Automation in a Lab Network

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Abstract

TechLabs, the lab network environment at Ara Institute of Canterbury is used for technical courses in information technology. As it has made use of virtualisation since 2001, it is likely the first lab environment in New Zealand that was based on virtualisation, specifically VMware software. The network has 84 student and staff workstations, and a number of physical and virtual servers, switches and so on. Deployments make use of various technologies, including the Microsoft Deployment Toolkit (MDT) and Windows Deployment Server (WDS). The initial build utilises PXE boot and then configuration is automated through the use of PowerShell scripts, applications and Group Policy. It works well and enables one to push out new applications and configuration quickly. However, this solution has two disadvantages. First, as it is scripted, it requires academic staff to be fluent in programming PowerShell. Second, the approach has limited compatibility with Linux-based equipment, such as servers, routers and switches. An automated solution would improve the efficiency of system management. The current PowerShell-based configuration will be replaced by an open-source configuration system, Ansible. However, this open-source software, contains modules that are not regularly maintained or do not work as intended. Therefore, the existing scripts need to be reviewed, converted or redesigned to fit into the new system during the process. The long-term goal is to migrate from VMware Workstation to Oracle VirtualBox, as it provides greater potential for automation, in terms of provisioning virtual machines and grading student products.