

# How to Install JPCap on Linux

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In this tutorial I will describe how to install JPCap from source code on Linux (Ubuntu 7.10 or Debian 4.0).

JPCap is an open-source Java library released under the GNU LGPL and designed to enable the capturing and sending network packets in Java. JPCap is developed by Keita Fujii and the University of California and Irvine.

The JPCap home page is <http://netresearch.ics.uci.edu/kfujii/jpcap/doc/>

JPCap is a Java Native Library Implementation (JNI) of the popular libpcap library and should therefore work on any OS which supports libpcap. libpcap is a user-level packet capture library that provides a common, system-independent API for low-level network monitoring. libpcap is also open-source software developed and maintained by TCPDump.org.

We will use JPCap and libpcap on the Linux operating system but the both libraries work on Microsoft Windows (WinPcap), Linux, FreeBSD, and Mac OS X.

JPCap supports the following types of network data:

Layer 2:	Ethernet Datagrams
Layer 3:	IPv4 & IPv6    ARP/RARP TCP, UDP and ICMPv4.

JPCap recognizes the packet types enumerated above but can capture any type of network traffic as a raw packet (i.e., as an instance of the Packet class) which contains the Packet's whole data. This feature allows Java applications to analyze any packet type.

## Step 1:     **Preparing the System**

Following are instructions to install JPCap on a fresh installation of Ubuntu 7.10 or Debian 4.0.

Install the necessary development software packages to create a usable development environment:

Install the GNU compiler and basic libraries  
`% sudo apt-get install build-essential`

Install the linux pcap library  
`% sudo apt-get install libpcap0.8`

Install the Java SDK from Sun  
`% sudo apt-get install sun-java6-sdk`

Download the JPCap source and extract it into your working directory  
<http://netresearch.ics.uci.edu/kfujii/jpcap/jpcap-0.7.tar.gz>

## Step 2: Building & Installing the JPCap JNI library

In a terminal window, navigate to the [jpcap]/src/c directory. For example:  
~/jpcap-0.7/src/c

[IMPORTANT] Edit the JAVA\_DIR Makefile entry to point to your version of jni.h  
You can find it quickly with the following command:  
\$ find /usr -name jni.h  
/usr/lib/jvm/java-6-sun-1.6.0.03/include/jni.h

The Makefile should then read  
JAVA\_DIR = /usr/lib/jvm/java-6-sun-1.6.0.03

In the terminal window under the [jpcap]/src/c directory type make to create the shared library  
\$ make  
This will create the file 'libjpcap.so'.

Copy 'libjpcap.so' your system's Java JNI library directory  
'[Java-dir]/jre/lib/<arch>' where <arch> is either 'i386' or 'sparc'.  
For my installation, this was /usr/lib/jvm/java-6-sun/jre/lib/i386  
Another option is to copy the library to the directory where your application is located.

## Step 3: Building and Installing the JPCap JAR file

In a terminal window, navigate to the [jpcap]/src/java directory. For example:  
~/jpcap-0.7/src/java  
There should be one subdirectory named 'jpcap'

Compile all of the .java files in the 'jpcap' and 'jpcap/packet' directories.  
\$ find . -name "\*.java" -exec javac {} \;

You may see the following error for IPPacket.java - ignore it.  
"Note: ./jpcap/packet/IPPacket.java uses unchecked or unsafe operations."

Create the JAR file  
jar -cf jpcap.jar jpcap

Confirm the contents of your JAR file with the following command:  
jar -tvf jpcap.jar

Copy the new jpcap.jar file to your Java extensions directory  
\$ cp jpcap.jar '[Java-dir]/jre/lib/ext/  
For my installation, this was /usr/lib/jvm/java-6-sun/jre/lib/ext  
Another option is to copy the JAR file to your application's directory and add it to your  
CLASSPATH.

You are now ready to begin using the JPCAP Java Native Interface Library.