

Distributed Virtual Computing



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What is DVC?



Distributed Computing:

- A computing system comprised of components located on multiple networked computers.

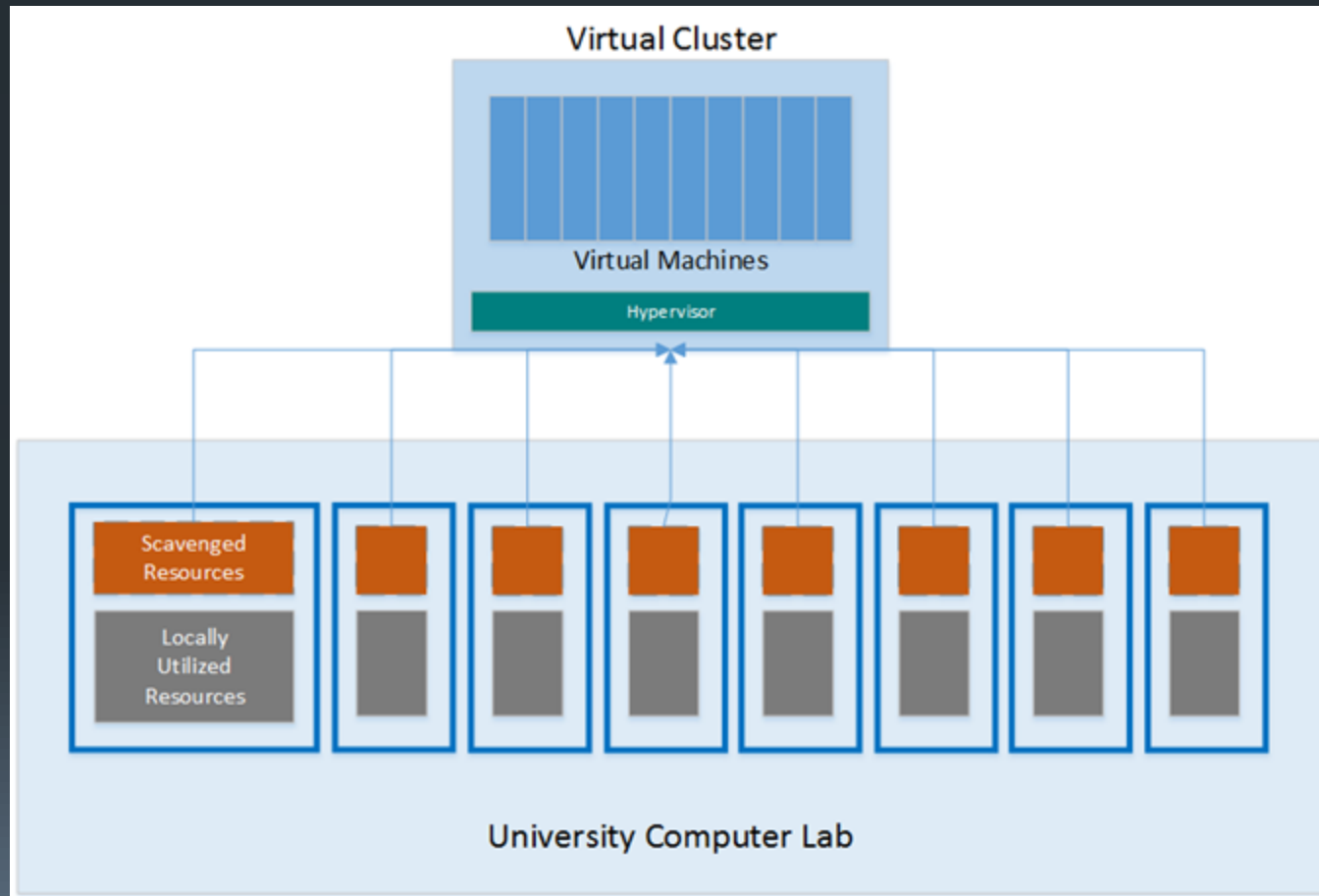
Virtual Computing:

- A computing system where comprised of components that are abstracted from the hardware itself

Our Goal

- Expand on the concept of Distributed Virtual Computing to include the clustering and virtualization of scavenged resources.
- Be able to host one or several virtual machines on a cluster comprised of the unused resources in a typical computer lab setup in such a way that the local user(s) of the lab are unaware of the scavenging process.

Our Goal



Obstacles

- While clusters are able to gracefully “hot” add and remove nodes, they are much less receptive to dynamically adjusting a node’s size.
- Resource scavenging programs are more report oriented than action oriented.
- Custom solutions are outside the scope of our project time frame.

Past DVC Projects

- Due to technical challenges, previous iterations modified their goal to explore similar technologies.
- Private grid computing solutions were researched, including BOINC, HTCondor, and some grid-specific Linux distributions.
- Focused on job-based computing (calculations and algorithms).
- Lately, new technologies have emerged that could get us closer to a general purpose computational grid

Where We Picked Up

- We discovered ScaleMP, which added the virtualized aspect and kept SMP capabilities for possible grid computing
- We started an info-session with a representative from ScaleMP
- ScaleMP requires Infiniband and some specific hardware sets
- Flexible with Hypervisor on Hypervisor capabilities
- Researched extensively into its capabilities

Acquired Hardware and Setup

- After talking to Mellanox we quickly received our required Infiniband hardware
 - 1 Mellanox SX6018 18 port 56 Gb/s IB switch
 - 5 ConnectX 56Gb/s HCA's
 - 5 ConnectX 56Gb/s Interconnects
- All of the hardware installed perfectly and was recognised by our HP and Dell Servers
- 5 USB Drives with vSMP images are being used to allow for installation of the hypervisor
- One acts as a primary node and all other system boards (servers) are secondary node systems
- Our IB link speeds are actually much higher than the internal bus structure of our servers

Current Progress

- Initially our 5 nodes worked fine and all of them recognised each other
- Negotiated link speeds at 15.2 Gb/s (scaled back)
- After this we encountered a fatal error with the CPU and vSMP
- Thinking it was a node/licensing problem, we tried to isolate it but even with only 2 nodes up, the results remained the same
- Log file difficult to find
- ScaleMP is actively working with us to try to solve this problem

What Lies Ahead?

- If we exhaust our resources with ScaleMP in troubleshooting we may need to acquire certified hardware or newer servers.
- Once or if we can get around the problem, we can then boot into RHEL as our system spanning OS
- With RHEL we will then make way for installation of KVM and configuring KVM as our VM sandbox



Questions?