

**WANPIPE™**

**Multi-protocol WANPIPE™ Driver**

**for**

**FreeBSD Operating System**

**INSTALLATION GUIDE**

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# CONTENTS

<b><u>INTRODUCTION.....</u></b>	<b><u>3</u></b>
<b><u>INSTALLING WANPIPE DRIVER PACKAGE.....</u></b>	<b><u>4</u></b>
<b>OBTAINING THE WANPIPE SOFTWARE.....</b>	<b>4</b>
<b>INSTALLING WANPIPE PACKAGE .....</b>	<b>4</b>
<b>REMOVING WANPIPE PACKAGE.....</b>	<b>5</b>
<b>DISPLAYING PACKAGE INFO .....</b>	<b>5</b>
<b>PACKAGE COMPONENTS .....</b>	<b>6</b>
<b>CONFIGURE FREEBSD KERNEL .....</b>	<b>7</b>
<b>DEVICE DRIVER CONFIGURATION VARIABLES .....</b>	<b>8</b>
<b>CREATE SANGOMA WANPIPE CUSTOM DISTRIBUTION PACKAGE .....</b>	<b>9</b>

# INTRODUCTION

The current manual describes how to install Sangoma WANPIPE and Sangoma WANPIPE (LITE) device driver for FreeBSD OS.

- Sangoma WANPIPE device driver for FreeBSD OS contains Sangoma drivers for S508/FT1 ISA and S514x PCI (S5141 1 CPU, S5142 2 CPUs, S5143 FT1, S5144 T1/E1, S5145 56K and S518 ADSL) cards. Protocols currently supported are Cisco HDLC, Frame Relay and Point-to-Point.
- Sangoma WANPIPE (LITE) device driver for FreeBSD OS contains Sangoma drivers for S508/FT1 ISA and S514x PCI (S5141 1 CPU, S5142 2 CPUs, S5143 FT1, S5144 T1/E1 and S5145 56K) cards. WANPIPE (LITE) attaches to kernel WAN stacks and supports Cisco HDLC and Point-to-Point protocol that implemented in a FreeBSD kernel.

Please note that this version contain number of changes to the card configuration process and debuggers.

*Conventions used in this Manual:*

Command line syntax conventions used are as follows:

- Command portion of the command line represented as normal text should be entered literally (exactly as printed).
- {argument} portion of the command line enclosed in curly braces represents variable name and should be submitted by the actual object name.
- [option] portion of the command line enclosed in square brackets is optional and can be omitted.

# INSTALLING WANPIPE DRIVER PACKAGE

## *Obtaining The Wanpipe Software*

Sangoma WANPIPE Drivers package can be downloaded from the Sangoma ftp site ([ftp://ftp.sangoma.com/FreeBSD/current\\_wanpipe](ftp://ftp.sangoma.com/FreeBSD/current_wanpipe)).

Note:

wanpipe-fbsd-2.4.13-b1.tgz	Sangoma WANPIPE device driver package supports FreeBSD-3.x/4.x/5.x releases.
wanpipe-lite-fbsd-1.1.1.tgz	Sangoma WANPIPE (LITE) device driver package supports FreeBSD-3.x/4.x/5.x releases.

It is recommended that a Sangoma Device Driver package be installed on a FreeBSD kernel that has no prior installation of Sangoma Device Drivers unless upgrading from an earlier version.

## *Installing WANPIPE package*

- All WANPIPE scripts must be run under bash (at least version 2.03) shell. (I suppose that bash shell locate in default directory /usr/local/bin directory).
- Make sure that you have a complete kernel source in your /usr/src/sys directory. A kernel source can be downloaded from [ftp.freebsd.org](ftp://ftp.freebsd.org).
- Make sure that your FreeBSD kernel has SPPP option enabled in a kernel configuration file (This option is required by WANPIPE (LITE) device driver).
- You can download package from Sangoma ftp site and then install WANPIPE package or you can install WANPIPE package from Sangoma ftp site.
- To install WANPIPE package previously downloaded from Sangoma ftp site, run follow command from directory where was WANPIPE package was copied:  
    `pkg_add wanpipe-fbsd-X.Y.Z.tgz` (WANPIPE device driver package)  
    or  
    `pkg_add wanpipe-lite-fbsd-X.Y.Z.tgz` (WANPIPE (LITE) device driver package)
- To install WANPIPE package directly from Sangoma ftp site, run follow command:  
`pkg_add -f ftp://ftp.sangoma.com/FreeBSD/current_wanpipe/wanpipe-[lite-]fbsd-X.Y.Z.tgz`
- `pkg_add` utility will execute the follow steps:
  1. Download the WANPIPE package (if you installing from Sangoma ftp site).

2. Unpack the WANPIPE package in /usr/local/wanpipe directory for WANPIPE device driver and in /usr/local/wanpipe-lite for WANPIPE (LITE) device driver.
3. Run *Setup* script (see description further).
- The *Setup* script performs the following steps:
  1. Would you like to install WAN Router now (Y|N)? – You can process all installation now or do this later by running ``Setup wanpipe POST-INSTALL``
  2. Would you like to copy WAN driver's files to kernel (Y|N)? – The Setup script will copy all necessary files to the appropriate directories.
  3. The Setup script will need verify kernel directory and kernel configuration name
  4. Set driver global variables? (Y|N) – Set global driver's variables such as enable/disable BPF, enable/disable ALTQ, enable/disable SPPP. The Setup script will ask to enable these features only if it enables in your kernel.
  5. Create Meta configuration file? (Y|N) – Create WANPIPE global configuration file (see Wanpipe configuration manual for more details) (only for WANPIPE device driver).
  6. Would you like to install WANPIPE start-up script? (Y|N) – You can set to start WANPIPE driver on start-up (only for WANPIPE device driver).
  7. Would you like to compile/install WANPIPE driver/utilities? (Y|N) – You can compile and install the WANPIPE driver/utilities now.
  8. Would you like to update kernel? (Y|N) – The Setup script can automatically update kernel configuration file. It will update kernel to support one ISA and one PCI card. If you are going to use more than one card, please duplicate corresponding line (change card index if it needs).
  9. Would you like to compile kernel? (Y|N) and Would you like to install new kernel? (Y|N) – The Setup script can compile and install new kernel if you need.

### ***Removing WANPIPE package***

- To remove the Sangoma WANPIPE package from the system, run the following command:

``pkg_delete wanpipe`` (for WANPIPE package)

``pkg_delete wanpipe-lite`` (for WANPIPE (LITE) package)

``pkg_delete wanpipe-custom`` (for WANPIPE custom package)

### ***Displaying package info***

- To display Sangoma package from the system, run the following command:

``pkg_info wanpipe`` (for WANPIPE package)

``pkg_info wanpipe-lite`` (for WANPIPE (LITE) package)

``pkg_info wanpipe-custom`` (for WANPIPE custom package)

- For example:

Information for wanpipe:

Comment:

Sangoma WANPIPE Device Driver for FreeBSD (version 2.4.13-b1).

Description:

This package contains the latest Sangoma drivers that supports following Sangoma cards under FreeBSD OS:

- S508 ISA card.
- S514x PCI cards: S5141 1 CPU, S5142 2 CPUs, S5143 FT1, S5144 T1/E1, S5145 56K, S5147 T1/E1 2 CPUs.
- S518 ADSL PCI card.

The current version wanpipe-fbsd-2.4.13-b1 supports following protocols:

- Cisco HDLC, Frame Relay and Point-to-Point (for S508 and S514x cards)
- PPPoE and PPPoA (for S518 ADSL card).

Release date:

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## ***Package Components***

- WANPIPE Driver package includes the following components:

Description	Original location (/usr/local/wanpipe/)	Destination
Driver installation script	Setup	None
Driver configuration script	scripts/wancfg	/usr/sbin/wancfg
Driver FT1 configuration script	scripts/wanpipe_cfgft1	/usr/sbin/wanpipe_cfgft1
Driver WANROUTER scripts	scripts/wanrouter	/usr/sbin/wanrouter
Driver configuration libraries	lib/*	/etc/wanpipe/lib/*
Driver sample configuration files	samples/*	/etc/wanpipe/samples/*
Firmware files for WANPIPE cards	firmware/*	/etc/wanpipe/firmware/*
Driver source files	wanpipe/*	None

	wanrouter/*	None
	sdladv/*	None
Driver header files	include/*	/usr/include/net/*
WANPIPE configuration utility	wantools/wanconfig	/usr/sbin/wanconfig
WANPIPE diagnostic utilities		
Frame Relay Monitor	wantools/fpipemon	/usr/sbin/fpipemon
Cisco HDLC Monitor	wantools/cpipemon	/usr/sbin/cpipemon
Point-to-Point Monitor	wantools/ppipemon	/usr/sbin/ppipemon
Adapter's Memory Viewer	wantools/sdladump	/usr/sbin/sdladump
API sample programs	wantools/api	

- WANPIPE (LITE) Driver package includes the following components:

Description	Original location (/usr/local/wanpipe-lite)	Destination
Driver installation script	Setup	None
Driver scripts	scripts/wanlite	/usr/sbin/wanlite
Driver sample configuration files	samples/*	/etc/wanpipe/samples/*
Driver source files	sources/wanpipe/*	None
Driver header files	include/*	/sys/net/*
WANPIPE (LITE) config script	source/util/wanhdlc	/usr/sbin/wanhdlc
WANPIPE (LITE) diagnostic utilities	source/util/wanutil	/usr/sbin/wanutil
Adapter's Memory Viewer	Source/util/sdladump	/usr/sbin/sdladump

### ***Configure FreeBSD kernel***

- Add driver source file to the kernel files list, which is /usr/src/sys/conf/files.i386 for FreeBSD-4.x/5.x or /usr/src/sys/i386/conf/files.i386 for FreeBSD-3.x. Add the following definition line into the list (it's stored alphabetically, so insert it appropriately):

```
i386/isa/sdla_dev.c  optional    sdla    device-driver  (for FreeBSD-3.x)
i386/isa/sdla_dev.c  optional    sdla                                (for FreeBSD-4.x/5.x)
```

- Add board probe entries into kernel configuration file which sits in /usr/src/sys/i386/conf. For each S508 board you want to use add the following configuration line:

```
device sdla0 at isa? port 0x360 irq 11 iomem 0xD2000 iosiz 0x2000
```

(For unit 1 it should be device sdla1... of course). Change the entry resources as required. See notes at the end of this document for the list of possible I/O port, IRQ and shared memory values.

For each S514 board you want to use add the following configuration line:

```
device sdla1 at pci?                (for FreeBSD-2.x/3.x/4.x)
device sdla                          (for FreeBSD-5.x)
```

- Build a new kernel using this configuration. Assuming your configuration file is called MYKERNEL do the following:

```
cd /usr/src/sys/i386/conf
config MYKERNEL
cd ../../compile/MYKERNEL (for FreeBSD-2.x/3.x/4.x)
cd ../../compile/MYKERNEL (for FreeBSD-5.x)
make depend
make
cp /kernel /kernel.b4.wanpipe<-- save a copy of current kernel
make install
reboot
```

And there you have it!

On startup the kernel will probe the configuration boards and will tell you whether it found it or not. If you missed this message on the boot time you can always view them with `dmesg` command or by taking a look at /var/log/messages files.

If a board is not found by the driver/kernel but it's actually plugged into machine then the most likely problem is that the I/O port address is incorrect. Make sure that the settings in your kernel configuration file correspond to the jumper settings on the board (see notes).

### ***Device driver configuration variables***

- Changing one of the following variables requires to re-compile WANPIPE modules/utilities.
- Device driver configuration variable (all variables located in wanpipe\_config.h file):  
*CONFIG\_WANPIPE\_ROUTERS* - Defined maximum number of running routers.  
*NBPFILTER* - If this variable is set to 1, Berkley Packet Filtering supported. Define this variable when you are going to use wanpipe device as API.

*ALTQ* – Define this variable to enable supporting Alternate Queuing (ALTQ) by this driver.

*SPPP* – This variable allow to driver to use kernel SPPP.

### ***Create Sangoma WANPIPE Custom distribution package***

- Sangoma WANPIPE package allows you to create custom distribution package with all pre-compiled WANPIPE modules/utilities. This feature allows you to install the Sangoma WANPIPE driver to production system without copying all WANPIPE source (only if both system has the same FreeBSD kernel).
- Before creating WANPIPE custom distribution package, compile all WANPIPE modules and utilities.
- To create WANPIPE custom distribution package, execute follow command from /usr/local/wanpipe or /usr/local/wanpipe-lite directory:

`./Setup wanpipe custom <WANPIPE custom distribution package name>`

- After running previous command, the file <WANPIPE custom distribution package name>.tgz can be found under /usr/local/wanpipe or /usr/local/wanpipe-lite directory.
- To install WANPIPE custom distribution package, follow the same steps as to install original Sangoma WANPIPE package (see above).