Storage Switzerland, LLC

When Good Flash Goes Bad

Fixing Flash Performance Problems in Your Data Center

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Storage Switzerland, LLC

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About Storage Switzerland

Storage Switzerland is an analyst firm focused on the storage, virtualization and cloud marketplaces. Our goal is to educate our readers on the various technologies and techniques available to help their applications scale further, perform better and be better protected.

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- Analyst firm focused on storage, cloud and virtualization

- Knowledge of these markets is gained through product testing and interaction with end users and suppliers

- The results of this research can be found in the articles, videos, webinars, product analysis and case studies on our web site:

http://storageswiss.com

Our Speaker

George Crump is the founder of Storage Switzerland, the leading storage analyst focused on the subjects of big data, solid state storage, virtualization, cloud computing and data protection. He is widely recognized for his articles, white papers, and videos on such current approaches as all-flash arrays, deduplication, SSDs, software-defined storage, backup appliances, and storage networking. He has 25 years of experience designing storage solutions for data centers across the US.

Agenda

- What Can Go Wrong With Flash?

- Addressing Flash Performance Issues

- Summary

What Can Go Wrong With Flash?

- Does Not Perform like the Vendor Promised

- Wears out too Quick

- Can't Scale beyond Initial Use Case

Addressing Flash Performance Issues

Causes of Poor Flash Performance

- Bad Application

- Bad Network

- Bad Flash Hardware

- Bad Flash Software

Fixing Application Performance

- **Number 1 Challenge:** Proving the Application *is* the Problem

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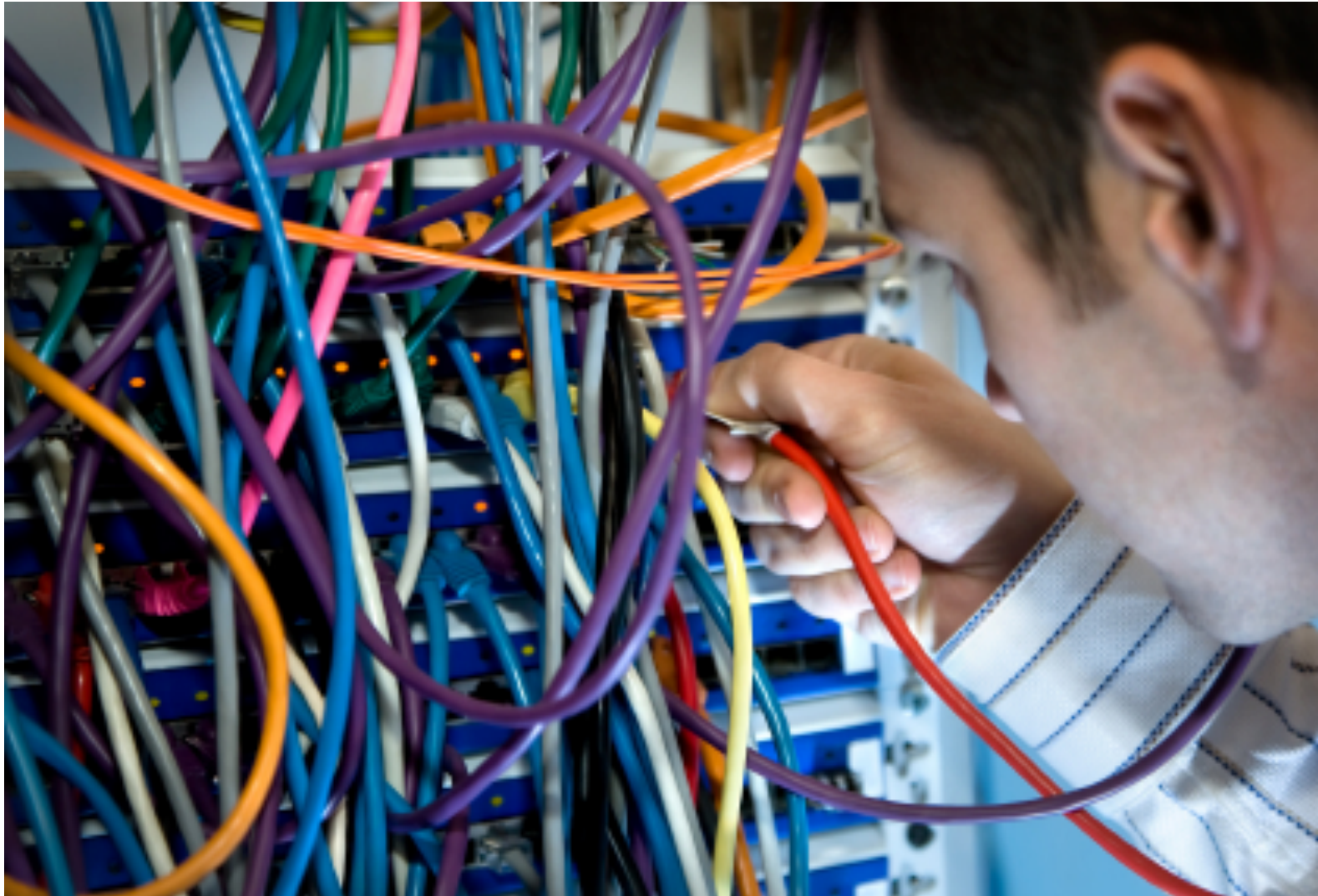
Fixing Application Performance

- **Number 1 Challenge:** Proving the Application *is* the Problem

- Remove Queries that are no longer needed

- Remove Index that are no longer needed

- Remove Batch Jobs or Reports that aren't needed
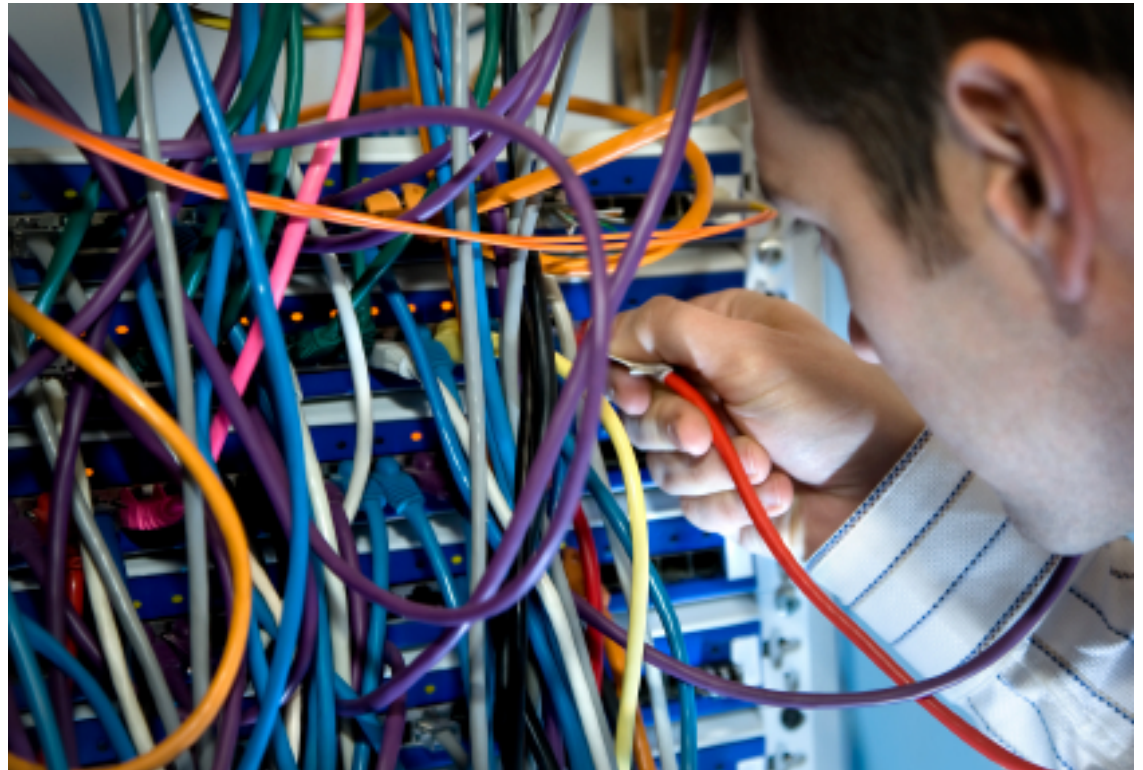
Causes of Poor Network Performance

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- Networking Problems with
  <u>Hyper-Converged</u> Solutions

Causes of Poor Network Performance

- Networking Problems with Hyper-Converged Solutions

- Networking Problems with Shared Storage Solutions

Fixing Networking Performance

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- **Upgrade Bandwidth**

    16GB FC, 10GB+ Ethernet

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- **Implement a Deterministic Network**

  Data Center Bridging

  Fibre Channel

Fixing Networking Performance

- **Upgrade Bandwidth**
  16GB FC, 10GB+ Ethernet

- **Implement a Deterministic Network**
  Data Center Bridging
  Fibre Channel

- **Leverage QoS for Prioritization**
  Storage QoS is a Requirement
  Network QoS Should be Too
  Eventually we need end-to-end QoS Integration

Fixing Networking Performance

- **Upgrade Bandwidth**
  - 16GB FC, 10GB+ Ethernet

- **Implement a Deterministic Network**
  - Data Center Bridging
  - Fibre Channel

- **Leverage QoS for Prioritization**
  - Storage QoS is a Requirement
  - Network QoS Should be Too
  - Eventually we need end-to-end QoS Integration

- **Combine Server Flash and Shared Flash**

Causes of Bad Flash Hardware

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- **In The Software Defined Data Center Hardware Matters**

  Especially for Flash Storage

Causes of Bad Flash Hardware

- **In The Software Defined Data Center Hardware Matters**

    Especially for Flash Storage

- **The Problems with 'Off The Shelf' Storage Hardware**

    Not Enough Processing Power

    Not Enough Internal I/O Paths

    Not Enough Hard Drives

Fixing Bad Flash Hardware

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- **Purpose Built Flash Hardware**

    Expensive but Fast
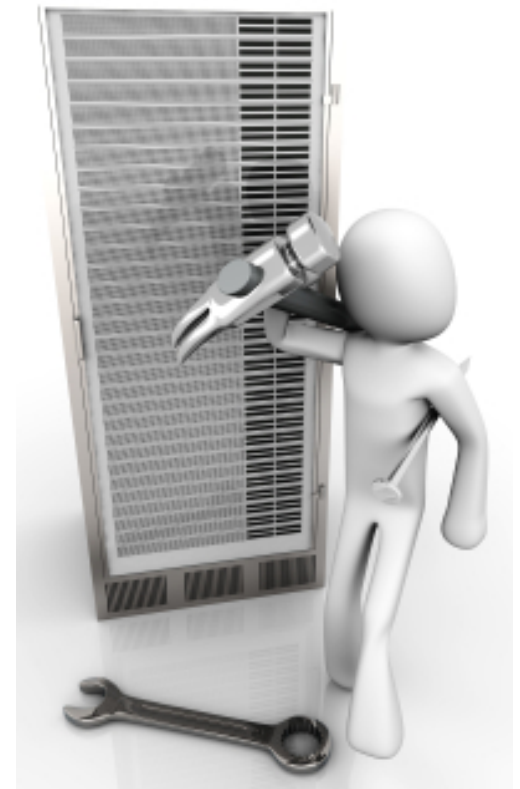
Fixing Bad Flash Hardware

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- **Scale-out Flash Hardware**

    Hard to start small

    Needs Parallel Workloads

Fixing Bad Flash Hardware

- **Purpose Built Flash Hardware**

  Expensive but Fast

- **Scale-out Flash Hardware**

  Hard to start small

  Needs Parallel Workloads

- **Thoughtfully Designed Commodity Hardware**

  Dedicated I/O Paths

  NVMe Support

Causes of Bad Flash Software

- Inability to turn on/off certain Software Features

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- Concerns about Deduplication's Ability to Scale

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- Lack of Feature Completeness leads to Additional Software Purchases

Summary

- Best Method is to "fix" the problem before it happens

- Develop a Performance Planning Process

- Most Performance Mistakes can be fixed by augmenting the Solution – But it will cost $

You Can't Teach A Kid
To Ride a Bike at a Seminar

Storage Switzerland

http://www.storageswiss.com

gcrump@storage-switzerland.com

LinkedIN: George Crump

StorageSwiss on Twitter:

@storageswiss / @georgeacrump

StorageSwiss on YouTube:

http://www.youtube.com/user/storageswiss