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The University of Texas at Austin

How Lmod supports finding “Highest” and marked defaults in one step

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Outline



- ▶ Lmod supports “module load name” as well as “module load name/version”
- ▶ In Lmod, fullName: “name/version”, version: “version” and shortName: “name”
- ▶ So how does pick a version when there is no version specified?

What rules does Lmod use to pick a default?

1. Pick highest priority marked default if it exists.
2. Otherwise pick the “highest” version.

How does Lmod sort versions?

- ▶ Karl Schultz (TACC \Rightarrow Intel \Rightarrow Open HPC \Rightarrow AMD) asked
- ▶ Can't Lmod know 5.9 is older than 5.10?
- ▶ I stole the ideas in Python's loose version code to build `src/parseVersion.lua`
- ▶ It converts version 2.11b into "000000002.0000000011.*b.*zfinal"
- ▶ It knows how to handle things like alpha and beta.
- ▶ So versions are ordered: $1.1\text{alpha} < 1.1\text{beta} < 1.1$
- ▶ 1.1alpha: "000000001.000000001.*alpha.*zfinal",
- ▶ 1.1beta: "000000001.000000001.*beta.*zfinal",
- ▶ 1.1: "000000001.000000001.*zfinal",

When there are no marked defaults?

- ▶ For name/version (not name/version/version) Lmod collects all version across all \$MODULEPATH directories.
- ▶ Only the first “acme/2.1” is used.
- ▶ Lmod picked the highest “pV” as default
- ▶ for N/V/V only the first directory in \$MODULEPATH is used

What if there marked defaults for shortName?

- ▶ Suppose acme/2.1, acme/2.2 and acme/2.3 exist and 2.1 is the marked default?
- ▶ How does Lmod chose?
- ▶ Does it look for marked defaults first then highest?

Lmod modifies pV \Rightarrow wV

- ▶ Lmod collects all version for “acme”
- ▶ It builds pV for each version
- ▶ Then it modifies pV to become wV (weighted version)
- ▶ By applying any marked defaults

Three ways to mark a default

- ▶ Lowest: filesystem: `.version`, `.modulerc`, or `.modulerc.lua` in version directory
- ▶ Medium: A System `modulerc` or `modulerc.lua` file
- ▶ Highest: A user `~/.modulerc` or `~/.modulerc.lua`

Modifying pV \Rightarrow wV

- ▶ If “acme/2.1” is the marked default then
- ▶ Lmod replaces the first character with
- ▶ “^” for filesystem
- ▶ “s” for System moduler
- ▶ “u” for user moduler
- ▶ For example a filesystem marked default becomes
- ▶ wV = “^00000002.000000001.*zfinal”

Using ascii sort order

- ▶ Since “u” > “s” > “^” > numbers
- ▶ Then user > system > filesystem > highest
- ▶ This is how Lmod picks the default

This (wV) can be seen the the moduleTable

```
$ module --mt # or ml --mt
...
acme =
  fn = "/opt/apps/modulefiles/Core/acme/2.1.lua",
  fullName = "acme/2.1",
  loadOrder = 5,
  propT = ,
  stackDepth = 1,
  status = "active",
  userName = "acme",
  wV = "^000000002.000000001.*zfinal",
,
```

Conclusions

- ▶ This is a potential bug if sites use versions more than 9 digits
- ▶ Version like 1.2.3.4.5.6.7.8.9.2.3 are ok
- ▶ Version like 12345678901.1 would be bad (but unlikely)
- ▶ Lmod could fix the by using more padding.
- ▶ Otherwise this is convenient way to find the default

Future Topics

- ▶ To be determined.
- ▶ Next Meeting will be August 1st at 9:30 Central (14:30 UTC)