

# Challenges of Net-Enabled Weapons

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# The Changing Nature of Defense Technology

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## Cold War Era

- Defense Technology Base
- Embedded in defense companies
- Point-to-point connections
- Resided in the US



**Point-to-Point  
Walkie Talkies**

## Today

- Originates in commercial technology base
- Embedded commercially driving companies
- Global . . . Interconnected
- Defense . . . Niche player



**World Wide Web**



# The Changing Nature of Innovation

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## From

- Invention
- **Linear innovation model**
- Build to forecasted demand
- Independent
- Single discipline
- **Product function**
- Local R&D

## To

- Innovation
- **Dynamic innovation model**
- Sense and respond to demand
- Interdependent
- Multiple discipline
- **Value to customer**
- Globalize R&D Teams

# Maturing the Capability

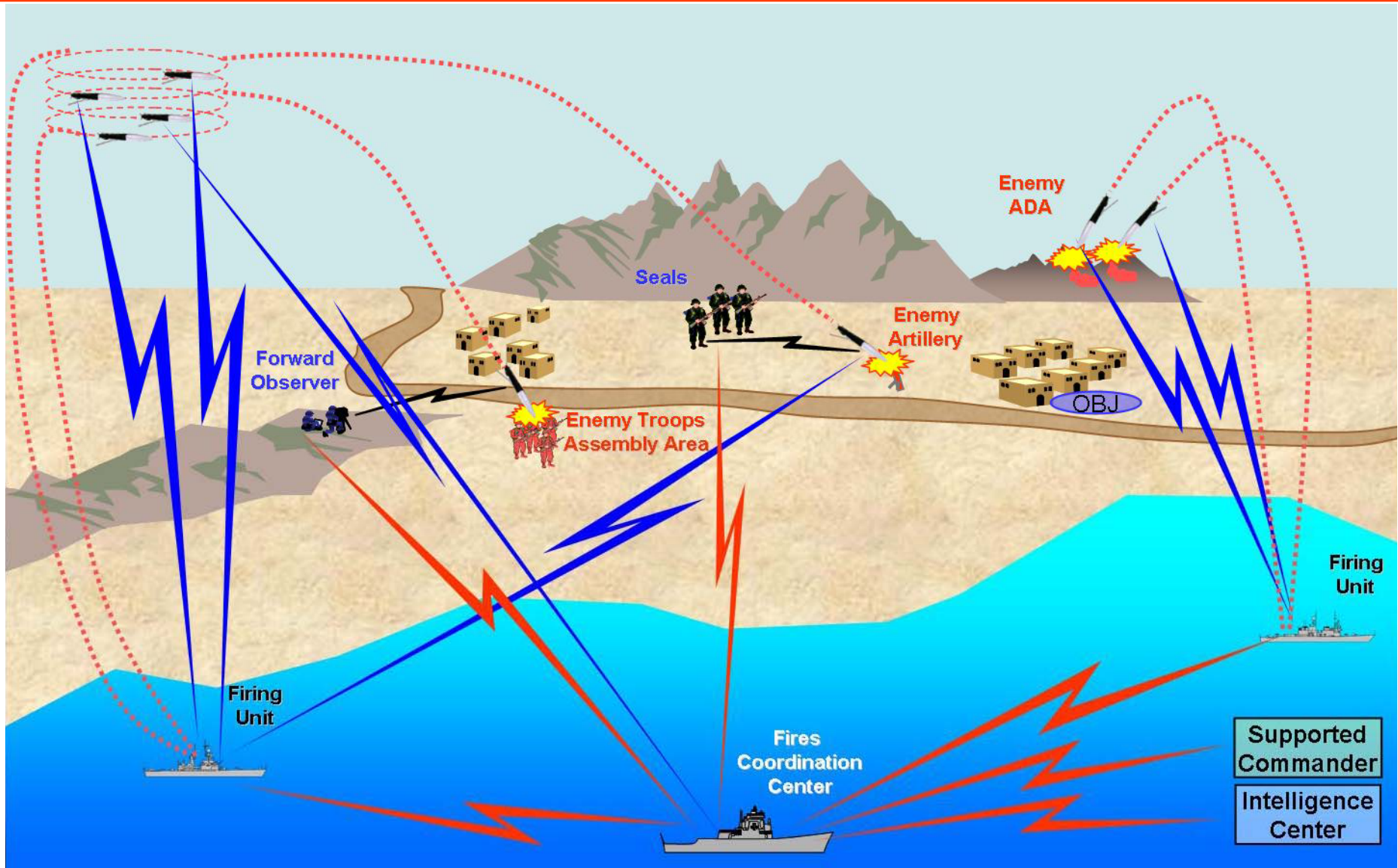
	<i>Missiles</i>	<i>Kill Chain</i>	<i>Missile as a Node in the Network</i>	<i>Net Enabled Effectors</i>
Battlespace Construct	Singular	Linear	Net Capable	Net Enabled
Information and Knowledge	Targeting	Sensing	?	?
Command and Control	One-Way	Smart One-Way	?	?
Effects	Tactical Receive Only	Tactical Decision Cycle	?	?

**From Product to Integrated Solutions**



# Existing and Emerging Capabilities

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Source: Government Publications  
11/16/2006

# A Great Example

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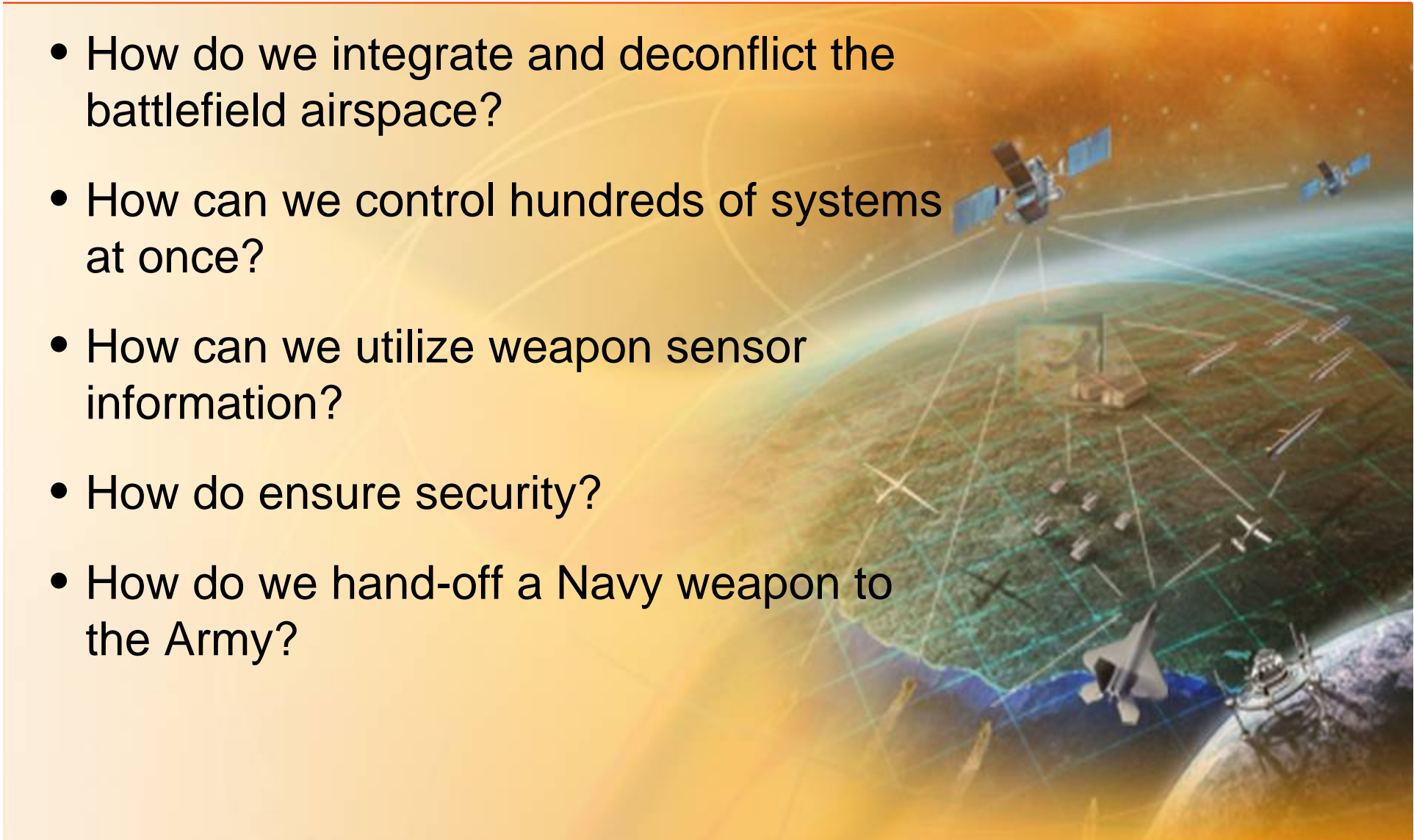




# Netted Warfare Challenges

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- How do we integrate and deconflict the battlefield airspace?
- How can we control hundreds of systems at once?
- How can we utilize weapon sensor information?
- How do ensure security?
- How do we hand-off a Navy weapon to the Army?



# Raytheon Net-Enabled Weapons Demonstrations & Experience

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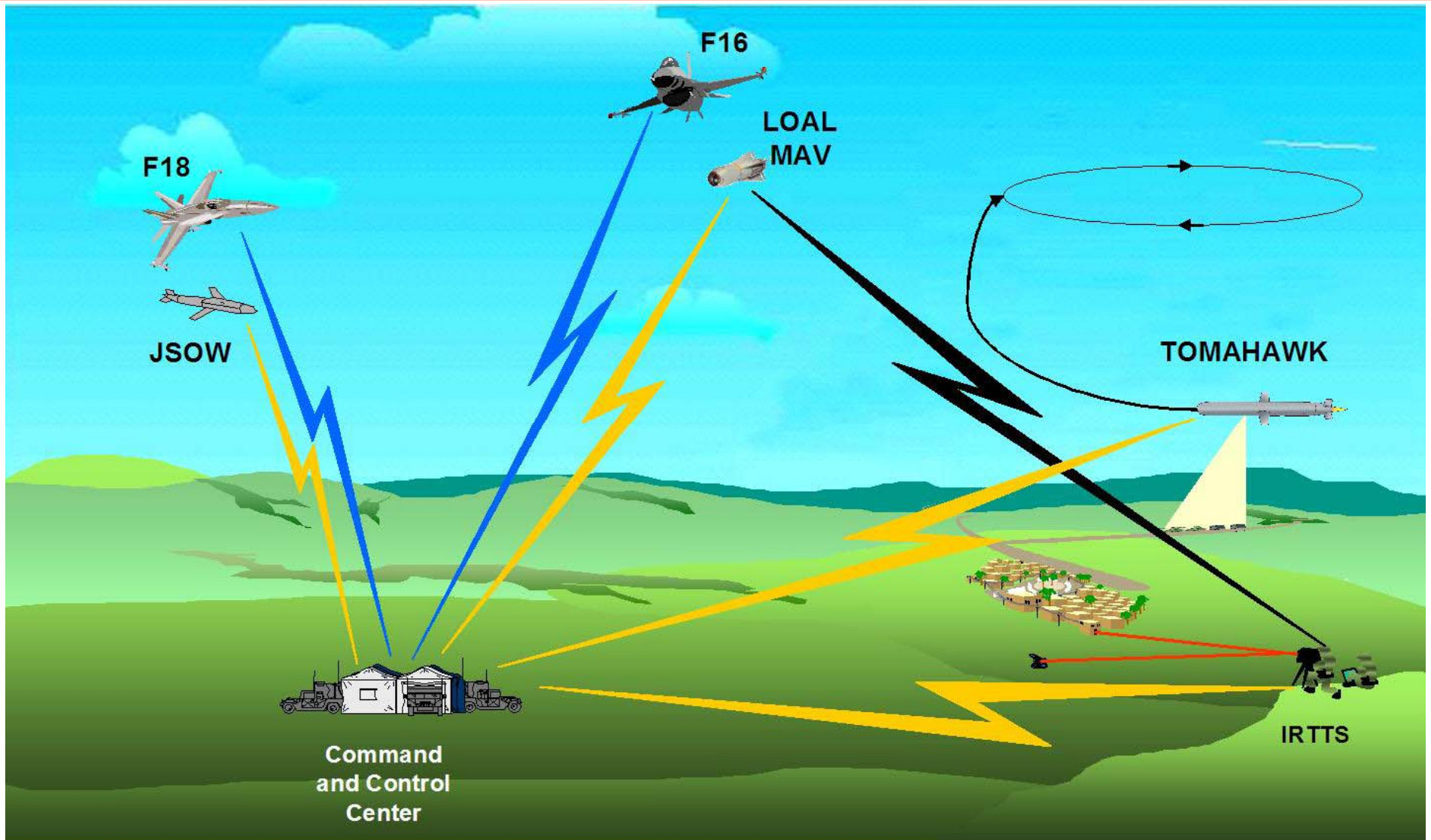
- C2 Systems Experience
- Netted Weapons Architecture
- Netted Weapon Experience
  - Tomahawk Blk IV
  - JSOW
- Demonstrations
  - Strike Netted Effects Demonstration (Nov 2005)
  - C2 Battle Lab (Aug 2006)





# Strike Netted Effects Demonstration (Nov 2005)

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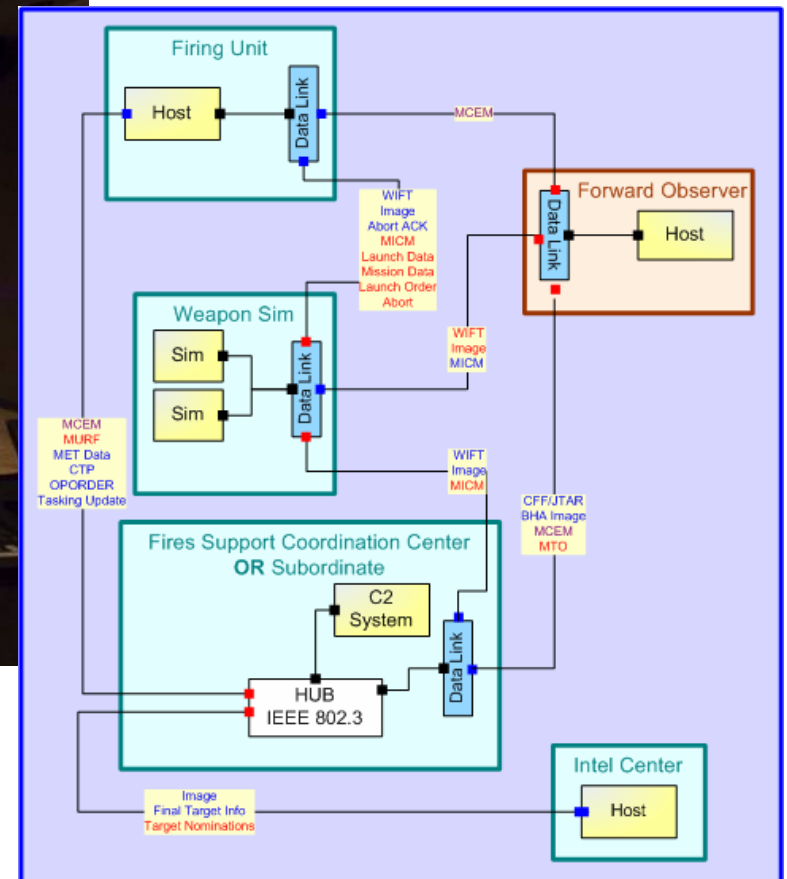


# Command & Control Battle Lab (Aug 2006)

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- Enables CONOPS validation & improvement
- Provides opportunity for early end-user influence in the design of weapon employment







*The electric light did not come from the continuous improvement of candles.*

**“Doing better things” in addition to doing things better**