

Virtual Cloud Labs: A Novel Architectural solution to Virtualize Computing Resources

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Universities all over the country face several challenging resource requirements that are often hard to accomplish both in terms of the load and costs. Costs for installing several diverse applications on the desktops are escalating causing huge economic impact to the colleges. Most software updates to newer versions on a semester to yearly basis making these software updates obsolete in a very short span of time. To cope with several of these shortcomings, we present a novel approach to virtualize these resources and obtain access to them using cloud based solutions. Our goal is to use standard existing industrial components, along with a combination of open source and [optional proprietary] softwares to build flexible and economically feasible lab solutions. The design aims at achieving a free open source platform with the primary goal of delivering dedicated, custom compute environments to users. The cluster of resources consists of bare bone machines, virtual machines hosted in cloud with a hypervisor to control its actions and normal lab computers found in our universities. We plan to leverage the advantages provided by several cloud providers to store huge amounts of data securely and access them through internet. A basic web portal will accompany, that can be hosted on college servers which can determine reservations at any point of time. The requests are then dynamically provisioned, secured and configured to allow remote access to user. The user is provided with remote desktop and SSH interfaces to access the requested system. We believe that the comprehensive model will bring down huge costs incurred at colleges for setup and maintenance of labs.