

Leveraging ITIL to Manage Your Virtual Environment

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Agenda

- Introduction
- VMware: Great promises, but some significant challenges
- Impact of virtualization on specific ITIL operational processes
 - Fault and Performance Management: Monitoring the health and performance of a virtual environment
 - Configuration Management: discovering and tracking virtual Configuration Items
 - Capacity Management: managing the growth of your virtual infrastructure
- Conclusion

Introduction

- IT Organizations small and large have steadily been adopting x86 server virtualization over the past 5 years
- VMware is approaching mainstream as a production-ready technology, and moving beyond being only a test and development platform
- However, as virtual machines are moving to production, their management is becoming critical to the success of IT operations

“The tools and management capabilities related to x86 server virtualization are still relatively immature”

Gartner, Server Virtualization Produces a Shift in Server Shipments

3 April 2006

Jeffrey Hewitt, Thomas J. Bittman, John Enck, Jonathon Hardcastle, Adrian O'Connell, Errol Rasit, George J. Weiss

VMware: Great promises, but some significant challenges

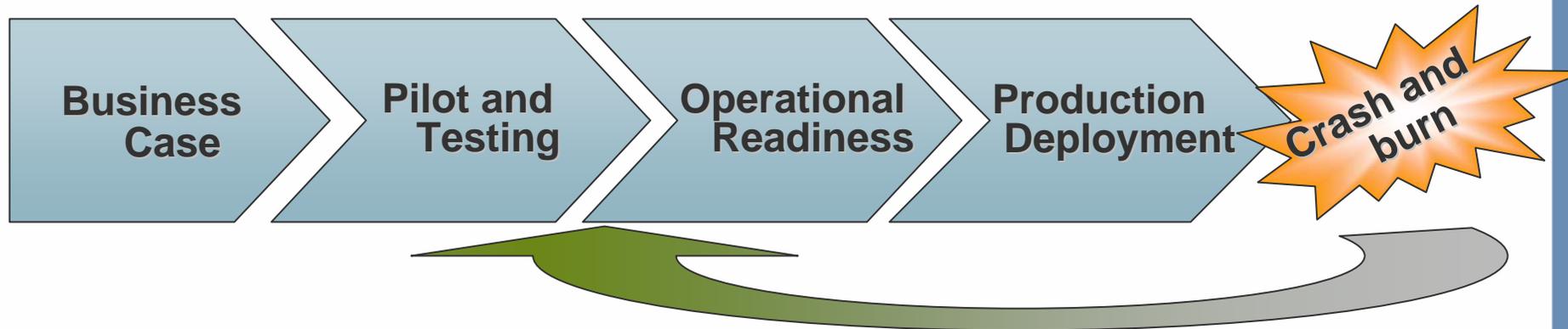
VMware – a paradigm shift with great promises

- Lower Hardware costs
- Better utilization of infrastructure
- Agility to roll out new services
- Zero down-time for hardware maintenance
- Smaller overall footprint
- Easier and cheaper management



Did you achieve this promise ?

Stages of a Virtual Deployment



Risks:

- Rolling out VMware without planning for operational impact
- Perception that VMs will be managed like physical servers
- No strategy to integrate VMware tools into Enterprise System Management architecture
- Tool-focused approach that neglects operational processes



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Twentieth Century Fox and its
related companies

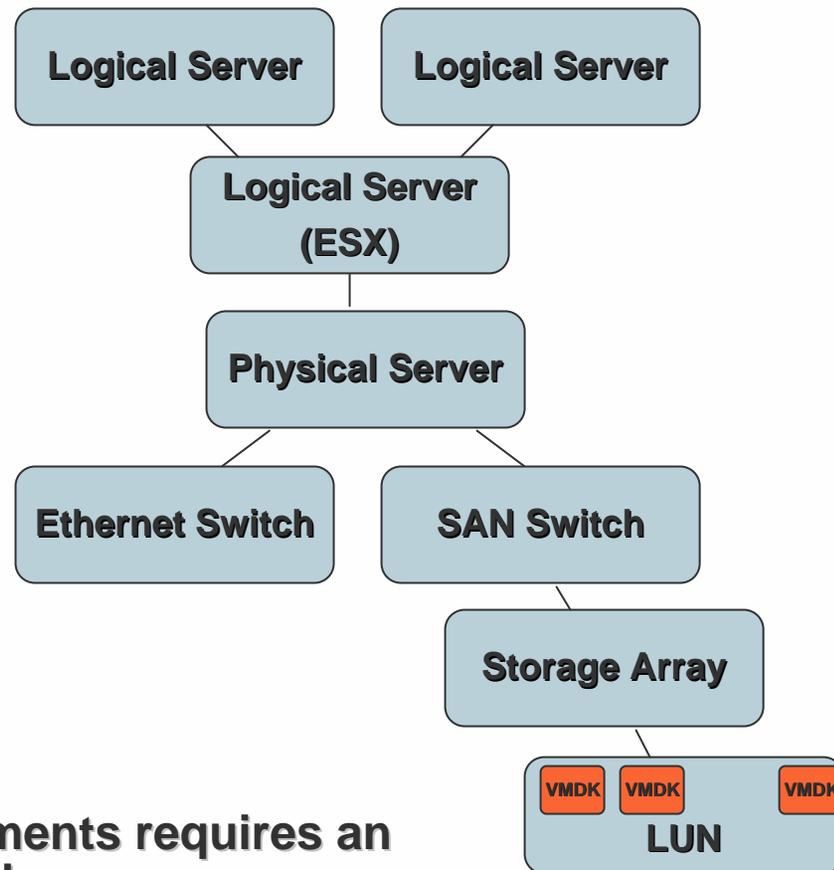
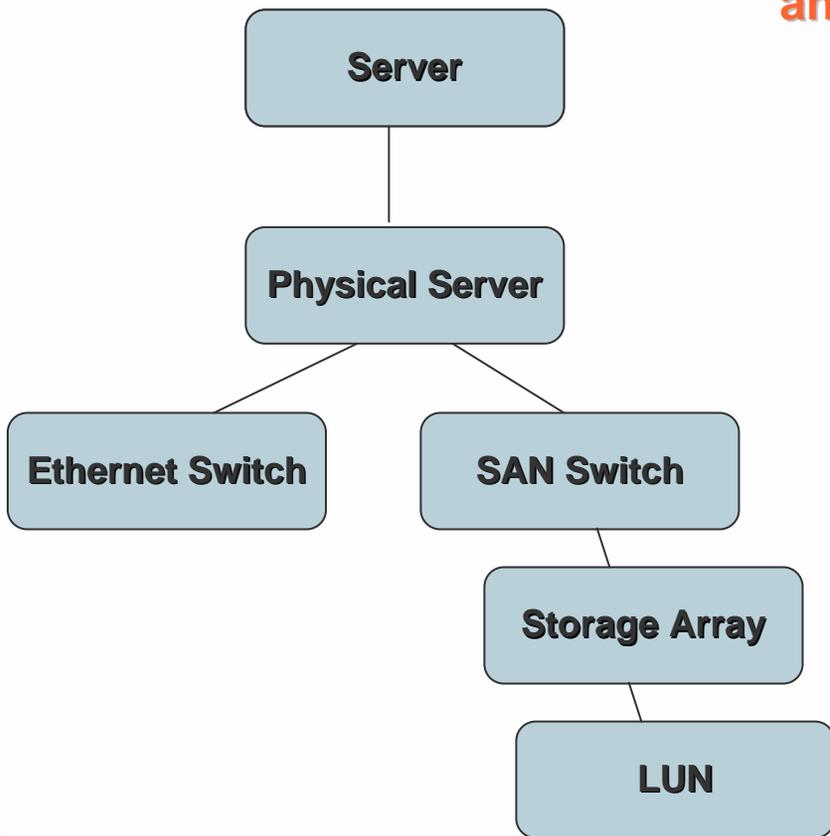
Do you have issues...?

- Controlling the sprawl of VMs
- Assessing the impact of a change on VMs and applications
- Tracking where VMs have run in the past, and where they run now
- Measuring how much resources VMs use
- Reporting on SAN storage used by each VM
- Viewing your infrastructure end-to-end
- Understanding the impact of a hardware fault on VMs, applications and end-users

VMware : a paradigm shift

It used to be one server in one box using one LUN...

...now we have multiple servers in the same box and on the same LUN
and they move around!



Management of large virtual environments requires an integrated approach

VMware poses specific operational requirements

Facilities

- Integration of VirtualCenter console into other consoles and portals
- Planning for KVM phase-out or consolidation
- Review of sizing of HVAC and Power



Processes

- Re-engineering of processes where significant impact exists, e.g. Change Management
- Re-writing procedures, for example server reboots
- Investigation of new key performance indicators and reviewing the old

People

- Documentation for required skillsets to manage a VMware environment
- Hiring VMware specialists
- Developing training plan for VMware, VirtualCenter, P2V...
- Organizing your teams
- Training on updated processes

Technology

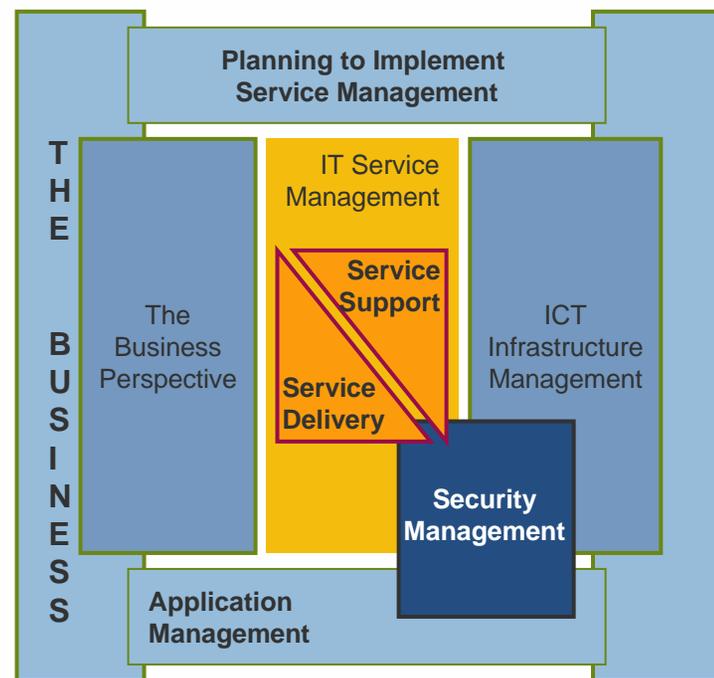
- Integrating VirtualCenter into enterprise management tools
- Developing a strategy for the management of the new VMware Infrastructure "layer"
- Developing a plan to remediate the implications of VMotion ("servers can move")

Impact of virtualization on ITIL operational processes

What is ITIL ?

ITIL is the **IT Infrastructure Library**, a definitive industry library focused on “Best Practices” for the management of Information Technology

- De-facto industry standard for IT Service Management
- Developed by the CCTA of the UK Government
- Standardized Approach & Terminology
- Publicly Available
- Industry Supported Software and Tools



ITIL® is a registered trademark of the OGC (Office of Government Commerce)

The goals of ITIL

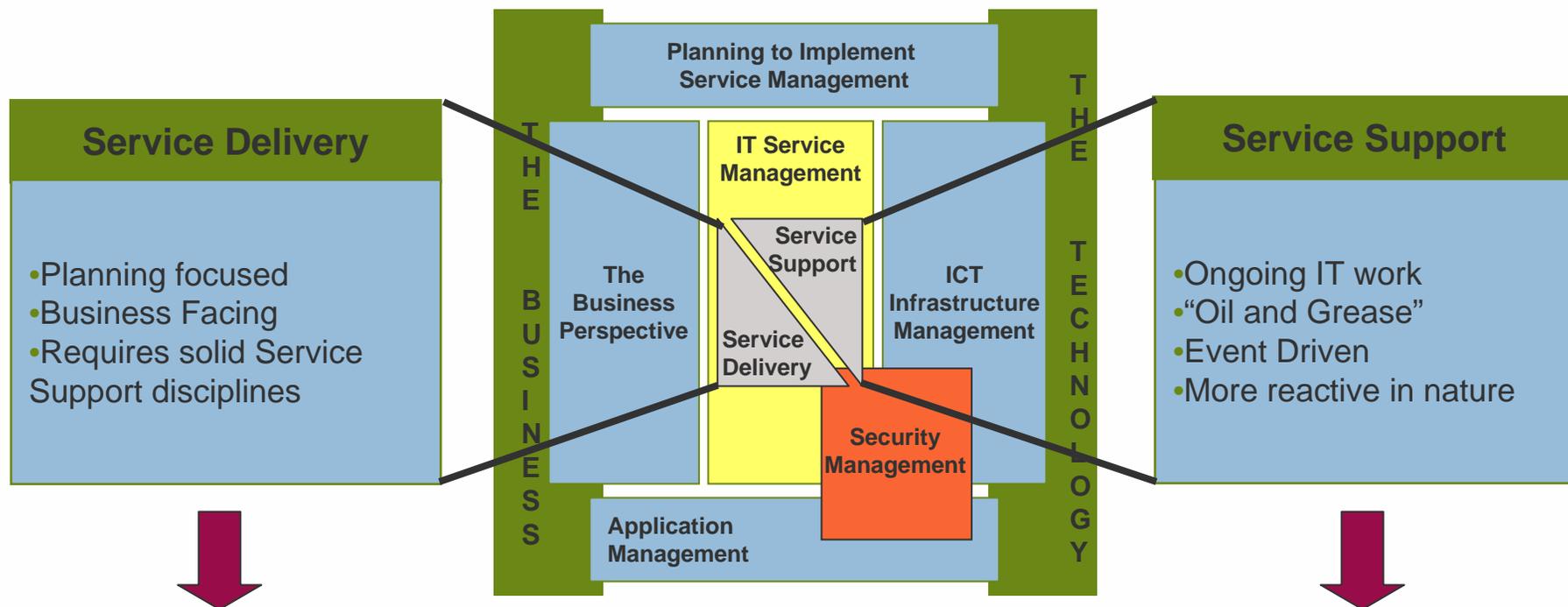
ITIL is aimed at maximizing the ability of IT to provide services that are cost-effective and meet the expectations and needs of the business

- Streamline service delivery and support processes
- Develop and document repeatable procedures
- Reduce number of service incidents and outages
- Implement standards to do things right the first time
- Perform proactive analysis, prevention and resolution
- Plan for, and ensure, future capacity
- Define clear services and service targets
- Accurately allocate and recover costs
- Audit, manage and improve IT processes



ITIL and Service Management

IT Service Management is the best known and most mature aspect of ITIL.

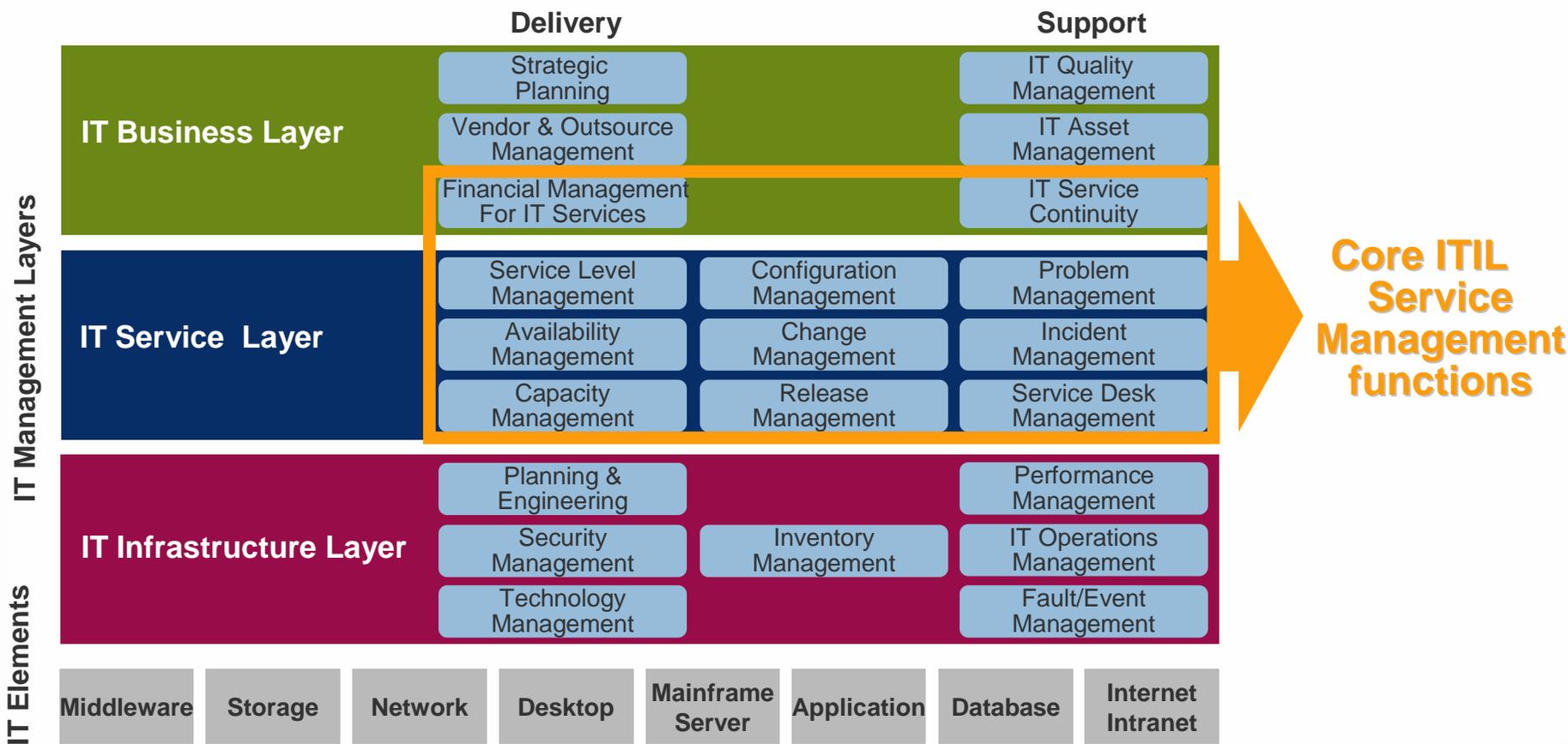


More challenging for traditional IT organizations, provides the planning for business alignment

Good starting point for implementation, immediate relief

ITIL Within BearingPoint's Model

The ITIL Service Management processes provide a great foundation for an IT operations process model, and may be complemented with other relevant functions and models



Impact of virtualization on ITIL functions

Almost all ITIL and Service Management functions are impacted by the move to a virtual infrastructure.

In the interest of time, we will now focus on:

- Fault and Performance Management
- Configuration Management
- Capacity Management

... but there is a lot more to be said! Stay tuned

Fault and Performance Management

**Monitoring the health and performance
of a virtual environment**

Fault and Performance Management Overview

Fault Management: Detect and handle conditions within the IT infrastructure that could lead to service degradations.

Performance Management: Ensure that the maximum value of IT infrastructure resources is obtained through pro-active threshold monitoring, trend data collection, performance tuning and meaningful reporting.

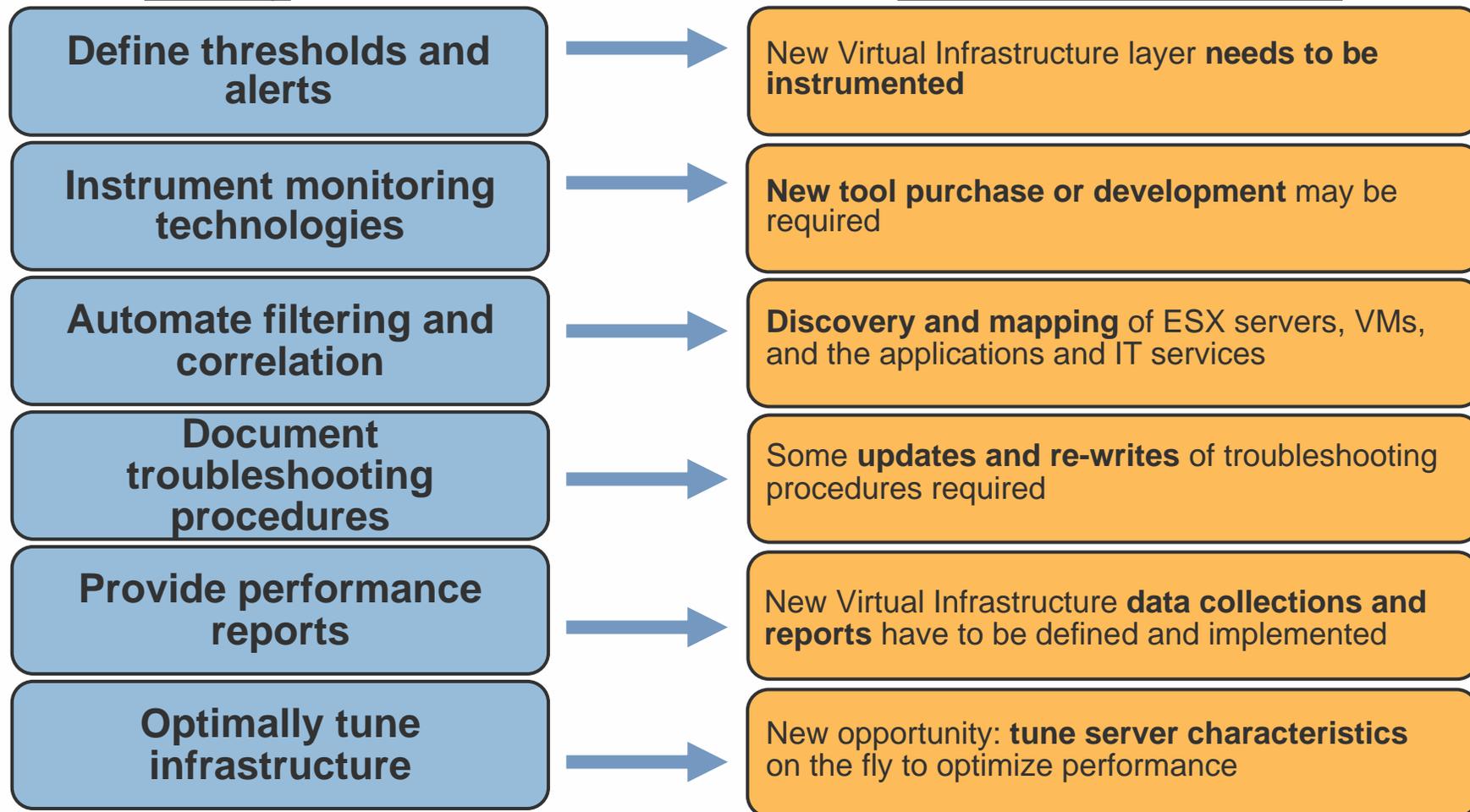
Key Objectives:

- Proactively detect conditions that can lead to service disruption
- Determine root cause and business impact of failures
- Quickly and consistently handle IT infrastructure events/faults
- Support proactive performance adjustments and planning
- Ensure resources and services perform according to SLAs

Impact of virtualization on Fault and Performance Management

Activity

Impact of Virtualization



Addressing the challenges

- Determine relevant and actionable metrics and alerts
- Instrument the ESX virtual layer
- Discover and map the topology
- Update procedures
- Define reporting requirements

Sample Tools

EMC² | smarts



Tivoli. software
MICROMUSE
NETCOOL SOLUTIONS

Microsoft
Operations
Manager 2005

bmcsoftware



Computer Associates

Illustration - Sample reference architecture

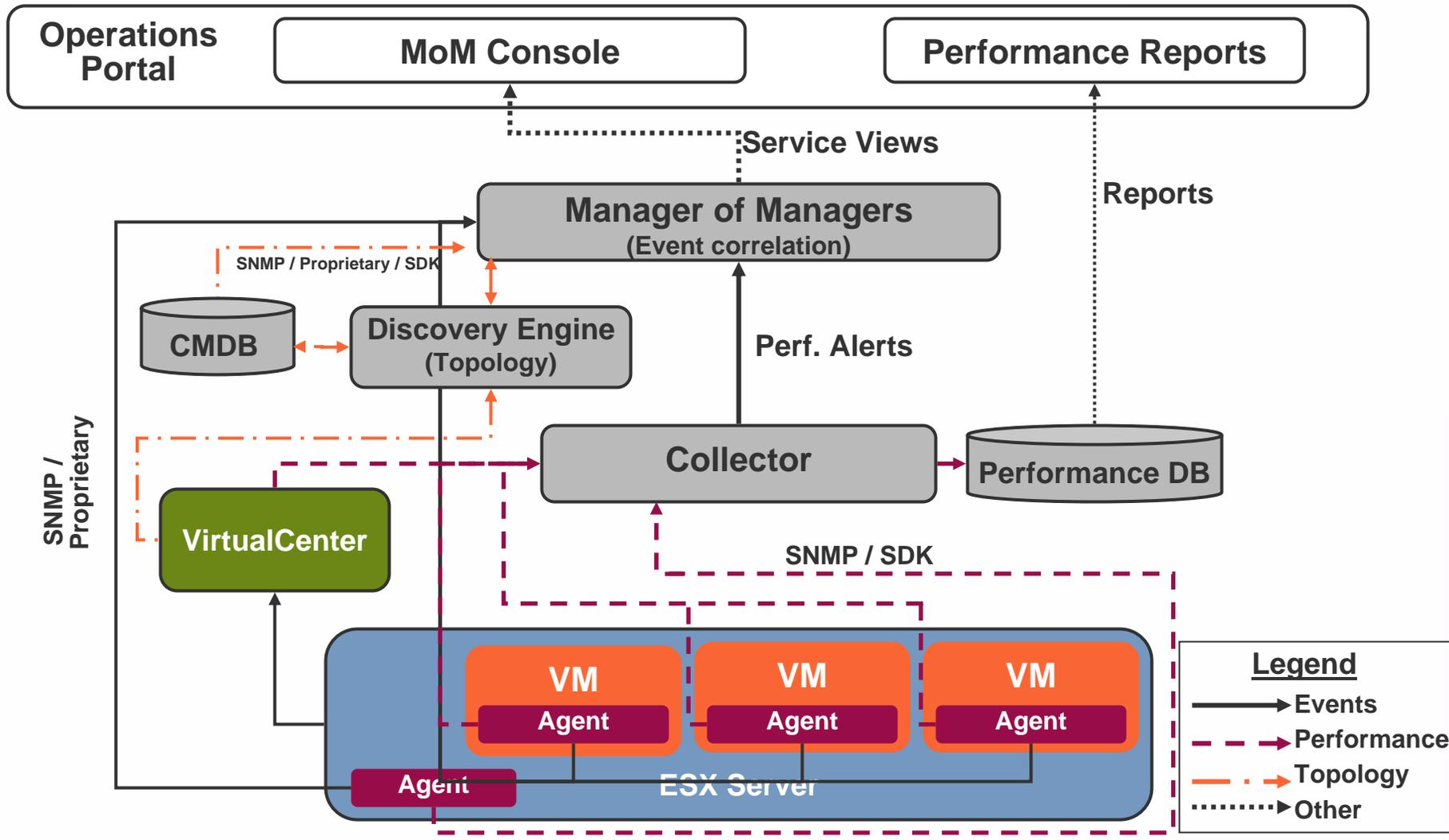
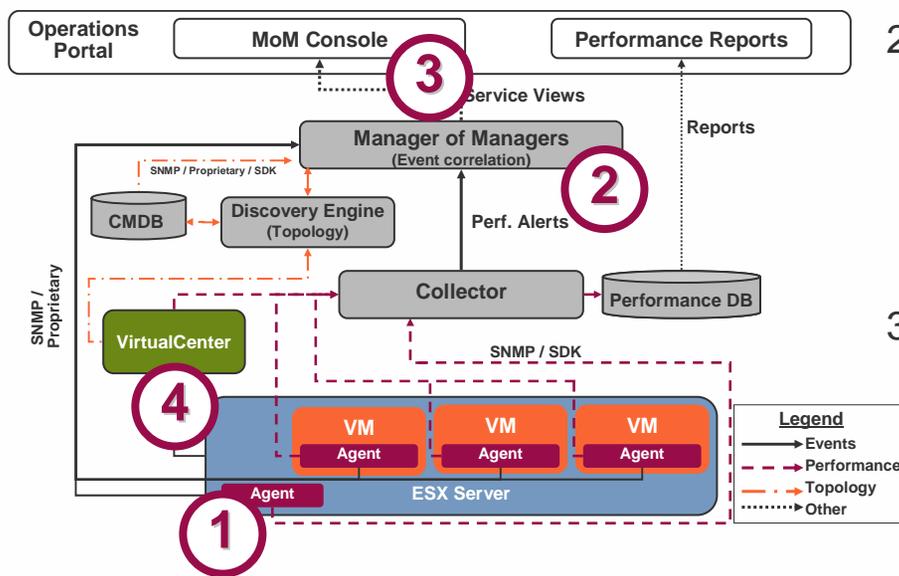


Illustration - Sample Use Case



1. A monitoring agent reports a physical NIC failure on an ESX server. The alert is sent to the Correlation layer of the MoM.
2. The correlation engine analyzes the flow of alerts from various sources (e.g. Hardware agent, VirtualCenter) against the topology data, and determines the NIC failure is the root cause. The root cause alert is forwarded to the Manager of Managers (MoM)
3. The MoM displays the root cause alert in the console, as well as the potential business impact: a finance application running on the ESX server may risk losing network connectivity, if the second bonded NIC also fails
4. An operator reviews the alert. After reviewing the potential business impact to the finance application, he follows the procedure to move it to a "safe" ESX server using VirtualCenter

Configuration Management

Discovering and tracking virtual configuration items

Configuration Management Overview

Configuration Management: Identify, control and audit the information required to manage IT services by defining and maintaining a database of configuration items, their status, lifecycle and relationships, and any information needed to manage the quality of IT services cost-effectively.

Key Objectives:

- Capture Configuration Items (CIs), i.e. components that make up the IT infrastructure required to deliver IT services
- Act as an authoritative source for relationships of IT components to IT components, and IT services / Business Functions
- Support other functions and processes by making configuration information available to them (e.g. problem management, change management, asset management..)
- Support IT inventory audit and reconciliation efforts
- Support root cause analysis and business impact to improve problem solving

Impact of virtualization on Configuration Management

Activity

Impact of Virtualization

Provide information on relationships



Need to distinguish between **physical and logical servers** in the CMDB
Some **CI attributes** become more dynamic in a virtual world

Keep the CMDB up to date



Manual updates difficult due to the **dynamic nature** of ESX-to-VM relationships

Support root cause analysis



Need to link **applications and business functions to IT components** (ESX, VMs)
Root cause analysis needs to know what VM runs where, and when

Support the Change Management process



Provide information on physical servers, VMs and applications for **change impact assessment**

Support IT Financial and Asset Management

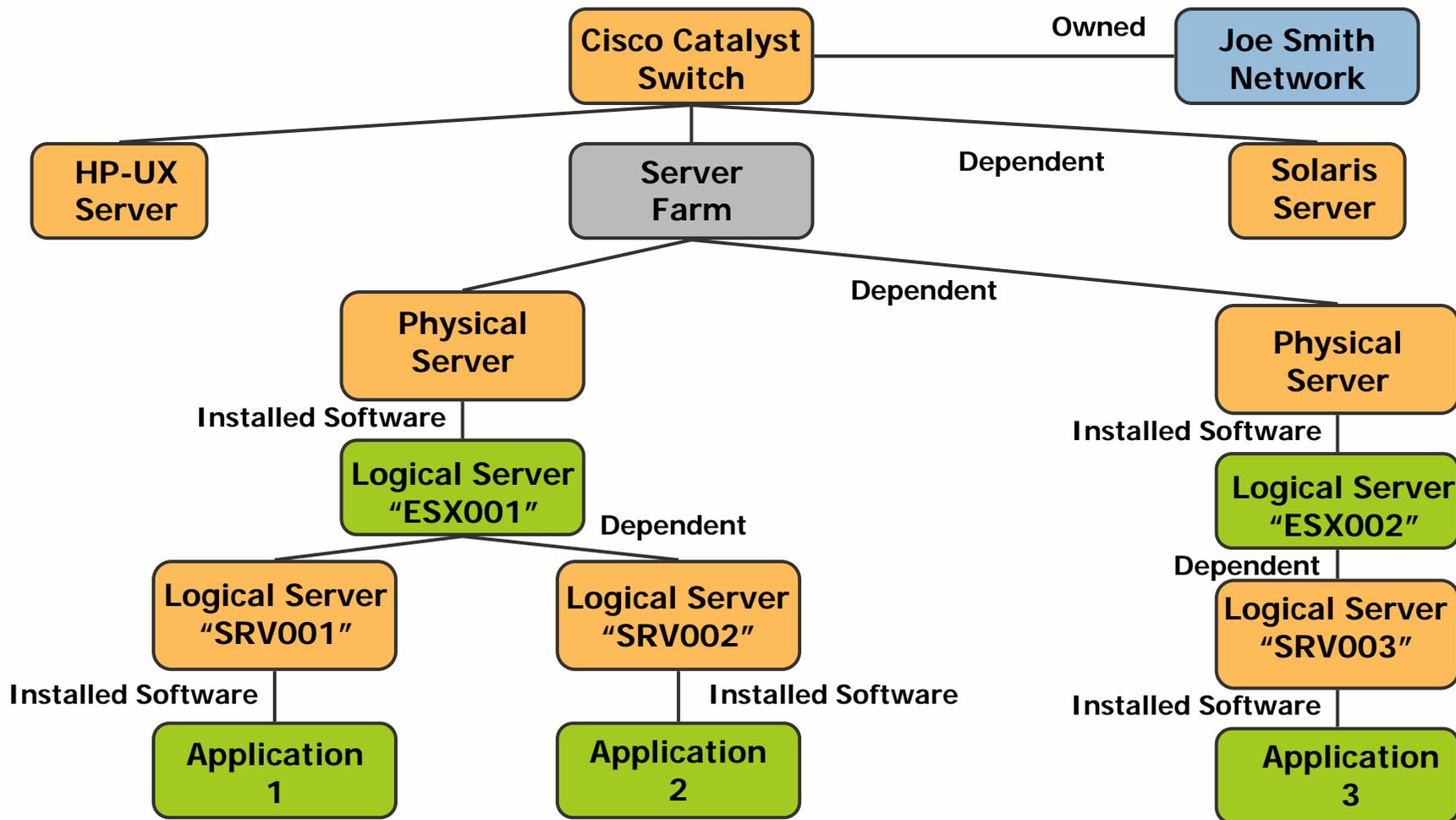


Tracking of application resource usage for **total cost of ownership**

Addressing the challenges

- **Add required CI types and sub-types for VMware**
 - ESX servers, ESX farms, Virtual Machines
 - Define level of granularity
- **(Re)define CI attributes and their lifecycle**
 - Adjust standard server CI attributes to virtual servers
 - Add attributes
 - Automatic updates of dynamic attributes or maintaining them outside the CMDB
- **Update the data model**
 - Identify authoritative data sources and how to link them
 - Define naming conventions that facilitate linking

Illustration - Sample Configuration Management Data Model in a Virtual World



Capacity Management

Managing the growth of your virtual infrastructure

Capacity Management Overview

Capacity Management: Ensure the optimal and cost-effective use of the IT Infrastructure to meet current and identified future business needs, by understanding how IT services will be used and matching IT resources to deliver these services at the agreed levels of service.

Key Objectives:

- Optimize the capacity of the IT infrastructure
- Right Size at the Right Cost
- Monitor and/or influence usage
- Relate IT Policies and Procedures to the business plan
- Build Capacity for new services so that existing services are not impacted

Impact of virtualization on Capacity Management

Activity

Impact of Virtualization

Optimally Size Infrastructure



Opportunity to **right-size** VM when sizing applications
Distributed Resource Scheduler (DRS) allows automated, **real-time adaptive server capacity**

Monitor Usage Trend



New metrics to measure and track usage may be required, in particular at the **ESX layer**
Correlation of VM and physical server trends

Forecasting Procedure



New challenges forecasting for a dynamic virtual environment. E.g. application sizing, license management, forecasting demand...

Demand Management



Ease of provisioning may increase demand
Variable costing allows IT to influence customer behavior

Build Capacity Plan

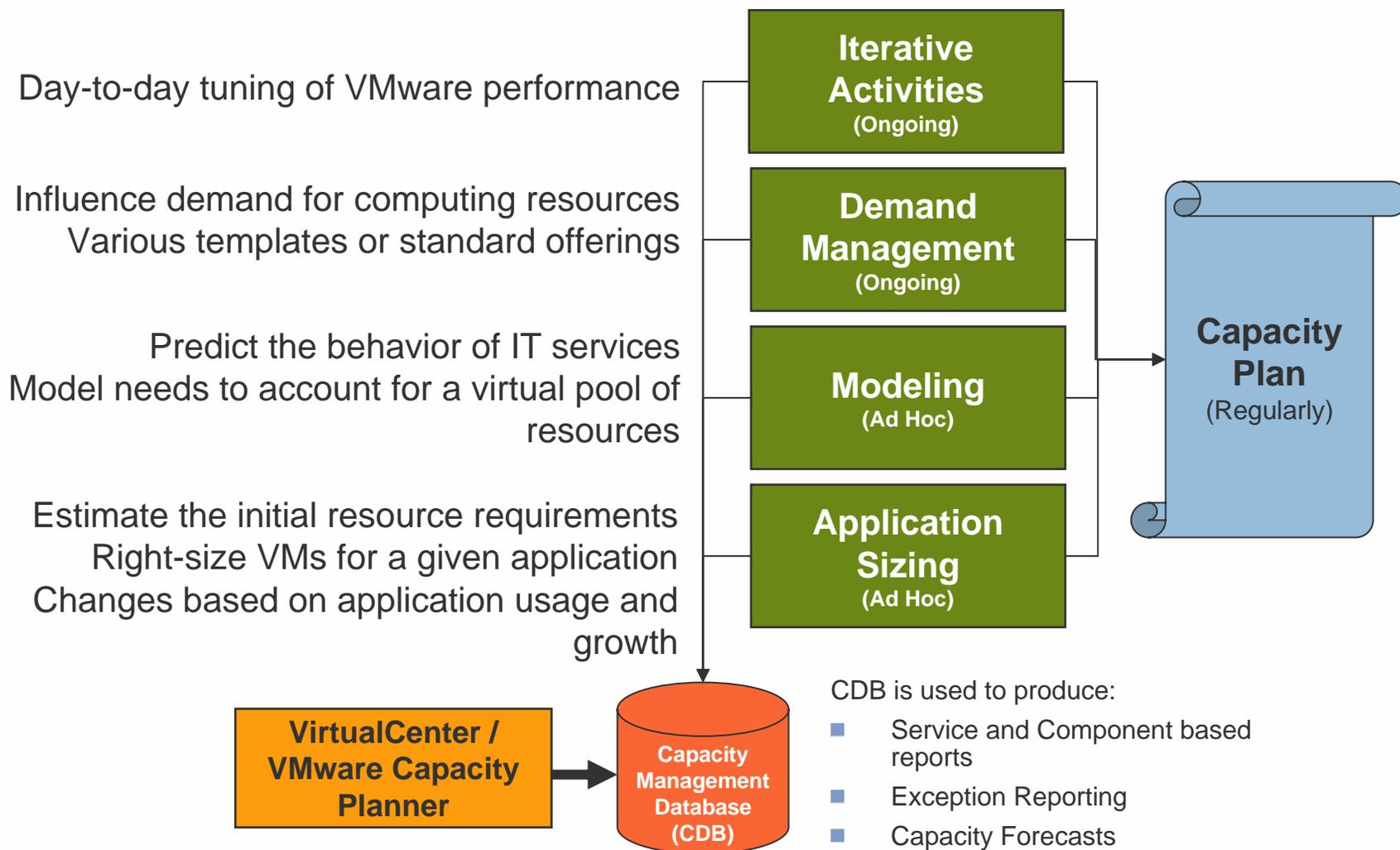


Shrinking safety margin due to the shared resources
Capacity plan may have to be updated more often

Addressing the challenges

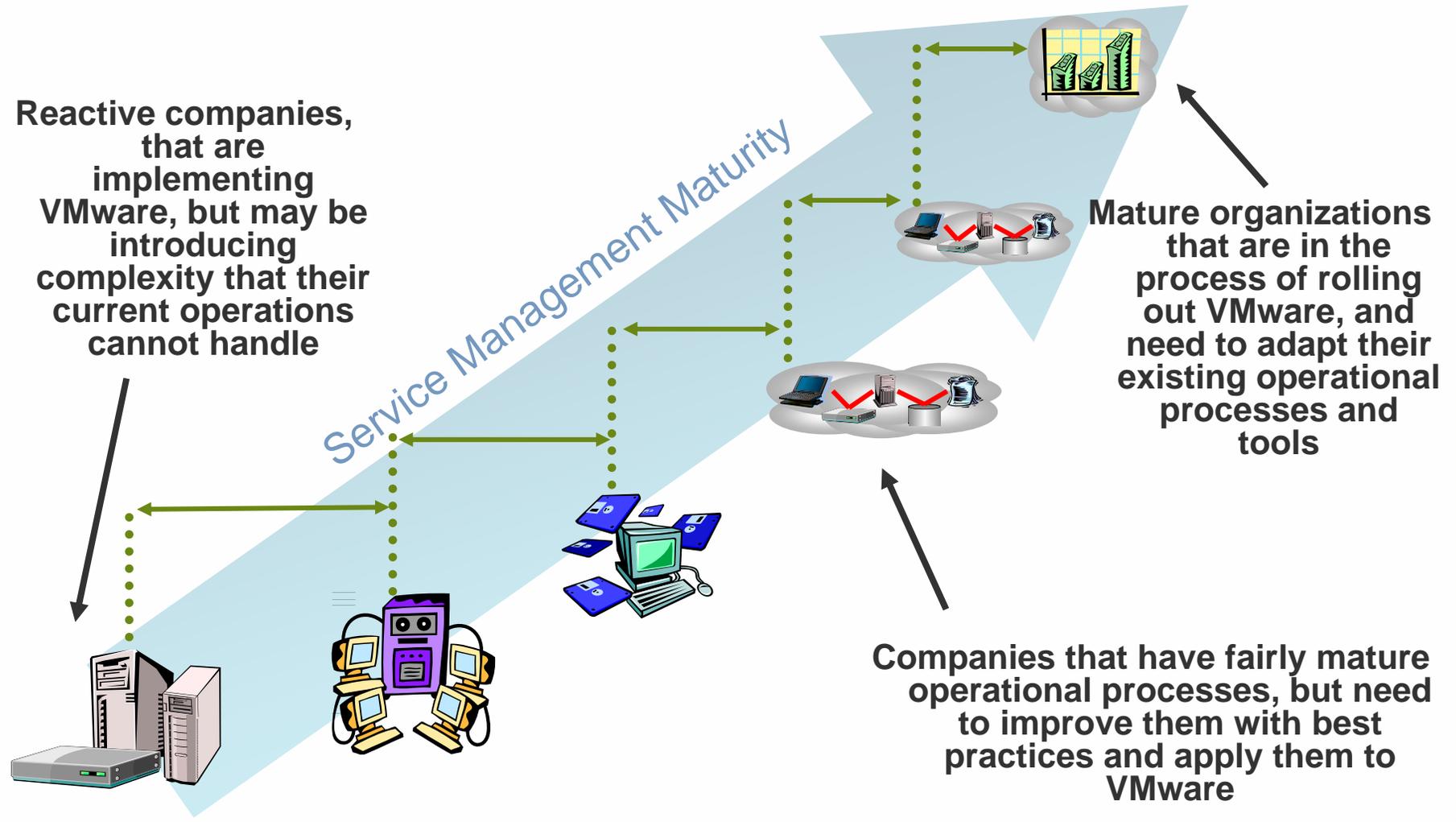
- **Define parameters for optimally-sized architecture**
- **Determine appropriate metrics for usage trending**
- **Update Capacity Forecasting procedures**
- **Define approach to influence customers' usage behavior**

Illustration – Capacity Management activities



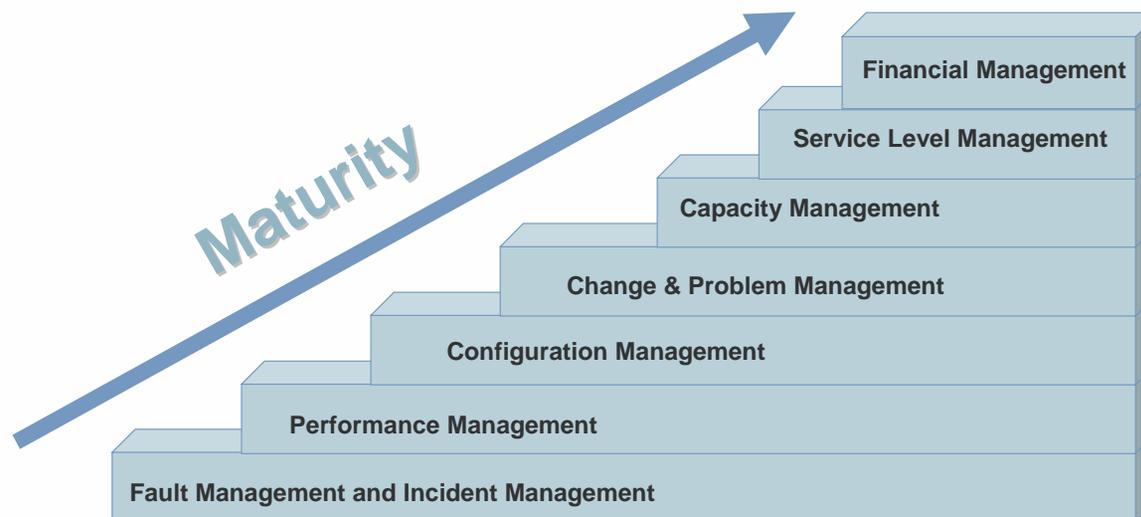
Conclusion

Who can benefit from leveraging ITIL to manage a virtual environment ?

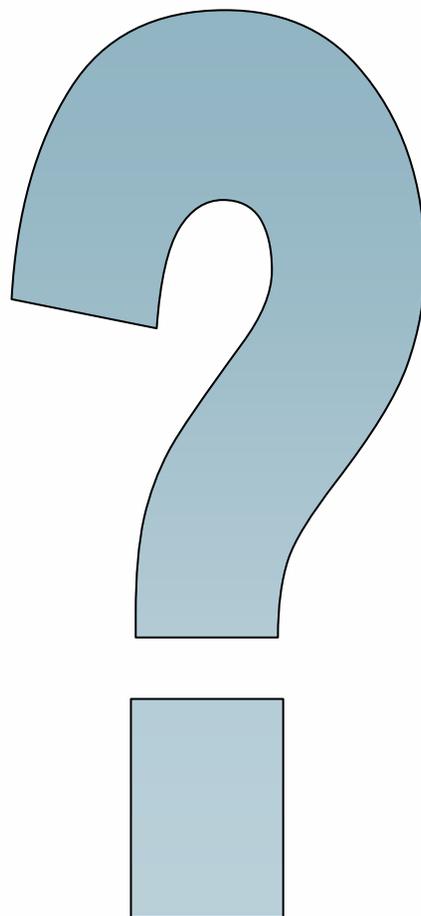


Conclusion

- Rolling out the capabilities to fully operate a VMware environment is a **challenging task**, but it is a necessary step to achieving end-to-end Service Management
- VirtualCenter, and the range of VMware tools, support the **technology foundation** for a successful integration into existing IT operations tools
- ITIL provides IT Service Management **best practices** that can be leveraged to manage a VMware infrastructure
- Consider a **phased approach** by prioritizing ITIL functions to address:



Questions





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