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## TECHNOLOGY

# Infrastructure Done Right: Part II

Column: From the Trenches

Nov. 01, 2007

Most tax and accounting firms and other businesses I visit have mechanical issues that need attention and correction. Your firm, regardless of its size, is probably no exception. Qualified internal IT personnel as well as outsourced vendors frequently make incorrect recommendations based on their level of knowledge

or perception that the firm won't spend the money to do things right.

This year is an excellent time to prepare your network infrastructure for the future while giving you more flexibility and reliability in day-to-day operations.

When your infrastructure is right, you also have greater productivity, team member satisfaction and easier disaster recovery.

My hope is that you can use the two-part checklist I've provided in last month's column and this one to see how your technology infrastructure measures up to current and reasonable standards. If you are a smaller business, you will still need most everything listed in the two lists. The items underlined are specifically for businesses of 50 or more people, but you will notice that very few items are underlined. Additionally, my team maintains a list of specific part number recommendations at [www.nmgi.com](http://www.nmgi.com). Look for technology recommendations on our site.

*For more info ...*

Look for Part I of this column in the October 2007 issue (also at [www.CPATechAdvisor.com/go/1759](http://www.CPATechAdvisor.com/go/1759))

where Randy started his checklist that included the following areas:

- Protection (surge protection, UPS, backup, continuous data protection & generators)
- Network (high-speed communication lines, load balancing firewall, SSL-VPN capability, commercial grade power over Ethernet, segmenting, Virtual LAN switch, certified CAT 6a cable & wireless access points)

Since many of you are now doing your final upgrades of the year, I have tried to prepare a simple list of key technologies. Last month's column specifically built from the outside communications towards servers. This column works towards workstations. Here are our best suggestions for the properly dressed infrastructure:

## **SERVERS**

- **Blade or Rack Servers**

Businesses of any size at all should be using rack mount servers for more reliability and the ability to repair more quickly instead of tower server configurations. However, there is a new generation of server technologies that has been introduced by IBM, HP and Sun called blade servers. The enclosures accommodate many physical CPUs, drives and network cards in a single cabinet. Small businesses can now justify owning blade servers, and will find performance, reliability and cost justifications for using this approach.

- **Storage**

- **DASD RAID V** — Direct Attached Storage Disks

(DASD) are still very popular, and the minimum configuration we like to recommend includes a Redundant Array of Inexpensive Disks (RAID) controller

with ample onboard

cache. RAID requires a minimum of three disks to play, and we actually prefer an additional hot spare drive in the array at all times, as well.

The only time we recommend a mirrored pair of drives in a server is when the server is attached to a SAN (storage area network) or the server has a special purpose like terminal services with no significant data stored locally.

- **SAN** — Storage Area Networks are very common in large businesses. The cost has continued to drop enough that smaller and smaller businesses can afford the technology. Expect SANs to arrive in blade enclosures to make them even more affordable for smaller businesses. Additionally, new technologies like iSCSI and IP SANs are reducing costs over traditional Fiber Channel technologies.
- **NAS** — Network Attached Storage is an inexpensive way to share a fairly large capacity of disk. Many of these units are slower and should only be used for backup or intermittently used files, not for day-to-day operations.
- **Virtualization**  
Your IT team should be looking at converting your physical servers to virtual servers. This technology is working excellently to reduce costs, improve reliability and speed up server deployments. We expect even the smallest businesses to use virtualized servers over the next few years. Virtualization for both servers and desktops is such an important topic that I will cover it in more detail in a future column.

## **WORKSTATION**

- **Desktop**
  - Dual-core or Quad-core 64-bit processors.
  - 2.00 GHz 4MB L2 Cache, 1333 MHz FSB.
  - 2GB to 4GB DDR2-667 ECC FBD RAM.
  - NVIDIA Graphics Card 256MB to 512MB On Board PCIe.
  - Integrated 4-channel SATA 3Gb/s controller with 150GB to 750GB 7200 or 10,000 SATA RPM Fixed Disks or optional 300GB 10K SCSI (SAS) drive as a backup add-on.
  - DVD/CD RW+/- Dual Layer (HDDVD/Blu-Ray add \$400).
  - 10/100/1000 Gigabit NIC (Wireless Option 802.11a/b/g/n).
  - Bluetooth, 54-1 Multimedia Flash Reader.
  - Front and rear USB 2.0, Firewire, Dolby 7.1 Surround Sound.
  - Dual Monitor Connections DVI and/or VGA.
- **b. Laptop — The Desktop Replacement**
  - Size.
    - 17” laptops weigh in at 8+ pounds.
    - 13” – 15” traditional laptops.
    - Portable, Ultra Portable, Ultra Mobile PC (UMPC).

- ii. Processor.
  - Intel Core 2 DUO Options.
    - T5200 – T7200 (higher the number, faster the processor).
    - Faster the processor, the hotter the system runs.
    - Gamers and heavy video users, the faster the better.
    - Tops out around 2.3GHZ with double clocking (hotter still!).
  - (b) AMD Turion 64 X2 Options.
    - T50 – T60 (higher the number, faster the processor).
    - Same caveats as above: faster = hotter.
    - Runs Vista in Native 64 or 32 emulation.
    - Most programs will have to run in emulation, so plan accordingly for business use.
- Graphics.
  - Look for On-Board Graphics Memory versus Shared Memory.
  - On-Board Memory is better, but it's more expensive and hotter.
  - 128MB On-Board Minimum – 256MB; 512MB better and hotter.
  - NVIDIA and ATI (AMD) Major players.
- Widescreens are the standard.
- Watch for DVI versus VGA External Monitor Port.
- 2GB of RAM for Vista Business and Ultimate.
- Blu-Ray/HD/DVD RW+ Drives.
- 74GB to 160GB SATA Fixed Disk.
- Flash Drives may be an option instead of fixed disk.
- Bluetooth (option on many brands).
- a/b/g/n Wireless Adaptor.
- 10/100/1000 NIC.
- No less than 2 USB and 4 is preferred; look for side-by-side, not over-under.
- ExpressCard instead of PC Card.
- **Monitors**
  - 19-inch to 21-inch okay.
  - 22-inch to 24-inch better, and quite affordable.
  - Consider monitors that rotate to a vertical position (portrait vs. landscape).

## INPUT/OUTPUT

- **Production quality scanners** — Fujitsu and Canon are the key vendors.
- **Color Laser — Multi-function Device (MFD)** worthwhile to obtain fax, backup scanning and other paper handling. Clearly HP is the winner in this category.
- **Multi-function copier** — Stay with the big brands like Xerox and Canon. Attach to your network, but only use scan capability for backup purposes.
- **Monochrome laser** — Go for very fast, network attached with duplex capability. HP is clearly the winner in this category, so watch for the DN designations (D=Duplex, N=Network).

### **Other items to consider in order to complete the picture:**

- **IP enabled security cameras** — Linksys and Sony are good choices here.
- **Voice over IP (VoIP) phone systems** — Like virtualization, this deserves a whole article by itself. Key Vendors: Cisco, ShoreTel, Avaya and InterTel.
- **Software.**
  - Windows approach — Windows Server 2003, SQL Server 2005, Exchange 2007, SharePoint 2007, Citrix or Terminal Server OR Windows Small Business Server with Citrix or Terminal Server along with Microsoft Office 2007.
  - Linux approach — Red Hat or SUSE Enterprise Linux, Ubuntu and Open Office.
  - Virtualization — VMWare ESX server, Xen or MS Virtual Server.
  - Anti-virus suite — CA eTrust, McAfee.
  - Spam control — DoubleCheck.
  - Cellular data connection – Sprint, Verizon and AT&T.
  - Smartphones — Blackberry, Treo, Samsung BlackJack.

Each of the items in this complete list could easily take hours to explain, and I understand you may not have as much detail as you would like. However, my chief concerns are that you are

1. buying sub-standard products to achieve false economy or because of lack of knowledge,
2. selecting a solution in every category where you have a need,

3. that you are preparing your network infrastructure for the major overhaul to come if you are going to transition to Windows Server 2008, Windows Vista and to a lesser degree Office 2007. Other applications are going to add additional requirements to your infrastructure. Prepare your infrastructure now to be ready for the changes in 2008.

Technology • Article

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