

Reducing backup windows and increasing performance when data reaches the terabyte range

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Our Organization

➤ *Grand River Conservation Authority* (www.grandriver.ca)

- ◆ Based in Cambridge, Ontario.
- ◆ Lay claim to being the first watershed management agency in Canada (est. 1932)
- ◆ 6800 km²; 925K pop. (about the same as the state of Delaware)
- ◆ Grand River 300km long spills out to Lake Erie
- ◆ Canadian Heritage River designation



Infrastructure Overview

- ◆ 200+ LAN/WAN desktop PCs across 25 sites connected to the domain
- ◆ Centralized data centre
- ◆ Hyper-V on HP 3-server failover cluster
- ◆ Nimble Storage at Primary and DR sites
- ◆ 9 TB Data (compressed and growing)
- ◆ IT compliment of 3: IT Architect/Supervisor, IT Specialist and Desktop Support Specialist

Before: Infrastructure Overview and Challenges

◆ Data Backup Environment

- ◆ D2D2T; 5 & 7 day GFS rotation (daily, weekly, monthly)
- ◆ Monthly backup tapes off site
- ◆ backup SAN at primary site; RP = 30 days if disaster struck

◆ Workloads

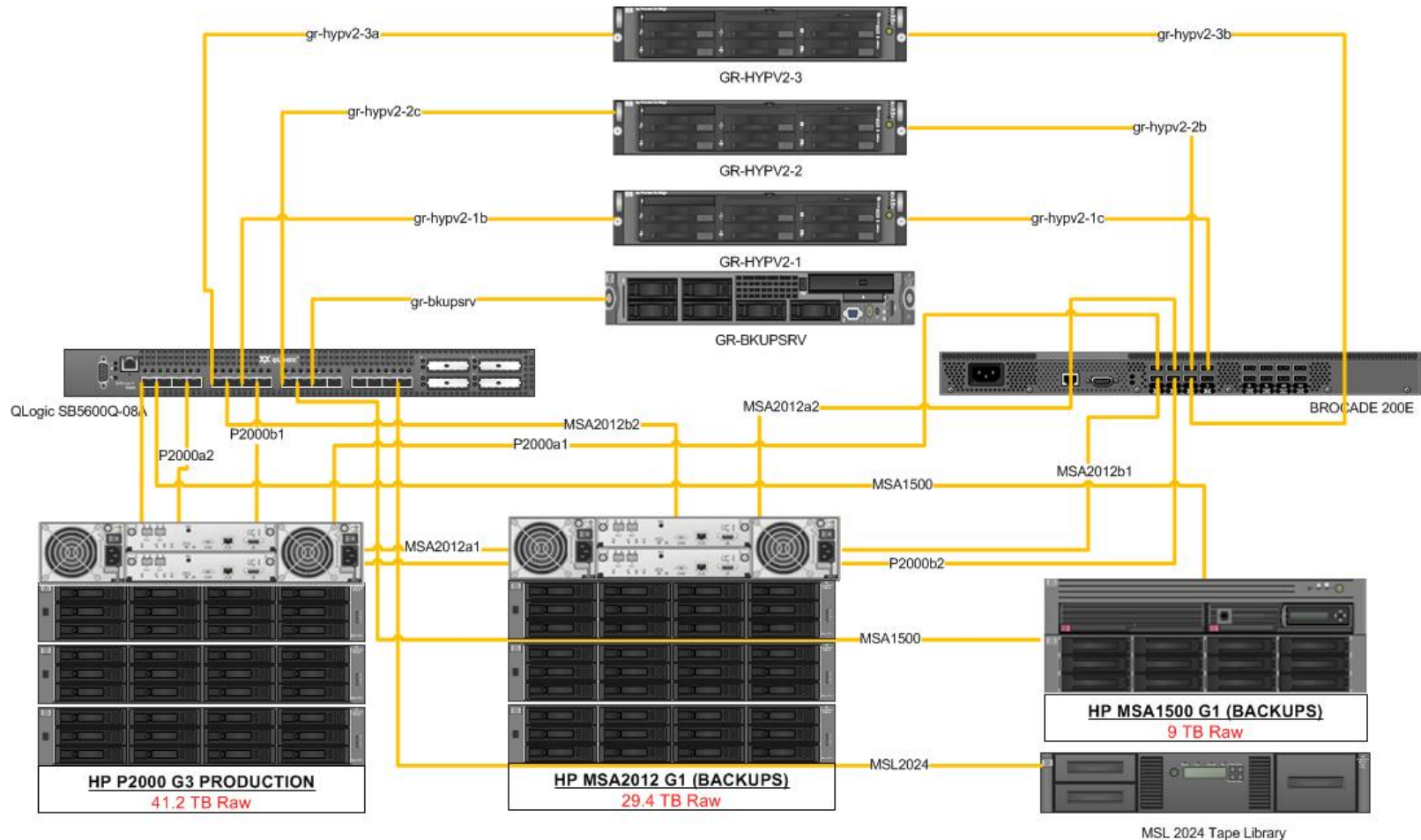
- ◆ MS SQL; MS Exchange; file shares (millions of small files)

◆ Challenges

- ◆ Ever expanding backup window
 - › Terabyte range databases; large numbers of GIS files
- ◆ Tape management – newer LTO drives incompatible with older archive tapes
- ◆ Have to juggle what to backup and when
- ◆ Backup failures and no time for make-up jobs
- ◆ Excessive staff time managing backups and tweaking performance

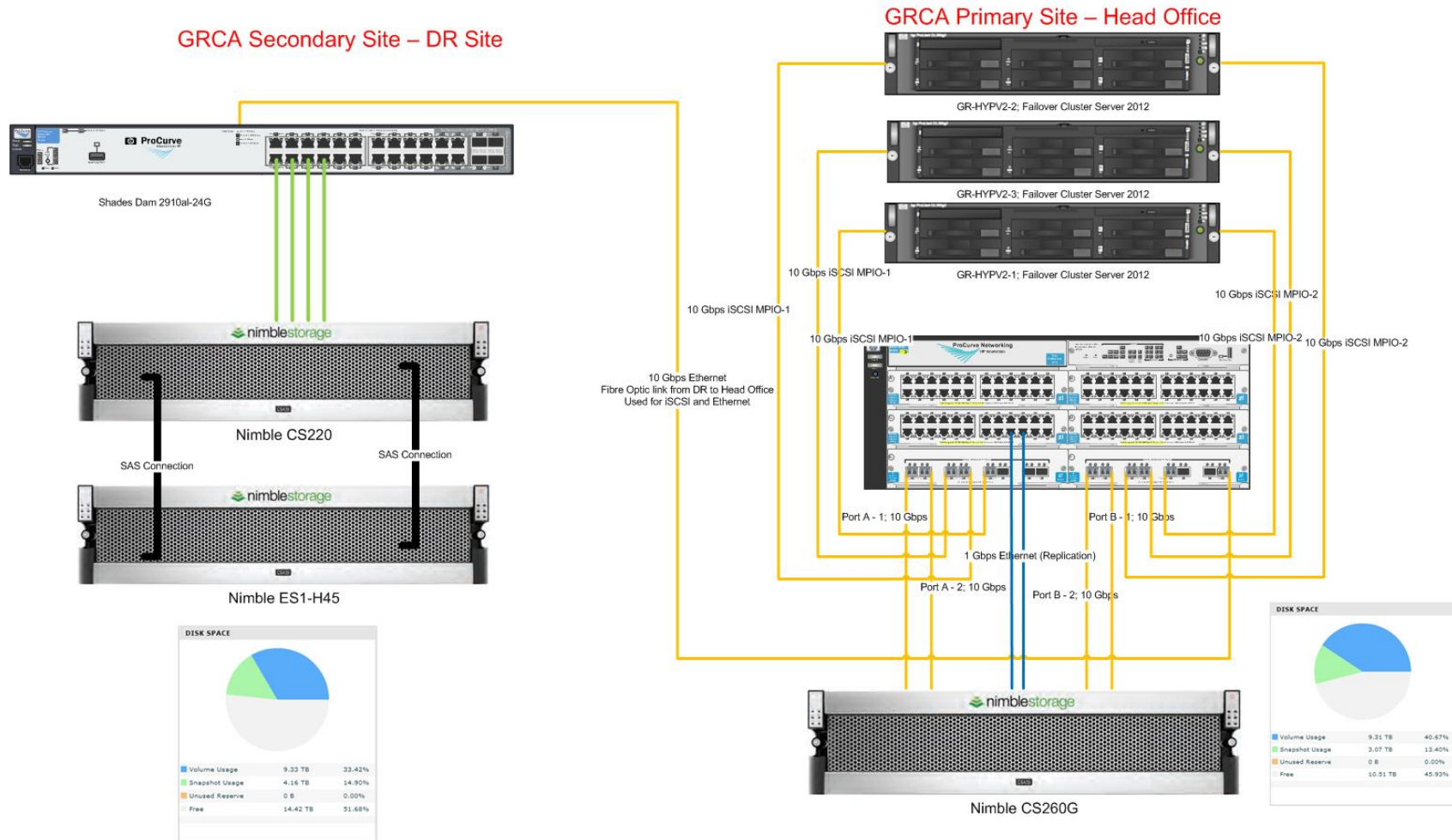
Before: Infrastructure

GRCA Fibre Channel Production and Backup SAN



After Infrastructure

GRCA iSCSI (Storage Area Network)

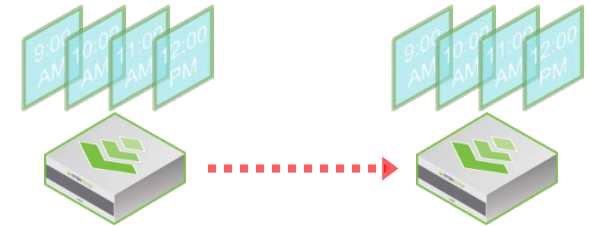


After: Flash-Optimized Storage

◆ Nimble Storage solution

- ◆ CS260G for production
- ◆ CS220 + ES1-45 at DR site for replication

◆ Snapshot Retention/Replication (Primary, DR Site)

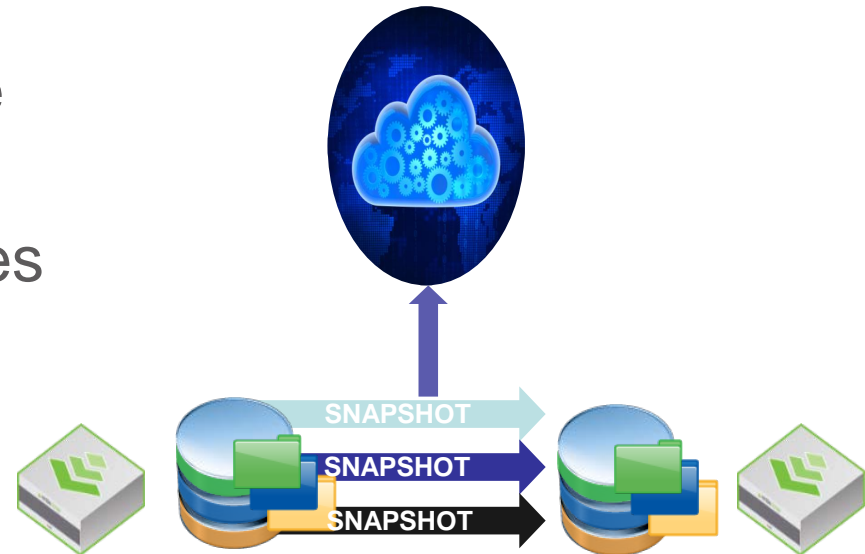


| Volume Collections | RP | Hourly | Daily | Weekly | Monthly |
|-------------------------|--------|--------|--------|--------|--------------|
| CTRL-MSQL (SQL 2008 R2) | 1 hour | 24,24 | 7,30 | | 2,13 |
| GR-MSQL (SQL 2008 R2) | 1 hour | 24,24 | 7,30 | | 2,13 |
| GR-MXCH (Exchange 2010) | 1 day | | 7,30 | | |
| GRFS (File Shares) | 1 hour | 24,84 | 60,395 | | 13,72 |
| HYPER-V (Windows 2012) | 1 day | | 30,30 | 6,60 | |



After: Cloud-Based Storage Monitoring and Analytics

- InfoSight – All Systems Are Go
 - ◆ Proactive alerting at multiple levels
 - ◆ Replication or Partner failures
 - ◆ Snapshot (VMware, VSS, Storage) alerts
 - ◆ System health alerts
- Automatically opens support cases
- Comprehensive dashboard views
- Drill down into details



After: Storage Monitoring Cont'd

By Array

| Array Name | Performance Policy | Space Used (%) | Compressed (GB) | Volumes (#) | Snapshots (#) | Compression (X) |
|------------------|--------------------------|----------------|-----------------|-------------|---------------|-----------------|
| gr-nimble260G-sr | Exchange log | 1.3% | 300 | 1 | 7 | 1.19 |
| | SQL Server Logs | 1.0% | 225 | 2 | 110 | 1.65 |
| | Exchange 2010 data store | 2.1% | 490 | 1 | 7 | 1.18 |
| | SQL Server | 14.7% | 3,443 | 2 | 110 | 1.26 |
| | Hyper-V CSV | 17.7% | 4,154 | 2 | 76 | 1.64 |
| | Windows File Server | 28.7% | 6,724 | 1 | 153 | 1.50 |
| Total | | 65.4% | 15,336 | 9 | 463 | 1.47 |

Click on an Array Name or a Performance Policy to highlight all views. (To select more than one, hold down Ctrl key)

By Pool

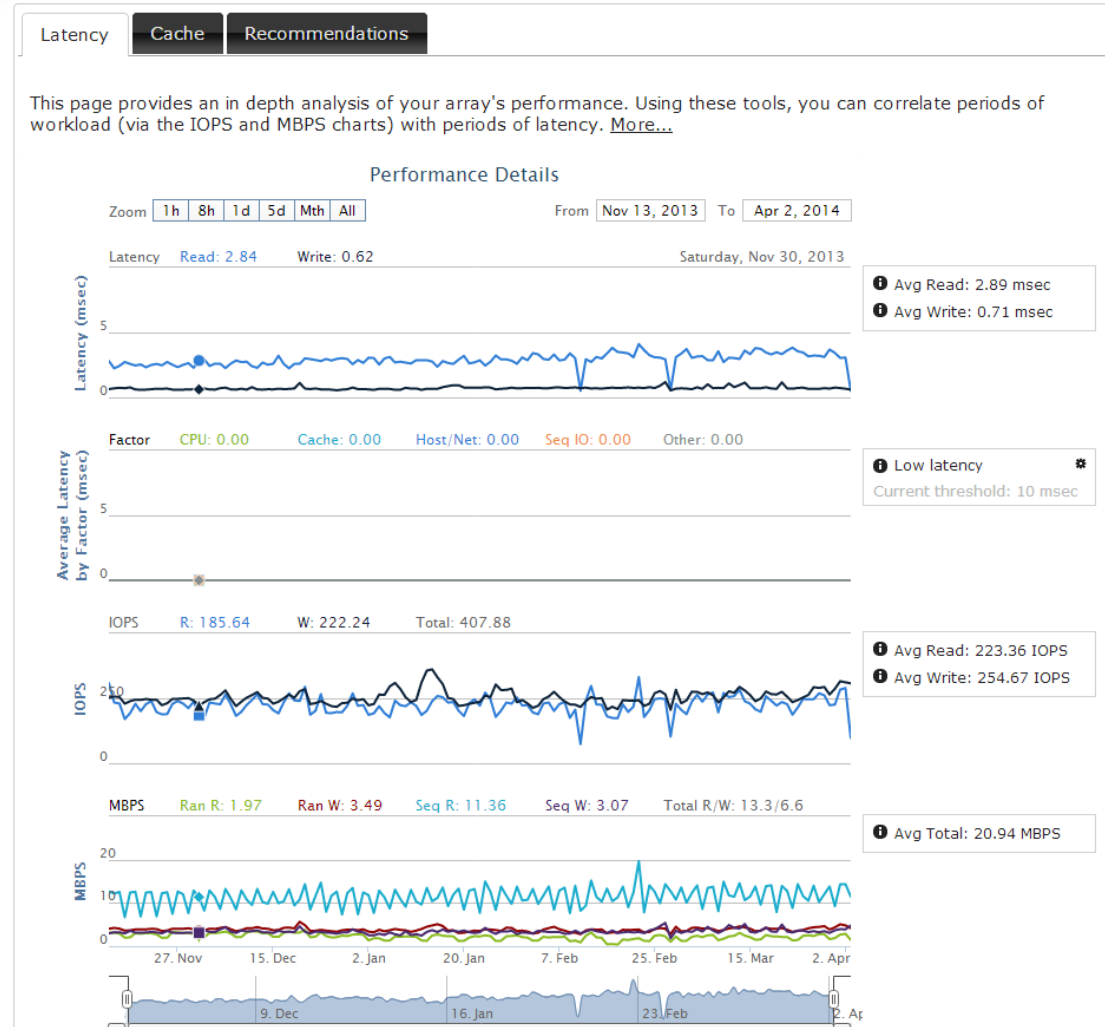
| Pool | Group Name | Performance Policy | Space Used (%) | Compressed (GB) | Volumes (#) | Snapshots (#) | Compression (X) |
|--|-------------------------|--------------------------|----------------|-----------------|-------------|---------------|-----------------|
| Pool: default Array: gr-nimble220- ShadesDam | gr-nimble220-ShadesDa.. | SQL Server Logs | 0.8% | 226 | 2 | 120 | 1.66 |
| | | Exchange log | 1.5% | 434 | 1 | 30 | 1.24 |
| | | Exchange 2010 data store | 1.8% | 526 | 1 | 30 | 1.29 |
| | | SQL Server | 12.1% | 3,465 | 2 | 120 | 1.25 |
| | | Windows File Server | 26.0% | 7,433 | 1 | 326 | 1.53 |
| | | Hyper-V CSV | 24.6% | 7,023 | 2 | 166 | 1.62 |
| Grand Total | | | 66.9% | 19,108 | 9 | 792 | 1.50 |

After: Analytics Cont'd

- Plethora charts and metrics
- Target analytics hourly, work week, monthly or entire range
- System Health and upgrade recommendations
- Executive dashboards ideal for quick overview

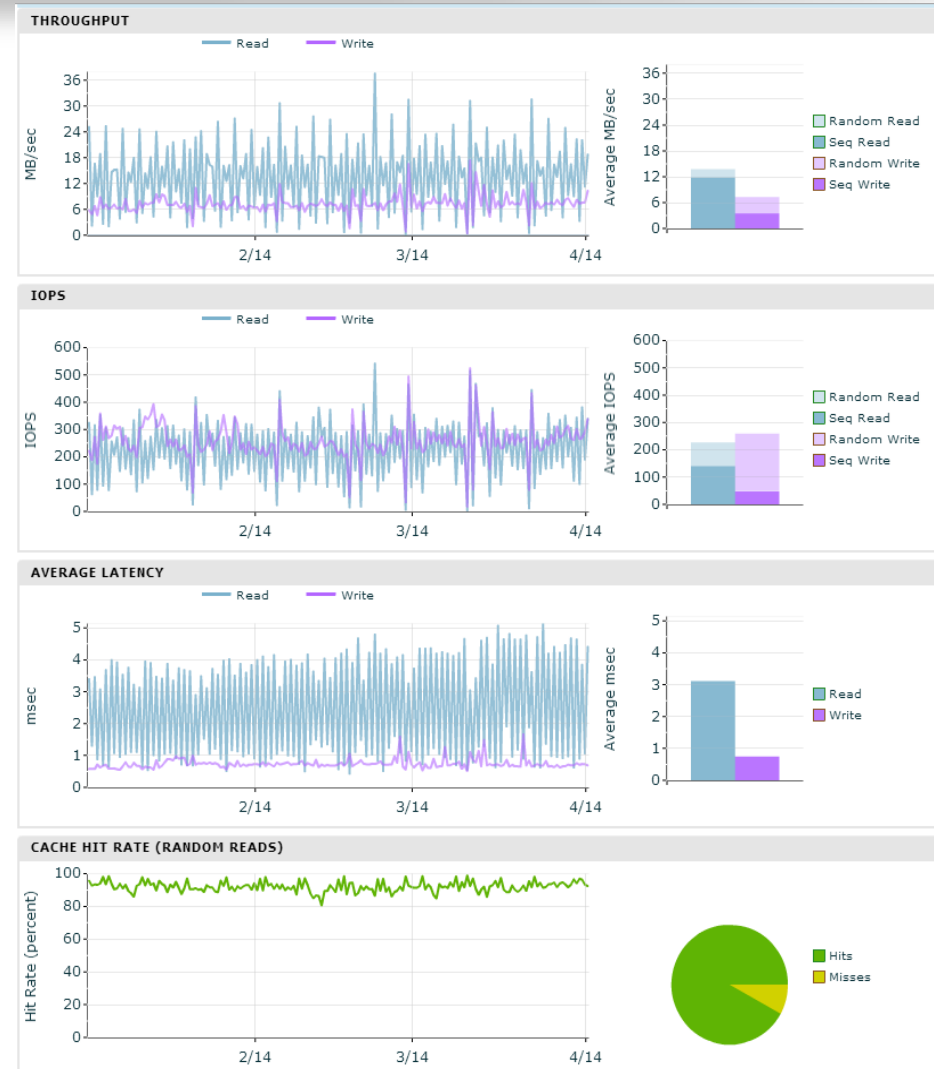
Performance Overview > gr-nimble260G-sr

S/N: AC-103337



After: Performance

- with 463 snapshots
- No appreciable performance hit on array due to snapshots and replication
- Monitoring our cache hit rate (92%) – higher during the day
- Snapshot count will settle out at 206 on primary and 805 at DR
- Unit was scaled properly but we are protected with a scale-to-fit approach in the Nimble architecture



After: Benefits

- Reduced RPO from 1 day to 1 hour.
- Eliminated weekly full-backup window of 30+ hours and nightly 13 hour incremental.
- Saving 1 day a week staff (blended) time previously spent on managing backups and tapes
- DR site array keeps 6 years-worth of monthly backups
 - ◆ No tape needed
 - ◆ Very little management – works as promised
- Performance integrity is maintained
- We did not hire a coop/contractor in Q4/2013 or Q1/2014 [real savings!]



Conclusion

- No longer a skeptic – Hybrid Storage technology from Nimble delivered as promised
- Our agency has the level of protection and confidence we require