Libpcap and Third Party Applications

EDM04-21

Protection Against Harmful Interference

When present on equipment this manual pertains to, the statement "This device complies with part 15 of the FCC rules" specifies the equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the Federal Communications Commission [FCC] Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

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Contents

Introduction

Overview

This document describes the correct installation of libpcap for use with third party applications and Endace DAG cards. These third party applications include protocol analyzers, network monitors, network intrusion detection systems and packet sniffers.

The third party applications covered in this document are:

- Snort
- Tcpdump
- Tcpreplay
- Wireshark (Ethereal) / Tshark
- CoralReef

Winpcap

This user guide does not cover Winpcap. For more information refer to the Winpcap website www.tcpdump.org/wpcap.html.
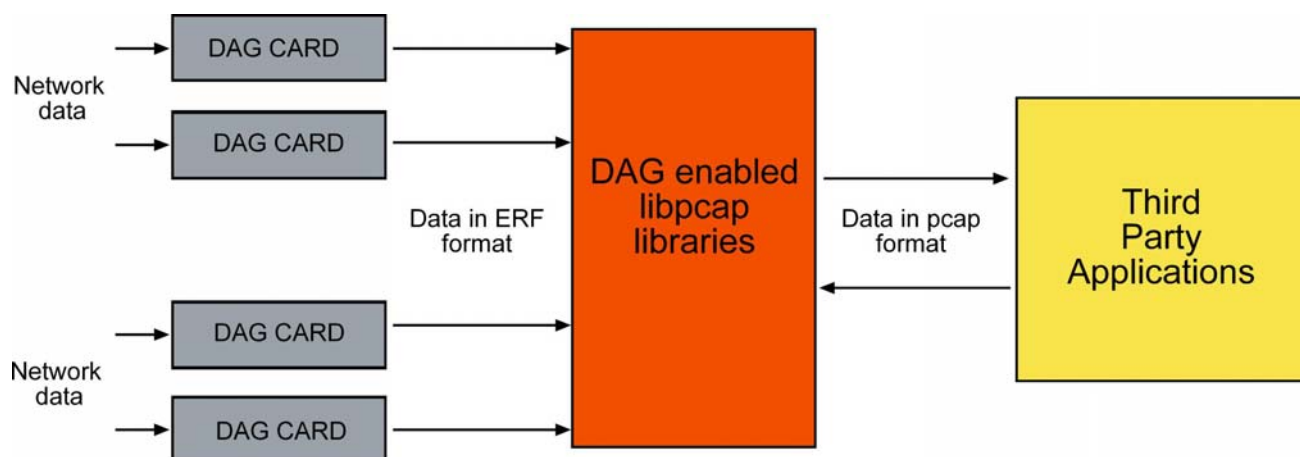
Libpcap

Overview

Libpcap is the implementation of pcap for Unix-like systems. Libpcap may be used by a program to capture packets travelling over a network. The libpcap API is the packet capturing and filtering engine for many open source and commercial network tools.

Libpcap and DAG cards

Data packets from DAG cards are converted from native ERF format to pcap format using the libpcap API.

In order to use some third party applications with Endace DAG cards you must use a DAG enabled version of libpcap.

The following diagram shows the data transfer process:

DAG enabled libpcap library

To run the third party applications covered in this manual a DAG enabled version of libpcap is needed.
Libpcap version 0.9.6 or greater is required.

This can be downloaded from our website:
 www.endace.com/resources/tools/
or
www.tcpdump.org

Checking DAG software

The DAG software supplied with the DAG card must be installed on the computer for the third party applications to work with the DAG card.

For more information on installing DAG software refer to *EDM04-01 DAG Software Insallation Guide*.

Installing Libpcap

Note: The third party application you want to use will determine whether you need to install the static or dynamic libpcap libraries. For more information see the table on page X.

The following procedures use "`libpcap-x.x.x.tar.gz`" to refer to the DAG enabled libpcap version 0.9.6 or greater.

Install libpcap static library – default location

1. Unpack `libpcap-x.x.x.tar.gz`
2. Run the following commands:
   - `./configure`
   - `make`
   - `make install`

   All of the libpcap system files are in standard locations of `/usr/local/bin` and `/usr/local/lib`.

Install libpcap dynamic library – default location

1. Unpack `libpcap-x.x.x.tar.gz`
2. Run the following commands:
   - `./configure`
   - `make shared`
   - `make install-shared`

   All of the libpcap system files are in standard locations of `/usr/local/bin` and `/usr/local/lib`.
3. Create a link to the `libpcap.so.x.x.x` file from `libpcap.so` so the script recognizes the correct version of libpcap using the following command:
   `ln -s libpcap.so.x.x.x libpcap.so`

Install libpcap static library – specified location

1. Unpack `libpcap-x.x.x.tar.gz`
2. Create a folder into which libpcap will be installed.
   In the following example the `/root/pcap` folder is used.
3. Run the following commands:
   - `./configure --prefix=/root/pcap`
   - `make`
   - `make install`

   All of the libpcap system files are in the location of `/root/pcap`.

Install libpcap dynamic library – specified location

1. Unpack `libpcap-x.x.x.tar.gz`
2. Create a folder into which libpcap will be installed.
   In the following example the `/root/pcap` folder is used.
3. Run the following commands:
   - `./configure --prefix=/root/pcap`
   - `make shared`
   - `make install-shared`

   All of the libpcap system files are in the location of `/root/pcap`.
4. Create a link to the `libpcap.so.x.x.x` file from `libpcap.so` so the script recognizes the right version of libpcap using the following command
   `ln -s libpcap.so.x.x.x libpcap.so`

Third party applications

Overview

Once libpcap is installed and setup you can choose an appropriate third party application and follow the instructions to configure and communicate with the installed DAG cards.

Some third party applications that use libpcap include tcpdump, Wireshark(Ethereal), Snort, nTop, tcpreplay, ssldump, Nmap.

Applications covered in this document:

Application	Usage	Library type
Wireshark	protocol analyzer	static or dynamic
SNORT	Intrusion detection system	dynamic
tcpdump	Capture / analyzer	static
tcpreplay	Reproduce and capture	Static
CoralReef	Capture / analyzer	Static or unused

Installing SNORT

Endace recommends SNORT to be used with dynamic libpcap libraries.

Install the DAG enabled libpcap into non-default folders. Installing into the default locations may cause problems with other versions of libpcap.

For this example libpcap has been installed into `/root/pcap`.

1. Go to the `root/pcap/lib` folder where the DAG enabled libpcap is installed.
2. If the `libpcap.a` file is present, delete it.
3. Unpack `snort-x.x.x.x.tar.gz`
4. Create a folder into which SNORT will be installed.
   In the following example the `/root/snort` folder is used.
5. Run the following commands, (each bullet point is a new line)

   - `./configure --prefix=/root/snort`
     `--with-libpcap-includes=/root/pcap/include`
     `--with-libpcap-libraries=/root/pcap/lib`

   - `make`

   - `make install`

6. Run the following code to make sure SNORT links the correct libpcap version in the specified path before SNORT is executed.
   `export LD_LIBRARY_PATH=/root/pcap/lib:$LD_LIBRARY_PATH`
7. Run `ldd /root/snort/bin/snort`. The full path to `libpcap.so` is displayed.
   If `/root/pcap/lib/libpcap.so` is displayed the correct version of libpcap is used.

Installing Tcpdump

Tcpdump uses statically linked libpcap libraries.

Endace recommends Tcpdump to be configured with the DAG enabled libpcap libraries installed in a non-default location.

1. Unpack `tcpdump-x.x.x.tar.gz`
2. Create a folder into which Tcpdump will be installed.

    In the following example the `/root/tcpdump` folder is used.
3. Run the following commands, (each bullet point is a new line)

    - ```
      ./configure --prefix=/root/tcpdump
      CPPFLAGS=-I/root/pcap/include/
      LDFLAGS=-L/root/pcap/lib
      ```
    - `make`
    - `make install`
4. Run the following code to check that tcpdump is linked with the appropriate version of libpcap
    ```
    /root/tcpdump -help
    ```
    The version of libpcap used by Tcpdump is displayed on screen.

Installing Tcpreplay

Tcpreplay uses statically linked libpcap libraries.

Endace recommends Tcpreplay to be configured with the DAG enabled libpcap libraries installed in the **default** location.

1. Unpack `tcpreplay-x.x.x.tar.gz`
2. Create a folder into which Tcpreplay will be installed.

    In the following example the `/root/tcpreplay` folder is used.
3. Run the following commands:

    - `./configure --prefix=/root/tcpreplay`

      After `./configure` has run the version of libpcap used is displayed on screen.
    - `make`
    - `make test`
    - `make install`

    Tcpreplay is now installed into `/root/tcpreplay`

Installing Wireshark / Tshark

Wireshark for Windows

Wireshark is a GUI based program, installed using an installation wizard. Winpcap libraries are installed as part of the Wireshark installation.

Wireshark / Tshark for Linux systems

Tshark is the console version of Wireshark and is designed to be run on the command line. Tshark is installed as part of the Wireshark package.

Tshark uses statically linked libpcap libraries.

Tshark has many dependencies that it needs to compile properly. These dependencies are various libraries that have to be installed in default locations for Tshark to link to them.

Endace recommends Tshark to be configured with the DAG enabled libpcap libraries installed in the **default** location.

1. Unpack wireshark-x.x.x.tar.gz.
2. Run the following commands to compile Tshark:
   - `./configure`
   - `make`
   - `make install`

   If Tshark does **not** compile properly there will be libraries missing. After compiling has failed the libraries needed are listed on screen.

   - Download and install the missing libraries using the following commands:
     ```
     apt-get install libgtk2.0-dev libpango1.0-dev libcairo2-dev libx11-dev
     libxext-dev libxinerama-dev libxi-dev libxrandr-dev libxcursor-dev
     libxfixes-dev libxdmcp-dev libxft-dev
     ```
   - Recompile using step 2.
3. Run the following command to check that Tshark can communicate with the installed DAG card(s):
   - `tshark -D`

   The following is displayed on screen:
   ```
   1. dag0
   2. dag0:0
   3. eth1
   4. any (Pseudo-device that captures on all interfaces)
   5. lo
   ```

Installing CoralReef

Installing CoralReef without libpcap

This method of installation links CoralReef to the DAG libraries. This method allows CoralReef to access full ERF metadata and high resolution timestamps.

CoralReef can read data from DAG cards and DAG files natively using the DAG API via libdag.

1. Unpack `coral-x.x.x.tar.gz`
2. Run the following commands:
   - `./configure --with-dag =/usr/local/`
   - `make`
   - `make install`

   CoralReef is now installed.

Example : usage for DAG 4.5G2 (dag2)

```
/crl_rate /dev/dag2 –C"iomode=proto=Ethernet,nif=2,first=110,varlen"
```

Version History

Version	Date	Reason
1	December 2007	First release.
2	February 2008	Added CoralReef section.