Packaging and Configuration

Chapel Team, Cray Inc.

Chapel version 1.14

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Outline

- Chapel Configuration File
- Anonymous ‘printchplenv’
- Chapel Docker Image
- Chapel Debian Package

Chapel Configuration File

ChplConfig: Background

- **CHPL variable priority in 1.13:**
  - Explicit compiler flags: `chpl --env=value`
  - Environment variables: `CHPL_ENV=value`
  - Inferred environment variables: `printchplenv`
- **Setting new default values requires:**
  - Modifying environment through a shell script or module
  - Modifying the printchplenv / chplenv source code
- **Problematic for system-wide installs and packaging**

ChplConfig: This Effort

- **CHPL variable priority in 1.14:**
  - Explicit compiler flags: `chpl --env=value`
  - Environment variables: `CHPL_ENV=value`
  - **Chapel configuration file: `~/.chplconfig`**
  - Inferred environment variables: `printchplenv`
- **Example Chapel Configuration File:**

```
# Default to multi-locale
CHPL_COMM=gasnet

CHPL_TASKS=qthreads # Use Qthreads

# System GMP is available on these machines
CHPL_GMP=system
```

ChplConfig: This Effort

- Filename priority
  - `chplconfig`
  - `.chplconfig`
- File search path priority
  - `$CHPL_CONFIG`
  - `$HOME`
  - `$CHPL_HOME`
- Write current overrides to a Chapel configuration file
  - `printchplenv --overrides > ~/.chplconfig`
- Write all settings to a Chapel configuration file
  - `printchplenv --simple > ~/.chplconfig`

ChplConfig: Status and Next Steps

Status:

- Users can now override default CHPL vars with a file
- Documented in online docs

Next Steps:

- Utilize the configuration file for reproducibility
  - Generate a config file for each configuration built under lib/
  - Use config files in testing infrastructure for different test environments

printchplenv --anonymize

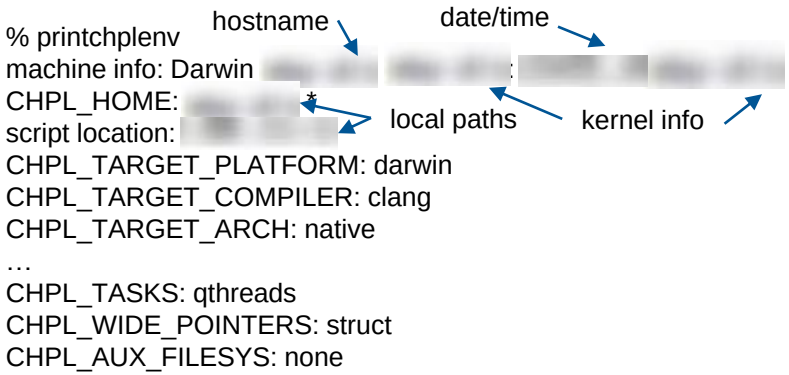
printchplenv --anonymize

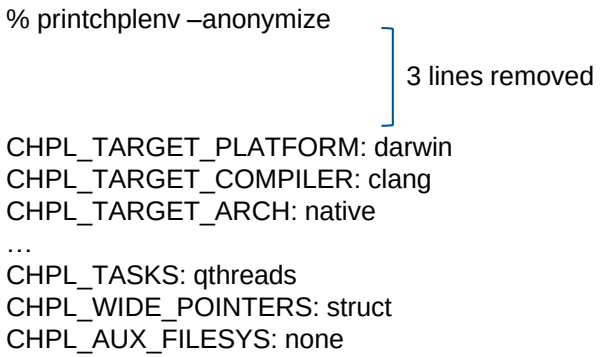
Background: We ask for printchplenv output in bug reports

- prints information about the machine to help reproduce the bug
  - lots of useful information
  - but may include details people don't wish to share (paths, hostname, etc.)

This Effort: Add an --anonymize flag to printchplenv

- Strips potentially sensitive details from the output

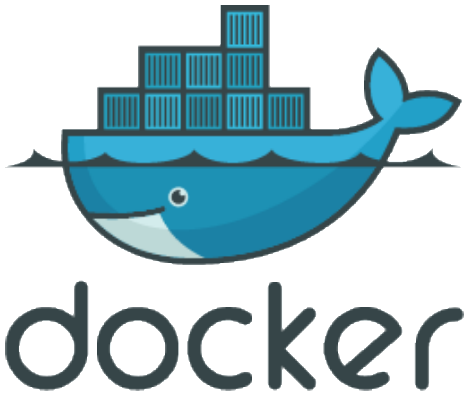




Impact: Bug reporters no longer need to edit this by hand

Chapel Docker Image

Chapel Docker Image



Background:

- Docker improves ease of installation and use
  - Improves accessibility in cloud services

This Effort:

- Official Docker image hosted on:
  - https://hub.docker.com/r/chapel/chapel/
- Easily hosted as a Docker container on Linux distros and OS X
- Contributed by Nick Park

Status:

- Docker images for 1.13.1 and 1.14.0 available on DockerHub

Next Steps:

- Get Chapel's docker image into https://github.com/docker-library
- Offer broader Chapel configurations as docker containers
- Integrate docker image testing into nightly build/test infrastructure

Chapel Debian Package

Chapel Debian Package: Background

- **Created initial Debian package for 1.13.0**
  - Submitted *request for package* (RFP) and *intent to package* (ITP)

- **Packaging Chapel has faced many challenges**
  - Debian has a strict packaging policy
    - Packages expected to build and install in a specific way
    - Third-party dependencies must be package-dependencies
  - Chapel has a non-traditional build system
    - Requires a *$CHPL_HOME*
    - Third-party dependencies are bundled into repository
    - No *configure* or *make install* build steps

Chapel Debian Package: This Effort & Impact

This Effort: Simplify our package

- Reduced Debian package to *chapel-minimal*
  - Stripped away all third-party packages (except utf-8 decoder)
  - Stripped away docs, tests, and test infrastructure
  - Similar approach done with other packages, e.g. *python-minimal*
- Received several iterations of feedback online and on ITP
- Chapel configuration file, *chplconfig*, takes place of patching overrides

Impact: Progress made towards acceptance

- Nearly all feedback has been addressed
- The simplified package has eliminated a lot of the initial challenges

Chapel Debian Package: Next Steps

- **Get *chapel-minimal 1.14.0-1* accepted into Debian**
  - Requires packaging UTF-8 decoder
  - Requires following filesystem hierarchy standard
- **Pursue full-featured Chapel package**
  - Including third-parties
- **Expedite propagation of package elsewhere**
  - *unstable* → *stable*
  - downstream distributions, such as Ubuntu
- **Extend to other linux distributions**
  - Fedora, SUSE, Arch, …
- **Encourage community members to build packages**
  - Packaging relies more on knowledge of the distribution than Chapel

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