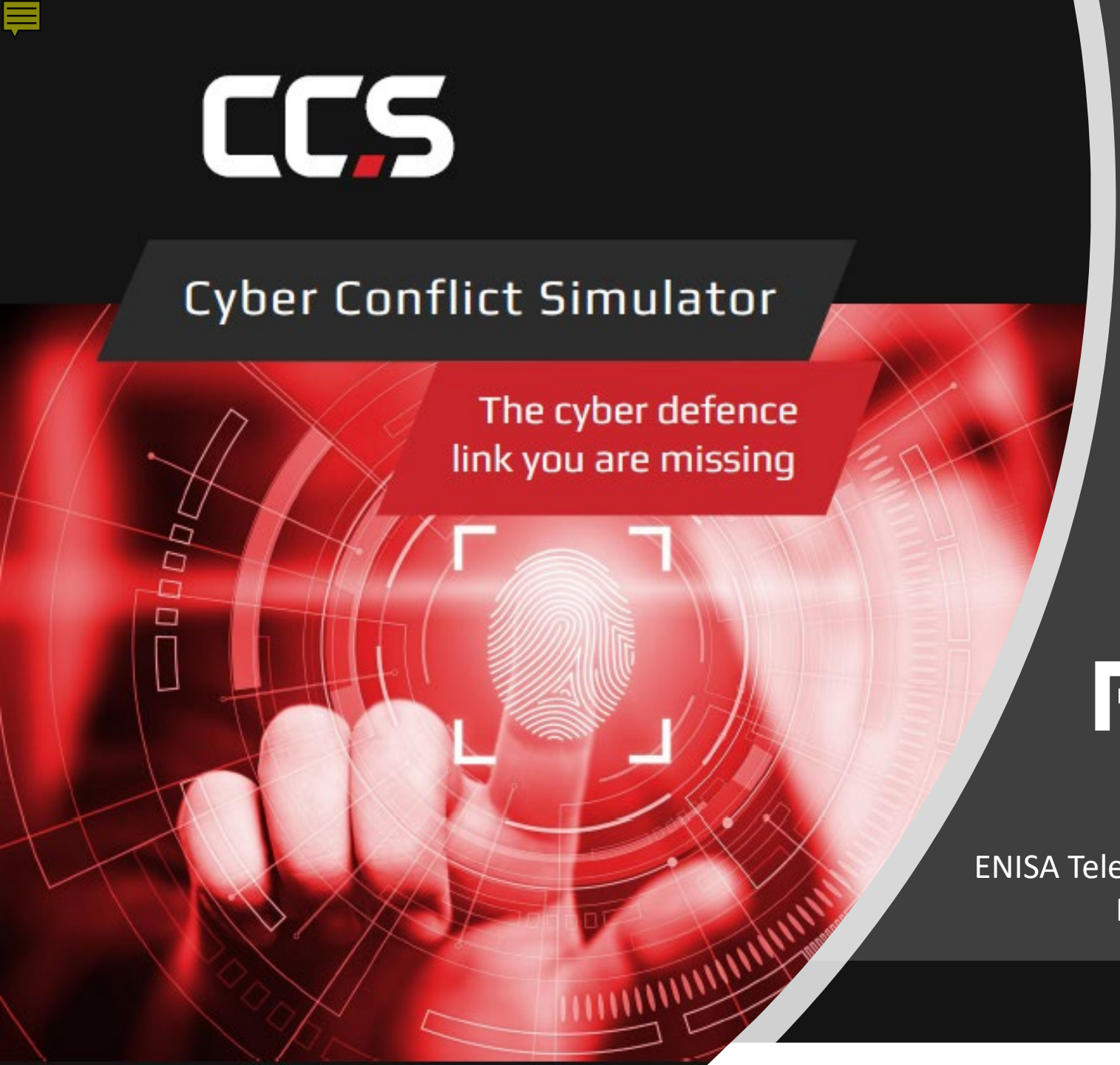

Rethinking Security Exercises

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Cyber Security Exercises

- Two main types of cyber security exercises
  - Cyber ranges and tabletop exercises
- Each has its own advantages and disadvantages
  - Cyber ranges at technical level, tabletops for management
  - Tabletops easier to setup, cyber ranges harder
  - Consequences in cyber ranges are seen, in tabletops not
  - Tabletops miss time dimension; cyber ranges compromise complexity
  - And many others…
- Also, there are a lot of other exercises on technical level (CTFs)
- It is how it’s done today

Is there another way?

- That integrates all decision-making levels?
- Allows multiple organizations to simultaneously participate?
- Is based on our IT/OT infrastructure, not a generic one?
- Allows training for incidents lasting for weeks, even months?
- Considers available resources and real-world restrictions?
  - For both, defenders and attackers?
- Brings uncertainty and tension as present in real-life incidents?
- **We claim there is – and it's embodied in a simulation tool we created – Cyber Conflict Simulator (CCS)**

How did it all start?

- Participated in Cyber Coalition Exercise
- Not satisfied with some elements of the exercise
- An idea to develop and use simulator as a solution
- EDA dual-use call in 2016
- R&D project 2018 - 2000 develop prototype
- Continuous development and use of CCS since then

R&D Project

- The problem we tried to solve was a hard one
  - Up to the middle of the project's duration we were still struggling to determine exactly what we want and, especially, how it should be done
  - There were no models or examples we could (re)use
  - At the beginning we run exercises manually
  - Several prototypes were developed in due course
- At the end of the project, we had a working prototype
  - Most accurate description „professional wargaming"

Cyber Conflict Simulator Features

- Infrastructure and implemented controls are modelled
- Low level technical details are abstracted and simulated
  - No need to have exact and detailed model of information system
- People are simulated as well
  - Both regular users, and key personnel for incident handling
- Trainees manage key personnel
  - Receive reports from them
  - Make decisions and communicate mutually
  - Assign tasks to key personnel
  - Wait for results
- Time can be sped up or slowed down
- Focus on **WHAT** not HOW

Cyber Conflict Simulator Features (cont'd)

- Supports multiple teams in the same exercise
- Supports participation of multiple organizations simultaneously
  - They cooperate by exchanging resources
- Multiple levels of organization's management can participate
- Business processes are modeled as well
  - With dependency on IT/OT infrastructure

Where we are now

- We’ve done over 30 exercises
- The most complex exercises so far
  - Financial institutions (Banks)
  - Supervisors for financial institutions
  - Exercise for Croatian Armed Forces, Minnesota National Guard
  - Workshops three years in a row on a security conference DEEP
  - Exercise for military cadets in Croatian Military Academy
- Developing Partner Network

Some experiences from those exercises

- It’s immersive – people forget on a time schedule
- Board members and business owners tend to be involved more then they expected
  - And they become aware of uncertainties of a cyber incidents
- Organizations start to grasp usefulness of different security tools, and problems when they are not there
- **And, so far, we never heard anyone did that!**

Further R&D

- We want to integrate CCS with cyber ranges and CTFs
- Evaluating economic consequences of cyber incidents
- Making simulations as close to reality as possible
- Automatically generating topologies and exercises for CCS (and cyber ranges)
- Training red teams in decision making, organization, planning, …

Thank you for your attention!

For business inquires

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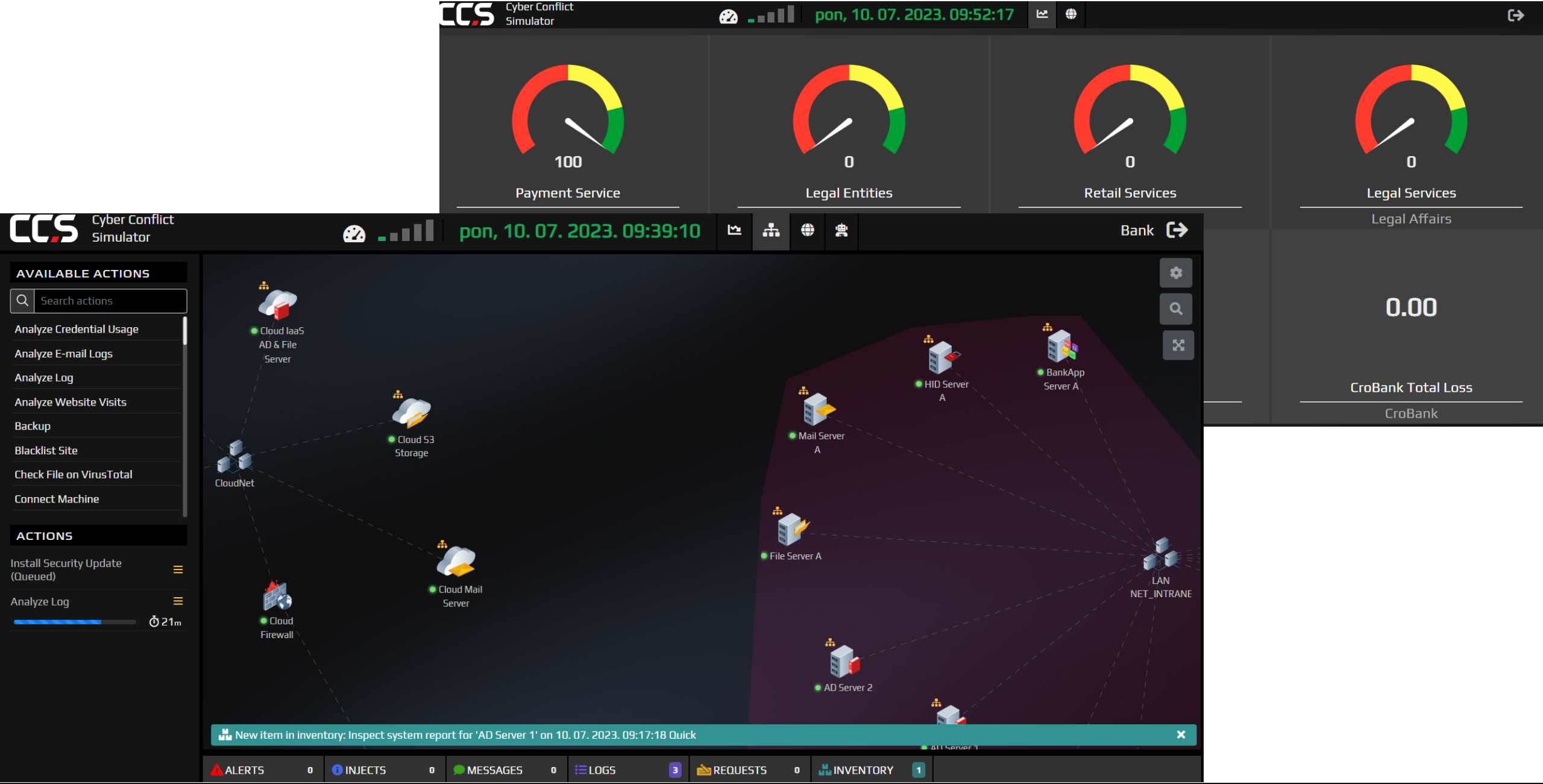
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Analyze Log
Analyze Website Visits
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Check File on VirusTotal
Connect Machine
ACTIONS
Install Security Update (Queued)
Analyze Log
21m
Cloud IaaS AD & File Server
Cloud S3 Storage
CloudNet
Cloud Mail Server
Cloud Firewall
HID Server A
BankApp Server A
Mail Server A
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LAN NET_INTRANE
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MESSAGES 0
LOGS 3
REQUESTS 0
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