

Resilient Week 2013

Keynote

Resilient Communications: Current Challenges and the Critical Need for Impactful Innovation

Dr. Rangam Subramanian, MBA

Chief, Wireless Technology and Business Strategy
National and Homeland Security Directorate
Idaho National Laboratory
Idaho Falls, ID

630 803 4759, rangam@inl.gov,
vsubramanian@kellogg.northwestern.edu

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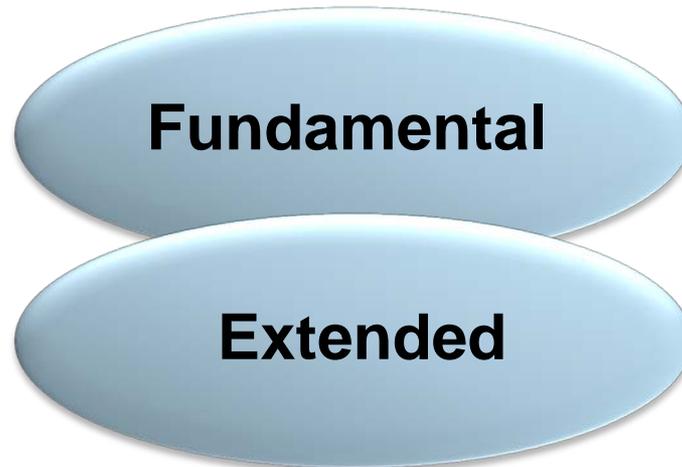
Agenda

- Communication Resiliency Definition
- Characteristics of Resilient Networks
- Impending Challenges to Resilient Communications
- Key Research Areas to Advance Resilient Communications
- Collaboration for Next Generation Resilient Communications
- Conclusion

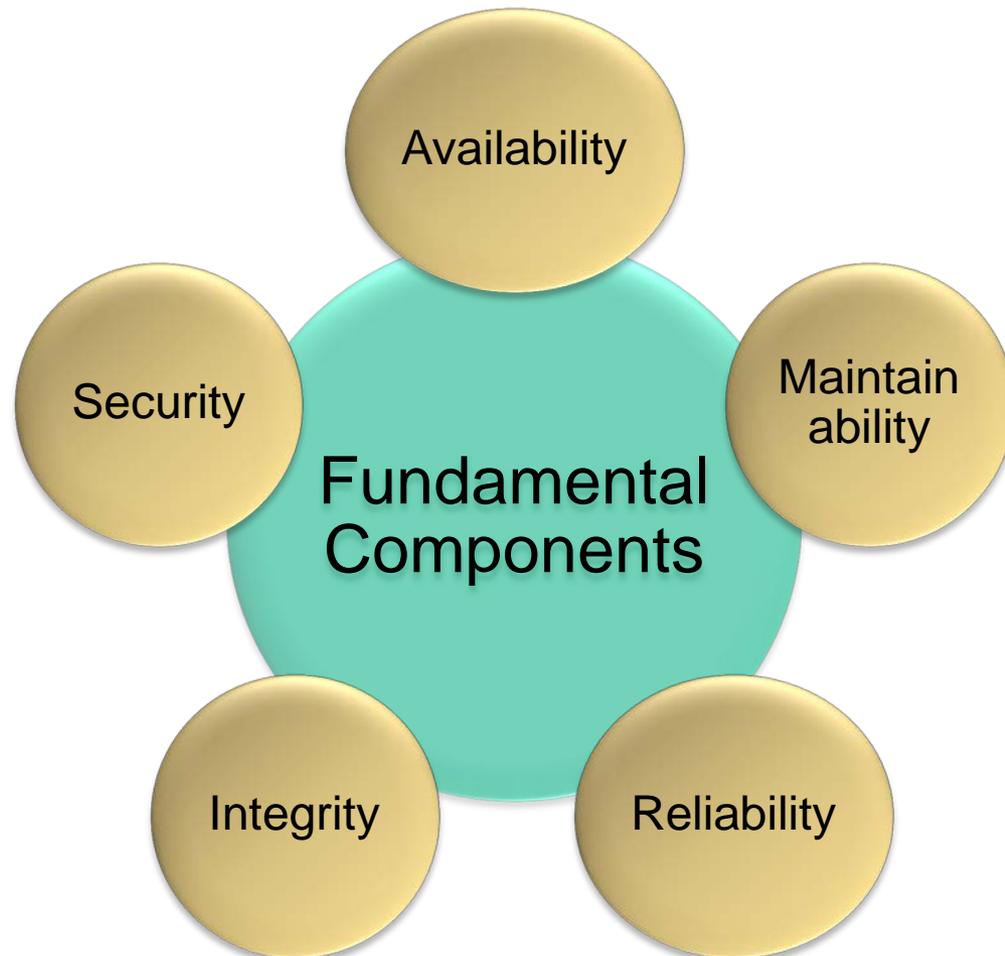
Communications Resiliency

“Acceptable level of service in the presence of faults or challenges to normal operations either due to natural or man-made effects”

Resilient Communication Components



Fundamental Resilient Communication Components



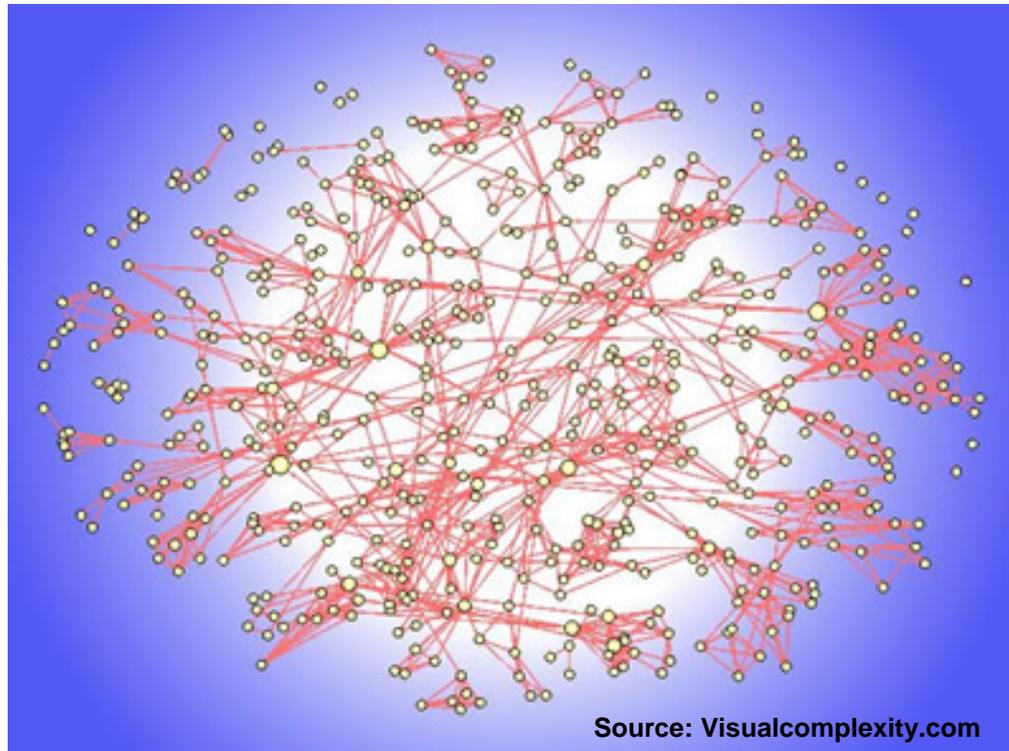
Key Resilient Communication Components



Impending Challenges to Resilient Communications

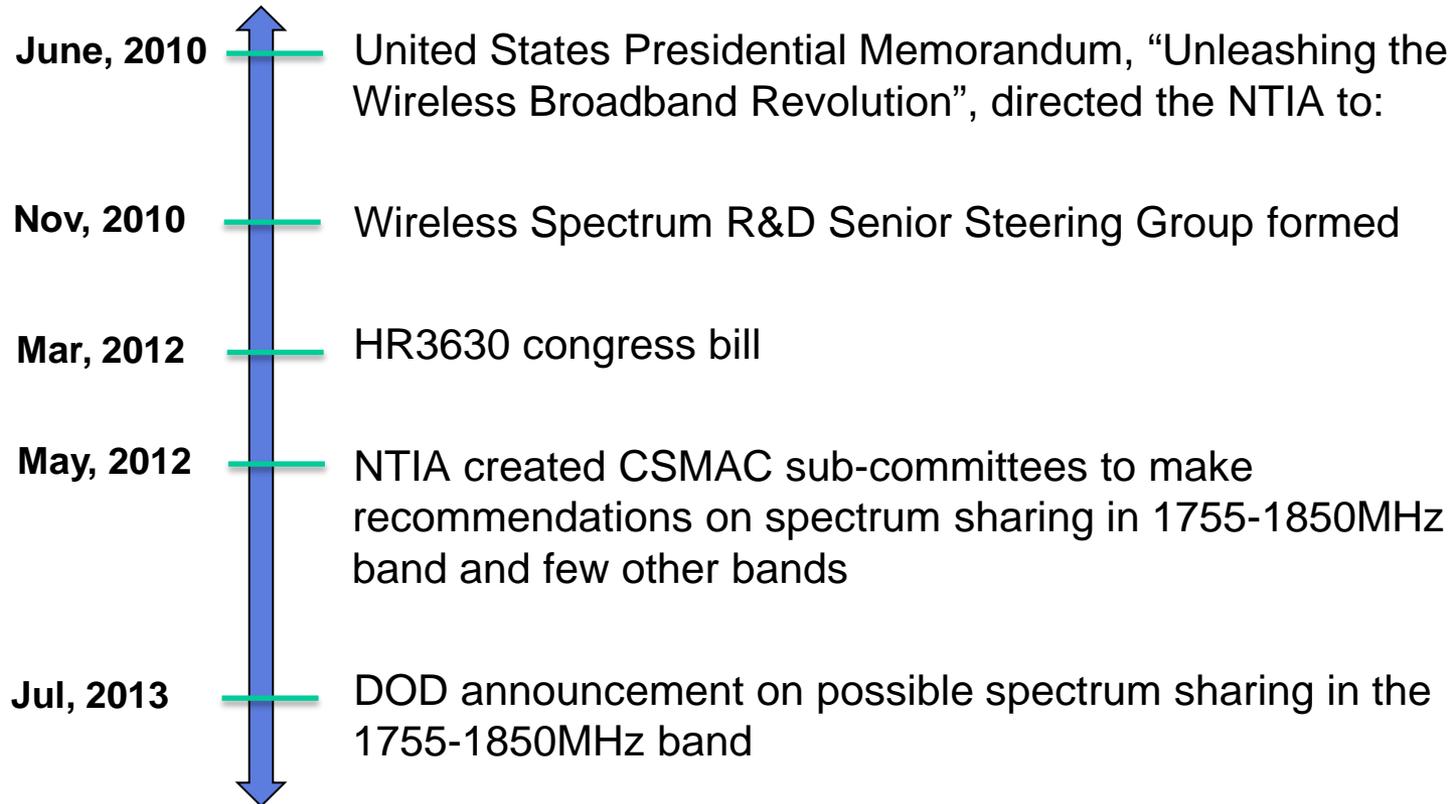
- Network complexity
- Communications resource availability, especially spectrum
- Managing the big data challenge
- Securing the enterprise
- Costs and changing economic models

Network Complexity



- **Plethora of Networks: PLMN, 2G/3G/4G, LMR, P25, Fiber, Microwave, Ethernet, WiFi, BlueTooth, aerial, others**
- **Public Safety: Critical need for talk around networking during emergencies**

The National Wireless Innovation and Spectrum Sharing Initiative



Exponential Wireless Growth

Some Examples

87% of American adults on a cell phone, and 45% of those are smart phones

82% take pictures on their cell phones, up from 76% in 2010

29% check their bank account online, up from 18% in 2011

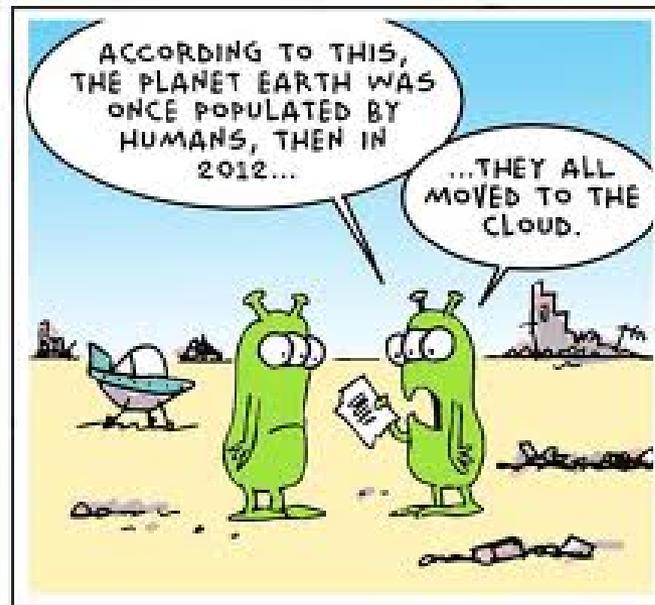
29% check their bank account online, up from 18% in 2011

29% check their bank account online, up from 18% in 2011 71% of smartphone users that see TV ads will immediately do a mobile search

The average American spends 30 minutes a day checking or updating social networks.

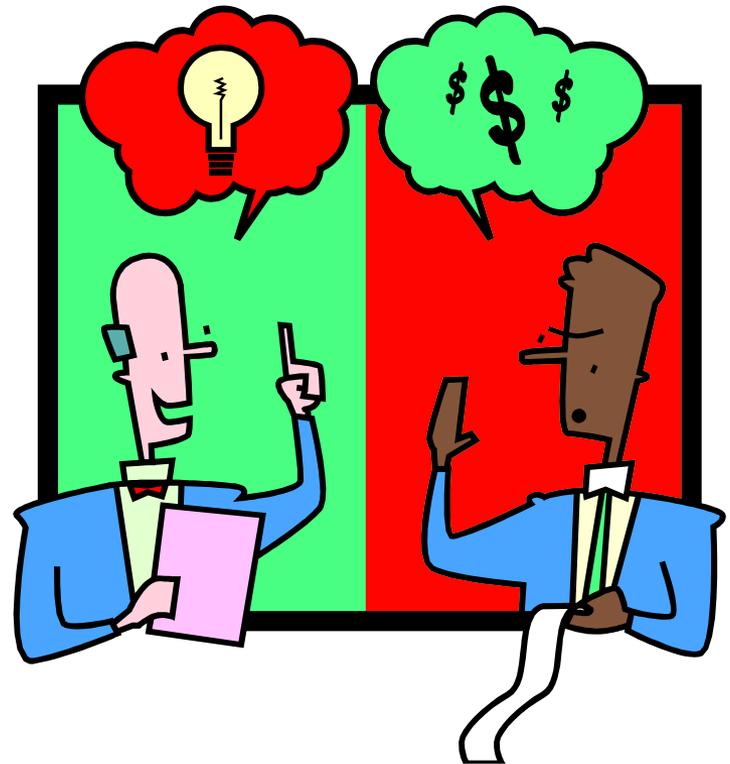
Managing the big data challenge

- **Huge explosion of data across the network**
- **Communications network resiliency - capacity, throughput, latency and fault tolerance, will decide big data management and delivery**



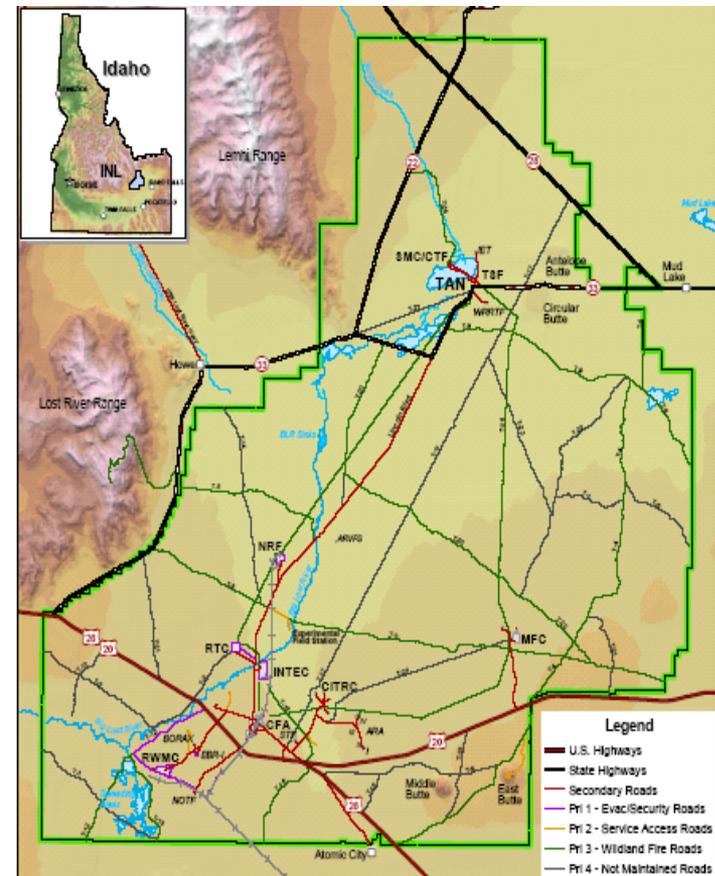
Costs and Changing Economic Models

- ***Costs of access and maintenance to multiple networks – E.g. Public safety, Smart grid***
- ***Cost models for resiliency in sharing***
- ***Resiliency of user access – has economic opportunities and difficulties***

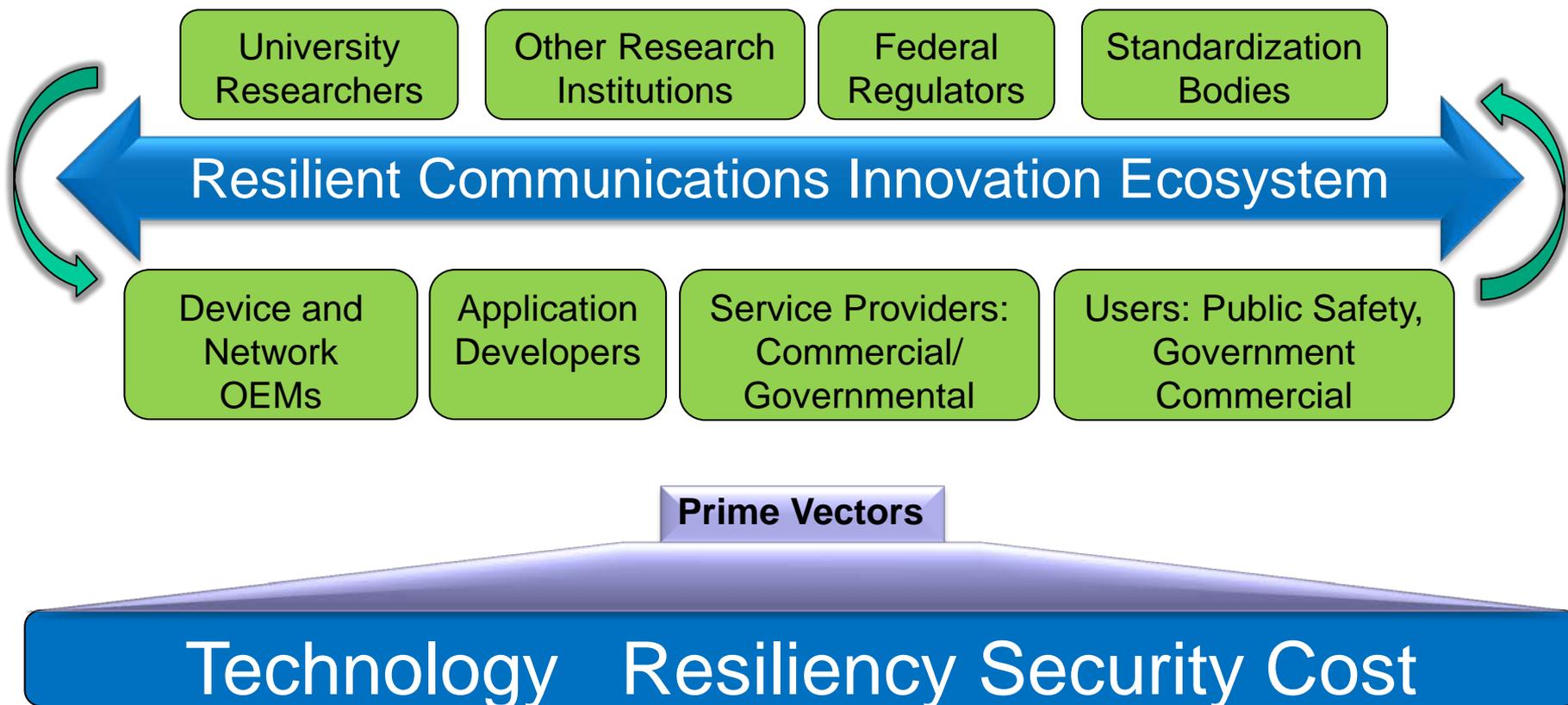


Key Research Areas

- Network Architecture
- Cognitive RF Layer, devices, antenna systems
- Medium access layer, policy implementation
- Dynamic Routing, Transport: Alternative to IPvX?
- Resilient applications
- Data management systems for communications networking
- Realistic Testbeds



Collaboration for Next Generation Resilient Communications





Thank You!

Rangam@inl.gov

208-526-0870