Miata Installation HOWTO

There are a few issues getting the Digital PersonalWorkStation (PWS 433, 500, 600 a/au, otherwise known as "Miata") working with RedHat Linux. The first part covers the general install procedure, the second part covers some specific issues.

Installation Guide

Make sure you have an alphabios (firmware) version that supports booting from the floppy-drive (the older ones didn't). You can get the latest firmware for your machine from Compaq / Digital site.

Beware!! updating the alphabios may be hazardous for your system. Carefully read the instructions!

With the disk partitioning utility (in the alphabios) make at least 3 partitions on your disk. A small one (5Mb should be enough) to hold linload and milo. This partition should be a FAT formatted partition. One partition for the swap space and (at least) one partition for the rest of the system. The swap and system partition will be formatted by the redhat install procedure.

Make the three floppy-disks for the installation (milo / linload, kernel, ramdisk). (If you're trying to install RedHat 5.X replace the kernel and milo on the disk with the ones provided below.)

```
Boot name:      Linux Setup
Boot file:      Floppy0                    \linload.exe
OS Path:        Disk1, Partition1          \milo
OS Options:
```

Insert the milo floppy and let the machine boot. When you land on the milo prompt replace the floppy with the floppy containg the kernel and type:

```
boot fd0:vmlinux.gz root=/dev/fd0 load_ramdisk=1 prompt_ramdisk=1
```

That should start the installation!!

Once the machine is installed you'll have to boot once more from floppy-disk (Linux-Setup entry). At the milo prompt enter the following:

```
boot fd0:vmlinux.gz root=/dev/sda2
```

(the `root=<device>` should correspond with the system partition on your system: /dev/sda2, /dev/sdb4 etc).

Log in as root and copy "linload.exe" and "milo" from the milo floppy-disk to the small FAT partition.

Then make a new boot entry in the alphabios with the following settings: Make this entry the default boot-entry.

```
Boot name:      Linux
Boot file:      Disk0, Partition0            \linload.exe
OS Path:        Disk0, Partition0            \milo
OS Options:     boot sda2:/boot/vmlinux.gz    root=/dev/sda2
```

(The setting above are and example. They may not work on your system because you may have chosen a different partition-layout / kernel name & location. Enter the right settings that reflect to your partition-layout / name & location of your files.)

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1) Qlogic ISP1040b boot problem (RedHat 5.X)

The QLogic ISP-1040b SCSI controller produces an error when booting with the default RedHat milo and kernel. This is because the firmware is downloaded to the SCSI controller. The SCSI controller doesn't like this.

To get the machine running use a modified kernel + milo image. Rename "milo-miata" to "milo" and put it on replace the milo on the milo floppydisk. Rename "miata-kernel-2034.gz" to "vmlinux.gz" and replace the vmlinux.gz on the kernel floppydisk.

2) Building a kernel (RedHat 5.x)

To build your own kernel with the "ISP1040b firmware download problem" solved get latest kernel sources. The problem should be solved (??) in the 2.0.37 kernels (For the 2.0.35 kernel a patch was needed).

3) The onboard network card has difficulty to set to 10BaseT (RedHat 5.X, 6.0)

The onboard network interface is based on the DEC 21143 chip. With tulip driver contained with the current kernel distribution the onboard network-interface has problems when running on a 10Mbit network. The symptoms of these problems are that the network-interface thinks he's on a 100Mbit network, eventhough he's on a 10Mbit network. The network is then flooded with junk. Configuring the networkcard through conf.modules doesn't help, only a recent tulip.c driver (0.90 or higher) does the job. Replace the tulip.c file in /usr/src/linux/drivers/net/ with this one and recompile the kernel. I compiled it as a module and, and used the following entry in the /etc/conf.modules:

```
alias eth0 tulip
options tulip options=8         #10 Mbit
#options tulip options=5        #100 Mbit
```

For more information on the drivers for the DEC Tulips chip check out:
http://cesdis.gsfc.nasa.gov/linux/drivers/tulip.html

4) Sound (RedHat 5.x, 6.0)

To get sound working on the miata choose the following options in the kernel config:

2.0.X kernel, compiled into the kernel:

```
CONFIG_SOUND=y
CONFIG_SB=y
CONFIG_AUDIO=y
CONFIG_MIDI=y
CONFIG_YM3812=y
SBC_BASE=220
SBC_IRQ=5
SBC_DMA=1
SB_DMA2=5
```

```
SB_MPU_BASE=330
SB_MPU_IRQ=9
DSP_BUFFSIZE=65536
```

2.2.X kernel, modular:

```
CONFIG_SOUND=m
CONFIG_SOUND_OSS=m
CONFIG_SOUND_SB=m
CONFIG_SOUND_ADLIB=m
CONFIG_YM3812=y
```

With the RedHat 6.0 setup tool I configured soundcard as a soundblaster16. The following entries are put into /etc/conf.modules:

```
alias sound sb
pre-install sound insmod sound dmabuf=1
alias midi opl3
options opl3 io-0x388
options sb io=0x220 irq=5 dma=1 dma16=5 mpu_io=0x330
```

5) Parallel port

The parallel port works with the following settings:

Kernel config:

```
CONFIG_PARPORT=m
CONFIG_PARPORT_PC=m
```

The following entries are put into /etc/conf.modules:

```
alias parport_lowlevel parport_pc
options parport_pc io=0x3BC irq=none
```

Misc

Compaq Alpha systems workstations
Alphastation systems au series
Infomation about overclocking the Miata (use at own risk).

My machine is a PWS 500au. At them moment it’s got the following components:

- 2Mb 3rd level B-cache
- 128Mb RAM
- 9Gb W-SCSI disk
- 2Gb SCSI disk
- 4 speed SCSI CDrom player
- ISP1040b UW-SCSI controller
- Onboard DEC 21143 network interface
- 3com 3c509 ISA network interface (turn OFF the Plug&Pray!!)
- Matrox Millennium II VGA card (use one of the 64bit PCI slots!!)
- Onboard sound (ESS1888)

At the moment it’s working as a server / internet gateway at my home. It’s got a cable modem attached to the 3com network interface. The onboard DEC 21143 network interface is connected to my hub and runs at 100Mbit.

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