



Education

# Three Virtualization Management Myths Busted

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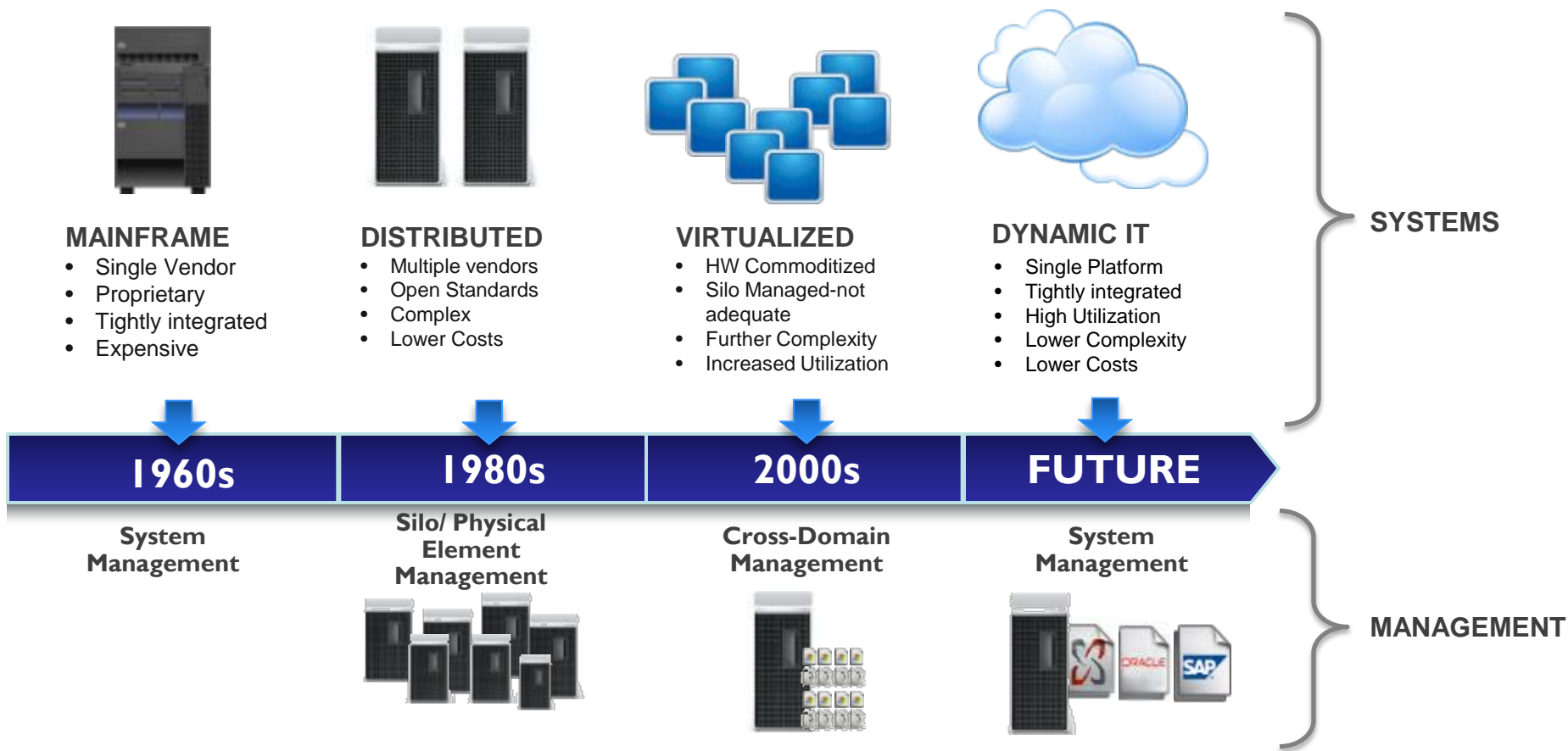
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## ➤ **Three Virtualization Management Myths Busted**

- Virtualization promises significant dollar savings. Since reducing cost is perhaps the biggest goal in today's corporate data centers, it's no wonder that virtualization efforts are accelerating. So far it's been easy to virtualize commodity servers that host less-critical utility applications. But after virtualizing all this "low-hanging fruit," IT now has to successfully virtualize higher-priority I/O intensive applications such as Exchange, SQL server, Oracle or SAP to improve its return on investment. Performance is critical for these business applications, and ensuring production performance when they become virtualized is a difficult challenge. IT shops fooled by common virtualization management myths can't properly manage virtual enterprise infrastructure comprised of both clustered host servers and SAN-based storage. This presentation will bust three common virtualization myths:
  - ◆ Virtualization Guarantees Performance
  - ◆ Virtualized IT Silos Can Be Managed in Isolation
  - ◆ Virtualized IT Can Be Managed Separately from Physical Infrastructure

- Virtualization has broken traditional management solutions
- Shared infrastructure creates performance issues
- Myth 1: Virtualization Won't Impact Performance
- Myth 2: You Can Manage Virtualized IT Silos in Isolation
- Myth 3: You Can Manage Virtual and Physical Infrastructure Separately
- Recommendations

# Data Center Mgmt Evolution



Driven by virtualization, Private Data Centers will evolve to a tightly integrated system requiring a cross-domain system management approach to be successful.

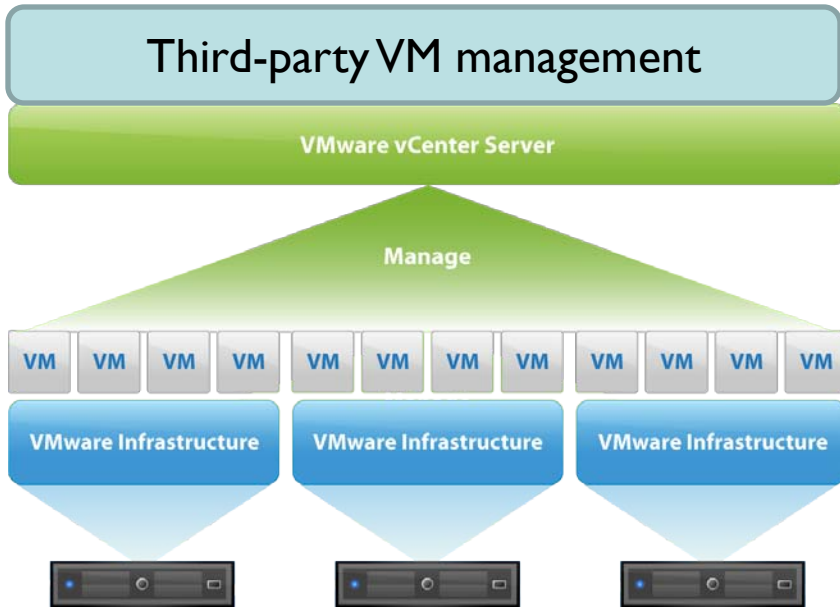
# Why Performance Management is Critical

- Can't successfully virtualize high priority I/O intensive applications without performance management
  - ◆ Exchange, SQL server, Oracle, SAP, etc.

Don't Be Fooled By Common Virtualization Management Myths

# Virtualization Management

## Old School: Server Virtualization as a Silo



- **Focused on VM management**

  - ◆ Setup, Provisioning, Connectivity, Migration, Backup, Debug
  
- **Third-party tools pull stats from Hypervisor Manager**

  - ◆ No physical server support
  
- **Limited in scope**

  - ◆ No visibility to storage

# Storage Resource Management

## Old School: Storage as a Silo



- **Focused on array management**
  - ◆ Setup, Provisioning, Connectivity, Migration, Backup, Debug
  
- **Server virtualization was an after thought**
  - ◆ Virtualization has changed the Storage world
  
- **Complex solutions evolved over time**
  - ◆ Focused on solving the distributed computing challenges
  
- **Expensive to deploy and maintain**
  - ◆ Multiple products required, PS required, agents, vendor-centric



# Myth 1: Virtualization Won't Impact Performance

## ➤ Confirmed:

- ◆ App performance can be boosted by migration to better server
- ◆ Sharing large host servers, each VM can get excess host capacity
- ◆ VM features that load balance apps across a cluster of hosts can increase server utilization and resulting average server performance



# Myth 1: Virtualization Won't Impact Performance

**BUSTED**

## ➤ Challenge: Reserves

- ◆ Customer was guessing how much reserves were required (blindly over-allocating memory)
- ◆ Had no insight into what the application was actually using
- ◆ For their database servers, if a SQL server needs 16GB of RAM, they would set a reserve for that whole 16GB
- ◆ They over-reserved the physical memory of the server, causing them not to be able to power on additional VMs
- ◆ Alternatively, you can set a reserve too low for an application and it will be starving for resources

# Myth 1: Virtualization Won't Impact Performance

## ➤ Challenge: Shares

- ◆ VMs get a “fair share” on any remaining unreserved capacity.
- ◆ Unreserved capacity is doled out to applications in need according to a “share” setting
- ◆ Shares change over time and should be viewed as part of the VMs total resource “entitlement” or guaranteed capacity
- ◆ VMs can still go over their entitlement, creating poor performance

**BUSTED**

# Myth 1: Virtualization Won't Impact Performance

## ➤ Challenge: Relying on Dynamic Resource Scheduling for business critical apps



- ◆ A given cluster of servers used as a total resource pool may simply not be big enough for all clients at peak times.
- ◆ The scheduler may "thrash" and simply move a problem from one host to the next
- ◆ The performance problem may not be solved by finding an application more server capacity, especially if it's really an I/O bottleneck.
- ◆ Even an hour of bad performance can be disastrous to business-critical applications.

# Myth 2: Virtualization Won't Impact Performance

- Confirmed: Virtualization Management is Required
  - ◆ Window into the virtualized server environment
  - ◆ Tool to allow you to do VM management, server management and storage provisioning task to the VMs
  - ◆ Day to day tasks to control and maintain the environment
  - ◆ Required to take advantage of underlying hypervisor value



# Myth 2: Virtualized Silos Can Be Managed in Isolation

## ➤ Challenge: Abstraction Layers

- ◆ Large number of managed objects and inter-relationships
- ◆ Dynamic allocation and movement within each layer, creates unintended cross-contention between and within complex applications
- ◆ Performance bottlenecks can be hidden under abstraction layers
  - › applications to server to storage to SANs to arrays to disks

**BUSTED**

# Myth 3: Virtual IT Can Be Managed Separately from Physical

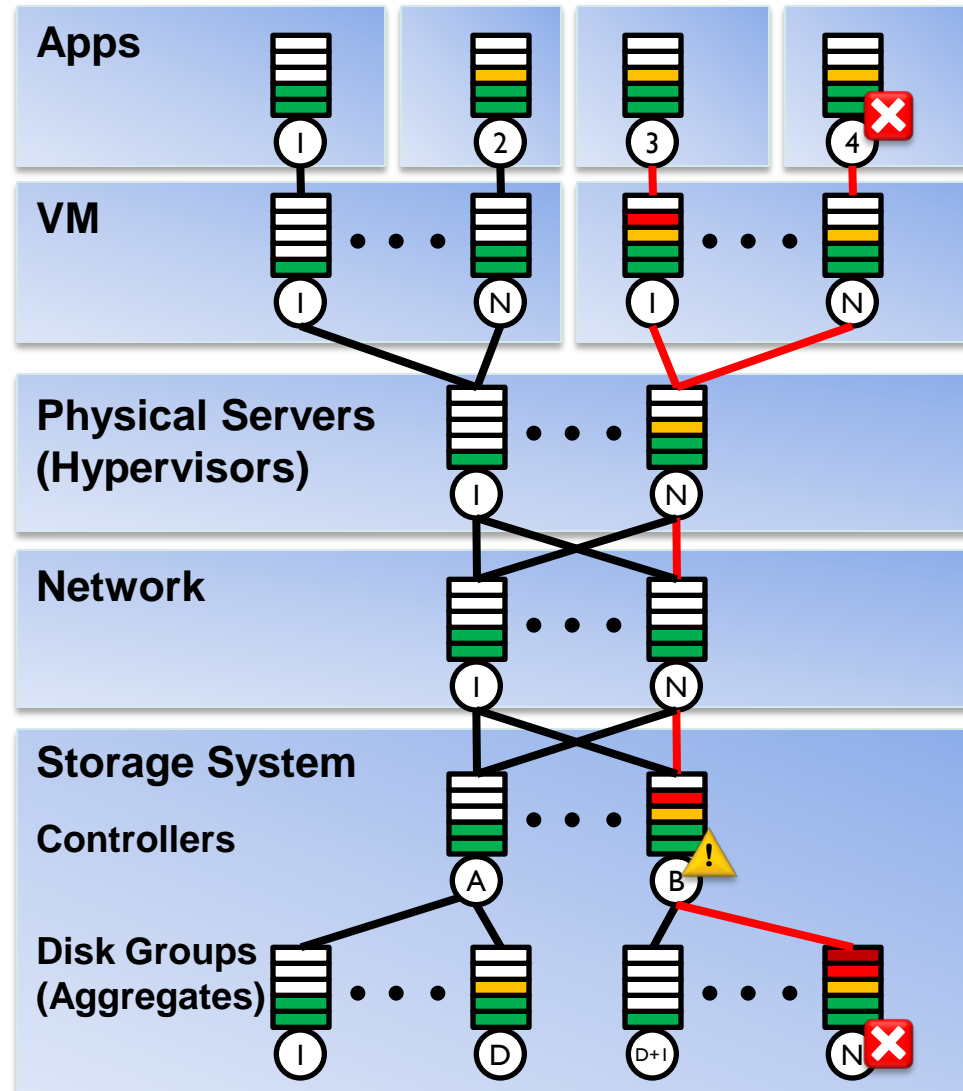
## ➤ Capacity Planning is More Important Than Ever

- ◆ Server resources need to be sized properly for performance
- ◆ Storage resources need to be sized both disk space requirements and performance
- ◆ Tough to predict storage needs – especially when using thin provisioning



# Myth 2: Virtualized Silos Can Be Managed in Isolation

- Example: Storage Bottleneck
- Symptom:
  - ◆ App 4 suffer from high IO latency and crash
- Problem:
  - ◆ Aggregate N (mark in red X) reach its maximum performance capacity
- Solution:
  - ◆ Discover the topology between app 4 and its aggregate (mark in red lines)
  - ◆ Analyze the queue depth in each layer (Apps, VM ... Storage systems)
  - ◆ The saturated queue is the probable cause for latency
  - ◆ Predict this situation and proactively alert administrator





# Myth 3: Virtual IT Can Be Managed Separately from Physical



## ➤ Challenge: Contention will happen

- ◆ Sharing storage resources between physically- and virtually-hosted apps; no insight into both
- ◆ Existing enterprise storage continues to be used in a bid to avoid disrupting a working application, affecting I/O performance, or spending inordinate effort in storage redesign
- ◆ Physical application volumes are moved into virtual server volumes, which are then mounted from the same enterprise storage to take advantage of performance and storage virtualization benefits
- ◆ Dynamic scheduling cannot be leveraged when retaining "direct" storage mapping.

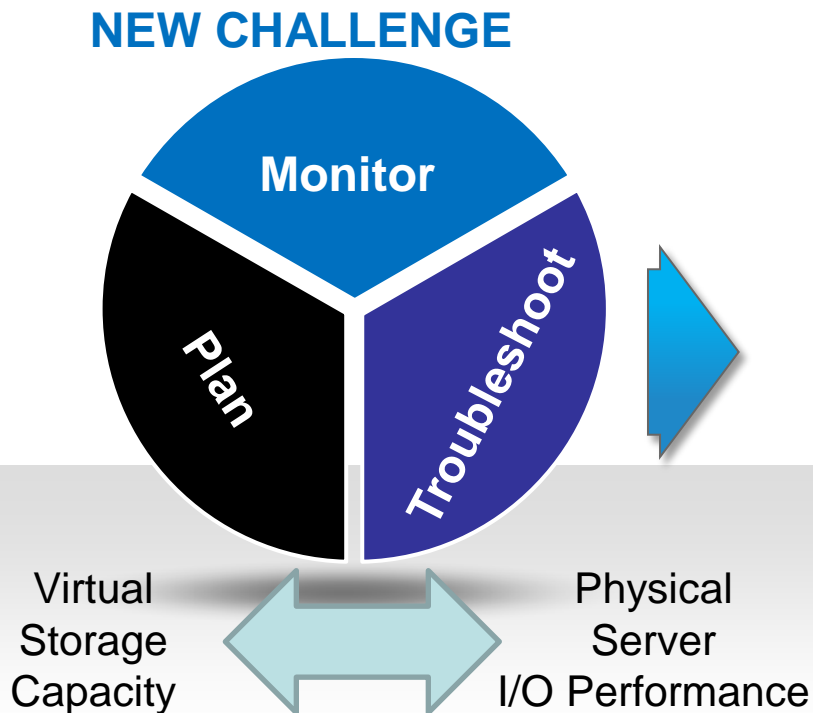
# Myth 3: Virtual IT Can Be Managed Separately from Physical

➤ Example: Contention between a physical and virtual client for storage can be invisible to siloed tools

**BUSTED**

- ◆ Storage management tool might show that aggregate client performance is OK
- ◆ Virtualization management tool might show that virtual host server performance is OK
- ◆ System management tool might show the physical host server is OK
- ◆ APM tool might show the applications are OK and can't or don't model actual virtual application performance

# Management Recommendations



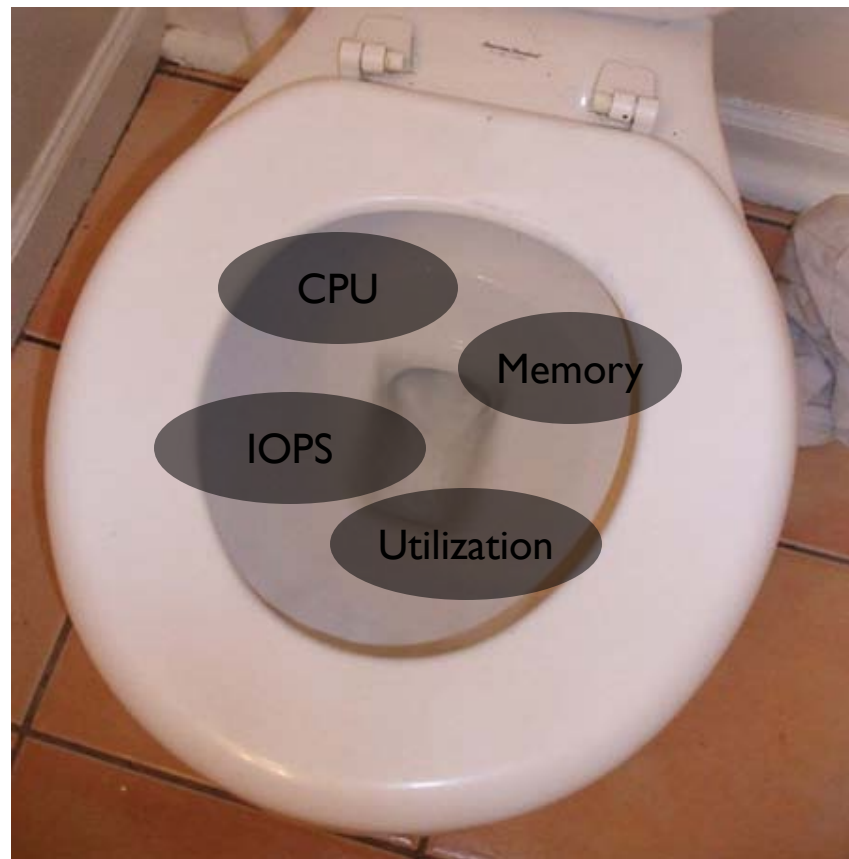
## NEW REQUIREMENTS

1. Cross-domain visibility
2. Fast troubleshooting across dynamic and virtualized domains
3. Balancing performance and volumetric capacity planning
4. Simplified use and deployment

# Metric Toilet

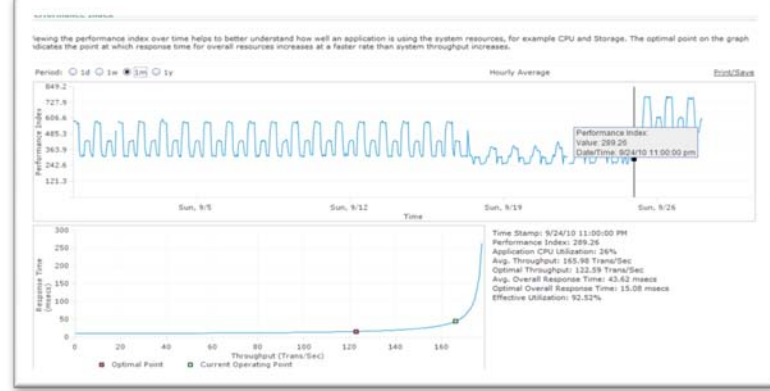
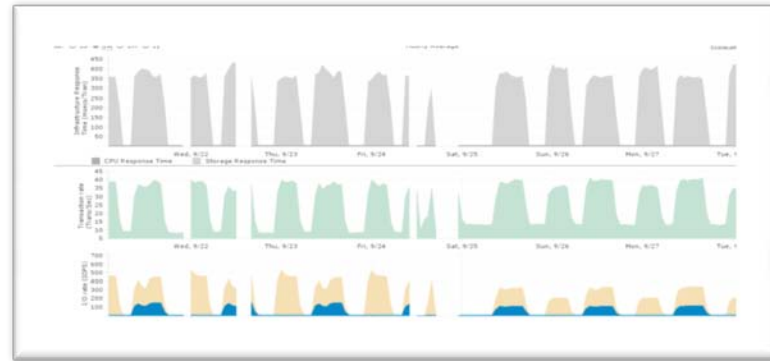
What do these mean to me?

How do I know what to do?



# New Metrics are Required

- **Infrastructure Response Time**
  - ◆ The true analytic which calculates how “well” application workload is being serviced by the infrastructure
  - ◆ Only way to tell if a Server and Storage are bottlenecking workloads
  
- **Performance Index**
  - ◆ One number that states the Health of Workload
  - ◆ Only way to look at CPU, Memory, and IO with one number – good or bad workload handling
  
- **Disk Group Utilization**
  - ◆ Predictive analytic determining if disk can handle multiple workloads
  - ◆ Only number to represent if storage throughput can be handled or not



- VMware vCenter Operations
- SolarWinds Tek-Tools, Hyper9
- Quest vFoglight Storage
- NetApp OnCommand Insight

Thank you



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- Please use this icon to refer to other SNIA Tutorials where appropriate.



**Check out SNIA Tutorial:**

**Industry Perspective:  
RFP 2.0: How to Prepare  
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Larry Freeman, Senior  
Technologist, NetApp





**Check out the Hands-On Lab:  
Storage Virtualization  
Storage Implications for Server**

- Please send any questions or comments on this presentation to SNIA: [trackvirtualization@snia.org](mailto:trackvirtualization@snia.org)

**Many thanks to the following individuals  
for their contributions to this tutorial.**

**- SNIA Education Committee**

**Rich Corley  
Lisa Crewe  
Chris Lionetti**