



Vatic Technologies  
Architecture Planning for Technology

# Don's Diatribe IX

Don Melton

Vatic Technologies Limited

# Disclaimers

---

- ❑ All opinions expressed in this presentation are those of the presenter and are not necessarily those of Vatic Technologies.
- ❑ All of the issues, discussions, and opinions in this presentation have been drawn from publicly available information.
- ❑ All trademarks are the respective property of the trademark owners.

# 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 should 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 knows 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 requires 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

---



Don Melton

Senior Consultant, Vatic Technologies Limited

e-mail: [meltond@acm.org](mailto:meltond@acm.org)

Telephone: 416-366-9608