

# Extending the Manchester site with containers and cloud technology

The Blackett cluster at the University of Manchester High Energy Physics group has evolved from the first EU DataGrid site in the UK in 2001. During most of its life its primary use has been as a WLCG Tier-2 site, accepting jobs through Grid CE interfaces. Funding for local users has added additional capacity as the Manchester Analysis Facility (MAF).

In 2018 we received funding as part of the IRIS project to support the full range of STFC sciences, including astronomy as well as particle physics, and deployed an additional 3000 processor slots and 1 PB of storage. As well as Grid CEs, the CPU capacity is to be presented as a container platform and Infrastructure-as-a-Service (IaaS) VMs.

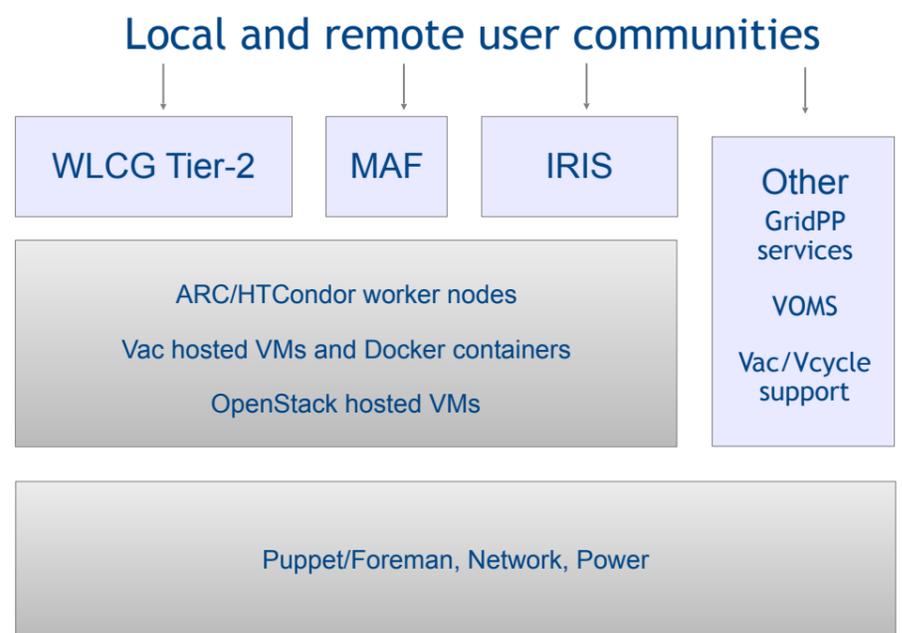


Figure 1

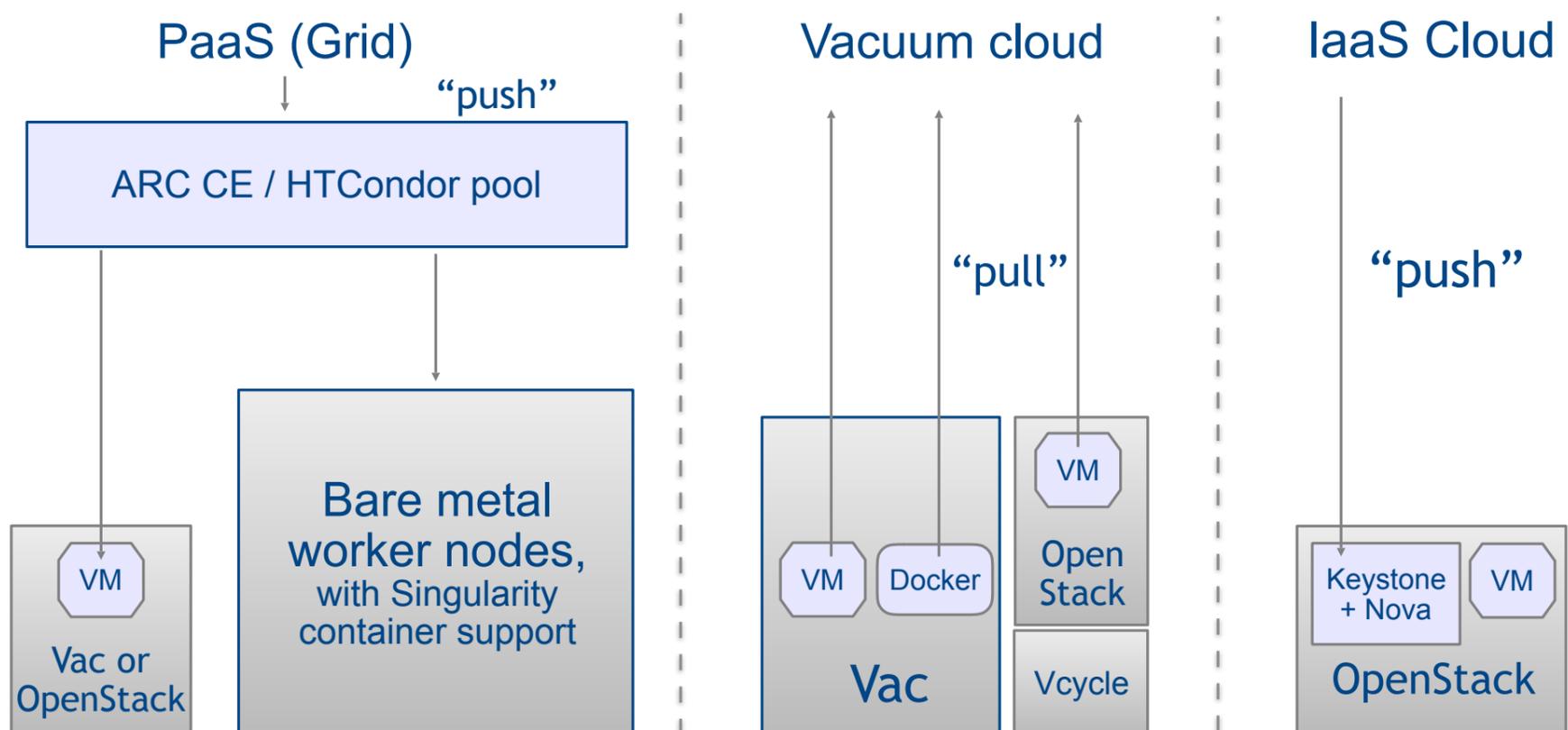


Figure 2

We were already able to provide VMs and Docker containers to experiments using the Vac system developed at Manchester. We are testing our eventual OpenStack deployment using production workloads from the LHCb experiment, managed by the Vcycle system, also developed at Manchester. We also plan to backfill any unused Vac and OpenStack capacity with VMs connecting to our existing ARC/HTCondor grid platform.

Figure 1 shows the overall architecture, with WLCG, local and IRIS communities supported on top of shared Grid, Vacuum, and IaaS. platforms. Underpinning this is our existing framework of Puppet and Foreman provisioning, and our network and power infrastructure. Figure 2 shows the three platforms in more detail, with fully deployed components in blue bounded boxes, and components in production testing in grey bounded boxes.