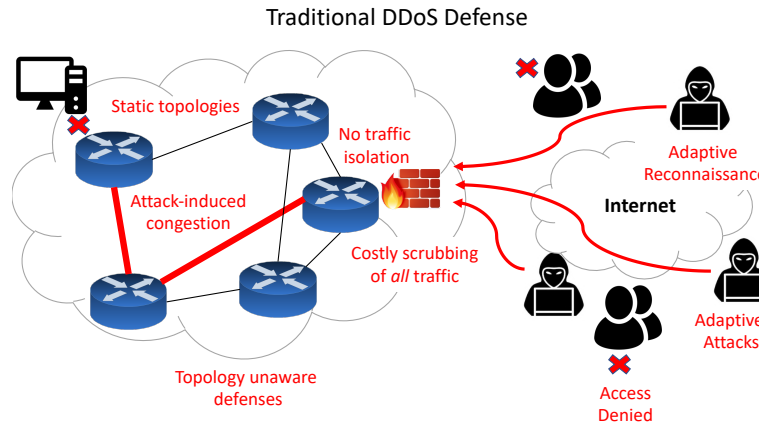


ONSET: Optics-enabled Network Defenses for Extreme Terabit DDoS Attacks



Challenges:

- DDoS attacks are adapting to defenses.
- Attacks are inducing collateral damages.
- Attackers are targeting the infrastructure with advanced reconnaissance.

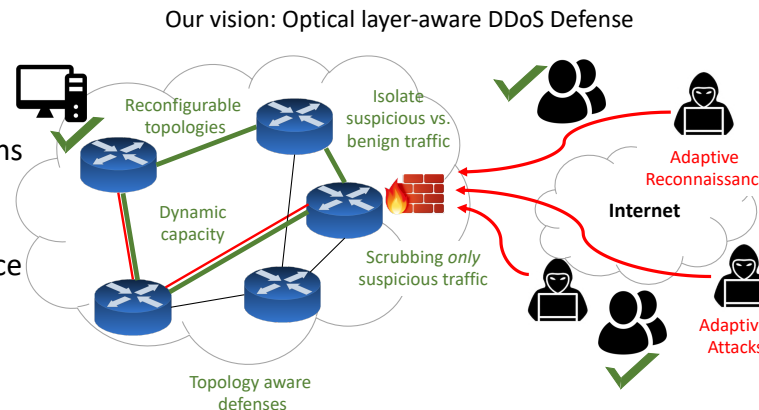


Scientific Impact:

- Novel solutions to reconfigure the wavelengths and switches.
- New cross-layer orchestration mechanisms for scalable resource management.
- New APIs and programming frameworks to express advanced defenses.

Solution: Cross-layer Programmable Defenses

- Data Plane
 - Reconfigure optical wavelengths
 - Programmable switch defense
- Control Plane
 - Cross-layer control and resource orchestration
- API
 - Northbound API for novel defenses



Broader Impact and Broader Participation:

- Roadmap to practical deployment.
- Effective demonstrations on the use of optical technologies as a visual medium for K-12 students.
- New courses at the intersection of optics, SDN, and security.
- Open-source software tools, models, and simulation frameworks.
- Outreach to underrepresented groups.

SaTC: Medium: #2132651, 2132643, 2132639

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