Wireless Networking

Using GenMAC with Supported and Unsupported Hardware

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Who Am I?

- Principal, Rosenthal & Rosenthal, LLC
- Network consultant since 1987
- Novell certified since 1998
- Certifications include CNA, CLE, and CLP
- Presented at Warpstock 2003-2007

Overview: What is GenMAC?

- Generic network card driver
- Two modes of operation: Wrapper & Native
- Wrapper mode "wraps" around an existing Win32 device driver, translating various Win32 APIs to OS/2 APIs
- Implements further Win32 APIs which do not exist in OS/2 (e.g., NDIS5)
- Completely replaces the need for a native OS/2 device driver
- Native mode provides a real OS/2 driver

Overview: History of GenMAC

- 2005: GenMAC 1.00 - 21 NICs; no wireless encryption support
- 2006: GenMAC 2.00 - >40 NICs; WEP 64, WEP 128, WPA, WPA2 (via included supplicant)
- 2007: GenMAC 2.20 - ~50 NICs; WarpIn install; re-worked NetBIOS and NetBIOS over TCP/IP; early support for ACPI (and APM) suspend/resume

Hardware Architectures

- 32-bit NICs ONLY
- PCI
- MiniPCI
- PCI-eXpress
- MiniPCI-eXpress
- CardBUS (*if* recognized/integrated by CBEnabler)

Hardware Architectures

- 16-bit NICs DO NOT WORK
- ISA – NO
- PCMCIA – NO
- USB – NO (in the future, perhaps)

PROTOCOL.INI

[W8086X4224_nif]   Driver section

    DriverName = WRND32$ Name of driver in memory
    VENDOR = 0x8086   PCI vendor ID string (Intel)
    DEVICE = 0x4224   PCI device ID string (unique)
    NDIS_SYS = "W29N51.SYS"   Binary driver (.sys file)
    NDIS_INF = "W29N51.INF"   Information (.inf file)
    SSID = "ANY"   Wireless SSID (unimportant)
    DEBUGLEVEL = "NONE"   Useful for troubleshooting
    OPTIONS = "NONE"   Shrouded in mystery...

DEBUGLEVEL

- NONE or NO
- ALL

- ALL,VIDEO1
- ALL,PORT

- (default)
- Dump to disk with "type wrnddb$ > *x*:\genmac.log"
- Log to screen
- Log to COM1 (add "CALL=*x*:\OS2\MODE.COM COM1" to CONFIG.SYS)

DEBUGGING NOTES

- VIDEO1 and/or PORT are useful when experiencing traps before IPL is finished
- All DEBUGLEVEL options except NONE (or NO) will negatively impact performance

OPTIONS

- NONE or NO
- LOADONLY

- UNSUPPORTED

- NATIVE

- (default)
- Only load the driver; do not initialize (pre-testing)
- Driver will accept an otherwise unrecognized (custom) PCI ID string & Win32 driver set
- Use native mode

A WORD ABOUT OPTIONS

Much discussion has been made about OPTIONS in the past. Many params have been deprecated (e.g., STACK32). The ones listed here are current as of GenMAC 2.20 (as vaguely documented), and subject to change.

LOG FILE & DRIVER INFO

- *x*:\IBMCOM\LANTRAN.LOG – logs network/card activity
- TYPE wrnd32$ (or wrnd322$, etc.) - dumps current driver info, including PciVendor, PciDevice, SysName, InfName, PciBus, PciSlot, InterruptLevel, etc.

MORE DETAIL

- DEBUGLEVEL = "ALL" (PROTOCOL.INI)
- REBOOT(!)
- Immediately following IPL, from a prompt, enter:
  TYPE wrnddb$ > genmac.log
- Most useful to Willibald, et al.

INSTALLATION: COMMON

- Prerequisites:
  - NIC(!)
  - PCI ID(s) of installed card(s)
  - Access to http://genmac.netlabs.org to download GenMAC & driver package(s)
  - Latest WarpIn from http://warpin.netlabs.org

INSTALLATION: COMMON

1. Download GenMAC base driver package from:
   http://genmac.netlabs.org/en/site/downloads.xml
2. Download GenMAC additional driver pack for your card (or ASIC) manufacturer (3Com, Atheros, Intel, etc.) from the same page (base driver package will sniff this if you don't know!)
3. Install base driver package
4. Install additional driver pack(s)
5. Reboot!!

INSTALLATION: UNSUPPORTED CARD

- Prerequisites:
  - Base driver package
  - Windows 2000/XP (NT 5.x) registry export for the Windows driver
  - Windows driver file (*xxxxxxx*.sys)
  - WFFF1xFFF1.NIF (available upon request) OR another .NIF to modify

INSTALLATION: UNSUPPORTED HARDWARE

1. Edit NIF as required
2. Create necessary directories for SYS & REG files
3. Install NIC via MPTS or manually
4. Set UNSUPPORTED option in PROTOCOL.INI
5. Reboot!

Assisting the Project

- Feedback: report working & non-working hardware
- Hardware: supply or contribute to funding to acquire new hardware
- Coding: NONE!!! Willibald is a Renaissance Man...

UTILITIES

- XWLAN - http://wlan.netlabs.org
- Command line – bundled with basic package

XWLAN

- eWPS/xWPS widget or standalone
- Includes WPA supplicant
- Manages multiple profiles
- Manages radio on/off
- Reports signal status
- Lists available hotspots

COMMAND LINE TOOLS

- SCAN.EXE: activates radio, scans for visible (beaconing) APs
- SSID.EXE: sets SSID & WEP key (no WPA support)
- LINK.EXE: displays detailed connection status
- DIS.EXE: disconnects/deactivates radio
- DEFAULT.EXE: resets NIC to defaults
- WPA_SUPPLICANT.EXE: sets SSID and
- WPA/WPA2 passphrase

QUESTIONS?