SC 24 Booth Talk: Lmod

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Introduction

- ▶ Feature and Recent changes that bear repeating
- ▶ Changes in the pass year.
- ▶ Future work?
- ▶ This talk: https://github.com/TACC/Lmod/blob/main/my_docs/24/sc_24_booth_ sentation.pdf

Features

- ▶ Current version is Lmod 8.7.53
- ▶ Release of 8.8 is very soon.
- ▶ Reads for TCL and Lua modulefiles
- ▶ One name rule.
- ▶ Support Software Hierarchy (but not required!)
- ▶ Spider Cache: fast `$ module avail`
- ▶ Properties (gpu, beta. ...)
- ▶ family("compiler") family("mpi") support
- ▶ Optional Tracking: What modules are loaded?
- ▶ Many other features: ml, collections, hooks, extended default, nag ...
- ▶ Google analytics report about 2000 unique users around the world read docs every month.

Recent Feature of Lmod 8+

- ► The TCL interpreter is now (optionally) embedded with Lmod.
- ► `depends_on()`
- ► New Function: `extensions("numpy/1.16.4 scipy/1.4")`
- ► Checking your module tree 8.4.3+

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depends_on()

- ▶ Modules X and Y depends on Module A
- ▶ ml purge; ml X; ml unload X; $\Rightarrow$ unload A
- ▶ ml purge; ml X Y; ml unload X; $\Rightarrow$ keep A
- ▶ ml purge; ml X Y; ml unload X Y ; $\Rightarrow$ unload A
- ▶ ml purge; ml A X Y; ml unload X Y ; $\Rightarrow$ keep A

Checking your module tree 8.4.3+

- ▶ New command added:
  $LMOD_DIR/check_module_tree_syntax
- ▶ Reports syntax errors across the entire $MODULEPATH
- ▶ Report which modules have multiple marked defaults sets
- ▶ Precedent order: default symlink, .modulerc.lua, .modulerc, .version
- ▶ Does not check SYSTEM MODULERCFILE for defaults.

Lmod Recent Features

- New Features now reported:
  https://lmod.readthedocs.io/en/latest/025_new.html
- `module overview`
- `module -d avail`
- New config file: /etc/lmod/lmod_config.lua
- LMOD_QUARANTINE_VARS
- updates to sh_to_modulefile
- source_sh(): source a shell script inside a modulefile

module overview

```
% module overview
----------------- /opt/apps/modulefiles/Core -----------------
StdEnv    (1)   hashrf   (2)   papi         (2)   xalt    (1)
ddt       (1)   intel    (2)   singularity (2)
git       (1)   noweb    (1)   valgrind    (1)

--------------- /opt/apps/lmod/lmod/modulefiles/Core ----------
lmod (1)   settarg (1)
```

/etc/lmod/lmod_config.lua configuration file

- ► This file is evaluated during Lmod startup.
- ► This location is the default during configuration.
- ► A site can change this location at configuration.

```
-- Example /etc/lmod/lmod_config.lua
require("strict")
local cosmic = require("Cosmic"):singleton()

cosmic:assign("LMOD_SITE_NAME", "XYZZY")
local function foo()
  ...
end
sandbox_registration { foo = foo }
```

Sourcing shell scripts inside a modulefile w/ source_sh()

► This was first implemented in Tmod 4.7

► Lmod 8.6 re-implements this feature in a similar way.

► It knows about env. vars and shell functions and aliases.

Changes this year (I)

- ▶ zsh and ksh have stopped fighting over FPATH
- ▶ Generate actual manpages via pod2man
- ▶ new option: `module --dumpname` ⇒ Lmod
- ▶ Now showing module extensions with `module --terse avail`
- ▶ Support for TCL 9.0+ (it works but not integrated into Lmod)

Changes this year (II)

- ▶ Dynamic LMOD_MODULERC and downstream conflicts
- ▶ New function depends_on_any()
- ▶ $MODULES_AUTO_HANDLING converts prereq, prereq_any into depends_on, depends_on_any
- ▶ Support for new: `hide{}` and `forbid{}`
- ▶ Support for $LMOD_SHOW_HIDDEN: avail, list, spider
- ▶ Support for non-reversible functions: setenv, load, ...

Dynamic $LMOD_MODULERC and Downstream Conflicts

- ► $LMOD_MODULERC controls defaults (along with .modulerc.lua etc)
- ► With this dynamic a site can change what are the defaults
- ► The `conflict()` function says you can't load the current modulefile if
- ► Downstream Conflicts allows sites to fail depend_on() loads

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New Function **depends_on_any()**

- ▶ depends_on_any("A","B","C") says try loading the first module you find
- ▶ The tricky part is that Lmod remembers which one it loaded.
- ▶ Needed to support converting prereq_any() into depends_on_any() when $MODULES_AUTO_HANDLING is set

`hide{}`

- ▶ A more powerful hide function with controls for users and/or groups
- ▶ Can hide before or after certain dates
- ▶ Can hide modules from being listed
- ▶ This hide when listed can be overridden (-A, LMOD_SHOW_HIDDEN)

`forbid{}`

- ▶ A forbid function which displays with ml avail but can't be loaded.
- ▶ Can forbid before or after certain dates
- ▶ Can mark certain users or groups special privileges

Lmod Module Tracking DB Update

- ▶ Lmod uses hooks to allow sites to track usage
- ▶ Old DB was smaller but slower to analyze
- ▶ New DB is one table but larger
- ▶ No joining required to analyze
- ▶ Can delete older data. We will only keep 1 years worth

Lmod Monthly Zoom Mtg

- ▶ Previous Topics
    1. Lmod Hooks Discussion
    2. Debugging Modulefiles
    3. Settarg and integrating Lmod with build system
    4. How Module collections works
    5. How to get current module info into hooks
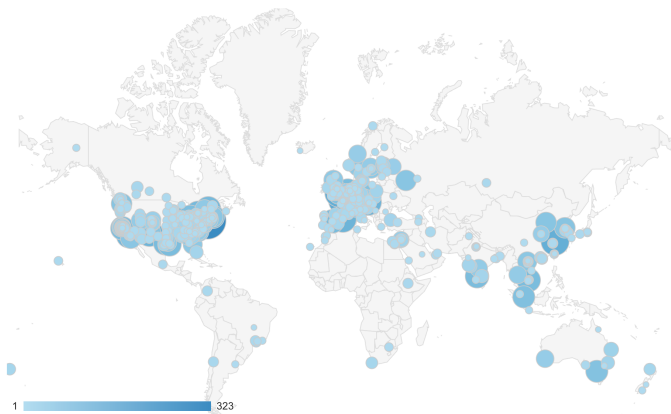   6. How Lmod testing works
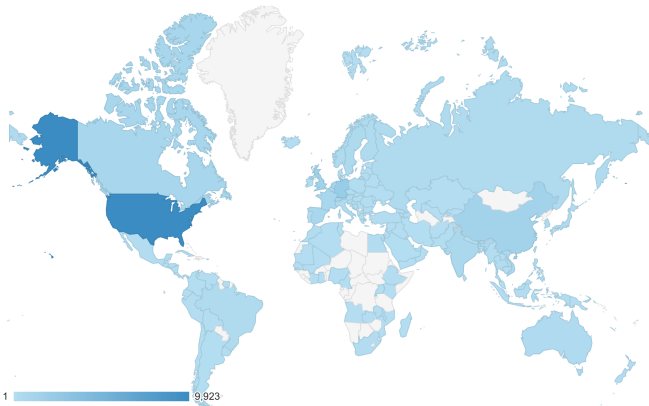- ▶ Zoom Mtg Usually 1st Tuesday
- ▶ See Mailing list or https://github.com/TACC/Lmod/wiki for details
- ▶ Next Meeting Dec. 10th at 15:30 UTC (9:30 US Central)
- ▶ Feel free to when you have questions or concerns and skip when you don't.

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Lmod Doc usage by City

Lmod Doc usage by Country

Conclusions: Lmod 8+

- ▶ Latest version: https://github.com:TACC/lmod.git
- ▶ Documentation: http://lmod.readthedocs.org
- ▶ Talks:
  https://github.com/TACC/lmod/tree/main/my_docs/24/sc_24_booth_t
- ▶
  https://github.com/TACC/Lmod/blob/main/my_docs/24/sc_24_booth_
  sentation.pdf

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