

# An Operational Framework for Battle in Network Space

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and

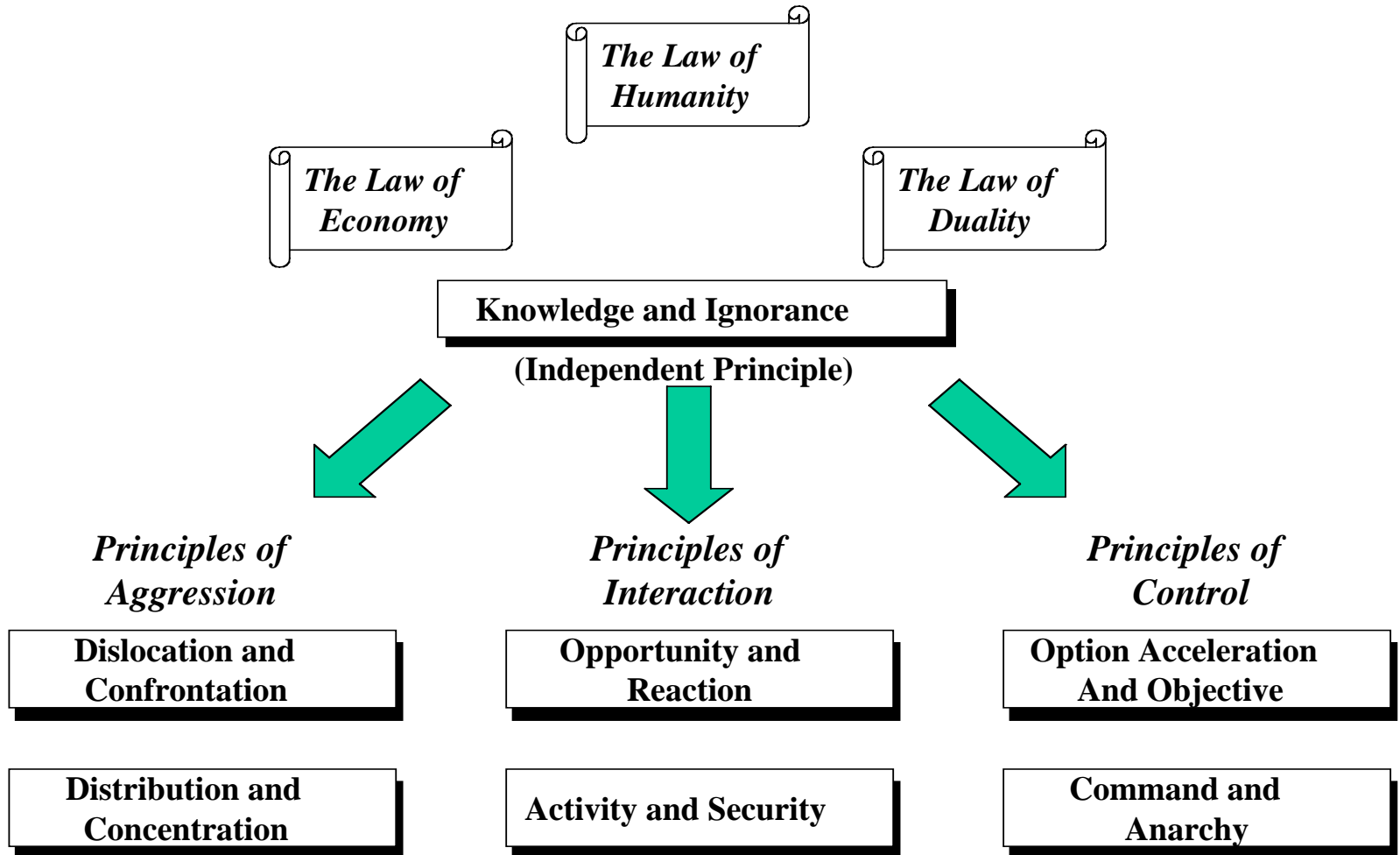
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Defence R&D Canada – Ottawa

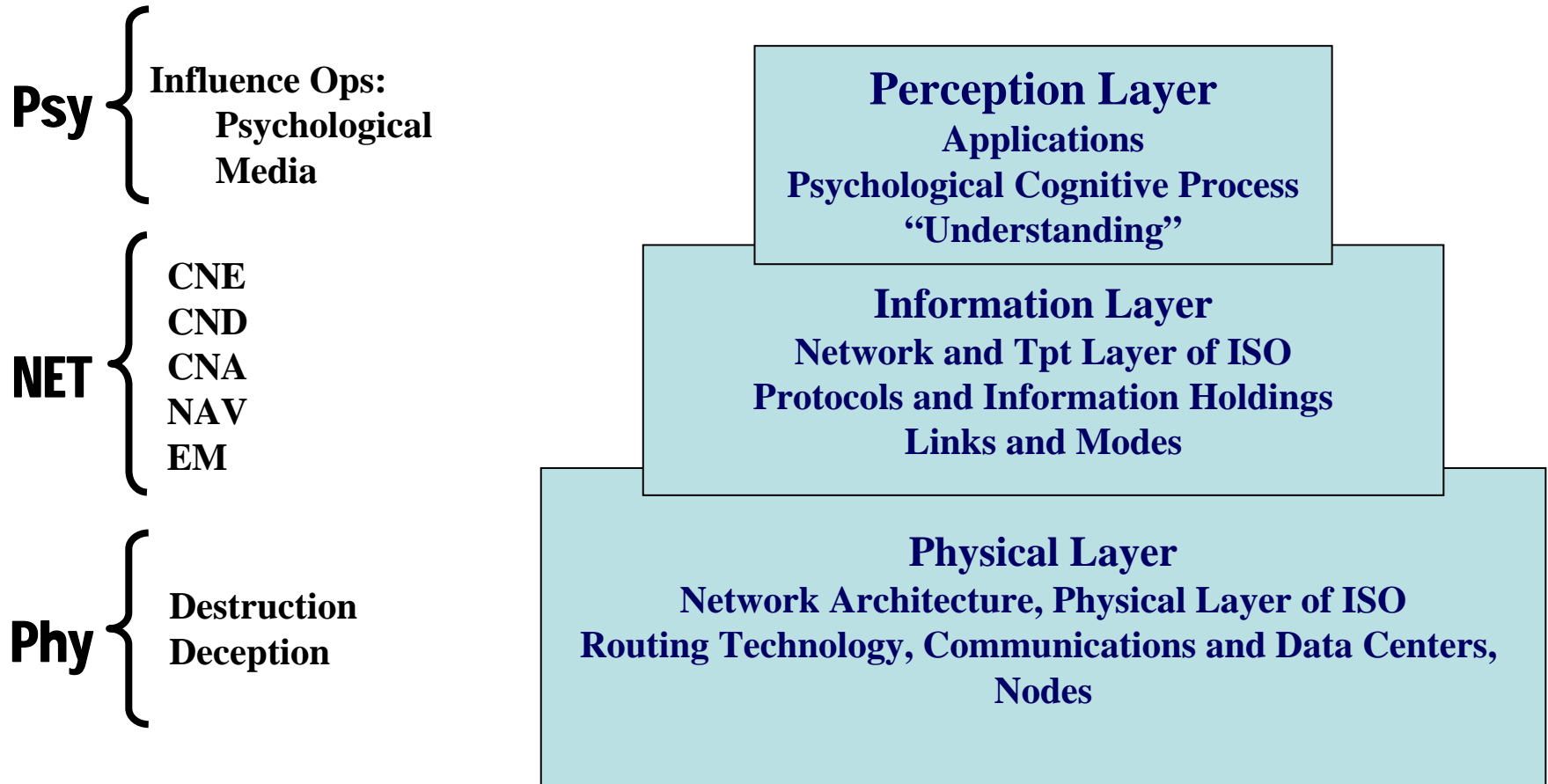
# Presentation Outline

- Principals of Warfare for Net Space
- Mapping IO to Network Battlespace
- A Main Defensive Battle in Net Space
- A Vision for Computer Network Operations
- Some useful Analogies?
  - CDD Imagery
  - Air Tasking Order
  - Combat Logistics

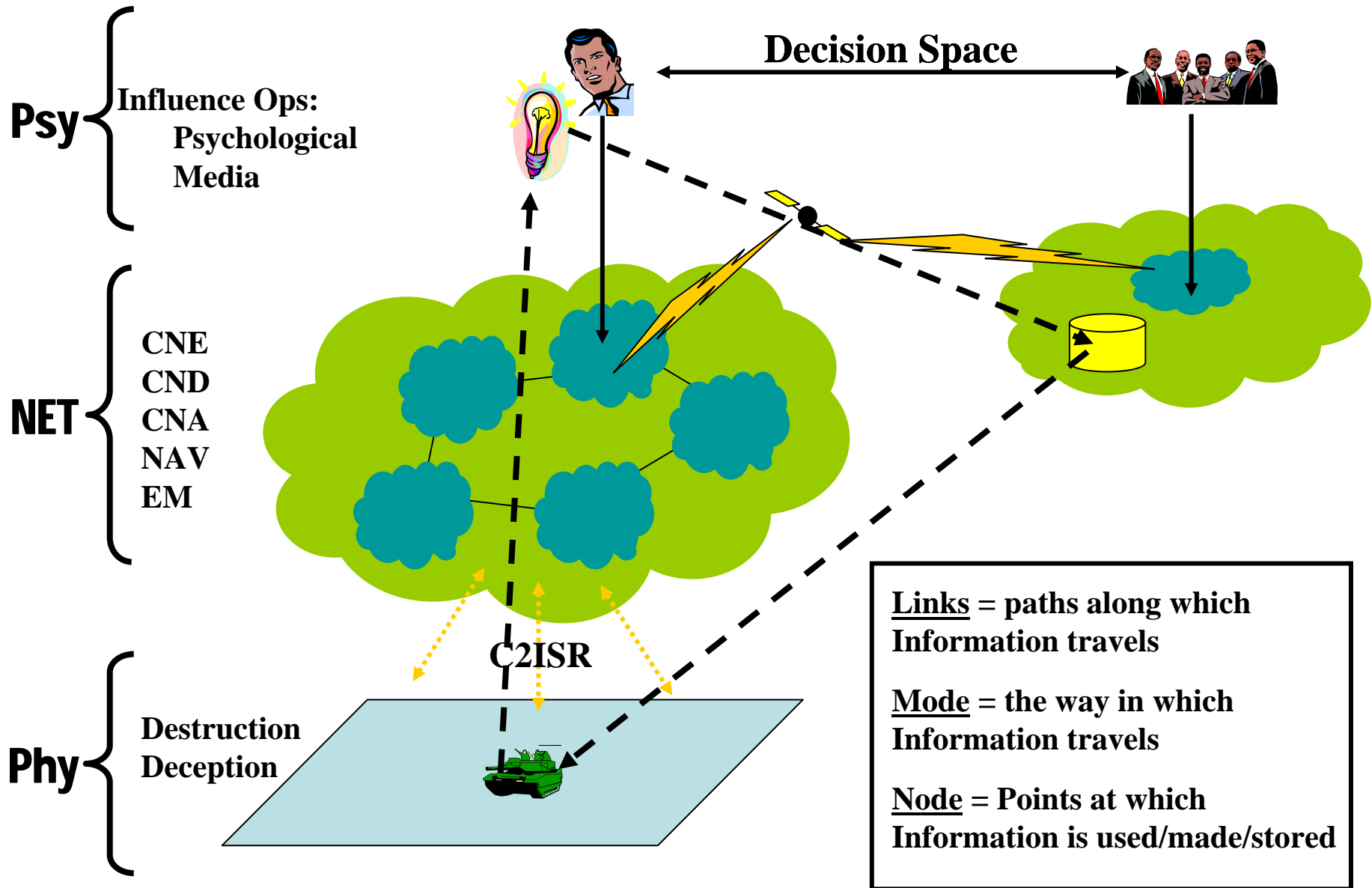
# *Leonhard's Principles of War for the Information Age*



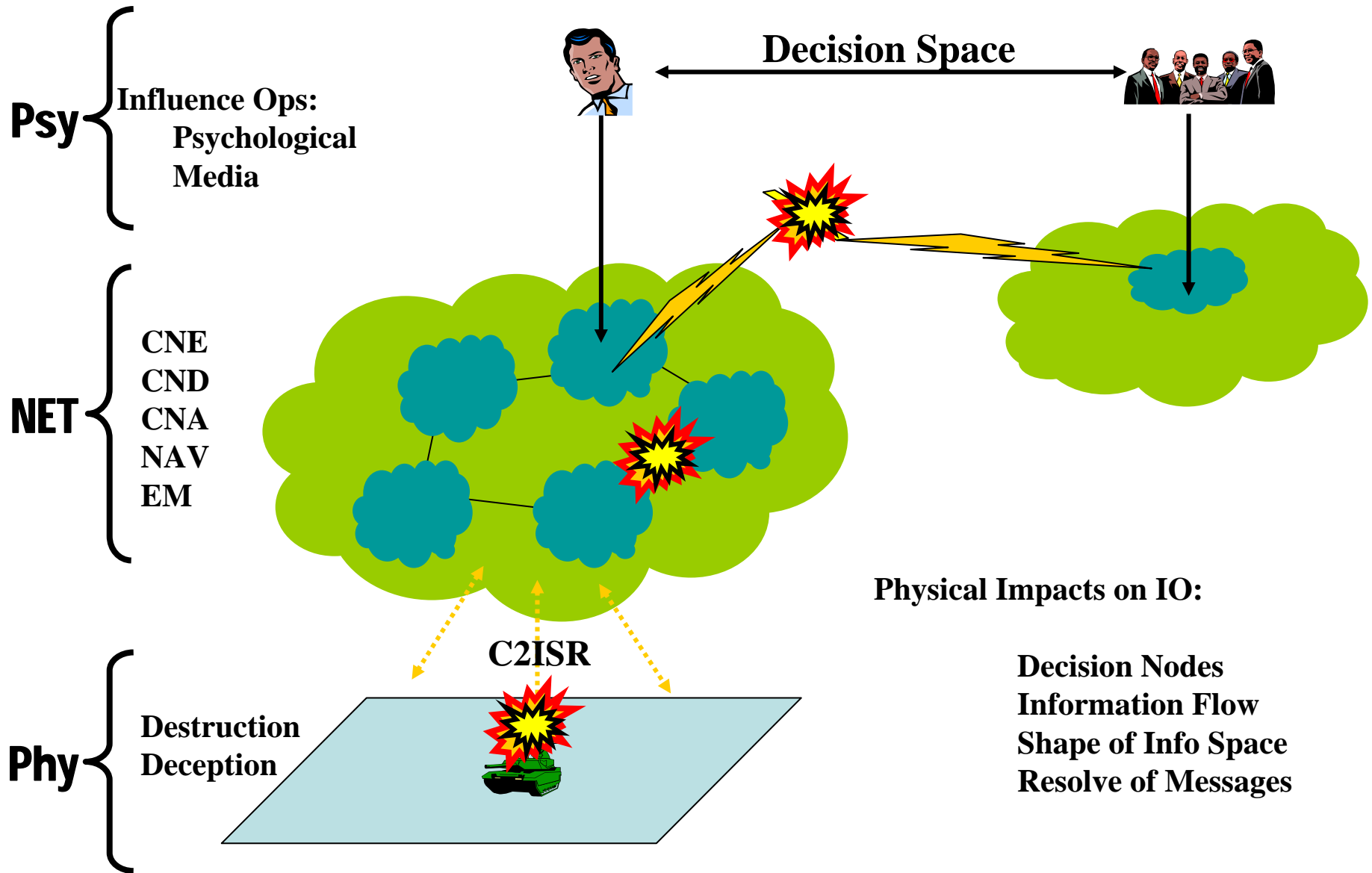
# Mapping Knowledge Environment to Information Ops



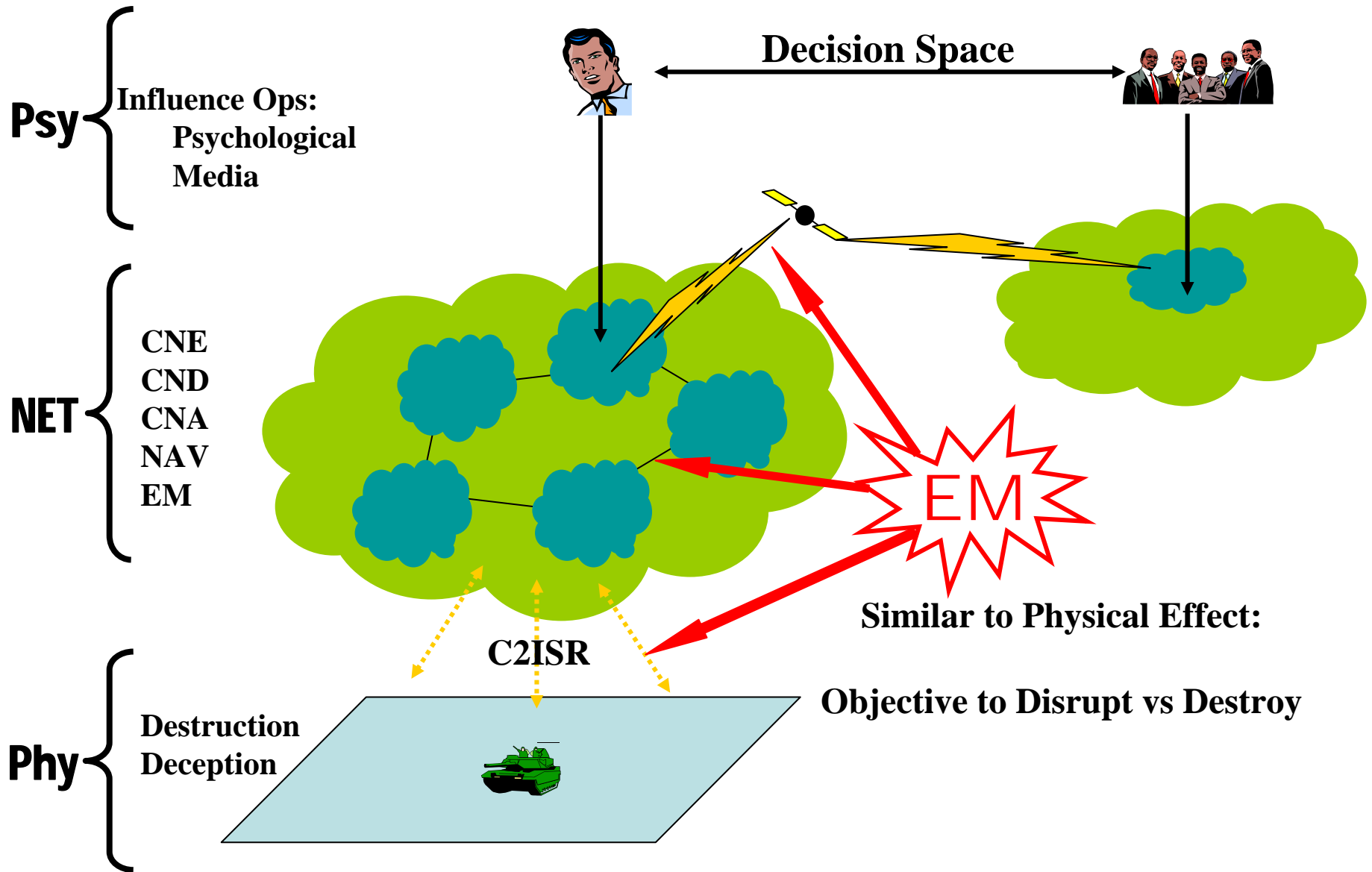
# Defining the Information Battle Space:



# Physical Dimension:



# Electromagnetic Battle:





**Observation  
Point**

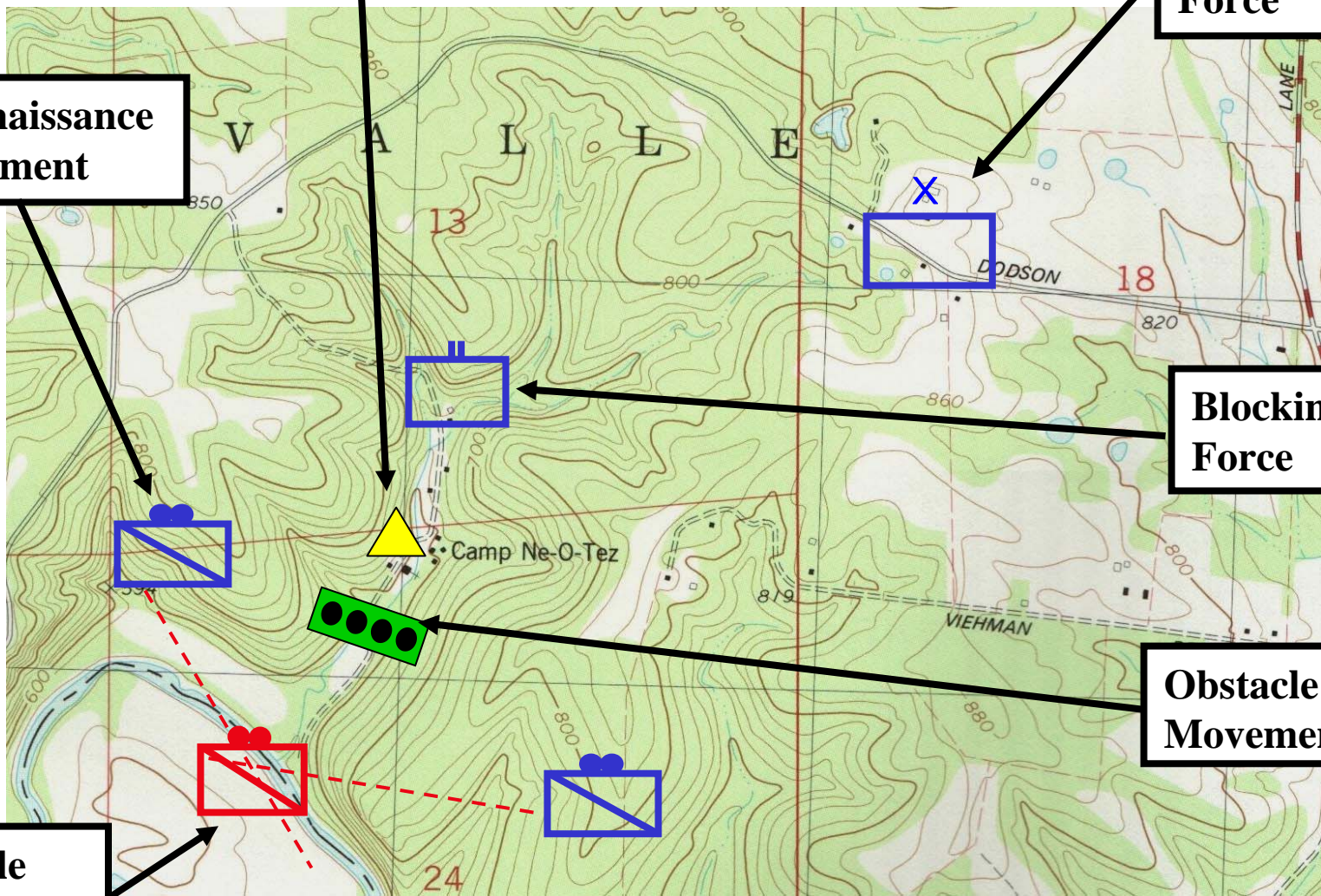
**High Value  
Force**

**Reconnaissance  
Detachment**

**Blocking  
Force**

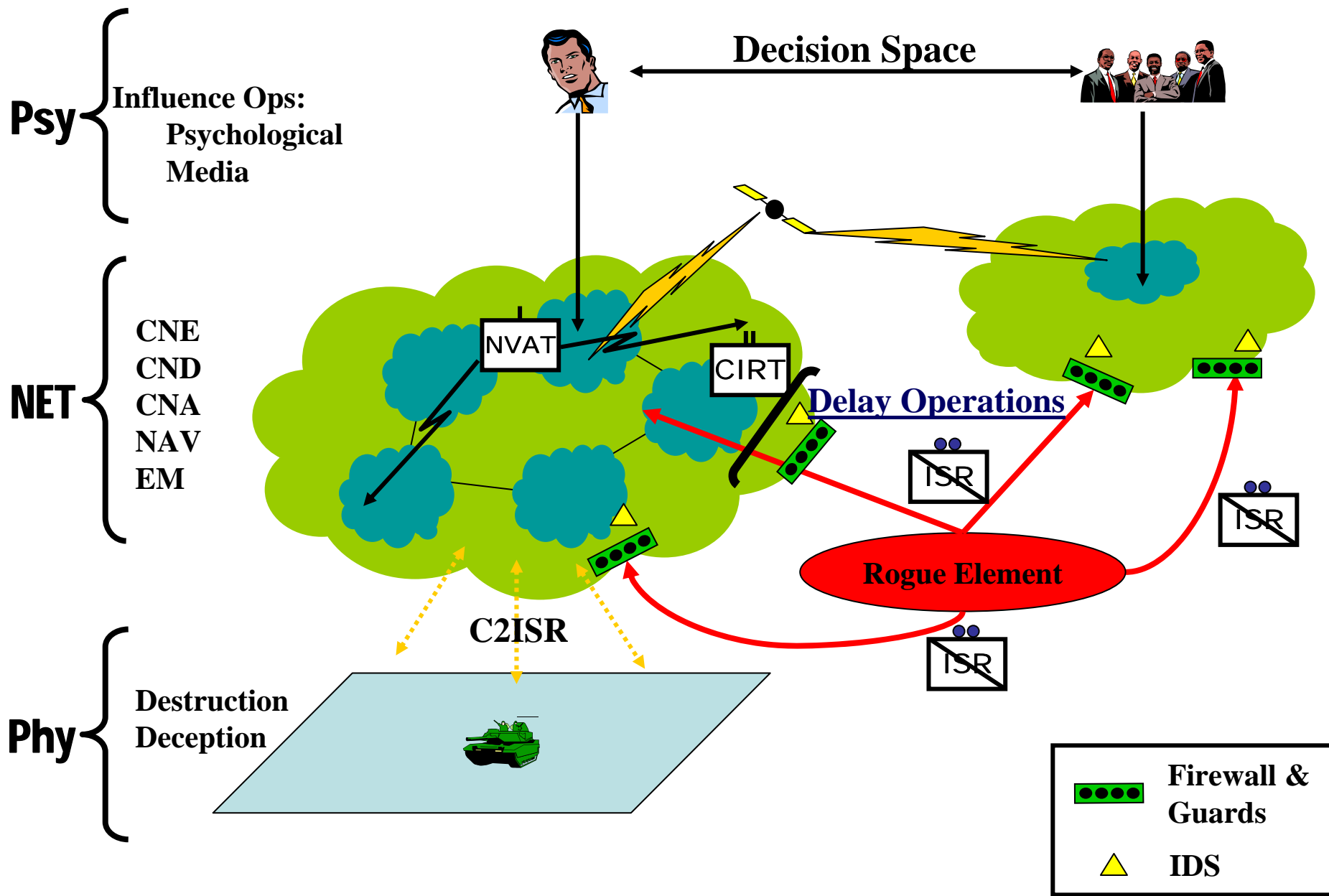
**Obstacle to  
Movement**

**Hostile  
Element**

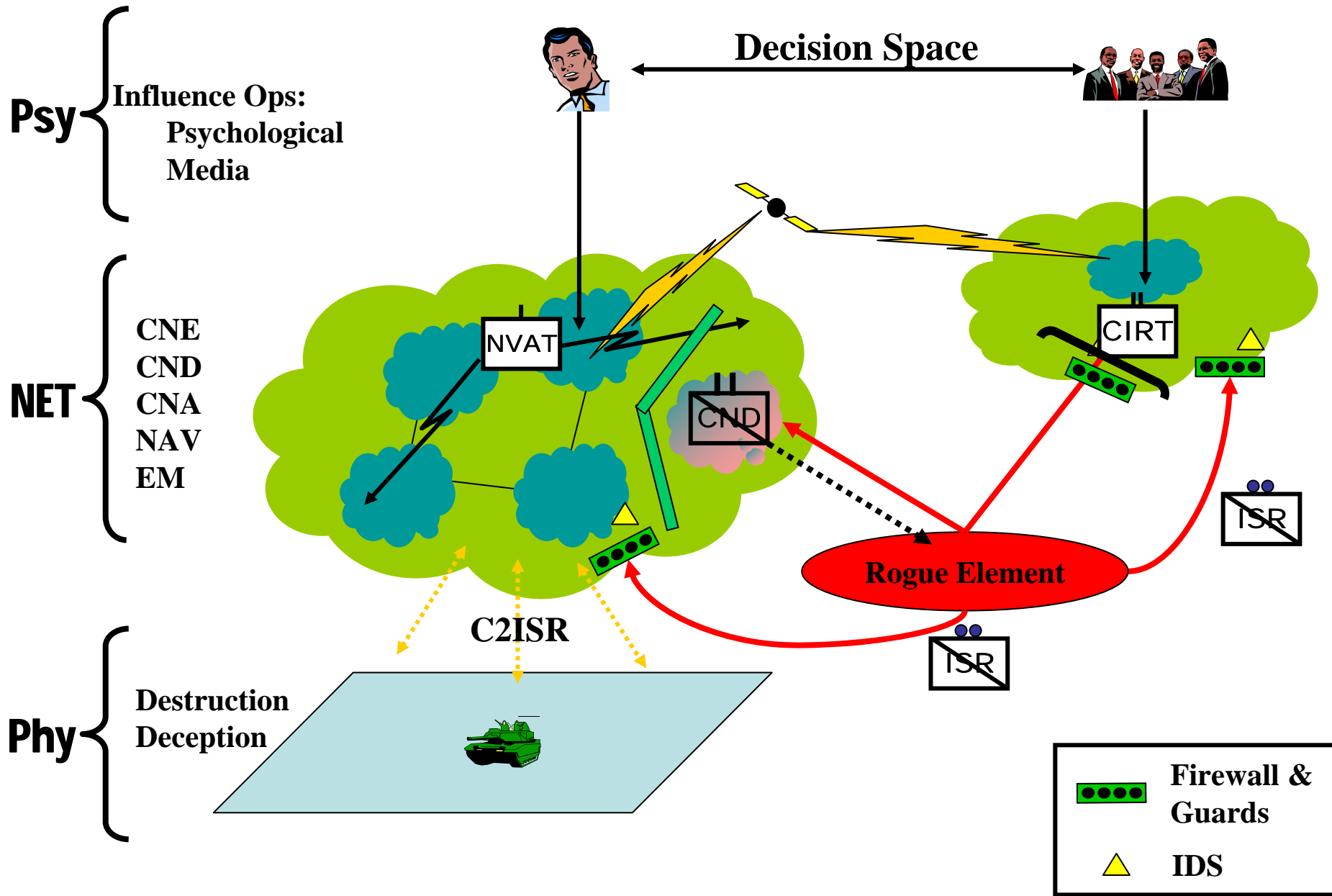




# Network Operations: Main Defensive Construct

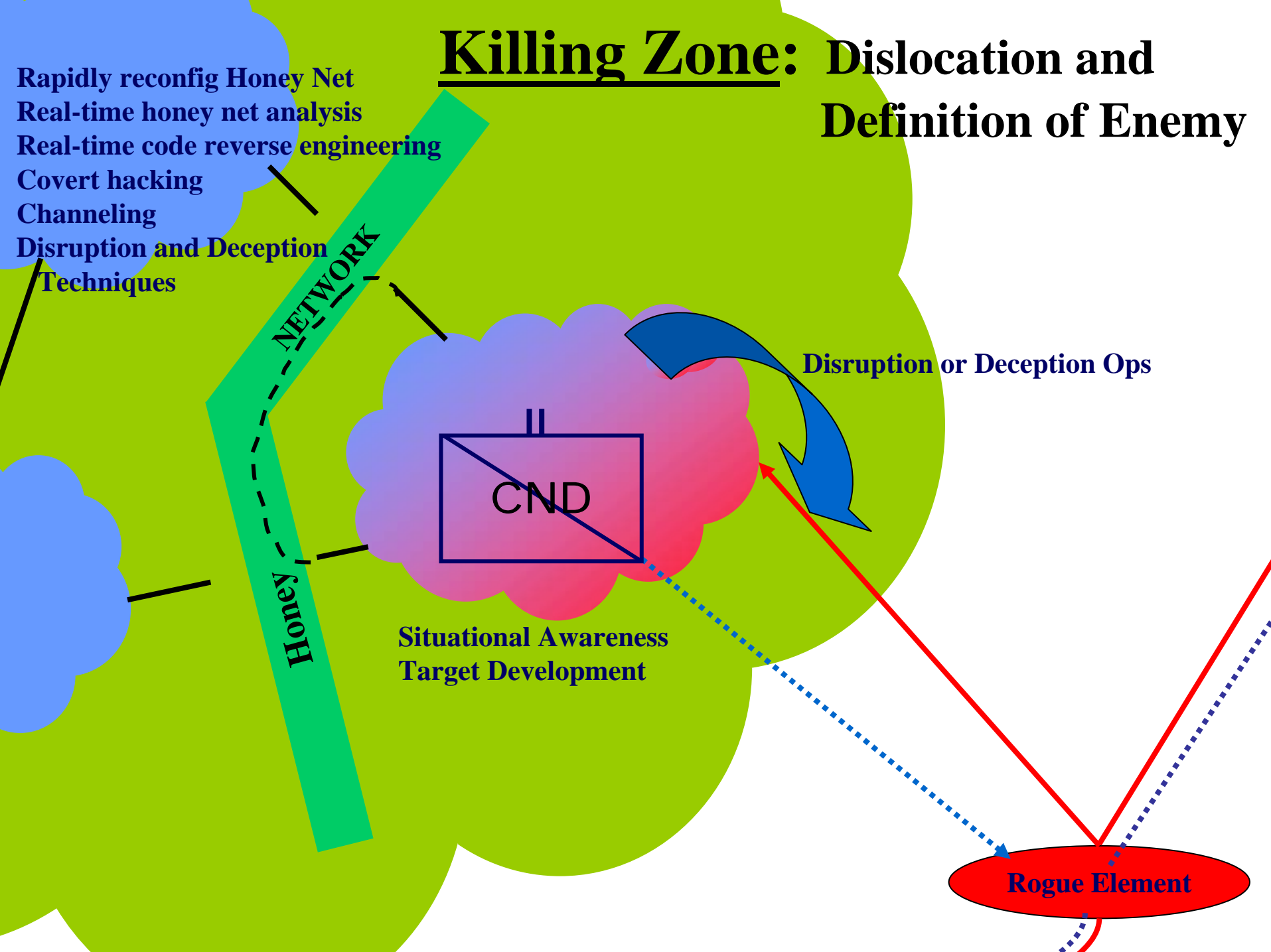


# Network Operations: Killing Zone



# Killing Zone: Dislocation and Definition of Enemy

Rapidly reconfig Honey Net  
Real-time honey net analysis  
Real-time code reverse engineering  
Covert hacking  
Channeling  
Disruption and Deception  
Techniques



# Rear Area Security

NVAT

CIRT

Architectural Security  
&  
Vulnerability

INFOCON  
Patches and Protocols  
SA & Surveillance  
Seyering Policy

ISSO

ISSO

NOC

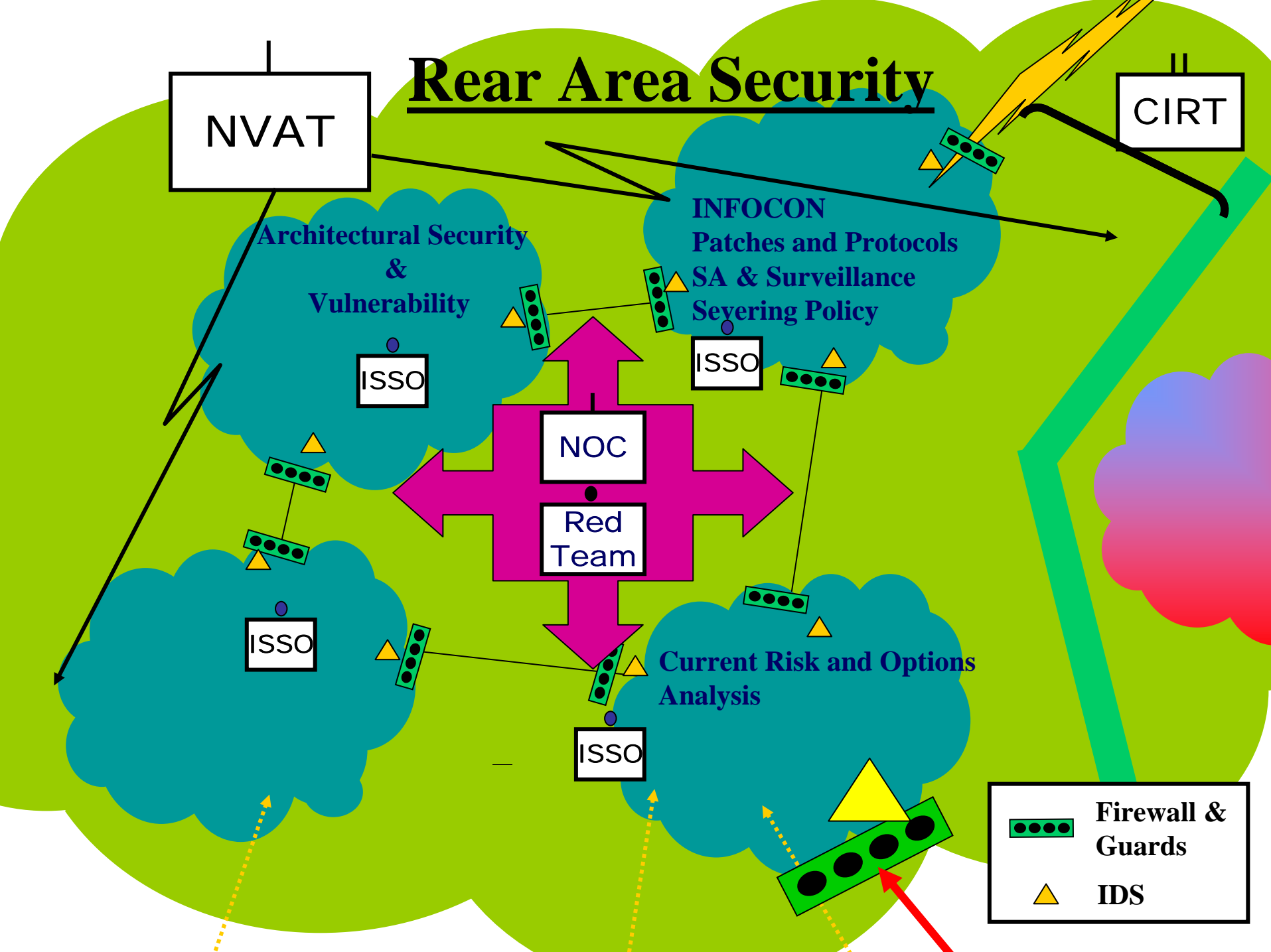
Red  
Team

ISSO

ISSO

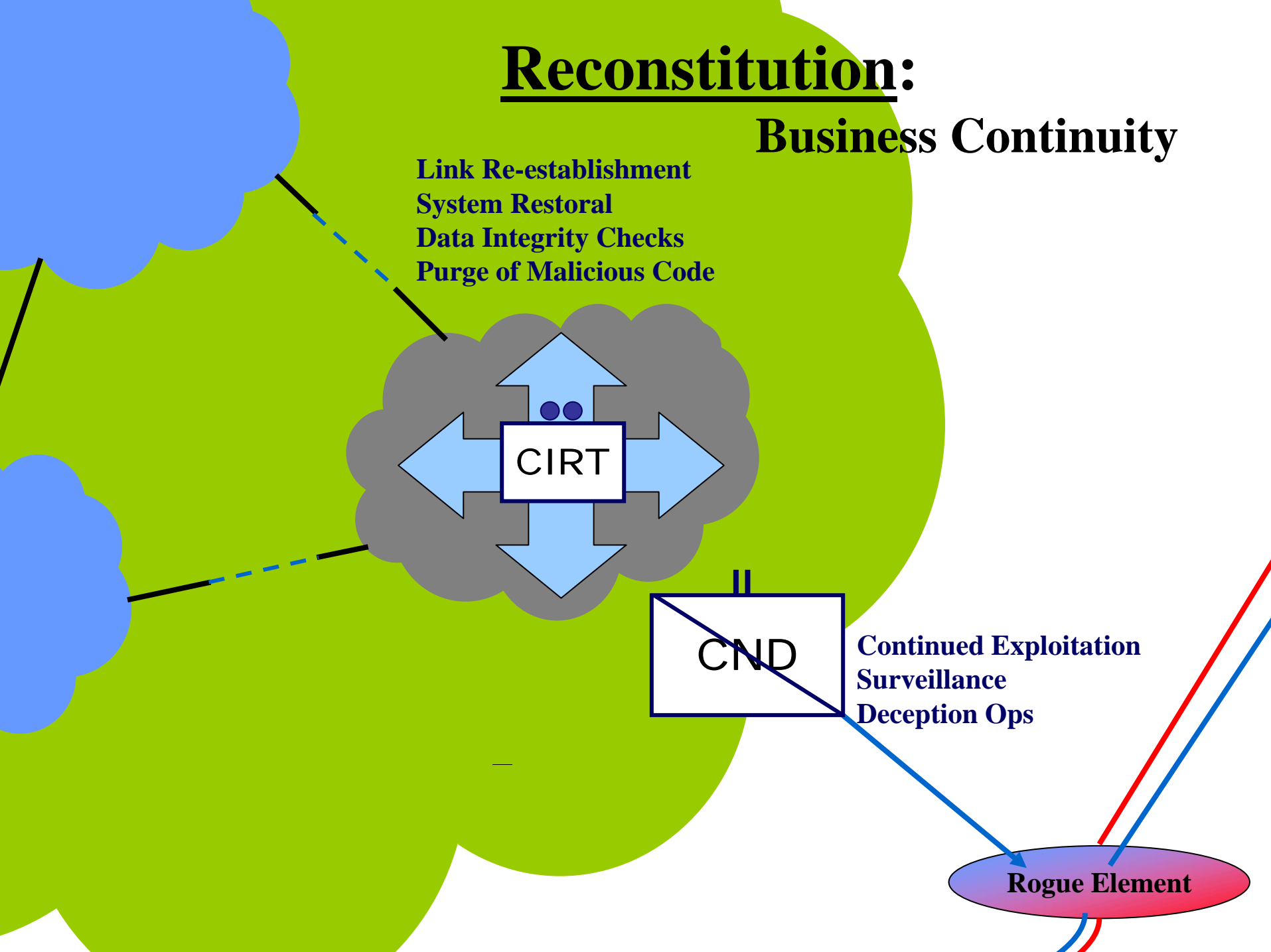
Current Risk and Options  
Analysis

Firewall &  
Guards  
IDS



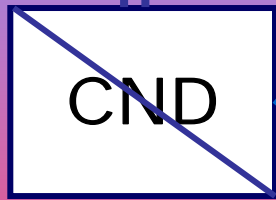
# Reconstitution:

## Business Continuity

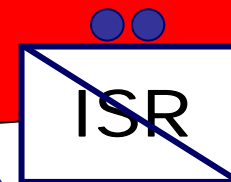
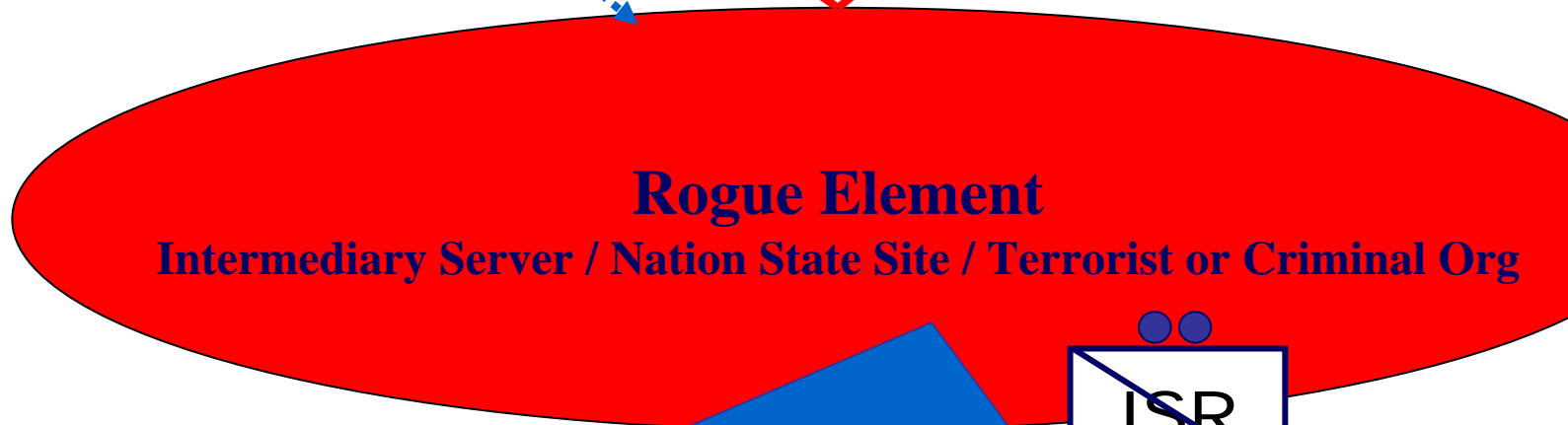
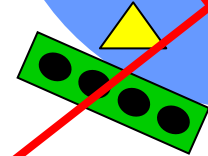


# The Network Attack:

**Disable or Defeat Enemy**



Situational Awareness  
Target Development  
Disruption or Deception Ops



Close Target Recce

Physical Interdiction: Hard Kill - Weapon  
Tactical Assault

Link Attacks: Jamming  
Denial of Service

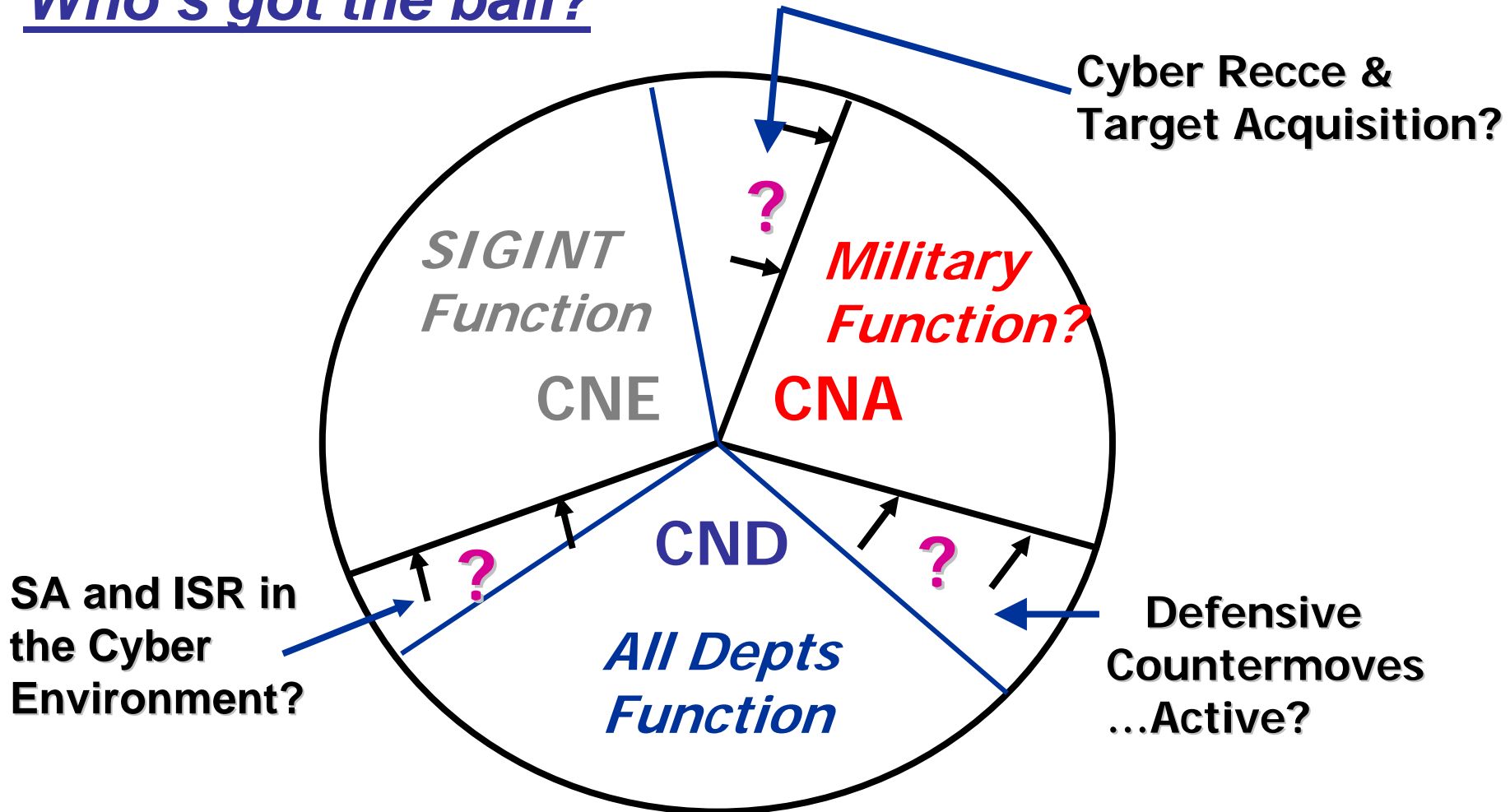
Network Attacks: Net Weapons  
Interdiction  
Capture



X

# A Vision of CNO

Who's got the ball?





# **Further Useful Analogies**

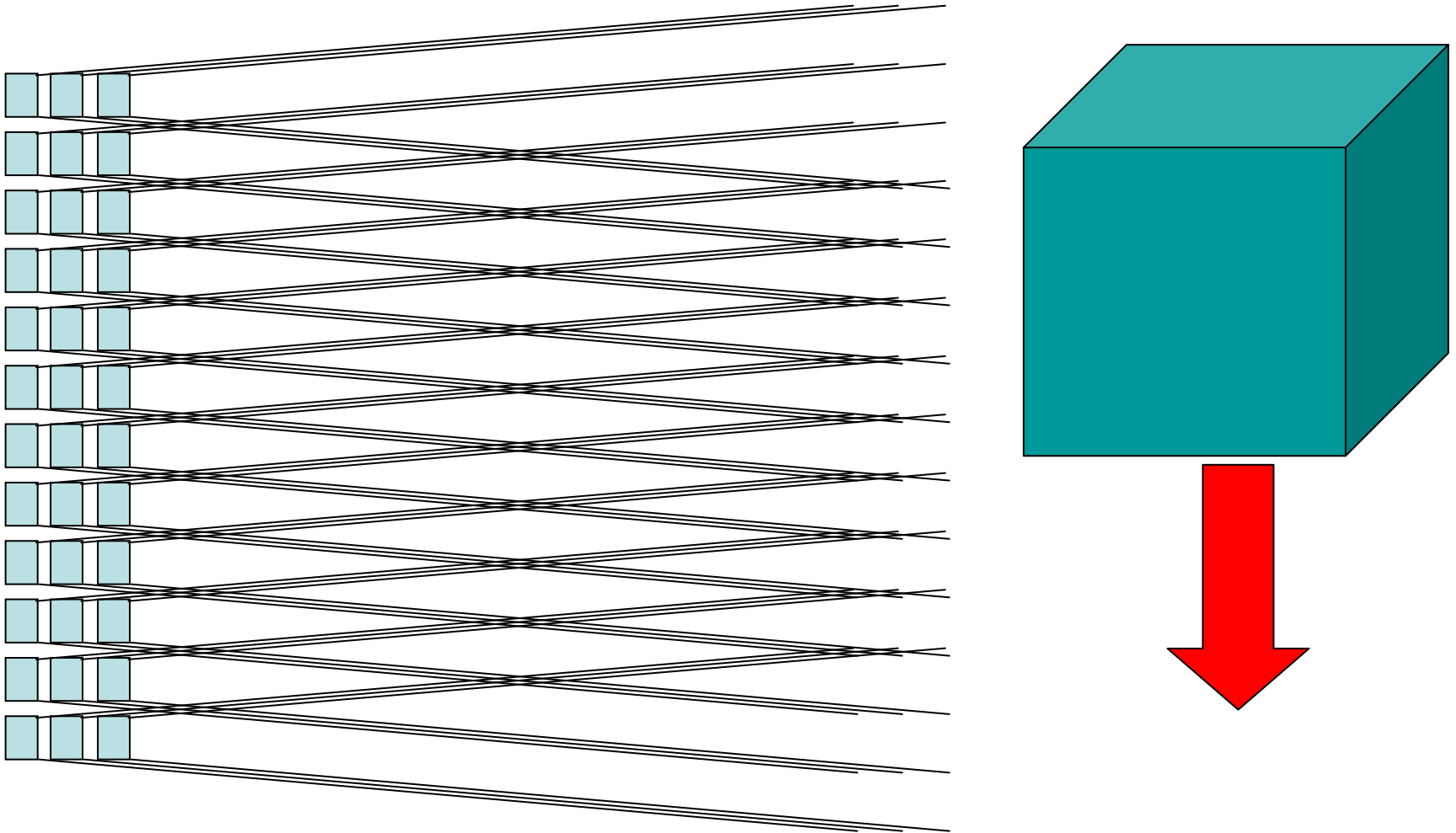
CDD Imagery

Air Tasking Order Battle Rhythm

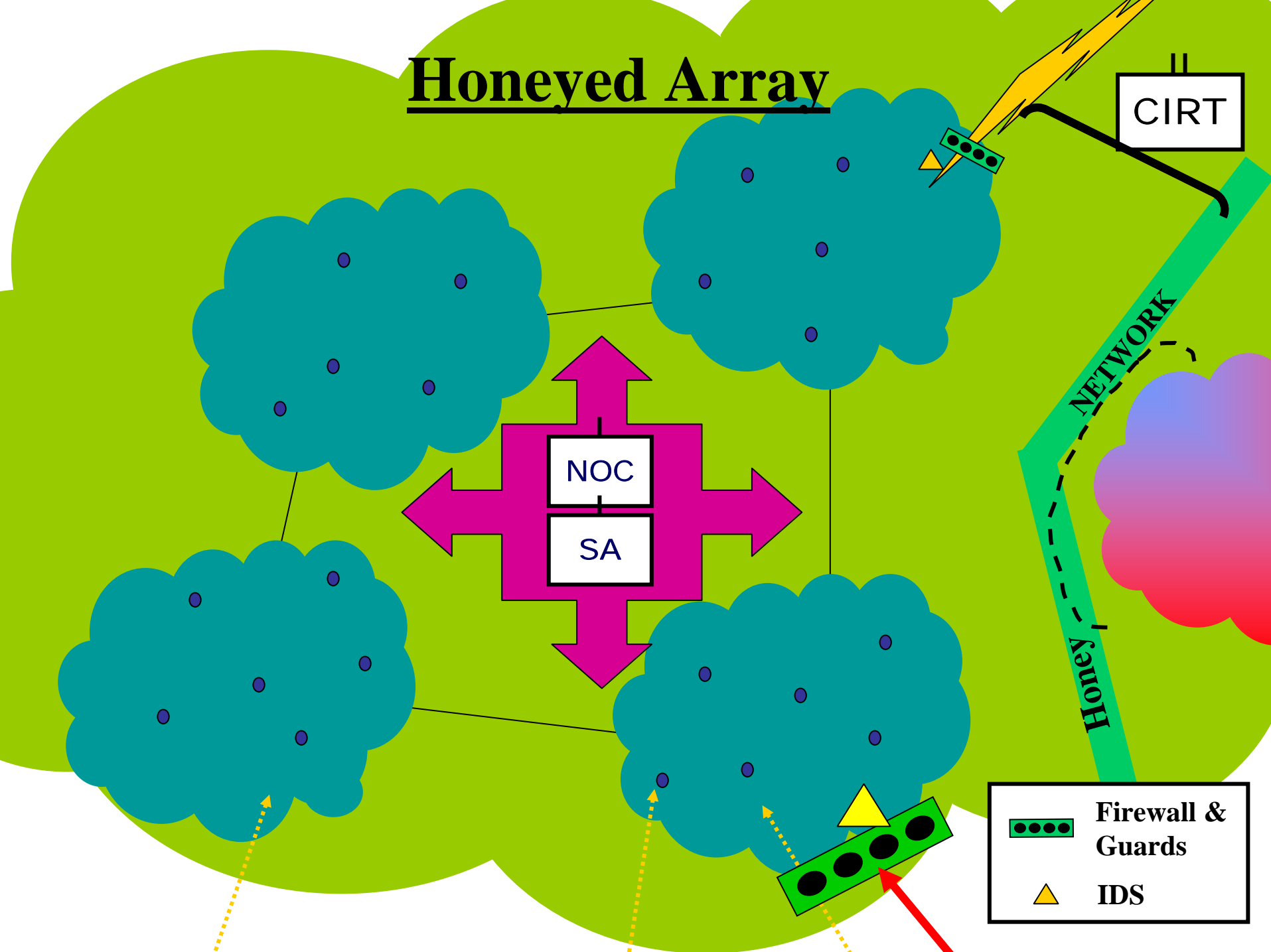
Strategic vs Combat Logistics

# Charge-Coupled Device (CCD)

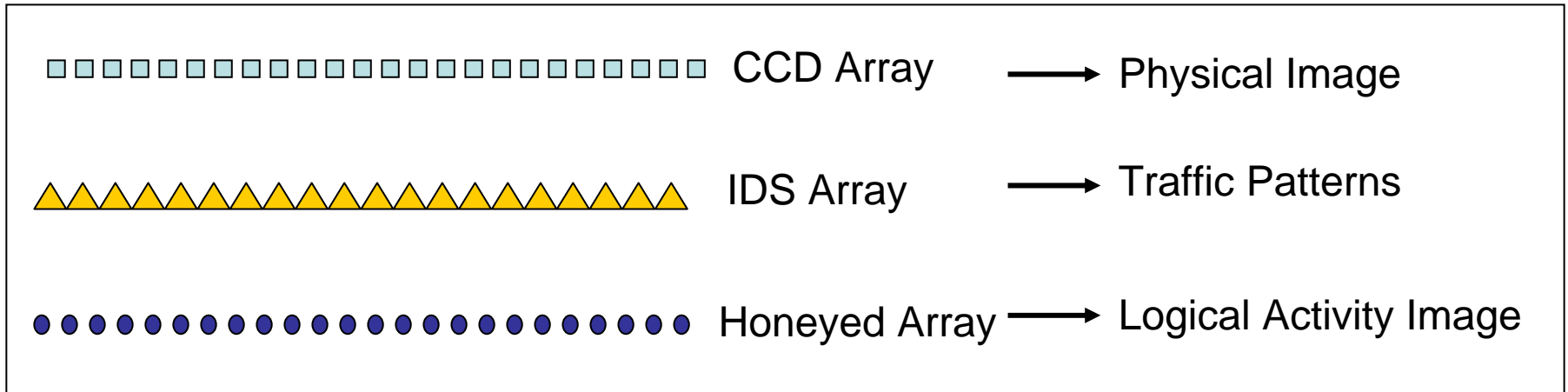
- is there a photon?
- if yes, then of what energy





# Honeyed Array

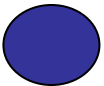



# An Analogy for ISR



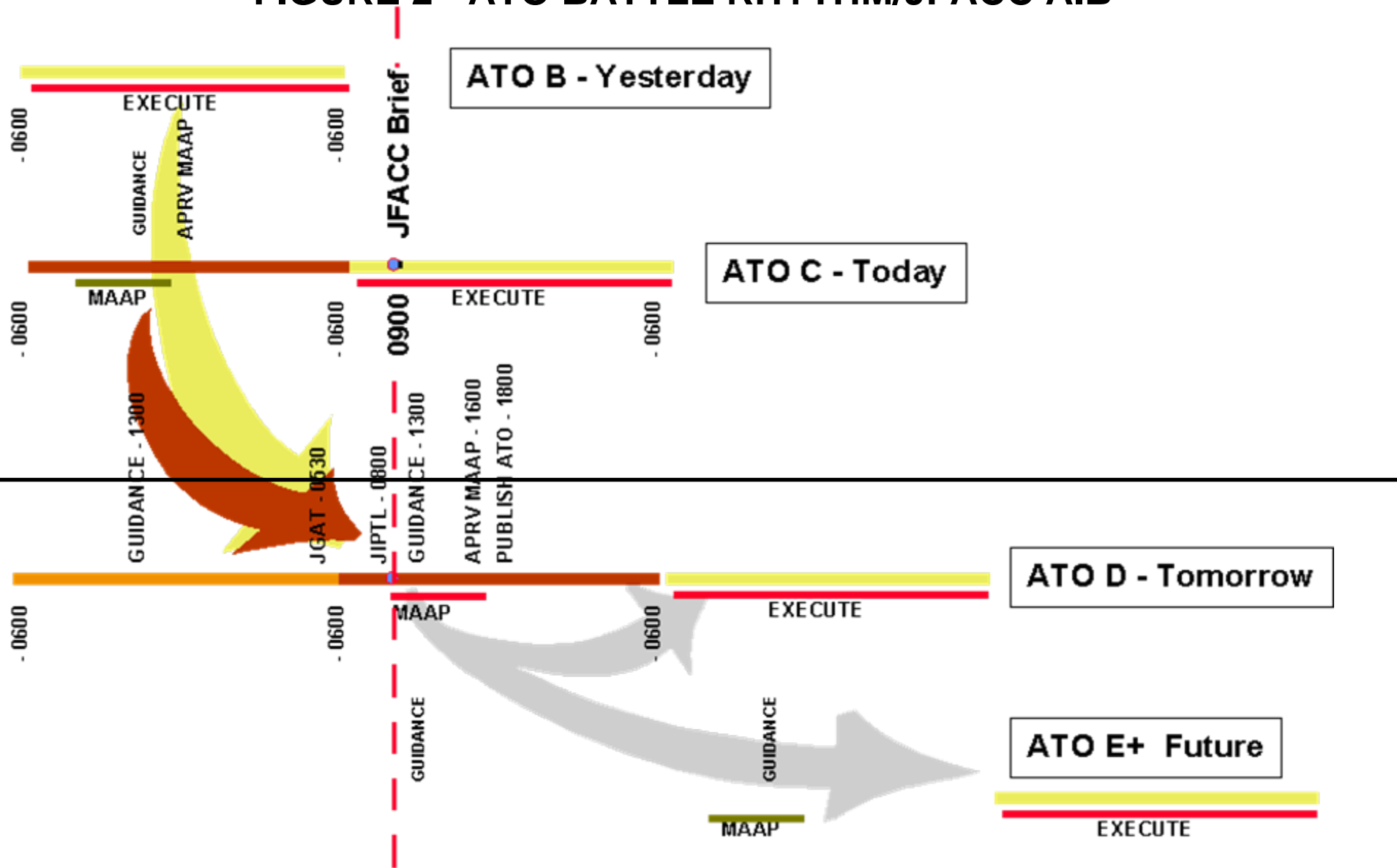
 = Honey Pot

**As #   > Stare time **

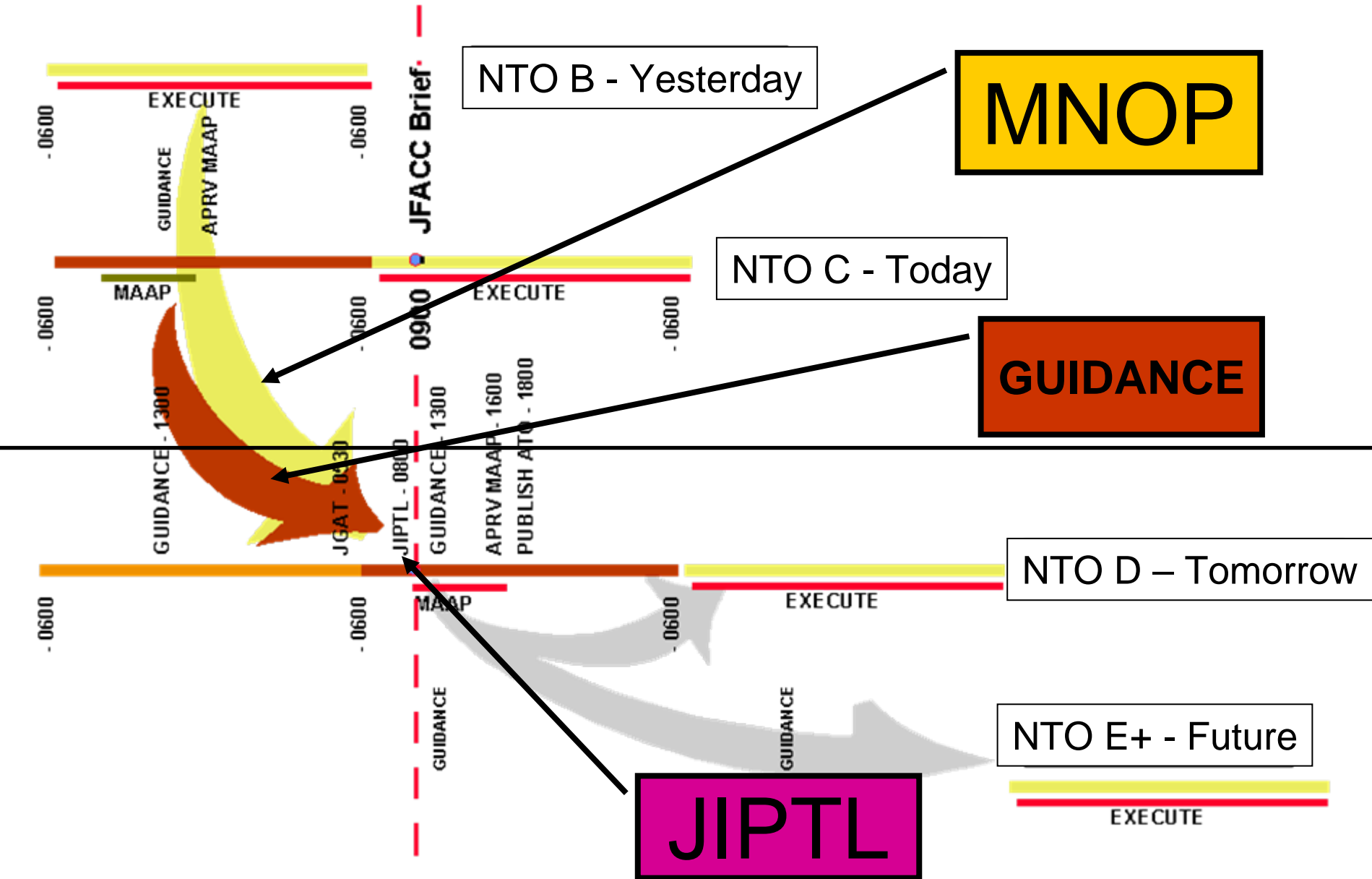
**As fidelity   > Stare time **

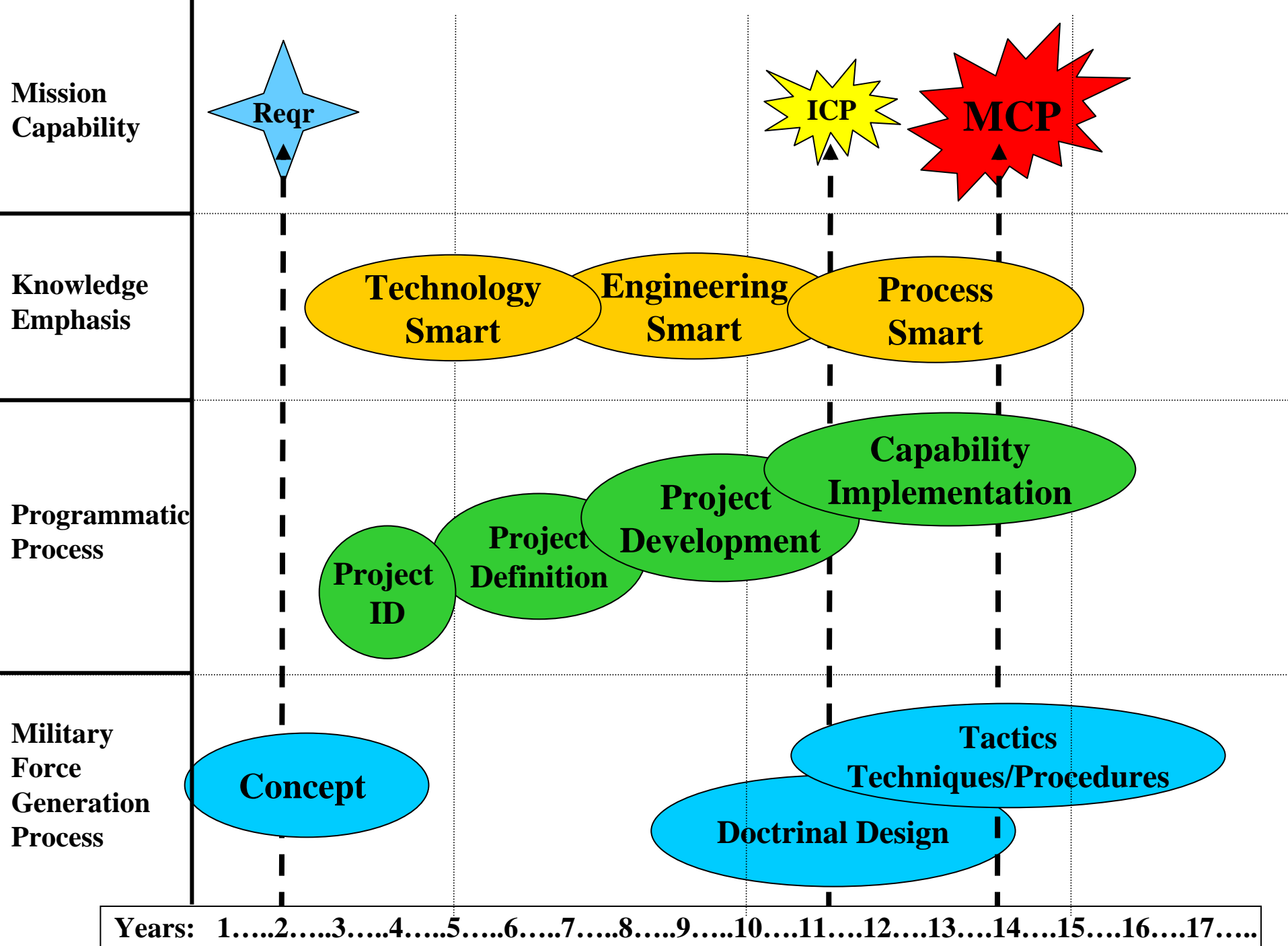
**Intelligent Deployment > Stare time **

# FIGURE 2 - ATO BATTLE RHYTHM/JFACC AIB



# Network Tasking Order BATTLE RHYTHM





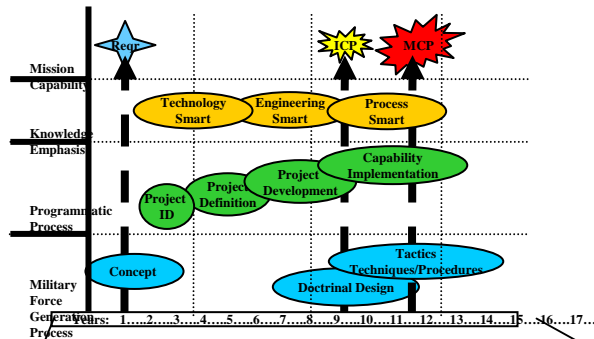
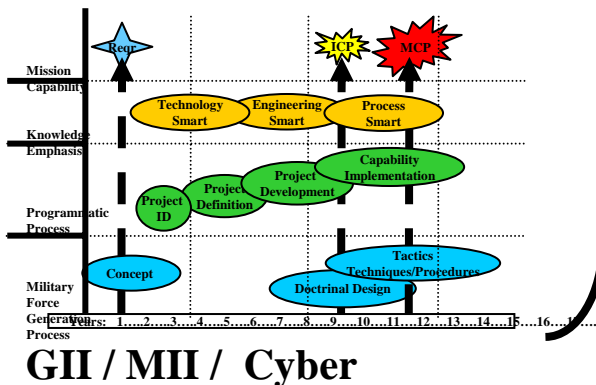
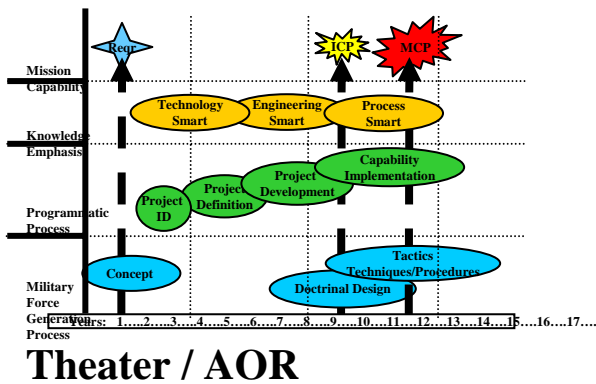
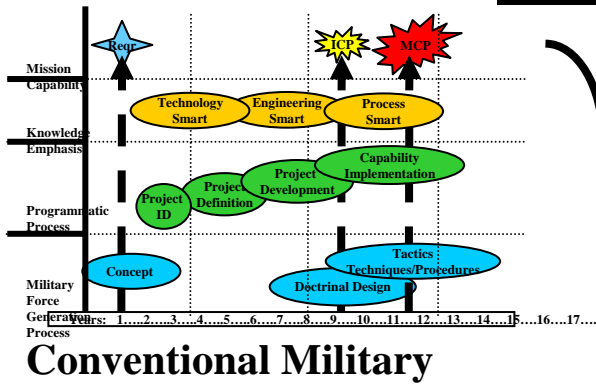


# The Problem Space!

From the synthesis of multiple Global Requirements

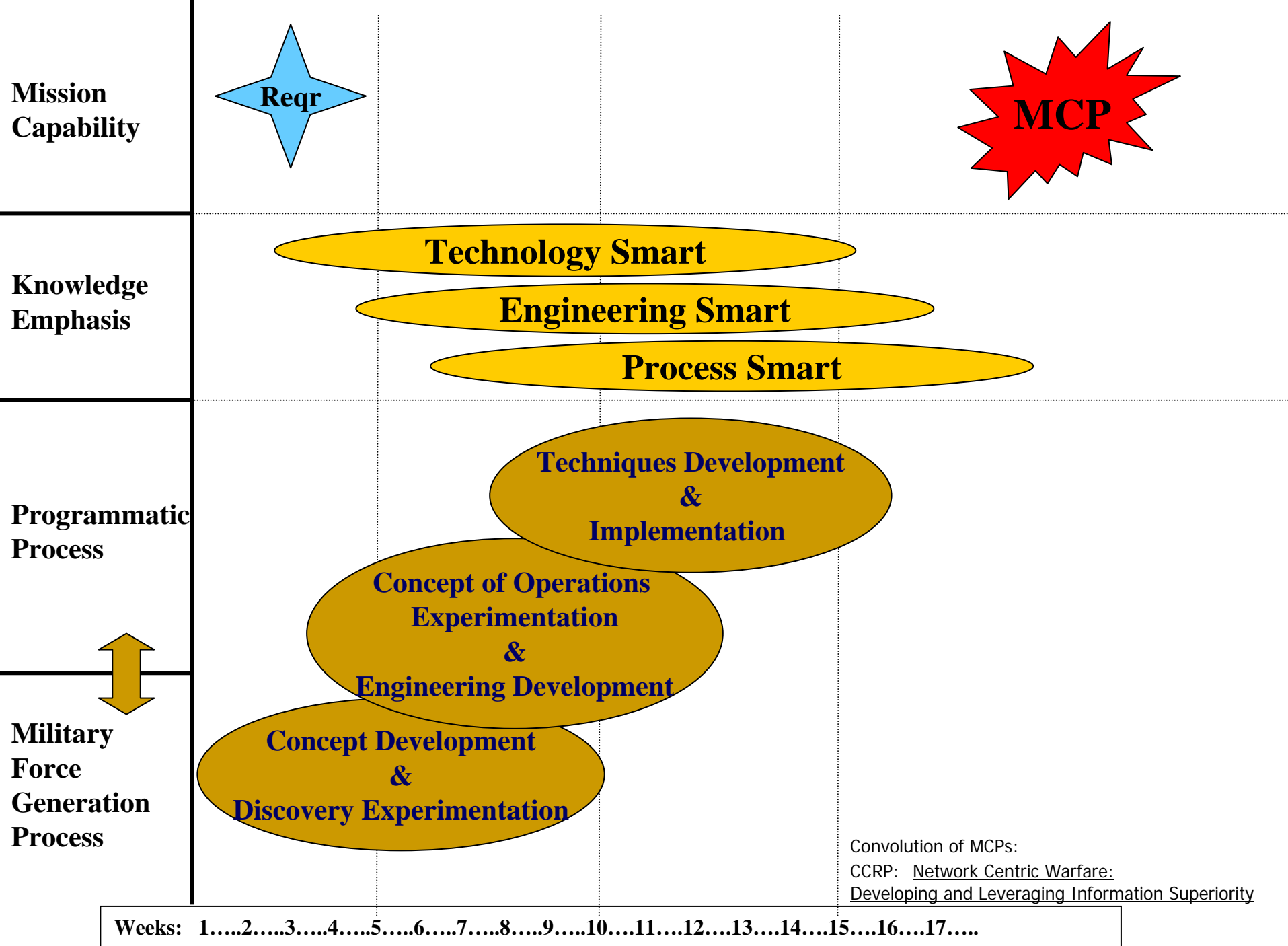
- in multiple AORs
- with separate TO&Es and
- with different Environmental leads...

...to a Mission Capability Package in **Weeks!**



...to a Mission Capability Package in **Days?**

**Weeks:** 1.....2.....3.....4.....5.....6.....7.....8.....9.....10....11....12....13....14....15....



**Mission  
Capability**

**Reqr**

**MCP**

**Knowledge  
Emphasis**

**Technology Smart**

**Engineering Smart**

**Process Smart**

**Self Synchronization**

**Knowledge Workers**

**Joint Philosophy**

- Shared Awareness with Force Generators
- Networked entities
- Clear Purpose
- Knowledge Base of Con Ops and Technologies

- Shared Awareness with J Staff
- Multiple COA development process
- Close coord with War fighter
- Lessons Learned Feed Back

**Robust Programmatic  
Process**

- Knowledge Base of Best Practices
- Close Coord with Contract Agents
- Clear Life Cycle and Strategic Capital Business Process

**Program Cost:  
(ReCap vs R&O)**

**Lack of  
Optimization**

**Loss of  
Program  
Control**

**Loss of  
Program  
Control**

**Maint  
ILS**

**HR  
Training**

# What is the Future?

**Technology Smart**

**Engineering Smart**

**Process Smart**

**Knowledge Workers**



**Network Awareness  
&  
Joint Strategic Guidance**

