DIVE INTO SOFTWARE-DEFINED INFRASTRUCTURE

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What is Software-Defined Infrastructure?

In a software-defined data center (SDDC) all infrastructure is virtualised. Physical servers, networking equipment and storage arrays are virtualised into software-defined compute, software defined networking (SDN), and software defined storage (SDS).

This software-defined infrastructure (SDI) can then be deployed on general purpose hardware, aggregating resources into pools, from commodity hardware underneath.

An SDDC extends beyond software-based infrastructure resources, to provide functions such as automation, operations, insight (performance, financial metrics, etc) and governance. The infrastructure is no longer defined by hardware and devices, and control of the data center is fully automated by software.

Consequently, the resources are logically pooled and can be managed as if they were software. This allows policy-based infrastructure provisioning and enables IT automation, and in turn can deliver higher levels of efficiency and consistency. Not bound by the fixed limits as would be the case of the OS/app was deployed directly onto bare metal – a physically defined infrastructure.

Software-defined infrastructure is not tied to specific hardware and can operate with little human intervention. This model allows many critical IT functions to be fully integrated and automated. Removing the human element eliminates the chance of misconfiguration and the limitations of deploying by hand, infrastructure is deployed in a known state, in any volumes.

For both new and existing workloads that are suitable for cloud-like platforms, organisations design and build a software defined data center (SDDC). This creates both a mirror of, and a stepping-stone into/from the public cloud. This is a key part of a hybrid cloud strategy. SDI also underpins how infrastructure is delivered on tap by Cloud providers such as AWS, Azure and GCP.

SDI/SDDC attributes:

- **Service agility** – significantly reduce time create/launch/consume services and resources. Quicker delivery reduces time-to-production, enables faster service delivery and service updates/upgrades.
- **Programmatically configured/controlled** – SDI lets platform managers configure, manage, secure, and optimise infrastructure resources very quickly via dynamic, automated SDI tools.
- **Standardised** – provides service catalogue for self-service consumption, with metering and billing.
- **Centrally managed** – infrastructure intelligence is logically centralised in operational tooling that maintains a global view of the infrastructure, both on-premises and in public cloud, which appears to applications and automation policy engines as a single, logical infrastructure composed of resource pools.
- **Open standard and vendor neutral** – this reduces hardware dependencies. When implemented through open standards and APIs, SDI simplifies platform design and operations.

Aligned to business priorities:

Software defined technologies allow a customer to align to wider business objectives, such as:

- **Improve business agility/speed** – via agile availability of resources, and improved service offerings and experience.
- **Increase productivity** – with less manual steps, less waiting, and less inefficiency.
- **Reduce cost** – by right-sizing people, process and technology with software technologies and automation, coupled with less proprietary hardware.
- **Improved accuracy** – based on better and predictable outcomes.
- **Reduce risk** – by simplifying, being more consistent, and automating.

Benefits of SDDC/SDI

This software defined approach introduces many benefits, in order to support workloads that are more flexible, scalable and elastic:

- Services-based approach rather than siloed
- Next generation virtualisation and PaaS to support a combination of VMs and containers
- Highly automated and API driven
- Scale-Out (all layers) for incremental growth
- Right-sizing - SDI is deployed on granular blocks of hyper-converged infrastructure (HCI). The building blocks or nodes are based on x86 servers and can be nodes tuned for processing or storage, or a blend.

Where are customers adopting SDI/SDDC?

After the fever of debating "Is it cloud or not?", "Is it public or private cloud?", "Is it on-prem or off-prem-?" – most customers now accept and embrace it is hybrid in the sense some workloads remain (and are born) on-prem, some workloads are off-prem and likely leveraging multiple public clouds. Therefore, where are customers deploying software-defined capabilities?

1. Software-defined infrastructure on-premises.
2. Software-defined infrastructure in the cloud.
3. Software-defined infrastructure between premises.
4. Software-enabled operations and automation over the two.

For new on-prem workloads, for existing workloads suitable for cloud-like platforms, then to host these on-premises (for the right reasons) leverage software-defined capabilities. Thus, building a conduit into the public cloud, as part of their hybrid cloud strategy.

Customers are then able to leverage software-based infrastructure resources from the public cloud providers to compose workloads (sometimes referred to as cloud-native). And/or they extend their SDDC out into, and onto, the public cloud -and not just within their on-prem and their off-prem workloads, customers leverage software-defined networking/security technologies in order to safely fuse together these environments.

Automation delivers better and predictable outcomes, with less scope for human error, and improved accuracy. With the IT services and processes being standardised, and with SDI being standardised, it allows customers to create a service catalogue as an internal shopfront for infrastructure. Standardised infrastructure builds are available as self-service consumption, with metering and billing.

Almost half of customers' IT teams accelerated their use of automation in 2020 in direct response to the pandemic. One recent survey concluded 48% did in 2020, and that 78% of IT teams will increase automation in 2021.

Software-Defined - Why Now?

It's really a combination of being more do-able, in conjunction with being unavoidable. Partly it's easier, by adopting public cloud, and by building on-premises clouds, customers themselves have begun to break down those technology silos. The technology itself has become less intimidating, allowing customers to create, then compose their infrastructure with a blend of on and off-premise resources.

It's no longer acceptable to tell the business you can have a Windows server in the data center in 9 months. Automation when done well abstracts complexities, particularly with multi-cloud.