

Porting Minix3 to x86-based platforms

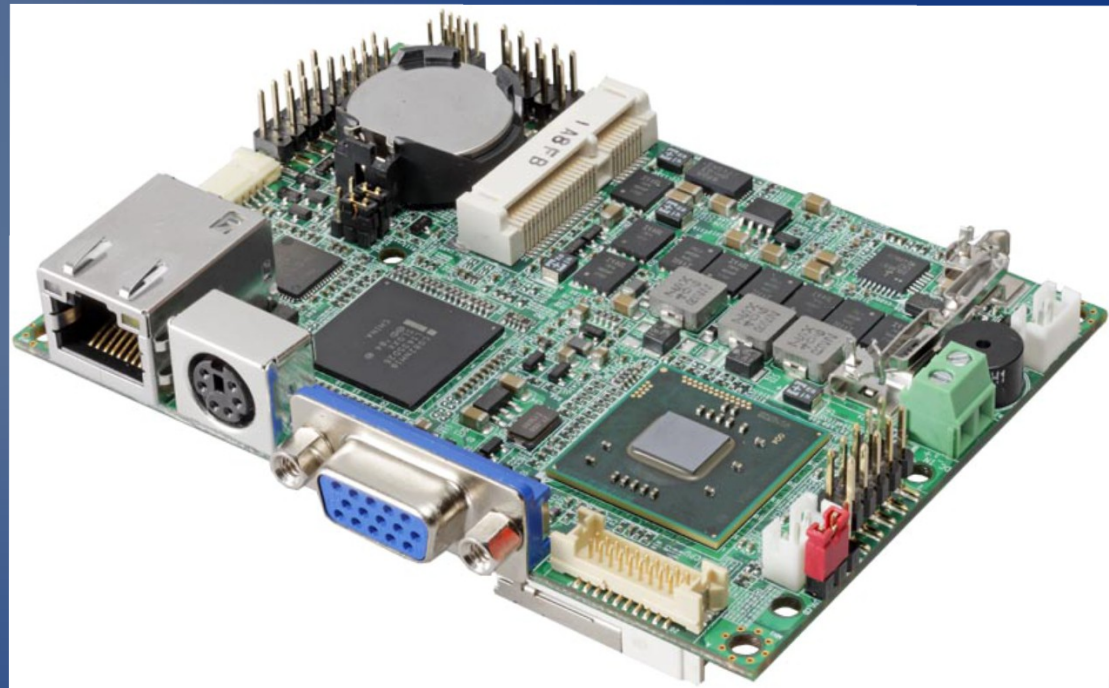
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How to install Minix3

- "Official" approach
 - Take an ISO and use an ATAPI/SATA optical drive
- Our approach
 - Use the image being generated by `x86_hdimage.sh`
 - Image was initially meant for QEMU only
 - Contained no boot loaders
 - Status today: the image is bootable!
- Time to make it an “official” alternative
 - Nice side effect: Boot the ramdisk via USB!

LP-172

- Intel NM 10 express chipset
- Atom D2550 (64bit, 2 core)
- Up to 4 GB RAM
- Intel 82583V LAN
- VGA, SATA
- serial port, (U|E)HCI, PS/2
- 100mm x 72mm

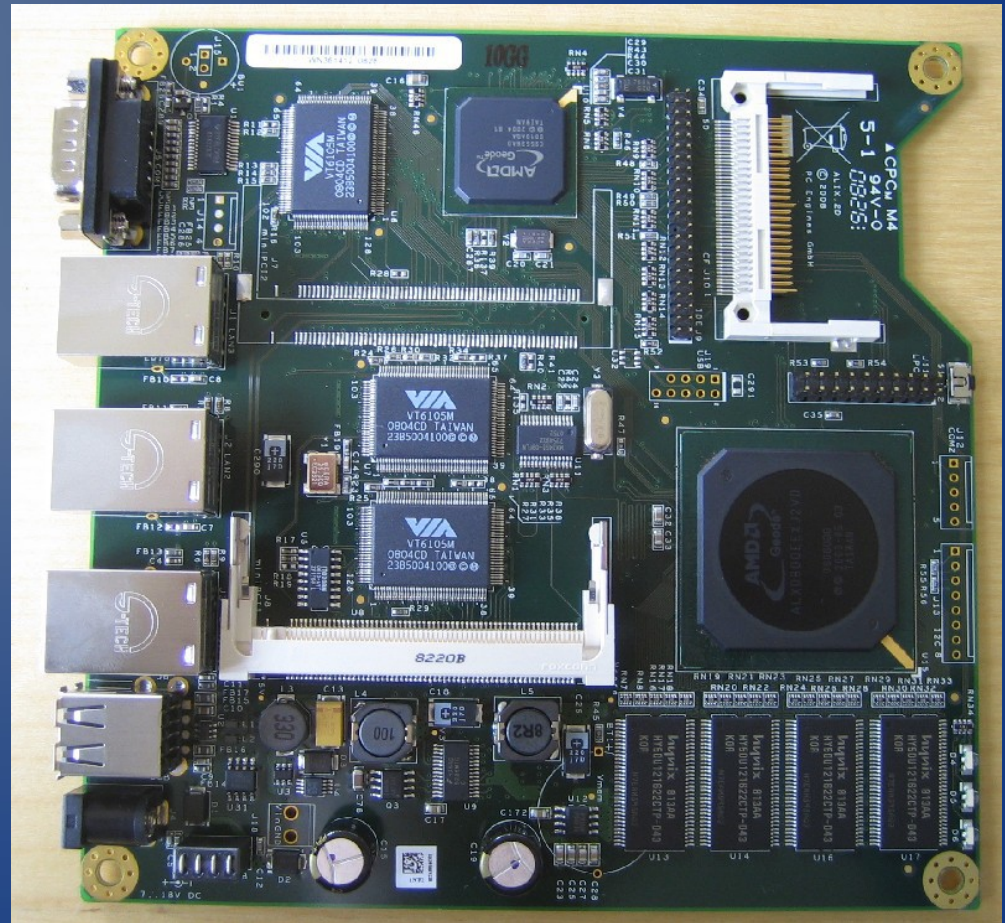


How to install it?

- Create an image
 - Write it to a SATA disk (via SATA/USB)
- Boot!
 - Serial works out of the box (its not self-evident!)
 - netconf (e1000)
- Keyboard, serial and network is working!
==> Device ID of Intel NIC was not there

ALIX2D3

AMD Geode LX 800
CS 5536 chipset
IDE CF Card
3 VIA Rhine NICs
(O|E)HCI & serial
TinyBIOS
152,4 mm x 152,4 mm



How to install it?

- Create an image
 - Write it to a CF card
- Boot!
 - Serial works
 - PCI & PCKBD panic's, ATA w/o DMA
- Fixes
 - Assumed PCI HC no longer at 0:0:0 (no standard)
 - Remove panic for missing keyboard, safeguard rc
 - Adding Alix option to boot loader

APU1D4

AMD G series T40E, 1 GHz
2/4 GB RAM
SD card (USB-MSD)
3 Realtek 8111E NICs
(O|E)HCI & serial
Coreboot
152,4 mm x 152,4 mm

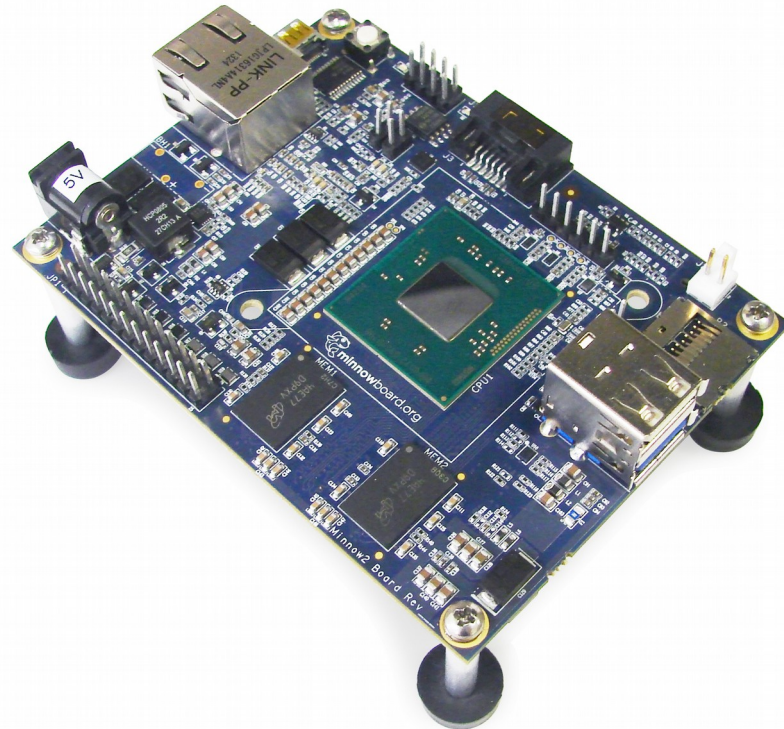


How to install it?

- Create an image
 - Write it to a SSD (size depends on your image)
- Boot!
 - Serial works
- Fixes
 - Nothing to fix, already made for ALIX
 - Big question: SSD without TRIM?

MinnowBoard MAX

Intel Atom E3825,
dual core, 64 bit,
Bay Trail chipset
2 GB DDR3 soldered
SDIO, SATA
Realtek 8111GS-CG
EHCI & XHCI
HSE (2x serial),
1 debug uart
99 mm x 74 mm

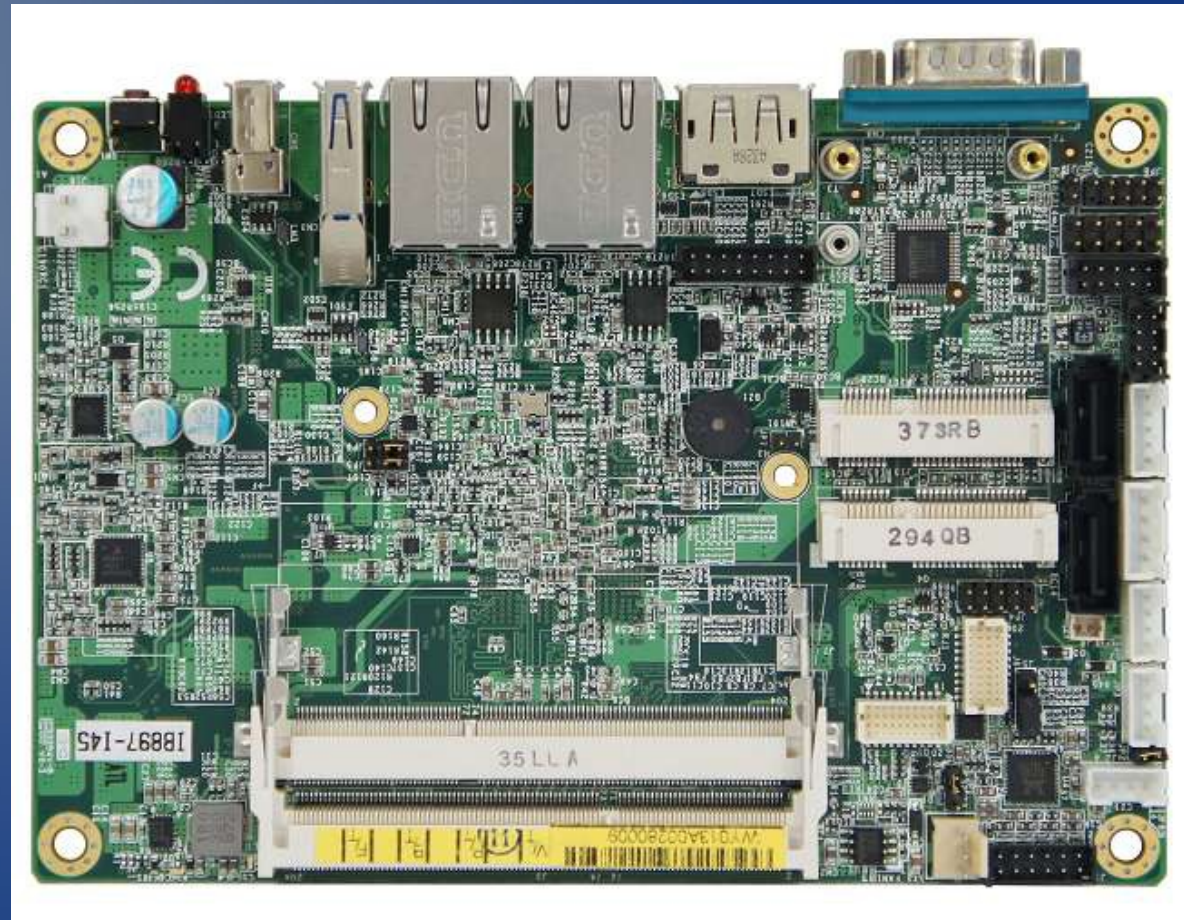


How to install it?

- Create an image
 - Write it to a SATA disk (find power for SATA)
- Boot!
 - Saw the bootloader, nothing else!
 - PCI serial, BIOS VGA calls, serial RTS/CTS
- Fixes
 - Flashing coreboot
 - Switch RTS/CTS on/off
 - For UEFI: getting rid of VGA BIOS calls

IB-897

Intel Atom E3845
64bit, quad core
Bay trail
2 x Intel i210 series
NICs
(E|X)HCI & serial
102 mm x 147 mm



How to install it?

- Create an image
 - Write it to a SATA disk
- Boot!
 - Serial works out of the box, UEFI **with** CS
 - No keyboard (→ USB)
- Serial is working
 - i210 series seems to be a new family?
 - USB is underway for HID

Current Status

	SATA/IDE	Keyboard	Network	Serial(LS)
ALIX	✓	-	✗	✓
APU	✓	-	✗	✓
IB-897	✓	✗	✗	✓
LP-172	✓	✓	✓	✓
Minnowboard	✓	✗	✗	✓

Resume (1/2)

- No major change needed (kernel → vga text)
- Streamlining the boot process would help
 - UEFI, BIOS
- Next target: Intel ComputeStick, NUC

Resume (2/2)

- Very few 32bit CPUs still available
- Very few single core CPUs available
- Target architecture
 - Bus: PCI Express, XHCI/USB3, SDHC, SMBUS
 - 64bit (instruction set & memory)
 - Multicore (maybe AMP instead of SMP?)
- We are working on buses & devices

How to contact

<https://www.linkedin.com/in/ralfneeb>