

PoC #15: Trustworthy Zero-touch Network and Service Management in 6G Networks with NDT support

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Agenda

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PoC Description

This PoC intends to demonstrate the use of **Network Digital Twins** (NDTs) in a cybersecurity context, as part of a 6G network. This approach includes two different Network Digital Twins as part of a sandbox environment, working together to **mitigate cyberattacks**. Those NDTs are applied for prediction and prevention, and to analyse the impact of mitigation actions. The combination of both NDTs supports **minimally invasive smart automated threat management**.

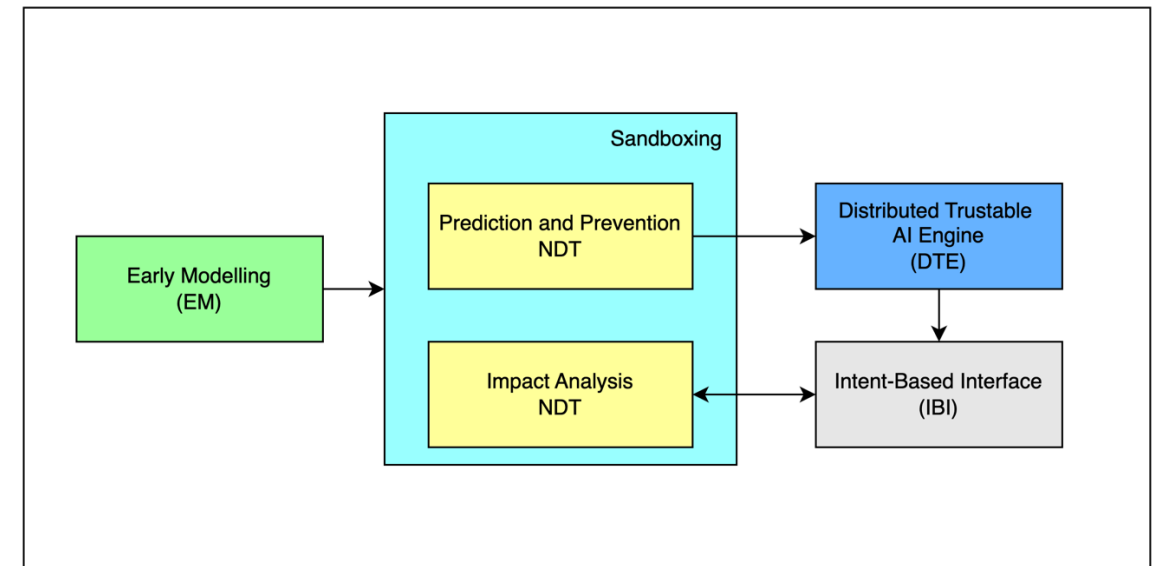
Supporting project: Holistic, Omnipresent, Resilient Services for Future 6G Wireless and Computing Ecosystems (**HORSE**, www.horse-6g.eu)

PoC Solution

Entities involved

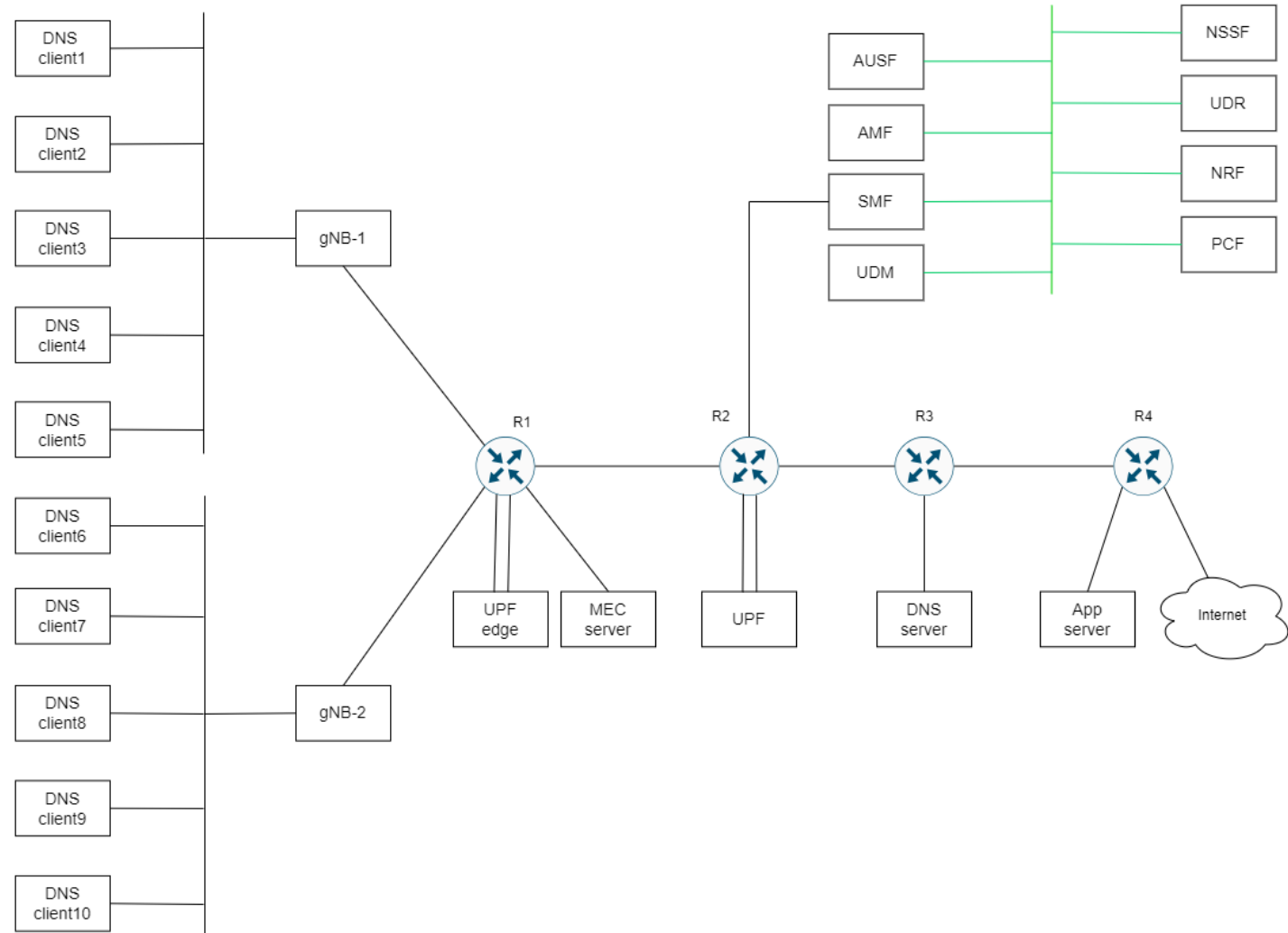


- Prediction and Prevention NDT (PP-NDT)
- Impact Analysis NDT (IA-NDT)
- Early Modelling (EM)
- Distributed Trustable AI Engine (DTE)
- Intent-based Interface (IBI)

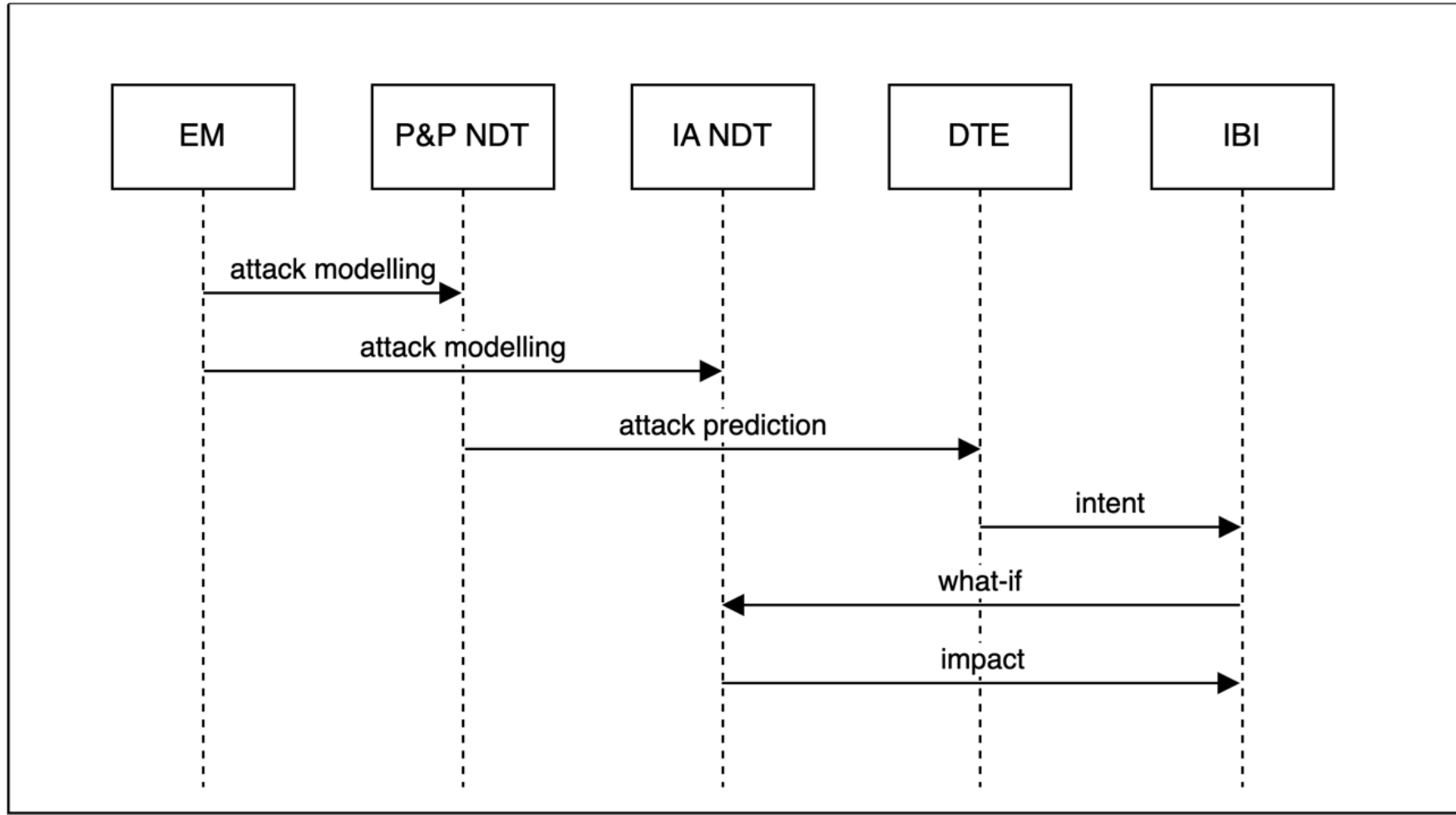


Emulated topology

- DNS clients
- 5G Core
- gNodesB
- DNS server
- Transport network

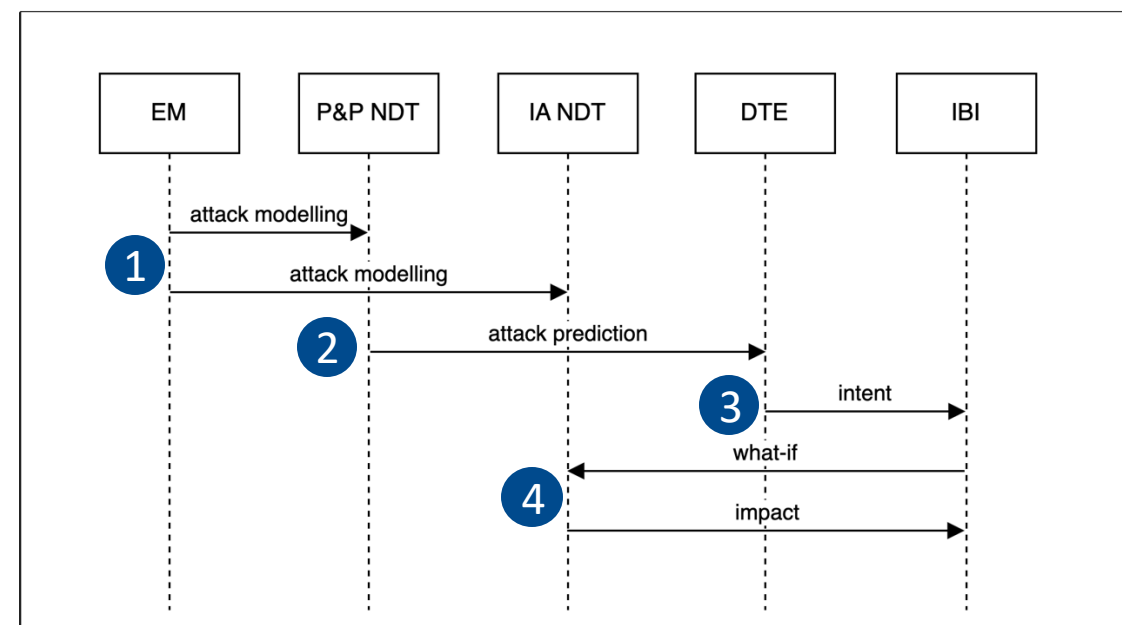


Demo workflow



Demo description

- **Attacks identifier:** DNS DDoS Amplification attack
- **Attack description:**
 - **Concept:** A DNS flood is a type of DDoS where an attacker floods a particular domain's DNS server to disrupt DNS resolution for that specific domain.
 - **Process:**
 1. EM sends attack information (threat model) to SAN modules.
 2. PP-NDT collects traffic traces, predicts the attack and sends information to DTE.
 3. DTE generates the intent & IBI generates the actions lifecycle with the information obtained.
 4. IA-NDT runs the what-if analysis and feeds the IBI, who sets the new lifecycle.
- **Mitigation actions:**
 - **MA#1:** Rate limit (bandwidth)
 - **MA#2:** Block attacker's IP address



PoC Demo Video



Full screen in the next slide.



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This Proof of Concept, in the context of the HORSE project, is showcasing the

PoC Timeline

●	PoC Starts	April 2025	Proposal Submission
●	PoC Initial Contribution	June 2025	First implementation of the demo
●	PoC Demo 1	September 2025	First demonstration of the PoC
●	PoC Final Demo	November 2025	Final video demonstration
●	PoC Final Report	December 2025	Final report with results



Thank you for your attention

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