## Building Cantera 1.5.4 from Source Code on a Windows PC

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#### This presentation covers...

How to build the Cantera kernel from the source code using Visual C++ / Visual Fortran

How to build the Cantera Python interface

How to build the Cantera MATLAB toolbox

## Before we start... are you *sure* you want to build Cantera from source code?

Do you only want to use Cantera from Python or Matlab?

If so, you can use the binary installer for Windows. Just download and run Cantera154.msi, and skip everything described here!

But if you want to use Cantera from Visual C++ or Fortran on a Windows PC, continue to the next slide...

## Getting Ready...

#### Things you will need before you start

#### A PC with Windows XP or 2000

#### Compilers

- Microsoft Visual C++ 6.0
- Compaq Digital Fortran 6.0
- other compilers may work too but have not been tested

#### Free downloads

- The cygwin unix-like environment for Windows
- Python
- Numeric Extensions for Python (NumPy)

## Why is cygwin needed?

- Cantera is designed to work on multiple platforms, including linux, unix, and Mac OS X
- On the other platforms, the GNU 'make' utility is used to build Cantera
- Impractical to maintain an entirely separate build procedure for Windows
- By installing cygwin, Windows PCs can use standard unix-like command-line tools, including `make'

#### Why is Python needed?

- Python is an easy-to-use, cross-platform scripting language
  - much more powerful than DOS or `cmd.exe'
  - much easier to use than 'sh' or 'perl'

The Cantera build procedure writes and runs some Python scripts

 Cantera also uses Python during operation to parse Cantera input files ('CTI Files')

 (If you take an hour or so to learn Python, you'll find lots of uses for it too)

#### Why is NumPy needed?

Adds fast MATLAB-like array functions to Python

Required only if you want to use Cantera from Python

Not needed if you only plan to use Python to process .cti files

#### Installing cygwin

Get it from <u>http://www.cygwin.com</u> by running setup.exe

When asked whether you want DOS or unix files, choose DOS

You only need a minimal installation
make, sed, and bash are required
everything else is optional

### **Installing Python**

Information about Python is at <a href="http://www.python.org">http://www.python.org</a>

Run this to install Python: <u>http://www.python.org/ftp/python/2.3.4/Python-</u> <u>2.3.4.exe</u>

### Installing NumPy

Go to <u>http://sourceforge.net/projects/numpy</u>

Under "latest file releases," select numpy

Download and run Numeric-23.1.win32py2.3.exe (or the latest version available)

#### Get the Cantera source code

Go to <u>http://sourceforge.net/projects/cantera</u>

Under "latest file releases," select package cantera

Get file cantera-1.5.4-src.zip

Extract its contents somewhere other than where you plan to install Cantera (e.g., not in c:\cantera)

#### **Configuring the Installation**

- Double-click the cygwin icon on the desktop to open a cygwin shell window
- `cd' to the directory where you extracted the Cantera source code, and type 'configure' to run the configuration script

E Select Cygwin	
dgg@DGGVAI0:~>cd_dv/sf/cantera dgg@DGGVAI0:~/dv/sf/cantera>configure	
Cantera Configuration Script	
Cantera will be installed in c:/cantera checking host system type i686-pc-cygwin	
checking target system type i686-pc-cygwin checking build system type i686-pc-cygwin checking for python2 no checking for python /cygdrive/c/python23/python	
checking for matlab //D/MATLAB6p5/bin/win32/matlab Windows MATLAB command: D:/MATLAB6p5/bin/win32/matlab checking for a BSD compatible install /usr/bin/install -c	2
checking SOdll creating ./config.status creating/Cantera/Makefile	
creating/Cantera/src/Makefile creating/Cantera/src/zeroD/Makefile creating/Cantera/src/oneD/Makefile	Hint: to refer to a DOS drive letter in cygwin, do it like this:
creating/Cantera/src/converters/Makefile	/cygdrive/c, /cygdrive/d etc.

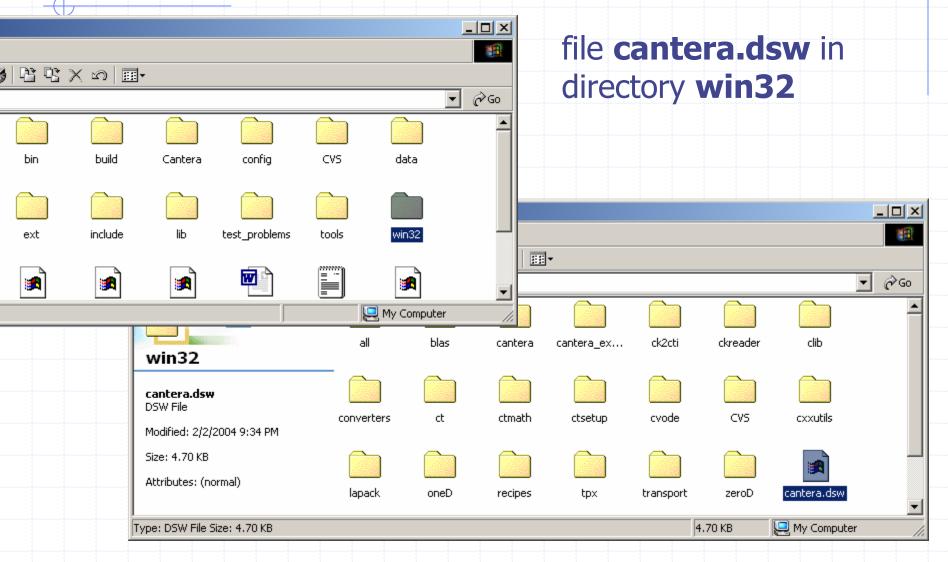
#### Choosing the Installation Directory

Sy default, Cantera will be installed in c:\cantera

To change this default, edit the configure script before running it

 Change variable CANTERA\_INSTALL\_DIR to the desired installation location

# Now open the Cantera Visual Studio project file

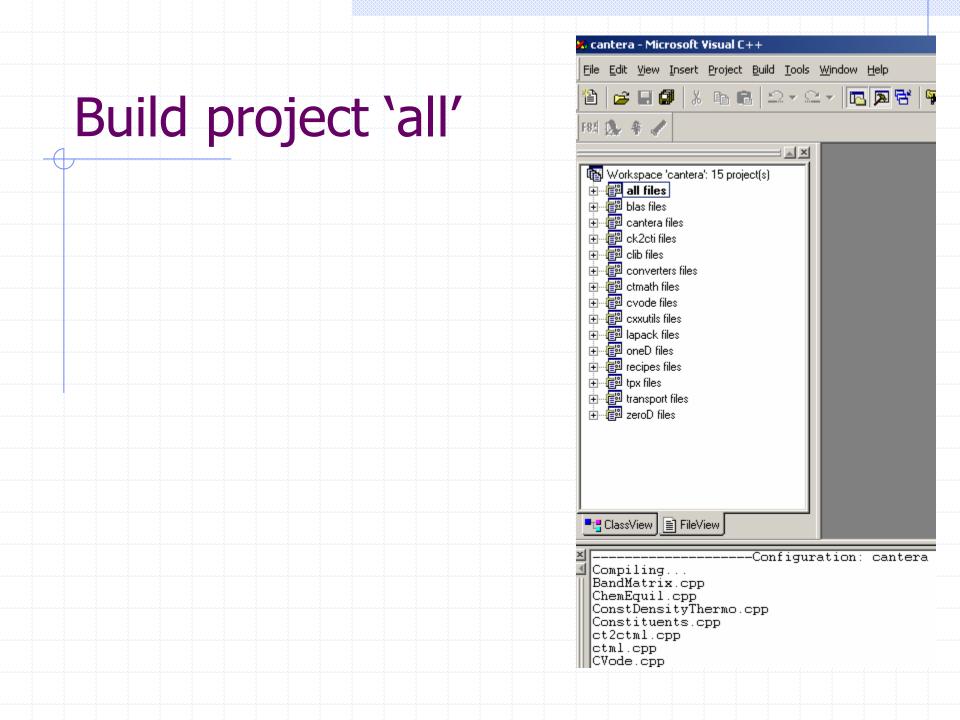


#### Set the active configuration

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#### Finish the Installation

When the build of project 'all' finishes, return to the cygwin window

type 'make win' to build the Python interface and MATLAB toolbox

type `make win-install' to install everything

you should now have a functional Cantera installation

#### The installation directory should look like this when 'make win-install' finishes

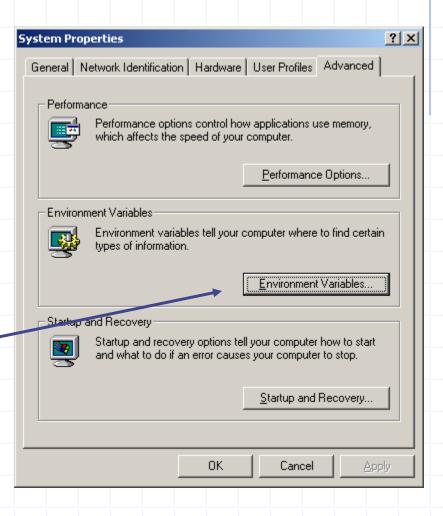
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#### Finishing Up

Cantera needs to know where to find the Python interpreter, since it uses Python to process '.cti' input files

To edit the system search path, select "System" on the Control Panel to pull up this dialogue box

Press the 'Environment Variables' button



#### Edit the PATH environment variable

Edit User ¥ariable

Variable <u>N</u>ame:

Variable <u>V</u>alue:

path

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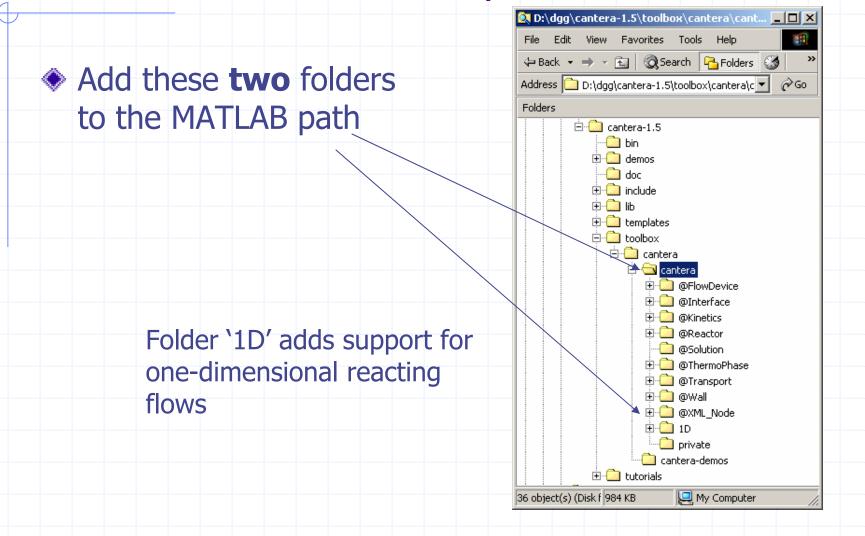
	OK Cancel
>	Add C:\PYTHON23 (or
	wherever you installed
	Python 2.3) to the PATH
	environment variable (use
	or system)

io\VC98\bin;d:\gs\gs7.00\bin;<mark>c:\python23</mark>

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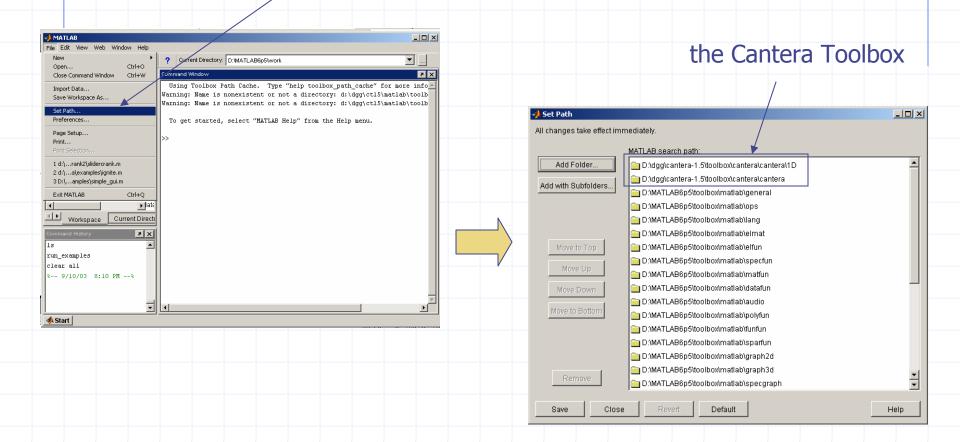
 Use a semicolon between paths

#### If you will use MATLAB, put the Cantera Toolbox on the MATLAB path



#### Setting the Path in Matlab

#### choose 'Set Path...' on the File menu



If desired, the Cantera toolbox can be moved to the folder containing other toolboxes (or anywhere else)

#### Now try it out!

If you have done everything described here, you should have a functioning Cantera 1.5.4 installation! (Congratulations.)

 Running the Python and MATLAB demonstration scripts is a good way to test your installation