INTEGRITY

RESPONSIVENESS

EXPERTISE

PROFESSIONALISM

HPC Systems - Not a good fit for most IT departments?

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Management and Analytics Solutions for Clusters

Abstract

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Everyone one can agree, there are major differences between running a 5,000 head cattle ranch with only 2 customers versus tending a herd of 500 Alpaca sheep whose wool is destined for thousands of boutique customers. Each business has its own sets of challenges to be addressed.

IT staffs deal with thousands of users typically, and only need to deploy a few dozen servers to manage them. HPC staffs typically deal with thousands of servers and usually only a dozen to hundreds of users having high-end workstations with specialty or home-grown software. The jobs for these two staffs are vastly different. Might it take a different organization with different skills to manage these very different scenarios? In this presentation we will discuss the similarities and differences between the needs presented to HPC departments vs those presented to IT departments. Our goal is for you to leave with at least one challenge for your IT or HPC computing departments to consider that will make your company stronger, more agile, better prepared for disaster, or better at meeting the needs of its user base.

Intro

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HPC Systems - Not a good fit for most IT departments?

HPC & IT Comparison Topics

- Some Differences
- Some Similarities (yes – there are some!)
- Delivery Success Factors
- Individual Strengths
- Teamwork Challenges
- Some Suggestions

Two Domains – Differences

Servers, Users, and Applications

Enterprise IT	HPC
Many Users – Few Servers	Few Users – Many Servers
Many Disparate Devices (Phones, Mobile, Printers, Wifi… and servers)	More homogeneity (Cluster nodes, Workstations, Switches, Storage)
Canned Business Apps, COTS O/S, Variety of applications	Few specialized applications, home-grown or customized. Specialized O/S.

Two Domains – Differences

Priorities

Enterprise IT	HPC
Regulatory Compliance	Speed
Retention Policies	Accuracy
Auditable Processes	High Volume
Business Continuity	Failure Tolerated
Disaster Recovery	Experimentation the norm

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Two Domains – Differences

Infrastructure

Enterprise IT	HPC
Oversubscribed network, commodity-based, includes wireless, firewalls, complex rules.	High bisection bandwidth, low latency, high speed. Simple authentication rules.
Complex Topology LAN/WAN/Wifi	Simple Topology (typically) LAN
Virtualization, VDI, lightweight desktops/laptops	Bare-Metal, performance servers, workstations

Two Domains – Similarities

Common Needs

Enterprise IT	HPC
People (Who follow processes and procedures)	
Processes – Compliance, Broad scope, continuity is important	Processes – Agile environment, uptime is important
Auditing – complex because of application diversity	Auditing - simpler
Authentication – Two-factor, very secure	Authentication – Typically rides on corporate system, lighter weight.
Provisioning Tools – Commercially available and expensive (but low server count), many from which to choose.	Provisioning Tools – Some commercial, but mostly open-source and a hodge-podge approach is typical.

Two Domains – Similarities

More Common Needs

Enterprise IT	HPC
Monitoring – One tool to rule them all, commercially available.	Monitoring - eclectic personal favorite – mostly open source.
Users – Business and support staff with HR, Accounting, Payroll, and Office apps HIGH COUNT	Users – Tech-aware, very few technical specialty applications, LOW COUNT
Hardware Support	
Vendor Management	
Reporting	
O/S and Application Support	
Capacity Planning	
Refresh Planning	

Two Domains – Similarities?-or-Differences?

Staffing

Staffing Type	Enterprise IT	HPC
Knowledge Areas	Microsoft, WAN, Security, Commercial applications, office apps, tape systems.	Linux/Unix, Open-source self-install, scripting, hardware, layer-2 networking (LAN), tape systems.

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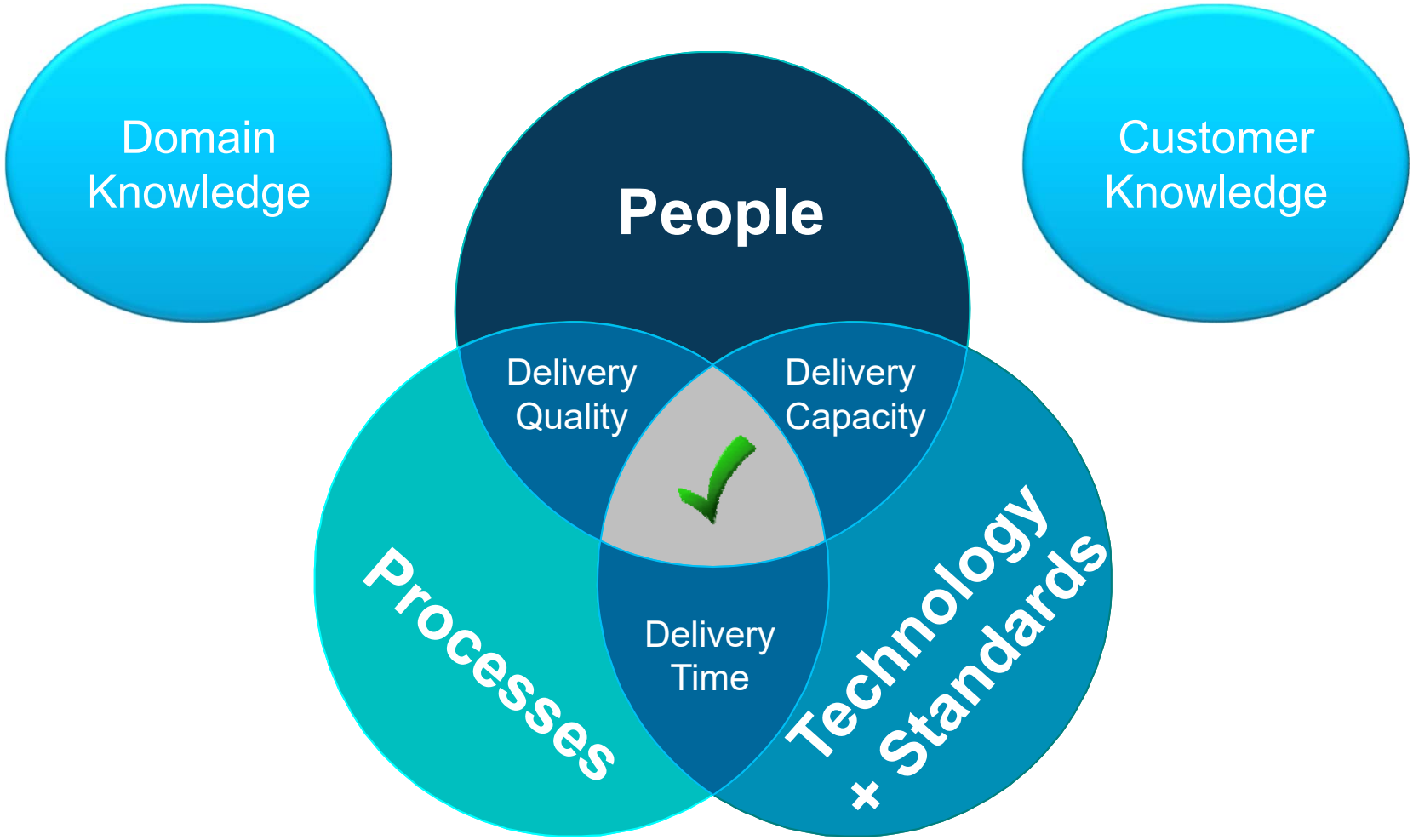
Delivery – Success Factors

- **People**
  - Smart, skilled & disciplined.
  - Positive attitude, passion for excellence, team players
- **Process**
  - Right level to ensure Quality & Speed – Agile
- **Technology & Standards**
  - Right match for Services Delivery process
- **Domain Knowledge**
  - Enterprise or HPC
- **Customer Knowledge**
  - Who they are and how they work (roles) – varies by industry & company

- TEAMWORK

Delivery – Success Factors



So close – and yet so (fill in the blank)

- **Staffing needs** are so different that you will have two VERY different departments
- **Scope differences** are so great that you will have two VERY different business drivers
- How do you leverage the best of both to be lean & mean….?

Our view of Ideal IT/HPC mix

Leverage your Enterprise IT for:

- Customer Service Focus
- Ticketing system
- Desktop Support and deployment (HPC use remote visualization)
- Email (Alerts and Notifications, call-home, etc. from HPC must be integrated into corporate system)

Our view of Ideal IT/HPC mix

Leverage your Enterprise IT for:

- Authentication (HPC may require caching, synchronization for speed)
- Shared (Enterprise) Storage
- Firewalls to the outside
- Printing Services
- File transfers in/out of company (ftp, dropbox, etc.)

Our view of Ideal IT/HPC mix

Leverage your (Technical Computing and) HPC for:

- Monitoring (Often open-source, linux related)
- Reporting (similar characteristics to monitoring)
- Application deployment and support (technical apps)
- License Management (technical apps, compilers, etc.)

Our view of Ideal IT/HPC mix

Leverage your (Technical Computing and) HPC for:

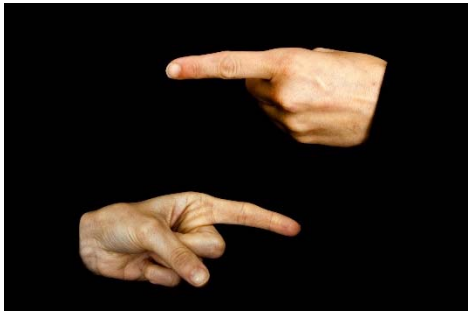
- HPC Network (typically segmented off of main network)
- HPC Storage (often it is faster, parallel, has a global name space, and may not be “enterprise” branded)
- Computers (*ux clusters, Large SMP, Vector Machines, GP/GPU, FPGA…)

Reality – Somewhat different almost all the time!

- Why does the world not typically resemble the ideal mix more often?
- Possibly because of some FACTS or MYTHS?

Are these Myths or "Real Problems"?

- **MYTHS about Enterprise**
  1. "They" don't understand "our" needs or our customers
  2. "They" are not responsive
  3. I have to explain repeatedly when calling help desk vs immediate problem resolution or escalation
  4. "They" don't have the technical skills



- **MYTHS about HPC**
  1. "They" don't have a process for anything!
  2. "They" are a bunch of primadonnas
  3. "They" are way too expensive. We can't allow that group to grow too large.

Some ideas on how to get there

- Fight myths with joint problem-solving teams
- Work with customer groups to ensure needs are met
- Use metrics to see how well the department(s) is/are doing.
- Wise leadership
- Hard work
- Wise leadership
- Hard work
- Wise leadership
- Hard work

How to Combine the best of both worlds

- Ensure each team has a capable leader who shares the "common" and embraces resource sharing
- Make sure the teams aren't in competition
- MYTH? The "Nimble" cannot have disdain for the "Careful" and the "Careful" cannot shrug off the need for the "Nimble"! (Careful does not imply slow and Nimble does not imply low quality)

Making Sure You're Covered

- Business needs come first
  - Security
  - Reliable service delivery
  - CUSTOMER SATISFACTION!
- HPC "coolness" is n
  - … but make sure HP ne (corporate) rules
  - … Use the "coolnes omers
- HPC is NOT a resear
  - It is critical to Geop Life Sciences …
  - It is business – run H ne
- Enterprise IT can be a superb ally
  - Use both departments to maximize their inherent strengths

Thanks for the opportunity to share

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