

Sun Solaris OS 和 Open Solaris OS 在仿真系统的运行

Sun Solaris OS and Open Solaris OS Running on emulated systems

William Xu
11/11/2022

摘要

运行在 SPARC 系统上面的 Solaris OS 是早年许多软件开发公司的首选. 笔者在美国的第一份工作就在 SPARC 系统上开发了许多 MOTIF 控制程序. 30年以后的今天, SPARC 硬件系统已经很少能够维持运行. 幸而各种软件仿真系统的流行使各位仍然有一睹 Solaris 芳容的机会. 本文介绍该操作系统的简单历史以及何种仿真软件可以运行不同版本的 Solaris 操作系统.

Sun Solaris OS 和 Open Solaris OS

在仿真系统的运行

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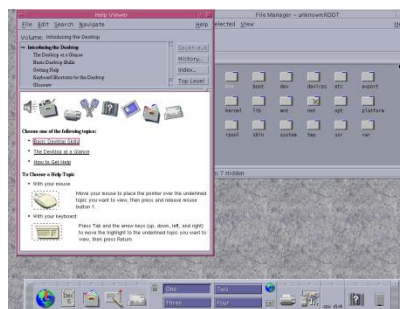
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I. 关于操作系统 Solaris 和 Open Solaris

Solaris 和 Open Solaris 是不一样的操作系统, 但是他们都出于 Oracle 公司. 下面分别介绍.

II. Solaris 操作系统

Solaris is a proprietary Unix operating system originally developed by Sun Microsystems. After the Sun acquisition by Oracle in 2010, it was renamed Oracle Solaris.

Solaris superseded the company's earlier SunOS in 1993, and became known for its scalability, especially on SPARC systems, and for originating many innovative features such as DTrace, ZFS and Time Slider.

Solaris supports SPARC and x86-64 workstations and servers from Oracle and other vendors. Solaris was registered as compliant with the Single UNIX Specification until 29 April 2019.

Solaris 是专有的 Unix 操作系统，最初由 Sun Microsystems 开发。2010年Sun 被 Oracle 收购后，更名为Oracle Solaris。

Solaris 于 1993 年取代了公司早期的 SunOS，并以其可扩展性（尤其是在 SPARC 系统上）而闻名，并因开发了许多创新功能（例如 DTrace、ZFS 和 Time Slider）而闻名。Solaris 支持来自 Oracle 和其他供应商的 SPARC 和 x86-64 工作站和服务器。在 2019 年 4 月 29 日，Solaris 被注册为符合单一 UNIX 规范。

2.1 操作系统 Solaris 简史

下面的表格显示 Solaris 操作系统从版本 1.x 到版本 11.4 的简单历史。目前 11.4 是最后的版本。据说要support 到2034年。

早年的 Solaris 操作系统版本不提供最基本的C编译功能，开发者需要另外购买 C, C++ 编译器。

在 Solaris 版本 2.6 以前，操作系统装好了以后不会自动启动 Desktop。系统 Boot 后进入console log in window。需要用下列命令启动：

`/usr/opwnwin/bin/openwin <CR>`

	Solaris V.	SunOs V	Bit	Hardware	Note	Emulator
1	1.x (1991)	4.1.x	32	SPARC		
2	2.0 (1992)	5.0	32	SPARC		
3	2.1 (1992)	5.1	32	SPARC, x86	开始有 PC x86 版本.	
4	2.2 (1992)	5.2	32	SPARC, x86		
5	2.3 (1993)	5.3	32	SPARC, x86		
6	2.4 (1994)	5.4	32	SPARC, x86	Support OSF/MOTIF	PCem
7	2.5 (1995)	5.5	32	SPARC, x86		
8	2.5.1(1996)	5.5.1	32	SPARC, x86		PCem

9	2.6 (1997)	5.6	32	SPARC, x86		QEMU
10	7 (1998)	5.7	64	SPARC, x86	版本号码去掉2.xx, 用SunOs 5.7的小数. 变为 Ver. 7.	PCem
11	8 (2000)	5.8	64	SPARC, x86		VmBox, PCem
12	9 (2002)	5.9	64	SPARC, x86		N/A
13	10 (1998)	5.10	64	SPARC, x86		VmBox, PCem
14	11 (2010)	5.11	64	SPARC, x86	Solaris Express	VmBox
15	11 (2011)	5.11	64	SPARC, x86		VmBox
16	11.1 (2012)	5.11	64	SPARC, x86		VmBox
17	11.2 (2014)	5.11	64	SPARC, x86		VmBox
18	11.3 (2018)	5.11	64	SPARC, x86		VmBox
19	11.4 (2018)	5.11	64	SPARC, x86	Support -> 2034	VmBox

III. Open Solaris 操作系统

OpenSolaris is a discontinued open-source computer operating system based on Solaris and created by Sun Microsystems. It was also, perhaps confusingly, the name of a project initiated by Sun to build a developer and user community around the eponymous operating system software.

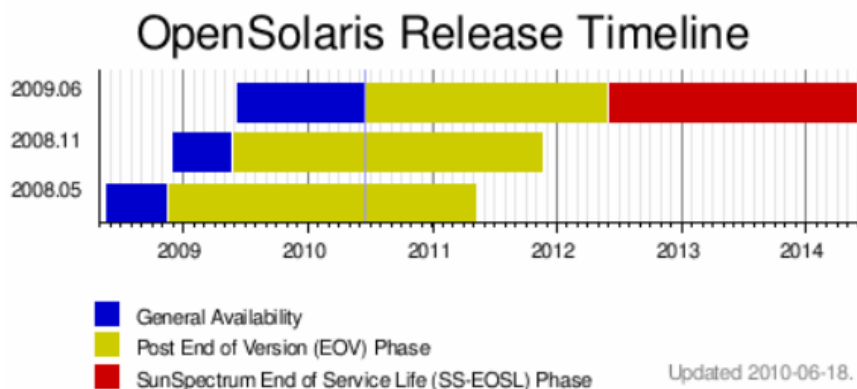
OpenSolaris is a descendant of the UNIX System V Release 4 (SVR4) code base developed by Sun and AT&T in the late 1980s and is the only version of the System V variant of UNIX available as open source. OpenSolaris was developed as a combination of several software consolidations that were open sourced starting with Solaris 10. It includes a variety of free software, including popular desktop and server software.

OpenSolaris 是一个已停产的开源计算机操作系统，基于 Solaris，由 Sun Microsystems 创建。它也是 Sun 发起的一个项目的名称，该项目旨在围绕同名操作系统软件建立开发人员和用户社区。

OpenSolaris 是 UNIX System V Release 4 (SVR4) 代码库的后代，由 Sun 和 AT&T 在 1980 年代后期开发，是 UNIX 的 System V 变体的唯一版本作为开源提供。OpenSolaris 是作为从 Solaris 10 开始开源的多个软件整合的组合而开发的。它包括各种免费软件，包括流行的桌面和服务端软件。

3.1 操作系统 Open Solaris OS 简史

Version	Build	Release date	End of support phase ^[32]		
			General Availability (GA)	Post End of Version (EOV)	SunSpectrum End of Service Life (SS-EOSL)
2008.05	86	13 May 2008	13 November 2008	13 May 2011	-
2008.11	101b	25 November 2008	25 May 2009	25 November 2011	-
2009.06	111b	1 June 2009	1 December 2009	1 June 2012	1 June 2014

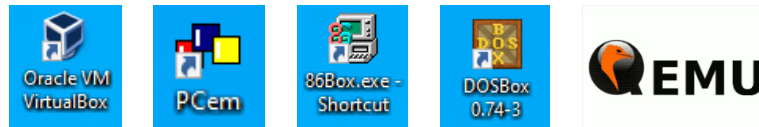


IV. 几个可以用于 Solaris 和 Open Solaris 仿真程序

网上可下载的仿真程序非常多。基本上可以作为两大类，第1类型是仿真软件结构的；第2类是仿真硬件结构的。大部分情况下，仿真硬件的仿真程序兼容程度比较高，但是因为仿真硬件所以它的运行速度就会降低到当年的慢速电脑。有时候觉得慢得不可思议。但是仿真软件的仿真程序也有不少限制。比如当年Windows95为了保护PC不

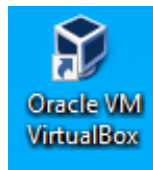
让运行太快发烫，所以Windows 95有超速保护机构。于是乎，VirtualBox 因为运行太快，Windows95 boot以后马上被停止。

以下是笔者测试过的几个实用仿真程序：



4.1 Oracle VM VirtualBox

<https://www.virtualbox.org/wiki/Downloads>

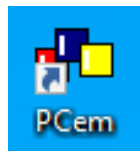


Oracle VM VirtualBox is a type-2 hypervisor for x86 virtualization developed by Oracle Corporation. VirtualBox was originally created by Innotek GmbH, which was acquired by Sun Microsystems in 2008, which was in turn acquired by Oracle in 2010.

Oracle VM VirtualBox 是由 Oracle Corporation 开发的用于 x86 虚拟化的 2 型管理程序。VirtualBox 最初由 Innotek GmbH 创建，该公司于 2008 年被 Sun Microsystems 收购，后者又于 2010 年被 Oracle 收购。

4.2 PCem

<https://pcem-emulator.co.uk/downloads.html>

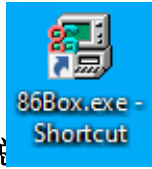


PCem is an IBM PC emulator for Windows and Linux that specializes in running old operating systems and software that are designed for IBM PC compatibles. Originally developed as an IBM PC XT emulator, it later added support for other IBM PC compatible computers as well

PCem 是适用于 Windows 和 Linux 的 IBM PC 模拟器，专门运行 IBM PC 兼容机设计的旧操作系统和软件。最初作为 IBM PC XT 模拟器开发，后来也增加了对其他 IBM PC 兼容计算机的支持。

4.3 86Box

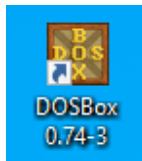
<https://86box.net/>



86Box is a low level x86 emulator that runs older operating systems and software designed for IBM PC systems and compatibles from 1981 through fairly recent system designs based on the PCI bus.

4.4 DOSBox 0.74-3

<https://www.dosbox.com/download.php?main=1>



DOSBox is a free and open-source emulator which runs software for MS-DOS compatible disk operating systems—primarily video games; DOSBox can be downloaded and used from the video game console emulator front-end RetroArch. It was first released in 2002

DOSBox 是一个免费的开源模拟器，它运行适用于 MS-DOS 兼容磁盘操作系统的软件——主要是视频游戏；DOSBox 可以从视频游戏控制台模拟器前端 RetroArch 下载和使用。它于 2002 年首次发布。

4.5 QEMU

<https://www.qemu.org/download/>



QEMU is a free and open-source emulator. It emulates the machine's processor through dynamic binary translation and provides a set of different hardware and device models for the machine, enabling it to run a variety of guest operating systems.

QEMU 是一个免费的开源模拟器。它通过动态二进制翻译模拟机器的处理器，并为机器提供一组不同的硬件和设备模型，使其能够运行各种客户操作系统。

V. Solaris 各版本的仿真

5.1 Solaris 1.x

5.2 Solaris 2.x

5.3 Solaris 3.x

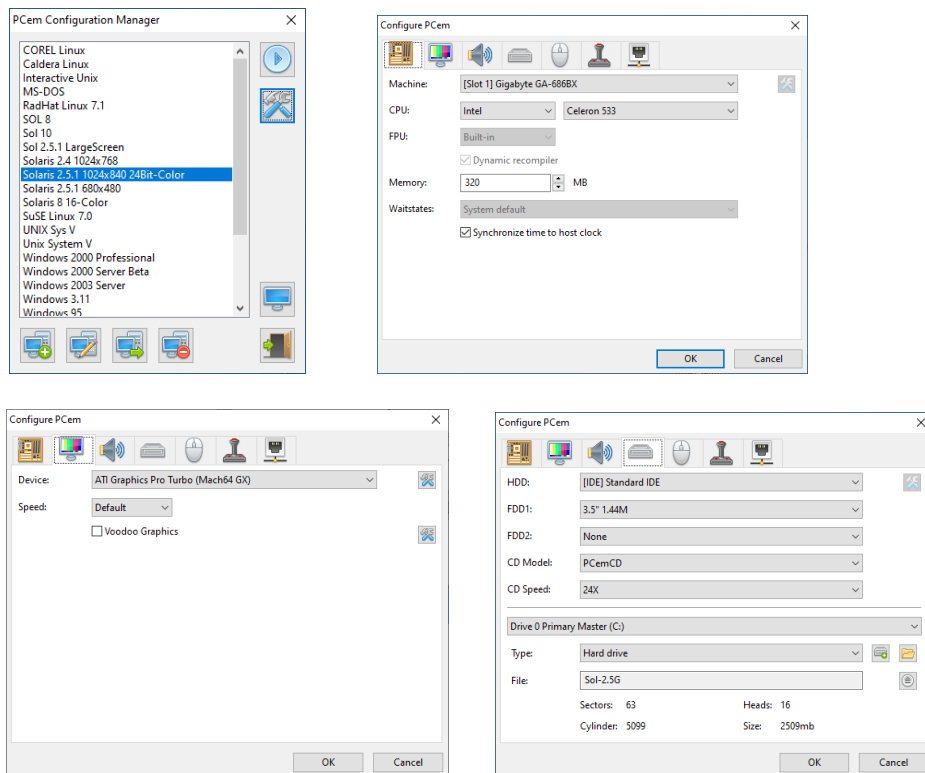
5.4 Solaris 4.x

5.5 Solaris 5.x

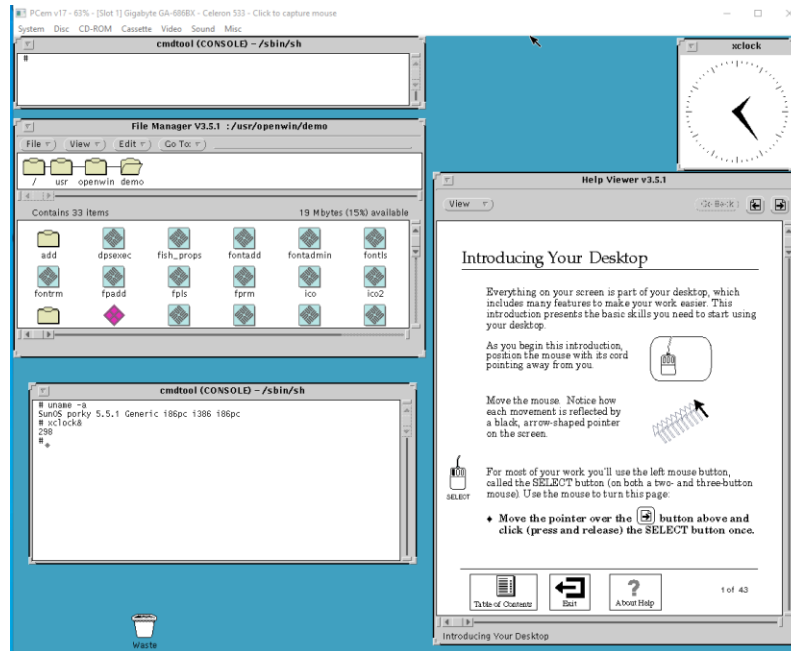
Download:

<https://winworldpc.com/product/sun-solaris/2x>

Emulator: PCem



Screenshot:



5.6 Solaris 2.6

Download:

Sun SPARC ISO 314.21 MB

<https://winworldpc.com/product/sun-solaris/2x>

Emulator: QEMU. Emulates Sparc-64 Hardware.

QEMU可以仿真很多硬件系统。本例是仿真Sparc-64 Hardware。在C:\QEMU目录下自行制作一个 CMD 文件：

`qemu-system-sparc -M SS-5 -m 128 -drive file=sparc.img,bus=0,unit=0,media=disk`

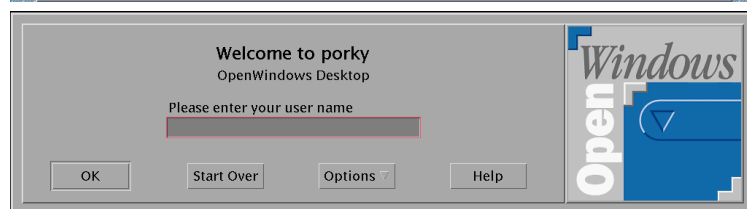
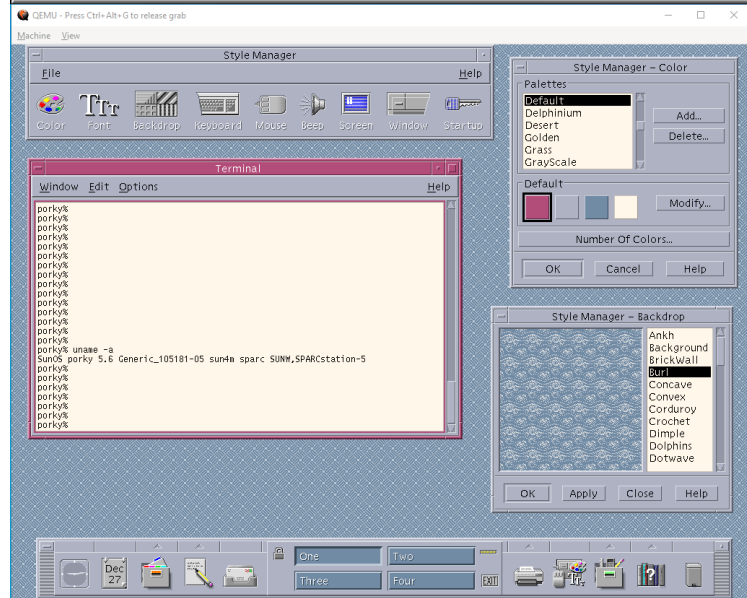
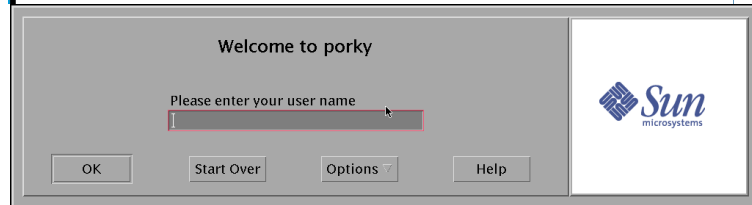
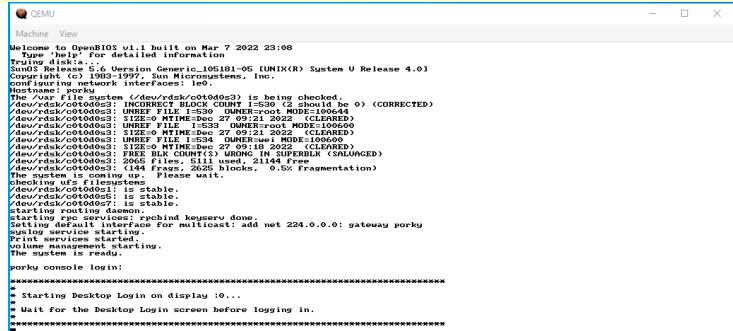
参见：

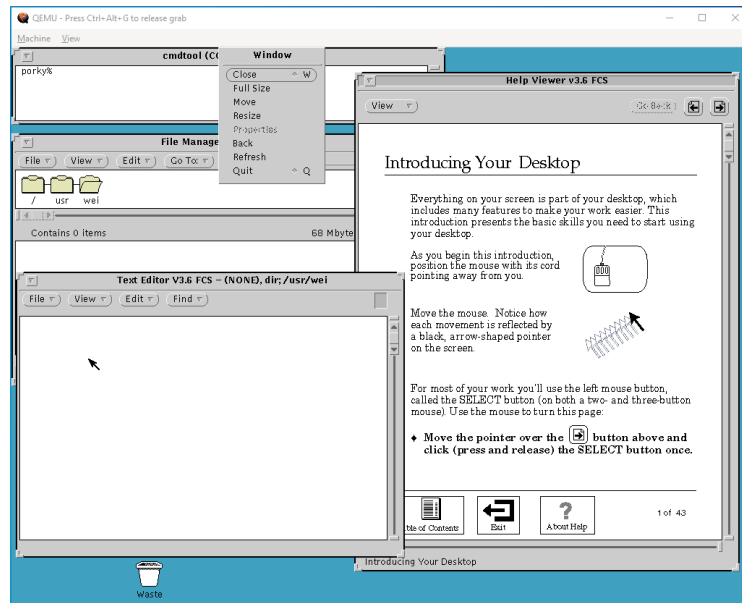
<https://learn.adafruit.com/build-your-own-sparc-with-qemu-and-solaris?view=all>



Screenshot:

System Boot, it shows: SunOS Release 5.6 [UNIX® System V Release 4.01]





5.7 Solaris 5.7

5.8 Solaris 5.8

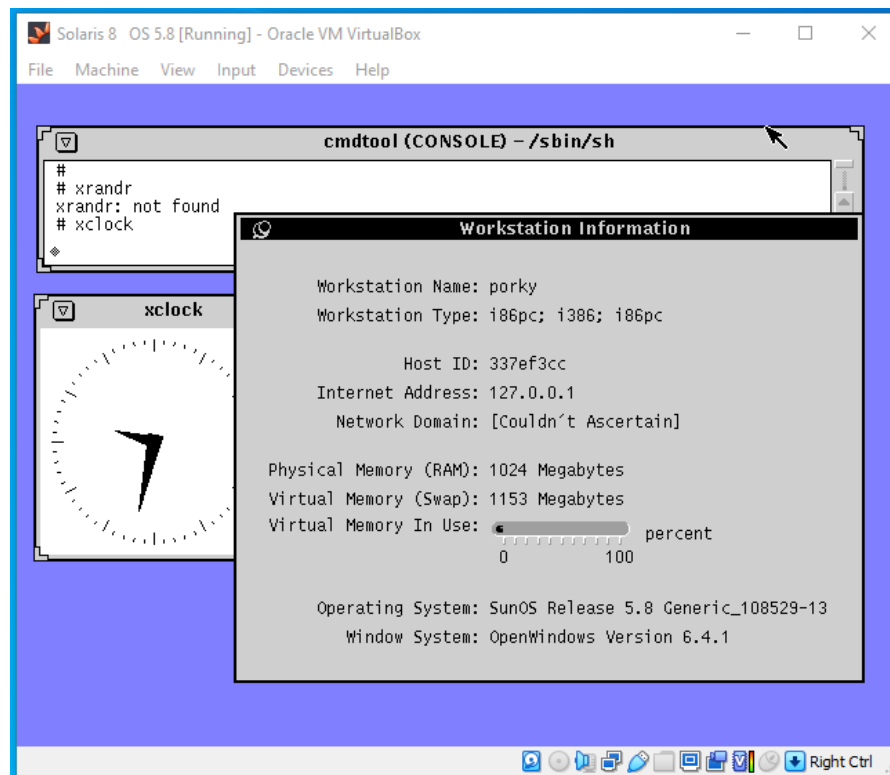
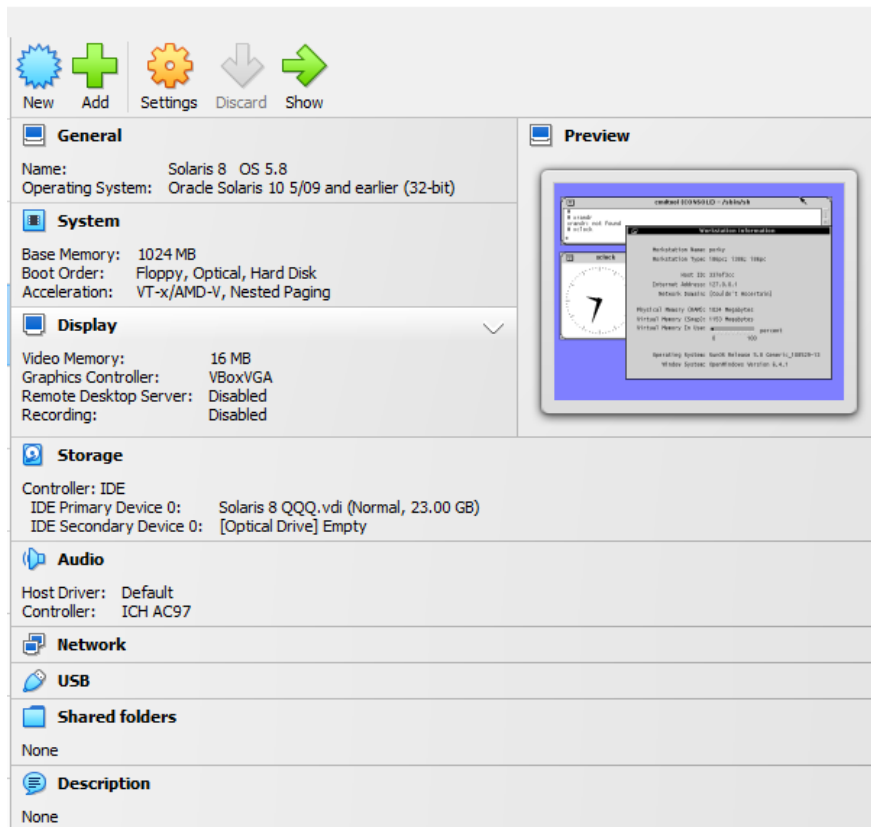
Sun OS Release 5.8 (1999) Running on Oracle VM Virtual Box

Download:

<https://winworldpc.com/product/sun-solaris/2x>

Emulator: Oracle VM Virtual Box

Screenshot:



5.9 Solaris 9.x

5.10 Solaris 10.x

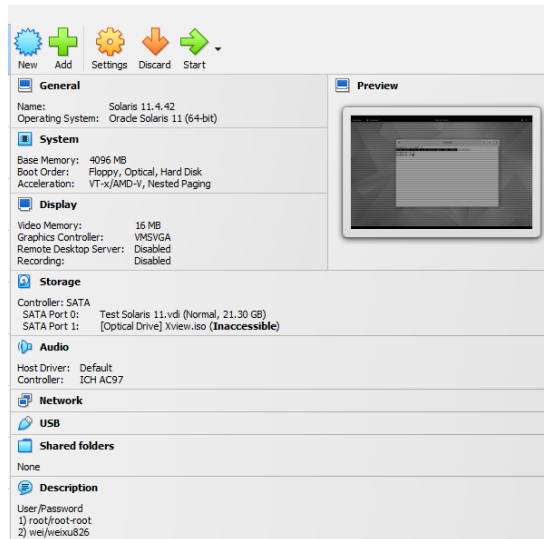
5.11 Solaris 11.x

Solaris 11.4.42 (2022) Running on Oracle VM Virtual Box

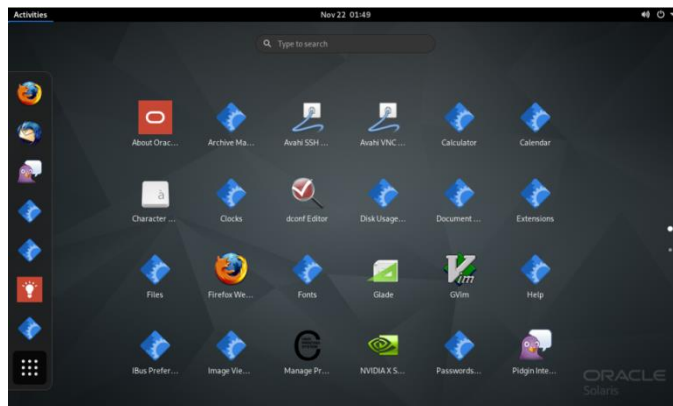
Download:

<https://www.oracle.com/solaris/solaris11/downloads/solaris-downloads.html#>

Emulator: Oracle VM Virtual Box



Screenshot:

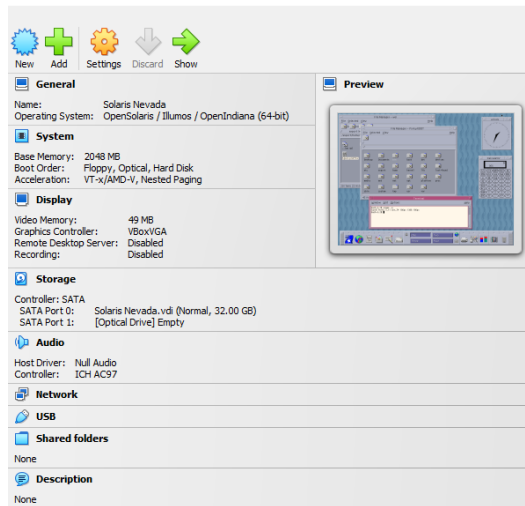


Solaris Nevada (2021) Running on Oracle VM Virtual Box

Download:

<https://archive.org/details/sol-nv-b24-x86>

Emulator: Oracle VM Virtual Box



Screenshot:

