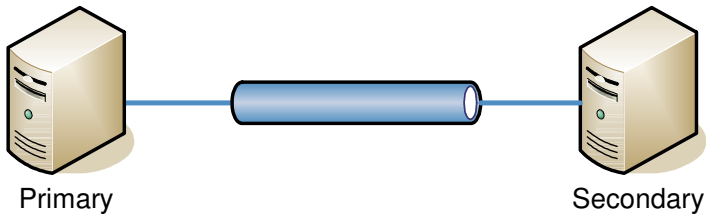




Server Redundancy Checklist v3.1.0

Proficy HMI/SCADA – CIMPLICITY



Outline

This document is intended to assist in the setup and basic troubleshooting for a CIMPLICITY HMI Server Redundant configuration. The basic troubleshooting covers issues related to incorrect or inconsistent configuration settings on the primary and secondary computers that make up the redundant pair.

NOTE:

If you have a computer (either the Primary or the Secondary) in the redundant pair that has more than one Network Card then you must do further configuration than the Basic Redundancy Configuration. Please see the appendices following the Basic Redundancy Configuration/Troubleshooting for additional information.

Basic Redundancy Configuration/Troubleshooting

Step 1: Verify Licensing

- ☐ **The CIMPLICITY HMI System is running in 4 day mode** (The system is not licensed and it is within 4 days of the initial installation of the CIMPLICITY HMI software)

OR

- ☐ **The CIMPLICITY HMI System is properly licensed.** To be properly licensed, the following conditions must be met:
 - 1) The Primary and secondary computers should be running with the same hardware and operating system.
 - 2) Both the primary and secondary computers must be running the same version of CIMPLICITY HMI (including service pack and hot-fixes)
 - 3) The primary computer must have a valid Server Development License.
 - 4) The secondary computer may have a development license or Server runtime license.

- 5) All options configured within the project, including Server Redundancy, must be installed and licensed on *both* servers.

Step 2: Verify Network Communications

☐ The following information is needed for this step:

- 1) TCP/IP address of the primary computer
- 2) TCP/IP address of the secondary computer
- 3) Hostname (Node name) for the primary computer
- 4) Hostname (Node name) for the secondary computer

☐ Test communications between machines using the Ping utility.

Validate communications as follows:

- 1) Open up a DOS command prompt on the Primary computer
- 2) Execute a ping command by TCP/IP address from the Primary to the Secondary computer.

Example: ping <TCP/IP address of secondary computer>

- 3) Open up a DOS command prompt on the Secondary computer.
- 4) Execute a ping by TCP/IP address from the Secondary to the Primary computer.

Example: ping <TCP/IP address of primary computer>

- 5) From the DOS command prompt on the Primary computer, execute a ping by hostname from the Primary to the Secondary computer, verifying that the TCP/IP address returned by the ping command is the expected for the secondary computer.

Example: ping -a <hostname of Secondary>

If this fails please see the **Appendix B: Name Resolution** and configure the cimhosts.txt file on the Primary computer.

- 6) From the DOS command prompt on the Primary computer, execute a ping by hostname from the Secondary to the Primary computer, verifying that the TCP/IP address returned by ping command is the expected address for the primary computer.

Example: ping -a <hostname of Primary>

If this fails please see the Appendix B: Name Resolution and configure the cimhosts.txt file on the Secondary computer.

☐ Verify that the Startup Options are configured properly on both the primary and secondary computers.

- 1) Open up the CIMPLICITY Options.
- 2) Select the Startup Options tab.
- 3) Verify that the Accept Connections checkbox is currently selected

Step 3: Secondary Only Configuration

- ❑ **Configure the directory for the CIMPLICITY HMI run-time project configuration on the secondary computer with the correct permissions.**

- 1) On the Secondary computer, stop all projects running using the CIMPLICITY Options utility. This can be accessed as follows:

Start->Programs->CIMPLICITY HMI->HMI->CIMPLICITY Options

- 2) Stop any running projects
- 3) Determine the location for the CIMPLICITY run-time project configuration data. The path name for the location cannot contain any spaces and the fully qualified path name should be 27 characters or less.

WARNING: Do not choose a location that within the directory tree of another CIMPLICITY HMI project.

- 4) Create the directory at the determined location.
- 5) Create a share name for the directory that does not contain any spaces. The user on the Primary computer where the project is started should have full control over this directory.

WARNING: When you attempt to start the project from the Primary, it will use the username and password of the logged in Windows user who initiated the request for the start request to the Secondary For the newer Microsoft Windows Operating Systems (Windows XP or newer) it is required that the username and password is the same for both users on the primary and the secondary in a workgroup. Each user must have a password; you cannot have an empty password or the start request will fail.

- 6) If you are using NTFS, configure the windows directory (i.e. C:\windows or C:\winnt), the system32 subdirectory (i.e. C:\windows\system32 or c:\winnt\system32) and the exe subdirectory under the CIMPLICITY installation directory (C:\simplicity\hmi\exe) so that SYSTEM, NETWORK and the user account starting CIMPLICITY on the primary has full control. If the permissions are not sufficient, the secondary cannot be started from the primary.
- 7) On Windows XP or Windows 2003, turn off Simple File Sharing.

To turn off Simple File Sharing:

- a) Open Windows Explorer
- b) Go to Tools->Folder Options->View->Advanced Settings
- c) Uncheck Simple File Sharing

Step 4: Primary and Project Configuration

- 1) Open the project in the workbench on the Primary computer
- 2) Uncheck Server redundancy in the project properties if it is already selected.
- 3) Start the project and verify it runs properly when not configured for redundancy.
- 4) Stop the project.
- 5) Open up Windows Explorer and create a new mapped network drive to the shared folder created on the secondary for storing the CIMPLICITY configuration files used on the secondary. The name should be something like <drive letter>:\ (i.e. f:\). The device name should be \\computername\share, where the "computername" is the hostname and not the TCP/IP address.

NOTE: If you are using CIMPLICITY 7.0 or higher, then you do not need to create a mapped network drive, as you will need to use a UNC Path (Example: [\\COMPUTER\Share\](#)).

- 6) Go to the Project Properties, and add the Server Redundancy option.
- 7) Select the Redundancy tab and enter the Secondary computer for the Computer name and the mapped drive name for the Project Path.

NOTE: If you are using CIMPLICITY 7.0 or higher do not use a mapped network drive; instead use a UNC Path (Example: [\\COMPUTER\Share\](#)). If you are using Windows XP this is mandatory.

- 8) If it isn't selected, select the Basic Control Option from the project properties (this only applies to versions prior to CIMPLICITY 7.0).
- 9) Press the Update configuration button in the workbench.

NOTE: This causes the runtime data to be copied over to the shared folder on the remote system. After pressing this you should see the files start to appear on the Mapped Network Drive. If the files do not get copied then there is a network permission or configuration error.

Step 5: Vista Specific Configuration

If you are using CIMPLICITY 8.0 or higher, and are intending to use Windows Vista you may need to do additional configuration. If you are not using Vista or CIMPLICITY 8.0 or higher then skip to the following step.

- 1) If you are using Workgroup Authentication (and not Domain Authentication) then you may need to change a Windows registry setting to allow this type of authentication. The following Microsoft article explains some of the additional configuration:

<http://msdn.microsoft.com/en-us/library/aa384423.aspx>

The following steps can be used to turn off the User Access Control security for configured Administrators. This will allow a Workgroup Authenticated Administrator to be able to start the remote project on the Secondary.

Using RegEdit go to the following registry location:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System

Create a new DWORD registry entry called "**LocalAccountTokenFilterPolicy**"
When prompted for a value give it a value of "**1**"

- 2) It is also required to start the Remote Registry Service on both Primary and Secondary so that the remote start requests can be handled. A service can be started via the Control Panel->Administrative Tools->Services. When the utility launches, find the service named "Remote Registry" and start it. The Startup Type should also be changed to "Automatic". Click OK when done.

Step 6: Starting the project

- 1) Open up the project in the workbench on the Primary Server.
- 2) Press the start button. When prompted between Primary and Secondary – choose Primary only.

- 3) Verify the project is working as expected with only the master started.
- 4) Hit the run button again this time choose start slave only. The other two choices should be greyed out.

NOTE: If you get an error saying that you do not have permissions to launch the secondary, then make sure that for the Windows Users that you are using there is a password configured. On newer OS releases, it is a requirement for remote authentication that each user has a password configured.

- 5) Test the system running as host redundant and verify it functions as expected.

At this point the system should be functioning correctly.

Appendix A: Cabling Redundancy and General Network configuration

The following information describes many common network scenarios encountered. It is recommended that this information be used in conjunction with the Viewer to Server checklist.

DHCP

It is not recommended that CIMPLICITY HMI be used on computers whose TCP/IP addresses are served by a DHCP server. This is because the TCP/IP address may change when the lease expires. Should this occur, the only recovery path is to stop and restart the CIMPLICITY HMI project/viewer on the computer whose address changed. After restarting the system, the time for remote systems to detect the change and attempt to re-establish a connection is defined by the System global `CONNECT_DROP_PERIOD`. The default value is 600 seconds (10 minutes).

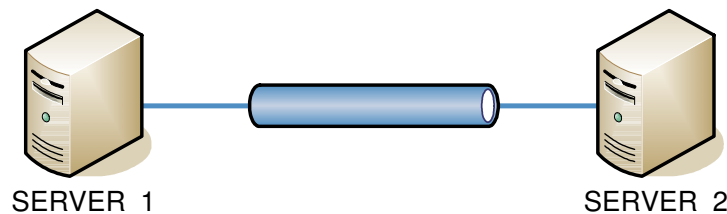
DNS and the CIMPLICITY HMI Router

CIMPLICITY HMI may be used with DNS. Should the TCP/IP address be changed, the recovery is as described above for DHCP.

Server Redundancy - Single Ethernet card

For server redundancy where the servers each have a single Ethernet card, configure the `cimhosts.txt` file to include the TCP/IP address of each server (local and remote servers). The `cimhosts.txt` file is located in the `etc` sub-directory located off the CIMPLICITY HMI installation root (e.g. `C:\cimplicity\hmi`).

Example:



TCP/IP Address Mappings	
Computer Name: SERVER_1	Computer Name: SERVER_2
Ethernet card 1: 10.1.1.1	Ethernet card 1: 10.1.1.2

cimhosts.txt Files	
SERVER_1 Cimhosts.txt file:	SERVER_2 Cimhosts.txt file:
10.1.1.2 SERVER_2	10.1.1.1 SERVER_1

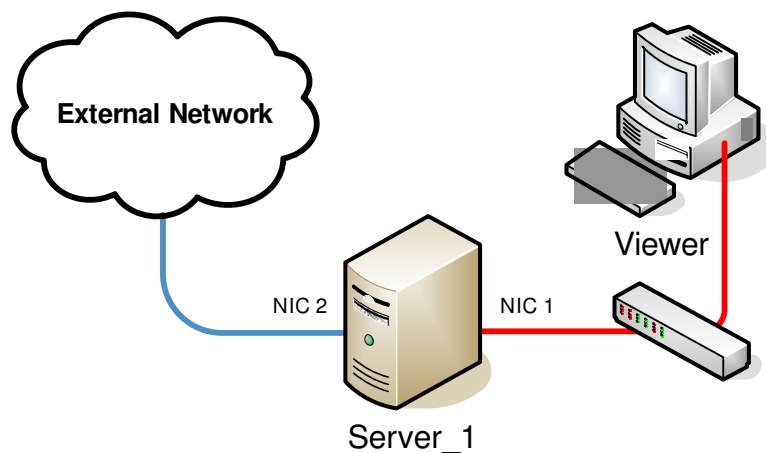
This does the proper association of computer name to IP address between the servers and should allow them to communicate properly.

Server Redundancy - Dual Ethernet card

Single Ethernet card Broadcast

When there are two Ethernet cards installed in the computer, but only one is desired for CIMPLICITY HMI server/viewer communications, a System Level Global Parameter called BIND_ADDR may be defined to declare which Ethernet card is to be used for broadcasts. The value for the BIND_ADDR variable is the TCP/IP address assigned to the card over which the broadcasts should occur. The cimhosts.txt file should also include an entry for the given server and bound TCP/IP address in each cimhosts.txt file that makes up the CIMPLICITY System (including the local server), and it should be updated whenever the address is changed on all computers that access the server (including itself).

Example:



TCP/IP Address Mapping	
Computer Name: SERVER_1	Computer name: VIEWER
Ethernet card 1: 10.1.1.1	Ethernet card 1: 10.1.1.3
Ethernet card 2: 192.168.1.1	

In this configuration, the system-level global parameter BIND_ADDR should be defined to be 10.1.1.1 on the server so that it is able to communicate with the viewer. Also, an entry in the cimhosts.txt file should also be created for the server for the same TCP/IP address.

System Global Parameter Name: BIND_ADDR

Value: 10.1.1.1

cimhosts.txt File (Server)	
10.1.1.1	SERVER_1
10.1.1.3	VIEWER

cimhosts.txt File (Viewer)	
10.1.1.1	SERVER_1
10.1.1.3	VIEWER

If these changes are not made, the server will not be able to communicate with the viewer.

Cable Redundancy

How it works:

When a system is configured as cable redundant there are two physical paths (two cables) to any other Viewer/Server on the network. With cable redundancy, the Viewer to Server and Server to Server communication is concurrently transmitted on both Ethernet cards. The receiving system will accept the first transmission received and will discard subsequent duplicates.

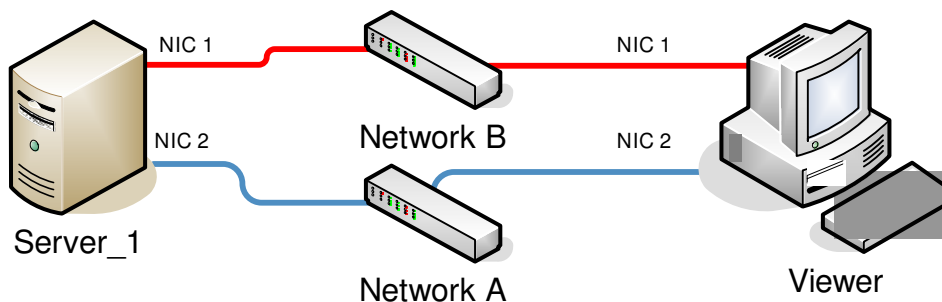
How it is configured:

On each system on the cable redundant network, there are two entries for each computer – one for each TCP/IP address. On each computer, the two TCP/IP addresses need to be on different subnets.

NOTE:

To use Cable Redundancy communication on a server, a Server Redundancy option license is required on each server. The license is not required on a cable redundant viewer

Example: Viewer to Server (Cable Redundant)



TCP/IP Address Mapping	
Computer Name: SERVER_1	Computer Name: VIEWER
Ethernet card 1: 10.1.1.1	Ethernet card 1: 10.1.1.2
Ethernet card 2: 192.168.1.1	Ethernet card 2: 192.168.1.2

Resulting entries included in the cimhosts.txt file:

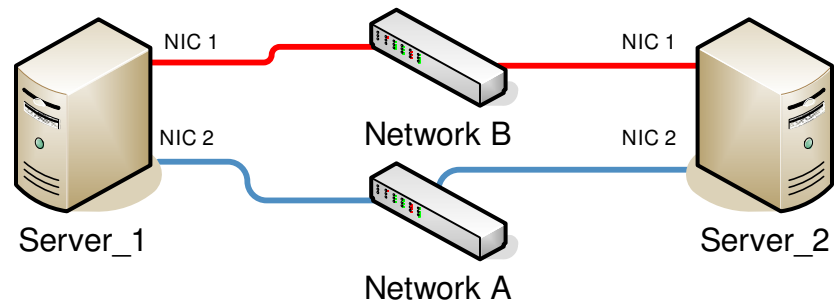
Cimhosts.txt Files	
SERVER_1 Cimhosts.txt file	VIEWER Cimhosts.txt file
10.1.1.1 SERVER_1	10.1.1.2 VIEWER
192.168.1.1 SERVER_1	192.168.1.2 VIEWER

10.1.1.2	VIEWER	10.1.1.1	SERVER_1
192.168.1.2	VIEWER	192.168.1.1	SERVER_1

Cable redundancy is not enabled if the cimhosts.txt file is not correctly setup on each system. All cable redundant systems (including that of the local PC), need to be included in each cimhosts.txt file on each computer.

A few examples are shown below:

Example: Redundant Primary to Redundant Secondary (Cable Redundant)



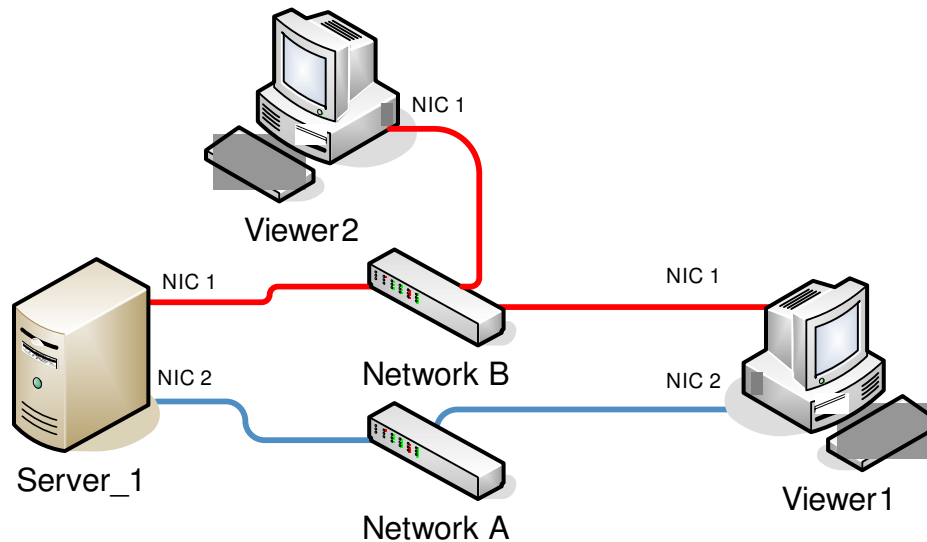
TCP/IP Address Mapping	
Computer Name: SERVER_1	Computer Name: SERVER_2
Ethernet card 1: 10.1.1.1	Ethernet card 1: 10.1.1.3
Ethernet card 2: 192.168.1.1	Ethernet card 2: 192.168.1.3

Cimhosts.txt Files	
SERVER_1 Cimhosts.txt file	SERVER_2 Cimhosts.txt file
10.1.1.1 SERVER_1	10.1.1.3 SERVER_2
192.168.1.1 SERVER_1	192.168.1.3 SERVER_2
10.1.1.3 SERVER_2	10.1.1.1 SERVER_1
192.168.1.3 SERVER_2	192.168.1.1 SERVER_1

Single Ethernet card Viewer on a Cable Redundant Network

Not all viewers need to be cable redundant in a cable redundant configuration. In the case of the non-redundant viewer in the cable redundant configuration, the cimhosts.txt file should only show the one path for communications on the viewer.

Example:



TCP/IP Address Mapping		
Computer Name: SERVER_1	Computer Name: VIEWER1	Computer Name: VIEWER2
Ethernet: card 1: 10.1.1.1 card 2: 192.168.1.1	Ethernet card 1: 10.1.1.2 card 2: 192.168.1.2	Ethernet card 1: 10.1.1.4

On the Server you would set up the Cimhosts file to talk to both viewers as follows:

cimhosts.txt file		
SERVER_1 Cimhost.txt file	VIEWER1 Cimhosts.txt file	VIEWER2 Cimhosts.txt file
10.1.1.1 SERVER_1 192.168.1.1 SERVER_1 10.1.1.2 VIEWER1 192.168.1.2 VIEWER1 10.1.1.4 VIEWER2	10.1.1.2 VIEWER1 192.168.1.2 VIEWER1 10.1.1.1 SERVER_1 192.168.1.1 SERVER_1	10.1.1.1 SERVER_1 10.1.1.4 VIEWER2

Appendix B: Name Resolution

To ensure that the Primary and Secondary computers can resolve each other's host names correctly, it is recommended that each name be configured in cimhosts.txt file on each computer. Although CIMPLICITY HMI will also look at the regular Windows hosts file, the cimhosts.txt file takes precedence.

The cimhosts.txt file resides in the CIMPLICITY HMI\HMI\etc directory in your CIMPLICITY HMI installation location.

An example cimhosts.txt file might look like this:

```
192.168.1.101      myprimary
192.168.1.105      mysecondary
```

NOTE:

For systems with two network cards, please see Appendix A.

Appendix C: Basic Troubleshooting

1) Configuration mismatch between Primary and Secondary.

- a) Stop all of the projects running on the secondary.
- b) Delete everything from the secondary's shared folder containing the CIMPLICITY HMI configuration data.
- c) Stop the Primary
- d) Update configuration
- e) Restart the project

This eliminates the possibility of a configuration change being present on the Primary, but not the Secondary. When they get out of sync in this manner, abnormal behavior is sometimes observed.

2) System hangs on startup of UR_RP process in workbench.

- a) Verify that Accept Connections is selected under the CIMPLICITY Startup Options. To verify, Open the CIMPLICITY Options, select the Startup Options tab and look at the Accept Connections. If the box is not checked, select it.
- b) Verify that the required project folders (subdirectories) exist. The following are required:

Master (Should exist on the Primary only)

Log
Data
Screens
Scripts
Lock

If the Log or Lock directory is missing, it can be re-created. If any of the other sub-directories are missing, the project should be restored from a project backup. If the sub-directories (except for Master) are missing from the secondary, please follow the steps above to recover.

3) **The project immediately goes into dual master mode when starting Primary and Secondary.**

When the Primary and Secondary both start as Master, a \$DUAL_MASTER alarm is generated and is visible in the alarm viewer. This often occurs when the network connection between the primary and secondary was disconnected for at least a short period of time. Normally, for this scenario, the two computers will recover without intervention.

Three system global parameters control the behavior of the redundant servers' communication and detection of the other's failure. If they are set too aggressively or are not set to the same values on both servers, each server will think that the other has failed and declare itself master. The result will be a system that is constantly in dual master state, or constantly entering and leaving dual master state for no apparent reason. If they are set too passively, detection of the partner's failure will be slow.

The system global parameters are:

REDUND_PROBE_DELAY
REDUND_PROBE_INTERVAL
REDUND_PROBE_COUNT

A good rule of thumb is that:

$REDUND_PROBE_DELAY * (REDUND_PROBE_COUNT + 1)$

should be greater than the time it takes to start the project. Lower values will typically result in the systems starting up in dual master mode.

For more information on configuration of these global parameters, please see Appendix F.

Appendix D: Upgrading or Moving Redundant Projects

- 1) When making significant network changes such as changing a computer name, significant network topology changes, etc. in a host redundant configuration:
 - a) Stop the project
 - b) De-select Server Redundancy from the Project Options
 - c) Make the necessary network changes
 - d) Update any related configuration files
 - e) Re-select Server Redundancy from the Project Options
 - f) Restart the project.
- 2) When moving the project to a different computer with the same setup:
 - a) Stop the project
 - b) De-select Server Redundancy from the Project Options (this ensures that the old secondary is not required to open the workbench)
 - c) Move the project
 - d) Update any related configuration files
 - e) Re-select Server Redundancy from the Project Options
- 3) On project upgrade
 - a) Read the Read Me or Important information documents

- b) Turn off any auto start or start at boot settings for the project (under CIMPLICITY Startup Options.
- c) Stop the project
- d) De-select Server Redundancy from the Project Options
- e) Make a backup of your project. (Faciliates rapid deployment)
- f) (optional) Create a backup image of your hard drive with the current configuration. (This may loose your license for HMI if re-imaged, but will faciliate rapid deployment if required)
- g) Open the Workbench on the primary
- h) Perform the upgrade on the project.
- i) (optional) Test the behaviour of the project to ensure continued functionality of all scripts and CimView screens
- j) Recompile all compiled scripts and API's
- k) Select Server Redundancy from the Project Options
- l) Verify and if necessary, correct the information under the Redundancy tab
- m) Start the project
- n) Test the behavior of the project to ensure it functions as expected.
- o) Stop the project
- p) Create backup of the project at this point (optionally removing the redundant configuration to make it more portable)
- q) Reconfigure auto start and start at boot options as originally configured
- r) Stop, backup, and upgrade viewers in a similar fashion.
- s) Be sure to test as often as possible during the change process to eliminate possible problems.

Appendix E: Server Redundancy with Series 90 Triplex

The runtime configuration of the PLC addresses for the CIMPLICITY Series 90 Triplex driver is stored in the GEF_CFG.INI file located in the Windows installation folder (i.e. C:\windows or C:\winnt). A version of the file is also maintained in your project's data folder.

In redundant configurations, the GEF_CFG.INI file sometimes gets out-of-date on the secondary resulting in a failure to communicate with one or more PLCs from the secondary. If the primary is able to communicate and the secondary cannot, copy the GEF_CFG.INI file from the primary's Windows installation directory to the secondary's Windows installation directory.

Appendix F: Server Redundancy Global Parameters

There are multiple global parameters that influence the behaviour of the Server Redundant Environment. These can be used for tuning purposes and for some enhanced behaviour. The list of the Server Redundant Global Parameters is as follows:

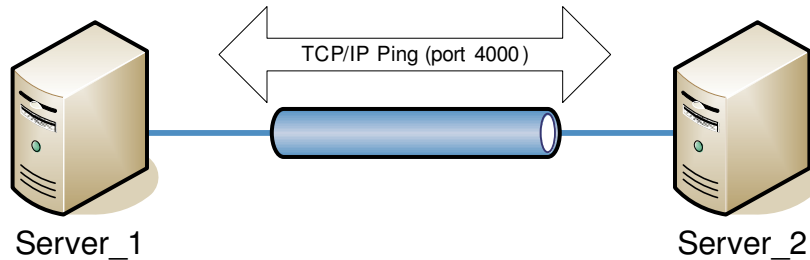
- ☐ REDUND_PROBE_PORT
- ☐ REDUND_PROBE_DELAY
- ☐ REDUND_PROBE_COUNT
- ☐ REDUND_PROBE_INTERVAL
- ☐ SLAVE_STARTUP_TIMEOUT
- ☐ REDUND_LINK_SLEEP

Failover Rate Configuration

The failover rate is the maximum amount of time it takes for the Primary and Secondary to realize a failure has occurred and to initiate the appropriate switching of Primary and Secondary.

The default value for the Server Redundant failover period is 20 seconds. It can be increased or decreased, depending on the needs of the application. Typically the default timing is acceptable for most systems. However, as systems get larger you will possibly want to increase these values. As well, the failover rate should never be modified to less than 3 seconds.

The two servers, (Primary and Secondary) are doing pings to each other at the specified Ping Interval. This ping occurs by default on Port 4000 (TCP/IP). By default, if a response is not received to these pings by the fourth attempt the failover will be initiated.



The failover period is defined as:

$\text{REDUND_PROBE_DELAY} * (\text{REDUND_PROBE_COUNT} + 1)$

Since the default for REDUND_PROBE_DELAY is 5000 milliseconds (5 seconds) and the REDUND_PROBE_COUNT is 3, you can see that this is $(5 * (3 + 1) = 20$ seconds as the standard failover period.

The two parameters, REDUND_PROBE_DELAY and REDUND_PROBE_COUNT are defined as project level global parameters.

Adding the Project Level Global Parameters

The formats for these parameters are:

REDUND_PROBE_DELAY|3|<millisec>
REDUND_PROBE_COUNT|3|<count>
REDUND_PROBE_PORT|3|<tcp/ip port>
SLAVE_STARTUP_TIMEOUT|1|<time in minutes>
REDUND_LINK_SLEEP|3|<time in seconds>

Where <millisec> is the number of milliseconds for the probe delay, <count> is the number of probes to make, and <tcp/ip port> for the two servers to ping each other on.

Sample entries for these parameters would be:

REDUND_PROBE_DELAY|3|5000
REDUND_PROBE_COUNT|3|3

A related parameter is REDUND_PROBE_PORT. This is the TCP/IP port number used to implement the probing mechanism. The default value is 4000. Only change this parameter if it conflicts with other software.

REDUND_PROBE_PORT|3|4000

SLAVE_STARTUP_TIMEOUT – Please refer to Appendix H for further information.

REDUND_LINK_SLEEP – Please refer to Appendix I for further information.

For further information please refer to the Cimplicity Plant Edition help files on how to add global parameters.

Appendix G: Cable Redundancy Router Entries (cimhosts.txt)

The Cabling Redundancy capability is all configured in the cimhosts.txt file. There are several different things that can be configured via the cimhosts.txt file. The following explanation goes through most of the possible configuration with regards to Cable Redundancy.

Failover Rate for Cabling Redundancy

The default value for detecting that a network connection has been lost is 20 seconds. Due to the seamless nature of CIMPLICITY HMI Computer Cabling Redundancy, this should be a reasonable default. It can be modified, depending on the needs of the application. The loss detection rate should never be modified to less than 3 seconds.

The failover period is defined as:

`PING_INTERVAL * (PING_COUNT + 1)`

The two parameters, PING_INTERVAL and PING_COUNT are defined in the cimhosts.txt file.

The formats for these parameters are:

```
#PING_INTERVAL <seconds>
#PING_COUNT <count>
```

Where <seconds> represents the number of seconds between probe attempts and <count> is the number of probes to make.

Example:

Sample entries for these parameters would be:

```
#PING_INTERVAL 2
#PING_COUNT 10
```

A related parameter is CONNECT_TIMEOUT. This is the number of seconds to wait after forming the TCP/IP connection for the initial data to arrive from the other computers. The default value is 10 seconds. There should be no reason to change this value.

TCP/IP Ports for Cabling Redundancy

To support CIMPLICITY HMI Computer Cabling Redundancy, you need to use a set of TCP/IP ports in the range 5000 to 6000. Depending on other communication software you are running you might have to alter this range. This is controlled by the START_PORT_RANGE and NUMBER_OF_PORTS parameters in the cimhosts.txt file.

The formats for these parameters are:

```
#START_PORT_RANGE <port>  
#NUMBER_OF_PORTS <count>
```

Where <port> represents the TCP/IP port to start with, and <count> is the number of ports to use.

Example:

Sample entries for these parameters would be:

```
#START_PORT_RANGE 5000  
#NUMBER_OF_PORTS 1000
```

Diagnostic Output for Cabling Redundancy

The CIMPLICITY HMI Computer Cabling Redundancy option can generate diagnostic output that you can use to track down problems with the functioning of the cabling redundancy system. To generate diagnostic output, enter a valid value for the DEBUG parameter in the cimhosts.txt file.

The format for this parameter is:

```
#DEBUG <flags>
```

Where <flags> is a value used to control what types of diagnostic output to generate.

You can add any of the following values together to form the <flags> value:

Value	Output
1	Print errors
2	Print infrequent calls
4	Print all Winsock calls
8	Print all transactions

Appendix H: Auto Starting Redundant Projects on Boot

On some occasions it is desirable to be able to have the redundant servers both start the project (Primary and Secondary) after reboot in order for the systems to be more fault tolerant. To do this you will need to do configure the project via the Cimplicity Options to "Start on Boot". On the primary system you would point this to the location where you have the Primary copy of the project. On the secondary system you would point to the location where you have the shared folder that contains the secondary copy of the project. This means that whenever the computers start they will automatically start both the primary project and the secondary project.

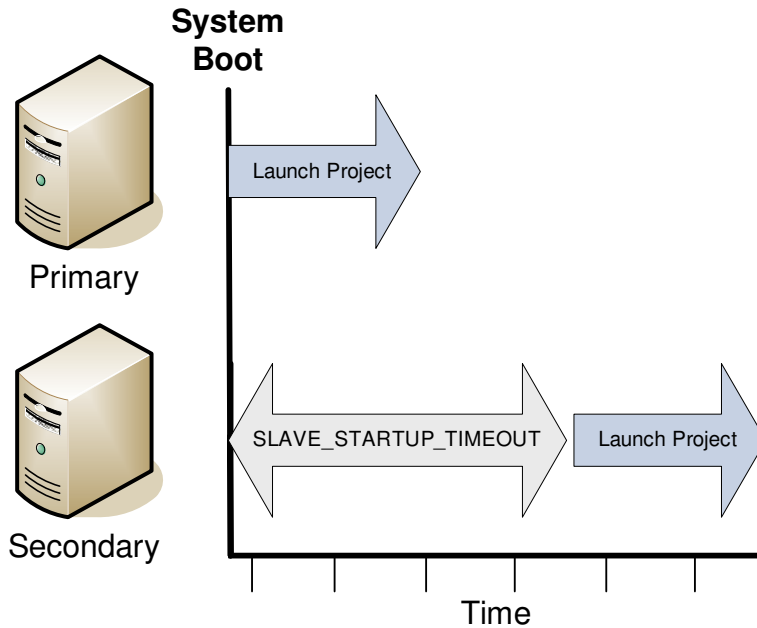
- 1) Open up "Cimplicity Options" on the Primary Server
- 2) On the "Startup Options" tab add the project (local) to the System boot options list.
- 3) Open up the "Cimplicity Options" on the Secondary Server
- 4) On the "Startup Options" tab add the project from the Secondary share to the System Boot Options list.

NOTE:

You use the <PROJECT>.GEF file from the secondary share when you are adding this where <PROJECT> is the name of your project.

SLAVE_STARTUP_TIMEOUT

It is possible to delay the start of the project on the Secondary system after the boot by using the global parameter SLAVE_STARTUP_TIMEOUT. This will actually put a delay from the time the system has started to the time it actually attempts to start the project on the secondary.



Global Parameter: SLAVE_STARTUP_TIMEOUT

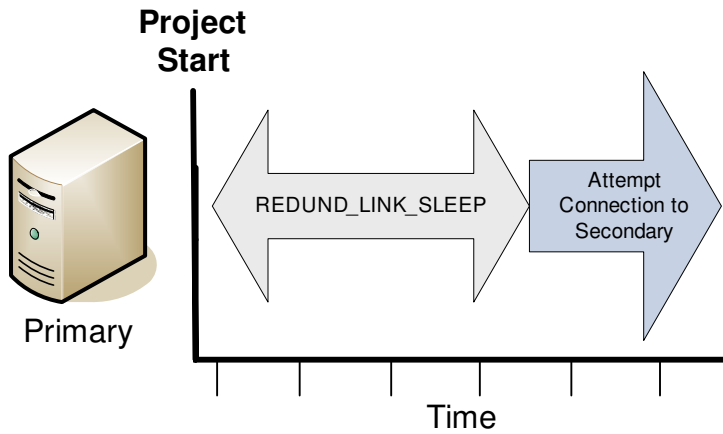
Value:<delay in minutes>

System or Project: Project

Where <delay in minutes> is the amount of time to delay the actual starting of the project on the secondary after boot. By default the value is 0 minutes.

To configure this you add this PROJECT level global parameter to the workbench on the primary system and do a configuration update. This global parameter will get copied across to the secondary share when the configuration update is complete.

Appendix I: Delaying Communication Link to Secondary on Project Startup



REDUND_LINK_SLEEP

It is possible to delay the connection to the secondary between the processes after the project has started. This is configured by the System level global parameter REDUND_LINK_SLEEP. There may be some further startup that you wish for the project to do on the primary before it attempts to establish the connection to the secondary on startup. This may be used in order to give the Primary system more time to get into a stable position with regards to CPU utilization or resource usage.

Global Parameter: REDUND_LINK_SLEEP

Value: <delay in seconds>

System or Project: System

The default value is 5 seconds.