Virtualization in the Public Sector: The Kane County Case Study

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# Agenda

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- The Challenge
- The Solution
- Virtual Infrastructure Environment
- Implementation Process
- Usage Scenarios
- Lessons Learned
- Q&A
Company Profile

- What we do
- Statistics
  - 1452 Employees
  - $460 million in “revenue”
  - $4.6 million IT budget
  - 4th largest county in Illinois, 17th fastest growing in the nation
- Contact Info
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Results

- In less than 18 months, ROI was achieved
- Eliminated licensing cost of over 110 servers
- Reduced data center space for 1900 sq. ft. to just under 400 sq. ft.
- Replaced 30 year old 80-ton A/C units with a single 40-ton A/C unit
  - Saved over $200k in planned expenditures
- Reduced power load from over 80KVA to under 30KVA
  - Saved over $74k in power consumption costs
- Eliminated the lifecycle purchase of over 110 servers
  - Saved $370k in needed server replacements
- We only spent $265k on our SAN and virtualized environment
- Staff savings weren’t realized, but productivity increased significantly
Infrastructure Before Virtualization

- 127 application servers, one app, one server environment
- 34 file and print servers
- 10 domain controllers largely distributed
- Largely T1 WAN connected infrastructure
- All servers were forklift upgrades from Y2K
- 45 Departments, heavy duplication of resources
- Limitations
  - Aging equipment
  - Constrained budget cycle impacting growth
  - Power, HVAC, space, and staffing cost concerns
The Challenge

- Upgrade network to fiber connected Metropolitan Area Network (MAN)
- Consolidation of file, print, and authentication servers
- Reduction of utility and application servers
  - Exchange 2000 site consolidation and virtualization
  - Centralized web farm
  - Eliminate multiple copies of middleware applications
- Cut down costs on HVAC, power, and space
- Provide better support with same or less staff
- Implementation in a politically charged environment
- Do more with less
  - Budget has continually been reduced 15-18% a year
The Solution

- Built gigabit fiber connected Metropolitan Area Network (MAN)
  - MAN connects 90% of all users
- Implemented SAN systems
  - NetApp (fibre-channel) and EqualLogic (iSCSI)
- VMware ESX Servers
  - 10 – Virtual Infrastructure 3 Servers
    - 4 – IBM xSeries 365, 4 CPU, 16GB RAM
    - 4 – Dell PowerEdge 6800, 4 CPU, 16GB RAM
    - 2 – Dell PowerEdge 2950, 2 CPU, Dual-Core, 16 GB RAM
  - 56 Virtualized Servers, 260 Virtualized Desktops
  - Exchange, SQL, GIS, Domain Controllers, Print Servers, Middleware
- Two fully-redundant hot data centers
  - Fiber connected
  - Each data center carries 50% of work load
# Implementation Process

- Established baseline of current environment
- Identified virtualization candidates
- Worked with departments to educate staff on virtual technology
- Eliminated file servers for CIFS service on wire
- Collapsed domain controller structure
- Collapsed redundant applications to one virtualized server
- Virtualized web farm
- Consolidated and virtualized Exchange structure
  - Consolidated from 5 servers to 1 virtualized Exchange 2003 server
  - Exchange is only VM on the ESX server hosting it
  - Storage for Exchange is handled through MS iSCSI initiator to dedicated storage LUN
- Gradually moved mission critical services on virtual farm
- Pilot project with VDI on-going
Systems We Virtualize

Exchange 2003
Usage Scenarios

- WIC Hosted Desktop Program
  - Eliminated the need for additional dedicated PCs
  - Works where terminal services and Citrix failed to deliver
  - Meets requirement for work anywhere mobility
  - HIPPA security issues are inherently addressed by allowing for isolation of access network and data dissemination protection
    - All data never leaves the datacenter
    - All machines are refreshed nightly protecting against privileged information accidentally left on machine
  - Provided access to healthcare partners with minimal investment
  - Achieving 50 desktops per 4-way server
  - Model being investigated for statewide deployment
  - Success driving VDI project for enterprise wide use
Usage Scenarios (continued)

- Mission Critical Systems
  - Exchange 2003 environment completely virtualized
    - Supports 4000 mailboxes
    - Voicemail with Cisco Unified Messaging enabled
  - ESRI ArcView
    - County-wide GIS data
    - Web services
    - Public safety – enhanced 911 data
    - Automatic Vehicle Locator (AVL) system
  - Financial System
    - Full ERP systems for county
    - Virtualization provides for critical disaster recovery need
  - All public and internal Web systems and services
Lesson Learned

- Benchmark environment before start of virtualization project
  - You need a reference point “before virtualization” to eliminate virtualization as the scapegoat
  - Understanding your VM candidates is critical to successful consolidation
- Prepare for the political fight over location of servers
  - It is NOT a technical problem
  - Elected offices will want to control their own environment
  - Education is the key along with finding a few allies
- Establish clear lines of authority over who owns what part of the project
  - Well documented support structure upfront will eliminate many long meetings down the line
- Check your licensing agreements with ISVs
  - Going from 1-CPU to 4-CPU physical box, may cost you!
  - Prepare to educate your ISVs and negotiate tough
Lessons Learned (continued)

- Virtualization is like the field of dreams, if you build it they will come
  > Be prepared for VM creep, once your population understand the technology
  > Have a good idea of how you handle charge backs for VMs that have no real equipment purchase tied to them
  > “It only took you 10 minutes to deploy, why are we paying for your time”
- Prepare to spend more upfront to save more in the future
  > Buying the right hardware, storage, and networking gear may not be the cheapest option
  > Built by the lowest bid may cause you to rebuild soon
- Educate your user and peers on virtualizations
  > The rumor mill is a quick way to sink you project before you start
- Establish a good TCO framework
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