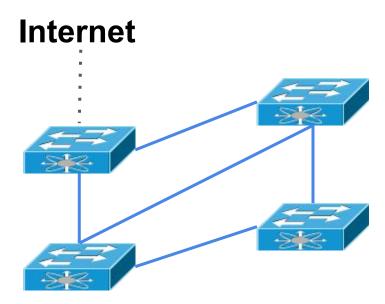


# Gerenciamento de Firewalls em Redes Híbridas

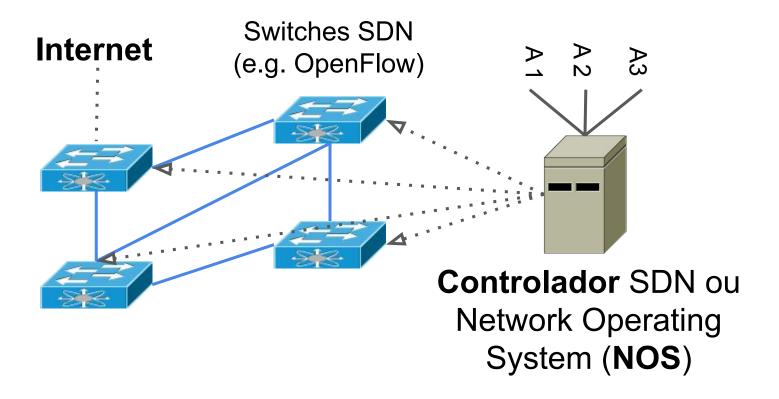
### Maurício Fiorenza, **Diego Kreutz**, Rodrigo Mansilha

XX Simpósio Brasileiro em Segurança da Informação e de Sistemas Computacionais

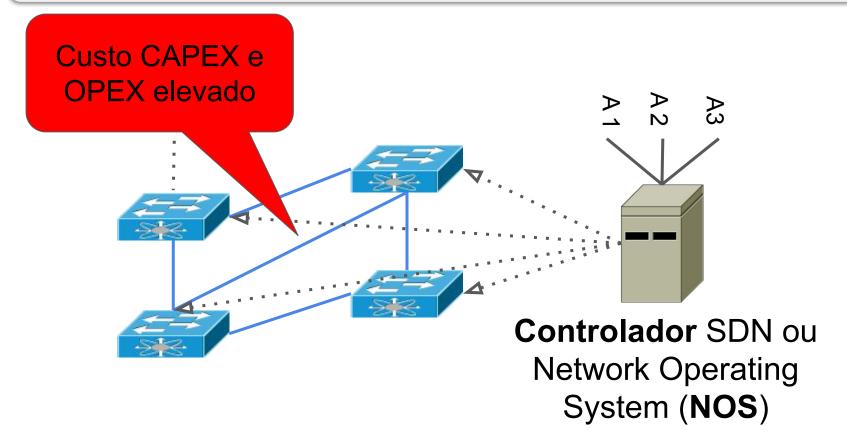
# Redes convencionais



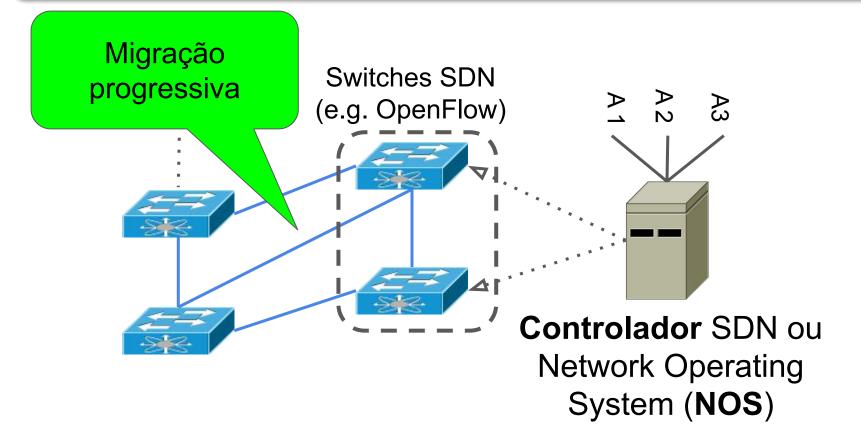
## Redes SDN (Software-Defined Networking)



## Migração de redes convencionais para SDN



### Rede híbrida: convencional + SDN



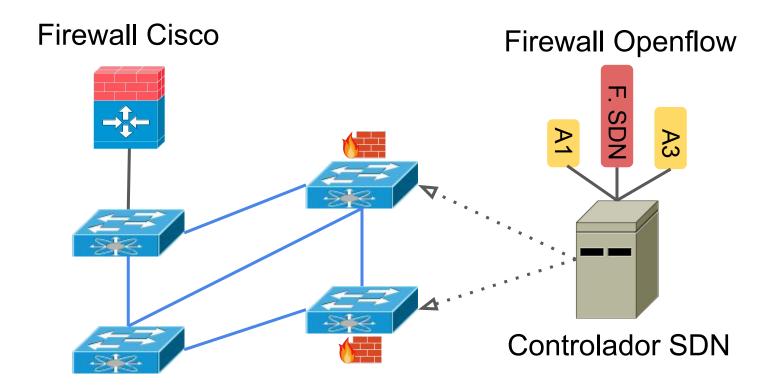
#### **Problema**

**Proposta** 

Implementação

Avaliação

### Gerenciamento de Firewalls



### Gerenciamento de Firewalls

Bloqueio de portas (sintaxe Cisco)

```
!
configure terminal
!
access-list inside_access extended deny tcp any any eq 22
!
```

Bloqueio de portas (sintaxe Openflow)

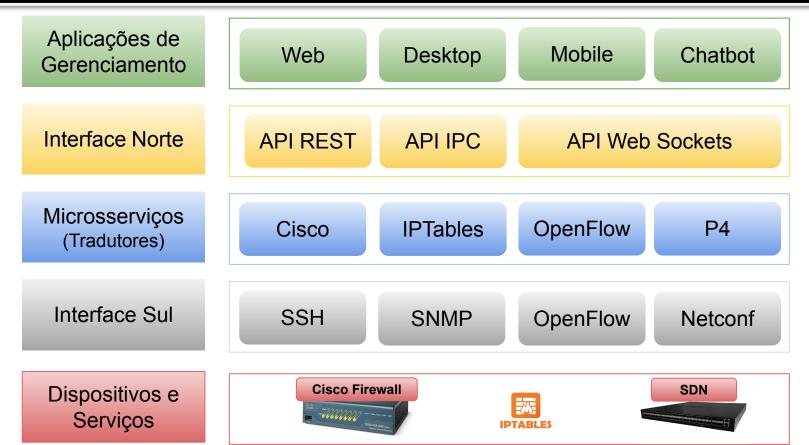
```
! ovs-ofctl add-flow br0 tcp,tcp_dst=22,actions=drop !
```

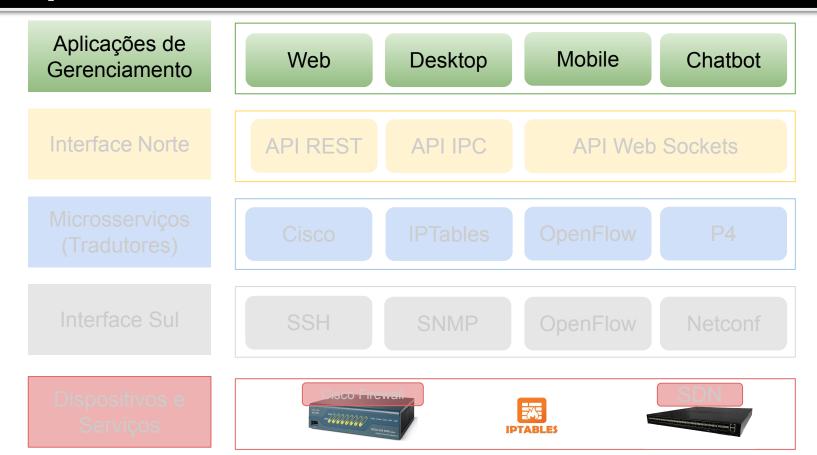
#### **Problema**

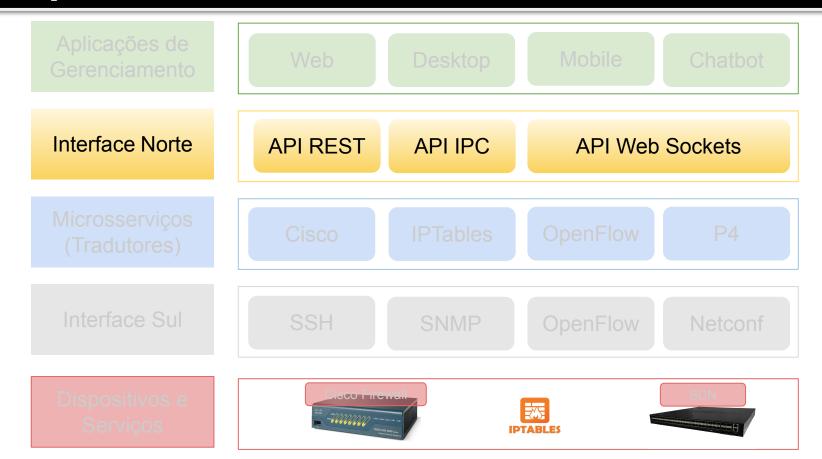
**Proposta** 

Implementação

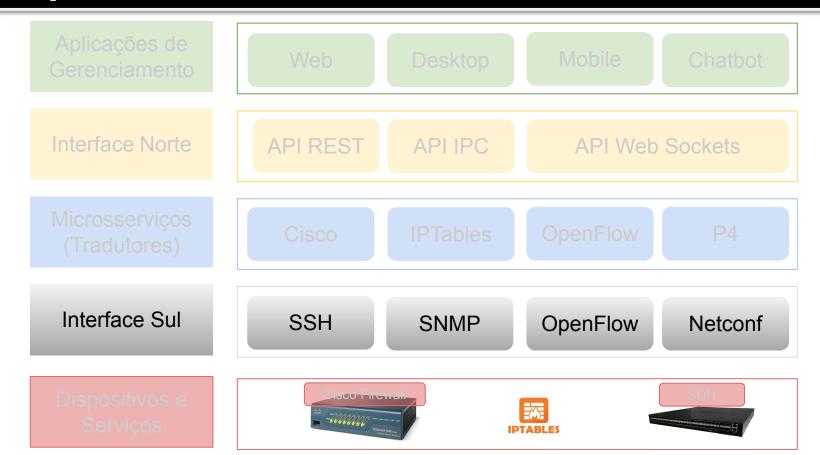
Avaliação

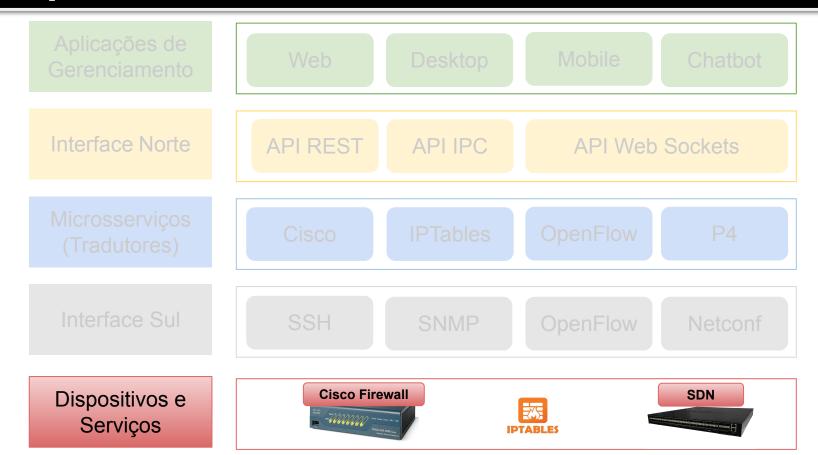






Interface Norte API REST API IPC **API Web Sockets** Microsserviços **OpenFlow** Cisco **IPTables P4** (Tradutores) **IPTABLES** 





#### **Problema**

**Proposta** 

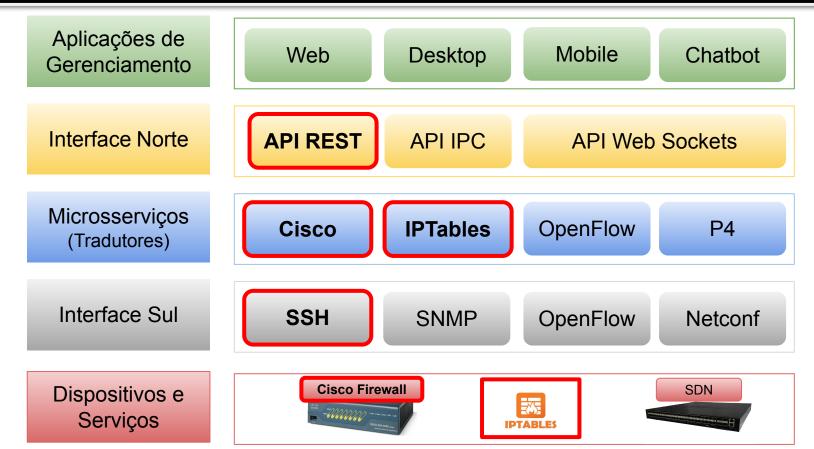
Implementação

Avaliação

# Políticas

- ACL
- NAT
- Traffic Shaping

### Componentes



## Tecnologias e Protocolos

Aplicações de Gerenciamento

**NILE** 

Interface Norte

Flask

Microsserviços (Tradutores)

Jinja2

YAML

Interface Sul

SSH

Dispositivos e Serviços

### NILE (linguagem de Intents)

#### define intent acl:

```
from range('192.168.1.0/24')
```

to endpoint('8.8.8.8')

rule allow('https')

apply insert/remove

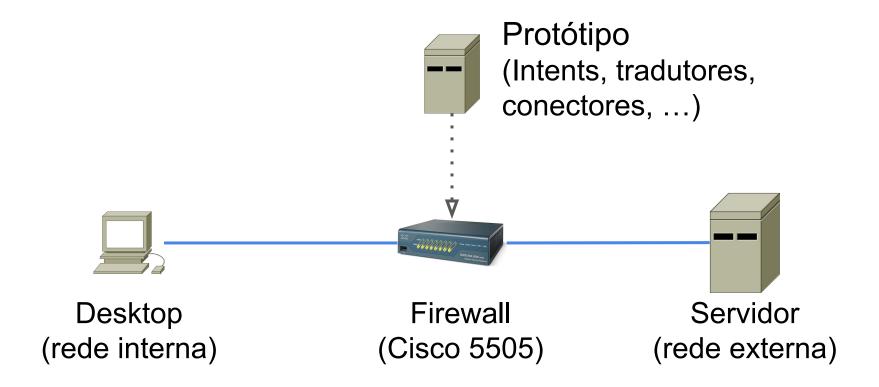
#### **Problema**

**Proposta** 

Implementação

Avaliação

### ACL e Traffic Shaping (Ambiente)



## **ACL ICMP (Intent)**

#### define intent acl:

from endpoint('192.168.1.2')

to endpoint('200.19.30.2')

rule deny('icmp')

apply insert/remove

### ACL ICMP (resultado)

```
usuario@xyz:~$ ping -i4 -0 200.19.30.2
PING 200.19.30.2 (200.19.30.2) 56(84) bytes of data.
64 bytes from 200.19.30.2: icmp seq=1 ttl=64 time=0.700 ms
64 bytes from 200.19.30.2: icmp seq=2 ttl=64 time=0.837 ms
64 bytes from 200.19.30.2: icmp seq=3 ttl=64 time=0.893 ms
no answer yet for icmp seq=4
no answer yet for icmp seq=5
64 bytes from 200.19.30.2: icmp seq=6 ttl=64 time=0.779 ms
64 bytes from 200.19.30.2: icmp seq=7 ttl=64 time=0.844 ms
64 bytes from 200.19.30.2: icmp seq=8 ttl=64 time=0.805 ms
```

## ACL Traffic Shaping (Intent)

define intent traffic\_shaping:

from endpoint('192.168.1.2')

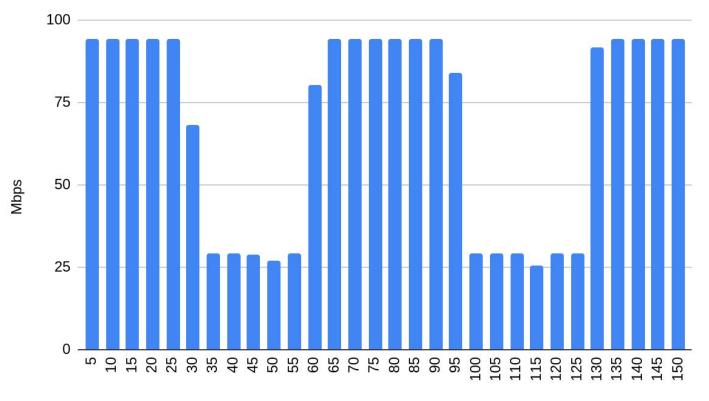
to endpoint('200.19.30.2')

for traffic('udp/5555')

with throughput('30Mbps')

apply insert/remove

## ACL Traffic Shaping (resultado)



Tempo (seg)

### Trabalhos em andamento

