Summary and Reaction:

Xen and the Art of Virtualization

NCS490 – Virtualization

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An important part about research is being able to validate your findings. The Advanced Operating Systems class from Clarkson University did just that when they set out to replicate the data from University of Cambridge Computer Laboratory’s paper “Xen and the Art of Virtualization.” The Clarkson class attempted to repeat the performance of Xen and compare how Xen fared against an IBM zServer whose sole purpose is virtualization.

The Clarkson class purchased a similar Xeon Server as per the original study but ran into complications due to a newer SCSI controller required a driver to be ported over to Xen. This configuration was comparable to that of the original paper. After benchmarking the Xeon Xen server with XenoLinux and UML to native Linux, Clarkson found that the standard deviation from the results in the first study were relatively close. However, the team discovered that the bare metal Linux performed better with SMP disabled which complicated reports due to testing with SMP enabled and disabled.

Replicating results not only allows for a verification of information but allows the researchers to test other aspects that were not questioned during the original experiment. Clarkson attempted to analyzed Xen’s usability for web hosting. The class hit several roadblocks when it came to memory and disk allocation due to lack of resource isolation. The findings returned that Xen was suitable for moderate web hosting of about 16 concurrent servers but performance dropped off after that.

Next, the class tested to see if Xen required a new Dell Xeon Server to adequately perform or if an older machine could be comparable. An older 1 GHz P3 with half a Gig of RAM was utilized for this test. The tests found the Zen to be only 3.5% slower on the older machine than native Linux. However, the disadvantage is less supported guests on the older machine, such that only 3 plus the dom0 are supported as opposed to the 16 with Xeon.

The final test the class conducted was pitting Xen against IBM’s zServer. zServer is IBM’s specialized virtualization environment that has been used for over 30 years. The test found that Xen out performed on every aspect of the test in such that zServer was far worse than Xen on the old machine.
Through this paper I saw how valuable replicated research is to a study. No only does it validate supposed values, but it allows for other unexplored questions to be tested and answered. I also saw how hard it was for the class to actually follow through and keep the tests as similar as possible to due lack or inaccuracies in documentation. I thought it was rather impressive that open source Xen seriously destroys $200,000 specialized zServer in a comparison test.