

EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

MATHEMATISCH-
NATURWISSENSCHAFTLICHE FAKULTÄT
FACHBEREICH INFORMATIK
INFORMATIONSDIENSTE

Grundlagen der Web-Entwicklung

INF3172

Der Apache Web-Server Teil I

Thomas Walter

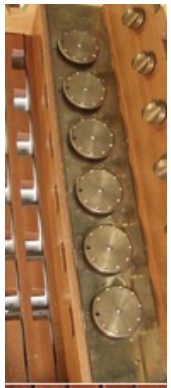
22.10.2026

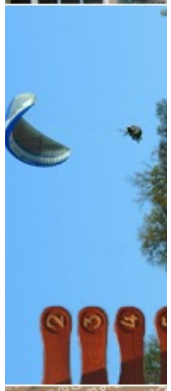
Version 1.0

Apache HTTP SERVER PROJECT

Apache HTTP SERVER PROJECT

SUPPORT APACHE

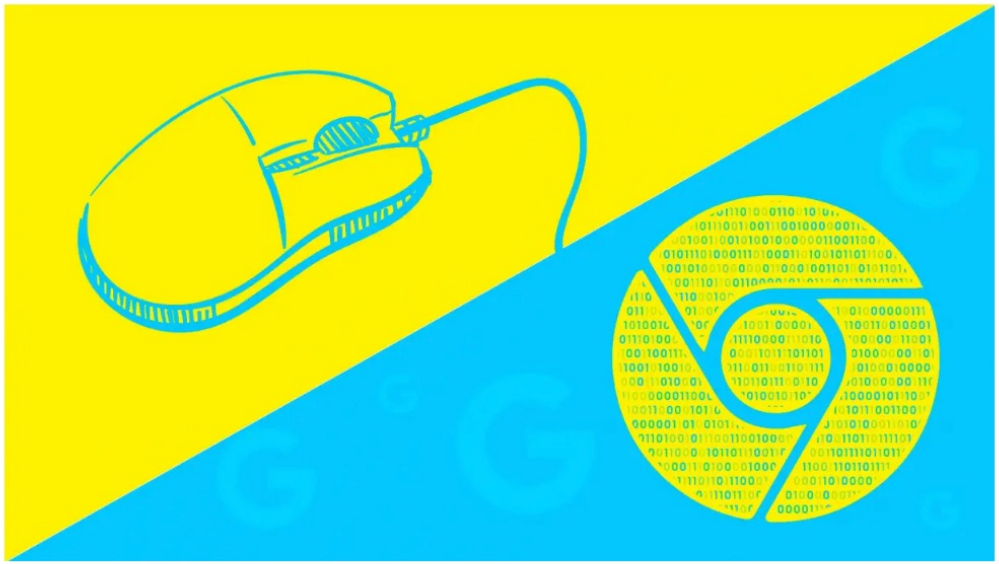





Google macht Schluss mit unsicheren HTTP-Verbindungen in Chrome

Ab Oktober 2026 warnt Chrome vor jedem Aufruf unverschlüsselter Websites. Google aktiviert die Sicherheitsfunktion standardmäßig für alle Nutzer.

67



(Bild: heise medien)

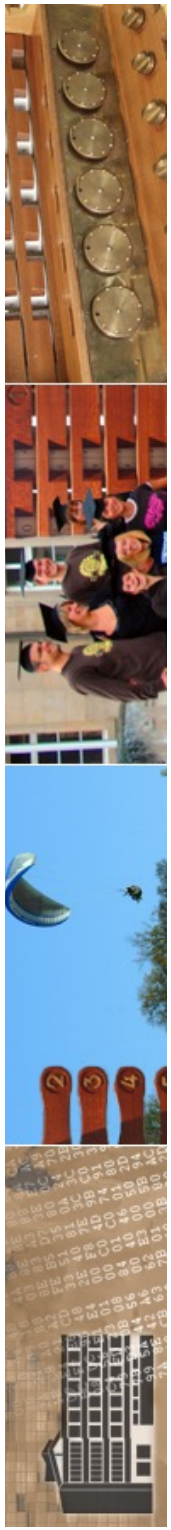
11:50 Uhr **Lesezeit: 3 Min.** | **iX Magazin**

Von Moritz Förster

INHALTSVERZEICHNIS

Google aktiviert mit Chrome 154 im Oktober 2026 standardmäßig die Funktion "Always Use Secure Connections" für alle Nutzer. Entsprechend muss der Browser künftig bei jedem ersten Zugriff auf eine öffentliche Website ohne HTTPS-Verschlüsselung um Erlaubnis fragen. Die Warnmeldung lässt sich zwar umgehen, soll aber Anwender vor Man-in-the-Middle-Angriffen schützen.

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uni-leipzig.de/angriff-auf-die-it-systeme/

U Tü | HIS | IT | MacBook | iP18p | Leica | V5Rs | Z | Rennrad | PetitMouton | VPN Tuebingen -... | Bookmarks | Alle Lesezeichen

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Kontakt Impressum

Angriff auf die IT-Systeme / Attack on IT systems

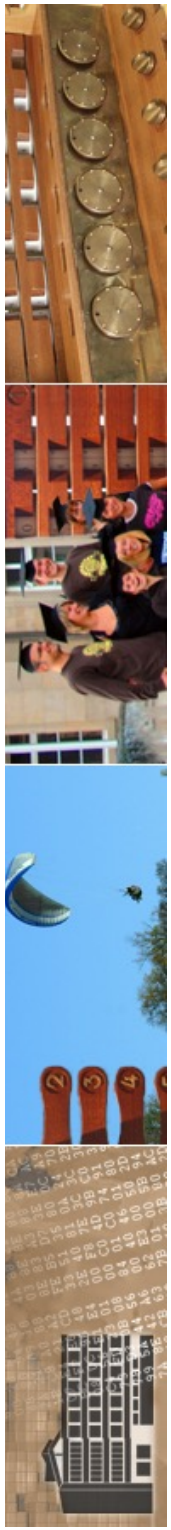
– English version below –

Es gab heute einen Angriff auf die IT-Systeme der Universität Leipzig. Zur Schadensabwehr wurden die Dienste komplett offline genommen, um weitere Analysen durchzuführen. Diese laufen aktuell.

Bitte informieren Sie sich weiterhin auf dieser Website sowie auf dem Instagram-Account der Universität Leipzig.

Attack on IT systems

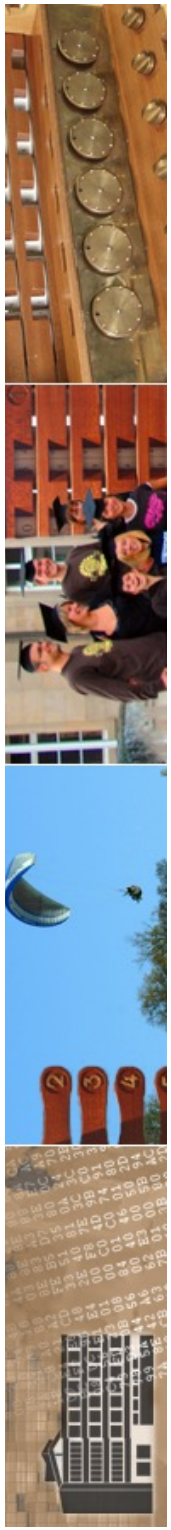
Leipzig University's IT systems were attacked today. In order to minimise the



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Apache knapp & bündig

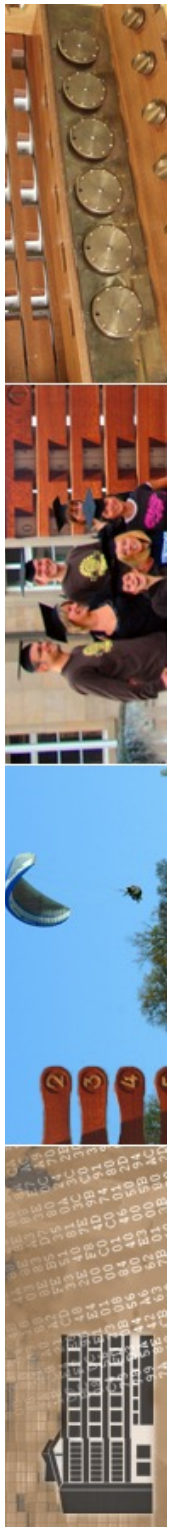
- Teil I
  - Bedeutung und Geschichte des Apache
  - Installation
  - Prinzip der Konfiguration
  - grundlegende Konfiguration
  - CGI-Programme
- Teil II
  - Erweiterungen des Apache



Entwicklung der Webserver

- erster verfügbarer Server: freier Webserver von Berners-Lee, der **CERN-Web-Server**
- Anfang 1995: NCSA-Web-Server, entwickelt durch Rob McCool, verbreitetster Server
- McCool verlässt um Anfang 1995 das NCSA; die Fortentwicklung verteilt sich und es erscheinen viele Patches zum NCSA-Server

  der Standard wird der *gepatchte NCSA-Server*
  Legende (?):
- **“a patchy server” = Apache**

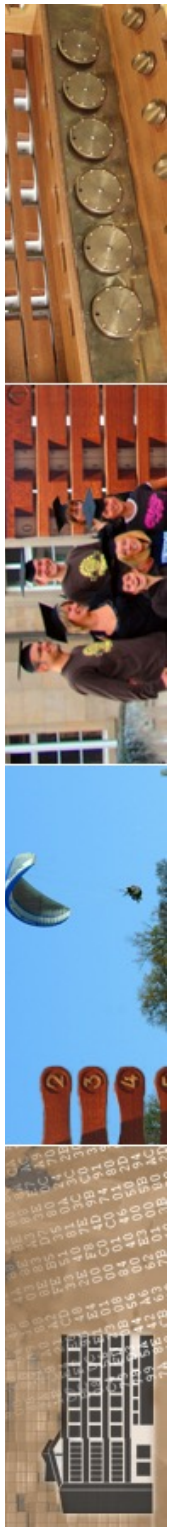


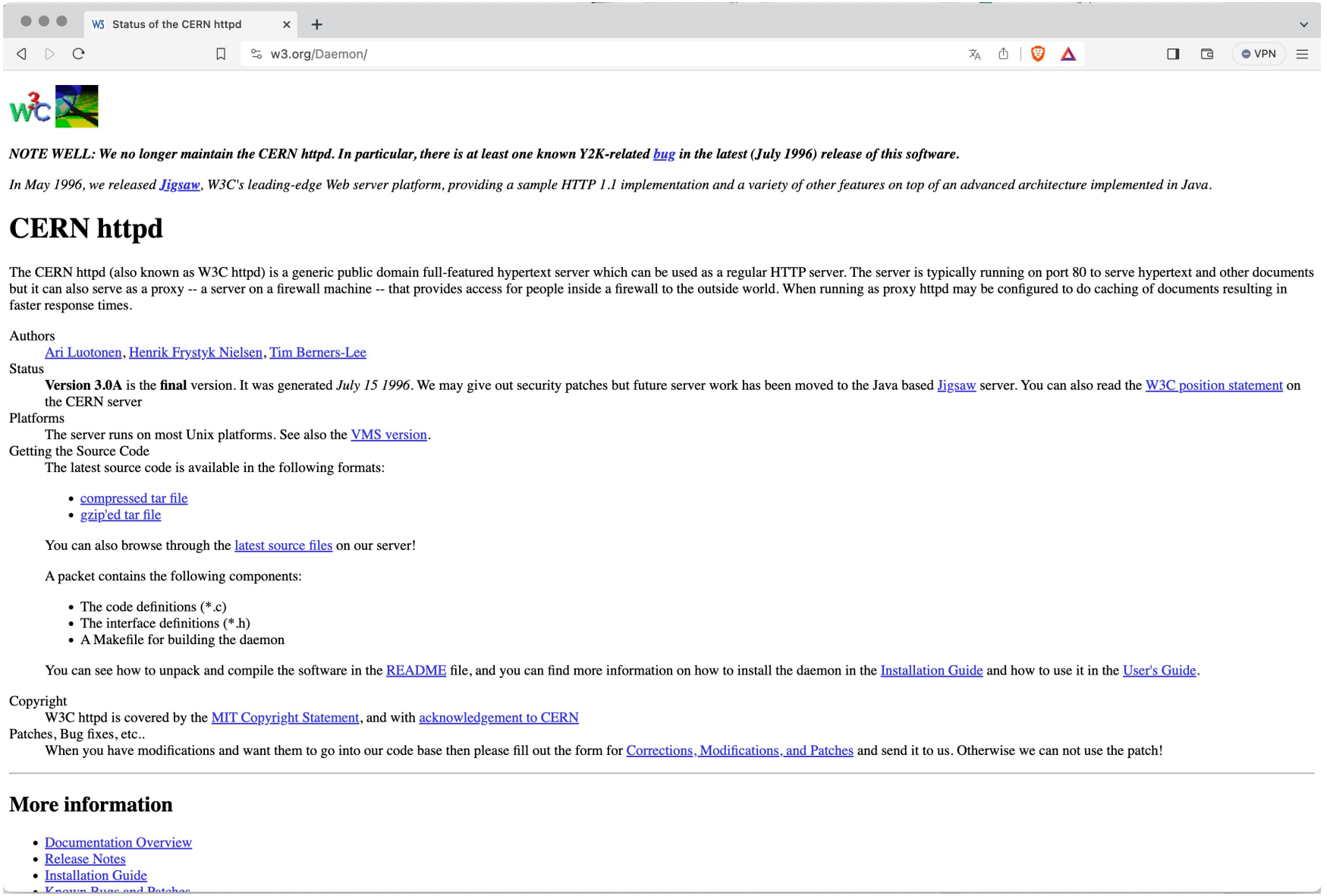
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http://httpd.apache.org/docs/1.3/misc/FAQ.html

- **Why the name "Apache"?** The name 'Apache' was chosen from respect for the Native American Indian tribe of Apache (Indé), well-known for their superior skills in warfare strategy and their inexhaustible endurance. For more information on the Apache Nation, we suggest searching Google, or AllTheWeb.

- Secondarily, and more popularly (though incorrectly) accepted, it's a considered cute name which stuck. Apache is "**A PAtCHy** server". It was based on some existing code and a series of "patch files".





NOTE WELL: We no longer maintain the CERN httpd. In particular, there is at least one known Y2K-related bug in the latest (July 1996) release of this software.

In May 1996, we released Jigsaw, W3C's leading-edge Web server platform, providing a sample HTTP 1.1 implementation and a variety of other features on top of an advanced architecture implemented in Java.

CERN httpd

The CERN httpd (also known as W3C httpd) is a generic public domain full-featured hypertext server which can be used as a regular HTTP server. The server is typically running on port 80 to serve hypertext and other documents but it can also serve as a proxy -- a server on a firewall machine -- that provides access for people inside a firewall to the outside world. When running as proxy httpd may be configured to do caching of documents resulting in faster response times.

Authors
Ari Luotonen, Henrik Frystyk Nielsen, Tim Berners-Lee
Status
Version 3.0A is the **final** version. It was generated *July 15 1996*. We may give out security patches but future server work has been moved to the Java based Jigsaw server. You can also read the W3C position statement on the CERN server
Platforms
The server runs on most Unix platforms. See also the VMS version.
Getting the Source Code
The latest source code is available in the following formats:

- compressed tar file
- gzip'ed tar file

You can also browse through the latest source files on our server!

A packet contains the following components:

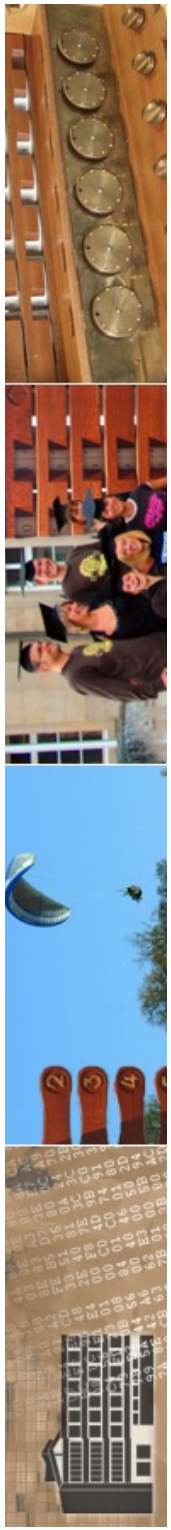
- The code definitions (*.c)
- The interface definitions (*.h)
- A Makefile for building the daemon

You can see how to unpack and compile the software in the README file, and you can find more information on how to install the daemon in the Installation Guide and how to use it in the User's Guide.

Copyright
W3C httpd is covered by the MIT Copyright Statement, and with acknowledgement to CERN
Patches, Bug fixes, etc..
When you have modifications and want them to go into our code base then please fill out the form for Corrections, Modifications, and Patches and send it to us. Otherwise we can not use the patch!

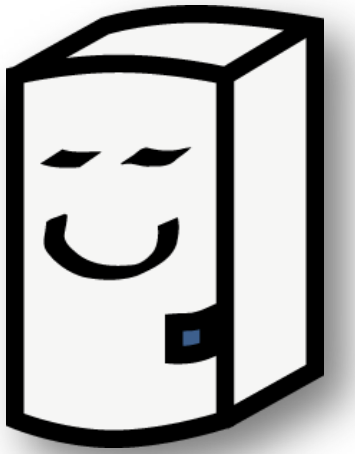
More information

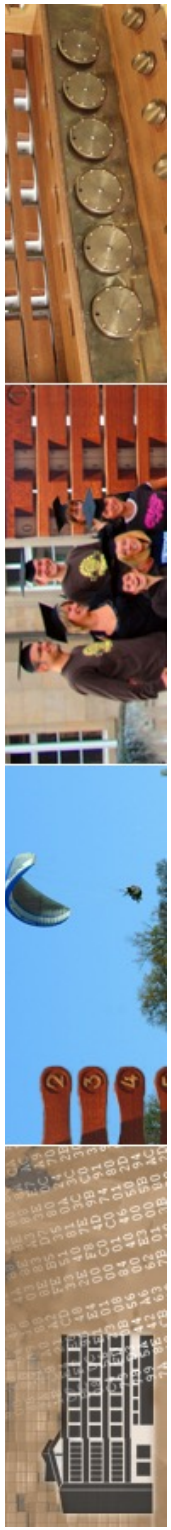
- Documentation Overview
- Release Notes
- Installation Guide
- Known Bugs and Patches



Funktion eines Web-Servers

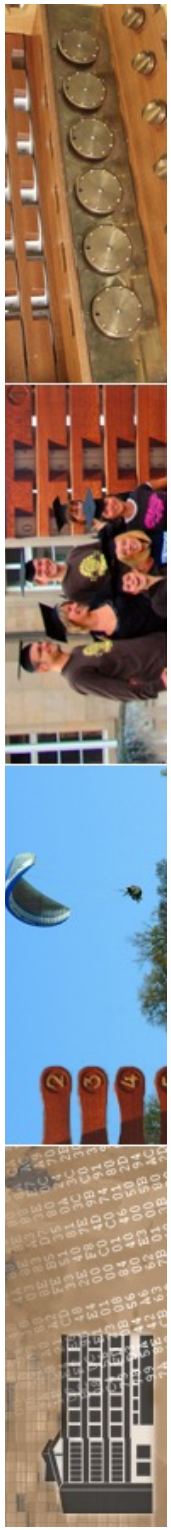
- was macht ein Web-Server?
  - Server-Anwendung auf tcp-Port 80 (443)
  - versteht HTTP
  - sehr stabil
  - sicher
  - anpassbar

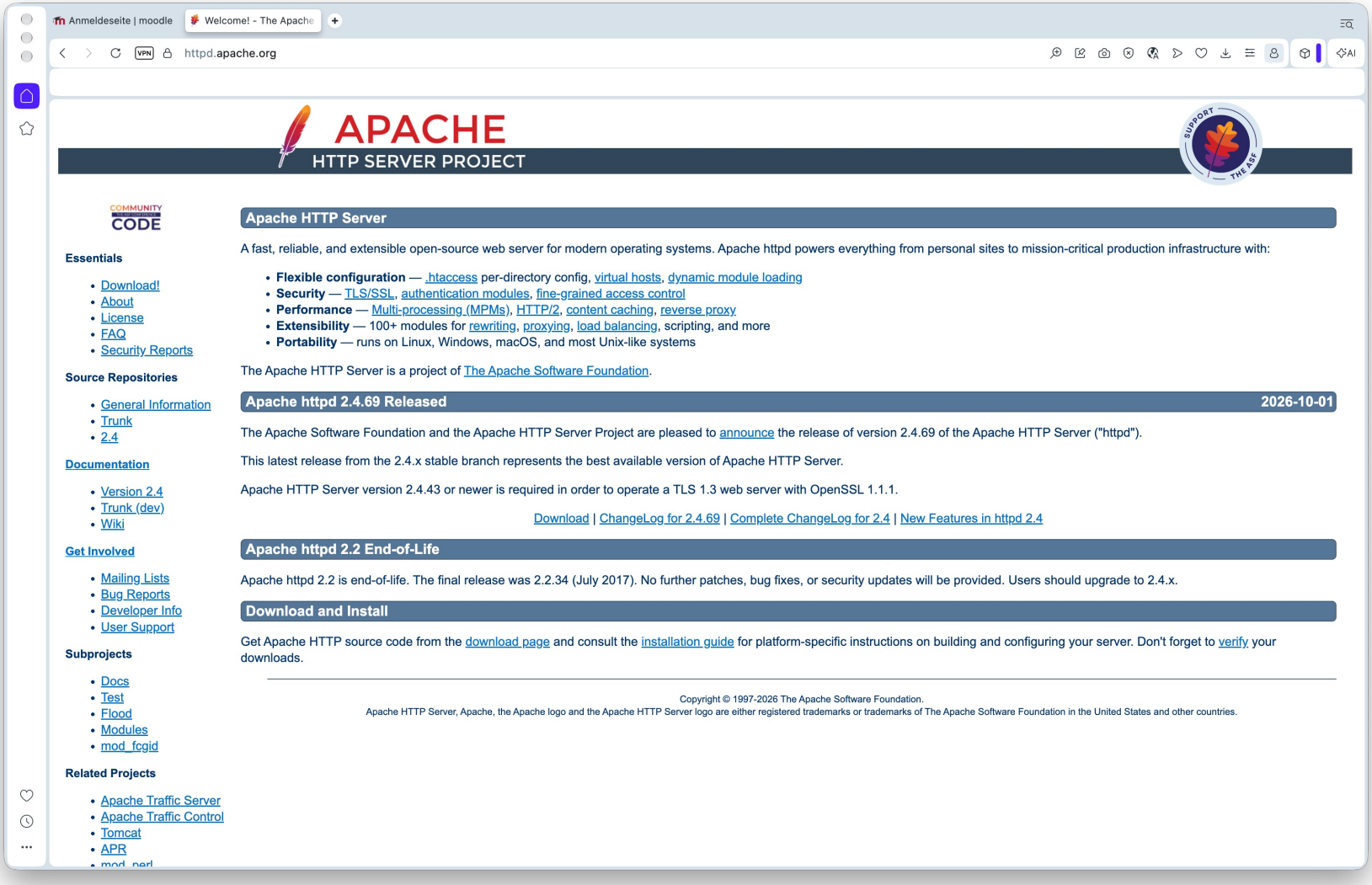


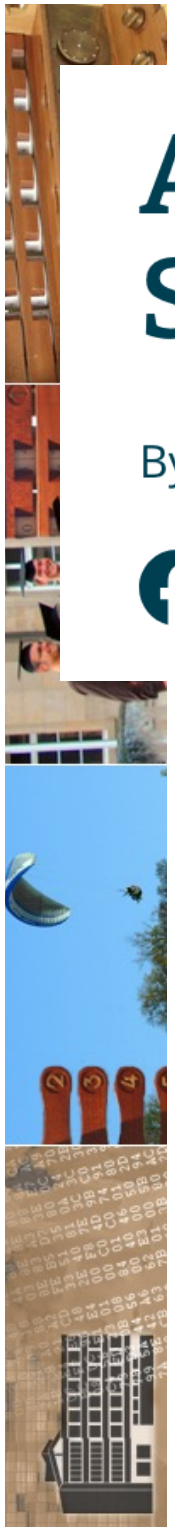


Apache

- ab April 1995 Apache-Webserver (als beta)
- Dezember 1995: Apache 1.0
- ab Ende 1996: Apache weltweit der am stärksten verbreitete Server
- (NCSA-Webserver wird nicht mehr weiterentwickelt; letzte Version 1.6 von Adam Cain)
- aktuell (Oktober 2026): **2.4.69**
  - Apache 2.0, 2.2 und 1.3 ("no longer maintained“)
- **`http://httpd.apache.org`**




Anmeldeseite | moodle
Welcome! - The Apache
httpd.apache.org
APACHE
HTTP SERVER PROJECT
COMMUNITY CODE
Essentials
Download!
About
License
FAQ
Security Reports
Source Repositories
General Information
Trunk
2.4
Documentation
Version 2.4
Trunk (dev)
Wiki
Get Involved
Mailing Lists
Bug Reports
Developer Info
User Support
Subprojects
Docs
Test
Flood
Modules
mod_fcgid
Related Projects
Apache Traffic Server
Apache Traffic Control
Tomcat
APR
Apache HTTP Server
A fast, reliable, and extensible open-source web server for modern operating systems. Apache httpd powers everything from personal sites to mission-critical production infrastructure with:
Flexible configuration — .htaccess per-directory config, virtual hosts, dynamic module loading
Security — TLS/SSL, authentication modules, fine-grained access control
Performance — Multi-processing (MPMs), HTTP/2, content caching, reverse proxy
Extensibility — 100+ modules for rewriting, proxying, load balancing, scripting, and more
Portability — runs on Linux, Windows, macOS, and most Unix-like systems
The Apache HTTP Server is a project of The Apache Software Foundation.
Apache httpd 2.4.69 Released
2026-10-01
The Apache Software Foundation and the Apache HTTP Server Project are pleased to announce the release of version 2.4.69 of the Apache HTTP Server ("httpd").
This latest release from the 2.4.x stable branch represents the best available version of Apache HTTP Server.
Apache HTTP Server version 2.4.43 or newer is required in order to operate a TLS 1.3 web server with OpenSSL 1.1.1.
Download | ChangeLog for 2.4.69 | Complete ChangeLog for 2.4 | New Features in httpd 2.4
Apache httpd 2.2 End-of-Life
Apache httpd 2.2 is end-of-life. The final release was 2.2.34 (July 2017). No further patches, bug fixes, or security updates will be provided. Users should upgrade to 2.4.x.
Download and Install
Get Apache HTTP source code from the download page and consult the installation guide for platform-specific instructions on building and configuring your server. Don't forget to verify your downloads.
Copyright © 1997-2026 The Apache Software Foundation.
Apache HTTP Server, Apache, the Apache logo and the Apache HTTP Server logo are either registered trademarks or trademarks of The Apache Software Foundation in the United States and other countries.



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August 2025 Web Server Survey

By Survey | August 24, 2025

from **1,300,016,299** sites across **281,522,947**
ıis reflects an increase of 24.9 million sites, 645,989

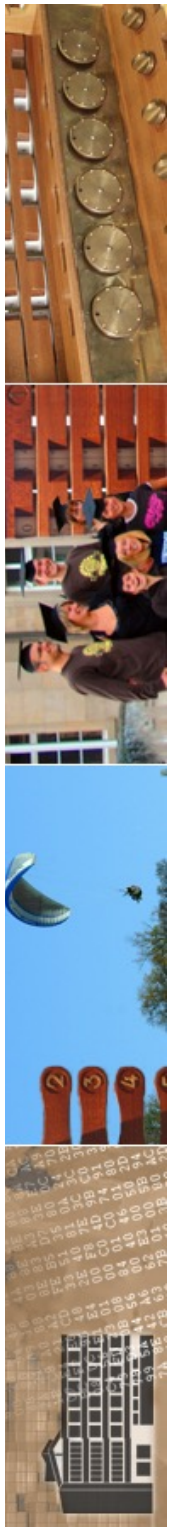
ı, and now accounts for 6.39% (+3.24pp) of sites
of 37.8 million sites (+13.8%).

sites (-3.86%) this month, reducing its market share to 13.6% (-0.82pp). Microsoft suffered the next largest loss, down by 65,461 sites (-0.38%).

Vendor news

- nginx announced native support for the ACME protocol, which is used to automatically obtain and renew SSL certificates from certificate authorities like Let's Encrypt.
- nginx 1.29.1 was released on 13th August, adding support for controlling compression of SSL certificates and for 0-RTT connection resumption in QUIC. The release also fixes a security vulnerability in nginx's SMTP module.
- LiteSpeed 6.3.4 was released on 1st August, containing a mixture of improvements, security fixes and bug fixes.
- Lighttpd 1.4.80 was released on 13th August, adding support for HTTP trailers. Lighttpd 1.4.81 followed on 17th August, fixing a security vulnerability where Lighttpd did not correctly reject HTTP trailers when proxying requests to a backend server.

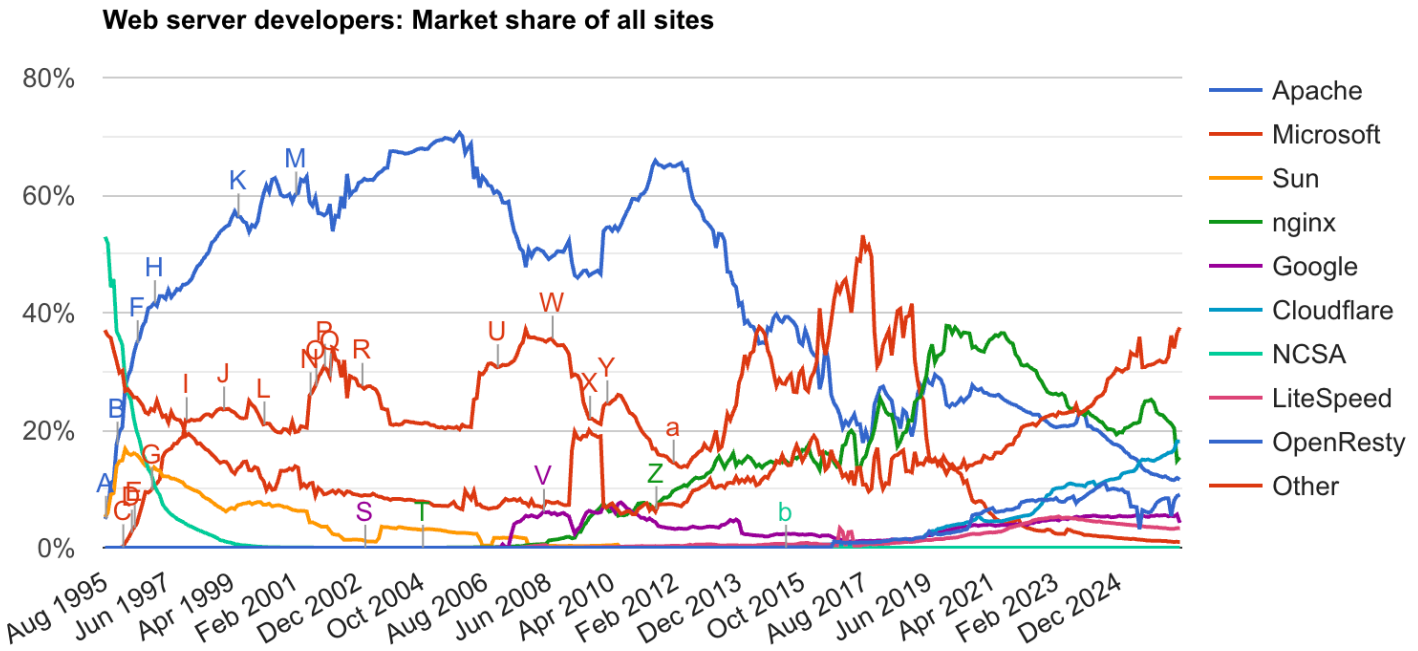
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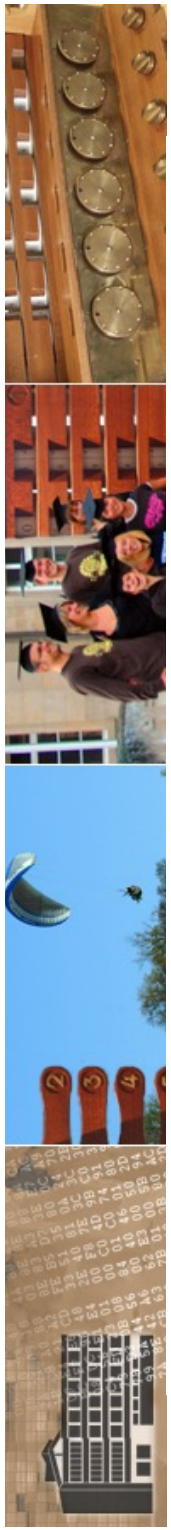
Verteilung der Web-Server

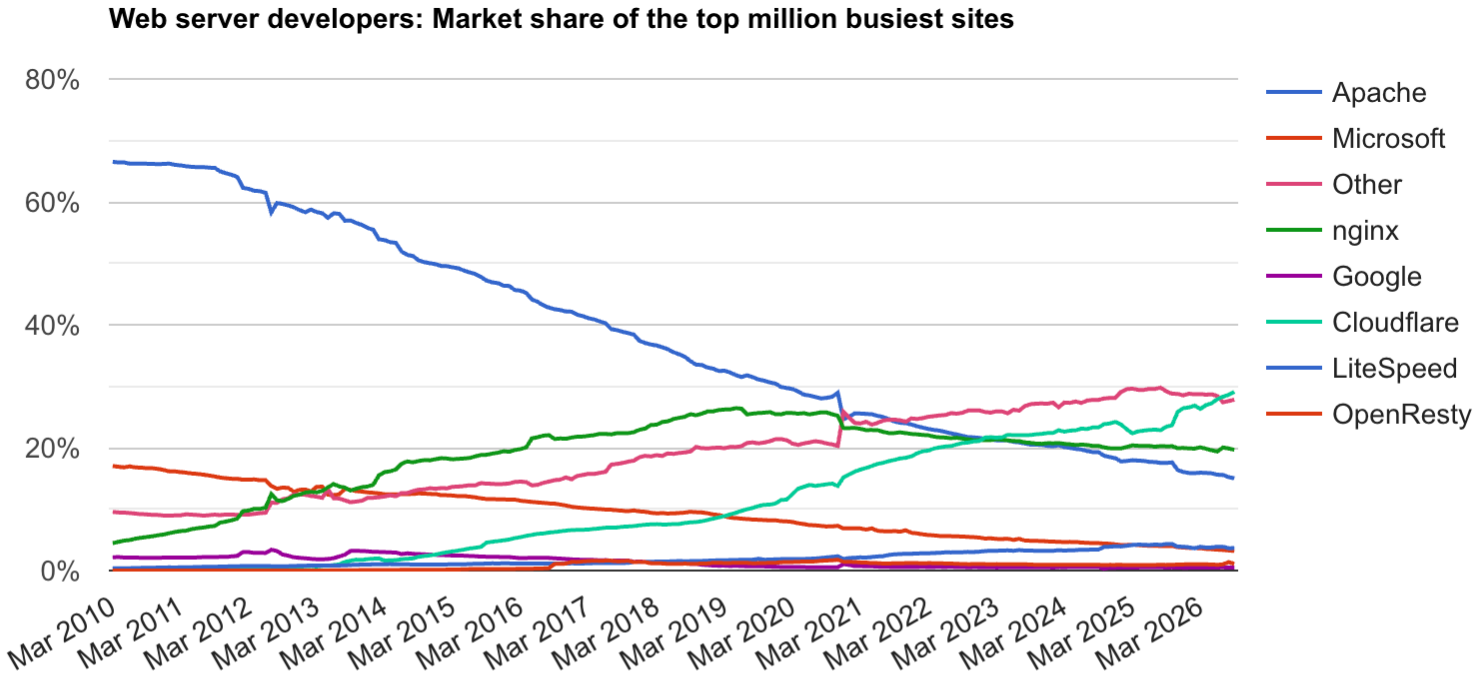
https://www.netcraft.com/blog/september-2026-web-server-survey



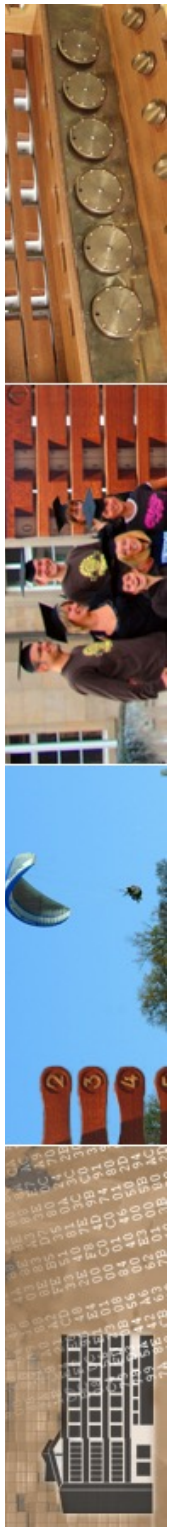
Developer	August 2026	Percent	September 2026	Percent	Change
Cloudflare	260,388,592	18.07%	266,160,479	18.10%	0.03
nginx	212,877,572	14.78%	225,366,509	15.33%	0.55
Apache	171,188,269	11.88%	170,006,920	11.56%	-0.32
OpenResty	126,918,171	8.81%	132,702,983	9.02%	0.21

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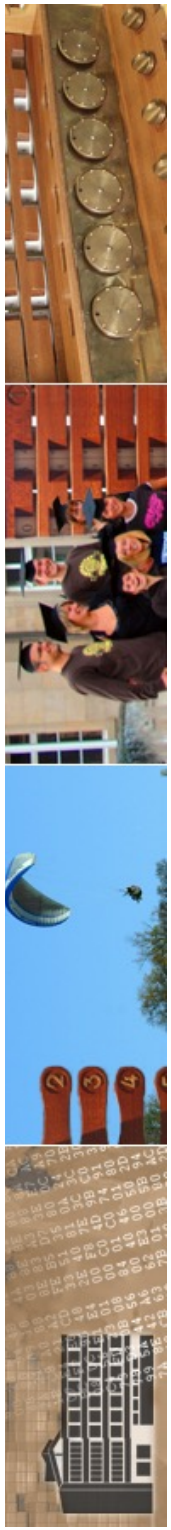


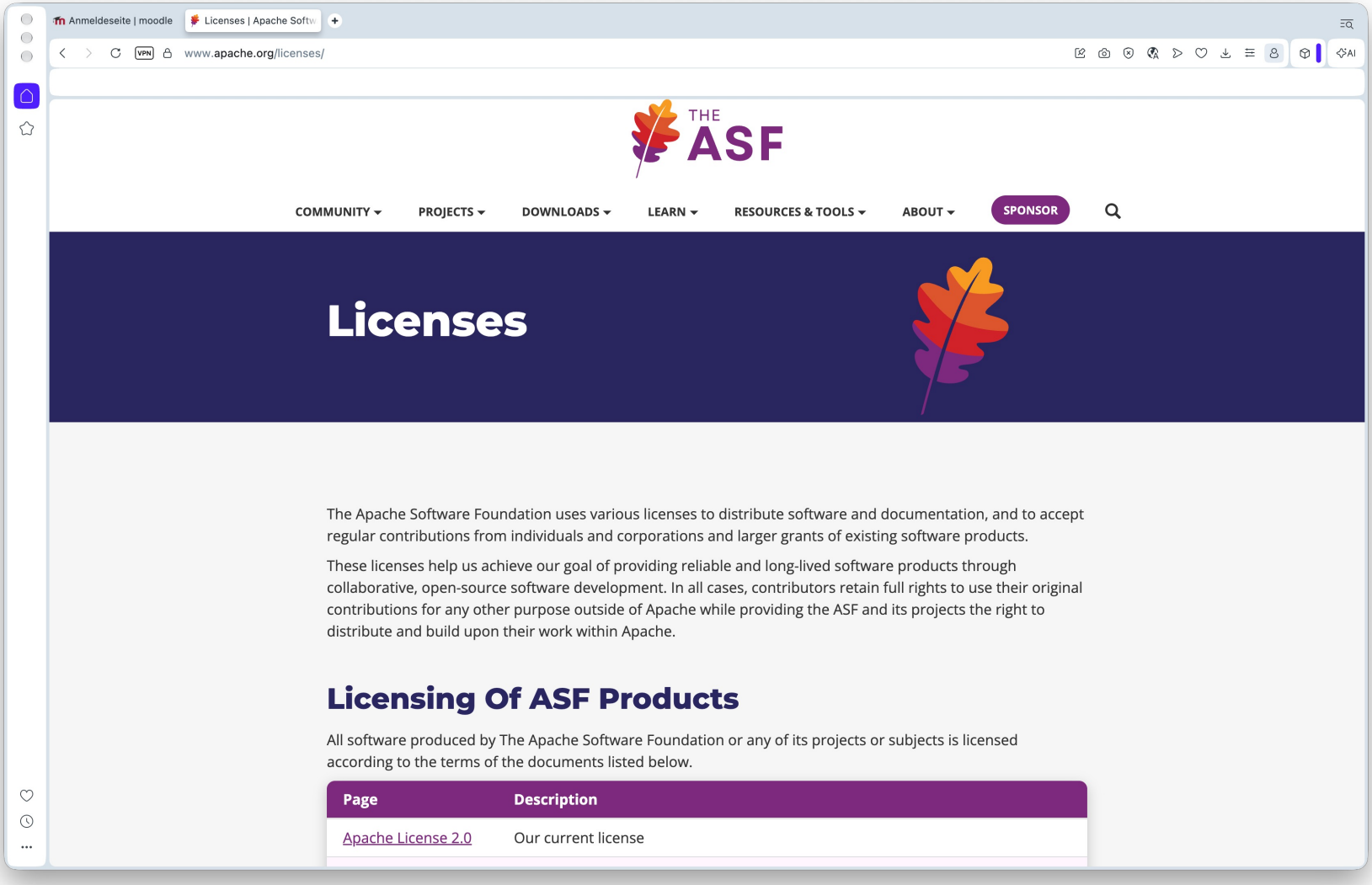
Developer	August 2026	Percent	September 2026	Percent	Change
Cloudflare	286,059	28.61%	291,038	29.10%	0.50
nginx	198,621	19.86%	196,514	19.65%	-0.21
Apache	152,087	15.21%	150,121	15.01%	-0.20
LiteSpeed	36,196	3.62%	36,604	3.66%	0.04

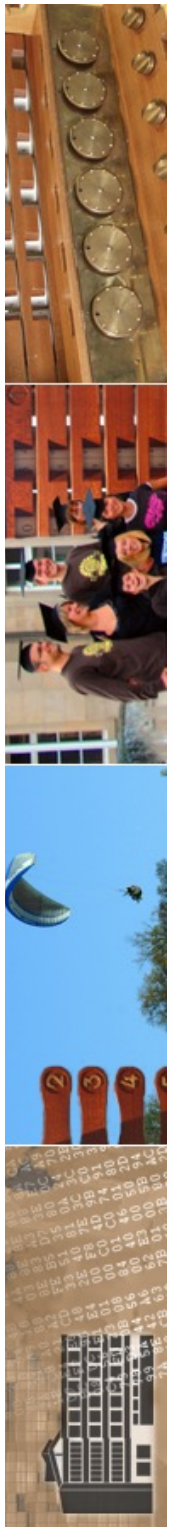


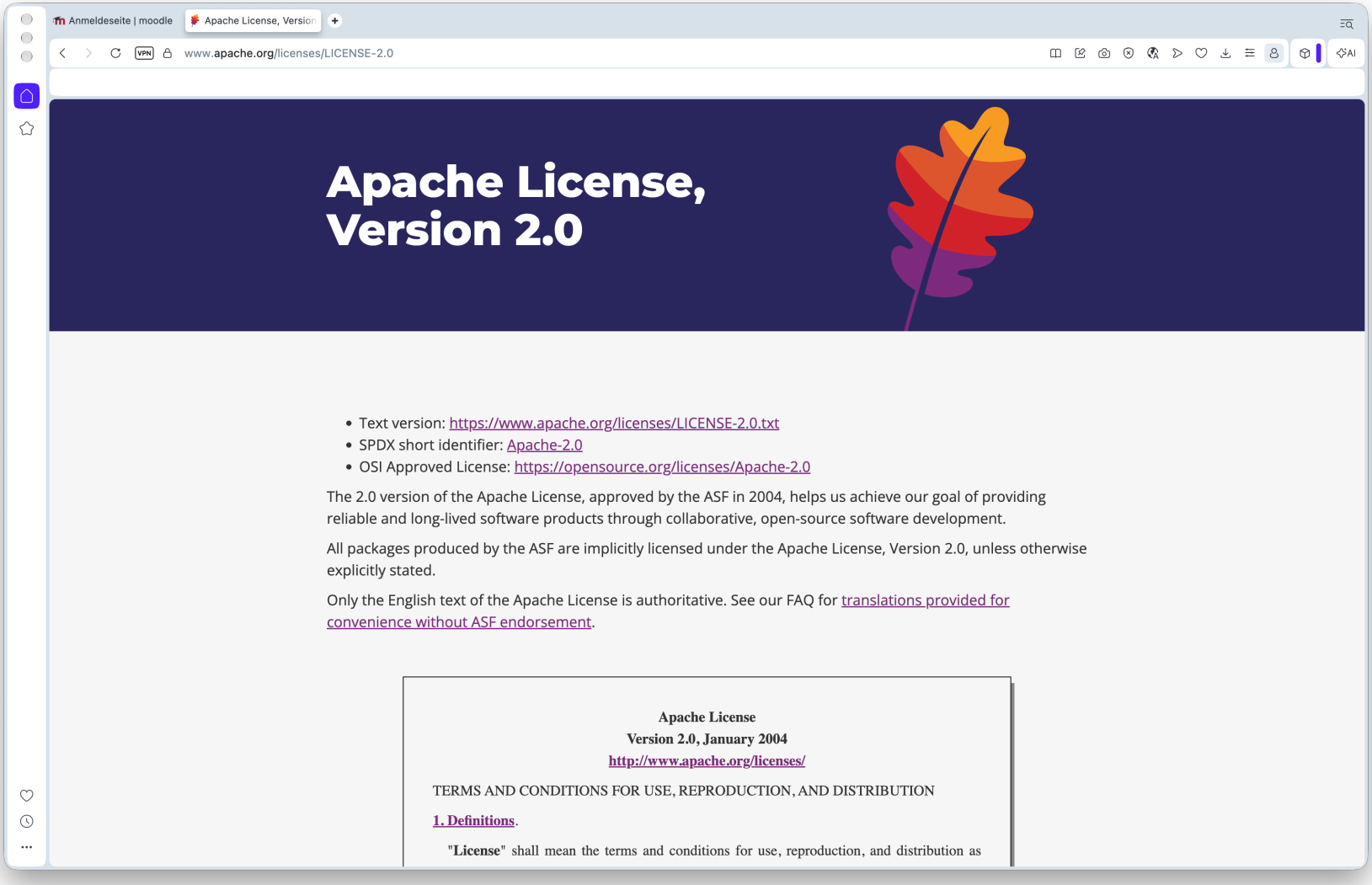
Apache Lizenz

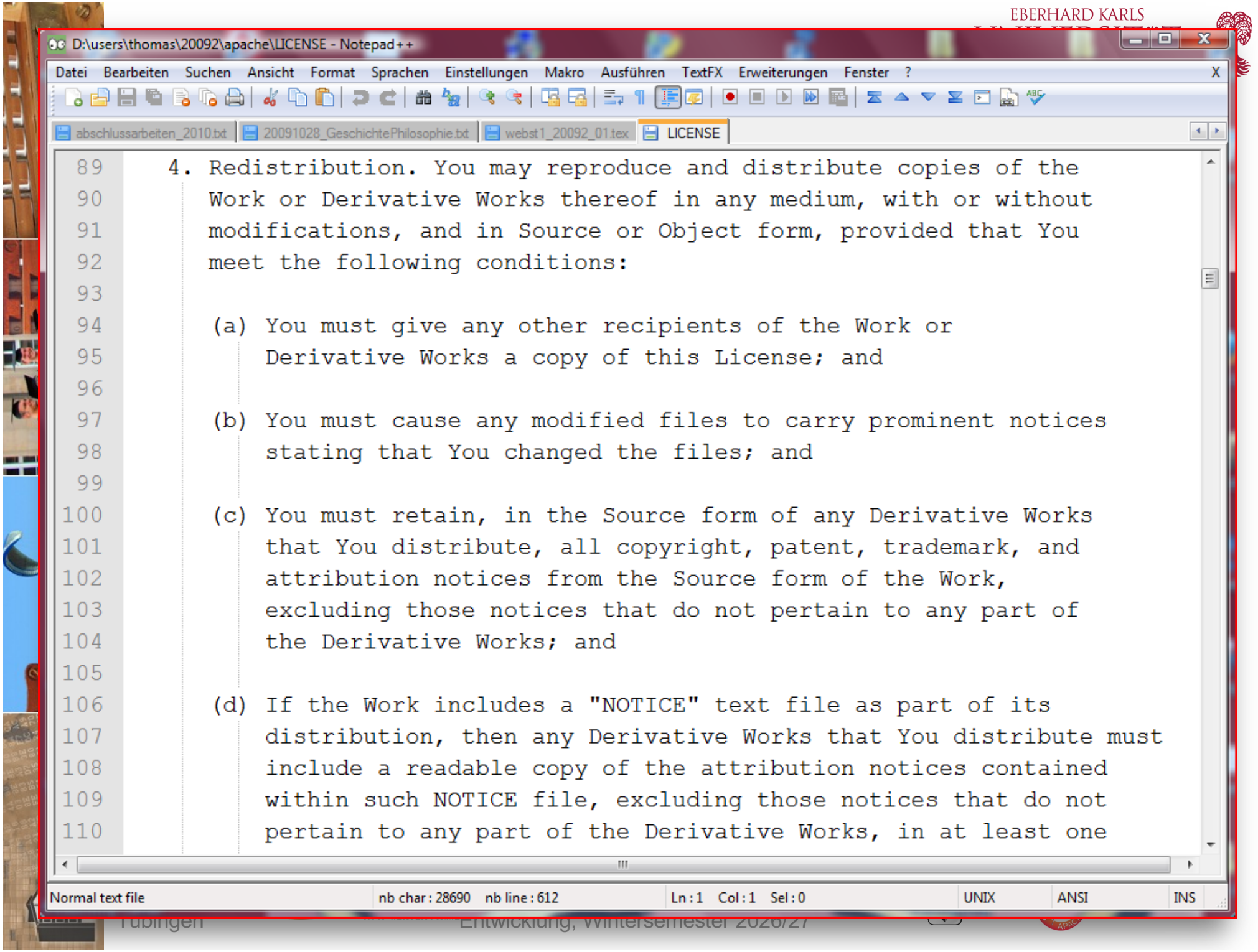
- der Apache wird mit der »Apache-Lizenzbedingung« (GNU - **FSF**) vergeben
- ist prinzipiell frei
  (auch für kommerziellen Gebrauch)
  - **Apache License**
    Version 2.0, January 2004
    http://www.apache.org/licenses/

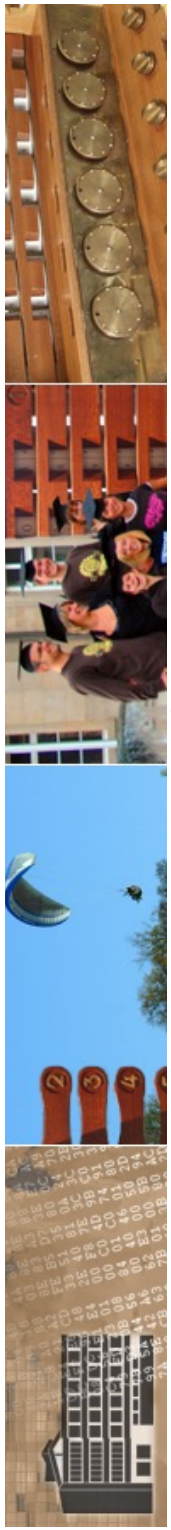



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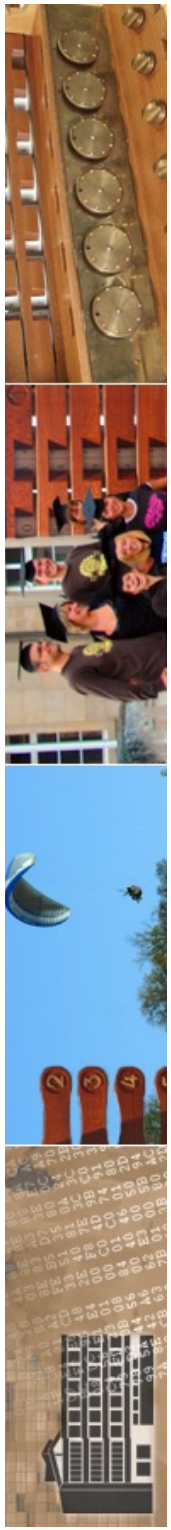

D:\users\thomas\20092\apache\LICENSE - Notepad++
Datei Bearbeiten Suchen Ansicht Format Sprachen Einstellungen Makro Ausführen TextFX Erweiterungen Fenster ?
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20091028_GeschichtePhilosophie.txt
webst1_20092_01.tex
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pertain to any part of the Derivative Works, in at least one
Normal text file
nb char : 28690 nb line : 612
Ln : 1 Col : 1 Sel : 0
UNIX
ANSI
INS



Grundlegende Installation von Apache

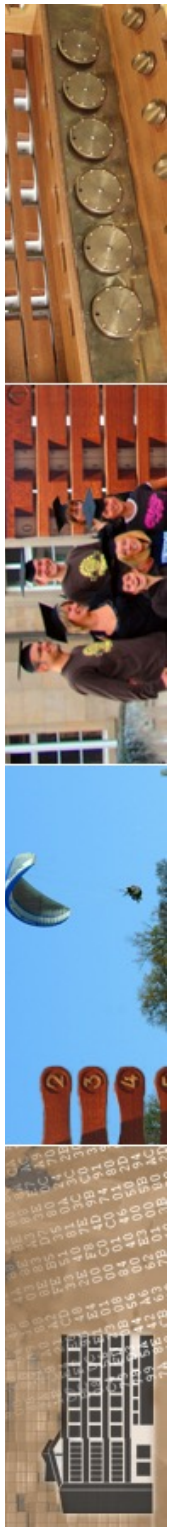
- Apache (genauso wie alle anderen Webserver auch) muss **installiert** und **konfiguriert** werden

- zunächst die Installation selbst: wir müssen uns dafür für ein Betriebssystem des Servers entscheiden und dafür, welchen Funktionsumfang der Webserver haben soll (welche Module mit installiert werden sollen und weitere Spezifika)



Betriebssysteme für Web-Server

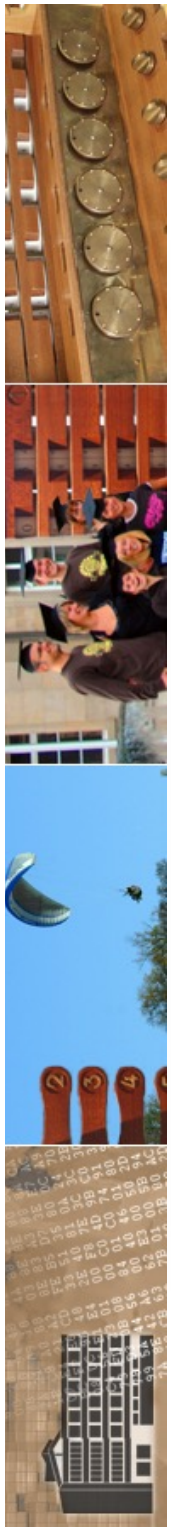
- verschiedene BS im Einsatz:
  - Linux/Unix
    - SuSe, Debian, Solaris, …
  - MS Windows Server
- Hardware: wichtig sind
  - Speicher (RAM)
  - IO-Prozesse: Netzwerkkarten

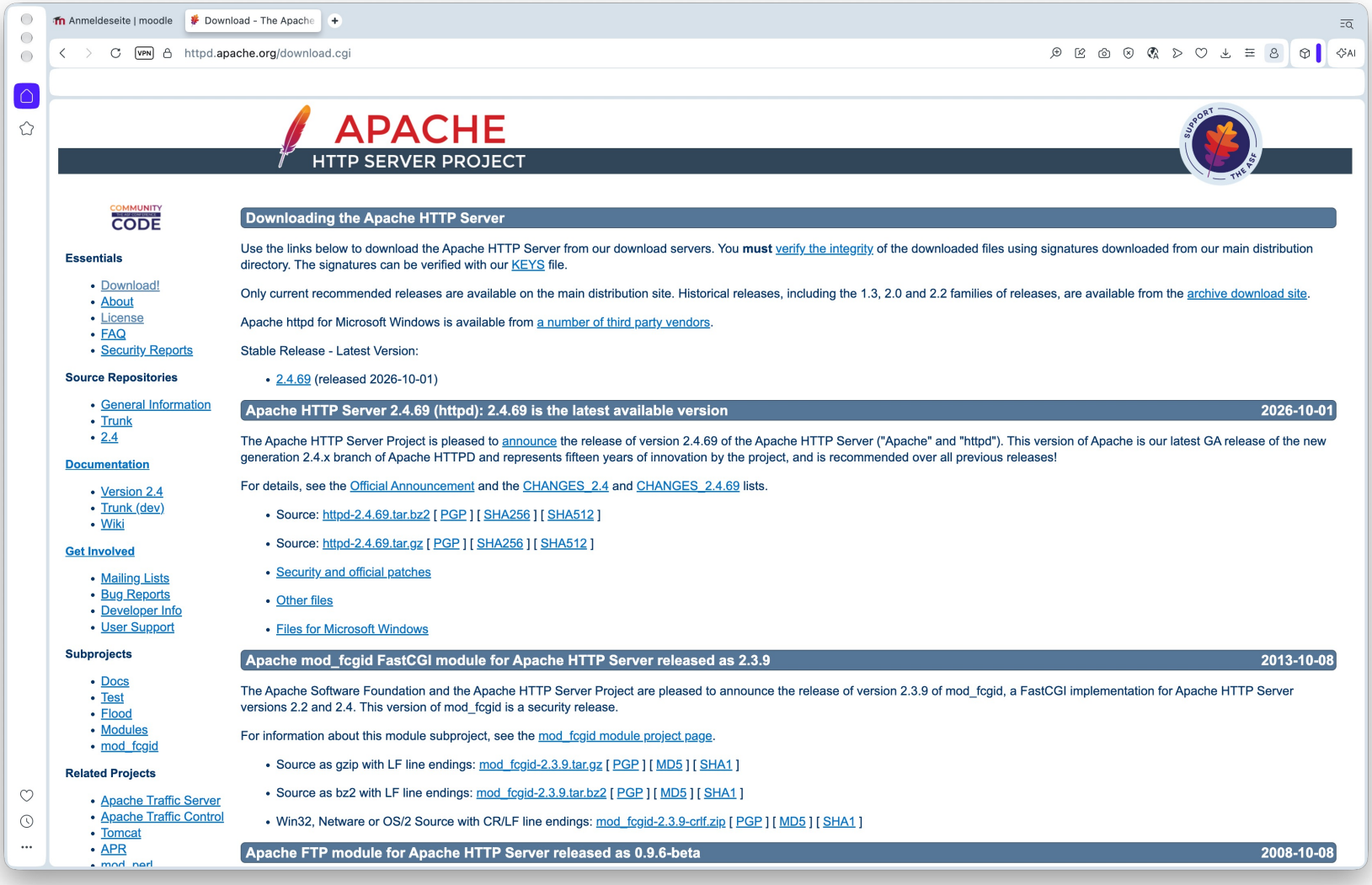


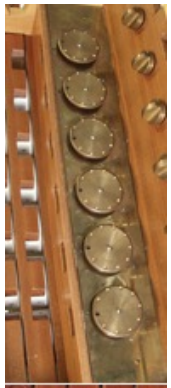
Installationsprocedere

- unter Unix/Linux
  - Paketinstallation
    - bereits kompiliert
    - Konfiguration danach
  - C++-Quellen Ausgangspunkt
    - eine Konfiguration legt Installationsparameter fest
    - danach sind gemäß dieser Auswahl die Quellen zu compilieren
    - die compilierten Programme sind zu installieren
    - der installierte Server ist entsprechend anzupassen (etwa docRoot, tcp-Port, ...)






Anmeldeseite | moodle
Download - The Apache
httpd.apache.org/download.cgi
APACHE
HTTP SERVER PROJECT
COMMUNITY CODE
Essentials
Download!
About
License
FAQ
Security Reports
Source Repositories
General Information
Trunk
2.4
Documentation
Version 2.4
Trunk (dev)
Wiki
Get Involved
Mailing Lists
Bug Reports
Developer Info
User Support
Subprojects
Docs
Test
Flood
Modules
mod_fcgid
Related Projects
Apache Traffic Server
Apache Traffic Control
Tomcat
APR
Downloading the Apache HTTP Server
Use the links below to download the Apache HTTP Server from our download servers. You must verify the integrity of the downloaded files using signatures downloaded from our main distribution directory. The signatures can be verified with our KEYS file.
Only current recommended releases are available on the main distribution site. Historical releases, including the 1.3, 2.0 and 2.2 families of releases, are available from the archive download site.
Apache httpd for Microsoft Windows is available from a number of third party vendors.
Stable Release - Latest Version:
2.4.69 (released 2026-10-01)
Apache HTTP Server 2.4.69 (httpd): 2.4.69 is the latest available version 2026-10-01
The Apache HTTP Server Project is pleased to announce the release of version 2.4.69 of the Apache HTTP Server ("Apache" and "httpd"). This version of Apache is our latest GA release of the new generation 2.4.x branch of Apache HTTPD and represents fifteen years of innovation by the project, and is recommended over all previous releases!
For details, see the Official Announcement and the CHANGES_2.4 and CHANGES_2.4.69 lists.
Source: httpd-2.4.69.tar.bz2 [PGP] [SHA256] [SHA512]
Source: httpd-2.4.69.tar.gz [PGP] [SHA256] [SHA512]
Security and official patches
Other files
Files for Microsoft Windows
Apache mod_fcgid FastCGI module for Apache HTTP Server released as 2.3.9 2013-10-08
The Apache Software Foundation and the Apache HTTP Server Project are pleased to announce the release of version 2.3.9 of mod_fcgid, a FastCGI implementation for Apache HTTP Server versions 2.2 and 2.4. This version of mod_fcgid is a security release.
For information about this module subproject, see the mod_fcgid module project page.
Source as gzip with LF line endings: mod_fcgid-2.3.9.tar.gz [PGP] [MD5] [SHA1]
Source as bz2 with LF line endings: mod_fcgid-2.3.9.tar.bz2 [PGP] [MD5] [SHA1]
Win32, Netware or OS/2 Source with CR/LF line endings: mod_fcgid-2.3.9-crlf.zip [PGP] [MD5] [SHA1]
Apache FTP module for Apache HTTP Server released as 0.9.6-beta 2008-10-08




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Installation unter Windows

- nicht direkt über Apache.org

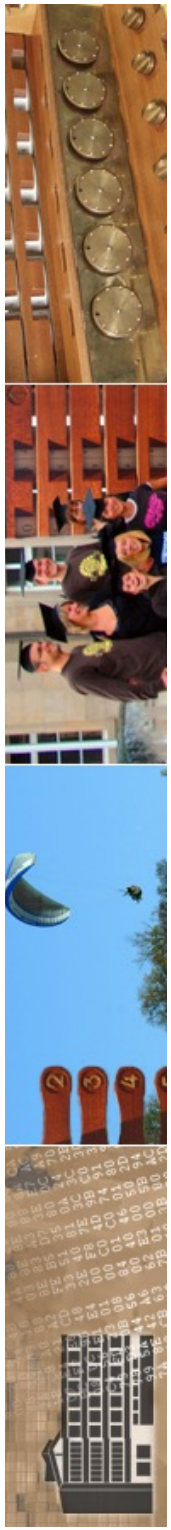
The Apache HTTP Server Project itself does not provide binary releases of software, only source code. Individual committers *may* provide binary packages as a convenience, but it is not a release deliverable.

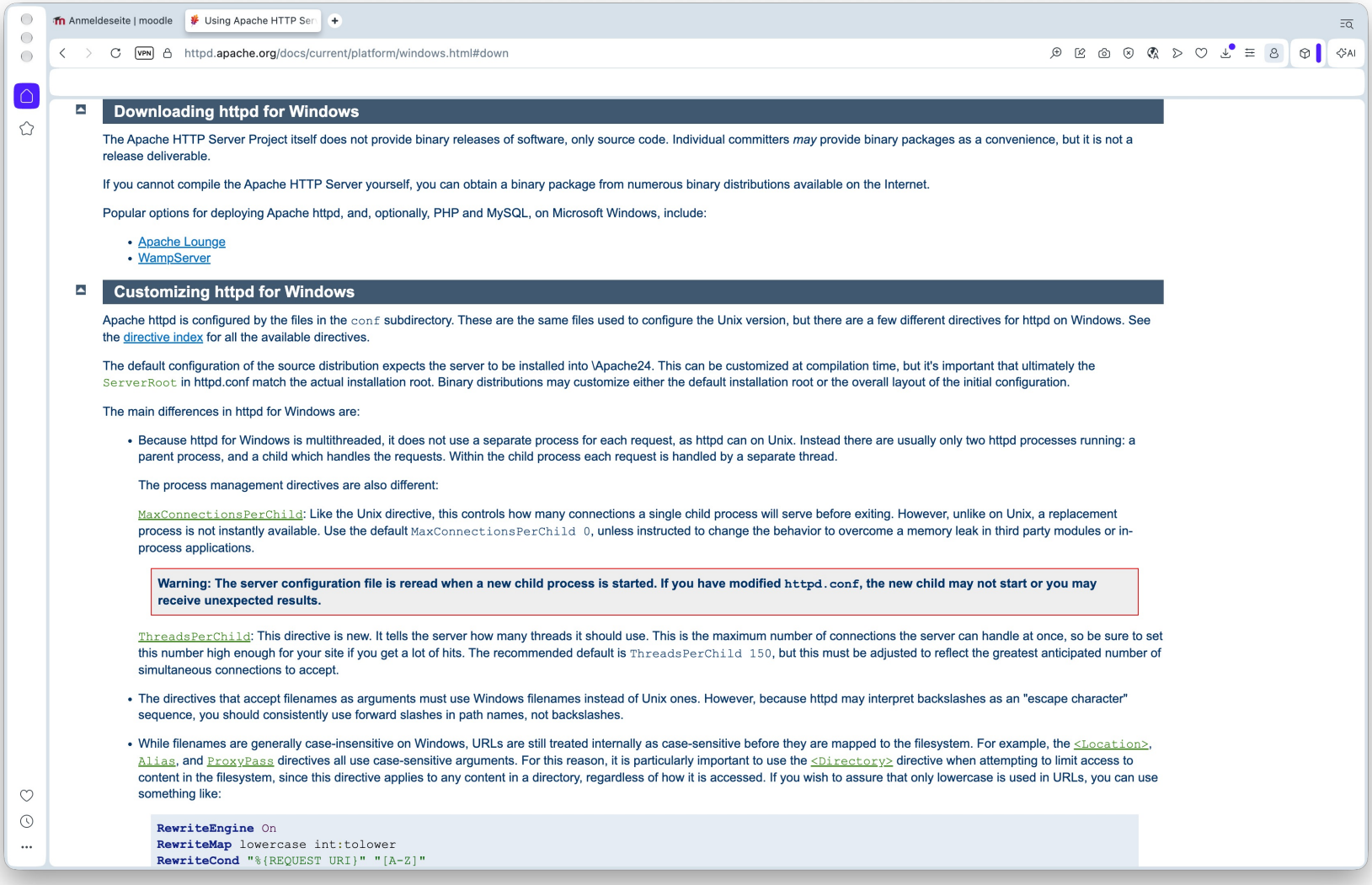
If you cannot compile the Apache HTTP Server yourself, you can obtain a binary package from numerous binary distributions available on the Internet.

Popular options for deploying Apache httpd, and, optionally, PHP and MySQL, on Microsoft Windows, include:

- ApacheHaus
- Apache Lounge
- Bitnami WAMP Stack
- WampServer
- XAMPP







Anmeldeseite | moodle — Using Apache HTTP Ser

httpd.apache.org/docs/current/platform/windows.html#down

Downloading httpd for Windows

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If you cannot compile the Apache HTTP Server yourself, you can obtain a binary package from numerous binary distributions available on the Internet.

Popular options for deploying Apache httpd, and, optionally, PHP and MySQL, on Microsoft Windows, include:

- Apache Lounge
- WampServer

Customizing httpd for Windows

Apache httpd is configured by the files in the `conf` subdirectory. These are the same files used to configure the Unix version, but there are a few different directives for httpd on Windows. See the directive index for all the available directives.

The default configuration of the source distribution expects the server to be installed into \Apache24. This can be customized at compilation time, but it's important that ultimately the `ServerRoot` in httpd.conf match the actual installation root. Binary distributions may customize either the default installation root or the overall layout of the initial configuration.

The main differences in httpd for Windows are:

- Because httpd for Windows is multithreaded, it does not use a separate process for each request, as httpd can on Unix. Instead there are usually only two httpd processes running: a parent process, and a child which handles the requests. Within the child process each request is handled by a separate thread.

  The process management directives are also different:

  `MaxConnectionsPerChild`: Like the Unix directive, this controls how many connections a single child process will serve before exiting. However, unlike on Unix, a replacement process is not instantly available. Use the default `MaxConnectionsPerChild 0`, unless instructed to change the behavior to overcome a memory leak in third party modules or in-process applications.

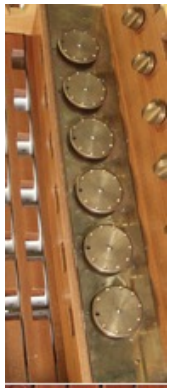
  Warning: The server configuration file is reread when a new child process is started. If you have modified `httpd.conf`, the new child may not start or you may receive unexpected results.

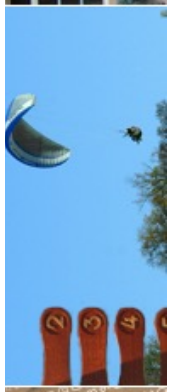
  `ThreadsPerChild`: This directive is new. It tells the server how many threads it should use. This is the maximum number of connections the server can handle at once, so be sure to set this number high enough for your site if you get a lot of hits. The recommended default is `ThreadsPerChild 150`, but this must be adjusted to reflect the greatest anticipated number of simultaneous connections to accept.

- The directives that accept filenames as arguments must use Windows filenames instead of Unix ones. However, because httpd may interpret backslashes as an "escape character" sequence, you should consistently use forward slashes in path names, not backslashes.

- While filenames are generally case-insensitive on Windows, URLs are still treated internally as case-sensitive before they are mapped to the filesystem. For example, the `<Location>`, `Alias`, and `ProxyPass` directives all use case-sensitive arguments. For this reason, it is particularly important to use the `<Directory>` directive when attempting to limit access to content in the filesystem, since this directive applies to any content in a directory, regardless of how it is accessed. If you wish to assure that only lowercase is used in URLs, you can use something like:

```
RewriteEngine On
RewriteMap lowercase int:tolower
RewriteCond "%{REQUEST_URI}" "[A-Z]"
```






Warning: TCP/IP networking must be installed

TCP/IP must be correctly installed, configured and running in order to install and use Apache on Windows. If you use dial-up networking exclusively, you may need to be connected to the internet for Apache to correctly determine that TCP/IP is installed.

If you are installing Apache on Windows 95, 98, ME or NT 4.0, stop

Read the LEGACY notes first!

If you are installing Apache on Windows XP prior to Service Pack 3

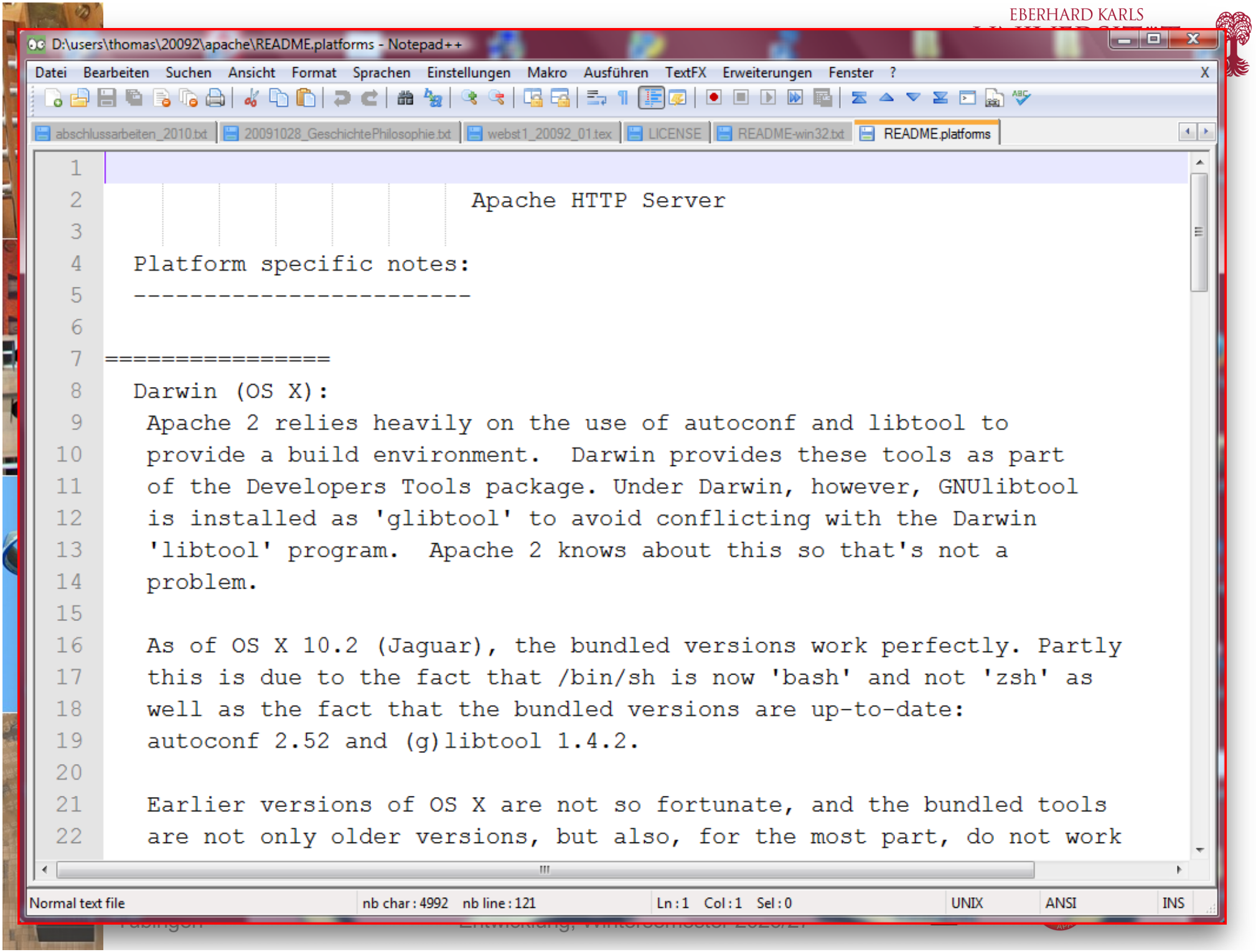
Install the Windows XP Service Pack 3. Refer to KB article 317949 if you need the gory details exactly why you must not run the original Windows XP or SP1.

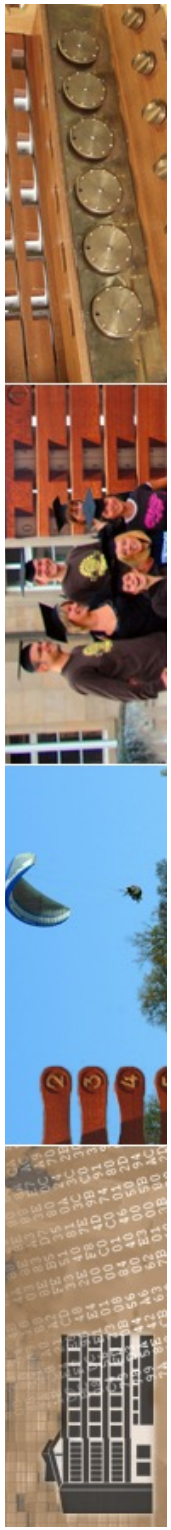
Warning about the Quality of Service driver

We suggest disabling the "Quality of Service" (or QoS) network driver from Microsoft if you primarily use the machine as an Apache Server, as Apache does not support the QoS extensions to the WinSock API.

Warning about Firewall and similar software

Most Firewall programs, Web Spam filters and other TCP/IP driver-based products (including spyware!) do not correctly implement the entire WinSock API. The shortcuts taken by the developers of such products cause Apache to fail. If you insist on leaving such programs installed, and have problems with your Apache installation, consider the suggestion below.

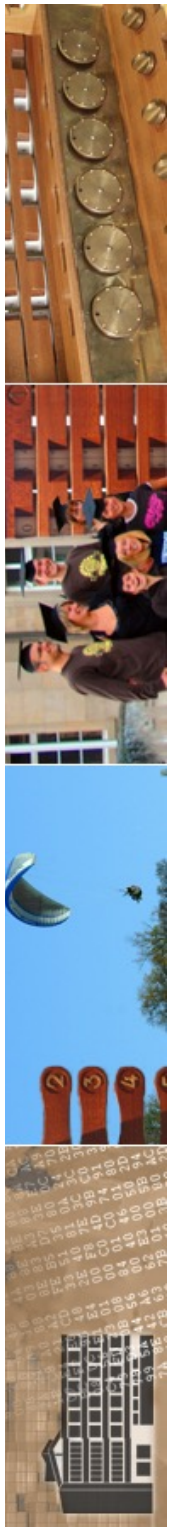

D:\users\thomas\20092\apache\README.platforms - Notepad++
Datei Bearbeiten Suchen Ansicht Format Sprachen Einstellungen Makro Ausführen TextFX Erweiterungen Fenster ? X
abschlussarbeiten_2010.txt
20091028_GeschichtePhilosophie.txt
webst1_20092_01.tex
LICENSE
README-win32.txt
README.platforms
1 Apache HTTP Server
2
3 Platform specific notes:
4 ------------------------
5
6 ================
7 Darwin (OS X):
8 Apache 2 relies heavily on the use of autoconf and libtool to
9 provide a build environment. Darwin provides these tools as part
10 of the Developers Tools package. Under Darwin, however, GNUlibtool
11 is installed as 'glibtool' to avoid conflicting with the Darwin
12 'libtool' program. Apache 2 knows about this so that's not a
13 problem.
14
15 As of OS X 10.2 (Jaguar), the bundled versions work perfectly. Partly
16 this is due to the fact that /bin/sh is now 'bash' and not 'zsh' as
17 well as the fact that the bundled versions are up-to-date:
18 autoconf 2.52 and (g)libtool 1.4.2.
19
20 Earlier versions of OS X are not so fortunate, and the bundled tools
21 are not only older versions, but also, for the most part, do not work
22
Normal text file nb char : 4992 nb line : 121 Ln : 1 Col : 1 Sel : 0 UNIX ANSI INS



Installationsprocedere

- unter Windows ist eine .msi – Datei verfügbar
  - einfache Installation ohne Compilieren – dafür nicht optimal für konkrete Rechnerarchitektur
  - Anpassung danach dann ganz **analog zu Unix/Linux**
  - man könnte auch auf Win compilieren…



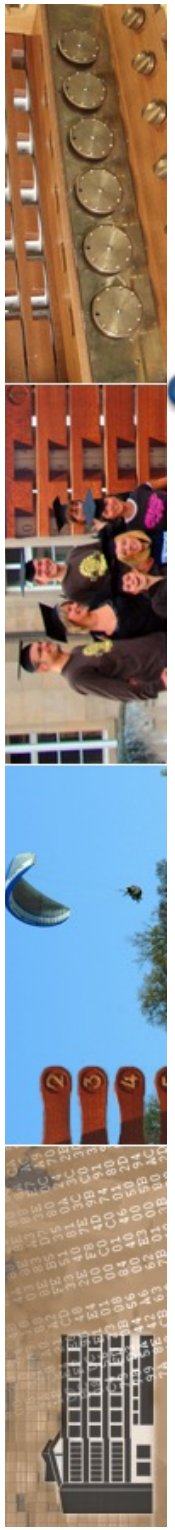


Installation unter Windows

- Ausgangspunkt ist eine Datei wie

  `httpd-2.4.69-win32-x86-no_ssl.msi`

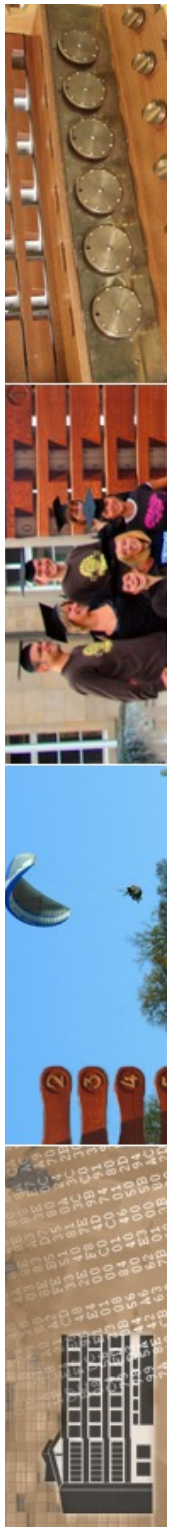
- enthält Standard-Konfiguration des Apache (einschließlich der typischen Module) ohne SSL
  - Version mit SSL ebenfalls über apache.org verfügbar



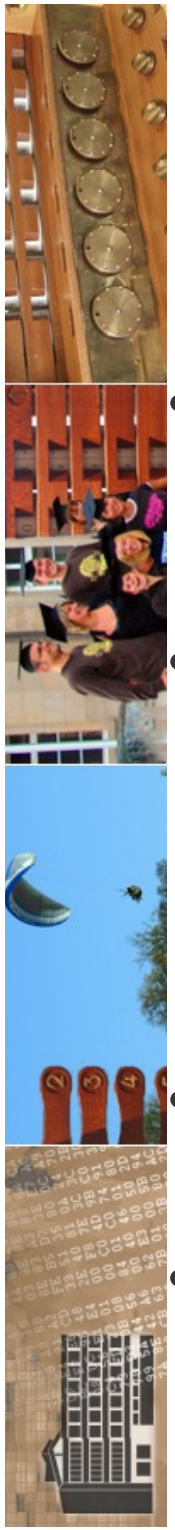
heute ist es nicht mehr so

WARNING

Apache on Win32 has not yet been optimized for performance. Apache still performs best, and is most reliable on Unix platforms. Over time we will improve performance for Windows NT. Folks doing comparative reviews of webserver performance are asked to compare against Apache on a Unix platform such as Solaris, FreeBSD, or Linux.



- **WARNING: The Win32 release of Apache should still be considered beta quality code. It does not meet the normal standards of stability and security that Unix releases do. There are numerous known bugs and inconsistencies. There is also a much greater chance of security holes being present in the Win32 version of Apache.**

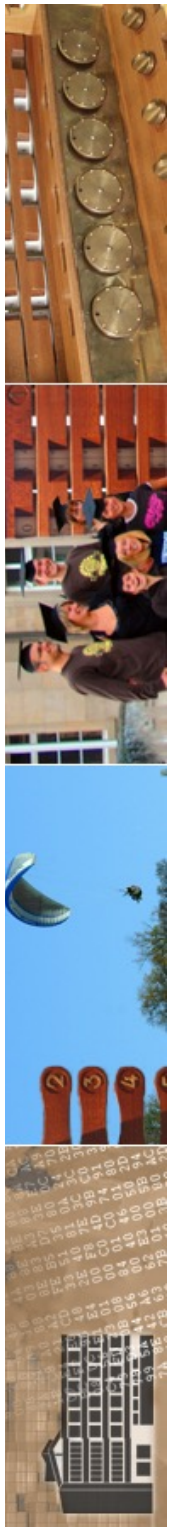


Windows-Dienste

- seit Apache 1.3.14 ist Apache unter NT/2000/XP/Vista/7 ein echter Dienst (Hintergrundprogramm)
- Dienst muß bei älteren Apache-Versionen noch separat installiert (registriert) werden:

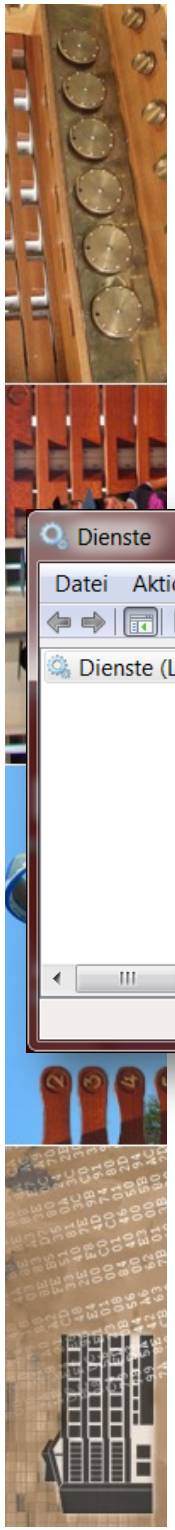
  `Apache -I` oder **`Apache -k install`**

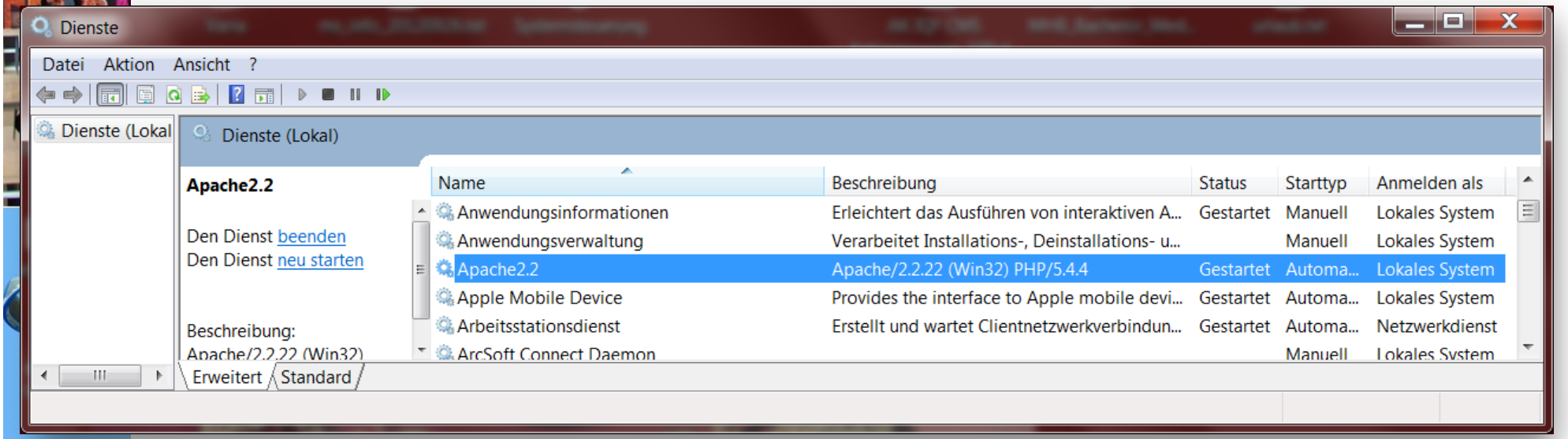
- neuere Versionen registrieren den Dienst nach Frage direkt über Setup-Programm
- Startscript über Eintrag in Services (Systemsteuerung)

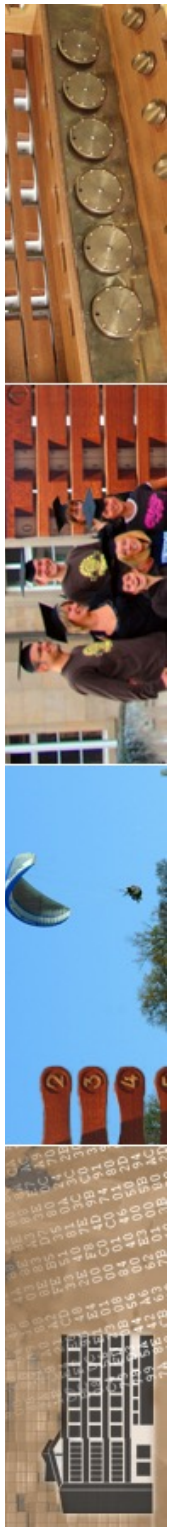


DOS Shell

```
C:\Program Files (x86)\Apache Software Foundation\Apache2.2\bin>.\httpd.exe -h
Usage: .\\httpd.exe [-D name] [-d directory] [-f file]
                    [-C "directive"] [-c "directive"]
                    [-w] [-k start|restart|stop|shutdown]
                    [-k install|config|uninstall] [-n service_name]
                    [-v] [-V] [-h] [-l] [-L] [-t] [-S]
Options:
  -D name            : define a name for use in <IfDefine name> directives
  -d directory       : specify an alternate initial ServerRoot
  -f file            : specify an alternate ServerConfigFile
  -C "directive"     : process directive before reading config files
  -c "directive"     : process directive after reading config files
  -n name            : set service name and use its ServerConfigFile
  -k start           : tell Apache to start
  -k restart         : tell running Apache to do a graceful restart
  -k stop|shutdown   : tell running Apache to shutdown
  -k install         : install an Apache service
  -k config          : change startup Options of an Apache service
  -k uninstall       : uninstall an Apache service
  -w                 : hold open the console window on error
  -e level           : show startup errors of level (see LogLevel)
  -E file            : log startup errors to file
  -v                 : show version number
  -V                 : show compile settings
  -h                 : list available command line options (this page)
  -l                 : list compiled in modules
  -L                 : list available configuration directives
  -t -D DUMP_VHOSTS  : show parsed settings (currently only vhost settings)
  -S                 : a synonym for -t -D DUMP_VHOSTS
  -t -D DUMP_MODULES : show all loaded modules
  -M                 : a synonym for -t -D DUMP_MODULES
  -t                 : run syntax check for config files
```

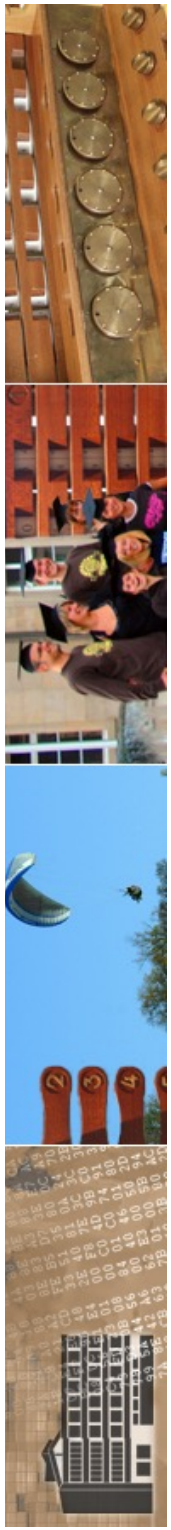


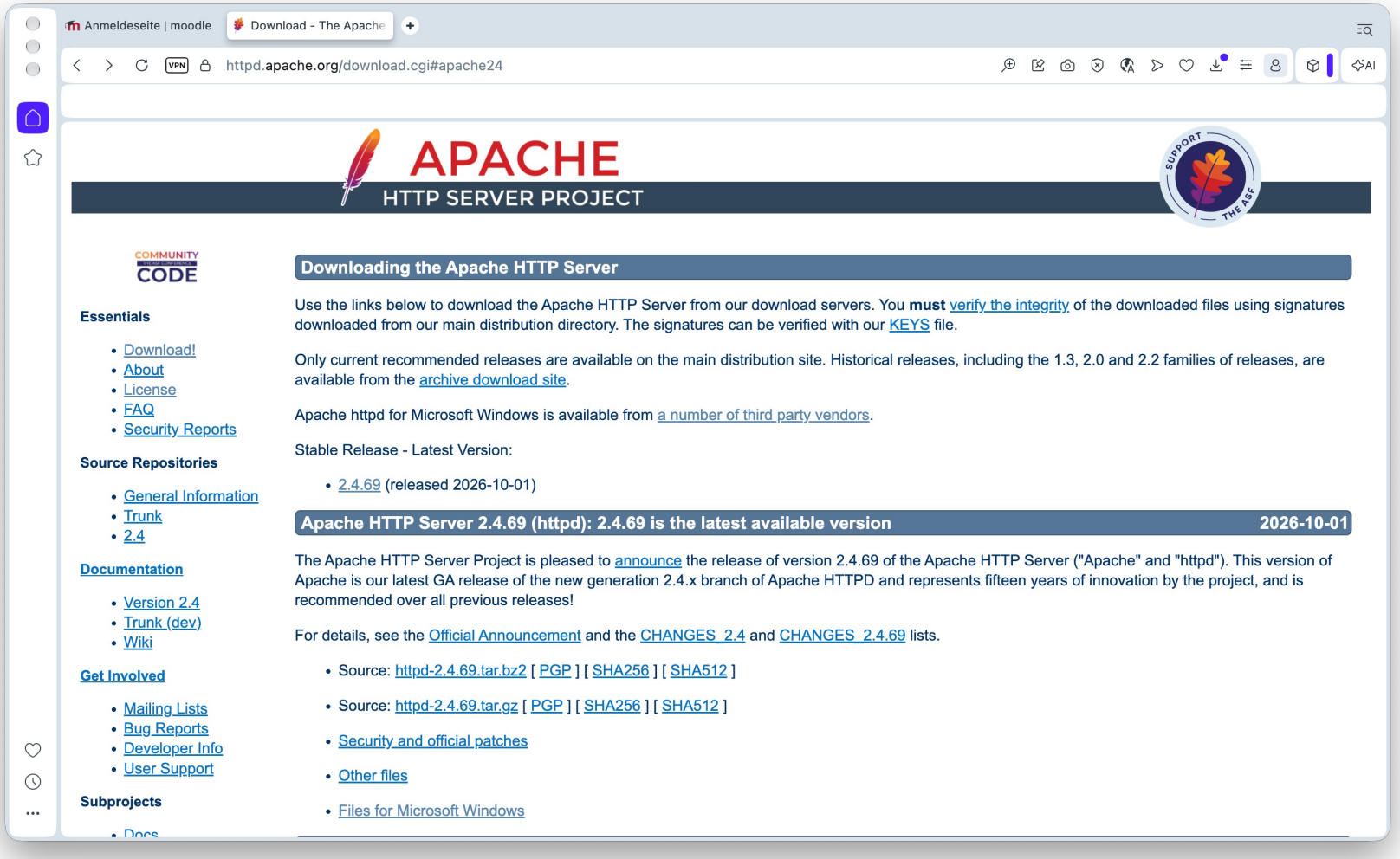

Dienste
Datei Aktion Ansicht ?
Dienste (Lokal)
Dienste (Lokal)
Apache2.2
Den Dienst beenden
Den Dienst neu starten
Beschreibung:
Apache/2.2.22 (Win32)
Name
Beschreibung
Status
Starttyp
Anmelden als
Anwendungsinformationen
Erleichtert das Ausführen von interaktiven A...
Gestartet
Manuell
Lokales System
Anwendungsverwaltung
Verarbeitet Installations-, Deinstallations- u...
Manuell
Lokales System
Apache2.2
Apache/2.2.22 (Win32) PHP/5.4.4
Gestartet
Automa...
Lokales System
Apple Mobile Device
Provides the interface to Apple mobile devi...
Gestartet
Automa...
Lokales System
Arbeitsstationsdienst
Erstellt und wartet Clientnetzwerkverbindun...
Gestartet
Automa...
Netzwerkdienst
ArcSoft Connect Daemon
Manuell
Lokales System
Erweitert
Standard

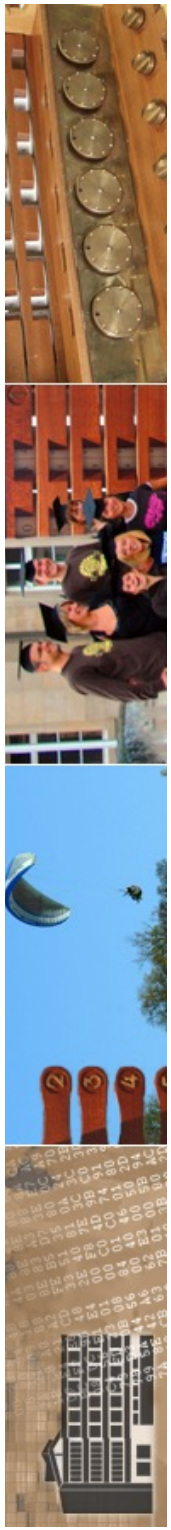


Installation unter Unix

- Grundprinzip:
  - herunterladen und entpacken der Quellen
  - **`./configure`** legt Installationsparameter fest (konkret: erzeugt spezifisches Makefile)
  - **`make`** compiliert die Quellen
  - **`make install`** installiert die compilierten Dateien
- configure läßt sehr zahlreiche Parameter zu!
- eine Übersicht gibt **`./configure --help`**

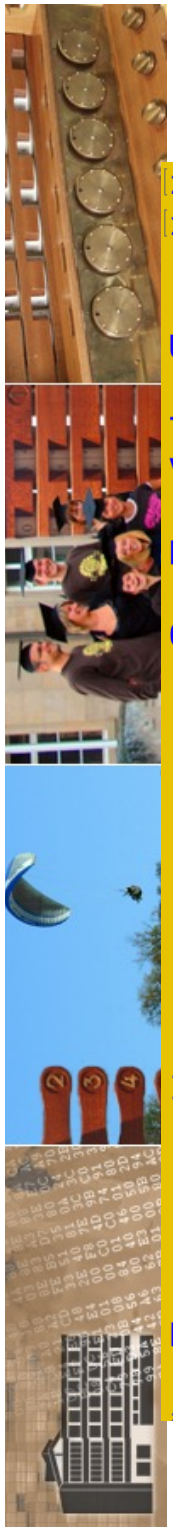



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APACHE
HTTP SERVER PROJECT
COMMUNITY
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Source Repositories
General Information
Trunk
2.4
Documentation
Version 2.4
Trunk (dev)
Wiki
Get Involved
Mailing Lists
Bug Reports
Developer Info
User Support
Subprojects
Docs
Downloading the Apache HTTP Server
Use the links below to download the Apache HTTP Server from our download servers. You must verify the integrity of the downloaded files using signatures downloaded from our main distribution directory. The signatures can be verified with our KEYS file.
Only current recommended releases are available on the main distribution site. Historical releases, including the 1.3, 2.0 and 2.2 families of releases, are available from the archive download site.
Apache httpd for Microsoft Windows is available from a number of third party vendors.
Stable Release - Latest Version:
2.4.69 (released 2026-10-01)
Apache HTTP Server 2.4.69 (httpd): 2.4.69 is the latest available version
2026-10-01
The Apache HTTP Server Project is pleased to announce the release of version 2.4.69 of the Apache HTTP Server ("Apache" and "httpd"). This version of Apache is our latest GA release of the new generation 2.4.x branch of Apache HTTPD and represents fifteen years of innovation by the project, and is recommended over all previous releases!
For details, see the Official Announcement and the CHANGES_2.4 and CHANGES_2.4.69 lists.
Source: httpd-2.4.69.tar.bz2 [PGP] [SHA256] [SHA512]
Source: httpd-2.4.69.tar.gz [PGP] [SHA256] [SHA512]
Security and official patches
Other files
Files for Microsoft Windows



hier bitte nicht ...





```
zrvwa01@infodienste =>
zrvwa01@infodienste => ./configure --help
`configure' configures this package to adapt to many kinds of systems.

Usage: ./configure [OPTION]... [VAR=VALUE]...

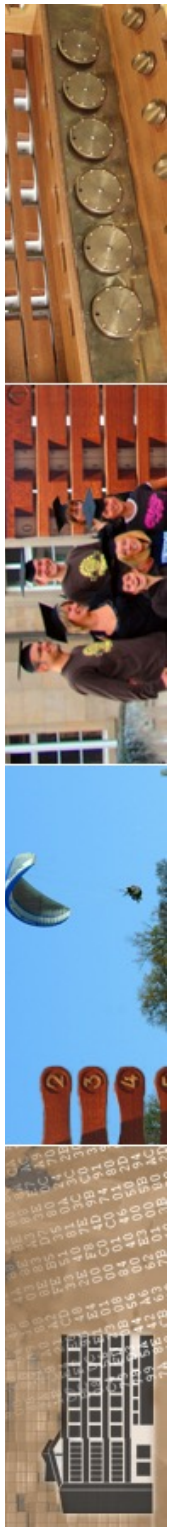
To assign environment variables (e.g., CC, CFLAGS...), specify them as
VAR=VALUE.  See below for descriptions of some of the useful variables.

Defaults for the options are specified in brackets.

Configuration:
  -h, --help              display this help and exit
      --help=short        display options specific to this package
      --help=recursive    display the short help of all the included packages
  -V, --version           display version information and exit
  -q, --quiet, --silent   do not print `checking ...' messages
      --cache-file=FILE   cache test results in FILE [disabled]
  -C, --config-cache      alias for `--cache-file=config.cache'
  -n, --no-create         do not create output files
      --srcdir=DIR        find the sources in DIR [configure dir or `..']

Installation directories:
  --prefix=PREFIX         install architecture-independent files in PREFIX
                          [/usr/local/apache2]
  --exec-prefix=EPREFIX   install architecture-dependent files in EPREFIX
                          [PREFIX]

By default, `make install' will install all the files in
`/usr/local/apache2/bin', `/usr/local/apache2/lib' etc.  You can specify
an installation prefix other than `/usr/local/apache2' using `--prefix'
```

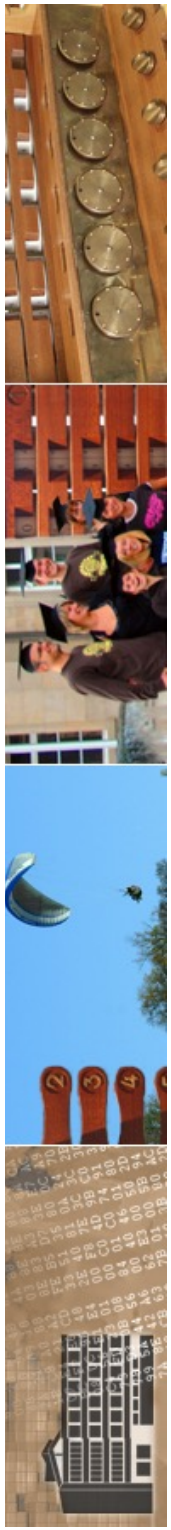


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Apache 2.4

- Apache 2.4 benötigt APR:
  Apache Portable Runtime
  - INSTALL beachten

- The mission of the Apache Portable Runtime (APR) project is to *create and maintain software libraries that provide a predictable and consistent interface to underlying platform-specific implementations*. The primary goal is to provide an API to which software developers may code and be assured of predictable if not identical behaviour regardless of the platform on which their software is built, relieving them of the need to code special-case conditions to work around or take advantage of platform-specific deficiencies or features.



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TÜBINGEN

Apache
Portable Runtime Project

Welcome

The mission of the Apache Portable Runtime (APR) project is to create and maintain software libraries that provide a predictable and consistent interface to underlying platform-specific implementations. The primary goal is to provide an API to which software developers may code and be assured of predictable if not identical behaviour regardless of the platform on which their software is built, relieving them of the need to code special-case conditions to work around or take advantage of platform-specific deficiencies or features.

Recommended releases

The recommended releases of the several Apache Portable Runtime libraries are

- APR 1.6.5, released September 14, 2018
- APR-util 1.6.1, released October 22, 2017
- APR-iconv 1.2.2, released October 22, 2017

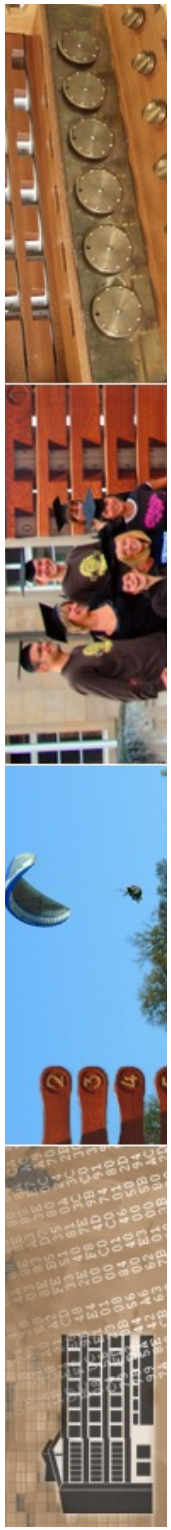
Apache Portable Runtime 1.6.5 Released

The Apache Software Foundation and the Apache Portable Runtime Project are proud to announce the General Availability of version 1.6.5 of the Apache Portable Runtime library. APR 1.6 brings a number of enhancements and bugfixes documented in CHANGES. Users of earlier versions are encouraged to update to this release.

For further details of this release, see the official announcement as well as the CHANGES-APR-1.6 file.

Download

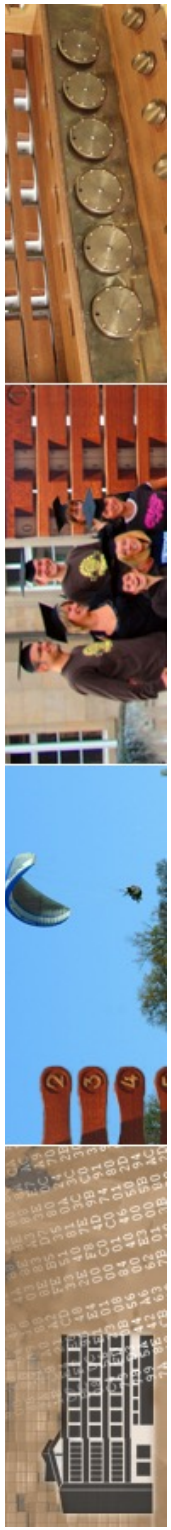
Programmer's Manual: APR



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Beispiel für `configure`

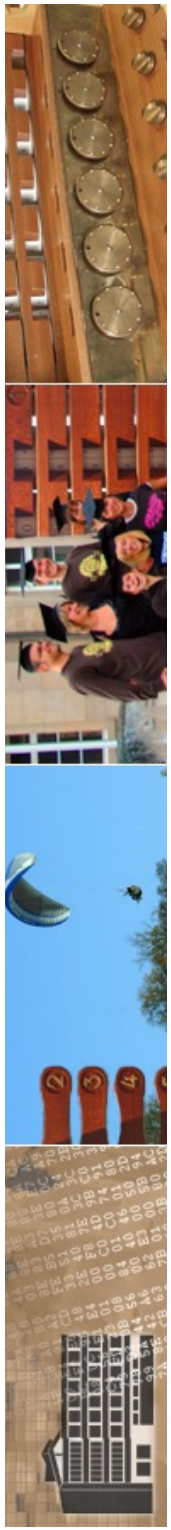
```
zrvwa01@infodienste =>
zrvwa01@infodienste => more myconfig
./configure                                  \
--prefix=/home/zrvwa01/apache_test   \
--with-port=4711                             \
--enable-cgi                                 \
--verbose                                    \
CC=gcc
zrvwa01@infodienste =>
zrvwa01@infodienste =>
```




```
config.status: creating build/pkg/pkginfo
config.status: creating build/config_vars.sh
config.status: creating include/ap_config_auto.h
config.status: executing default commands
configure: summary of build options:

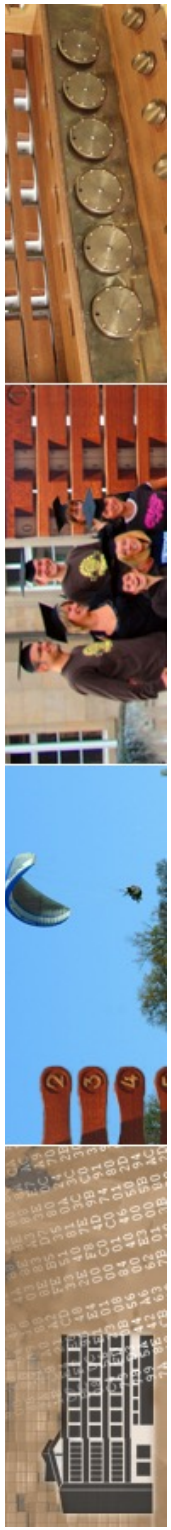
    Server Version: 2.4.65
    Install prefix: /home/zrvwa01/apache_test
    C compiler:     gcc
    CFLAGS:
    CPPFLAGS:         -DLINUX -D_REENTRANT -D_GNU_SOURCE
    LDFLAGS:
    LIBS:
    C preprocessor: x86_64-linux-gnu-gcc -E

[zrvwa01@infodienste =>
[zrvwa01@infodienste =>
zrvwa01@infodienste =>
```



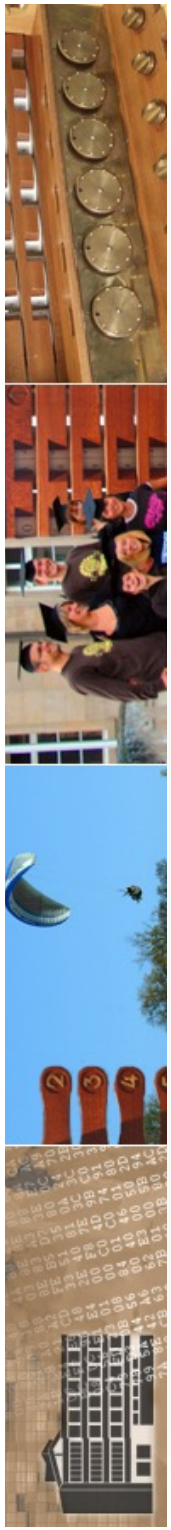
Starten von Apache (I)

- nun könn(t)en wir unseren Apache starten
- vorher müssen wir ihn aber noch etwas konfigurieren
  (ihm sagen, auf welchem tcp-Port er arbeiten soll, wo die Webdokumente liegen etc.)
- dafür Konfigurationsdatei httpd.conf im Unterordner conf

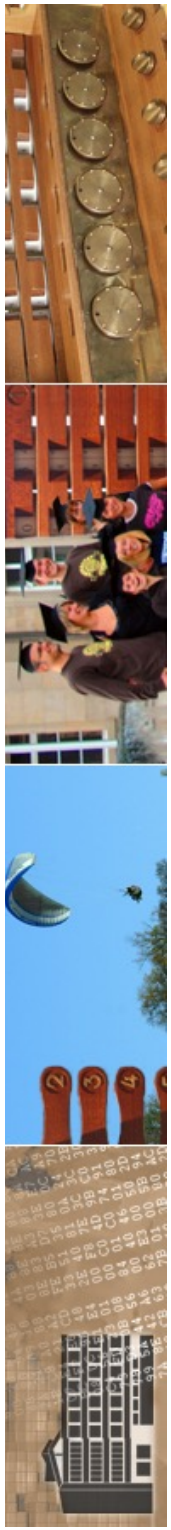


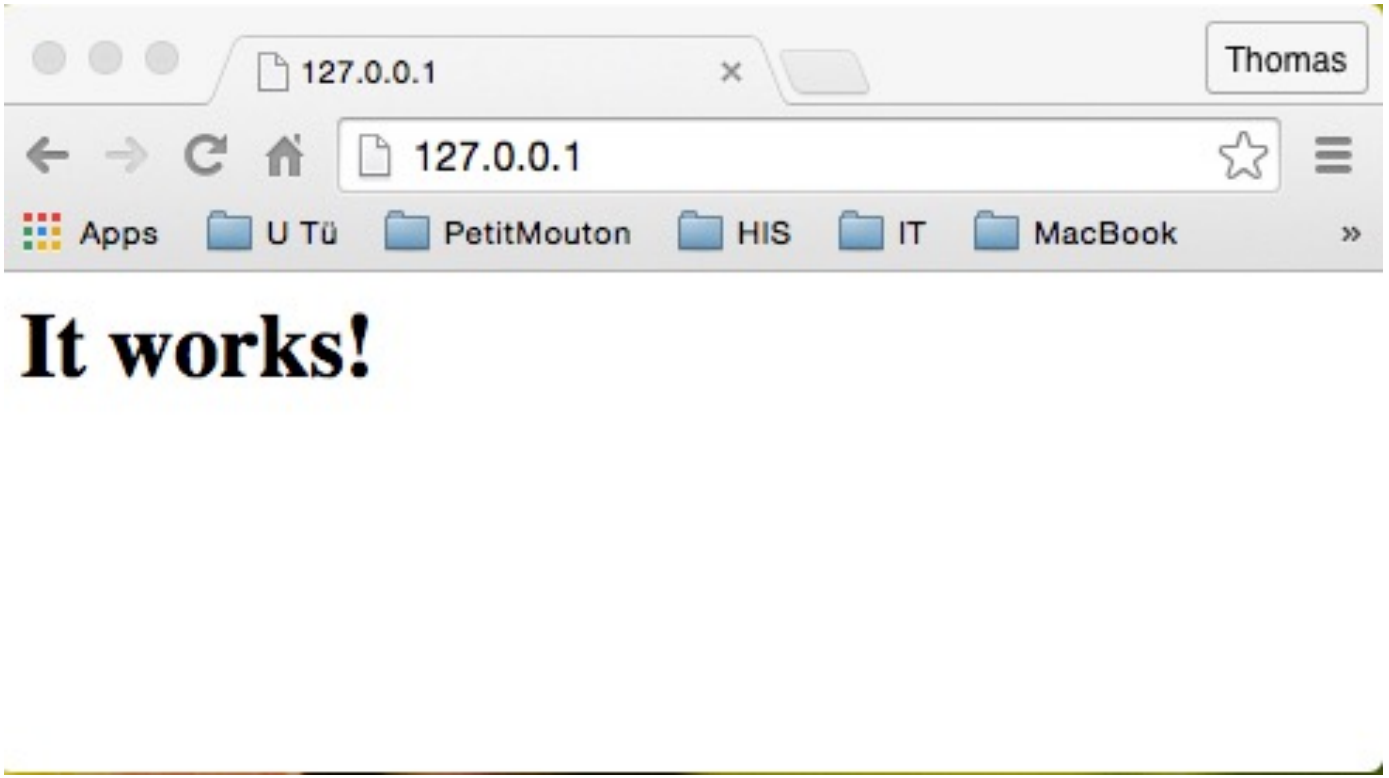
Starten von Apache (II)

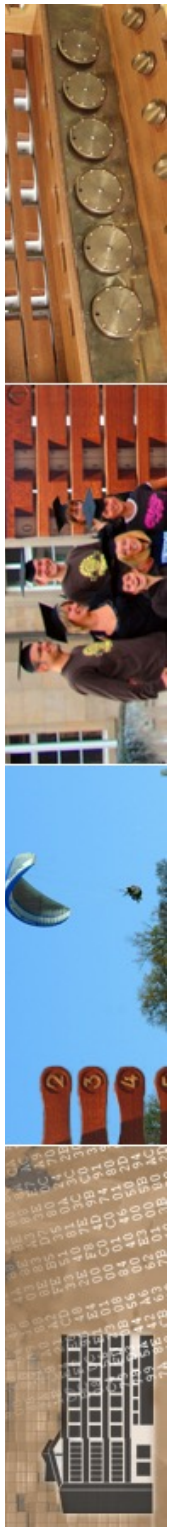
- Starten auf Unix:
  - `<apachedir>/bin apachectl start`
- Starten auf Windows:
  - starten über **`Programme|Apache`** als Konsolenfenster
  - oder (besser): Starten des Windows-Dienstes

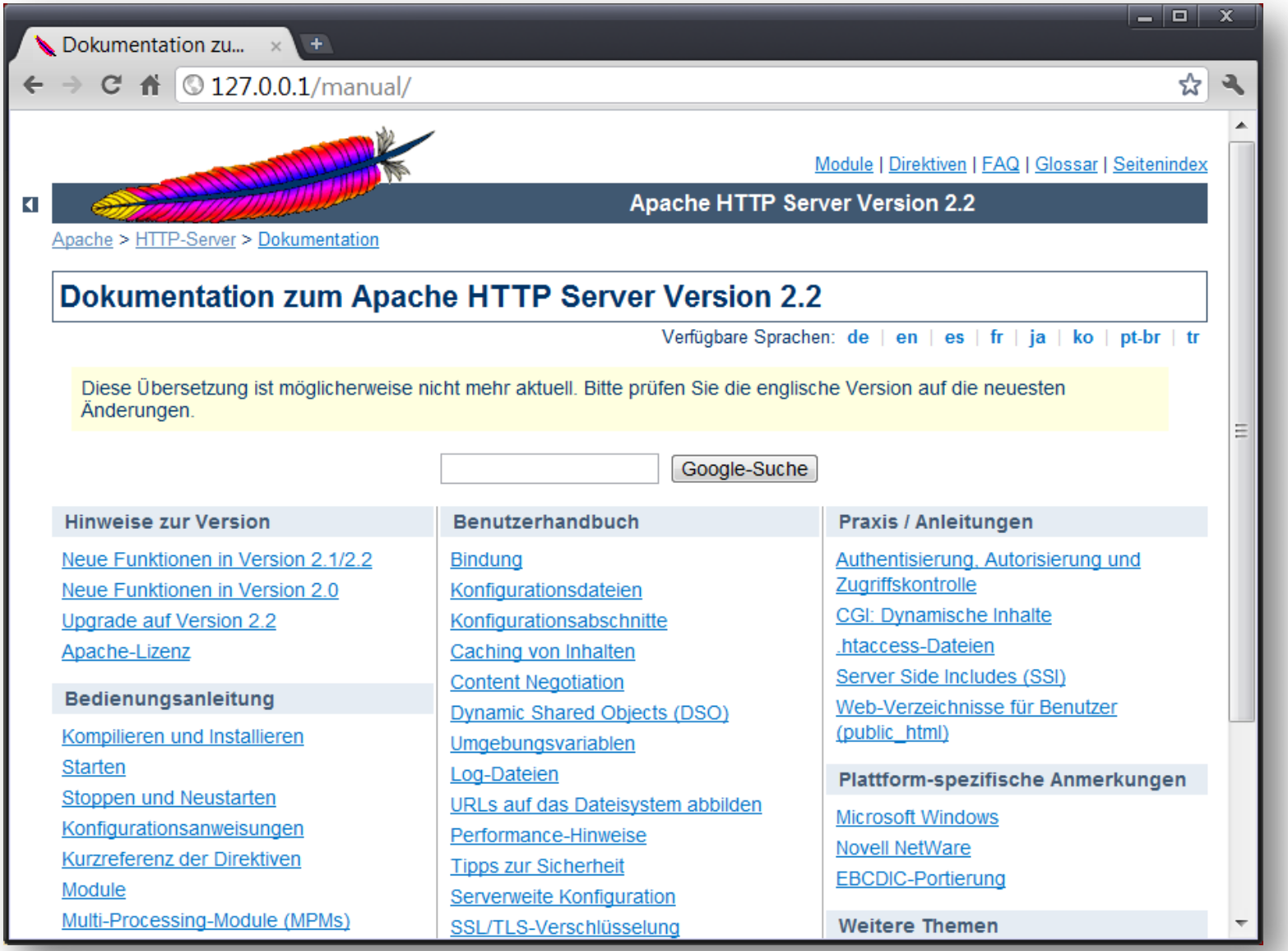


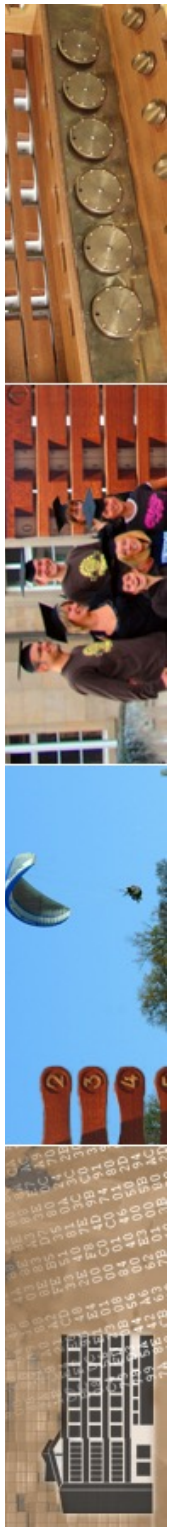

Testseite fuer die Apache-Installation auf dieser Web Site - Netscape
File Edit View Go Bookmarks Tools Window Help
http://octopussy:8080/
Programmie... Huge differ... RHEINPFAL... asknet AG Status of th... Jetspeed - J... Amazon.de:... Testseite fu...
Es klappt! Der Apache Web-Server ist auf dieser Web-Site installiert!
Wenn Sie diese Seite sehen, dann bedeutet das, dass die Eigentümer dieser Domäne soeben einen neuen Apache Web-Server erfolgreich installiert haben. Jetzt muss noch der richtige Web-Inhalt zugefügt und diese Platzhalter-Seite ersetzt werden (oder der Web-Server für den Zugriff auf den richtigen Inhalt umkonfiguriert werden).
Wenn Sie diese Seite an Stelle einer anderen erwarteten Web-Site sehen sollten, dann nehmen Sie bitte Kontakt mit dem Eigentümer dieser Site auf (Versuchen Sie, eine EMail an <Webmaster@domänenname> zu senden)!
Obwohl der Eigentümer dieser Domäne die Apache Web-Server Software verwendet, hat diese Web-Site ziemlich sicher keinerlei Verbindung mit der Apache Software Foundation (die diese Software kostenlos vertreibt). Es besteht also keinerlei Veranlassung, eine EMail an die Entwickler der Software zu senden. Sollten Sie das dennoch tun, wird Ihre Mail stillschweigend ignoriert.
Die englische Online-Dokumentation für die Apache Web-Server Software ist Bestandteil dieser Software-Distribution.
Dem WebMaster dieser Web-Site steht es frei, das untenstehende "Powered by Apache"-Logo auf einem Apache-basierten Web-Server zu verwenden.
Vielen Dank, dass Sie Apache gewählt haben!
Powered by APACHE




127.0.0.1
Thomas
127.0.0.1
Apps
U Tü
PetitMouton
HIS
IT
MacBook
It works!




Dokumentation zu...
127.0.0.1/manual/
Module | Direktiven | FAQ | Glossar | Seitenindex
Apache HTTP Server Version 2.2
Apache > HTTP-Server > Dokumentation
Dokumentation zum Apache HTTP Server Version 2.2
Verfügbare Sprachen: de | en | es | fr | ja | ko | pt-br | tr
Diese Übersetzung ist möglicherweise nicht mehr aktuell. Bitte prüfen Sie die englische Version auf die neuesten Änderungen.
Google-Suche
Hinweise zur Version
Neue Funktionen in Version 2.1/2.2
Neue Funktionen in Version 2.0
Upgrade auf Version 2.2
Apache-Lizenz
Bedienungsanleitung
Kompilieren und Installieren
Starten
Stoppen und Neustarten
Konfigurationsanweisungen
Kurzreferenz der Direktiven
Module
Multi-Processing-Module (MPMs)
Benutzerhandbuch
Bindung
Konfigurationsdateien
Konfigurationsabschnitte
Caching von Inhalten
Content Negotiation
Dynamic Shared Objects (DSO)
Umgebungsvariablen
Log-Dateien
URLs auf das Dateisystem abbilden
Performance-Hinweise
Tipps zur Sicherheit
Serverweite Konfiguration
SSL/TLS-Verschlüsselung
Praxis / Anleitungen
Authentisierung, Autorisierung und Zugriffskontrolle
CGI: Dynamische Inhalte
.htaccess-Dateien
Server Side Includes (SSI)
Web-Verzeichnisse für Benutzer (public_html)
Plattform-spezifische Anmerkungen
Microsoft Windows
Novell NetWare
EBCDIC-Portierung
Weitere Themen



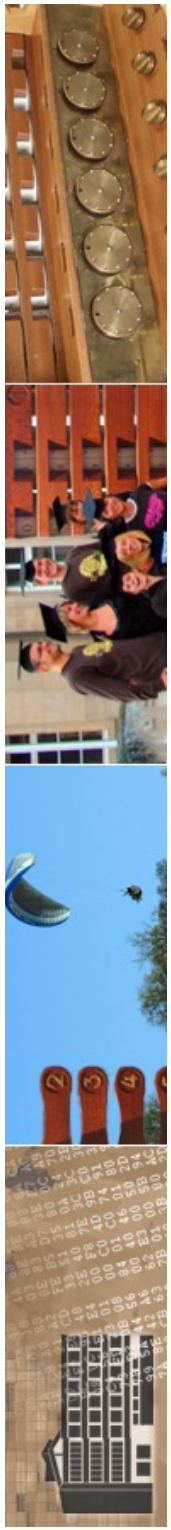
Apache 2.4.69

- Entpacken
- Konfigurieren

```
thomas — ssh ◂ -bash — 76×10
~/Desktop — -bash ... ~ — ssh ◂ -bash

zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => more myconfig
./configure                                  \
--prefix=/home/zrvwa01/apache_test           \
--with-port=4711                             \
CC=gcc                                       \
--enable-cgi
zrvwa01@infodienste =>
zrvwa01@infodienste =>
```

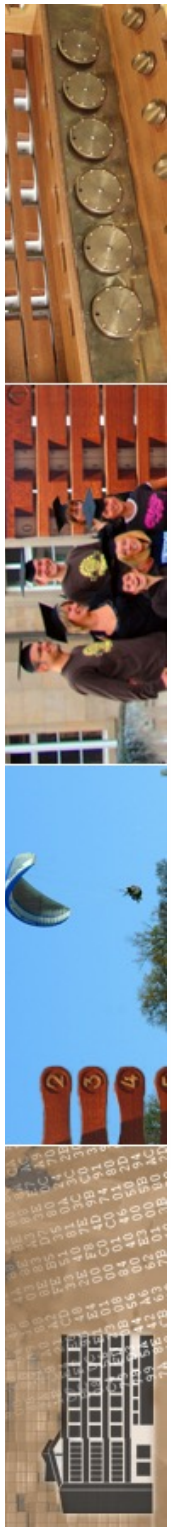
- make
- make install
- starten



thomas — ssh ◂ -bash — 106×26

~/Desktop — -bash ... ~ — ssh ◂ -bash +

```
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => . ./myconfig
checking for chosen layout... Apache
checking for working mkdir -p... yes
checking for grep that handles long lines and -e... /usr/bin/grep
checking for egrep... /usr/bin/grep -E
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking target system type... x86_64-pc-linux-gnu
configure:
configure: Configuring Apache Portable Runtime library...
configure:
checking for APR... yes
  setting CPP to "x86_64-linux-gnu-gcc -E"
  setting CFLAGS to " "
  setting CPPFLAGS to "  -DLINUX -D_REENTRANT -D_GNU_SOURCE"
  setting LDFLAGS to " "
configure:
configure: Configuring Apache Portable Runtime Utility library...
configure:
checking for APR-util... yes
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
```



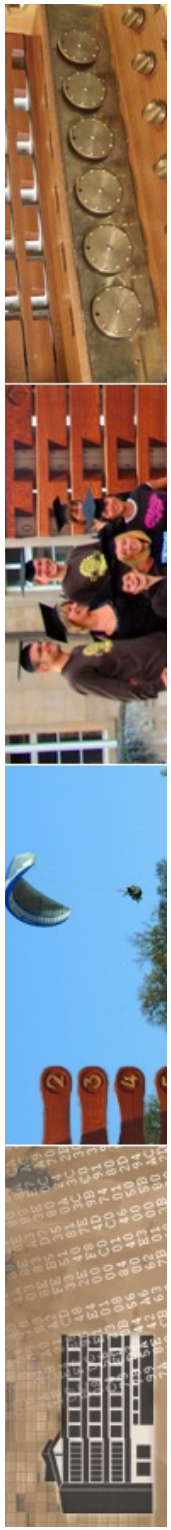
thomas — ssh ◂ -bash — 73×17

~/Desktop — -bash ... ~ — ssh ◂ -bash +

```
config.status: creating build/rules.mk
config.status: creating build/pkg/pkginfo
config.status: creating build/config_vars.sh
config.status: creating include/ap_config_auto.h
config.status: executing default commands
configure: summary of build options:

    Server Version: 2.4.69
    Install prefix: /home/zrvwa01/apache_test
    C compiler:     gcc -std=gnu23
    CFLAGS:
    CPPFLAGS:         -DLINUX -D_REENTRANT -D_GNU_SOURCE
    LDFLAGS:
    LIBS:
    C preprocessor: x86_64-linux-gnu-gcc -E

zrvwa01@infodienste =>
```

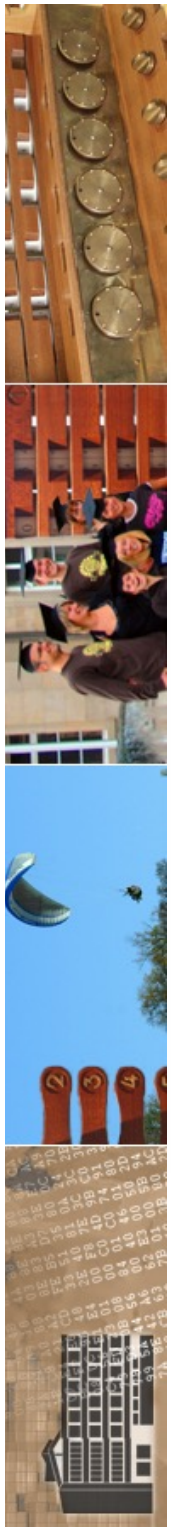


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thomas — ssh ◂ -bash — 145×31

~/Desktop — -bash ... ~ — ssh ◂ -bash +

```
zrvwa01@infodienste => make
Making all in srclib
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/srclib“ wird betreten
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/srclib“ wird verlassen
Making all in os
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os“ wird betreten
Making all in unix
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird betreten
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird betreten
/usr/share/apr-1.0/build/libtool --silent --mode=compile gcc -std=gnu23        -DLINUX -D_REENTRANT -D_GNU_SOURCE     -I. -I/home-link/zrvwa01/ap
ache_install/httpd-2.4.69/os/unix -I/home-link/zrvwa01/apache_install/httpd-2.4.69/include -I/usr/include/apr-1.0 -I/usr/include -I/home-link/zrv
wa01/apache_install/httpd-2.4.69/modules/aaa -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/cache -I/home-link/zrvwa01/apache_install/h
ttpd-2.4.69/modules/core -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/database -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modul
es/filters -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/ldap -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/loggers -I/home
-link/zrvwa01/apache_install/httpd-2.4.69/modules/lua -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/proxy -I/home-link/zrvwa01/apache_
install/httpd-2.4.69/modules/http2 -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/session -I/home-link/zrvwa01/apache_install/httpd-2.4
.69/modules/ssl -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/test -I/home-link/zrvwa01/apache_install/httpd-2.4.69/server -I/home-lin
k/zrvwa01/apache_install/httpd-2.4.69/modules/md -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/arch/unix -I/home-link/zrvwa01/apache_i
nstall/httpd-2.4.69/modules/dav/main -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/generators -I/home-link/zrvwa01/apache_install/http
d-2.4.69/server -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/mappers  -prefer-non-pic -static -c unixd.c && touch unixd.lo
/usr/share/apr-1.0/build/libtool --silent --mode=link gcc -std=gnu23          -o libos.la -static  unixd.lo
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird verlassen
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os“ wird verlassen
Making all in server
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server“ wird betreten
Making all in mpm
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm“ wird betreten
Making all in event
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm/event“ wird betreten
make[4]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm/event“ wird betreten
```



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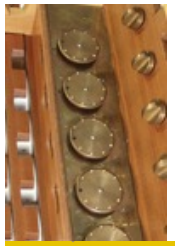


thomas — ssh ◂ -bash — 145×31

~/Desktop — -bash ... ~ — ssh ◂ -bash +

```
ttpd-2.4.69/modules/core -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/database -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modul
es/filters -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/ldap -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/loggers -I/home
-link/zrvwa01/apache_install/httpd-2.4.69/modules/lua -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/proxy -I/home-link/zrvwa01/apache_
install/httpd-2.4.69/modules/http2 -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/session -I/home-link/zrvwa01/apache_install/httpd-2.4
.69/modules/ssl -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/test -I/home-link/zrvwa01/apache_install/httpd-2.4.69/server -I/home-lin
k/zrvwa01/apache_install/httpd-2.4.69/modules/md -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/arch/unix -I/home-link/zrvwa01/apache_i
nstall/httpd-2.4.69/modules/dav/main -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/generators -I/home-link/zrvwa01/apache_install/http
d-2.4.69/server -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/mappers -prefer-pic -c mod_alias.c && touch mod_alias.slo
/usr/share/apr-1.0/build/libtool --silent --mode=link gcc -std=gnu23             -o mod_alias.la -rpath /home/zrvwa01/apache_test/modules -module
 -avoid-version  mod_alias.lo
/usr/share/apr-1.0/build/libtool --silent --mode=compile gcc -std=gnu23        -DLINUX -D_REENTRANT -D_GNU_SOURCE     -I. -I/home-link/zrvwa01/ap
ache_install/httpd-2.4.69/os/unix -I/home-link/zrvwa01/apache_install/httpd-2.4.69/include -I/usr/include/apr-1.0 -I/usr/include -I/home-link/zrv
wa01/apache_install/httpd-2.4.69/modules/aaa -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/cache -I/home-link/zrvwa01/apache_install/h
ttpd-2.4.69/modules/core -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/database -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modul
es/filters -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/ldap -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/loggers -I/home
-link/zrvwa01/apache_install/httpd-2.4.69/modules/lua -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/proxy -I/home-link/zrvwa01/apache_
install/httpd-2.4.69/modules/http2 -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/session -I/home-link/zrvwa01/apache_install/httpd-2.4
.69/modules/ssl -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/test -I/home-link/zrvwa01/apache_install/httpd-2.4.69/server -I/home-lin
k/zrvwa01/apache_install/httpd-2.4.69/modules/md -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/arch/unix -I/home-link/zrvwa01/apache_i
nstall/httpd-2.4.69/modules/dav/main -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/generators -I/home-link/zrvwa01/apache_install/http
d-2.4.69/server -I/home-link/zrvwa01/apache_install/httpd-2.4.69/modules/mappers -prefer-pic -c mod_rewrite.c && touch mod_rewrite.slo
/usr/share/apr-1.0/build/libtool --silent --mode=link gcc -std=gnu23             -o mod_rewrite.la -rpath /home/zrvwa01/apache_test/modules -modu
le -avoid-version  mod_rewrite.lo
make[4]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/modules/mappers“ wird verlassen
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/modules/mappers“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/modules“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/support“ wird betreten
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/support“ wird verlassen

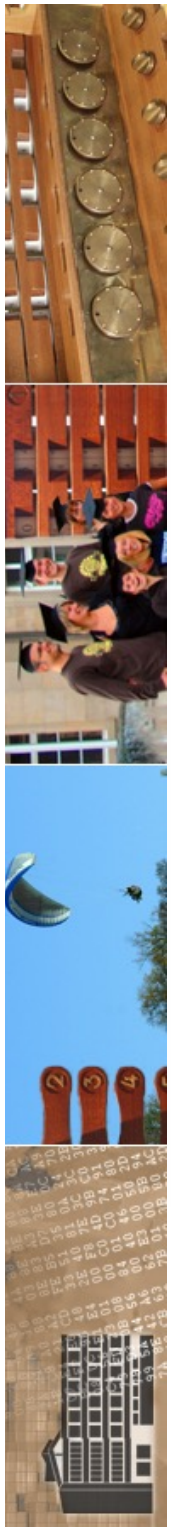
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69“ wird verlassen
zrvwa01@infodienste =>
```




```
che_install/httpd-2.4.65/modules/proxy -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/http2 -I/home-link/zrvwa01/apache_in
stall/httpd-2.4.65/modules/session -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/ssl -I/home-link/zrvwa01/apache_install/
httpd-2.4.65/modules/test -I/home-link/zrvwa01/apache_install/httpd-2.4.65/server -I/home-link/zrvwa01/apache_install/httpd-2.4.65/m
odules/md -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/arch/unix -I/home-link/zrvwa01/apache_install/httpd-2.4.65/module
s/dav/main -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/generators -I/home-link/zrvwa01/apache_install/httpd-2.4.65/serv
er -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/mappers -prefer-pic -c mod_alias.c && touch mod_alias.slo
/usr/share/apr-1.0/build/libtool --silent --mode=link gcc              -o mod_alias.la -rpath /home/zrvwa01/apache_test/modules -modu
le -avoid-version  mod_alias.lo
/usr/share/apr-1.0/build/libtool --silent --mode=compile gcc        -DLINUX -D_REENTRANT -D_GNU_SOURCE     -I. -I/home-link/zrvwa01/
apache_install/httpd-2.4.65/os/unix -I/home-link/zrvwa01/apache_install/httpd-2.4.65/include -I/usr/include/apr-1.0 -I/usr/include -
I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/aaa -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/cache -I/home-l
ink/zrvwa01/apache_install/httpd-2.4.65/modules/core -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/database -I/home-link/
zrvwa01/apache_install/httpd-2.4.65/modules/filters -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/ldap -I/home-link/zrvwa
01/apache_install/httpd-2.4.65/modules/loggers -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/lua -I/home-link/zrvwa01/apa
che_install/httpd-2.4.65/modules/proxy -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/http2 -I/home-link/zrvwa01/apache_in
stall/httpd-2.4.65/modules/session -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/ssl -I/home-link/zrvwa01/apache_install/
httpd-2.4.65/modules/test -I/home-link/zrvwa01/apache_install/httpd-2.4.65/server -I/home-link/zrvwa01/apache_install/httpd-2.4.65/m
odules/md -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/arch/unix -I/home-link/zrvwa01/apache_install/httpd-2.4.65/module
s/dav/main -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/generators -I/home-link/zrvwa01/apache_install/httpd-2.4.65/serv
er -I/home-link/zrvwa01/apache_install/httpd-2.4.65/modules/mappers -prefer-pic -c mod_rewrite.c && touch mod_rewrite.slo
/usr/share/apr-1.0/build/libtool --silent --mode=link gcc              -o mod_rewrite.la -rpath /home/zrvwa01/apache_test/modules -mo
dule -avoid-version  mod_rewrite.lo
make[4]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.65/modules/mappers“ wird verlassen
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.65/modules/mappers“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.65/modules“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.65/support“ wird betreten
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.65/support“ wird verlassen

make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.65“ wird verlassen
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste =>
```



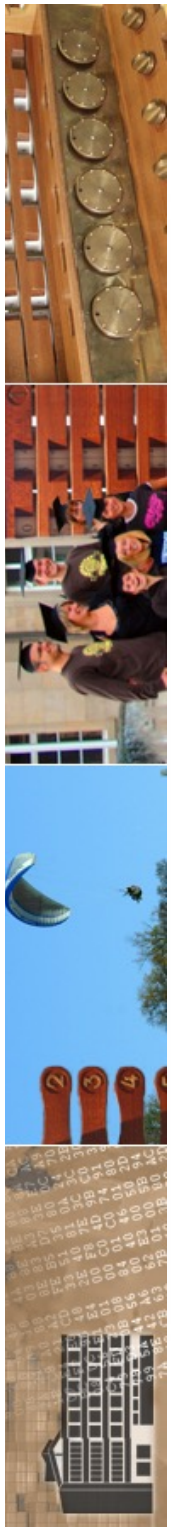


thomas — ssh ◂ -bash — 133×31

~/Desktop — -bash ... ~ — ssh ◂ -bash

```
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => make install
Making install in srclib
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/srclib“ wird betreten
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/srclib“ wird betreten
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/srclib“ wird verlassen
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/srclib“ wird verlassen
Making install in os
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os“ wird betreten
Making install in unix
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird betreten
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird betreten
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os/unix“ wird verlassen
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os“ wird betreten
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os“ wird verlassen
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/os“ wird verlassen
Making install in server
make[1]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server“ wird betreten
Making install in mpm
make[2]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm“ wird betreten
Making install in event
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm/event“ wird betreten
make[4]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm/event“ wird betreten
mkdir /home/zrvwa01/apache_test/modules
make[4]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm/event“ wird verlassen
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm/event“ wird verlassen
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm“ wird betreten
make[3]: Verzeichnis „/home/zrvwa01/apache_install/httpd-2.4.69/server/mpm“ wird verlassen
```

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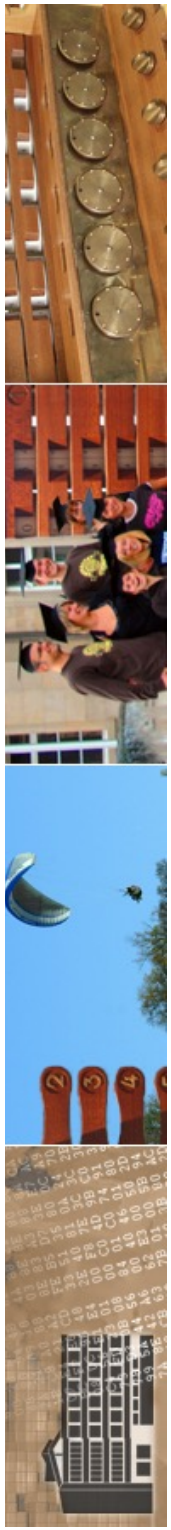


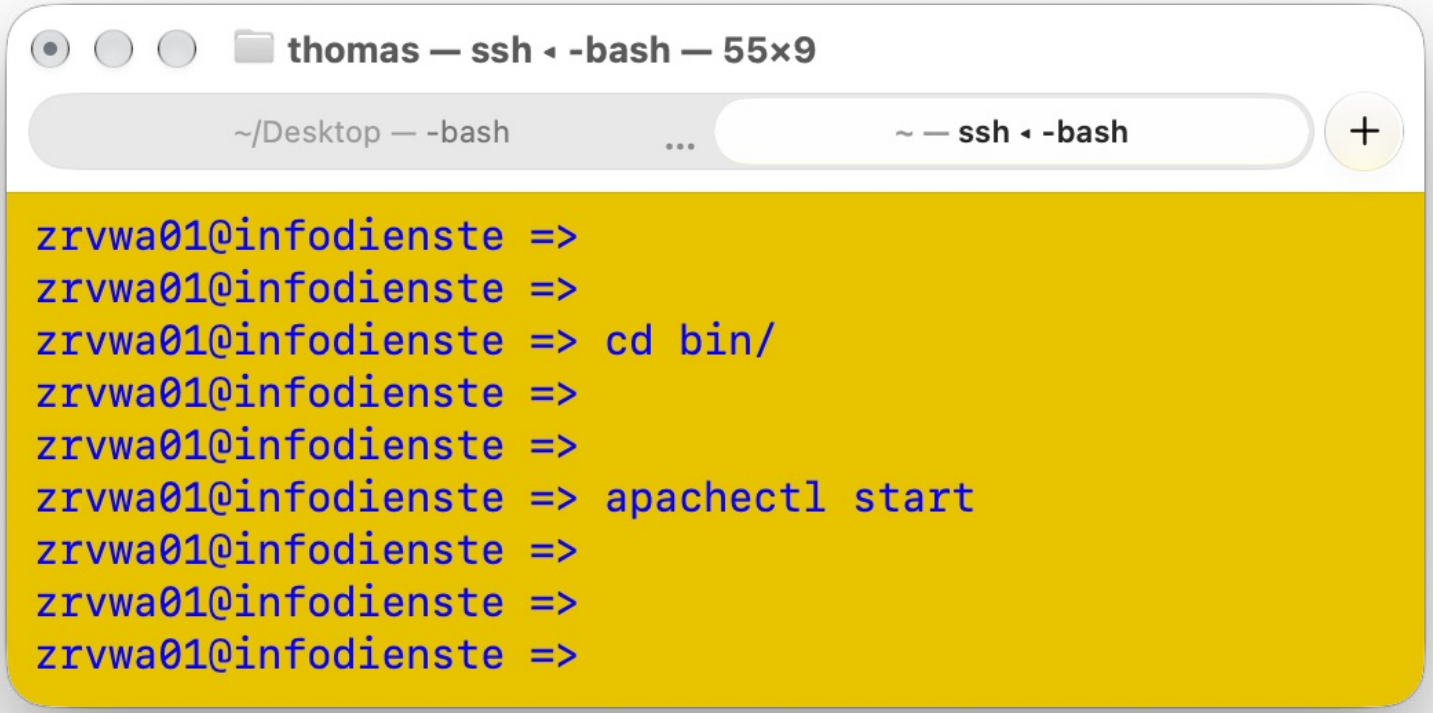
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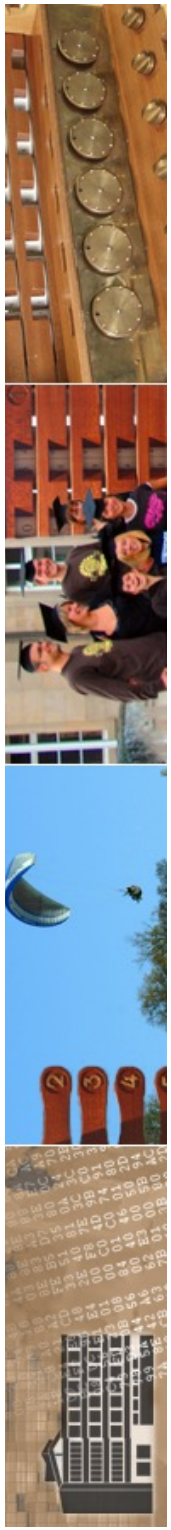
thomas — ssh ◂ -bash — 77×26

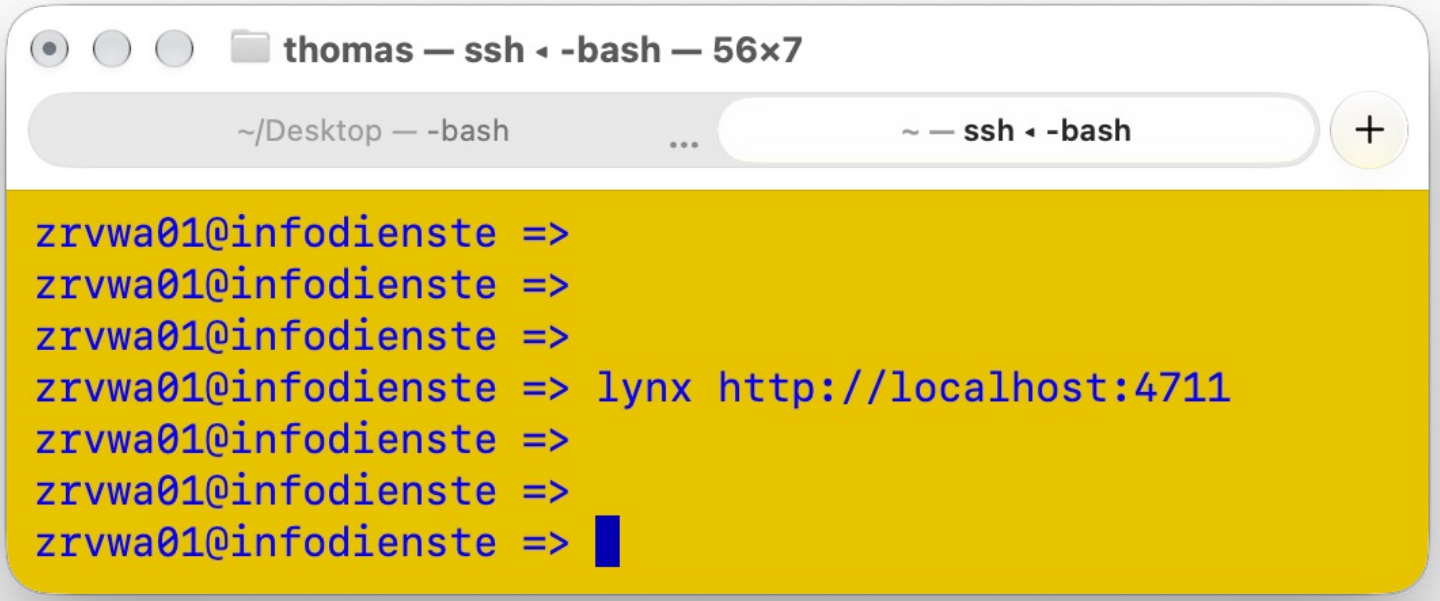
~/Desktop — -bash ... ~ — ssh ◂ -bash +

```
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => cd
zrvwa01@infodienste => cd apache_test/
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => ll
insgesamt 64
drwxr-xr-x 14 zrvwa01  4096 28. Okt 09:45 ./
drwx---r-x 24 zrvwa01  4096 28. Okt 09:28 ../
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 bin/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 build/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 cgi-bin/
drwxr-xr-x  4 zrvwa01  4096 28. Okt 09:45 conf/
drwxr-xr-x  3 zrvwa01  4096 28. Okt 09:45 error/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:30 htdocs/
drwxr-xr-x  3 zrvwa01  4096 28. Okt 09:45 icons/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 include/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 logs/
drwxr-xr-x  4 zrvwa01  4096 28. Okt 09:45 man/
drwxr-xr-x 14 zrvwa01 12288 28. Okt 09:30 manual/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 modules/
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste =>
```

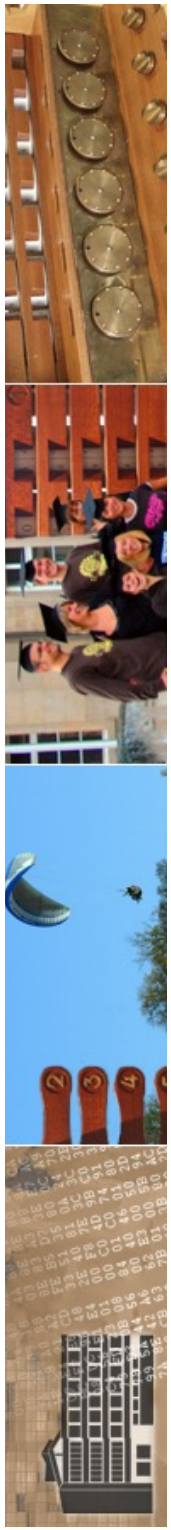


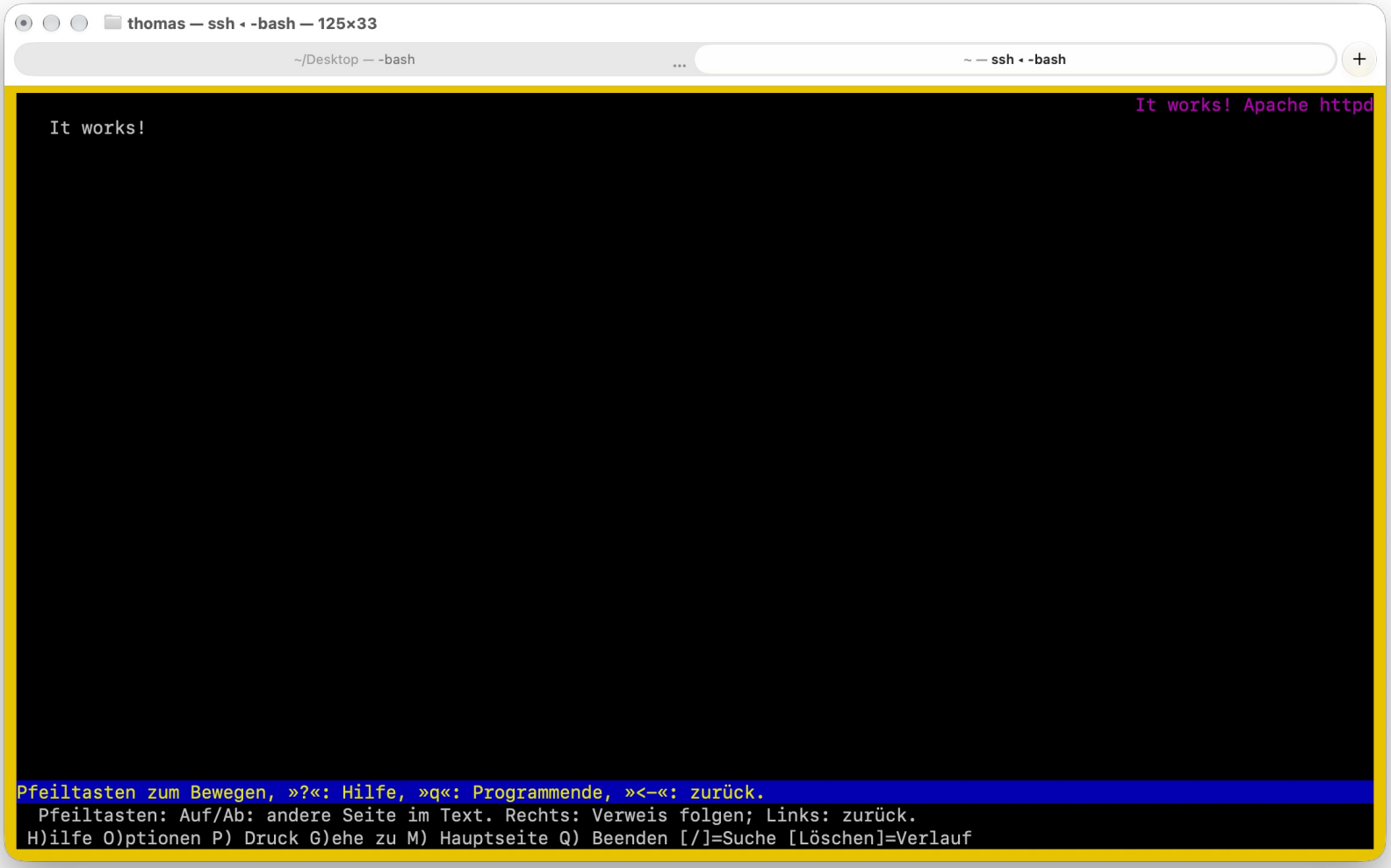

thomas — ssh ◂ -bash — 55×9
~/Desktop — -bash
...
~ — ssh ◂ -bash
+
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => cd bin/
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => apachectl start
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste =>

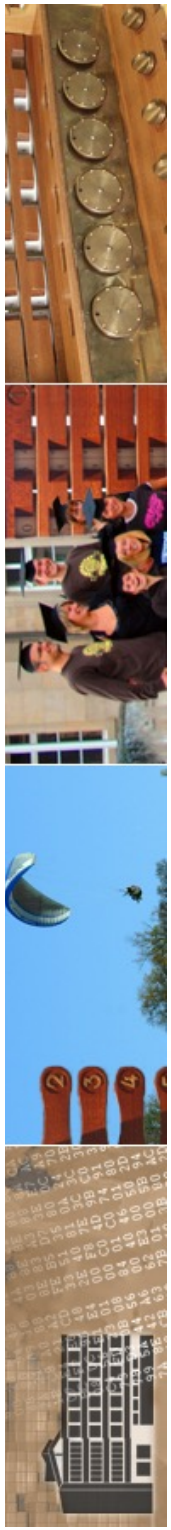


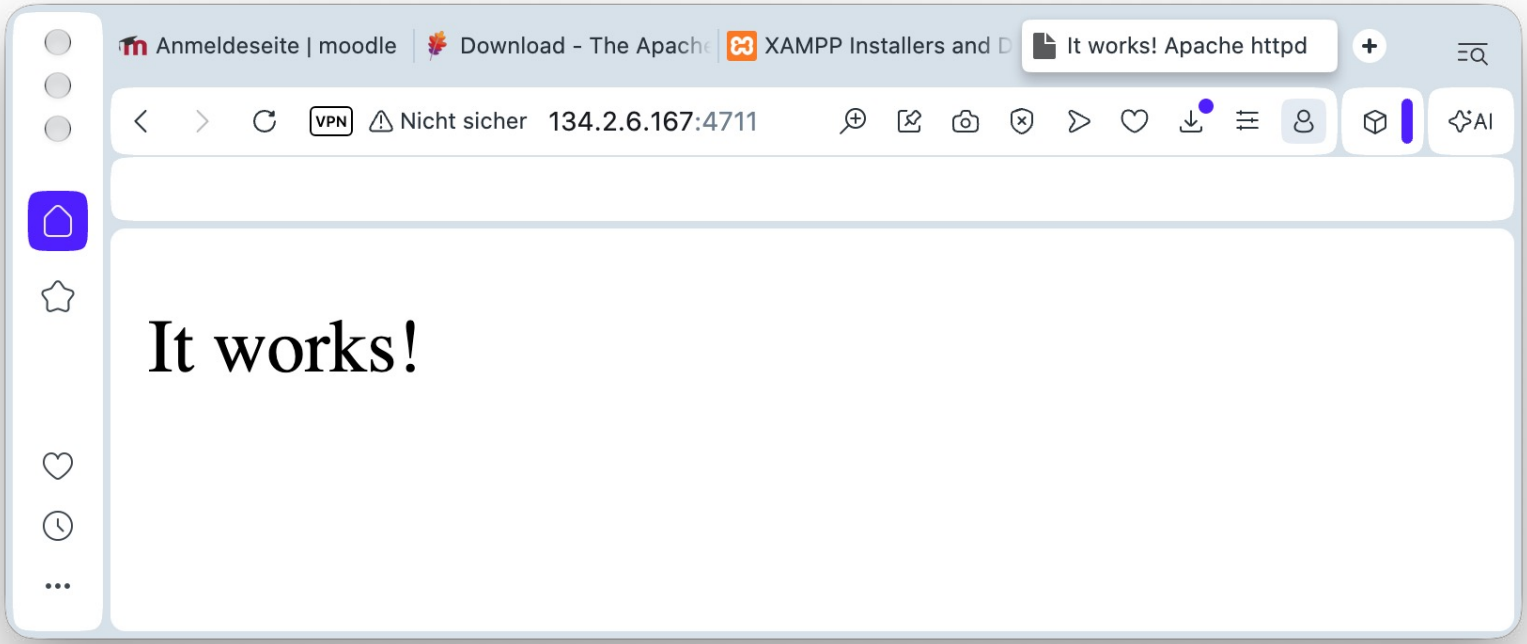


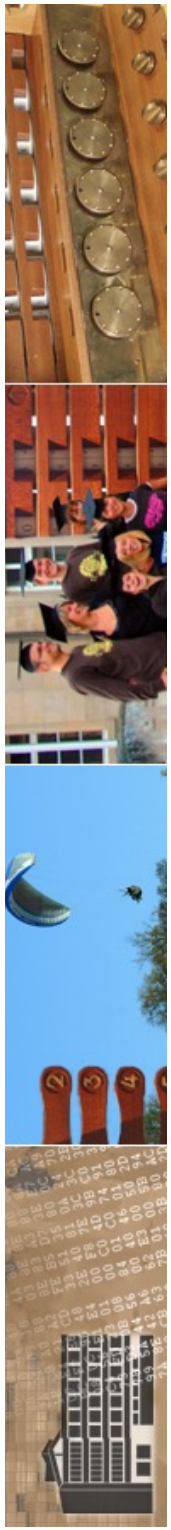
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thomas — ssh ◂ -bash — 125×33
~/Desktop — -bash
~ — ssh ◂ -bash
It works! Apache httpd
It works!
Pfeiltasten zum Bewegen, »?«: Hilfe, »q«: Programmende, »<–«: zurück.
Pfeiltasten: Auf/Ab: andere Seite im Text. Rechts: Verweis folgen; Links: zurück.
H)ilfe O)ptionen P) Druck G)ehe zu M) Hauptseite Q) Beenden [/]=Suche [Löschen]=Verlauf



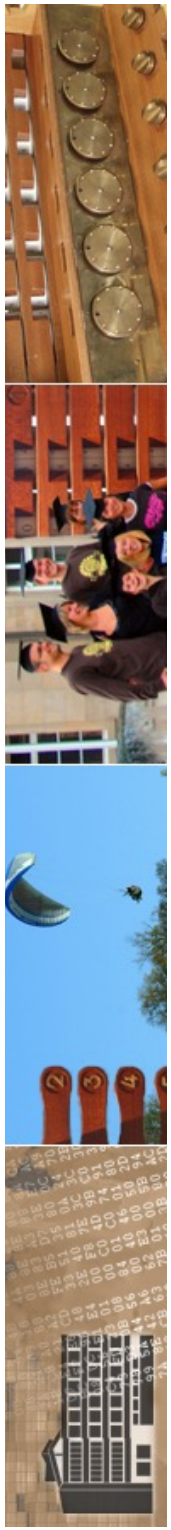

Anmeldeseite | moodle
Download - The Apache
XAMPP Installers and D
It works! Apache httpd
VPN
Nicht sicher
134.2.6.167:4711
AI
It works!



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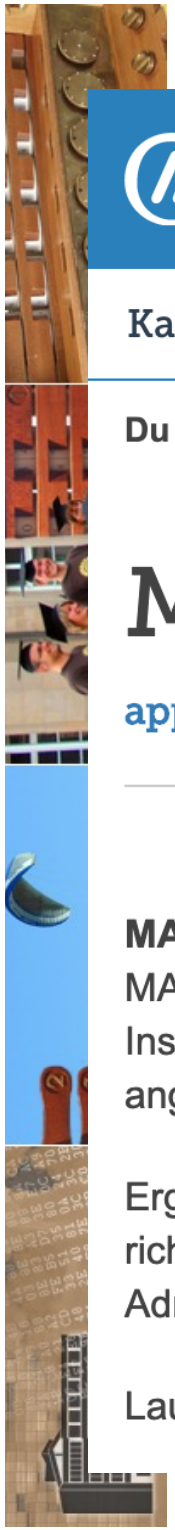
Apache bei Linux-Distributionen

- Apache gehört zu allen gängigen Linux-Distributionen
- kann mittels Pakete-Tool a la YaST oder pkgadd installiert werden
- typische Pfade:
  - /usr/sbin für Programm
  - /etc/httpd für Konfigurationsdateien
  - /var/log/httpd für Logfiles
  - /usr/local/httpd/htdocs für die Dokumente
- Linux verwendet häufig einen Apache für online-Dokumentation



zum Vergleich: Unix

- typische Pfade auf einem Unix-System:
  - Apache in **`/usr/local/apache`**
  - dort Unterverzeichnisse bin, logs, libexec, …



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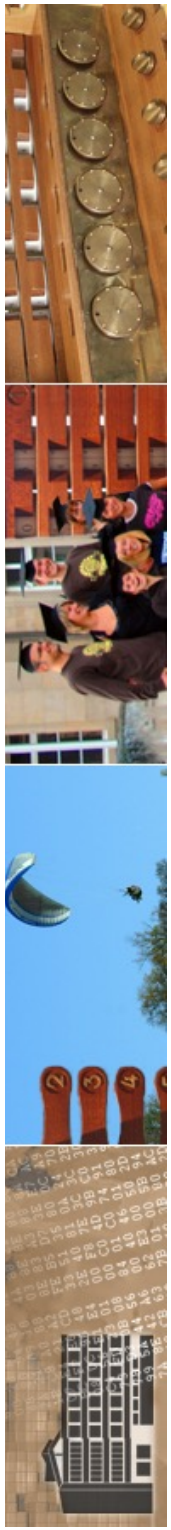
MAMP (Mac Apache MySQL PHP)

appsolute

MAMP (Mac Apache MySQL PHP) installiert eine lokale Serverumgebung auf dem Mac. Dabei installiert MAMP ohne Einstellungsänderungen Apache Webserver, MySQL, PHP, Python und Perl. Durch die Installation wird das System nicht verändert und insbesondere eine aktivierte Apache Installation nicht angerührt. Soll MAMP entfernt werden, so ist nur der MAMP-Ordner zu löschen.

Ergänzend zur kostenlosen Version ist auch eine kostenpflichtige Version MAMP PRO erhältlich. Diese richtet sich an Webentwickler sowie Programmierer und soll ihnen eine komfortablere Installation und Administration der Entwicklungsumgebung ermöglichen.

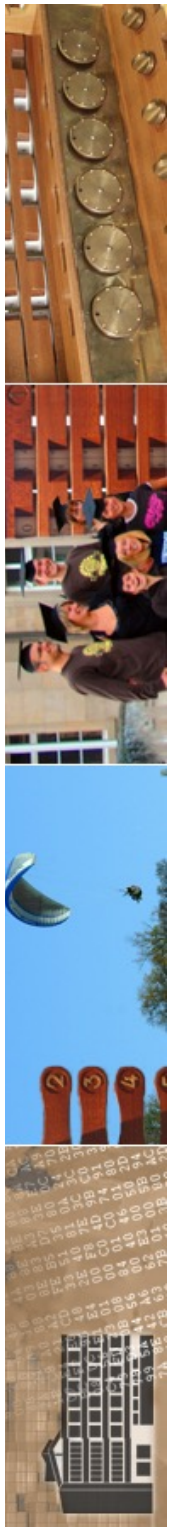
Laut Herstellerangaben ist bald auch eine Windows-Version erhältlich.



die Konfiguration mittels httpd.conf

- der Apache-Webserver wird mittels Konfigurationsdateien konfiguriert (Endung .conf)
- früher drei zentrale Dateien:
  - **`httpd.conf`**
  - **`srm.conf`**
  - **`access.conf`** (➔ NCSA-Webserver Rob McCool)
- heute praktisch *nur eine zentrale Konfigurationsdatei*, welche wiederum Folgedateien lädt:

`httpd.conf`



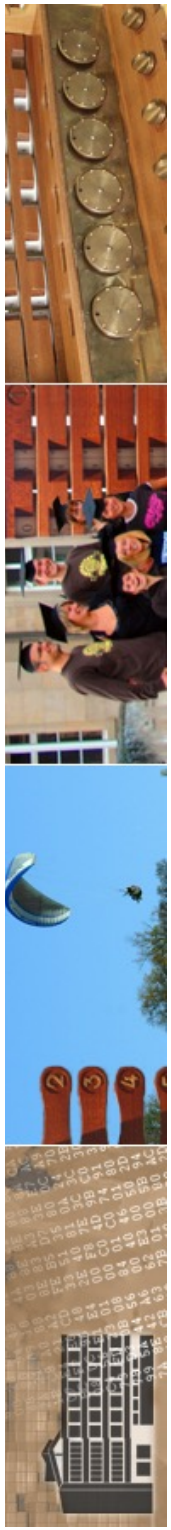
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Die Konfigurationsdateien

- alle Konfigurationsdateien sind üblicherweise im Verzeichnis **`<apacheroot>/conf`** abgelegt

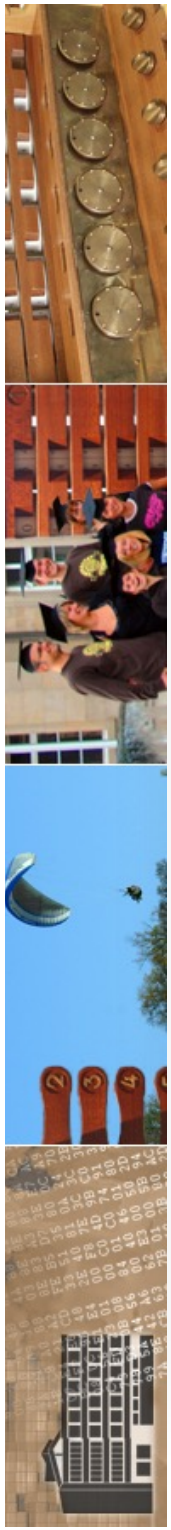
- Apache kann beim Starten eine *alternative Konfiguration* über den Schalter **-f** mitgegeben werden:

  – **`apachectl -f myconfig.conf start`**



Bedeutung der Konfiguration

- über das Konfigurationsfile wird der Apache-Server sehr flexibel und detailliert konfiguriert
  - Beispiel: Festlegung des tcp/ip-Ports, des docRoots und der Serversignature
  - sehr weitreichende Konfiguration

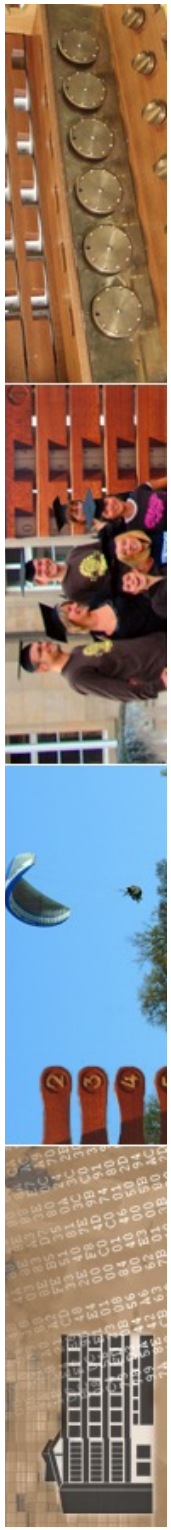


typisches Verzeichnis-Layout

thomas — ssh ◂ -bash — 77×26

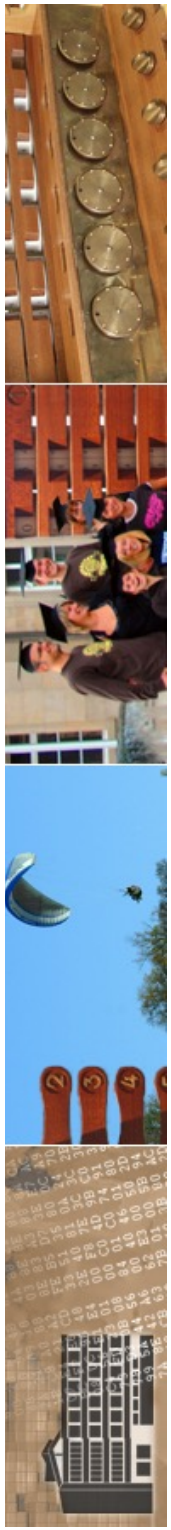
~/Desktop — -bash ... ~ — ssh ◂ -bash +

```
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => cd
zrvwa01@infodienste => cd apache_test/
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste =>
zrvwa01@infodienste => ll
insgesamt 64
drwxr-xr-x 14 zrvwa01  4096 28. Okt 09:45 ./
drwx---r-x 24 zrvwa01  4096 28. Okt 09:28 ../
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 bin/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 build/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 cgi-bin/
drwxr-xr-x  4 zrvwa01  4096 28. Okt 09:45 conf/
drwxr-xr-x  3 zrvwa01  4096 28. Okt 09:45 error/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:30 htdocs/
drwxr-xr-x  3 zrvwa01  4096 28. Okt 09:45 icons/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 include/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 logs/
drwxr-xr-x  4 zrvwa01  4096 28. Okt 09:45 man/
drwxr-xr-x 14 zrvwa01 12288 28. Okt 09:30 manual/
drwxr-xr-x  2 zrvwa01  4096 28. Okt 09:45 modules/
zrvwa01@infodienste =>
```



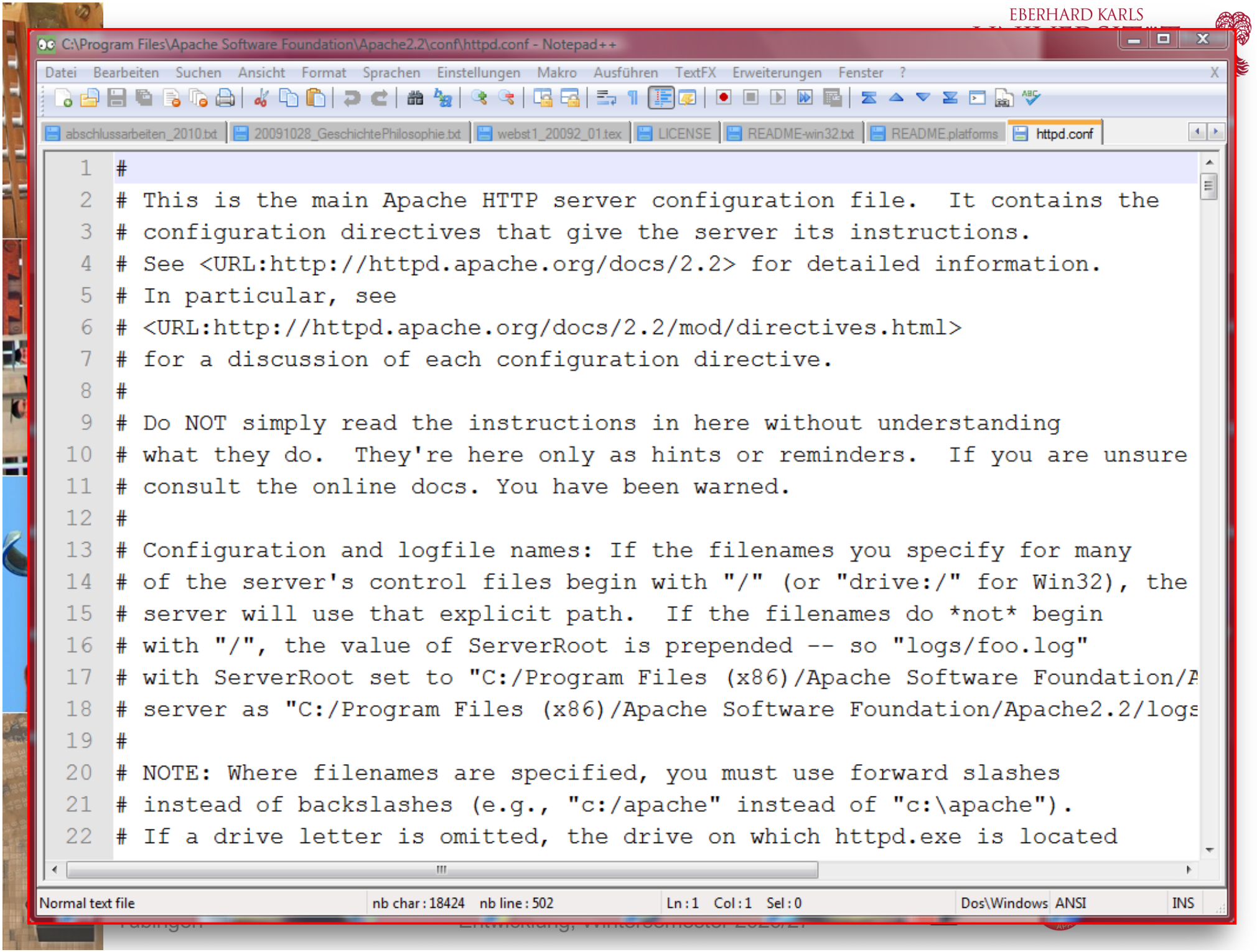
typisches Verzeichnis-Layout

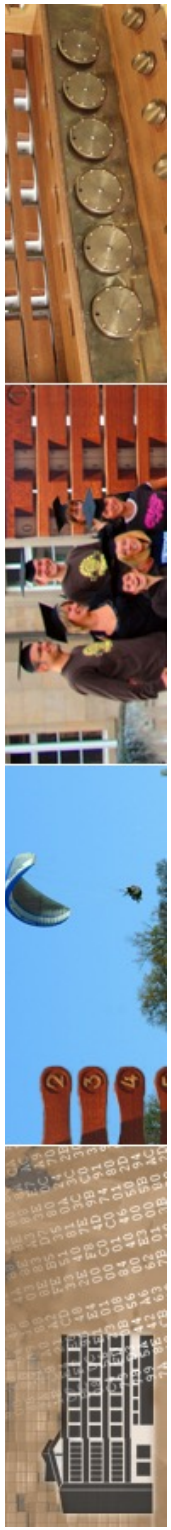
- bin: Binaries
- **logs:** Log-Files
- **conf**: Konfigurationsdateien
- htdocs: Verzeichnis für Webdokumente
- **cgi-bin:** Default-Verzeichnis für cgi-Programme
- man: manpages
- lib: Dynamische Module



typischer Aufbau von httpd.conf

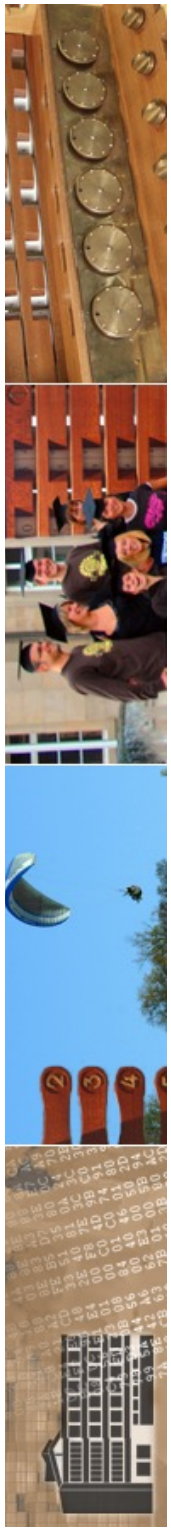
- httpd.conf für alle Apaches weitgehend gleich
- typische httpd.conf hat um 1.100 Zeilen, dabei sehr viele (!!!) Kommentare (eingeleitet mit #)
- wird mit normalem Editor bearbeitet
- **Hinweis für Windows**: als Fileseperator wird wie bei Unix der Slash / verwendet, nicht \
- **die httpd.conf ist nach Installation bereits grundlegend angepasst!**


C:\Program Files\Apache Software Foundation\Apache2.2\conf\httpd.conf - Notepad++
Datei Bearbeiten Suchen Ansicht Format Sprachen Einstellungen Makro Ausführen TextFX Erweiterungen Fenster ?
abschlussarbeiten_2010.txt
20091028_GeschichtePhilosophie.txt
webst1_20092_01.tex
LICENSE
README-win32.txt
README.platforms
httpd.conf
1 #
2 # This is the main Apache HTTP server configuration file. It contains the
3 # configuration directives that give the server its instructions.
4 # See <URL:http://httpd.apache.org/docs/2.2> for detailed information.
5 # In particular, see
6 # <URL:http://httpd.apache.org/docs/2.2/mod/directives.html>
7 # for a discussion of each configuration directive.
8 #
9 # Do NOT simply read the instructions in here without understanding
10 # what they do. They're here only as hints or reminders. If you are unsure
11 # consult the online docs. You have been warned.
12 #
13 # Configuration and logfile names: If the filenames you specify for many
14 # of the server's control files begin with "/" (or "drive:/" for Win32), the
15 # server will use that explicit path. If the filenames do *not* begin
16 # with "/", the value of ServerRoot is prepended -- so "logs/foo.log"
17 # with ServerRoot set to "C:/Program Files (x86)/Apache Software Foundation/A
18 # server as "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/logs
19 #
20 # NOTE: Where filenames are specified, you must use forward slashes
21 # instead of backslashes (e.g., "c:/apache" instead of "c:\apache").
22 # If a drive letter is omitted, the drive on which httpd.exe is located
Normal text file
nb char : 18424 nb line : 502
Ln : 1 Col : 1 Sel : 0
Dos\Windows ANSI INS



Strukturierung von httpd.conf

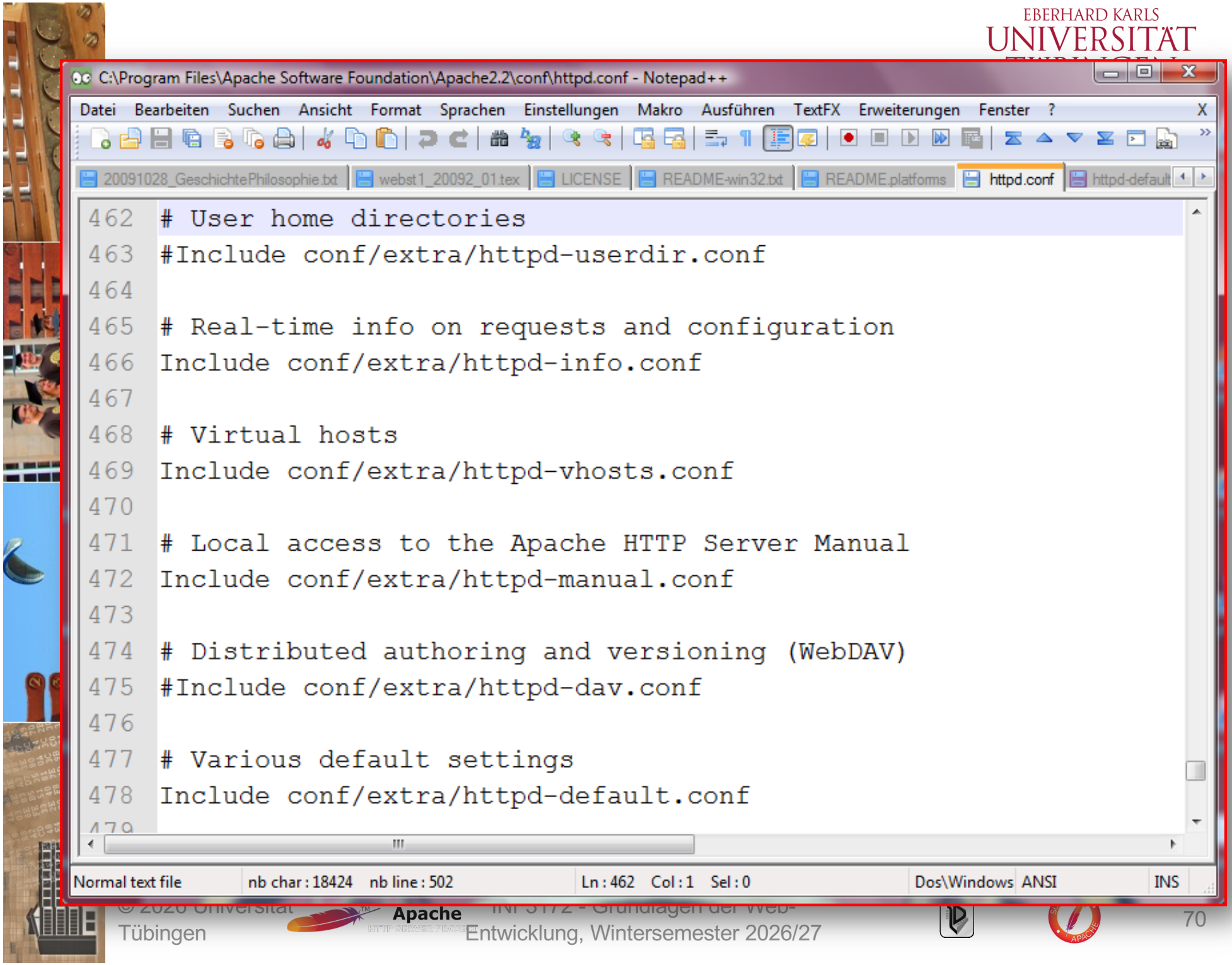
- httpd.conf ist klassisch in drei Abschnitte untergliedert:
  - Teil I: Allgemeines
    - Regeln, die den ganzen Webserver betreffen (Festlegung der globalen Umgebung)
    - Beispiel: Servername, Port, wo stehen die Webdokumente, ...
  - Teil II: Direktiven des Hauptservers
    - Regeln für die einzelnen Verzeichnisse des Webservers
    - Festlegung, was erlaubt/verboten in einem speziellen Verzeichnis oder sogar für einzelne Datei
  - Teil III: Virtuelle Hosts
    - (behandeln wir hier nicht)

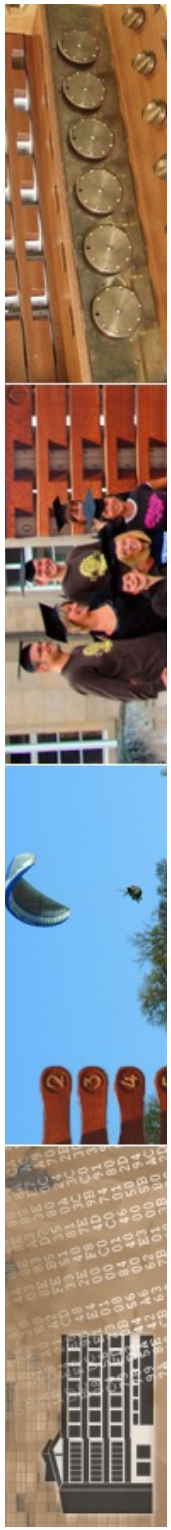


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modulare httpd.conf

- um mehr Struktur zu gewinnen, wird die eigentliche httpd.conf auf Teil 1 beschränkt (prinzipielles) und alle anderen configs ausgelagert
- typisch in Unterordner **`conf/extra`**
- Import mittels Include:
  - `# Various default settings`
    `Include conf/extra/httpd-default.conf`


C:\Program Files\Apache Software Foundation\Apache2.2\conf\httpd.conf - Notepad++
Datei Bearbeiten Suchen Ansicht Format Sprachen Einstellungen Makro Ausführen TextFX Erweiterungen Fenster ? X
20091028_GeschichtePhilosophie.txt
webst1_20092_01.tex
LICENSE
README-win32.txt
README.platforms
httpd.conf
httpd-default
462 # User home directories
463 #Include conf/extra/httpd-userdir.conf
464
465 # Real-time info on requests and configuration
466 Include conf/extra/httpd-info.conf
467
468 # Virtual hosts
469 Include conf/extra/httpd-vhosts.conf
470
471 # Local access to the Apache HTTP Server Manual
472 Include conf/extra/httpd-manual.conf
473
474 # Distributed authoring and versioning (WebDAV)
475 #Include conf/extra/httpd-dav.conf
476
477 # Various default settings
478 Include conf/extra/httpd-default.conf
Normal text file
nb char : 18424
nb line : 502
Ln : 462
Col : 1
Sel : 0
Dos\Windows
ANSI
INS




```
# Supplemental configuration
#
# The configuration files in the conf/extra/ directory can be
# included to add extra features or to modify the default configuration of
# the server, or you may simply copy their contents here and change as
# necessary.

# Server-pool management (MPM specific)
#Include conf/extra/httpd-mpm.conf

# Multi-language error messages
#Include conf/extra/httpd-multilang-errordoc.conf

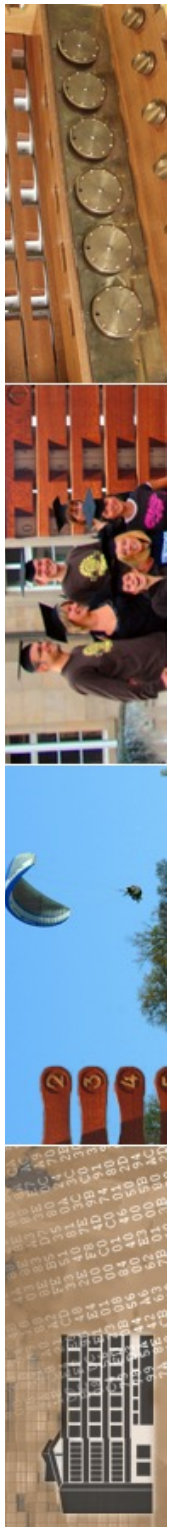
# Fancy directory listings
#Include conf/extra/httpd-autoindex.conf

# Language settings
#Include conf/extra/httpd-languages.conf

# User home directories
#Include conf/extra/httpd-userdir.conf

# Real-time info on requests and configuration
#Include conf/extra/httpd-info.conf

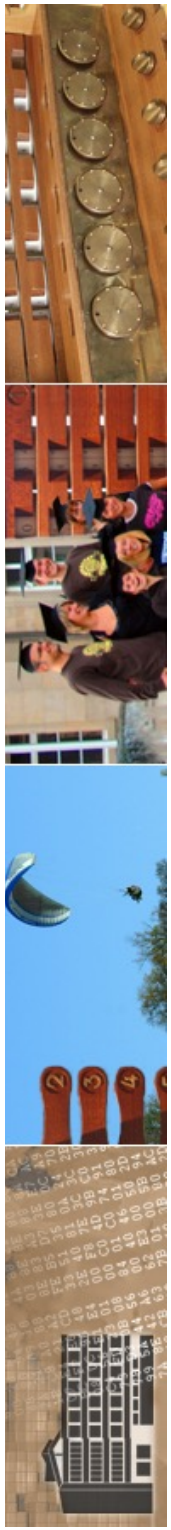
# Virtual hosts
#Include conf/extra/httpd-vhosts.conf
```



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Prinzipielles (I)

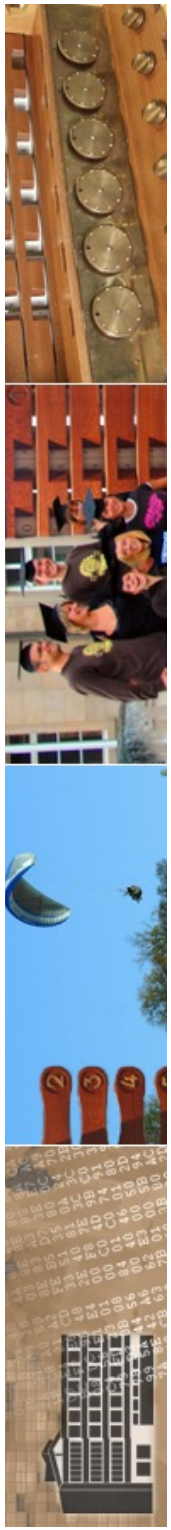
- httpd.conf-Parameter sind case-sensitiv!
- Zeilenkommentare durch führendes #
- es gibt auch mehr oder weniger rudimentäre GUI-Tools zur Bearbeitung der httpd.conf, die wir hier einfach ignorieren
- auch unter Windows / als Pfadtrenner
- eine httpd.conf-Regel wird als „Direktive“ bezeichnet (directive)



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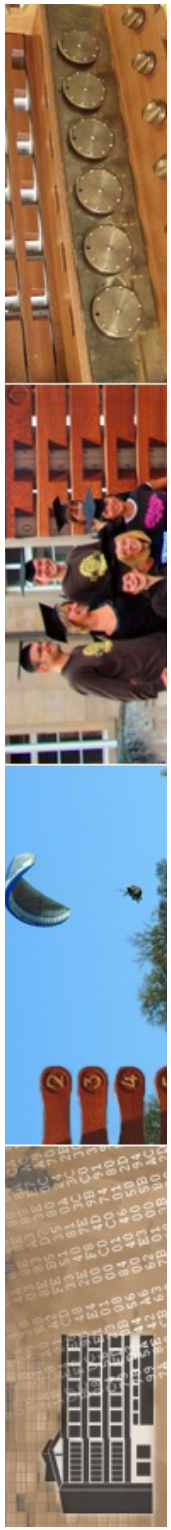
Prinzipielles (II)

- es sind für jede aktive (nicht-auskommentierte) Direktive default-Wert nach der Installation gesetzt
- Die möglichen Direktiven hängen von der Compilationskonfigurtation des Apache ab (welche Module hineincompiliert wurden)
- Beispiel:
  - ```
    #
    # PidFile: The file in which the server should
    #                                record its process
    # identification number when it starts.
    #
    PidFile logs/httpd.pid
    ```
    ```



Konfiguration der globalen Umgebung

- **`ServerRoot`**
  gibt an, in welchem Verzeichnis Apache selbst installiert ist
  - Beispiel (typisch für Unix mit root-Rechten):
    `ServerRoot  /usr/local/apache`

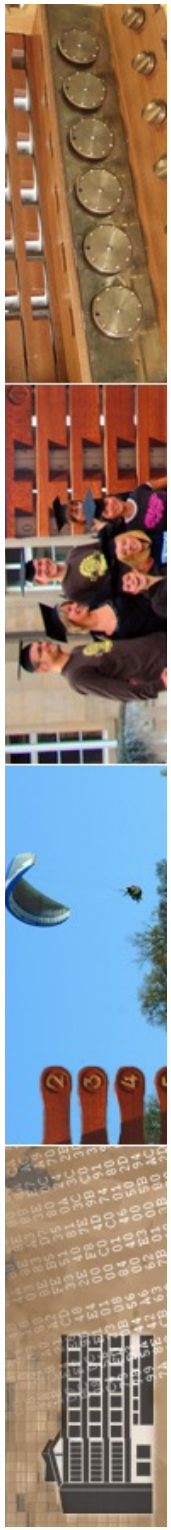


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Direktive Port

- die Direktive **`Port`** legt fest, auf welchem tcp-ip-Port der Hauptserver arbeitet
  - **`Port 80`**
  - Default sind 80 (mit root-Rechten) oder 8080 (ohne Root-Rechte)
  - der Port kann schon durch Parameter von configure vorkonfiguriert werden:

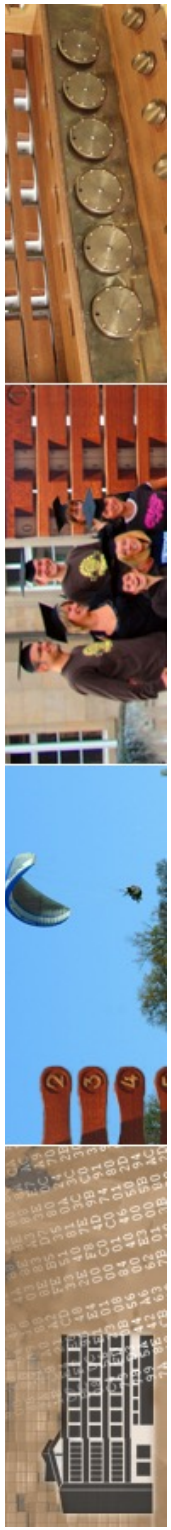
```
./configure --with-port=8081 …
```



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Server-Informationen

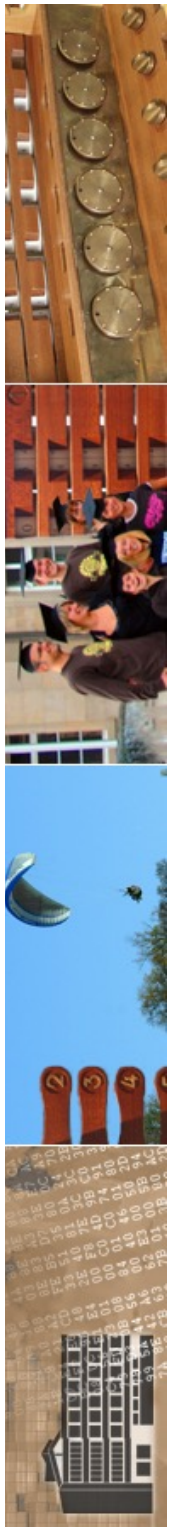
- mehrere Direktiven legen Informationen zum Server fest
  - diese Direktiven werden bei der Installation möglichst sinnvoll vorbelegt
  - **`ServerAdmin thomas.walter@uni-tuebingen.de`**
  - **`ServerName ceres`**



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Wurzel der HTML-Dokumente

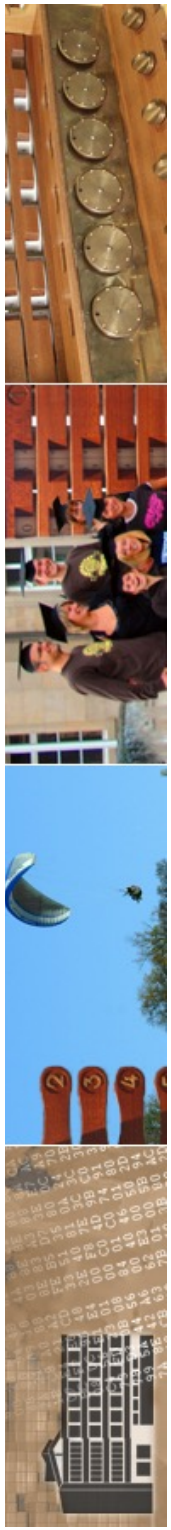
- die zentrale Direktive DocumentRoot legt das Wurzelverzeichnis der HTML-Dokumente fest
  - Default ist das Verzeichnis htdocs im <APACHEDIR>
  - **`DocumentRoot "C:/Programme/Apache Group /Apache/htdocs"`**
  - Wichtig:
    - absolute Pfade
    - kein abschließendes /
    - Zeichenkette in “ eingeschlossen
    - nur Dateien unterhalb dieses Knotens können ausgeliefert werden (wenn nicht gelinkt etc.) ➔ Sicherheit



Konfiguration der Verzeichnisse

- nun werden die einzelnen Verzeichnisse im Detail konfiguriert
- es können für jedes Verzeichnis detailliert Regeln gesetzt werden
- teilweise sind sogar Regeln für einzelne Dateien möglich

- Grundprinzip:
  - Regeln gelten für alle Unterverzeichnisse, wenn nicht dort wieder überschrieben
  - Konfiguration „von oben nach unten“



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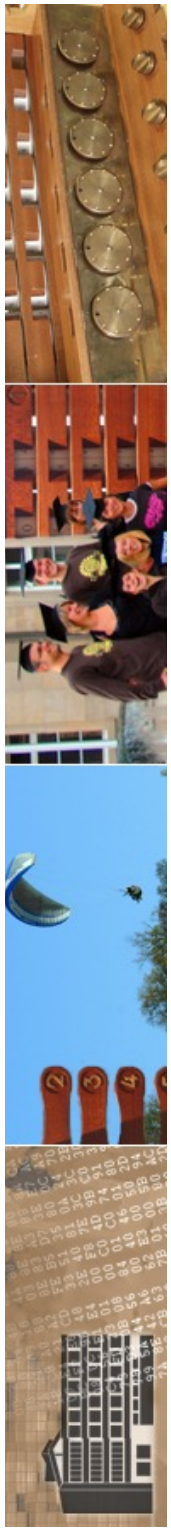
Verzeichnisse (I)

- Grundsyntax:
  es sind drei Varianten möglich:

  - ```
    <Directory "/home/thomas/apache/htdocs/test">
          so_dies_und_das
    </Directory>
    ```

  - ```
    <Location "/test">
          so_dies_und_das
    </Location>
    ```

  - ```
    <File "/home/thomas/apache/htdocs/test/index.html">
          so_dies_und_das
    </File>
    ```
    ```



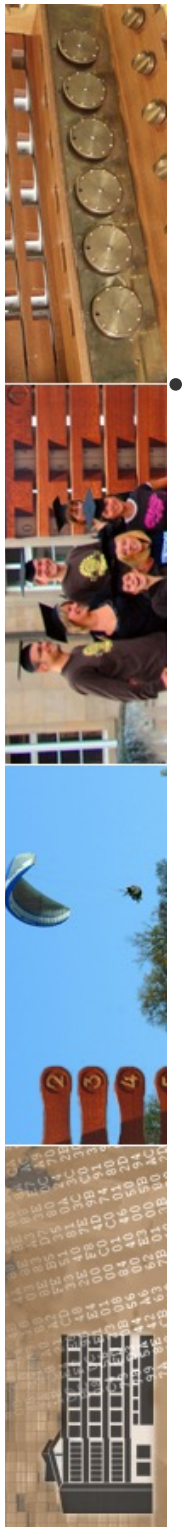
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Verzeichnisse (II)

- typische default-Beispiele:

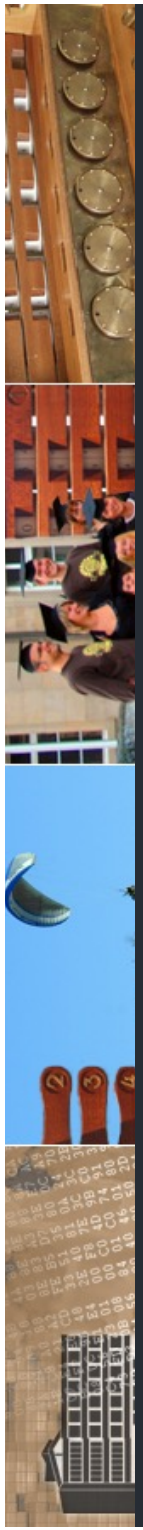
```
<Directory />
        Options None
        AllowOverride None
        Deny from all
    </Directory>

<Directory "d:/WWW">
        Options Indexes FollowSymLinks MultiViews
        AllowOverride All
        Order allow,deny
        Allow from all
</Directory>
```

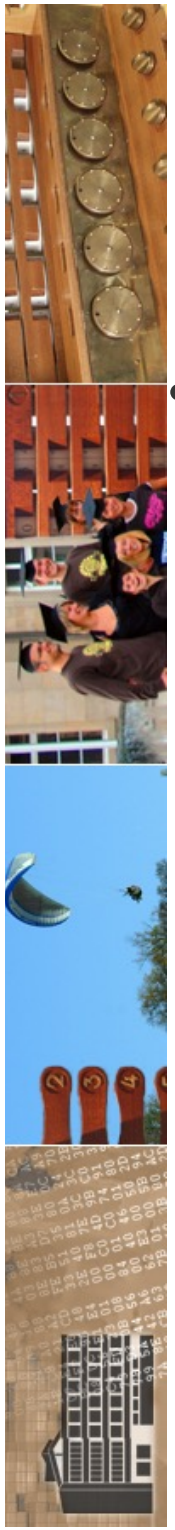


Verzeichnisse (III)

- AllowOverride
  - gibt an, ob für einzelne Verzeichnisse separate Konfigurationsdateien gelesen werden, und welche Anweisungskategorien darin erlaubt sind
  - werden explizite Konfigurationen beachtet (“.htaccess” - behandeln wir später)
  - Default: All
  - möglich:
    - None
    - All
    - AuthConfig : Authentifizierung und Autorisierung
    - FileInfo : Veränderung Dokumentenattribute
    - Indexes : Erstellung von Verzeichnisindexen
    - Limit : Zugruffskontrolle
    - Options Verzeichnisoptionen
    - Vorsicht: wird im Kontext <Files> ignoriert!

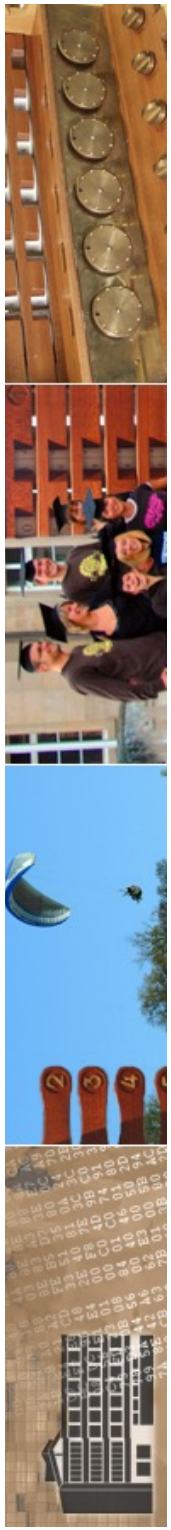


```
237  DocumentRoot "/Users/thomas/data/www"
238
239  <Directory "/Users/thomas/data/www">
240      #
241      # Possible values for the Options directive are "None", "All",
242      # or any combination of:
243      #   Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
244      #
245      # Note that "MultiViews" must be named *explicitly* --- "Options All"
246      # doesn't give it to you.
247      #
248      # The Options directive is both complicated and important.  Please see
249      # http://httpd.apache.org/docs/2.4/mod/core.html#options
250      # for more information.
251      #
252      Options FollowSymLinks Multiviews
253      MultiviewsMatch Any
254
255      #
256      # AllowOverride controls what directives may be placed in .htaccess files.
257      # It can be "All", "None", or any combination of the keywords:
258      #   AllowOverride FileInfo AuthConfig Limit
259      #
260      AllowOverride None
261
262      #
263      # Controls who can get stuff from this server.
264      #
265      Require all granted
266  </Directory>
```



Verzeichnisse (IV)

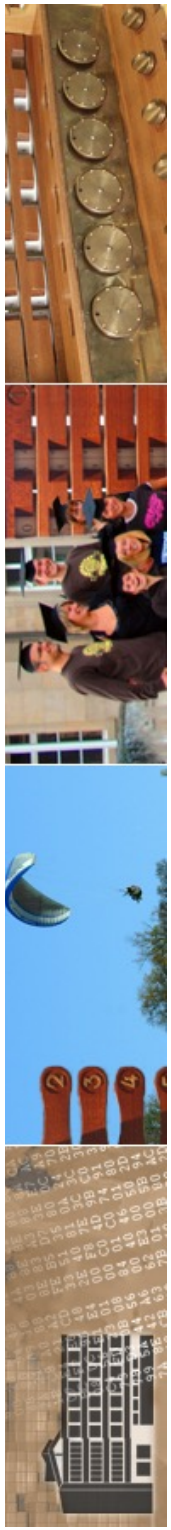
- `Options` (auch mit vorangestelltem + oder -)
  - ExecCGI : werden CGI-Programme ausgeführt?
  - FollowSymLink : sind Links im Filesystem zulässig?
  - Includes : Direktive für ServerSideIncludes
  - Indexes : ist Directory-Listing erlaubt?
  - **All** (= die vier obigen)
  - None
  - IncludesNOEXEC : SSI erlaubt ohne #include und #exec
  - MultiViews (gesendete Datei nach Präferenzen des Clients)
  - default-Einstellung: All



```
#
# DocumentRoot: The directory out of which you will serve your
# documents. By default, all requests are taken from this directory, but
# symbolic links and aliases may be used to point to other locations.
#
DocumentRoot "/home-link/zrvwa01/apache_test/htdocs"
<Directory "/home-link/zrvwa01/apache_test/htdocs">
    #
    # Possible values for the Options directive are "None", "All",
    # or any combination of:
    #   Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
    #
    # Note that "MultiViews" must be named *explicitly* --- "Options All"
    # doesn't give it to you.
    #
    # The Options directive is both complicated and important.  Please see
    # http://httpd.apache.org/docs/2.4/mod/core.html#options
    # for more information.
    #
    Options Indexes FollowSymLinks

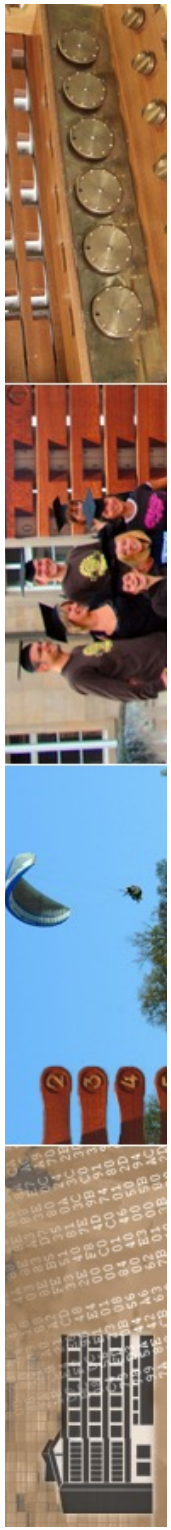
    #
    # AllowOverride controls what directives may be placed in .htaccess files.
    # It can be "All", "None", or any combination of the keywords:
    #   AllowOverride FileInfo AuthConfig Limit
    #
    AllowOverride None

    #
    # Controls who can get stuff from this server.
    #
    Require all granted
</Directory>
```



Server-Informationen

- die Direktive ServerSignature legt fest, ob und welche Informationen über den Server ausgegeben werden
- zusätzliche Optionen können den Output steuern
  - `ServerSignature On`



Testen der Konfiguration

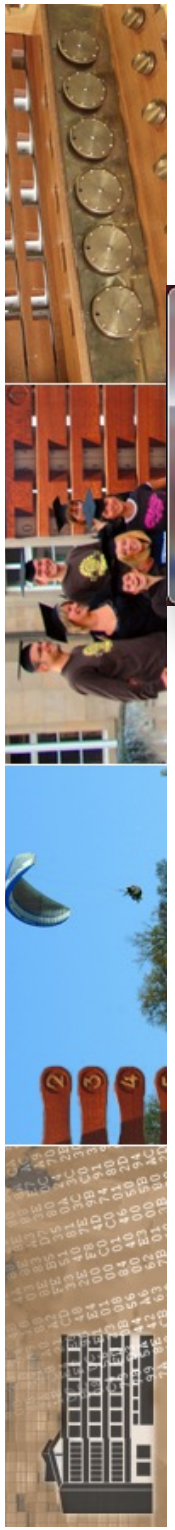
- es ist sinnvoll, vor dem Starten die jeweilige Konfiguration zu testen

unter Unix:

```
apachectl -t
```

unter Windows:

```
httpd -t
```

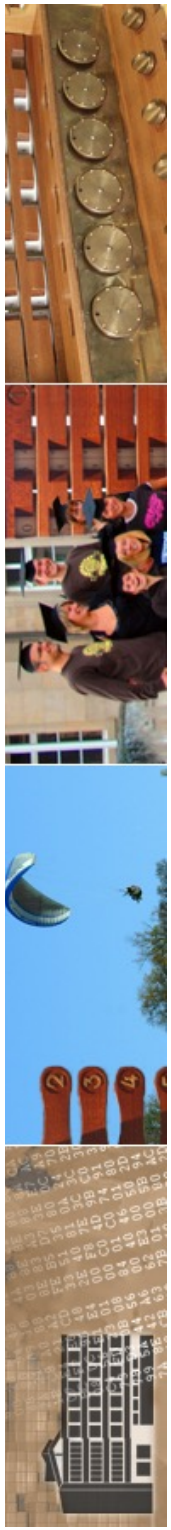


DOS Shell

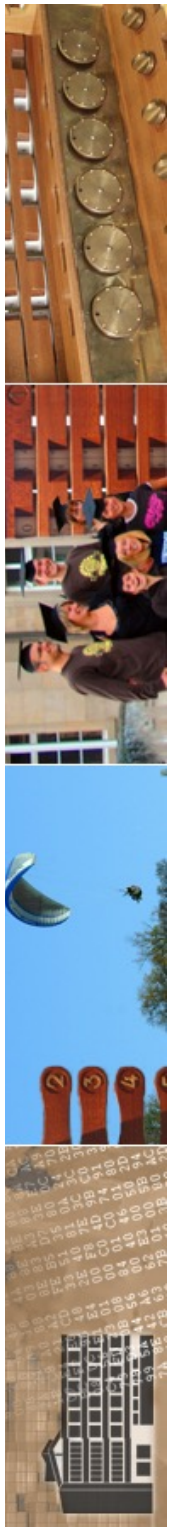
```
C:\Program Files (x86)\Apache Software Foundation\Apache2.2\bin>
C:\Program Files (x86)\Apache Software Foundation\Apache2.2\bin>.\httpd.exe -t
Syntax OK

C:\Program Files (x86)\Apache Software Foundation\Apache2.2\bin>
```

```
root@Vaux =>
root@Vaux => ./httpd -t
 Syntax OK
root@Vaux =>
```



```
zrvwa01@infodienste:~/apache_test/bin$
zrvwa01@infodienste:~/apache_test/bin$
zrvwa01@infodienste:~/apache_test/bin$ ./apachectl -t
Syntax OK
zrvwa01@infodienste:~/apache_test/bin$
zrvwa01@infodienste:~/apache_test/bin$
```



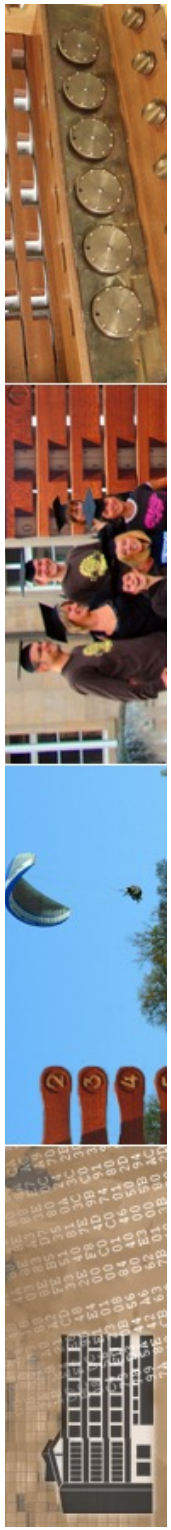
Starten von Apache

- Starten von Apache:

```
apachectl –start
apachectl –k start
```

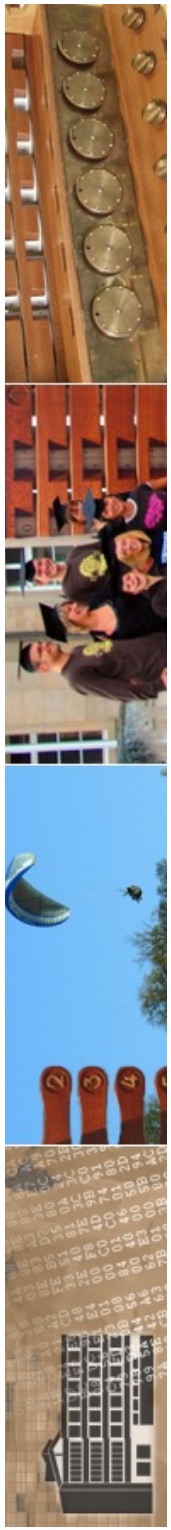
- nach Änderung der Konfiguration: **Neustart**

```
apachectl -restart
```



Konfiguration für cgi (I)

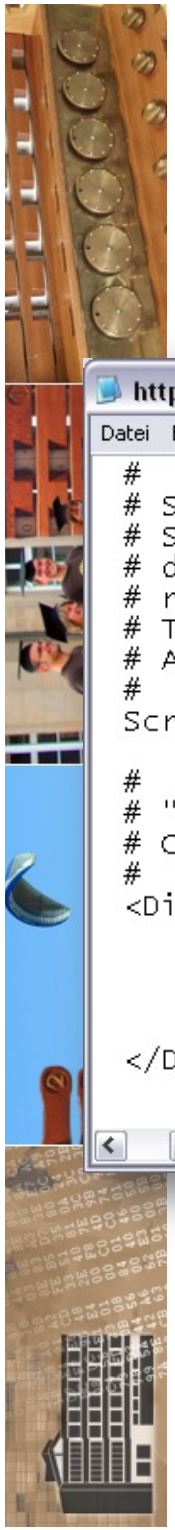
- mittels
  - `ScriptAlias /cgi-bin/ "/home/thomas/temp/apache/cgi-bin/"`
- wird das Verzeichnis cgi-bin des Apache-Installationsverzeichnisses durch die URL /cgi-bin/ angesprochen



Konfiguration für cgi (II)

- genauer:
  - **`Alias`** legt allgemein einen Alias für die URL fest, so daß alle passenden Requests dazu entsprechend gemappt werden
  - Directive **`ScriptAlias`** legt direkt Verzeichnis für ausführbare Scripte fest, so daß request zu diesem Verzeichnis stets ausgeführt wird
  - **`ScriptAlias /cgi-bin/ "C:/Programme/Apache Group/Apache/cgi-bin/"`**

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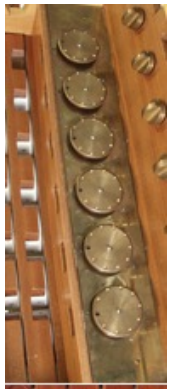
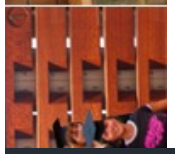


httpd.conf - Editor

Datei Bearbeiten Format Ansicht ?

```
#
# ScriptAlias: This controls which directories contain server scripts.
# ScriptAliases are essentially the same as Aliases, except that
# documents in the realname directory are treated as applications and
# run by the server when requested rather than as documents sent to the client.
# The same rules about trailing "/" apply to ScriptAlias directives as to
# Alias.
#
ScriptAlias /cgi-bin/ "C:/Programme/Apache Group/Apache/cgi-bin/"

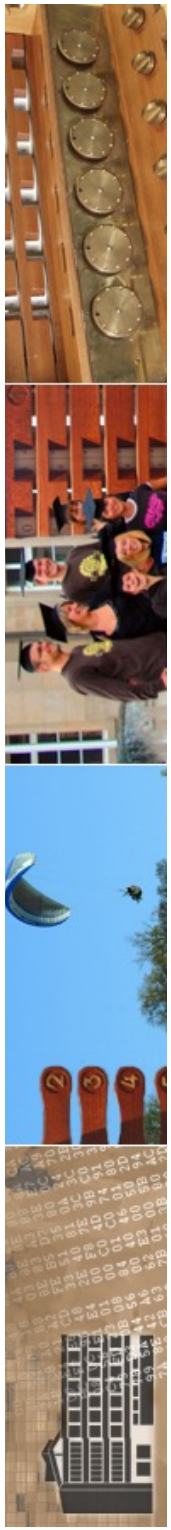
#
# "C:/Programme/Apache Group/Apache/cgi-bin" should be changed to whatever your ScriptAliased
# CGI directory exists, if you have that configured.
#
<Directory "C:/Programme/Apache Group/Apache/cgi-bin">
    AllowOverride None
    Options None
    Order allow,deny
    Allow from all
</Directory>
```

```
#
# ScriptAlias: This controls which directories contain server scripts.
# ScriptAliases are essentially the same as Aliases, except that
# documents in the target directory are treated as applications and
# run by the server when requested rather than as documents sent to the
# client.  The same rules about trailing "/" apply to ScriptAlias
# directives as to Alias.
#
ScriptAliasMatch ^/cgi-bin/((?!(?i:webobjects)).*$) "/Library/WebServer/CGI-Executables/$1"

```



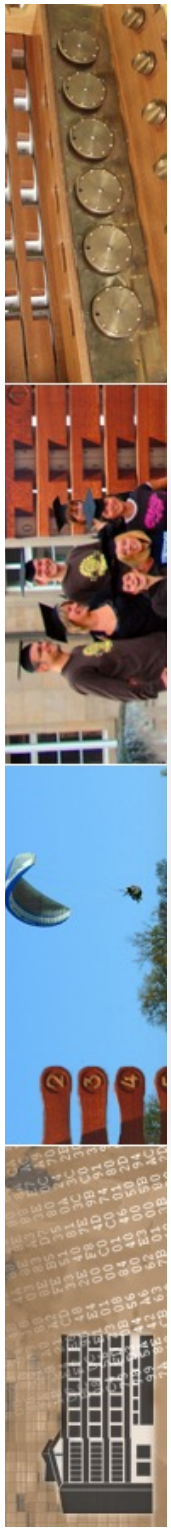



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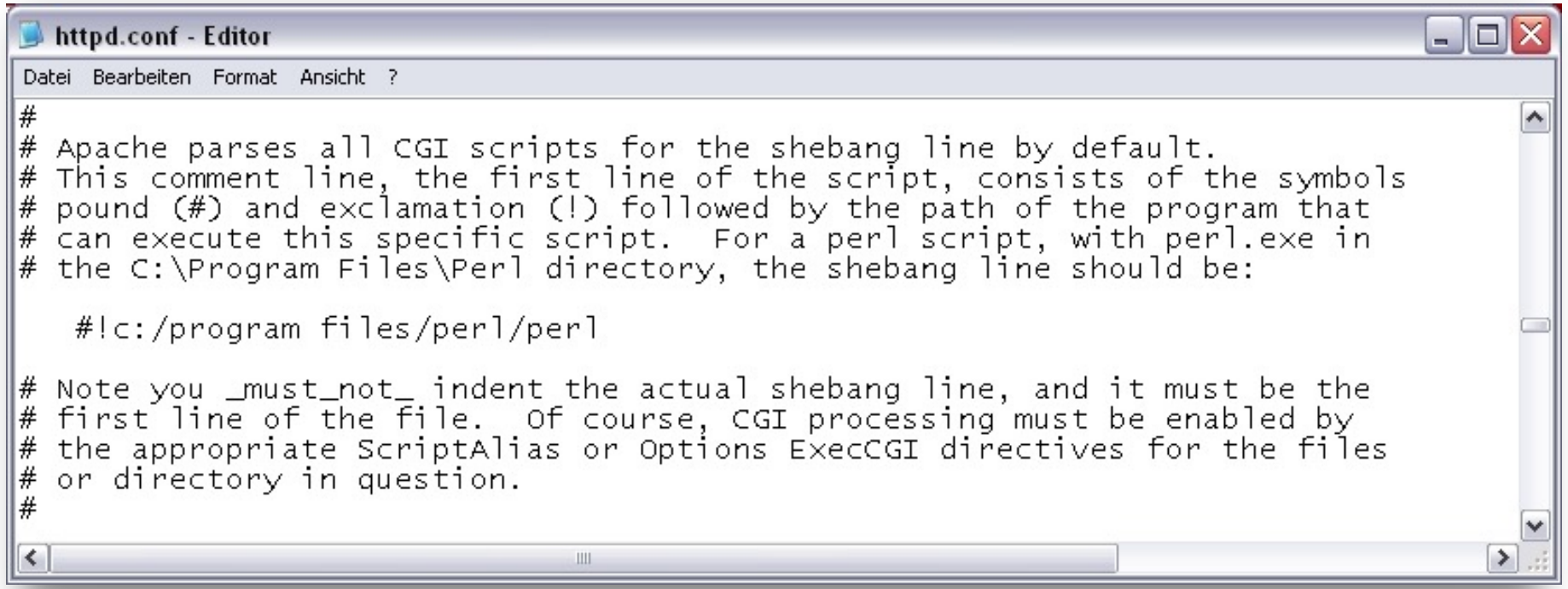
die shebang-Zeile

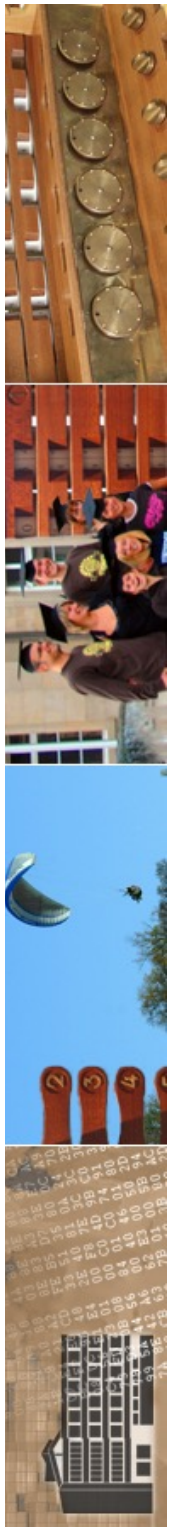
- Apache wertet defaultmäßig die shebang-Zeile #!... aus, die am Anfang des Scriptes stehen muß!

- unter Windows kann auch die Dateiendung ausgewertet werden (dann aber nicht mehr shebang)
  - Vorsicht: Diese scripte laufen dann nicht unter Unix
  - Apache-Direktive: **`#ScriptInterpreterSource registry`**



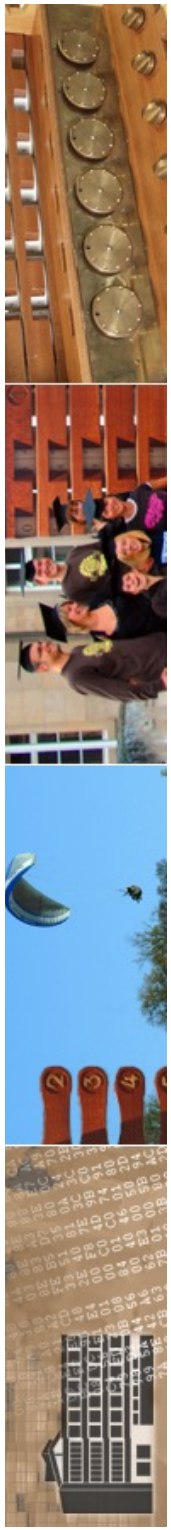
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speziell unter Windows

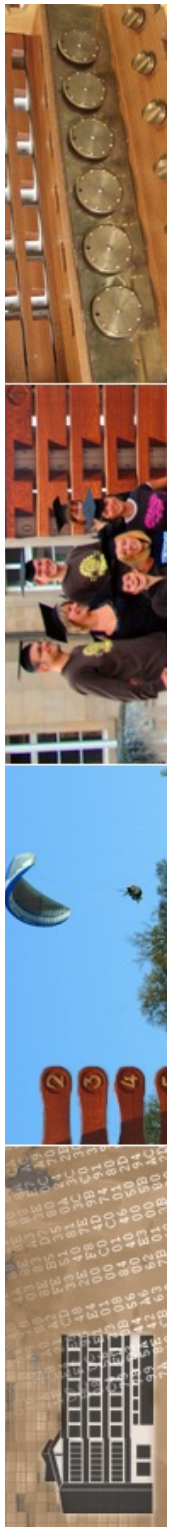
- es ist – unter Windows – möglich, anstelle der Shebnag-Zeile die *Dateiendung* zur Kennzeichnung des notwendigen Interpreters zu verwenden
  - etwa .py-Dateien für Python
- es wird die Zuordnung über die Windows-registry verwendet
- nicht empfehlenswert, da proprietär



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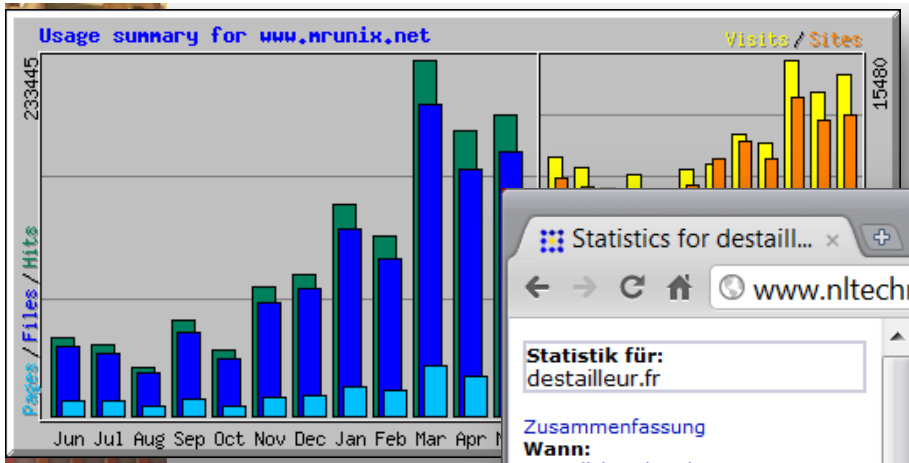
die Logfiles des Apache

- im Unterordner logs werden verschiedene Logfiles geschrieben
- standardmäßig zwei Logs
  - access.log: die Zugriffe (Zeit, Client, Request)
  - error.log: Fehler
- log-rotation: typisch wöchentliches Wechseln der Logs
- zu Beachten: Datenschutz

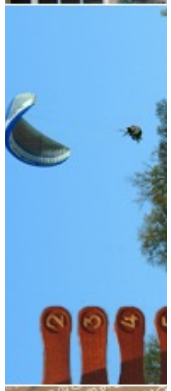


Auswertung von Logfiles

- es gibt sehr praktische Tools zur Analyse von Apache-Logs, etwa
  - webalizer (PHP)
  - awstats (Perl)
- diese werten die Server-Logs aus und sind wesentlich unbedenklicher als etwa Google Analytics









Statistics for destaill...

www.nltechno.com/awstats/awstats.pl?config=destailleur.fr

Statistik für:
destailleur.fr

Zusammenfassung
Wann:
Monatliche Historie
Tage im Monat
Wochentage
Stunden (Serverzeit)
Wer:
Länder
- Gesamte Liste
- Regions
- Cities

Rechner
- Gesamte Liste
- Letzter Zugriff
- Unaufgelöste IP Adressen

beglaubigte Benutzer
- Gesamte Liste
- Letzter Zugriff

Robots/Spiders (Suchmaschinen)
- Gesamte Liste
- Letzter Zugriff

Navigation:
Aufenthaltsdauer
Datei-Typen
Downloads
- Gesamte Liste

Zugriffe
- Gesamte Liste
- Einstiegsseiten
- Exit Seiten

Betriebssysteme
- Versionen
- Unbekannt

Browser
- Versionen
- Unbekannt

Bildschirmauflösungen
Verweise:
Herkunft
- Suchmaschinen
- Websites

Häufigkeit
- Suchausdrücke
- Suchbegriffe

Sonstige:
Kompressionsrate
Verschiedenes
HTTP Fehlercodes
- Nicht gefundene Seiten

Still using AWStats?
Here are Ten Things Logaholic can show your that AWStats can't.
www.Logaholic.com

Zuletzt aktualisiert: 14.11.2010 - 06:33

Zeitraum: Nov 2010 OK

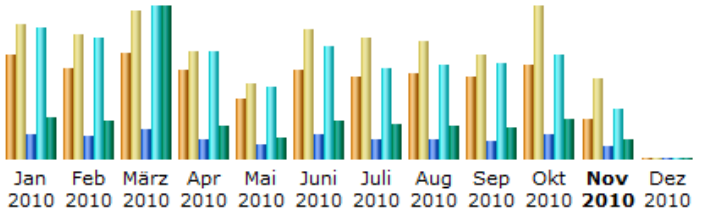
Zusammenfassung

Zeitraum Monat Nov 2010
Erster Zugriff 01.11.2010 - 02:25
Letzter Zugriff 14.11.2010 - 06:22

	Unterschiedliche Besucher	Anzahl der Besuche	Seiten	Zugriffe	By
gesehener Traffic *	**349**	**699** (2 Besuche/Besucher)	**1,279** (1.82 Seiten/Besuch)	**4,751** (6.79 Zugriffe/Besuch)	**17.1** (25.11 KI
nicht gesehener Traffic *			**4,403**	**7,686**	**67.2**

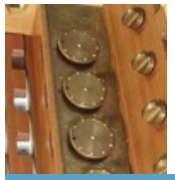
* Nicht gesehener Traffic ist Traffic, welcher von Robots, Würmern oder Antworten mit speziellem HTTP-Statuscode

Monatliche Historie



Monat	Unterschiedliche Besucher	Anzahl der Besuche	Seiten	Zugriffe	Bytes
Jan 2010	899	1,171	2,317	12,550	36.95 MB
Feb 2010	790	1,082	2,226	11,706	35.31 MB
März 2010	919	1,290	2,905	14,645	138.43 MB
Apr 2010	766	935	1,828	10,365	30.34 MB

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StatTool | Uni Tübingen

Thomas Walter (zrvwa01)

Logout

Zentrum für Datenverarbeitung

Zeitraum: Mai 2017

Zurück zu Ihren Statistiken

WANN

Monatliche Historie
Tage im Monat
Wochentage
Stunden (Serverzeit)

WER

Länder
Rechner
Robots/Spiders (Suchmaschinen)

NAVIGATION

Aufenthaltsdauer
Dateitypen
Downloads
Zugriffe
Betriebssysteme
Browser

VERWEISE

Herkunft
Häufigkeit

Statistik für: www.uni-tuebingen.de

Zuletzt aktualisiert: 19.05.2017 - 05:57

Zeitraum: Monat Mai 2017

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Wann: Monatliche Historie Tage im Monat Wochentage Stunden (Serverzeit)
Wer: Länder Gesamte Liste Rechner Gesamte Liste Letzter Zugriff Unaufgelöste IP Adressen Robots/Spiders (Suchmaschinen) Gesamte Liste Letzter Zugriff
Navigation: Aufenthaltsdauer Datei-Typen Downloads Gesamte Liste Zugriffe Gesamte Liste Einstiegsseiten Exit Seiten Betriebssysteme Versionen Unbekannt Browser Versionen Unbekannt
Verweise: Herkunft Suchmaschinen Websites Häufigkeit Suchausdrücke Suchbegriffe
Sonstige: Verschiedenes HTTP Fehlercodes Nicht gefundene Seiten

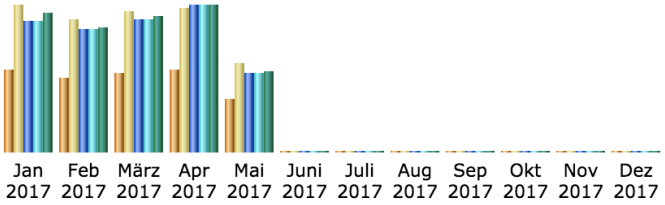
Zusammenfassung

Zeitraum	Monat Mai 2017
Erster Zugriff	01.05.2017 - 00:07
Letzter Zugriff	18.05.2017 - 06:24

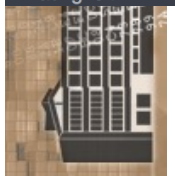
	Unterschiedliche Besucher	Anzahl der Besuche	Seiten	Zugriffe	Bytes
gesehener Traffic *	**9,990**	**16,900** (1.69 Besuche/Besucher)	**38,685** (2.28 Seiten/Besuch)	**38,685** (2.28 Zugriffe/Besuch)	**726.47 MB** (44.01 KB/Besuch)
nicht gesehener Traffic *			**18,751**	**38,420**	**319.98 MB**

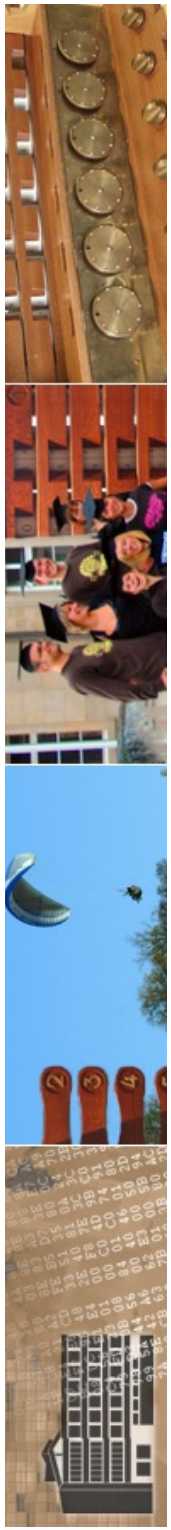
* Nicht gesehener Traffic ist Traffic, welcher von Robots, Würmern oder Antworten mit speziellem HTTP-Statuscode

Monatliche Historie



Monat	Unterschiedliche Besucher	Anzahl der Besuche	Seiten	Zugriffe	Bytes
Jan 2017	15,624	27,727	63,745	63,757	1.24 GB
Feb 2017	14,166	25,228	59,495	59,500	1.11 GB

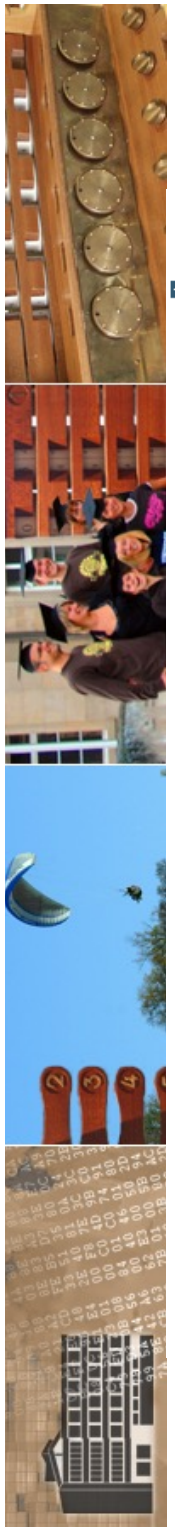




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Neues zu Apache 2.4

- Performanz verbessert
  - Default: Event-MPM-Modul setzt Threads ein
- über 40 (!) neue Module
  - fastCGI (übernächste Vorlesung)
- zahlreiche Detailoptimierungen
  - Beispiel: Loglevel pro Verzeichnis



APACHE HTTP SERVER PROJECT

Apache HTTP Server Version 2.4

Dokumentation zum Apache HTTP Server Version 2.4

Verfügbare Sprachen: da | de | en | es | fr | ja | ko | pt-br | tr | zh-cn

Diese Übersetzung ist möglicherweise nicht mehr aktuell. Bitte prüfen Sie die englische Version auf die neuesten Änderungen.

Google-Suche

Hinweise zur Version

- Neue Funktionen in Version 2.3/2.4
- Neue Funktionen in Version 2.1/2.2
- Neue Funktionen in Version 2.0
- Upgrade auf Version 2.4
- Apache-Lizenz

Bedienungsanleitung

- Kompilieren und Installieren
- Starten
- Stoppen und Neustarten
- Konfigurationsanweisungen
- Module
- Multi-Processing-Module (MPMs)
- Filter
- Handler
- Der Ausdrucksparser
- Server und Hilfsprogramme
- Glossar

Benutzerhandbuch

- Erste Schritte
- An Adressen und Ports binden
- Konfigurationsdateien
- Konfigurationsabschnitte
- Caching von Inhalten
- Content Negotiation
- Dynamic Shared Objects (DSO)
- Umgebungsvariablen
- Log-Dateien
- URLs auf das Dateisystem abbilden
- Performance-Hinweise
- Tipps zur Sicherheit
- Serverweite Konfiguration
- SSL/TLS-Verschlüsselung
- Suexec für CGI
- Einführung in die URL-Manipulation
- Virtual-Hosts

Praxis / Anleitungen

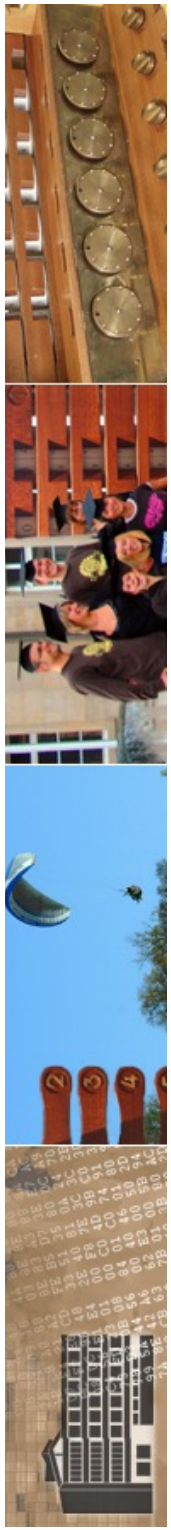
- Authentisierung und Autorisierung
- Zugriffskontrolle
- CGI: Dynamische Inhalte
- .htaccess-Dateien
- Server Side Includes (SSI)
- Web-Verzeichnisse für Benutzer (public_html)

Plattform-spezifische Anmerkungen

- Microsoft Windows
- RPM-basierte Systeme (Redhat / CentOS / Fedora)
- Novell NetWare
- EBCDIC-Portierung

Weitere Themen

- Häufig gestellte Fragen (FAQ)
- Seitenindex
- Dokumentation für Entwickler
- Mithilfe bei der Dokumentation
- Sonstiges
- Wiki

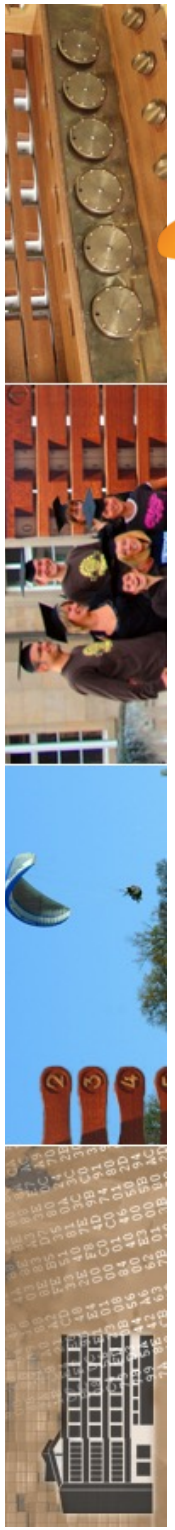


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Tipps & Tricks

- wichtig ist für diese Veranstaltung insbesondere **error.log**
- der loglevel kann in der httpd.conf konfiguriert werden, sinnvoll ist ein deutlich höherer, etwa „debug“
- wichtig zur Fehlersuche in CGI-Programmen

- DNS-Namesauflösung in den Logfiles:
  `HostnameLookups On`
  Vorsicht wegen Performance



Apache HTTP SERVER PROJECT …und nun…

- …sollten Sie „Ihren“ Apache zum Laufen bringen!
  - ausführlich in der Übung…



- als nächstes: Apache Teil 2: Module des Apache