



Leveraging **CLOUD**

The benefits of building hybrid cloud into your existing infrastructure

Many IT managers are asking or being asked how to achieve cloud's characteristics within their existing enterprises. While some enterprises look to move their entire IT infrastructure to a public cloud, many do not have that option. One reason is enterprises don't want to store critical business data outside of their premises. In some cases, government regulations mandate that data pertaining to their citizens should be stored within their geographical limits.

Srirama Krishnakumar is a senior IT business management consultant for the IBM Eagle Team in Seattle.

Angshuman Roy is an IBM-certified senior IT architect on the IBM Competitive Project Office Power Systems team in Boston.

A key reason to consider an on-premises cloud is to leverage the significant investment in creating infrastructure in-house for systems of record (SoRs) that continue to provide value to the business. Typically, these are enterprise-class servers, such as Power* servers. For these enterprises, hybrid cloud—a mix of public and private cloud—is an attractive option. They can move non-mission-critical applications, such as marketing campaigns, to a public cloud that offers lower entry costs and greater flexibility

while critical applications stay in-house. With cloud management tools, workloads can seamlessly be moved to and from an on-premises and public cloud.

This article describes how an organization's existing infrastructure can be transformed into a hybrid cloud.

What's Built-In

POWER8* servers are an ideal platform for building both public and private cloud applications. The Power Systems* platform supports virtualization and features

the PowerVM* hypervisor, which is built into the firmware. Its minimal overhead gives greater virtual machine (VM) density and lets the servers run at higher utilization. Running a higher number of VMs per core delivers superior cloud economics over commodity x86 servers, as the cost per workload decreases—especially when core-based licenses are used (ibm.co/2dPsJ7H). This feature makes Power servers more secure than commodity x86 servers, as hypervisors on x86 systems typically run on top of the firmware.

Private Cloud With Power Servers

For implementing the best possible private cloud infrastructure for your enterprise, follow two guidelines:

1. If the current servers are older enterprise class servers, consolidate the workloads to the recently announced Power Systems cloud servers, E870C and E880C. These servers are based on Power Enterprise E870 and E880 servers with built-in, OpenStack-based cloud management software. According to an IBM Power Systems performance report, the POWER8 processor delivers about twice the performance per core compared to the POWER7* processor (ibm.co/2dfViMk). This enables clients to reduce the number of required cores, cutting core-based software maintenance costs in half. Clients can take advantage of Elastic Capacity on Demand (CoD) available on these servers to build a private cloud capacity as a service. With Elastic CoD, users pay for core and memory by day of use: \$11 a day per processor core to activate and \$1 a day per 8 GB of memory activation. This enables clients to shift capital expenditure (capex) to operational expenditure (opex), which many businesses prefer; so, capex is mainly spent on “inactive” physical hardware, which is 15 to 20 percent of the full server cost. IBM middleware, such as WebSphere* or DB2* technology, enables payment on a monthly basis. Unlike a perpetual license based on processor value unit, this monthly pricing, called virtual processor core pricing,

is the same for all classes of servers. The majority of enterprise Power Systems clients run the AIX* OS. Keeping them in mind, IBM has ported several open-source packages popular in the cloud environment for installation on AIX. This allows resources with Linux* and open-source skills to be productive in the AIX environment.

2. The Linux OS is a popular option for clients looking to build a private cloud in a scale-out environment. The Power Systems platform includes the L and LC Linux-only servers. The LC server

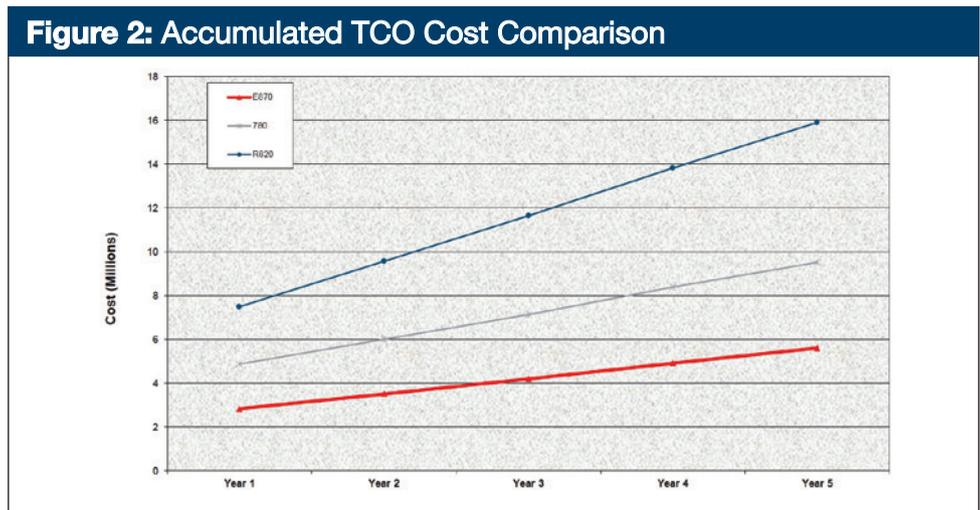
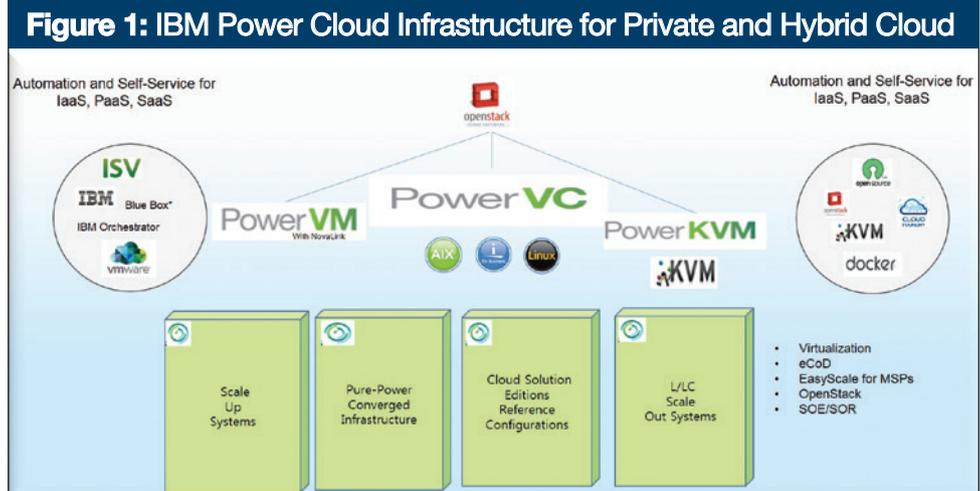


family consists of one- or two-socket servers available in 1U and 2U form factors. Because these servers are only designed to run Linux, they're priced lower than those that can run both AIX and IBM i OSes. The LC servers are built in collaboration with OpenPOWER partners and support Kernel-based VM (KVM). KVM is an attractive choice for users migrating to a Power environment from x86, as the transition is smooth with a familiar hypervisor. Clients also have a choice of running on bare metal without a hypervisor.

The Power cloud servers come with PowerVC and Cloud PowerVC Manager, which enable clients to build, run and manage a cloud environment. The managers include a self-service portal for process automation, metering of usage for billing and a catalog of VMs and images, and can also be expanded to include IBM Cloud Orchestrator (ICO), IBM UrbanCode* Deploy and VMware vRealize Automation technology (see Figure 1, above). This enables management of up to 5,000 VMs on 20 physical hosts. ICO can deploy and scale on-premises and off-premises cloud services in a hybrid cloud environment, as well as integrate existing infrastructure with public cloud providers such as the IBM SoftLayer* platform and Amazon EC2.

Public Cloud With Power Servers

Power servers are available through several public cloud vendors worldwide. SoftLayer technology offers stand-alone OpenPOWER-based POWER8 servers in four configurations: small, medium, large and



large/SSD. These are available as bare metal servers and can only run Linux. IBM offers AIX in the cloud through Cloud Managed Services and other partners, including Site Ox, LPARBOX and Connectria. IBM i-based cloud services are available through providers including Connectria, HelpSystems and Tieto.

Cost Savings With Power Servers

Power clients can consolidate existing workloads onto newer Power servers and realize significant cost savings, as shown by an IBM Eagle IT economics study. In this case, a client (whose name is withheld for confidentiality purposes) was considering migrating an existing database workload from an existing Power 780 environment into an x86-based environment. An x86-based public cloud environment with only virtual servers requires significant investment in software license costs, as each virtual central processing unit is considered to be equivalent to a physical core. POWER8 cores with up to eight threads offer an overall lower software cost per core

because of multithreading. As evidenced by the study, this client would save over \$10 million in a five-year time period (see Figure 2, above).

An Attractive Choice

Power servers are a high-performance, cost-effective option for clients to operate and run a private cloud environment.

Clients who want to benefit from the properties of a public cloud environment have several choices, including hybrid clouds based on POWER8 technology and CoD capability within the POWER8 processor. All of these make POWER8 technology an attractive choice for clients who like to benefit from cloud technologies. **P**