

SETUP GUIDE

D-LINK SERVER CARD **LOAD BALANCING AND FAILOVER SOFTWARE** **FOR LINUX**

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D-LINK SERVER CARD SOFTWARE

FOR LINUX SETUP GUIDE

Introduction to the D-Link Server Card Software

Your PCI Fast Ethernet Server Card includes a software-only solution that provides dynamic fail over and allows customers to load balance network traffic across multiple network adapters in the server. The D-Link Server Card software is an elegantly simple yet extremely effective solution for increasing server availability and performance. The software's hardware independence and protocol independence allow easy integration into most Linux environments, making it ideal for mission-critical database servers, electronic commerce, web servers and file servers.

The software eliminates the network interface as a single point of failure by providing redundancy across multiple network ports in a D-Link Server Card. The software ensures that users maintain non-stop access to key resources on the network, even if one or more of the network interface connections go down. If a connection to an adapter is lost, it will instantly be taken out of the array and the traffic will be balanced across the remaining ports with no loss of data and, just as importantly, without loss of connection.

The software can eliminate network interface performance bottlenecks by distributing traffic among the multiple Ethernet ports on the server. The software instantly routes connections to different adapters as users access the server. This process effectively increases network interface bandwidth by a factor equal to the number of adapters on the server. To the server, these multiple adapters appear as a single network interface. To the remote workstation or web surfer, the server appears immediately available without the delay caused by congestion during high-access periods.

Key Features

- **Increased performance with network traffic Load Balancing.**
- **Can more than triple your server's throughput.**
- **Instant failover across multiple NICs without loss of data.**
- **Remote management with Web-based Enterprise Manager.**
- **Provides detailed throughput graphing and reporting.**

Important Information

The following sections cover important information you need to successfully install the Server NIC software. Please read this section carefully. This information is intended to help you get up and running quickly and minimize the "gotchas" that can waste hours of installation time.

1.0 About the D-Link Software

D-Link uses a software-only solution that enables Linux systems to load balance network traffic across two or more network connections creating redundant data paths throughout the network. For a low per-system cost, you can simultaneously eliminate the risk of downtime due to a network failure while more than tripling your server's throughput.

The software will automatically group up to four network interface cards into a single group. Think of this group as a single virtual adapter that is actually made up of two to four physical adapters. To the system and the network, it appears as a single interface with one IP address. However, throughput is increased by a factor equal to the number of adapters in the group. Also, the D-Link software detects faults anywhere from the NIC out into the network and provides dynamic fail-over in the event of a failure.

1.1 Supported Kernels

This version currently supports Linux kernel versions 2.2.18, 2.2.19, and 2.4.2 through 2.4.16.

Important:

Prior to installing and using the D-Link software with kernel versions 2.2.18 and 2.2.1, you must download and apply a patch for each version. The patches are located at:

<http://bridge.sourceforge.net>

Select kernel patches and download bridge-0.0.9-against-2.2.18.diff or ~.19.diff files. Apply the appropriate patch to your kernel. You will need to do this before performing step #2 below. These patches are only required for the 2.2.18 and 2.2.19 versions.

1.2 v. 1.0 Issues

For this release, the creation of groups and assignment of adapters has been simplified. This version will automatically create one group (nex0). All adapters loaded on the system will automatically be assigned to the nex0 group. The creation of multiple groups is not supported in the software. In the released version, the D-Link software will support the creation of multiple groups and allow you to manually assign adapters to the groups.

2.0 Installation

D-Link has provided script files to install and uninstall the D-Link software for Linux. You will need to follow these general steps:

1. Check kernel for "Module Versions" and recompile kernel if necessary.
2. Enable "bridging hooks" in the kernel.
3. Execute the self-extracting installation file install located in the Linux/ directory on the CD. After downloading the D-Link software, launch **DLink.bin**.

Since the D-Link software uses the bridging hooks within the kernel, you must modify your kernel so that bridging is enabled before the D-Link software is installed. Bridging is not performed by the product; the D-Link software just utilizes the bridging hooks.

After the installation is finished, the D-Link software will automatically assign the first four adapters (normally eth0 through eth3) to the group "nex0". The first device assigned to the group (normally eth0) will be the primary interface. The IP address of this interface will also be the one assigned to the group of NICs so make sure eth0 contains the IP address you want to advertise to the network for the server.

2.1 Check for "Module Versions"

Currently, the D-Link software only supports mod versions with the Red Hat 7.1 and 7.2 distributions. If mod versions are turned on for any other distributions, you will need to recompile your kernel with mod versions turned off before installing the D-Link software. To rebuild with mod versions turned off, run 'make menu config.' Select the "Load Module

Support", then deselect "Set version information on all module symbols" by unchecking its checkbox.

2.2 Install bridging support

If bridging support is not already enabled within your kernel, please perform the following steps before installing the product.

- a) Ensure that the desired kernel version is installed and is a loadable option on your Linux system.
- b) Run 'make menuconfig' to make sure 'mod versions' are disabled and to set 802.1d Ethernet Bridging to 'module'. You must be in the /usr/src/linux directory to run this configuration tool. To check for 'mod versions', you select 'Loadable Module Support' from menuconfig's main selection window. Make sure that 'Set version information on all module symbols' is empty. Then from the main selection window, select the 'Networking Options'. Find the 802.1d Ethernet Bridging and select 'M'.

NOTE: Do not load the Bridging module. Bridging is not performed. This procedure just enables the bridging hooks so the D-Link software can use them.

- c) Save this configuration, rebuild the kernel ('make dep clean bzlilo'), and reboot the system.

2.3 Launching the D-Link software installer

- a) Insert the D-Link software CD in your CD-ROM drive
- b) Run the install script install located in the Linux directory on the CD or run ./DLink.bin if you downloaded. This self-extracting install script will validate your current kernel configuration to determine if it is configured correctly for the D-Link software. Follow the installation steps to setup and install the D-Link software. You are provided with the option to load the product immediately or instructions on how to install at a later time.

Upon launching DLink.bin, the following files are extracted and installed to the /usr/local/DLink directory:

nexload

used to install the D-Link software. See section 2.4 for details.

nexunload

used to unload the D-Link software.

nexcui

console based user interface. See section 3.1 for details on using nexcui.

nexjui

Java based user interface. Requires the Java Runtime Environment (JRE) from Sun Microsystems. See section 3.2 for details on using nexjui.

nexctl

used to set the D-Link software parameters. See section 6.0 for using nexctl and its command line options.

nexconfig

console utility used to create groups, assign adapters to the groups, and configure advanced settings.

After DLink.bin extracts the files, the D-Link software installer is launched. The loader will prompt you with a series of questions. The next section will step you through running nexload and its installation options.

2.4 Installation options and prompts

The D-Link software installer performs the following tasks during install:

1. Determines if the system's kernel version is supported.
2. Determines if the kernel was built with Module Versions turned off or on.
3. Determines if bridging hooks were turned on (see 2.1 above).
4. Prompts user to choose "Automatic" or "Manual" configuration method.
5. Prompts user if they would like to start the D-Link software after install and add the command to the system's startup script.

The following covers each step of the installation process.

2.4.1 Initial Installation Options

- a) After the install script presents the license agreement and option to view the Readme file, the install will check the systems kernel version. Currently the D-Link software supports the following kernel versions: 2.2.18, 2.2.19, and 2.4.0 through 2.4.16.

NOTE: If your current kernel is not supported, the Installer will terminate and you will need to update your kernel before continuing.

b) After the kernel support is verified, the installer will examine if Module Versions was enabled for the kernel. Currently, the D-Link software only supports mod versions with the Red Hat 7.1 and 7.2 distributions. If mod versions are turned on for any other distributions, you will need to recompile your kernel with mod versions turned off before installing the D-Link software.

c) Next, the install will verify whether the bridging hooks were turned on. If bridging support has not been properly configured, the installer will terminate. The D-Link software uses the bridging hooks in the kernel to redirect traffic for both the load balancing and failover features. Section 2.1 above provides details on installing bridging hooks.

Important:

DO NOT install the bridging module. Only enable bridging support. The D-Link software uses the hooks that are created when bridging support is turned on and will not run if the bridging module is loaded.

d) Next, the install script will give you an choice to use the "Automatic" configuration option or the "Manual" configuration method. The automatic option will configure all available adapters in a single group (nex0). The Automatic method will use the adapter eth0 as the primary adapter and use eth0's IP address for that of the group. The Manual option gives you the choice to create multiple groups and manually configure options such as load balancing. If you choose the Automatic method continue with the Automatic Configuration Option section below. For documentation, please refer to the section Using the Manual Configuration Option.

2.4.2 Automatic Configuration Option

a) If you chose the Automatic configuration option, the next few prompts from the installer are used to configure the D-Link software. The first prompt is for an external IP address to be used by the D-Link software to test for failover conditions. If a default gateway is configured for the system, the Installer will provide you with a choice to use its IP address or allow you to input an alternate address. If a link goes down, the D-Link software will use this IP address to ping and verify which port to take down. Also, the test address is used to help determine that the port is functioning properly when the link is reestablished. This value can be edited later by running the nexconfig utility.

b) The install will next prompt to enable load balancing or not. If load balancing is not enabled, all traffic will normally flow through the primary adapter (eth0). If the primary port were to fail, traffic will then failover to the secondary port. With load balancing enabled, connections will be assigned to each adapter in a round robin fashion and traffic will be load balanced across all adapters in the group. With load balancing enabled, you have the benefits of both increasing throughput to the server and dynamic failover in case of a failure.

c) After the install script is finished configuring the D-Link software, it will prompt whether or not to load the D-Link software automatically upon startup. If you answer yes, the installer will add the following command to the end of your `/etc/rc.d/rc.local` file:

```
/usr/local/DLink/nexload
```

If you choose no, you can load the D-Link software manually at anytime by using the `nexload` command. Symbolic links have been created for `nexload` and it can be executed from any prompt.

You have now successfully installed and configured the D-Link software. Please proceed to section 3.0 below for details on the two user interfaces used to monitor the D-Link software.

2.4.3 Manual Configuration Option

If the manual configuration option was selected, the install script will load the configuration utility console. The following console screen should now be displayed:

```

D-Link software for Linux v1.2 Configuration Utility
Number of Groups: [ ]

Adapters: [ ] [ ] eth0
          [ ] [ ] eth1
          [ ] [ ] eth2
          [ ] [ ] eth3

Groups (Devices):

          [ ] Load Balancing Disabled

          <Save> <Cancel> <Help>

Enter the number of groups needed or ? for field help.
```

Please follow the steps below to manually configure the adapter groups and assign the adapters to each group:

- a) The cursor should be in the "Number of Groups" box. Input the number of groups (arrays) you would like to create.

- b) The cursor should now be in the first box of the first adapter (eth0). For all adapters listed, the first box is for the group number (0 though n) the adapter should be assigned to. The second box is to designate the adapter as either Primary (p) or Secondary (s). For eth0, input the group number it should be assigned to and either "P" for "primary" or "S" for secondary.
- c) Repeat for the remaining adapters. Make sure that you have assigned at least one adapter as primary. The group will use the IP address of the Primary adapter for the group's IP address.
- d) Next, for each group listed, input an external IP address to be used by the D-Link software to test for failover conditions. If a default gateway is configured for the system, we recommend you use its IP Address as the test address. Make sure that test IP address chosen for each group is reachable from the IP address assigned to that group. If a link goes down, the D-Link software will use this IP address to ping and verify which port to take down. Also, the test address is used to help determine that the port is functioning properly when the link is reestablished. This value can be edited later by running the nexconfig utility.
- e) The final box will either leave the load balancing function turned on or disable it. If you only want failover functionality, place an X in this box. If you want to load balance traffic across the adapters, leave this box blank.
- f) Use the arrow keys to select the <Save> option and hit enter to save your configuration.
- g) After the install script is finished configuring the D-Link software, it will prompt whether or not to load the D-Link software automatically upon startup.

If you answer yes, the installer will add the following command to the end of your `/etc/rc.d/rc.local` file:

```
/usr/local/DLink/nexload
```

If you choose no, you can load the D-Link software manually at anytime by using the nexload command. Symbolic links have been created for nexload and it can be executed from any prompt.

You have now successfully installed and configured the D-Link software. Please proceed to section 3.0 below for details on the two user interfaces used to monitor the D-Link software.

3.0 Using the D-Link Software

D-Link has provided two interfaces to monitor the D-Link software product. The first is a console interface called nexcui. The other interface is a graphical interface written in Java. The next two sections cover the use of these two interfaces to monitor the D-Link software.

3.1 DFE-580TX Console - nexcui

The D-Link software console interface is accessed by launching nexcui. Symbolic links have been created for nexcui and it can be executed from anywhere. This text-based, console interface will show the current status of the D-Link software group, the NICs and their statistics. A sample output from the console can be seen below:

```

root@rh71.dlink.com.tw: /root - Terminal
File Sessions Settings Help
-----
Group Device Status Statistics
-----
nex0 eth0 Down In Bytes: 0 In Packets: 0
Out Bytes: 75264 Out Packets: 1176
Total Bytes: 75264 Total Packets: 1176
Mbits/sec: 0.0015 Packets/sec: 3.0
eth1 Up In Bytes: 14304 In Packets: 233
Out Bytes: 82176 Out Packets: 1284
Total Bytes: 96480 Total Packets: 1517
Mbits/sec: 0.0027 Packets/sec: 6.0
eth2 Up-DwnPr In Bytes: 5252 In Packets: 47
Out Bytes: 86400 Out Packets: 1350
Total Bytes: 91652 Total Packets: 1397
Mbits/sec: 0.0031 Packets/sec: 6.0
eth3 Down In Bytes: 0 In Packets: 0
Out Bytes: 74880 Out Packets: 1170
Total Bytes: 74880 Total Packets: 1170
Mbits/sec: 0.0015 Packets/sec: 3.0
Group Bytes: 338276 Group Packets: 5260
Mbits/sec: 0.0088 Packets/sec: 18.0

```

The first column shows the D-Link software group's device name. In the above example there is one group (nex0). The second column lists the Ethernet adapters that are assigned to the group. In the above example eth0 and eth1. The third column displays the current status of each adapter. The D-Link software keeps track of five adapter states listed in the table below.

Status Values	Definitions
Up	Normal State. Adapter functioning properly.
Down	Adapter is currently down for the first time.
Up-DwnPr	Adapter is currently up, however it has failed at least once since last reboot.
DwnMulti	Adapter is currently down and has been down multiple times.
Disabled	Adapter is has been permanently removed from the group.

Table 1. Status values used in the DFE-580TX console.

In addition to device status, two columns of throughput statistics are collected for each device, the groups, and totals for the system. If you would like to see the statistics continuously updated, use the -c command line option:

```
nexcui -c
```

The default update interval is once per second. If you need to change this use the -i command line option:

```
nexcui -c -i sec
```

Where "sec" is the amount of time in seconds for the update interval. For example nexcui -c -i 5 will update every 5 seconds.

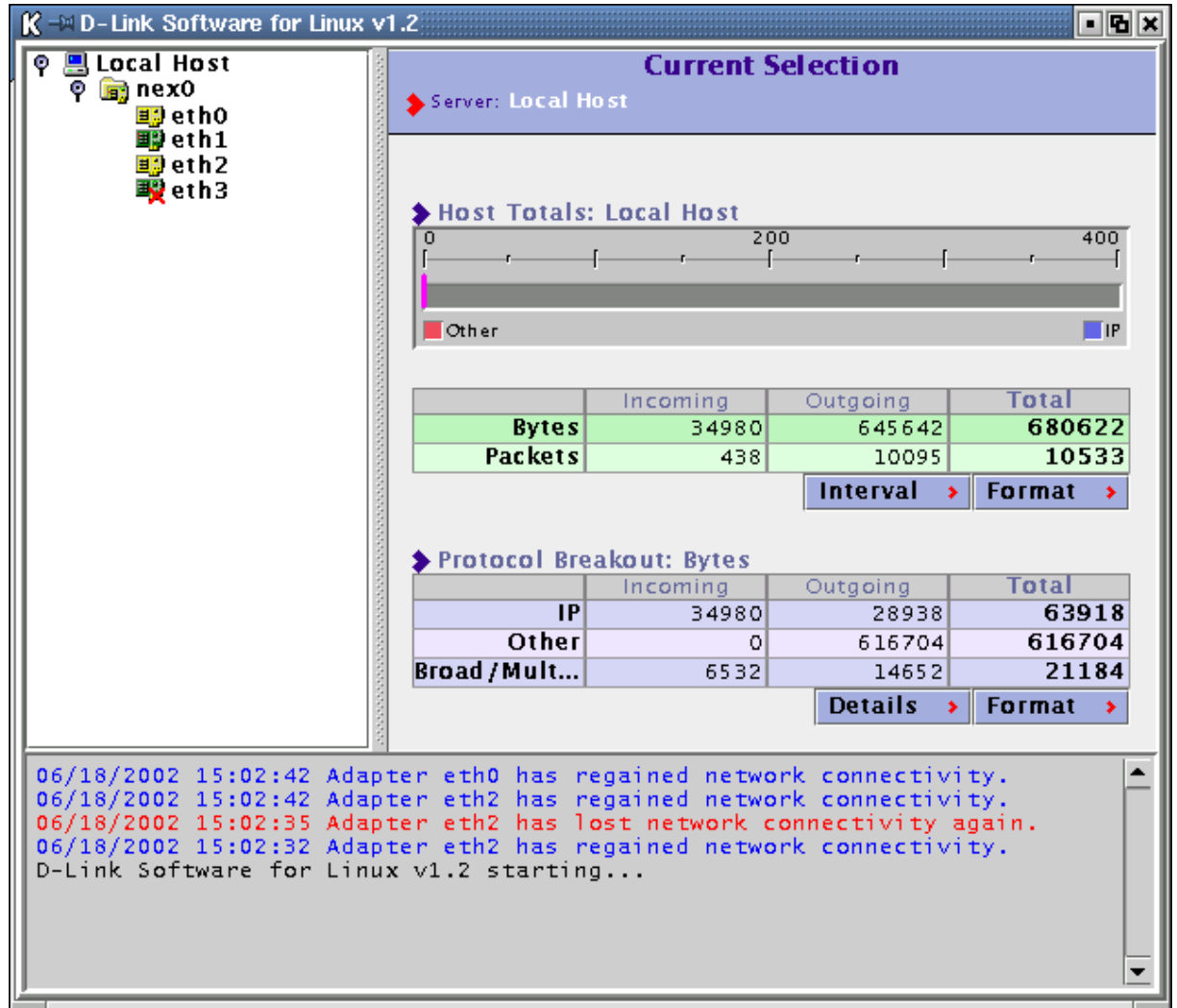
To exit the console interface, press Control-Z.

3.2 The D-Link Software Java Console – nexjui

The D-Link software also has a graphical interface that is accessed by launching nexjui from within an XTerm window. Symbolic links have been created for nexjui and it can be executed from anywhere. This Java-based, graphical interface will show the current status of the D-Link software group, the NICs and their statistics.

Since the standard Linux distributions do not include Java, you must download the Java Runtime Environment (JRE) from Sun Microsystems. To download the JRE, go to <http://java.sun.com/j2se/1.3/jre/download-linux.html>.

From this page you can download the JRE in a RedHat RPM file or in a GZip tar file. The instructions for installing either file are also on that page. The installation should place all files in the /usr/java/jre1.3.1_01/ directory. To launch the java interface from a command line, execute the shell script called nexjui. Once loaded, you should see console similar to the one below.



When the Java console has been loaded, you should see a familiar tree view on the left hand side representing the device list showing the current status of each device. The right hand side is broken up into three sections. The top displays the current selection, the middle section lists throughput details for the selected device. The last section provides break-up of

statistics by device or protocol. Also note that the Statistics section will be blank until you select a device on the left-hand side to monitor.

Current Status

The Current Status section of the console located on the left-hand side provides an at-a-glance view of the D-Link software system and all devices. Here you can see the current state of each adapter and whether the adapter has currently failed, or has failed in the past. The top layer of the Tree is the system host followed by the list of the D-Link software groups and finally each adapter contained within each group. You may notice all of the Icons for system hosts, groups and adapters are color coded to provide an at-a-glance view of the health of all devices being managed. A complete list of Icons and their meanings is provided below:

NOTE: The current version only supports two states, UP and DOWN.

Status Icons Used in the Console.

Server Icons	
	Normal State. Server up and running with no errors.
	Server Shutdown normally.
	Server has one or more failed adapters.
	Communication to server was lost.
	All ports to server have shutdown and server is unavailable.
Group Icons	
	Normal State. All adapters in the group are functioning properly.

	One or more adapters in the group have failed.
	Group down. All adapters in the group have failed.
	Communication to group was lost.
Adapter Icons	
	Normal State. Adapter functioning properly.
	Adapter is currently down for the first time.
	Adapter is currently up, however it has failed at least once since last reboot.
	Adapter is currently down and has been down multiple times.
	Adapter is has been permanently removed from the group.
	Communication to adapter was lost.

Table 2. Status icons that are used in the tree view of the console.

Current Statistics

To view statistics for a specific device, first select the device (either the system, group or adapter) from the Current Status tree on the left side of the console. Statistics for the selected device are displayed in three sections on the right side of the console. The first section provides a real-time bar graph of the currently selected device. Next, device totals are broken down for both incoming and outgoing data. The device details section at the bottom shows further data broken up by protocol or device. The following topics will describe each section in detail.

Current Selection Bar

The Current Selection bar, located at the top of the right-hand side, identifies the current device that throughput statistics are being generated on. To change the current device, simply select a server, group or adapter from the tree in the left side of the console. Notice how the Current Selection Bar changes depending on whether a Server, group or adapter is selected.



Figure 4. The Current Selection Bar at the top of the Console identifies the device being monitored.

Device Totals

The heading of this section provides a detailed description of the device currently being monitored and is located just above the bar graph. This heading changes to Server Totals:, Group Totals:, or Adapter Totals:, followed by the description of the device depending on what type of device is being monitored.

The Device Totals section is broken down into two sections. First, a bar graph shows total throughput in real-time for the device broken down by protocol. Below the bar chart, total throughput is broken out in tabular form. Each of these sections will be described in more detail.

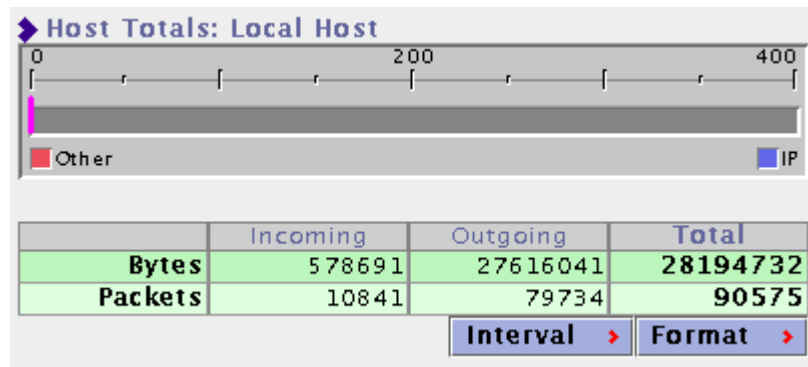


Figure 5. The Device Totals section displays total throughput in bar graph and tabular formats.

Bar Graph

The bar graph at the top of the Device Totals section provides a real-time graphical representation of network traffic through the device (a server, group or adapter depending on what is selected on the left of the console). The maximum value on the scale is fixed and determined by the number of adapters and their media speed. For instance, if a group consisting of two 100Mbit adapters is selected the scale will show the maximum theoretical throughput of 200Mbsec and represent the actual throughput of the group in relation to the 200 Mbits maximum.

Throughput Totals

Directly below the Bar Chart, the total throughput for the device is displayed in both Mbits per second or Packets/sec. The totals are also broken down by incoming and outgoing data. Optionally you can choose to view cumulative totals for the device measured in either packets or bytes. There are two buttons located under the Device Totals table to set the time interval that data is updated as well as the format or scale used to display the data. The following section will describe how to change both the Interval and format of the data.

	Incoming	Outgoing	Total																
Bytes	559425	27265897	27825322																
Packets	10463	74263	84726																
Interval > Format >																			
▶ Protocol Breakout: Bytes <table> <tr> <th></th><th>Incoming</th><th>Outgoing</th><th>Total</th></tr> <tr> <td>IP</td><td>559425</td><td>23786281</td><td>24345706</td></tr> <tr> <td>Other</td><td>0</td><td>3479616</td><td>3479616</td></tr> <tr> <td>Broad / Mult...</td><td>14398</td><td>47616</td><td>62014</td></tr> </table>					Incoming	Outgoing	Total	IP	559425	23786281	24345706	Other	0	3479616	3479616	Broad / Mult...	14398	47616	62014
	Incoming	Outgoing	Total																
IP	559425	23786281	24345706																
Other	0	3479616	3479616																
Broad / Mult...	14398	47616	62014																
Details > Format >																			

Figure 7. The time interval for updating data in the Console can be changed from 1 to 60 seconds.

Changing Interval

The time interval in which data is updated can be easily changed by selecting the Interval button under the Device Total table in the middle of the console. The default setting is every second. However the interval can be changed to every 5, 10, 30 or 60 seconds.

NOTE: Changing this setting affects all data collected in the console.

Changing format

The format of data displayed can easily be changed for the device totals. The format can be switched from a per second basis to cumulative data for the

device. Also note that the scale of the data can be changed from Bytes to Mbits/second if on a per second basis.

	Incoming	Outgoing	Total
Bytes	581091	27658281	28239372
Packets	10889	80394	91283

Interval >
Format >

☒ Cumulative
Per Second

Protocol Breakout: Bytes

Figure 8. You can switch between cumulative totals or per second data for device totals.

Device Breakout

The Device Breakout section provides detailed breakout of throughput data for the currently selected device. You can choose between the breakout of the data by Protocol or by device. Furthermore, the format of the data can be changed as well.

Protocol Breakout: Bytes			
	Incoming	Outgoing	Total
IP	200	768	968
Other	0	1804032	1804032
Broad / Mult...	92	384	476

Details >

☒ Protocol
Group
Adapter

v1.2 starting...

Figure 9. The Breakout section can be switched between protocol or device breakout data.

Changing the Breakout Details

You can compare throughput data in a number of ways for the currently selected device. Options include breakout by protocol, by group or adapter. To change the type of breakout detail displayed, select the Details button and choose the desired selection. The following describes each selection in detail.

Protocol

The Protocol option will breakout data by protocol with statistics gathered for IP based traffic. All other protocol data is listed under "Other". In addition, broadcast and multicast traffic detail is provided.

Group

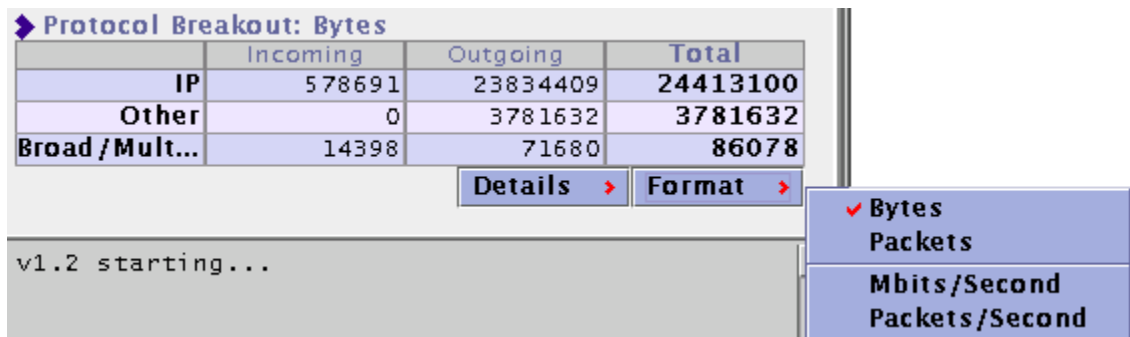
This option will contrast the device totals above with each group (array) total on the server.

Adapter

This will provide details for each of the adapters in a group (array). If the current selection is a group it will display breakout for each of the adapters in that group.

Changing Format

The format of the data can easily be changed for the device breakout section. First, the format can be switched between cumulative Bytes, cumulative Packets, Mbits per second, and Packets per second. Each option is described below.



Protocol Breakout: Bytes

	Incoming	Outgoing	Total
IP	578691	23834409	24413100
Other	0	3781632	3781632
Broad / Mult...	14398	71680	86078

Details > Format >

v1.2 starting...

☒ Bytes
☐ Packets
☐ Mbits/Second
☐ Packets/Second

Figure 10. The format of the Breakout section can be changed from cumulative to per second data.

Bytes

This option provides cumulative data displayed in Bytes. This option shows the total bytes sent or received since the server was last rebooted.

Packets

This option provides cumulative data displayed in packets. This option shows the total packets that were received since the server was last rebooted.

Mbits/sec

This option displays incoming, outgoing, and total data for each component in Mbits/Sec.

Packets/sec

This option displays incoming, outgoing and total data for each component in packets/sec.

4.0 Uninstalling the D-Link Software

To unload the D-Link software driver, run nexunload. Nexunload will unload the D-Link software virtual device and restore the bindings back to the original physical adapters. Symbolic links have been created for nexunload and it can be executed from anywhere.

5.0 Setting the IP address of the server

To change the IP address of the server with the D-Link software loaded , you will need to modify the IP information for the nex0 device. To re-address the nex0 device, use the ifconfig utility as you would with any other Ethernet device. The D-Link software supports all ifconfig requests. For example to change the IP address of the server to 66.139.25.28 with a subnet mask of 255.255.255.192 you would use the following command:

```
ifconfig nex0 66.139.25.28 netmask 255.255.255.192
```

6.0 Advanced Configuration Options Using Nexconfig

The nexconfig utility is used to create groups, assign adapters to the groups, select the default gateway/failover detection host, and to disable load balancing. Symbolic links have been created for nexcui and it can be executed from anywhere. If you installed with the automatic configuration option, the configuration screen will look like the example below.

```
Number of Groups: [ ]

    Adapters: [ ] [ ] eth0
               [ ] [ ] eth1
               [ ] [ ] eth2
               [ ] [ ] eth3

Groups (Devices):

    [ ] Load Balancing Disabled

    <Save> <Cancel> <Help>

Enter the number of groups needed or ? for field help.
```

To reconfigure adapter assignments or other configuration options in nexconfig, perform the following steps:

1. If no groups were defined, enter the number of groups (1 to 4) you wish to create. Each group you create will need at least one adapter assigned to it. In the example below, 2 groups were created. Note that the console screen is updated with the two groups (nex0 and nex1) listed below the adapter list.

```

D-View Software for Linux v1.2 Configuration Utility

Number of Groups: [2]

    Adapters: [ ] [ ] eth0
              [ ] [ ] eth1
              [ ] [ ] eth2
              [ ] [ ] eth3

Groups (Devices): (0) nex0 DefGw: [ ]
                  (1) nex1 DefGw: [ ]

                [ ] Load Balancing Disabled

                <Save> <Cancel> <Help>

Enter the group/device number to assign the device to or ? for field help.

```

2. For each adapter (eth0 through ethn), input the group number you want the adapter assigned to in the first box. For example, to assign eth0 to group nex0, input "0" in the first box on the eth0 line. In the second box, assign either primary or secondary status for the adapter. Type a 'P' for primary or 'S' for secondary status. The IP address of the primary will be the address assigned to that group number. Also, only one adapter can be chosen as primary.
3. Repeat step 2 for each adapter.
4. Next, for each group listed, input an external host IP address to be used by the DFE-580TX to test for failover conditions. If a default gateway is configured for the system, we recommend you use its IP Address as the test address. Make sure that test IP address chosen for each group is reachable from the IP address assigned to that group. If a link goes down, the DFE-580TX will use this IP address to ping and verify which port to take down. Also, the test address is used to help determine that the port is functioning properly when the link is reestablished.

In the example below, 66.137.8.1 was assigned as the test address for nex0 and 192.44.69.1 was assigned for nex1.

5. The final box will either leave the load balancing function turned on or disable it. If you only want failover functionality and have the load balancing function turned off, place an X in this box. If you want to load balance traffic across the adapters, leave this box blank.
6. Arrow down to the <Save> button to save the current configuration and exit.

```

D-Link Software for Linux v1.2 Configuration Utility

Number of Groups: [2]

    Adapters: [0] [P] eth0
              [0] [S] eth1
              [1] [P] eth2
              [1] [S] eth3

Groups (Devices): (0) nex0 DefGw: [66.137.8.1 ] <IP Addr: 66.137.8.6>
                  (1) nex1 DefGw: [192.44.69.1 ] <IP Addr: 192.44.69.96>

[ ] Load Balancing Disabled

<Save> <Cancel> <Help>

Enter the number of groups needed or ? for field help.

```

Navigation Keys used in nexconfig

?	- field specific help
Tab	- move to the next field
Left arrow	- move to the previous field or previous character
Right arrow	- move to the next field or next character
Up arrow	- move to the previous field
Down arrow	- move to the next field
Backspace	- delete previous character
^M <CR>	- execute button or move to next field
^H	- this help text
^S	- save and exit
^X	- clear entire field
^C	- abort and exit
^Z	- abort and exit

Contacting D-Link Corporation

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