Fighting DDoS attacks together on a national scale

ONE Conference
Wed Oct 2, 2019
The Hague, The Netherlands

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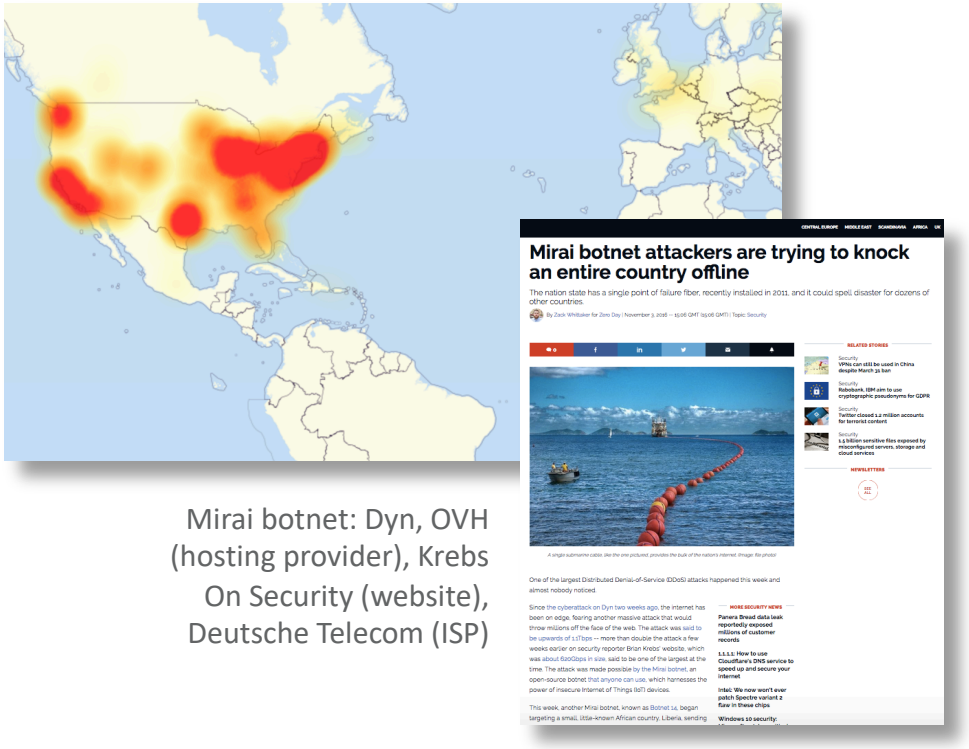
DDoS examples



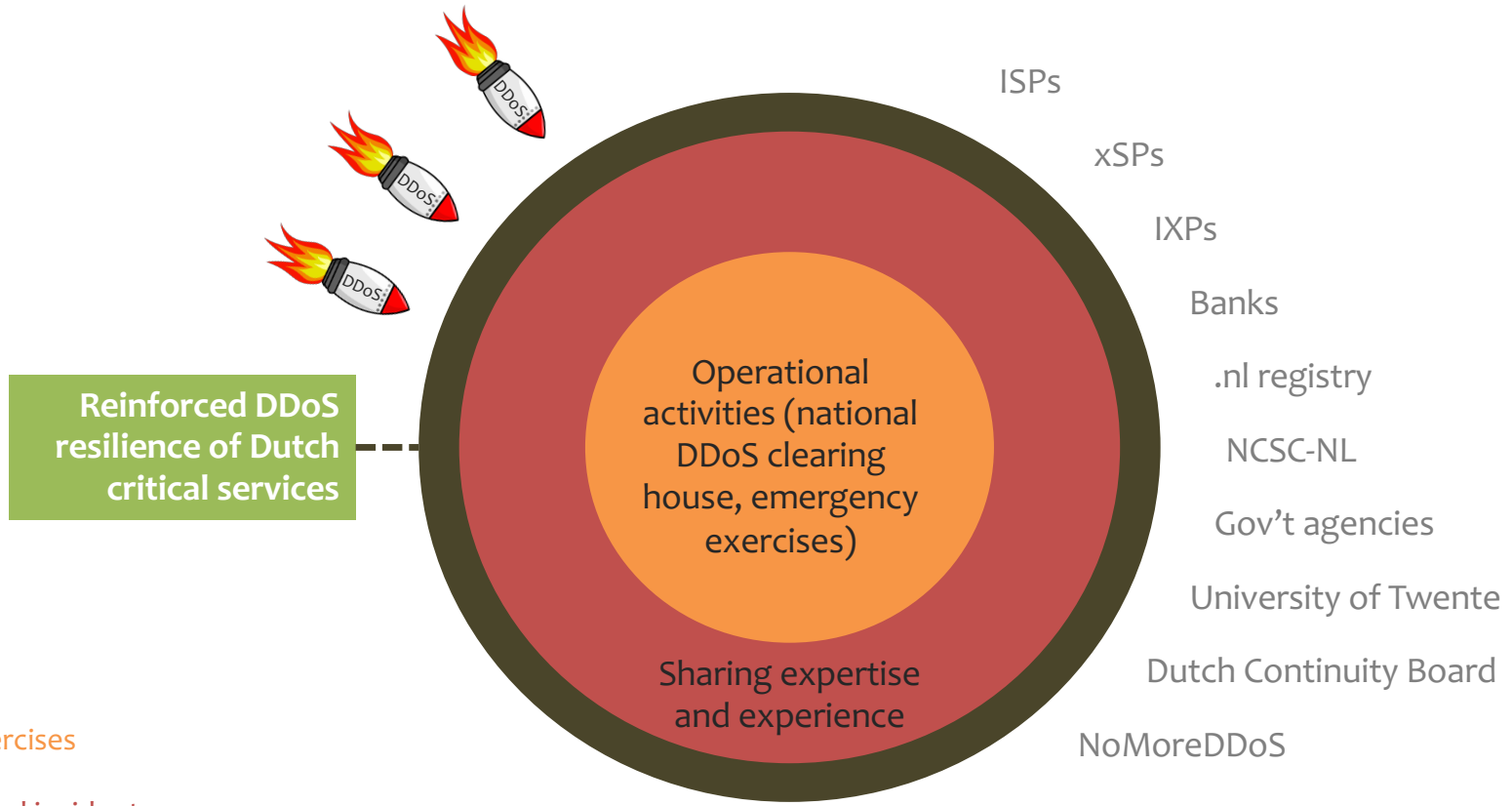
Mirai botnet: Dyn, OVH (hosting provider), Krebs On Security (website), Deutsche Telecom (ISP)

January 2018

https://en.wikipedia.org/wiki/2016_Dyn_cyberattack
https://www.zdnet.com/article/mirai-botnet-attack-briefly-knocked-an-entire-country-offline/

Dutch anti-DDoS coalition

Objective: further improve the protection of Dutch critical services by sharing expertise, experiences, and operational data on DDoS attacks



Working groups:

- Clearing house
- Emergency exercises
- Outreach
- Ground rules and incident response
- Sustainable collaboration

Status and next steps

- Pilot in the Netherlands (short-term)
  - Approach: start small and iteratively scale up to more partners
  - Key challenge: data sharing agreement clearing house

- DDoS clearing house for Europe
  - Part of CONCORDIA project (www.concordia-h2020.eu)
  - Development of a clearing house "cookbook"
  - Second pilot in Italy

CONCORDIA
Cyber security cOmpeteNCe fOr Research anD InnovAtion

- Envisioned long-term growth paths
  - Netherlands → Europe → global
  - Extend to "non-critical" service providers

Technical (and scientific) challenges

Classification
Reduction
Anonymization
Conversion
Distribution

Demo ahead!

Jair Santanna

https://github.com/ddos-clearing-house

Classification

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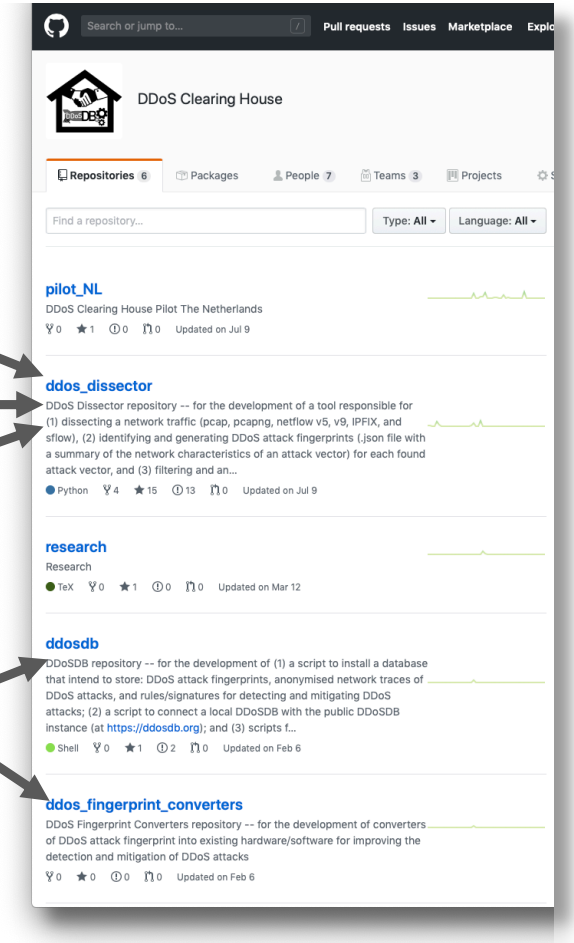
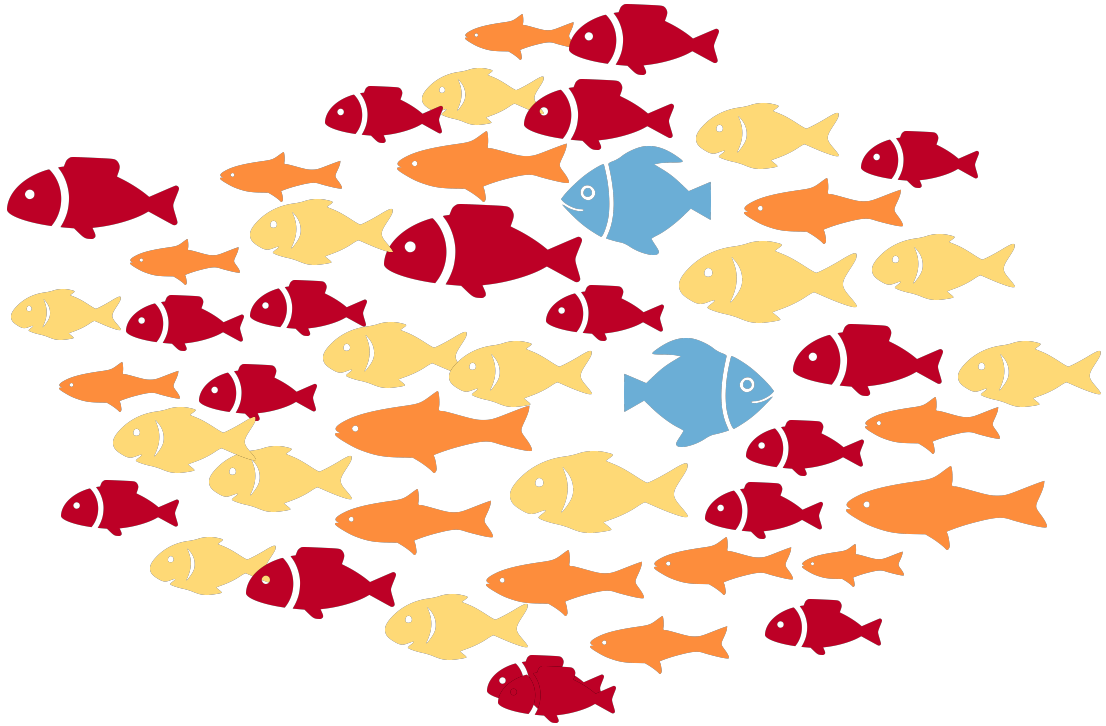
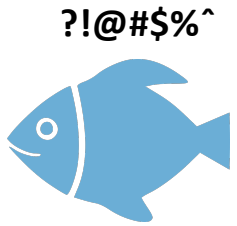
Conversion

Distribution



Definition of DDoS attack

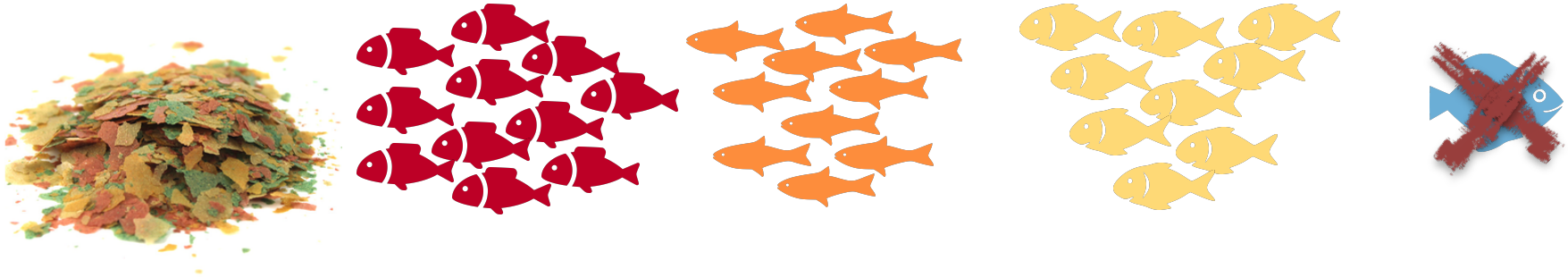




LARGE/ABNORMAL **frequency** of incoming network traffic with **same characteristics** aiming to deny legitimate users to access a computational/network resource.

The Classification Challenge

"The DDoS Dissector"



DDoS Dissector is tool for identifying (multi)vectors of attack
in **post-mortem** network trace
[meant for after an anomaly-based detection tool]

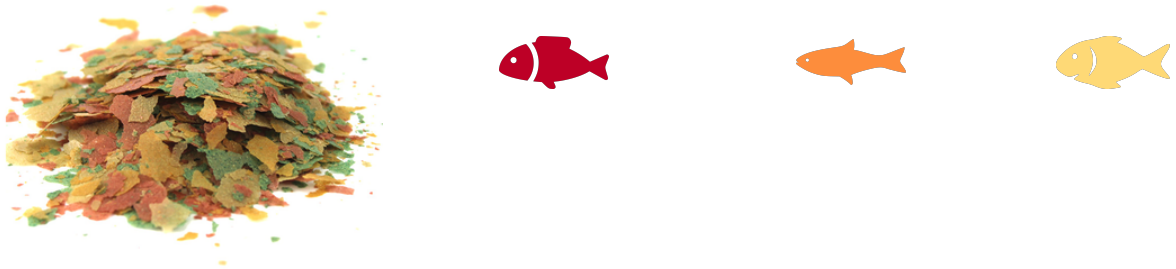
DDoS Dissector is based on a **ranking algorithm**

DDoS Dissector is **NOT** an anomaly-based detection tool!

PROBLEMS?
Encrypted Traffic!
Flash crowd!

The Reduction Challenge

“The DDoS Dissector”



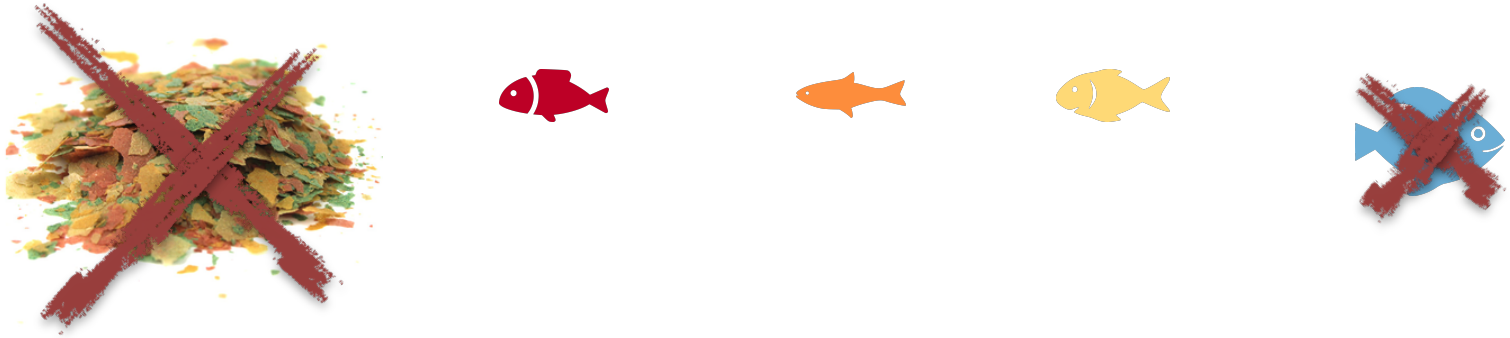
The **main** output of the DDoS Dissector is
a **summary** of the characteristics of a DDoS attack,
called ***DDoS fingerprint***

Each attack vector is **one** DDoS fingerprint (with one **“key"**)

Multiple attack vectors in a network trace are linked (“**multivector_key"**)

The Anonymization Challenge

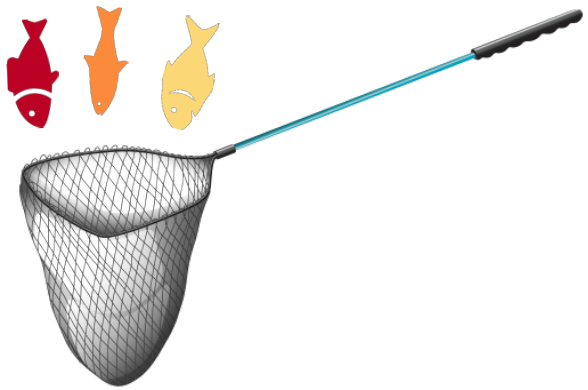
“The DDoS Dissector”



The DDoS Dissector removes **ANY** information related to the **attack target**, remaining ONLY source IP add. information

The Conversion Challenge

“The DDoS Fingerprint Converters”



EMPTY??

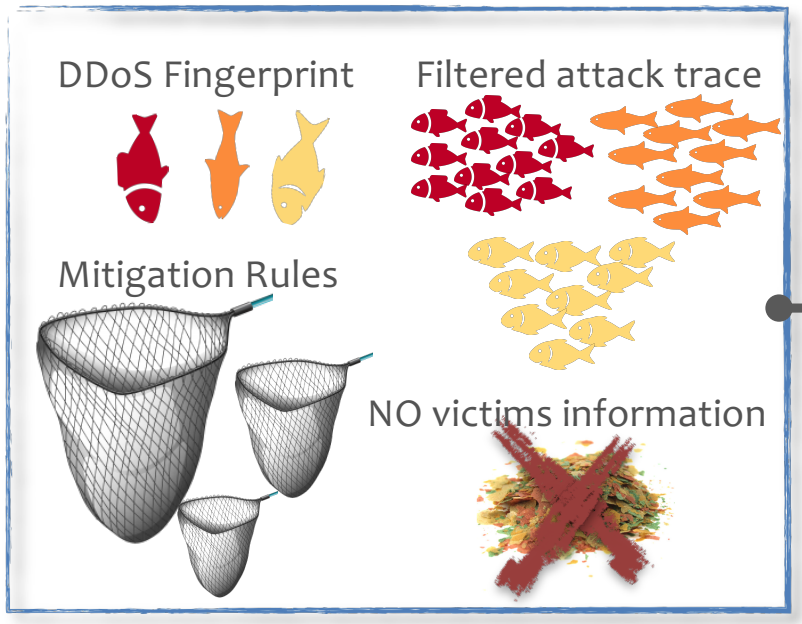
DDoS Fingerprints are converted to detection/mitigation **specific “boxes"**

Candidates: NetFilter/IPTables, SNORT, SURICATA, BRO/ZEEK, MODSECURITY, BGP Flowspec, XDP+eBPF, IETF DDoS Open Threat Signaling (DOTS),
<what else do YOU consider important?>

Check the impact of a mitigation rule (to YOUR network) **BEFORE** deploying it!

The Distribution Challenge

“DDoSDB”



What?
Public? Private?
Open? Closed?
With whom?
Automatic? Manual?

NOSQL database (Elasticsearch) + “FileSystem”

Feed? To CERTs/CSIRTs?

Malware Information Sharing Platform (MISP)?

Common Attack Pattern Enumeration and Classification (CAPEC)?

https://github.com/ddos-clearing-house

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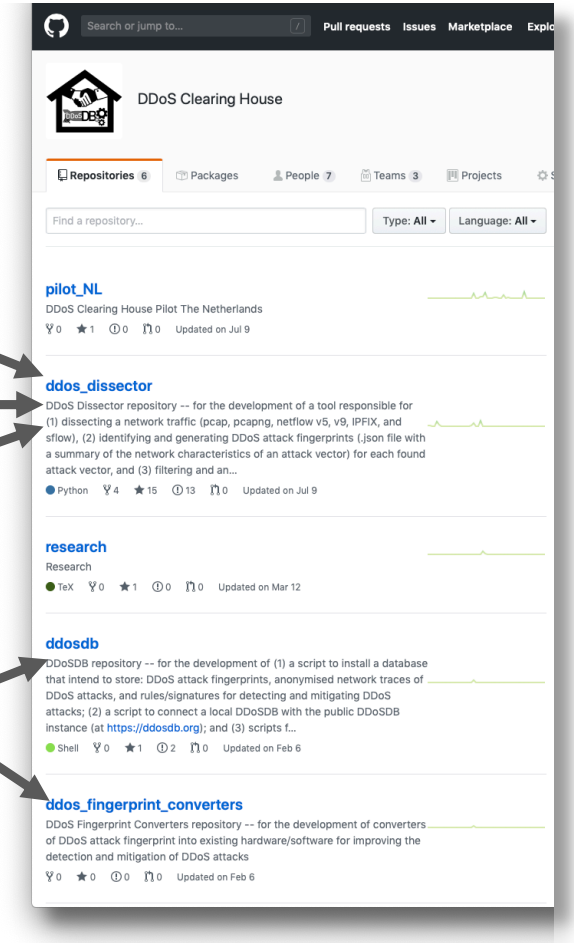

Panel discussion

Panelists: Marco Doeland (Dutch Payment Association), Oscar Koeroo (KPN), Karl Lovink (Belastingdienst), Benno Overeinder (NLnet Labs, on behalf of NCSC-NL), Octavia de Weerdt (NBIP)

Moderator: Raymond Doijen (NCSC-NL)

Plus NoMoreDDoS and Dutch Continuity Board

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