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The University of Texas at Austin

Lmod 8.* + changes to TCL module support

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Outline

- Lmod 8.0+ brought many improvements to TCL support
- Optional Integration of TCL interpreter into Lmod (saves time)
- Support for is-loaded
- Support for is-avail and why I resisted supporting this
- Special features of setenv and pushenv in TCL
- New bugs found when integrating the TCL interpreter into Lmod

How Lmod handles TCL modulefiles

- From last time we talk about how Lmod handles TCL modulefiles
- Use tcl2lua.tcl to read the modulefile.
- It evaluates all pure TCL code
- It outputs Lua strings for all module commands (setenv, etc)
- Lmod evalutes Lua output from tcl2lua.tcl
- Means that all TCL if stmts are evaluated by tcl2lua.tcl

How Lmod handles TCL modulefiles (II)

- Remember that tcl2lua.tcl is a separate code written in TCL
- It doesn't have access to the internal Lmod structures
- There is only a command-line interface between the two programs.

Special Features of tcl2lua.tcl

```
setenv ABC def
if { $env{ABC} == "def" } {
     # do something
}
```

- Internally setenv and pushenv change the current environment
- Also output: `setenv("ABC","def")`

Support for TCL is-loaded

```
if { ! [ is-loaded foo ] } {
   module load foo
}
```

- To handle this a list of currently loaded modules is provides (every time!) to tcl2lua.tcl
- This way if there is an **is-loaded**, it can be evaluated.
- It is cheap for Lmod to provide this list.

Support for TCL is-avail

```
if { [ is-avail foo ] } {
   module load foo
}
```

- This is much harder to provide.
- Lmod could provide a list of currently available modules
- But this is expensive and most times this is not needed.
- Is there another way to provide this?

The user provided the key

- What if the tcl module requested an avail
- Well tcl2lua.tcl could do that work on behalf of the modulefile
- It is expensive but only when is-avail requested.

How tcl2lua.tcl implements the is-avail

- It does: **$LMOD_CMD bash –no_redirect -t avail**
- This generates a list of available module written to stderr
- This list is processed and stored in a TCL dictionary
- Then the is-avail argument is checked.

Lmod 8+ supports integrating the tcl interpreter

- It is optionally but can be disabled
- Configure or set LMOD_FAST_TCL_INTERP=no
- Enabled it speeds tcl evaluations.
- No need to fork-exec a separate program for every TCL modulefile or TCL .version or TCL .modulerc file

Integrating the TCL interpreter exposed bugs

- Kenneth Hoste reported that pushenv didn't work in TCL modulefiles.
- Lmod's pushenv saves the old value in a hidden env. var.
- Now that the TCL interpreter is in the same executable
- Its environment is also in the same environment
- The TCL pushenv (like setenv) changes the local environment
- When Lmod evaluated the `pushenv()` lua command
- The old env value was over-written

pushenv and setenv solution

- The tcl2lua code remembers any setenv or pushenv env names and values in a TCL dictionary.
- It only remembers the first time an env. var is changed.
- It resets the env. before exiting tcl2lua.tcl

Next Time

- What is TCL break and why you might use it
- How TCL help messages are supported
- How TCL puts is handled.

Future Topics

- Next Meeting: January 3nd or 10th 9:30 US Central (15:30 UTC)?