Supporting the needs of highly unpredictable workloads

It's all about flexibility, scalability and cost effectiveness

FREEFORM DYNAMICS   IBM

Do you find it hard to match the demand from applications without over-allocating resources? Do you have services - perhaps developed using Agile techniques - that start small but can then change rapidly, with usage accelerating or even collapsing quickly? And do you also need to run many applications with different characteristics and uneven usage patterns? If so, you are far from alone! Supporting such unpredictability needs a platform able to flex and scale quickly and simply.

How high-scale, vertically integrated systems can help

Key system characteristic	Why this matters
Entire system designed, end to end, as an integrated whole to ensure that all components work optimally together out of the box, reducing testing requirements and failures.	Systems that are engineered using components designed to work and scale together in the most elegant, robust and efficient manner, can speed up your roll out and minimise operational management.
Operating system and virtualisation hypervisor able to logically partition the environment to enable different service capabilities to be met with minimal underutilisation of resources.	Sophisticated workload management allows multiple applications to be run on a single system, ensuring service quality goals are maintained when requirements change over short or medium time spans.
System architected using different processor, storage and networking capabilities to provide a range of capacities well suited for different workload types.	A consistent architecture able to run on internal and external clouds, using a common platform and management tools saves time, reduces administration and minimises risks.
System designed with long service lifetime, including the ability to make in place upgrades, thereby increasing flexibility and scalability, and encouraging systems reuse or resale.	A system designed with upgrades in mind allows the platform to be fitted with new components as technologies evolve, which permits the system to meet evolving business requirements.

Other things to think about

Configuring x86 platforms to be flexible, scalable, performant and secure for business applications is challenging, especially if you need to keep up with the steep or roller coaster shaped demand curves often associated with modern digital applications. Cloud platforms can help, but you are still dealing with disparate components under the covers. A different approach uses a single platform designed to scale rapidly with minimum downtime, and able to host multiple workloads, each with different performance, protection and availability requirements. Such systems are often architected from scratch using tightly coupled, pre-tested components and automated management.

Real-world solution example: IBM Power

To illustrate some of the principles and advantages of vertically integrated systems, let's take a look at an offering from the sponsor of this paper - the Power® platform from IBM®. Please note, nothing we say here should be taken as endorsing or recommending any particular product or service, but it is very useful to see how a specific example translates some of these principles to reality.

The Power platform is designed from the mainboard up to be inherently scalable and flexible, in order to support diverse workloads and users while maintaining good performance. Key technology features to enable this include a high-speed memory architecture, plus automated processor core allocation to optimise workload placement, and hence system resource usage. This automation reduces the need for manual administrator intervention, even for highly unpredictable workloads and workload mixes.

Clearly some workloads may eventually require physical system upgrades. IBM® Power® caters for this using pre-tested, low-risk upgrade and clustering options. Even so, there may come a time when the agility and flexibility required by an unpredictable workload means it would function better in a public cloud or a combination of both. Power is deeply integrated with the IBM hybrid cloud platform, which allows it to flexibly extend to IBM Power Virtual Server resources hosted at IBM Cloud locations around the world.

However, providing workload flexibility and scalability can add cost unless care is taken. IBM Power systems are very efficient in their use of electricity, a matter of growing importance for financial and ESG reasons. In addition, the combination of automated workload placement and the highly capable Power processors means software licence costs can often be optimised if using core-based charging models.

About the Power Perspective series

This document is one of a series of similar pieces looking at how high-scale, vertically integrated systems can provide tangible business benefits in context for a range of different themes. Other Power Perspectives include:

S/4HANA without compromise
A modern ERP architecture needs a powerful and future-proof platform

Getting real about IT sustainability
From good intentions to tangible results through smart systems selection

Have you made the right platform choices to minimise risk?
Critical systems have to run and run

Don't let your smart software suffer from poor system choices
Mismatched AI and analytics can be massively inefficient

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