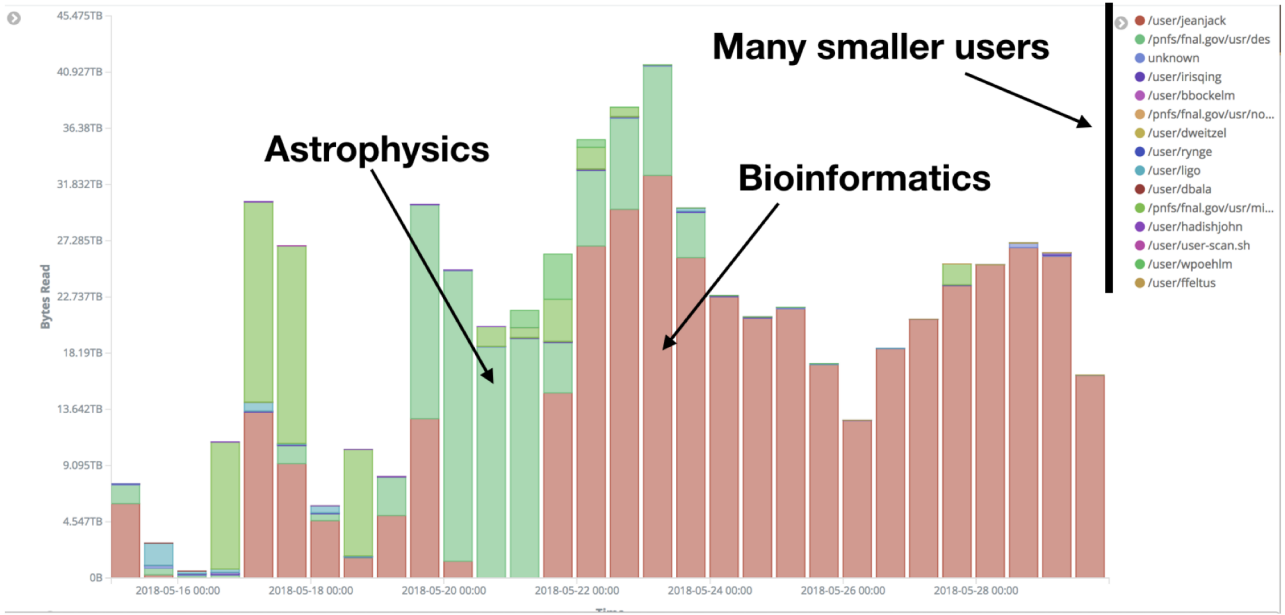
Large Output and Shared File Systems

Thursday PM, Lecture 1

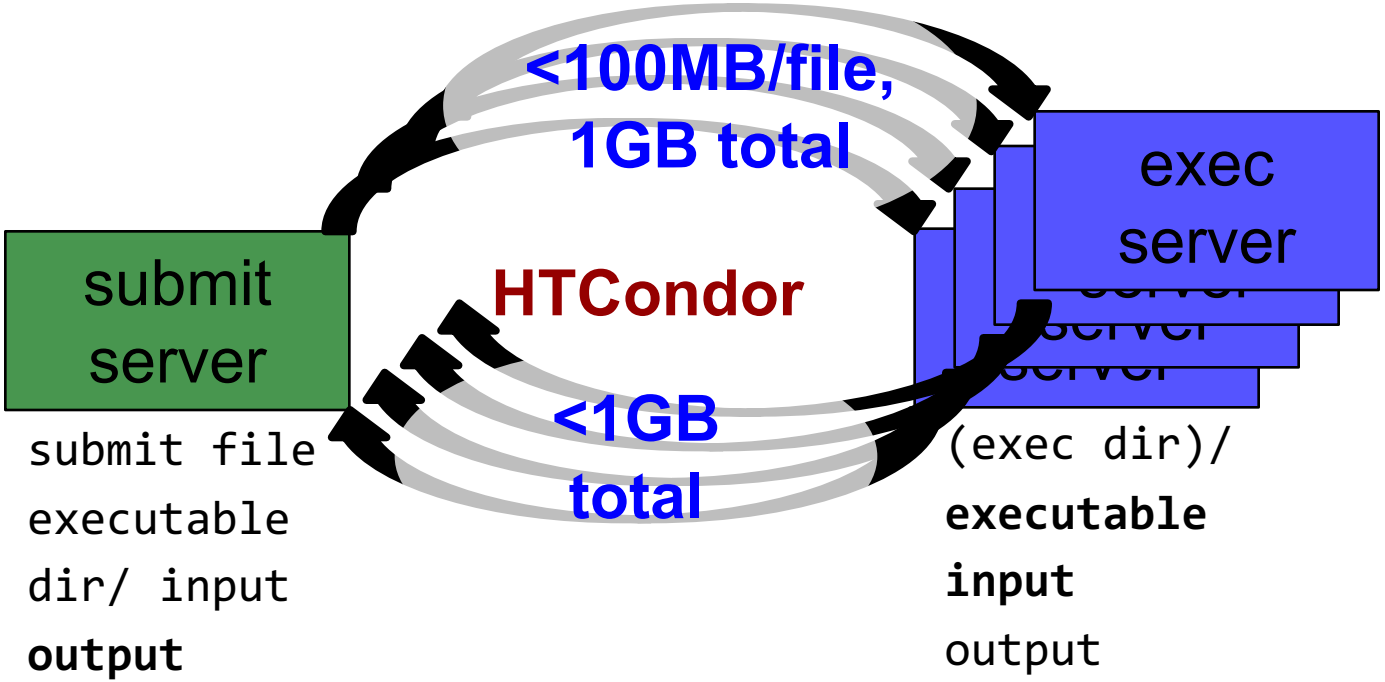
Lauren Michael

StashCache

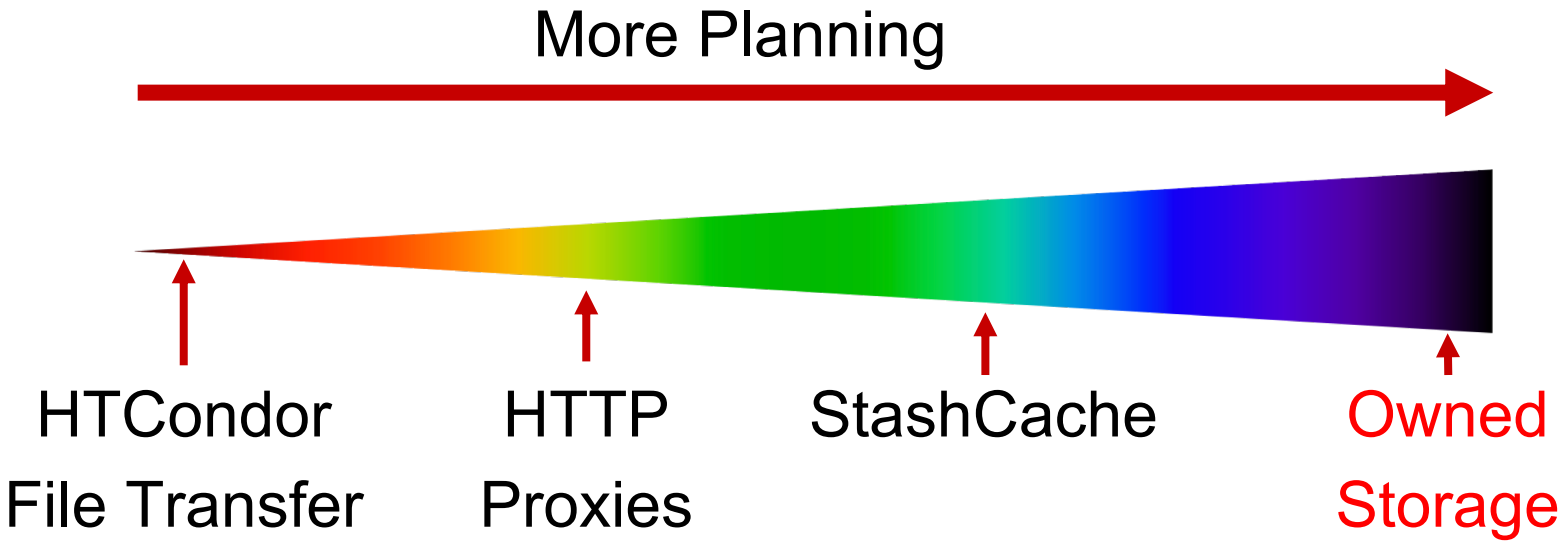
- Lots of experiments also use StashCache



Per-job transfer limits



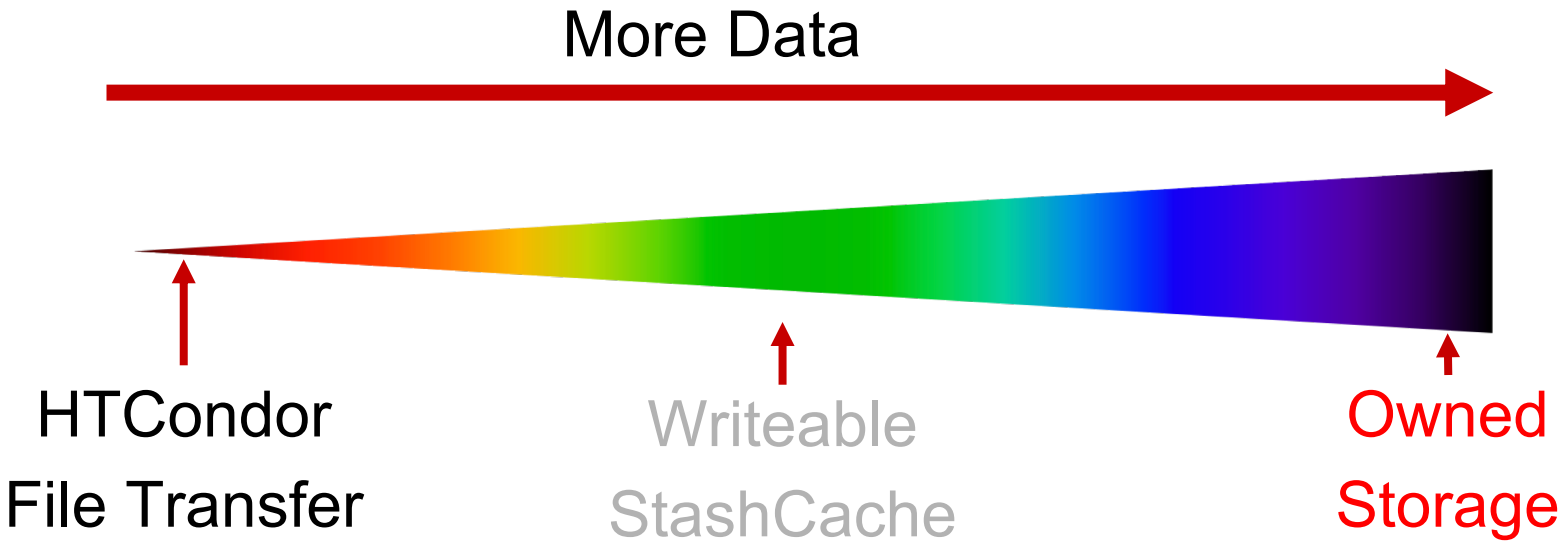
Transfers


More Planning
HTCondor
File Transfer
HTTP
Proxies
StashCache
Owned
Storage

What's Different for Output?

- always unique (right?), so caching won't help
- files not associated with your local username
  - security barriers outside of local context
- security issues with world-writability
  - (versus okay world-readability for input)

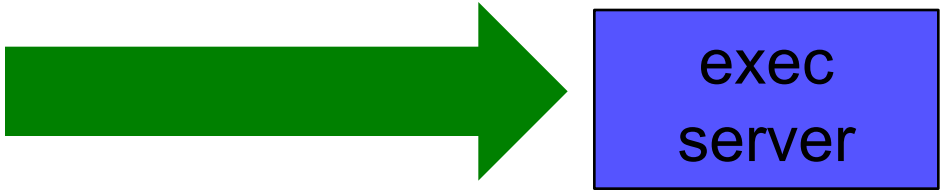
Output


More Data
HTCondor
File Transfer
Writeable
StashCache
Owned
Storage

Output for HTC and OSG

file size	method of delivery
~~words~~	~~within executable or arguments?~~
tiny – 1GB	HTCondor file transfer (up to 1 GB total per-job)
1GB+	**shared file system (local execute servers)**

Large input in HTC and OSG



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tiny – 10MB per file	HTCondor file transfer (up to 1GB total per-job)
10MB – 1GB, shared	download from web proxy (network-accessible server)
1GB - 10GB, unique or shared	StashCache (regional replication)
10 GB – TBs, unique or shared	**shared file system (local copy, local execute servers)**

(Local) Shared Filesystems

- data stored on file servers, but network-mounted to local submit and execute servers
- use local user accounts for file permissions
  - Jobs run as YOU!
  - readable (input) and writable (output, most of the time)
- *MOST* perform better with fewer large files (versus many small files of typical HTC)

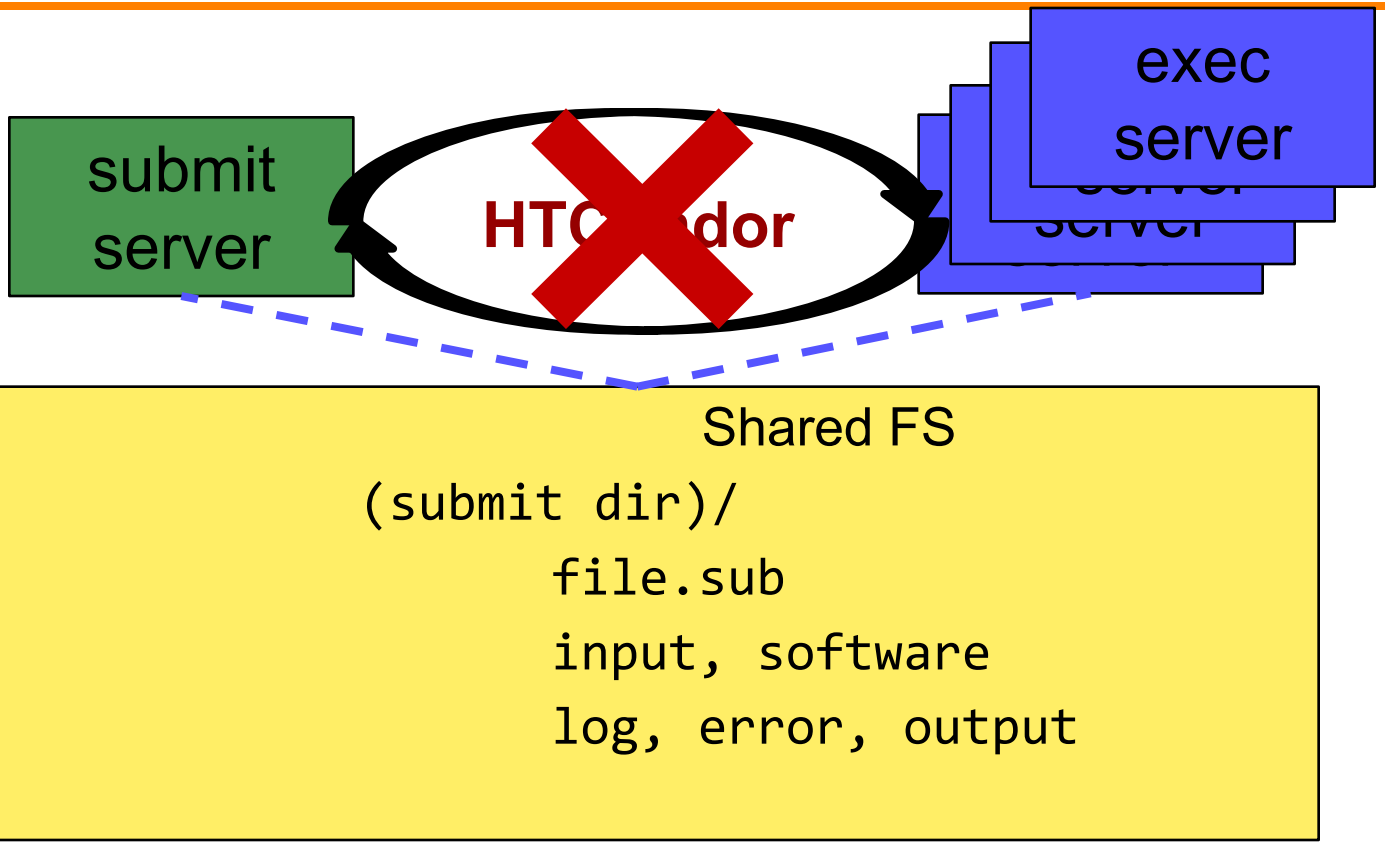
Shared FS Technologies

- *via network mount*
  - NFS
  - AFS
  - Lustre
  - Gluster (may use NFS mount)
  - Isilon (may use NSF mount)
- *distributed file systems (data on many exec servers)*
  - HDFS (Hadoop)
  - CEPH

Shared FS Configurations

1. Submit directories *WITHIN* the shared filesystem
   - most campus clusters
   - limits HTC capabilities!!
2. Shared filesystem separate from local submission directories
   - supplement local HTC systems
   - treated more as a repository for VERY large data (>GBs)
3. Read-only (input-only) shared filesystem
   - Treated as a repository for VERY large input, only

Submit dir within shared FS



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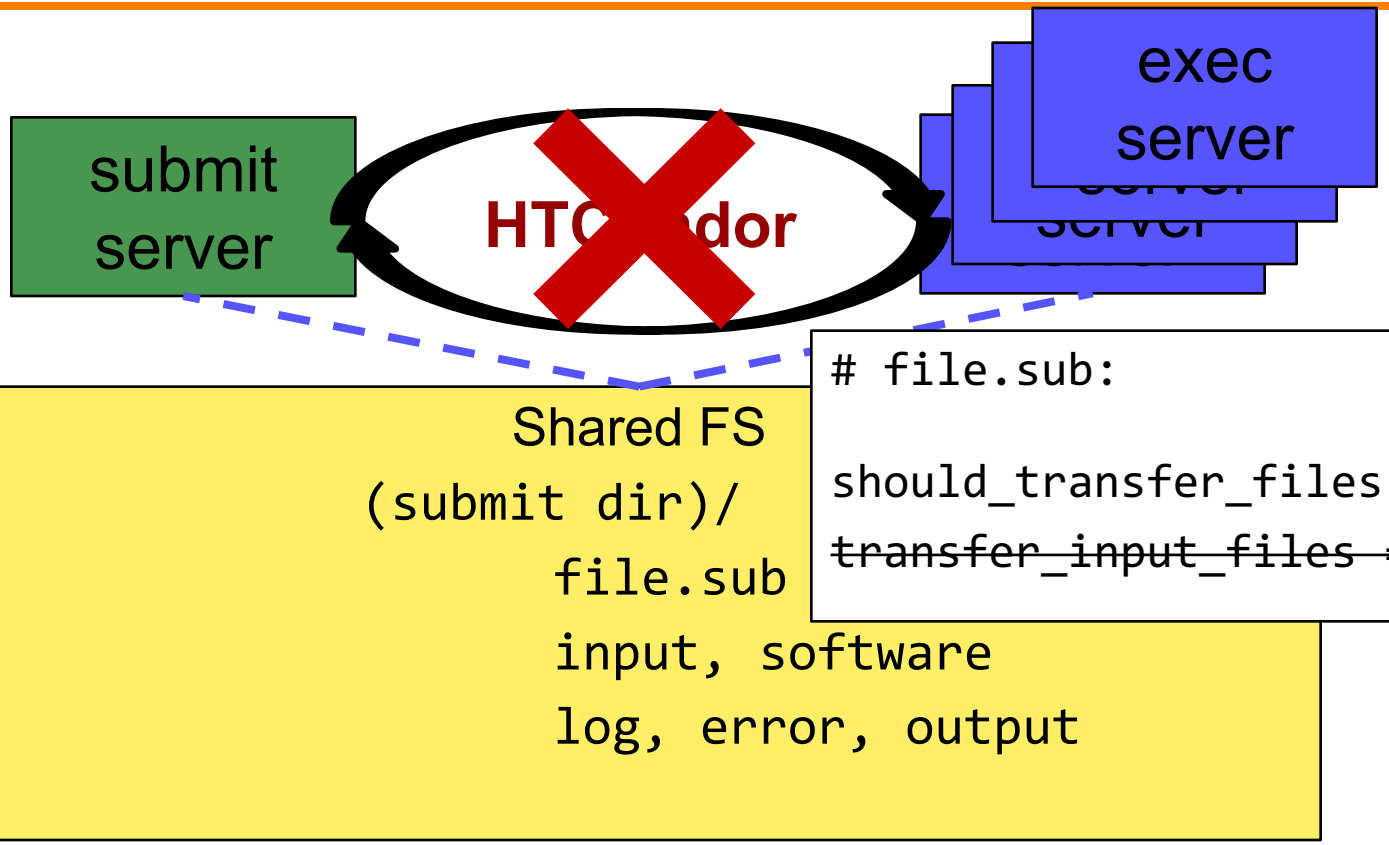
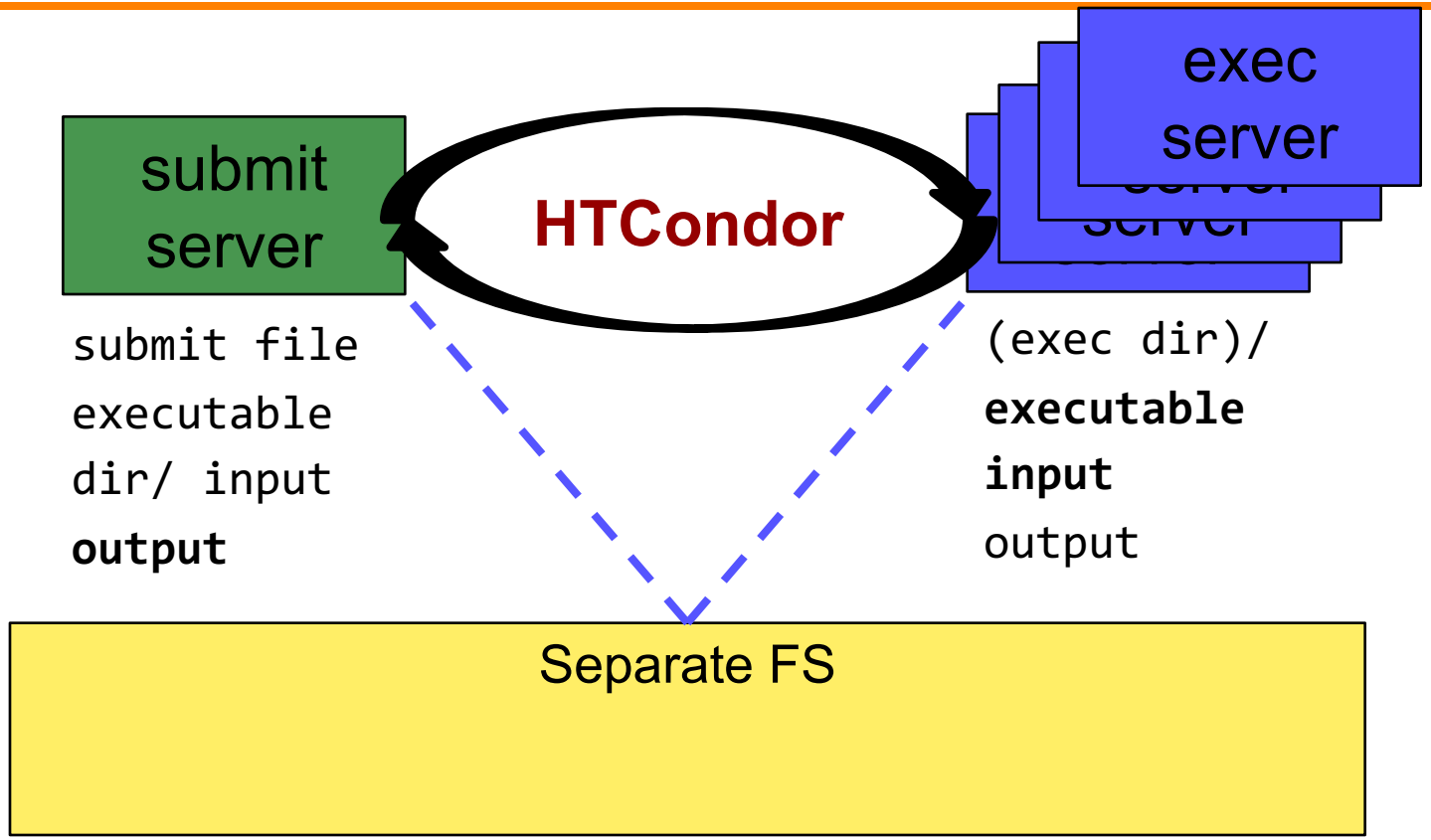


Separate shared FS



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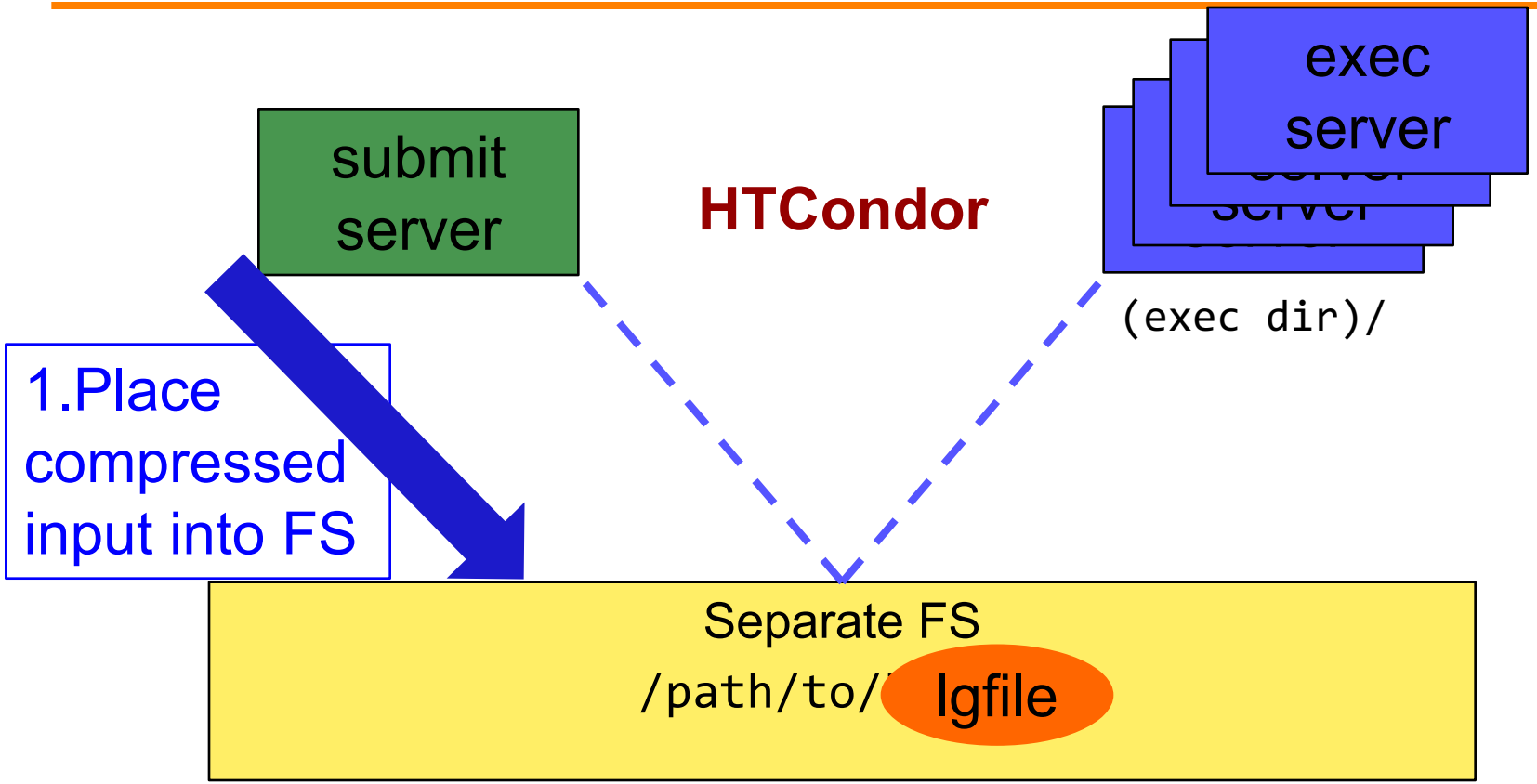

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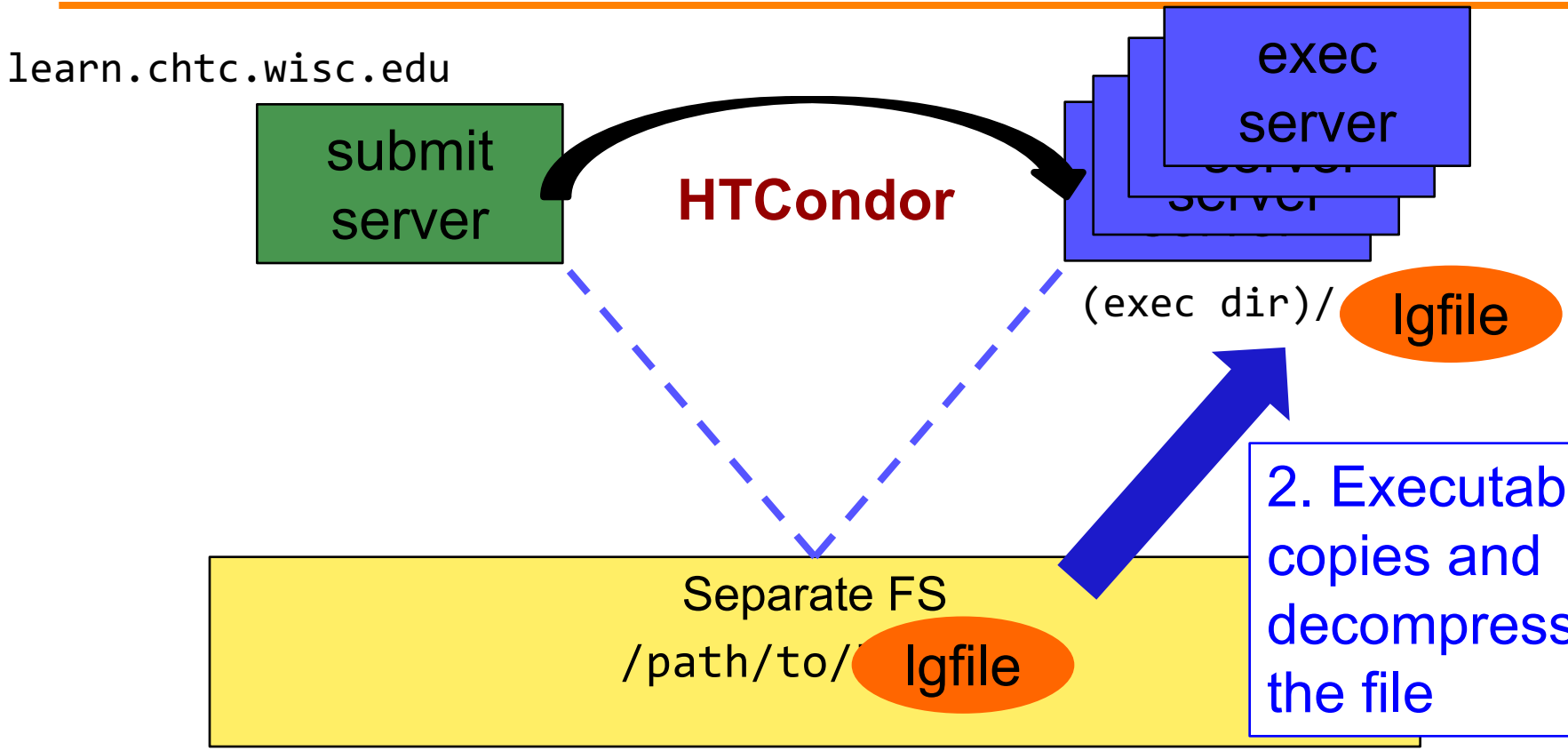

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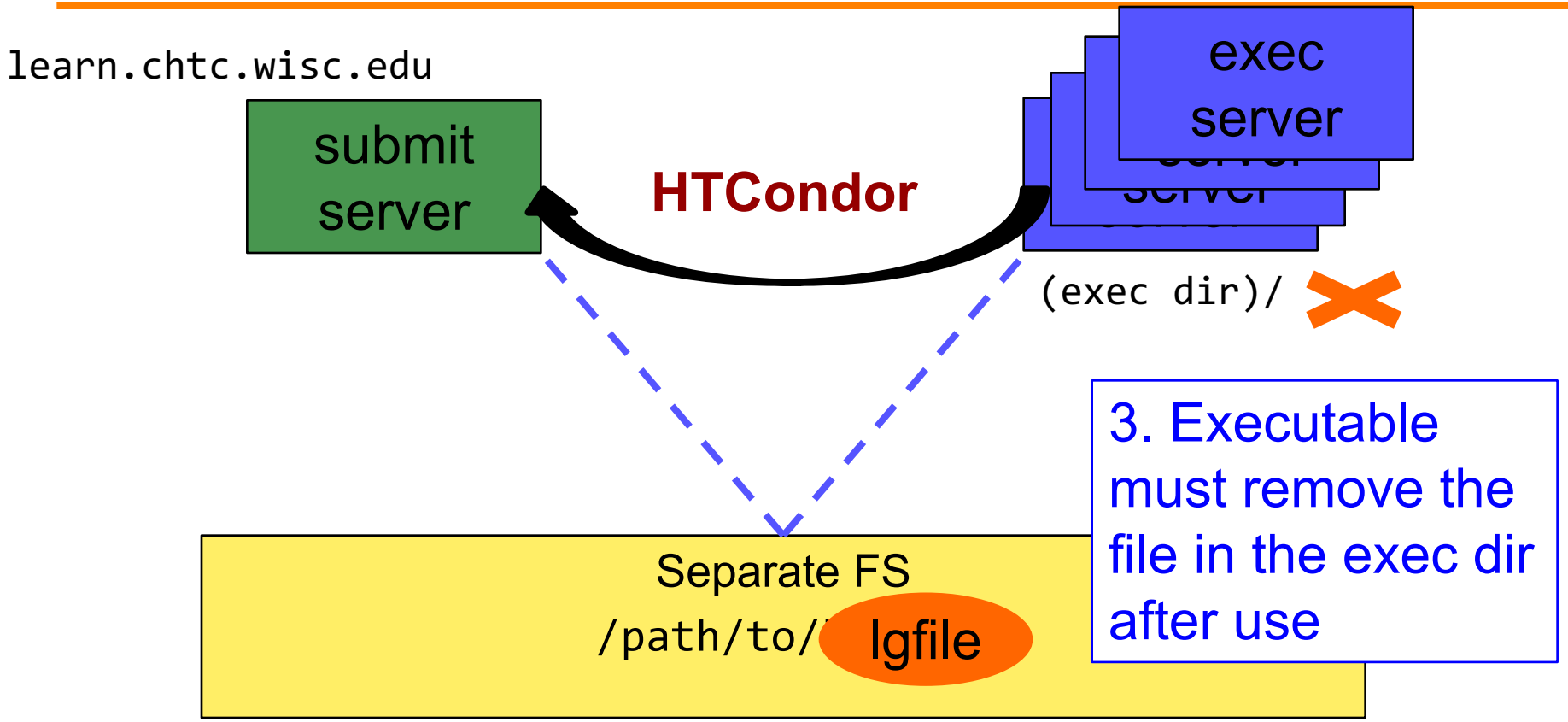

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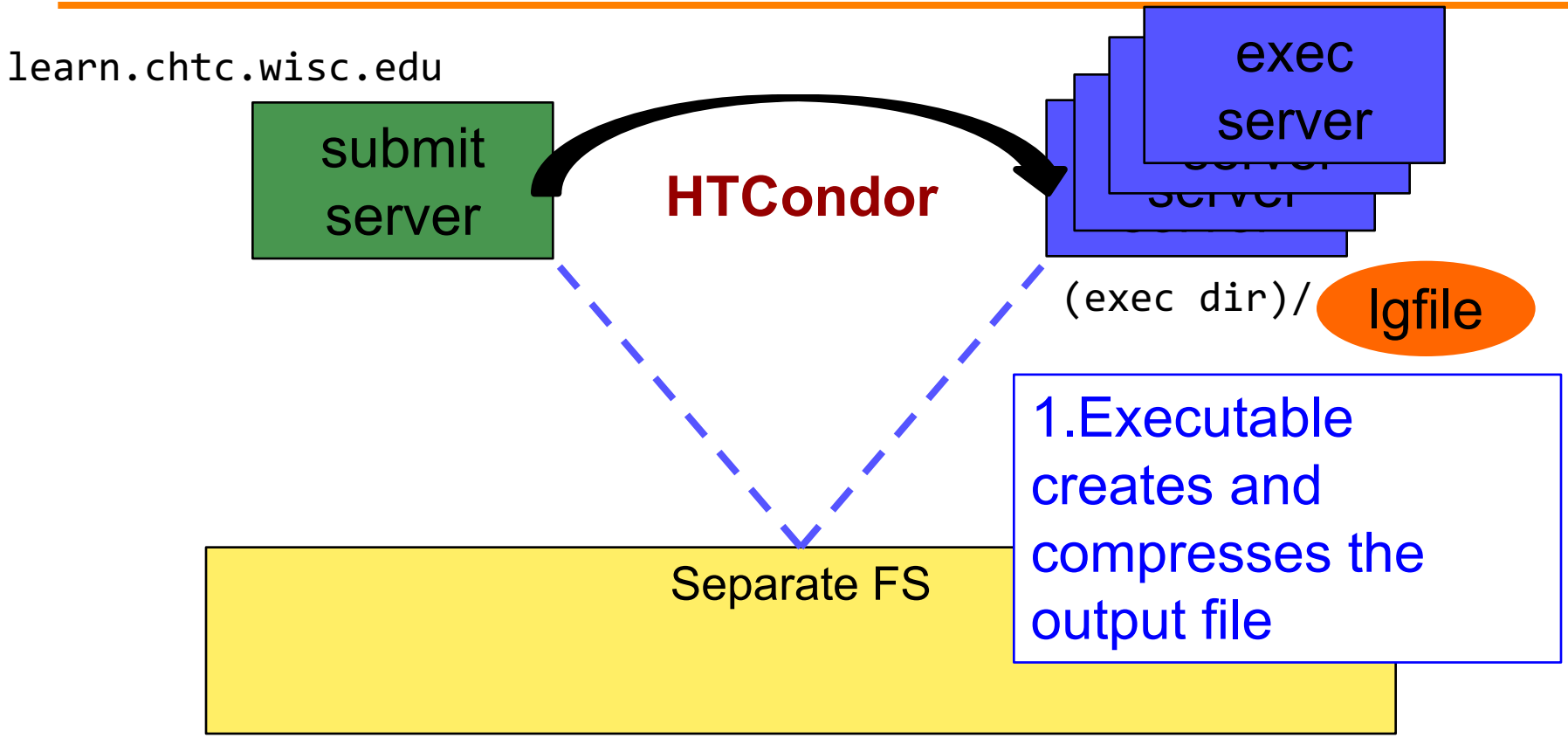

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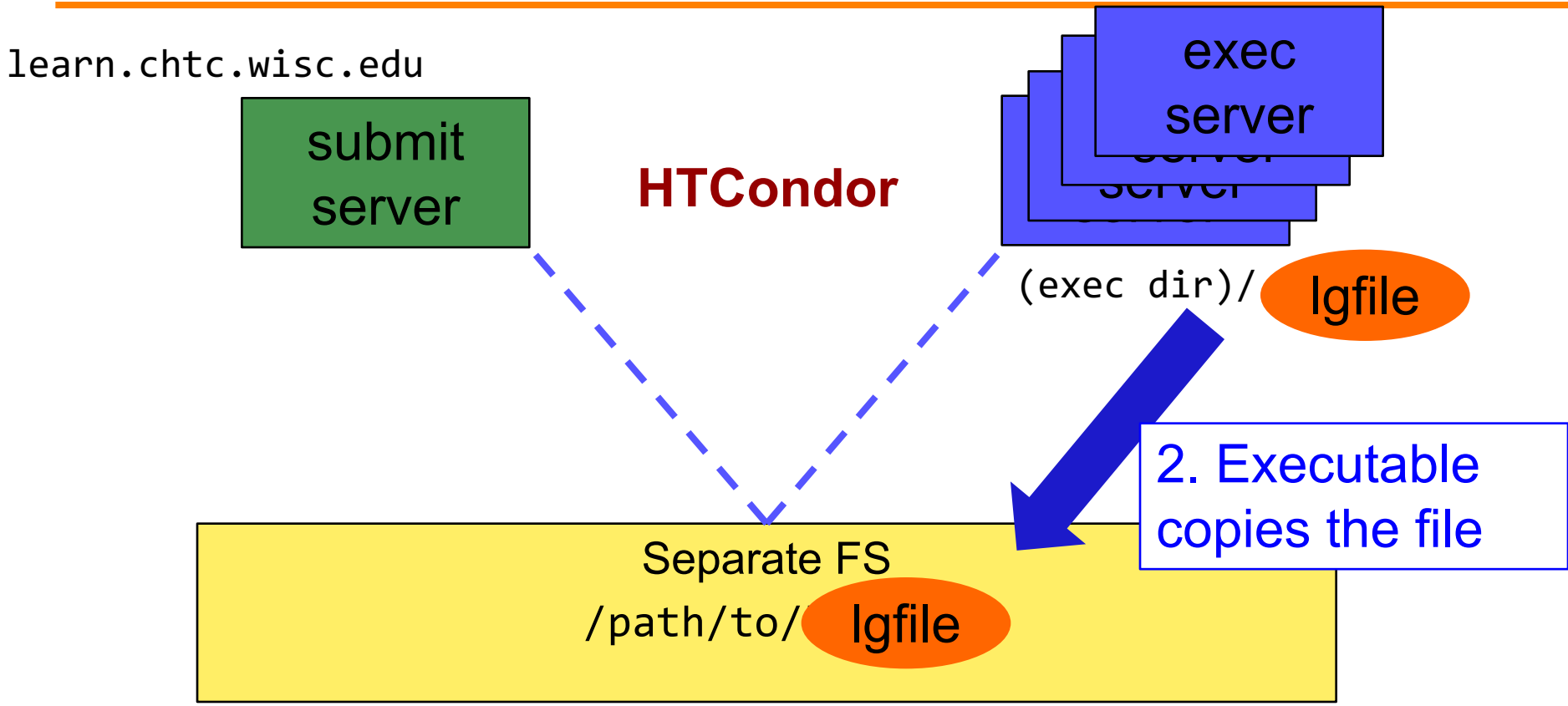

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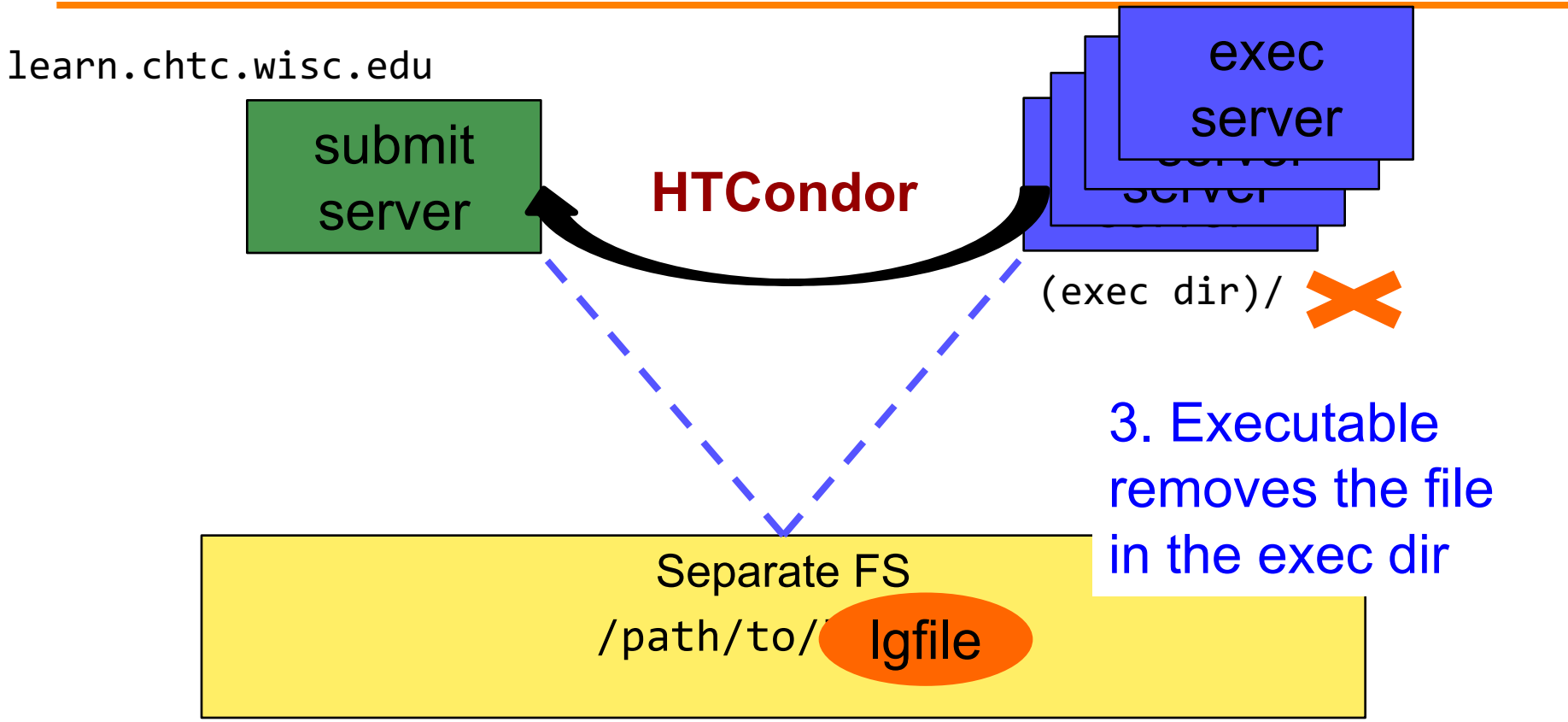
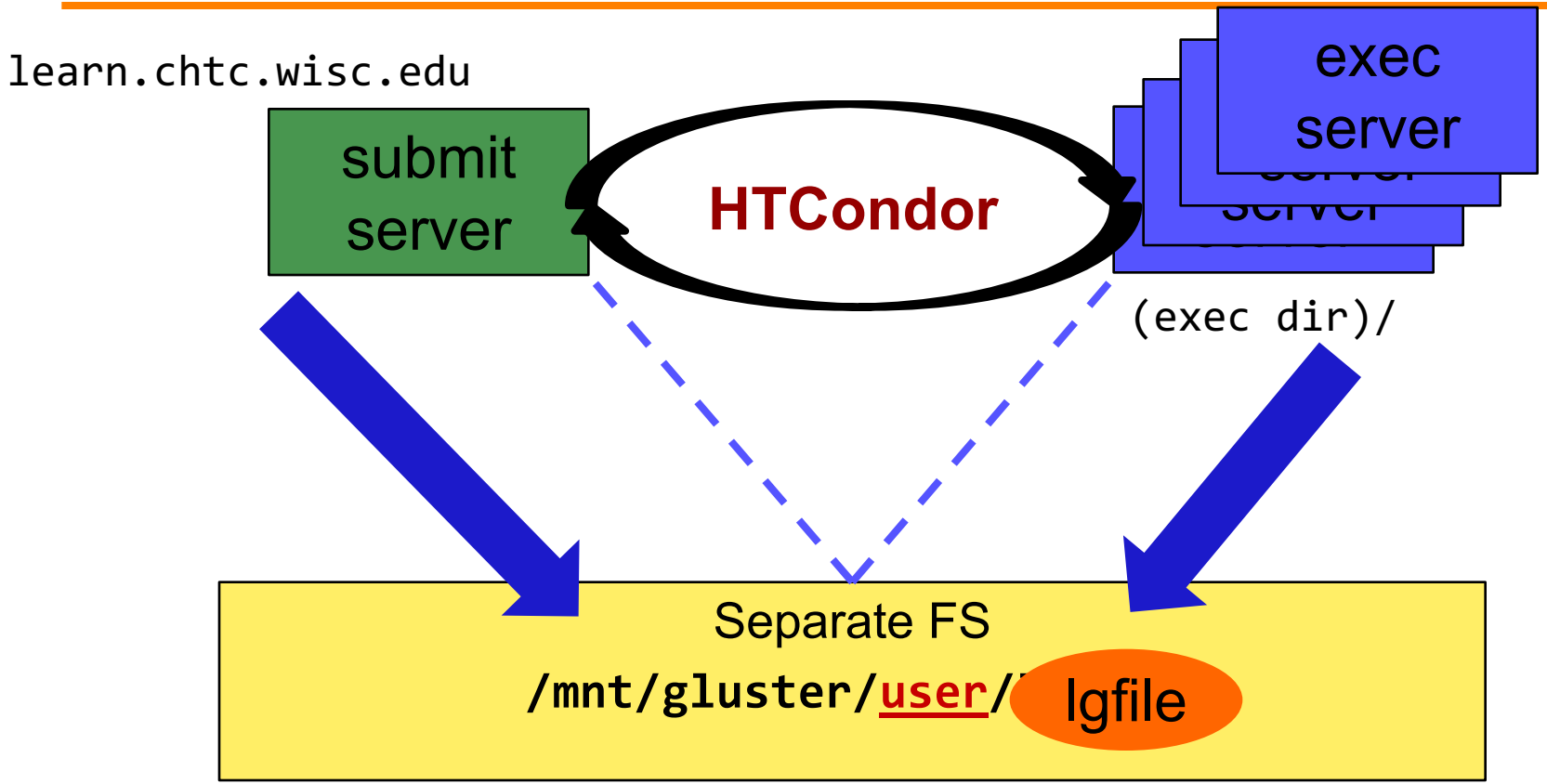


At UW-Madison (Ex. 4.1-4.2)



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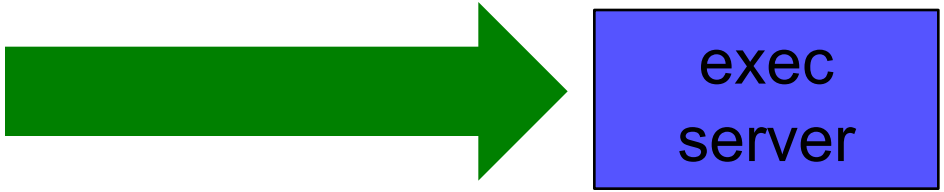

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Review

Option	Input or Output?	File size limits	Placing files	In-job file movement	Accessibility?
HTCondor file transfer	Both	10 MB/file (in), 1 GB/file (out); 1 GB/tot (either)	via HTCondor submit node	via HTCondor submit file	anywhere HTCondor jobs can run
Web proxy	Shared input only	1 GB/file	specific to VO	HTTP download	anywhere, by anyone
StashCache	Shared and unique input	10 GB/file (will increase!)	via OSG Connect submit server	via `stashcp` command (and module)	OSG-wide (90% of sites), by anyone
Shared filesystem	Input, likely output	TBs (may vary)	via mount location (may vary)	use directly, or copy into/out of execute dir	local cluster, only by YOU (usually)

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Exercises

- 3.1 Shared Filesystem for Large Input
- 3.2 Shared Filesystem for Large Output

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Questions?

- Next: Exercises 3.1-3.2
- Later: Job workflows