

I2NSF Project @ IETF-97 Hackathon



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Why Do We this Project?

❖ I2NSF: Chartered to use NETCONF/RESTCONF + Data Models

- Is this approach reasonable for management of security devices?
- Is it better than writing another security protocol?
- Can we get I2NSF Key Data Model (Capability) refined, and put open source code for VOIP/VoLTE and Firewall?

❖ Result: I2NSF WG approach works, fast time to market

- NM/OPS should expand their work into Security
- I2NSF follows up with MILE, SACM, DOTS, and SECEVENTs

❖ Does this work for a student project – Yes!!

- 25 new 1st timers at IETF
- Put Code on Web

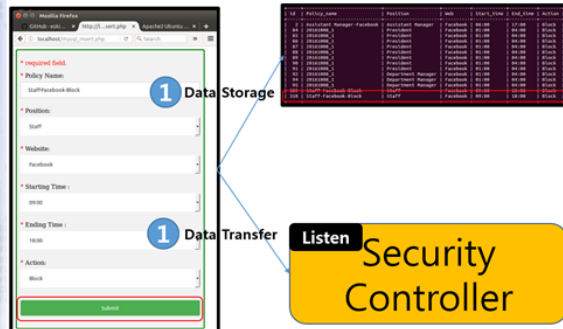
IETF I2NSF (Interface to Network Security Functions) Working Group: I2NSF Framework Project

Champions: Jaehoon Paul Jeong, Jinyong Tim Kim (SKKU), Jung-Soo Park (ETRI), and Tae-Jin Ahn (KT)

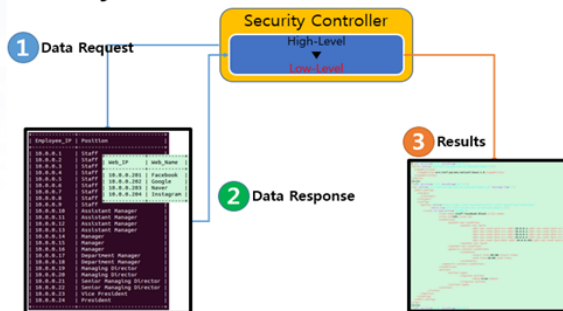
IETF 97 Hackathon

I2NSF Framework Project

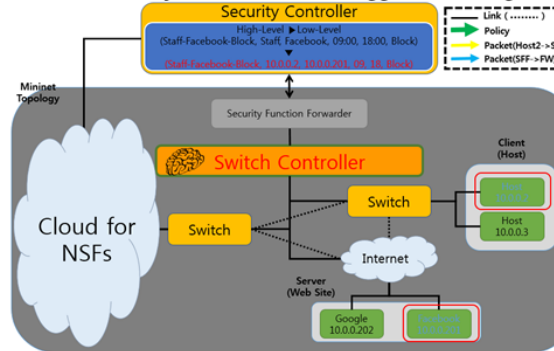
I2NSF Client (Web)



Security Controller



Network Security Functions (NSF) -Triggered Steering



Where to get code

- Github – Source code
 - ✓ <https://github.com/YunSukYeo/secuBrain/invitations>
- USB – Source code & environment
 - ✓ Provided by USB Driver

What to pull down to set-up environment

- OS : Ubuntu 14.04TL
- Netconfd : 6.2 Version
- Apache2 : 2.4.7 Version
- MySQL : 14.14 Version
- PHP : 5.5.9 Version
- Mininet : 2.2.1 Version
- OpenDaylight : Distribution-karaf-0.4.3-Beryllium-SR3

Manual for Operation Process

- README.txt

Contents of Implementation

- Firewall
- DPI for VoIP-VoLTE Security Service

Mission

- Firewall
 - ✓ Deletion of policy
 - ✓ Update of policy
 - ✓ Avoidance of the duplication of policy
- VoIP-VoLTE Security Service
 - ✓ Deletion of policy
 - ✓ Update of policy
 - ✓ Avoidance of the duplication of policy

Professors

- Jaehoon (Paul) Jeong (Sungkyunkwan)
- Hyounghick Kim (Sungkyunkwan)
- Hoon Ko (Sungkyunkwan)
- Sangwon Hyun (Sungkyunkwan)

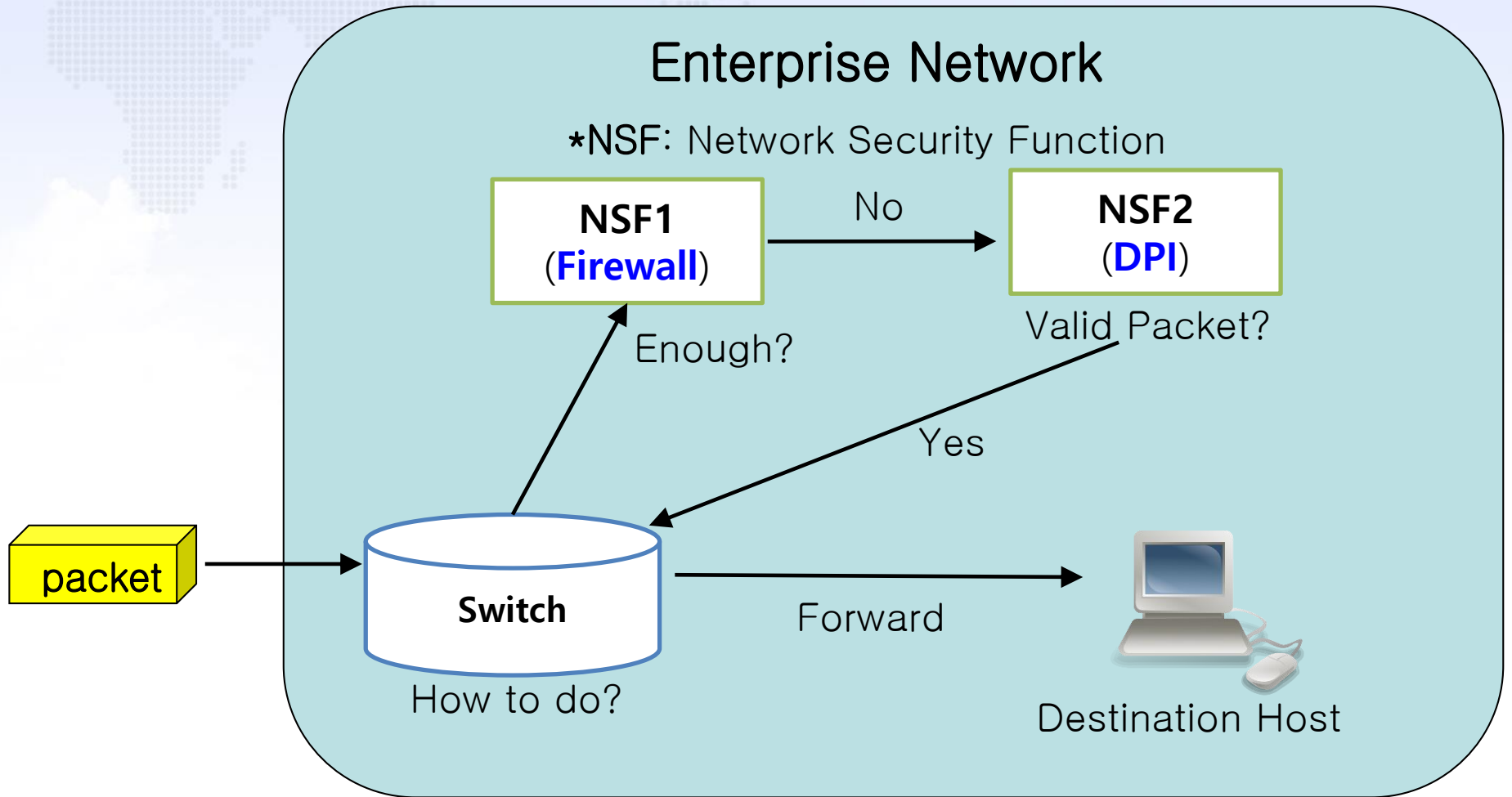
Collaborators

- Jung-Soo Park (ETRI)
- Tae-Jin Ahn (Korea Telecom)

Students

- Jinyong Tim Kim
- Sanguk Woo
- Daeyoung Hyun
- Eunsoo Kim
- Mahdi Daghmehchi Firoozjaei
- Sanghak Oh
- Yunsuk Yeo
- Soyoung Kim

What are Network Security Functions (NSFs)?



Goal of I2NSF Project

Given the code base of I2NSF Framework for provisioning Network Security Functions (NSFs), we implemented two things:

(i) Firewall for Web-filtering in I2NSF Framework using SDN and

(ii) Deep Packet Inspection (DPI) for VoIP/VoLTE Security Service in I2NSF Framework.

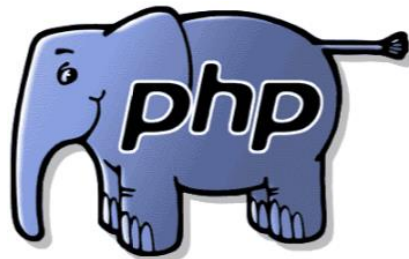
Contributions for the Goal

- 1. Proof of Concept (POC) of I2NSF Framework using Open Sources.**
- 2. Validity of I2NSF Interface Design for I2NSF Framework.**
- 3. Feasibility of Data-driven Approach (YANG) for Network Security Services.**

Hackathon Development

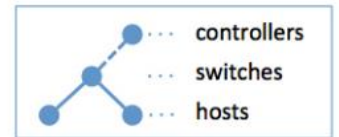
Building Environment

1. **OS**
 - Ubuntu 14.04TL
2. **Netconfd**
 - 6.2 Version
3. **Apache2**
 - 2.4.7 Version
4. **MySQL**
 - 14.14 Version
5. **PHP**
 - 5.5.9 Version



5. **Mininet**
 - 2.2.1 Version
6. **OpenDaylight**
 - Distribution-karaf-0.4.3-Beryllium-SR3

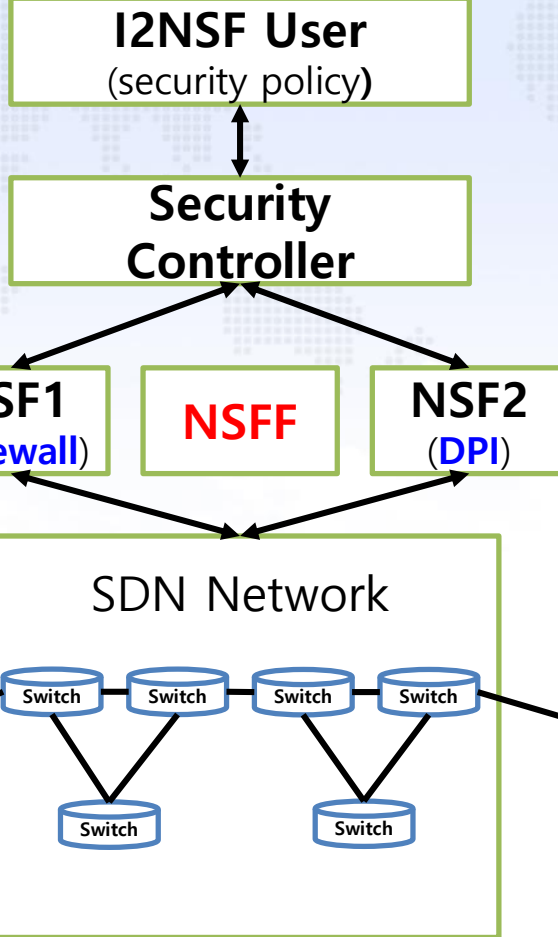
```
> sudo mn
```



ubuntu

Scenario of Security Services in I2NSF Testbed

Enterprise
Network
with I2NSF



*NSF: Network Security Function

*NSFF: NSF Forwarder for Traffic Steering

1. Time-dependent Firewall

e.g.) 09:00 – 18:00 => Block

18:01 – 08:59 => Unblock

2. VoIP/VoLTE Filtering Rule

e.g.) Blacklist of SIP URI and
User Agent

Lessons from the Implementation @ Hackathon

1. Proof of Concept (POC) of I2NSF Framework using Open Sources:

- **Confd** for NETCONF
- **OpenDaylight** for SDN Controller
- **Mininet** for SDN Network
- **RestAPI** for I2NSF Interface

2. Validity of I2NSF Interface Design for I2NSF Framework:

- Firewall for Web Filtering
- DPI for VoIP/VoLTE (e.g., Blacklist and Whitelist)

3. Feasibility of Data-driven Approach (YANG) for Network Security:

- YANG Data Models for I2NSF Interfaces among System Entities (I2NSF User, Security Controller, NSFs),

Demonstration of I2NSF Implementation

YouTube Videoclip:

<https://www.youtube.com/watch?v=5iflpVt4l6U&feature=youtu.be>

