Using ViNe IP overlays to establish virtual private condor pools across PRAGMA resources

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ViNe is a project developed at University of Florida that implements routing and other communication mechanisms needed to establish wide-area IP overlays supporting symmetric communication among public and private network resources (even when they are behind firewalls/NATs). Since not all PRAGMA resources (physical or virtual) can be configured with publicly accessible IP addresses, ViNe can offer an overlay network solution to enable the communication among resources on public and private networks, without the need to reconfigure the physical network infrastructure.

HTCondor is a workload management system that provides mechanisms for job queuing, job scheduling, monitoring, and resource management. A simple Condor pool consists of a central manager, a set of execute machines, and submit machines. The central manager collects information about resources (execute machines), negotiate resources to execute jobs, and dispatch jobs for execution. Execute machines accept jobs to be executed, while submit machines are systems authorized to submit Condor jobs.

While many techniques exist to make HTCondor, firewalls, and private networks get along, full connectivity among resources offered by ViNe overlays is a friendlier networking environment for a Condor pool.

The goals of this demo are:

1. Show how ViNe enable full connectivity among resources (VMs) on private networks at UF, UCSD, IU, and potentially more PRAGMA sites, forming a Condor pool across multiple sites.
2. Show how ViNe support for multiple overlays can help deploying independent Condor pools – for example, an execute node on overlay A is not able to join a Condor pool deployed on overlay B.
3. Make a VM in Thailand (on-site) join the demo Condor pool.