

# On Enterprise Information Systems and Cyber Threats: Some Pentagon's Shortcomings and Newer Initiatives

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## What about

The newer Pentagon activities:

**Cloud Strategy and Artificial intelligence.**

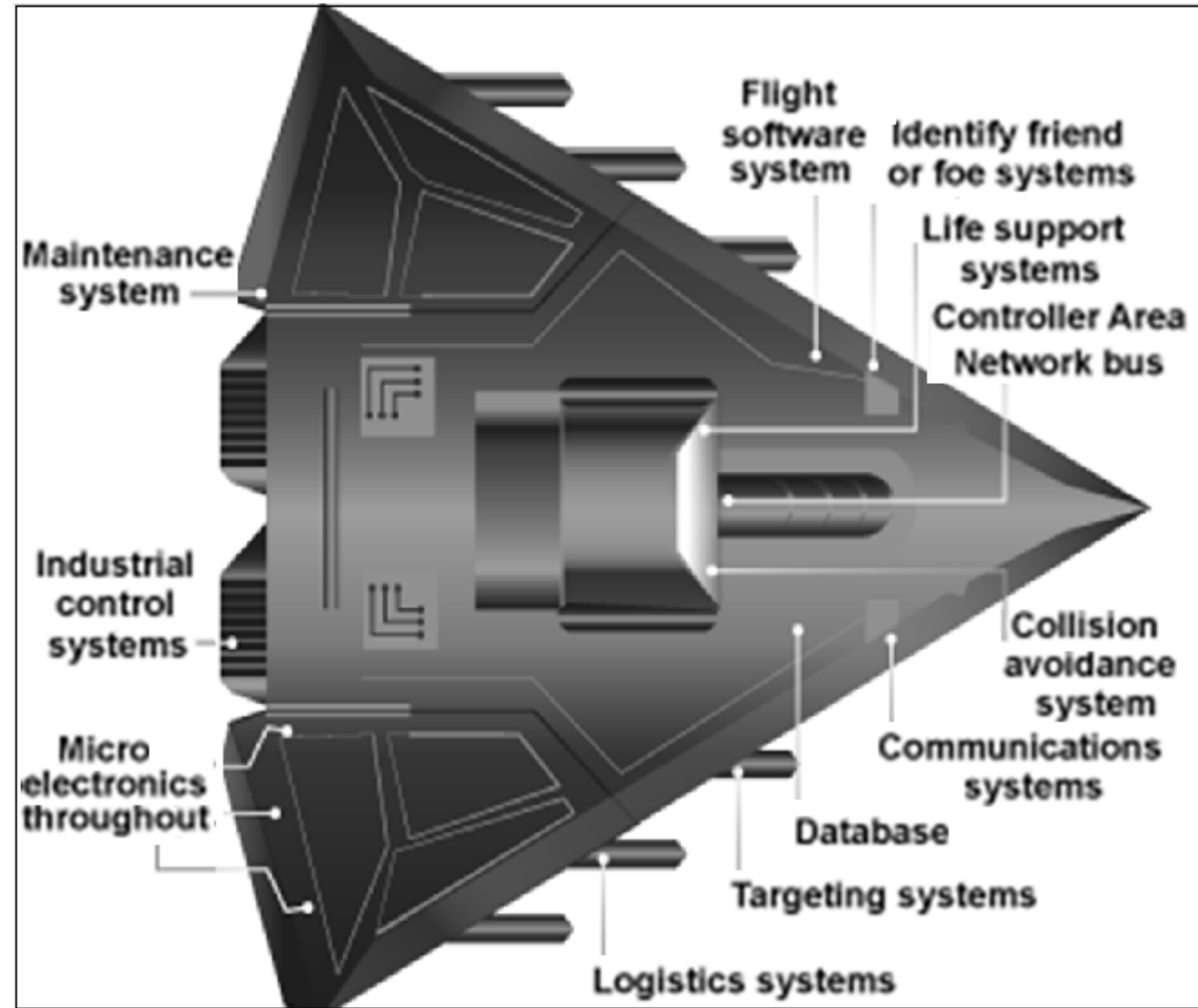
This Pentagon's new strategy after the shortcomings

**1) Joint Information Environment**

**2) its key cyber-security equipment - Joint Regional Security Stacks.**

## *Case 1. DoD cyber threats (2018)*

GAO report of October 2018: the United States weapons systems developed between 2012 and 2017 have severe, even “mission critical” cyber vulnerabilities.



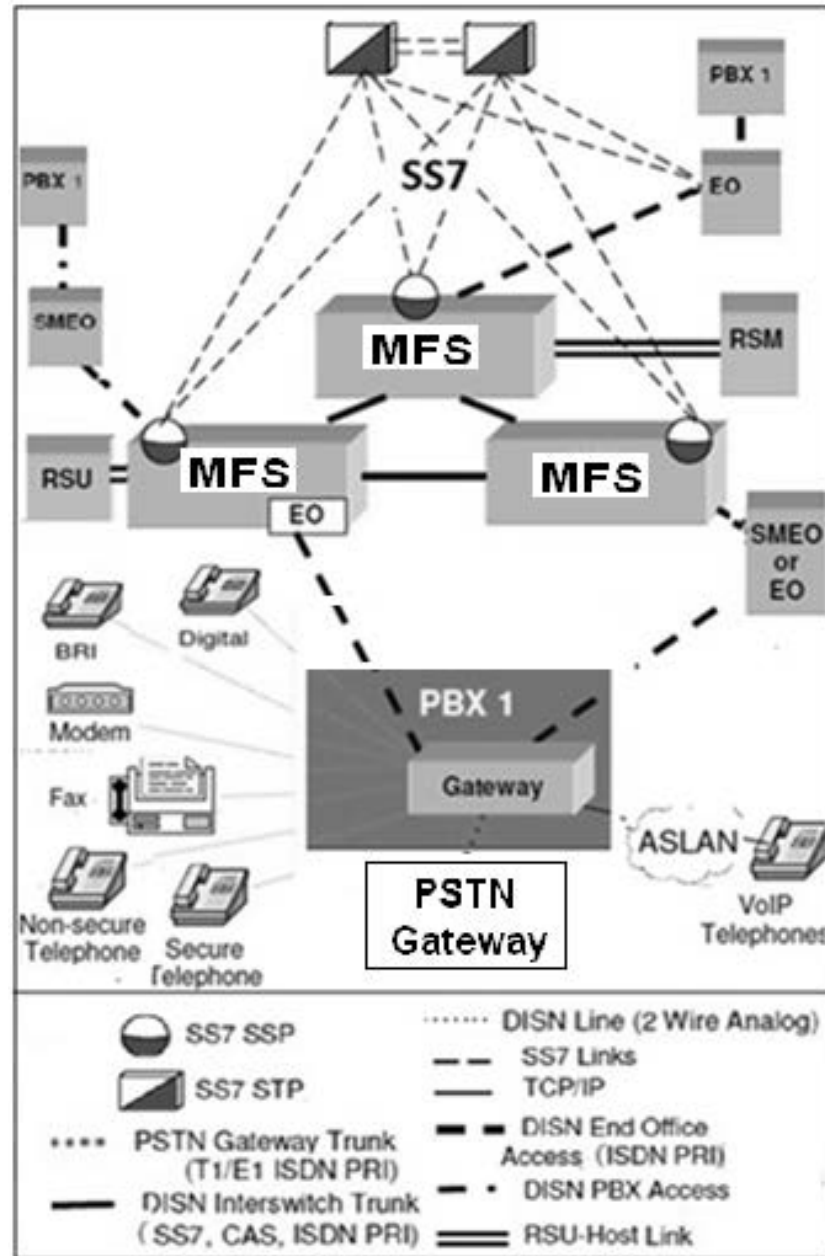
## *Case 2. On the aging DISN (AT&T experts' view, 2018)*

DoD today still has analog, fixed, premises-based, time-division multiplexing (TDM) and even asynchronous transfer mode (ATM)

DISN architecture is based on point-to-point circuits

15,000 separate networks comprise the DoD's network,  
were built by hundreds of different companies

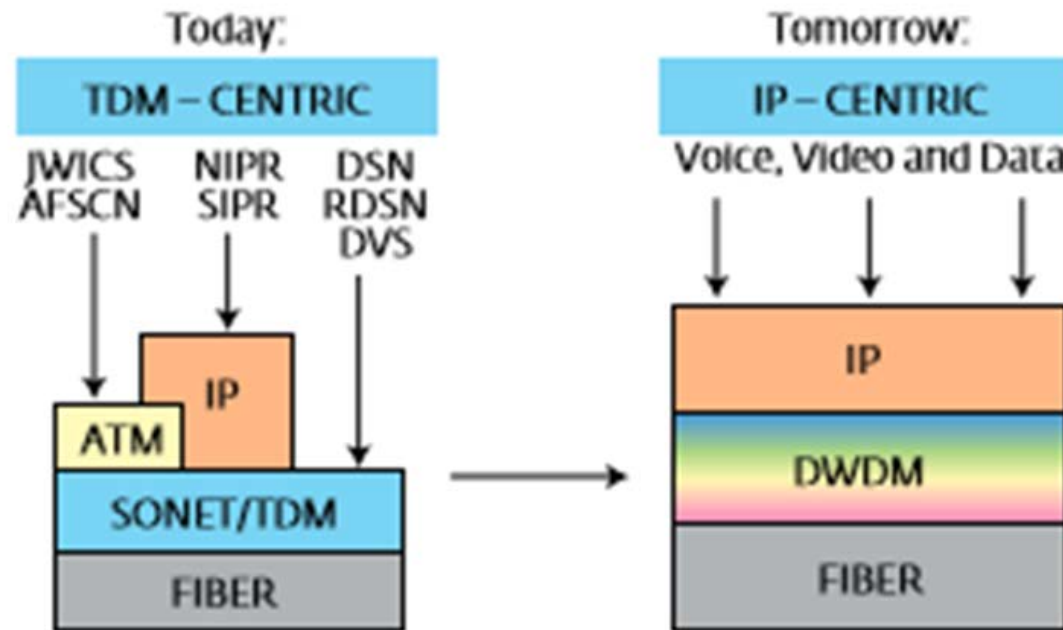
# DISN JOINT VISION 2010: SS7 & AIN



But...the simplified DISN  
view up to now

# DISN JOINT VISION 2020: from SS7 to IP

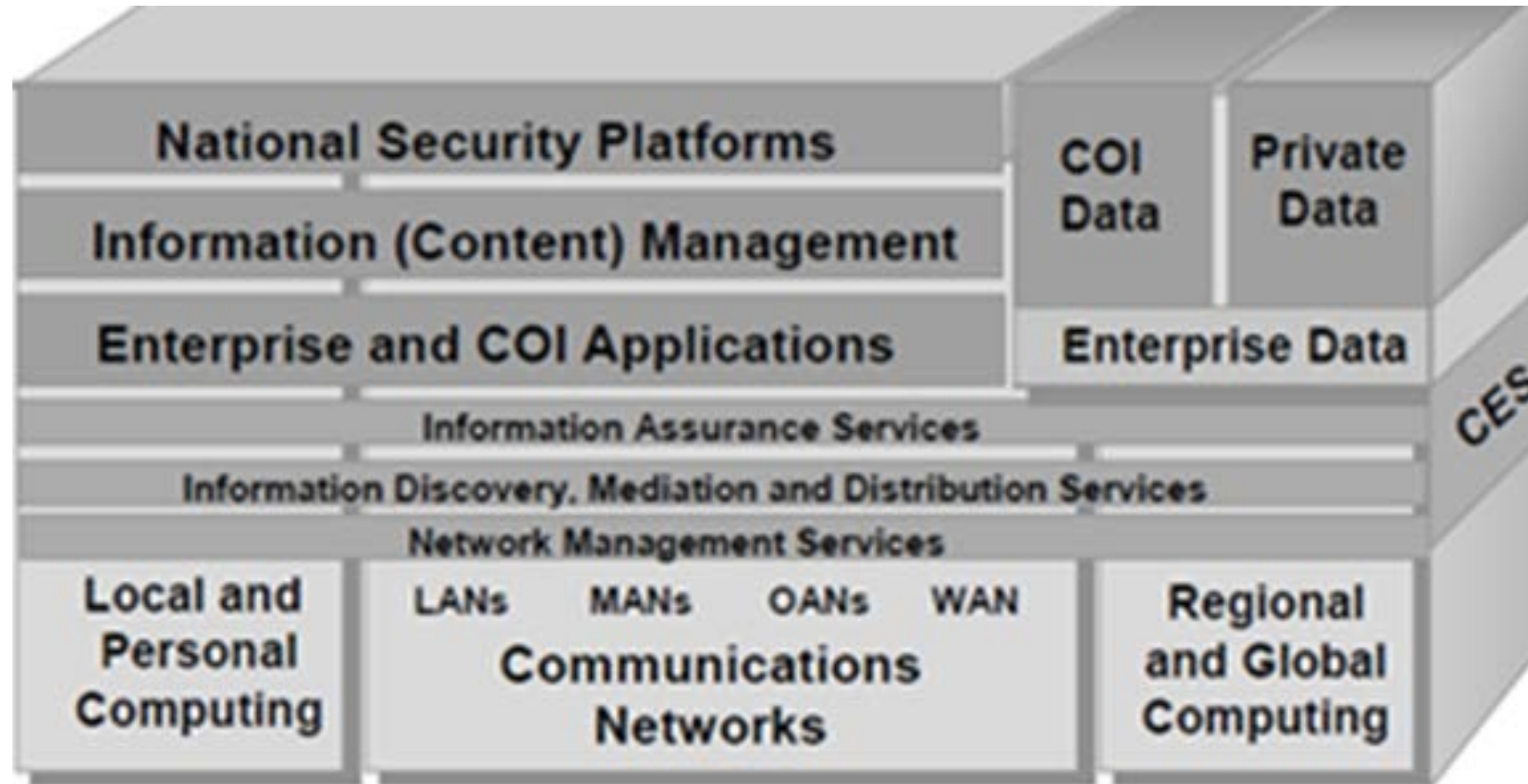
...the vision only



DSN (Defense Switched Network),  
DRSN (Defense Red Switched Network),  
DVS (DISN VIDEO).

JWICS (Joint Worldwide Intelligence Communications System)  
AFSCN (Air Force Satellite Control Network),  
NIPRNet (Non-classified Internet Protocol Router Network)  
SIPRNet (Secret Internet Protocol Router Network)

# ***CASE 3. JOINT INFORMATION ENVIRONMENT (JIE):*** **A BEAUTIFUL BUT UNATTAINABLE DREAM**



The target architecture of the JIE: seven-level model

# DoDAF metamodel

JIE documentation consists of 52 volumes from 8 Viewpoints:

- All Viewpoints – 2 volumes,

- Capability Viewpoint – 7 volumes,

- Data and Information Viewpoint – 3,

- Operational Viewpoint – 9,

- Project Viewpoint – 3,

- Services Viewpoint – 13,

- System Viewpoint – 13,

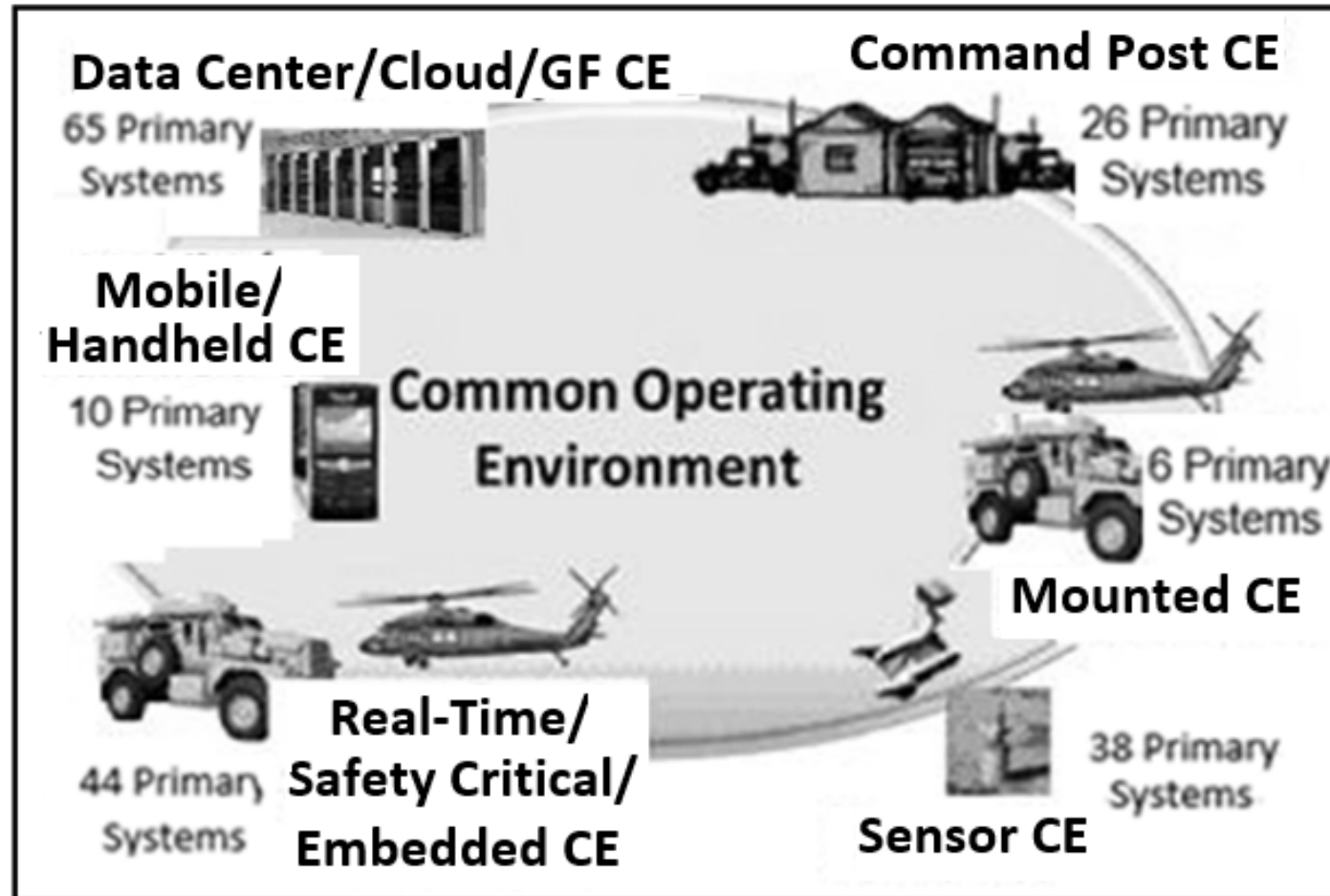
- Standard Viewpoint – 2.

The development of DoDAF has been going on for 25+ years

The very DoDAF idea is an impossible task or the Zachman's model itself is erroneous at all.



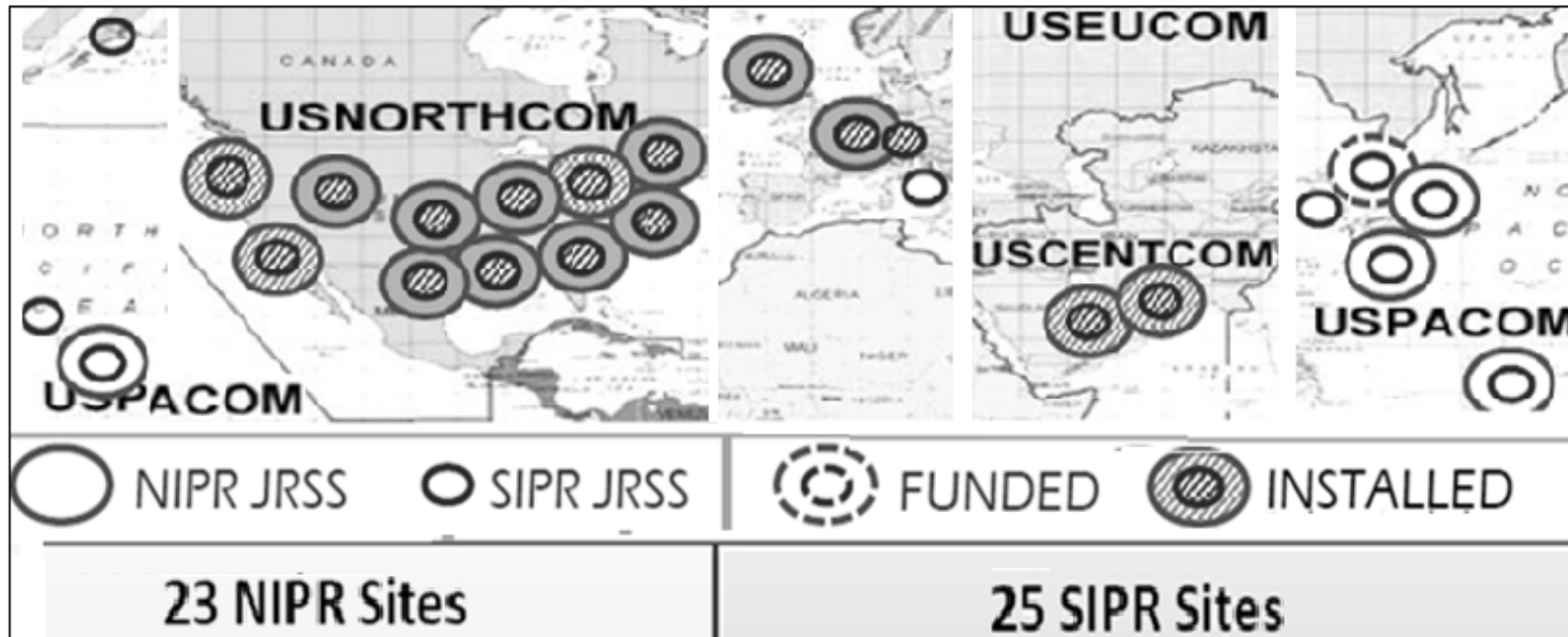
# ON MILITARY SOFTWARE COMPLEXITY



COE focuses on six CE containing 189 US Army primary military systems

## Case 4. Joint Regional Security Stacks

- the key cyber-security equipment of JIE



JRSS Current and Planned Deployments

## Why JRSS plan failed

July 2016. A report GAO-16-593 required more control over spending of funds for the creation of the Joint Information Environment.

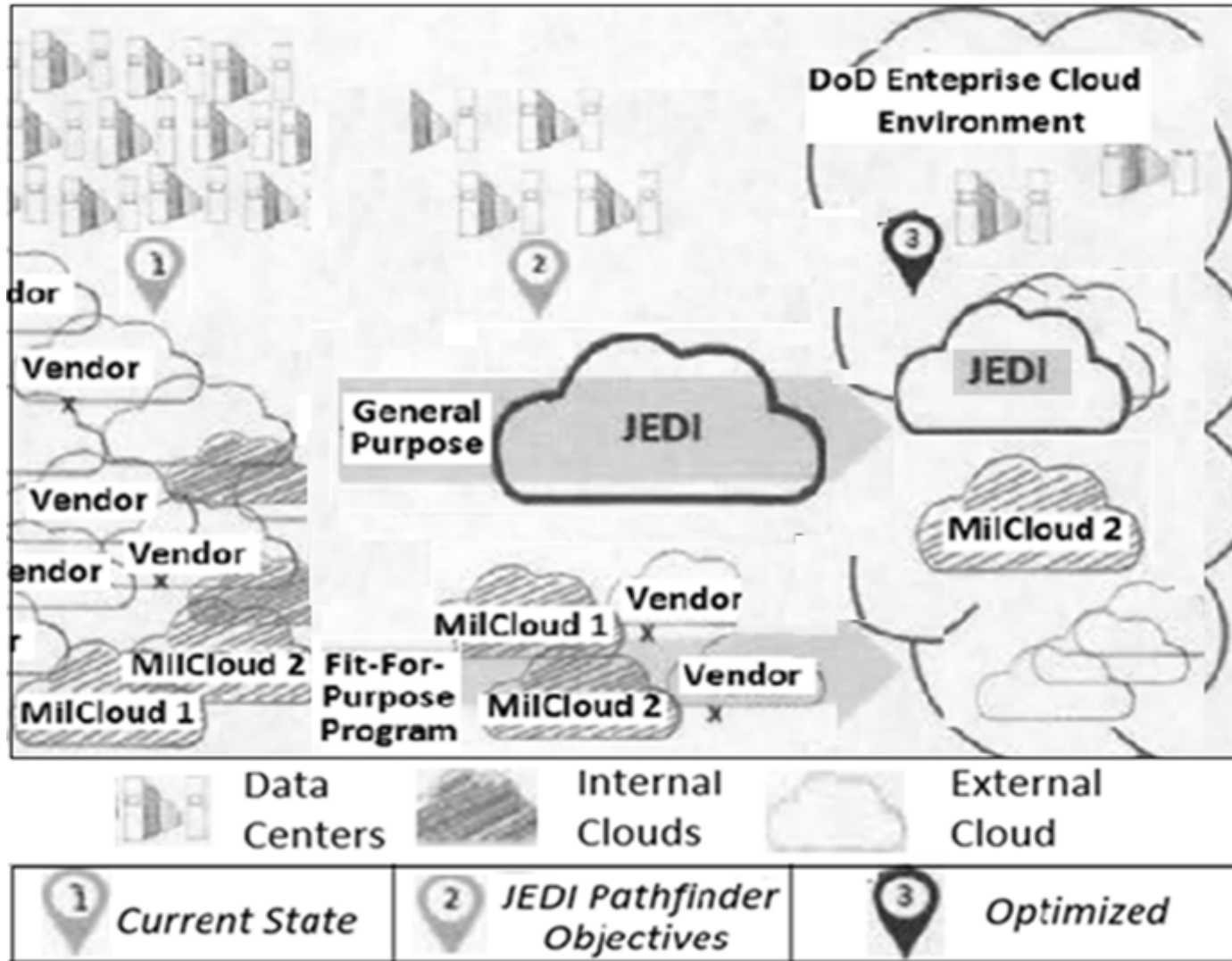
January 2018. Under the pressure of GAO critics, the Pentagon's chief weapons tester said the DoD should stop deploying its new network security platform JRSS.

Potential JRSS developers (for Leidos) - work experience of 12-14 years and knowledge of at least two or more products from ArcSight, TippingPoint, Sourcefire, Argus, Bro, Fidelis XPS, Niksun FPCAP, Lancope, NetCool, InfoVista, and Riverbed.

**The crucial JRSS failure is extremely important:**

**JRSS is too S-L-O-W.**

## ***Case 5. Joint Enterprise Defense Infrastructure (JEDI) cloud initiative (2019)***



## Pentagon already is a multi-cloud environment: 500+ clouds

JEDI is the Pentagon's first major effort to create a highly-classified, cloud-based military command, control, communications and intelligence system

April 10, 2019. DoD confirms that Amazon and Microsoft are the winners of cloud contract: up to 10 years and **\$10 billion**

# Artificial Intelligence Initiative

The Defense Innovation Unit (DIU) launched in 2015, headquartered in California — Silicon Valley.

The Joint Artificial Intelligence Center is a focal point of the DoD AI Strategy.

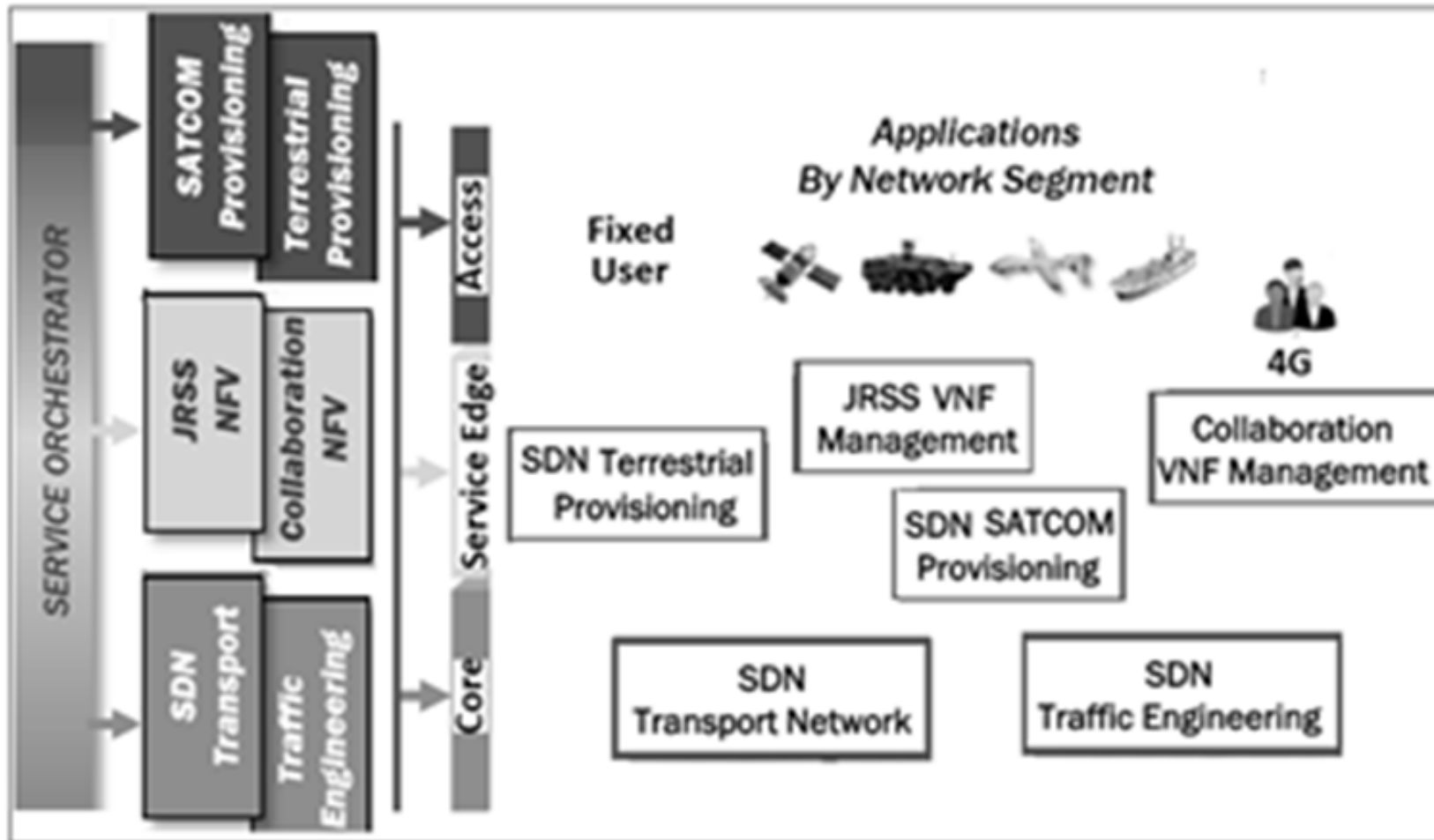
In the face of competition from China and Russia and the urgency of this emerging technology race, **President Trump** signed the executive order, **Maintaining American Leadership in Artificial Intelligence**, on February 11, 2019, launching the American AI Initiative.

This was immediately followed by the release of **DoD's first-ever AI strategy**.



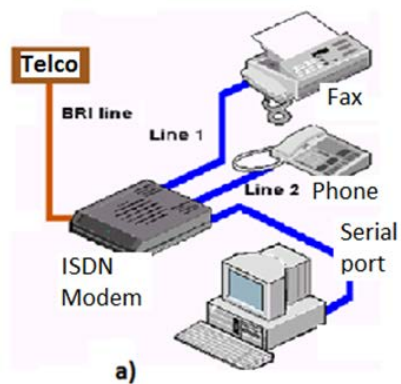
**Bradley Fighting Vehicle** is part of strategic approach for the 2030s and beyond: long-range multi-function sensors, 360-degree cameras, manned-unmanned teaming, computer-enabled vehicle defenses and artificial intelligence.

# The newer DoD achievements: SDN and NFV (2018)

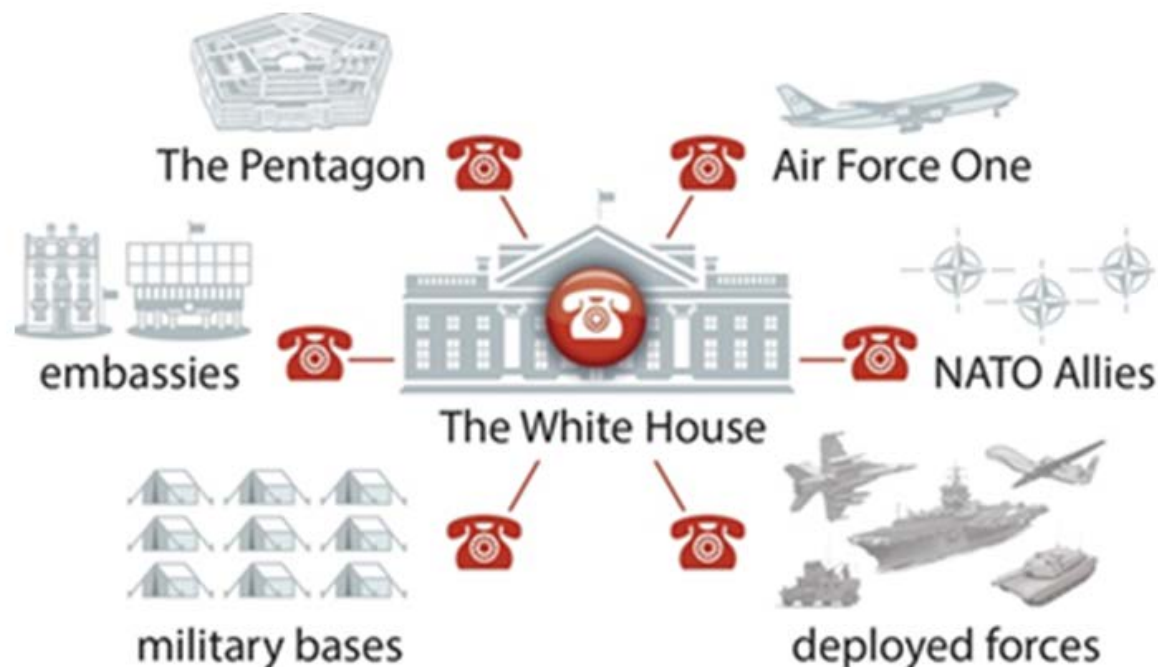




## Case 6. Defense Red Switch Network: **the ISDN era**



a) ISDN line; b) STE desk set. Note slot in front for Crypto PC Card and MLPP buttons



DRSN scheme

# Summing up

The main goal - to look for new university courses.

Digital technologies: Big Data; neuro-technologies and artificial intelligence; quantum technologies; industrial internet; robotics and sensory; wireless communication; technologies of the virtual and complemented realities.

Thanks!

## **Two-sided difficulties for Information System modernization:**

- **the industry pressure for the newer achievements: Software Defined Network and Network Function Virtualization**
- **to abandon 'old' technologies: time-division multiplexing, asynchronous transfer mode equipment, signaling protocol SS7 and Advanced Intelligent Network.**

