Goodbye Channels 👋
👋 Hello GlobusComputeExecutor

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Channels: A bit of history

- A way to connect to multiple remote machines to run workflows
  - Simplify connecting to remote systems
  - Automation of remote tasks
  - Connection persistence
- Clouds and some misunderstood priorities
- Poor man's clusters
- MFA and adamant non-conformity of auth over the years

Channels: What's wrong with it?

- MFA makes it difficult to login reliably without human in the loop
- Security rules limit session times, making it hard to run long lived workflows

Other indirect issues:

- Remote machines often do not share file-systems
  - Users need to be explicit about files and staging
- Distributed environment management is difficult
- Unmaintained and barely used code sitting in core of parsl

Channels: What now?

- Channels are marked as deprecated as of Aug 07, 2024
- Planned to be removed on Nov 07, 2024
  - If you depend on channels, please come talk to us
  - If you've thought or complaints, please post over on (Parsl issue #3515)
- But… we've got an alternative for you

GlobusComputeExecutor

- GCE wraps a Globus Compute into the familiar executor model.
- Multi-site remote workflows are simpler than ever, with reliable authentication and better handling of long-lived workflows
  - *facility (un)scheduled downtime can still mess up things, but we are better equipped to handle this

GlobusComputeExecutor PR is in review ([PR #3619](#))

GlobusComputeExecutor: An example

```python
GlobusComputeExecutor.py
1   import parsl
2   from parsl import Config, python_app
3   from parsl.executors import GlobusComputeExecutor
4
5   @python_app
6   def double(x):
7       return x * 2
8
9   # My local endpoint ID
10  ep_id = "a1e677f9-c08a-4b70-8b70-4a51b13128cd"
11  config = Config(executors=[
12      GlobusComputeExecutor(endpoint_id=ep_id)
13  ])
14  parsl.load(config)
15
16  future = double(10)
17  print(f"{future.result()=}")
```

GlobusComputeExecutor: An even cooler example

```python
multisite_workflow.py

1   import parsl
2   from parsl import Config, python_app
3   from parsl.executors import GlobusComputeExecutor, ThreadPoolExecutor
4
5   config = Config(executors=[
6       GlobusComputeExecutor(
7           label='perlmutter',
8           endpoint_id="e6235ebd-ab89-455a-bd80-05ba591258d2"),
9       GlobusComputeExecutor(
10          label='expanse',
11          endpoint_id="fa0cfca5-866b-4ce8-99c2-5f6707bbd26a"),
12      ThreadPoolExecutor(
13          label='local_threads'),
14  ])
15
16  parsl.load(config)
17
```

```python
18  @python_app(executors=['perlmutter'])
19  def plat_info_perlmutter():
20      import platform
21      return platform.uname()
22
23  @python_app(executors=['expanse'])
24  def plat_info_expanse():
25      import platform
26      return platform.uname()
27
28  @python_app(executors=['local_threads'])
29  def concat(info1, info2):
30      return str(info1) + '\n' + str(info2)
31
32  combined = concat(plat_info_perlmutter(), plat_info_expanse())
33
34  print(combined.result())
```

```
(parsl_py3.11) /Users/yadu/src/parsl:>python3 gce_slow.py
/Users/yadu/opt/anaconda3/envs/parsl_py3.11/lib/python3.11/site-packages/globus_compute_sdk/sdk/client.py:192: U
serWarning:
Environment differences detected between local SDK and endpoint fa0cfca5-866b-4ce8-99c2-5f6707bbd26a workers:
        SDK: Python 3.11.7/Dill 0.3.6
        Workers: Python 3.11.8/Dill 0.3.6
This may cause serialization issues.  See https://globus-compute.readthedocs.io/en/latest/sdk.html#avoiding-seri
alization-errors for more information.
  warnings.warn(check_result, UserWarning)
/Users/yadu/opt/anaconda3/envs/parsl_py3.11/lib/python3.11/site-packages/globus_compute_sdk/sdk/client.py:192: U
serWarning:
Environment differences detected between local SDK and endpoint e6235ebd-ab89-455a-bd80-05ba591258d2 workers:
        SDK: Python 3.11.7/Dill 0.3.6
        Workers: Python 3.11.9/Dill 0.3.6
This may cause serialization issues.  See https://globus-compute.readthedocs.io/en/latest/sdk.html#avoiding-seri
alization-errors for more information.
  warnings.warn(check_result, UserWarning)
uname_result(system='Linux', node='login21', release='5.14.21-150400.24.81_12.0.87-cray_shasta_c', version='#1 S
MP Thu Jan 11 20:03:21 UTC 2024 (e30c7c1)', machine='x86_64')
uname_result(system='Linux', node='login02', release='4.18.0-513.24.1.el8_9.x86_64', version='#1 SMP Thu Apr 4 1
8:13:02 UTC 2024', machine='x86_64')
```

Channels & GCE: fin

- Please come find <Yadu> if you still use Channels