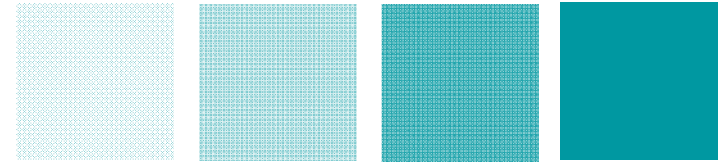




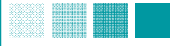
BEUTH HOCHSCHULE FÜR TECHNIK BERLIN  
University of Applied Sciences



# Backend - Einführung

## Multimedia Engineering II WS 13/14

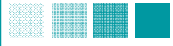
Sven Spielvogel



# Backend - Einführung

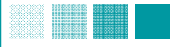
- Kurze Retrospektive
- Backend
  - Backendtechnologien im kurzen Überblick
  - Installation der Basics
    - Apache, MySQL, PHP
    - Nginx
    - node.js
    - mongoDB
    - Verbindung PHP und mongoDB
    - Verbindung node.js und mongoDB
  - Kleiner Einblick in die Programmierung





# Kurze Retrospektive





# Zeitplan

- 9.10 - Einführung
- 16.10 - HTML4/5 + JS
- 23.10 - JavaScript + jQuery
- 30.10 - Logging + Debugging
- 6.11 - Responsive Design
- 13.11 - Backend Einführung
- ~~20.11 - Hochschultag!~~
- 27.11 - Backend Vertiefung
- 4.12 - Modulare Entw.
- 11.12 - backbone.js
- 18.12 - backbone.js
- 8.1 - HbbTV
- 15.1 - Streaming
- 22.1 - Puffer/Wunschthema
- 29.1 - Klausurvorbereitung
- 5.2 - Klausur
- 12.2 - Klausurrückgabe



# Was möchte ich euch beibringen?



REST



Design Patterns



Responsive Design



Debugging



# Was möchte ich euch beibringen?



REST



Design Patterns

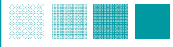


Responsive Design



Debugging

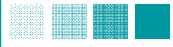




# Backend

- Was ist ein Back-End und welche Aufgaben hat dieses?
- Was ist node.js?
- Gibt es Faktoren, die man bei der Verwendung von XAMPP beachten muss?
- Was ist PHPMyAdmin?
- Was ist nginx?
- Was ist der Unterschied von mongoDB und MySQL?



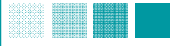


# Backend - Einführung

- Kurze Retrospektive
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  - Installation der Basics
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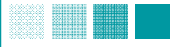






# Backend Technologien im Überblick





# Backend

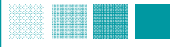
- Begriff: Backend oder auch Back-End

Das Back-End ist im Gegensatz zum Front-End der Teil einer Client-Server-Architektur oder eines Computersystems, der teilnehmerfern liegt.

Betrachtungsmäßig liegt er näher am System, wohingegen das Front-End näher am Benutzer liegt. In einer Client-Server-Architektur bildet das Back-End den Server, der die Clients versorgt. Back-Ends können Mainframes oder Workstations sein, an die die Peripheriegeräte angeschlossen sind. Ein Back-End-Netzwerk verbindet die Rechner untereinander. Es benötigt typischerweise eine hohe Bandbreite und wird in der Regel mit optischen Übertragungsmedien realisiert.

<http://www.itwissen.info/definition/lexikon/Back-End-back-end.html>





# Backend

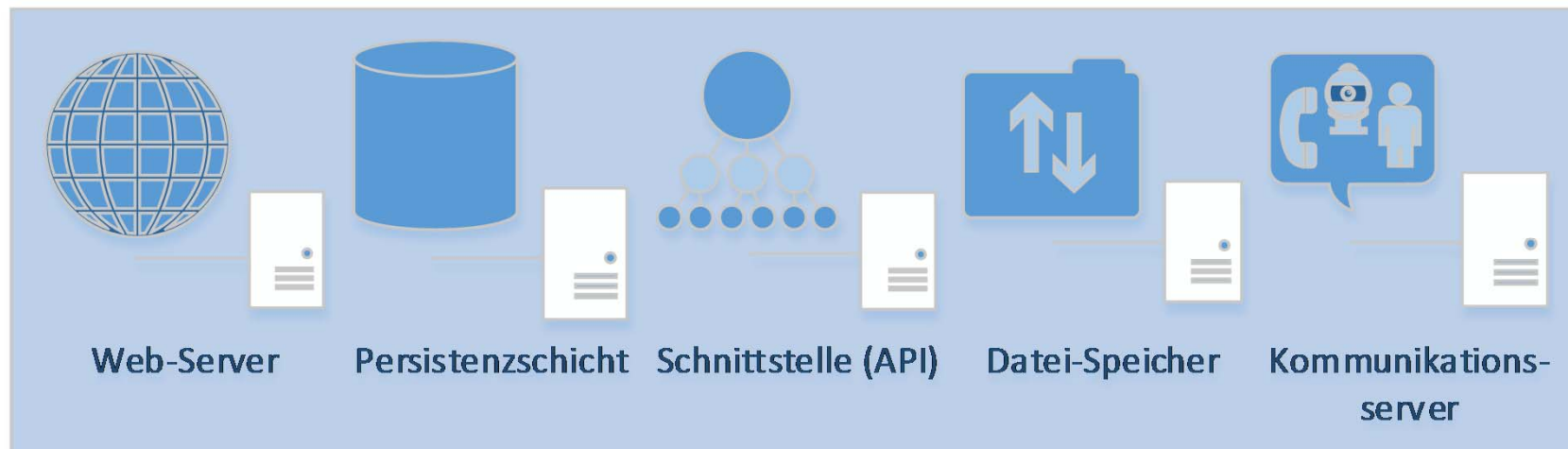
- Begriff: Backend oder auch Back-End
  - teilnehmerfern
  - näher am System, Front-End näher am Benutzer
  - Server, der die Clients versorgt → Aufgaben
  - Mainframes oder Workstations
  
- Als Back-End wird auch oftmals eine Administrationsoberfläche bezeichnet

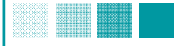
<http://www.itwissen.info/definition/lexikon/Back-End-back-end.html>



# Backend

- Aufgaben in unserem Umfeld

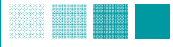




# Backend

- Web-Server/Datei-Speicher
  - Apache
  - Nginx
  - (node.js)
- Persistenzschicht
  - MySQL
  - MongoDB
- Schnittstelle (API)
  - PHP
  - node.js
- Kommunikationsserver
  - node.js

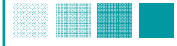




# Backend

- JavaScript
  - node.js
- SQL
  - MySQL
- JSON
  - MongoDB
- PHP
  - API → SlimPHP, Restler 3
- Shell
  - Apache
  - Nginx

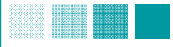




# Backend

## Installation der Basics





# Backend - Einführung

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# Apache

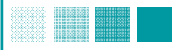




# XAMPP

- Apache – Windows/Mac
  - XAMPP
  - <http://www.apachefriends.org/de/xampp.html>
- Inhalt:
  - Apache 2.4.4
  - MySQL 5.6.11
  - PHP 5.5.3
  - phpMyAdmin 4.0.4
  - FileZilla FTP Server 0.9.41
  - Tomcat 7.0.42 (with mod\_proxy\_ajp as connector)
  - Strawberry Perl 5.16.3.1 Portable
  - XAMPP Control Panel 3.2.1 (from hackattack142)





# Linux

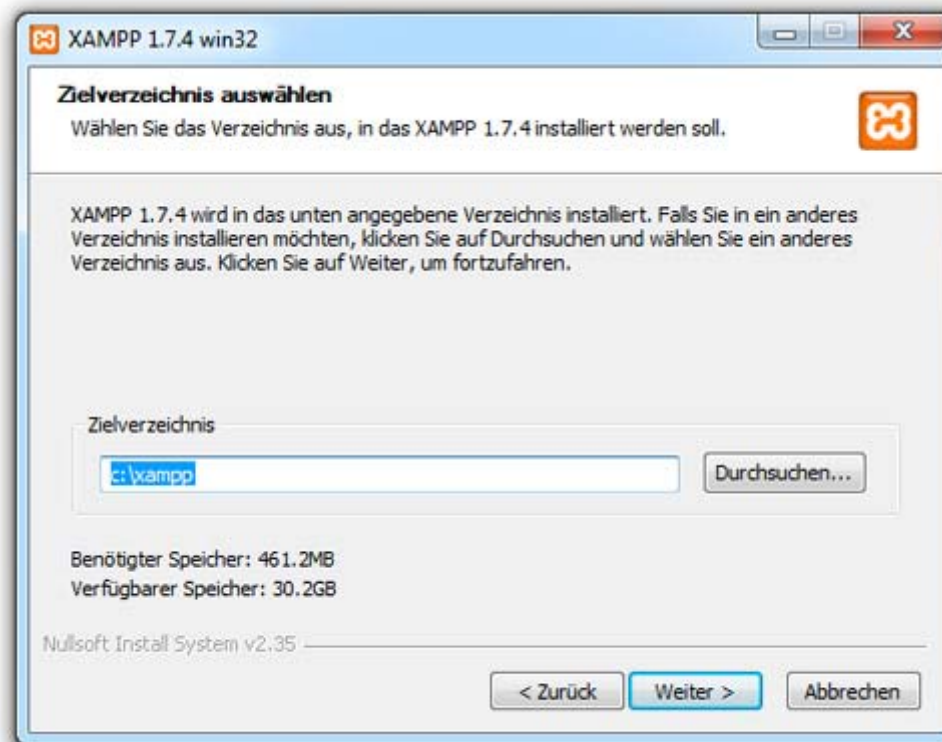
- Ubuntu 12.04 LTS

Für andere Versionen von Linux können die Installationen stark variieren. Bitte bei Problemen die Referenzseiten zu Rate ziehen!



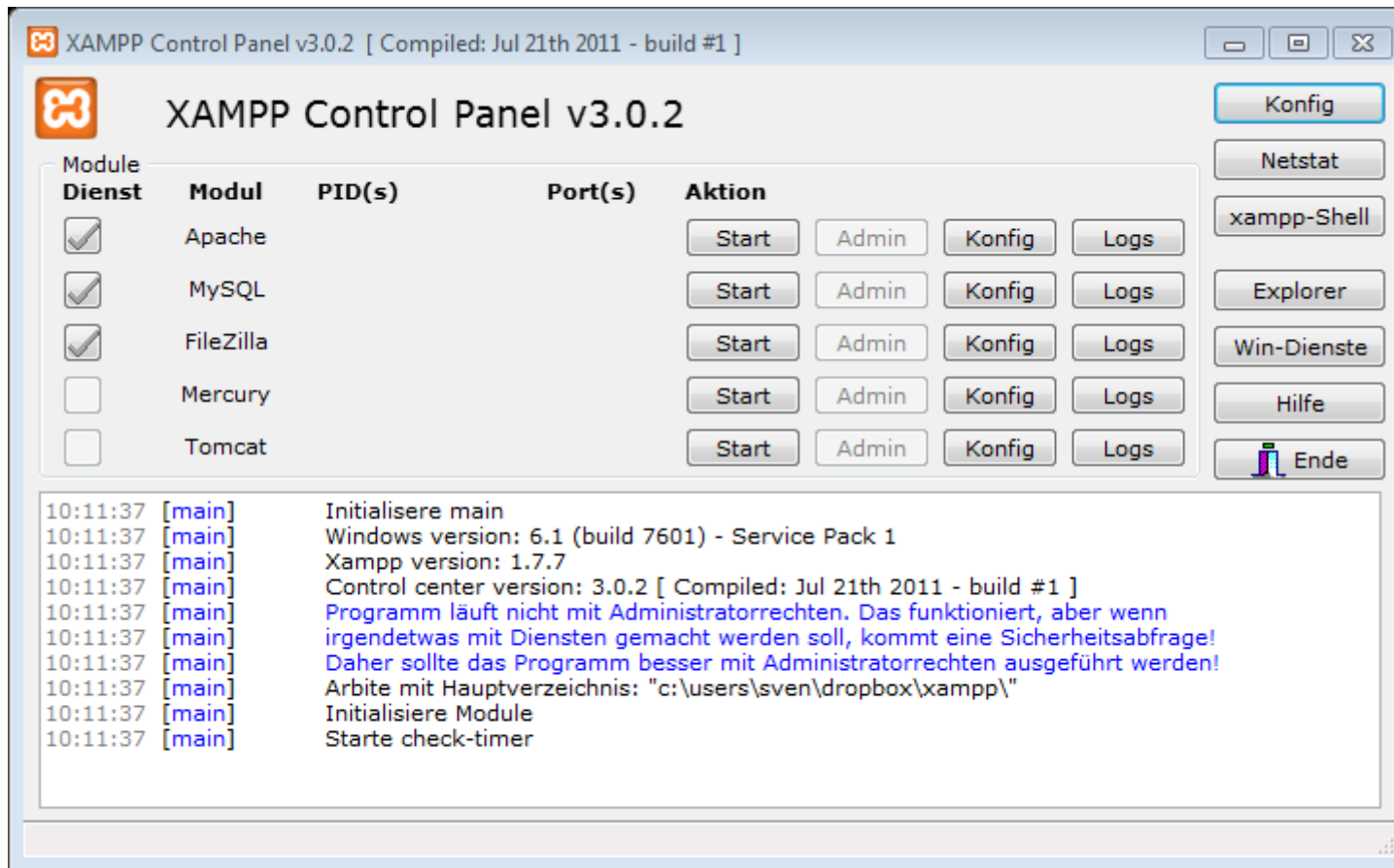
# Installation XAMPP

- Installation über Installer



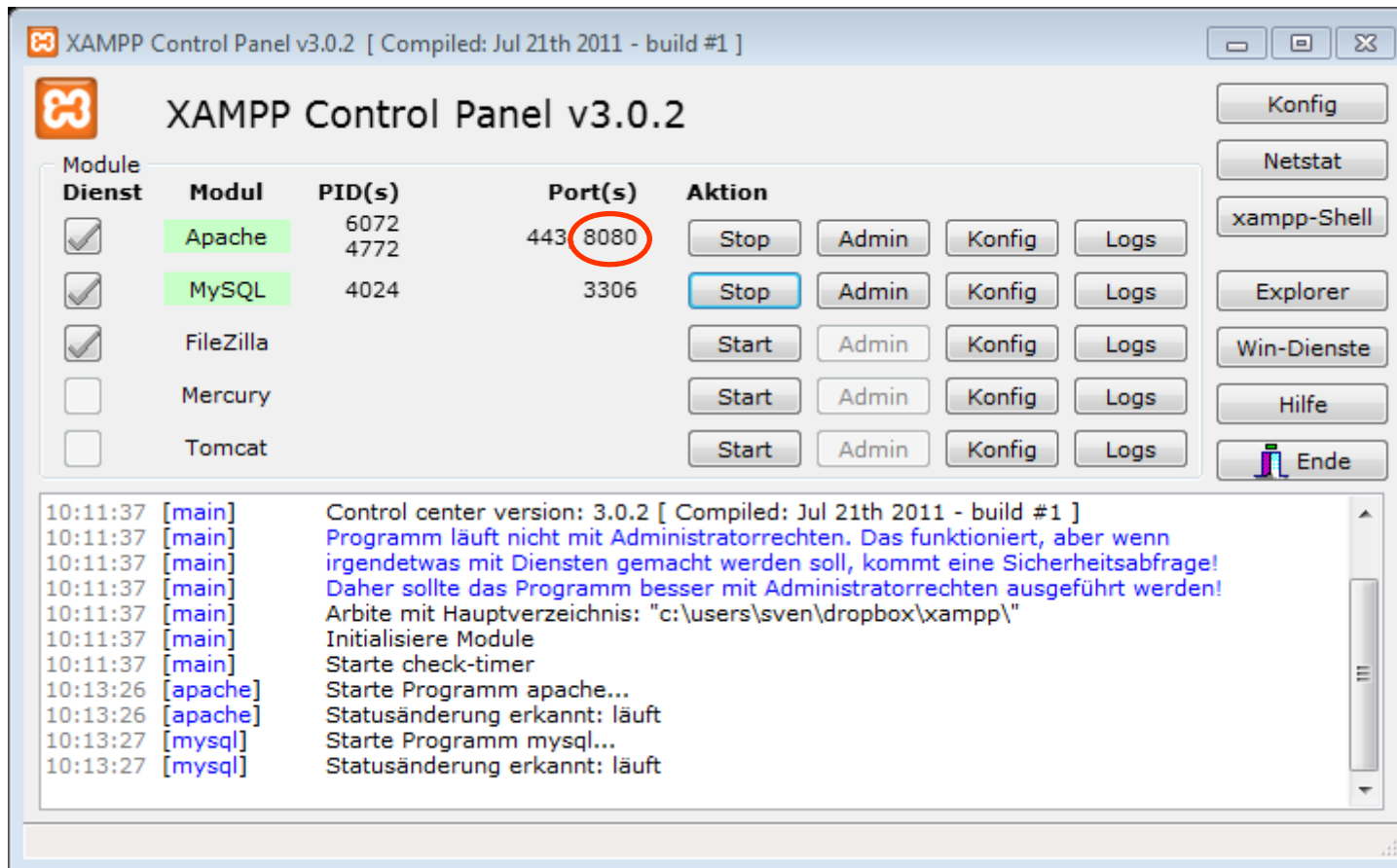
# Installation XAMPP

- Komfortables Panel zum Verwalten der Services



# Installation XAMPP

- Komfortables Panel zum Verwalten der Services



# Installation XAMPP

- Infoseite von Xampp - <http://localhost:8080>



The screenshot shows the XAMPP for Windows control panel. At the top, there's a logo and the text "XAMPP für Windows". To the right of the logo, there's a list of languages: English / Deutsch / Français / Nederlands / Polski / Italiano / Norwegian / Español / 中文 / Português (Brasil) / 日本語. Below this, the version "XAMPP 1.7.7 [PHP: 5.3.8]" is displayed. The main content area is divided into two columns. The left column contains a sidebar with links: Willkommen (highlighted), Status, Sicherheitscheck, Dokumentation, and Komponenten. Below these are sections for PHP (phpinfo(), CD-Verwaltung, Biorhythmus, Instant Art, Telefonbuch), Perl (perlinfo(), Gästebuch), J2EE (Status, Tomcat examples), and Tools (phpMyAdmin, Webalizer, Mercury Mail, FileZilla FTP). The right column contains a welcome message: "Willkommen zu XAMPP für Windows! Herzlichen Glückwunsch: XAMPP ist erfolgreich auf diesem Rechner installiert!". Below this, there's a paragraph in German explaining that the user should click on "Status" to see the current status of the services. It also mentions that some functions might be disabled by default. At the bottom of the right column, there's a note about using a test certificate for OpenSSL support with the URL <https://127.0.0.1> or <https://localhost>. The footer of the interface says "Viel Spaß, Kay Vogelgesang + Kai 'Oswald' Seidler".

**XAMPP**  
1.7.7  
[PHP: 5.3.8]

**Willkommen**  
Status  
Sicherheitscheck  
Dokumentation  
Komponenten

**PHP**  
phpinfo()  
CD-Verwaltung  
Biorhythmus  
Instant Art  
Telefonbuch

**Perl**  
perlinfo()  
Gästebuch

**J2EE**  
Status  
Tomcat examples

**Tools**  
phpMyAdmin  
Webalizer  
Mercury Mail  
FileZilla FTP

**Willkommen zu XAMPP für Windows!**

**Herzlichen Glückwunsch:  
XAMPP ist erfolgreich auf diesem Rechner installiert!**

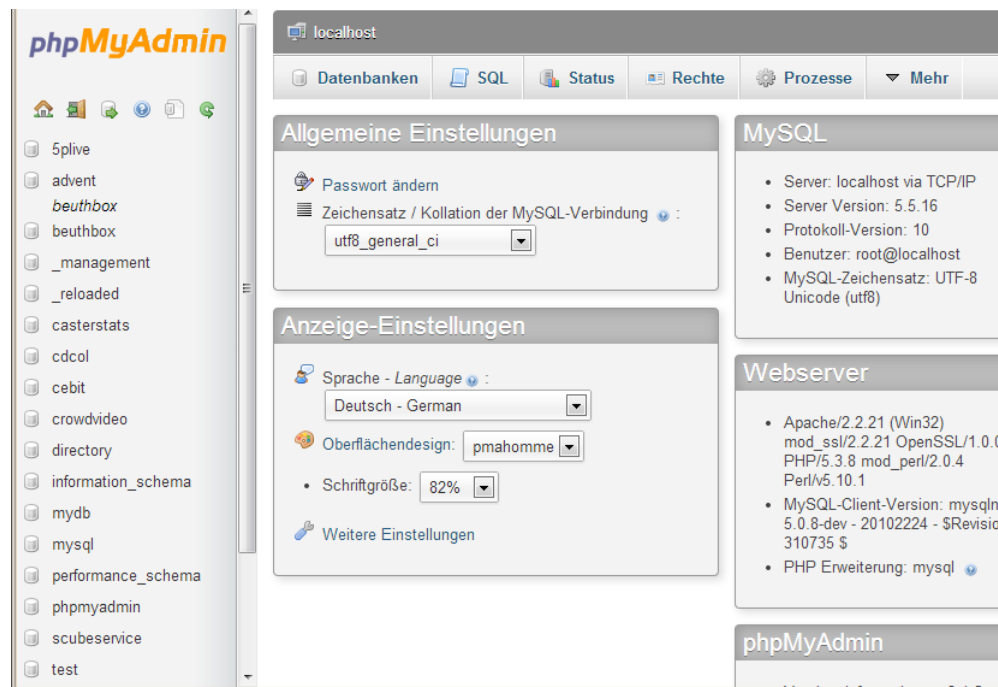
Nun kann es losgehen. :) Als erstes bitte einmal auf der linken Seite auf »Status« klicken. Damit bekommt man einen Überblick was alles schon funktioniert. Ein paar Funktionen werden ausgeschaltet sein. Das ist Absicht so. Es sind Funktionen, die nicht überall funktionieren oder evtl. Probleme bereiten könnten.

Für die OpenSSL Unterstützung benutzt bitte das Testzertifikat mit der URL <https://127.0.0.1> bzw. <https://localhost>

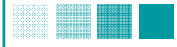
Viel Spaß, Kay Vogelgesang + Kai 'Oswald' Seidler

# Installation XAMPP

- MySQL mit PHPMyAdmin- <http://localhost:8080/phpmyadmin/>
  - Zugang: Nur root als Benutzername ohne Passwort







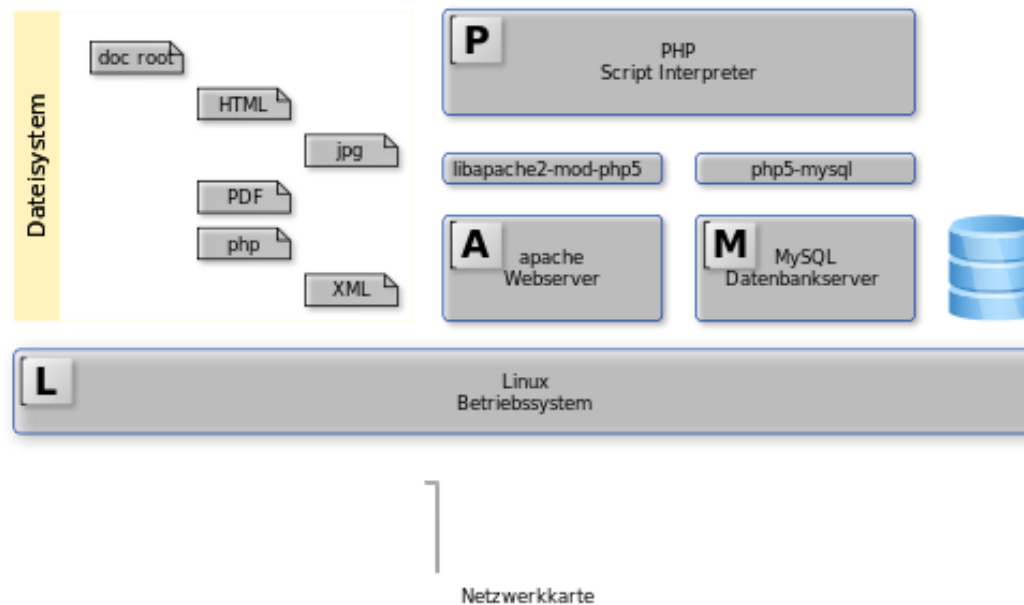
# Installation XAMPP

- ACHTUNG! Xampp sollte nicht als Webserver für einen Produktivbetrieb genutzt werden!
  - Mangelnde Sicherheitseinstellungen
- Der MySQL-Administrator (root) hat kein Passwort.
- Der MySQL-Server ist übers Netzwerk erreichbar.
- phpMyAdmin ist übers Netzwerk erreichbar.
- Das XAMPP Verzeichnis ist nicht geschützt.
- Bekannte Beispiel-Benutzer bei FileZilla FTP und dem Mercury Mail Server.



# Linux

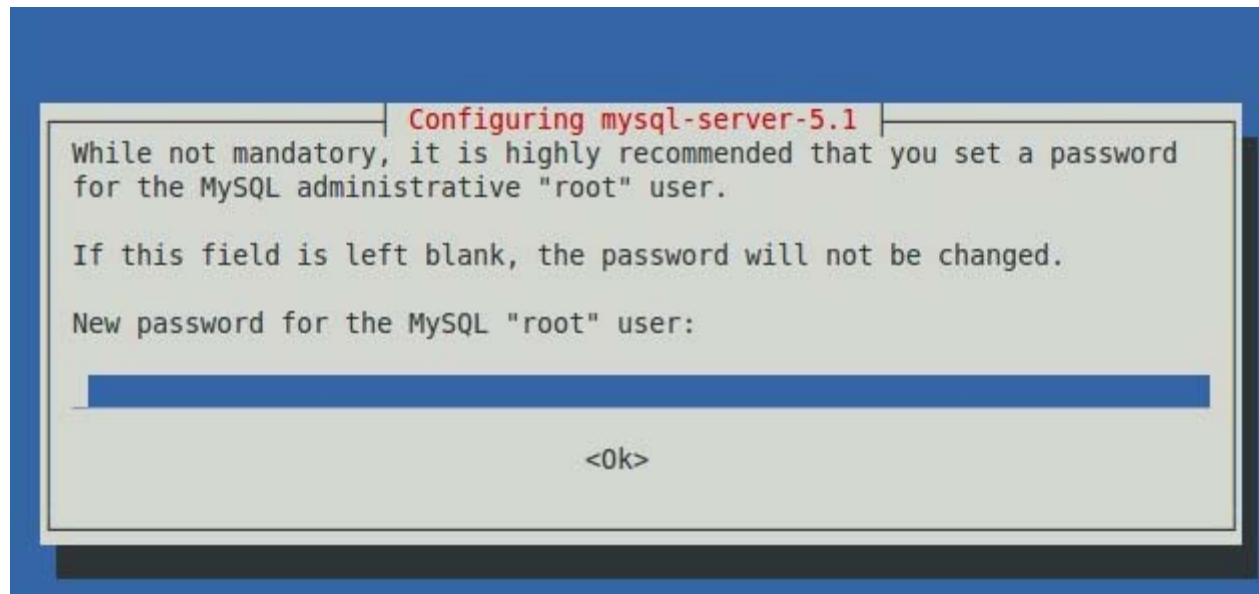
- LAMP - **L**inux, **A**pache, **M**ySQL and **P**HP



Quelle: Wikipedia

# Installation LAMP

- LAMP - **L**inux, **A**pache, **M**ySQL and **P**HP
  - `sudo apt-get install lamp-server^`
  - ➔ Installiert alle nötigen Komponenten für eine Reibungslose Kommunikation zwischen Apache, MySQL und PHP





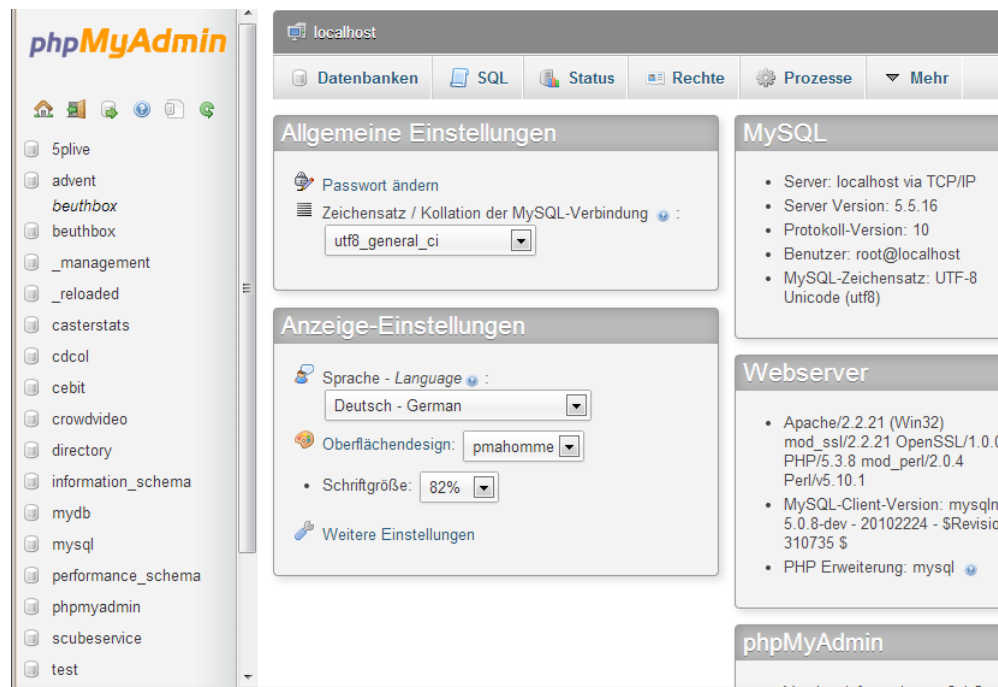
# Installation LAMP

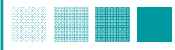
- LAMP - **L**inux, **A**pache, **M**ySQL and **P**HP
  - Web: /var/www
- PHPMyAdmin
  - `sudo apt-get install phpmyadmin`
  - Eingabe des Root-Passwords von MySQL während des Set-Ups
- Adressen:
  - <http://server>
  - <http://server/phpmyadmin>



# Installation LAMP

- MySQL mit PHPMyAdmin- <http://localhost/phpmyadmin/>
  - Zugang: root und gewähltes Passwort





# Apache Server steuern

```
# Allgemein sudo /etc/init.d/apache2  
{start|stop|restart|reload|force-reload}  
# Beispiel sudo /etc/init.d/apache2 restart
```

- `start` - startet den Webserver
- `stop` - stoppt den Server
- `restart` - startet den Server neu, bestehende Verbindungen auf den Server werden gekappt
- `reload` - lädt die Konfigurationsdateien neu, ohne dass Verbindungen getrennt werden
- `force-reload` - Lädt die Konfigurationsdateien neu, auch wenn dabei Verbindungen getrennt werden müssen
- `sudo update-rc.d -f apache2 remove` - Apache2 aus der Autostartliste entfernen
- `sudo update-rc.d apache2 defaults` - Apache2 wieder der Autostartliste hinzufügen





# Backend - Einführung

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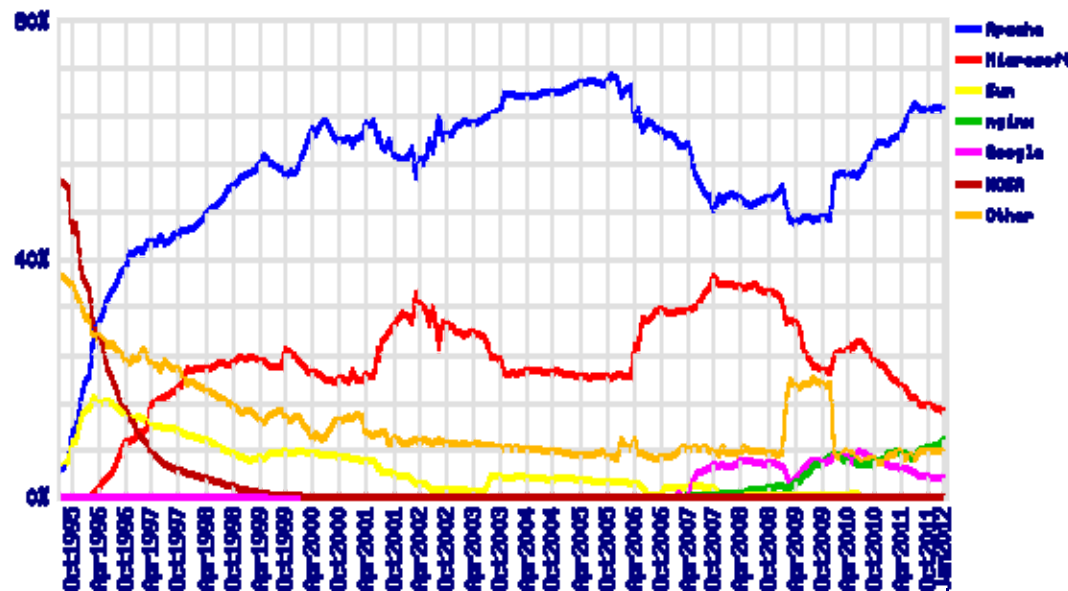
# NGINX



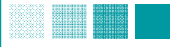


# NGINX

- NGINX oder auch „engine-x“
  - 2002 entwickelt von Igor Sysoev
  - 2004 erste public Release
  - 12,18% aller Webseiten (22,2 Mio.)



Quelle: <http://news.netcraft.com/archives/2012/01/03/january-2012-web-server-survey.html>



# NGINX

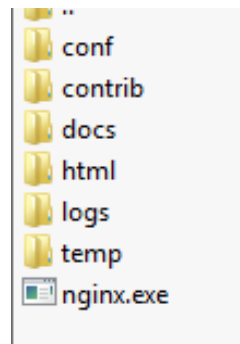
- NGINX
  - [Netflix](#), [Hulu](#), [Pinterest](#), [CloudFlare](#), [Airbnb](#), [WordPress.com](#), [GitHub](#), [SoundCloud](#), [Zynga](#), [Eventbrite](#), [Zappos](#), [Media Temple](#), [Heroku](#), [RightScale](#), [Engine Yard](#), [NetDNA](#)



# NGINX

- NGINX Windows

- 1. nginx laden → <http://nginx.org/>

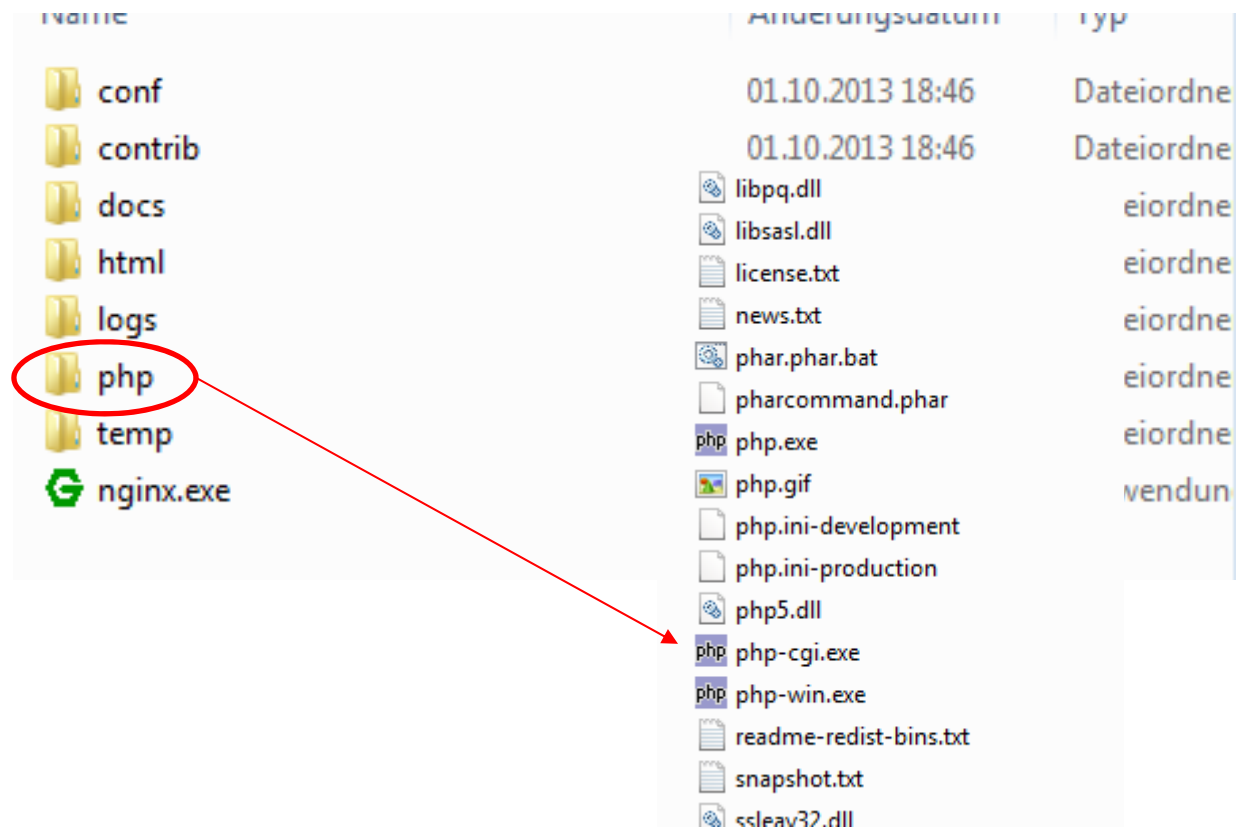


- 2. PHP binaries → <http://php.net/downloads.php>
    - Installation nach C:\nginx\php



# NGINX

## ■ NGINX Windows



# NGINX

- NGINX Windows
  - 3. Konfiguration
  - C:\nginx\conf\nginx.conf

```
location ~ /\.php$ {  
    root html;  
    fastcgi_pass 127.0.0.1:9000;  
    fastcgi_index index.php;  
    fastcgi_param SCRIPT_FILENAME c:/nginx/html/$fastcgi_script_name;  
    include fastcgi_params;  
}
```

# NGINX

- NGINX Windows
  - 4. Starten

```
c:\nginx\nginx.exe
```

```
c:\nginx\php\php-cgi.exe -b 127.0.0.1:9000 -c c:\nginx\php\php.ini
```

```
10.11.2013 11:08 <DIR>      php
10.11.2013 10:56 <DIR>      temp
          1 Datei(en),      2.677.248 Bytes
          9 Verzeichnis(se), 36.786.802.688 Bytes frei
C:\Users\Sven\Desktop\nginx-1.5.6>nginx.exe
```

```
          31 Datei(en),      35.442.627 Bytes
          5 Verzeichnis(se), 36.786.843.648 Bytes frei
C:\Users\Sven\Desktop\nginx-1.5.6\php>php-cgi.exe -b 127.0.0.1:9000 -c c:\Users\Sven\Desktop\nginx-1.5.6\php\php.ini
```

# NGINX

- NGINX Linux

- 1. nginx

- `sudo apt-get install nginx`

- 2. PHP

- `sudo apt-get install php5-cli  
php5-fpm`

- 3. Konfiguration

- <http://www.sitepoint.com/setting-up-php-behind-nginx-with-fastcgi/>



# NGINX

- NGINX mac
  - <https://gist.github.com/mystix/3041577>



# NGINX

- NGINX Linux

## Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support  
Commercial support is available at [nginx.com](#)

*Thank you for using nginx.*

PHP Version 5.5.5



System	Windows NT SVEN-PC 6.1 build 7601 (Windows 7 Business Edition Service Pack 1) i586
Build Date	Oct 15 2013 10:24:55
Compiler	MSVC11 (Visual C++ 2012)
Architecture	x86
Configure Command	cscript /nologo configure.js "--enable-snapshot-build" "--enable-debug-pack" "--disable-zts" "--disable-isapi" "--disable-nsapi" "--without-mssql" "--without-pdo-mssql" "--without-pi3web" "--with-pdo-oci=C:\php-sdk\oracle\instantclient10\sdk,shared" "--with-oci8=C:\php-sdk\oracle\instantclient10\sdk,shared" "--with-oci8-11g=C:\php-sdk\oracle\instantclient11\sdk,shared" "--with-enchanted=shared" "--enable-object-out-dir=../obj/" "--enable-com-dotnet=shared" "--with-mcrypt=static" "--disable-static-analyze" "--with-pgo"
Server API	CGI/FastCGI
Virtual Directory	disabled

# NGINX

- PHP Integration
  - Apache Modul (mod\_php)
    - Verbreitet
    - Schnell
  - CGI PHP
    - Mehr Kontrolle
    - Langsamere Ausführung
  - →FastCGI →mehr Performance
  - <http://de.wikipedia.org/wiki/FastCGI>
  - →Neuer: FPM (FastCGI Process Manager)
  - <http://php-fpm.org/>

# Backend

- JavaScript
  - node.js
- ~~SQL~~
  - ~~MySQL~~
- JSON
  - MongoDB
- ~~PHP~~
  - API → SlimPHP, Restler 3 → Später mit den APIs
- ~~Shell~~
  - ~~Apache~~
  - ~~Nginx~~

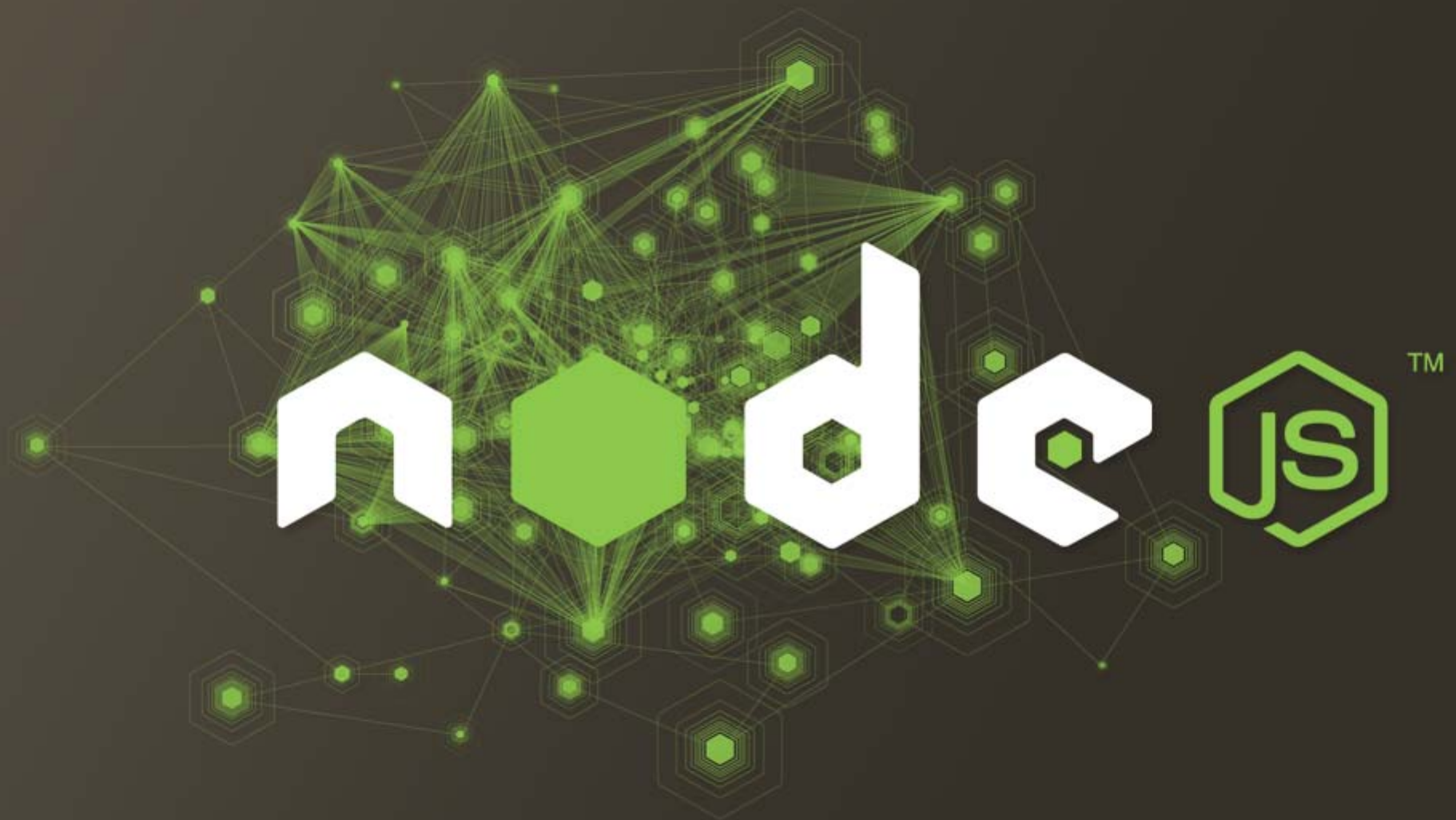


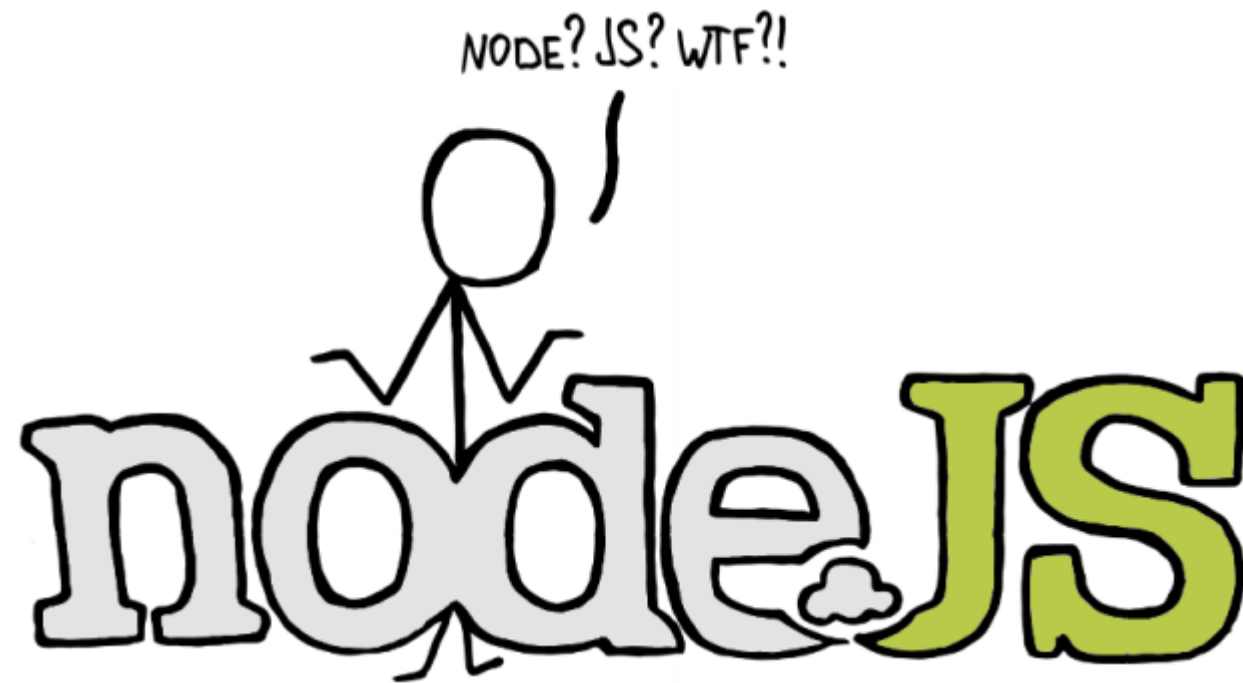
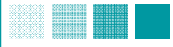


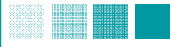
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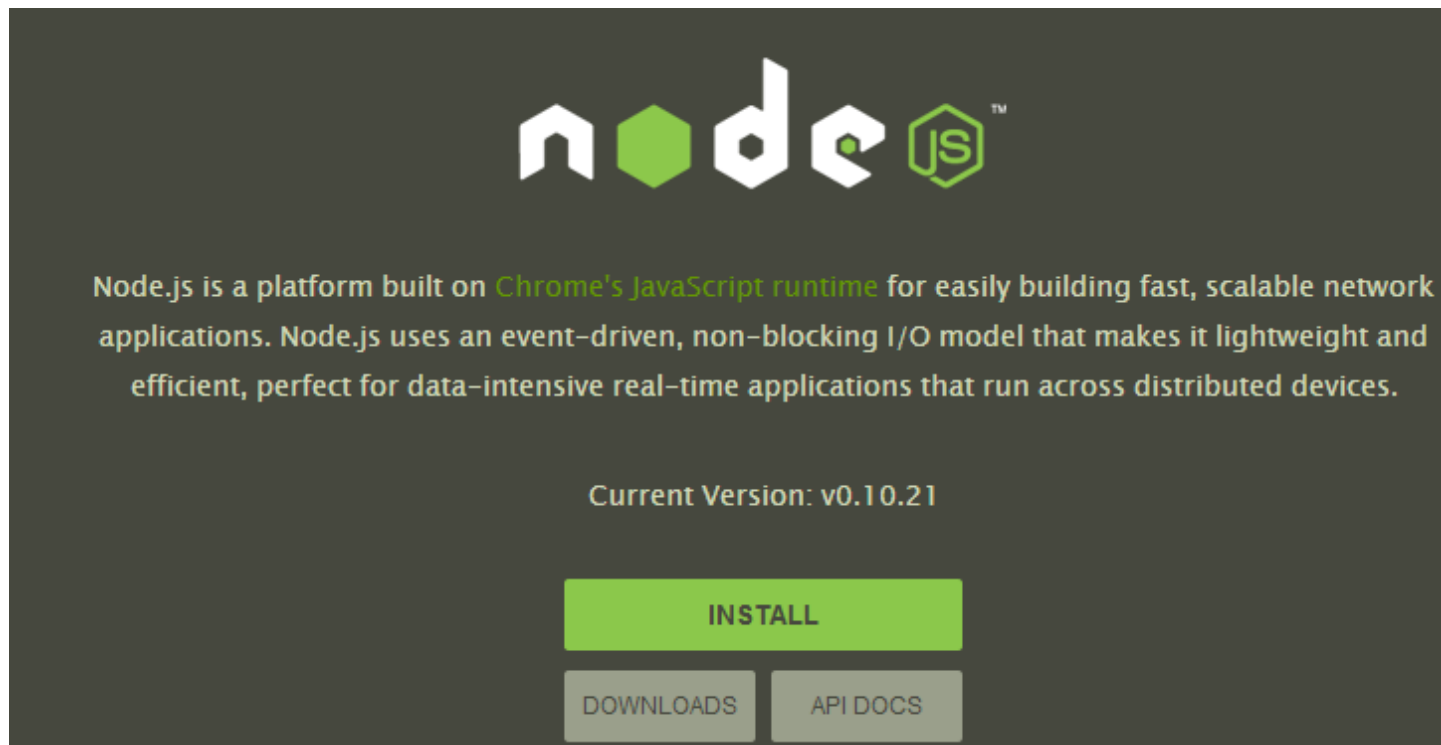
# node.js

- serverseitige Plattform
- Basierend auf Chrome's JavaScript runtime
- Ermöglicht die Entwicklung von schnellen und skalierbaren Netzwerkanwendungen
- Event-gesteuert
- Ermöglicht eine besonders große Anzahl an parallelen Verbindungen



# node.js - Installation

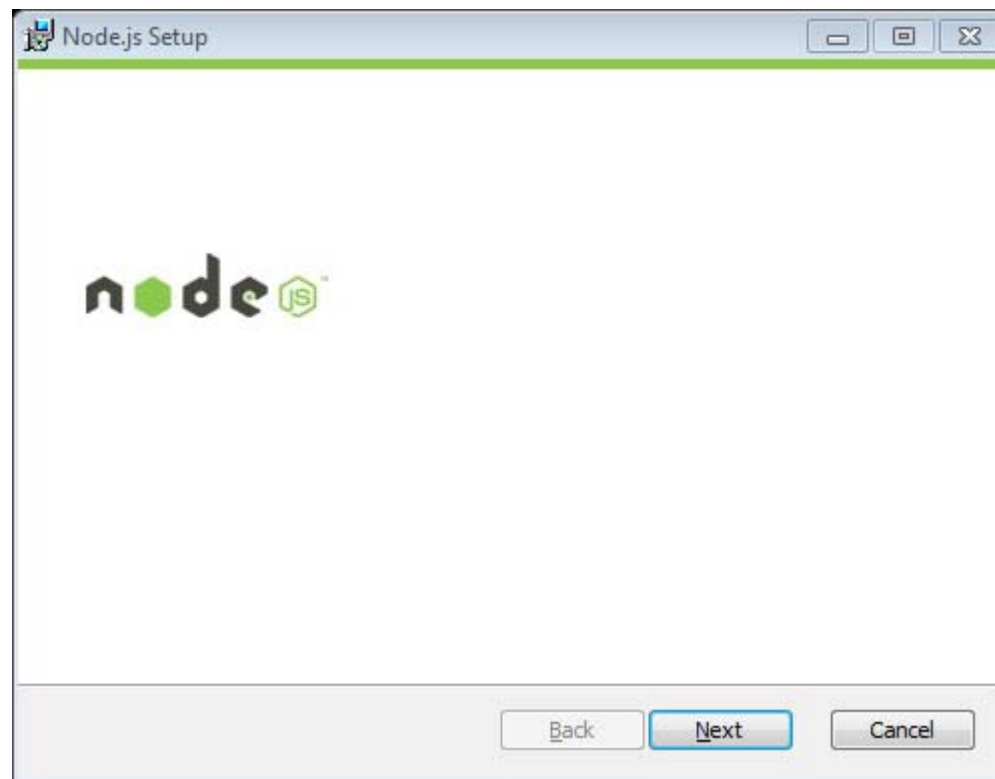
- Windows
  - <http://nodejs.org/>





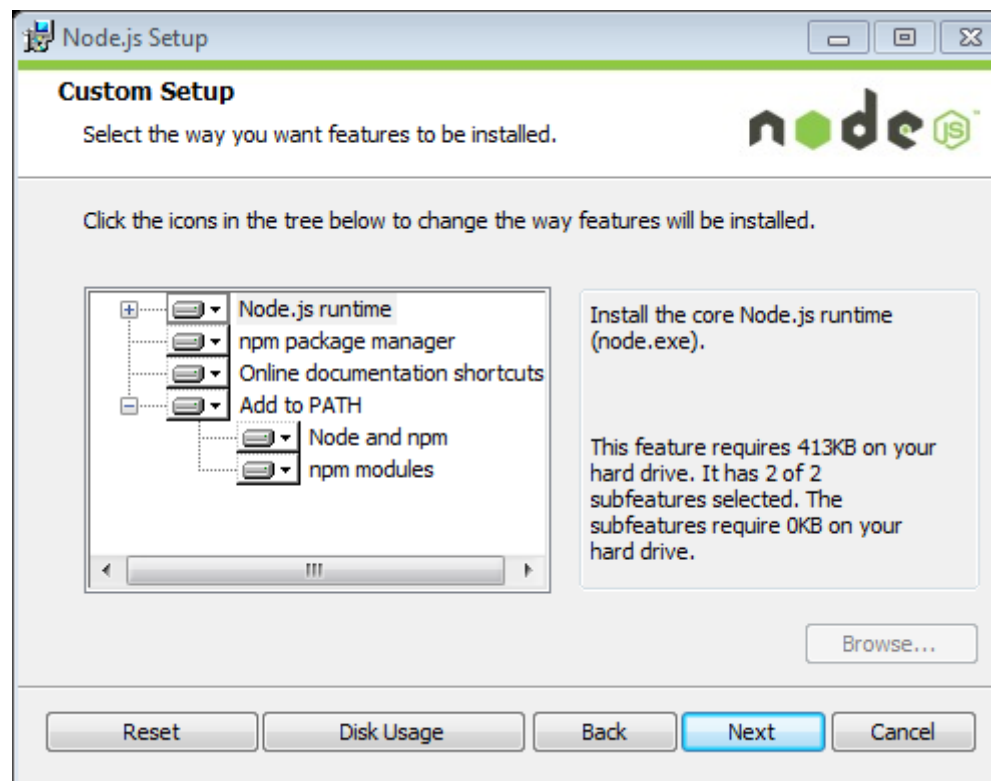
# node.js - Installation

- Windows



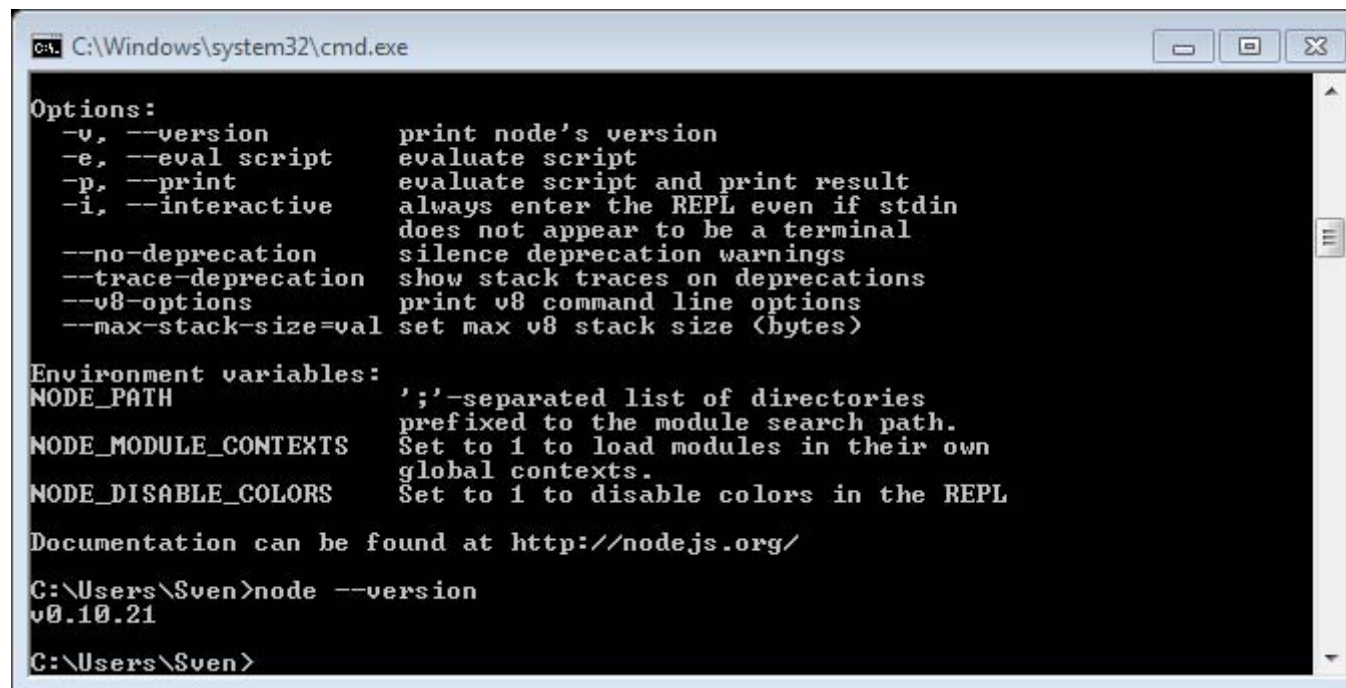
# node.js - Installation

- Automatische PATH-Verknüpfung
- npm – Node.js Package Manager → Dependencies



# node.js - Installation

- node nun im cmd verfügbar



```
C:\Windows\system32\cmd.exe

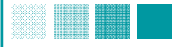
Options:
  -v, --version      print node's version
  -e, --eval script   evaluate script
  -p, --print         evaluate script and print result
  -i, --interactive   always enter the REPL even if stdin
                      does not appear to be a terminal
  --no-deprecation    silence deprecation warnings
  --trace-deprecation show stack traces on deprecations
  --v8-options         print v8 command line options
  --max-stack-size=val set max v8 stack size (bytes)

Environment variables:
NODE_PATH             ';'--separated list of directories
                      prefixed to the module search path.
NODE_MODULE_CONTEXTS   Set to 1 to load modules in their own
                      global contexts.
NODE_DISABLE_COLORS    Set to 1 to disable colors in the REPL

Documentation can be found at http://nodejs.org/

C:\Users\Sven>node --version
v0.10.21

C:\Users\Sven>
```



## node.js - Installation

- Linux
  - `sudo apt-get update`
  - `sudo apt-get install -y python-software-properties python g++ make`
  - `sudo add-apt-repository -y ppa:chris-lea/node.js`
  - `sudo apt-get update`
  - `sudo apt-get install nodejs`



# node.js - Installation

- node nun im Terminal verfügbar

```
root@viwitra:~# node --help
Usage: node [options] [ -e script | script.js ] [arguments]
       node debug script.js [arguments]

Options:
  -v, --version           print node's version
  -e, --eval script       evaluate script
  -p, --print             evaluate script and print result
  -i, --interactive       always enter the REPL even if stdin
                          does not appear to be a terminal
  --no-deprecation        silence deprecation warnings
  --trace-deprecation     show stack traces on deprecations
  --v8-options            print v8 command line options
  --max-stack-size=val   set max v8 stack size (bytes)

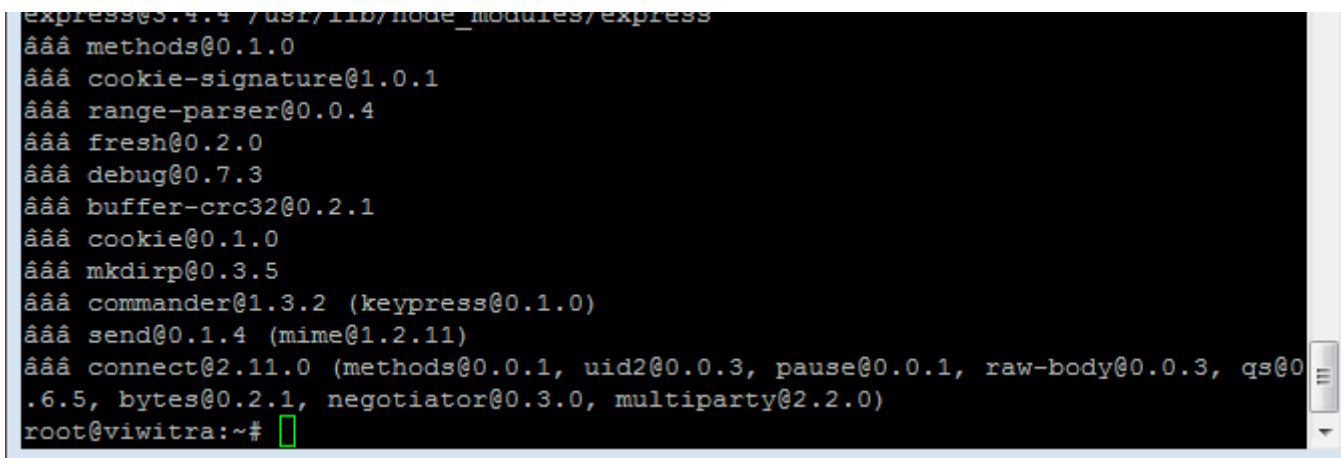
Environment variables:
NODE_PATH                ':'-separated list of directories
                          prefixed to the module search path.
NODE_MODULE_CONTEXTS     Set to 1 to load modules in their own
                          global contexts.
NODE_DISABLE_COLORS      Set to 1 to disable colors in the REPL

Documentation can be found at http://nodejs.org/
root@viwitra:~# node --version
v0.10.10
```

# node.js - Installation

- Express installieren
  - Express ist eine Erweiterung mit vielen nützlichen Funktionen um später Server zu entwickeln

```
npm install -g express
```

A terminal window showing the output of the command 'npm install -g express'. The output lists various dependencies being installed, including methods, cookie-signature, range-parser, fresh, debug, buffer-crc32, cookie, mkdirp, commander, send, connect, and others. The prompt at the bottom is 'root@viwitra:~#'.

```
express@3.4.4 /usr/lib/node_modules/express
âââ methods@0.1.0
âââ cookie-signature@1.0.1
âââ range-parser@0.0.4
âââ fresh@0.2.0
âââ debug@0.7.3
âââ buffer-crc32@0.2.1
âââ cookie@0.1.0
âââ mkdirp@0.3.5
âââ commander@1.3.2 (keypress@0.1.0)
âââ send@0.1.4 (mime@1.2.11)
âââ connect@2.11.0 (methods@0.0.1, uid2@0.0.3, pause@0.0.1, raw-body@0.0.3, qs@0
.6.5, bytes@0.2.1, negotiator@0.3.0, multipart@2.2.0)
root@viwitra:~#
```

# node.js – Ein kleiner Server

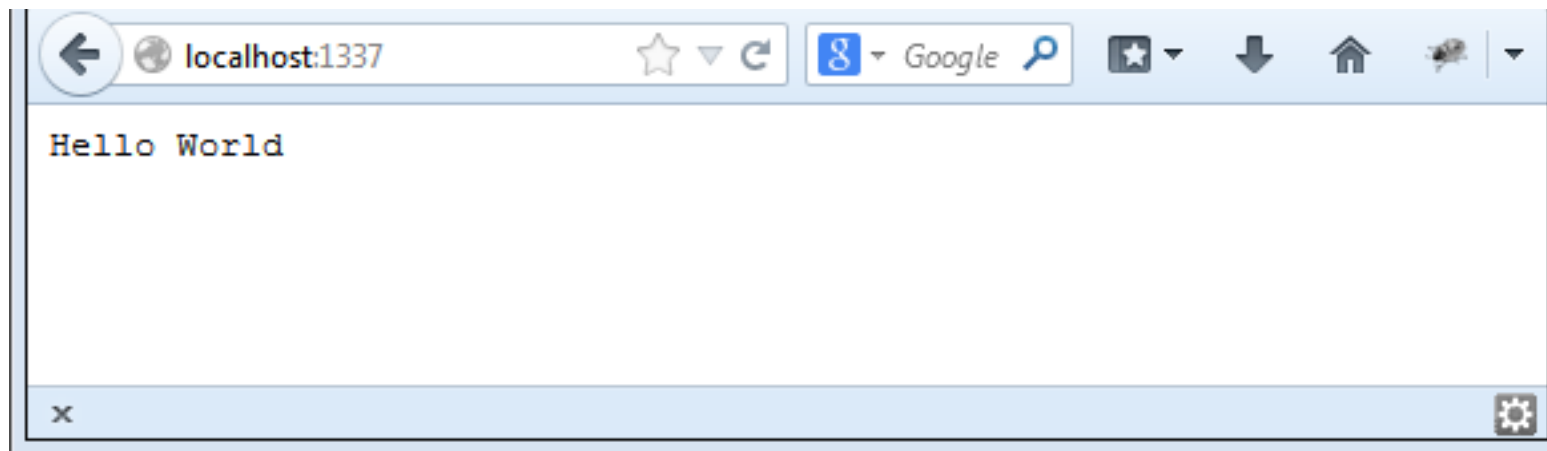
## ■ server.js

```
var http = require('http');

http.createServer(function (req, res) {
    res.writeHead(200,
        {'Content-Type': 'text/plain'});
    res.end('Hello World\n');
}).listen(1337, '127.0.0.1');
console.log('Server running at http://127.0.0.1:1337/');
```

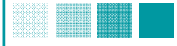
```
C:\Users\Sven\Desktop>node server.js
Server running at http://127.0.0.1:1337/
```

# node.js – Ein kleiner Server



<http://nodejs.org/api/>

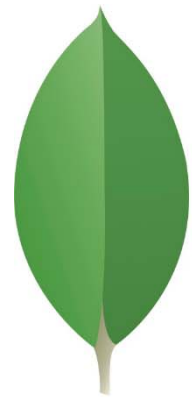
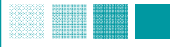




# Backend - Einführung

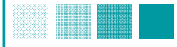
- Kurze Retrospektive
- Backend
  - Backendtechnologien im kurzen Überblick
  - Installation der Basics
    - Apache, MySQL, PHP
    - Nginx
    - node.js
    - **mongoDB**
    - Verbindung PHP und mongoDB
    - Verbindung node.js und mongoDB
  - Kleiner Einblick in die Programmierung





mongoDB





# mongoDB

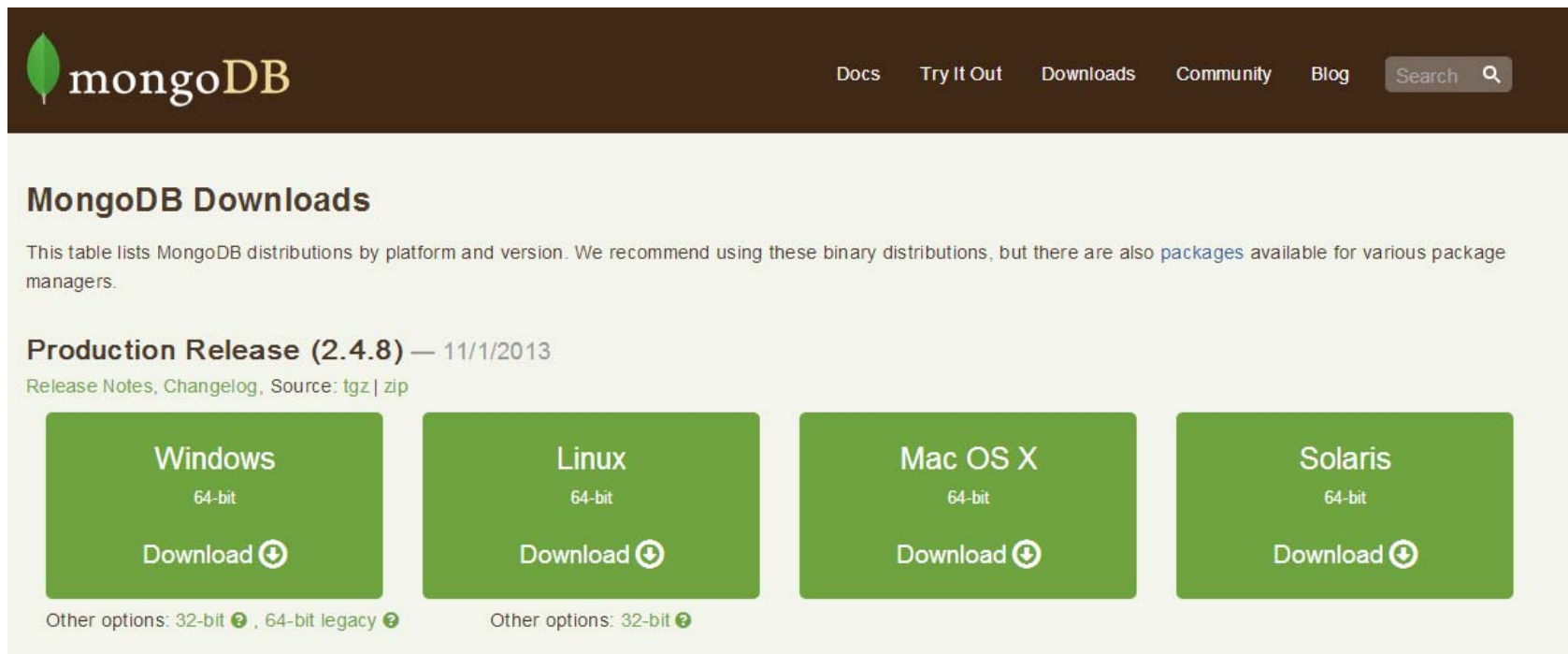
- Kommt von „humongous“
- führende NoSQL-Datenbank
- open-source
- Dokumentenorientiert (JSON)
- Skalierbar (horizontal und vertikal)



# mongoDB - Installation

- Windows

- <http://www.mongodb.org/downloads>



The screenshot shows the MongoDB website's 'Downloads' section. At the top is the MongoDB logo and a navigation bar with links for Docs, Try It Out, Downloads, Community, and Blog, along with a search bar. The main heading is 'MongoDB Downloads'. Below it, a paragraph states: 'This table lists MongoDB distributions by platform and version. We recommend using these binary distributions, but there are also packages available for various package managers.' The current release is 'Production Release (2.4.8) — 11/1/2013', with links for 'Release Notes', 'Changelog', and 'Source: tgz | zip'. There are four green buttons for downloading the 64-bit versions: 'Windows 64-bit', 'Linux 64-bit', 'Mac OS X 64-bit', and 'Solaris 64-bit'. Each button has a 'Download' link with a download icon. Below the buttons, there are links for 'Other options: 32-bit' and '64-bit legacy' for Windows and Linux.

**MongoDB Downloads**

This table lists MongoDB distributions by platform and version. We recommend using these binary distributions, but there are also packages available for various package managers.

**Production Release (2.4.8) — 11/1/2013**  
Release Notes, Changelog, Source: tgz | zip

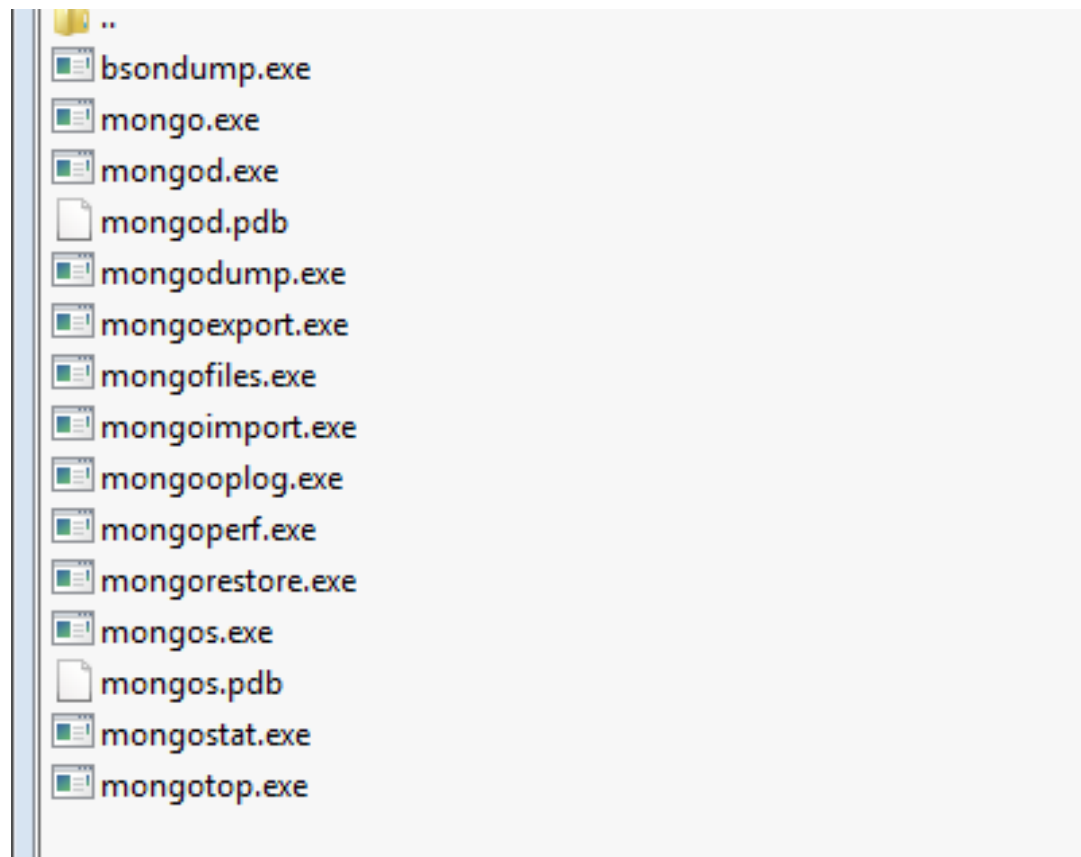
Platform	Architecture	Download
Windows	64-bit	<a href="#">Download</a>
Linux	64-bit	<a href="#">Download</a>
Mac OS X	64-bit	<a href="#">Download</a>
Solaris	64-bit	<a href="#">Download</a>

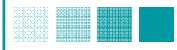
Other options: 32-bit, 64-bit legacy

<http://docs.mongodb.org/manual/tutorial/install-mongodb-on-windows/>

# mongoDB - Installation

- 1. Entpacken





## mongoDB - Installation

- 2. Datenbankordner erstellen
  - data
- z.B.:
  - h:\bin\data



# mongoDB - Installation

- 3. mongoDB starten
  - `h:\bin\mongod.exe --dbpath h:\bin\data`

```
H:\bin>mongod.exe --dbpath h:\bin\data
Sun Nov 10 13:29:39.028 [initandlisten] MongoDB starting : pid=5820 port=27017 d
bpath=h:\bin\data 64-bit host=Sven-PC
Sun Nov 10 13:29:39.029 [initandlisten] db version v2.4.8
Sun Nov 10 13:29:39.029 [initandlisten] git version: a350fc38922fbda2cec8d5dd842
237b904eafc14
Sun Nov 10 13:29:39.029 [initandlisten] build info: windows sys.getwindowsversio
n(major=6, minor=1, build=7601, platform=2, service_pack='Service Pack 1') BOOST
LIB_VERSION=1_49
Sun Nov 10 13:29:39.030 [initandlisten] allocator: system
Sun Nov 10 13:29:39.030 [initandlisten] options: { dbpath: "h:\bin\data" }
Sun Nov 10 13:29:39.036 [initandlisten] journal dir=h:\bin\data\journal
Sun Nov 10 13:29:39.037 [initandlisten] recover : no journal files present, no r
ecover needed
Sun Nov 10 13:29:39.046 [FileAllocator] allocating new datafile h:\bin\data\loca
l.ns, filling with zeroes...
Sun Nov 10 13:29:39.046 [FileAllocator] creating directory h:\bin\data\tmp
Sun Nov 10 13:29:39.073 [FileAllocator] done allocating datafile h:\bin\data\loc
al.ns, size: 16MB, took 0.026 secs
Sun Nov 10 13:29:39.073 [FileAllocator] allocating new datafile h:\bin\data\loca
l.0, filling with zeroes...
Sun Nov 10 13:29:39.178 [FileAllocator] done allocating datafile h:\bin\data\loc
al.0, size: 64MB, took 0.104 secs
Sun Nov 10 13:29:39.179 [initandlisten] command local.$cmd command: { create: "s
tartup_log", size: 10485760, capped: true } ntoreturn:1 keyUpdates:0 reslen:37
133ms
Sun Nov 10 13:29:39.180 [initandlisten] waiting for connections on port 27017
Sun Nov 10 13:29:39.180 [websvr] admin web console waiting for connections on po
rt 28017
```

## mongoDB - Test

- `h:\bin\mongo.exe`

```
H:\bin>mongo
MongoDB shell version: 2.4.8
connecting to: test
Welcome to the MongoDB shell.
For interactive help, type "help".
For more comprehensive documentation, see
    http://docs.mongodb.org/
Questions? Try the support group
    http://groups.google.com/group/mongodb-user
>
```

Auf dem Server:

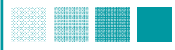
```
Sun Nov 10 13:32:11.798 [initandlisten] connection accepted from 127.0.0.1:54186
#1 (1 connection now open)
```



## mongoDB - Test

```
H:\bin>mongo
MongoDB shell version: 2.4.8
connecting to: test
Welcome to the MongoDB shell.
For interactive help, type "help".
For more comprehensive documentation, see
    http://docs.mongodb.org/
Questions? Try the support group
    http://groups.google.com/group/mongodb-user
> db.test.save({a:1})
> db.test.find()
{ "_id" : ObjectId("527f7d496adb07197837d4f4"), "a" : 1 }
>
```

 journal	10.11.2013 13:35
 local.0	10.11.2013 13:29
 local.ns	10.11.2013 13:29
 mongod.lock	10.11.2013 13:35
 test.0	10.11.2013 13:34
 test.1	10.11.2013 13:34
 test.ns	10.11.2013 13:34

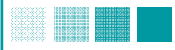


## mongoDB - Installation

- Linux – APT vorbereiten
  - `sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv 7F0CEB10`
- Source-List erstellen
  - `echo 'deb http://downloads-distro.mongodb.org/repo/ubuntu-upstart dist 10gen' | sudo tee /etc/apt/sources.list.d/mongodb.list`

<http://docs.mongodb.org/manual/administration/install-on-linux/>

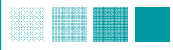




# mongoDB - Installation

- APT updaten
  - `sudo apt-get update`
- mongoDB installieren
  - `sudo apt-get install mongodb-10gen`





# mongoDB - Installation

```
root@viwitra:~# apt-get install mongodb-10gen
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be upgraded:
  mongodb-10gen
1 upgraded, 0 newly installed, 0 to remove and 80 not upgraded.
Need to get 87.9 MB of archives.
After this operation, 829 kB of additional disk space will be used.
Get:1 http://downloads-distro.mongodb.org/repo/ubuntu-upstart/ dist/10gen mongodb-10gen amd64 2.4.8 [87.9 MB]
Fetched 87.9 MB in 11s (7572 kB/s)
(Reading database ... 37554 files and directories currently installed.)
Preparing to replace mongodb-10gen 2.4.4 (using .../mongodb-10gen_2.4.8_amd64.deb) ...
arg: upgrade
mongodb stop/waiting
Unpacking replacement mongodb-10gen ...
Processing triggers for ureadahead ...
ureadahead will be reprofiled on next reboot
Setting up mongodb-10gen (2.4.8) ...
mongodb start/running, process 13357
root@viwitra:~#
```



# mongoDB - Test

- Start über mongo

```
root@viwitra:~# mongo
MongoDB shell version: 2.4.8
connecting to: test
Welcome to the MongoDB shell.
For interactive help, type "help".
For more comprehensive documentation, see
  http://docs.mongodb.org/
Questions? Try the support group
  http://groups.google.com/group/mongodb-user
> db.test.save({a:1})
> db.test.find()
{ "_id" : ObjectId("527fa3b1b5fb8b2f03ff2e08"), "a" : 1 }
> █
```

- Daten in /var/lib/mongodb

```
root@viwitra:~# cd /var/lib/mongodb/
root@viwitra:/var/lib/mongodb# ls
TreeTest.0  kaputt.0  mongod.lock  test.1  user.0  viwitratesprojekt.ns
TreeTest.1  kaputt.1  neutest.0  test.ns  user.1
TreeTest.ns  kaputt.ns  neutest.1  testprojekt.0  user.ns
_tmp  local.0  neutest.ns  testprojekt.1  viwitratesprojekt.0
journal  local.ns  test.0  testprojekt.ns  viwitratesprojekt.1
root@viwitra:/var/lib/mongodb# █
```

# Backend

- JavaScript

- node.js

- SQL

- MySQL

- JSON

- MongoDB

- PHP

- API → SlimPHP, Restler 3 → Später mit den APIs

- Shell

- Apache

- Nginx

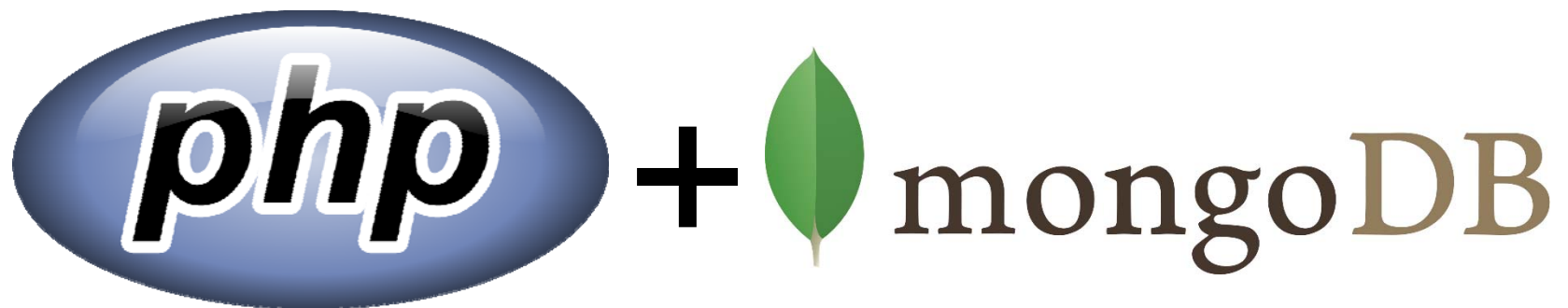




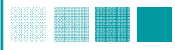
# Backend - Einführung

- Kurze Retrospektive
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  - Kleiner Einblick in die Programmierung









# mongoDB-PHP - Installation

## ■ Windows

- <https://github.com/mongodb/mongo-php-driver/downloads>

### Download Packages

1.  17,340 downloads

[php\\_mongo-1.3.2RC1.zip](#) — PHP 5.2, 5.3 and 5.4 builds for Windows VC9 (32bit and 64bit)

884KB · Uploaded 11 months ago

2.  11,277 downloads

[php\\_mongo-1.3.1.zip](#) — PHP 5.2, 5.3 and 5.4 builds for Windows VC9 (32bit and 64bit)

872KB · Uploaded 11 months ago

3.  3,219 downloads

[php\\_mongo-1.3.0.zip](#) — PHP 5.2, 5.3 and 5.4 builds for Windows VC9 (32bit and 64bit)

874KB · Uploaded a year ago

4.  897 downloads

[php\\_mongo-1.3.0RC3.zip](#) — PHP 5.2, 5.3 and 5.4 builds for Windows VC9 (32bit and 64bit)

870KB · Uploaded a year ago



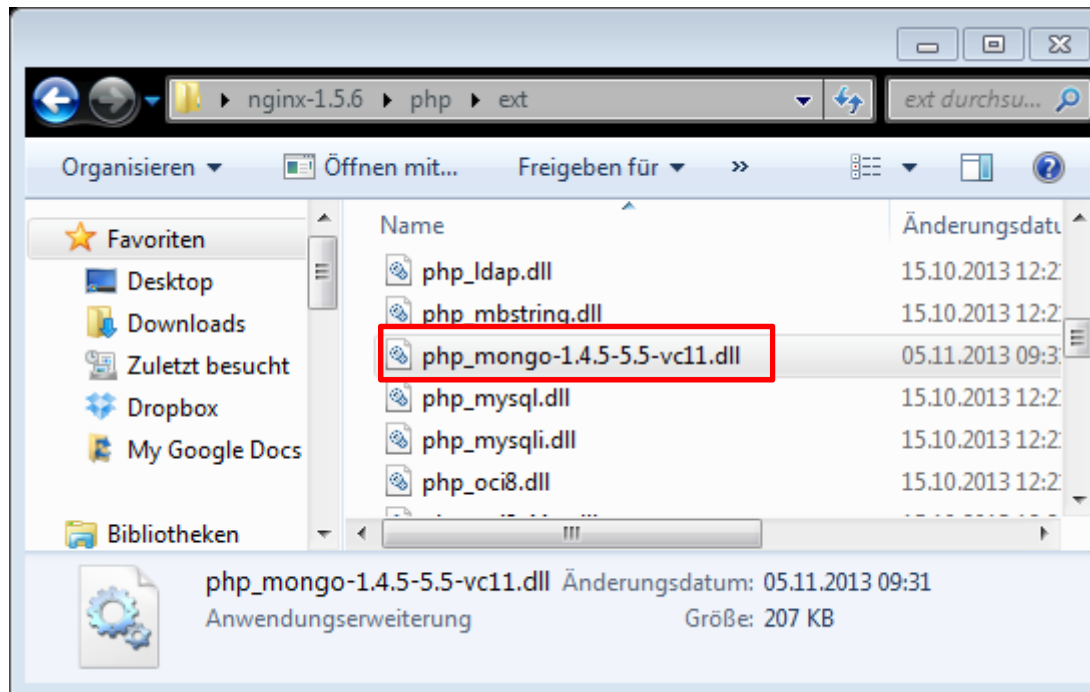
# mongoDB-PHP - Installation

- Windows
  - <https://s3.amazonaws.com/drivers.mongodb.org/php/index.html>
  - <https://github.com/mongodb/mongo-php-driver>

<u>Size</u>	<u>Lastmodified</u>	<u>Name</u>
0 B	2013-01-03T14:08:06.000Z	
7775 B	2013-03-21T11:12:04.000Z	<a href="#">index.html</a>
446968 B	2013-01-03T14:13:02.000Z	<a href="#">mongo-1.1.4.zip</a>
728753 B	2013-01-03T14:12:57.000Z	<a href="#">php_mongo-1.2.11.zip</a>
732964 B	2013-01-03T14:12:59.000Z	<a href="#">php_mongo-1.2.12.zip</a>
893006 B	2013-01-03T14:12:51.000Z	<a href="#">php_mongo-1.3.1.zip</a>
906110 B	2013-01-03T14:12:54.000Z	<a href="#">php_mongo-1.3.2RC1.zip</a>
917373 B	2013-01-16T15:49:33.000Z	<a href="#">php_mongo-1.3.3.zip</a>
929713 B	2013-01-31T13:24:12.000Z	<a href="#">php_mongo-1.3.4.zip</a>
933518 B	2013-03-15T12:06:26.000Z	<a href="#">php_mongo-1.3.5.zip</a>
1294766 B	2013-03-26T10:43:33.000Z	<a href="#">php_mongo-1.3.6.zip</a>
1296279 B	2013-04-10T12:51:54.000Z	<a href="#">php_mongo-1.3.7.zip</a>
1371505 B	2013-05-21T18:44:40.000Z	<a href="#">php_mongo-1.4.0.zip</a>
1370883 B	2013-05-10T14:28:16.000Z	<a href="#">php_mongo-1.4.0RC1.zip</a>
1367428 B	2013-04-26T13:42:25.000Z	<a href="#">php_mongo-1.4.0beta1.zip</a>
1376825 B	2013-06-03T09:48:42.000Z	<a href="#">php_mongo-1.4.1.zip</a>
1379209 B	2013-07-22T14:22:28.000Z	<a href="#">php_mongo-1.4.2.zip</a>
1384712 B	2013-08-15T14:15:17.000Z	<a href="#">php_mongo-1.4.3.zip</a>
1394460 B	2013-09-25T11:26:07.000Z	<a href="#">php_mongo-1.4.4.zip</a>
1394709 B	2013-11-05T11:25:33.000Z	<a href="#">php_mongo-1.4.5.zip</a>

# mongoDB - Installation

- Entsprechende DLL in den php/ext Ordner kopieren
- XAMPP: xampp/php/ext



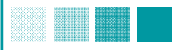
# mongoDB - Installation

- php.ini anpassen:

```
842
843  ;;;;;;;;;;;;;;;;;;;;;;;;;
844  ; Dynamic Extensions ;
845  ;;;;;;;;;;;;;;;;;;;;;;;;;
846
847  extension=php_mongo-1.4.5-5.5-vc11-x86_64.dll
```

- Ggf. Muss noch der extensions-Ordner angepasst werden

```
727  ; Directory in which the loadable extensions (modules) reside.
728  ; http://php.net/extension-dir
729  ; extension_dir = "."
730  ; On windows:
731  ; extension_dir = "ext"
732  extension_dir = "C:\Users\Sven\Desktop\nginx-1.5.6\php\ext"
```



# mongoDB - Installation

- phpinfo()

## mongo

MongoDB Support	enabled
Version	1.2.12

Directive	Local Value	Master Value
mongo.allow_empty_keys	0	0
mongo.allow_persistent	1	1
mongo.chunk_size	262144	262144
mongo.cmd	\$	\$
mongo.default_host	localhost	localhost
mongo.default_port	27017	27017
mongo.is_master_interval	60	60
mongo.long_as_object	0	0
mongo.native_long	0	0
mongo.no_id	0	0
mongo.ping_interval	5	5
mongo.utf8	1	1



# mongoDB-PHP - Installation

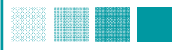
- Linux
  - Abhängigkeiten
    - `sudo apt-get install php-pear php5-dev`
  - Treiber
    - `pecl search mongo`
    - `(sudo apt-get install make)`
    - `sudo pecl install mongo`

<http://w3layer.blogspot.de/2012/07/installing-mongodb-driver-for-php.html>

# mongoDB-PHP - Installation

- php.ini anpassen
  - `sudo vi /etc/php5/apache2/php.ini`
  - `extension = mongo.so`

```
; Dynamic Extensions ;
;
; If you wish to have an extension loaded automatically, use the following
; syntax:
;
;   extension=module.extension
;
; For example, on Windows:
;
;   extension=msql.dll
;
; ... or under UNIX:
;
;   extension=msql.so
;
; ... or with a path:
;
;   extension=/path/to/extension/msql.so
;
; If you only provide the name of the extension, PHP will look for it in its
; default extension directory.
extension = mongo.so
; Module Settings ;
```



# mongoDB - Installation

- phpinfo()

## mongo

MongoDB Support	enabled
Version	1.2.12

Directive	Local Value	Master Value
mongo.allow_empty_keys	0	0
mongo.allow_persistent	1	1
mongo.chunk_size	262144	262144
mongo.cmd	\$	\$
mongo.default_host	localhost	localhost
mongo.default_port	27017	27017
mongo.is_master_interval	60	60
mongo.long_as_object	0	0
mongo.native_long	0	0
mongo.no_id	0	0
mongo.ping_interval	5	5
mongo.utf8	1	1



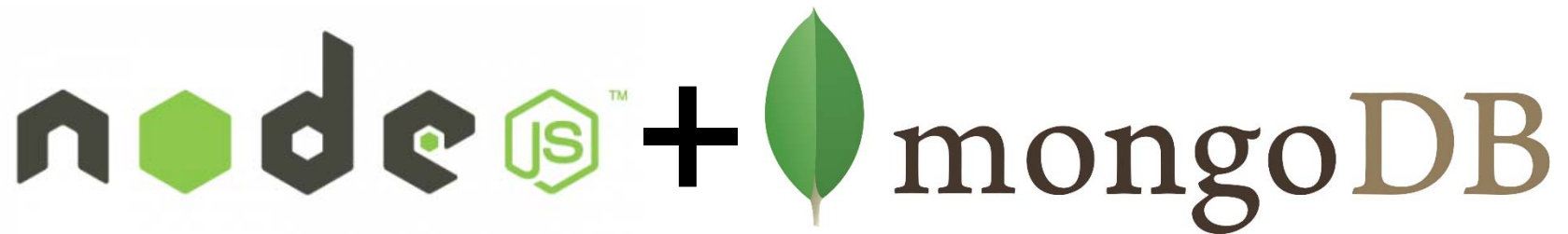




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    - Verbindung node.js und mongoDB
  - Kleiner Einblick in die Programmierung





# mongoDB-PHP - Installation

- Linux und Windows!
  - Npm installiert mongojs
  - `npm install mongojs`

```
> kerberos@0.0.3 install /var/lib/mongodb/node_modules/mongojs/node_modules/mon
> (node-gyp rebuild 2> builderror.log) || (exit 0)

> bson@0.2.2 install /var/lib/mongodb/node_modules/mongojs/node_modules/mon
> (node-gyp rebuild 2> builderror.log) || (exit 0)

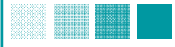
make: Entering directory `/var/lib/mongodb/node_modules/mongojs/node_modules/mongodb/node_modules/kerberos/build'
  SOLINK_MODULE(target) Release/obj.target/kerberos.node
make: Leaving directory `/var/lib/mongodb/node_modules/mongojs/node_modules/mongodb/node_modules/kerberos/build'
make: Entering directory `/var/lib/mongodb/node_modules/mongojs/node_modules/mongodb/node_modules/bson/build'
  CXX(target) Release/obj.target/bson/ext/bson.o
make: Leaving directory `/var/lib/mongodb/node_modules/mongojs/node_modules/mongodb/node_modules/bson/build'
mongojs@0.9.6 node_modules/mongojs
âââ thunky@0.1.0
âââ readable-stream@1.1.9 (debuglog@0.0.2, core-util-is@1.0.0)
âââ mongodb@1.3.19 (kerberos@0.0.3, bson@0.2.2)
root@vivitra:/var/lib/mongodb#
```

[illegible]

# mongoDB-PHP - Installation

- Linux und Windows!
  - Mongoose ist ein MongoDB-Object Mapper
  - `npm install mongoose`

```
make: Entering directory `/root/node_modules/mongoose/node_modules/mongodb/node_modules/kerberos/build'
  SOLINK_MODULE(target) Release/obj.target/kerberos.node
make: Leaving directory `/root/node_modules/mongoose/node_modules/mongodb/node_modules/kerberos/build'
make: Entering directory `/root/node_modules/mongoose/node_modules/mongodb/node_modules/bson/build'
  CXX(target) Release/obj.target/bson/ext/bson.o
make: Leaving directory `/root/node_modules/mongoose/node_modules/mongodb/node_modules/bson/build'
mongoose@3.8.0 node_modules/mongoose
âââ regexp-clone@0.0.1
âââ muri@0.3.1
âââ sliced@0.0.5
âââ mpromise@0.3.0
âââ hooks@0.2.1
âââ mpath@0.1.1
âââ ms@0.1.0
âââ mquery@0.3.2 (debug@0.7.0)
âââ mongodb@1.3.19 (kerberos@0.0.3, bson@0.2.2)
root@viwitra:~#
```



# Backend - Einführung

- Kurze Retrospektive
- Backend
  - Backendtechnologien im kurzen Überblick
  - Installation der Basics
    - Apache, MySQL, PHP
    - Nginx
    - node.js
    - mongoDB
    - Verbindung PHP und mongoDB
    - Verbindung node.js und mongoDB
  - Kleiner Einblick in die Programmierung





# Kleiner Einblick in die Programmierung





## ■ Node.js - Minimaler Server

```
var express = require('express');  
var app = express();  
app.get('/', function(req, res){  
    res.send('Hello World');  
});  
app.listen(8080);
```





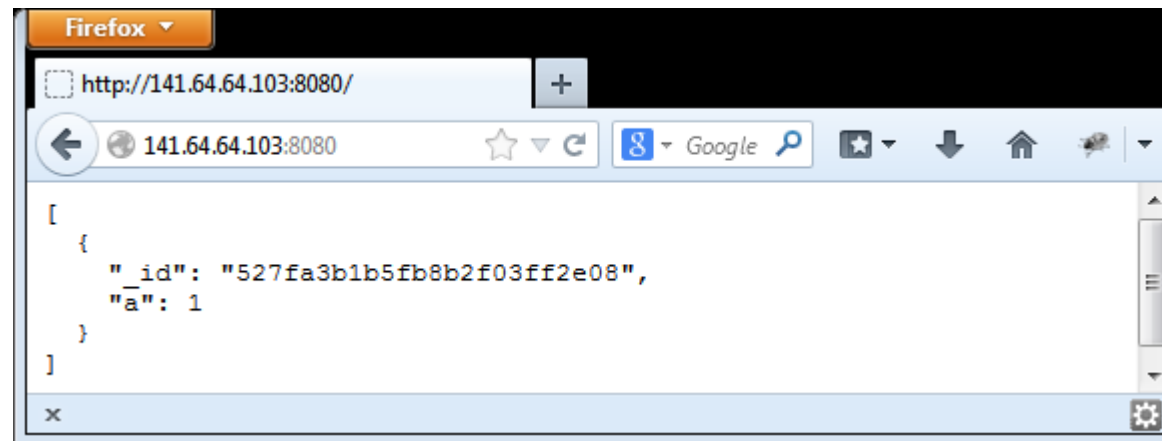
## ■ MongoDB

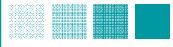
```
var express = require('express');
var mongojs = require('mongojs');
var app = express();
var db = mongojs('test', ['test']);
app.get('/', function(req, res){
    db.test.find(function(err, docs) {
        console.log(docs);
        res.send(docs);
    });
});
app.listen(8080);
```





## ■ MongoDB

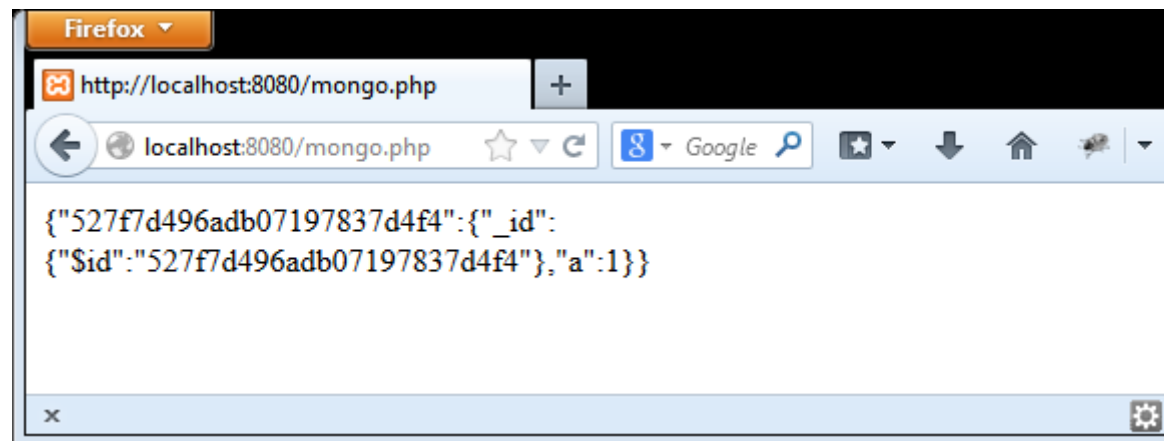


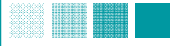


```
<?php
try {
    // open connection to MongoDB server
    $conn = new MongoClient('localhost');
    // access database
    $db = $conn->test;
    // access collection
    $collection = $db->test;
    // execute query
    // retrieve all documents
    $cursor = $collection->find();
    //print result
    echo json_encode(iterator_to_array($cursor));
    // disconnect from server
    $conn->close();
} catch (MongoConnectionException $e) {
    die('Error connecting to MongoDB server');
} catch (MongoException $e) {
    die('Error: ' . $e->getMessage());
}
?>
```



- Mongo PHP





# Vielen Dank für die Aufmerksamkeit!

