Social Networking and Cybersecurity

NDIA San Diego Cyber Symposium
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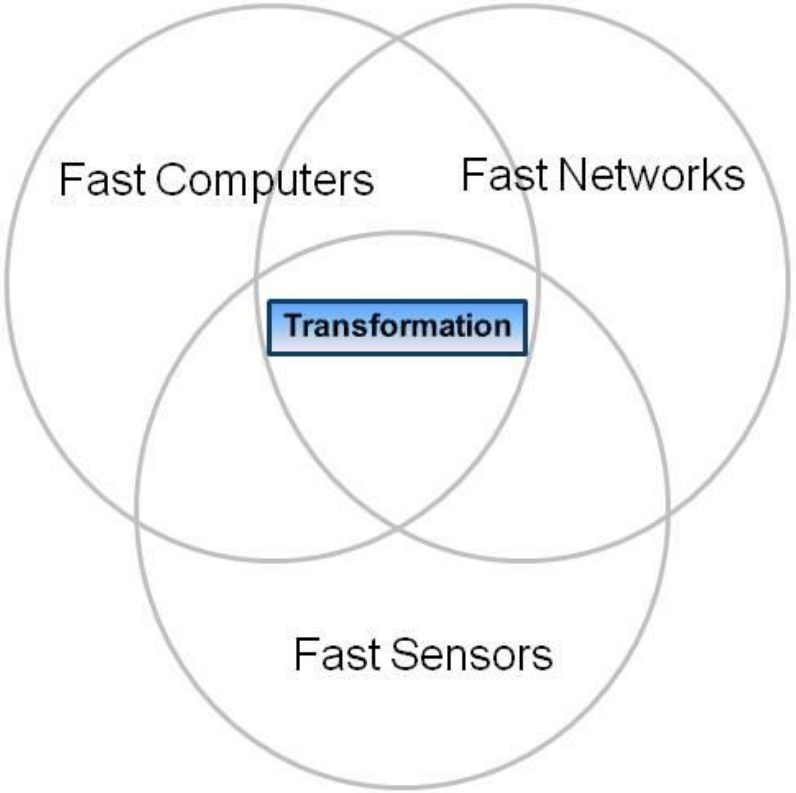
Concluding Thoughts

- You cannot maximize both data sharing and data protection completely

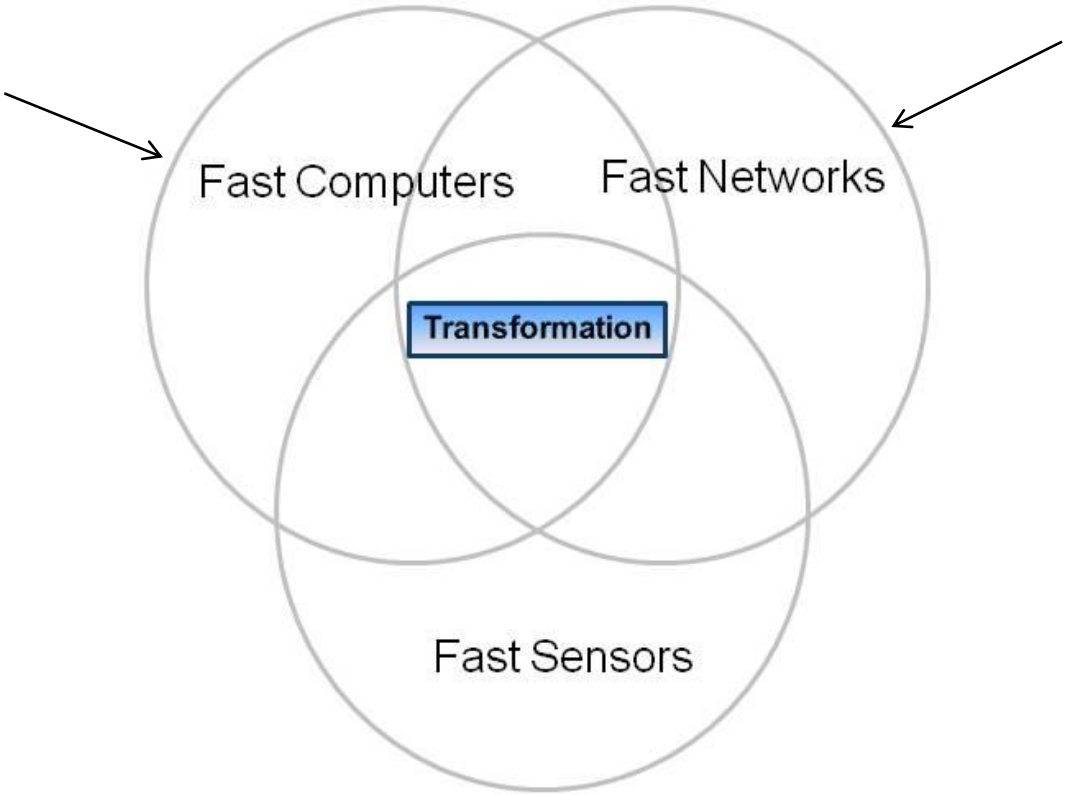
Context and Implications

- We need to keep in mind that Social Networking as we know it and Cloud Computing as we imagine it are merely a point in a continuum
- To better understand either or both it is useful to understand not just what they seem to mean now but why now
- Further we may understand a little better what will come next (though I do not)

My Version of Context



Where We Are Today



Transactional Cost Economics

- What do you know about Ronald Coase?
- He provided an explanation for the economic basis for a corporation ‘s existence
  - The higher the cost for a ‘transaction’, the more advantageous to integrate that capability internal to the corporation
- BUT – when transactional costs are reduced dramatically by the impact of the Internet, what then?
- For example, Proctor and Gamble …

The Impact of Fast Computers and Especially Fast Networks

- Social Networking
  - It is possible to create widely distributed, large networks in many geographies
  - All kinds of content can be distributed
  - The impact is bi-directional; it changes the users too
- Cloud Computing
  - It now becomes cheaper to access data centers outside than having them inside

Sample Statistics From Facebook

- More than 300 million active users
- 50% log on to Facebook in any given day
- The fastest growing demographic is those 35 years old and older
- More than 8 billion minutes are spent on Facebook each day (worldwide)
- More than 2 billion photos uploaded to the site each month
- More than 14 million videos uploaded each month
- More than 2 billion pieces of content (web links, news stories, blog posts, notes, photos, etc.) shared each week
- About 70% of Facebook users are outside the United States
- More than one million developers and entrepreneurs from more than 180 countries
- There are more than 65 million active users currently accessing Facebook through their mobile devices.

From NIST's Presentation Yesterday About Clouds

A Working Definition of Cloud Computing

- Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.
- This cloud model promotes availability and is composed of five essential **characteristics,** three **service models**, and four **deployment models**.

5 Essential Cloud Characteristics

- On-demand self-service
- Broad network access
- Resource pooling
  - Location independence
- Rapid elasticity
- Measured service

3 Cloud Service Models

- Cloud Software as a Service (SaaS)
  - Use provider's applications over a network
- Cloud Platform as a Service (PaaS)
  - Deploy customer-created applications to a cloud
- Cloud Infrastructure as a Service (IaaS)
  - Rent processing, storage, network capacity, and other fundamental computing resources
- To be considered "cloud" they must be deployed on top of cloud infrastructure that has the key characteristics

4 Cloud Deployment Models

- Private cloud
  - enterprise owned or leased
- Community cloud
  - shared infrastructure for specific community
- Public cloud
  - Sold to the public, mega-scale infrastructure
- Hybrid cloud
  - composition of two or more clouds

General Security Advantages

- Shifting public data to an external cloud reduces the exposure of the internal sensitive data
- Cloud homogeneity makes security auditing/testing simpler
- Clouds enable automated security management
- Redundancy / Disaster Recovery

Cloud Security Challenges Part 1

- Data dispersal and international privacy laws
  - EU Data Protection Directive and U.S. Safe Harbor program
  - Exposure of data to foreign government and data subpoenas
  - Data retention issues
- Need for isolation management
- Multi-tenancy
- Logging challenges
- Data ownership issues
- Quality of service guarantees

Cloud Security Challenges Part 2

- Dependence on secure hypervisors
- Attraction to hackers (high value target)
- Security of virtual OSs in the cloud
- Possibility for massive outages
- Encryption needs for cloud computing
  - Encrypting access to the cloud resource control interface
  - Encrypting administrative access to OS instances
  - Encrypting access to applications
  - Encrypting application data at rest
- Public cloud vs internal cloud security
- Lack of public SaaS version control

Additional Issues

- Issues with moving PII and sensitive data to the cloud
  - Privacy impact assessments
- Using SLAs to obtain cloud security
  - Suggested requirements for cloud SLAs
  - Issues with cloud forensics
- Contingency planning and disaster recovery for cloud implementations
- Handling compliance
  - FISMA
  - HIPAA
  - SOX
  - PCI
  - SAS 70 Audits

Cost of Traditional Data Centers

- 11.8 million servers in data centers
- Servers are used at only 15% of their capacity
- 800 billion dollars spent yearly on purchasing and maintaining enterprise software
- 80% of enterprise software expenditure is on installation and maintenance of software
- Data centers typically consume up to 100 times more energy per square foot than a typical office building
- Average power consumption per server quadrupled from 2001 to 2006.
- Number of servers doubled from 2001 to 2006

Cloud Economics

- Estimates vary widely on possible cost savings
- “If you move your data centre to a cloud provider, it will cost a tenth of the cost.” – Brian Gammage, Gartner Fellow
- Use of cloud applications can reduce costs from 50% to 90% - CTO of Washington D.C.
- IT resource subscription pilot saw 28% cost savings - Alchemy Plus cloud (backing from Microsoft)
- Preferred Hotel
  - Traditional: $210k server refresh and $10k/month
  - Cloud: $10k implementation and $16k/month

Back to the story

And Those Fast Sensors? They Are Happening Already

- It starts with the addition of fast sensors to the fast computers and fast networks that are now in place in much, though not all, of the country
  - Sensors become participants in the network, not just passive receptors of instructions or senders of data
  - It becomes possible to perform real-time simulations in real-time with real-time data
- And thus virtual environments and ‘real’ environments being to comingle
  - Becomes possible to emulate accurate representations of reality in real-time for interpretation and management
  - The implications are enormous and hard to predict

And Thus My Opinion of Web 3.0

- Passive Internet
- Active Internet
- Immersive Internet

And Change Is Still Accelerating

- We are more willing to admit our inability to have predicted the present than we are our inability to predict the future
- However …
  - We will guess wrong even more frequently than we do now
  - Even when right, it will often be irrelevant since we will react too slowly
  - Thus when we invest internally in such decisions we will be wasting money
- AND THEREFORE
  - We will find that the power is in the connections, not the endpoints
  - It is less important as to what, perhaps not even who, but how many you know
  - Not how much you know, but how much and how well you share
  - And all of this will have as a foundation the use of what we refer to now as social networking
- Organizations who do not adapt may fail and disappear

Who thinks that Governments will not be faced with the same dilemma and potentially with the same result?

Concluding Thoughts

- You cannot maximize both data sharing and data protection completely

From the January 16, 2009 Congressional Quarterly Today – Online News – Intelligence:

*Michael McConnell on Friday said “I believe we failed the nation at 9/11 because there was sufficient information in the system that had it been properly recognized, shared, and considered, we probably would have reacted in a different way”

“There is a constant tension between information sharing and protecting sources and methods, but as much as possible you want to share information.”

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