Kitsap County Virtualization Project

- Initially a Server Room Remodel Project
- Key Business Drivers
  - Out of Electrical Power
    - Could not add any more outlets/connections
  - Out of Physical Space
    - Could not add any more Server Cabinets
  - Out of Air Conditioning Capacity
    - Designed for 2 active, one spare
    - Reality, all three working at capacity

Kitsap County Virtualization Project

- Needed Professional Solution
- Published RFP for Electrical Contractor
  - Resolve Electrical Capacity Issues
  - Increase A/C Capacity
  - Estimated cost to solve these problems $450,000 - plus
    - Additional electrical capacity
    - New server racks
    - Additional A/C capacity

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- Interim Solution - Blade Servers
  - Consolidate up to 16 servers in a small area
  - Uses same power source as two servers
    - Puts out more heat in smaller space
  - Reduce physical connections to SAN (Storage Area Network, i.e, Disk Farm)
    - From 32 to 2

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- Permanent Solution **VIRTUALIZATION**
- One Solution Fixes All
  - Electrical Power
  - Physical Space
  - Air Conditioning
  - Disaster Recovery/Business Resumption
  - Future Capacity
  - Lower TCO (Total Cost of Operation)

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- What is “Virtual Server”?
  - An application that enables a server to run a range of operating systems-including Windows Server 2000, NT, WinXP, Linux, and Novell simultaneously on a single physical server.
  - The ability to consolidate many physical servers onto a large server
    - Average server CPU utilization <10%
  - 1970’s IBM Mainframe 360/370 Virtual Machine technology, on steroids

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- Business Values of Virtual Implementation
  - Minimize Total Cost of Infrastructure Ownership
  - Increase hardware utilization & reduce hardware requirements with server consolidation ratios
    - Ten virtual servers per physical processor
  - Reduce required datacenter square footage, rack space, power, cooling, cabling, storage and network components by dramatically reducing the number of physical machines.

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- Proof of Concept
  - Server analysis
    - Over 100 physical servers
    - Industry Server consolidation at least 10:1
    - Some servers/applications not certified
      - Oracle data-base
    - Some servers not applicable
      - High-profile or high-transaction
    - Blades hold up to 16 servers...
    - Uses same power as two servers

Kitsap County Virtualization Project

- Solution Architecture
  - HP C-Class Blades
    - Designed for redundancy & VMware
  - VMware ESX 3
    - Vmotion
    - High Availability
    - Dynamic Resource Scheduler

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- VMware ESX 3 - Details
  - Enterprise solution: ESX Server 3 is a "bare metal" hypervisor that partitions physical servers in multiple virtual machines. Each virtual machine represents a complete system, with processors, memory, networking, storage and BIOS.
  - P2V Utility: Plug & Play
  - VMotion: move servers to perform maintenance, move from failing server (server level)
  - H/A: failover protection (host level)
  - DRS: Allocate resources to highest priority apps (resource pool)
    - Combined: fail over of virtual environment to alternate site

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- Business Benefits
  - Reduced Hardware to support
  - Reduced maintenance costs
  - Reduced software costs
  - Reduced power consumption
  - Reduced server replacement costs
  - Enhanced High Availability & Disaster Recovery capabilities