Parallel Object Programming C++ Installation manual for the Cygwin™ version

version POP-C++ : 1.1.1
version documentation : 1.0

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1. Introduction

Cygwin™ (http://www.cygwin.com) is a Linux-like environment for Windows. It ports for Windows the main popular GNU software tools. This chapter is a guide to how install and configure Cygwin™ to run POP-C++ ont top of it.

Contents of the distribution

The POP-C++ distribution for Cygwin™ contains 3 directories and 3 files :

- include
  This directory contains the SUN-XDR include file fitted for POP-C++

- src
  This directory contains the source files of POP-C++

- cygwin_packages
  This directory contains the required packages for POP-C++. You will use it if you don't want to download these packages from the internet

- setup_cygwin.exe
  This application is the setup to install Cygwin™. You will use it if you don't want do download it from the internet

- Installation_manual_POPC_Cygwin.pdf
  This is the installation manual for Cygwin™ and POP-C++

- README.TXT
  This file contains some late informations

WARNING :

- **POP-C++ uses à special manufactured xdr.h file. The original one from Cygwin™ will be replaced during the installation of POP-C++. After the installation of Cygwin™ or if Cygwin was already installed, we strongly recommand to save the original xdr.h file before you begin with the installation of POP-C++ in order to be able to reverse this operation.**

Known limitations :

- Actually Cygwin™ ist not able to deal with the use of space character in the directory name. You should be sure that you install and run POP-C++ in a directory which have **no** space in his name

This installation guide is part of the official documentation « Parallel Object Programming C++ User and Installation Manual (version 1.1.1) » . The copyright and licences term for the Cygwin™ version of POP-C++ are the same as for the standard Linux version. Cygwin™ has his own copyright and licences terms, so please see the official documentation of Cygwin™ to know about this.

2. Installing Cygwin

First of all, you need to download the Cygwin™ installer. It can be found at this address: http://www.cygwin.com/setup.exe

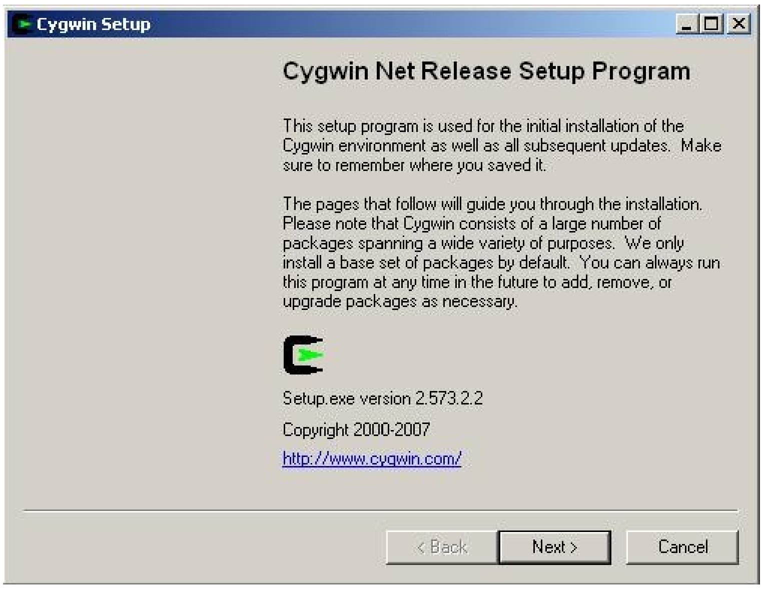
Execute the installer and follow the instructions. Here are the required packages you need to install in order to install POP-C++ later:

devel/autoconf
devel/automake
devel/flex
devel/gcc
devel/make
editors/vim
libs/sunrpc
net/openssh
utils/diffutils
web/wget

Of course, you can select more packages if you need editors or some other stuff.

To simplify the life of people which are not familiar with Cygwin™, you will find here an example of the installation

1. Just after launching the setup you will have an « Welcome » window with some explanation (fig.1.1). Just click « Next »



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.

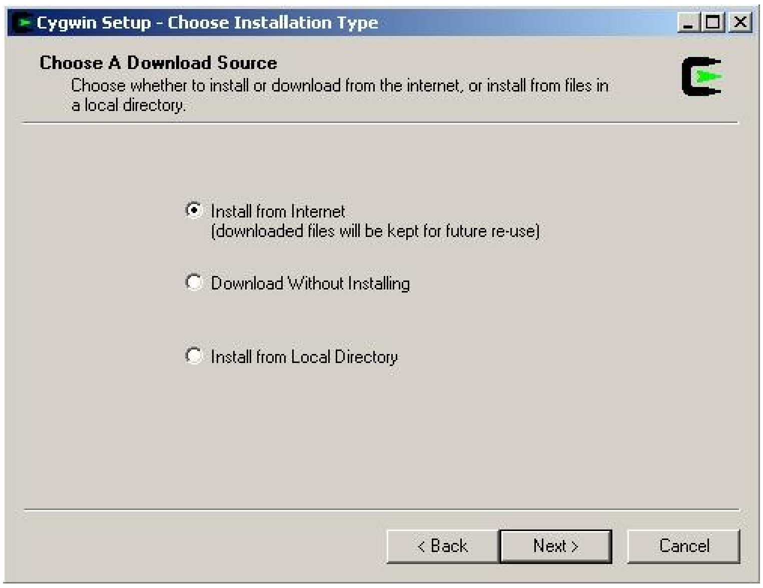
Setup.exe version 2.573.2.2

Copyright 2000-2007

http://www.cygwin.com/

fig 1.1

2. Because the setup needs a lot more files, it ask where do you want take the necessary files. In our example the files were not stored locally so they will be installed from internet (fig.1.2). Choose the installation method and then click « Next »



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)

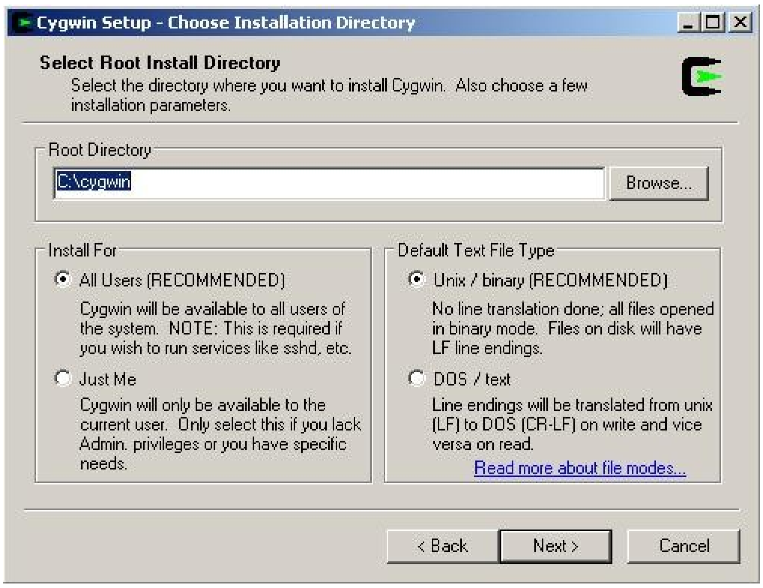
○ Download Without Installing

○ Install from Local Directory

fig 1.2

If you already downloaded the files or download them without installing, you will be of course able to install from local directory without download it again.

3. The setup will now ask where do you want have the root directory. If you don't have special requirement, let all to the default (fig. 1.3). When you have give the suitable informations click « Next »


Cygwin Setup - Choose Installation Directory
Browse...
Read more about file modes...
< Back
Next >
Cancel

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

Root Directory: C:\cygwin

Install For

● All Users (RECOMMENDED)
Cygwin will be available to all users of the system. NOTE: This is required if you wish to run services like sshd, etc.

○ Just Me
Cygwin will only be available to the current user. Only select this if you lack Admin. privileges or you have specific needs.

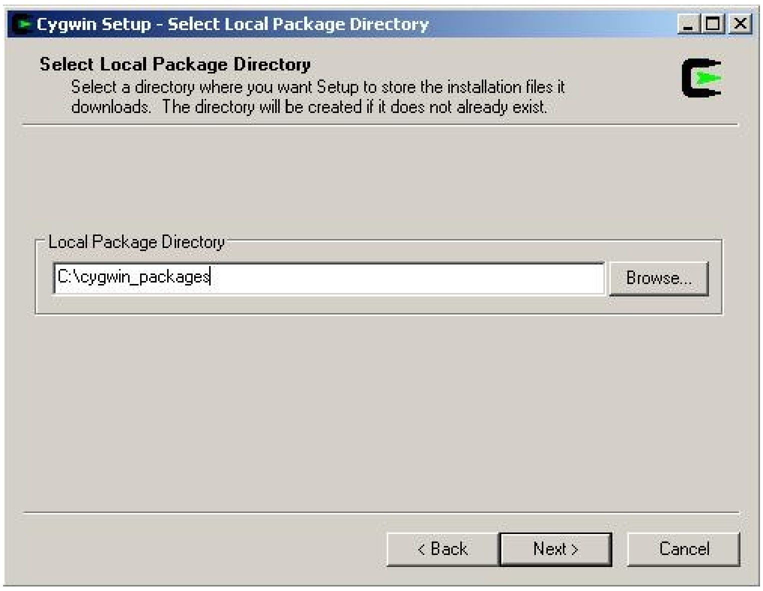
Default Text File Type

● Unix / binary (RECOMMENDED)
No line translation done; all files opened in binary mode. Files on disk will have LF line endings.

○ DOS / text
Line endings will be translated from unix (LF) to DOS (CR-LF) on write and vice versa on read.

fig 1.3

4. If you are installing from the internet or just download the files you need to inform the setup where it must store the needed files for the installation (fig. 1.4). In this example, the files will be downloaded to the directory c:\cygwin_packages. You can choose the directory you want but should not be the same as the root directory.



Cygwin Setup - Select Local Package Directory

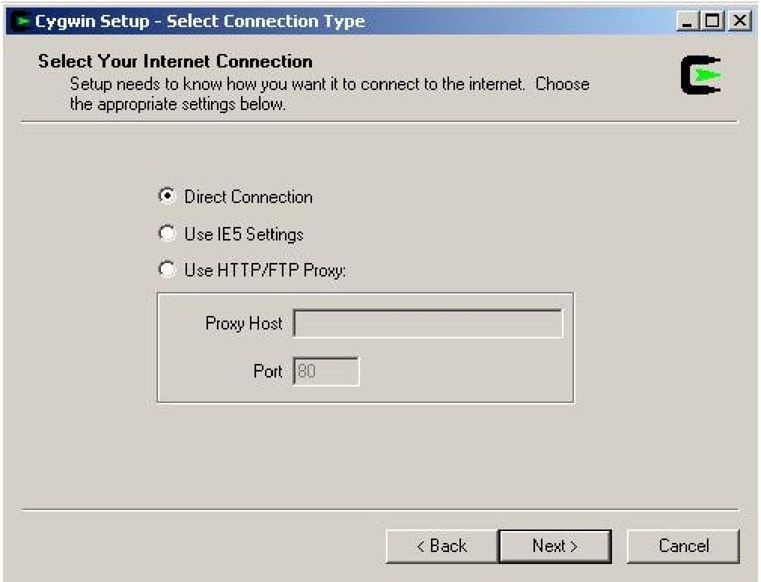
Select Local Package Directory

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: C:\cygwin_packages

fig 1.4

5. In case of downloading (just downloading or with installation) the setup will ask you how you are connected to the internet (fig. 1.5) Select the correct connection and confirm with a click on « Next »



Cygwin Setup - Select Connection Type

Select Your Internet Connection

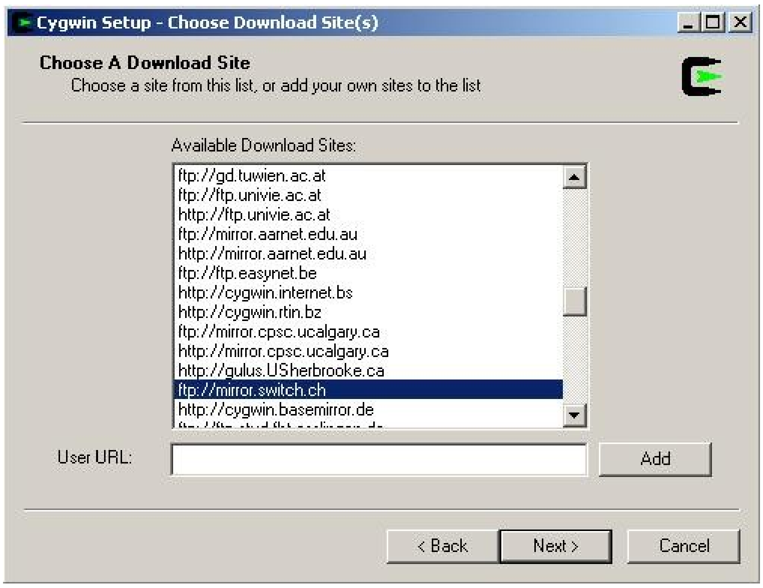
Setup needs to know how you want it to connect to the internet. Choose the appropriate settings below.

● Direct Connection
○ Use IE5 Settings
○ Use HTTP/FTP Proxy:

Proxy Host:
Port: 80

fig 1.5

6. To avoid the use of unnecessary router around the world, select a mirror in your region from where the setup will download the necessary files (fig 1.6) and click « Next »



Cygwin Setup - Choose Download Site(s)

Choose A Download Site
Choose a site from this list, or add your own sites to the list

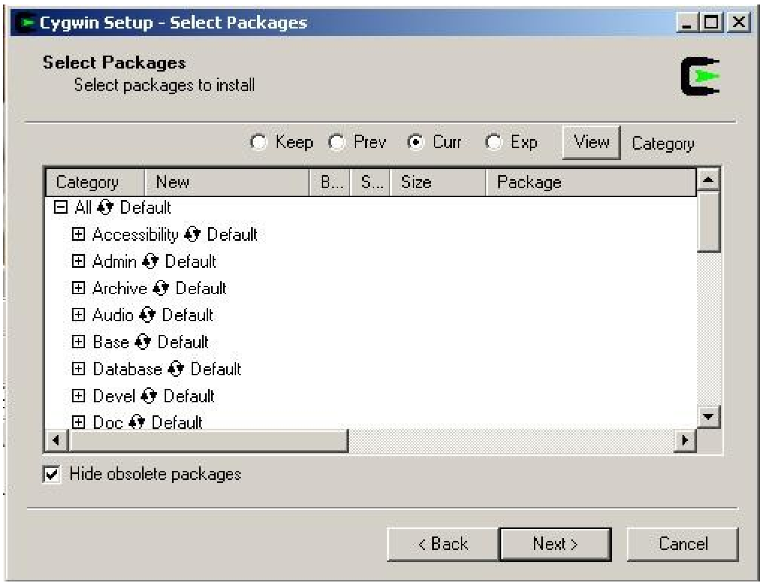
Available Download Sites:

```
ftp://gd.tuwien.ac.at
ftp://ftp.univie.ac.at
http://ftp.univie.ac.at
ftp://mirror.aarnet.edu.au
http://mirror.aarnet.edu.au
ftp://ftp.easynet.be
http://cygwin.internet.bs
http://cygwin.rtin.bz
ftp://mirror.cpsc.ucalgary.ca
http://mirror.cpsc.ucalgary.ca
http://gulus.USherbrooke.ca
ftp://mirror.switch.ch
http://cygwin.basemirror.de
```

User URL:

fig 1.6

7. To avoid unnecessary traffic due to transfert from unnecessary files, you will be asked now to select the packages you need (fig 1.7). If you don't know exactly which is the purpose of the option on the top, just let « Curr » (current) active and let the obsoleted package hided (at the bottom of the window)



Cygwin Setup - Select Packages

Select Packages
Select packages to install

○ Keep ○ Prev ● Curr ○ Exp View Category

Category	New	B...	S...	Size	Package
⊟ All ♲ Default					
⊞ Accessibility ♲ Default					
⊞ Admin ♲ Default					
⊞ Archive ♲ Default					
⊞ Audio ♲ Default					
⊞ Base ♲ Default					
⊞ Database ♲ Default					
⊞ Devel ♲ Default					
⊞ Doc ♲ Default					

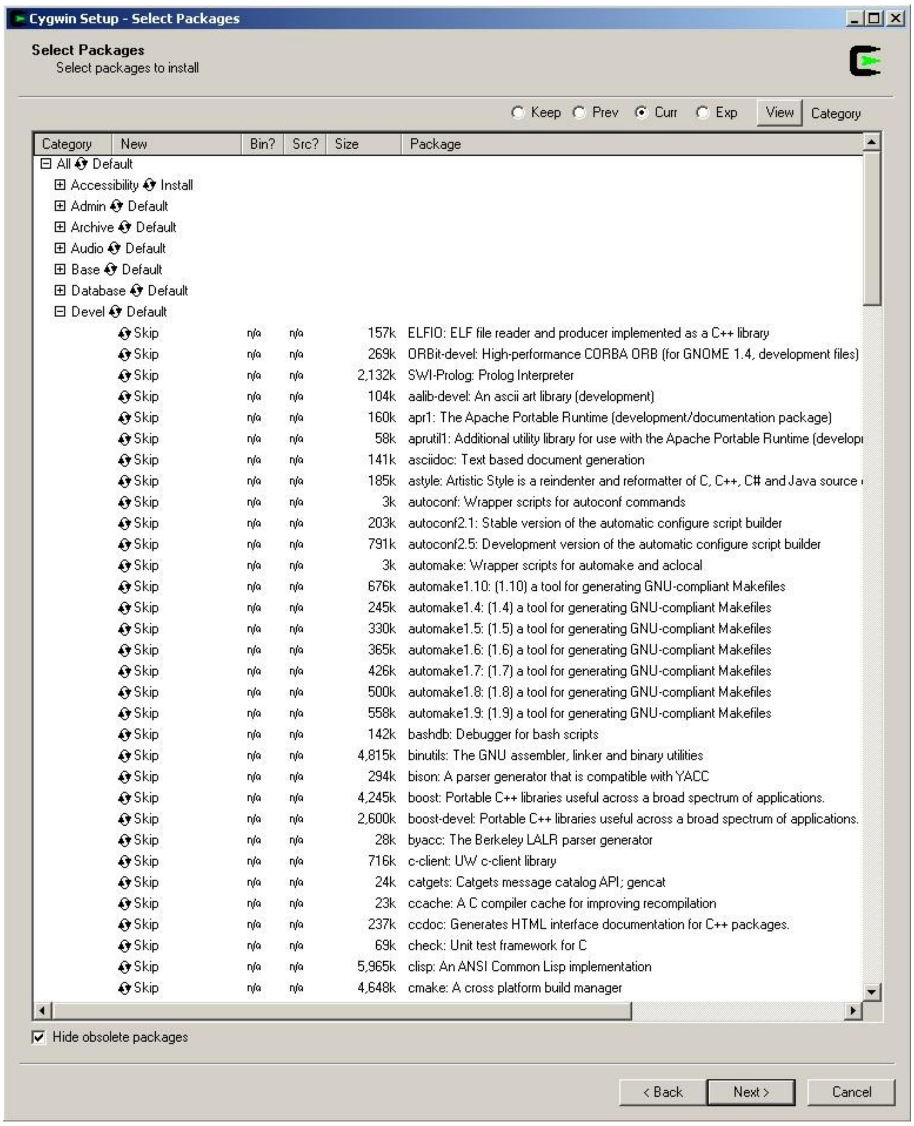
☑ Hide obsolete packages

fig 1.7

The following operations are the most complicated part of the installation of Cygwin™.

8. When you will install a package from a group, you need to click on the cross on the left of the package group to expand the group.

9. To select a package, click once on « Skip » on the left of the package you will install (fig. 1.8)



Select Packages

Select packages to install

○ Keep ○ Prev ● Curr ○ Exp View Category

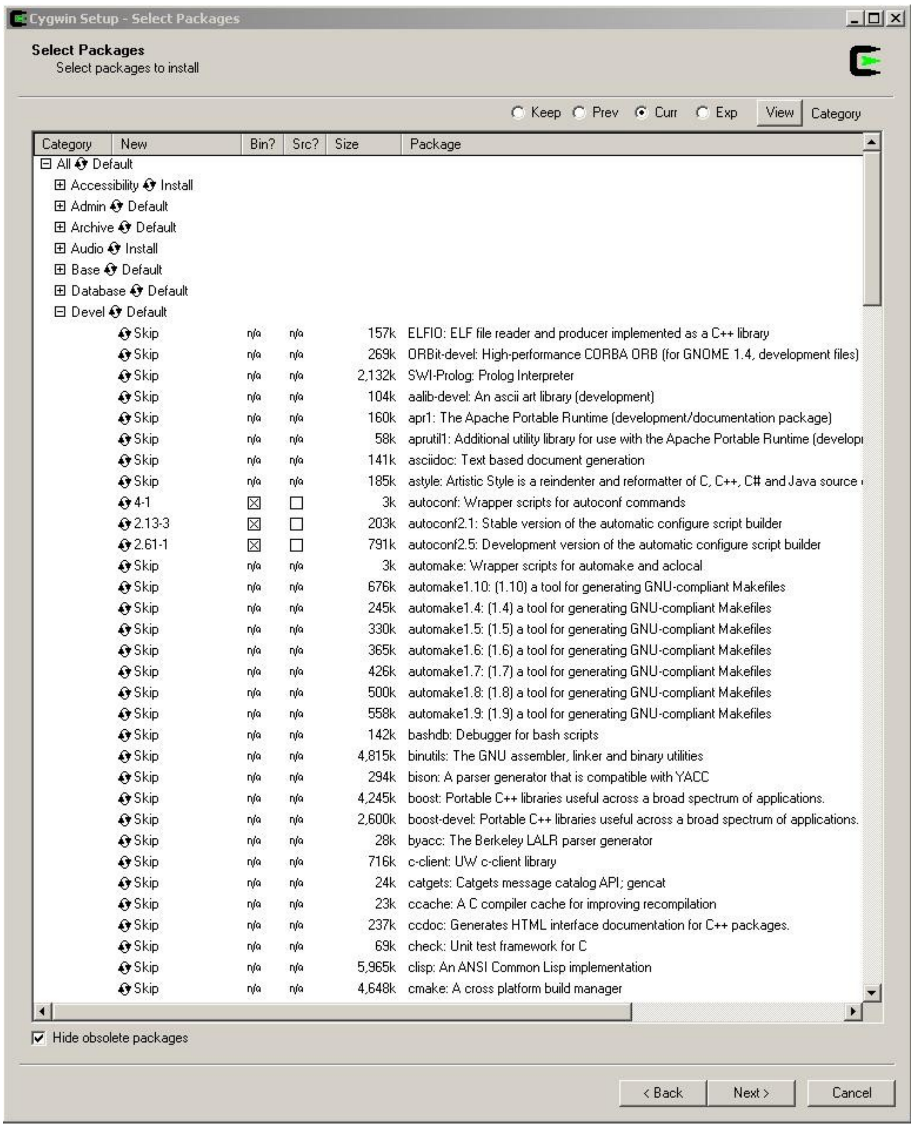
Category	New	Bin?	Src?	Size	Package
⊟ All ⟳ Default					
⊞ Accessibility ⟳ Install					
⊞ Admin ⟳ Default					
⊞ Archive ⟳ Default					
⊞ Audio ⟳ Default					
⊞ Base ⟳ Default					
⊞ Database ⟳ Default					
⊟ Devel ⟳ Default					
	⟳ Skip	n/a	n/a	157k	ELFIO: ELF file reader and producer implemented as a C++ library
	⟳ Skip	n/a	n/a	269k	ORBit-devel: High-performance CORBA ORB (for GNOME 1.4, development files)
	⟳ Skip	n/a	n/a	2,132k	SWI-Prolog: Prolog Interpreter
	⟳ Skip	n/a	n/a	104k	aalib-devel: An ascii art library (development)
	⟳ Skip	n/a	n/a	160k	apr1: The Apache Portable Runtime (development/documentation package)
	⟳ Skip	n/a	n/a	58k	aprutil1: Additional utility library for use with the Apache Portable Runtime (develop
	⟳ Skip	n/a	n/a	141k	asciidoc: Text based document generation
	⟳ Skip	n/a	n/a	185k	astyle: Artistic Style is a reindenter and reformatter of C, C++, C# and Java source
	⟳ Skip	n/a	n/a	3k	autoconf: Wrapper scripts for autoconf commands
	⟳ Skip	n/a	n/a	203k	autoconf2.1: Stable version of the automatic configure script builder
	⟳ Skip	n/a	n/a	791k	autoconf2.5: Development version of the automatic configure script builder
	⟳ Skip	n/a	n/a	3k	automake: Wrapper scripts for automake and aclocal
	⟳ Skip	n/a	n/a	676k	automake1.10: (1.10) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	245k	automake1.4: (1.4) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	330k	automake1.5: (1.5) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	365k	automake1.6: (1.6) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	426k	automake1.7: (1.7) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	500k	automake1.8: (1.8) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	558k	automake1.9: (1.9) a tool for generating GNU-compliant Makefiles
	⟳ Skip	n/a	n/a	142k	bashdb: Debugger for bash scripts
	⟳ Skip	n/a	n/a	4,815k	binutils: The GNU assembler, linker and binary utilities
	⟳ Skip	n/a	n/a	294k	bison: A parser generator that is compatible with YACC
	⟳ Skip	n/a	n/a	4,245k	boost: Portable C++ libraries useful across a broad spectrum of applications.
	⟳ Skip	n/a	n/a	2,600k	boost-devel: Portable C++ libraries useful across a broad spectrum of applications.
	⟳ Skip	n/a	n/a	28k	byacc: The Berkeley LALR parser generator
	⟳ Skip	n/a	n/a	716k	c-client: UW c-client library
	⟳ Skip	n/a	n/a	24k	catgets: Catgets message catalog API; gencat
	⟳ Skip	n/a	n/a	23k	ccache: A C compiler cache for improving recompilation
	⟳ Skip	n/a	n/a	237k	ccdoc: Generates HTML interface documentation for C++ packages.
	⟳ Skip	n/a	n/a	69k	check: Unit test framework for C
	⟳ Skip	n/a	n/a	5,965k	clisp: An ANSI Common Lisp implementation
	⟳ Skip	n/a	n/a	4,648k	cmake: A cross platform build manager

☑ Hide obsolete packages

fig 1.8

You will see that a number will replace « skip » and that also some other lines are changed. The number indicate the version number of the package and the other lines which are also changed are packages which are required from your selected package. You will also see that under the column « Bin? » the « n/a » ist replaced by a square with a cross. This indicate that the binary of the package will be installed. If you don't really need the source, let the square under « Src? » empty.

So, as indicated above, you will need to install the package « autoconf » from the group « devel » and you will become a window like this bellow (fig 1.9). You can ignore all lines which contain no required for the installation of POP-C++. You will also see that some packages are installed by default. These packages are needed from Cygwin™ itself so that it can provide the basic services. Of course, depending when you download the packages, the number of the version can change but the principle leave the same.



Cygwin Setup - Select Packages

Select Packages
Select packages to install

○ Keep ○ Prev ● Curr ○ Exp View Category

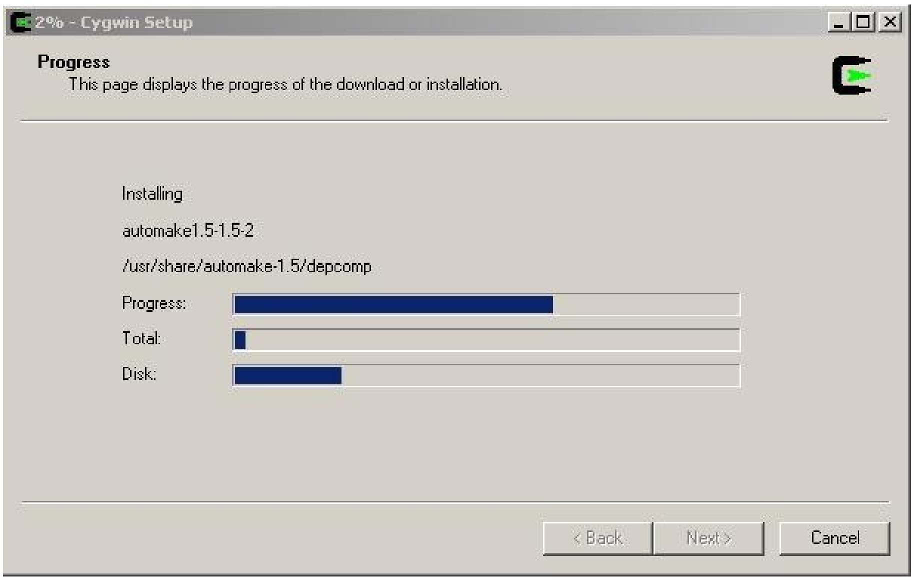
Category	New	Bin?	Src?	Size	Package
⊟ All Default					
⊞ Accessibility Install					
⊞ Admin Default					
⊞ Archive Default					
⊞ Audio Install					
⊞ Base Default					
⊞ Database Default					
⊟ Devel Default					
	Skip	n/a	n/a	157k	ELFIO: ELF file reader and producer implemented as a C++ library
	Skip	n/a	n/a	269k	ORBit-devel: High-performance CORBA ORB (for GNOME 1.4, development files)
	Skip	n/a	n/a	2,132k	SWI-Prolog: Prolog Interpreter
	Skip	n/a	n/a	104k	aalib-devel: An ascii art library (development)
	Skip	n/a	n/a	160k	apr1: The Apache Portable Runtime (development/documentation package)
	Skip	n/a	n/a	58k	aprutil1: Additional utility library for use with the Apache Portable Runtime (develop
	Skip	n/a	n/a	141k	asciidoc: Text based document generation
	Skip	n/a	n/a	185k	astyle: Artistic Style is a reindenter and reformatter of C, C++, C# and Java source
	4-1	☒	□	3k	autoconf: Wrapper scripts for autoconf commands
	2.13-3	☒	□	203k	autoconf2.1: Stable version of the automatic configure script builder
	2.61-1	☒	□	791k	autoconf2.5: Development version of the automatic configure script builder
	Skip	n/a	n/a	3k	automake: Wrapper scripts for automake and aclocal
	Skip	n/a	n/a	676k	automake1.10: (1.10) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	245k	automake1.4: (1.4) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	330k	automake1.5: (1.5) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	365k	automake1.6: (1.6) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	426k	automake1.7: (1.7) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	500k	automake1.8: (1.8) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	558k	automake1.9: (1.9) a tool for generating GNU-compliant Makefiles
	Skip	n/a	n/a	142k	bashdb: Debugger for bash scripts
	Skip	n/a	n/a	4,815k	binutils: The GNU assembler, linker and binary utilities
	Skip	n/a	n/a	294k	bison: A parser generator that is compatible with YACC
	Skip	n/a	n/a	4,245k	boost: Portable C++ libraries useful across a broad spectrum of applications.
	Skip	n/a	n/a	2,600k	boost-devel: Portable C++ libraries useful across a broad spectrum of applications.
	Skip	n/a	n/a	28k	byacc: The Berkeley LALR parser generator
	Skip	n/a	n/a	716k	c-client: UW c-client library
	Skip	n/a	n/a	24k	catgets: Catgets message catalog API; gencat
	Skip	n/a	n/a	23k	ccache: A C compiler cache for improving recompilation
	Skip	n/a	n/a	237k	ccdoc: Generates HTML interface documentation for C++ packages.
	Skip	n/a	n/a	69k	check: Unit test framework for C
	Skip	n/a	n/a	5,965k	clisp: An ANSI Common Lisp implementation
	Skip	n/a	n/a	4,648k	cmake: A cross platform build manager

☑ Hide obsolete packages

< Back Next > Cancel

fig 1.9

Once the last required package is selected, click on « next » to continue the installation which is the downloading from the packages (fig. 1.10)



2% - Cygwin Setup

Progress

This page displays the progress of the download or installation.

Installing

automake1.5-1.5-2

/usr/share/automake-1.5/depcomp

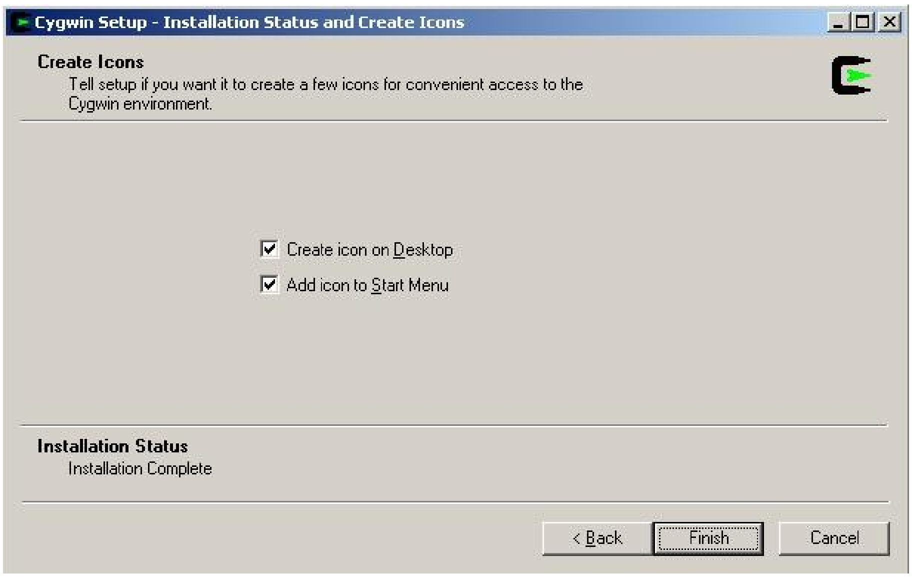
Progress:

Total:

Disk:

fig 1.10

When the packages are downloaded and installed the setup ask if you want to create some shorcuts. Select both options and click « Finish » to complete the installation of Cygwin™ (fig. 1.11)



Cygwin Setup - Installation Status and Create Icons

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

fig 1.11

3. Configuration of Cygwin™

3.1 Changing Windows variables

Before continuing the configuration of Cygwin™, you need to changes some Windows variables.

To do this, click with the right button on « My Computer » and left click on « properties » (fig 3.1)

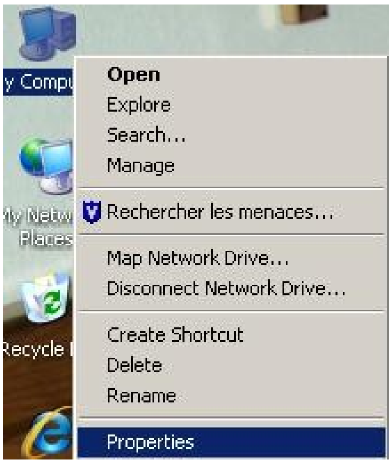
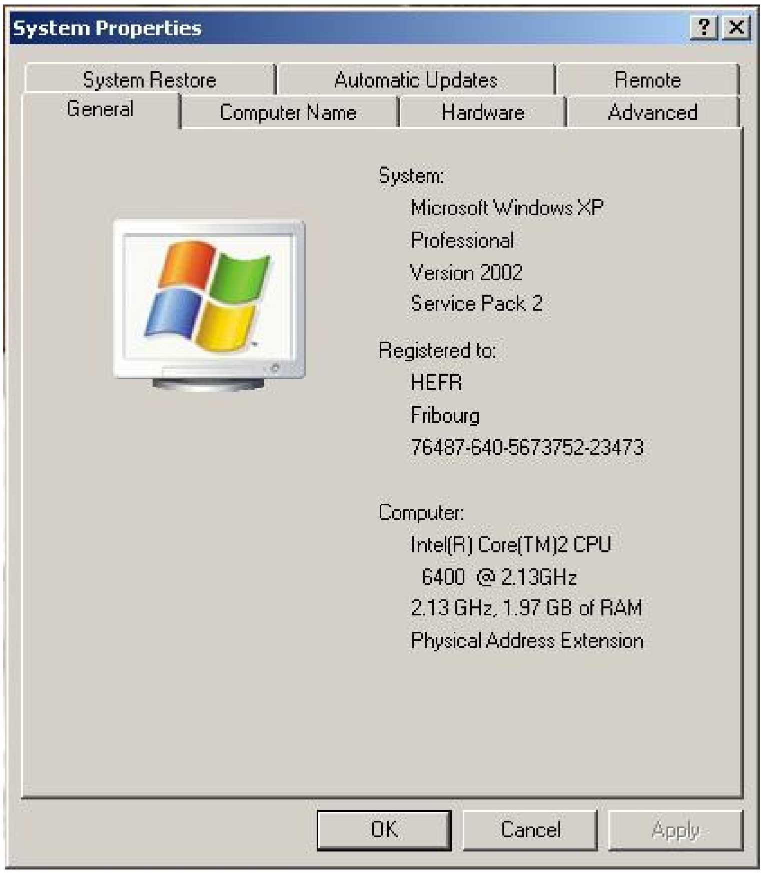


fig 3.1

then click on the « Advanced » (fig 3.2) tab.



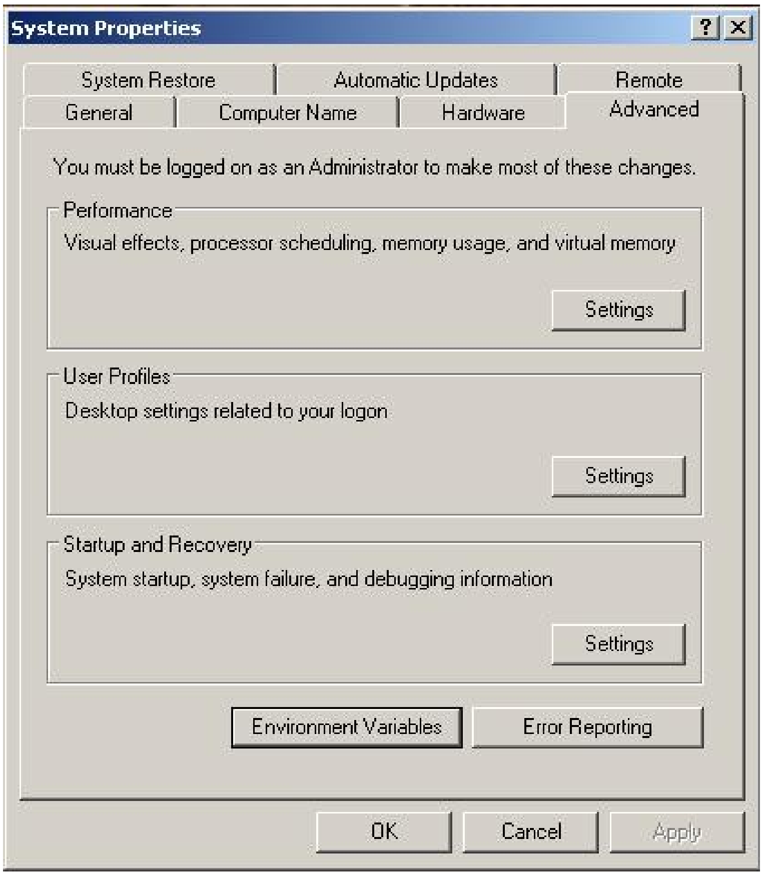
System:
Microsoft Windows XP
Professional
Version 2002
Service Pack 2

Registered to:
HEFR
Fribourg
76487-640-5673752-23473

Computer:
Intel(R) Core(TM)2 CPU
6400 @ 2.13GHz
2.13 GHz, 1.97 GB of RAM
Physical Address Extension

Fig 3.2

To acces the Windows variables just click on « Environment Variables » (fig 3.3)



You must be logged on as an Administrator to make most of these changes.

Performance

Visual effects, processor scheduling, memory usage, and virtual memory

User Profiles

Desktop settings related to your logon

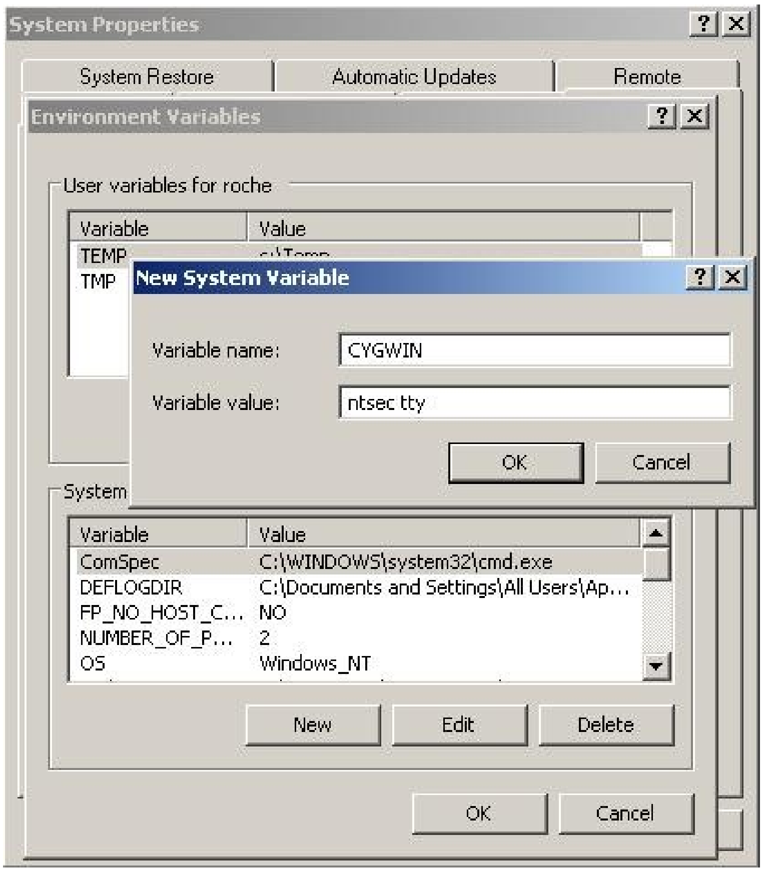
Startup and Recovery

System startup, system failure, and debugging information

fig 3.3

We can now make the necessary changes. First we add a new system variable called « CYGWIN » which have the value « **ntsec tty** ». To do this, we click on the « new » button in the System variable area. A new window will apear and you can fill both areas as displayed on fig. 3.4 Accept the modification with a click on the « Ok » button.

You also have to add the path of the binary of Cygwin™. Select the variable named « Path » in the system variables area (fig 3.5) and click on the « edit » button. A new window will appear. Go to the end of the variable value and append « ;c:\cygwin\bin » to the existing variable string. Accept the modification with a click on the « Ok » button



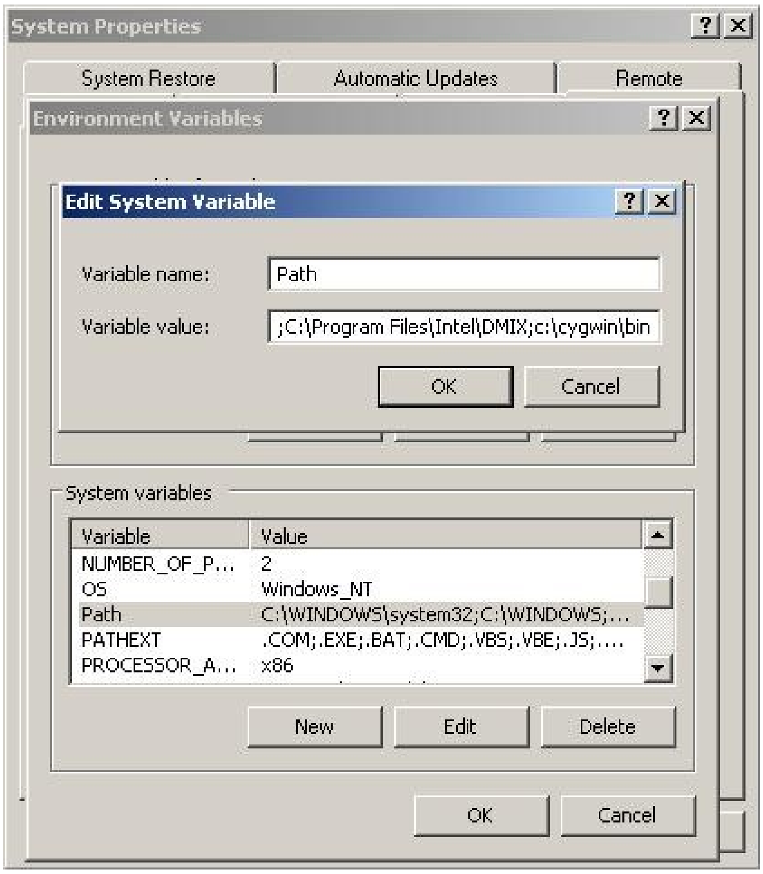
Variable	Value
TEMP	c:\Temp
TMP	

Variable name: CYGWIN

Variable value: ntsec tty

Variable	Value
ComSpec	C:\WINDOWS\system32\cmd.exe
DEFLOGDIR	C:\Documents and Settings\All Users\Ap...
FP_NO_HOST_C...	NO
NUMBER_OF_P...	2
OS	Windows_NT

fig 3.4



Variable name: Path

Variable value: ;C:\Program Files\Intel\DMIX;c:\cygwin\bin

Variable	Value
NUMBER_OF_P...	2
OS	Windows_NT
Path	C:\WINDOWS\system32;C:\WINDOWS;...
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;....
PROCESSOR_A...	x86

fig 3.5

3.2 Configuring Cygwin™

3.2.1 Configuring users

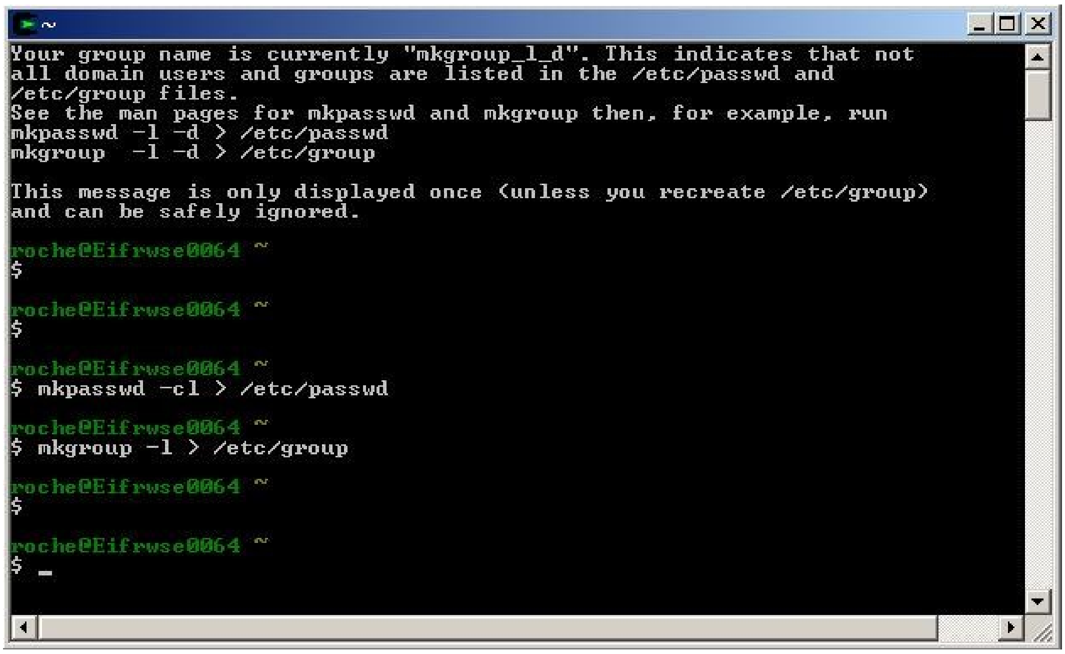
You need to synchronize users defined in Windows with Cygwin™. Open a Cygwin™ window with a double-click on the Cygwin™ icon (fig 3.6)

fig 3.6

and run the following commands

```
mkpasswd -cl > /etc/passwd
mkgroup -l > /etc/group
```

as shown on fig 3.7



```
Your group name is currently "mkgroup_l_d". This indicates that not
all domain users and groups are listed in the /etc/passwd and
/etc/group files.
See the man pages for mkpasswd and mkgroup then, for example, run
mkpasswd -l -d > /etc/passwd
mkgroup  -l -d > /etc/group

This message is only displayed once (unless you recreate /etc/group)
and can be safely ignored.

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$ mkpasswd -cl > /etc/passwd

roche@Eifrwse0064 ~
$ mkgroup -l > /etc/group

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$ _
```

fig 3.7

3.2.2 Configuring SSH server

To run properly a POP-C++ applicatin, you need to have a SSH server running on your machine. You must open a Cygwin™ window in order to configure the SSH server. When you are at the prompt, type the following command:

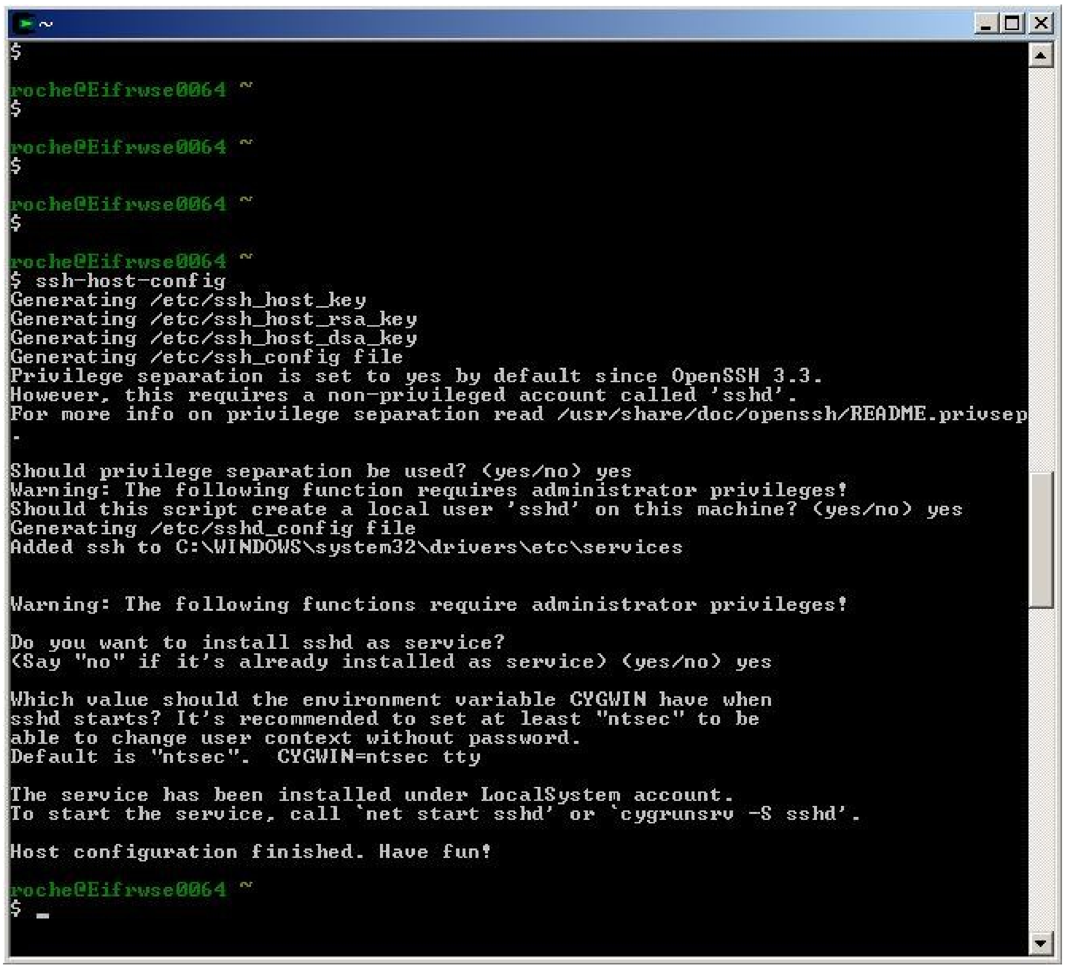
```
ssh-host-config
```

This program will ask you several questions:

to « privilege separation », answer **yes**
to « create local user sshd », answer **yes**

to « install sshd as service », answer **yes**
to « CYGWIN = », your answer must be **ntsec tty**

As shown on fig. 3.8



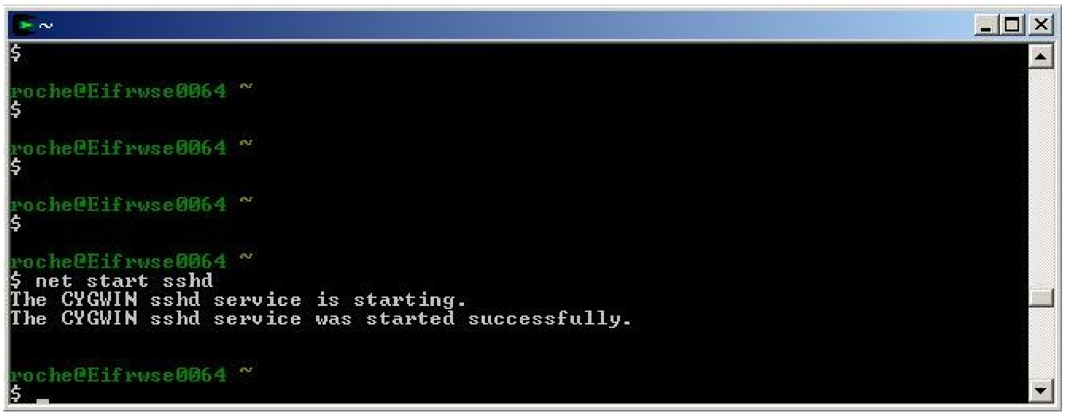
```
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$ ssh-host-config
Generating /etc/ssh_host_key
Generating /etc/ssh_host_rsa_key
Generating /etc/ssh_host_dsa_key
Generating /etc/ssh_config file
Privilege separation is set to yes by default since OpenSSH 3.3.
However, this requires a non-privileged account called 'sshd'.
For more info on privilege separation read /usr/share/doc/openssh/README.privsep
.

Should privilege separation be used? (yes/no) yes
Warning: The following function requires administrator privileges!
Should this script create a local user 'sshd' on this machine? (yes/no) yes
Generating /etc/sshd_config file
Added ssh to C:\WINDOWS\system32\drivers\etc\services


Warning: The following functions require administrator privileges!

Do you want to install sshd as service?
(Say "no" if it's already installed as service) (yes/no) yes

Which value should the environment variable CYGWIN have when
sshd starts? It's recommended to set at least "ntsec" to be
able to change user context without password.
Default is "ntsec".  CYGWIN=ntsec tty

The service has been installed under LocalSystem account.
To start the service, call `net start sshd' or `cygrunsrv -S sshd'.

Host configuration finished. Have fun!

roche@Eifrwse0064 ~
$ _
```

fig 3.8

SSH is now configured and it should be possible to start the server using the following command:

```
net start sshd
```

as shown on fig. 3.9



```
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$

roche@Eifrwse0064 ~
$ net start sshd
The CYGWIN sshd service is starting.
The CYGWIN sshd service was started successfully.


roche@Eifrwse0064 ~
$ _
```

fig. 3.9

4. Standard installation of POP-C++ for Cygwin™

The installation of POP-C++ on Cygwin™ is done with very few differences than the POP-C++ installation on traditional Linux machine as described in the standard POP-C++ documentation available at http://www.eif.ch/gridgroup/popc.

To install POP-C++ on Cygwin™ you can follow the procedure below :

Go to the directory where you have copied and decompress the sources of POP-C++.

The new xdr.h file is a special manufacturing for POP-C++ and could cause problem if you use other applications which use the standard one ! We strongly recommend to save the original xdf.h file in order to be able to reverse this operation

Before we begin with the compilation you have to copy the file **xdr.h** located in the directory **/distrib_1.1.1/include** in the directory **/usr/include/rpc** to replace the original one.

Enter the command

```
./configure
```

Once this command is terminated, go to the directory **parser** by entering the command

```
cd parser
```

now we start the make command with the parameter LDFLAGS="-lfl"

```
make LDFLAG="-lfl"
```

This will make the compilation of the parser. When this is finished we go back to the source directory with the command

```
cd ..
```

now we make the compilation of the rest of POP-C++ with the command

```
make
```

followed by the

```
make install
```

Once this is finished, POP-C++ for the Cygwin™ is ready to work.