

## Achieving Maximum I/O Density & Diversity for vSphere – The Perfect Fit!

One of the most important data center metrics for gauging success and best cost/performance is in its ability to achieve the highest consolidation ratio for virtual machines (VM) to physical server density. A typical virtual server deployment averages anywhere from 5:1 to under 20:1 VMs per physical server host. More progressive IT organizations are even seeking to exceed 40:1 VMs per server host.

With the advent of automation and advanced management technologies such as Distributed Resource Scheduling (DRS) and vMotion, VM workloads can be distributed across underutilized physical servers and evenly provisioned to maximize resource utilization. The most powerful and densely packed server hosts translate into -- the lowest cost per virtual machine deployed. In addition, it shrinks the overall server footprint... which is a major “win” from a power, cooling and physical density perspective.

### About Regatta

Founded in 1981, Regatta has grown to be one of the largest names in outdoor clothing. They are the UK’s leading outdoor clothing supplier and export to over 30 countries.

### What were the challenges faced?

In 2010 Regatta’s IT organization identified a need to improve server consolidation ratios for their mission critical application environment. Rather than accepting the inflexible, unmanageable, and non-scalable approach of forever deploying additional 1 GbE network interfaces as “band-aid” solutions to I/O provisioning, Chris Bulmer, Regatta’s Director of IT Operations, was seeking to implement a more robust and agile solution that would allow them to scale applications and critical services beyond the norm. By consolidating and virtualizing their network and storage I/O, Bulmer reasoned, the IT organization would be able to:

- Provision I/O dynamically and remotely in the same manner as a virtual machine
- Make servers “agnostic” to the storage/network resources
- Improve resource utilization of essential devices, achieving even greater VM density (virtual to physical)
- Free server and network administrators from resource intensive “routine” tasks and allow the IT staff focus on greater improvements in data center efficiency



## What does Regatta's data center look like?

Regatta's primary application environment consists of four Dell R610 servers, each with 48Gb of RAM per host, and containing dual (multi-core) Intel 5500 series CPUs. Each host is connected to dedicated access layer switching; for storage traffic, they leverage Brocade's Silkworm 200E FC SAN switches and for their core network and end user traffic, they have deployed Cisco Catalyst 3750 Ethernet network switches. Their data storage environment is primarily Fibre Channel based, leveraging three IBM DS4700 disk arrays/enclosures. The environment is for both mission critical data and test/development purposes.

Regatta's primary operating system is Redhat Enterprise Linux 5.5 and VMware vSphere 4.1, using vCenter 4.1. The application workloads, both physical and virtualized, are primarily databases (DBs), web, and application servers. Their core applications are developed in house and built upon MySQL DBs, specifically used to monitor/maintain backlog inventory, order planning/history, accounts management, and tracking warehouse availability. As part of their application architecture, they use Apache 2.2 web servers on the front end to query the MySQL DBs, allowing their end users to access the data via a standard web browser.

Before deciding to leverage Virtensys' awarding winning VIO-4000 series, Regatta were utilizing multiple 1 GbE NICs and 4 GB HBAs per server. Regatta's objectives were straight forward; not only did they want to reduce costs associated with provisioning I/O to servers but they were also seeking to maximize the utilization their existing data center design. They were seeking an I/O connectivity solution that could:

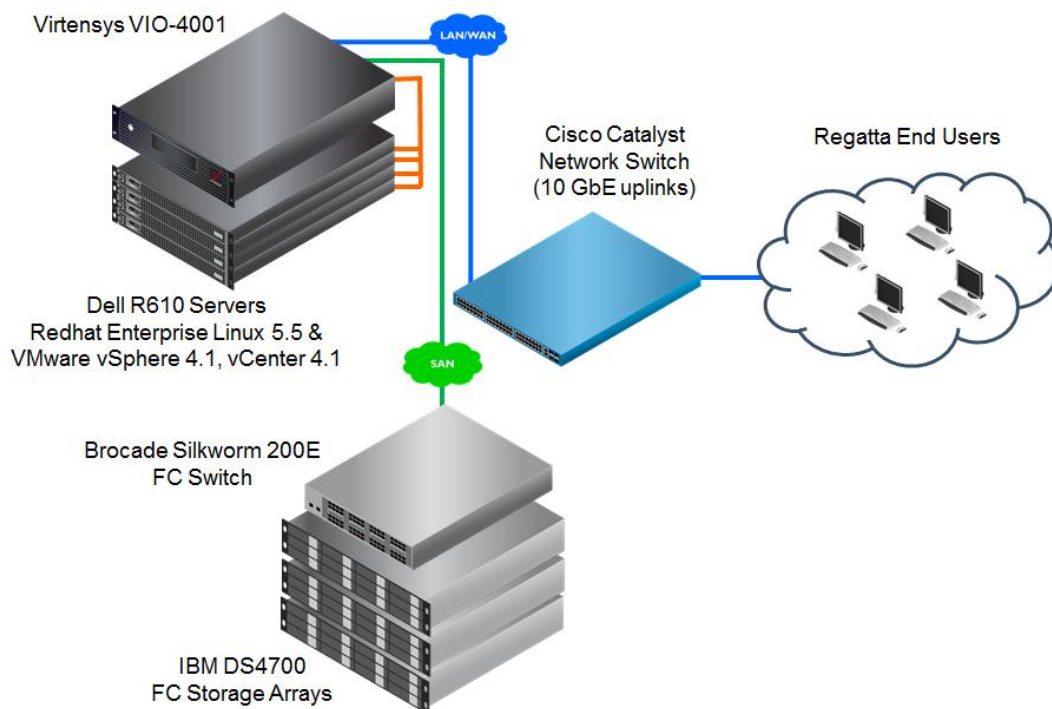
1. Deliver 10 GbE access speeds/connectivity to all database servers and web servers.
2. Provide reductions in network traffic and reduce load on their 1 GbE infrastructure.
3. Improve data transfers/transactions between servers, improving latency from an application perspective.
4. Provide the ability to reuse their internal/existing network infrastructure, without having to incur an expensive rip and replace.

## Why did they select Virtensys?

Evaluating the options available to meet their specific requirements, Regatta chose to implement Virtensys' I/O virtualization solution. Virtensys' unique approach I/O provisioning, rooted in its ability to virtualize and leverage a smaller number of standard PCIe network interface cards and storage controllers, reduces physical complexity, increases cost performance and optimizes resource utilization.

The specific model Regatta selected, the VIO-4001, provides both 10 Gigabit Ethernet (10 GbE) and Fibre Channel (FC) virtualized I/O connectivity to all connected server hosts. As with all the Virtensys VIO-4000 series, the VIO-4001 leverages industry standard PCIe (PCI Express) connectivity between the servers and the IOV appliance, meaning that communications within the appliance experience the lowest possible latency, communicating at PCIe bus speed, 20 GigaTransfers/sec (20 GT/s), providing each server a dedicated throughput of 16 Gbps.

As a result of Regatta's decision to implement Virtensys' VIO-4001, they are able to meet their objectives and extend the limits of their data center design – as well as improving management, reducing cost, and now each host has access to 10 GbE and 4 GB Fibre Channel connectivity to all existing and new hosts with their environment (see Figure 1).



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Figure 1: Improving Network Performance and Achieving Maximum I/O Flexibility

## How did Regatta benefit?

By implementing Virtensys' VIO-4001 IOV appliance, Regatta has seen an increase in data center efficiency. Having the ability to provision I/O dynamically, in the same manner as a virtual machine, the IT organization at Regatta are able to make their servers agnostic to the storage/network resources, thereby improving utilization of these essential devices and ultimately achieving even greater VM density.

By choosing to deploy Virtensys' VIO-4001 IOV appliance Regatta can now:

- Simply “wire” their servers once and deploy 10 GbE network connectivity “at will”
- Seamlessly add robust/resilient network interfaces to critical applications and services that demand more bandwidth and throughput
- Deliver higher VM densities per host, by delivering more dedicated I/O per host
- Eliminate the physical cabling that had previously been required to meet addressed network connectivity needs
- Leverage simultaneous access to different I/O resources, allowing them to have the flexibility in the future to leverage both 10 GbE and Fibre Channel simultaneously to assist with storage migrations and storage related operations
- Maximize their I/O diversity per server host, yet within the smallest possible physical footprint

## About Virtensys

Traditional data centers take a conservative approach when it comes to provisioning and managing I/O connectivity to rack-mount based servers. This typically consists of installing multiple network interface cards (NICs) and storage host bus adapters (HBAs). To keep pace with business demands for greater connectivity bandwidth usually means installing more and more I/O resources. This impairs the IT organization's ability to remain agile and responsive to the business needs as time, cost and resource needs for setup/teardown simply becomes greater.

Virtensys' approach to I/O provisioning and management leverages something called I/O virtualization (IOV). This means that servers can leverage virtual instances of traditional NICs and HBAs which appear to the server as locally installed physical I/O adapters. I/O provisioning to the servers is managed remotely and done “on-demand”. The core value of the Virtensys' IOV appliance is to simplify the I/O provisioning process, thereby allowing IT to address greater operational and capital expense improvements.

Virtensys' award winning VIO-4000 series architecture leverages industry standard PCIe (PCI Express) technology to control how servers connect to the Virtensys appliance. PCIe is a universally adopted and accepted server technology; it is native to the server and is well known and understood by every server administrator.