

GSL - Installation und Einführung

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bei

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Installation

Unix

apt (Debian, Ubuntu, ...)

```
# apt install libgsl-dev
```

portage (Gentoo)

```
# emerge -av gsl
```

pkg (OpenBSD, FreeBSD, ...)

```
# pkg_add gsl
```

Installation

macOS

Homebrew (<https://brew.sh>)

```
$ brew install gsl
```

Installation


Windows

Cygwin (<https://www.cygwin.com/>)

- ▶ Erstinstallation und Paketverwaltung über den Setup (https://www.cygwin.com/setup-x86_64.exe)
- ▶ „Cygwin Terminal“ als Unix-Kommandozeile

Installation

Windows



Cygwin Net Release Setup Program

This setup program is used for the initial installation of the Cygwin environment as well as all subsequent updates. Make sure to remember where you saved it.


The pages that follow will guide you through the installation. Please note that Cygwin consists of a large number of packages spanning a wide variety of purposes. We only install a base set of packages by default. You can always run this program at any time in the future to add, remove, or upgrade packages as necessary.

Setup version 2.891 (64 bit)
Copyright 2000-2018
<http://www.cygwin.com/>

< Back Next > Cancel

Installation

Windows

Choose A Download Source 

Choose whether to install or download from the internet, or install from files in a local directory.


Install from Internet
(downloaded files will be kept for future re-use)

Download Without Installing

Install from Local Directory

Installation

Windows

Select Root Install Directory 

Select the directory where you want to install Cygwin. Also choose a few installation parameters.

Root Directory


Install For

All Users (RECOMMENDED)
Cygwin will be available to all users of the system.

Just Me
Cygwin will still be available to all users, but Desktop Icons, Cygwin Menu Entries, and important Installer information are only available to the current user. Only select this if you lack Administrator privileges or if you have specific needs.

Installation

Windows

Select Local Package Directory 

Select a directory where you want Setup to store the installation files it downloads. The directory will be created if it does not already exist.

Local Package Directory

Installation

Windows

Select Your Internet Connection

Setup needs to know how you want it to connect to the internet. Choose the appropriate settings below.

Use System Proxy Settings

Direct Connection

Use HTTP/FTP Proxy:

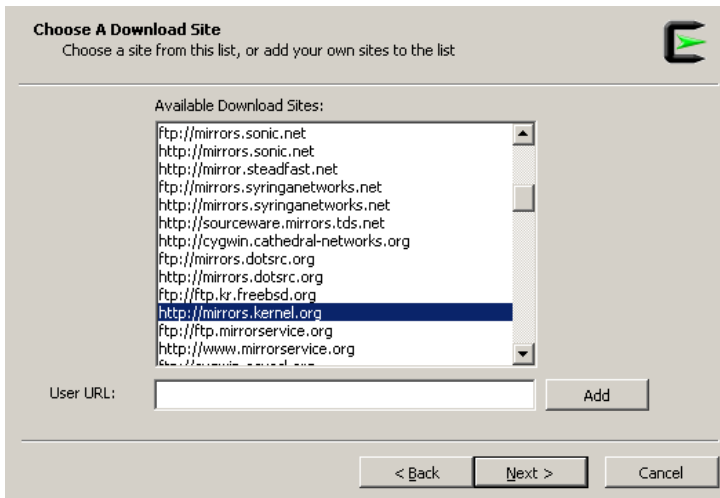
Proxy Host

Port

< Back Next > Cancel

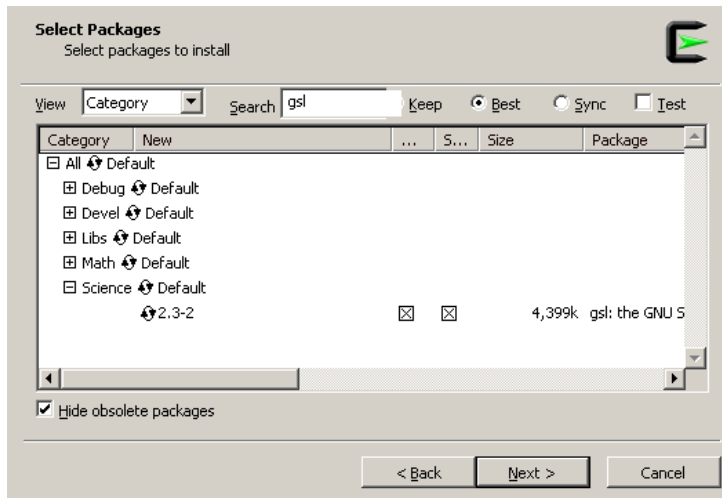
Installation

Windows



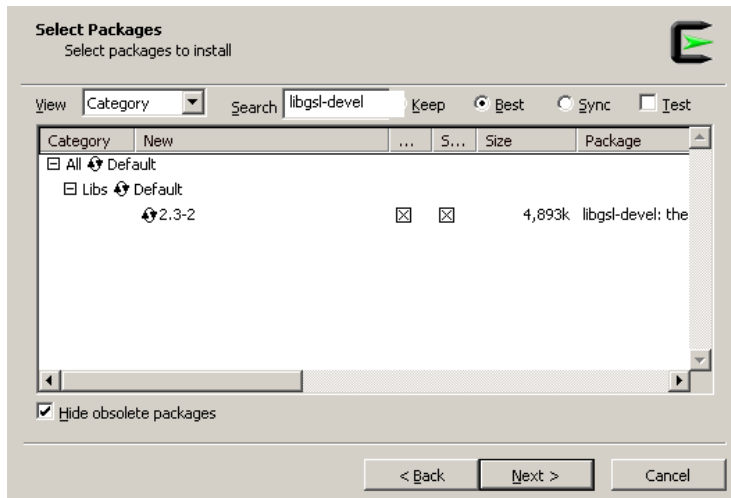
Installation

Windows



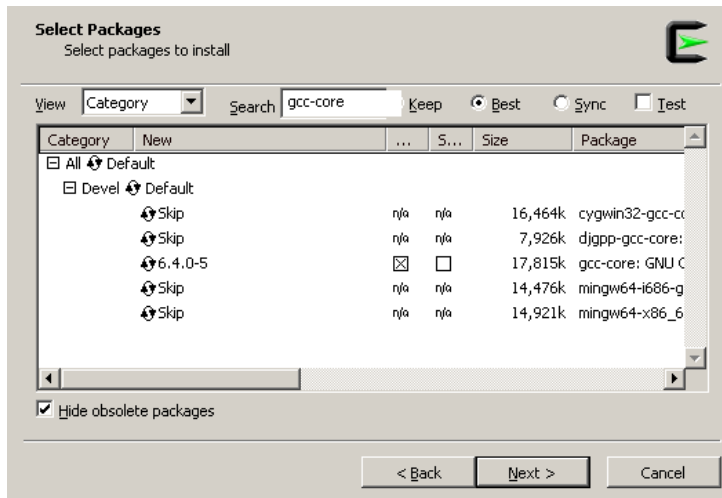
Installation

Windows



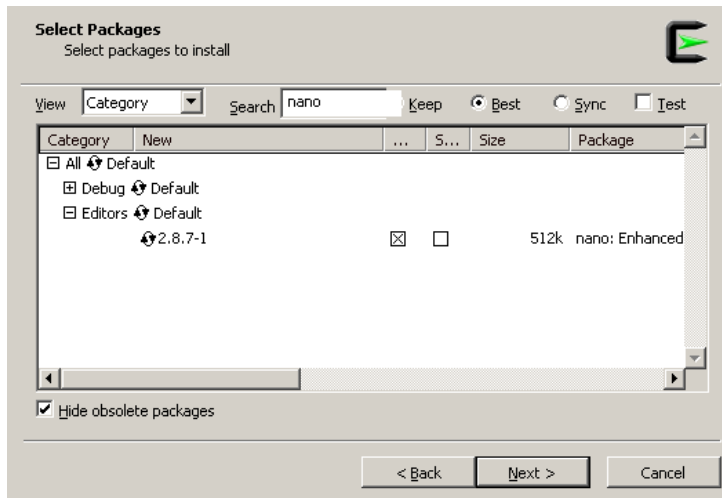
Installation

Windows



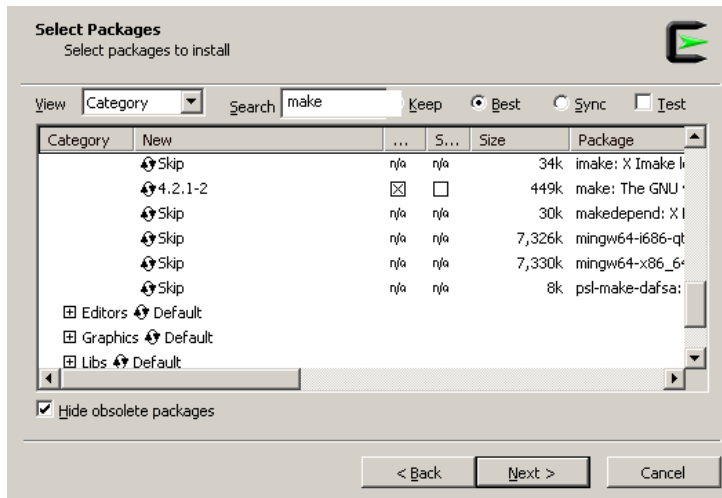
Installation

Windows



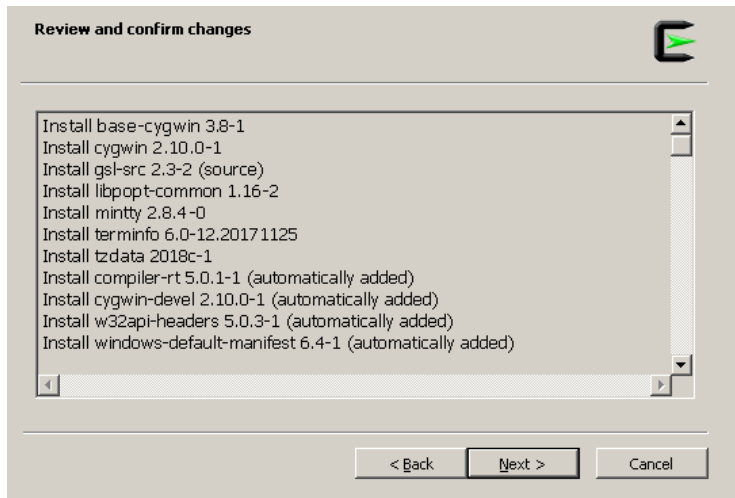
Installation

Windows




Installation

Windows



Installation

Windows

Create Icons 

Tell setup if you want it to create a few icons for convenient access to the Cygwin environment.

Create icon on Desktop

Add icon to Start Menu

Installation Status
Installation Complete

< Back Finish Cancel

Einführung

Terminalbefehle

- ▶ `pwd`
Gebe aktuelles Verzeichnis aus („print working directory“).
- ▶ `ls`
Liste Dateien im aktuellen Verzeichnis auf.
- ▶ `cd`
Wechsle Verzeichnis („change directory“).
- ▶ `mkdir`
Erzeuge Ordner („make directory“).
- ▶ `touch`
Erzeuge Datei bzw. aktualisiere Zeitstempel
- ▶ `rm`
Entferne Datei oder Ordner (-r) („remove“)
- ▶ `man`
Zugriff auf die Handbücher („manual“)

Einführung

Struktur

Header

```
/usr/include/gsl/gsl_*.h
```

```
#include <gsl/gsl_*.h>
```

Bibliotheken

```
/usr/lib/libgsl.so
```

```
/usr/lib/libgslcblas.so
```

```
$ cc -o test test.c -lgsl -lgslcblas
```

Referenzhandbuch

```
https://gnu.org/software/gsl/doc/latex/gsl-ref.pdf
```

Einführung

Beispiel

Betrachte die `CLAUSEN`-Funktion (GSL, Kapitel 7.6)

Definition

$$Cl_2(\Theta) := - \int_0^\Theta \ln \left(\left| 2 \sin \left(\frac{t}{2} \right) \right| \right) dt$$

Funktion

```
double gsl_sf_clausen(double theta)
```

Header

```
/usr/include/gsl_sf_clausen.h
```

Einführung

Beispiel

```
#include <stdio.h>
#include <gsl/gsl_sf_clausen.h>

int
main(void)
{
    int i;
    double p[] = { 0.0, 0.5, 4.2, 13.0 };

    printf("Clausen-Funktion:\n");
    for (i = 0; i < sizeof(p) / sizeof(*p); i++) {
        printf("\tCl2(%f)\t=\t%f\n", p[i],
            gsl_sf_clausen(p[i]));
    }

    return 0;
}
```

Einführung

Beispiel

Kompilation

```
$ cc -o clausen clausen.c -lgsl -lgslcblas
```

Ausführung

```
$ ./clausen
```

Ausgabe

Clausen-Funktion:

CI2(0.000000) = 0.000000

CI2(0.500000) = 0.848312

CI2(4.200000) = -0.682767

CI2(13.000000) = 0.797088

Ende

Vielen Dank für Ihre Aufmerksamkeit!