ACHTUNG! 9front dash1 manual is written by and for 9front users.

_Those who can do, those who can't write and those who can't write make ezines._
— Sape Mullender

ACHTUNG! Information provided by this document is UNOFFICIAL and may be outdated or just plain WRONG. Use your brain. NO REFUNDS.

__sl’s info is incorrect.__
— anth_x

ACHTUNG! 9front is absolutely and unalterably opposed to racism, sexism, homophobia, transphobia, nationalism, ethnocentrism, religious fundamentalism, and oppressive and coercive power structures of all kinds.

_Nobody wants 2 take the weight – The responsibility_
— Prince,
_Avalanche_

ACHTUNG! Don’t read too much into what you find here.

_Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men._
— FM34–60 COUNTERINTELLIGENCE
0 – Introduction to Plan 9

0.1 – What is Plan 9?

0.1.1 – Plan 9 is not UNIX

0.1.1.1 – Plan 9 is not plan9port

0.1.1.2 – Plan 9 is not Inferno

0.1.2 – Plan 9 is not a product

0.1.3 – Plan 9 is not for you

0.2 – Why Plan 9?

0.2.1 – What do people like about Plan 9?

0.2.1.1 – What do you use Plan 9 for?

0.2.2 – What do people hate about Plan 9?

0.2.2.1 – What is not in Plan 9

0.2.3 – Why did Plan 9’s creators give up on Plan 9?

0.2.3.1 – Why did Plan 9’s users give up on Plan 9?

0.2.3.2 – Why did CIA give up on Plan 9?

0.2.3.3 – Why did Rob give up on releasing tracks by The Residents, Wire, Lou Reed, and
Debby Harry on the Plan 9 CD-ROM?

0.2.4 – What is the deal with Plan 9’s weird license?

0.2.4.1 – Richard Stallman hates the Plan Nine license (circa 2000)

0.2.4.2 – Theo de Raadt hates the Plan 9 license (circa 2003)

0.2.4.3 – Everyone hates the Plan 9 license (circa 2014)

0.2.4.4 – PRAISE FOR 9FRONT’S BOLD ACTION, RE: LICENSING

0.2.4.5 – Everyone loves the Plan 9 license (circa 2021)

0.2.4.6 – Plan 9 is a registered trademark of SouthSuite Inc.

0.3 – Further Reading

0.3.1 – Plan 9 papers

0.3.2 – Man pages

0.3.3 – Web pages

0.3.4 – Books

1 – Introduction to 9front

1.1 – What is 9front?

1.1.1 – Cirno

1.2 – On what systems does 9front run?

1.3 – Why might I want to use 9front?

1.3.0 – Why might I not want to use 9front?

1.3.0.1 – Why did 9front stop making fun of Nazis?

1.3.1 – New Features

1.3.1.1 – New Programs

1.3.1.2 – New Hardware Support

1.4 – Is 9front really free?

1.5 – How can I help support 9front?

1.6 – Who maintains 9front?

1.7 – When is the next release of 9front?
1.8 – What is included with 9front?
1.9 – Can I use 9front as a desktop system?
1.10 – Why is/isn’t ProductX included?
1.11 – Fine, where can I get 9front?
1.11.1 – Mirrors
1.11.1.1 – 9front.iso
1.11.1.2 – git repository

2 – Getting to know 9front
2.1 – Web Pages
2.2 – Mailing Lists
2.2.1 – Mailing List Archives
2.2.1.1 – Unofficial Web Archives
2.2.1.2 – Official Web Archives
2.2.2 – Other useful mailing lists
2.2.2.1 – Starfleet General Order 1
2.3 – Manual Pages
2.3.2 – How do I write my own manual page?
2.4 – Reporting Bugs
2.4.1 – Your bug report SUCKS
2.4.2 – How do I get more useful info for developers?
2.4.2.1 – Take a photo of the panic screen
2.4.2.2 – Make a stack trace of a crashed process
2.4.2.3 – Make a process snapshot
2.5 – Sending Fixes
2.5.1 – How do I write good patches?
2.5.2 – How do I send in my patches?
3 – Hardware

3.1 – Selecting Hardware

3.2 – Known Working Hardware

3.2.0 – Input Devices

3.2.0.1 – Mice

3.2.0.1.1 – IBM/Lenovo

3.2.0.2 – Keyboards

3.2.0.2.1 – IBM/Lenovo

3.2.0.2.2 – TEX Electronics

3.2.0.2.3 – MNT Research GmbH

3.2.1 – Audio

3.2.2 – Graphics

3.2.2.1 – AGP

3.2.2.2 – Integrated

3.2.2.3 – PCI Express

3.2.3 – Networking

3.2.3.1 – Ethernet

3.2.3.1.1 – Integrated

3.2.3.1.2 – USB

3.2.3.1.3 – PCMCIA

3.2.3.2 – WiFi

3.2.3.2.1 – Bridge (external)

3.2.3.2.2 – Mini–PCI

3.2.3.2.3 – Mini–PCI Express

3.2.3.2.3.1 – iwl

3.2.3.2.3.2 – wpi

3.2.3.2.3.3 – rt2860
3.2.3.2.4 – PCI
3.2.3.2.5 – PCMCIA
3.2.4 – Tablet Digitizers
3.2.4.1 – Serial
3.2.4.1.1 – Integrated
3.2.4.2 – USB
3.2.4.2.1 – Integrated
3.2.4.2.2 – External
3.2.5 – Desktop and Laptop Systems
3.3 – Virtual Machines
3.3.1 – Qemu
3.3.1.1 – Installation
3.3.1.1.1 – arm64 QCOW
3.3.1.2 – Post–Installation Booting
3.3.1.2.1 – Multiboot
3.3.1.4 – Networking
3.3.1.4.1 – Linux VDE
3.3.1.4.2 – OpenBSD TAP
3.3.1.4.3 – Windows TAP
3.3.1.4.4 – Linux TAP
3.3.1.5 – Audio
3.3.1.6 – Graphics
3.3.2 – Virtualbox
3.3.2.1 – Ethernet
3.3.2.2 – Audio
3.3.2.3 – Graphics
3.3.2.4 – Known Working Versions
3.3.3 – Virtio
3.3.4 – bhyve

4 – 9front Installation Guide
4.1 – Pre–installation Checklist
4.2 – Creating bootable 9front install media
  4.2.1 – ISO image
  4.2.1.1 – Creating on Plan 9
  4.2.2 – USB drive
  4.2.2.1 – Creating on Plan 9
  4.2.2.2 – Creating on Linux
  4.2.2.3 – Bootargs
4.3 – Performing a simple install
  4.3.1 – boot
  4.3.2 – bootargs
  4.3.3 – user
  4.3.4 – vgasize, monitor, mouseport
  4.3.4.1 – Changing screen resolution
  4.3.5 – inst/start
  4.3.6 – configfs
  4.3.6.1 – cwfs no–dump configuration
  4.3.7 – partdisk
  4.3.8 – prepdisk
  4.3.9 – mountfs
  4.3.10 – configdist
  4.3.11 – confignet
  4.3.11.1 – automatic
  4.3.11.2 – manual
4.3.12 – mountdist
4.3.13 – copydist
4.3.14 – ndbsetup
4.3.15 – tzsetup
4.3.16 – bootsetup
4.3.17 – finish
4.4 – Encrypted Partitions

5 – Building the System from Source
5.1 – Why should I build my system from source?
5.2 – Building 9front from source
5.2.1 – Update sources
5.2.1.1 – hgrc
5.2.1.2 – git
5.2.2 – Building from source
5.2.2.1 – Cross compiling
5.3 – Building an ISO
5.4 – Common Problems when Compiling and Building
5.4.1 – Upgrading compilers
5.4.2 – Trouble upgrading the compilers

6 – Networking
6.1 – Before we go any further
6.2 – Network configuration
6.2.1 – Host name
6.2.2 – Identifying and setting up your network interfaces
6.2.2.1 – WiFi
6.2.2.1.1 – Interfaces
6.2.2.1.1.1 – wavelan
6.2.2.1.1.2 – wavelanpci
6.2.2.1.1.3 – iwl
6.2.2.1.1.4 – rt2860
6.2.2.1.1.5 – wpi
6.2.2.1.2 – WPA
6.2.2.1.3 – WiFi Roaming
6.2.2.1.4 – WiFi Debug
6.2.3 – IP address
6.2.4 – Default gateway
6.2.5 – DNS Resolution
6.2.5.1 – Caching DNS server
6.2.5.2 – DNS authoritative name server
6.2.5.2.1 – Troubleshooting DNS authoritative name server
6.2.6 – Network-wide configuration
6.2.7 – Activating the changes
6.2.7.1 – NIC
6.2.7.2 – cs
6.2.7.3 – dns
6.2.8 – Verifying network settings
6.2.8.1 – Checking routes
6.2.8.1.1 – Adding static routes
6.2.9 – Setting up your 9front box as a forwarding gateway
6.2.10 – Setting up aliases on an interface
6.3 – How do I filter and firewall with 9front?
6.4 – Dynamic Host Configuration Protocol (DHCP)
6.4.1 – DHCP client
6.4.2 – DHCP server
6.5 – PPP
6.6 – Setting up a network bridge in 9front
6.7 – How do I boot from the network?
6.7.1 – How do I tcp boot?
6.7.1.1 – Passing arguments to ipconfig at the bootargs prompt
6.7.2 – How do I boot using PXE?

7 – System Management
7.1 – Plan 9 Services Overview
7.1.1 – What is the kernel?
7.1.2 – What is the file server?
7.1.3 – What is the auth server?
7.1.4 – What is the cpu server?
7.1.5 – What is a terminal?
7.2 – Kernel configuration and maintenance
7.2.1 – How do I mount the 9fat partition?
7.2.2 – How do I modify plan9.ini?
7.2.3 – Kernel configuration file
7.2.4 – Kernel drivers
7.2.5 – How do I install a new kernel?
7.3 – Fileserver configuration and maintenance
7.3.1 – Adding users
7.3.2 – Configuring nvram
7.3.3 – Setting up a listener for network connections
7.3.3.1 – Stop cwfs from allowing user none to attach without authentication
7.3.3.1.1 – notes on user none
7.3.4 – Mounting a file system from userspace
7.3.5 – dump
7.3.5.1 – manually trigger the dump
7.4 – Auth server configuration and maintenance
7.4.1 – Configuring an auth server
7.4.1.1 – Avoiding an ndb entry for the auth server
7.4.2 – Adding users
7.4.3 – secdred
7.4.3.1 – Adding users to secdred
7.4.3.2 – Converting from p9sk1 to dp9ik
7.5 – Cpu server configuration and maintenance
7.5.1 – Configuring a cpu server
7.6 – Terminal configuration and maintenance
7.6.1 – Configuring a terminal
7.6.2 – Configuring a Terminal to Accept cpu Connections
7.6.3 – UTC Timesync
7.7 – Mail server configuration and maintenance
7.7.0 – tcp25
7.7.1 – smtpd.conf
7.7.2 – rewrite
7.7.3 – names.local
7.7.4 – remotemail
7.7.5 – SMTP over TLS
7.7.6 – IMAP4 over TLS
7.7.7 – Spam Filtering
7.7.7.1 – ratfs
7.7.7.2 – scanmail
7.7.8 – Troubleshooting the mail server
7.7.9 – Setting up a mailing list
7.7.9.1 – mlmgr
7.8 – Web server configuration and maintenance
7.8.1 – ip/httpd
7.8.2 – rc-httpd
7.9 – TLS certificates
7.9.1 – ACME protocol

8 – Using 9front
8.1 – rc
8.1.1 – Prompts
8.1.2 – /env
8.2 – rio
8.2.1 – The Pop-up Menu
8.2.2 – Window control
8.2.3 – Text in rio windows
8.2.4 – Scrolling
8.2.5 – Mouse Chording
8.2.6 – Keyboard Shortcuts
8.2.6.1 – No, really, keyboard shortcuts (and virtual desktops for free)
8.2.7 – Color scheme
8.2.8 – Why is rio like this?
8.2.9 – tips
8.2.9.1 – Taking a screenshot
8.2.9.2 – Prevent console messages from overwriting the screen
8.3 – Text Editors
8.3.1 – sam
8.3.1.1 – Scrolling
8.3.1.2 – Mouse Chording
8.3.1.3 – Why does sam have a separate snarf buffer from rio?
8.3.1.4 – Keyboard Shortcuts
8.3.2 – acme
8.4 – Internet
8.4.1 – Mail
8.4.1.1 – upasfs
8.4.1.1.1 – Reading gmail via IMAP
8.4.1.1.2 – Sending mail with gmail
8.4.1.1.3 – Reading mailboxes on remote Plan 9 file systems
8.4.1.2 – nedmail
8.4.1.2.1 – mother
8.4.1.2.2 – Nail
8.4.1.3 – nupas
8.4.2 – NNTP
8.4.3 – IRC
8.4.3.1 – ircrc
8.4.3.2 – irc7
8.4.3.3 – ircs
8.4.3.4 – wircrc
8.4.4 – FTP
8.4.5 – HTTP
8.4.5.1 – mothra
8.4.5.2 – abaco
8.4.5.3 – hget
8.4.5.4 – charon
8.4.5.5 – i
8.4.5.6 – NetSurf
8.4.6 – SSH
8.4.6.1 – ssh
8.4.6.1.1 – sshfs
8.4.6.1.2 – sshnet
8.4.6.5.1 – Mounting a remote u9fs share over SSH
8.4.7 – secstore
8.4.8 – drawterm
8.4.8.1 – Connect to Plan 9 from a mobile device
8.4.8.2 – drawterm behind firewalls
8.4.9 – Peer to Peer (P2P)
8.4.9.1 – Tinc
8.4.9.2 – Torrents
8.4.9.2.1 – ip/torrent
8.4.9.2.2 – torrent
8.4.10 – Remote Administration
8.4.10.1 – VNC
8.4.10.1.1 – vnc and vncs
8.4.10.2 – RDP
8.4.10.2.1 – rd
8.5 – Audio
8.6 – External Media
8.6.1 – Mount an ISO9660 CD-ROM
8.6.2 – Burn a CD-ROM
8.6.3 – Mount a FAT formatted USB device
8.7 – Emulation
8.7.1 – Linux Emulation
8.7.2 – Nintendo
8.7.3 – Sega
8.7.4 – Commodore
8.7.5 – PC
8.7.5.1 – Virtualization Using vmx(1)
  8.7.5.1.1 Block Devices
  8.7.5.1.2 Ethernet
  8.7.5.1.3 OpenBSD
  8.7.5.1.4 Linux
  8.7.5.1.5 Windows NT
8.8 – Additional Software
  8.8.1 – 9front sources server
  8.8.2 – 9front contrib
  8.8.3 – Other public 9p servers
  8.8.4 – Advanced Namespace Tools for Plan 9
  8.8.5 – Even More Additional Software
  8.8.6 – Community Maintained Link For Additional Software
8.9 – Bootstrapping architectures not included on the ISO
  8.9.1 – amd64
  8.9.2 – Raspberry Pi
  8.9.3 – arm64
8.10 – ACPI
  8.10.1 – Enabling ACPI
8.12 – Revision Control
  8.12.1 – cvs
  8.12.2 – git
  8.12.3 – Mercurial
8.12.4 – svn
8.13 – Video
8.13.1 – treason
8.13.2 – camv
8.14 – Keyboard Input
8.14.1 – Keyboard Maps
8.14.2 – Ktrans
8.14.2.1 – Japanese
8.14.2.2 – Chinese Pinyin

9 – Troubleshooting
9.1 – First
9.2 – Booting
9.2.2 – Break into a shell
9.2.3 – Editing plan9.ini
9.2.4 – Boot media not recognized
9.2.5 – I moved my hard drive between ports
9.3 – Graphics
9.3.1 – Rio fails to start
9.3.2 – VESA BIOS does not contain a valid mode
9.4 – Networking
9.4.1 – Networking is not working
9.4.2 – Cannot resolve domain names
9.4.3 – /mnt/web/clone does not exist
9.4.4 – PCMCIA WiFi stopped working after reboot
9.5 – USB
9.5.1 – Devices not recognized or not working
9.5.2 – System freezes after showing memory sizes
9.6 – auth

9.99999999999999999999999999999999 – GIVE UP

Appendix

B – Bounties

G – GSOC

J – Junk

L – Languages

T – TODO

Z – Getting Started With 9front