EPICS on Win32

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April 24, 2008
(Version 0.11)

Contents

Motivation

This document describes how to install EPICS base and synApps extensions on a Windows XP machine. It describes the procedures needed for two *free* environments, Cygwin and MingW with emphasis on MingW approach though.

NOTE: Be sure to add TCP 5064 and UDP 5064 into Windows Firewall exceptions.

Chapter 1

Cygwin

Cygwin is

> ... a Linux-like environment for Windows. It consists of two parts:
>
> - A DLL (cygwin1.dll) which acts as a Linux API emulation layer providing substantial Linux API functionality.
> - A collection of tools which provide Linux look and feel. ...

which says that all compiled binaries require this single DLL to run.

1.1 Install Cygwin

The following descriptions are largely dependent on `http://www.sls.psi.ch/controls/help/howto/CygwinInstallationLog.pdf`, with modifications by my own experience.

1. Fetch and run the latest Cygwin setup from `http://www.cygwin.com/setup.exe`.

2. In the **Choose Installation Directory** page, Root Directory → c:\cygwin
   Default TextFile Type → DOS/text

3. In the **Choose Local Package Directory** page, Local Package Directory → c:\cygwin

4. In the **Choose a Download Site** page, choose `http://mirrors.kernel.org` in the **Available Download Sites** list box.

5. In the **Select Packages** page, select the following packages:

Admin	cygrunsrv
Base	All
Devel	cvs, gcc-core, gcc-g++, gcc-g77, make, readline
Editors	vim, emacs
Interpreters	perl, python
Libs	libncurses-dev, sunrpc
Net	openssh
Utils	file
X11	xorg-x11-base [1]

1.2 Compile EPICS

1. Get EPICS from `http://www.aps.anl.gov/epics/download/base/baseR3.14.9.tar.gz` and decompress it to `C:\epics`

2. open cygwin shell

```
cd /cygdrive/c/epics/base-3.14.9
export EPICS_HOST_ARCH=cygwin-x86
make
```

3. Compiled executables and libraries will be in `C:\epics\base-3.14.9\bin\cygwin-x86` and `C:\epics\base-3.14.9\lib\cygwin-x86` respectively.

4. Run caRepeater as a service,

```
cygrunsrv -I caRepeater \
        -P /cygdrive/c/epics/base-3.14.9/bin/cygwin-x86/caRepeater
cygrunsrv -S caRepeater
```

1.3 Compile synApps

1. Get synApps from `http://www.aps.anl.gov/bcda/synApps/index.php` and decompress it to `C:\epics`

2. Edit `C:\epics\synApps_5_2\config\MASTER_RELEASE` , make changes to reflect our EPICS setup,

```
SUPPORT=/cygdrive/c/epics/synApps_5_2/suppor
EPICS_BASE=/cygdrive/c/epics/base-3.14.9
```

Comment out unwanted packages as you wish and do the same in `Makefile`.[2]

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[1] At the time of writing, X does not work. Error message is `Could not open default font ''Fixed''`. And it cannot be fixed by applying `http://x.cygwin.com/docs/faq/cygwin-x-faq.html#q-error-font-eof`

[2] Because synApps is composed of many small packages, if you upgrade one from the developer's site, make sure this version change is reflected in `MASTER_RELEASE`

3. Open cygwin shell

```
cd /cygdrive/c/epics/synApps_5_2/support/
export EPICS_HOST_ARCH=cygwin-x86
make release
make
```

Chapter 2

MinGW

MinGW stands for Minimalist GNU for Windows. `http://www.mingw.org/` defines its goal as,

> A collection of freely available and freely distributable Windows specific header files and import libraries combined with GNU toolsets that allow one to produce native Windows programs that do not rely on any 3rd-party C runtime DLLs.

which states the difference from Cygwin.

To be noticed, it is possible then to build Windows binaries on Linux hosts. The MinGW crosscompiler is available in modern Linux distributions.

2.1   GNU tool chains

GnuWin32 provides port of useful tools to Windows. I installed the following, emphCoreUtils,FileUtils, Sh-Utils, TextUtils, TextInfo, Grep, Tar, Gzip, Bzip2, Tree. `http://gnuwin32.sourceforge.net/packages.html`

2.2   Install MinGW

1. Download the *Automated MinGW installer*, `http://sourceforge.net/project/showfiles.php?group_id=2435`

2. or following manual installation guide, `http://www.mingw.org/MinGWiki/index.php/Install%20MinGW`

2.3   Compile EPICS

1. Get EPICS from `http://www.aps.anl.gov/epics/download/base/baseR3.14.9.tar.gz` and decompress it to `C:\epics`

2. Install ActivePerl for windows, following `http://www.activestate.com/Products/activeperl/`. When asked to add to system path or not, do

it. [1]

3. Edit `configure\os\CONFIG_SITE.win32-x86-mingw.Common`,

```
PERL=c:/perl/bin/perl.exe
```

4. run Windows cmd,

```
cd c:\epics\base-3.14.9
set EPICS_HOST_ARCH=win32-x86-mingw
make
```

5. Compiled executables and libraries will be in `C:\epics\base-3.14.9\bin\win32-x86-mingw` and `C:\epics\base-3.14.9\lib\win32-x86-mingw` respectively.

2.4 Compile synApps

1. Get synApps from `http://www.aps.anl.gov/bcda/synApps/index.php` and decompress it to `C:\epics`

2. Edit `C:\epics\synApps_5_2\config\MASTER_RELEASE` , make changes to reflect our EPICS setup,

```
SUPPORT=c:/epics/synApps_5_2/suppor
EPICS_BASE=c:/epics/base-3.14.9
```

Comment out unwanted packages as you wish and do the same in `Makefile`.[2]

3. open cygwin shell

```
cd c:\epics\synApps_5_2\support
export EPICS_HOST_ARCH=win32-x86-mingw
make release
make
```

2.5 MEDM for Windows

You need to install MEDM extension for Windows, which is part of the *Win32 Extensions*`http://www.aps.anl.gov/epics/download/distributions/index.php` distributed by APS Controls group. The README elaborate how to configure Hummingbird Exceed to run MEDM windows. The next section will show how to do by Xming.

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[1] Alternatively you can also use perl-cygwin, but it caused problem when compile EPICS-3.14.9 failing to locate the epics library path. This is due to how they handle path name, e.g. `/cygdrive/c/epics` in perl-cygwin but it should be `c:\epics` in ActivePerl.

[2] Because synApps is composed of many small packages, if you upgrade one from the developer's site, make sure this version change is reflected in `MASTER_RELEASE`

2.6 Xming

From `http://freedesktop.org/wiki/Xming`,

> Xming is the port of the X Window System to Microsoft Windows.
> Unlike Cygwin/X it does not depend on the Cygwin environment.

1. Install Xming and Xming-fonts from `http://sourceforge.net/project/showfiles.php?group_id=156984`.

2. Add MEDM widget fonts alias to C:\Program Files\Xming\fonts\misc\fonts.alias,

```
widgetDM_4 -misc-fixed-medium-r-normal--8-60-100-100-c-50-iso8859-1
widgetDM_6 -misc-fixed-medium-r-normal--8-60-100-100-c-50-iso8859-1
widgetDM_8 -misc-fixed-medium-r-normal--9-80-100-100-c-60-iso8859-1
widgetDM_10 -misc-fixed-medium-r-normal--10-100-75-75-c-60-iso8859-1
widgetDM_12 -misc-fixed-medium-r-normal--13-100-100-100-c-70-iso8859-1
widgetDM_14 -misc-fixed-medium-r-normal--14-110-100-100-c-70-iso8859-1
widgetDM_16 -misc-fixed-medium-r-normal--15-120-100-100-c-90-iso8859-1
widgetDM_18 -sony-fixed-medium-r-normal--16-120-100-100-c-80-iso8859-1
widgetDM_20 -misc-fixed-medium-r-normal--20-140-100-100-c-100-iso8859-1
widgetDM_22 -sony-fixed-medium-r-normal--24-170-100-100-c-120-iso8859-1
widgetDM_24 -sony-fixed-medium-r-normal--24-170-100-100-c-120-iso8859-1
widgetDM_30 -adobe-times-medium-r-normal--25-180-100-100-p-125-iso8859-1
widgetDM_36 -adobe-helvetica-medium-r-normal--34-240-100-100-p-176-iso8859-1
widgetDM_40 -adobe-helvetica-bold-r-normal--34-240-100-100-p-182-iso8859-1
widgetDM_48 -adobe-helvetica-bold-r-normal--34-240-100-100-p-182-iso8859-1
widgetDM_60 -adobe-helvetica-bold-r-normal--34-240-100-100-p-182-iso8859-1
```

3. Add the following Environments Variable,

```
DISPLAY=localhost:0.0
XKEYSYMDB=C:\Program Files\Xming\XKeysymDB
XLOCALEDIR=C:\Program Files\Xming\locale
```

4. Start Xming X server

5. Now we can open any MEDM widges, e.g.

```
"C:\Program Files\EPICS WIN32 Extensions\medm.exe" -x demo.adl
    or
start medm -x demo.adl
```