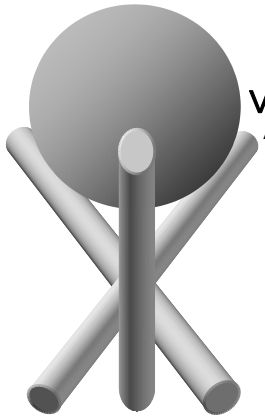

Vatic Technologies
Architecture Planning for Technology

Don's Diatribe VII

IT issues: Dreams or Nightmares?

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Disclaimers

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Introduction

- This presentation tries to identify some of the most significant recent technology changes and elicit comments and discussion on them.
- As part of my job as a consultant I try to know a little bit about many things and a lot about a few things. This presentation represents an accumulation of the former.
- You may find some of these issues provocative, that's intentional. ☺

General Slide Format

- Category
  - Component
    - Issue
      - comments, and backup material
  - 😐 My “take” on the issue. (☺ or 😐 or ☹)
  - Your $0.02

Agenda

- Operating Systems
- Networks
- Security
- Platforms
- Storage
- Architecture
- Futures
- Wrap-up

Operating Systems

- Windows
  - "Longhorn" (Windows Vista/Server 2008) is here
    - Will need more horsepower than most enterprise desktops carry
    - Gartner [and others] are suggesting 2010 for full deployment
    - Performance issues: "… upgrading to Vista can lessen a system's performance by as much as 58 percent, depending on what's being processed." [http://www.crn.com/software/198702242]
    - Hardware upgrades required: PIII500/512MB/10GB not good enough [Vista Upgrade Advisor Report]
    - Linux Instead?
    - SP1 withdrawn because of re-boot issues
    - "Vista Ready" logo issues
    - "Downgrade" options, Windows XP EOS June 2008
    - Wait for Windows 2009?
    - Is Vista Microsoft's version of IBM's OS/360? [Fred Brooks' Mythical Man Month]

☹ *Do we really **need** a new version of Windows?*

Operating Systems

- Linux
  - Can Linux distributions avoid being “contaminated” by non-OS issues?
    - Novell now “owns” (distributes) SuSE Linux
      - Novell has incorporated a lot of it’s Novell-only (e.g., directory) concepts into the SLES platform.
      - Harder to find the “free” version (http://www.opensuse.org/)
    - My List [as of 2007Q3 on a PIII500/512MB/10GB]:
      - OpenSUSE – unresolved video driver issues with 3D graphics
      - SLED – same as OpenSUSE
      - Ubuntu – easy to install, OS “hidden” from user
      - Linspire – odd add-on software marketing model
      - Slackware – can you say “propeller-heads” ☺
      - Puppy – small, cute, no house-training
      - Damn Small Linux – small (P90/24MB Notebook), functional (802.11)

☹ *Linux distributions are already becoming bloated and there is a chance that (in the search for product differentiation) they will become more so.*

☺ *Still some “lightweight” Linux if you look hard enough*

Networks

- VoIP
  - VoIP needs to be deliverable over wireless networks to penetrate businesses.
    - Some new devices that use Cell service outside the office and auto-switch to the local PBX VoIP over 802.11 inside
  - Consumer business case is in “free” long distance
    - VoIP-ready phones/gateways are now available.
    - Really just a de-duplication of service
      - still need a wire into your home (from Telco or cable company) and you’ll still want your cell phone.
    - QOS is not there yet
      - Latency/packet drops can kill a voice line.
      - My DSL line drops (and reconnects) for about 5 seconds without warning about once every 500 hours (99.97%) TCP/IP manages to survive, will a VoIP 911 call?
  - 😐 *VoIP will only succeed if it can provide equal service to the existing cellular network.*
  - ☹ *VoIP is being heavily marketed as part of the “Multiple Play” strategy.*

Networks

- Wireless
  - WiFi (IEEE 802.11) is everywhere (… well, almost)
    - Doesn't seem to be a profit model (people won't pay for a hotspot)
    - Toronto Hydro delivered a WiFi network [OneZone] in downtown Toronto in September 2006 .
      - Free access period ended
      - my experience: slow, unreliable. YMMV Would I pay?
      - Toronto Hydro Telecom is up for sale.
    - Wireless Toronto [http://www.wirelesstoronto.ca]
      - Non-profit volunteers to manage your set-up [$50.00/year]
      - Location pays for AP and broadband connection
  - ☹ *Ubiquitous WiFi still awaits a sustainable cost model*

Networks

- Wireless (Continued)
  - IEEE 802.11n
    - Draft 2.0 was authorized in March 2007 [with 1635 technical comments to be resolved ☹]
    - Pre-standard products being delivered in enterprise now. ☺
    - Must use 5GHz band to achieve advertised data rates
    - APs are ugly ☺

☹ *Increase in 802.11 deployments will result in increased interference and lower data rates.*

☹ *802.11a deployments will be susceptible to interference*

Networks

- Wireless (Continued)
  - WiMAX (IEEE 802.16)
    - Wireless with 100's of metres range, 40Mbps
    - Alternative for "last mile" connection
    - No-one is delivering in NA yet? Rogers?
  - ☺ *Should allow areas that are not serviced by DSL/Cable to receive broadband connectivity.*

Networks

- Wireless PANs
  - "Personal Area Networks"
    - Bluetooth is "slow", but almost ubiquitous.
  - My BT Experience
    - Devices:
      - Palm TX, Toshiba e800 PocketPC, Motorola "Razr", Logitech "Traveler" Headset, Creative BT Stereo Headphones, MSI USB BT Adapter, DLink USB BT Adapter, Socket SDIO BT Adapter
    - Issues:
      - "Razr": Only one BT connection at a time, drops headset periodically
      - Palm TX: OBEX doesn't work with "Razr"; no headset profile
      - E800: add-on BT, no headset profile
      - Creative: needs AADP
      - DLink: no AADP
  - ☹ *Bluetooth has a lot of "options" that make it difficult to ensure that all of your devices will play nice together.*

Networks

- Convergence
  - Triple [Quadruple] Play
    - Voice/Data/Media[/Mobile] all in one service
    - Requires re-think of “bandwidth provider” business
      - Un-bundle service from bandwidth [being done by some ILEC/CLEC in Europe]
    - New backbone: “Ethernet Everywhere” [drop OAM, ATM?]
    - Requires Over-Subscription? [currently 10x to 20x]
  - ☺ *Un-bundling should result in more competitive services*
  - ☹ *Over-Subscription may result in reduced service at peak times [e.g. Telco's during disaster scenarios]*

Security

- New Attack Vectors
  - What's Out:
    - Viruses
    - Worms
  - What's In:
    - Social engineering
      - Load a USB stick (or digital picture frame) with "evil" code, leave it to be found.
    - Phishing
      - Click "here" to have your bank account emptied.
    - BOTNETS
      - You are so "pwned".
      - "Flux" networks
  - ☹ *The bad guys will continue to win until the end-points [i.e. home computers] are secured [or "un-hackable"].*
  - ☹ *"Safe" computing tends to be less "exciting" [i.e., no scripts, no Flash, no HTML e-mail, …]*

Security

- Firewalls
  - Everyone should have a FW [especially broadband users]
    - Why don't MB's come with a basic FW?
      - Built-in NIC could easily be protected by default
      - Configure via BIOS [hard to hack]
      - Already have built-in RAID
      - Simple, eliminate many exploits
    - Some new DSL/Cable modems incorporate Router/Firewall
      - Often shipped in bridge mode
    - Hard [impossible] to find Router/Firewall with dial-up support
      - Many people still don't have broadband access

☹ *Until consumer connections are "stealthed" creating botnets and "owning" PC's is far too easy.*

Security

- Firewalls (Continued)
  - Endian open source firewall
    - SOHO/SMB with “Enterprise class” requirements
      - offered by *endian* [http://www.endian.com/en/community/about]
      - Linux-based, up to 4 “zones”
      - Use “old” PC (Pentium 166, 96MB)
      - Available as VMware image (could run a PC as 1 VM firewall/1 VM client), or install CD
      - Provide traffic shaping, IDS (Snort)

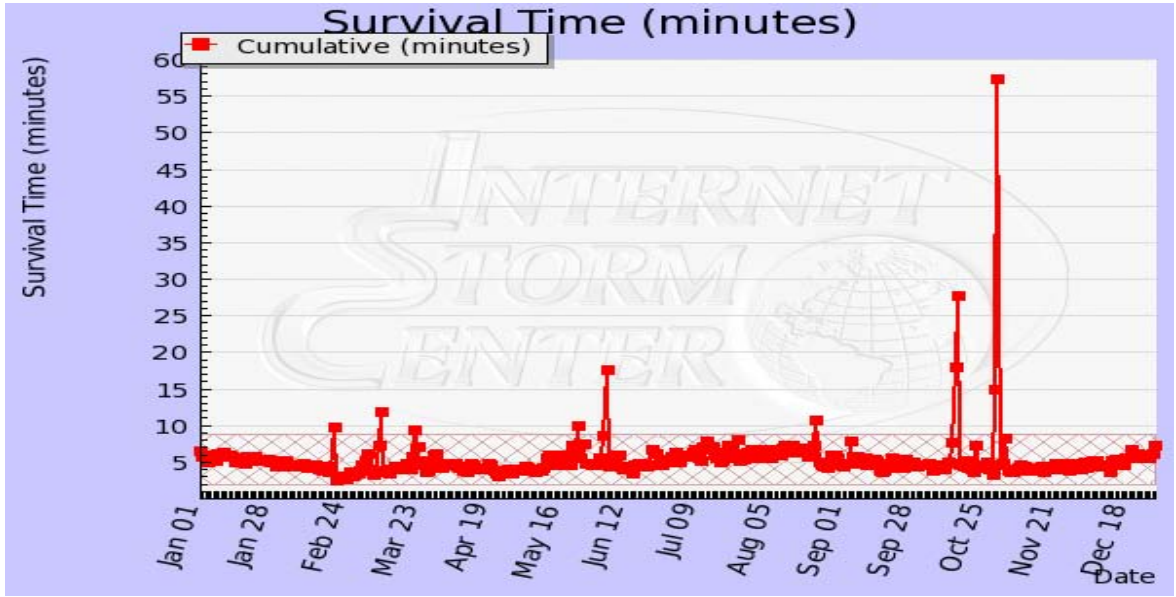
☹ *Requires a bit more knowledge than the general home user.*

☺ *Free! (as in beer)*

☺ *Great for SOHO/SMB that needs a bit more control.*

Security

- Windows Patching
  - Patch Tuesday
    - Zero Day exploits
      - An un-patched Windows machine lasts less than 10 minutes on the internet. (see http://isc.sans.org/survivaltime.html)



☹ *MS needs to adopt a two-tiered patch approach (can you spell A-P-A-R)*

Security

- SPAM
  - Black(Block)lists
    - SPAM issues used to be about the cost of keeping it away from your business (i.e. lost productivity) now additional cost of losing business due to blocking.
    - Collateral damage
    - Vigilantism?
  - Business Case
    - Too many people profit from SPAM
      - Bad guys: hackers, “botnet” owners, …
      - “Good” guys: SPAM filtering software, business advertising
  - ☹ *UCE will continue to plague us – user education is the **only** way to get rid of it.*
  - ☹ *May never get rid of it as long as it’s low-cost [read “free”].*

Security

- Privacy
  - Social Networking Sites (e.g. Facebook)
    - Facebook “Beacon” allows cross-site tracking of on-line activity
    - Security settings are obscure and non-intuitive
    - Need to remember that these sites are trying to make a profit.

☹ *Social Networking services use private information to generate revenue. “TANSTAAFL”.*

☹ *Do you really want John Doe from high school demanding to be your “friend”?*

Security

- Privacy
  - Focus on Sarbanes Oxley, etc has deflected Canadian business from reviewing PIPEDA compliance.
  - PIPEDA has flaws that need to be reviewed [CIA subpoena to SWIFT (ITWorldCanada.com 04Apr2007)]
    - "… data such as customer names, account numbers, and other personal identifiers were provided by SWIFT, as the request was deemed lawful."
    - No check that the organization has same (or any privacy legislation).

☹ *PIPEDA will be largely ignored until the Canadian Government begins enforcement (along with penalties) or there is a public scandal. E.g., all of a financial institution's customers experience identity theft.*

Platforms

- Processor Architectures
  - Multi-core CPUs
    - What can we fill that empty silicon with?
      - Driven by reduction in size of transistors (Moore's Law)
      - Molecular transistor demonstrated in lab – going to get more interesting soon.
    - Software licensing
    - Application issues (multi-processing is hard)
    - Reached consumer/desktop machines with latest Intel and AMD chips.
    - 1,000's of cores per chip not unrealistic in the near future
  - ☺ *Multiple cores will continue to proliferate although they won't necessarily be directly accessible to the OS (e.g., IBM Cell)*
  - ☹ *We will have a whole new set of desktop application "bugs" related to poor implementation of multi-threaded applications*
  - ☹ *Need a language with Tier-1 support for multi-threading – Ada [PL/1 ☺]?*
  - ☹ *Focus on CMT might reduce single core development? Amdahl's Law!*

Platforms

- Internet
  - Net Neutrality
    - Carriers are looking to differentiate services based on content
      - Rogers inserting their own stuff into HTML stream
      - Bell “throttling” traffic

☹ *Why stop at HTML? Insert advertising into VOIP calls as well.*

☹ *Will carriers decide to throttle **all** encrypted traffic?*

Platforms

- Internet
  - Web 2.0
    - Hard to write secure applications
      - Running significant code on client side
  - Enterprise 2.0
    - Collaboration is the “new black”
      - IM, Wikki, WebLog
      - Large organizations (CA, IBM) embracing collaboration
      - Knowledge Management vs. Knowledge Sharing
    - “Millennials” will demand these tools
      - Equivalent to “grey beards” having a desk phone

☹ *Are we back at the “Fat Client” stage again?.*

☹ *Need to re-think deployment of “social” tools for business use.*

☺ *With some thought, internal applications can be secured & managed.*

Platforms

- Internet
  - IPV6
    - IPV4 addresses will run out around 2011 [Vint Cerf]
    - IS being rolled out within carriers
    - Gateways may need upgrades

☺ *At least the LAN should be able to stay on IPV4.*

Platforms

- Virtualization
  - Support for VM included in Linux
  - CPU vendors adding support for VM within the chip.
  - VMWare offers a free version of the run-time engine
    - This enables entire systems to be distributed as VMWare images
  - Microsoft including VM in Server 2008

☺ *This is another step on the road to OS/Hardware decoupling.*

☺ *Virtualization may be the "easy" way to get performance out of multi-core CPUs.*

☹ *New "hammer" to fix everything*

Storage

- Grid Oriented Storage
  - Integrated appliance for distributing/accessing data across a Grid infrastructure[1]

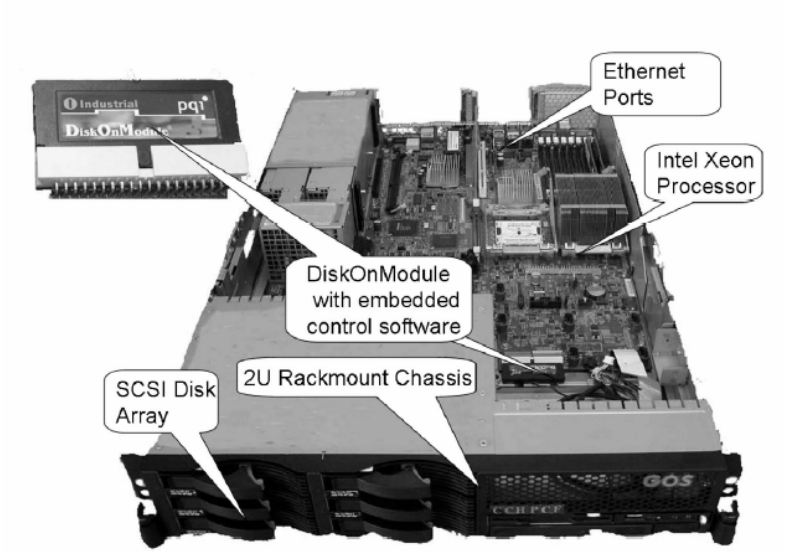


Fig. 2. A Grid-Oriented Storage (GOS) unit and its DiskOnModule with embedded control software.

☺ *A new storage paradigm that is needed for GRID computing that is data-intensive.*

1. [Grid Oriented Storage: A Single-Image, Cross-Domain, High-Bandwidth Architecture; IEEE Transactions on Computers, Vol.56, No.4]

Storage

- Virtualization/Consolidation
  - SANs are becoming standard in datacentres
    - FC/FICON in large enterprise
    - iSCSI becoming prevalent in SMB (single network technology)
  - ☺ *Decoupling of compute/storage is a good thing. Actually have a Data-centre instead of a Server-centre.*
  - NAS Appliances now available for consumer
    - E.g. D-Link DNS-323: RAID-1, 1000Base-T, FTP/CIFS
    - Add 2 SATA disks to make 1TB NAS at $0.75/GB
  - ☺ *Consumer networked storage will help to drive down costs of enterprise-class.*

Architecture

- Services Oriented Architecture
  - Application SOA
    - The “A” is for Architecture
      - Hot new thing – very difficult to implement – vendors have product but you need an architecture (the “A” in SOA).
  - Infrastructure
    - Thinking of infrastructure as a set of services shouldn’t be new
      - Need to develop patterns (like the SOA for applications) to help people understand the value.
  - 😐 *The complexity of computing solutions today **requires** an abstraction layer. Architecture, (Application, Data, and Infrastructure) should provide that abstraction.*
  - ☺ *Virtualization technology is slowly making this possible – Architecture is a conceptual virtualization of the IT systems.*

Futures

- I think therefore I am
  - Brainwave Authentication[1]
    - The latest “Biometric” authentication system.

☺ *There’s always something new to lose sleep over.*

1. [Person Authentication Using Brainwave (EEG) and Maximum A Posteriori Model Adaptation; IEEE Transactions on Pattern Analysis and Machine Intelligence Vol.29, No.4]

Wrap-up

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