined security name in the panel.**

Cause: A security name is used but is not defined.

Action: Define new security name in third panel of WebClient in user domain.

- **TROUBLESHOOTING**
- *Error Messages*
- 
-

# *WebClient HTML Pages*

## CREATING WEBCLIENT HTML PAGES

The remote user must load a previously created HTML page containing the necessary codes to activate the ActiveX control in order to access a FactoryLink application using WebClient. The following paragraphs provide information about creating WebClient HTML pages.

Some HTML editing programs have tools to simplify the insertion of the code for ActiveX controls. Microsoft has created the ActiveX Control Pad, a free Windows utility to assist adding the necessary code. It is available at the Microsoft web site.

Below is the code necessary to implement a basic WebClient connection:

```
<html>
<body>

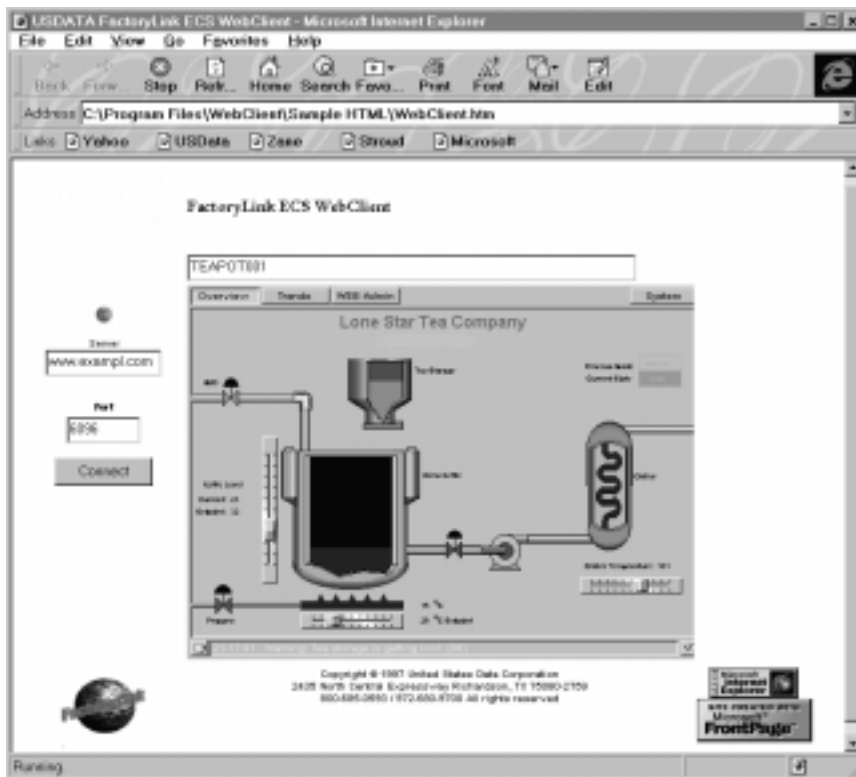
<object
id="WebClient1"
classid="CLSID:67BE6D83-1E12-11D0-B9D3-0020AFE4BC61">
width="320"
height="240">
<PARAM NAME="LocationURL" VALUE="myservername">
</object>

</body>
</html>
```

The classid information is machine-specific and derived from the Windows registry. The width and height dimensions can be adjusted to your preference. The LocationURL parameter should match the host name of your WebClient server.

- **WEBCLIENT HTML PAGES**
- *Creating WebClient HTML Pages*
- 
- 

The WebClient client-side installation includes sample HTML pages as examples for developing your own page. The following page is typical.



This page uses HTML code and VBScript to provide additional functionality. If you have multiple servers and multiple FactoryLink applications you wish to connect to, this page enables the user to select among them.

Rather than requiring the user to modify the HTML code to change the server URL, this page enables the user to enter the URL and port in the appropriate text entry boxes, and click the connect box.

For more details, use your HTML or text editor to view the source code of the examples provided in the Sample HTML directory of your WebClient installation.



# ***WebClient ActiveX Control Properties***

## **OVERVIEW**

The WebClient ActiveX control complies with the Microsoft standards for such controls. You can insert it into any ActiveX-enabled application, including programs created in Microsoft Visual Basic. The following is a list of the properties, methods, and events for the control.

## **PROPERTIES**

### **AccessSecurityName Property**

- |             |   |
|-------------|---|
| Description | Returns a string containing the name of security access group associated with the current connection. |
| Syntax      | <i>object</i> . <b>AccessSecurityName</b>   |
| Parts       | <i>object</i><br>Required. A WebClient object.  |

### **Busy Property**

- |             |  |
|-------------|--|
| Description | Returns a Boolean value specifying whether the WebClient control is busy; that is, connecting to a server or processing window messages. |
| Syntax      | <i>object</i> . <b>Busy</b>  |
| Parts       | <i>object</i><br>Required. A WebClient object.   |

- **WEBCLIENT ACTIVEX CONTROL PROPERTIES**

- *Properties*

- 
- 

### **CacheDirectory Property**

Description Returns or sets a value containing the path for the current cache directory. The cache directory is used to store application data for remote connections.

Syntax *object*.**CacheDirectory** [= *cache directory*]

Parts *object*  
Required. A WebClient object.

*cache directory*

Optional. A string containing the directory to store the cached data.

Note: Changing this property does not affect the default settings and the previous directory is not cleared. This setting cannot be changed after a connection is established.

### **Connected Property**

Description Returns a Boolean value specifying whether the WebClient control is connected to a server.

Syntax *object*.**Connected**

Parts *object*  
Required. A WebClient object.

### **ConnectType Property**

Description Returns an integer indicating the type of connection established with the server.

Syntax *object*.**ConnectType**

Parts *object*  
Required. A WebClient object.

Values **NOT\_CONNECTED** **0**  
**CONNECT\_REMOTE\_VIEWONLY** **3**  
**CONNECT\_REMOTE\_FULL** **4**

**DrawingName Property**

Description Returns a string that contains the name of the current drawing displayed in the WebClient window. An empty string is returned if no drawing is displayed.

Syntax *object*.**DrawingName**

Parts *object*  
Required. A WebClient object.

**Error Property**

Description Returns a string containing the last error encountered. This value is set after encountering an **Error** event or **NetworkError** event.

Syntax *object*.**Error**

Parts *object*  
Required. A WebClient object.

**GraphParameters Property**

Description Returns or sets a value containing the command line parameters that will be used by WebClient.

Syntax *object*.**GraphParameters** [= *graph parameters*]

Parts *object*  
Required. A WebClient object.

*graph parameters*

Optional. A string containing the parameters that are normally used as command line options for the FactoryLink Graph task. See “WebClient Command Line Switches” on page 99.

**Height Property**

Description Returns or sets the vertical dimension, in pixels, of the frame window that contains the WebClient control.

Syntax *object*.**Height** [= *height*]

Parts *object*  
Required. A WebClient object.

*height*

Optional. A long integer value specifying the vertical dimension of the frame window, in pixels.

- **WEBCLIENT ACTIVEX CONTROL PROPERTIES**

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### **HWND Property**

Description Returns the handle of the WebClient main window.

Syntax *object*.**HWND**

Parts *object*  
Required. A WebClient object.

### **Left Property (Not applicable in Internet Explorer)**

Description Returns or sets the distance between the left edge of the WebClient control and the left edge of its container.

Syntax *object*.**Left** [= *distance*]

Parts *object*  
Required. A WebClient object.  
*distance*  
Optional. A long integer expression specifying distance.

### **LocationName Property**

Description Returns a string that contains the name of the resource the WebClient is currently displaying. This corresponds to the WebClient service description value in the FactoryLink Configuration Manager WebClient Connections panel.

Syntax *object*.**LocationName**

Parts *object*  
Required. A WebClient object.

### **LocationURL Property**

Description Returns a string that contains the URL of the server the WebClient is currently connected to. See Navigate method for the format of the URL.

Syntax *object*.**LocationURL**

Parts *object*  
Required. A WebClient object.

**Name Property**

Description Returns a string that evaluates to the name of the WebClient control; that is, WebClient control.

Syntax *object*.**Name**

Parts *object*  
Required. A WebClient object.

**Port Property**

Description Returns or sets a string that contains the current TCP port used for remote connections.

Syntax *object*.**Port** [= port]

Parts *object*  
Required. A WebClient object.

*port*

Optional. The TCP port used for remote connections.

Note: Changing this setting does not affect the default settings. This setting cannot be changed after a connection is established.

**Rate Property**

Description Returns or sets a value that indicates the sleep time between real-time database queries.

Syntax *object*.**Rate** [= *Delay*]

Parts *object*  
Required. A WebClient object.

*Delay*

Optional. The sleep time between real-time database queries expressed in milliseconds.

**Status Property**

Description Returns a string that contains the current status of the WebClient control. See StatusChanged event for valid string values.

Syntax *object*.**Status**

Parts *object*  
Required. A WebClient object.

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- **Top Property (Not applicable in Internet Explorer)**

Description Returns or sets the distance between the top edge of the WebClient control and the top edge of its container.

Syntax *object*.**Top** [= *distance*]

Parts *object*  
Required. A WebClient object.

*distance*  
Optional. A long integer expression specifying the distance.

- **UserMenuEnabled Property**

Description Returns or sets a Boolean value indicating whether the context menu (right mouse button menu) is enabled.

Syntax *object*.**UserMenuEnabled** [= *value*]

Parts *object*  
Required. A WebClient object.

*value*  
Optional. A Boolean expression specifying the enabled state of the WebClient context menu. If **True**, the menu displays when not connected and the right mouse button is pressed inside the control. If **False**, the menu does not display.

- **Visible Property (Not applicable in Internet Explorer)**

Description Returns or sets a value indicating whether WebClient control is visible or hidden.

Syntax *object*.**Visible** [= *value*]

Parts *object*  
Required. A WebClient object.

*value*  
Optional. A Boolean expression specifying the visible state of the WebClient control. If **True**, the window is visible; if **False**, it is hidden.

**Width Property**

Description Returns or sets the horizontal dimension, in pixels, of the frame window containing the WebClient control.

Syntax *object*.**Width** [= *width*]

Parts *object*  
Required. A WebClient object.

*width*  
Optional. A long integer value specifying the horizontal dimension frame window, in pixels.

**WindowTitle Property**

Description Returns a string that contains the title of the window currently displayed in the WebClient ActiveX control.

Syntax *object*.**WindowTitle**

Parts *object*  
Required. A WebClient object.  
See also “TitleChange Event” event.

**Events**

**BeforeNavigate Event**

Description Occurs when the WebClient is about to connect to a different site, which may happen as a result of external automation or initialization with the URL specified. The container has an opportunity to cancel the pending navigation.

Syntax **Private Sub** *object\_BeforeNavigate*  
**(ByVal URL As String, Cancel As Boolean)**

Parts *object*  
Required. A WebClient object.

*URL*  
A string expression that evaluates to the URL the client is navigating to. See method for URL format.

*Cancel*  
A Boolean value that the container can set to **True** to cancel the navigation or to **False** to allow it to proceed.

- **WEBCLIENT ACTIVEX CONTROL PROPERTIES**

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See also “Navigate Method” method and “NavigateComplete Event” event.

### **DrawingChange Event**

**Description** Occurs when the drawing displayed in the WebClient control changes. Note that this applies only to the window displayed in the WebClient ActiveX control, not to any secondary windows displayed outside the container application.

**Syntax** **Private Sub** *object* **DrawingChange** (*Name As String*)

**Parts** *object*  
Required. A WebClient object.

*Name*  
A string containing the name of the new drawing.

### **Error Event**

**Description** Occurs when the control encounters an internal error.

**Syntax** **Private Sub** *object* **Error** (*Number As Integer*  
*Description As String*  
*Scode As Error*  
*Source As String*  
*HelpFile As String*  
*HelpContext As Long*  
*CancelDisplay As Boolean*)

**Parts** *object*  
Required. WebClient object.

*Number*  
The error number encountered.

*Description*  
A string containing the description of the error.

*Scode*  
A value containing detailed information of the interface method or function encountering the error.

*Source*  
A string containing a description of the interface method or function encountering the error.

*HelpFile*  
A string containing a path to a Windows help file containing detailed help information.



*HelpContext*

The context of the error in the help file.

*CancelDisplay*

A Boolean value the container can set to **True** to display or **False** to cancel the display of the control's default error message box.

**NavigateComplete Event**

Description Occurs after the client has successfully navigated to a new location.

Syntax **Private Sub** *object\_NavigateComplete* (**ByVal** *URL As String*)

Parts *object*  
Required. A WebClient object.

*URL*

A string expression that evaluates to the URL the client is navigating to. See Navigate method for URL format.

See also Navigate, BeforeNavigate.

**NetworkError Event**

Description Occurs when the network layer encounters an error.

Syntax **Private Sub** *object\_NetworkError* (**ByVal** *Message As String*  
**ByVal** *Level As Integer*  
*CancelDisplay As Boolean*)

Parts *object*  
Required. A WebClient object.

*Message*

A string expression containing the error the network layer encountered.

- **WEBCLIENT ACTIVEX CONTROL PROPERTIES**

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*Level*

The error level encountered.

Constant	Value	Description
<b>ERROR_LEVEL_FATAL</b>	<b>-3</b>	A fatal error occurred and the application will terminate.
<b>ERROR_LEVEL_ERROR</b>	<b>-2</b>	An error occurred and the application may eventually terminate.
<b>ERROR_LEVEL_WARN</b>	<b>-1</b>	The error should not be fatal and the application should continue execution normally.
<b>ERROR_LEVEL_INFO</b>	<b>0</b>	The error is for informational purposes only.

*CancelDisplay*

A Boolean value the container can set to **True** to display or to **False** to cancel the display of the control's default error message box.

**Quit Event**

Description Occurs when the Quit method is invoked.

Syntax **Private Sub** *object\_Quit* (*Cancel As Boolean*)

Parts *object*  
Required. A WebClient object.

*Cancel*

A Boolean value that the container can set to **True** to cancel the Quit or to **False** to allow it to proceed.

See also "Quit Event".

**StateChange Event**

Description Occurs when the control's state changes.

Syntax **Private Sub** *object\_StateChange* (*State As Integer*)

Parts *object*  
Required. A WebClient object.

*State*  
The new state of the control.

Constant	Value	Description
<b>STATE_STOPPED</b>	<b>0</b>	The control is idle. No connection is established.
<b>STATE_CONNECTING</b>	<b>1</b>	The control is attempting to connect to the server.
<b>STATE_STARTING</b>	<b>2</b>	A connection is established and the initial data is being retrieved.
<b>STATE_RUNNING</b>	<b>3</b>	The connection is established and the control is currently active.
<b>STATE_STOPPING</b>	<b>4</b>	The control is attempting to disconnect from the current server.

**StatusChange Event**

Description Occurs when the control's status changes.

Syntax **Private Sub** *object\_StatusChange* (**ByVal** *Status As String*)

Parts *object*  
Required. A WebClient object.

- **WEBCIENT ACTIVEX CONTROL PROPERTIES**

- *Properties*

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*Status*

A string value containing the new status text for the WebClient.  
The status strings are:

Connecting to <servername>

Connected to <servername>

Getting start-up file (x of y): filename  
where x is an incrementing counter and y is the total number of  
start-up files being transferred

Getting file: <filename>

Running

Disconnecting from server

Not Connected

See also “Status Property”.

### **Stop Event**

Description Occurs before the WebClient processes the Stop method.

Syntax **Private Sub** *object* **Stop (Cancel As Boolean)**

Parts *object*  
Required. A WebClient object.

*Cancel*

A Boolean value the container can set to **True** to cancel the Stop  
or **False** to allow it to proceed.

See also “Stop Event”.

### **TitleChange Event**

Description Occurs when the control window’s title text changes or becomes  
available.

Syntax **Private Sub** *object* **TitleChange**  
**(ByVal Title As String)**

Parts *object*  
Required. A WebClient object.

*Title*

A string containing the new control title.

See also “WindowTitle Property”.

Methods

**ClearCache Method**

Description Removes the files and directories from the default cache. Note that this method cannot be used while connected to a server.

Syntax *object*.**ClearCache** Prompt

Parts *object*  
Required. A WebClient object.

*Prompt*

Required. A Boolean value that indicates whether the control should prompt to remove the cache. If the value is **True**, the control displays a Yes/No message box asking if the cache should be cleared; if **False**, the cache clears immediately.

See also “CacheDirectory Property”.

**Navigate Method**

Description Navigates (connects) to the server the URL identifies. If there was an active connection when this method was invoked, that connection is closed.

Syntax *object*.**Navigate** URL

Parts *object*  
Required. A WebClient object.

*URL*

A string expression that evaluates to the URL of the resource to display. The format of the URL for Graph is as follows:

[*Host Name*] [:*Service*]

*Host Name* is the name or IP address of a machine running the WebClient server processes.

*Service*

Optional. A port number defined in the system host file.

See also “NavigateComplete Event”, “Navigate Method”.

- **WEBCIENT ACTIVEX CONTROL PROPERTIES**

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### **Quit Method**

Description Stops all communication and disconnects from the server.

Syntax *object*.**Quit**

Parts *object*  
Required. A WebClient object.

See also “Refresh2 Method”, “Navigate Method”.

### **Refresh Method**

Description Redraws the contents of the current drawing.

Syntax *object*.**Refresh**

Parts *object*  
Required. A WebClient object.

See also “Refresh2 Method”, “Stop Event”.

### **Refresh2 Method**

Description Redraws the contents of the current drawing. Unlike the **Refresh** method, this method contains a parameter that specifies the refresh level.

Syntax *object*.**Refresh2** [*Level*]

Parts *object*  
Required. A WebClient object.

*Level*

Optional. A constant or value that specifies the refresh level. It can be one of the following values:

Constant	Value	Description
<b>REFRESH_NORMAL</b>	0	Invalidate the window to redraw the display. Restart the real-time database timer if it stopped.
<b>REFRESH_RESTART</b>	1	Reconnect to the server and perform the <b>REFRESH_NORMAL</b> actions.

See also “Stop Event”, “Refresh Method”.

### **Stop Method**

Description Stops the drawing update or an in-process Navigate.

Syntax *object*.**Stop**

Parts *object*  
Required. A WebClient object.

See also “Refresh Method”, “Navigate Method”.

- **WEBCLIENT ACTIVEX CONTROL PROPERTIES**
- *Properties*
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# *WebClient Minimum Tags*

## OVERVIEW

This chapter lists the minimum set of tags that must be configured for a view-only client to write to for proper functionality.

**Table 9-0** WebClient Minimum Tags

Tag ID	Domain	Type	Description/Values
FLOPERATOR_U	USER	MESSAGE	Application operator.
FLSECEVENT_U	USER	MESSAGE	Application security event.
FLSECEVENTUSER_U	USER	MESSAGE	User name for application security event.
GRAPHCONNTYPE	USER	ANALOG	Graph connection and security type.
GRAPHMBX_U	USER	MAILBOX	Graphics input mailbox.
SPCGMBX_U	USER	MAILBOX	SPC graphics input mailbox.
SPRGMBX_U	USER	MAILBOX	SPR graphics input mailbox.
TASKSTART_U[ ]	USER	DIGITAL	User task start trigger.
TASKSTATUS_U[ ]	USER	DIGITAL	User task status value.
TASKMESSAGE_U[ ]	USER	MESSAGE	User task message.
TASKDSTATUS_U[ ]	USER	MESSAGE	User task display status message.
TOPWINDOW_U	USER	MESSAGE	Current top window name.
TRENDBOX_U	USER	MAILBOX	Trending mailbox.

- **WEBCLIENT MINIMUM TAGS**
- *Overview*
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# ***WebClient Command Line Switches***

Command line switches are available that modify the way WebClient operates. These switches fall into three categories:

- Connection Server task switches
- Data Server task switches
- Graphics task or WebClient switches

The following paragraphs describe the syntax and arguments for the switches and provide typical examples of configuring the switches to accomplish error logging.

- **WEBCLIENT COMMAND LINE SWITCHES**

- *Overview*

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## **OVERVIEW**

The Graphics task switches are specified on the client side in the WebClient Properties dialog or by using GRAPHSET.EXE for the standalone Graphics task. These settings are in addition to any switches set for the GRAPH task in the FactoryLink System Configuration panel.

The Connection Server and Data Server switches are specified in the Program Arguments column of the System Configuration panel in FactoryLink Configuration Manager.

Two primary command line switches enable logging for the WebClient tasks. Other switches control how the log file is managed and whether or not the logged information includes time-stamping.

Information related to the connection and disconnection of remote nodes, file transfers, task data, and more can be captured and either displayed for you or saved in a log file. You can focus on a particular aspect of WebClient operation by specifying a topic. The topics include broker service, connection/disconnection, data service, file transfer service, kernel service, network service, remote procedure calls, USER instances, and task layers.

You can also specify the level of detail included in the data log. Five different levels of detail are available, ranging from simple error messages to full data captures.

### **Connection Server Command Line Switches**

The switches are specified in the Program Arguments column of the System Configuration panel in the FactoryLink Configuration Manager.

The following paragraphs describe the function and syntax of the Connection Server command line switches. The command line switches are not case sensitive.

- d<X> Enables logging information related to topic <X>.
- i<n> Sets the maximum idle connection time of <n> seconds. This specifies the maximum period the Connection Server or Data Server tasks wait for an idle before closing the connection. The default is 180 seconds.
- l Writes the logging information to the log file.
- m<n> Sets the maximum time for a single data transfer, where <n> is the maximum in seconds. The default value is 5 seconds.

- n<n> Sets the maximum number of sessions, or WebClient connections. The default is 32.
- r<n> Retry period. This parameter defines the maximum period of time (in seconds) the WebClient ActiveX control attempts to connect with the server. The default is 15 seconds. If you are on a slow remote connection and are having problems connecting, increasing this value may help
- v Insert a time-stamping into each message
- w<#> Wrap the log file every <#> messages
- y<#> Close and reopen the log file every <#> messages

### Connection Server Debug Topics

The -d switch can be configured to focus on specific topics by adding the following topic parameters:

- C Connection/Disconnection -remote node name/address, Security, Rejections.
- N<a|...|z><#> NSI layer debugging (Note that now, NSI layer debugging is a topic at the task layer) Also you can specify a topic in NSI layer with the letter following the N.
- O NSI Class layer debugging (Now NSI class layer is also a topic at task layer).
- R Remote Procedure call(RPC)/ Network layer debugging.
- U User Instance (availability, connection, exiting notification, RUNMGR launch).

All the other letters have not been defined and have no meaning.

### Data Server Command Line Switches

The switches are specified in the Program Arguments column of the System Configuration panel in the FactoryLink Configuration Manager.

Each command line switch starts with a hyphen followed by the flag (the different flags are given below), and then the string or number follows with no space in between. Options are specified in the Program Arguments column of the System Configuration panel in the FactoryLink Configuration Manager.

- b<n> Sets the TCP/IP socket receive and send buffer to <n> bytes (default: 16K).

- **WEBCLIENT COMMAND LINE SWITCHES**

- *Overview*

- 
- 

- d<X> Enables logging information related to topic <X>.
- i<n> Sets the maximum idle connection time of <n> seconds. This specifies the maximum period the Connection Server or Data Server tasks will wait for an idle before closing the connection. The default is 180 seconds.
- l Writes the logging information to the log file.
- m<n> Sets the maximum time for a single data transfer, where <n> is the maximum in seconds. The default value is 5 seconds.
- n<n> Sets the maximum number of sessions, or WebClient connections. The default is 32.
- t<n> Sets the maximum wait period for remote tasks to exit during shutdown, where <n> is the limit in seconds.
- v Inserts a time-stamping into each message.
- w<#> Wraps the log file every <#> messages.
- y<#> Closes and reopens the log file every <#> messages.

## Data Server Debug Topics

The -d switch can be configured to focus on specific topics by adding the following topic parameters:

- B Broker Service.
- C Connection/Disconnection -remote node name/address, Security, Rejections.
- D Data Service (RPC calls including the service and function name, return values; specific to Data Server task and Remote Graphics task).
- K Kernel Service (specific to Data Server task and Remote Graphics task).
- N NSI layer debugging
- O NSI Class layer debugging (Now NSI class layer is also a topic at task layer).
- R Remote Procedure call(RPC)/ Network layer debugging.
- U User Instance (availability, connection, exiting notification, RUNMGR launch).

- T Task layer (Initializing Mailbox IPC, network services, Loading Ct, shutdown etc.).

All the other letters have not been defined and have no meaning.

Each topic has certain levels defined. In general terms, the levels of logging associated with the levels for each topic are:

- 1 Errors
- 2 Warnings
- 3 Function calls
- 4 Return codes
- 5 Parameter Dumping

The Topic C level 1 is the exception that also logs the applicable connection information like remote node name, port number, security and connection success or failure, and a brief indication of the reason for failure (for example, all data servers in use, no access to host, wrong port number).

Normally, the log file for the Data Server and Connection Server tasks are opened in the Append mode unless the `-w<#>` switch is specified. If the `-w<#>` switch is specified, the log file is not appended.

- **WEBCLIENT COMMAND LINE SWITCHES**

- *Graphics Task Command Line Switches*

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- 

## **GRAPHICS TASK COMMAND LINE SWITCHES**

Some command line switches can be used to configure how the WebClient remote Graphics task operates on the client, in addition to any switches set for the GRAPH task in the FactoryLink System Configuration panel. You enable these switches using the WebClient properties dialog. See “Running WebClient” on page 41 for more information.

### **Network Switches**

**Note:** The command line switches for the Graphics task should be preceded by the -n switch, and entered in lower case, separated by commas, with no spaces.

We recommend these switches not be used under normal circumstances. These switches are:

- b<n> Sets the TCP/IP socket receive and send buffer to <n> kilobytes (K). The default value is 16K.
- d<X> Displays logging information related to topic <X> in a separate window.
  - l Writes the logging information to the log file.
- m<n> Sets the maximum time for a single data transfer, where <n> is the maximum in seconds. The default value is 5 seconds.
- n<n> Sets the maximum number of sessions or WebClient connections. The default is 32.
- r<n> Retry period. This parameter defines the maximum period of time (in seconds) the WebClient ActiveX control attempts to connect with the server. The default is 15 seconds. If you are on a slow remote connection and are having problems connecting, increasing this value may help.
- v Insert time-stamping into each message.

The -d switch can be configured to focus on specific topics by adding the following topic parameters:

- C Connection/Disconnection -remote node name/address, Security, Rejections.
- F File Transfer Service (specific to Data Server task and Remote Graphics task).



- K Kernel Service (specific to Data Server task and Remote Graphics task).
- N<a|...|z><#> NSI layer debugging (Note that now, NSI layer debugging is a topic at the task layer) Also you can specify a topic in NSI layer with the letter following the N.
- O NSI Class layer debugging (Now NSI class layer is also a topic at task layer).
- R Remote Procedure call (RPC)/ Network layer debugging.

**Graphics Switches**

The following command line switches relate specifically to the Graph task and control how it operates. See the FactoryLink *Fundamentals* manual for more information.

- o1 Run-time graphics switch. Performs redraw for static objects (This is the letter “o”).
- P Performs redraw of symbol background.
- T Uses object’s animated value.
- Z<nn:mm:oo> Polling control switch (standalone GRAPH only), used to improve performance. When multiple users are connected, the polling of the server for data can degrade performance.

The -Z parameter sets a default delay of 1 second between polls of the server.

The nn parameter changes the default to nn milliseconds, unless the operator performs an input function (pressing a key, clicking the mouse). If an input function is detected, the delay is changed to oo milliseconds for a duration of mm milliseconds. After mm milliseconds, the delay reverts to nn milliseconds.

If the oo parameter is omitted, the faster polling rate used is nn / 10.

**EXAMPLE CONFIGURATIONS**

**Connection Server**

- dc1 -l -v This is the most useful debug switch to turn on at the connection server. Logs the version of both the connection server and data server, number of connections allowed, connection requests from

- **WEBCIENT COMMAND LINE SWITCHES**

- *Example Configurations*

- 
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each host, host security, connection success or failure and the reason for failure (for example, host lacks access privileges, no data server available, exceeded total number of connections, incompatible version)

- dr2 -l This is useful for logging the network error messages. This setup logs errors and warnings that include network message send and receive errors, invalid message header information, invalid signature, message export and import errors, message type mismatches, and null session errors.
- dt2 -l This is another useful switch for logging errors specific to the task. Logs errors and warnings associated with loading the CT files, missing mailbox tags, mailbox read errors, initialization errors, and task shutdown errors.
- dN1 -l This is useful to log all the errors at network (NSI) layer. This provides more detail if the information obtained with the previous switches cannot diagnose the problem.

Your specific need may dictate a combination of switches. Some examples are:

```
-dc1 -dt2 -l -v  
-dc1 -dr2 -l -v  
-dc1 -dt2 -dr2 -l -v0
```

**Caution:** While you can specify a level of detail ranging from 1 to 5, we highly recommend the level specified be between 1 and 3. Using higher levels of logging generates a large number of messages, and could consume all available disc space. This is particularly applicable if the R topic is specified.

**Data Server:**

- dc1 -l -v Logs errors during connection with the remote GRAPH task. It includes connection request from host, host security, connection success or failure, and the reason for failure (for example, host has no access, incompatible version), session disconnect, session timeout, and listen socket failure.
- dd2 -l Logs errors and warnings that include packing and unpacking of the RPC messages, unknown RPC message, and RPC failures. Any RPC failure is logged with the service name (data service, file service or kernel service), RPC name, the error string, and the host name.

- dk2 -l Logs errors and warnings for kernel service. This includes error creating kernel session, invalid user signature, and kernel call failures. Each kernel call failure is logged with the FactoryLink error number returned by Fl\_errno().
- df2 -l Logs errors and warnings for file service. This includes invalid user signature and file operation failures. Each file service request failure is logged with the RPC name and error string. This includes errors resulting from file open, file access, file read, checking file path and read buffer allocation failures. Logs the filename and the system error message resulting from any of the above failures.
- dr2 -l This is useful for network error messages. Logs errors and warnings including network message receive and send errors, invalid message header information, invalid signature, message export and import errors, message type mismatches, and null session errors.
- dt2 -l This is useful for logging errors specific to the task. Logs errors and warnings associated with loading CT files, missing mailbox tags, mailbox read errors, initialization errors, and task shutdown errors.
- dN1 -l Logs all the errors at network (NSI) layer. This provides more detail if the information obtained with the above switches cannot diagnose the problem.

Your specific need may dictate a combination of switches. Some examples are:

```
-dd2 -dt2 -l -v
-dd2 -dk2 -l -v
-dt2 -dd2 -df2 -l -v
-dc1 -dd2 -dn1 -l -v
```

### Remote Graph:

**Note:** The command line switches for the Remote graph task should start with -n. All subsequent switches are separated using a comma.

- dc1,-l,-v Logs errors during connection with the Connection server and Data server. It includes Connection request to host, Connection success or failure, and the reason for failure (Host has No access, Incompatible Version), Session disconnect, Session timeout, and listen socket failure.

- **WEBCLIENT COMMAND LINE SWITCHES**

- *Example Configurations*

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- dd2,-l Logs errors and warnings that include packing and Unpacking of the RPC Data messages, RPC failures, and RPC send failures. Any RPC failure is logged with the service name (Data service, File service or Kernel service), RPC name (actual function call), the error string, and the error code.
- dr2,-l This is useful to log any of the network message errors. Logs errors and warnings that include network message receive and send errors, invalid message header information, invalid signature, message export and import errors, message type mismatches, and null session errors.
- dN1,-l This is useful to log all the errors at Network (NSI) layer. This should be handy to go in detail if the previous switches cannot diagnose the problem.

Your specific need may dictate a combination of switches. Some examples are:

-n-dd2,-dc1,-l,-v

-n-dd2,-l,-v

-n-dC2,-dd2,-l,-v

-n-dc1,-dd2,-dn1,-l,-v

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