

Milux - Minimal Linux

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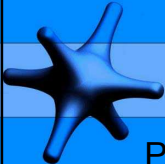


Milux - Minimal Linux

Milux?

- Semesterprojekt Studiengang Internettechnik und –management
- Ziel: OS für den Netzwerkeinsatz
 - Hoher Sicherheitslevel
 - „Minimale“ Hardwareanforderungen (128M)

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Projektanforderungen

- Maximale Sicherheit
- Minimale Implementation (Flash)
- Keine Module, kein SysV-Init
- uClibc statt glibc
- libsafe
- FreeS/WAN vollständig implementiert

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“Maximale Sicherheit”



- Schutz gegen diverse Overflows (libsafe, gsecurity-patches)
- Keine Kernel-Module
- Filesystem ACLs
- IPTables
- OpenSSH: v2 & public-key, tcpwrapper

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“Minimale Implementation”


- Linux from Scratch 
- RedHat 8.0/9 → Entwicklungssystem → Milux
- uClibc
- kein SysV-Init
- BusyBox

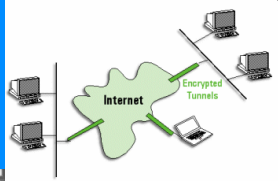
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“Free/SWAN implementiert”

- IPSEC (Internet Protocol Security): 
 - Build secure tunnels (VPN)



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Hardware



RedAix PNA-1312 Appliance

1GHz Intel Celeron Processor, 128MB RAM, 128MB Flash-Disk,
2x 10/100 Ethernet, 2xUSB, 1x RS-232, 2 PCI-slots, LCD panel

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Projektfortführung

- mALFS
- Webinterface (Boa & PHP)
- Vlan-Support
- Quagga Routingdaemon (BGP, OSPF, RIP, ..)
- CDP
- SNMP-Support

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Footprint

- HD-Usage: 23MB
- RAM-Usage: 16MB
(inkl. Webinterface, Snort-IDS, IPsec, ..)

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Einsatzgebiet

- Router
- Firewall
- IDS
- VPN-Gateway
- OS für diverse Applikationen
 - Webserver, Mailserver, FTP-Server, ..
- ...

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Weiterentwicklung

- ITM-Studiengang / XGeNOS Labs
 - Semesterprojekte
 - Bereichsübergreifende Projektarbeiten

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Weiterentwicklung – Themen (1)

- IPv6 & -Security
- Mobile IPv6 (MIPL)
- C-Library Optimization
- Crypto-API
- Webinterface-Enhancements
- TCPA Chip Integration/Secure Code

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Weiterentwicklung – Themen (2)

- USBToken/Smartcard Support
- Kernel Optimization
- Footprint Reduction
- Run-on-Ramdisk
- Intelligent Firewall
- Packet Generator

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Weiterentwicklung – Themen (3)

- Sourcecode Management
- IMQ
- Virtual Machines
- MicroBSD/Milux Comparison
- VMM Routine Rewrite
- P2P Stopper

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Weiterentwicklung – Themen (4)

- NPU Support
- Secure Download
- ...

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mALFS

- „milux Automated Linux from Scratch“
- Milux Build System
 - Adaptierung von Neven Has's nALFS System
 - XML to Shellsript parser
 - libxml2 & nALFS
 - XML beschreiben den build Prozess ...

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mALFS

- Wie bei LFS wird Milux von Source kompiliert..
- 3 Hauptschritte
 - Statisches Teilsystem
 - Toolchain gcc, binutils, uclibc
 - Dynamisch kompiliertes Milux System

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```
<!-- Chroot into Milux to create devices, users .. -->
<stage name="Entering chroot, creating users, groups and devices"
  <stageinfo>
    <user>root</user>
    <root>&LFS;</root>
    <environment>
      <variable name="PATH">
        /bin:/usr/bin:/sbin:/usr/sbin:/static/bin
      </variable>
    </environment>
  </stageinfo>
  <!-- Preparing the Chroot enviroment-->
  &c4-mounting_proc;
  &c4-mtab;
  &c4-linking_bash;
  &c4-user_group;
  &c4-MAKEDEV;
  &c4-kernel;
</stage>
  <!-- Preparing uClibc on the host system-->
  <stage name="install uclibc">
    &c4-uclibc;
  <!-- &c4-uclibc-patch;
  &c4-uclibc-prepare;
  &c4-gencollate;
  &c4-final;
  -->
  </stage>
</stage>
```

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mALFS Features

- Browsing the profiles in a tree-like mode.
- Support for multiple profiles and different syntaxes.
- Adding, removing, reloading and reordering the profiles from the program.
- Starting execution from selected elements.
- Marking elements and executing only those marked.
- Browsing the profiles while output is scrolling in a separate window.
- Nice run-status marks, so you can know which elements are currently being executed, which failed, which are successfully done etc.
- Automatically skipping already (successfully) executed elements.
- Jumping quickly to running, failed and successfully executed elements, as well as packages.
- Searching for elements.
- Logging of system output, installed files, compile times.

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mALFS

```
* > - milux.xml
* #
* # + Chapter 3
* # - Chapter 4
* # + Installing packages in /static as milux.
* # + Entering chroot, creating users, groups and devices
* # + install uClibc
* # - Chapter 5
* # + Installing Milux Packages
* # + Installing Milux Packages
-> * + Chapter 6
* # + Chapter 7
* # + Chapter 8
* # + Tools for Milux
* # + Create 'MILUX'
```

Automatisierte Milux-Erstellung

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Praxiseinsatz

- Projekt-Netzwerk DMZ-Gateway
- Mur.at



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Links

- Milux - <http://www.milux.org>
- XGeNOS - <http://tiki.xgenos.org>
- LinuxFromScratch - <http://www.linuxfromscratch.org>
- uClibc - <http://www.uclibc.org>
- BusyBox - <http://www.busybox.net>
- *.* - <http://www.google.com>

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Q & A

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