An IW Perspective on Entropy Warfare

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AIM

The aim of this presentation is to give a military perspective regarding the practical application of Information Warfare to achieve Entropy-Based Warfare .

AGENDA

- **Introduction**

- **Entropy**

- **Information Warfare (IW)**

    - **Battle Space Dimention**

    - **Information Sphere**

    - **C^{4}I^{3}RS**

- **Entropy-Based Warfare**

- **IW Planning Matrix**

- **Warfare / War**

- **Conclusion**

INTRODUCTION

- **The rapid development of ICT has considerably increased the significance of information within the OBS.**

- **The advent of the PC and the birth of the public version of the Internet, communication and information capabilities have exploded.**

- **Everything and everyone is connected to some degree by the ICT also in the military operational environment: Network-centric**

WARFARE

- **Warfare [wáwr fair]** *noun* **- waging of war: the act or fact of engaging in a war.**

- **Warfare, the use of armed force by states or other organised groups to impose their will on opponents.**

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ENTROPY (1/2)

- **Entropy measure the disorderliness with which energy is stored in a system:**

  – **The greater the disorder the greater the entropy.**

- **Entropy can also be explained as follow:**

  – **Increasing Entropy**

    - **As the sun set what you see become more obscure until such a stage where you do not see any more.**

  – **Decreasing Entropy**

    - **As the sun rise random obscurity becomes clearer more discernible.**

ENTROPY (2/2)

The principle of entropy can be applied as follow:

Information Movement Towards Entropy

Information Measures		

Information		Entropy
Order		Disorder
Signal		Noise
Music		Cacophony
Cosmos		Chaos
Design		Randomness

INFORMATION WARFARE (IW)

*... an Information Age / Digital Age Transformation*

Information Warfare defends or attacks the bits and bites stream

INFORMATION WARFARE (IW)

INFORMATION WARFARE ACTIONS AND EFFECTS

Offensive
Attack

- deny, corrupt, destroy or delay an adversary's information use and/or assets,

Exploitive
Exploit

- exploit information and IW technology to enhance own combat effectiveness.

Deterrent
Deter

- convince others about our own capabilities and the risk associated in attacking the RSA,

Defensive
Protect

- safeguard our own information and information systems against attack,

Supportive
Support

- provide an extended IW capability in support of other activities primarily for the attainment of information Superiority.

BATTLE SPACE DIMENSIONS

SPACE

AIR

INFORMATION SPHERE
(INFOSPHERE)

SEA

LAND
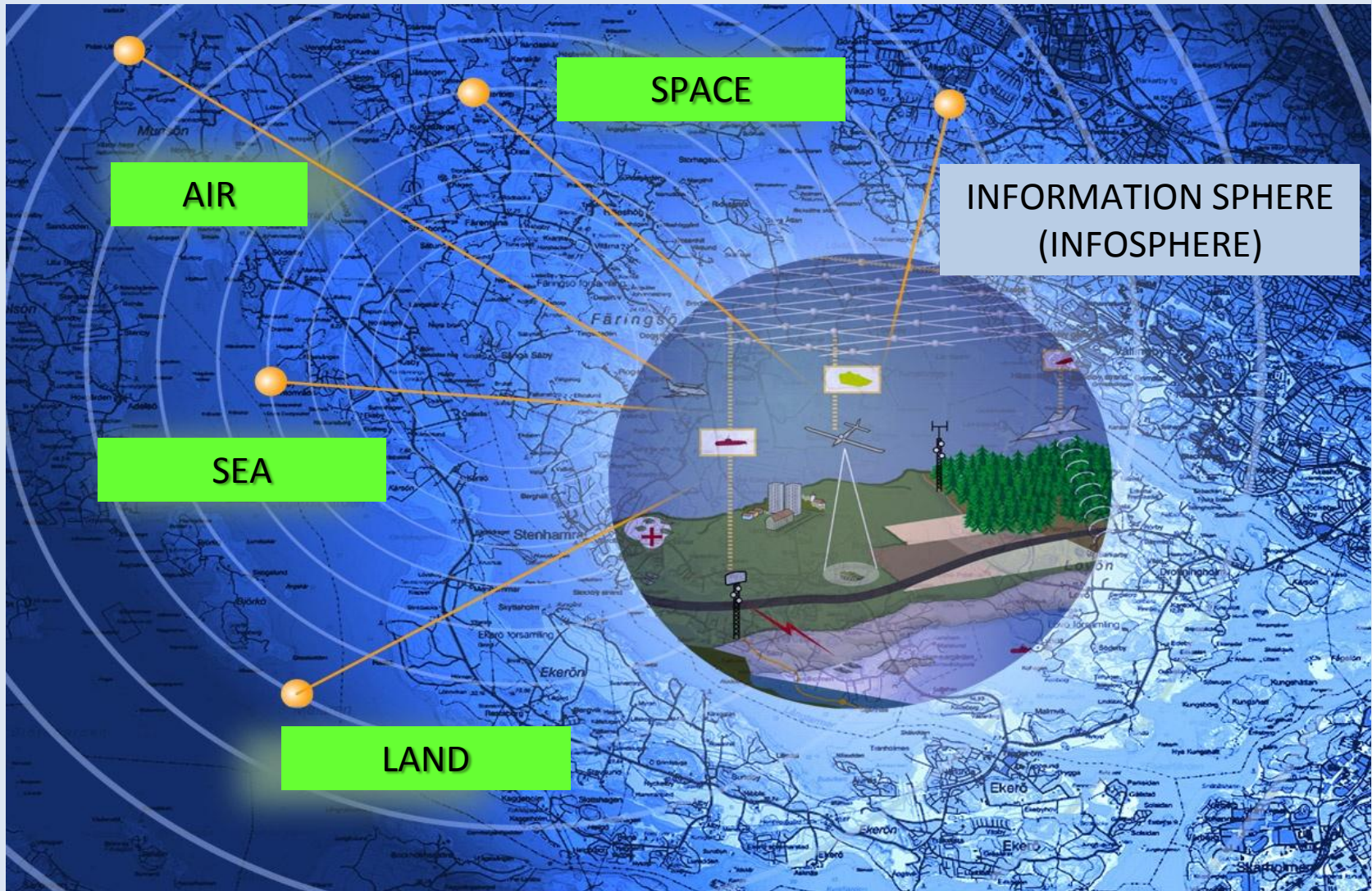
Military action is in the future likely to take place
simultaneously in all warfare arenas.
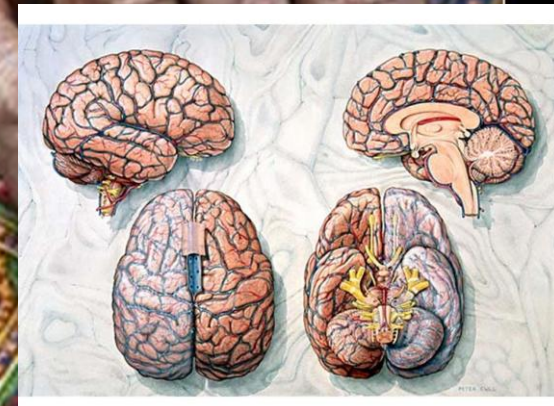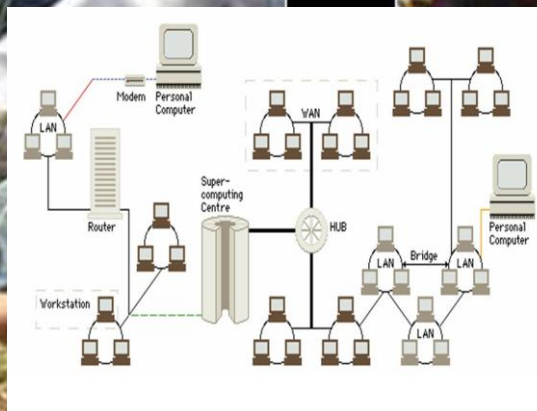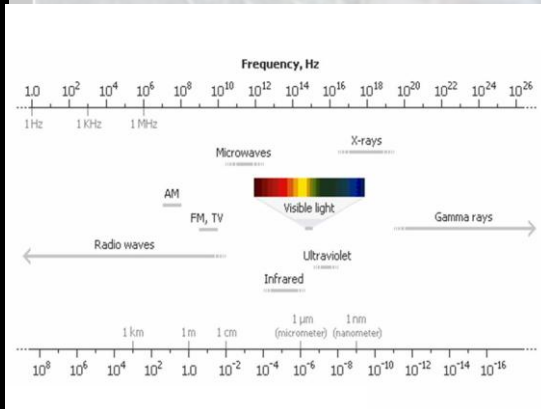
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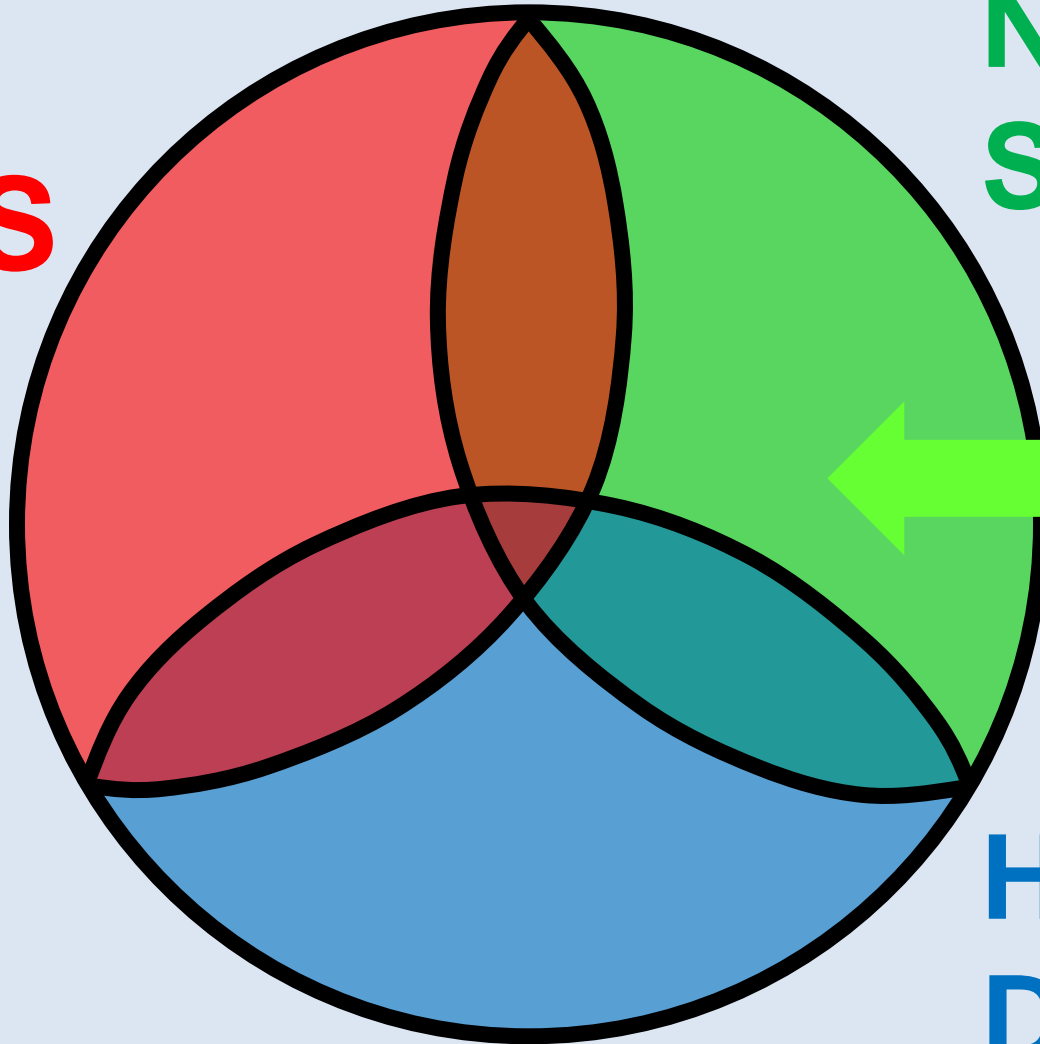
INFOSPHERE (1/3)

It is the domain where command and control takes place and it consists of the following:

- ✓ **The Electromagnetic Spectrum,**

- ✓ **Network Spectrum (Cyberspace) and the**

- ✓ **Human Domain (cognitive domain) is the spine of the infosphere.**

EMS

Network Spectrum

Cyber Warfare happens in this environment

Human Domain

INFOSPHERE (3/3)

The role that IW plays in the infosphere is to affect or protect the *Command and Control* capability, as this is the centre from where planned strategies are executed and controlled.

IW also influences the *Information Infrastructure* which forms the basis of the infosphere as this is the area where the data is moved from the sensors through the *Information Based processing* environment and then again to the decision makers to visualise a situational awareness picture.

Converged
IP Network
for Net-Centric Warfare

Radio
Video
Voice
Data

OVER IP
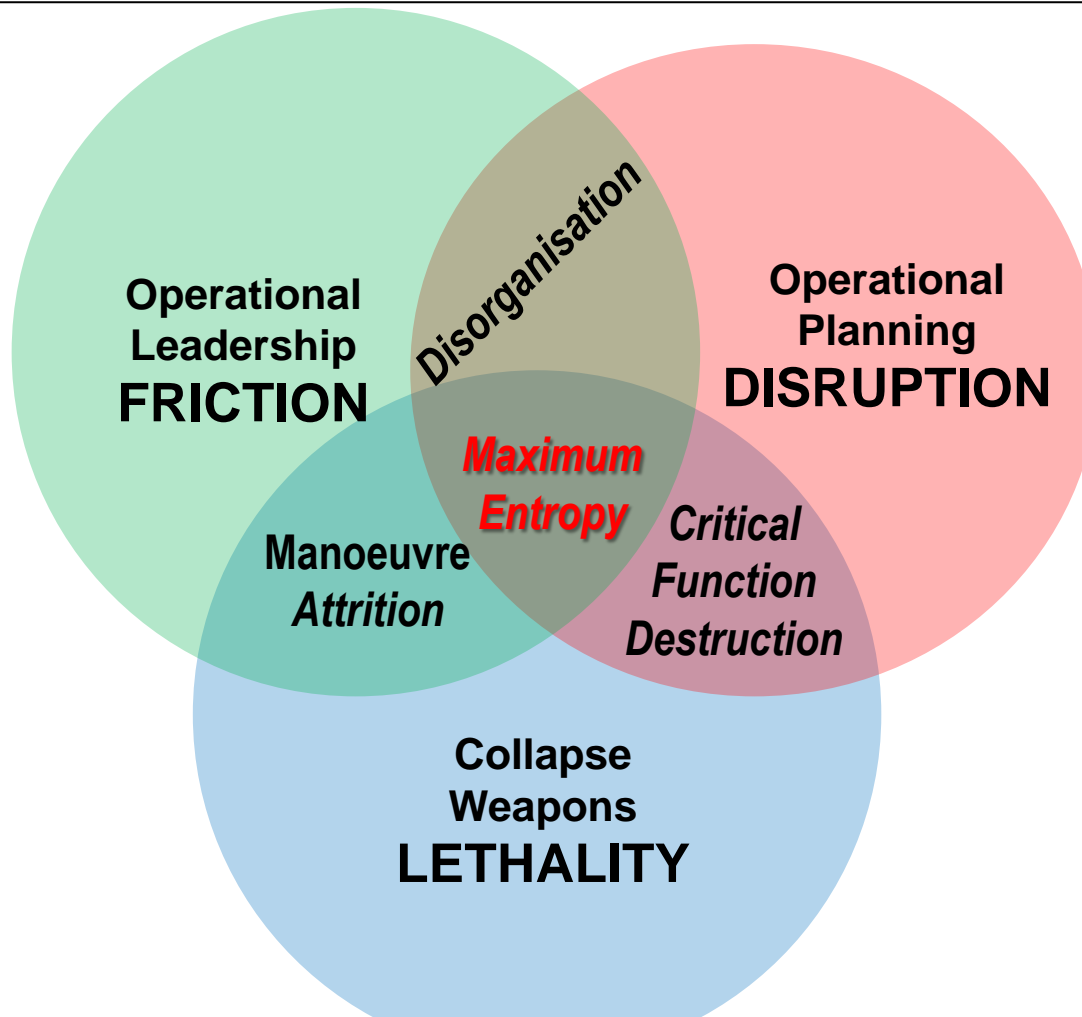
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C⁴I³RS

- **The focus of IW is on the C² including the cognitive domain**
- **C⁴I³RS + C =**
  - **Command and**
  - **Control**
  - **Communication and**
  - **Computers**
  - **Information**
  - **Intelligence and**
  - **Infrastructure**
  - **Reconnaissance and**
  - **Surveillance**
  - **Cognitive**

COMMAND AND CONTROL (C²)

- **C² =**
  - **Situational Awareness**
  - **Planning**
  - **Tasking**
  - **Control**
- **Enablement of C² =**
  - **Cognitive**
  - **Communications and**
  - **Computers**
  - **Infrastructure**
  - **Information and**
  - **Intelligence**
  - **Reconnaissance and**
  - **Surveillance**

Entropy-Based Warfare

Diagrammatic Representation of Entropy-Based Warfare (Venn Diagram)

Operational Leadership **FRICTION**

Operational Planning **DISRUPTION**

Collapse Weapons **LETHALITY**

Disorganisation

Maximum Entropy

Manoeuvre *Attrition*

Critical Function Destruction

IW PLANNING MATRIX

		INFORMATION WARFARE								
		IBP			II			C²		
		EW	CW	PO	EW	CW	PO	EW	CW	PO
Situational Awareness	Strategy									
	Operational									
	Tactical									
	Weapons Systems									
Plan	Strategy									
	Operational									
	Tactical									
	Weapons Systems									
Task	Strategy									
	Operational									
	Tactical									
	Weapons Systems									
Control	Strategy									
	Operational									
	Tactical									
	Weapons Systems									

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Infrastructure

WARFARE

FACP

Battle Space
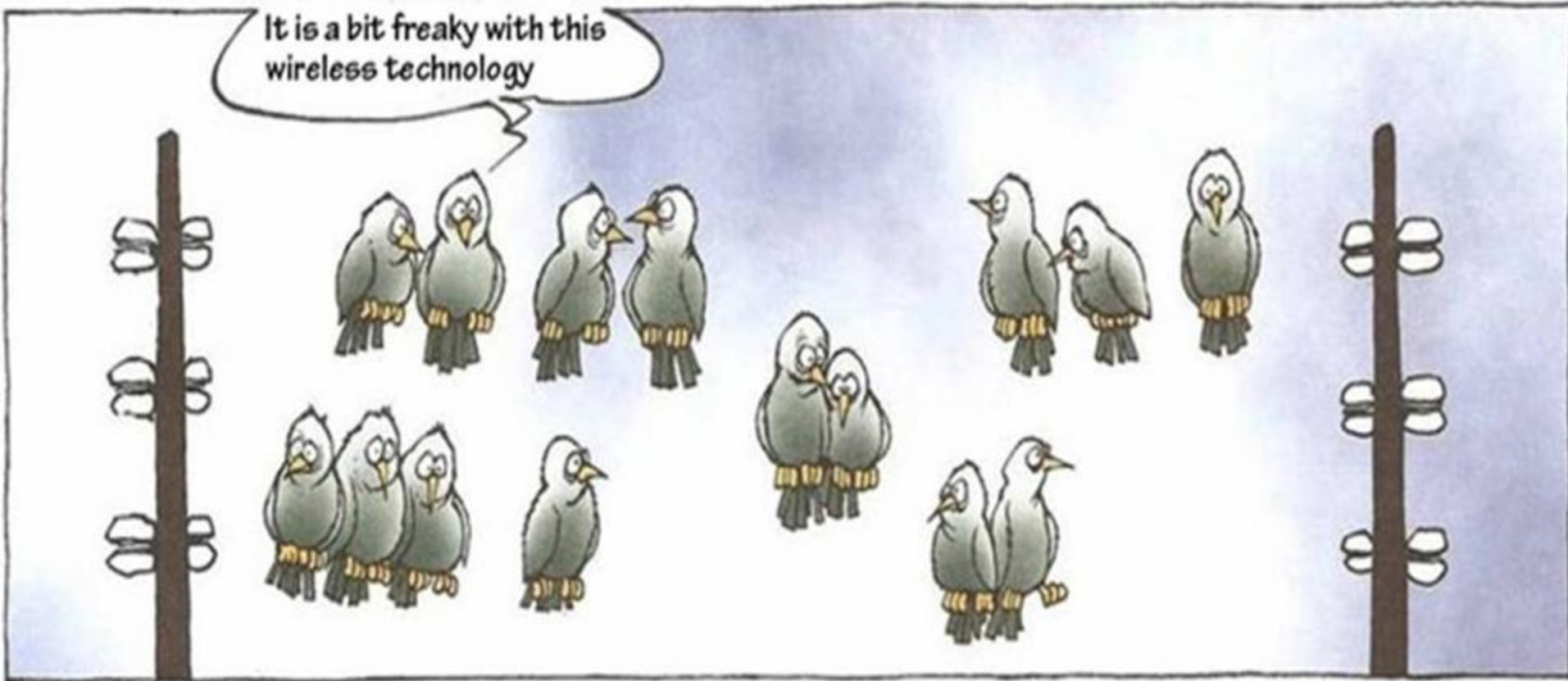
OP

LP

Int

SF

SF

UAV

FSCC

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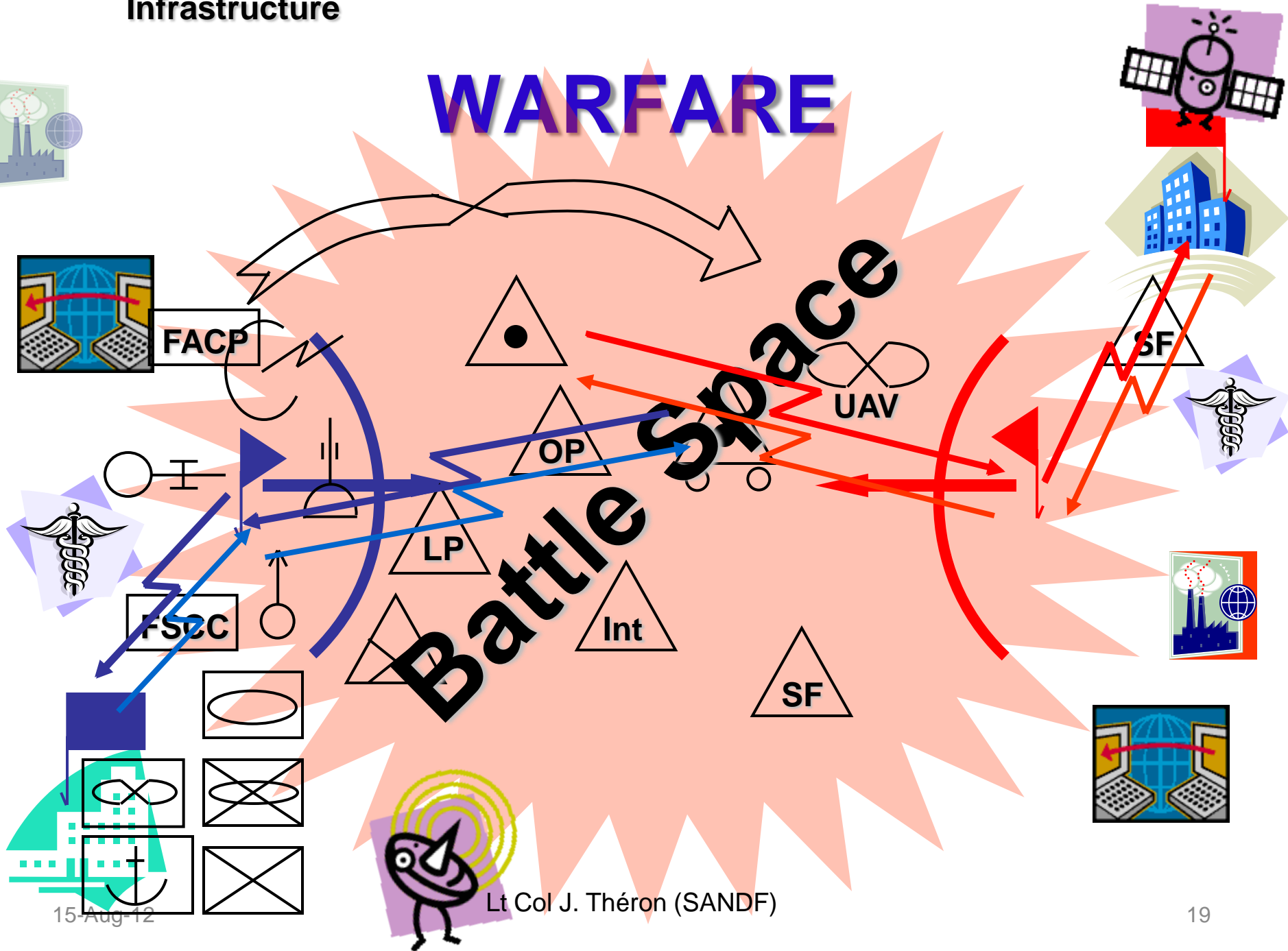
WAR

- **What is WAR?**

- **Are we experts on War?**

- **Experts on War although we were never in a WAR!**

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CONCLUSION

- **By applying the principle of IW to target the enemy's Information-in-Warfare with EW, CW and PO entropy can be achieved within the enemy's C^2.**

- **It can thus be concluded that the application of IW within the Infosphere will achieve Entropy Warfare.**

- "Therefore those who win every battle are not really skilful – those who render other armies helpless without fighting are the best of all" ~ *Sun Tzu.*

QUESTIONS