

CYLC workflow manager @ CMCC SCC

Osvaldo Marra & Mauro Tridici
CMCC Supercomputing Center (SCC)

Riunione PARC
01/07/2020



what is CYLC?

Cylc is a workflow manager for HPC users needs.

A Cylc workflow is a single (possibly cycling) suite of inter-dependent tasks.

A Cylc workflow service is workflow manager program for a single workflow, formerly known as a suite server program or a suite daemon. (Cylc has no central server - each workflow gets its own ad-hoc service that runs as the user).



CYLC available releases (pro and cons)

# version	type	pro	cons
7.8.4	production	stable	Based on old python and desktop GUI application versions
8.1	alpha1	not stable	Based on new python version and browsable shared web interface

Cylc-7 is written in Python 2, with PyGTK desktop GUIs and relatively simple local client/server architecture in which everything runs as the user, all clients are treated equally (user GUI and CLI, and job CLI), clients get some server information via the filesystem and port scanning, and automatic owner-only authentication via a suite-specific passphrase file. Unfortunately:

Python 2 end-of-life is 1 Jan 2020, after which “there will be no [Python 2] updates, not even source-only security patches”.

PyGTK is Python 2 based and has not been updated for years



First CYLC prototype @ CMCC SCC

CYCL service has been deployed on a dedicated **virtual machine** in order to prevent changes on HPC systems login nodes. CYLC core is running on a independent server instance **mounting (via NFS) Zeus /users_home file system and connected to Zeus NIS server.**

Users can reach CYLC server using **DMZ VPN** and their well known password.

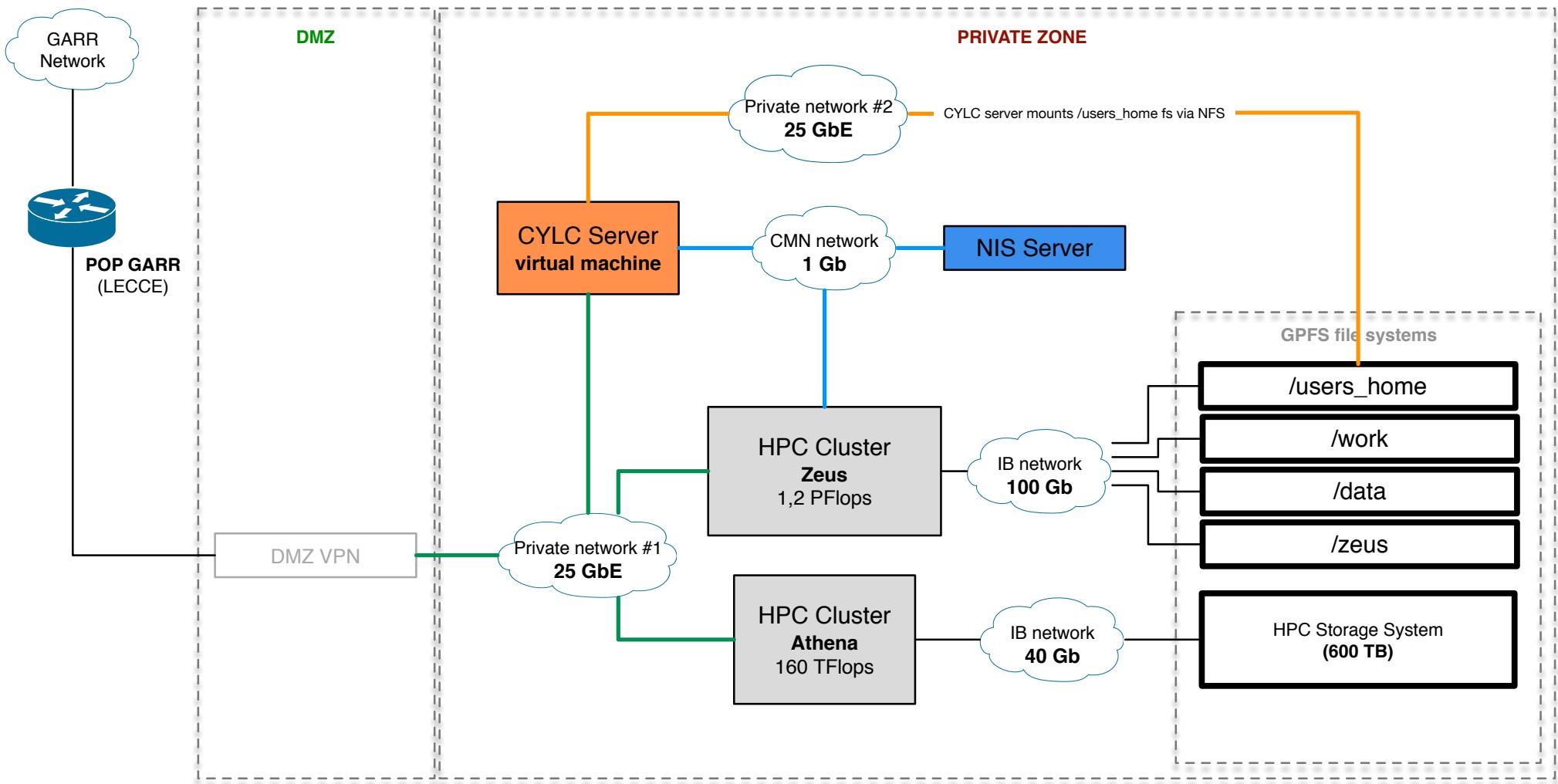
They can create their own CYLC suites directly on **/users_home backed-up file system** and they can run them pointing to Zeus login nodes (at this moment, only login3 has been configured to accept remote CYCL requests).

In order to increase the operational speed of CYLC desktop user interface a lot of **improvements** have been introduced (Enhanced SSH, VNC server for high speed virtual desktop access and so on).

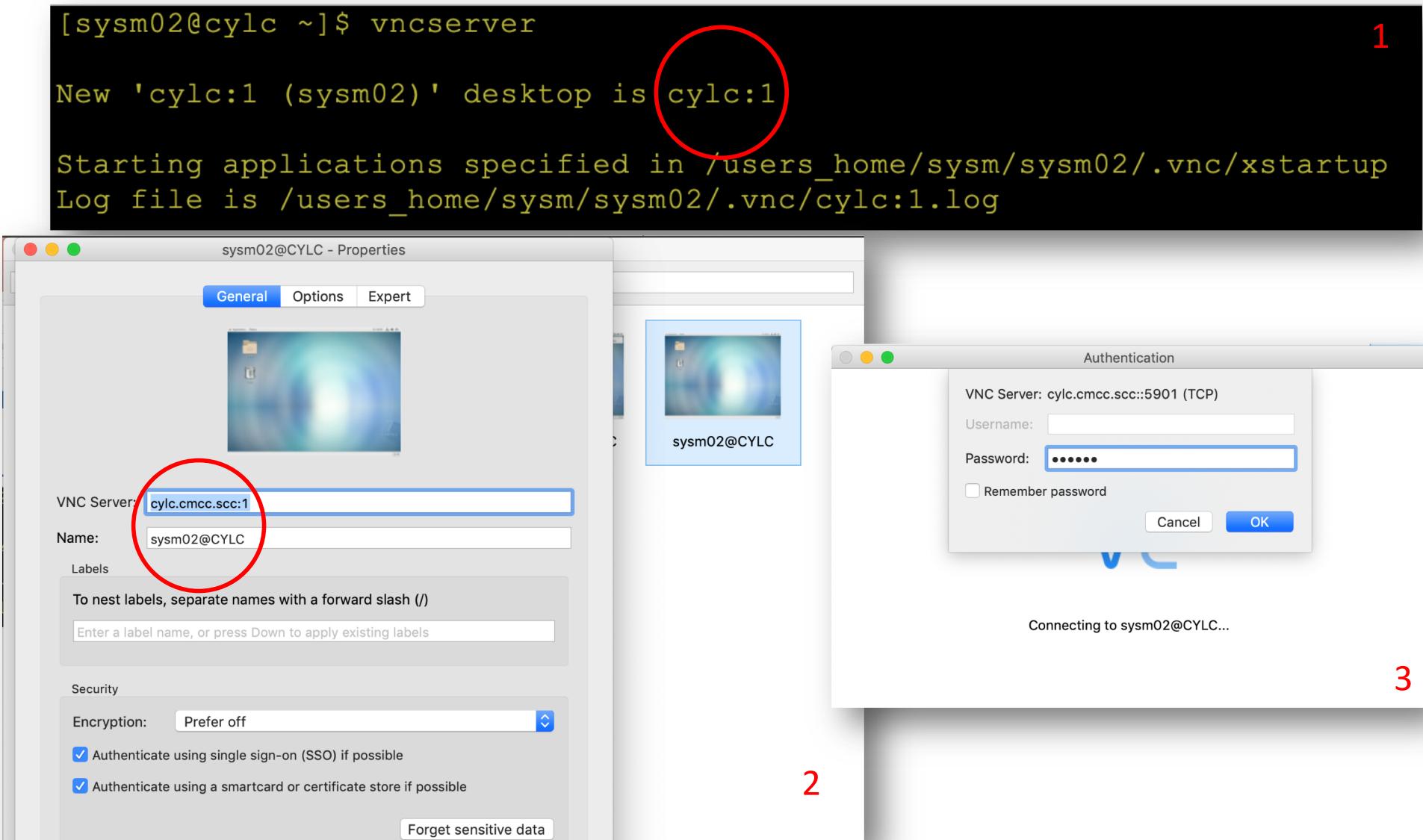
So, users can use CYLC CLI or CYLC GUI. They can also monitoring the job results consulting produced log files or CYLC web interface.



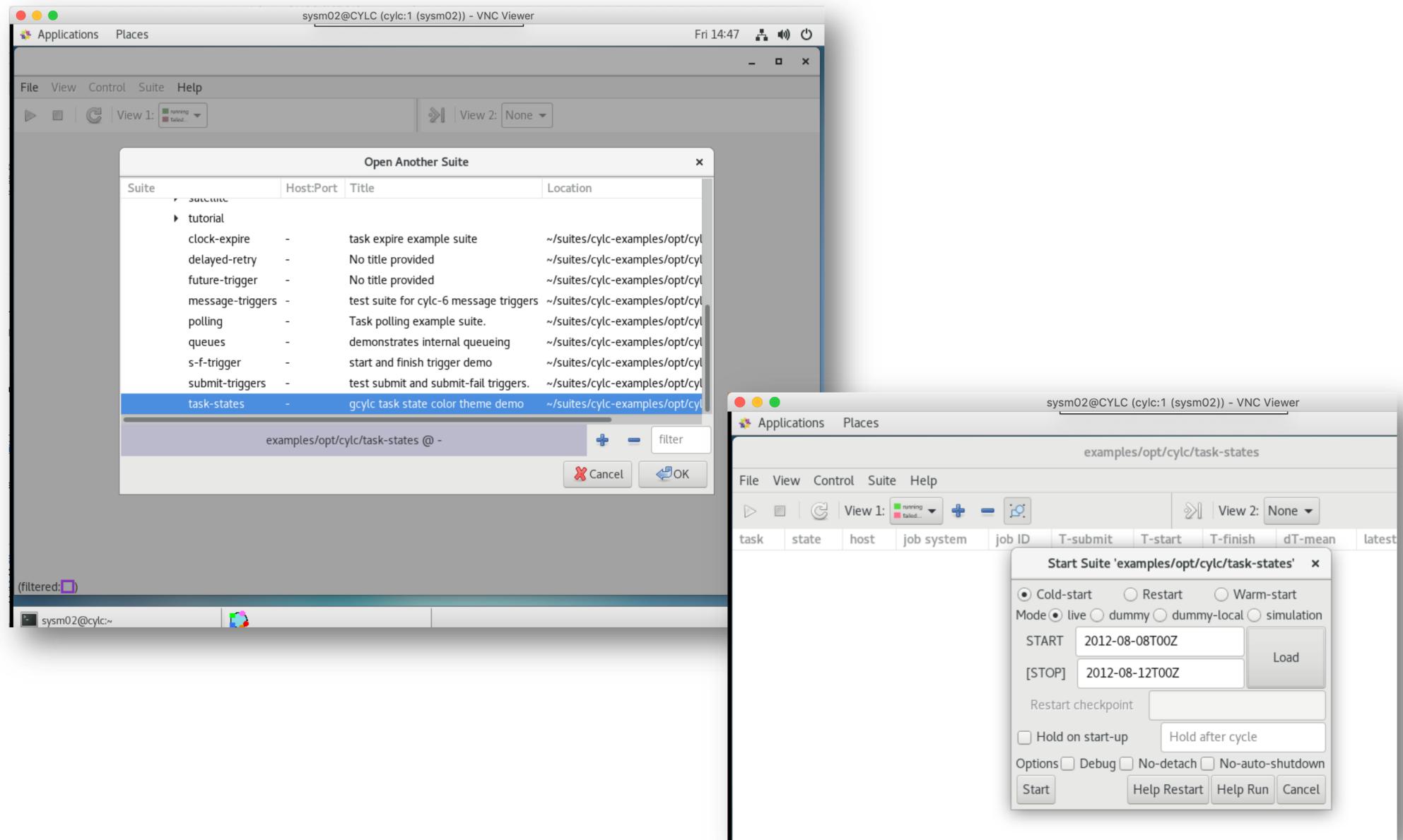
CYLC prototype schema



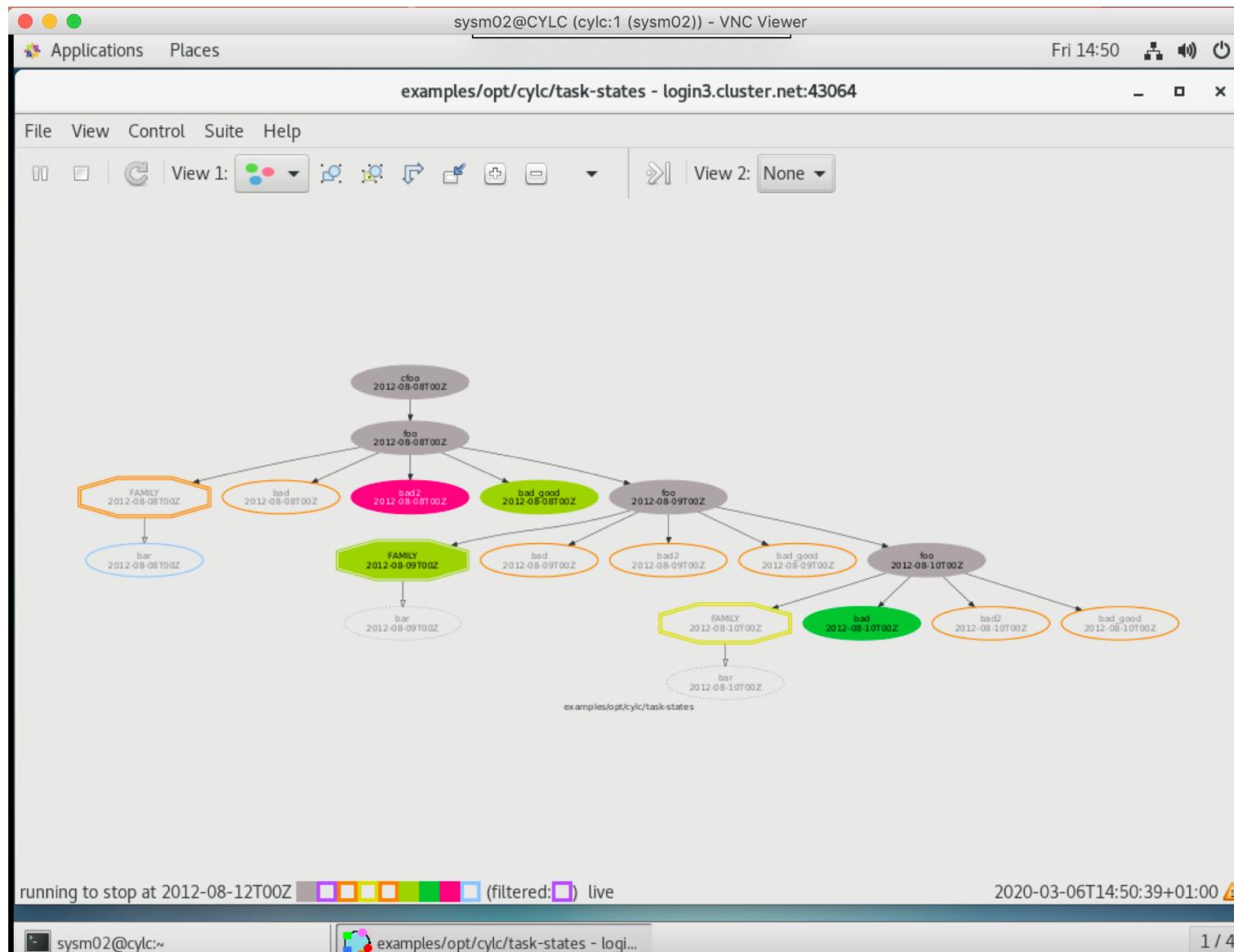
Remote CYLC usage example using GUI – part 1



Remote CYLC usage example using GUI – part 2



Remote CYLC usage example using GUI – part 3



Remote CYLC usage example using CLI

```
[Mauros-MacBook-Pro:~ mtridici$ ssh sysm02@cylc.cmcc.scc
Last login: Fri Mar  6 13:14:28 2020 from 192.168.118.1
[sysm02@cylc ~]$
```

```
[sysm02@cylc ~]$ cylc run --until=1 examples/opt/cylc/tutorial/oneoff/basic 1
SSH: Server;Ltype: Version;Remote: 192.168.118.13-22;Protocol: 2.0;Client: OpenSSH_7.4

          .--.
          |||      The Cylc Suite Engine [/opt/cylc]
          |_.--.    Copyright (C) 2008-2019 NIWA
          | !_.--.  & British Crown (Met Office) & Contributors.
          !_.--.!_.|_!_.--!_ This program comes with ABSOLUTELY NO WARRANTY;
          .--!_|_!_.|_!_.--!_ see `cylc warranty`. It is free software, you
          !_.--!_.|_!_.--!_ are welcome to redistribute it under certain

*** listening on https://login3.cluster.net:43026/ ***

To view suite server program contact information:
$ cylc get-suite-contact examples/opt/cylc/tutorial/oneoff/basic

Other ways to see if the suite is still running:
$ cylc scan -n 'examples/opt/cylc/tutorial/oneoff/basic' login3.cluster.net
$ cylc ping -v --host=login3.cluster.net examples/opt/cylc/tutorial/oneoff/basic
$ ps -opid,args 116369 # on login3.cluster.net
```

```
[sysm02@cylc 01]$ cat /users/home/sysm/sysm02/cylc-run/examples/opt/cylc/tutorial/oneoff/basic/log/job/1/hello/01/job.out
Suite      : examples/opt/cylc/tutorial/oneoff/basic
Task Job  : 1/hello/01 (try 1)
User@Host: sysm02@login3

2020-03-06T14:19:30+01:00 INFO - started
Hello World!
2020-03-06T14:19:40+01:00 INFO - succeeded
```



CYLC jobs monitoring

The screenshot shows a Firefox browser window with the following details:

- Title Bar:** Firefox File Edit View History Bookmarks Tools Window Help
- Address Bar:** pdu_settings_for_mdcn.txt
- Content Area:** A table titled "Cyc Review @ cylc" showing 58 installed suite(s) "a few seconds ago".
- Table Headers:** suite name, cycles list, task jobs list, last active time, project, title.
- Table Data:** A list of 58 suites, all of which have "cycles list" and "task jobs list" set to "None".
- Bottom Status Bar:** Result loaded a few seconds ago Page 1 of 1 Entries 1-58
- OS Dock:** Shows various application icons including Finder, Mail, Safari, and others.



Thanks

