

GenMAC 2.1

GenMAC 2.1 Current Status of the Development

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GenMAC 2.1

Introduction

- GenMAC is a universal network card driver that emulates parts of MS Windows to be able to use standard 32-bit Windows network card drivers on OS/2.
- This "wrapper" called function translates some Windows-APIs to the corresponding OS/2-APIs and implements a lot of other Windows-APIs that does not exist in OS/2. This allows also to use very time critical routines in Win-drivers.
- It is not possible to support really every Windows-API, so there always will be some nics that can not be supported by GenMAC at all.

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Introduction

- First version of GenMAC v 1.00 was published in 2005 and supported 21 nics without encryption or with WEP which is quite useless nowadays.
- GenMAC 2.00, released end of 2006 supported more than 40 nics and also up-to-date encryption WPA/WPA2 with command line tools or with XWLAN 3.0.

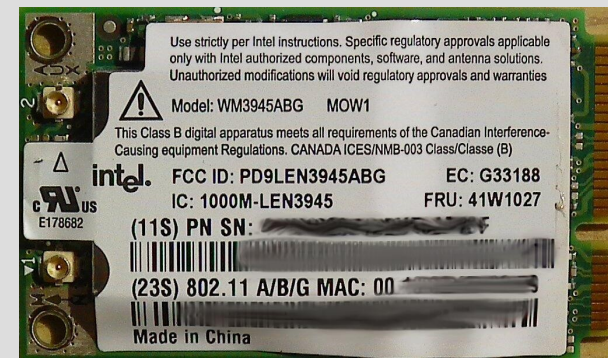
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Supported Hardware

- GenMAC only supports 32-bit nics that are connected via PCI, MiniPCI, PCI-express or MiniPCI-express.



Intel PRO/Wireless 2915abg MiniPCI



Intel PRO/Wireless 3945abg MiniPCI-E

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Supported Hardware

- 32-bit CardBus-cards may also work if they are correctly integrated with Veits CBEabler.
- ISA- or PCMCIA/PC-Card-Adapter (16 bit) are NOT supported at all, same is true for some old 11 MBit/s-cards even if they come as MiniPCI card (f.ex. Prism 2.5) because they are not fully PCI-compatible.
- The support of USB network adapters is not included yet, because the implementation of USB in OS/2 has some design flaws that make it hard to get it working
 - a future version GenMAC may support USB too.

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What is new in GenMAC 2.1

- Support for more than 50 nics, including (Mini)PCI-express and gigabit nics like: Intel PRO/Wireless 3945ABG, Intel PRO/Wireless 4965AGN, several PCI-E Intel PRO/1000 Gigabit, nForce 4 and nForce 5.
- "NATIVE"-mode that supports some Intel- and NVidia-nics with a native OS/2-driver, especially the support of newer NVidia-nics was not possible in wrapper-mode.
- Support for plain NetBIOS, up to version 2.0 it was not usable because of a bug in the implementation.

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What is new in GenMAC 2.1

- Support for Windows-registry exports in a REG-file instead of generating a INF-file for use. This simplifies the support of new nics.
- Some basic support for suspend/resume with ACPI 3.0 on modern systems (works NOT yet in native-mode).
- "UNSUPPORTED"-mode, that allows to use nics that are currently not supported by GenMAC on your own risk and without any support!
- Extending the driver, fixing of several bugs.

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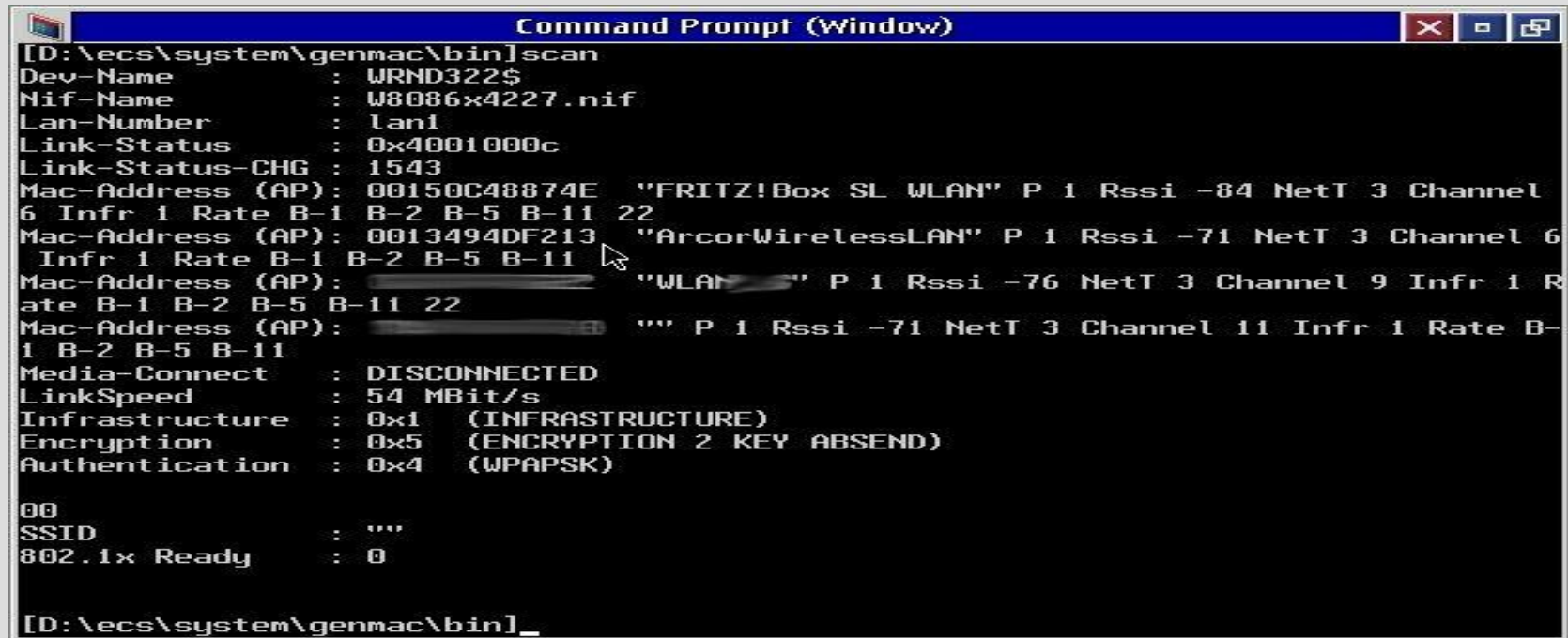
Installation GenMAC 2.1

- An updated installation-package of the release version of GenMAC 2.1 for installing or for upgrade from older drivers will be available soon.
- Current test-packages are available on request only for experienced users and need to be installed manually.

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Command line tools

- The command line tools are located in the bin-directory of GenMAC and are very useful for debugging.
 - scan.exe: Activates the radio of a wireless nic, scans for available, not hidden wireless access points.



```
[D:\ecs\system\genmac\bin]scan
Dev-Name       : WRND322$
Nif-Name       : W8086x4227.nif
Lan-Number     : lan1
Link-Status    : 0x4001000c
Link-Status-CHG : 1543
Mac-Address (AP): 00150C48874E "FRITZ!Box SL WLAN" P 1 Rssi -84 NetT 3 Channel
6 Infr 1 Rate B-1 B-2 B-5 B-11 22
Mac-Address (AP): 0013494DF213 "ArcorWirelessLAN" P 1 Rssi -71 NetT 3 Channel 6
Infr 1 Rate B-1 B-2 B-5 B-11
Mac-Address (AP): "WLAN" P 1 Rssi -76 NetT 3 Channel 9 Infr 1 R
ate B-1 B-2 B-5 B-11 22
Mac-Address (AP): "" P 1 Rssi -71 NetT 3 Channel 11 Infr 1 Rate B-
1 B-2 B-5 B-11
Media-Connect  : DISCONNECTED
LinkSpeed      : 54 MBit/s
Infrastructure : 0x1 (INFRASTRUCTURE)
Encryption     : 0x5 (ENCRYPTION 2 KEY ABSEND)
Authentication : 0x4 (WPAPSK)

00
SSID          : ""
802.1x Ready  : 0

[D:\ecs\system\genmac\bin]_
```

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Command line tools

- ssid.exe: Sets the SSID and if necessary the WEP-key.
- link.exe: Shows you more detailed informations about the current link-status of you nic.



```
Command Prompt (Window)
[D:\ecs\system\genmac\bin]link
Device-Name      : W8086x109A.nif
Lan-Number       : lan2
Link-Status      : 0x4001000b
Link-Status-CHG : 1
Media-Connect    : CONNECTED
LinkSpeed        : 1000 MBit/s

Device-Name      : W8086x4227.nif
Lan-Number       : lan1
Link-Status      : 0x4001000c
Link-Status-CHG : 1547
Media-Connect    : DISCONNECTED
LinkSpeed        : 54 MBit/s

[D:\ecs\system\genmac\bin]
```

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Command line tools

- `dis.exe`: Disconnects the nic from the access point, may turn of the radio on some nics.
- `default.exe`: Resets the WLAN device to default.
- `wpa_supPLICANT.exe`: Sets SSID and key for the WPA/WPA2-encryption, this is included in XWLAN.

After you are connected with an access point you also have to configure TCP/IP for your wireless nic.

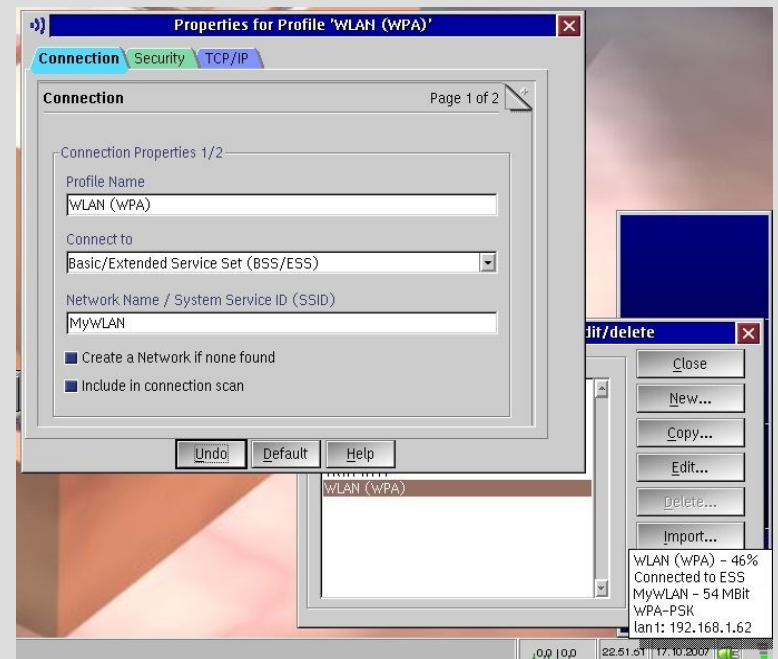
Please use XWLAN for standard configuration if you are not debugging. For further information about this, read the GenMAC-/XWLAN-documentation.

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Wireless LAN Monitor XWLAN

- The Wireless LAN Monitor is a comfortable GUI-application for:
 - Status of your WLAN connection.
 - Managing WLAN profiles.
 - Setting encryption for WLAN.etc.

Please use always WPA/WPA2 if setting up a wireless LAN, WEP is totally useless as encryption and can be cracked in minutes!



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Advanced use for testing

- PROTOCOL.INI:
 - The settings will be done during installation and only have to be changed by experienced users for debugging purpose!
 - Example for Intel PRO/1000 PL Gigabit nic:

```
[W8086x109A_nif]
DriverName = WRND32$ (1st), WRND322$ (2nd)
VENDOR = 0x8086
DEVICE = 0x109A
NDIS_SYS = "E1E5132.SYS"
NDIS_INF = "E1E5132.REG"
DEBUGLEVEL = "NONE"
OPTIONS = "NONE"
```

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Advanced use for testing

- `DEBUGLEVEL` :
 - "NONE" or "NO": For no debugging (default).
 - "ALL": For creating a debug-log that can be copied to a textfile with `type wrnddb$ >genmac.log` after finished booting.
 - "ALL,VIDEO1": The debug-informations will be written on the screen.
 - "ALL,PORT": With `CALL=\os2\mode.com COM1 . . .` in the `CONFIG.SYS` the debug-output will be written to first serial port.

Use the parameters "VIDEO1" or "PORT" if the system traps before finishing loading the os, all debug-parameters may reduce the network performance!

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Advanced use for testing

- OPTIONS :
 - "NONE " or "NO " : For no options (default).
 - "LOADONLY " : The driver will only be loaded without initialising any hardware, useful for pre-testing.
 - "UNSUPPORTED " : Sets the driver in a special mode where you can enter custom vendor-/device-id and Windows-driver/reg-file.

Other options will be obsolete in future, so please don't use them anymore!

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Advanced use for testing

- Usefull log-files from OS/2 and GenMAC:
 - Informations if the driver(s) and protocols loaded successfully:
`type lantran.log`
 - Status-informations for the loaded GenMAC-drivers:
`type wrnd32$ (for the first nic)`
or
`type wrnd322$ (for the second nic)`

You will get informations for the loaded driver like
PciVendor, PciDevice, SysName, InfName,
PciBus, PciSlot, InterruptLevel and other.

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Advanced use for testing

- Create a debug-log with GenMAC:
 - In PROTOCOL.INI set DEBUGLEVEL = "ALL" for the nic you have problems with, then reboot your system.
 - BEFORE generating any network traffic (logon, ping etc.) open a OS/2-command-line and enter:

```
type wrnddb$ >genmac.log (for the first nic)
```

or

```
type wrnddb2$ >genmac.log (for the second nic)
```

ZIP this log-file and send it to us.

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Using unsupported adapters

- Pre-testing new nics with the “UNSUPPORTED”-option:
 - Preliminary note:

GenMAC only supports a small set of the Windows-APIs under special conditions, so if a new driver comes out it probably will use different, not supported APIs and/or different timing-parameters and will fail with the current GenMAC-driver!

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Using unsupported adapters

- Include a new, unsupported device in GenMAC:
 - GenMAC 2.1 has to be installed correctly.
 - Get the Windows-driver and registry-export from your Windows XP/2000-installation.
 - Get the “WFFF1xFFF1”-NIF (ONLY available on request and MUST NOT be distributed), adjust all values according to your new nic and driver.
 - Create needed directories similar to the available ones and put the SYS-, REG- and NIF-files in there.
 - Install the new adapter using MPTS or install it manually.
 - In the `PROTOCOL.INI` set `DEBUGLEVEL = "NONE"` or `"ALL"`, set `OPTIONS = "UNSUPPORTED"`.

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Using unsupported adapters

- Reboot your system and hope ...
- If it works be happy and please report it in the genmac-user-group, if not "bad luck" and don't expect any support for this feature!

IMPORTANT: This mode even can make your system unusable, so use it only if you have a backup of your system, if you have a different boot-system (CD, recovery-partition etc.) and if you know what you are doing!

And please don't blame us if it is not working - this is a "NOT supported" feature ONLY for experienced users!

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Testing the throughput

- Some benchmark-results with NetIO from Kai Uwe Rommel:
 - Server:
IBM NetFinity 3500-M20, Intel PRO/1000 PCI-X, ACP2R
 - Client 1:
IBM ThinkPad T40,
Intel PRO/1000 MT Mobile (8086:101E, OS/2-driver),
Intel PRO/Wireless 2915ABG MiniPCI (8086:4223,
GenMAC 2.1), MCP2R
 - Client 2:
IBM ThinkPad T60,
Intel PRO/1000 PL Gigabit (8086:109A, GenMAC 2.1),
Intel PRO/Wireless 3945ABG MiniPCI-E (8086:4227,
GenMAC 2.1), eCS20rc1

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Testing the throughput

- Client 1, LAN 100 Mbit/s-connection:

Packet size 1k bytes: 10904 KByte/s Tx, 10791 Kbyte/s Rx

...

Packet size 32k bytes: 10911 KByte/s Tx, 10406 Kbyte/s Rx

- Client 1, LAN 1000 Mbit/s-connection:

Packet size 1k bytes: 32995 KByte/s Tx, 35319 KByte/s Rx

...

Packet size 32k bytes: 39550 KByte/s Tx, 42394 KByte/s Rx

- Client 1, WLAN 54 MBit/s-connection, 30%-50% signal:

Packet size 1k bytes: 1824 KByte/s Tx, 777 KByte/s Rx

...

Packet size 32k bytes: 1272 KByte/s Tx, 550 KByte/s Rx

- Client 1, WLAN 54 MBit/s-connection, >80% signal:

Packet size 1k bytes: 2458 KByte/s Tx, 2224 KByte/s Rx

...

Packet size 32k bytes: 2444 KByte/s Tx, 2624 KByte/s Rx

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Testing the throughput

- Client 2, LAN 1000 Mbit/s-connection:

```
Packet size 1k bytes: 34707 KByte/s Tx, 34402 KByte/s Rx
Packet size 2k bytes: 35713 KByte/s Tx, 37282 KByte/s Rx
Packet size 4k bytes: 36505 KByte/s Tx, 38717 KByte/s Rx
Packet size 8k bytes: 37538 KByte/s Tx, 41230 KByte/s Rx
Packet size 16k bytes: 35655 KByte/s Tx, 41792 KByte/s Rx
Packet size 32k bytes: 35290 KByte/s Tx, 40352 KByte/s Rx
```

- Client 2, WLAN 54 MBit/s-connection, >80% signal:

```
Packet size 1k bytes: 2621 KByte/s Tx, 1929 KByte/s Rx
Packet size 2k bytes: 2625 KByte/s Tx, 2283 KByte/s Rx
Packet size 4k bytes: 2252 KByte/s Tx, 2642 KByte/s Rx
Packet size 8k bytes: 1270 KByte/s Tx, 1901 KByte/s Rx
Packet size 16k bytes: 1972 KByte/s Tx, 1503 KByte/s Rx
Packet size 32k bytes: 2616 KByte/s Tx, 1289 KByte/s Rx
```

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Future of GenMAC

- Future development of GenMAC:
 - In the past Willibald was always able to get working all hardware he got provided or sponsored quite fast and will do so also in the future!
 - Most of the supported (Mini)PCI-cards (at about 30 nics) Willibald owns and bought by himself - so if you really need support for a new card, you may ask if it makes sense that he get hands on the hardware!

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Future of GenMAC

- It is mostly NOT possible to support hardware Willibald does not have physical access to.

A good example was the 3945abg where it was not possible to get it running over month with tons of log-files and really cooperative users - he send me a first e-mail using this nic 2 days after he installed it in his laptop!

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Future of GenMAC

- Further development:
 - It is important that we get feedback from the users, please don't expect that you always will get any reaction from us!
 - In the past we often send a new driver to users and never got any response if they had success or not.
This makes bug-fixing or enhancement impossible!

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Links/Contact

- GenMAC is maintained and distributed by netlabs.org:
<http://genmac.netlabs.org/>
- If you need help for GenMAC itself please check the GenMAC-mailing-list at Netlabs.org:
<http://news.gmane.org/gmane.org.netlabs.genmac.user/>
- If you can't find any solution for your problem subscribe the list "genmac-user@netlabs.org" and ask there.
Please DO NOT write an e-mail to the developer or to me if you need personal support!

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Links

- If you have problems with connecting to a WLAN, with TCP/IP-configuration, encryption etc. the WLAN-mailing-list might be the better place to search and ask for:
<http://news.gmane.org/gmane.org.netlabs.wlan.general/>
- The listname for this group is "wlan-user@netlabs.org".
- Wireless LAN Monitor by Christian Langanke (netlabs.org):
<http://wlan.netlabs.org/>
- WPA Security with Wireless LAN Monitor by C. Langanke:
<http://www.clanganke.de/os2/pres/wse2006/lan01/index.html>

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Links

- Craig Hart's PCI+AGP bus sniffer for OS/2 (compiled by Veit Kannegieser), up-to-date pcidevs.txt:
<http://kannegieser.net/veit/programm/pci104vka.arj>
<http://members.datafast.net.au/dft0802>
- Support for 32-bit CardBus-nics with OS/2 by Veit Kannegieser:
http://kannegieser.net/veit/test/pciconf_test.zip
http://kannegieser.net/veit/test/cbenable_test.zip

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Credits

I would like to thank Willibald Meyer very much
for the great work he is doing with
the GenMAC-driver for OS/2
giving it away for free!

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Thanks
for your attention!