6
DIGITAL InfoServer Client for DIGITAL UNIX Utilities

This chapter describes the utilities you use to configure DIGITAL InfoServer Client for DIGITAL UNIX software on your system and to manage product functions.

- Use the LASTport utilities to configure the LASTport transport protocol on your system and to monitor protocol activity.
- Use the LASTport/Disk Client utilities to load the LASTport/Disk driver, to bind to and unbind InfoServer services, and to display service and binding information.

Section 6.1 describes LASTport utilities; Section 6.2 describes LASTport/Disk Client utilities.

6.1 LASTport Utilities

Table 6-1 summarizes LASTport utility functions.

Table 6-1 LASTport Utility Functions

Utility	Function
loadlast	Loads the LASTport transport.
showlastcounters	Shows the LASTport transport counters.
showlaststatus	Shows the LASTport transport status, including transport state, versions, number of clients, and number of servers.
startlast	Starts the LASTport protocol.
stoplast	Stops the LASTport protocol.
unloadlast	Unloads the LASTport transport

loadlast

Loads the LASTport transport.

Access

Superuser required.

Format

```
loadlast  <nodename> <nodedev> [-checksum [y][n]]
```

Description

The `loadlast` command does the following:

- Invokes the specified data link driver to obtain the default data link address for use as the `node id`
- Invokes the LASTport transport with the `node id` to establish the connection between the portable module and the Operating System module.

Table 6-2 describes `loadlast` parameters; Table 6-3 describes loadlast advance parameters.

Table 6-2 loadlast Parameters

Parameter	Data Type	Default	Description
<nodename>	String	Required	Specifies a node name (16 characters maximum).
<nodedev>	String	Required	Specifies which Ethernet device receives the node id.
-checksum	Enumerated type	`n`	`y` enables message checksumming on all messages sent and received by the LASTport transport. `n` disables checksum.

Table 6-3 loadlast Advance Parameters

Parameter	Data Type	Default	Description
-startInterval	Integer	2	Number of seconds between circuit Start message transmissions
-startLimit	Integer	3	Maximum number of circuit Start message transmissions
-progressInter	Integer	600	Number of seconds in circuit keep-alive interval
-checkInterval	Integer	60	Number of seconds between circuit check Solicit message transmissions
-checkLimit	Integer	1	Maximum number of circuit check Solicit message transmissions

Example

```
# loadlast mynode ln0
```

This command loads the LASTport transport on node `mynode` and uses the default address of the data link device `ln0` as the `node id`.

showlastcounters

Shows the LASTport transport counters.

Access

Superuser required when `-c` is requested.

Format

```
showlastcounters  [-port] [-circuit] [-assoc] [-c]
```

Description

By default, only port counters are displayed. Table 6-4 describes `showlastcounters` parameters.

Table 6-4 showlastcounters Parameters

Parameter	Description
-port	All active device counters
-circuit	Circuit counters
-assoc	Association Counters
-c	Clear the counters shown (Superuser required)

Example

```
# showlastcounters -circuit -c
Circuit                    Receive      Send         Parse Failure
Run                        216          102          0
Start                      0            1            0
Stack                      1            0            0
Stop                       0            0            0
Adv                        72           3            0
Solicit                    29           229          0
SolRsp                     44           0            0
C-Adv                      619
C-Sol                      0
C-SolRsp                   219
```

This command shows and clears the circuit counters.

showlaststatus

Shows the LASTport transport status, including transport state, versions, number of clients, and number of servers.

Access

Superuser not required.

Format

```
showlaststatus
```

Description

This command displays LASTport status information.

Table 6-5 describes the display fields.

Example

```
% showlaststatus
LAST is loaded
Kit build date:                        Jan 16 1997 10:00
OS Version                             3.2
Portable Version                       1.0
Interface Version                      1.0
Protocol Version                       3.1
Circuit Count                            1
Client Count                             1
Server Count                             0
NDB Count                                1
Client Association Count                 1
Server Association Count                 0
Pending Transaction Count                0
Acting Transaction Count                 0
```

Table 6-5 showlastatus Display Fields

Field	Description
Kit Build Date	Date the kit was created
OS Version	DIGITAL UNIX operating system version
Portable Version	Portable LASTport driver version
Interface Version	Portable LASTport interface version
Protocol Version	LASTport protocol version
Circuit Count	Number of active LASTport circuits
Client Count	Number of client drivers using the LASTport driver
Server Count	Number of server drivers using the LASTport driver
NDB Count	Number of nodes in the LASTport
Client Association Count	Number of active LASTport client associations
Server Association Count	Number of active LASTport server associations
Pending Transaction Count	Number of transactions awaiting service
Acting Transaction Count	Number of transactions being serviced

startlast

Enables data link driver support for the LASTport protocol.

Access

Superuser required.

Format

```
startlast  <devicename> [-g groupCode]
            [-initMsgRate <messages per second>]
            [-msgRateInc <message rate increment>]
            [-maxMsgRate <maximum message rate>]
            [-msgRateDecNum <Numerator>]
            [-msgRateDecDeno <denominator>]
            [-advDelay <Seconds>]
            [-advBurstInterval <Seconds>]
            [-advBurstLimit <number>]
            [-advMsgInterval <Seconds>]
            [-advMsgLimit <Seconds>]
```

Description

The `loadlast` command must be executed before the `startlast` command. The `startlast` command does the following:

- Invokes the data link driver to include the LASTport protocol.
- Converts the group code to a multicast address.
- Invokes the LASTport driver to enable the multicast address.
- Invokes the LASTport driver to provide the LASTport portable module with the Operating System data link port handle and configuration parameters.

After these operations have completed successfully, the LASTport transport is ready to accept a new agent.

Table 6-6 describes `startlast` parameters; Table 6-7 describes `startlast` advance parameters.

Table 6-6 startlast Parameters

Parameter	Data Type	Default	Description
<devname>	String	Required	Specifies the name of the Ethernet device.
-g	Integer	0	Specifies the group code (0 to 1023 inclusive) for the Ethernet device.

Table 6-7 startlast Advance Parameters

Parameter	Data Type	Default	Description
-initMsgRate	Integer	350	Nominal receive message rate (messages per second).
-msgRateInc	Integer	10	Message rate increment when there is no congestion.
-maxMsgRate	Integer	1050	Maximum message rate at which congestion control is disabled.
-msgRateDecNum	Integer	1	Numerator.
-msgRateDecDeno	Integer	2	Denominator. Constant at which message rate should be decreased during congestion. For example: newRate = oldRate * numerator / denominator.
-advDelay	Integer	1	Seconds before first port advertise burst should start.
-advBurstInterval	Integer	0	Seconds between port advertise bursts.
-advBurstLimit	Integer	1	Number of advertise bursts.
-advMsgInterval	Integer	1	Seconds between individual messages of each advertise burst.
-advMsgLimit	Integer	3	Number of individual messages in each advertise burst.

Example

```
# startlast ln0 -g 12
```

This command enables device `ln0` to support the LASTport transport and includes the transport in group 12.

stoplast

Removes the LASTport transport from the active transport protocol list for the specified data link device.

Access

Superuser required.

Format

```
stoplast  <devname>
```

Description

Table 6-8 describes the `stoplast` parameter.

Table 6-8 stoplast Parameter

Parameter	Data Type	Default	Description
<devname>	String	Required	Specifies the name of the Ethernet device.

Example

```
# stoplast ln0
```

This command stops the LASTport transport on device `ln0`.

Note

Make sure that all file systems being served by the InfoServer are unmounted and all logical units unbound, before issuing the `stoplast` command.

unloadlast

Unloads the LASTport transport.

Access

Superuser required.

Format

`unloadlast`

Description

You must enter the `stoplast` command before entering the `unloadlast` command.

Example

```
# stoplast ln0
# unloadlast
```

These commands stop and unload the LASTport transport.

6.2 LASTport/Disk Client Utilities

Use the LASTport/Disk Client utilities to configure the LASTport/Disk protocol on DIGITAL UNIX client systems and to perform the following operations:

- Establish bindings to InfoServer device services. Bindings create new virtual device units on the local DIGITAL UNIX system. These device units are also referred to as virtual device units. They represent the local DIGITAL UNIX context for devices that reside on a remote InfoServer system.
- Show services offered by InfoServer systems.
- Remove bindings to InfoServer device services.
- Show client unit binding information.

You can control service access by using a service access password. You can also write-protect InfoServer device services. In this case, local users of the device unit receive an error if they attempt a write operation to the unit.

The LASTport/Disk protocol allows users to access devices on an InfoServer system as though the devices are locally connected to your DIGITAL UNIX system. Because several DIGITAL UNIX clients can share the same devices, there is no need for duplicate drives and media.

Table 6-9 summarizes LASTport/Disk Client utility functions.

Table 6-9 LASTport/Disk Client Utility Functions

Utility	Function
bindladcunit	Binds a virtual device unit to a service.
loadladc	Loads the LASTport/Disk client driver.
showladcbind	Shows current LASTport/Disk binding information.
showladservice	Shows services offered by InfoServer systems on the LAN.
unbindladcunit	Unbinds a virtual device unit from a service and deallocates all the associated memory.

bindladcunit

Binds a virtual device unit to a service.

Access

Superuser required.

Format

```
bindladcunit <unitnumber> [-serviceName <servicename>]
                           [-serverAddr <server physical address>]
                           [-nodeName <server unique name>]
                           [-devName <device name>]
                           [-serviceClass [unix][iso_9660]]
                           [-passwd <password>]
                           [-version [2][3]]
                           [-diskSize <disk size>]
                           [-diskType <type of disk>]
                           [-blockSize <disk block size>]
                           [-resizeEnabled [yes][no]]
```

Description

The `bindladcunit` command binds a virtual device unit to a service and does the following:

- Builds a solicit request descriptor that contains information such as the target service name and device type.
- Invokes the LASTport/Disk client driver to solicit the target service.
- Invokes the LASTport/Disk client driver to receive the solicit response information.
- Binds the first solicit response to the specified device unit number.
- Invokes the LASTport/Disk client driver to flush the solicit information.
- Determines the disk default partition from the solicit response information.
- Calls the LASTport/Disk client driver to set the default partition.

Table 6-10 describes `bindladcunit` parameters.

Table 6-10 blindladcunit Parameters

Parameter	Data Type	Default	Description
<unitnumber>	Integer	Required	Device unit number.
-serviceName	String	Null	Target device service name.
-serverAddr	6-byte	Multicast	Target server data link address. If the data link address is not supplied, the multicast address is used.
-nodeName	String	Null	Target server node name.
-devName	String	Null	Target server device name, for example, RZ56.
-serviceClass	Enumerated type	`unix`	`unix` specifies DIGITAL UNIX UFS on-disk format. iso_9660 specifies `ISO 9660` on-disk format.
-passwd	String	Null	Password for the connect.
-version	Integer	3	LASTport/Disk version (2 or 3).
-diskSize	Integer		Disk size (in blocks); required when version 2 is specified.
-blockSize	Integer	512	Disk block size.
-diskType	String		Type of disk; for example, RZ56.
-resizeEnabled	Boolean	Yes	Enables or disables the auto-resize algorithm used when formatting UNIX partitions in a partition on the InfoServer hard drive. If this switch is set to “no,” the `newfs` command may display warning messages indicating that some sectors are unused. “Yes” enables and “no” disables the resize algorithm.

Example

```
# bindladcunit 0 -serviceClass iso_9660 -serviceName DEC_EXPLORER
```

This command binds device unit 0 to the service DEC_EXPLORER in the iso_9660 service class. Note that you must specify the `-serviceClass iso_9660` parameter when binding to services in the iso_9660 service class.

loadladc

Loads the LASTport/Disk client driver.

Access

Superuser required.

Format

```
loadladc
```

Description

You must enter the `loadlast` and `startlast` commands before entering the `loadladc` command.

Example

```
# loadladc
LASTport/Disk Driver loaded successfully.
```

This command loads the LASTport/Disk client driver.

showladcbind

Shows the current LASTport/Disk binding information.

Access

Superuser not required.

Format

`showladcbind  <unitnumber>`

`showladcbind  -a`

Description

Table 6-11 describes `showladcbind` parameters.

Table 6-11   showladcbind Parameters

Parameter	Data Type	Default	Description
<unitnumber>	Integer	Required	Specifies a client device unit number.
-a	Character	Required	Specifies that all device unit binding information be displayed.

Example

```
% showladcbind -a

Unit 0 Connected          Service UNIXBOOK
/dev/ladc/unit0c          Server  DOCSERVER

Drive Name          DK2          Service Rating            65007
Device Class        CD-ROM       Max Read Session          1000
Device Type         RRD42        Max Write Session         0
Device Format       UNIX         Current Read Session      22
Device Size         892500       Current Write Session     0
```

```
Unit 1 Loaded             Service UNIX_RW
/dev/ladc/unit1c          Server  DOCSERVER

Drive Name         DK11         Service Rating            65418
Device Class       Fixed Disk   Max Read Session          1000
Device Type        RZ57         Max Write Session         1
Device Format      UNIX         Current Read Session      0
Device Size        1989250      Current Write Session     0
```

This command shows all device unit binding information. Note that the system shows a unit as Connected if the file system is mounted. Otherwise the unit is shown as Loaded.

The state of the logical unit is displayed just after the unit number in the `showladcbind` output. Each unit may be in any one of five stable states (described in Table 6-12) or in one of two transitive states (described in Table 6-13).

Table 6-12 Stable States of a Logical Unit

State	Description
Unbound	Unit has not been bound to an InfoServer service.
Loaded	Unit has been bound to an InfoServer service.
Connected	Unit is bound to an InfoServer service and mounted as part of the DIGITAL UNIX file system.
Aborted	An unrecoverable I/O error occurred while the unit was in the connected state. The unit is still mounted as part of the DIGITAL UNIX file system.
Discarded	A unit in the aborted state was unmounted from the DIGITAL UNIX file system and is ready to be unbound or mounted once the original problem has been cleared.

Table 6-13 describes the transitive states of a logical unit.

Table 6-13 Transitive States of a Logical Unit

State	Description
Connecting	The DIGITAL UNIX `mount` command was issued, and the unit is in transition between the loaded or discarded states and the connected state.
Disconnecting	The DIGITAL UNIX u`mount` command was issued, and the unit is in transition between the connected and loaded states after unmounting the unit.

The state transition diagram (Figure 6-1) shows the various states of a unit and those actions that cause a state transition. During normal operation, the unit begins in the unbound state and is placed in the loaded state once the `bindladcunit` command is issued.

Description of Normal Operations

The unit then moves through the connecting (transitive) state to the connected state after successful completion of a mount request. The unit stays in the connected state as long as I/O requests are completing successfully and the unit is mounted. When the unit is unmounted, it moves from the connected state through the disconnecting (transitive) state, back to the loaded state. At this point, the unit can be either remounted or unbound. If the unit is unbound, it moves from the loaded state to the unbound state from where it started. The `showladcbind` command reports information on those units that are in at least the loaded state and, for this reason, will never report a unit in the unbound state.

Recovering from the Aborted State

If there is a problem a device on the InfoServer becomes unavailable while the unit is in the connected state, the DIGITAL InfoServer Client for DIGITAL UNIX will transition the device into the aborted state. For example, a device becomes unavailable if the disc is ejected from the CD-ROM drive on the InfoServer or if the physical device actually fails. The unit will report "Connection timed out" when input/output activity is requested by the client. To recover from this type of problem, the system manager can follow either one of the strategies:

A. Unmount the file system and unbind the logical unit. Bind the logical unit to the chosen service and mount the file system.

B. Make sure the disc containing the correct service is placed in the exact drive in the InfoServer from which it was previously bound. Unmount the file system to transition the logical unit from the "Aborted" state to the "Discarded" state. Then remount the file system to cause transition to the "Connected" state.

Users should now be able to access the service. The "Discarded" state simply means that the logical unit was previously in the "Aborted" state.

Figure 6-1 Bind State Diagram

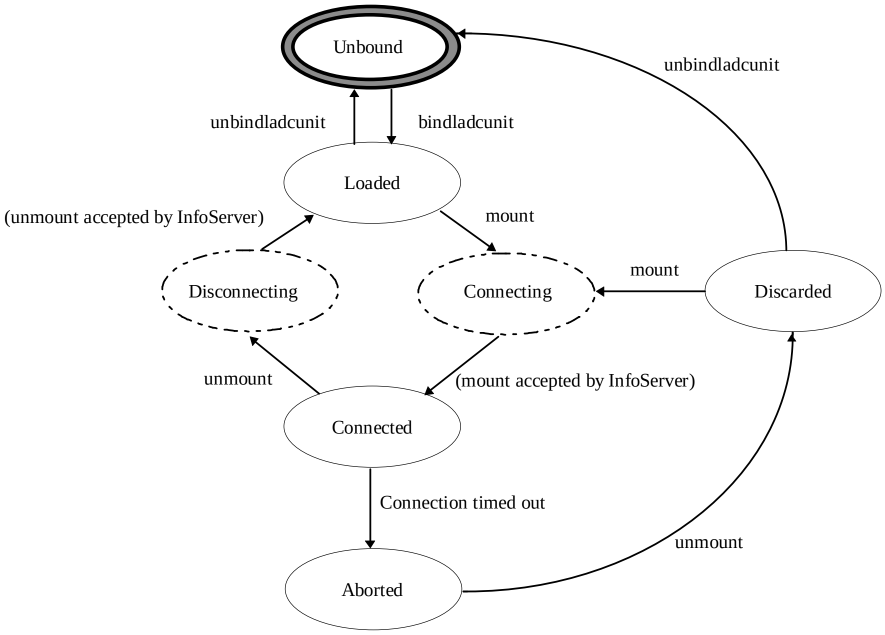

Table 6-14 describes the `showladbind` display fields.

Table 6-14 showladbind Display Fields

Field	Description
Drive Name	The name of the InfoServer device for which the service is being offered.
Device Class	The class of device (fixed disk, CD-ROM, and so forth) attached to the unit.
Device Type	An ASCII string (such as RRD42) that the device returns to identify itself.
Device Format	The on-disk structure of the device.

Field	Description
Device Size	The total number of blocks on the attached device.
Service Rating	The service rating value (from 0 to 65535) currently assigned to the service. A higher value means better service.
Max Read Session	The maximum number of concurrent read sessions allowed for the specified service.
Max Write Session	The maximum number of concurrent write sessions allowed for the specified service.
Current Read Session	The current number of read sessions connected to the specified service.
Current Write Session	The current number of write sessions connected to the specified service.

showladservice

Shows services offered by InfoServer systems on the LAN.

Access

Superuser not required.

Format

```
showladservice  [-maxSkipCount <integer number>]
                [-serviceName <servicename>]
                [-serverAddr <server physical address>]
                [-nodeName <server unique name>]
                [-devName <device name>]
                [-serviceClass [unix][iso_9660][dos][ods_2]]
                [-version [2][3]]
```

Description

This command does the following:

- Builds a Solicit Request message that contains information such as the target service name and device type.
- Invokes the LASTport/Disk client driver to solicit a service.
- Invokes the LASTport/Disk client driver to receive the solicit information.
- Displays the solicit response.
- Invokes the LASTport/Disk client driver to flush the solicit information.

If you do not specify the `-serviceClass` parameter, the `showladservice` command displays `unix` services by default.

Table 6-15 describes the `showladservice` parameters.

Table 6-15 showladservice Parameters

Parameter	Data Type	Default	Description
-maxSkipCount	Integer	999	Maximum instance count for the service.
-serviceName	String	Null	Target device service name.
-serverAddr	6-byte	Multicast	Multicast Target server data link address. If not supplied, the multicast address is used.
-nodeName	String	Null	Target server node name.
-devName	String	Null	Target server device name, for example, RZ56.
-serviceClass	Enumerated type	`unix`	`unix` specifies DIGITAL UNIX UFS on-disk format. `iso_9660` specifies ISO 9660 on-disk format. `ods_2` specifies VMS ODS-2 on-disk format. `dos` specifies MS-DOS on-disk format.
-version	Integer	3	LASTport/Disk version.

Example

This command displays all ISO 9660 services offered by InfoServer systems on the LAN.

```
% showladservice -serviceClass iso_9660
Interrogating network, please wait...
Services offered by node LIBRARY_ESS (LAD V3.0, Address: 08 00-2B-39-21-AB)

Service             Drive (Device)      Rating       Users        Mode
-------             --------------      ------       -----        ----
DEC_EXPLORER        DK2   (RRD42)       64760          4           RO
TRADEMARKS          DK8   (RRD42)       65007          1           RO

Services offered by node PROGRAMMER (LAD V3.0, Address: 08-00-2B-22-49-BB)

Service             Drive (Device)      Rating       Users        Mode
-------             --------------      ------       -----        ----
WINDOW_WIDGETS      DK2   (RRD42)       65007          7           RO
```

unbindladcunit

Unbinds a virtual device unit from a service and deallocates all the associated memory.

Access

Superuser required.

Format

```
unbindladcunit  <unitnumber>
```

Description

Table 6-16 describes the `unbindladcunit` parameter.

Table 6-16 unbindladcunit Parameter

Parameter	Data Type	Default	Description
<unitnumber>	Integer	Required	Specifies a client device unit number.

Example

```
# unbindladcunit 0
```

This command removes the service information associated with the client device unit 0.