

hdpm - Hall-D Package Manager

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CUA

Hall-D Offline Meeting

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Purpose

- Simplify building [sim-recon](#) and its dependencies: xerces-c, cernlib, root, evio, ccdb, jana, hdds
- Simplify updating/maintaining these packages
- Allow for multiple versions of packages to coexist without conflict

hdpm

- Wrapper around the individual build systems (Make, SCons) for each package source
- Its global nature provides a mechanism to check dependencies and ensure seamless integration of environment variables
- Management commands are executed from the top-level directory of the manager

- Builds are “configured” with simple text files
- The “templates” directory is a permanent storage area for groups of settings files
- The “settings” directory holds the current settings
- Generate these directories for the first time by selecting an example-template
- `hdpm select <template id> (“all”, “Sp15”, “F14”)`

```

NAS-MBP:~ nathansparks$ cd Scripts/hdpm/
NAS-MBP:hdpm nathansparks$ ls
README.md          patches            settings           setup-osx.sh      setup.sh          templates
example-templates pkgs              setup-osx.csh     setup.csh         src
NAS-MBP:hdpm nathansparks$ source setup-osx.sh
Mac OS X (10.7+): Hall-D Package Manager setup
Run the 'hdpm' command in the current working directory.
julia-0.3.11 directory already exists; nothing to download.
Putting julia in your PATH.
Good to go!
NAS-MBP:hdpm nathansparks$ hdpm select all
NAS-MBP:hdpm nathansparks$ hdpm show

```

Current build settings

```

ID: all
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG:

```

name	version	url	path
xerces-c	3.1.2	http://www.motorlog.com/apache/xerces/c/3/sources/xerces-c-3.1.2.tar.gz	xerces-c-3.1.2
cernlib	2005	http://www-zeuthen.desy.de/linear_collider/cernlib/new/cernlib.2005.corr.2014.04.17.tgz	cernlib
root	5.34.32	https://root.cern.ch/download/root_v5.34.32.source.tar.gz	root-5.34.32
amptools	0.9.1	http://iweb.dl.sourceforge.net/project/amptools/AmpTools_v0.9.1.tgz	amptools-0.9.1/AmpTools
geant4	10.01.p02	http://geant4.cern.ch/support/source/geant4.10.01.p02.tar.gz	geant4-10.01.p02
evio	4.4.5	https://coda.jlab.org/drupal/system/files/coda/evio/evio-4.4/evio-4.4.5.tgz	evio-4.4.5
ccdb	1.05.00	https://github.com/JeffersonLab/ccdb/archive/v1.05.00.tar.gz	ccdb-1.05.00
jana	0.7.3	https://www.jlab.org/JANA/releases/jana_0.7.3.tgz	jana-0.7.3
hdds	b6f249a	https://github.com/JeffersonLab/hdds	hdds
sim-recon	0cb6115	https://github.com/JeffersonLab/sim-recon	sim-recon

```

NAS-MBP:hdpm nathansparks$ hdpm build
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/xerces-c-3.1.2 exists
INFO: Mac OS X detected: skipping cernlib
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/root-5.34.32 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/amptools-0.9.1/AmpTools exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/geant4-10.01.p02 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/evio-4.4.5 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/ccdb-1.05.00 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/jana-0.7.3 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/hdds exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/sim-recon exists

```

```

INFO: Mac OS X detected: disabling cernlib

```

package	build time	disk use	timestamp
xerces-c-3.1.2	174 s	242MB - 51MB	2015-08-17_21:20:27
root-5.34.32	340 s	677MB - 199MB	2015-08-17_21:26:09
amptools-0.9.1	19 s	6.0MB - 1.3MB	2015-08-17_21:26:30
geant4-10.01.p02	441 s	330MB - 177MB	2015-08-17_21:35:14
evio-4.4.5	22 s	8.4MB - 3.2MB	2015-08-17_21:35:37
ccdb-1.05.00	29 s	86MB - 45MB	2015-08-18_20:52:32
jana-0.7.3	14 s	199MB - 1.9MB	2015-08-17_21:36:26
hdds-b6f249a	40 s	41MB - 1.9MB	2015-08-17_21:37:09
sim-recon-0cb6115	227 s	1.1GB - 179MB	2015-08-17_21:40:58

```

NAS-MBP:hdpm nathansparks$

```

- source setup file each time you begin new shell session
- Run `hdpm` to see available commands
- `hdpm help <cmd>` tells you about cmd args.
- `show` command can also show dependencies and build commands

```

NAS-MBP:hdpm nathansparks$ source setup-osx.sh
Mac OS X (10.7+): Hall-D Package Manager setup
Run the 'hdpm' command in the current working directory.
julia-0.3.11 directory already exists; nothing to download.
You already have julia in your PATH.
Good to go!
NAS-MBP:hdpm nathansparks$ hdpm
usage: hdpm <command> [<args>]
  commands:
    help          Show available commands
    select        Select a 'build template' from the 'templates' directory
    save          Save the current settings as a new 'build template'
    show          Show selected packages
    fetch         Checkout/download/clone selected packages
    build         Build selected packages (fetch if needed)
    update        Update selected Git/SVN packages
    clean         Completely remove build products of selected packages
    clean-build  Clean build of selected packages
Use 'hdpm help <command>' to see available arguments.
NAS-MBP:hdpm nathansparks$ hdpm help show
Show the current build settings
usage: hdpm show |<column>| |<column spacing>|
columns: version, url, path, deps, cmds
NAS-MBP:hdpm nathansparks$ hdpm show deps

Current build settings
ID: all
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG:

name      deps
xerces-c
cernlib
root
amptools  root
geant4
evio
ccdb
jana      xerces-c,root,ccdb
hdds      xerces-c
sim-recon xerces-c,root,evio,ccdb,jana,hdds
NAS-MBP:hdpm nathansparks$ hdpm show cmds

Current build settings
ID: all
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG:

name      cmds
xerces-c  ./configure --prefix=xerces-c-3.1.2
xerces-c  make
xerces-c  make install
cernlib   NA
root      ./configure --with-clang --enable-roofit
root      make -j 8
amptools  make
geant4    cmake -DCMAKE_INSTALL_PREFIX=geant4-10.01.p02 geant4-10.01.p02
geant4    make -j 8
geant4    make install
evio      scons --prefix=evio-4.4.5 install
ccdb      scons with-mysql=false
jana      scons -u -j8 install
hdds      scons -u install
sim-recon scons -u -j8 install DEBUG=0
NAS-MBP:hdpm nathansparks$

```

Example session

Recompile against ccdb-1.03

- Change version in “vers.txt”
- Add tag in “top.txt”
- Tag allows hdds and sim-recon to be recompiled with pre-existing source code

```
NAS-MBP:hdpm nathansparks$ source ../env_hd-preqs.sh
NAS-MBP:hdpm nathansparks$ source setup-osx.sh
Mac OS X (10.7+): Hall-D Package Manager setup
Run the 'hdpm' command in the current working directory.
julia-0.3.11 directory already exists; nothing to download.
Putting julia in your PATH.
Good to go!
NAS-MBP:hdpm nathansparks$ atom settings/vers.txt
NAS-MBP:hdpm nathansparks$ atom settings/top.txt
NAS-MBP:hdpm nathansparks$ hdpm show

Current build settings
ID: all
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG: ccdb-1.03

name      version  url
xerces-c  3.1.2    http://www.motorlog.com/apache/xerces/c/3/sources/xerces-c-3.1.2.tar.
cernlib   2005     http://www-zeuthen.desy.de/linear_collider/cernlib/new/cernlib.2005.co
root      5.34.32  https://root.cern.ch/download/root_v5.34.32.source.tar.gz
amptools  0.9.1    http://iweb.dl.sourceforge.net/project/amptools/AmpTools_v0.9.1.tgz
geant4    10.01.p02 http://geant4.cern.ch/support/source/geant4.10.01.p02.tar.gz
evio      4.4.5    https://coda.jlab.org/drupal/system/files/coda/evio/evio-4.4/evio-4.4.
ccdb      1.03.00  https://github.com/JeffersonLab/ccdb/archive/v1.03.00.tar.gz
jana      0.7.3    https://www.jlab.org/JANA/releases/jana_0.7.3.tgz
hdds      b6f249a  https://github.com/JeffersonLab/hdds
sim-recon 0cb6115  https://github.com/JeffersonLab/sim-recon
NAS-MBP:hdpm nathansparks$ hdpm build
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/xerces-c-3.1.2 exists
INFO: Mac OS X detected: skipping cernlib
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/root-5.34.32 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/amptools-0.9.1/AmpTools exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/geant4-10.01.p02 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/evio-4.4.5 exists

INFO: downloading v1.03.00.tar.gz
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %             %             Dload  Upload   Total   Spent    Left   Speed
100  127    0  127    0    0    74      0  --:--:--  0:00:01  --:--:--    74
100 21.4M 100 21.4M    0    0 5204k    0  0:00:04  0:00:04  --:--:-- 8835k
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/jana-0.7.3 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/hdds exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/sim-recon exists

INFO: Mac OS X detected: disabling cernlib

package      build time  disk use      timestamp
xerces-c-3.1.2  174 s      242MB - 51MB  2015-08-17_21:20:27
root-5.34.32   340 s      677MB - 199MB  2015-08-17_21:26:09
amptools-0.9.1  19 s       6.0MB - 1.3MB 2015-08-17_21:26:30
geant4-10.01.p02 441 s     330MB - 177MB 2015-08-17_21:35:14
evio-4.4.5     22 s       8.4MB - 3.2MB 2015-08-17_21:35:37

INFO: ccdb: checking dependencies
INFO: building ccdb-1.03.00
scons: Reading SConscript files ...

Darwin platform is detected. Setting -install_name @rpath/${TARGET.file}
To compile with -m32 forced use 'with-m32=true' flag
CCDB is being build WITHOUT MySQL support. Use 'with-mysql=true' flag to explicitly enable M
Building without examples. To build with examples add 'with-examples=true' flag
scons: done reading SConscript files.
scons:7Building targets ...
g++ -o tmp/Tests/tests.o -c -Iinclude -Isrc/include -Isrc -Isrc/src -Iinclude/SQLite -Isrc/i
g++ -o tmp/Tests/test_StringUtils.o -c -Iinclude -Isrc/include -Isrc -Isrc/src -Iinclude/SQLite
```

```

Linking [./build-ccdb-1.03/plugins/Utilities/trackeff_missing/trackeff_missing.so]
Installing [/Users/nathansparks/Scripts/hdpm/pkgs/sim-recon/build-ccdb-1.03/plugins/trackeff_missing.so]
scons: done building targets.
elapsed time: 222.003950246 seconds
NAS-MBP:hdpm nathansparks$ hdpm show

```

Current build settings

```

ID: all
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG: ccdb-1.03

```

name	version	url	path
xerces-c	3.1.2	http://www.motorlog.com/apache/xerces/c/3/sources/xerces-c-3.1.2.tar.gz	xerces-c-3.1.2
cernlib	2005	http://www-zeuthen.desy.de/linear_collider/cernlib/new/cernlib.2005.corr.2014.04.17.tgz	cernlib
root	5.34.32	https://root.cern.ch/download/root_v5.34.32.source.tar.gz	root-5.34.32
amptools	0.9.1	http://iweb.dl.sourceforge.net/project/amptools/AmpTools_v0.9.1.tgz	amptools-0.9.1/AmpTools
geant4	10.01.p02	http://geant4.cern.ch/support/source/geant4.10.01.p02.tar.gz	geant4-10.01.p02
evio	4.4.5	https://coda.jlab.org/drupal/system/files/coda/evio/evio-4.4/evio-4.4.5.tgz	evio-4.4.5
ccdb	1.03.00	https://github.com/JeffersonLab/ccdb/archive/v1.03.00.tar.gz	ccdb-1.03.00
jana	0.7.3	https://www.jlab.org/JANA/releases/jana_0.7.3.tgz	jana-0.7.3
hdds	b6f249a	https://github.com/JeffersonLab/hdds	hdds
sim-recon	0cb6115	https://github.com/JeffersonLab/sim-recon	sim-recon

```

NAS-MBP:hdpm nathansparks$ hdpm build
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/xerces-c-3.1.2 exists
INFO: Mac OS X detected: skipping cernlib
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/root-5.34.32 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/amptools-0.9.1/AmpTools exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/geant4-10.01.p02 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/evio-4.4.5 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/ccdb-1.03.00 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/jana-0.7.3 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/hdds exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/sim-recon exists

```

```

INFO: Mac OS X detected: disabling cernlib

```

package	build time	disk use	timestamp
xerces-c-3.1.2	174 s	242MB - 51MB	2015-08-17_21:20:27
root-5.34.32	340 s	677MB - 199MB	2015-08-17_21:26:09
amptools-0.9.1	19 s	6.0MB - 1.3MB	2015-08-17_21:26:30
geant4-10.01.p02	441 s	330MB - 177MB	2015-08-17_21:35:14
evio-4.4.5	22 s	8.4MB - 3.2MB	2015-08-17_21:35:37
ccdb-1.03.00	29 s	83MB - 42MB	2015-08-19_11:56:16
jana-0.7.3	14 s	395MB - 198MB	2015-08-19_11:56:33
hdds-b6f249a	41 s	79MB - 41MB	2015-08-19_11:57:16
sim-recon-0cb6115	222 s	2.0GB - 1.1GB	2015-08-19_12:01:01

```

NAS-MBP:hdpm nathansparks$ ls pkgs/env-setup
env_halld.csh      env_halld.sh      hdenv-ccdb-1.03.csh  hdenv-ccdb-1.03.sh  hdenv.csh      hdenv.sh
NAS-MBP:hdpm nathansparks$ ls pkgs
amptools-0.9.1      ccdb-1.05.00      evio-4.4.5          hdds                julia-0.3.11      root-5.34.32      xerces-c-3.1.2
ccdb-1.03.00        env-setup          geant4-10.01.p02    jana-0.7.3          root-5.34.26      sim-recon

```

```

NAS-MBP:hdpm nathansparks$ ls pkgs/sim-recon/
Darwin_macosx10.10-x86_64-llvm6.1.0  build-ccdb-1.03  setenv.csh  src

```

```

NAS-MBP:hdpm nathansparks$ pkgs/sim-recon/
-bash: pkgs/sim-recon/: is a directory
NAS-MBP:hdpm nathansparks$ more pkgs/sim-recon/build-ccdb-1.03/success.hdpm
sim-recon-0cb6115
2015-08-19_12:01:01
# build time (seconds)
222
# disk use, final minus initial
"2.0GB - 1.1GB"
# compiled against
"xerces-c-3.1.2,root-5.34.32,evio-4.4.5,ccdb-1.03.00,jana-0.7.3,hdds-b6f249a"
NAS-MBP:hdpm nathansparks$ hdpm save ccdb-1.03
NAS-MBP:hdpm nathansparks$

```


- State is saved with **save** command as new template:

“ccdb-1.03”

- Will not be overwritten if we switch back to “all” template

- This is typical workflow of hdpm

```
Last login: Wed Aug 19 11:53:06 on ttys000
NAS-MBP:~ nathansparks$ cd Scripts/hdpm
NAS-MBP:hdpm nathansparks$ ls
README.md          settings           setup.sh
example-templates  setup-osx.csh     src
patches            setup-osx.sh      templates
pkgs               setup.csh
NAS-MBP:hdpm nathansparks$ source setup-osx.sh
Mac OS X (10.7+): Hall-D Package Manager setup
Run the 'hdpm' command in the current working directory.
julia-0.3.11 directory already exists; nothing to download.
Putting julia in your PATH.
Good to go!
NAS-MBP:hdpm nathansparks$ hdpm select all
NAS-MBP:hdpm nathansparks$ hdpm show
```

Current build settings

```
ID: all
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG:
```

name	version	url	path
xerces-c	3.1.2	http://www.motorlog.com/apache/xerces/c/3/sources/xerces-c-3.1.2.tar.gz	xerces-c-3.1.2
cernlib	2005	http://www-zeuthen.desy.de/linear_collider/cernlib/new/cernlib.2005.corr.2014.04.17.tgz	cernlib
root	5.34.32	https://root.cern.ch/download/root_v5.34.32.source.tar.gz	root-5.34.32
amptools	0.9.1	http://iweb.dl.sourceforge.net/project/amptools/AmpTools_v0.9.1.tgz	amptools-0.9.1/AmpTools
geant4	10.01.p02	http://geant4.cern.ch/support/source/geant4.10.01.p02.tar.gz	geant4-10.01.p02
evio	4.4.5	https://coda.jlab.org/drupal/system/files/coda/evio/evio-4.4.5.tgz	evio-4.4.5
ccdb	1.05.00	https://github.com/JeffersonLab/ccdb/archive/v1.05.00.tar.gz	ccdb-1.05.00
jana	0.7.3	https://www.jlab.org/JANA/releases/jana_0.7.3.tgz	jana-0.7.3
hdds	b6f249a	https://github.com/JeffersonLab/hdds	hdds
sim-recon	0cb6115	https://github.com/JeffersonLab/sim-recon	sim-recon

```
NAS-MBP:hdpm nathansparks$ hdpm select ccdb-1.03
NAS-MBP:hdpm nathansparks$ hdpm show
```

Current build settings

```
ID: ccdb-1.03
TOP: /Users/nathansparks/Scripts/hdpm/pkgs
TAG: ccdb-1.03
```

name	version	url	path
xerces-c	3.1.2	http://www.motorlog.com/apache/xerces/c/3/sources/xerces-c-3.1.2.tar.gz	xerces-c-3.1.2
cernlib	2005	http://www-zeuthen.desy.de/linear_collider/cernlib/new/cernlib.2005.corr.2014.04.17.tgz	cernlib
root	5.34.32	https://root.cern.ch/download/root_v5.34.32.source.tar.gz	root-5.34.32
amptools	0.9.1	http://iweb.dl.sourceforge.net/project/amptools/AmpTools_v0.9.1.tgz	amptools-0.9.1/AmpTools
geant4	10.01.p02	http://geant4.cern.ch/support/source/geant4.10.01.p02.tar.gz	geant4-10.01.p02
evio	4.4.5	https://coda.jlab.org/drupal/system/files/coda/evio/evio-4.4.5.tgz	evio-4.4.5
ccdb	1.03.00	https://github.com/JeffersonLab/ccdb/archive/v1.03.00.tar.gz	ccdb-1.03.00
jana	0.7.3	https://www.jlab.org/JANA/releases/jana_0.7.3.tgz	jana-0.7.3
hdds	b6f249a	https://github.com/JeffersonLab/hdds	hdds
sim-recon	0cb6115	https://github.com/JeffersonLab/sim-recon	sim-recon

```
NAS-MBP:hdpm nathansparks$ hdpm build
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/xerces-c-3.1.2 exists
INFO: Mac OS X detected: skipping cernlib
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/root-5.34.32 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/amptools-0.9.1/AmpTools exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/geant4-10.01.p02 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/evio-4.4.5 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/ccdb-1.03.00 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/jana-0.7.3 exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/hdds exists
INFO: /Users/nathansparks/Scripts/hdpm/pkgs/sim-recon exists
```

```
INFO: Mac OS X detected: disabling cernlib
```

package	build time	disk use	timestamp
xerces-c-3.1.2	174 s	242MB - 51MB	2015-08-17_21:20:27
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jana-0.7.3	14 s	395MB - 198MB	2015-08-19_11:56:33
hdds-b6f249a	41 s	79MB - 41MB	2015-08-19_11:57:16
sim-recon-0cb6115	222 s	2.0GB - 1.1GB	2015-08-19_12:01:01

```
NAS-MBP:hdpm nathansparks$
```

Major changes

- Name change to hdpm from HDBuildManager
- hdpm command user-interface
- Check dependencies within listed packages
- Control build commands with “commands.txt”
- Support for geant4 and amptools
- Setup scripts for 64-bit Linux and Mac OS X

Try it!

- git clone <https://github.com/JeffersonLab/hdpm>
- source appropriate setup file (in hdpm directory)
- JLab iFarm: `hdpm build <id>`
 - `<id>` = “Sp15” or “F14”
- OS X or 64-bit Linux:
`hdpm build all`

