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Meeting of the Technical Steering Committee (TSC) Board

Wednesday, April 24th, 2019
11:00am ET

Meeting Logistics

- https://zoom.us/j/556149142

- United States : +1 (646) 558-8656
  - Meeting ID: 556 149 142

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Agenda

- 1.3.7.1 release with singularity permissions fix went live April 11
- ISC'19 BoF Submission
  - BoF has been accepted
  - Scheduled for Wed, June 19th, 8:30-9:30am
- PEARC'19 tutorial
  - if you are interested in helping prepare content for the tutorial this summer, let me know (if you haven't already done so). Expect to setup additional prep meetings for that.
- 1.3.8 project area created in OBS
  - issues created for component updates
  - looks like ~38% of components have updates available
- alternate build flag support continued discussion

Alternate build flag support

- Thanks to Kevin for starting fresh PR on this topic
- Would like to continue the discussion....

- First: What do we want to achieve?
  - Primary Goal: make it easier for downstream user to rebuild ohpc packages uniformly with different compiler flags (alternate optimizations, micro-architecture specific flags, etc)
  - Ideally, no change to .spec file required

```
# rpmbuild --bb --define "new_CXXflag -O42" foo.spec
```

Alternate build flag support

- Regarding setting of opt flags, recall that rpmmacro exists to provide uniform settings on build host
- Obviously only applies to autotool'ed packages (majority, but certainly not all of our components)
- We use this currently in small number of .spec files (it hard-codes the install prefix)

```
# rpm --eval %configure


  CFLAGS="${CFLAGS:--O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-strong --param=ssp-buffer\
-size=4 -grecord-gcc-switches   -m64 -mtune=generic}" ; export CFLAGS ;
  CXXFLAGS="${CXXFLAGS:--O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-strong --param=ssp-bu\
ffer-size=4 -grecord-gcc-switches   -m64 -mtune=generic}" ; export CXXFLAGS ;
  FFLAGS="${FFLAGS:--O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-strong --param=ssp-buffer\
-size=4 -grecord-gcc-switches   -m64 -mtune=generic -I/usr/lib64/gfortran/modules}" ; export FFLAGS ;
  FCFLAGS="${FCFLAGS:--O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-strong --param=ssp-buff\
er-size=4 -grecord-gcc-switches   -m64 -mtune=generic -I/usr/lib64/gfortran/modules}" ; export FCFLAGS ;
  LDFLAGS="${LDFLAGS:--Wl,-z,relro }"; export LDFLAGS;
  [ "1" == 1 ] && [ "x86_64" == ppc64le ] && /usr/lib/rpm/redhat/libtool-handle-ppc64le.sh ;
  for i in $(find . -name config.guess -o -name config.sub) ; do
      [ -f /usr/lib/rpm/redhat/$(basename $i) ] && /usr/bin/rm -f $i && /usr/bin/cp -fv /usr/lib/rpm/redhat/$(basename \
$i) $i ;
  done ;
  ./configure --build=x86_64-redhat-linux-gnu --host=x86_64-redhat-linux-gnu \
  --program-prefix= \
  --disable-dependency-tracking \
  --prefix=/usr \
```

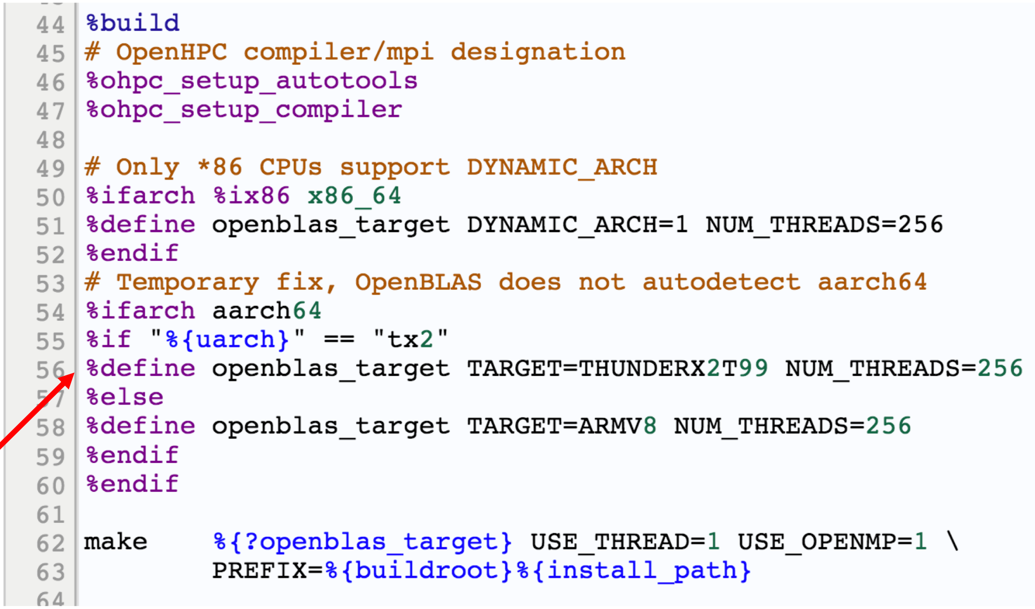
example from x86_64 host

Alternate build flag support

- For most autoconf'ed components (those installed into %{OHPC_PUB}) we call "./configure" directly
  - These autotool'd projects typically have their own default settings
- Fundamental issue I see presently is that we do not have a mechanism to apply external compiler flags settings without touching .spec file
- To resolve this, we would first need to undertake updates to apply uniform settings to each component's build system
  - vanilla make
  - autoconf/automake
  - cmake
  - bjam
  - other misc. craziness
- Defaults can be specified in our current OHPC_macros file; should then be straightforward to allow users to override

Alternate build flag support

- Note: this doesn’t solve all problems as some components have very specific settings to choose different compile options
- OpenBLAS is one of those (and the package which started us on this discussion)
- For these, might need additional changes to allow override



```
%build
# OpenHPC compiler/mpi designation
%ohpc_setup_autotools
%ohpc_setup_compiler

# Only *86 CPUs support DYNAMIC_ARCH
%ifarch %ix86 x86_64
%define openblas_target DYNAMIC_ARCH=1 NUM_THREADS=256
%endif
# Temporary fix, OpenBLAS does not autodetect aarch64
%ifarch aarch64
%if "%{uarch}" == "tx2"
%define openblas_target TARGET=THUNDERX2T99 NUM_THREADS=256
%else
%define openblas_target TARGET=ARMV8 NUM_THREADS=256
%endif
%endif

make    %{?openblas_target} USE_THREAD=1 USE_OPENMP=1 \
        PREFIX=%{buildroot}%{install_path}
```

however, would prefer to not do this, and inherit from external macro variable instead.

Alternate build flag support

- Other thoughts…
  - if we were to do this, presumably need equivalent of a CFLAGS, CXXFLAGS, FCFLAGS that has default settings in OHPC_MACROS and update all .spec to take advantage
  - say, OHPC_CFLAGS, OHPC_CXXFLAGS, OHPC_FCFLAGS
  - if putting in work to update each .spec to use external compiler settings, could also embed the flags used in resulting module file (e.g. make it visible with "module show foo")
  - would likely have to be an incremental rollout
    - could agree on conventions for 1.3.8 and include in components that are being updated for this release
    - update all .specs accordingly over time