Challenges, and Flash Solutions, Facing the Virtualized Enterprise Data Center

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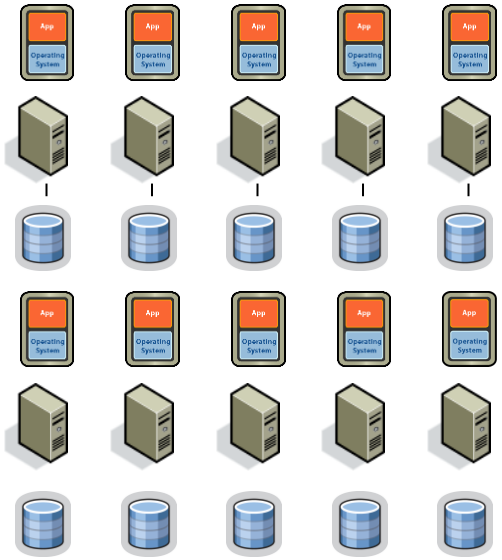
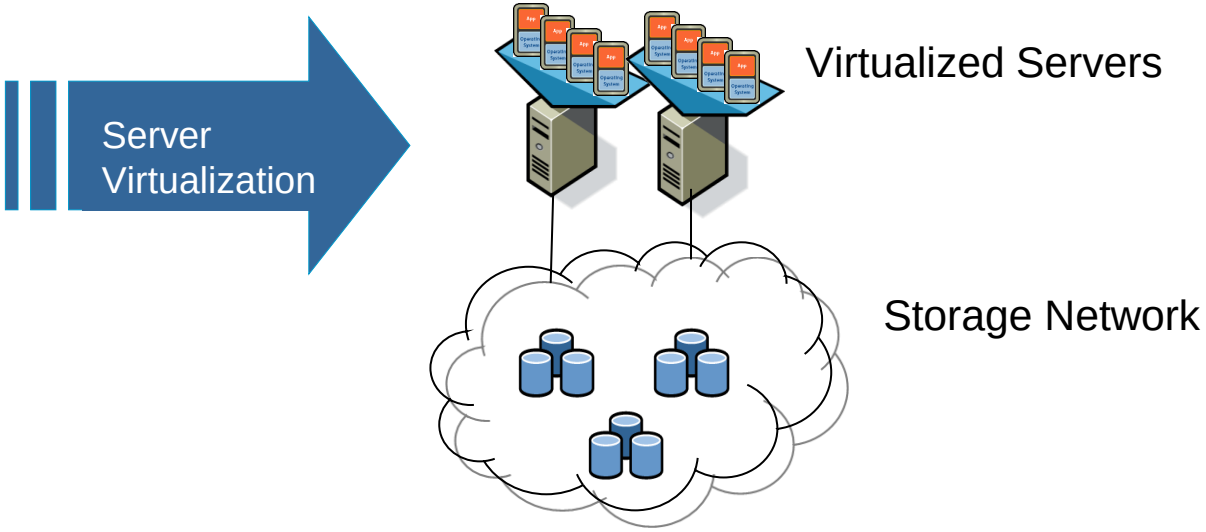
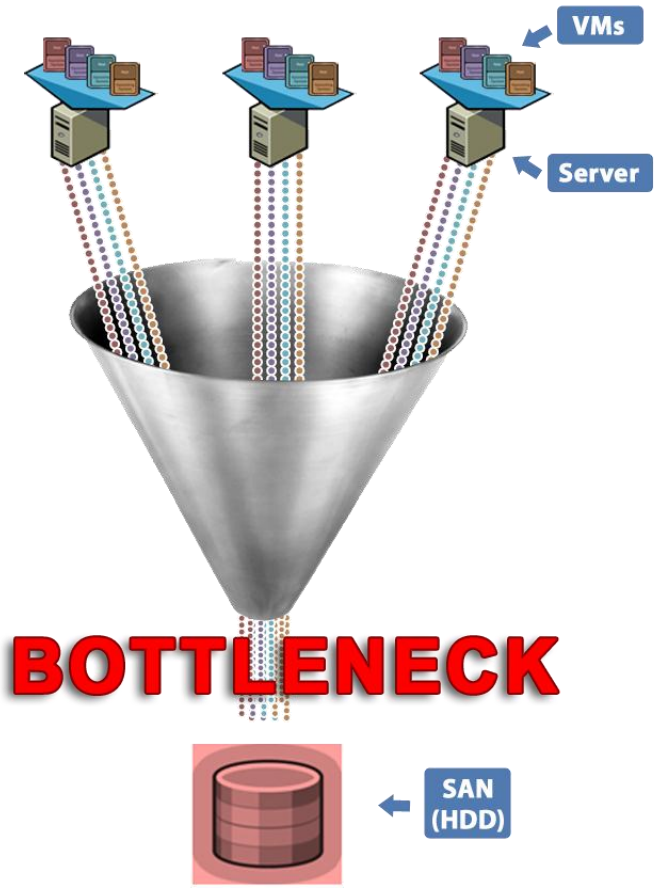
The Traditional Approach to Storage in Virtualized Environments





The Problem



System performance has surpassed storage performance in virtualized environments

- External storage has become the bottleneck

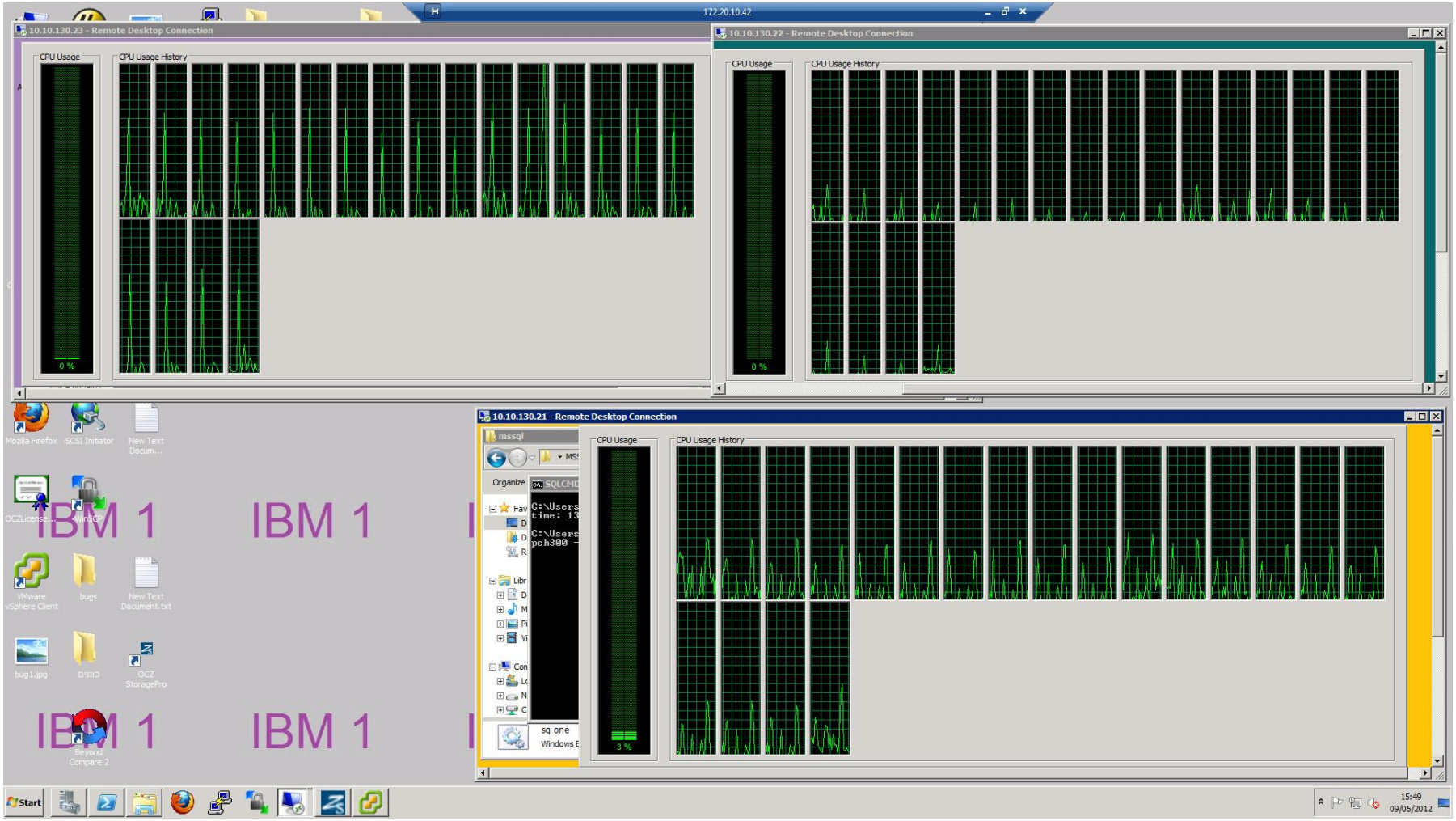
Too many Virtual Machines are vying for access to slow external storage

- Thousands of VMs on tens to hundreds of servers are all competing for data from few storage arrays
- Arrays are filled with slow HDDs that have trouble servicing simultaneous requests

High latency exists in accessing external data

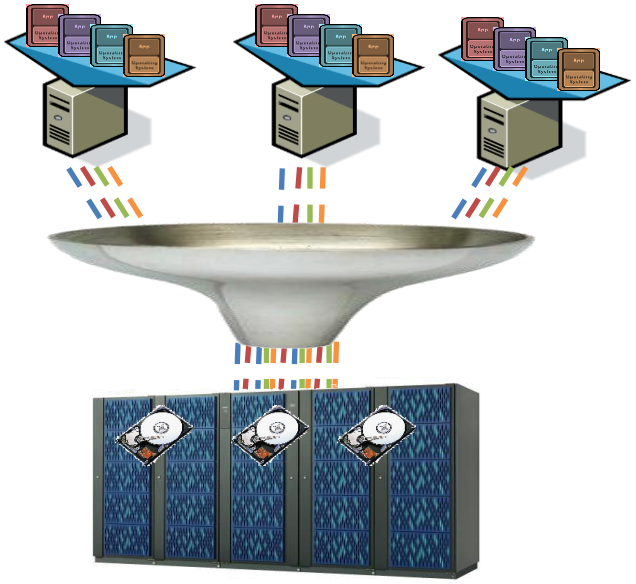
- Trips out to external storage devices for data comes with higher latency than internal storage

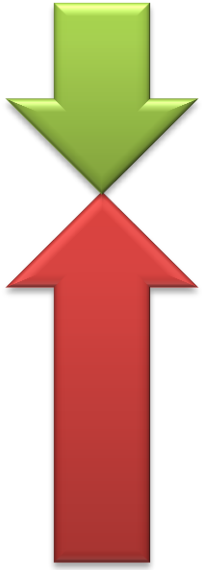
Example – 60 Virtualized CPU Cores Waiting for Data from HDDs



Buying More HDDs Won't Help

- More HDDs in the SAN provide more IOPS, but
  - Drastically increase storage costs in Virtualized Environments
  - Unnecessarily Increase cooling/energy requirements
  - Do not provide a solution to the Internal Host Server bottleneck

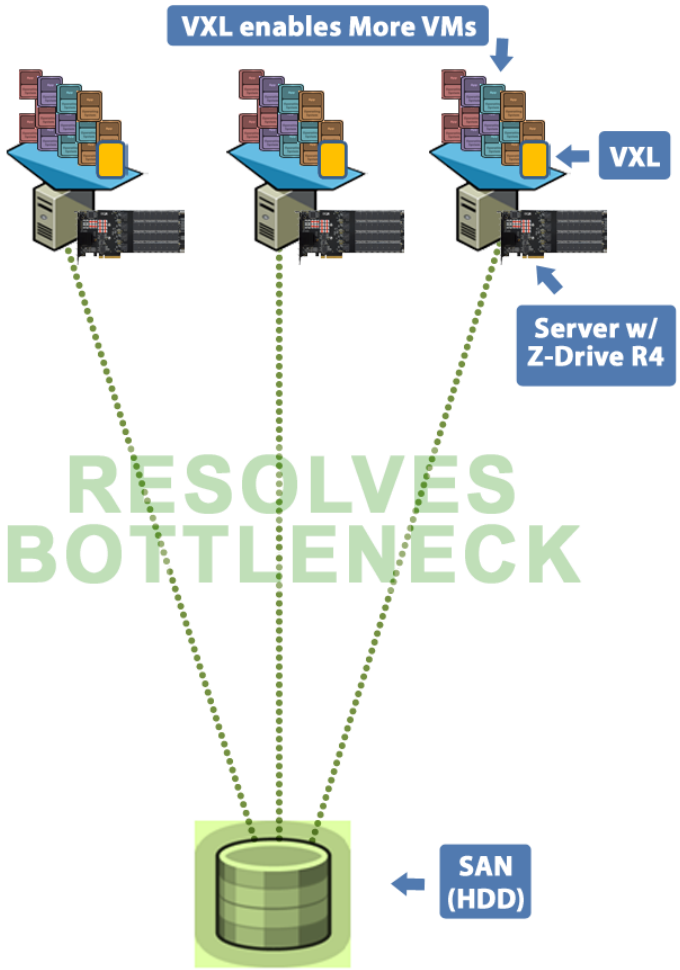




Server Costs

Storage Costs

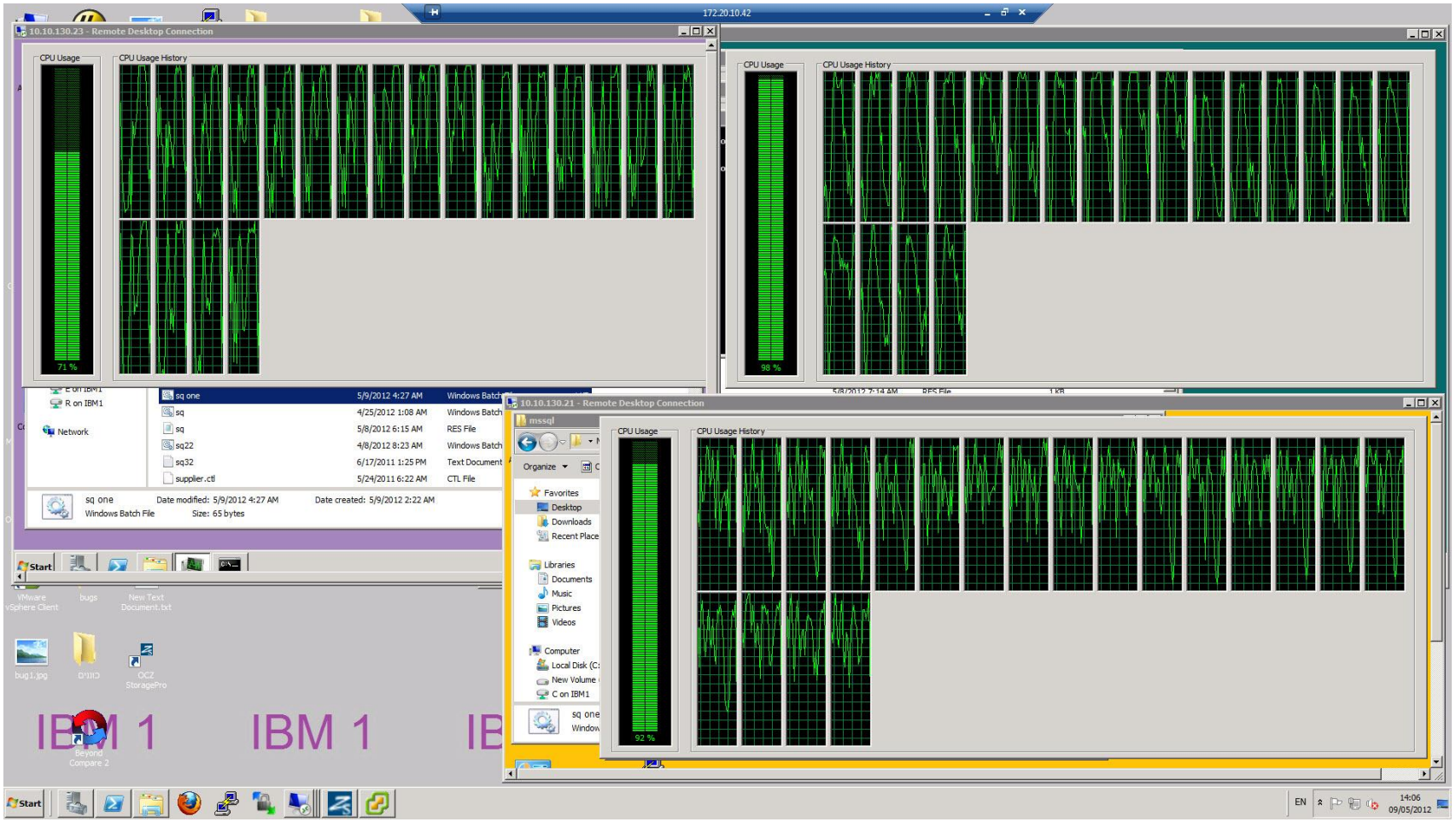
The Solution – On Host Flash with Storage ***Virtualization*** and ***Acceleration***



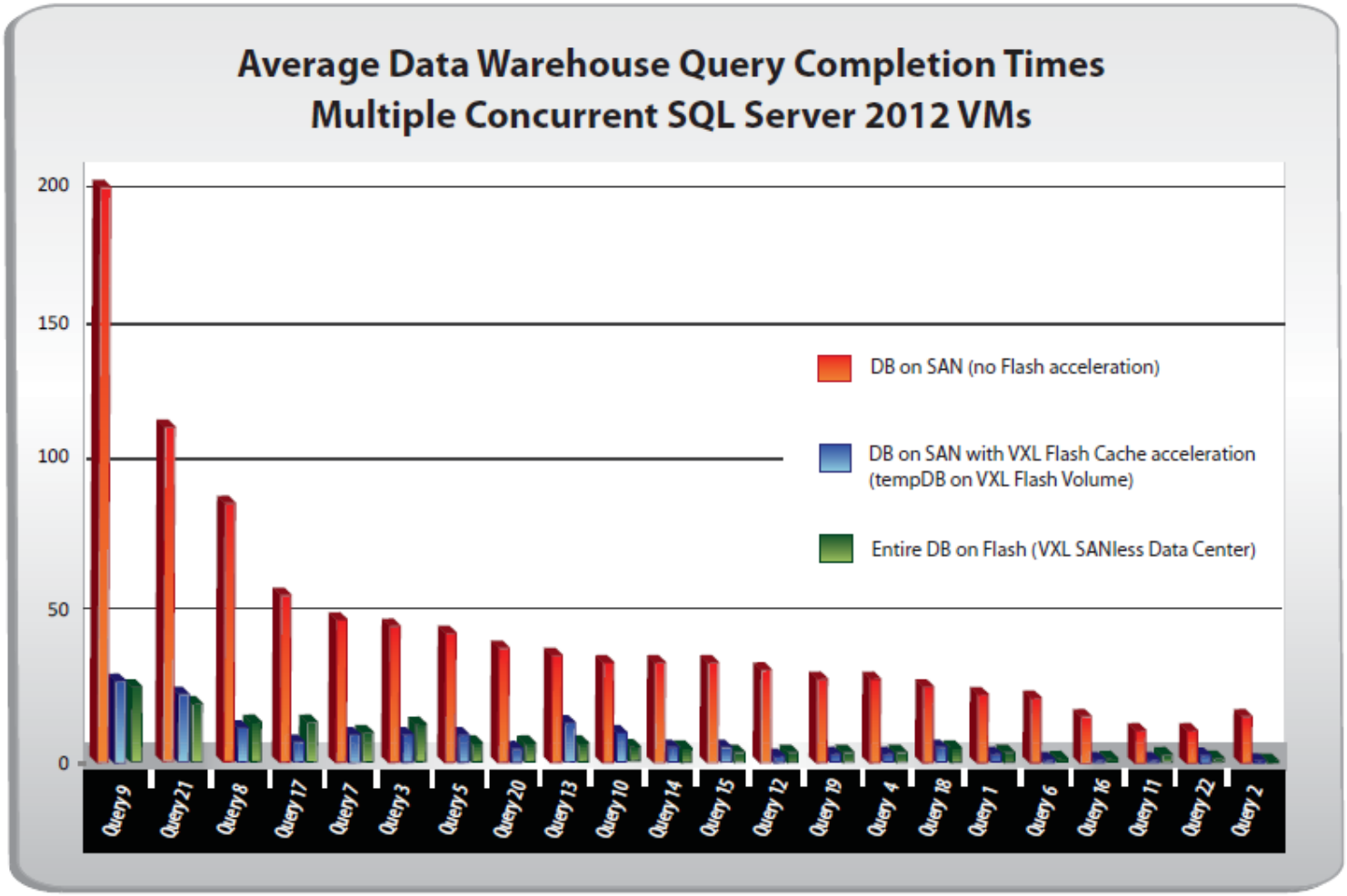
OCZ VXL Virtual Appliance with ***Z-Drive R4 resolves the Virtualization Bottleneck***

- ***Storage Acceleration Enables*** up to 10X the number of VMs on the same physical host resulting in massive server cost savings
- ***Storage Virtualization Enables*** Keeping Server Virtualization's intended ease of deployment, maintenance, and management unchanged

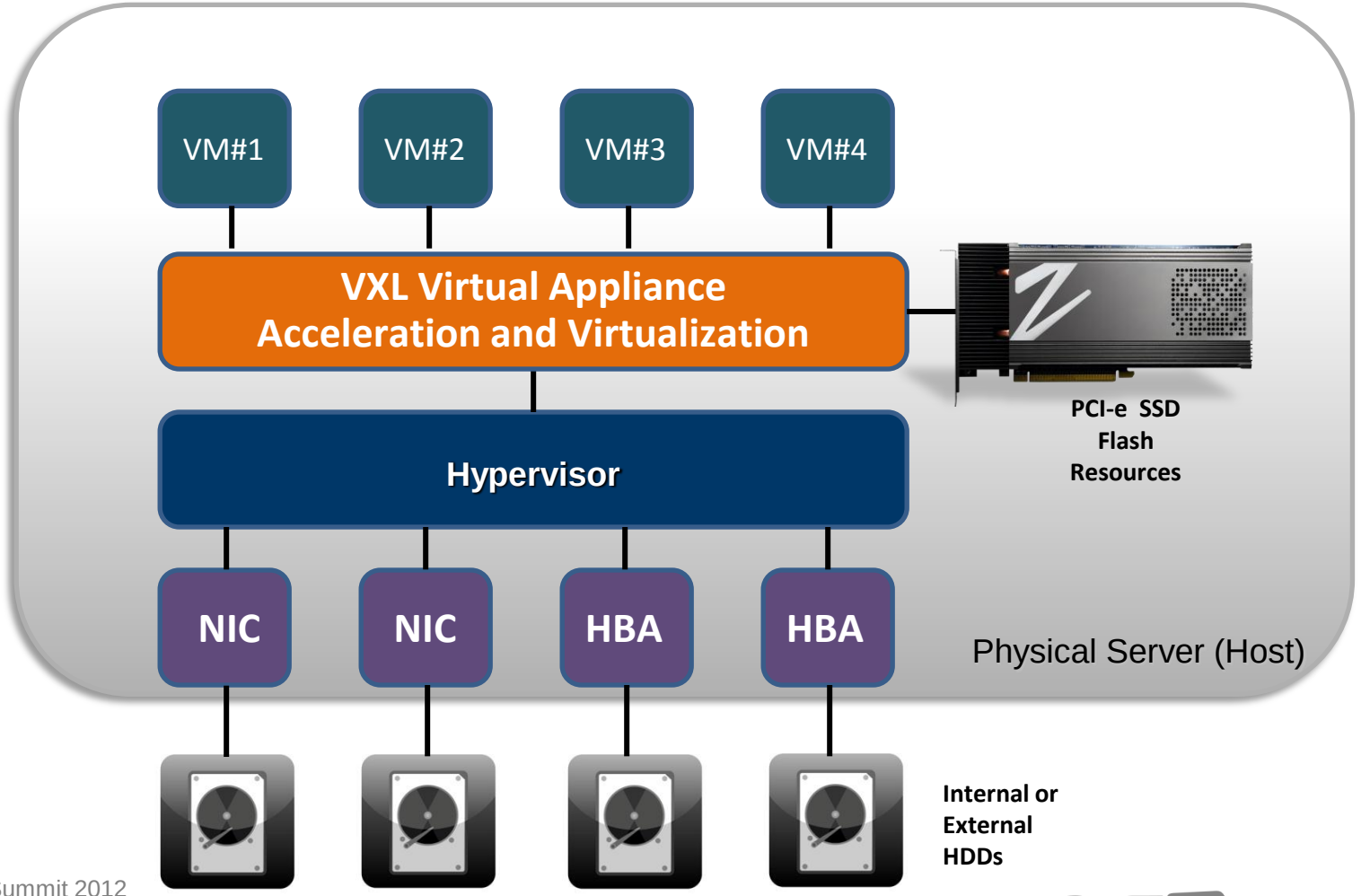
Unleashing the Power of Virtualization



The Result: Satisfying the Data Center Business Requirements

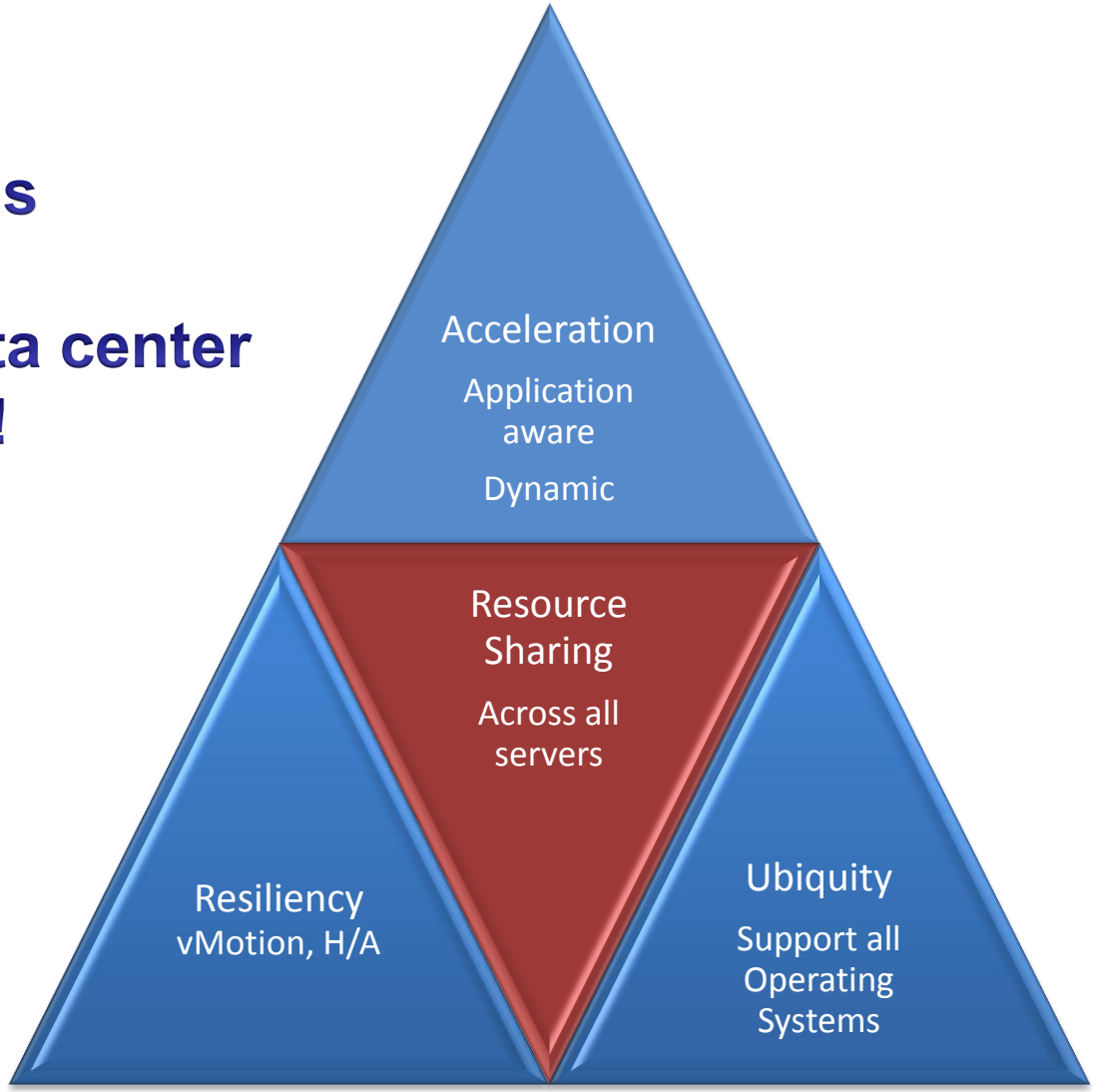


VIRTUAL APPLIANCE ARCHITECTURE FOR ACCELERATION & VIRTUALIZATION

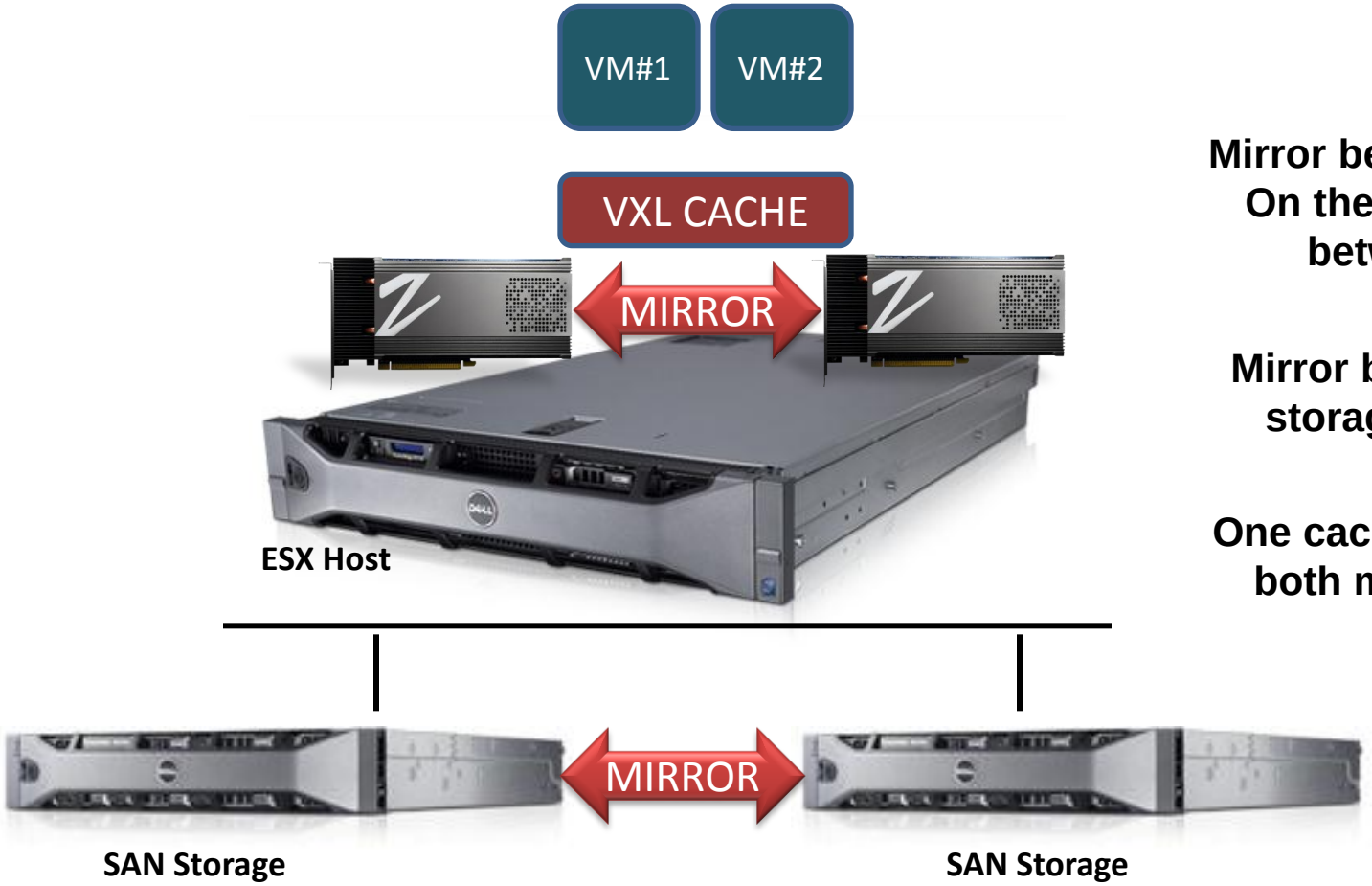


VIRTUAL DATA CENTER FLASH STORAGE CHALLENGES

Acceleration is *one of many* enterprise data center requirements!



FLASH SOLUTION: MIRRORING BETWEEN FLASH Z-DRIVES & SAN SYSTEMS



Mirror between Z-Drives: On the same host, or between hosts

Mirror between SAN storage systems

One cache servicing both mirror legs

FLASH Solution: The All Silicon (SAN-less) Data Center

Clustered Flash-enabled servers with H/A and Load Balancing

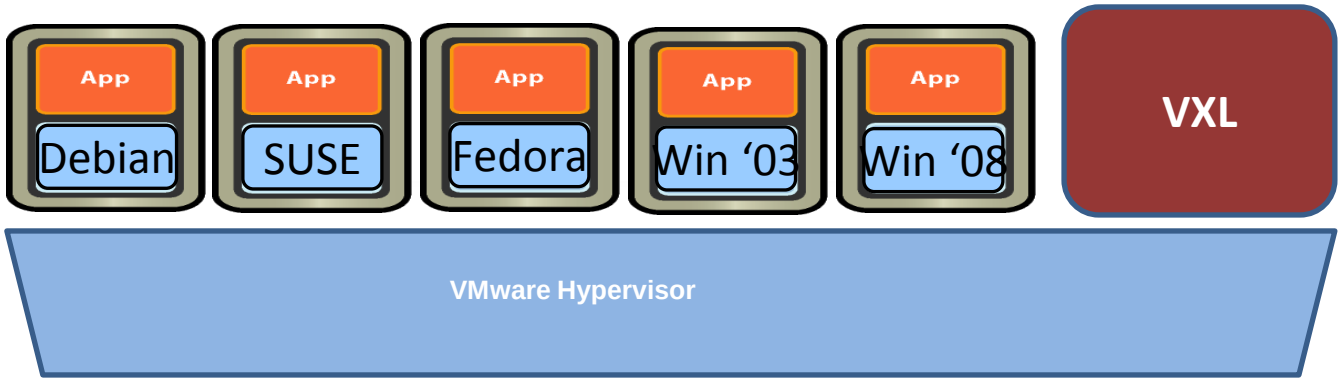
VXL Flash Virtualization mirrors data between Flash cards on Servers and manages Flash Storage H/A

Achieve Flash level performance and end-to-end H/A without requiring an external SAN

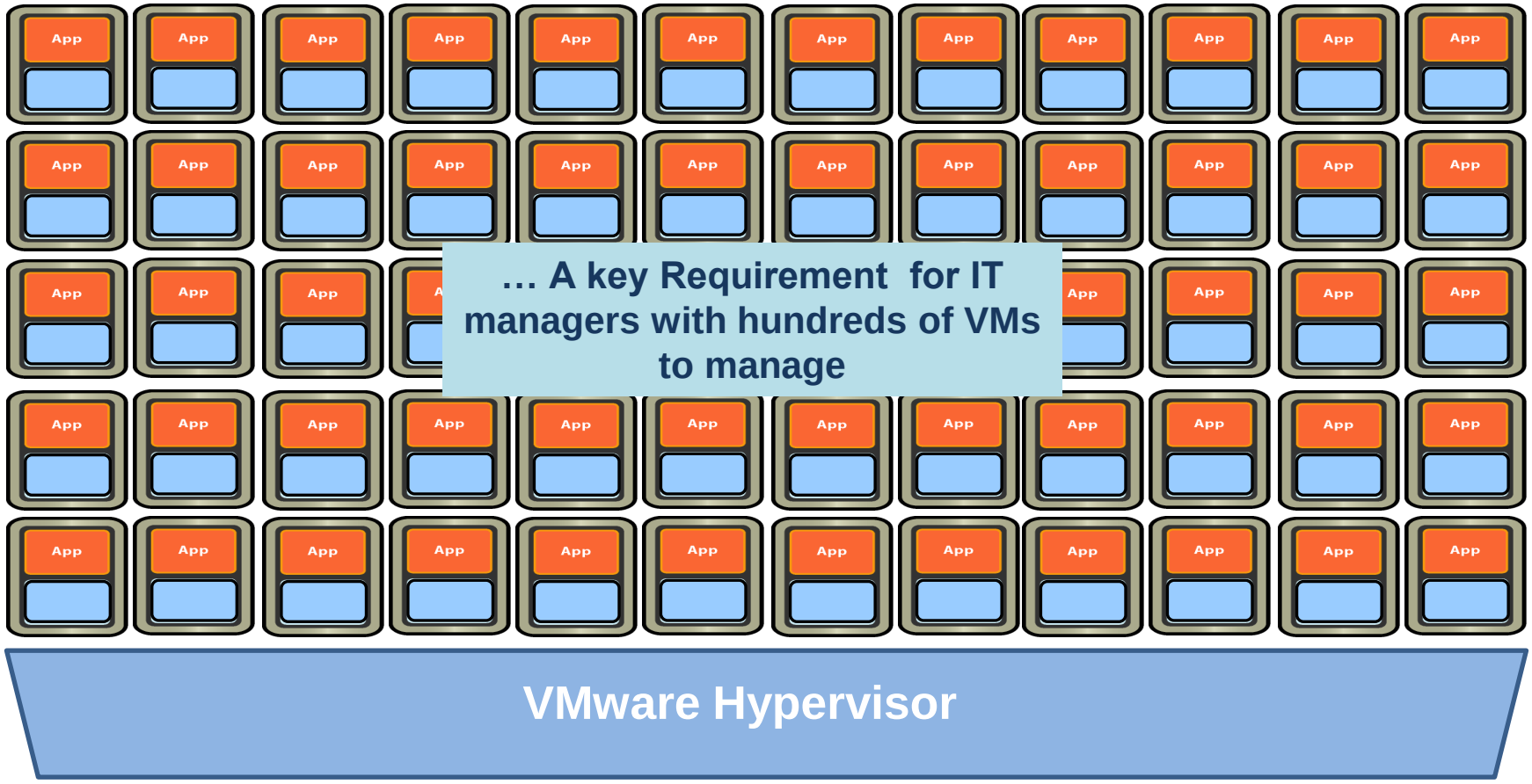
FLASH SOLUTION: AGENTLESS ARCHITECTURE

No agent in guest OS allows supporting any Linux distribution…

Any windows distribution… in fact any guest OS…



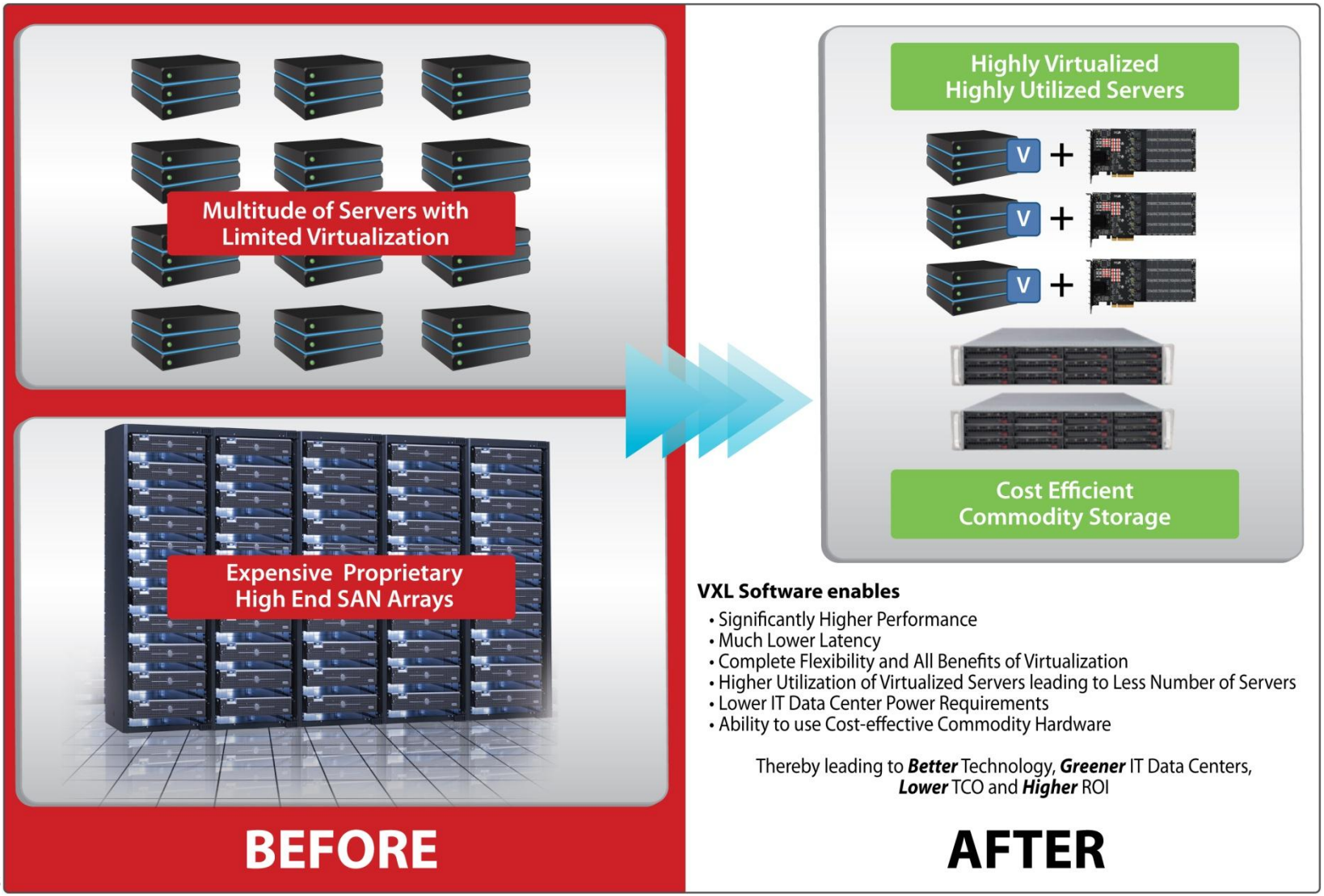
AGENTLESS ARCHITECTURE



FLASH Solution: Application-Optimized Caching

- Central Virtual Appliance provides a powerful architecture for
  - Application-specific caching
    - Dynamic Hot Zone Detection
    - Rule Base for Application Specific Data Access DNA
  - Predictive read/write IO pattern recognition
  - Dynamic run time adjustment
  - “Business Rule” cache warming

On Host Flash with Storage Virtualization: Creating The Lean, Mean and Green Data Center



Thank You