Personal Condor

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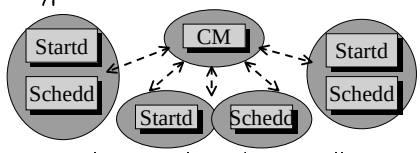
What is Personal Condor?

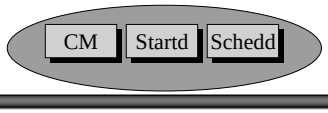
- Condor re-focused and re-packaged to emphasize
  - Use by an individual
    - … without scores of machines local to their organization
    - … without sysadmin experience
    - … without sysadmin authority
  - Some Specific Condor Mechanisms
    - Flocking
    - Globus Job Universe
    - GlideIn

A Pool of One

- Typical Condor Installation



- Typical Personal Condor Installation

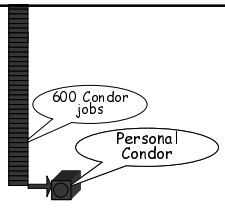


Personal Condor?!

What's the benefit of a Condor "Pool" with just one user and one machine?

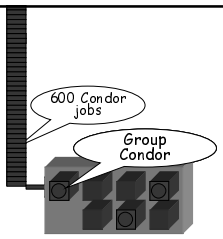
Your Personal Condor will ...

- … keep an eye on your jobs and will keep you posted on their progress
- … implement your policy on when the jobs can run on your workstation
- … implement your policy on the execution order of the jobs
- … add fault tolerance to your jobs
- … keep a log of your job activities



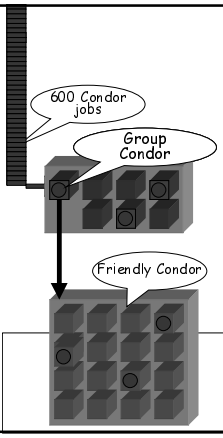
There's more! Build a Personal Cluster

- Install Condor on any other machines you have
- Point them at your Personal Condor installation machine



There's more! Take advantage of your friends

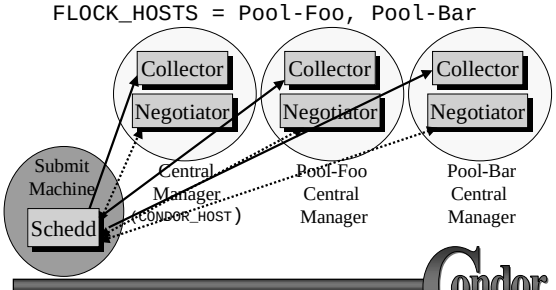
- Get permission from "friendly" Condor pools to access their resources
- Configure your Personal Condor to "flock" to these pools



How Flocking Works

- Put in condor_config :

```
FLOCK_HOSTS = Pool-Foo, Pool-Bar
```



Flocking: Pros & Cons

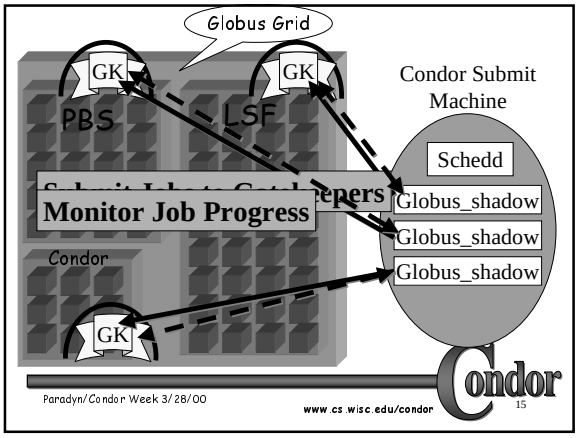
- Pros
  - Flock hosts are tried *in the order specified* until jobs are satisfied
  - Property of the Schedd, not the CM
    - Different users can Flock to different pools
  - User priority system is "flocking-aware"
- Cons
  - Not yet well-integrated with the tools
  - Job Rank does not work across pools

There's More! Access the National Technology Grid

- National Technology Grid
  - Collaborative effort underway by many Government labs, National Science Foundation, and several Universities
  - Centralized "virtual machine room" for account creation, etc.
- Globus Toolkit
  - Grid Certificate (X.509)
  - Globus Gatekeepers

Submit a job in Condor to run on Globus

- In submit description file given to *condor_submit*, specify:
  - Universe = Globus
  - Which Globus Gatekeeper to use
  - Location of file containing your Globus certificate

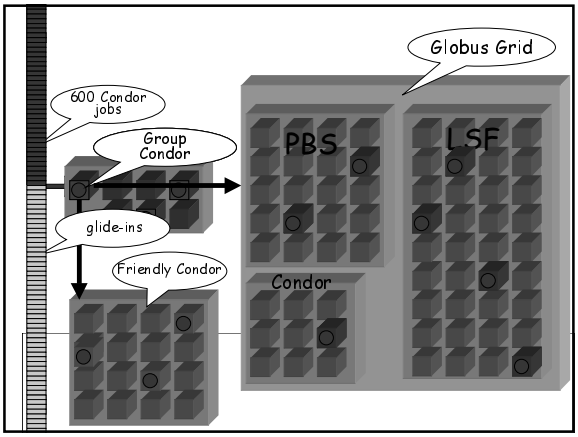


Condor's Globus Universe Pros/Cons

- Pros
  - Persistent queue for jobs destined to run on Globus resources
  - Jobs submitted to run on Globus resources are managed
    - details on progress, order of execution, DAGMan, …
- Cons
  - Must specify a particular gateway
  - What about Standard Universe features?
    - Checkpoint/Restart, Remote system calls, etc.

One Solution: Condor GlideIn

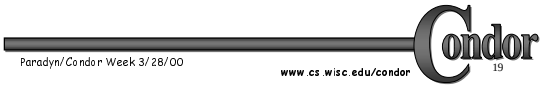
- Submit your jobs as regular Condor jobs (Standard, Vanilla, or PVM Universe…)
- Expand your Personal Condor pool by submitting "GlideIn Jobs"
  - A Globus Universe job which consists of the Condor Daemons (master, startd, starter).
- When your GlideIn Jobs run on the Globus resource, *that resource will join your Personal Condor Pool!*
- Then your regular Condor jobs get matched and run on Globus resources as usual.



Some Problems and some Solutions

What if all your jobs completed before a given GlideIn job starts running?

Solution: If the Condor daemons which have glided-in are not matched with a job in 10 minutes, they terminate.



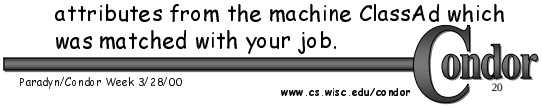
Some Problems and some Solutions, cont.

My Personal Condor is flocking with a bunch of Solaris machines, and also doing a GlideIn to a Silicon Graphics O2K. I do not want to statically partition my jobs.

Solution: In your submit file, say:

```
Executable = myjob.$$(OpSys).$$(Arch)
```

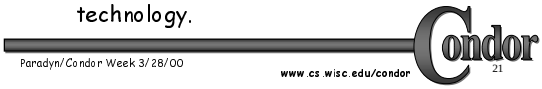
The "$$(xxx)" notation is replaced with attributes from the machine ClassAd which was matched with your job.



In Review

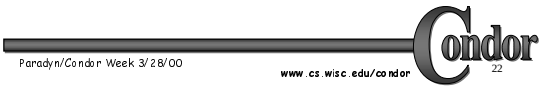
With Personal Condor you can…

- … manage your compute job workload
- … access local machines
- … access remote Condor Pools via flocking
- … access remote compute resources on the Grid via Globus Universe
- … carve out your own personal Condor Pool from the Grid with GlideIn technology.



Current Status

- Initial Personal Condor implementation exists
  - Includes Flocking, Globus Uni., GlideIn
  - Powered several demonstrations at SC99 (SuperComputing 1999 Conference)
  - In use by some collaborators
  - Demonstration tomorrow



Current Status, cont.

- Work currently in progress
  - Enhance robustness, scalability
  - Add features missing from Condor's Globus Universe
  - Streamline the process for the user
  - Personal Condor distribution
    - Simplified Installation Procedure
    - "Grid-Access Only" mode

Questions and Thank You!