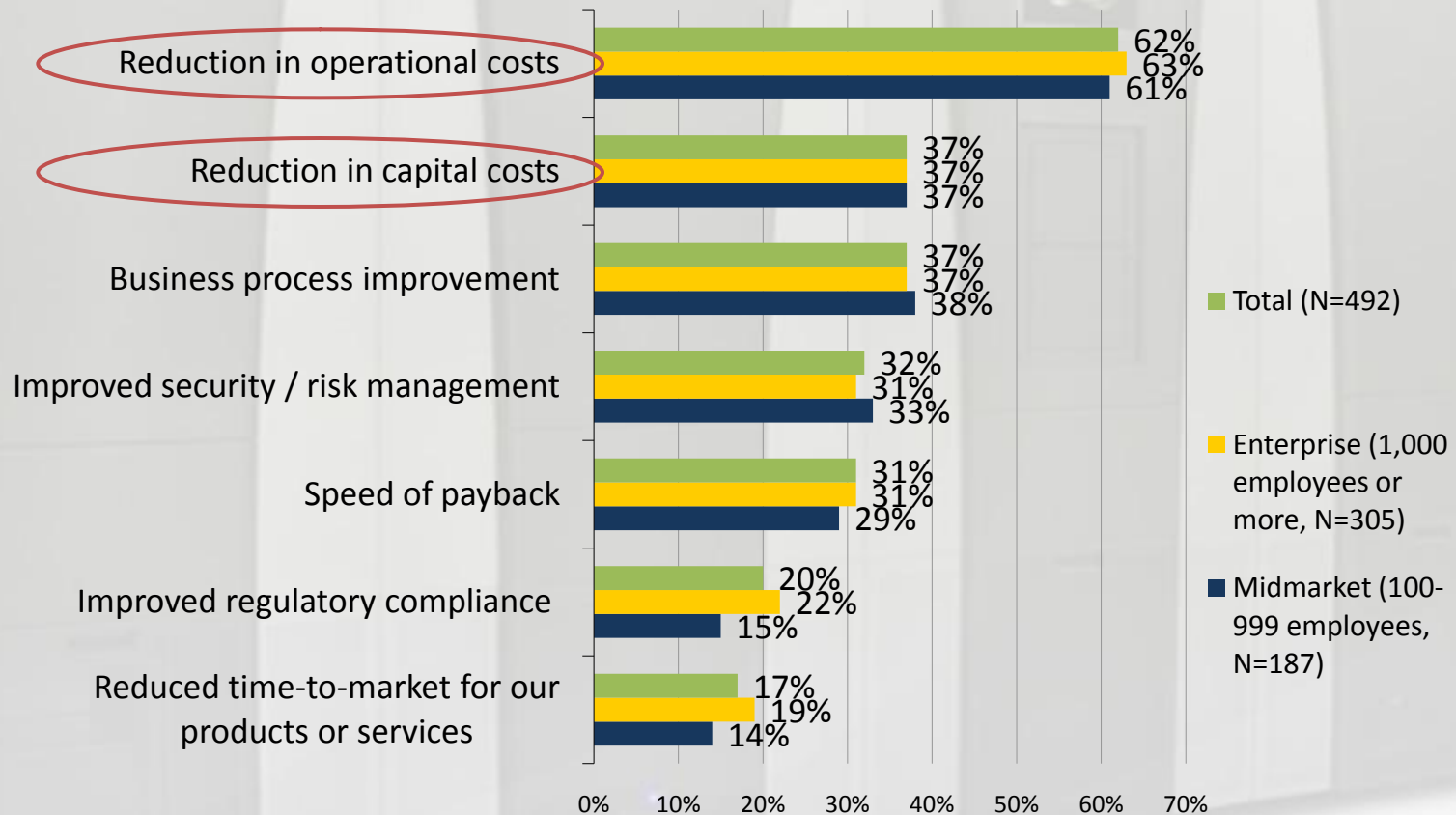# Big Data Challenges

- Scalability

  – Need systems that are big now and can easily get bigger year after year

- Performance

  – Faster, Faster, Faster

- Flexibility

  – Need options for connectivity, drives, media, etc.

- Reliability/Resiliency

  – It has to work and have features and functionality to ensure high availability and little to no downtime.

Data Protection: Investment Priorities

Which of the following considerations do you believe will be most important in justifying IT investments to your organization's business management team over the next 12-24 months? (Percent of respondents, multiple responses accepted)

Consideration	Total (N=492)	Enterprise (1,000 employees or more, N=305)	Midmarket (100-999 employees, N=187)
Reduction in operational costs	62%	63%	61%
Reduction in capital costs	37%	37%	37%
Business process improvement	37%	37%	38%
Improved security / risk management	32%	31%	33%
Speed of payback	31%	31%	29%
Improved regulatory compliance	20%	22%	15%
Reduced time-to-market for our products or services	17%	19%	14%

0%   10%   20%   30%   40%   50%   60%   70%

3

Spectra Logic: 30 Years of Success

- <u>Proven Innovator and History of Success</u>

  – Intelligent integration of complete data protection solutions

  – Founded in 1979, **self-funded, profitable**, **100% debt-free growth**

  – Continuous innovation

  – High customer satisfaction & support ratings

- <u>Achieving Strong Market Traction and Growth</u>

  – Yr/Yr growth in enterprise and mid-range tape libraries; media and support services

  – Leader in data intensive verticals: Media & Entertainment, Federal

  - • ***Quickly becoming the leader in HPC***

  – Major involvement with Active Archive Alliance

  - • www.activearchive.com

T950 Flagship

- Enterprise Leader

  – Highest density (smallest footprint) in industry

  – Lowest power consumption in industry

  – All hot swap components

  – Scales to over 10,000 slots (LTO)

  – Integrated (Industry only features)

    - Lifecycle management

    - Encryption

    - Partitioning

  – ***Most awards and accolades in the industry***

Typical Archive solution:

- Argonne National Lab

  - 20K plus slots, LTO4
  - HPSS

- Los Alamos National Labs

  - 20K plus slots, LTO4
  - HPSS

- NASA Ames

  - 20K plus slots LTO4
  - DMF

- KMA

  - 10K plus slots LTO4
  - StorNext

What we hear from industry

- Data growth in HPC is 40% - 60% per year

- Want higher reliability from hardware manufacturers but more importantly anticipation of failures

- Active Archive is not backup

- Analyst state that more than 70% of data can move to tape

What we hear from industry

- "Archive storage needs to have built in data integrity verification capabilities".

  - *We can verify the tape and data both:*

    - 1) when written to tape initially;

    - 2) and on a schedule for years into the future.

    - (Very important for infrequently accessed data)

We heard: Released T-Finity

- Highest storage density in the industry

- Lowest power consumption

- LTO and TS11XX drives/media

  - (drive agnostic)

- Wide software support

  - (software agnostic)

- Highest scalable library in the industry

  - 30,000 slots per library, 120,000 slots per complex

- Completely integrated "Lifecycle Management"

T-Finity Architecture Supports Extreme Scalability

Skyway Pass-Through connecting libraries in complex.
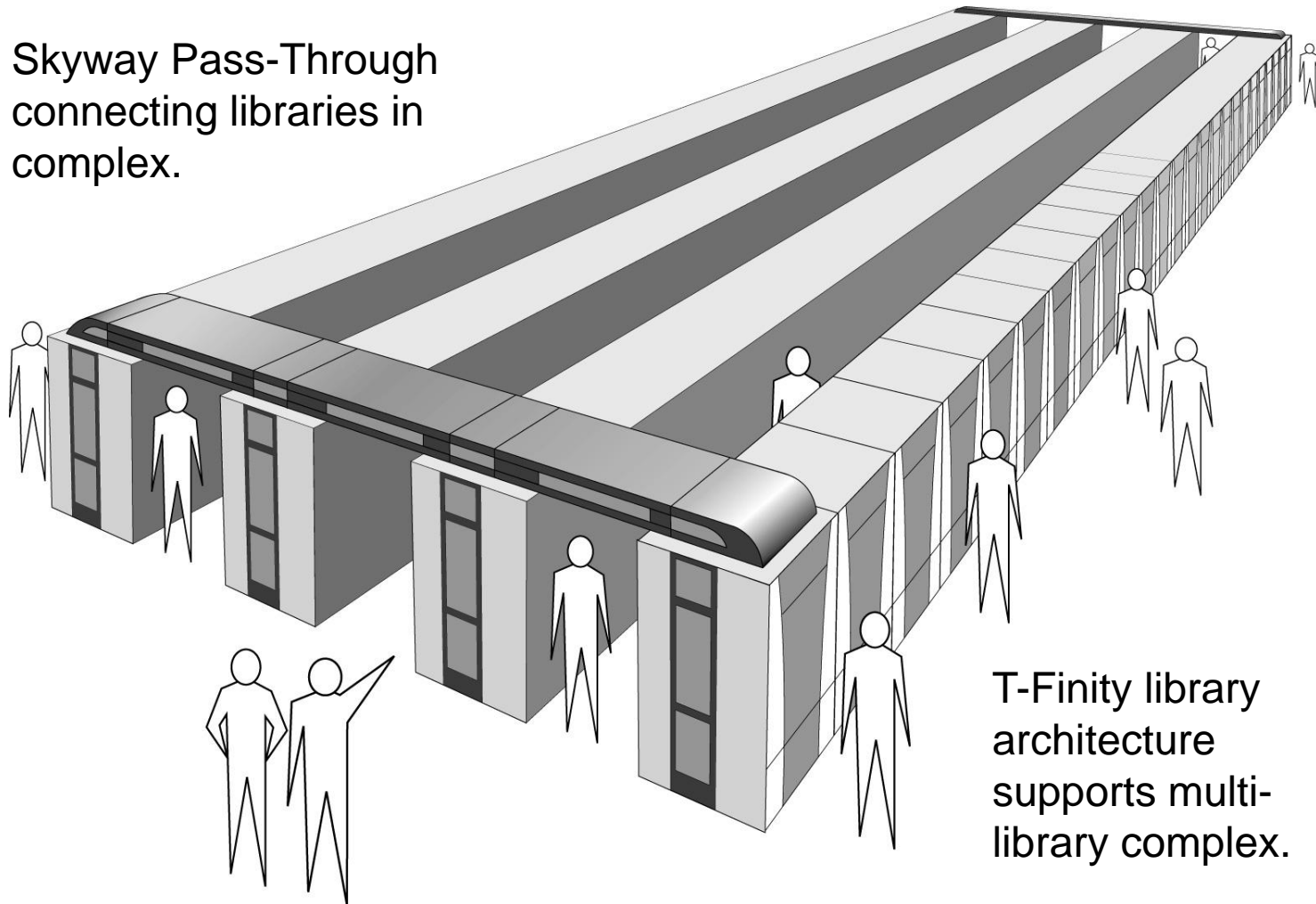
T-Finity library architecture supports multi-library complex.

T-Finity Delivers:

- Massive scalability for enormous storage and data throughput
- Redundant systems architecture for reliable 24 x 7 x 365 operations
- Multiple robotics for high transaction cartridge exchange requirements

…and More!

T-Finity (Library) Min. Config.	T-Finity (Library) Max. Config	T-Finity (Complex) Max. Config
2 Robots	2 Robots	Up to 8 Robots
3 Frames	Up to 25 Frames	Up to 100 Frames
100 slots	Up to 30,520 slots	Up to 122,080 slots
2 Tape Drives	Up to 480 Tape Drives	< 480 Tape Drives
Single Control/Communication Path	Redundant Control/Communications Paths	
LTO-2, 3, 4, 5; TS1130 & SDLT Tape Drives		
Upgrade in 10 slot increments		
TranScale upgrade path to T-Finity from: T50, T50e, T120, T200, T380, T680, T950		

Spectra T-Finity Key Differentiators

Modern Design: 30% CapEx Savings; 15-20% Annual OpEx Savings

- **Highest Storage Density** → Optimal floor space utilization and TCO

- **The Most Scalable** → Buy only what is needed today, scale as needed

- **The Only Integrated Data Encryption** → Single platform/no charge: Lower cost of compliance

- **Storage Virtualization Architecture** → Maximizes performance and storage utilization

- **Most Power Efficiency** → Minimizing data center power and cooling costs

- **High Availability Architecture** → Reduce staff administrative burden

- **Powerful Lifecycle Management** → Ensures Data Integrity and Availability

- **Unified Management** → Simplifies operator administration time

Integrated Architecture
Reduces TCO by 30%

T-Finity offers Enterprise users the only truly unified, tape storage solution. T-finity provides a dramatically superior way for enterprises to cost effectively store and manage large amounts of data.

- Reduce power and cooling infrastructure
- Reclaim Data Center space
- Eliminate external servers for Tape Library Management
- Eliminate 3rd party, extra appliances for encryption, key management and media health management
- Reduce network infrastructure

Built in, Not Bolted on

Industry Leading Density

Library	Footprint	TB / sq ft	T-Finity Density Advantage
Spectra T-Finity	**35.64 sq ft**	**72**	____
IBM TS3500	61.22 sq ft	42	**71% more** dense than TS3500
Sun SL3000	79 sq ft	33	**218% more** dense than SL3000
Sun STK SL8500	51.1 sq ft	50	**44% more** dense than SL8500

NASA AMES Case Study:

Replaced 10 STK silos with 2 Spectra high density libraries

- *Increased archive capacity from 12 Petabytes to 32 Petabytes*
- *Reclaimed 1400 sq. ft. of data center space*
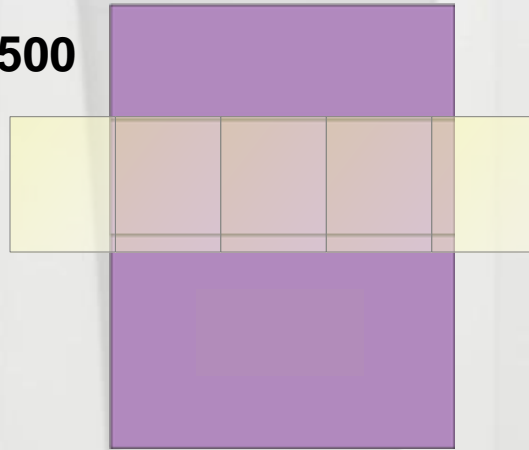
Unique Architecture = Intense Density

TeraPack™ Container Architecture:

- 10 cartridges per TeraPack

- Highly efficient use of library wall space
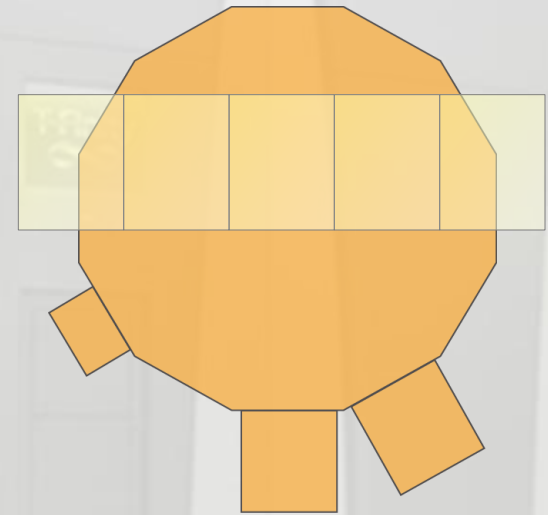
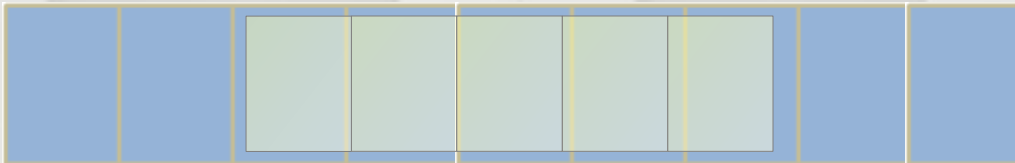- Utilizes cubic footage of library

Footprint Comparisons
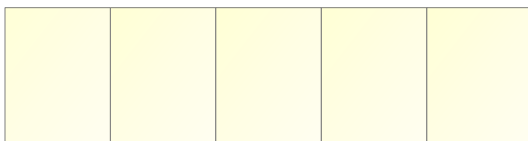
Sun/STK 9310 (Silo)

Sun/STK SL8500

IBM TS3500

Five Frame Spectra T-Finity
With Robotic Service Frames

All configurations shown are floor space requirements (to scale) needed to contain ~3,500 slots and 10 drives.

Industry Leading Scalability

- More frames, slots, and drives than competitors (FC, **SAS, **iSCSI)

- TranScale T200 through T-Finity: Common components, uncommon scalability

Library	Slots	Drives	Frames	Capacity
T-Finity **(library complex)**	**30,000** **(120,000)**	**120** **(480)**	**25** **(100)**	**45 PB** **(180 PB)**
SL8500 (library complex)	10,088 (70,616)	64 (448)	6 (42)	15.1 PB (106 PB)
TS3500	6,887	192	16	10.3 PB

** Available with LTO-5

Lifecycle Management Enables High Data Integrity and Availability

Spectra Lifecycle Management

– Drive Lifecycle Management (DLM)
– Library Lifecycle Management (LLM)
– Media Lifecycle Management (MLM)

Red icon: ⊗
Retire this tape

Yellow icon: ⚠
Data on tape is safe,
but stop adding new data

Green icon: ✅
This tape is safe for
Read and Write operations

Media Lifecycle Management Report

Partition: Total Library [»Go]

Report: Media Health [»Go]

Barcode	Media Health	Load Count
🔴 18C458L4	Poor	8
🔴 04O446L3	Poor	16
🔴 16S456L4	Poor	24
⚠ 04U446L3	Average	20
🟢 19P459L4	Good	37
🟢 09H496L3	Good	74
🟢 13F453L4	Good	111
🟢 09L496L3	Good	68

[»Save Report]

valid as of 7:06 3/25/2008   su(superuser)   10.0.0.1

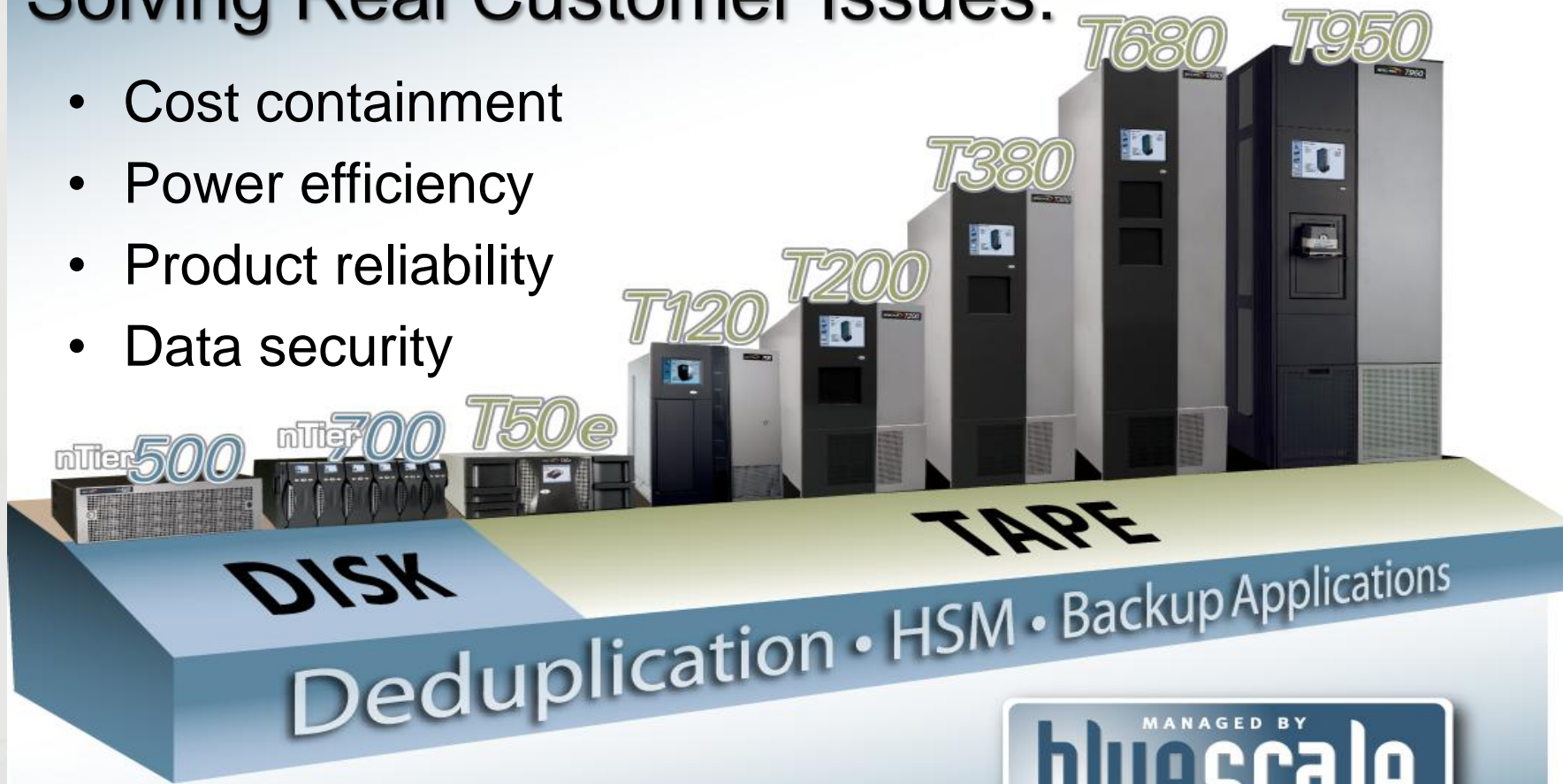General — More Options — Import/Export — Metrics — Media Lifecycle Management — Configuration — Maintenance — Security

Solving Real Customer Issues:

- Cost containment
- Power efficiency
- Product reliability
- Data security

Questions

Jim McKinley
jimm@spectralogic.com
972-333-6988