



Manitoba's Server and Data Centre Consolidation Success Story

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Brian Konopski, Executive Director

GTEC

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Manitoba 

- In March of 2011, Manitoba successfully completed a \$13.5 M journey of data center and server consolidation that spanned 45 months
- We are very proud of the results we achieved and pleased to be able to share our story and lessons learned with you



- Historically, each department in the Government of Manitoba (GOM) managed its own Information and Communications Technology (ICT) infrastructure for business applications
- Over the years, experienced organic infrastructure growth based on siloed needs
- Sustainability and vitality for applications was seldom planned for or acted on
- Rust out of infrastructure was accelerating, fell further and further behind contemporary standards



- Weekly hardware failures placed ICT support staff in perpetual fire fighting mode
- Interruptions to internal facing applications were bad, but...
- Increasing interruptions to high profile public facing online services were worse!
- Burning platform

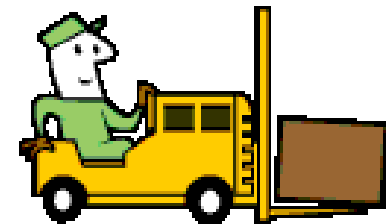


- Server and data centre consolidation initiative launched in July 2007
- Goal was consolidation and modernization through application transformation to n-1 standards and technologies in a shared services infrastructure
- Project was initially successful, learned that shared services infrastructure was effective and efficient way to deploy new applications but...

- Approach placed a tremendous draw on business resources at time of increased financial pressures and, increased demands on public service staff
- Evident that rust out of hosting infrastructure would overwhelm us if we remained on this path
- Team charged with developing a fresh approach
- Reduce risk while minimizing costs and maximizing value
- CAT was proposed as the answer

- CAT (or Control, Aggregation and Transformation) was sanctioned and launched in January 2009
- Previous Transformation path was retained as the landing zone for new applications, strategic migrations
- Methodology was based on leading data centre consolidation best practices, adapted for Manitoba's scope, current situation and business requirements

- Schedule was highly modularized
- Each data centre was a Logical Unit (or LU)
- Multiple teams worked in parallel; enabled overlapping phases across different LU's
- Schedule could easily be adapted to accommodate discoveries, shifting business priorities by moving LU's
- New phases allowed us to leverage higher percentage of contract resources, reduce load on government staff
- New focus on making technology and tools do the heavy lifting!



Control

- Sub-phases within control were assessment and remediation
- Assessment put boots on the ground to visit, inventory, photograph, document and baseline every site
- Remediation stabilized current infrastructure, implemented acceptable operating practices (patching, monitoring/alerts, backups, system security) in preparation for migration
- Also included architecture and planning for new co-location data centre DC3 based on maximizing use of virtualization for both processing and storage

What did Assessment reveal?

- Over 1,000 security vulnerabilities identified as ***High*** by Manitoba's Information Protection Centre
- Over 15,000 server patches in arrears
- Over 50 servers with inadequate or even non-existent backup
- Multiple storage arrays with failed hard drives
- Critical systems built with TB's of production data stored on consumer-quality external USB drives
- Many power and cooling deficiencies impacting reliability of most sites and over 200 applications

Aggregation

- Migration of application server infrastructure from existing legacy data centres to DC3
- Included implementation of hardware, software and tools for DC3
- Data centres were “fork lifted” one at a time from the legacy location to DC3
- Heavy reliance on virtualization; everything that could be virtualized was (achieved 90% success ratio in virtualizing legacy servers, better than forecast)

- Fundamental approach was to incrementally virtualize servers to an onsite swing server, performing one or more cutovers after hours
- Preserve legacy equipment only where absolutely required (appliances, archive capabilities)
- Each legacy data centre required unique migration plan based on application, network, and security architectures and, end user needs (all based on Manitoba's standard LU-based strategy)

- Final move night saw swing server moved to DC3, virtual images ported over, any required physical hardware moved, network link cut over to DC3
- Final user acceptance testing capped off with an all parties conference call to give go/no-go decision
- There was one rollback; team took it hard but rollback plan was in place as part of standard planning, simply had to execute it

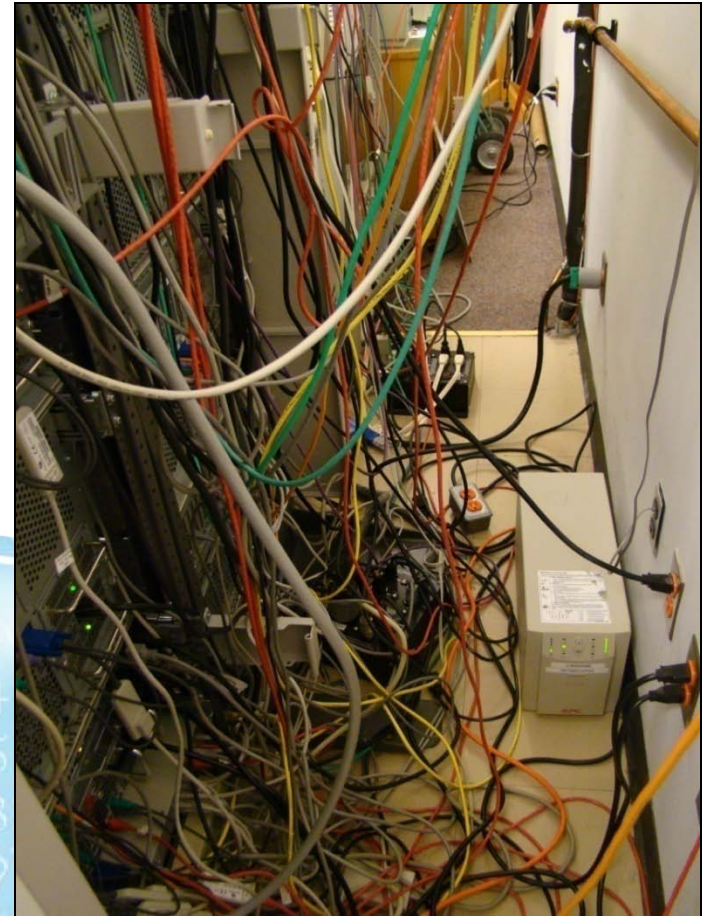
- Formal decommissioning process of migrated legacy data centres was final Aggregation step
- Data centre contents carefully recorded, bar coded and inventoried to ensure nothing “fell through the cracks”
- Inventory reviewed, approved with site contacts
- All ICT infrastructure related hardware, materials, documentation, backup tapes, etc. were removed and reused or recycled as appropriate
- Space returned to department for their reuse

Transformation

- Control and Aggregation delivered an “80/20” value proposition for data centre consolidation
- Transforming applications into the centralized shared services hosting infrastructure became an ongoing continuous improvement initiative
- DC3 is a “farm team” of migration candidates that can continue to run in that cost-effective, reliable and secure environment until an advantageous time to migrate them arrives, driving even further efficiencies



Before...





And after... DC3: Manitoba's Consolidation Facility

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Manitoba's Data Centre Consolidation Success Story

DC3 Characteristics

- 8 equipment racks housed in commercial Tier 3 data centre space (occupies just 128 sq/ft)
- 28 blade servers utilized to host 226 legacy server images
- 100 TB SAN space for shared storage
- Also includes required backup, switching, appliances and legacy hardware (20 servers) for archive restorations

Benefits

- 6,100 sq/ft of former legacy data center space freed up and returned to departments
- 29 legacy data centre sites decommissioned and contents recycled including:
 - 303 physical servers;
 - 88 UPS's, 47 switches, 16 AC units; and
 - 1,105 legacy hard drives (shredded)

- Overall hosting quality benchmark improved from average of 55% to over 95%*
- Server fleet age reduced from average 6 years plus (and up to 15!) to 1.5 years, and under warranty/support
- Improved hardware and storage utilization rates
- Increased flexibility of hosting infrastructure—quicker to respond to business needs

* (75% was pass/fail boundary)

- Reduced electrical power consumption by 80% overall
- Standardized support, management and monitoring/alert capabilities enabling proactive support
- Rationalization of hardware, software, tools created operational efficiencies

Lessons Learned

- Data centre and server consolidation is all about change and good organizational change management is a critical success factor
- Data centre and server consolidation is also a highly technical endeavor, engage the right expert resources throughout—right from planning through to completion

- Build flexibility into the plan; impossible to have final, detailed plan up front
- Frame project based on “good enough” data, use an agile approach, roll with new and changing information and priorities

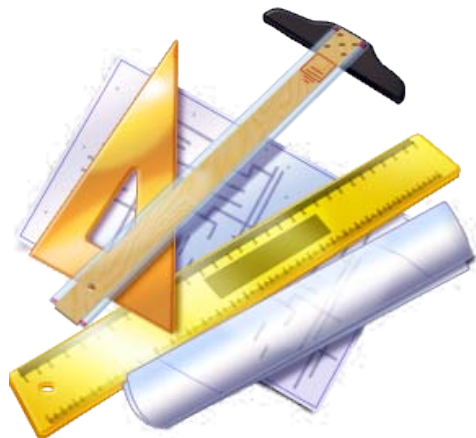
“A good plan violently executed now is better than a perfect plan executed next week.”

- George S. Patton



- Cliché alert! You can't over-communicate—need a comprehensive communications plan and include all stakeholders (executive steering committee through to end users) in it
- You can't over-document your work—much like communication, solid documentation aids in handover to operations, sustainability

- Measure everything that you can (practically) measure!
- Metrics are critical to objectively monitor progress, control scope and demonstrate delivered value



- Manitoba used a site scorecard for each data centre that objectively measured ten quality indicators
- Completed for baseline, then repeated at end of Control and Aggregation phases
- From the 55% baseline, scores improved to 63% after Control and 95% after Aggregation



Going Forward...

- Manitoba launched Application Portfolio Management Initiative (APMI) in 2010 as a strategic priority
- Application-based approach that grabs the baton from the data centre and server consolidation project's completion
- Aligns well with the continuous improvement path of Transformation
- Drives forward with seeking further efficiencies by helping us tackle the right applications at the right times

Manitoba would be pleased to share its methodology, templates, tools and other project materials. For more information, please feel free to contact:

Brian Konopski
Executive Director, ICT Service Delivery – Applications
brian.konopski@gov.mb.ca

Dean Tokariwski
Director, Infrastructure Management Services – Hosting
dean.tokariwski@gov.mb.ca