



TEXAS ADVANCED COMPUTING CENTER

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TEXAS

The University of Texas at Austin

XALT: Job-Level Usage Data on Today's Supercomputers

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XALT: Outline



XALT

- ▶ What is XALT and what it is not?
- ▶ How it works.
- ▶ Container issues
- ▶ Conclusions
- ▶ This talk:
https://github.com/xalt/xalt/blob/main/my_docs/24/sc_24_booth_talk/sentation.pdf

Understanding what your users are doing

- ▶ Current Version: XALT 3.1.1 (3.2 is coming)
- ▶ What programs, libraries are your users using?
- ▶ What imports from R, MATLAB, Python?
- ▶ What are the top programs by core-hours? by counts? by users?
- ▶ System, User or Built by Other executables?
- ▶ Are Executables implemented in C/C++/Fortran/Others?
- ▶ Track MPI task and/or Threading (\$OMP_NUMTHREADS)
- ▶ Function Tracking
- ▶ Census Taker, Not a performance tool!

How XALT 2 works

```
#include <stdio.h>
void myinit(int argc, char **argv)
{ printf("This is run before main()\n"); }
void myfini()
{ printf("This is run after main()\n"); }

__attribute__((section(".init_array"))) __typeof__(myinit) *__init = myinit;
__attribute__((section(".fini_array"))) __typeof__(myfini) *__fini = myfini;
```

How XALT works (III)

```
$ ./try
```

Hello World!

```
$ LD_PRELOAD=./libxalt.so ./try
```

This is run before main()

Hello World!

This is run after main()

Implications of tracking everything

- ▶ Too much data!! \Rightarrow Sampling
- ▶ Being in the same namespace of your program
- ▶ Sharing memory allocation with your program.
- ▶ Feeling like I'm a developer on every program team.
- ▶ Fixing these issues has been part of XALT becoming mature.

Containers

- ▶ XALT can track executions in Containers
- ▶ But XALT depends on newer libc than container
- ▶ When linking libxalt.so to container exec complains
- ▶ Not sure how to solve this

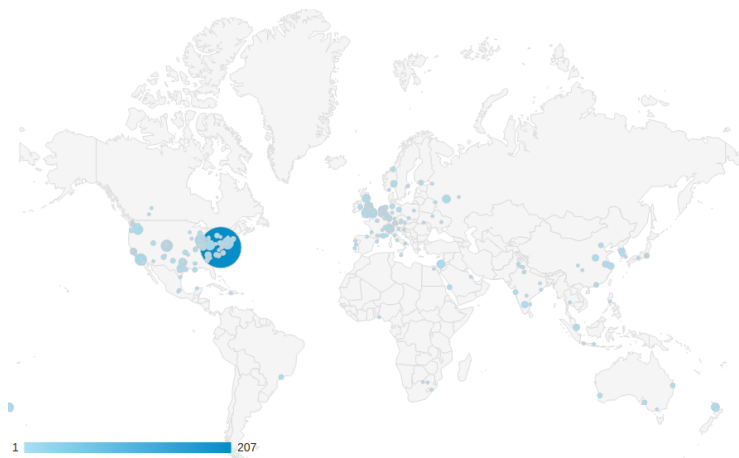
UUID v7

- ▶ XALT uses UUIDs extensively (Universal Unique ID)
- ▶ It has used UUID v4 which isn't time sortable
- ▶ Version 7 is new and *IS* time sortable
- ▶ This leads to faster indexing in a database
- ▶ XALT 3.1.1+ now uses UUIDv7 on computers that support getentropy function in libc

Updating Python \leftrightarrow MySQL interface

- ▶ XALT has used MySQLdb as its interface.
- ▶ This package is no longer supported.
- ▶ XALT is switching to `mysql.connector.python`

XALT Doc usage by City



XALT Monthly Zoom Mtg

- ▶ Usually the 3rd Thursday of the Month at 10:00 am US Central
- ▶ Feel free to attend when you have questions or concerns and not when you don't.

Conclusions

- ▶ XALT is useful and low cost tool to know how your users run on your system.
- ▶ Lmod:
 - ▶ Source: [github.com/TACC/lmod.git](https://github.com/TACC/lmod)
 - ▶ Documentation: lmod.readthedocs.io
- ▶ XALT:
 - ▶ Source: [github.com/xalt/xalt.git](https://github.com/xalt/xalt)
 - ▶ Documentation: XALT 2 \Rightarrow xalt.readthedocs.io
 - ▶ Join mailing list:
<https://sourceforge.net/projects/xalt/lists/xalt-users>
 - ▶ This talk:
https://github.com/xalt/xalt/blob/main/my_docs/24/sc_24_booth_talk/presentation.pdf