Non-destructive eComStation Installation to the ASUS EeePC.

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Please note this is a WIP document, since V1 we have managed to get sound and video working however networking remains a problem. An option could be to replace the Atheros WiFi Mini-PCIe card with one that has already GenMAC support such as an Intel 3945ABG based card, however at present we are still trying to get GenMAC to work with the Atheros card. The cable nic is onboard and hence not so easy to exchange, it is also less likely to be able to be made to work with GenMAC, so if you don't have WiFi access in your location, at present the EeePC running eCS is not an option for you.

The process described will get eCS operational but without network. This is being worked on but there was a demand from several people to document what we have achieved as a community, so far.

 This project was to install eComStation (version 2.0 RC4) on the ASUS Eeepc as I felt that the two would go together very well. The ASUS EeePC has limited power and capacity and eComStation runs well on lower powered systems.

The model of Eeepc used in this project is the PC701 4G. This has a 900MHz Celeron running at 600MHz, a 7inch screen, an internal 4GB Solid State Disk, three USB ports, a built in SD memory card reader, webcam and 10/100 Ethernet and 802.11G WiFi networking. Some models also come with a V90 modem (but not the ones released in Australia). Not bad in a very portable (900grams) unit about this size of a A5 diary. My model was from the original "A" batch and has an empty mini PCIe socket where a larger Solid State Disk (presently up to 16GB in size) can be installed. Not all releases of this PC have the extra socket, so I did not want to use that approach to install eCS and these SSDs are hard to obtain and very expensive. On the other hand the speed and capacity of SD (camera) memory cards is increasing and the cost falling drastically at present. The EeePC has the ability to select which device to boot from (including USB devices) through a menu that is not dissimilar to the OS/2 boot manager menu in appearance. This appears if you press the escape key at startup (the same screen where you can enter the BIOS setup from by pressing F2).

As I did not want to risk losing the standard install on the PC, which uses 4 primary partitions and as such is not suitable for a shrinking process to create an extra partition, I was only left with the SD card option. This also appeals to me as it means one can have a complete operating system on a card about the size of your thumb nail and put it in when required and remove it otherwise. Using an SD card (ideally the same colour as the EeePC – which comes in a choice of 5 colours, Pearl white and black being the most common) it can't even be seen that it is there.

As you may know, eComStation 2.0 cannot at present be installed from a USB attached device (normally a CD/DVD Rom drive), so this meant that I needed to prepare the image on my desktop PC and then copy and adapt it to go onto the SD card.

I would not have achieved this project without the help of Rainer Stroebel and Sigurd-Fastenrath (both from

Germany) and Peter Rehfisch (Australia) who have had a lot of experience with booting from USB devices (which the card reader in the EeePC is) and the determination shown by Sigurd to make things work. Thankyou to all three of you !

The area where we had to change an "out of the box" installation config.sys is in the disk accessing area. To make an USB device acceptable to OS/2-eCS as a bootable device the /I13 parameter must be added to the usbd.sys base device drive and the OS2DASD basedev replaced with dani's DANIDASD with parameters to suit the hardware. DANIDASD.DMD needs to be copied into the \OS2\BOOT\ directory. (If you don't have the DANIDASD driver it can be downloaded from the Hobbes website). After a lot of trial and error and investigation it was found that eCS will see the SD card as drive D: and hence we needed to set the BD (boot drive) parameter to be D and "mount" (/MT) the first partition on our card as Aa. Without these changes (and removal of the OS2LVM Basedev) you will either get a Trap 000D abort or the message that OS/2 cannot operate your harddisk a little after the eCS globe logo goes away.

Pre-requisites:

- Working EeePC system
- Desktop system with space for a "template install" eCS D: partition.
- eComStation 2.0 install CD and license key
- A copy of DFSee software (ideally the latest version) – you can use the "trial" version but I always recommend people to register to get support and to support the authors great work.
- Working Secure Digital memory card (Ideally class 4 (4Mb/s) or class 6 (6Mb/s) – class 6 is only available on SDHC cards at present it seems) that can be totally wiped. Alternatively a booting capable USB memory key can be used (see appendix for details of how to select & prepare).
- Uniaud32.sys file from the Uniaud v 1.13 package (current version in eCS 2.0RC4 build is v 1.14 and not compatible with this chipset).
- Downloaded panorams widescreen_v071.zip (or later) from the betazone.
- SD Card reader/writer attached and operational on your desktop system
  (I use the card reader in my Brother MFC 620CN Multi Function Centre – printer/scanner/fax/card reader)

Here is the step by step process so that you can do the same:

1. On an existing eCS 2.0 installed PC, adjust drive letters and freespace so that you can create a 1GB partition with the letter D:
2. Use the standard eCS 2.0 install to install to this partition, select the advanced install options in the install process itself and make sure you select the following options:

   Template Build Options – eCS 2.0RC4.
   Advanced Install
   Set your country and timezone.
   Create a HPFS formatted partition (2GB is large enough) – drive letter D:
   Hardware & Peripherals configuration,
     defaults except :-
             Display – Panorama enhanced VESA.
             Standard devices – Advanced power management – install.
                             - Disable serial port controller support
                             - USB Support – 1 EHCI controller
                                             2 UHCI controllers
                                              - Add USBCDROM and USBMODEM support.
                             - Multimedia support – Uniaud support.
             Select Components – Legacy Software support – deselect DOS and WIN16
                             - system extensions – filesystem drivers – select FAT32 support.
             Network adapters and protocols – remove any network cards the install has spotted from your desktop
                             PC and add the "No Network Adapter" option.

       In the "Final tasks" panels, in screen settings – Panorama sgould be shown at 800x600 – the display needs to be changed to "no monitor is selected" if the install has identified the monitor on your desktop system.
        You obviously need to set username, domain name etc. as you wish to have them and eespite the fact that we have configured with the "no network adapter" you should select the "allow computer to be seen on network"

and "allow sharing..." options in networking to make sure the code is required for use once we have (hopefully) address the NIC support issues.
  Do NOT install ACPI as it stops booting from USB devices at present.

> In summary:
> No ACPI option – it doesn't work when using a bootable USB device.
> First listed Uniaud audio adapter(we will modify by back-levelling one file later)
> No network adapter
> Panorama graphics (it will install in it's default 800x600 mode but we will add the widescreen driver later to switch to the 800 x 480 resolution of the EeePC)
> HPFS formatted partition
> No legacy (DOS / WIN16) support (unset this – it's set by default).
> No Serial Port support (unset this – it's set by default)
> If you are building this "template" on a laptop, exclude all laptop/PCMCIA support (on a desktop this will not be selected).

3. Once you have installed this "template" eComStation, you can boot it on your desktop system to make sure it works but do not make any changes to it.
4. To be able to use an SD card in PRM (partitioned removable media) mode with eCS and the EeePC, it first needs to be completely wiped. In Dfsee, follow the following steps:
   ➢ file / open object to work with / disk / (SD Disk)
   ➢ actions / erase, wipe selected areas / erase, wipe current object (depending upon the size this can take a long time ~ 20 mins / GB).
   ➢ mode=fdisk / mbr area operations / wipe start of disk to zero / (SD Disk)

   NOTE: although Dfsee recommends a reboot at this stage to ensure the correct GEO of the card is read, I have found that when booting at this point my MFC card reader renders the card no longer accessible. My recommendation at this point is not to reboot. (please refer to the troubleshooting section at the end of this article for how I recover a non-working SD card problem caused by interrupting the process). You may be able to reboot if you are not using a reader with additional "intelligence to reject faulty cards" such as in MFCs. I HIGHLY RECOMMEND, you get a single SDHC to USB card reader rather than a multi card reader device or try using existing readers built into printers etc. as I did. They simply cause to many problems! One problem that took me a long time to trace back to the reader/writer that I used, was that the completed SD card when the EeePC was booted from it caused the OS to complain from time to time that it could not rewrite OS2SYS.INI ! The simple SDHC to USB readers cost betweem AU$2.50 and AU$4.50 (+postage) on eBAY so they're not an expensive item and very worthwhile !
   If you are installing to a USB memory key, you SHOULD reboot at this point as instructed to by DFSee.

   Now we need to create the new partition:
   ➢ mode=fdisk / mbr area operations / new mbr code, erase tables / (SD Disk)
   ➢ mode=fdisk / create new partition / (SD Disk)
       create primary partition
       partition type HPFS
       create new mbr clear existing
       do not include LVM data
       set as active partition
        IBM/Default Dfsee CHS style
   If you have the luxury of a larger SD card, you can create one primary and one (or more) logical partition(s), but make sure to increment the number of removables in the USBMSD command or you wont see the additional partitions which appear as additional drive letters.
5. Eject the disk (EJECT "drive:" from a command prompt).
   - If you didn't earlier, this is a good point to reboot your desktop PC to ensure all correct HD definitions are accepted by the system.
6. Remove & re-insert the card.
7. Refresh removable media.
8. Format the SD card as HPFS.
9. Xcopy (using parameters /S /T /H /E /R /O /V) your previously prepared eCS partition to the card.
10. Add DANIDASD.DMD into the OS2\BOOT directory on the card.
11. Change drive letters again so that your SD Card or USB drive is drive D: and apply system tracks by running SYSINSTX (SD drive letter:) from \OS2\INSTALL\BOOTDISK on your running eCS 2.0 desktop system. If you don't change the driveletter of the SD/USB to D:, the OS remembers somewhere in the boot tracks the currently assigned drive letter, this cause Warpin and other install programs to think

it should install to the drive letter that the card was when connected to the desktop PC and of course on the EeePC this drive doesn't exist !

Required changes to the config.sys of the system on the SD Card

    Add the /I13 Parameter to the USBD.SYS statement and move the statement so that it is the first of the USB device statements.
    BASEDEV=USBD.SYS /V /I13

    Comment the OS2LVM.DMD and OS2DASD.DMD statements
    Rem Basedev=OS2LVM.DMD
    Rem Basedev=OS2DASD.DMD

    Add the DANIDASD.DMD statement
    BASEDEV=DANIDASD.DMD /BD:D /MT:Aa

- For simplicity you can replace your Basedev section with the [Base Device Drivers] section below, this will ensure all basedevs are in the correct sequence:

```
REM [ Base Device Drivers ]
BASEDEV=IBMKBD.SYS
BASEDEV=TIMER0.SYS
BASEDEV=PRINT01.SYS
BASEDEV=CHKDSK.SYS

REM [ Base Device Drivers for USBBOOT ]
BASEDEV=USBD.SYS /V /I13
BASEDEV=USBEHCD.SYS
BASEDEV=USBUHCD.SYS
BASEDEV=USBUHCD.SYS
BASEDEV=USBUHCD.SYS
BASEDEV=USBUHCD.SYS
BASEDEV=usbhid.sys
BASEDEV=USBMSD.ADD /V  /FLOPPIES:0  /REMOVABLES:5
basedev=danis506.add /V
BASEDEV=DANIDASD.DMD /BD:D /MT:Aa   *(or /MT:Aa, Ab  if you created 2 partitions on the card)
REM    Note: don't miss the .DMD off the BASEDEV name

REM [ Other Base Device Drivers ]
rem BASEDEV=CADH.SYS
rem BASEDEV=IBM1FLPY.ADD
rem BASEDEV=USBCDROM.ADD
rem BASEDEV=DANIATAP.FLT
```

12. Final changes:
    You now need to backlevel the Uniaud
    Copy the UNIAUD v 1.13 uniaud32.sys to c:\mmos2\ overwiting the file that is already there.

    You also need to add the widescreen driver (in widescreen_v071.zip) for Panorama to the SD image and config.sys and set it's parameters to -800 which will force the resolution to the required 800x480 pixels of the EeePC display. Unpack widescreen_v071.zip and move the intlbios.sys into \os2\boot on your boot device (SD card or USB key) add the following line into config.sys
    BASEDEV=INTLBIOS.SYS /0800 (note that is zero, eight, zero, zero – do not drop the first zero).

13. Completion:
Eject the card from your desktop attached card reader.

 Test boot in your EeePC:
a)   insert the card in the card reader
b)   turn on the EeePC
c)   when the grey screen with press F2 for setup appears, press the escape key
d)   the boot selection menu now appears, use the cursor key to go to the SD card reader and press enter.
e)   If all goes well the system should boot up to a similar looking desktop to that of your "template partition". Turn on archiving at every restart and increase the number of archives 9 (I prefer to have

as many backups as possible) before doing any modifications. The archiving function backs up the system INI files and the desktop, however if you edit the "OS2.KEY" text file you can add any other configuration files that you wish to keep and be able to restore to if needed.

f) Install drivers (when available) for audio, networking and video.

Once you have the desktop the way you like it you can execute "ARCINST" which will override the original install backup with the current settings so that you can always return to a known good point in time.

I also recommend you take a backup copy of your SD card or USB memory key once it is how you want it, on your desktop system as SD & USB keys are more suseptable to problems if power in unexpectably lost from the PC.

Troubleshooting section:

- What if the SD card stops being accessible or is accessible but doesn't let you write to it or re-partition it? In my case I have found the only way to address this issue is to put the card into a camera and re-format it there and then restart the process from point 4 above. The references below may also be very helpful.

References

For booting from USB and USB hints and tricks **OS4YOU Wiki** –
http://www.os4you.de/wiki-usb-boot-en.html and http://www.os4you.de/wiki-usb-tricks-en.html
(substitute de for en to access the German versions)

For general information on the EeePC   **Eeeuser Wiki** –
http://forum.eeeuser.com/index.php

For DANIDASD and other OS/2 drivers   **Hobbes site** -
http://hobbes.nmsu.edu

CARDSPEED - Card Readers and Memory Cards & SD Compatibility
http://www.hjreggel.net/cardspeed/index.html#special-sd.html

USB Device file systems and partitioning / formatting
http://www.os2voice.org/vnl/past_issues/VNL0606H/feature_2.html#format_dialogue