

SI2-SSE: XALT: Understanding the Software Needs of High End Computer Users

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XALT is a tool that tracks user codes and environments on a cluster

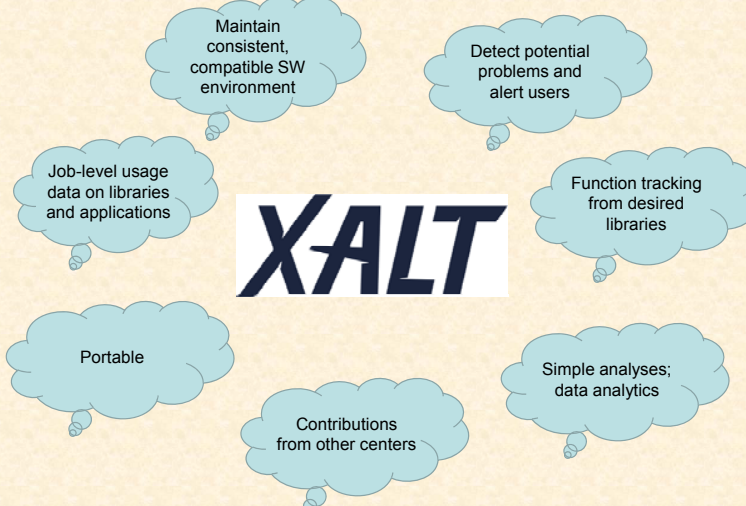
- Collecting accurate and detailed run-time and link-time data at the level of the individual job
- Collection is transparent to users
- Building a community around analytics about software needs, trends, and issues at the level of the individual job being delivered

XALT will

- Generate a picture of the compilers, libraries, and other software that users need to run their jobs successfully
- Highlight the products our researchers need and do not need
- Alert users and support staff to the root causes of software configuration issues as soon as they occur
- Mitigate the difficulties new users encounter
- Identify opportunities to improve documentation, education and outreach programs

BENEFITS

- Understanding current library usage and plan for future software need
- Providing usage statistics to developers and vendors
- Restoring the program environment where user applications were built
- Assisting with debugging system issues



Capabilities:

- Track how many users and projects use a library or executable
- Track if a maintained library is used and how often
- Identify users and codes that used a buggy library
- Provide provenance data on how an executable was built
- Identify applications that are using deprecated libraries
- Three methods for transmitting data to database with generic database interface
- Function tracking
- Support for both static and shared libraries

A critical bug identified in FFTW version 3.3.0.2, affected code correctness. Who linked to this library?

```
mysql> select distinct xalt_run.run_id, xalt_run.job_id, xalt_run.date, xalt_run.syshost,
xalt_run.user, xalt_run.exec_path from xalt_run, xalt_object, join_run_object where
xalt_object.object_path like '%fftw/3.3.0.2/' AND xalt_object.obj_id=join_run_object.obj_id AND
join_run_object.run_id=xalt_run.run_id;
```

run_id	job_id	date	syshost	user	exec_path
1	7273	350840.0000	2013-10-23 13:22:29	daxter	/user4 /-cp2k/cp2k_pump

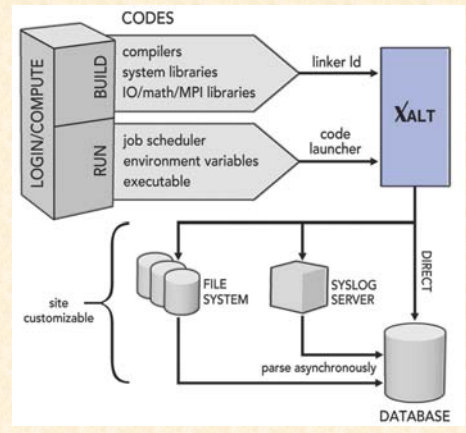
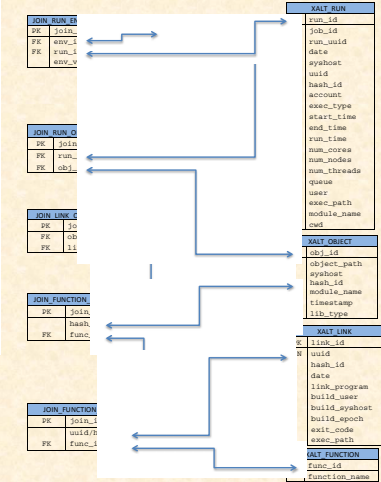
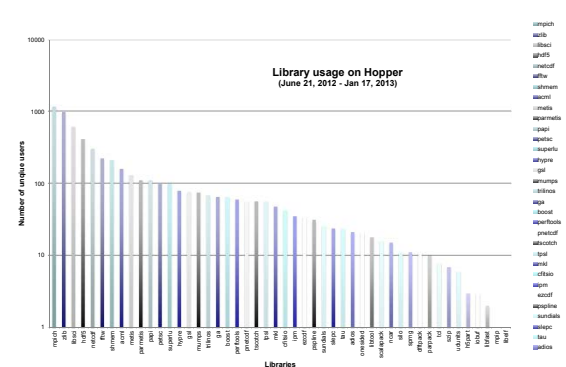
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The libraries used by this executable

The executable was compiled by user *whitaker* on 2013-08-28.

The *linkline* was:

```
gribmeanp.x /usr/lib/.lib64/crt1.o /usr/lib/.lib64/crti.o /opt/gcc/4.8.0/snos/lib/gcc/x86_64-suse-linux/4.8.0/crtbeginT.o /opt/intel/composer_xe_2013.4.183/compiler/lib/intel64/for_main.o /scratch1/scratchdirs/whitaker/fortkTy55V.o /project/projectdirs/incite11/whitaker/edison/newstuff/nwprod/lib/libw3lib-2.0_4.a /project/projectdirs/incite11/whitaker/edison/newstuff/nwprod/lib/libbacio_4.a /opt/cray/mpt/6.0.0/gni/mpich2-intel/130/lib/lbimpich.a /usr/common/usg/darshan/2.2.7/lib/darshan-mpi-io.a /usr/lib/.lib64/lib.a /opt/cray/atp/1.6.3/lib/libAtpSigHCommData.o /opt/cray/atp/1.6.3/lib/libAtpSigHandler.a /opt/cray/mpt/6.0.0/gni/mpich2-intel/130/lib/lbimpich_intel.a /opt/cray/mpt/6.0.0/gni/mpich2-intel/130/lib/lbimp.o /opt/cray/xpmmem/0.1-2.0500.41356.1.11.ar/lib64/libxpmem.a /opt/cray/ugni/5.0-1.0500.0.3.306.ar/lib64/libugni.a /opt/cray/pm/4.0.1-1.0000.9421.73.3.ar/lib64/libpm.a /opt/cray/alps/5.0-3-2.0500.8213.1.1.ar/lib64/libalps.a /opt/cray/alps/5.0-3-2.0500.8213.1.1.ar/lib64/libalpslib.a /opt/cray/alps/5.0-3-2.0500.8213.1.1.ar/lib64/libalpsutil.a /opt/cray/udreg/2.3.2-1.0500.6756.2.10.ar/lib64/libudreg.a /usr/lib/.lib64/libpthread.a /opt/intel/composer_xe_2013.4.183/compiler/lib/intel64/libimf.a /usr/common/usg/darshan/2.2.7/lib/darshan-posix.a /usr/lib/.lib64/libpthread.a /opt/intel/composer_xe_2013.4.183/compiler/lib/intel64/libifcore.a /opt/intel/composer_xe_2013.4.183/compiler/lib/intel64/libimf.a /opt/intel/composer_xe_2013.4.183/compiler/lib/intel64/libirc.a /usr/lib/.lib64/libpthread.a /usr/lib/.lib64/libdl.a /usr/lib/.lib64/libc.a /opt/gcc/4.8.0/snos/lib/gcc/x86_64-suse-linux/4.8.0/libgcc.a /opt/gcc/4.8.0/snos/lib/gcc/x86_64-suse-linux/4.8.0/libgcc_eh.a /usr/lib/.lib64/libc.a /opt/gcc/4.8.0/snos/lib/gcc/x86_64-suse-linux/4.8.0/crtend.o /usr/lib/.lib64/crti.o
```



restore the build environment for an application:

```
mysql> select object_path, timestamp from xalt_object, join_link_object where
join_link_object.link_id=4* AND join_link_object.obj_id=xalt_object.obj_id;
```

object_path	timestamp
/usr/lib64/libc.a	2014-09-26 15:49:53
/usr/lib64/libld1.a	2014-09-26 15:49:53
/usr/lib64/liblbbf.a	2014-09-26 15:49:53
/usr/lib64/libm.a	2014-09-26 15:49:53
/usr/lib64/libpthread.a	2014-09-26 15:49:53
/usr/lib64/librt.a	2014-09-26 15:49:53
/usr/lib64/libz.a	2014-09-26 15:49:53
/opt/cray/atp/1.2.2/lib/libAtpSigHCommData.a	2014-09-26 15:49:53
/opt/cray/atp/1.7.2/lib/libAtpSigHandler.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libcupp.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libf.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libff.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libf.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libf.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libf.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libf.a	2014-09-26 15:49:53
/opt/cray/cce/8.2.5/cray/lib/x86_64/libf.a	2014-09-26 15:49:53
/opt/cray/hdf5/1.8.12/CRAY/81/lib/libhdf5_fortran_cray.a	2014-09-26 15:49:53
/opt/gcc/4.4/snos/lib/gcc/x86_64-suse-linux/4.4.4/crtbeginT.o	2014-09-26 15:49:53
/opt/gcc/4.4.4/snos/lib/gcc/x86_64-suse-linux/4.4.4/crtend.o	2014-09-26 15:49:53
/opt/gcc/4.4.4/snos/lib/gcc/x86_64-suse-linux/4.4.4/crtfastmath.o	2014-09-26 15:49:53
/opt/gcc/4.4.4/snos/lib/gcc/x86_64-suse-linux/4.4.4/libgcc.a	2014-09-26 15:49:53
/opt/gcc/4.4.4/snos/lib/gcc/x86_64-suse-linux/4.4.4/libgcc_eh.a	2014-09-26 15:49:53
/usr/lib64/crt1.o	2014-09-26 15:49:53
/usr/lib64/crti.o	2014-09-26 15:49:53
/usr/lib64/crti.o	2014-09-26 15:49:53
/usr/lib64/crti.o	2014-09-26 15:49:53

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This work was supported by the NSF award 1339690 entitled "Collaborative Research: SI2-SSE: XALT: Understanding the Software Needs of High End Computer Users."

This material is based upon work performed using computational resources provided by the University of Tennessee's Joint Institute for Computational Sciences (JICS) and the Texas Advanced Computing Center (TACC) at the University of Texas at Austin.