

## Installing Zeroshell On a Soekris Net 6501 from a Windows PC

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### Introduction

I've been running Zeroshell as a primary gateway router on a Soekris Engineering NET 6501 computer. I found the installation to be challenging and couldn't find a complete stand alone procedure that worked reliably.

### References

Configuring ZeroShell on a Soekris net6501 -- <https://sites.google.com/site/zeroshellonsoekrisnet6501/>

Soekris Net 6501 Manual -- [https://soekris.com/media/manuals/net6501\\_manual.pdf/](https://soekris.com/media/manuals/net6501_manual.pdf/)

### Parts List

1. Soekris Engineering Net 6501 (NET6501-70 used)
2. mSata hard disk (ATA PLEXTOR PX-64M6M used)
3. DB-9 serial cable (null modem)
4. DB-9 gender changer adapter
5. 16GB (minimum) USB thumb drive (Sandisk Cruiser Glide used)\*\*\*\*
6. Ethernet cable
7. Windows PC
8. Zeroshell USB image (ZeroShell-3.4.0-USB.img.gz used)
9. PhysDiskWrite image writer (<http://m0n0.ch/wall/physdiskwrite.php>)
10. Serial terminal software (Putty used)

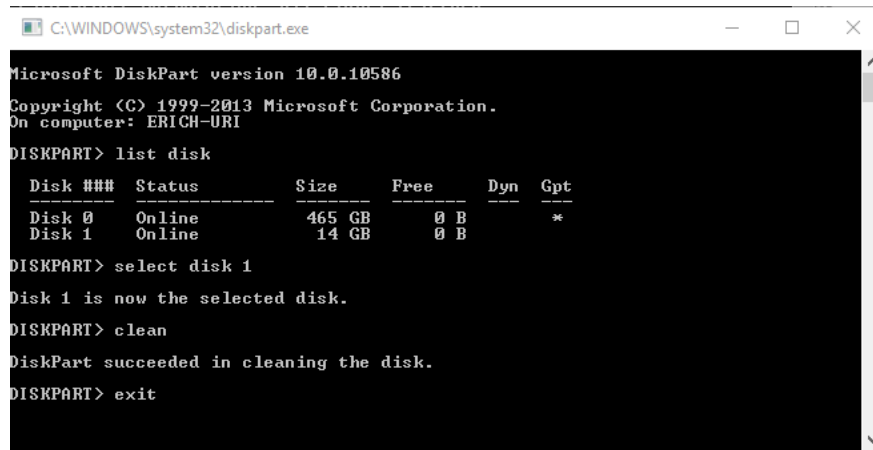
*\*\*\*\*The Soekris 6501 is picky when it comes to bootable thumb drives. The only brand of thumb drive that I was able to successfully boot Zeroshell with was Sandisk. Numerous models of Kingston thumb drives and a single PNY thumb drive were not bootable not matter what method I used to write the Zeroshell image.*

### Procedure

- 1) Plug in your USB thumb drive. I highly recommend that you use a Sandisk brand drive (see note above).
- 2) Before you write the Zeroshell image you need to remove all partitions. Open a new command window and type the following commands:
  - a. diskpart
  - b. list disk
  - c. select disk \* (with disk number of the USB drive)
  - d. clean
  - e. exit

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```
C:\WINDOWS\system32\diskpart.exe
Microsoft DiskPart version 10.0.10586
Copyright (C) 1999-2013 Microsoft Corporation.
On computer: ERICH-URI

DISKPART> list disk

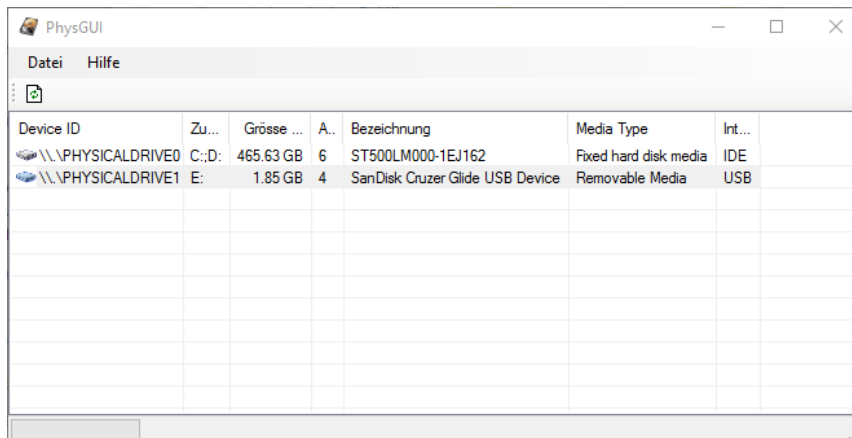
   Disk ###  Status         Size           Free           Dyn    Gpt
   -----  -
   Disk 0    Online         465 GB         0 B            *
   Disk 1    Online         14 GB          0 B

DISKPART> select disk 1
Disk 1 is now the selected disk.

DISKPART> clean
DiskPart succeeded in cleaning the disk.

DISKPART> exit
```

- 3) Download the latest ZeroShell USB image (ZeroShell-3.4.0-USB.img.gz used). Unzip the image into a working folder on your machine.
- 4) Open PhysGui.exe (IN ADMINISTRATOR MODE!!). Right click on your thumb drive and choose “Image Laden.” Select your USB image. Ignore the 2GB warning and the follow on warning in German. I don’t know what it says, but it’s not important.

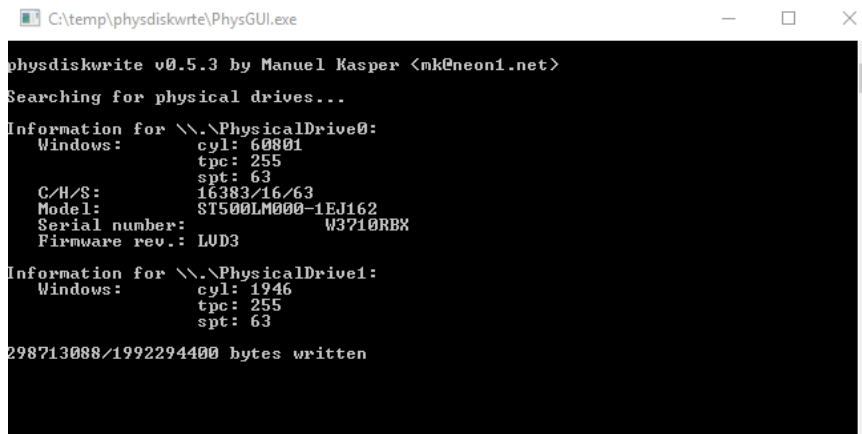


Device ID	Zu...	Größe ...	A.	Bezeichnung	Media Type	Int...
\\PHYSICALDRIVE0	C::D:	465.63 GB	6	ST500LM000-1EJ162	Fixed hard disk media	IDE
\\PHYSICALDRIVE1	E:	1.85 GB	4	SanDisk Cruzer Glide USB Device	Removable Media	USB

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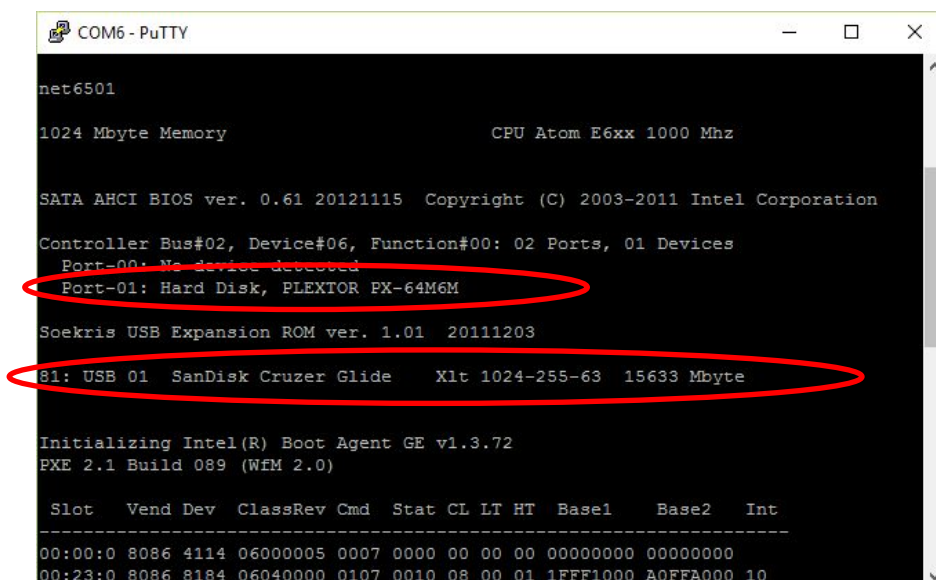
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- 5) The USB image should now be writing itself to the thumb drive. This takes a while. If it doesn't take a while, something is wrong.



```
C:\temp\physdiskwrte\PhysGUI.exe
physdiskwrite v0.5.3 by Manuel Kasper <mk@neon1.net>
Searching for physical drives...
Information for \\.\PhysicalDrive0:
  Windows:      cyl: 60801
                tpc: 255
                spt: 63
  C/H/S:       16383/16/63
  Model:       ST500LM000-1EJ162
  Serial number:      W3710RBX
  Firmware rev.:    LUD3
Information for \\.\PhysicalDrive1:
  Windows:      cyl: 1946
                tpc: 255
                spt: 63
298713088/1992294400 bytes written
```

- 6) Install the mSata drive into your Soekris 6501 in either of the two ports. Plug in your USB drive to one of the USB ports.
- 7) Connect your null modem serial cable between your PC and the Soekris 6501. You will likely need a gender changer because both ports are male DB9.
- 8) Start a terminal session (Putty used for this procedure). The NET6501 serial defaults are 19200,8,N,1. When you power on the NET6501 you should now see the boot screen in your terminal.
- 9) At boot you should now see both your mSata hard disk and your USB thumb drive listed. Notice in the following photo that the thumb drive make and model are shown. If you just see a blank line, the chances are that your thumb drive is not bootable. You'll need to use another drive.

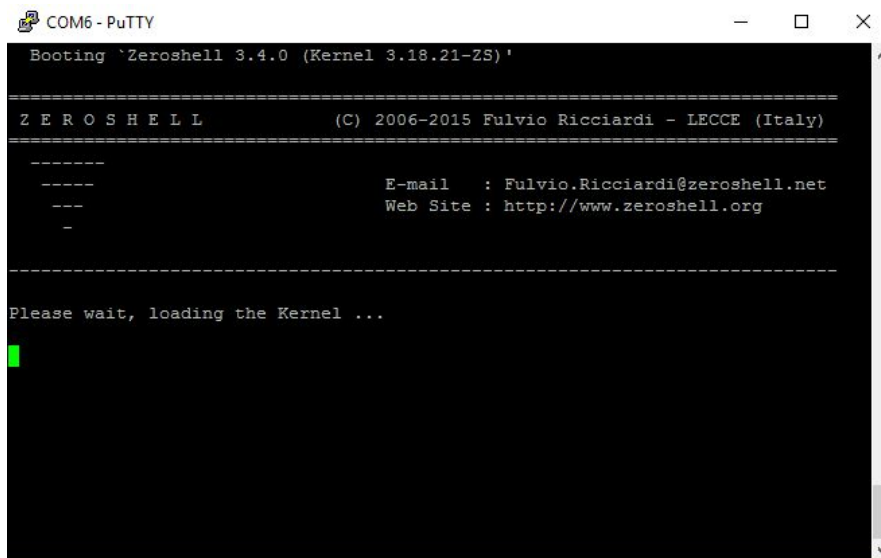


```
COM6 - PuTTY
net6501
1024 Mbyte Memory                      CPU Atom E6xx 1000 Mhz
SATA AHCI BIOS ver. 0.61 20121115  Copyright (C) 2003-2011 Intel Corporation
Controller Bus#02, Device#06, Function#00: 02 Ports, 01 Devices
Port-00: No device detected
Port-01: Hard Disk, PLEXTOR PX-64M6M
Soekris USB Expansion ROM ver. 1.01 20111203
81: USB 01 SanDisk Cruzer Glide Xlt 1024-255-63 15633 Mbyte
Initializing Intel(R) Boot Agent GE v1.3.72
FXE 2.1 Build 089 (WFM 2.0)
Slot  Vend Dev  ClassRev Cmd  Stat CL LT HT  Base1  Base2  Int
-----
00:00:0 8086 4114 06000005 0007 0000 00 00 00 00000000 00000000
00:23:0 8086 8184 06040000 0107 0010 08 00 01 1FFF1000 A0FFA000 10
```

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- 10) Before the boot sequence is complete – press ctrl-p to enter the console mode
- 11) Enter the following commands
  - a. Set conlock = disabled
  - b. Set conspeed = 38400
- 12) You've just set the default baud rate of the NET6501 to 38400 which is the default baud rate of ZeroShell. This makes installation a lot easier.
- 13) Start a new terminal session at 38400, 8, N, 1 and reboot the NET6501
- 14) Press ctrl-p to enter console mode again
- 15) Type "boot 81" to boot ZeroShell from your USB device. (81 is default, but you should use whatever number is shown at boot).
- 16) You should now see GRUB loading messages and the ZeroShell console starting



The screenshot shows a PuTTY terminal window titled "COM6 - PuTTY". The terminal output is as follows:

```
Booting `ZeroShell 3.4.0 (Kernel 3.18.21-ZS) '  
=====   
Z E R O S H E L L          (C) 2006-2015 Fulvio Ricciardi - LECCE (Italy)   
=====   
-----   
----- E-mail   : Fulvio.Ricciardi@zeroshell.net   
----- Web Site  : http://www.zeroshell.org   
-----   
-----   
Please wait, loading the Kernel ...   
█
```

- 17) Once the Kernel is loaded you will see the zeroshell console menu.

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```
Z e r o S h e l l - N e t S e r v i c e s 3.4.0          December 26, 2015 - 20:07
-----
Hostname : zeroshell.example.com
CPU (2)  : Intel(R) Core(TM) i7-3820 CPU @ 3.60GHz 3602MHz
Kernel   : 3.10.21-ZS
Memory   : 2071320 kB
Uptime   : 0 days, 00:19                               User      : admin
Load     : 0.01 0.04 0.08                               Password  : zeroshell
Profile  : DEFAULT PROFILE
-----
COMMAND MENU
<A> Installation Manager          <P> Change admin password
<D> Profile Manager              <T> Show Routing Table
<S> Shell Prompt                 <F> Show Firewall Rules
<R> Reboot                       <N> Show Network Interface
<H> Shutdown                    <Z> Fail-Safe Mode
<U> Utilities                   <I> IP Manager
<W> WiFi Manager

                                  Select: _
```

- 18) The zeroshell default admin credentials are username:admin, password:zeroshell. Using the serial menu options you should change the defaults to whatever you prefer (using the “P” command). You might also want to set up the IP address on one of your NET6501 ports to your desired local IP/subnet using the “I” command. This is optional at this point.
- 19) Now you want to install Zeroshell onto your mSata disk for permanent operation. Other procedures I’ve found have you copy the USB stick image onto the SSD using the “dd” command. I found that this is not the best approach for two reasons. One is that a default profile that cannot be edited will be created for you. Another is that your large 64GB SSD will only have 16GB of usable space because you’ve put a 16GB disk image onto it. There’s a better way!
- 20) From the Zeroshell command menu enter the installation manager (option “A”). You’ll be presented with a list of disks. Select your mSata SSD as the target.
- 21) Ignore the overwrite warning and install ZeroShell onto the SSD. You’ll be asked to create a profile. Although it’s optional I prefer to set up the profile at this time for a cleaner system.
- 22) Now you can unplug your USB stick and reboot the NET6501. This time let the boot process run and your SSD should boot automatically. I found total boot time to be about 2 minutes. You can speed this up by entering the NET6501 console and entering the command
  - a. set connute = enabledBut I don’t recommend this because months from now when you want to re-image your NET6501 you’ll be scratching your head as to why the console isn’t working!
- 23) You should now see the zeroshell console on your terminal window. Congratulations, you’re now running Zeroshell on your permanent storage!

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24) Now you'll want to enter the web interface. After all, the name "ZeroShell" implies that you won't ever need to use the console again.

25) Set up your PC network adapter with the following settings (unless you've already changed the default ZeroShell network settings in step 18)

- a. IP Address 192.168.0.X
- b. Netmask 255.255.255.0
- c. Gateway 192.168.0.75
- d. DNS 8.8.8.8 (or blank...it's not important)

26) Open your web browser and type 192.168.0.75. You will probably get an https certificate warning. Do what you need to do to add an exception and continue on.

27) You should now see the ZeroShell web login screen. If you haven't already changed the credentials, the defaults are username:admin, password:zeroshell. This procedure won't go in to basic network setup. There are plenty of great tutorials out there that already do this.



**ZEROSHELL**  
Net Services

Username

Password