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The Center for Education and Research in Information Assurance and Security

PurSec Lab

Exploiting Intent State and Flow Configuration Discrepancy

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Overview

- **Intent based networking** (IBN) is a **high-level network configuration concept** that allows network operators to use high-level **intents** instead of complex low-level details

- We found there are **discrepancies** in intent installation vs. flow configuration using **ONOS**

Compiling → Installing	Setting "max flow" on flow table and installing an intent over limit doesn't result in intent **failing**
Installing → Recompiling	Installing two way host intent and removing flow doesn't result in intent **failing**

Table1: Vulnerabilities during intent transition
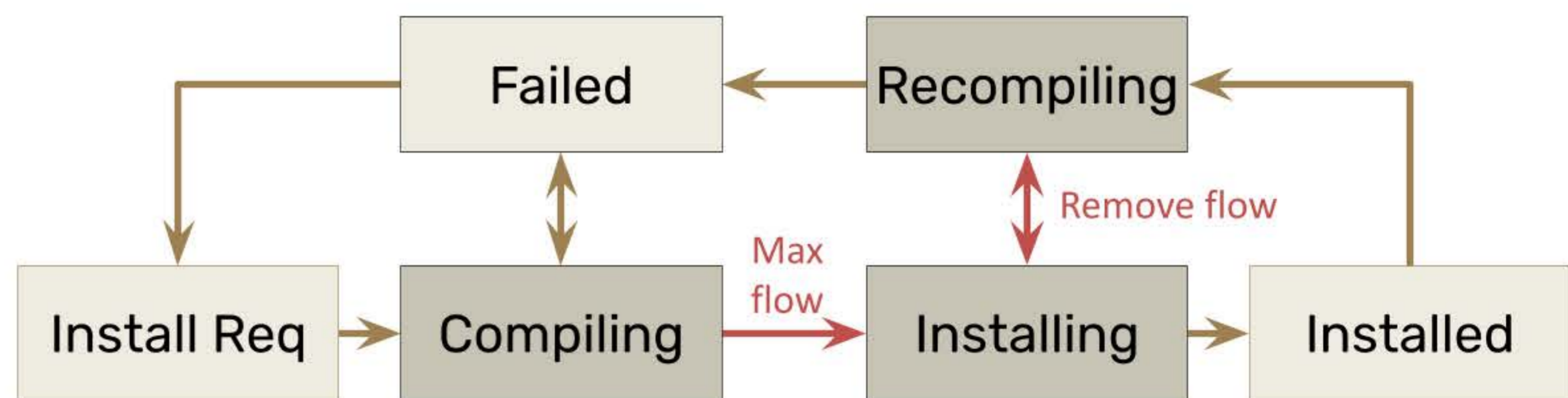

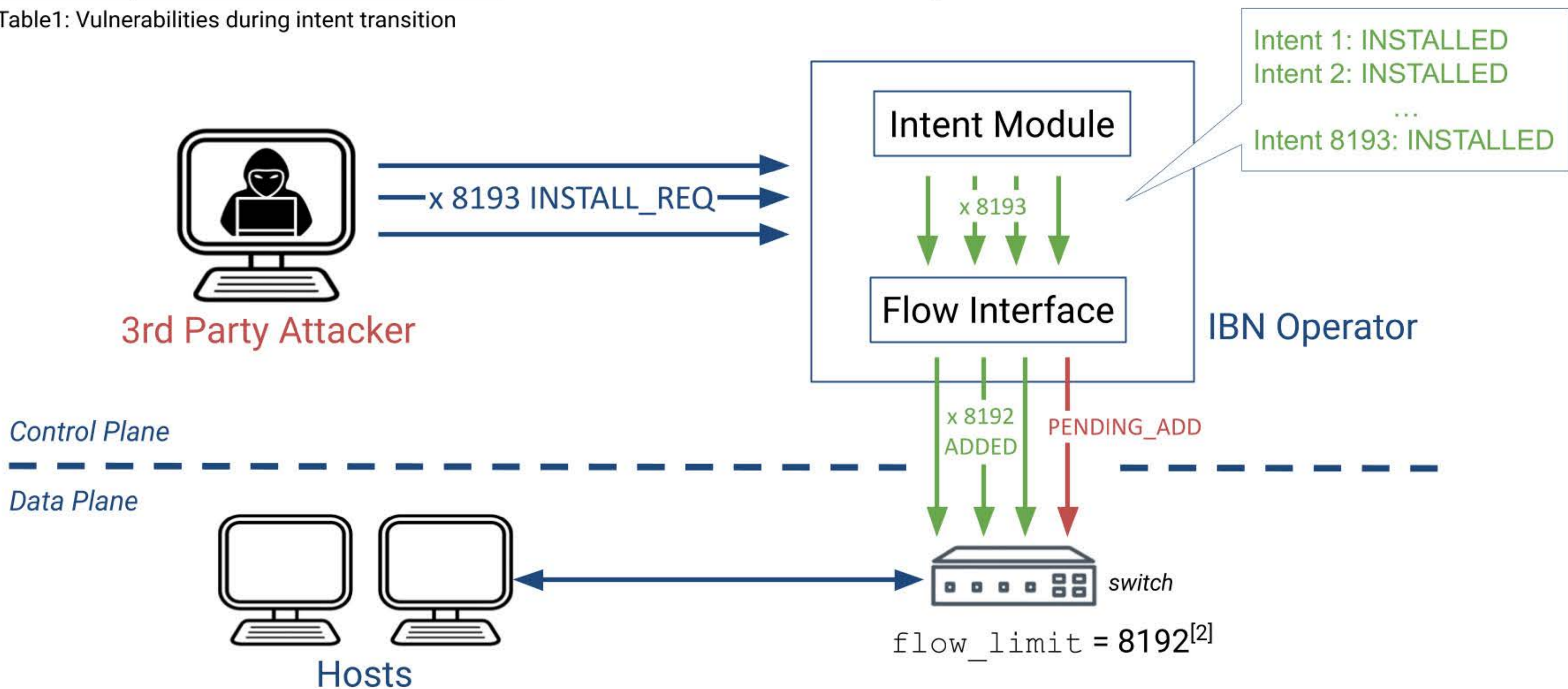Figure1: Intent Transitions[1]

Figure2: Overview of max flow scenario

Findings

- ONOS **does not check** for successful flow installation after intent installation for all cases
- Discrepancies between flow configuration and intent installation can mislead intent operators, and let attackers exploit networks with **DoS** attacks
- Future Research: find theoretical model to find and sync intent state and flow configuration

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