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Nonproductive Servers in the Data Center

A Viridity Software Brief

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30% of Servers
On the data center floor
may not be performing useful
work for the business.

Nonproductive Servers in the Data Center

According to Ken Brill of the Uptime Institute, as many as 30 percent of the servers on the data center floor are not performing useful business work. This statement likely comes as little surprise to many data center operators but they need to be careful about what they do with this information. A data center manager may unwittingly shut down a server that has been sitting idle for 11 1/2 months only to find that the accounting department needs it to run a year-end report. Turning off the wrong server can be a career-limiting move. This white paper examines the problems associated with shutting down servers, as well as possible solutions and their impact.

Why Servers Become Nonproductive

Potentially useful systems remain nonproductive or underemployed for many reasons, including the following.

- Businesses are unable to predict application-usage profiles, requiring systems to run with little use.
- New applications replace old ones, leaving the old server running.
- Old applications retire, leaving the servers running.
- Business interests change.
- Business cannot track their IT assets closely, much less the space, power, and cooling they use.
- More broadly, specific business groups have no idea how their applications and the servers they run on impact the data center environment.

Challenges of Removing Nonproductive Servers

When it comes to managing nonproductive servers, data center operators have become paralyzed because they lack insight into which business applications (if any) are running on which servers and their frequency, or whether or not an application is even being used.

Most data center operators live by the Hippocratic Oath of the data center: "First do no harm, then take no chances". Faced with the conflicting objectives of maintaining service and reducing energy costs, they automatically turn to the worst offenders by reducing power and cooling systems. Replacing air conditioning units or UPS's with more efficient

The Data Center Hippocratic Oath

" First do no harm, then take no Chances."

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versions can help, but the replacement cycle can be extremely long, delaying any benefit, and requiring a significant initial investment in new, expensive hardware.

Well-known energy efficiency techniques include isolating hot and cold aisles and plugging leaks in floors and racks. But since as many as 30 percent of servers in the data center are non-productive, leaving them running is foolhardy. Turning off servers benefits organizations two-fold: increasing both energy efficiency and computing efficiency.

Removing Servers - Low-Hanging Fruit

If a business could identify servers producing useful work and turn off its nonproductive ones, it could save 20-30 percent in IT energy use and infrastructure cooling load. When you consider that each watt of IT energy requires at least as much energy in infrastructure support, a huge potential for savings and energy reduction exists, without risking operations.

Consider the following benefits of identifying and eliminating or repurposing non-productive servers in the data center.

Top 7 Reasons to remove orphan servers from the data center floor.

1. Be Net Productive
Nonproductive servers are net consumers of power, space, and cooling rather than producers. They increase energy costs while providing little to no return on investment (ROI). Clearly, shutting them down reduces energy waste and increases the value of the data center.

2. Quick Win Project
Eliminating unused servers is a short-term project, requiring no additional hardware investment. It becomes a "quick-win" project, yielding a measurable increase in ROI, data center efficiency, and an extended future savings in energy costs.

3. Increase PUE & DCiE Accuracy
As energy concerns continue to pressure data centers in terms of transparency, efficiency, and accountability, organizations increasingly rely on industry-standard efficiency metrics like power usage effectiveness (PUE) data center infrastructure efficiency (DCiE) to determine the effectiveness of their energy management. By reducing any associated wasted power and cooling, terminating unnecessary servers is an easy way to improve PUE reports.

4. Reducing Total Assets to be Managed
Removing orphans makes the remaining systems in the data center more effective. It reduces the total number of assets to be managed

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and removes non-productive assets altogether. Managers can then attend to the servers that are critical to business applications. Ridding the facility of unnecessary computers should become routine maintenance, along with other best practices like blanking panels and airflow management.

5. Eliminate Hot Spots

Servers are hot. One data center operator refers to nonproductive servers as "energy parasites". Removing them can reduce or eliminate hot spots.

6. Green Friendly

Given all the current geopolitical implications of energy management, reducing the number of computers in a data center is eco-responsible. An organization can trim its carbon footprint, making itself a "greener," more conscientious corporate citizen.

7. Make Room for New Technology

If an organization can consolidate or redeploy less-efficient servers, it can make room for newer, greener technology.

"data center operators still need to find an effective way to identify non-useful server candidates."

While these benefits are plain to see, the challenge is determining which servers are business useful. Data center operators still need to find an effective way to identify non-useful server candidates, organize them, and monitor them long enough to know they will not interfere with business.

How is this accomplished? Currently, data center operators might use manual and basic tools like Microsoft Excel and Visio to keep inventory organized, and use scripting to poll the server load to find nonproductive servers. They typically set up this inventory and monitoring system for every server on the floor and make sure the collecting server stays up. Often, they find they have not accounted for equipment on their inventory and only discover them visually, by chance.

Another approach is to use an agent residing on the server to put them in various stages of sleep, but this solution isn't desirable in a data center because the intrusive nature of agents is risky. Furthermore, they never allow for complete removal or repurposing of underutilized servers.

A more reasonable way would be to discover, monitor, and analyze servers for function, and then to virtualize the operating system and redeploy or decommission less-useful servers. This approach reduces power usage and frees up those servers for other business applications.

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Conclusion

Again, as much as 30 percent of servers contribute no useful work to the business. With better options for discovery, monitoring, and analysis over time, data center operators can better identify non-useful servers and make more intelligent decisions about what to do next. If they arm themselves with the right knowledge, they can shut down the correct servers, without jeopardizing their career.

We propose continuous, non-intrusive monitoring of the servers in the data center over extended periods. A system that sets up attributes that identify IT components and maps their business needs could help determine whether or not a server is a redeployment candidate, a consolidation candidate, or a useful—albeit limited—part of the system.

About Viridity

Viridity Software is the innovator in data center optimization and energy management software. Its software-based, agent-less approach offers customers a new way for understanding the connection between physical infrastructure, IT equipment, and applications and its affect on power consumption and utilization. Actionable energy information and strategies are provided that enable customers to run more efficient, less expensive, eco-friendly data centers.