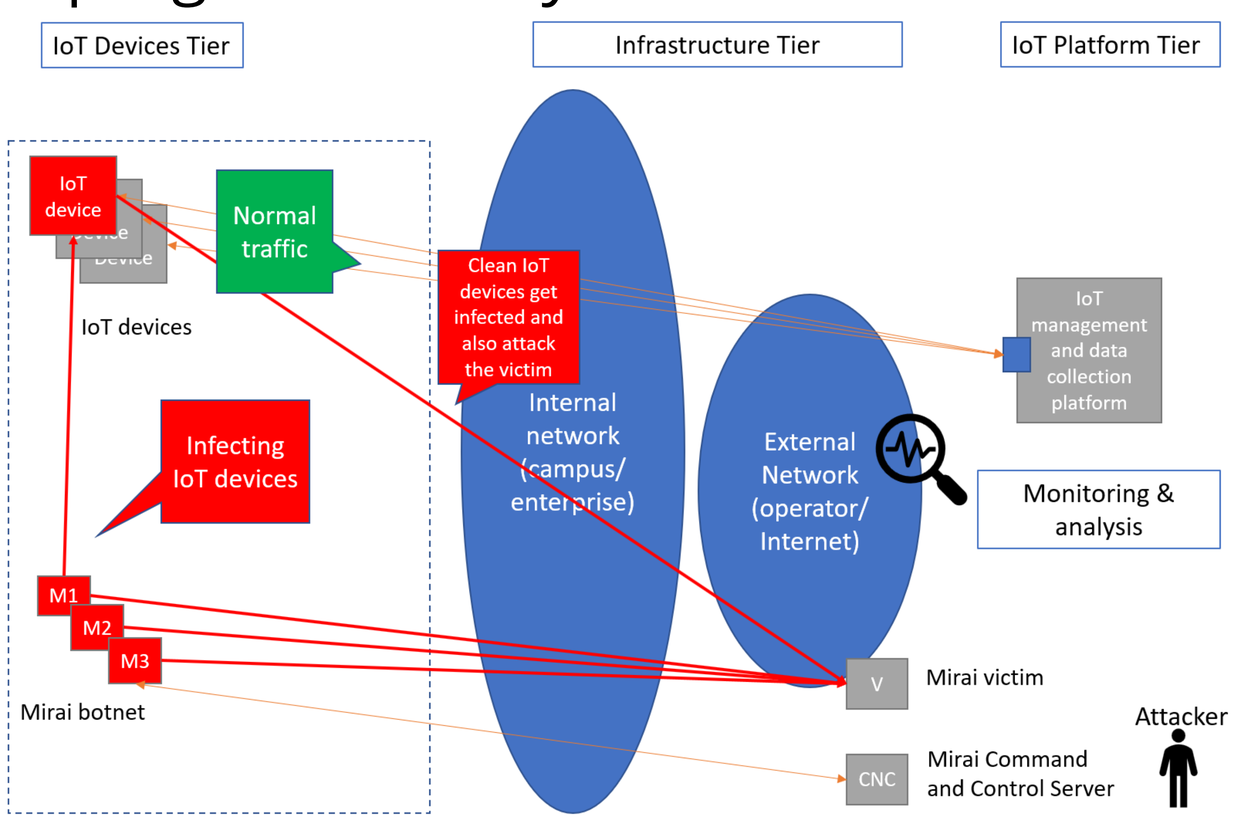
AI-NET-PROTECT

TNO innovation for life

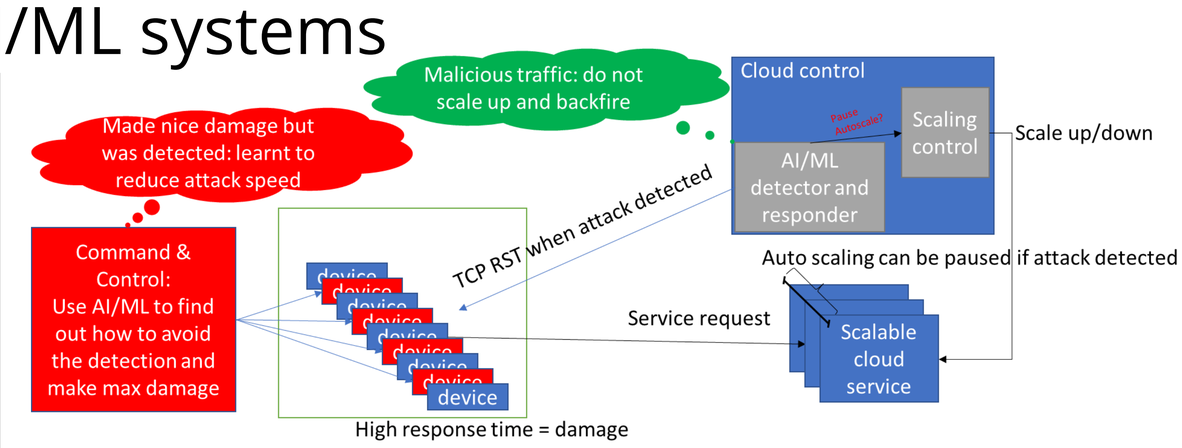
Elevate security of IoT by using cloud programmability and AI/ML

- IoT = Internet of … Troubles !
  - Huge number of devices, old firmware, default passwords, no crypto,…
- Our focus: take perspective of infrastructure you can control (cloud, telco)
  - Do not try to fix IoT devices themselves
- Run/detect/isolate/… using programmable infrastructure functions
  - Programmability: easier design as well as reconfiguration in run-time
  - Exploit AI/ML to help with anomaly detection and/or resource management

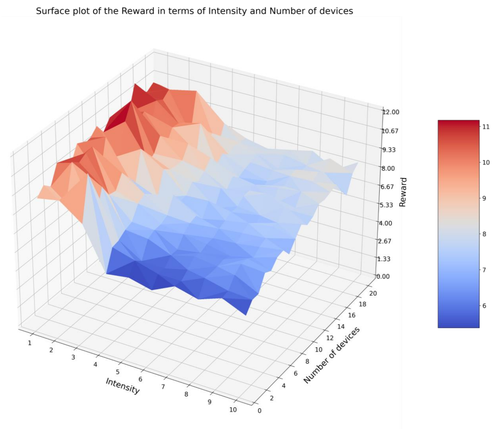


Work in progress: attacks *against* AI/ML systems

- What if AI/ML system becomes target on its own ?
- Example:
  - infected IoT devices send malicious requests
  - …which are detected and blocked by AI/ML-based defense system
  - However, attack pattern can be then tuned to avoid detection (e.g., send less traffic)
  - Moreover, attacker can also employ AI/ML to learn how to by-pass AI/ML-based detectors
- **General problem of AI/ML, not limited to IoT**
- **Interested ? mailto:piotr.zuraniewski@tno.nl**

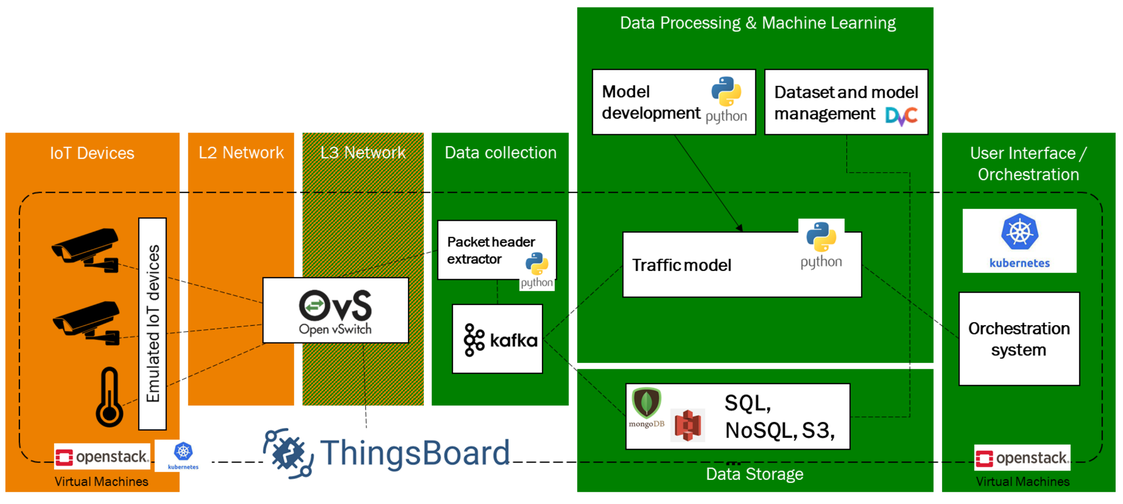


- Reinforced learning to get optimal parameters set for attack



Realization in TNO Research Cloud – malware deployed as cloud service

- Virtual lab in our private cloud, emulating enterprise network, IoT devices, ISP, cloud services, public Internet,…
- Programmability and automation for ease of management, reproducibility and flexibility (e.g., scaling)
- Real but partially disarmed malware (Mirai) and custom software used to infect IoT devices and orchestrate attacks
- AI/ML: data collection and analysis pipelines to monitor, model, detect and ultimately react



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