

BOINC and Virtualization

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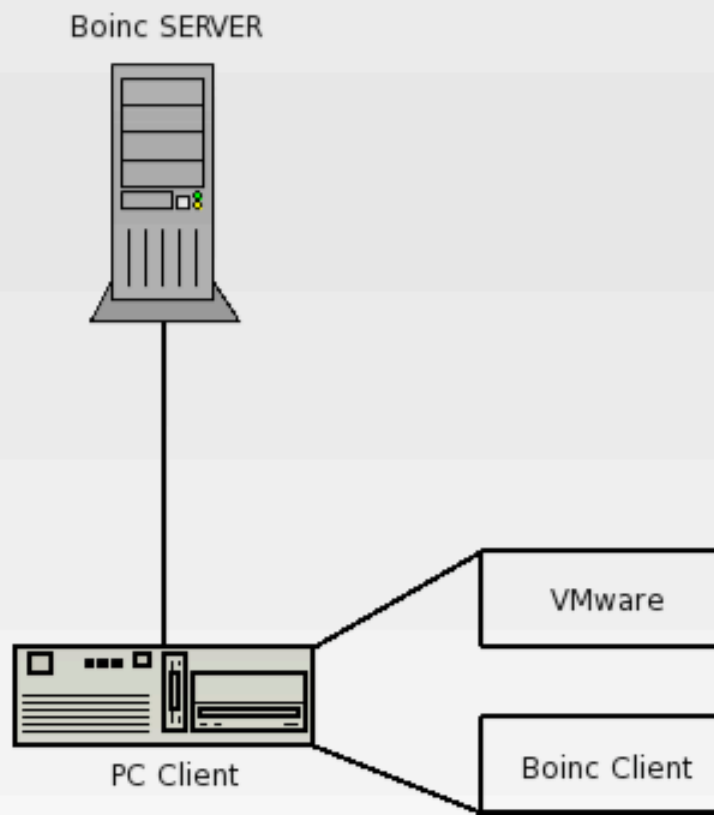
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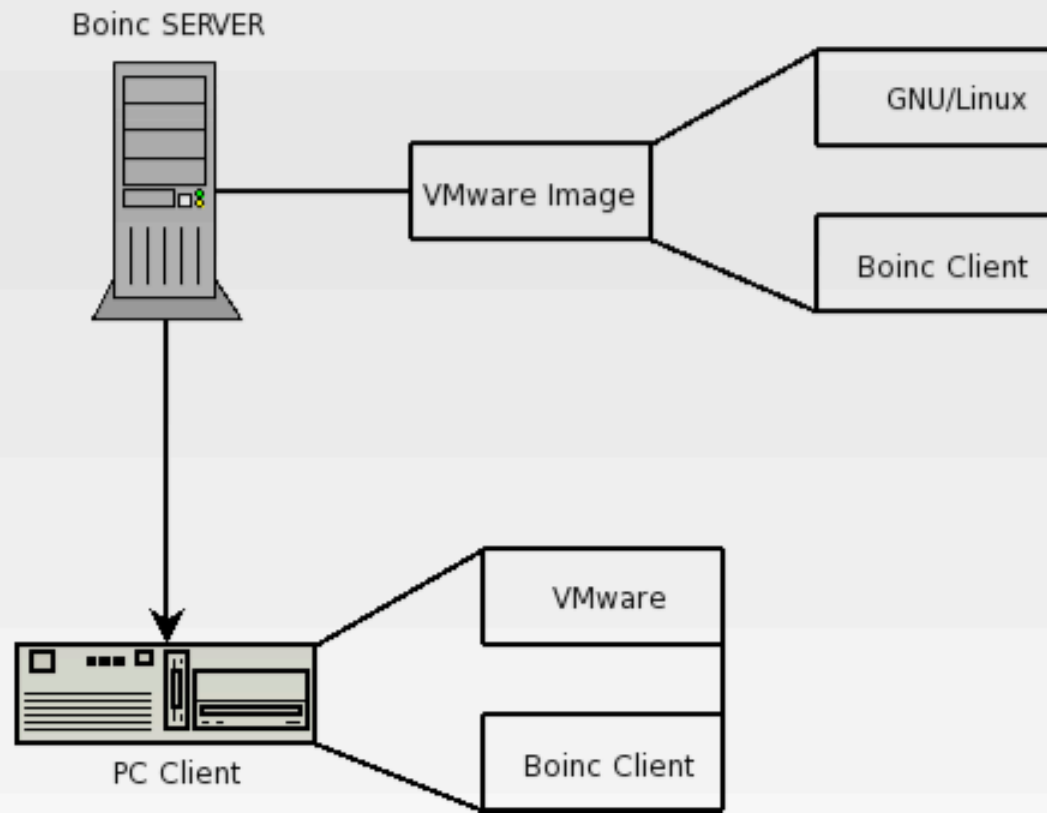
BOINC & Virtualization

- Work began at CERN in 2006 (DLG + others)
 - Chose VMware Player over (k)QEMU, etc.
 - Proved feasibility and built a working prototype
 - Continued project at Univ. Extremadura
- Work continued at CERN in 2007 (DW)
 - Succeeded to build a VM for full Athena environment
 - Reduced size of VM image by mounting runtime libraries over AFS

How it works



How it works



Wrapper

- Let's you execute any legacy application
- Handles:
 - suspend/resume/quit/abort
 - reporting CPU time
 - loss of heartbeat from core client
- Does not handle:
 - Checkpointing

Wrapping the Wrapper

- The wrapper has some problems
- In GNU/Linux it doesn't end in the right way
- In MS Windows it doesn't run bat files
- So we have to create a new wrapper for the wrapper
- The new wrapper is called “starter”
- We have two versions:
 - GNU/Linux version
 - MS Windows version

Starter in GNU/Linux

- This application will be started by the original wrapper
- More less is the same application
- Creates a fork for running the legacy application
- The new wrapper will run a program called: “worker”
- The best feature in GNU/Linux is that worker could be a script

Starter in MS Windows

- This application will be started by the original wrapper
- Creates a Windows-fork for running the legacy application
- It will read a file called “image” where you must write the name of the VMware image
- You cannot run a Bat file, if you try it you will get a client error

Vmware@Home

- Boinc will be the back-end for serving the VMware images
- The Clients will have a pre-installed VMware Player software and a Boinc client
- The Boinc client will download the images from the server and start the VM
- The images could have what ever you want: your own scientific environment

BOINC & Virtualization

- Work accomplished at CERN in 2008 (PB)
 - Established collaboration with the CernVM Project
 - General interface to all CERN physics software
 - Size of VM images now optimized and cached locally
 - Able to build VMs for full ATLAS, LHCb, ALICE (and soon CMS) environments and tested a VM with full Athena environment
 - Included an interface to physics groups' production chain (tested with ATLAS Panda job management)

BOINC & Virtualization

- Work remaining at CERN in 2008 (DW)
 - Improve Wrapper's handling of VMware VM's:
 - Cleanly Start, Stop, Suspend, Restart guest VM's from host OS (using VIX API available for VMware Server).
 - Monitor host OS resources of guest VM's (for BOINC credit)
 - Possibly extend to Sun VirtualBox VM's with their API