

用QEMU软件仿真 Sun SPARC Hardware

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本文摘要:

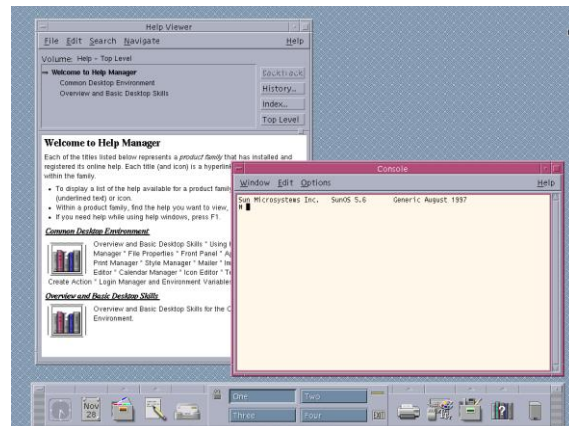
本文介绍如何使用QEMU(Quick Emulator)软件仿真 Sun SPARC 硬件系统并且在此仿真系统上直接安装SPARC版本的 Solaris 2.6 OS (1997). 需要说明的是, QEMU本身不带有GUI, 以下描述的各项命令都是在 Windows 10 DOS CMD 上面键入的.

关于QEMU软件的安装请看 Appendix A, Install QEMU.

Build your own SPARC workstation with QEMU and Solaris

<https://learn.adafruit.com/build-your-own-sparc-with-qemu-and-solaris/overview>

https://learn.adafruit.com/build-your-own-sparc-with-qemu-and-solaris/create-a-disk-image?gclid=EAIaIQobChMIgfK6jNzR-wIVkInIch12ZglQEAMYASAAEgIoNfD_BwE



You'll need:

- The latest version of [QEMU](#), for this guide version 3.1.0 worked well.
- A system to run it on – Windows, Linux, or Mac
- [Solaris 2.6 ISO](#) (SPARC Version)

- For added fun, a Sun Type 5 keyboard converted to USB with [Drakware's Sun2USB](#) or DIY with the [SPARC keyboard specification](#) and a small Arduino like the Trinket M0

QEMU 没有 GUI, 以下命令都用 DOS CMD Prompt (在 C:\QEMU 目录下)键入:

1) Create a disk image

```
qemu-img create -f qcow2 sparc.qcow2 9663676416
```

2) Set SPARC Machine

```
qemu-system-sparc -M SS-5 -m 128
-drive file=sparc.qcow2,bus=0,unit=0,media=disk
-drive
file=solaris_2.6_598_sparc.iso,bus=0,unit=2,media=cdrom,readonly=on
```

Let's take a look at the options:

qemu-system-sparc – run the emulator for a 32-bit SPARC system

-M SS-5 – emulate a SPARCstation 5

-m 128 – 128 MB of RAM

-drive file=sparc.qcow2,bus=0,unit=0,media=disk – Use our disk image, put it on SCSI bus 0, unit 0

-drive

file=solaris_2.6_598_sparc.iso,bus=0,unit=2,media=cdrom,readonly=on – Use the Solaris 2.6 ISO as a CD drive, SCSI bus 0, unit 2

2) Once you run that, the OpenBIOS ROM should start first and bring you to a prompt, type:

```
boot cdrom:d -vs
```

```

Machine View
ohio0 at root
z00 at ohio0: ohio 0x1000000 sparc ipl 12
z00 is /ohio/z00: 1000000
z01 at ohio0: ohio 0x0 sparc ipl 12
z01 is /ohio/z00: 0
SRMU,tx00 at sbus0: SBus slot 3 0x0000000 and SBus slot 3 0x2000000 and SBus slot 3 0x4000000 and SBus
slot 3 0x6000000 and SBus slot 3 0xc000000 and SBus slot 3 0xe000000 and SBus slot 3 0x701000 and SBus slot 3 0x200000 and SBus
slot 3 0x300000 and SBus slot 3 0x0 and SBus slot 3 0x240000 and SBus slot 3 0x280000 SBus level 5 sparc ipl 9
SRMU,tx00 is /icmu0,10000000/sbus0,10001000/SRMU,tx00,800000
tx00: revision 0, screen 1024x768
Configuring devices...
fdintr: nobody sleeping (c0 0 0)
ledna0 at sbus0: SBus slot 5 0x0400010
led0 at ledna0: SBus slot 5 0x8000000 sparc ipl 6
led0 is /icmu0,10000000/sbus0,10001000/ledna0,0400010/led0,8c00000
sbusmen0 at sbus0: SBus slot 0 0x0
sbusmen0 is /icmu0,10000000/sbus0,10001000/sbusmen0,0
sbusmen1 at sbus0: SBus slot 1 0x0
sbusmen1 is /icmu0,10000000/sbus0,10001000/sbusmen01,0
sbusmen2 at sbus0: SBus slot 2 0x0
sbusmen2 is /icmu0,10000000/sbus0,10001000/sbusmen02,0
sbusmen3 at sbus0: SBus slot 3 0x0
sbusmen3 is /icmu0,10000000/sbus0,10001000/sbusmen03,0
sbusmen4 at sbus0: SBus slot 4 0x0
sbusmen4 is /icmu0,10000000/sbus0,10001000/sbusmen04,0
sbusmen5 at sbus0: SBus slot 5 0x0
sbusmen5 is /icmu0,10000000/sbus0,10001000/sbusmen05,0
pseudo-device: winlock0
winlock0 is /pseudo/winlock0
pseudo-device: llic10
llic10 is /pseudo/llic10
[INIT: SINGLE USER MODE]
# drvconfig
fdintr: nobody sleeping (c0 0 0)
pseudo-device: lockstat0
lockstat0 is /pseudo/lockstat0
SRMU,C542310 at sbus0: SBus slot 4 0xc000000 SBus level 5 sparc ipl 9
SRMU,C542310 is /icmu0,10000000/sbus0,10001000/SRMU,C542310,c000000
drvconfig: /etc/path_to_inst.69: Read-only file system
drvconfig: Warning: Failed to update /etc/path_to_inst
# disks
# format
Searching for disks...WARNING: /icmu0,10000000/sbus0,10001000/espdna05,0400000/esp05,8000000/sd0,0 (sd0):
corrupt label - wrong magic number
done Vendor 'QEMU', product 'QEMU', 18874368 512 byte blocks

AVAILABLE DISK SELECTIONS:
0: c0t0d0 (drive type unknown)
/icmu0,10000000/sbus0,10001000/espdna05,0400000/esp05,8000000/sd0,0
Specify disk (enter its number): 0

AVAILABLE DRIVE TYPES:
0: Auto configure
1: Quantum ProDrive 805
2: Quantum ProDrive 1052
3: CDC Moon IU 94171-344
4: SUN104
5: SUN0207
6: SUN0207
7: SUN0340
8: SUN0424
9: SUN0525
10: SUN0640
11: SUN1.0C
12: SUN1.0C
13: SUN1.3C
14: SUN2.1C
15: SUN2.9C
16: other
Specify disk type (enter its number): #

```

- 3) The system should boot into single user mode and bring you to a root prompt (#). First we run a few commands to prep the system, then we'll format the disk.

```

# drvconfig
# disks
# format

```

- 4) Solaris only knows about a few specific disk types, so we need to specify our own geometry.

```

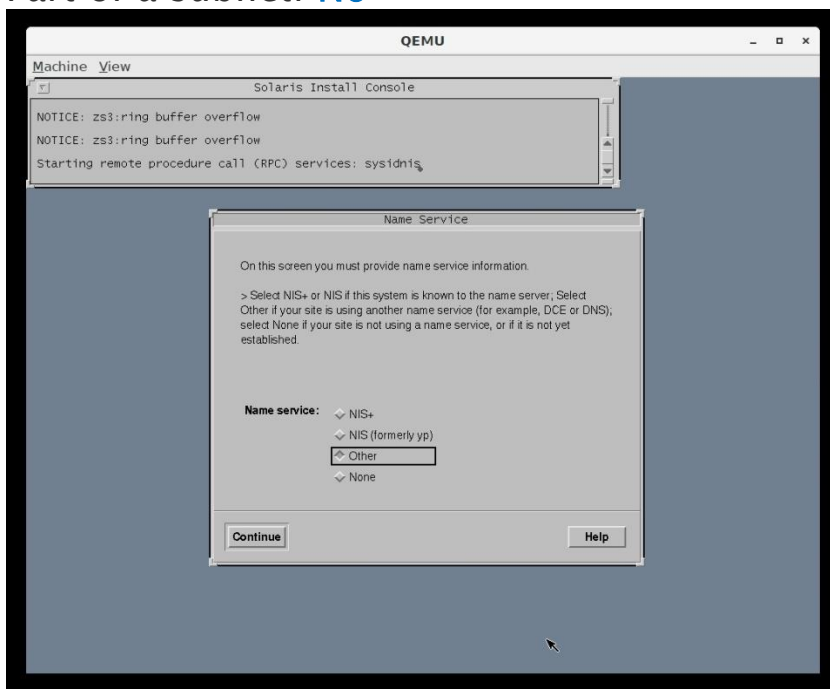
Specify disk (enter its number): 0
Specify disk type (enter its number): 16
Enter number of data cylinders: 16381
...defaults are fine here...
Enter number of heads: 16
...
Enter number of data sectors/track: 63
...
Enter disk type name (remember quotes): Qemu9G

```


- 8) When you reach the networking options, pick a hostname and check **Yes** for Networked. Use **10.0.2.15** for the IP address, QEMU has its own internal network.

Name service: **Other**

Part of a subnet: **No**



- 9) Once everything is finished you should see "The finish script log `finish log` is located in `/var/sadm/system/logs` after reboot." followed by a root prompt (#).

- 10) Now that the installation has finished we need to adjust a few settings to make everything work, we'll use the console to do it. Below, ^D means push Ctrl+D.

First we'll set the SCSI flags so it'll boot properly.

```
# cd /a/etc
# cat >> system set scsi_options=0x58
^D
#
```

- 11) Next we need some network settings. Let's add a default router, the address that QEMU uses is **10.0.2.2**.

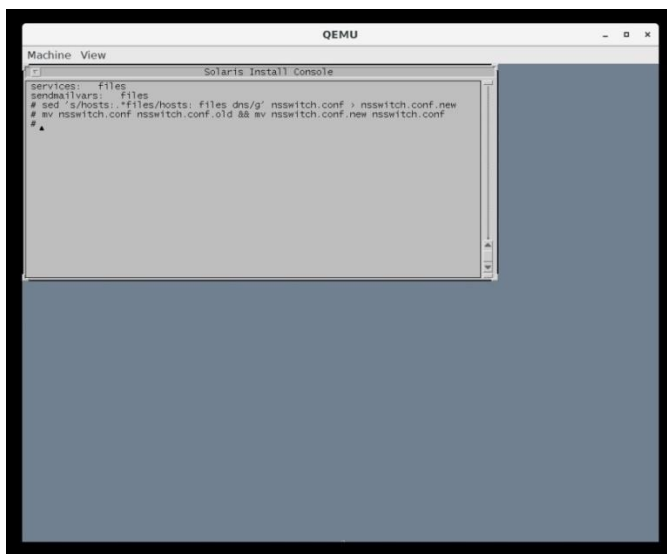
```
# cat > defaultrouter
10.0.2.2
^D
#
```

- 12) Now configure DNS. The nameserver is **10.0.2.3**.

By default, Solaris doesn't use a nameserver at all so we need to enable it. The first 3 lines make that change to **nsswitch.conf** and save it in a new file, replace the old file, then set the right permissions.

Next we tell it what nameserver to use by adding a line to the **resolv.conf** file.

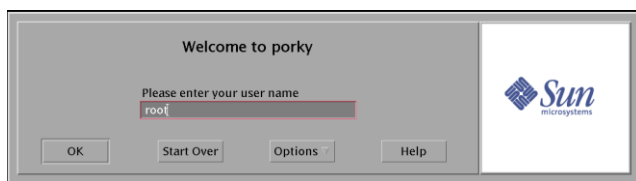
```
# sed 's/hosts:.*files/hosts: files dns/g' nsswitch.conf
> nsswitch.conf.new
# mv nsswitch.conf nsswitch.conf.old && mv
nsswitch.conf.new nsswitch.conf
# chmod 644 nsswitch.conf
# cat > resolv.conf nameserver 10.0.2.3
^D
```

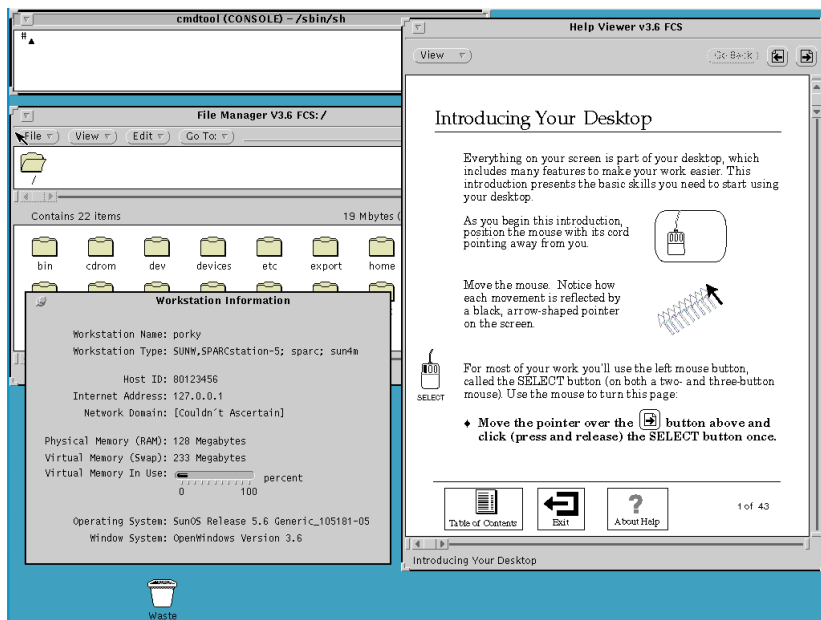
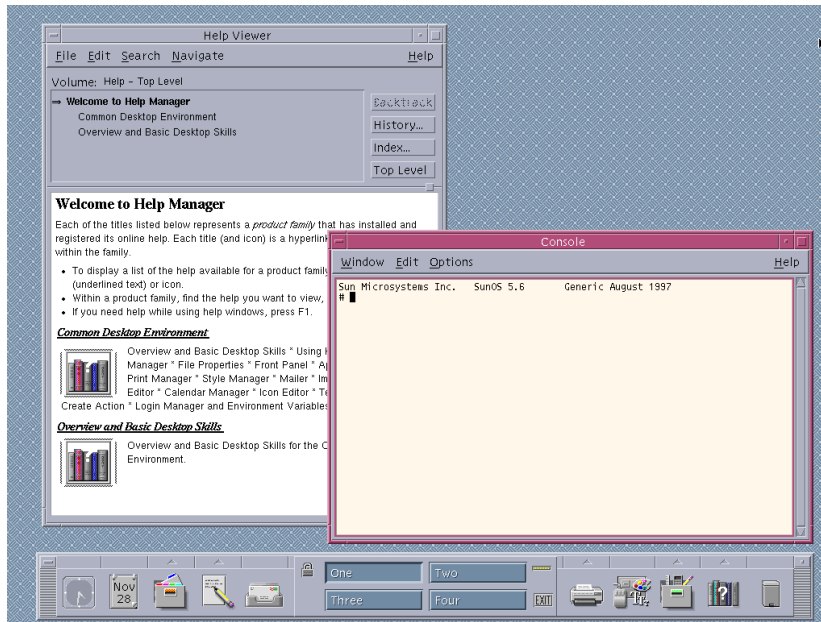


- 13) All set! Time to reboot, just type **reboot** and hit enter.
- 14) When you want to shut down, click **Exit** again, then go to Options and Command Line Login. Press **enter** to get a console login prompt, login as root, then type **shutdown now**. After that you can quit QEMU.
- 15) 操作系统安装全部完成。关机以后再启动用如下命令：
(这里用已经安装操作系统的硬盘 File ‘sparc.qcow2’ 启动 Boot.)
`qemu-system-sparc -M SS-5 -m 128`
`-drive file=sparc.qcow2, bus=0,unit=0,media=disk`
`-drive file=abc.iso, bus=0,unit=2,media=cdrom, readonly=on`
- 16) 为了启动方便我做了一个cmd文件, `stsol.cmd`:
`qemu-system-sparc -M SS-5 -m 128 -drive file=sparc.qcow2,bus=0,unit=0,media=disk`
- 每次启动 SPARC Solaris 2.6, 只要做以下操作:

```
C:\> Cd C:\QEMU <CR>  
C:\QEMU> stsol <CR>
```

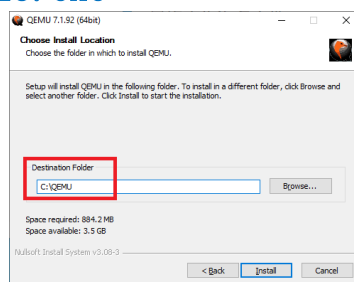
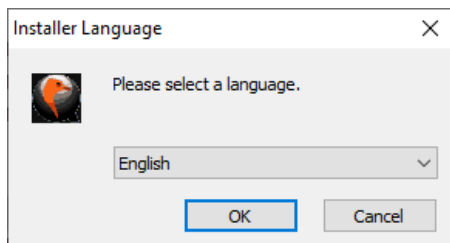
Login的时候可以选择两个不同的 Desktop: CDE or OpenWindows.





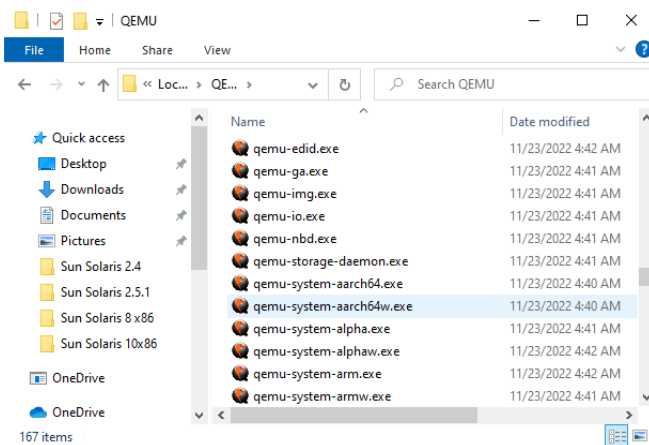
Appendix A Install QEMU

- 1) Download EQMU PKG
<https://download.qemu.org/qemu-7.2.0-rc2.tar.xz> 122,399,628
- 2) Run [qemu-w64-setup-20221123.exe](#)



注意：指定安装到目录 C:\QEMU

- 3) 最终产生C:\QEMU 许多*.exe文件。这里除了qemu-img.exe 以外其他 *.exe 都是某一种机器的仿真程序。例如 qemu-system-sparc.exe 就是SPARC硬件的仿真程序。



- 4) QEMU Documents
<https://qemu-project.gitlab.io/qemu/system/targets.html>

- 5) 附加说一句：另外有人为 QEMU 程序开发了 GUI，称作 qtemu。见下面 link
<https://qtemu.org/>

