Portability and Packaging

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Outline

- Default Executable Name
- Support Traditional Configure/Install Workflow
- Debian Packaging
- Other Portability Improvements
Default Executable Name
Default Executable Name: Background, Effort

**Background:** Historically `chpl` produced `a.out` by default

```bash
$ chpl myprogram.chpl  // wrote executable to a.out
$ ./a.out
```

- This behavior was inherited from C compilers
- The name refers to an outdated executable format

**This Effort:** By default, base output name on input

```bash
$ chpl myprogram.chpl  // usually writes executable to myprogram
$ ./myprogram
```

- Follow other modern languages in moving beyond `a.out`
- Base executable name on the main module name
Default Executable Name: Impact, Status

**Impact:** Compiler is more user-friendly
- Easier to work with many different Chapel programs at once
- … but it can be jarring for people used to typing ./a.out
  - possible to restore old default behavior with
    ```
    export CHPL_EXE_NAME=a.out
    ```

**Status:** Output file name derives from main module name
- But confusion can still arise if module and file names differ
- Confusion can also arise if main module is an inner module
Main module, thus executable, is MyModule:

// MyProgram.chpl
module MyModule {
    writeln("Hello from MyModule");
}

$ chpl MyProgram.chpl
$ ./MyProgram
-bash: ./MyProgram: No such file
$ ./MyModule
Hello from MyModule
Main module, thus executable, is InnerModule:

```chapel
// MyModules.chpl
module MyProgram {
    writeln("init MyProgram");
    module InnerModule {
        proc main {
            writeln("main");
        }
    }
}

$ chpl MyModules.chpl
$ ./MyModules
-bash: ./MyModules: No such file
$ ./InnerModule
main
```
Default Executable Name: Future Work

- Warn when module and file names don’t match?
  - Users of the module might expect the names to match
  - Making the names match would at least be a best practice

- Warn for inner main module compiled without -o?

- Name executable after file containing main module?
  - rather than main module itself?
Support Traditional Configure/Install Workflow
Configure/Install: Background

● Chapel has historically used a custom build process

```bash
source util/setchplenv.bash
export CHPL_COMM=gasnet
make
chpl hello.chpl -o hello
./hello
```

● This approach has drawbacks
  ● Can be confusing
    ● users don't necessarily read the documentation
    ● they try ./configure but find it's not there

● Additionally, 'make install' was requested by users
Configure/Install: This Effort

- **Added support for configure, make install**

- **Configure**
  - Is purpose-built for Chapel, not from the autoconf/automake tool string
  - Offers helpful text output
  - Saves the current CHPL_* settings to chplconfig
  - Selects installation mode and destination directory

- **Two installation modes:**
  1. Copy $CHPL_HOME somewhere
     - what we have used historically
  2. Install to /usr/bin, /usr/lib, /usr/share
     - this mode is important for the Debian packaging effort
Configure/Install: Impact, Next Steps

**Impact:** 'configure' and 'make install' available

- Adds ability to install Chapel
- Enables Debian packaging effort
- Supports the common pattern:
  ```
  ./configure
  make
  make install
  ```
- Also supports the [Try It Online](#) site

**Next Steps:**

- Add 'make uninstall'
- Continue Debian packaging effort
Debian Packaging
Debian Packaging

**Background:** Debian Intent To Package (ITP) under review
- An ITP is like a pull request in Debian, where a sponsor reviews

**This Effort:** Implemented more Debian sponsor feedback
- ‘configure’ & ’make install’
- Including dependencies in source package for future
- A few other minor updates

**Impact:** Closer to acceptance for *buster* (Debian 10)
- Unfortunately, Debian sponsor has moved on

**Status:** Waiting for a new Debian sponsor (as of writing)
- All feedback provided has been addressed

**Next steps:**
- Host unofficial DEBs (Debian) and PPAs (Ubuntu) until acceptance
- Continue pushing forward on Debian package
Other Portability Improvements
Other Portability Improvements

- **printchplenv improvements**
  - Output distinguishes settings from configuration file and environment
  - Infers location of CHPL_HOME

- **Added support for using Chapel on an OmniPath cluster**
  - See [https://chapel-lang.org/docs/1.16/platforms/omnipath.html](https://chapel-lang.org/docs/1.16/platforms/omnipath.html)

- **Improved code conformance with C++14**

- **Improved code portability across versions of gcc**

- **Improved portability of code with respect to Cygwin**

- **Dependences**
  - Using LLVM now requires CMake
  - Third-party RE2 and thus regexp module now requires C++11
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