Vatic Technologies
Architecture Planning for Technology

Don's Diatribe IX

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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

- Solaris
  - Sun moving to an OpenSource model
    - OpenSolaris
      - Available for x86
      - Ported to IFL+z/VM by Sine Nomine
      - “Legal” under IBM IFL licence as of November 2008?

☹ *IBM not making a lot of noise? Will support be continued?*

☺ *Opportunity to consolidate to a single HW platform / standardize OS.*

☺ *Java is also available as OpenSource*

Operating Systems

- Windows
  - "Longhorn" (Windows Vista/Server 2008) is here (and gone?)
    - Will need more horsepower than most enterprise desktops carry
    - Gartner [and others] are suggesting 2010 for full deployment
    - Hardware upgrades required
    - Linux Instead?
    - "Downgrade" options with Vista
    - Most people are waiting for Windows 7 (2009/2010)
    - Windows 7 upgrade path requires Vista (can't go from XP)
    - XP support till 2010?

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

😐 *I'm hoping for some "value" in Windows 7 that will convince me to upgrade (maybe a client-side VM, or enhanced multi-core support)*

😐 *Application support in Vista/7 concerns me; my XP migration was nightmare-ish.*

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)
    - 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*
  - IEEE 802.11n
    - Standard is due to be ratified by the WG in January 2010
    - Pre-standard products being delivered in enterprise now. ☺
    - Must use 5GHz band to achieve advertised data rates
  - ☹ *Increase in 802.11 deployments will result in increased interference and lower data rates.*
  - ☹ *802.11a deployments will be susceptible to interference*

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?]
    - The “other side” of the customer gateway will probably be IP.
    - 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]*

😐 *Use of IP in the backbone means all the phones are essentially VOIP.*

☹ *North America is suffering from the desire of carriers to bundle content with services.*

Security

- New Attack Vectors
  - What's Out:
    - Viruses
  - What's In:
    - Worms using zero-day exploits (e.g., "conficker")
    - 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, …]*
  - ☹ *Current economic climate is encouraging the "shadow economy".*

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.
    - Worm distribution via social networking
    - Twitter worm (just discovered this week)

☹ *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

- 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.*

☹ *Attack vector is shifting to use social engineering to activate exploits. Does this nullify the usefulness of the firewall?*

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)

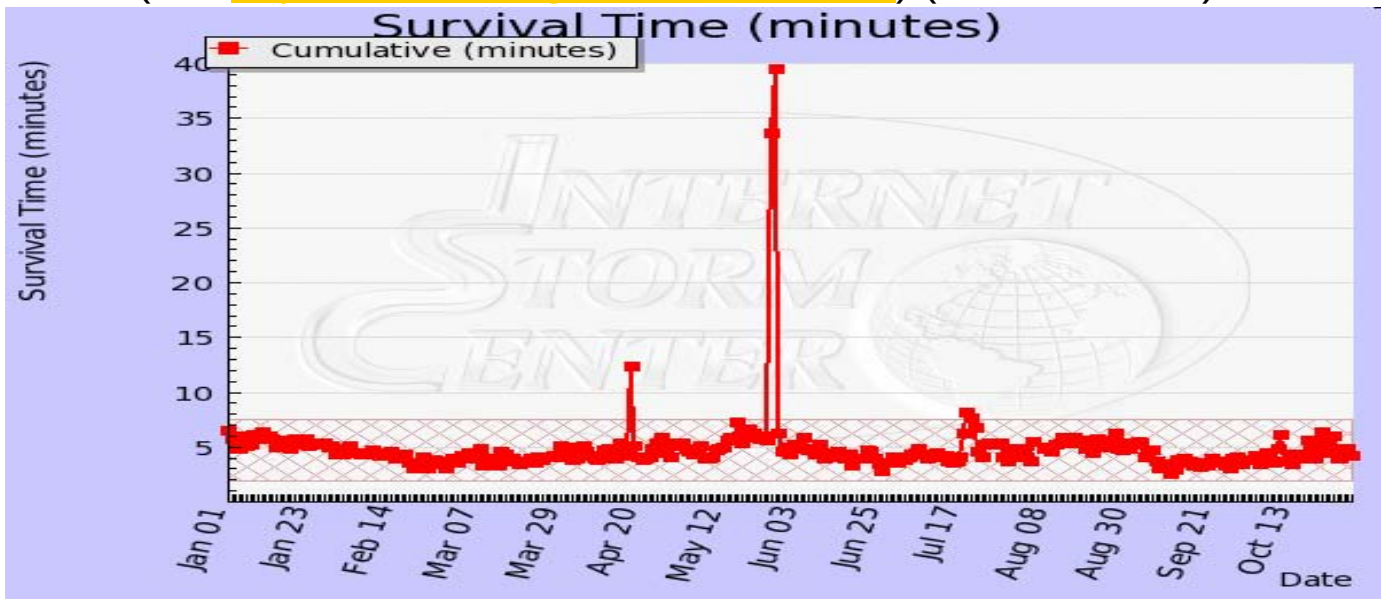
☹ *Requires a bit more knowledge than the general home user.*

☺ *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 machine lasts less than 10 minutes on the internet. (see http://isc.sans.org/survivaltime.html) (2008 Jan-Nov)



☺ *MS has adopted out-of-band patching (APAR?) for critical/zero-day problems.*

Platforms

- zSeries emulators are dead?
  - IBM licensing issues with PSI
  - FLEX-ES systems are expiring
  - IBM won't licence z/OS on Hercules
  - IBM doesn't seem to want to make their internal zPDT tool available.

☹ *Small development shops are going to have to move to a shared system provided by IBM.*

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

- Smart Phones
  - Apple, RIM, Google, Palm all have products
    - Too expensive for consumer?
    - Application lockdown (end of “generative internet” – Communications of the ACM)
    - Security
  - ☹ *I think the internet service is too slow and too expensive to be useful*
  - 😐 *LTE may provide sufficient bandwidth, but the price may still be too high.*
  - ☹ *The PDA functions are hard to expand (e.g., sync with Linux systems?)*
  - ☺ *Competition <u>should</u> bring the price down.*

Platforms

- PHP Considered Harmful ?
  - Much “Social Networking” software uses PHP
    - Lots of vulnerabilities.
    - Easy to write “bad code”.
    - Scanning for vulnerable systems is rampant.

☹ *Would you write banking apps with ISPF dialogues and CLIST/Rexx? (i.e. HTTP+PHP+Perl)*

Platforms

- Everything is a computer
  - Software failures can impact daily life
    - Tech writer ended up with “bricked” DVD/BluRay player
    - Microcode error in Seagate HD

☹ *Vision of ’70s was to replace discrete logic with processors and software. We’re there and it’s not as pretty as it seemed at the time.*

☹ *Will get worse as devices network. How about malware that spreads from an infected movie through your DVD player and “bricks” you new $5,000 HD television?*

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?*

☹ *ISP association lost in bid to have CRTC rule against Bell.*

☹ *“Silo” content to particular carrier?*

Platforms

- Internet
  - IPV6
    - IPV4 addresses will run out around 2011 (800 days!) [Vint Cerf]
    - *Is* being rolled out within carriers
    - Gateways may need upgrades
    - Everyone gets a “static” IP?

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

☺ *Static IP which makes running local services easier? (home web server)*

☹ *Static IP makes privacy harder? (everyone <u>knows</u> who you are)*

☺ *Static IP make authentication possible? (similar to caller-ID)*

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*

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 (I've just upgrade to a quad-core desktop) 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!*

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/SAN 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
    - Netgear ??? RAID-0/1/2/3/4/5/6, Dual 1000Base-T, NAS & iSCSI SAN
      - 2TB RAID-5 version at $0.75/GB
      - 4TB RAID-5 version at $0.50/GB

☺ *Consumer networked storage will help to drive down costs of enterprise-class.*

Architecture

- "Cloud Computing"
  - SAAS by another name
  - Ultimate outsourcing
  - Concerns regarding security, integrity, availability
  - All the issues with outsourcing with a much smaller "stick" on the consumer side.

☹ *All the issues with outsourcing with a much smaller "stick" on the consumer side.*

☺ *Insourced "cloud" may be the driver of infrastructure architecture.*

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.*
  - ☺ *Cloud <u>requires</u> SOA infrastructure.*

Futures

- Current economic “crisis”
  - All malware attack measures are increasing.
  - Underground economy is thriving (either prices or volume is up).
  - Unemployment is driving people to seek “alternative” means of making money.

☹ *The “bad guys” are doing quite well.*

Futures

- Changing workforce/user community
  - User community that is adept with using tools but does not necessarily understand how they work.
    - Circumventing corporate browsing controls
    - Connecting to outside services using personal devices (i.e. smartphone)
  - We need to educate the users about technology risks?
    - Vendors won't do it (it cuts into their sales)
    - Parents can't do it (don't know the technology well enough)
    - Schools?

☹ *Maybe we need an licence to surf the internet super-highway.*

Wrap-up

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