Meeting of the Technical Steering Committee (TSC) Board

Wednesday, December 12th, 2018
11:00am ET

Meeting Logistics

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

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

openHPC

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Agenda

- LF Update
  - folks may have heard Jeff E. is no longer our LF program manager
  - my understanding is that, for now, send project related business to Todd Benzies (tbenzies@linuxfoundation.org)

- CentOS Update
  - CentOS 7.6 (1810) was released on Dec 03
  - have downloaded and imported aarch64 and x86_64 packages into our OBS backend
  - working to get ohpc 1.3.7 build area completed leveraging this latest CentOS 7.6
  - todo: add centos7.6 image as option in our bare-metal CI environment
    - ohpc 1.3.7 will use CentOS7.6 for test env (along with SLES 12 SP3)

- OpenBLAS compilation/optimization experiences (Kevin Pedretti, Sandia)

Overview

- Deployed and evaluated OpenHPC on Arm testbed at Sandia
  - 47 compute nodes, dual-socket Cavium ThunderX2 28-core @ 2.0 GHz

- Identified gaps / issues with respect to our requirements + usage model
  - OpenHPC moves fast, typically provides latest version of a given package
    - E.g., OpenHPC 1.3.5 moved to gcc7.3.0, Sandia validating with gcc7.2.0, need to use that version
  - Difficult to install multiple versions of a given package
    - Installing multiple versions of the same rpm base package name possible, but not common
    - 'yum upgrade' breakage
  - Lack of architecture-optimized builds
    - HPL is 4.8x faster when compiled with an OpenBLAS targeting CaviumTX2 vs. OpenHPC OpenBLAS
  - No support for static linking (build recipes actively remove static libraries)
    - Many Sandia users like to build static binaries, ship single binary between machines + networks
  - Hard to rebuild packages due to reliance on Open Build Service

- Sandia / DOE NNSA Tri-labs is working to address these gaps for our particular use cases =>

The Astra Arm-based supercomputer at Sandia
is using a software stack derived from OpenHPC

uarch-dependent packages

- Modified OHPC_macros to provide uarch-dependent macros

```
# Default optimization flags are empty
%define ohpc_optflags -fPIC -O3 -g
%define ohpc_optflags_uarch %{nil}

# Autotools dependencies
%if 0%{?ohpc_autotools_dependent} == 1
BuildRequires:  autoconf%{PROJ_DELIM}
BuildRequires:  automake%{PROJ_DELIM}
BuildRequires:  libtool%{PROJ_DELIM}
BuildRequires:  m4
%endif

# Micro-architecture dependencies
%if 0%{?ohpc_uarch_dependent} == 1

# Default case, use lowest-common-denominator
'generic' target
%{!?uarch: %define uarch generic}

# Default case, no uarch specified
%global UARCH_DELIM %{nil}
```

```
# Arm targets
%ifarch aarch64
%if "%{uarch}" == "tx2"
%global UARCH_DELIM -tx2
%global ohpc_optflags_uarch -mtune=thunderx2t99 -mcpu=thunderx2t99
%endif
%endif

# Add appropriate 'Provides:' and 'Conflicts:' to allow
# only one uarch variant to be installed at a time.
%if "%{UARCH_DELIM}" != "%{nil}"
%if 0%{?ohpc_compiler_dependent} == 1
%if 0%{?ohpc_mpi_dependent} == 1
Provides:  %{pname}-%{compiler_family}-%{mpi_family}%{PROJ_DELIM}
Conflicts: %{pname}-%{compiler_family}-%{mpi_family}%{PROJ_DELIM}
%else
Provides:  %{pname}-%{compiler_family}%{PROJ_DELIM}
Conflicts: %{pname}-%{compiler_family}%{PROJ_DELIM}
%endif
%endif
%endif

%endif
```

uarch-dependent package example (1)

```
11  %define pname openblas
12
13  %define ohpc_autotools_dependent 1
14  %define ohpc_compiler_dependent 1
15  %define ohpc_uarch_dependent 1
16
17  %include %{_sourcedir}/OHPC_macros
18
19  Name:           %{pname}-%{compiler_family}%{UARCH_DELIM}%{PROJ_DELIM}
20  Version:        0.3.4
21  Release:        1%{?dist}
22  Summary:        An optimized BLAS library based on GotoBLAS2
23  License:        BSD-3-Clause
24  Group:          %{PROJ_NAME}/math-libs
25  Url:            http://www.openblas.net
26  #Source0:        https://github.com/xianyi/OpenBLAS/archive/v%{version}.tar.gz#/%{pname}-%{version}.tar.gz
27  Source0:        v%{version}.tar.gz
28  Patch1:         openblas-libs.patch
29  # PATCH-FIX-UPSTREAM openblas-noexecstack.patch
30  Patch2:         openblas-noexecstack.patch
31  ExclusiveArch:  %ix86 ia64 ppc ppc64 ppc64le x86_64 aarch64
32
33  %description
34  OpenBLAS is an optimized BLAS library based on GotoBLAS2 1.13 BSD version.
35
36  %define install_path %{OHPC_LIBS}/%{compiler_family}/%{pname}/%{version}
```

uarch-dependent package example (2)

```
44 %build
45 # OpenHPC compiler/mpi designation
46 %ohpc_setup_autotools
47 %ohpc_setup_compiler
48
49 # Only *86 CPUs support DYNAMIC_ARCH
50 %ifarch %ix86 x86_64
51 %define openblas_target DYNAMIC_ARCH=1 NUM_THREADS=256
52 %endif
53 # Temporary fix, OpenBLAS does not autodetect aarch64
54 %ifarch aarch64
55 %if "%{uarch}" == "tx2"
56 %define openblas_target TARGET=THUNDERX2T99 NUM_THREADS=256
57 %else
58 %define openblas_target TARGET=ARMV8 NUM_THREADS=256
59 %endif
60 %endif
61
62 make    %{?openblas_target} USE_THREAD=1 USE_OPENMP=1 \
63         PREFIX=%{buildroot}%{install_path}
64
```

openblas-gnu7

ⓘ 3 derived packages

No description set

⮑ Branch package   📦 Submit package   📦 Edit description   📦 Delete package   📦 Trigger services

Source Files

Show [25 ⌄] entries

Search: [   ]

Filename ▲	Size	Changed	Actions
_service	1.32 KB	5 days ago	📥 🗑
_service:extract_file:download.sh	93 Bytes	5 days ago	📥
_service:extract_file:OHPC_macros	6.84 KB	5 days ago	📥
_service:extract_file:openblas-libs.patch	245 Bytes	5 days ago	📥
_service:extract_file:openblas-noexecstack.patch	1.07 KB	5 days ago	📥
_service:extract_file:openblas.spec	4.18 KB	5 days ago	📥
_service:extract_file:v0.3.4.tar.gz.md5	48 Bytes	5 days ago	📥
_service:tar_scm:_servicedata	237 Bytes	5 days ago	📥
_service:tar_scm:git-infra-1544133642.8519906.tar	50 KB	5 days ago	📥
v0.3.4.tar.gz	11.3 MB	5 days ago	📥 🗑

Showing 1 to 10 of 10 entries

Previous   [1]   Next

📄 Add file

Build Results   Rpmlint Results

openblas-arm-tx2

CentOS_7   🚚 aarch64   succeeded ⓘ

openblas-gnu7

CentOS_7   🚚 aarch64   succeeded ⓘ

openblas-gnu7-tx2

CentOS_7   🚚 aarch64   succeeded ⓘ

openblas-gnu8-tx2

CentOS_7   🚚 aarch64   succeeded ⓘ