

# ONOS Security Overview

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## \$whoami

- PhD Student → “Security in Distributed Software-Defined Networks”
- ONOS SecPerf Brigade → Vulnerability Analysis
- Website: <https://smythtech.net>

## Talk Outline

- SDN Threat Landscape
- ONOS Security
- Open Issues
- Recent Vulnerabilities
- Demo

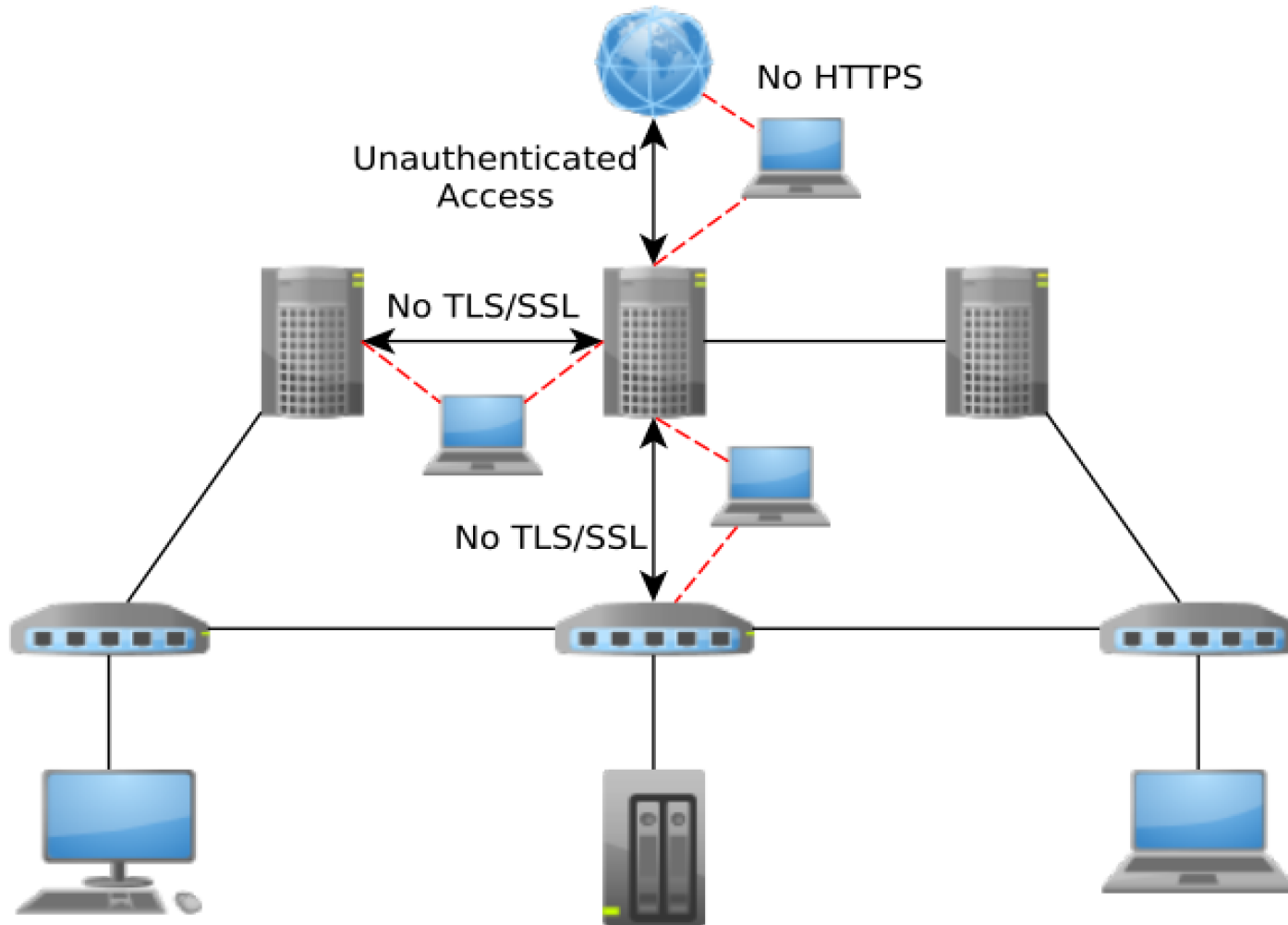
# SDN Threat Landscape



- Configuration Issues
- General SDN Security Issues
- Specific Vulnerabilities

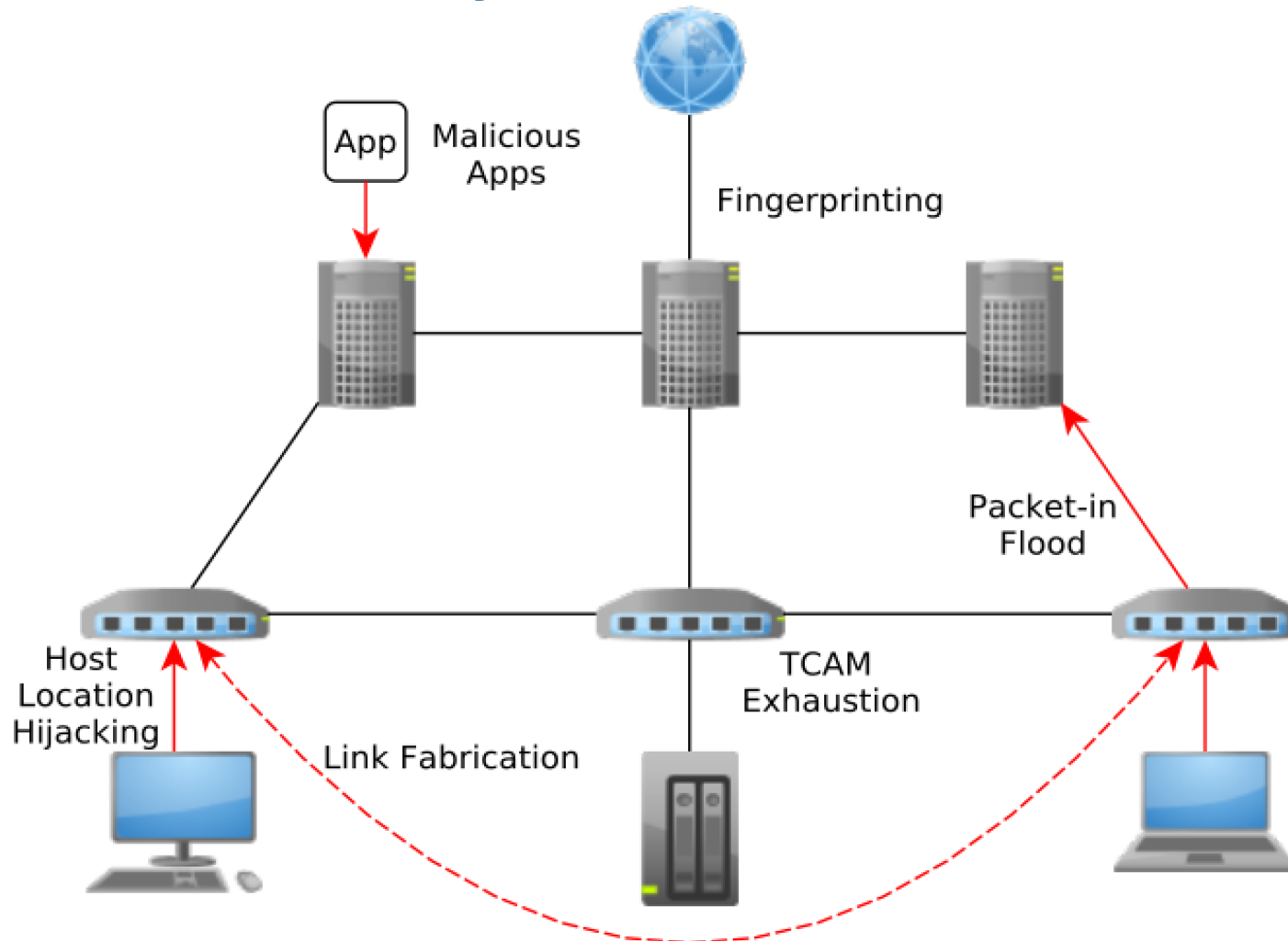
# SDN Threat Landscape

## Security Configuration Issues



# SDN Threat Landscape

## General SDN Security Issues



- Configuration Issues
  - Applying security configuration
  
- General SDN Security Issues
  - Deploying specific defences
  
- Specific Vulnerabilities
  - Patching & updating software

- Good security configuration available:
  - HTTPS for REST API & Web UI
  - TLS for inter-controller comm.
  - SSL for control channel



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  - HTTPS for REST API & Web UI
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- Security Mode ONOS:
  - Provides role-based access for apps
  
- No other specific defences are implemented

- Link Fabrication
  - Message validation
  - Port classification
  - Link latency anomaly detection
  
- Host Location Hijacking
  - Using ARP to verify host migration
  
- TCAM Exhaustion
  - Optimal flow timeouts
  - Attack prevention algorithms (e.g. SIFT)

# Recent Vulnerabilities



- 8 public vulnerabilities in total
- 6 vulnerabilities discovered last year
- XSS, unauthenticated access, and DoS
- Versions 1.8.0 → 1.10.0 were patched

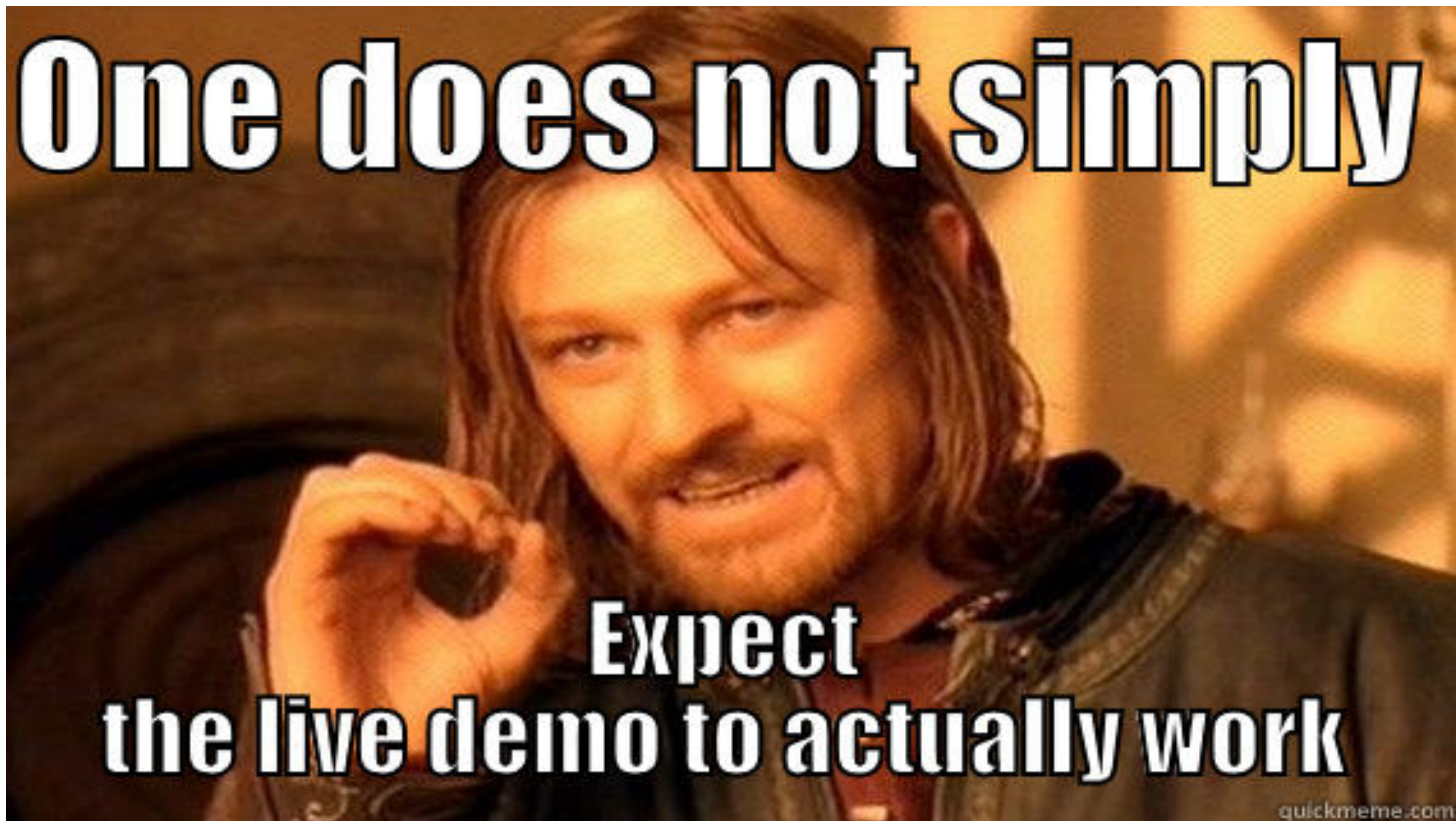
# Recent Vulnerabilities



- Unauthenticated websocket usage
  - CVE-2017-1000080
- Unauthenticated app upload
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- XSS in Web UI
  - CVE-2017-13762

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- Test for and demonstrate these using sdnpxn

**Demo!**



**Thank you**