



## Security Events Impacting the Rail System (at the Operations, Economic and reputation levels)

*Lisboa, 28 November 14*

# Cyber Defence Response – A Strategic Challenge –



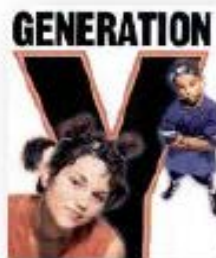
**Lt Col Paulo Viegas Nunes**  
nunes.pfv@mail.exercito.pt

# Agenda

- Cyberspace Strategic Impact
- Information Warfare: a new Operational Paradigm
- Social Risk Management
- Cyber Security and Cyber Defense
- National Cyber Security Strategic Concept
- Conclusions



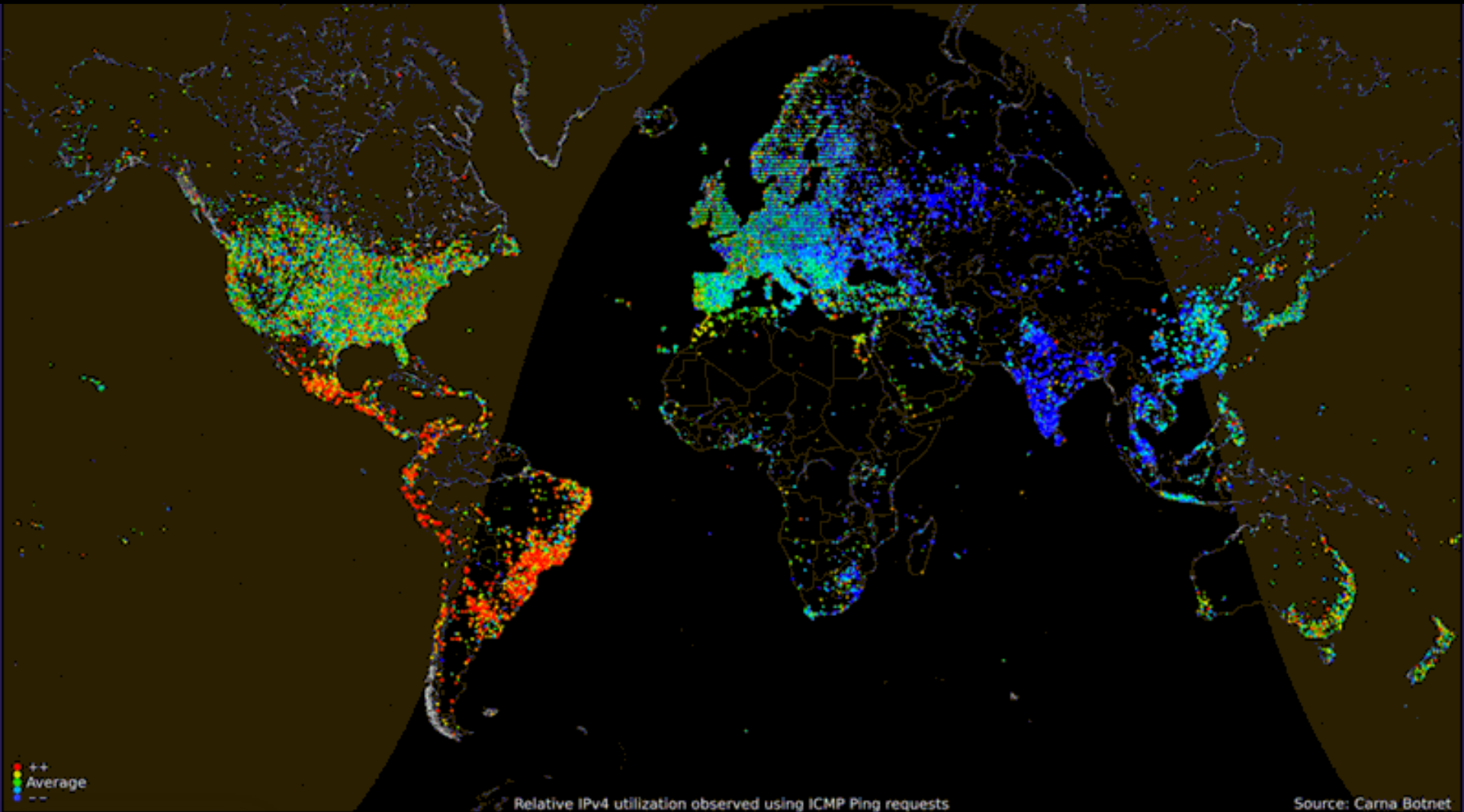
# Technical (Re) Evolution – Profiles and Generations



Adaptado de:



# Cyberspace - "A New Global Common..."



Time

5:04<sup>45</sup> pm

internet time @086.6

8 Mar 2010/Mon

Money

bitcoin

This block features two gold Bitcoin coins with the Bitcoin symbol and the text 'BITCOIN' and 'PRODUCED IN HOLLAND'. Below the coins is the Bitcoin logo and the word 'bitcoin' in a bold, sans-serif font.

Multi-User

This block shows six small, colorful globes (red, blue, green, yellow, purple, orange) arranged in a row. Each globe has a pair of headphones connected to its base, symbolizing multi-user access to a shared resource.

Multi-Proprietary

This block depicts a large group of people in various uniforms (blue, yellow, red) holding up a large, flat, rectangular sheet that is covered in a grid of small, colorful squares. This represents a multi-proprietary or multi-stakeholder environment.

# The dawn of the Cyber era



# “Do the Ends justify the Means” ?



**The Economist**  
 JUN 2 2010 - JULY 31 2013  
 Economist.com

How bad is China's credit crisis?  
 Shale shakes up Russia  
 A tech revolution in schools, at last  
 Why we need more property taxes  
 Of mice and Manet

## The march of protest

facebook

Tunísia, Egípto, Argélia, Irão, Jordânia, Iémen, Líbia, Maurítânia, Arábia Saudita e Síria...

Tunísia, (Dec10-Jan11)  
 Egípt, Jan-Feb 11

THE RELUCTANT HEGEMON: A 14-PAGE SPECIAL REPORT ON GERMANY

**The Economist**  
 JUN 1 2010 - JUL 31 2013  
 Economist.com

Emerging markets in turmoil  
 America's endangered coasts  
 The other mile-high club  
 Chris Christie, Republican heavyweight  
 Death of a storm chaser

## i-spy

Have America's intelligence agencies gone too far?

**The Economist**  
 JUL 2 2010 - JUL 31 2010  
 Economist.com

Victory for the gun lobby  
 Who will run BaseX?  
 Rewriting Wall Street's rules  
 How Big Oil became Big Gun  
 The link between IQ and disease

## Cyberwar

The threat from the internet

**Secret**

Wikileaks began on Su...  
 United States embassy c...  
 to be released into the p...  
 the world an unprec...

**NATIONAL SECURITY AGENCY**  
 UNITED STATES OF AMERICA

# The “Obama Effect” - Schedule of Events

**2007** – “Defensive mindset in cyberspace”

**2009** – **Stuxnet Deployed**

**2010** – US CYBERCOM Operational

**2011** – **US Cyber Strategy**

**2012** – US Air Force: **Cyber Operations at local Commander’s discretion**

**2013** – **US Preemptive Cyber Strategy**



# Operational Costs vs Reach

\$90B



Nuclear Sub Fleet

\$40B



Stealth Fighter Fleet

\$10B



Euro Fighter Fleet, Leopard II Group

\$1B



Cyber weapons Program, MIL Targets

\$100M



Cyber weapons Program, CI Targets

\$5M



Singular cyber attack against National Critical Infrastructures

non-state actors threshold



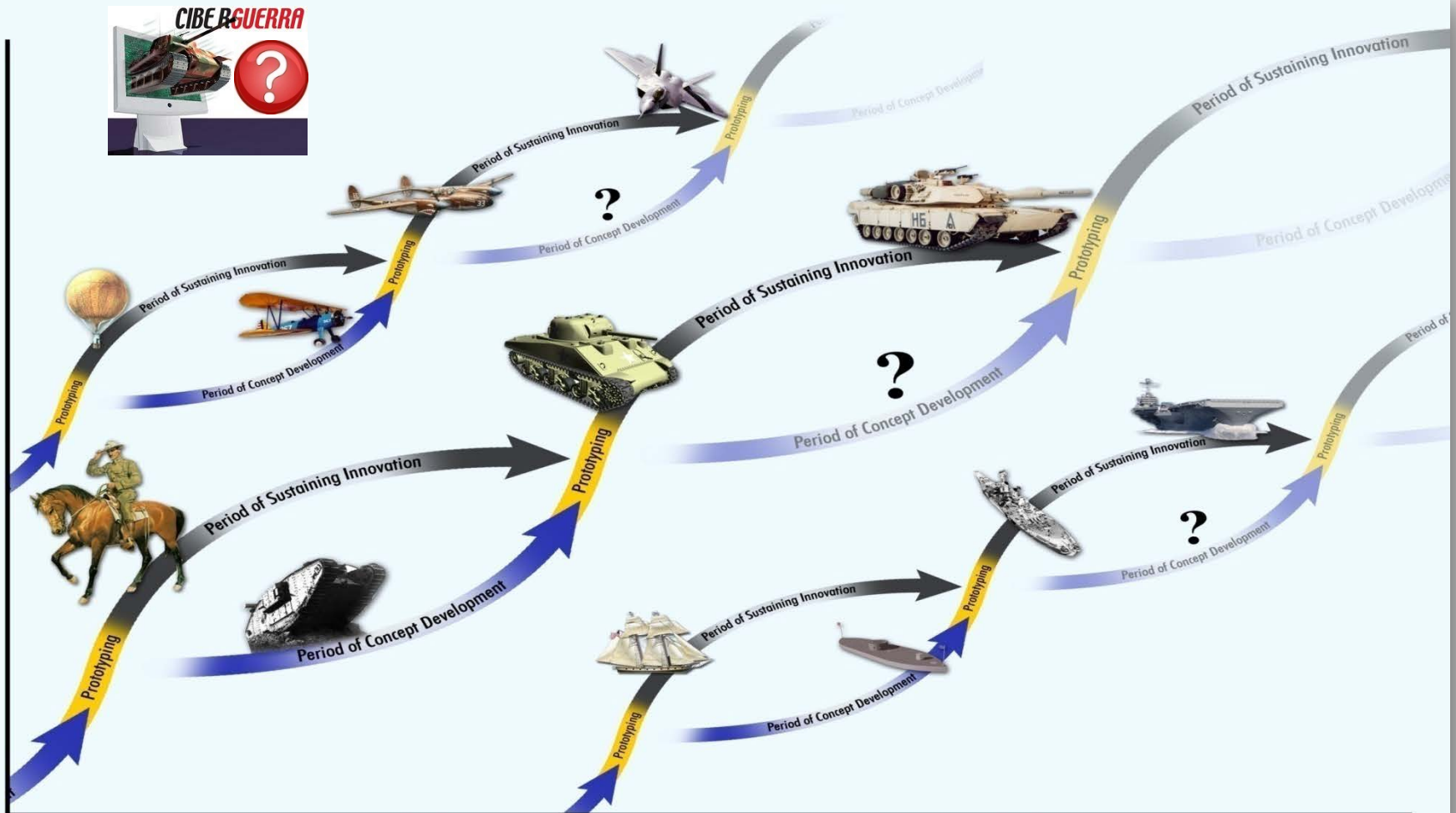
# Information Warfare: A Paradigm Shift

To wage non kinetic conflicts



# Military Innovation

## Concept Development and Experimentation



Source: Dennis Popiela; Delivering Innovation ; Joint Concept Development and Experimentation MITRE Corp.

# Cyberspace: 4+1 Dilemma ...



4+1?

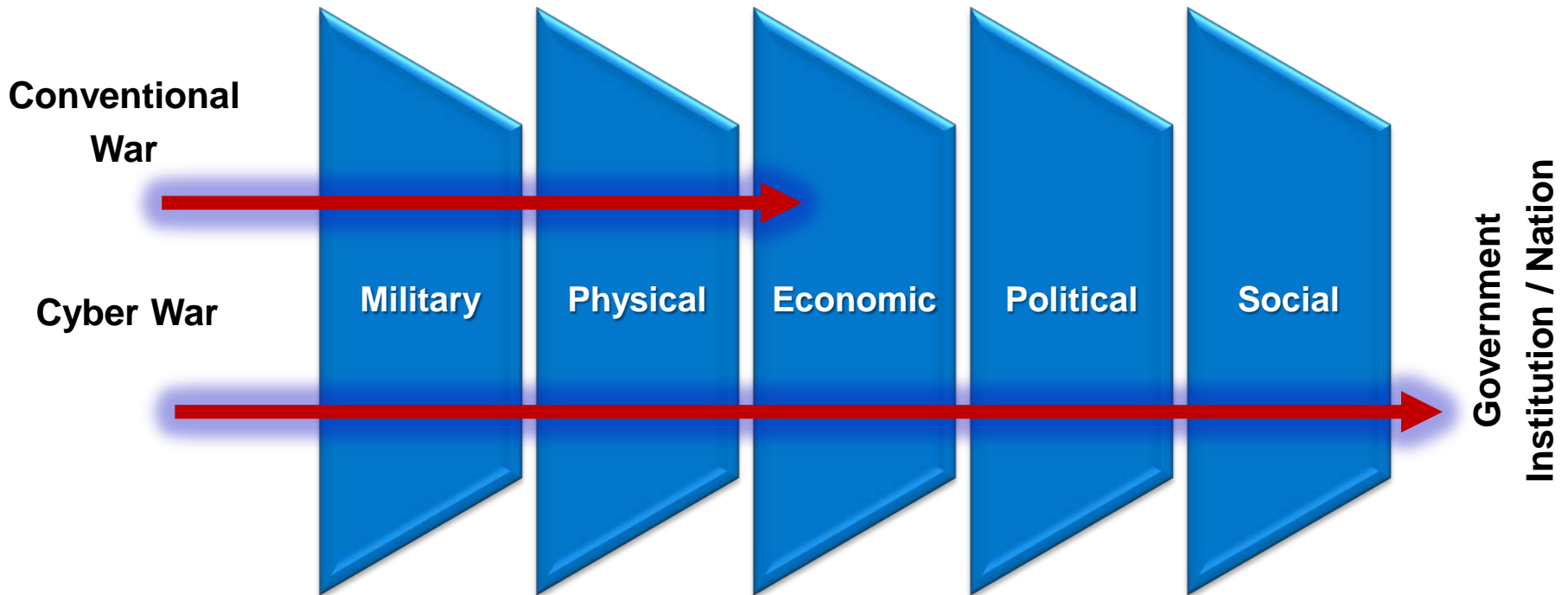
or



or the 2!!

**SUBDOMAIN !!**

# Cyber War Impact



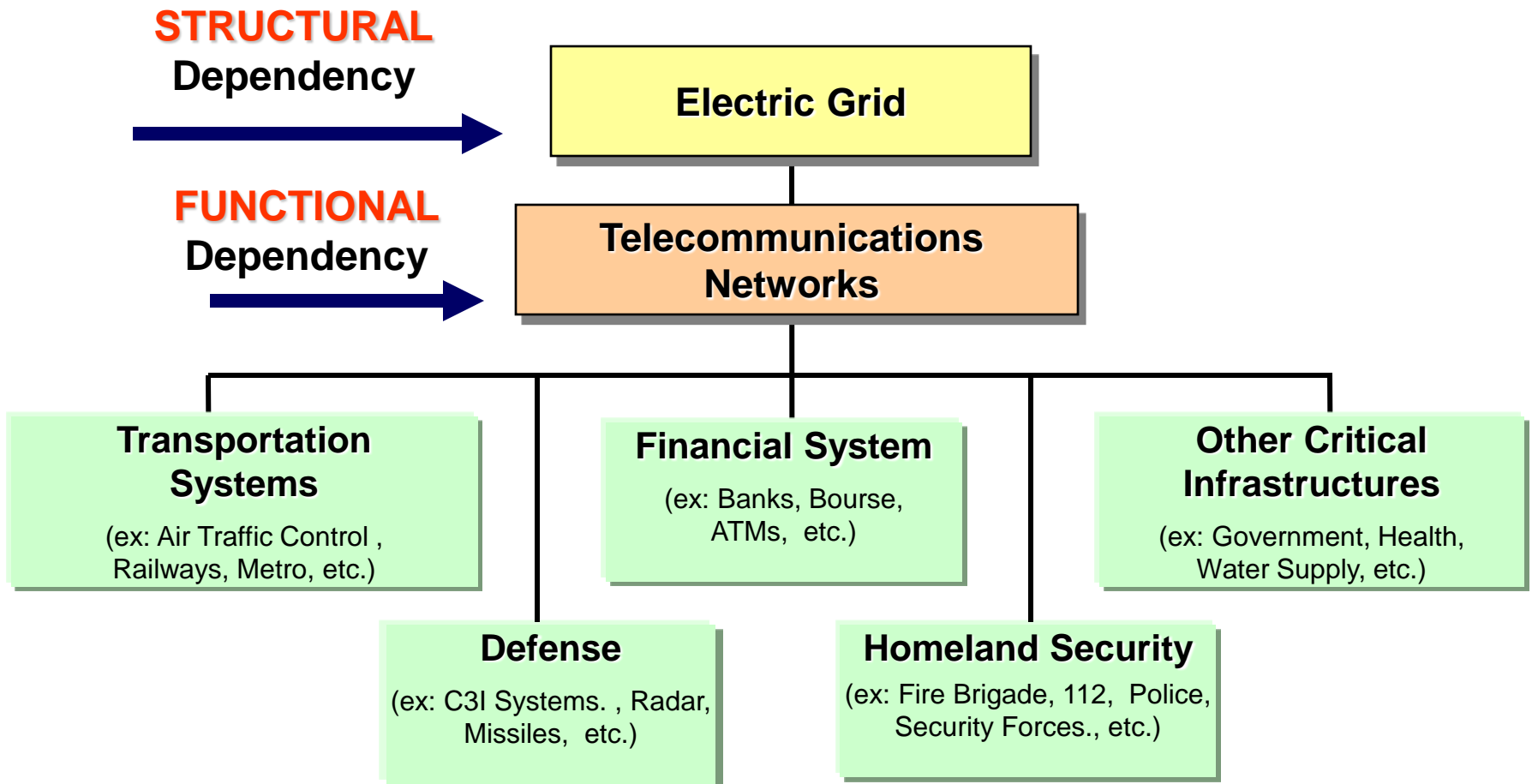
“Os verdadeiros alvos são a mente dos Decisores e Comandantes, não os seus Exércitos ou as infraestruturas impenetráveis que os protegem”

*(autor desconhecido)*

# *Social Risk Management – Cyber Impact*



# National Critical Infrastructures : Interdependency Model



Source: Adapted Gen Pinto Ramalho (2003); Eng. Sousa Cardoso (2003).



# Global Risks (2007-2014)

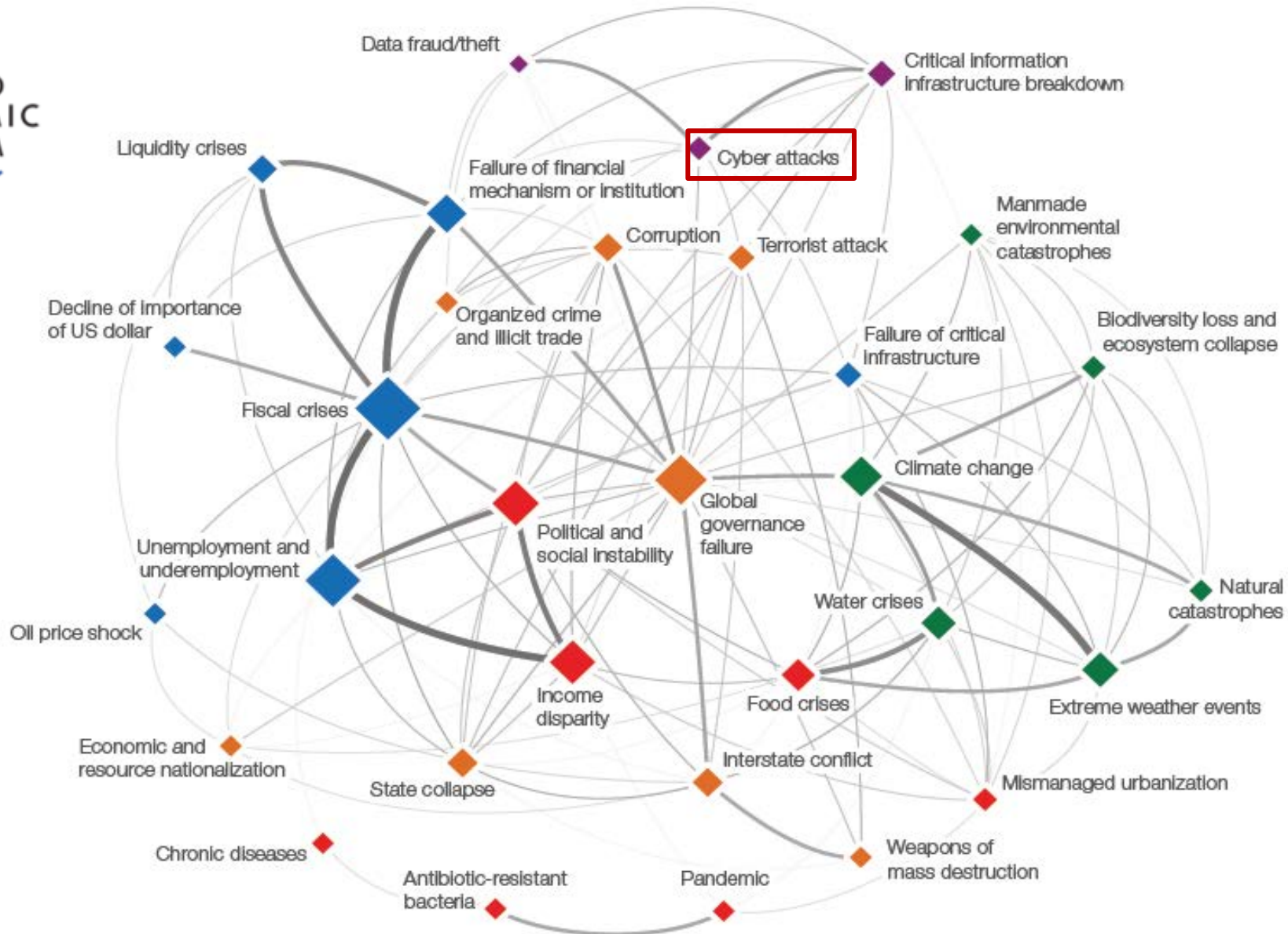


## Top 5 Global Risks in Terms of Likelihood

	2007	2008	2009	2010	2011	2012	2013	2014
1st	Breakdown of critical information infrastructure	Asset price collapse	Asset price collapse	Asset price collapse	Storms and cyclones	Severe income disparity	Severe income disparity	Income disparity
2nd	Chronic disease in developed countries	Middle East instability	Slowing Chinese economy (<6%)	Slowing Chinese economy (<6%)	Flooding	Chronic fiscal imbalances	Chronic fiscal imbalances	Extreme weather events
3rd	Oil price shock	Failed and failing states	Chronic disease	Chronic disease	Corruption	Rising greenhouse gas emissions	Rising greenhouse gas emissions	Unemployment and underemployment
4th	China economic hard landing	Oil and gas price spike	Global governance gaps	Fiscal crises	Biodiversity loss	Cyber attacks	Water supply crises	Climate change
5th	Asset price collapse	Chronic disease, developed world	Retrenchment from globalization (emerging)	Global governance gaps	Climate change	Water supply crises	Mismanagement of population ageing	Cyber attacks

Fonte: WEF, Global Risks Report 2014

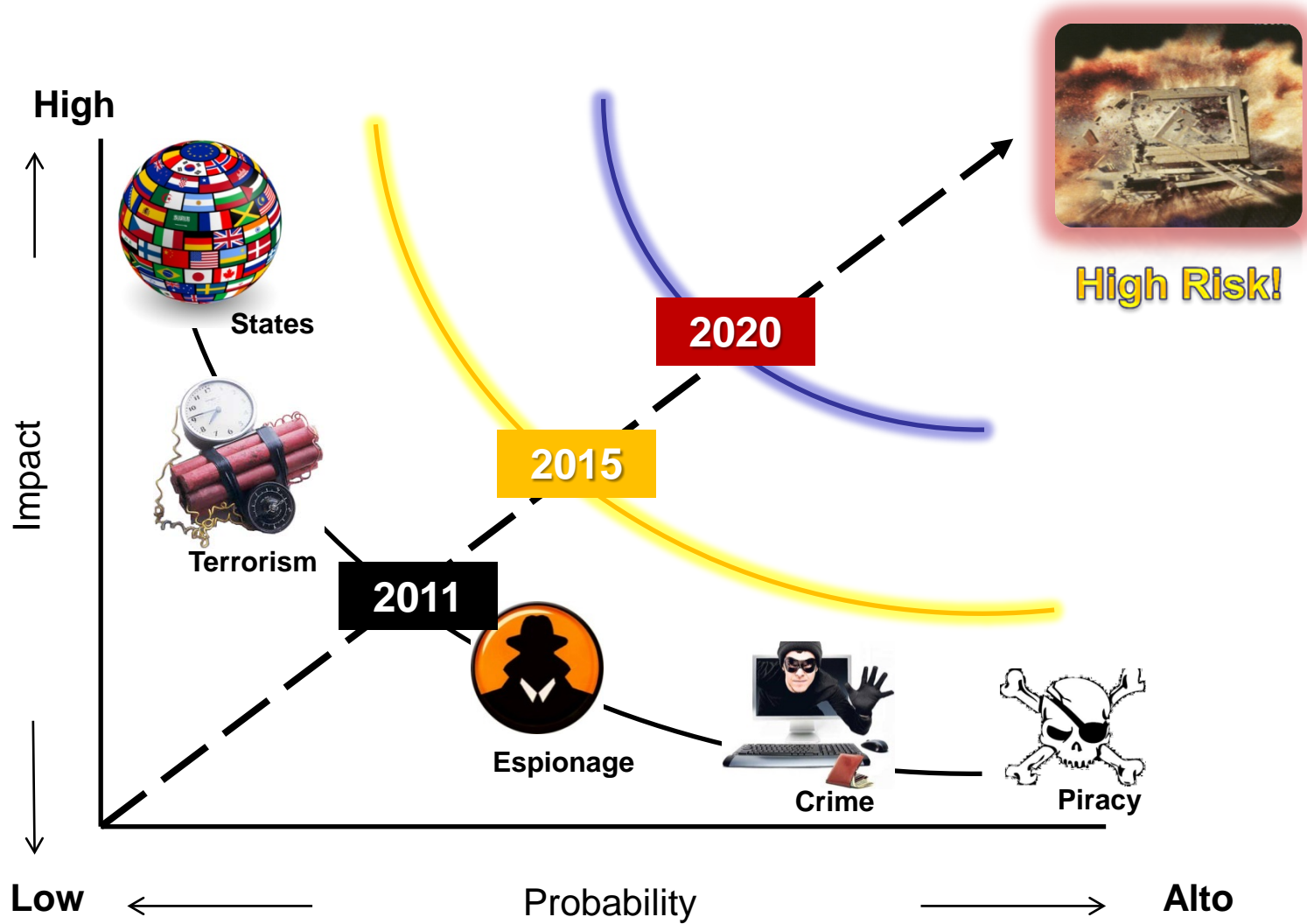
# Global Risks 2014 – Interconnections Map



List



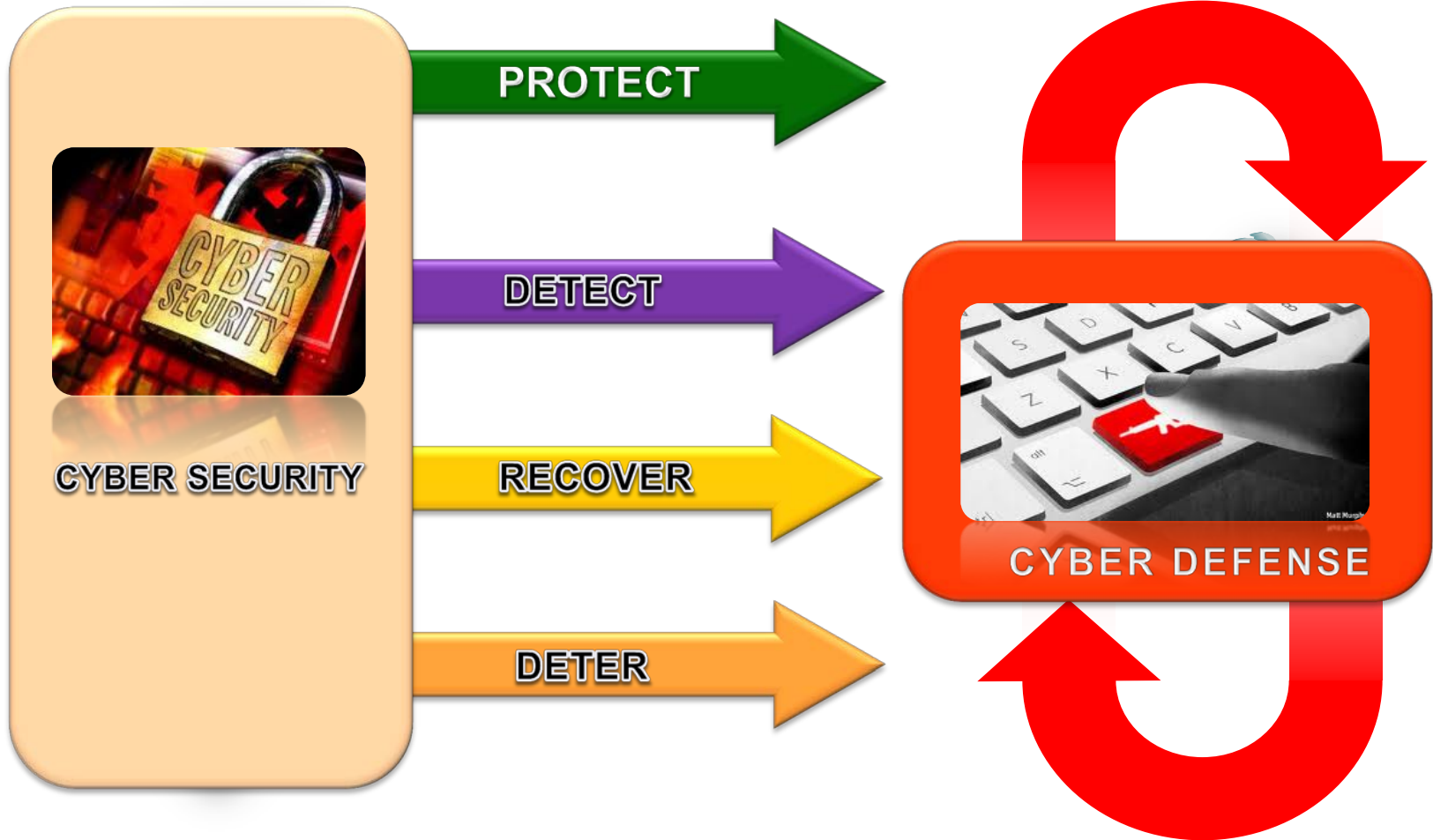
# Threat Spectrum – Future



A world map is displayed on a large screen, overlaid with a grid and glowing blue lines that suggest a global network or data flow. The text "SYSTEM FAILURE" is prominently displayed in the center of the map in a white, stylized, futuristic font, flanked by double arrowheads pointing left and right. In the foreground, the silhouettes of three people are visible, sitting at a desk and looking towards the screen.

SYSTEM FAILURE

# Social Risk : What can we do about it?

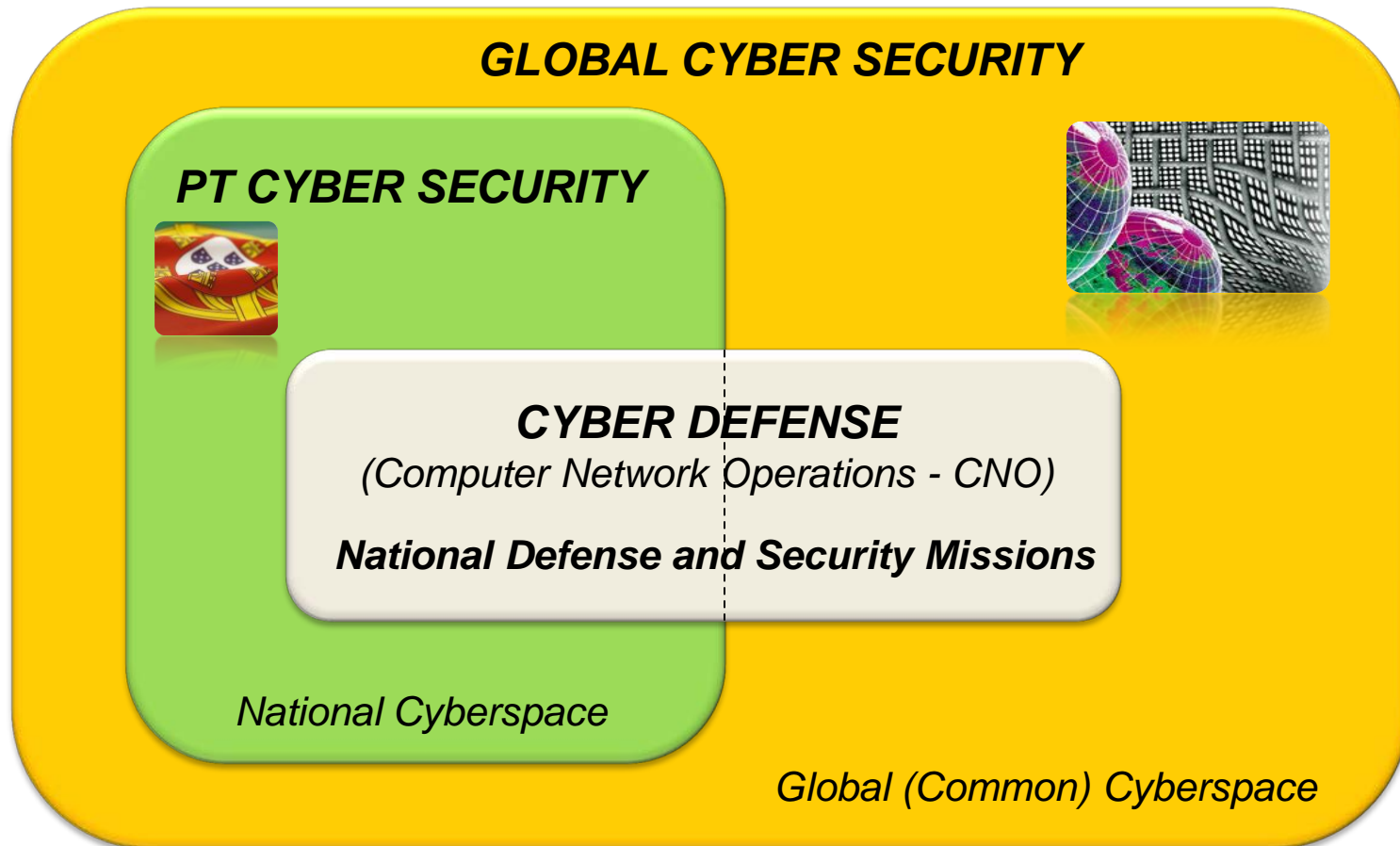




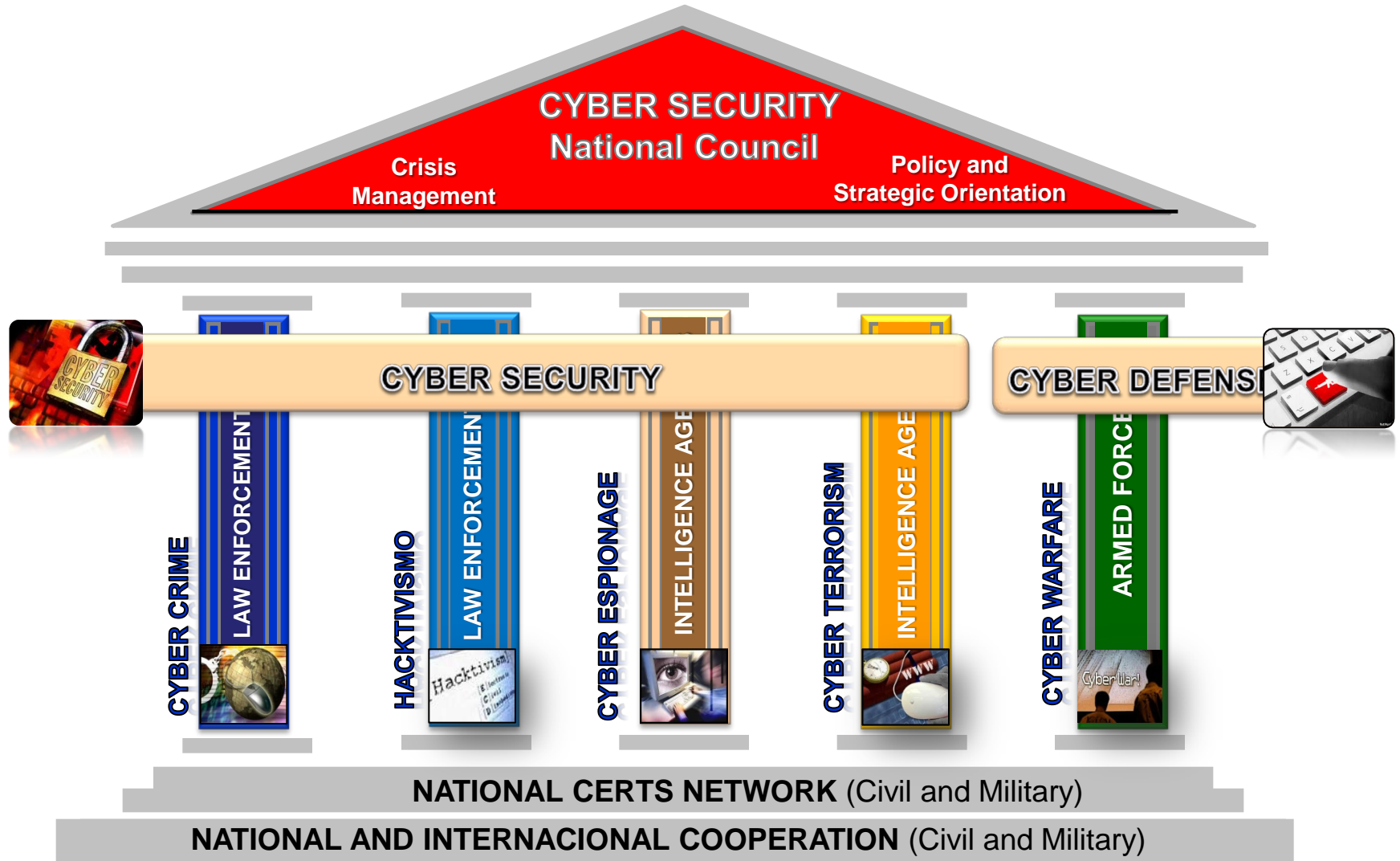
## **CYBER SECURITY and CYBER DEFENSE:**

Protection and Defense of NII  
Relevant Questions

# Cyber Security vs Cyber Defense



# Cyber Security and Cyber Defense: “One house, several pillars”





**“In our interconnected world,  
we will either succeed collectively  
or fail individually.”**

Anders Fogh Rasmussen, NATO Secretary General



# **National Cyber Security Strategy** *(from vision to action)*





# Strategic Approach: **From Vision to Action**



**National Interests**



Principles and Strategic Goals



**Aim**

(Level of Ambition)



**Objectives**






**Measures**



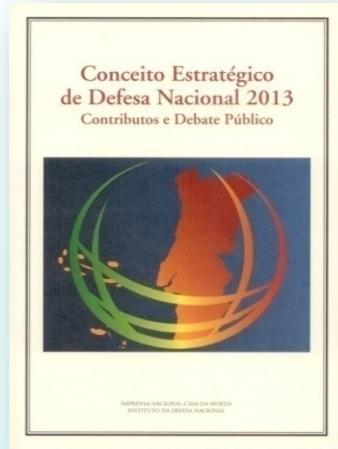
Promote and Reinforce  
National Strategic  
Potential

# National Cyber Security Strategy: Aim, Objectives and Measures

		
<p style="text-align: center;"><b>Aim</b></p>	<p style="text-align: center;"><b>Objectives</b></p>	<p style="text-align: center;"><b>Measures</b></p>
<p style="text-align: center;"><b>Information Assurance</b></p> <ul style="list-style-type: none"> <li>▪ Secure and efficient use of Cyberspace;</li> <li>▪ Protection and Defense of National Critical Information Infrastructure</li> <li>▪ Information Security and Cyber Defense</li> </ul>	<p style="text-align: center;"><b>Secure use of Cyberspace</b> <i>(Generate and Protect Value)</i></p>	<ul style="list-style-type: none"> <li>▪ Analyse Information environment and anticipate attacks;</li> <li>• Detect and block attacks, alert and support potential victims;</li> <li>• Enhance R&amp;D to promote National technological independence;</li> <li>• Adapt Legal framework and fight Cybercrime;</li> <li>• Develop international cooperation initiatives</li> <li>• Communicate, raise awareness and inform citizens</li> </ul>
	<p style="text-align: center;"><b>Reinforce Cyber Security of National Critical Infraestruturas</b> <i>(Reduce Social Risk)</i></p>	<ul style="list-style-type: none"> <li>• Reinforce Governmental Networks ICT Security;</li> <li>• Reinforce Government and Critical Infrastructures IS Security (Resilience and Survival);</li> </ul>
	<p style="text-align: center;"><b>Defend National Interests and Freedom of Action in Cyberspace</b> <i>(Reaffirm National Identity and Defend National Sovereignty)</i></p>	<ul style="list-style-type: none"> <li>• “Knowledge and Information Society” initiatives;</li> <li>• Protect and Defend National E-Gov;</li> <li>• National Cyber Security and Cyber Defense Structures;</li> <li>• National Synergies and International Cooperation</li> </ul>

# Cyber Defence Political Guidance : **From Vision to Action**

The Strategic Vector  
"Information and  
Cyberspace Security"  
(Objectives and Lines of Action)



**National Defence  
Strategic Concept  
2013**  
(RCM Nº 19/2013, 05Abr13)

*Strategic Vision*

**"Defence 2020"  
Reform**  
Despacho MDN,  
Nº 7527 -A/2013  
(31Mai13)



*National Cyber Defence  
Capability Implementation Plan*

Despacho MDN,  
Nº 13692/2013,  
(11Out13)



*Initiating Directive*  
(Principles, Objectives and Guidelines)

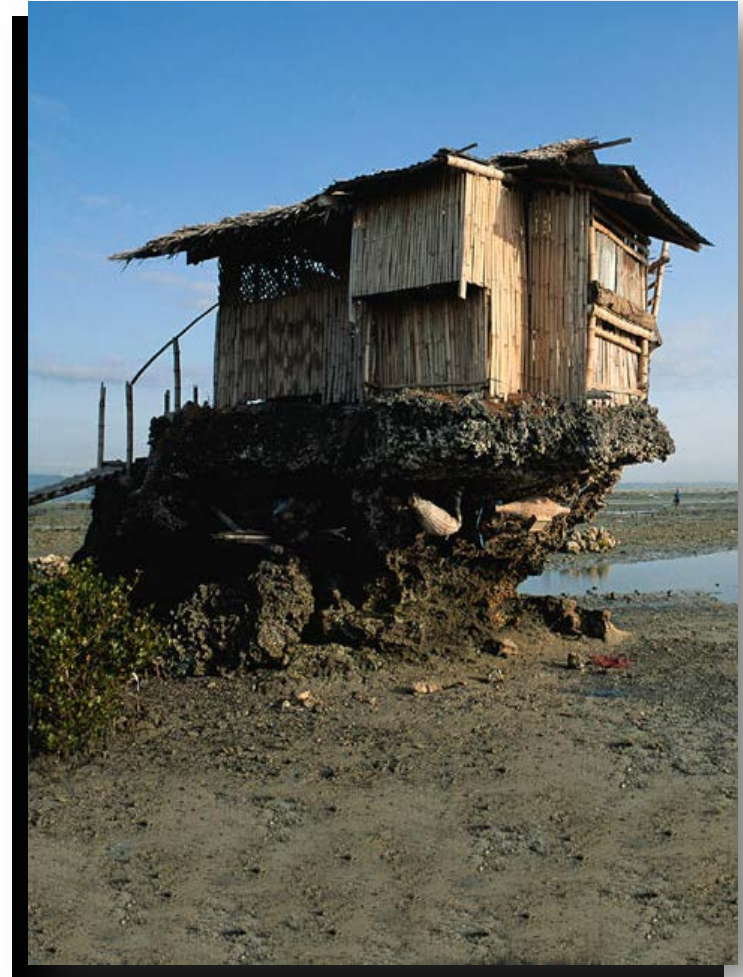


# Conclusions

- **Cyberspace is not limited:** individual/collective; public/private; civil / military or national / international (Networked Society);
- Cyberspace is **the 5<sup>th</sup> Operational Domain of modern warfare**, influencing all the physical domains (land, sea, air and space)
- Cyberspace is a **priority strategic domain** where national values and interests must be defended (**non negotiable**);
- Building a **digital future** requires a **National Cyber Security Strategy**
- **Legal Framework, doctrine, governance/organization** and **means** to implement a National Cyber Security Strategy
- Clarify **Cyber Security vs. Cyber Defense** concepts
- **National Cyber Security and Cyber Defense** are mandatory for Information Age Societies – NATO and EU Directives



# How should the Future be build ?





**Questions?**

**Thank You!**



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nunes.pfv@mail.exercito.pt