The LANdon Bridge

User's Guide and Reference Manual

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Contents

Chapter 1 -- Introduction 3
About This Manual 3
The READ.ME File 4
Typeface Conventions 4
System Requirements 5
Chapter 2 -- Basic Network Bridging Concepts 7
Wiring Standards 7
Network Wiring Segments 9
Repeaters 9
Bridges 10
Routers 11
The LANdon Bridge 11
Uses For The LANdon Bridge 12
Chapter 3 -- Installing and Using The LANdon Bridge 15
Software Installation 15
Using BRIDGE.EXE in Batch Files 16
Using The LANdon Bridge 16
An Interconnectivity Scenario 17
A Segmentation Scenario 18
An Administrative Maintenance Scenario 20
Controlling the Operation of The LANdon Bridge 21
Using The LANdon Bridge with Microsoft Windows™ 23
Chapter 4 -- Using Command Line Switches 25
@indirect-file 26
HELP or ? 27
ADAPTERS 27
ADD_SERVER_NAME 28
BUFFER_SIZE 28
FLUSH 28
LOGINS 28
PASS_MESSAGES 29
PASS_SERVER_IDS 29
REMOVE 29
REQUEST_SIZE 30

RESTART *30*
SERVERS *30*
SHUTDOWN *30*
TASKS *31*
USE_SERVER_IDS *31*
VERBOSE *31*
Appendix A -- Messages 33
Index 39

Chapter 1 -- Introduction

Congratulations on your purchase of The LANdon Bridge Network Routing Manager for Artisoft™ networks!

The LANdon Bridge will enable you to use your Artisoft™ network in ways which otherwise would either require additional expensive hardware or would simply not be possible. You will be able to extend the reach of your workstations across the network, even across segments with different types of cabling. Users of the LANtastic®/Z network will even be able to log on to servers anywhere on the network, rather than just the one machine they are connected to. Larger LANtastic® networks can be divided into smaller segments, reducing network congestion and increasing security, without sacrificing access to servers anywhere on the LAN.

About This Manual

The LANdon Bridge Network Routing Manager for Artisoft™ networks lets users of the Artisoft™ LANtastic® Network Operating System turn any computer in their network with multiple network adapters into a network bridge. It lets you extend, segment, or interconnect your LANtastic® networks using your existing hardware. This manual introduces you to the topic of network interconnectivity, and tells you how to install and use The LANdon Bridge to interconnect your LANtastic® networks.

Chapter 2 explains some of the basic concepts of network bridging devices, how The LANdon Bridge takes the place of these devices in your LANtastic® network, and how you can use The LANdon Bridge to solve various network management problems with the hardware you already have.

Chapter 3 tells you how to install and use The LANdon Bridge on your computer.

Chapter 4 explains the optional command-line switches you can use when you run The LANdon Bridge.

Appendix A explains the various error and informational messages The LANdon Bridge displays as it runs.

The READ.ME File

Whenever changes have been made to the software or its documentation or other information has become available after the manual is printed, this new information is placed in the file called READ.ME on your program disk. It is an ASCII text file, and can be read with any text editor or word processor, or you can use the DOS TYPE command.

Typeface Conventions

nstallation and other procedural steps that you are to perform are marked with numbered blocks (❶, ❷). Commands that you will enter will be printed in this **bold font**. The text you will see as the program's response to those commands is printed in this plain font.

System Requirements

The LANdon Bridge will run on any system that is compatible with Artisoft™ LANtastic® Network Operating System, version 3.*x* or higher. The LANdon Bridge requires that the Artisoft™ NOS software be installed and running in order to operate.

Chapter 2 -- Basic Network Bridging Concepts

The LANdon Bridge Network Routing Manager lets users of the Artisoft™ LANtastic® Network Operating System turn any computer with multiple network adapters into a network bridge.

The first section of this chapter contains a brief discussion of LAN interconnectivity. The latter section describes how The LANdon Bridge can be used to solve various LAN interconnectivity problems for the users of Artisoft™ LANtastic®. It is assumed that the reader is familiar with basic LAN terminology and wiring standards.

Wiring Standards

The Artisoft™ Network Interface Cards (AE1, AE2, AE3, and the NodeRunner 2000 series) all follow the Ethernet LAN standard. These cards make available various types of network interfaces:

- **AUI:** Attachment Unit Interface. This is a point to point, short distance digital interface. It is most commonly used to connect to a LAN transceiver to access a 10Base5, or thick coaxial, network. The Artisoft™ AE2, AE3 and the NodeRunner 2000/A cards all provide this interface.

- **10Base2:** Also called Thinnet or Cheapernet. This standard specifies thin coaxial cable, rated at 10 Mb/s. The maximum segment length is 185 Meters. There can be up to 30 nodes per segment. The Artisoft™ AE2/C, AE3, and NodeRunner 2000/C and 2000/A cards provide this interface.

- **10Base5:** This standard specifies thick coax cable, also rated at 10 Mb/s. The maximum segment length is 500 Meters. There can be up to 100 nodes per segment. The network interface card connects to an external transceiver through an AUI interface. Artisoft™ cards that provide the AUI interface (see above) can be used to interface with this type of network cabling.

- **10BaseT:** This standard specifies unshielded twisted pair (UTP) wiring. This standard also runs at 10 Mb/s. The maximum segment length is 100 Meters, with a maximum total network span of 500 Meters. The Artisoft™ AE1, AE2/T, AE3, and NodeRunner 2000/T and 2000/A cards provide this interface.

- **Artisoft™ LANtastic® 2Mbps Adapter:** This is *not* an Ethernet LAN standard interface. It runs, as the name implies, at 2 Mb/s. Artisoft™ 2Mbs adapters can be daisy-chained together with a maximum of 32 nodes per segment, and a total network span of 500 Meters.

- **Artisoft™ LANtastic®/Z network:** This also is *not* an Ethernet LAN standard interface. It is intended as a point to point, short distance interface, with a maximum of 2 nodes per segment. It is usually used to connect a laptop to a desktop computer, or to connect two computers in a single office or building, as a low-cost alternative to Ethernet cards for network services. With this interface, the low-level SPORT.EXE and PPORT.EXE drivers provided by Artisoft™ make the serial or parallel ports used for the network look like network adapters.

With the Ethernet standard, each network interface card is assigned a unique address by the manufacturer. These addresses are used to identify the source and destination of information which is transmitted over the LAN. The Artisoft™ AE and NodeRunner 2000 series

Network Interface Cards meet the Ethernet standard for unique addresses. The Artisoft™ 2Mbps adapters and the LANtastic®/Z network port drivers emulate this feature of the Ethernet standard.

Data is handled by the hardware and software on the network at different levels, and is done using various protocols. All repeaters, bridges, and routers access network data at a very low level. Network hardware that meets the Ethernet standard is able to interface with these devices. Non-standard hardware, such as the Artisoft™ 2Mbps adapters or the LANtastic®/Z network cannot interface with these devices.

Network Wiring Segments

A LAN "segment" is a single, continuous length of media between two network terminations. In the case of 10Base2 and 10Base5, many devices can be attached to a single segment. With 10BaseT and LANtastic®/Z, each segment supports only two devices -- one at either end.

Segments can be joined together to form larger and more complex networks that exceed the single segment distance limitations. There are three basic devices which can be used to join LAN segments: repeaters, bridges, and routers.

Repeaters

A repeater can be thought of as two Ethernet transceivers connected back-to-back. Any signal received on one LAN segment is immediately transmitted on the other segment. The repeater amplifies and regenerates the signal, but is transparent to both segments. Thus, a repeater can be thought of as creating one large LAN out of smaller segments. The only real purpose of a repeater

is to extend the physical length of the LAN, or to join two different types of media, such as 10Base5 to 10Base2. Ethernet specifies a maximum of 4 repeaters between any two stations, allowing a maximum of 5 segments in a single LAN. Some repeaters are multi-port repeaters, which transmit incoming signals from any one segment to all other segments. A 10BaseT wiring hub is essentially a multi-port repeater.

Bridges

A bridge operates quite differently from a repeater. Unlike a repeater, a bridge does not re-transmit all information detected on each segment. Instead, a bridge only transmits the information which must cross it in order to reach its destination.

A bridge connected between two LANs will monitor traffic on each LAN, but will only transmit data packets destined for a device on the other LAN. If it does forward the data, it transmits it on the other LAN just as a local device would - it waits until the LAN is clear and then sends the information. The effect of this is to logically segment the two networks. Information destined for a device on the same network will *not* be forwarded to the second LAN. Only traffic destined for the other LAN will be forwarded. Overall congestion on each LAN will be greatly reduced.

Because a bridge buffers the data and must wait to forward packets to a second LAN, performance suffers somewhat. However, since the bridge actually receives the data, stores the information, and then re-transmits the data on another LAN as if it were the originator, the rule about segments and repeaters does not hold true. There can be virtually any number of bridges between

two network devices, obviously within practical limits. Depending upon the features supported by the bridge, circular paths and multiple paths can also be supported.

Routers

A Router operates on a concept similar to that of a bridge, but at a higher level. It usually has much more intelligence built into it about various network protocols, as well as algorithms for "learning" how to best route data to each address. A router has more capabilities than a bridge, but is usually slower, because it must do more processing on the data, and is usually much more costly. A router might be used if complex network topologies are required, or if more than one network protocol were being used on one or more of the interconnected LAN segments.

The LANdon Bridge

The LANdon Bridge implements some of the best features of Repeaters, Bridges and Routers for users of Artisoft™ LANtastic®, using the hardware you already have. The LANdon Bridge works on any computer running Artisoft™ LANtastic® NOS Version 3.x or higher, with two or more network adapters, including 2Mbps adapters or the LANtastic®/Z, and each adapter connected to a different LAN segment.

The LANdon Bridge operates on the at the same level as LANtastic® does, the NETBIOS level. It intelligently manages the NETBIOS data packets that LANtastic® uses for network communication.

Certain data packets, such as NET SEND * messages or a server's SEND_SERVER_ID messages, which are intended to be sent to all machines on the network, are retransmitted indiscriminately, like a repeater. For most network traffic, however it acts like a bridge or a router, forwarding data packets between workstations and servers on different segments, but only when necessary.

Unlike a repeater, bridge, or router, a computer running The LANdon Bridge has the advantage of remaining available as a workstation, a server, or both.

Uses For The LANdon Bridge

There are basically four ways to use The LANdon Bridge:

- **LAN Interconnectivity:** To connect LANs segments using different media, such as 10Base5 and 10BaseT, or even connecting 2Mbps adapters and LANtastic®/Z networks to standard Ethernet LAN segments. Because The LANdon Bridge operates at the NETBIOS level, it is not limited to using hardware that meets the Ethernet standard.

  If you already have a LANtastic® network using one kind of media, and would like to expand your network, but, for reasons of cost, performance, or logistics, you want to begin using a different kind media, you can put both kind of adapters in one machine, and use The LANdon Bridge to connect the two networks.

- **LAN Extension:** To expand your network beyond the physical limits imposed by the media you are using. The LANdon Bridge can be used to extend the overall network length by joining two or more distinct networks which are interconnected.

- **LAN Segmentation:** To increase network performance and/or reliability through segmentation of your network.

  If there are two different data-intensive applications, such as an accounting system and an order entry system both running on the same LAN, it would slow the LAN considerably. All packets of information for both applications would be broadcast over the single LAN, although the vast majority of the packets for any one application would always be destined for just a few of the computers on the LAN.

  A better approach would be to break the LAN into two smaller segments, one for accounting and one for order entry, then use The LANdon Bridge, which will only forward packets that need to reach nodes on the other segment, reducing the overall congestion. This is important because in an Ethernet LAN, performance falls off dramatically once the network is saturated with traffic. Having many nodes competing for network access causes frequent collisions.

Chapter 3 -- Installing and Using The LANdon Bridge

Software Installation

Installing The LANdon Bridge software on your computer is a simple matter of copying the files from the software distribution diskette. First, you should stop and make a working copy of your program diskette and put the original away in a safe place.

Having made a working copy:

❶ At the DOS prompt, change to the LANTASTI directory. Type:

CD \LANTASTI then press **Enter**.

❷ Copy the software from the working copy of your software distribution diskette into the LANTASTI directory now by typing:

COPY A:*.* then pressing **Enter**.

❸ Start your LANtastic network software. If you will be running The LANdon Bridge on a server, make sure you have already installed the Artisoft™ LANtastic® SERVER.EXE program, then:

❹ Run The LANdon Bridge program. Type:

BRIDGE then press **Enter**.

You should see these messages:

LANdon Bridge v1.0 (C) Copyright 1993 Limerick Software
---- LANdon Bridge Installed ----

If you get an error message instead, refer to Appendix A -- Messages in this manual for an explanation and suggestions how to correct the problem.

Using BRIDGE.EXE in Batch Files

If you have a batch file (such as an AUTOEXEC.BAT or a STARTNET.BAT) which brings up the NETBIOS and LANtastic® NOS software on your computer, you may want to include the BRIDGE command in this batch file. This will install the bridge whenever you run the batch file. Be sure that the BRIDGE command is placed after the REDIR and SERVER commands.

Using The LANdon Bridge

Using The LANdon Bridge entails little more that installing the program in the memory of your computer. Most of the functionality of The LANdon Bridge is automatic. Once installed, no further intervention on the part of either the users of the network or the network administrator is required, for most applications. There are many different possible network configurations, and many different ways The LANdon Bridge could be used in any single network environment. The following sections of this chapter will outline a few of the more likely scenarios, and how to use The LANdon Bridge to achieve specific goals within each scenario.

An Interconnectivity Scenario

The simplest scenario where The LANdon Bridge could be useful is one where you have two different network segments, and you would like workstations on one segment to be able to access servers on the other. For example, you might have some machines which are running on the LANtastic® 2Mbps adapters, and other machines running on Ethernet standard hardware, such as the Artisoft™ AE or NodeRunner 2000 series cards. Or, perhaps you use the LANtastic®/Z network to connect your laptop computer to your desktop network node at the office. With this scenario, you can use a single machine which has an adapter for each of the different kinds of network hardware you are using to connect the nework segments.

Without The LANdon Bridge, that one machine common to both segments can see all the network nodes on each segment, and all the machines on the different network segments can see the one common machine. However, except for the common machine, the nodes on one segment still cannot see any other nodes on the other segments, because each node can only communicate with nodes on their own segment.

Using The LANdon Bridge will allow all the nodes on any segment to access any server on any segment, and to send messages to any node, as though the different segments were one single segment. To set The LANdon Bridge up to achieve this, you would perform the following steps:

❶ Make sure that the servers on your network are up and running and that they are configured using SEND_SERVER_IDS=YES.

❷ Install the LANtastic® NOS software on the common machine.

❸ Install The LANdon Bridge on the common machine by typing:

BRIDGE then press **Enter**.

❹ Login to the network servers of your choice from any machine, using the NET LOGIN/WAIT option. Note that it may take several seconds for the server IDs to be sent and processed by The LANdon Bridge. You can also now send and receive messages from any node on the network.

A Segmentation Scenario

Another scenario where The LANdon Bridge can be used is one where you have one large network segment which has become congested with network traffic from two or more different applications which are being used simultaneously on several different nodes, such as an Order Entry department and an Accounting department both on one network. Let's assume that the program and data files for the two different departments must reside on the same file server.

Without The LANdon Bridge, you could put two network adapter cards into the common server, and run the cable from one adapter to the Order Entry department, and a cable from the other adapter to the Accounting department. This would leave both departments with access to the program and data files they need on the common server, and would reduce the congestion on the network for each department. However, access to other servers in one department, such as print servers

or additional file servers, would not be available from the other department, and messages could no longer be sent from Order Entry to Accounting or vice versa.

By running The LANdon Bridge on the common server, you can get all the benefits of segmenting your network, without sacrificing the ability to access servers or send messages anywhere on the network. To set The LANdon Bridge up to achieve this, you would perform the following steps:

❶ Make sure that the servers on your network are up and running and that they are configured using SEND_SERVER_IDS=YES.

❷ Install the LANtastic® NOS software on the common server.

❸ Install The LANdon Bridge on the common machine by typing:

BRIDGE/LOGINS=xxx then press **Enter**,

where xxx represents the maximum number of simultaneous logins you want the bridge to support. If you want The LANdon Bridge to provide access to more servers than the default number of 8, then you would type:

BRIDGE/LOGINS=xxx/SERVERS=yyy then press **Enter**,

where yyy represents the number of servers. For more information of the optional command line switches, see Chapter 4.

❹ Users may now login to the network servers of thier choice from any machine, using the NET LOGIN/WAIT option. Note that it may take several seconds

for the server IDs to be sent and processed by The LANdon Bridge. Users can also now send and receive messages to and from any node on the network.

An Administrative Maintenance Scenario

Perhaps you are the administrator of a LANtastic® network with several network segments stemming from a single server with multiple adapters. The network also has other servers on the various network segments. In order to perform your administrative duties, you must either login from the common file server, or move from network segment to network segment, logging in from a new node each time, in order to access all the server control directories on the network. With The LANdon Bridge, you can have access to all the network's servers from just one node, without having to work from the common server.

To set The LANdon Bridge up to achieve this, you would perform the following steps:

❶ Make sure that the servers on your network are up and running and that they are configured using SEND_SERVER_IDS=YES.

❷ Install the LANtastic® NOS software on the common server.

❸ Install The LANdon Bridge on the common machine by typing:

BRIDGE/PASS_SERVER_IDS=NO/PASS_MESSAGES=NO

then press **Enter**.

This will require you to know the names of the network servers in order to login. Users will not see the servers that The LANdon Bridge is providing access to in their list of available servers. Also messages will not be sent across the bridge. For more information of the optional command line switches, see Chapter 4.

❹ You may now login to the network servers of your choice from any machine, using the NET LOGIN/WAIT option. Note that it may take several seconds for the server IDs to be sent and processed by The LANdon Bridge.

Controlling the Operation of The LANdon Bridge

Whatever way you decide to setup and configure your network using The LANdon Bridge, once it is installed correctly it needs little attention to continue running smoothly. There are a few commands, however, that will control the operation of The LANdon Bridge after it is already installed. The following is a brief discussion of some of those commands. For more information of the optional command line switches, see Chapter 4 -- Command Line Switches.

After installation, The LANdon Bridge learns the names of servers from one of two places. It listens for server IDs from servers started with SEND_SERVER_IDS set to YES. You can also explicitly tell it about network servers by running The LANdon Bridge again, using the ADD_SERVER_NAME command line switch. Whether or not The LANdon Bridge listens for the server IDs is determined by the setting of the USE_SERVER_IDS switch when you start The LANdon Bridge. The default value for this switch is YES.

While The LANdon Bridge is running, you can use the ADD_SERVER_NAME command line switch to tell it about network servers, regardless of the setting of the USE_SERVER_IDS switch. If there are servers that you want The LANdon Bridge to provide access to which are set up for SEND_SERVER_IDS=NO, then you *must* use the ADD_SERVER_NAME switch to tell The LANdon Bridge about those servers.

Once it has learned a network server name, The LANdon Bridge adds that name to its internal table, and that name uses up one of the SERVERS specified by the SERVERS=ddd switch at startup, which is set to 8 by default. Access to that server will be provided to any node on the network, as long as the server remains in operation and as long as the network node logging in, The LANdon Bridge, and the server being logged into each has at least one available LOGIN from its respective LOGINS=ddd switch.

At any time after installation, The LANdon Bridge can be stopped temporarily from providing access across the bridge by using the SHUTDOWN command. Once The LANdon Bridge is SHUTDOWN, all services it provieds are temporarily halted. No messages will be sent across the bridge, no users may login across the bridge, and existing server connections across the bridge are broken. Users already logged in over the bridge receive warning messages stating that The LANdon Bridge is shutting down and that it is terminating their connection with the server.

The LANdon Bridge's internal server name table can be erased, resetting the number of available entries back to the startup value specified by the SERVERS=ddd switch, by using the FLUSH command. The current version provides no means for removing individual server names.

The RESTART command is used after a SHUTDOWN or FLUSH to place The LANdon Bridge back in operation. All servers, if any, still in the internal server name table will immediately be made available once again. Users whose connections were broken by the SHUTDOWN can now reconnect, and in most instances a "Retry" response to the "Abort, Retry, Fail?" prompt will re-establish the connection. In some instances, however, it should be noted that a bridge SHUTDOWN may, force users to login again or even to reboot their machines to recover, due to other programs' responses to the severed connection.

When you are ready to terminate the operation of The LANdon Bridge entirely, or if you wish to re-install it with a different configuration, you can use the REMOVE command to shut it down and uninstall it from memory.

Using The LANdon Bridge with Microsoft Windows™

The LANdon Bridge is compatible with the Standard mode of Microsoft Windows™. After installing The LANdon Bridge on a network node, you may run Microsoft Windows™ on that node, but in Standard mode only. This limitation only applies to a machine which is runnint The LANdon Bridge. Network nodes that are not running The LANdon Bridge, but are accessing servers over the bridge, may run Microsoft Windows™ in either Standard or Enhanced mode.

The LANdon Bridge may be run in a DOS window to issue the ADD_SERVER_NAME, SHUTDOWN, FLUSH, and RESTART commands. The LANdon Bridge must not be *installed* from a DOS window in the Microsoft Windows™ environment, but must be installed before Microsoft Windows™ is run. You must exit Microsoft Windows™ in order to issue the REMOVE command.

Chapter 4 -- Using Command Line Switches

You can use optional software parameters (known as switches) when you run The LANdon Bridge software. The proper syntax for using switches is as follows:

BRIDGE(/SWITCHES)

where BRIDGE is the name of the BRIDGE.EXE LANdon Bridge program you are running and SWITCHES denotes any optional command line switches. If you are using more than one switch in a command line, use a space or a forward slash(/) to separate the arguments. If a switch takes a value (such as when you assign a number of simultaneous logins) the switch must be followed by an equal sign (=) or a colon (:). All switch values are checked to make sure they are valid. Illegal values produce error messages.

These are valid switch formats:

SWITCH
/SWITCH
SWITCH:VALUE
/SWITCH=VALUE

You would use one of the first two formats for a switch that does not take a value. For example:

BRIDGE/HELP

You would use the third or fourth formats for a switch that takes a value. Such as:

BRIDGE/LOGINS=2

The optional command line switches are given below. The letters “ddd” indicate that you must give a decimal value for that switch. The letters “xxx” denote text strings. Values enclosed in parenthesis “()” indicate default values for the switch. Values after the parenthesis “()” denote the valid range of the switch.

@indirect-file

This switch instructs The LANdon Bridge to look for further switches in an indirect file that you have previously created. You can place as many LANdon Bridge command line switches in the indirect file as you wish. This is extremely useful for reducing the length of the command line if you will be using many switches. Switches after the indirect file name will be acted upon, as well. You may invoke indirect files from within indirect files as often as you like, within the limits of the FILES line in your system’s CONFIG.SYS file and the limits of your computer’s memory.

You may also include comments for each line of the indirect file. Comments must be preceded by a semicolon (;) at the beginning of each line or after switches. For example:

BRIDGE @setup

The file SETUP contains

```
; BRIDGE program set up file
;
LOGINS=2        ; Allow up to 2 simultaneous logins
verbose         ; Display verbose information
```

HELP or **?**

This switch displays help information about the various valid command line switches, but does not install The LANdon Bridge. The following is a sample HELP output:

```
Valid command line switches:
   ADAPTERS= range 2 to 8 decimal
   ADD_SERVER_NAME= range 1 to 16 character string
   BUFFER_SIZE= range 512 to 32768 decimal
   FLUSH
   HELP
   LOGINS= range 1 to 127 decimal
   PASS_MESSAGES= one of the following choices:
         YES NO
   PASS_SERVER_IDS= one of the following choices:
         YES NO
   REMOVE
   REQUEST_SIZE= range 14 to 4096 decimal
   RESTART
   SERVERS= range 1 to 127 decimal
   SHUTDOWN
   TASKS= range 1 to 32 decimal
   USE_SERVER_IDS= one of the following choices:
         YES NO
   VERBOSE
   ?
   @ range 0 to 1000 byte file
```

ADAPTERS=ddd (2) 2-8

This switch specifies the maximum number of network adapters which the bridge will use. The default value is 2, which is the minimum necessary in order to run the bridge. If you have more than 2 network adapters installed in the bridge machine, and you want the bridge program to use all of them, then you must use this switch to tell the bridge program to look for them. This switch can be used only when first installing The LANdon Bridge.

ADD_SERVER_NAME=XXXXXXXXXXXXXXX
range=1-15 character machine name

This switch informs the bridge about a server you wish to make available to users across the bridge. Use this switch if you have set USE_SERVER_IDS=NO, or if the server you wish the bridge to provide access to is configured with SEND_SERVER_IDS=NO. The LANdon Bridge must be already running to use this switch.

BUFFER_SIZE=dddd (1024) 512-32768

This switch specifies the size of the bridge task buffers to be used by The LANdon Bridge. One buffer will be allocated for each bridge task specified with the TASKS switch. For optimum performance, the buffer size should be set to the same value as was used with the NETWORK_BUFFER_SIZE switch used for servers on the network. This switch may only be used when first installing The LANdon Bridge.

FLUSH

This switch causes The LANdon Bridge to shutdown if it is still running, and causes it to forget all the currently stored server names. This switch should be used in preparation for the RESTART command, to force The LANdon Bridge to restart as though it had just loaded. The LANdon Bridge must be already running to use this switch.

LOGINS=ddd (1) 1-127

This switch specifies the maximum number of simultaneous logins which the bridge will allow. The default value is 1, which will allow one user to sign in on one server which is being accessed via the bridge. This setting will not have any effect on the number of normal (not using the bridge) logins allowed for any particular

server or user, nor will it allow more logins to any machine than the limits imposed by REDIR or SERVER. This switch may only be used when first installing The LANdon Bridge.

PASS_MESSAGES=(YES) one of the following choices:
YES NO

This switch specifies whether or not The LANdon Bridge will pass any messages received from workstations on the network along to nodes across the bridge. If set to YES, it will cause The LANdon Bridge to repeat all messages across the bridge. If set to NO, normal messages will not be sent across the bridge, but server shutdown messages for servers being bridged will still be passed along to workstations logged in to those servers over the bridge. This switch may only be used when first installing The LANdon Bridge.

PASS_SERVER_IDS=(YES) one of the following choices:
YES NO

This switch specifies whether or not The LANdon Bridge will pass any server IDs received from servers on the network along to nodes across the bridge. If set to YES, it will cause The LANdon Bridge to repeat all server IDs across the bridge. If set to NO, the server IDs will not be sent across the bridge, and users accessing a server via the bridge will have to know the name of the server. If The LANdon Bridge was started with USE_SERVER_IDS set to NO, then this switch is forced to a value of NO. This switch may only be used when first installing The LANdon Bridge.

REMOVE

This switch removes The LANdon Bridge from memory. The LANdon Bridge must be already running to use this switch.

REQUEST_SIZE=ddd (14) 14-4096

This switch specifies the size of the buffer The LANdon Bridge uses to listen for workstation requests. For optimum performance, this switch should be set to the same value as that used for network servers. This switch may only be used when first installing The LANdon Bridge.

RESTART

This switch restarts The LANdon Bridge after it has been shutdown with the SHUTDOWN or FLUSH switch. If the SHUTDOWN switch only was used to shut the bridge down, then RESTART will reactivate the bridge with immediate access to all servers previously in its server list. If the FLUSH switch was used, then RESTART will reactivate the bridge in its initial startup condition.

SERVERS=ddd (1) 1-127

This switch specifies the maximum number of server names The LANdon Bridge will remember and provide access to. The default value is 8, which will allow users to sign in on up to eight servers which are being accessed via the bridge.

SHUTDOWN

This switch causes The LANdon Bridge to terminate access to servers across the bridge. Messages are sent to all workstations logged in to servers over the bridge. An informative tone is sounded to indicate that the bridge is shutting down. The bridge can be made to forget about all the servers it was providing access to by using the FLUSH switch. The bridge can later be reactivated with the RESTART switch.

TASKS=ddd (1) 1-32

This switch specifies the maximum number of simultaneous requests that The LANdon Bridge can process. One buffer of the size specified with the BUFFER_SIZE switch will be allocated for each task.

USE_SERVER_IDS=(YES) one of the following choices:
YES NO

This switch specifies whether or not The LANdon Bridge will listen for the server IDs being sent by servers on the network using the SEND_SERVER_IDS=YES switch. If set to YES, this switch will cause The LANdon Bridge to use these server IDs to automatically remember the names of servers that send their IDs, and it will automatically make those servers available to nodes across the bridge. If set to NO, then The LANdon Bridge will ignore the server IDs, and must be explicitly told which servers to bridge by using the ADD_SERVER_NAME switch. This switch may only be used when first installing The LANdon Bridge.

VERBOSE

This switch causes detailed information about the configuration of The LANdon Bridge to be displayed. This switch may only be used when first installing The LANdon Bridge. The following is a sample of verbose output from The LANdon Bridge:

```
Command line          /verbose

Machine name          BRIDGE    Adapters in use      2
Network Tasks         1         Buffer size          1024
Maximum logins        1         Maximum servers      8
Request Size          14        Use server IDs       YES
Pass messages         YES       Pass server IDs      YES
Bytes of memory used  10384
          ---- LANdon Bridge Installed ----
```

Appendix A -- Messages

The following is a list of the various error and informative messages that The LANdon Bridge returns when it is run. It is sorted alphabetically in order to help you find the messages more easily. For each entry in the list of messages, you will see the message text in bold, an explaination of the message in italics, and then the steps you should take in response to the message, if any.

Can't remove — interrupts have been re-hooked
Some other software has been installed in memory after The LANdon Bridge or another conflict is preventing it from removing itself from memory. Remove any Terminate-and-Stay-Resident (TSR) programs installed after The LANdon Bridge and try again.

Cannot open switch file - @file
The file "@file" cannot be opened as a switch file. The file must exist before it can be used as a switch file.

Error reading switch file - @file
A DOS error occurred while reading the file @file.

Illegal character after switch name - ??????xddd
The switch ?????? was followed by a character x other than "=" or ":", or the switch does not take a value. Use only the characters "=" or ":" and use no spaces between the switch and its value, and do not place any character other than a space " " or a slash "/" after switches that do not take values.

Illegal digit in switch value - ??????=dddd
A character was used instead of a digit in the numeric value for the switch. You must use only the digits 0-9 in the value of a numeric switch.

Illegal switch - ??????=dddd
The switch ??????=dddd is not a valid command line switch. For a list of the various valid command line switches, type "BRIDGE /HELP" or "BRIDGE /?".

---- LANdon Bridge flushed ----
This message is displayed as a confirmation after the LANdon Bridge has flushed its memory.

---- LANdon Bridge Installed ----
This message is displayed as a confirmation after the LANdon Bridge is successfully installed.

---- LANdon Bridge NOT Installed ----
This message is displayed if The LANdon Bridge is not installed. The LANdon Bridge will not install if help information is displayed or an error occurred.

LANdon Bridge is shutting down. Connection to server ???? ending.
This is the text of a LANtastic NET SEND style message sent to all workstations logged in to server ???? over The LANdon Bridge when it is shutting down.

---- LANdon Bridge removed ----
This message is displayed as a confirmation after the LANdon Bridge has successfully removed itself from memory.

---- LANdon Bridge restarted ----
This message is displayed as a confirmation after the LANdon Bridge has successfully restarted operating after being shutdown or flushed.

---- LANdon Bridge shutdown ----
This message is displayed as a confirmation after the LANdon Bridge has successfully shutdown.

Machine name ???? not found on any adapter
The machine name ???? which was specified after the ADD_SERVER_NAME switch could not be found. Make sure the machine with the name ???? is running and that it has the Artisoft™ REDIR program loaded.

Must have two or more NetBIOS adapters installed
The LANdon Bridge must have at least two NETBIOS adapters installed in order to have something to bridge. Make sure that the machine has two or more adapters, and that they are functioning properly and that the low-level drivers and NETBIOS drivers have been installed successfully.

Name ???? is already known locally
The machine name ???? which was specified after the ADD_SERVER_NAME switch is already in the local NETBIOS name table of one or more adapters in the machine that The LANdon Bridge is running on. Either The LANdon Bridge is running on machine ????, or the machine named ???? is a server which is already being bridged.

REDIR is not loaded - The LANdon Bridge must be run after Artisoft's (TM) REDIR
You attempted to start The LANdon Bridge before loading REDIR.EXE. The LANdon Bridge requires that REDIR be run first before it will install. Make sure that you have successfully installed REDIR and try again.

—— Server name ???? added ----
This message is displayed as a confirmation after the LANdon Bridge has added the server ???? to its list of available servers.

---- Server name ???? NOT added ----
An error occured while attempting to add the server name ????.

Switch is ambiguous - SWITCH-NAME
The abbreviated version of the switch name you used had too few characters to distinguish it from one or more other valid command line switches. Retype the command, using as many characters in the name of the switch as are necessary to make it clear which switch you intend.

Switch value not in range - ??????=dddd Valid range is llll to hhhh
The numeric value dddd is not within the valid range for the switch. The value for this switch must be between a low of llll and a high of hhhh. Retry the command, specifying a value within these limits.

Switch value not in range - ??????=xxxx Valid range is one of the following choices: CH1 CH2 CH3 ... CHn
The value xxxx given for the switch is not in the list of valid choices. The list of choices given in this message show all the valid choices for the value of the ?????? switch. Retry the command, using a value from the list.

The LANdon Bridge V1.0 ß - (C) Copyright 1993 Limerick Software
This message is displayed each time The LANdon Bridge program (BRIDGE.EXE) is run.

The LANdon Bridge is not loaded
You attempted to use a command line switch which requires that The LANdon Bridge already be installed in order to work. Make sure that you have loaded The LANdon Bridge successfully and try the command again.

The LANdon Bridge is already installed
You attempted to install The LANdon Bridge when it was already installed. If you wish to reset The LANdon Bridge without altering the configuration, you can use the FLUSH and RESTART command line switches. If you wish to reinstall with a new configuration, you must use the REMOVE switch to uninstall the first copy of the program, then retry the command.

The LANdon Bridge is not active
You attempted to use the SHUTDOWN command line switch when The LANdon Bridge was already shutdown. If you have used the SHUTDOWN or FLUSH command line switches previously, you must use the RESTART switch before issuing the SHUTDOWN command again.

The LANdon Bridge is already active
You attempted to use the RESTART command line switch when The LANdon Bridge was already started. You must use the SHUTDOWN or FLUSH switch before you can issue a RESTART command.

The memory limit has been exceeded
You have specified a configuration which requires more memory than is available. Use fewer TASKS= and/or a smaller BUFFER_SIZE=.

This software is licensed for use only with an ARTISOFT NETBIOS
This message is displayed if you attempt to run the Artisoft™ LANtastic® SERVER.EXE program after installing The LANdon Bridge. If you want a machine to be both a bridge and a server at the same time, you must install the SERVER.EXE program first, before you install The LANdon Bridge. Issue the REMOVE command to uninstall The LANdon Bridge, and then try installing SERVER.EXE again.

Verbose Output for BRIDGE

Command line	/verbose		
Machine name	BRIDGE	Adapters in use	2
Network Tasks	1	Buffer size	1024
Maximum logins	1	Maximum servers	8
Request Size	14	Use server IDs	YES
Pass messages	YES	Pass server IDs	YES
Bytes of memory used	10384		

Index

Abort, Retry, Fail? 23
Adapters 7–9.
See also Network adapters
Command line switches
? 27
ADAPTERS 27
ADD_SERVER_NAME 21, 28, 31, 35
BUFFER_SIZE 28, 31, 37
FLUSH 22, 28, 30, 36, 37
HELP 27
LOGINS 19, 22, 28
PASS_MESSAGES 20, 29
PASS_SERVER_IDS 20, 29
REMOVE 23, 29, 37
REQUEST_SIZE 30
RESTART 22, 28, 30, 36, 37
SERVERS 19, 22, 30
SHUTDOWN 22, 30, 37
TASKS 28, 31, 37
USE_SERVER_IDS 21, 28, 29, 31
VERBOSE 31, 37
Controlling The LANdon Bridge 21
Error messages 33
Files
AUTOEXEC.BAT 16
BRIDGE.EXE 16, 25, 36
CONFIG.SYS 26
NET.EXE 18, 20, 21, 34
PPORT.EXE 8
READ.ME 4
REDIR.EXE 16, 29, 35
SERVER.EXE 15, 16, 29, 37
SPORT.EXE 8
STARTNET.BAT 16
switch file 33
Informative messages 33
Installing The LANdon Bridge 15
LANtastic® 2Mbps adapter 8, 11, 12, 17.
See also Network adapters
LANtastic®/Z 3, 8, 11, 12, 17.
See also Network adapters
Microsoft Windows™ 23
NETBIOS 11, 12, 16, 35, 37
Network adapters
2Mbps 8, 9
AE1 7, 8
AE2 7, 8
AE3 7, 8
LANtastic®/Z 9
NodeRunner 2000 7, 8
Network bridges 10
Network repeaters 9
Network routers 11
Network segments 9, 17, 19, 20
Network wiring standards 7–9
NETWORK_BUFFER_SIZE 28.
See also Command line switches
SEND_SERVER_IDS

12, 18, 19, 20, 21, 28, 31.
See also Command line switches
System Requirements 5
Typeface conventions 4
Uses for The LANdon Bridge 12
Using The LANdon Bridge 16
Wiring Standards
AUI 7
Wiring standards
10Base2 7
10Base5 8, 12
10BaseT 8, 12