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This Was Big Data

Me in College!
What Is Big Data?

Big Data is a collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications.
Universal Access

Imagine a world where there may be as many as 50 billion devices all connected to each other, offering new types of services and opportunity for people, business and government.
Benefits?

- Increased Dialogue
- Uncover sentiment
- Analyze Threats
- Detect Sensitive Information
- Predictive Analysis
- Increased Production
- Potential Efficiencies
- Reducing Barriers to Participation
- Enterprise-Wide Insights
- Knowledge
- Once Invisible Correlations

http://www.youtube.com/watch?v=JcSzqm5Whwc
So What Does It All Mean?

- Countries once considered less advanced due to minimal/no infrastructure jumped straight to the wireless/mobile age on broad scale…in some cases well ahead of us
- U.S. surpassed in broadband internet penetration (access and technical job placement)…by those with not necessarily similar views or ideals

Threat to our nation? Our Way of life? Our security?
Challenges

• Efficiently and effectively navigating the massive waves of data as a combat multiplier vice getting inundated…leading to a state of analysis-paralysis

• Data Protection

• Difficulty in distinguishing fact from fiction…data in context!
Once You Have the Data?

Then you can...

- Collaborate
- Analyze
- Understand

- Predict
- Prevent
- Neutralize
Why Is This Important to the Community?

http://www.youtube.com/watch?v=InIX6LaoAHo
Back-up
Industry Predictions

Wikibon Predicts the following for growth in universal access as it relates to Big Data.
Industry Trends with Big Data

Big Data Explosion
Data Size - 90% of data today is unstructured, and getting larger and larger
Data Access – difficulty in getting agencies to share their data
Data Governance – differences in ownership, timing, quality, level of detail of the data
Data Location - moving data around for analysis, storage - move only what they are interested in

Diversity of IP Networks—Media, Bandwidth Rates, and Conditions
Variable bandwidth rates (slow to super-fast)
Bandwidth rates increasing—costs decreasing
Network media remains diverse (terrestrial, satellite, wireless)
Conditions vary—all networks prone to degradation over distance

Global Workflows—moving Big Data over WANs
Greater integration, information sharing, and information safeguarding
Common IT approach that substantially reduces costs
Moving away from isolated, private clouds

Cloud Computing Grows Up
Amazon Web Services (AWS) S3 cloud storage – 2010: 262 billion objects, 2012: 1.3 trillion objects
More choices: Microsoft Azure, OpenStack, HP Cloud
No longer a niche – CIA (AWS), NASA (OpenStack & Rackspace), NAIAD (Windows LiveMesh)
Big Data Cloud Storage Challenge

1st Bottleneck

The WAN

Transfers over the WAN are TCP based (FTP, SCP, HTTP etc)
Single HTTP: <10 Mbps
Multi: <10 -100 Mbps

2nd Bottleneck

The Data Center

“Last-foot” local transfers from server to object storage can use multiple HTTP connections
Single HTTP: <10 -100 Mbps
Goals & Objectives

- Estimated cloud exchange path
  - Define the build
- How do we share data?
- Compatible / commodity infrastructure

The Intersection
How do we get there from here?
Where we play now

Army  Navy

Where we should be playing

- Separate discrete systems
- Many barriers to sharing (physical & Logical)
- Ad-hoc communication structure requires too much human-in-the-loop
Who Is Doing What?

Define roles and responsibilities
Show the evolution

JAN-MAR (3 Mon.)
- Define the Checklist
  - NSA
  - Army
  - Navy
  - NGA
    - Data-flows
    - Tier zero
    - SWASN

APR-JUN (3 Mon.)
- Next level
  - Architecture
  - Guidance
Assumptions

- The ‘Disconnected’ argument
- Security (S/C – SCI)
  - UAS available and approved
- PL3 / PL4 environment
- Ability to normalize the cost model
- Hybrid approach
- **Prevent Strategic Surprise**
  - Connect the dots
  - Cyber threats

Challenges

- Terms of reference
- Process
- Culture change
- Acquisition process
  - How / What / Resources

Assume Challenge!

- Service Programming (agency)
- DISA working capital fund

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**Incentive model**

Sharing in gap closure

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The Art of the Possible

Current state is…
- Complex
- Pre-negotiated

Known Gaps
- Delta’s in Architecture
  - Address key processes
  - Define / Dry book
- CONOPS, TTP’s, Doctrine
  - Non-material
  - Material
- ID – Mitigate – Address approaches to solutions
- Understanding services in new architecture
  - Inter-cloud services
- Current definitions / Business Model
  - Industry
  - Government

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So What

• Change decision paradigm
• Influence how we use big data
• Describe / Outline the path to individual Action
  • Big Data Empowerment
Summary

• Address technology space for sharing & Collaboration
• Approach – use real world relevant threads
  • -FOCUS-
  • Emphasis on “Real”

“To succeed we must first be willing to fail”