

# Betriebssysteme

Windows, macOS, Unix, Virtualisierung und Tools

Tom Gries



Dokumenten URL:

<http://docs.tx7.de/TT-BS3>

Autor:

Tom Gries <TT-BS3@tx7.de>  
@tomo@chaos.social

Lizenz:

Creative Commons BY-NC-ND

Version:

7.3.0 vom 22.07.2025





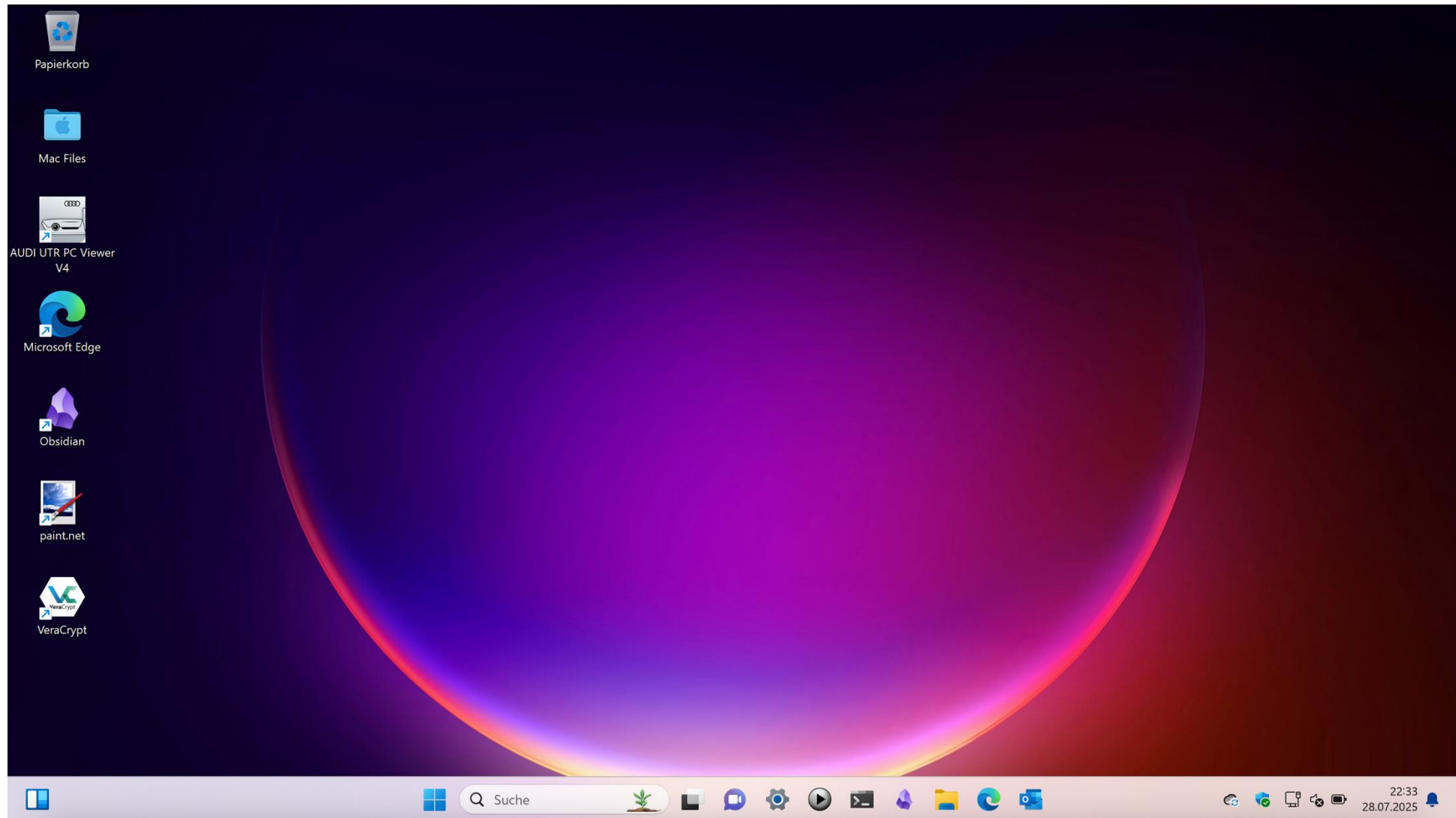
Ein Betriebssystem (BS) verwaltet die Hardware eines Computers und teilt die Ressourcen zu. Bekannte Betriebssysteme für PCs und mobile Endgeräte sind (in chronologischer Reihenfolge):

System	Jahr
UNIX	1971
DOS (Nachfolger von CP/M)	1974
Windows	1983
OS/2 Warp	1987
Linux	1991
MacOS	2001
iOS (vorher iPhone OS)	2007
Android	2008

System	2018	2023
Android	38,97 %	41,64 %
Windows	37,07 %	29,25 %
iOS	13,18 %	17,71 %
macOS	5,24 %	6,57 %
Linux	0,76 %	1,54 %
nicht identifizierte BS	2,72 %	1,93 %
andere BS	2,06 %	1,36 %



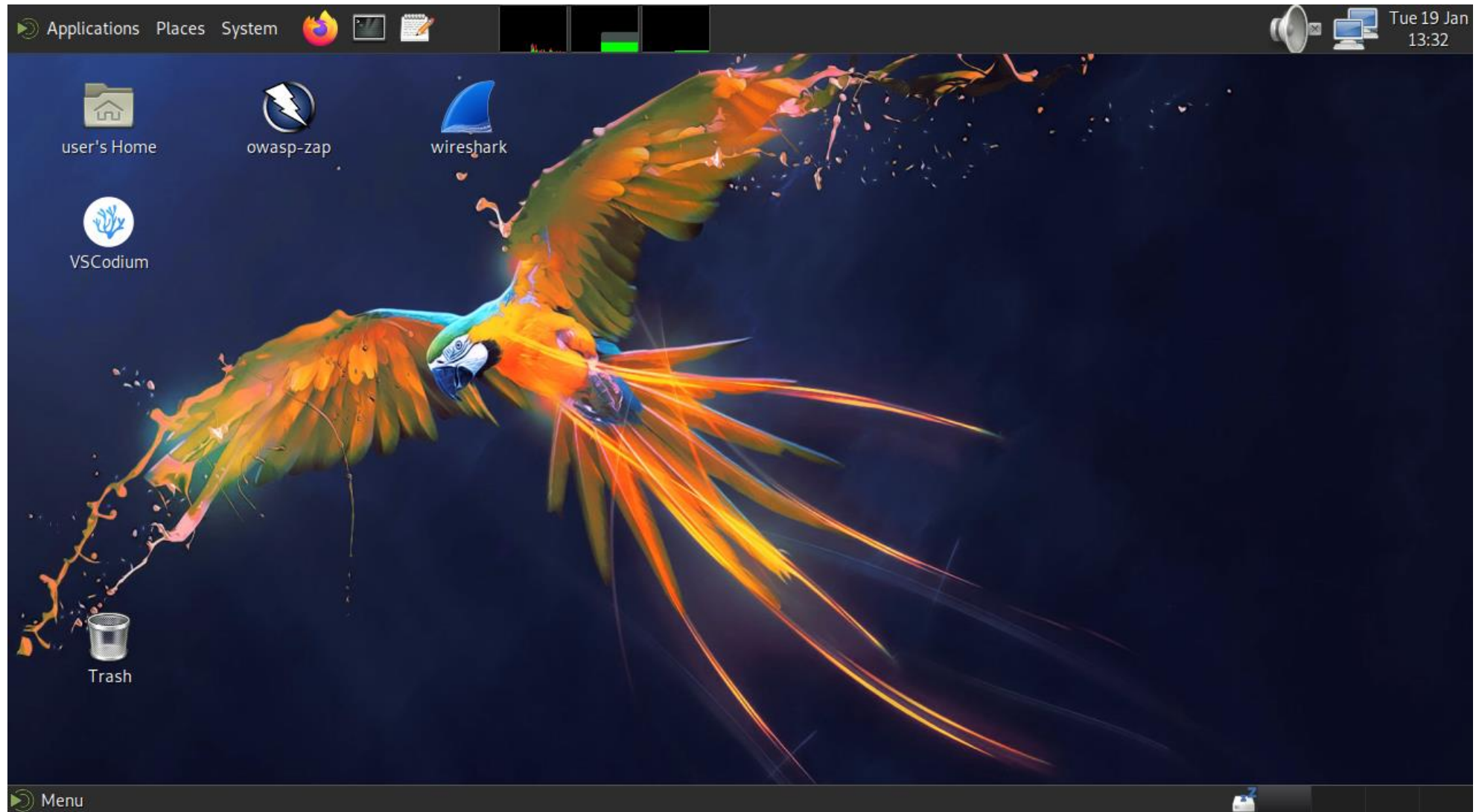
# Windows







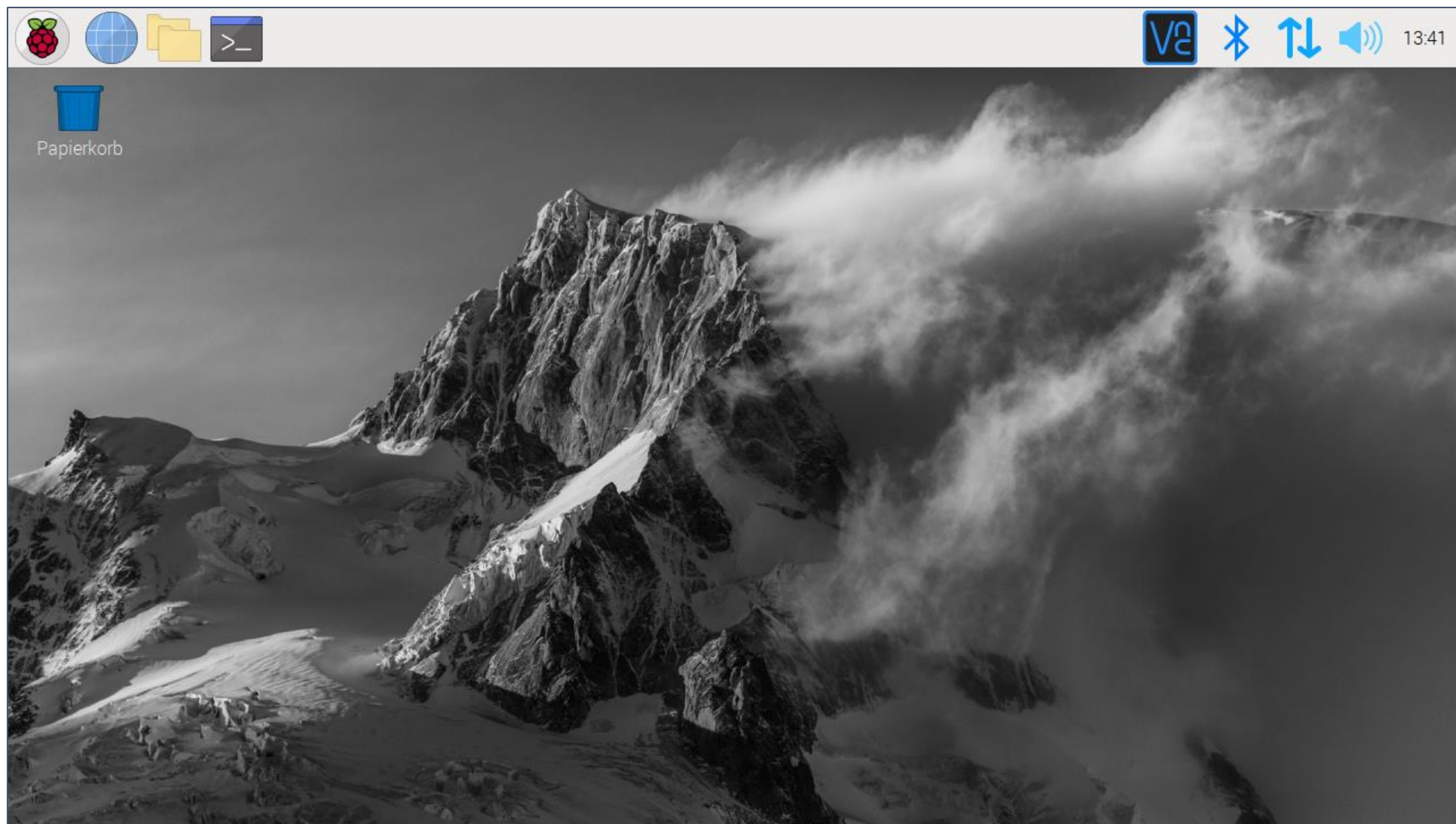
# Parrot Security





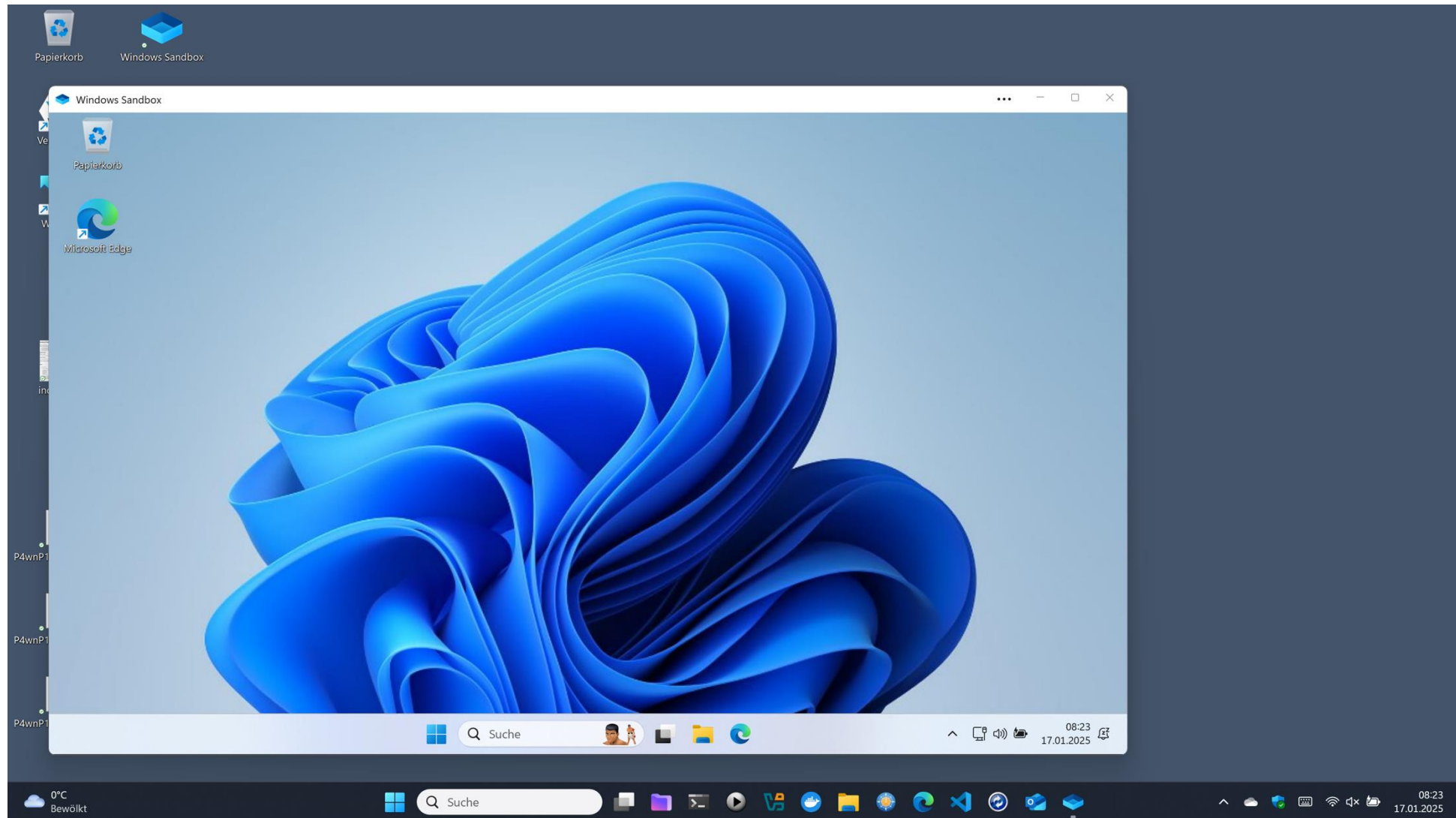


# Raspberry Pi OS



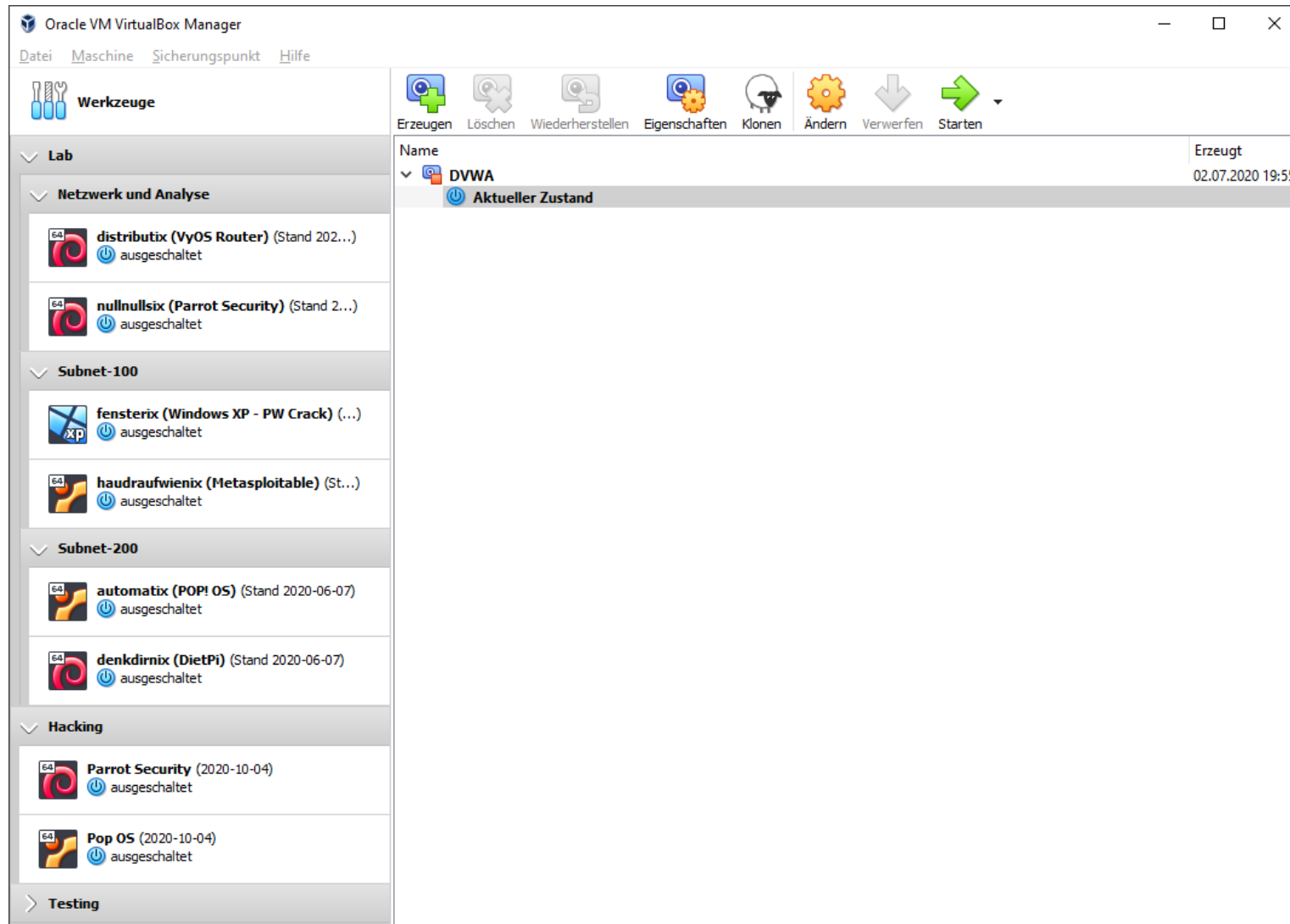


# Windows Sandbox





# VirtualBox







PROXMOX Virtual Environment 6.0-4

Search

Documentation

Create VM

Create CT

root@pam

Server View

Datacenter (democluster)

pve6-demo1

ceph (pve6-demo1)

cephfs (pve6-demo1)

local (pve6-demo1)

local-lvm (pve6-demo1)

pve6-demo2

100 (Buster)

ceph (pve6-demo2)

cephfs (pve6-demo2)

local (pve6-demo2)

local-lvm (pve6-demo2)

pve6-demo3

101 (debianct)

ceph (pve6-demo3)

cephfs (pve6-demo3)

local (pve6-demo3)

local-lvm (pve6-demo3)

production

testlab

Datacenter

Search

Summary

Cluster

Ceph

Options

Storage

Backup

Replication

Permissions

Users

Groups

Pools

Roles

Authentication

HA

Firewall

Support

Health

Status

Nodes

Ceph

Cluster: democluster, Quorate: Yes

HEALTH\_OK

Resources

CPU

Memory

Storage

1% of 18 CPU(s)

21% 4.92 GiB of 23.36 GiB

11% 17.66 GiB of 153.91 GiB

Subscriptions

Community

Your subscription status is valid.

Guests

Virtual Machines

LXC Container

Running 1

Stopped 0

Running 1

Stopped 0

Nodes

Name

ID

Online

Support

Server Address

CPU usage

Memory usage

Uptime

pve6-demo1 1

Online

Community

192.168.6.80

1%

18%

00:06:36

pve6-demo2 2

Online

Community

192.168.6.81

1%

26%

00:06:35

pve6-demo3 3

Online

Community

192.168.6.82

1%

19%

00:06:30

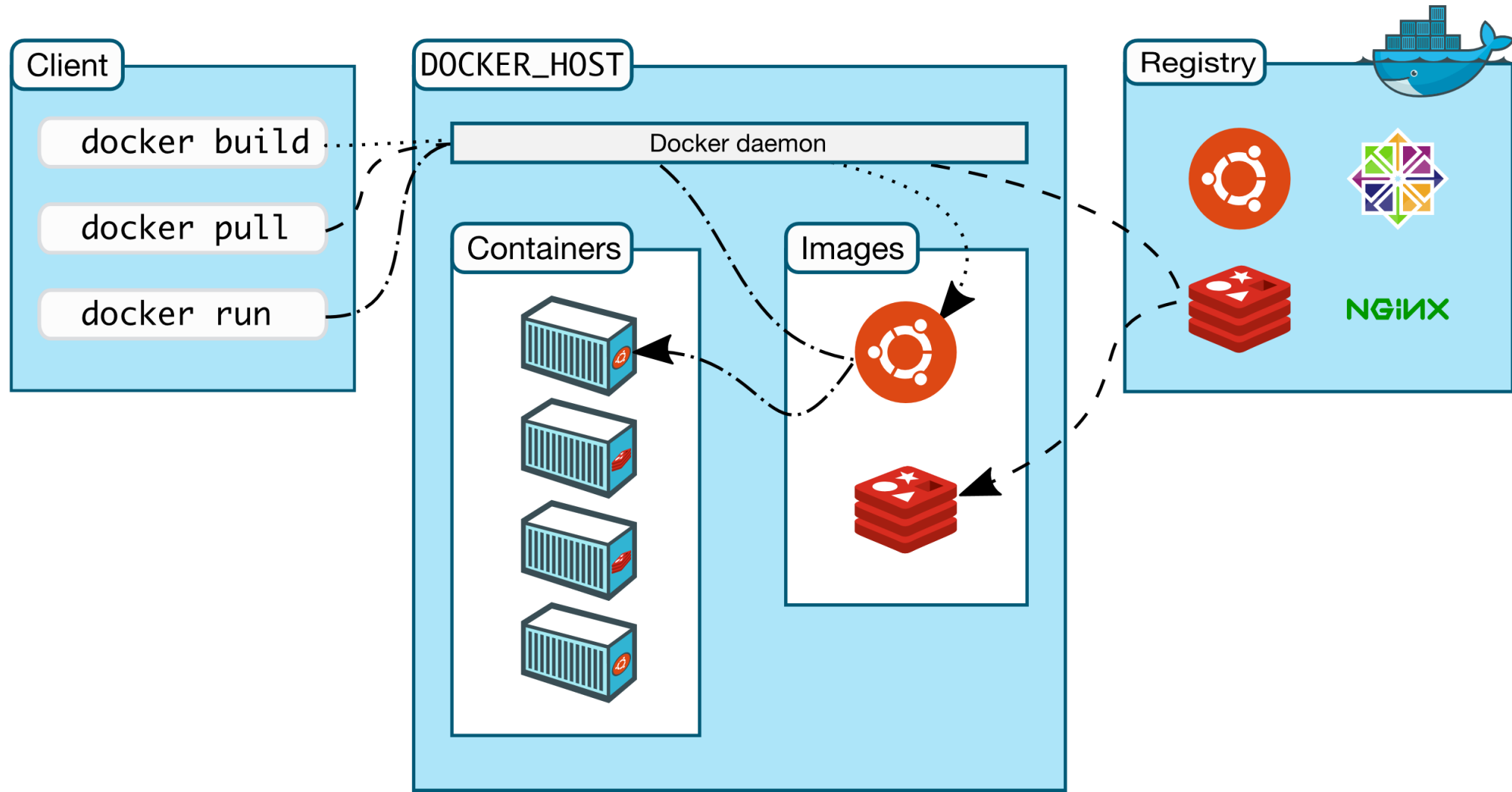
Tasks

Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Jul 16 11:31:59	Jul 16 11:32:02	pve6-demo1	root@pam	Shell	OK
Jul 16 11:31:18	Jul 16 11:31:19	pve6-demo2	root@pam	VM 100 - Start	OK
Jul 16 11:29:15	Jul 16 11:30:00	pve6-demo3	root@pam	CT 101 - Start	OK
Jul 16 11:27:21	Jul 16 11:27:23	pve6-demo3	root@pam	Start all VMs and Containers	OK
Jul 16 11:27:15	Jul 16 11:27:17	pve6-demo2	root@pam	Start all VMs and Containers	OK
Jul 16 11:27:12	Jul 16 11:27:16	pve6-demo1	root@pam	Start all VMs and Containers	OK



# Docker





portainer.io

Home

KASM

Dashboard

App Templates

Stacks

Containers

Images

Networks

Volumes

Events

Host

SETTINGS

Users

Environments

Registries

Authentication logs

Settings

A new version is available

portainer.io 2.11.0

Container list Containers

tomo  
[my account](#) [log out](#)

Containers Columns Settings

Start Stop Kill Restart Pause Resume Remove Add container

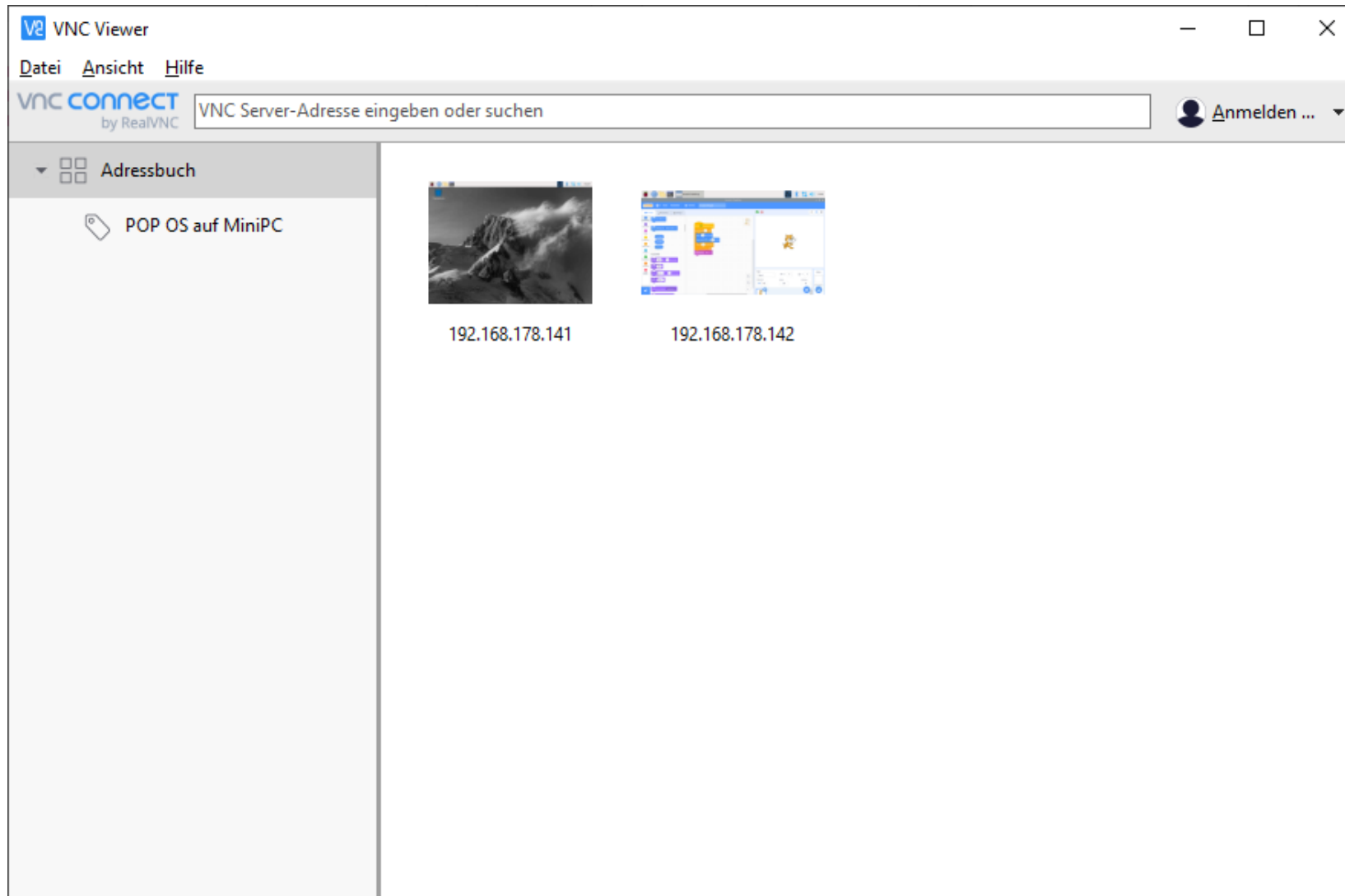
Search...

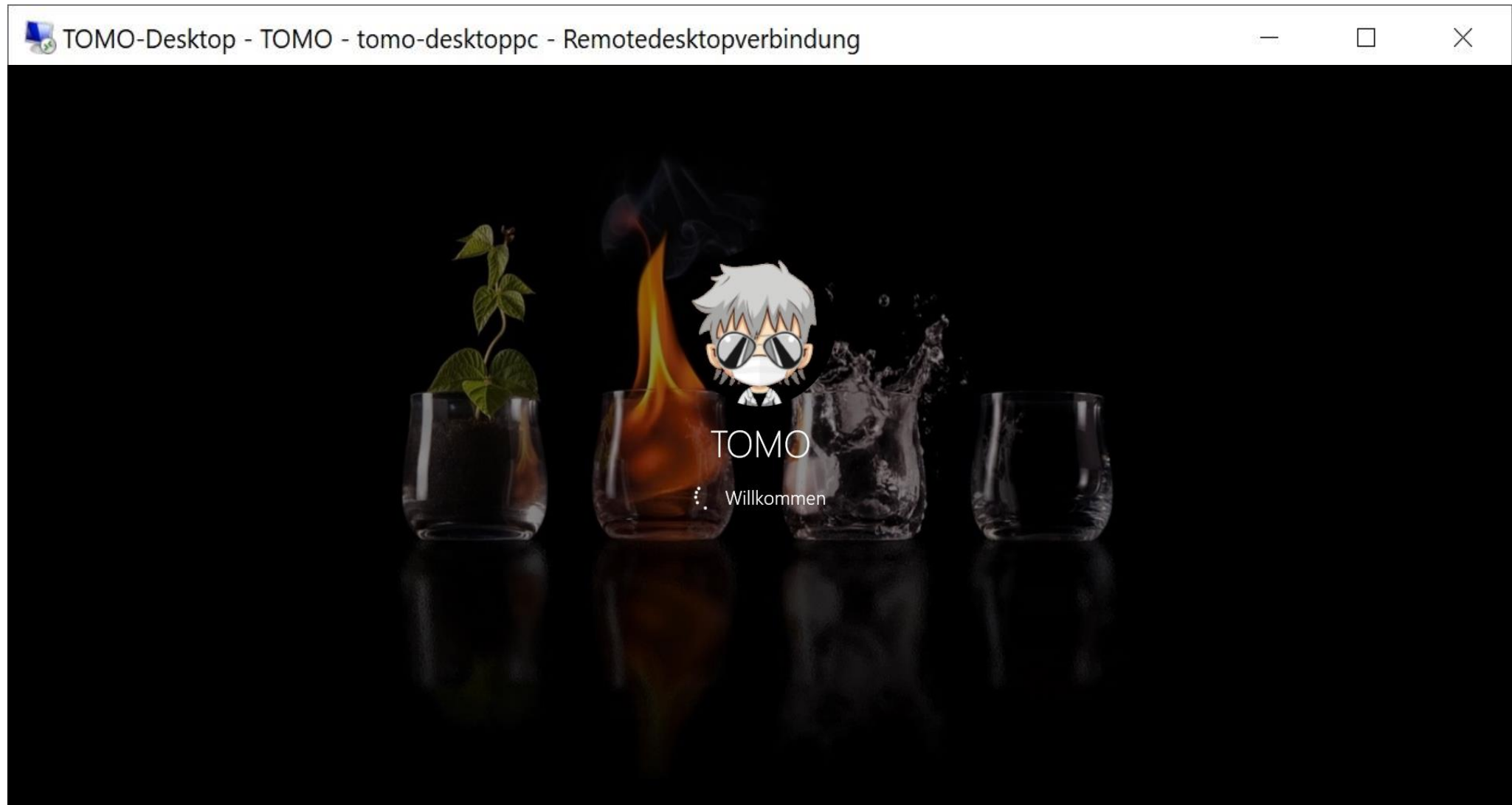
<input type="checkbox"/>	Name	State <div>Filter</div>	Quick actions	Stack	Image	Created	IP Address	Published Ports	Ownership
<input type="checkbox"/>	portainer	running	<div></div>	-	portainer/portainer-ce:2.11.0	2021-12-10 21:31:45	172.17.0.3	<div>8000:8000 9000:9000 9443:9443</div>	administrators
<input type="checkbox"/>	portainer_agent	running	<div></div>	-	portainer/agent	2021-12-08 10:15:12	172.17.0.2	<div>9001:9001</div>	administrators

Items per page 10 1 2



# VNC Viewer



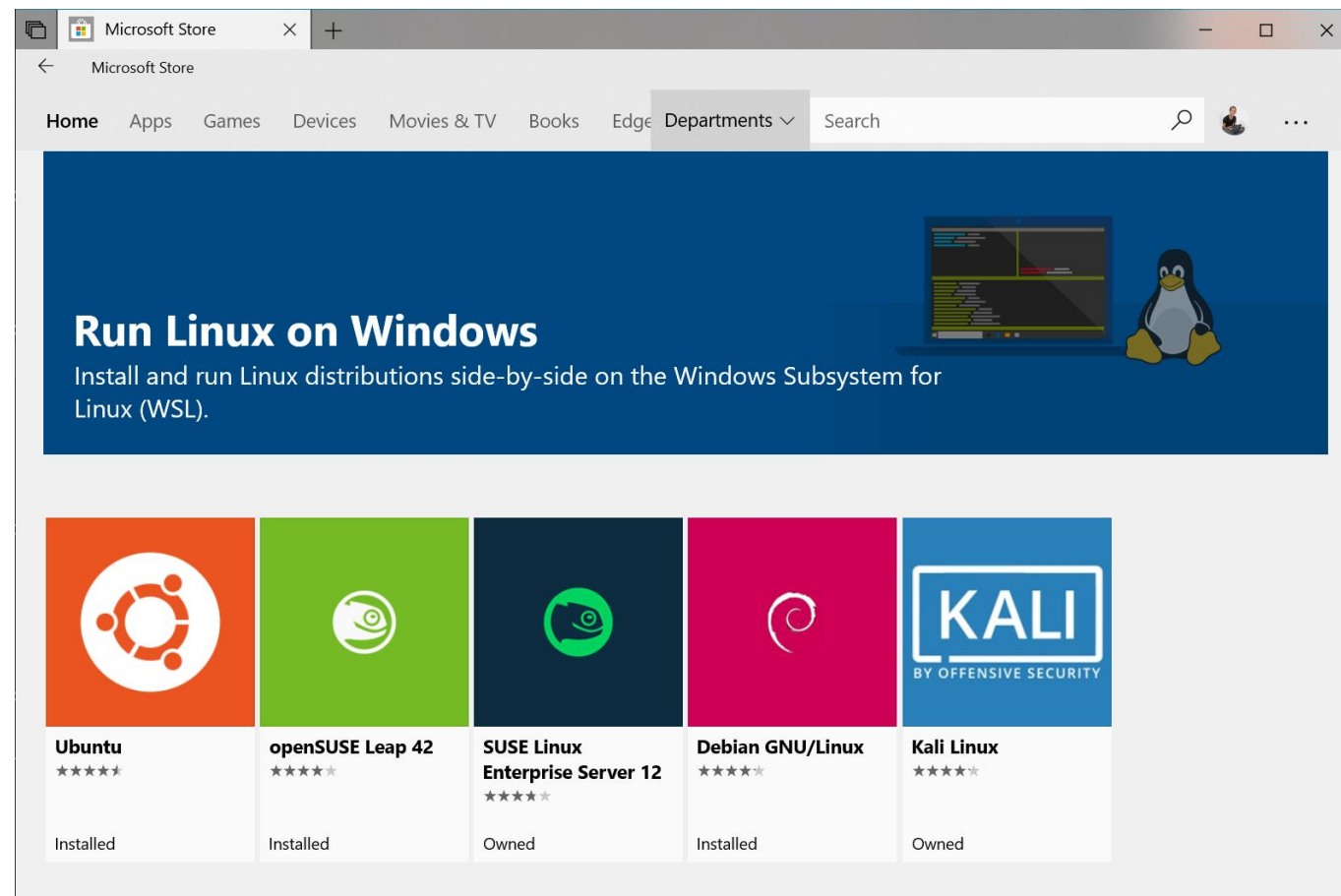






Das **Windows Subsystem for Linux**, kurz WSL, ist eine Erweiterung von Windows 10, um Linux innerhalb von Windows auszuführen.

WSL nutzt Virtualisierungstechniken der CPU.

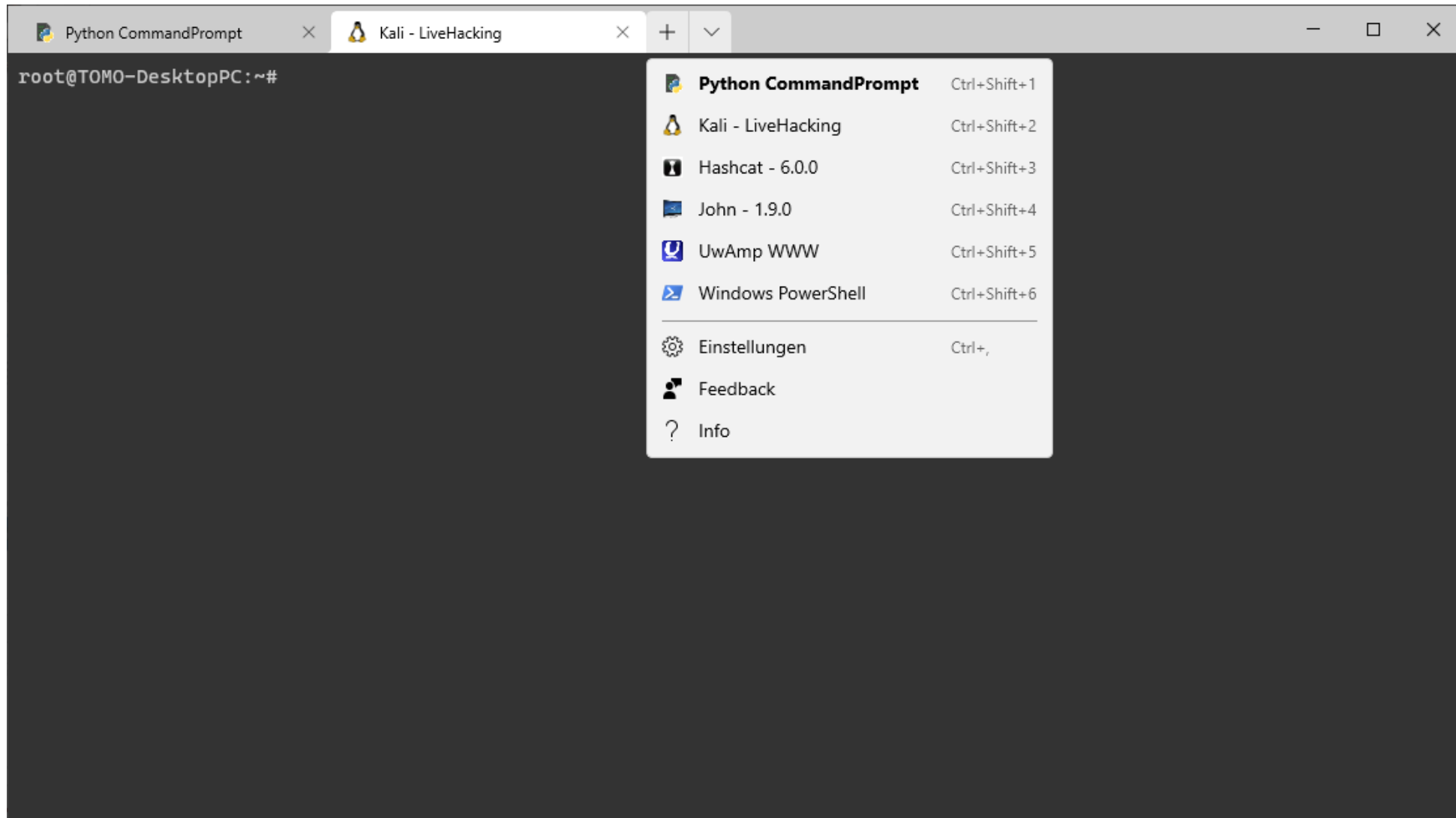




```
tomo@TOMO-DesktopPC: ~  
Installing, this may take a few minutes...  
Please create a default UNIX user account. The username does not need to match your Windows username.  
For more information visit: https://aka.ms/wslusers  
Enter new UNIX username: tomo  
New password:  
Retype new password:  
passwd: password updated successfully  
Installation successful!  
(Message from Kali developers)  
  
This is a minimal installation of Kali Linux, you likely  
want to install supplementary tools. Learn how:  
  https://www.kali.org/docs/troubleshooting/common-minimum-setup/  
  
(Run "touch ~/.hushlogin" to hide this message)  
(tomo@TOMO-DesktopPC)-[~]  
$ _
```



# Windows Terminal





# Putty

Putty war einer der meistverwendeten SSH Clients unter Windows. Putty ist kostenlos.

```
tomo@TOMO-DesktopPC: ~  
login as: tomo  
tomo@172.24.92.77's password:  
Linux TOMO-DesktopPC 4.19.104-microsoft-standard #1 SMP Wed Feb 19 06:37:35 UTC  
2020 x86_64  
  
The programs included with the Kali GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
tomo@TOMO-DesktopPC:~$
```

The image shows the PuTTY Configuration dialog box. On the left, a tree view under 'Category:' has 'Session' selected. The right pane is titled 'Basic options for your PuTTY session'. It contains fields for 'Host Name (or IP address)' and 'Port' (set to 22). The 'Connection type:' section has radio buttons for Raw, Telnet, Rlogin, SSH (selected), and Serial. Below this is a section for 'Load, save or delete a stored session' with a 'Saved Sessions' list box containing: Default Settings, Kali Linux in VirtualBox, Raspi Initial (FritzBox), Raspi Initial (Link Lokal), TOMO-NAS, TOMO-PI-1-Bplus-01, and TOMO-PI-1-Bplus-02. To the right of the list are 'Load', 'Save', and 'Delete' buttons. At the bottom, the 'Close window on exit:' section has radio buttons for Always, Never, and Only on clean exit (selected). At the very bottom are 'About', 'Help', 'Open', and 'Cancel' buttons.



# NirSoft und SysInternals im NirLauncher

NirLauncher - NirSoft Utilities

File Edit View Options Launcher Packages Help

Password Recovery Utilities

Network Monitoring Tools

Web Browser Tools

Video/Audio Related Utilities

Internet Related Utilities

Command-Line Utilities

Desktop Utilities

Outlook/Office Utilities

Programmer Tools

Disk Utilities

System Utilities

Other Utilities

All Utilities

Name	Description	Version	Updated On	Web Page URL	EXE Filename	EXE Modifie...	EXE Created Time	GUI/C...	Help F...	In Favorites
*ProduKey*	Displays the CD-Keys of...	1.97	17.04.2021 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	17.04.2021 1...	17.04.2021 11:48:42	GUI A...	C:\Use...	No
ActiveXHelper	view essential informati...	1.12	21.12.2007 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	21.12.2007 1...	21.12.2007 16:22:40	GUI A...	C:\Use...	No
AdvancedRun	Run a program with diff...	1.51	11.04.2022 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	11.04.2022 1...	11.04.2022 11:00:26	GUI A...	C:\Use...	No
AllThreadsView	Displays a list of all run...	1.00	23.03.2018 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	23.03.2018 2...	23.03.2018 23:24:36	GUI A...	C:\Use...	No
AppCompatibilityView	List of all programs that...	1.07	17.02.2022 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	17.02.2022 1...	17.02.2022 14:05:36	GUI A...	C:\Use...	No
AppCrashView	Displays the details of a...	1.35	10.11.2018 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	10.11.2018 0...	10.11.2018 08:42:42	GUI A...	C:\Use...	No
AppResourcesUsageView	View application resour...	1.06	06.11.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	06.11.2024 1...	06.11.2024 15:31:40	GUI A...	C:\Use...	No
BatteryHistoryView	Displays battery history ...	1.06	20.12.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	20.12.2024 1...	20.12.2024 15:36:36	GUI A...	C:\Use...	No
BatteryInfoView	Displays battery inform...	1.26	03.12.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	03.12.2024 1...	03.12.2024 11:34:56	GUI A...	C:\Use...	No
BlueScreenView	Show information abou...	1.55	29.01.2015 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	29.01.2015 0...	29.01.2015 09:11:02	GUI A...	C:\Use...	No
BluetoothLogView	Creates a log of Blueto...	1.12	20.10.2016 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	20.10.2016 1...	20.10.2016 19:45:44	GUI A...	C:\Use...	No
BluetoothView	Monitors the activity of ...	1.70	30.09.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	30.09.2024 1...	30.09.2024 15:56:32	GUI A...	C:\Use...	No
BulkFileChanger	Change date/time/attri...	1.73	19.04.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	19.04.2024 1...	19.04.2024 13:45:10	GUI A...	C:\Use...	No
ControlMyMonitor	View and modify the se...	1.38	01.04.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	01.04.2024 1...	01.04.2024 13:29:42	GUI A...	C:\Use...	No
CurrProcess	Displays the list of all pr...	1.13	22.05.2008 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	22.05.2008 0...	22.05.2008 07:45:40	GUI A...	C:\Use...	No
DevManView	Alternative to the stand...	1.80	06.09.2023 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	06.09.2023 1...	06.09.2023 11:31:38	GUI A...	C:\Use...	No
DriverView	Displays the list of all d...	1.51	05.08.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	05.08.2024 1...	05.08.2024 10:03:42	GUI A...	C:\Use...	No
EventLogChannelsView	View,Disable,Enable Eve...	1.38	28.09.2023 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	28.09.2023 1...	28.09.2023 12:38:48	GUI A...	C:\Use...	No
EventLogSourcesView	Displays the list of all e...	1.00	09.08.2013 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	09.08.2013 1...	09.08.2013 10:19:04	GUI A...	C:\Use...	No
ExecutedProgramsList	Displays programs and ...	1.11	18.03.2016 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	18.03.2016 1...	18.03.2016 11:11:04	GUI A...	C:\Use...	No
FirmwareTablesView	Displays a list of firmwa...	1.02	06.08.2022 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	06.08.2022 0...	06.08.2022 09:44:20	GUI A...	C:\Use...	No
FolderChangesView	Monitor folder/drive ch...	2.37	28.08.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	28.08.2024 1...	28.08.2024 16:04:20	GUI A...	C:\Use...	No
FolderTimeUpdate	Updates the 'Modified ...	1.72	22.08.2023 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	22.08.2023 1...	22.08.2023 19:30:12	GUI A...	C:\Use...	No
FullEventLogView	Event log viewer for Wi...	1.80	22.09.2023 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	22.09.2023 1...	22.09.2023 12:43:22	GUI A...	C:\Use...	No
HandleCountersView	Shows handle counter f...	1.19	15.08.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	15.08.2024 1...	15.08.2024 15:05:12	GUI A...	C:\Use...	No
InstalledAppView	View installed Windows...	1.09	04.09.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	04.09.2024 1...	04.09.2024 11:21:58	GUI A...	C:\Use...	No
InstalledDriversList	Lists all device drivers t...	1.06	21.09.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	21.09.2024 1...	21.09.2024 16:20:34	GUI A...	C:\Use...	No
InstalledPackagesView	Displays installed MSI p...	1.10	16.04.2024 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	16.04.2024 1...	16.04.2024 15:59:46	GUI A...	C:\Use...	No
JumpListsView	Displays the informatio...	1.16	25.03.2018 ...	<a href="https://www.nirsoft.net/">https://www.nirsoft.net/...</a>	C:\Users\LiveHacking\One...	25.03.2018 2...	25.03.2018 22:45:50	GUI A...	C:\Use...	No

Run

Advanced Run

Web Page

Help File

Web Search

Package

Package

85 Utilities, 1 Selected

NirSoft Freeware. <https://www.nirsoft.net>





# NirSoft und SysInternals im NirLauncher

NirLauncher - SysInternals Suite -[2024.02.13]-

File Edit View Options Launcher Packages Help

**File and Disk Utilities** **Networking Utilities** **Process Utilities** **Security Utilities** **System Information Utilities** **Miscellaneous Utilities**

**All Utilities**

Name #	Description	Version	Updated On	Web Page URL	EXE Filename	EXE Modifie...	EXE Created Time	GUI/C...	Help F...	In Favorites
Autoruns	Shows what programs a...	14.11	06.02.2024 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	06.02.2024 1...	17.01.2025 15:28:47	GUI A...	C:\Use...	No
Autoruns Command-line	Shows what programs a...	14.11	06.02.2024 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	06.02.2024 1...	17.01.2025 15:28:47	Consol...		No
ClockRes	Views resolution of the ...	2.1	22.06.2020 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	22.06.2020 2...	17.01.2025 15:28:47	Consol...		No
Coreinfo	Shows CPU caps and m...	3.6	29.09.2022 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	29.09.2022 2...	17.01.2025 15:28:47	Consol...		No
LiveKd	Uses Microsoft kernel d...	5.63	27.04.2020 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	27.04.2020 1...	17.01.2025 15:28:47	Consol...		No
LoadOrder	Shows order in which d...	1.02	12.10.2021 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	12.10.2021 2...	17.01.2025 15:28:47	GUI A...		No
LoadOrder Command-line	Shows order in which d...	1.02	12.10.2021 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	12.10.2021 2...	17.01.2025 15:28:47	Consol...		No
PipeList	Displays the named pip...	1.02	30.04.2020 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	30.04.2020 1...	17.01.2025 15:28:47	Consol...		No
PsInfo	Obtains information ab...	1.79	30.03.2023 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	30.03.2023 1...	17.01.2025 15:28:48	Consol...		No
RAMMap	Advanced physical me...	1.61	11.05.2022 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	11.05.2022 1...	17.01.2025 15:28:48	GUI A...		No
VMMMap	Process virtual and phys...	3.4	18.10.2023 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	18.10.2023 1...	17.01.2025 15:28:48	GUI A...	C:\Use...	No
WinObj	Object Manager names...	3.14	27.01.2022 ...	<a href="https://docs.microsoft.c...">https://docs.microsoft.c...</a>	C:\Users\LiveHacking\One...	27.01.2022 2...	17.01.2025 15:28:48	GUI A...		No

Run Advanced Run Web Page Help File Web Search Package Package

12 Utilities, 1 Selected NirSoft Freeware. <https://www.nirsoft.net>

**Anmerkungen oder Fragen?**