

Physical and Virtual Desktop Cost Comparison

Overview

This report compares the costs of virtual and physical desktops. The WCOB implemented a virtual desktop pilot project in 2013 with the intent to replace 400 physical desktops. The virtual desktops, based on the Zero Client System (ZCSs), are to replace physical desktops, Dell Optiplexes. The Virtual Desktops consume less electricity and are overall less expensive to implement. Cost savings per virtual desktop are \$330.76. This cost savings includes the cost of a monitor since that cost would still be incurred. Replacing 10,000 machines would save \$17.7 million dollars just in initial hardware costs. Cost savings would be \$2.2 million per year, based on eight-year replacement cycles for ZCSs and four-year replacement cycles for physical desktops.

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Analysis

The analysis holds three assumptions. Should these assumptions fail to be true, adjustments will be made accordingly. Assumptions are as follows:

- Machines operate 365 days per year.
- The physical and virtual desktops are replaced every 4 and 8 years, respectively.
- Electrical consumption data was secured during an observation period by the Office for Sustainability and published elsewhere.

Costs

A virtual desktop is \$330.76 cheaper than a physical PC. The hardware costs include storage costs, cost of the server, the Zero Client itself, and licensing costs. The electrical consumption is based on a previous study. The study showed that when compared to the PC system, the Zero Client System demonstrates an 88% reduction in electrical consumption, including front-end consumption and back-end server needs. The expected life expectancy of the Zero Client System is approximately 8 years, twice the lifespan of standard physical desktops.

The total cost for a single PC system for eight years includes the initial purchase and replacement costs at years four. This is necessary to compare to the Zero Client System whose product life is about 8 years.

While a single Virtual Desktop saves an annual amount of \$38.79 on electricity, there are greater savings in deferred replacement costs. For example, the deferred replacement and electrical costs of 10,000 physical desktops for eight years would nearly equal \$20,000,000.00 (Table 1).

Table 1 Comparison for Physical and Virtual Desktops with back-end infrastructure costs

	Physical Desktop (Standard PC)	Virtual Desktop (Zero Client System)
Total Hardware and Software Cost per Machine	\$1,135.00	\$804.25
Total Electrical Consumption (kWh) per day per Machine	1.727	0.1992
Total Daily Power Cost per Machine	\$0.12	\$0.0137
Total kWh per year per Machine	630.39	72.71
Annual Power Costs per Machine	\$43.80	\$5.01
Lifespan	3-5 years	7-10 years
Electrical and infrastructure cost after eight years for one desktop	\$2,620.40	\$844.33
Electrical and infrastructure cost every eight years for 10,000 desktops	\$26,204,000.00	\$8,443,300.00

Summary

Each unit of the Zero Client System is \$330.76 less expensive and uses significantly less electricity than that of a standard PC. Over a period of eight years, replacing 10,000 standard PCs with the Zero Client System can save the university over \$17.7 million, which equates to an average of \$2.2 million in savings per year during the lifecycle of the systems.