Mi | MODERN INFRASTRUCTURE SEMINAR

TechTarget®

Building *today's* data center

Presented by Scott Lowe
Founder & Managing Consultant, The 1610 Group
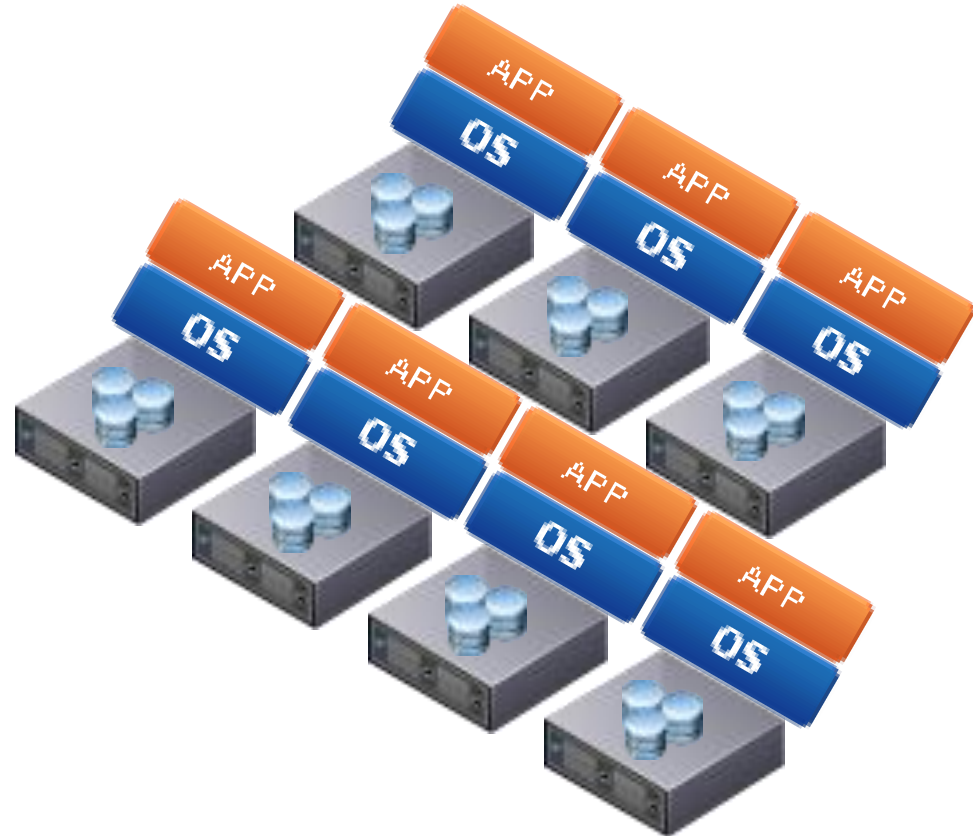
events.techtarget.com

Session 1:
Advanced Infrastructure Technologies

Achieving State of the Art Infrastructure

events.techtarget.com

Where Did We Start?

- 1990s saw the rise of:

  - Centralized storage

  - Microsoft Windows NT

  - Collaboration via corporate intranets

  - "Server sprawl" began to be a major problem

Where Did We Go?

- 2000's heralded:
  - Rapid adoption of Gigabit Ethernet
  - Server sprawl gave way to virtualization
  - Server consolidation projects became increasingly popular
 - Virtualization changed computing
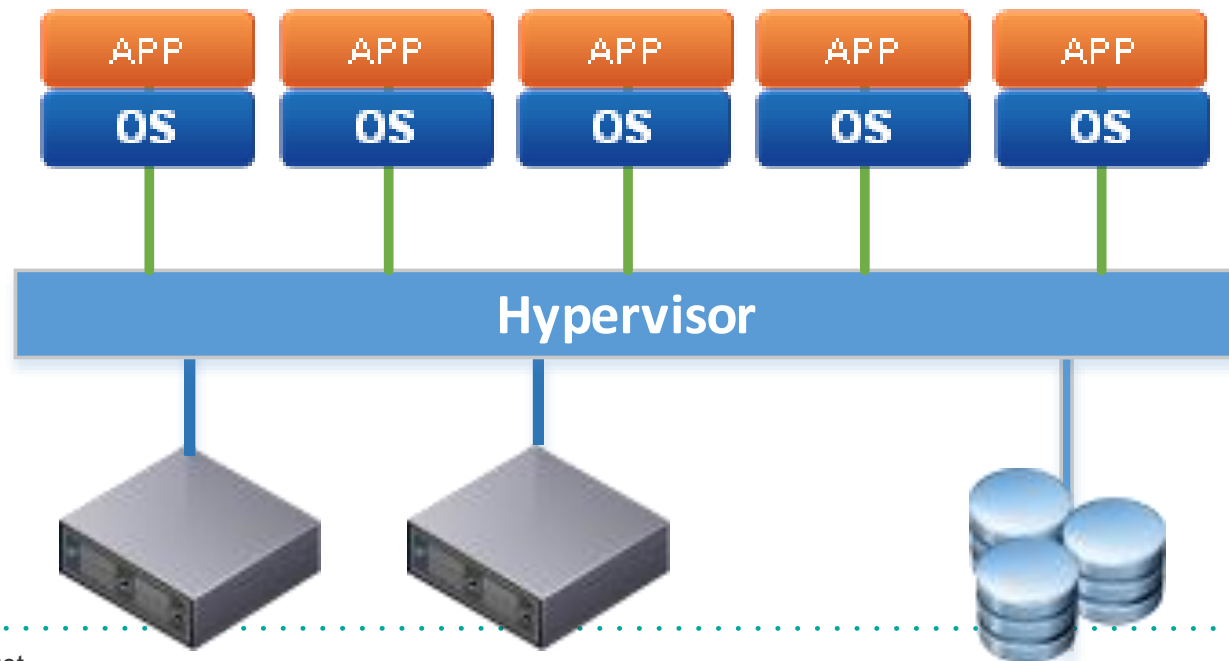
How Do Things Look Today?

- Workload flexibility has led to new market and business opportunities

- Storage has become a stumbling block for many organizations
  - The "I/O blender" effect is in play
  - When workloads had their own hardware, storage design was relatively simple
  - Until recently, correcting storage issues was difficult
    - With the rise of flash, storage performance is easier to address

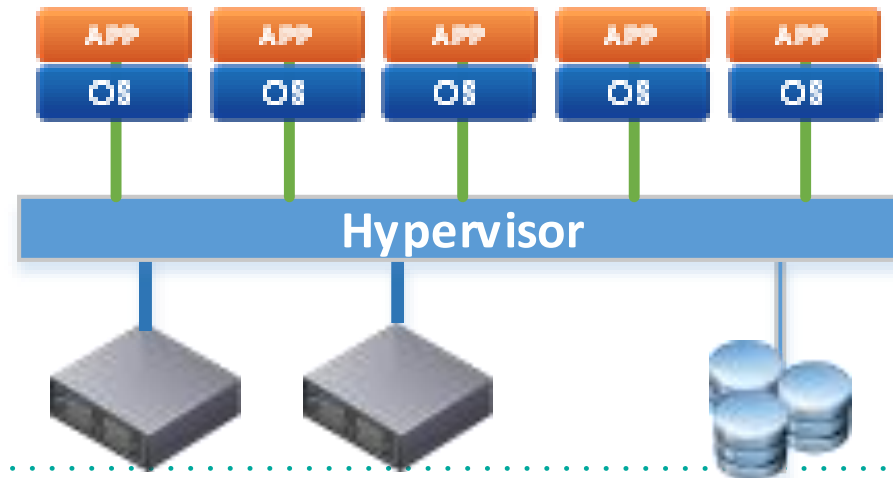- Data centers have become more focused on normalized scale than on raw hardware density

Workload Challenges Creating Virtual Islands

- When there are massive workload differences, some organizations are creating islands in various ways
  - Creating storage tiers
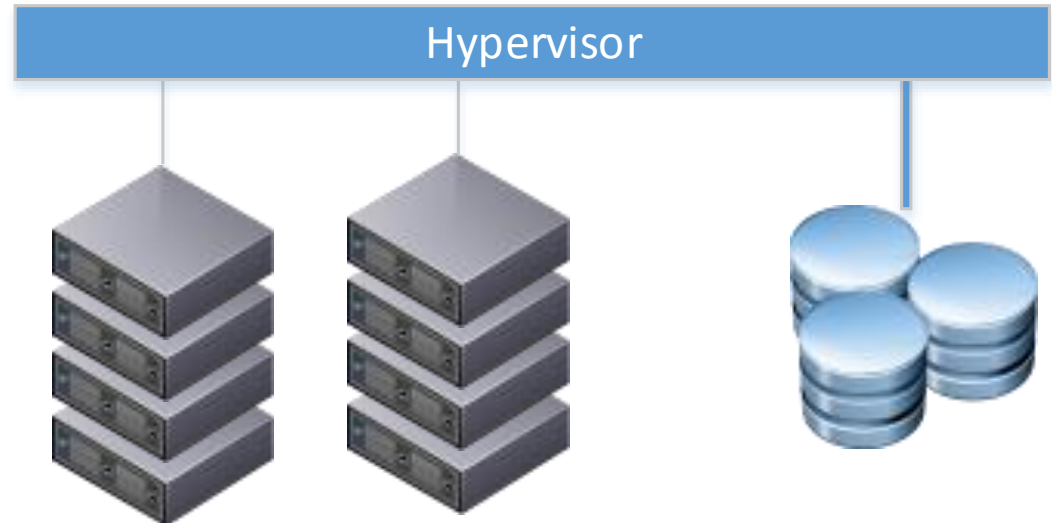 - Creating hypervisor tiers
  - Creating separate application environments
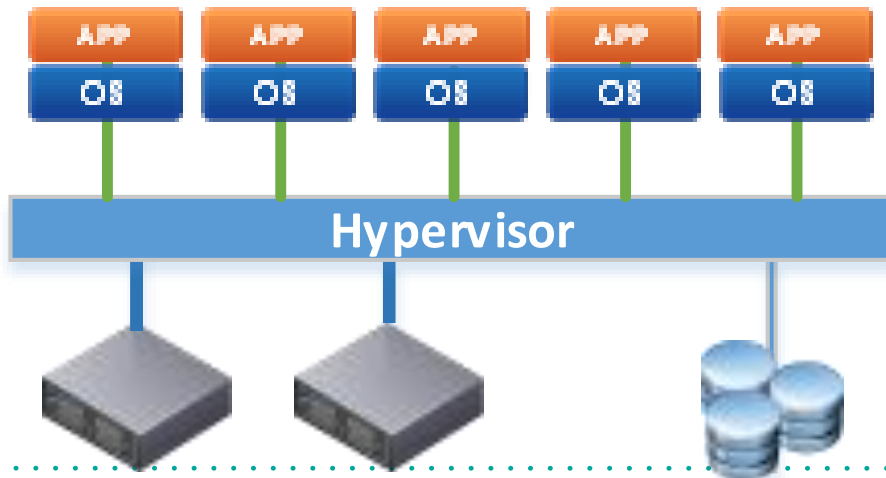
Virtualization's Role in the Modern Data Center

- The hypervisor has become a commodity
  - vSphere
  - Hyper-V
  - Xen
  - KVM

- The hypervisor is the common glue of the modern data center


Hypervisor

Emerging Challenges

- Primarily storage related, but not completely

- Continue to simply add hosts and react to storage issues

- Rise of multi-hypervisor opportunities

- Rise of software-defined everything

- Need for deeper DR

- Need for more data center automation

Trend #1: Management Focus

- Abstraction has resulted in an emerging focus on the data center management layer and new ways of thinking about data center hardware, particularly as cloud becomes a more compelling opportunity

APP · APP · APP · APP · APP
OS · OS · OS · OS · OS

vCenter, SCVMM, HotLink
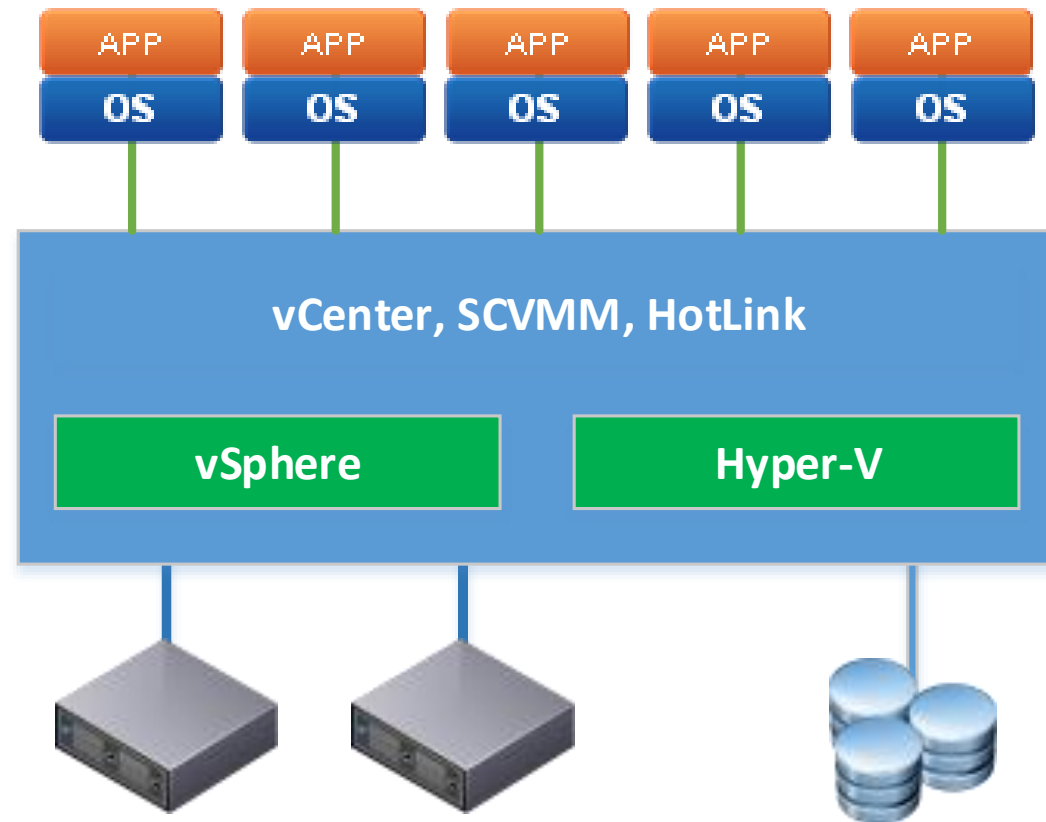
vSphere · **Hyper-V**

Trend #2: Hybrid Clouds

- Cloud services are emerging that provide easier integration opportunities for CIOs
  - VMware vCloud Hybrid Service
  - Windows Azure/Hyper-V 2012 R2
  - Great potential here!
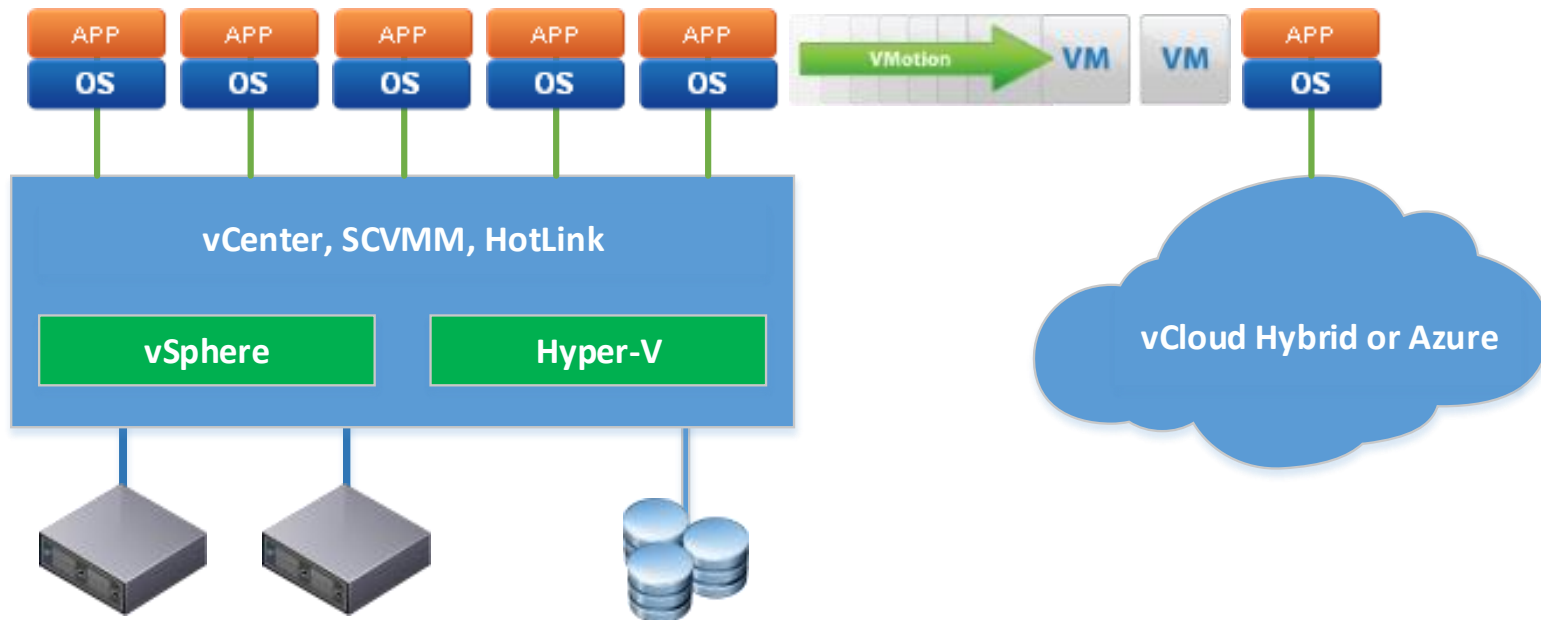
Trend #3: Solid State Storage

- Solid state storage has hit the market in a big way

- Many ways to leverage this technology
  - Server side
  - All flash arrays
  - Hybrid storage arrays

- Emerging vendors take a no holds barred approach to enterprise level storage features that vastly improve data center economics
  - Data reduction tools

Trend #4: Commoditization and Scale Out

- Facebook and Google led the way here
  - The economies of scale don't come far down market
  - The concept, however, does

  - Commodity hardware with exacting specifications
  - Scale out using a building block mentality

  - Software defined data centers are an outcome of some of these plays

Trend #5a: Convergence (Macro)

- A significant trend is the rise of convergence
  - HP Flexpod
  - EMC/Cisco/VMware (VCE) Vblock
  - Dell Active Systems

- Single SKU, prevalidated data center architectures
  - Often ship in a prebuilt, precabled rack
  - Place the rack and turn it on
  - Need more capacity? Buy another "unit of infrastructure"

- Based primarily on new combinations of existing products

- "Big iron", high cost of entry

Trend #5b: Convergence (Hyper)

- Hyperconverged infrastructure
  - Nutanix is on a tear
  - Other players include Simplivity and Pivot3

- Characteristics
  - Very granular
  - Purpose built using commodity hardware
  - Almost always takes hybrid approach to storage
  - Complete infrastructure (minus networking)
  - Need more power? Add a unit
  - Emerging differentiation for easier expansion targeting
  - Very low cost of entry

General Thoughts

- Throw it all away
  - But not today!
  - Consider phasing in new architecture using current replacement cycle

- Some IT staff training needed
  - But most of the trending items simply extend from existing knowledge base

- CIO focus for today and beyond (and how trends enable)
  - Less on tech, more on business
  - Better ability to identify issues and predict costs
  - Easier to consider cloud as potential solution

Session 2:
Five Things You Can Do in the Cloud Today

Smart Entry to the Cloud

events.techtarget.com

What is the "Cloud"?

- The cloud has many different definitions and use cases
  - Sometimes used as a metaphor for the Internet
  - Virtual servers available over the Internet
  - A service that enables organizations to move to a consumption-based IT model; sometimes referred to as utility computing
  - There are many different kinds of services that fall under the "cloud" umbrella
    - Software-as-a-Service (SaaS)
    - Platform-as-a-Service (PaaS)
    - Infrastructure-as-a-Service (IaaS)

Public Clouds

- A multi-tenant environment operated by a service provider

- Services are located in the provider's data center

- Customer may not always even be aware in which provider data center services reside

- Built with the assumption that hardware will likely fail
  - Avoids the need for expensive failover/availability systems
  - Software management layers handle availability

- Provides grid-like scalability to great levels

Public Clouds

- Pros

  - Enables immediate implementation

  - Low to no initial deployment costs

  - Consumption-based cost model, utility model

  - Provides more cost-effective scale than would be feasible in a private data center

- Cons

  - Potentially unpredictable ongoing usage charges

  - Charges across every aspect of the environment

  - Customer has no control over underlying infrastructure

  - Care needs to be taken to avoid lock-in

Private Clouds

- Generally a single tenant environment built out in an on-premises data center or a single tenant environment in a public data center

- Private cloud environments are characterized by heavy virtualization which fully abstracts the applications from underlying hardware components

- They may offer service level products to internal clients in a cloud-like manner

Private Clouds

- Pros
    - Provides an opportunity to shift workloads between servers to best manage spikes in utilization
    - Enables ability to deploy new workloads on a common infrastructure
    - Full control of the entire environment, from hardware to storage to software
    - Customers can customize the environment
    - Provides additional levels of security and compliance due to single tenant nature

Private Clouds

- Cons
  - Requires customers to build, buy, and manage hardware
  - Does not enable reduced management scenarios
  - Doesn't provide what is considered a cloud computing economic model
  - Can carry very high initial costs

Cloud Service Differentiators

- Software-as-a-Service (SaaS)

  - The simplest level of cloud-based service

  - Provider controls everything

    - Provides an application layer interface only for specific configuration items

  - Customer does not need to worry about any underlying services except those that may extend the service

Cloud Service Differentiators

- Infrastructure-as-a-Service (IaaS)

  - Vendor provides infrastructure

    - Network, storage, compute resources and virtualization technology

    - Developers still need to configure these resources

  - Customer continues to manage security, databases, and applications

Cloud Service Differentiators

- Platform-as-a-Service (PaaS)

  - Provides infrastructure and an application development platform

  - Platform includes ability to automate and deploy applications and includes operating systems, databases, middleware, tools and services

  - Customer manages the application and data layers

Cloud Services Division of Responsibilities
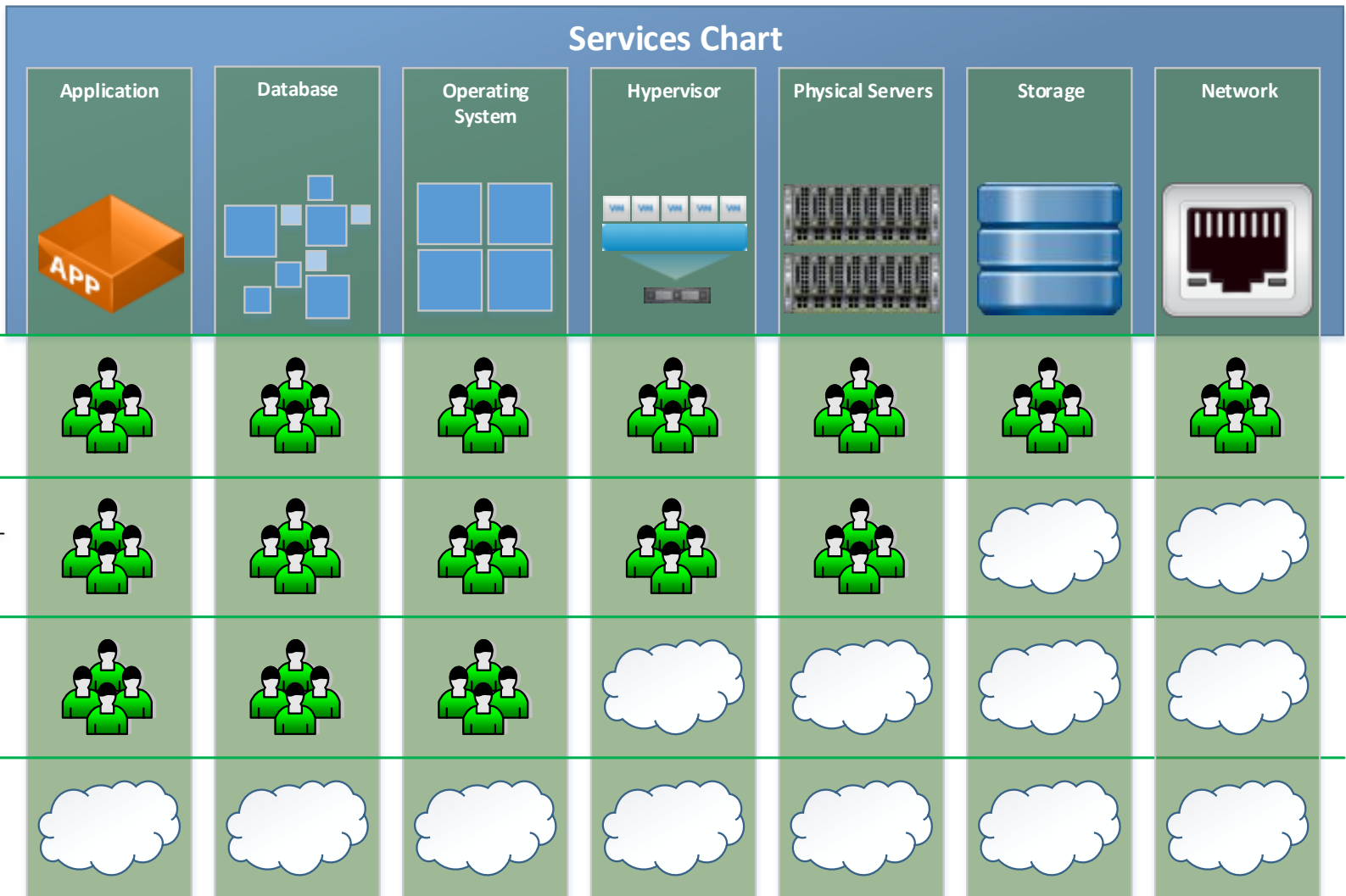
Understand the Details!

- Hyper-scale

- Failures of elasticity

- "Eventual consistency"

- Utility model

#1a: Backups

- Backup continues to have challenges:
  - Shortening backup windows
  - Need to make sure that data at rest remains safe and secure, yet accessible

- Backup paradigm has shifted in many ways to a virtual machine focus

- Some backup vendors (i.e. Veeam) now build cloud-connectivity into the product as a storage target

#1b: Disaster Recovery

- Particularly in SMB, building a separate data center is cost-prohibitive

- DR is still important, though

- Hypervisors are getting into the game (i.e. Hyper-V Replica)

- Leveraging cloud – particularly hybrid cloud – is a perfect fit for the SMB space

#2: Big Data Analytics/HPC Needs

- Organizations large and small occasionally need big compute

- Building it and operating it can be expensive, time consuming, and is often a non-core activity

- Cloud providers can be leveraged to provide the on-demand compute needs with results delivered back to the on-premises client

#3: E-mail

- Exchange still rules the roost in on-premises environments

- Office 365 has become extremely popular (now estimated at a $1.5 billion dollar a year business for Microsoft) and is getting better every day

- Google Apps for Business is another popular options

- Reduce on-premises footprint and eliminate some hardware need
  - Skill sets shifts to pure application focus
  - May reduce e-mail TCO

#4: Anything Web

- If you have your only web presence in your data center, consider moving it or a replica of it to a cloud service

- Web-based applications are increasingly popular in the cloud as well

#5: Secondary Authentication

- As organizations become more geographically diverse, localized authentication issues can become more common

- With cloud-based services, such as Azure Active Directory, organizations can leverage cloud as a backup authentication source and possibly reduce direct WAN costs

- Also useful if moving some apps into the cloud anyway

What to Keep Local

- Primary authentication/Identity management

  - Somewhat debatable, but try to keep primary authentication close to the user and in your control

- ERP

  - Legacy ERP systems remain pretty resource intensive

- Anything that you're unsure about from a regulatory perspective

- Customer PII

Transition Challenges

- Bandwidth

- Latency

- Variability

- Architectures

- Licensing

- Auditors

- Cost structures

Thank You!
Questions?

Email:
slowe@1610group.com

Twitter:
@ OtherScottLowe

Websites:
www.1610group.com
www.cioscape.com

TechTarget®