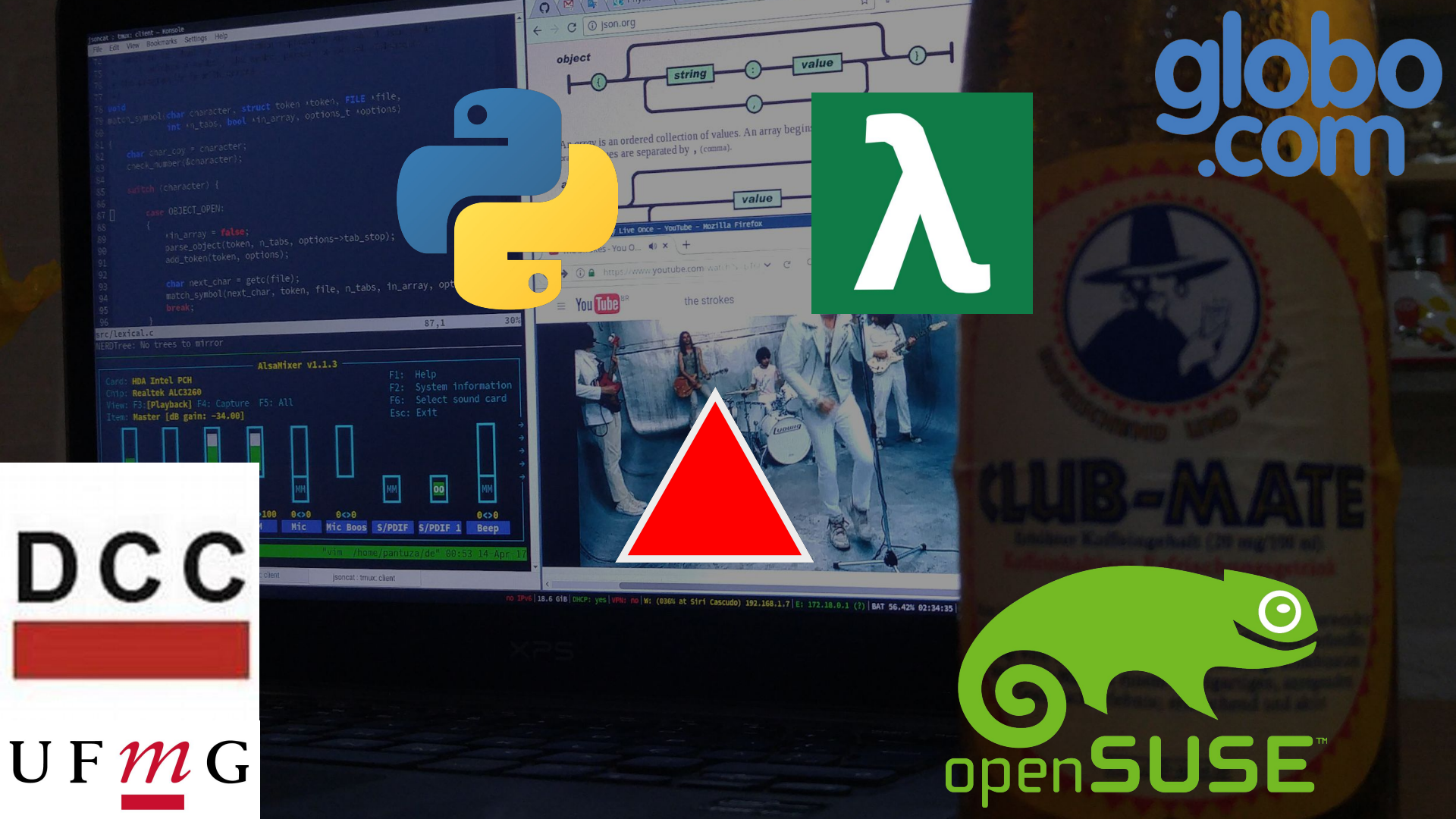
Automação de ACLs através de Redes Definidas por Software

Gustavo Pantuza

globo.com

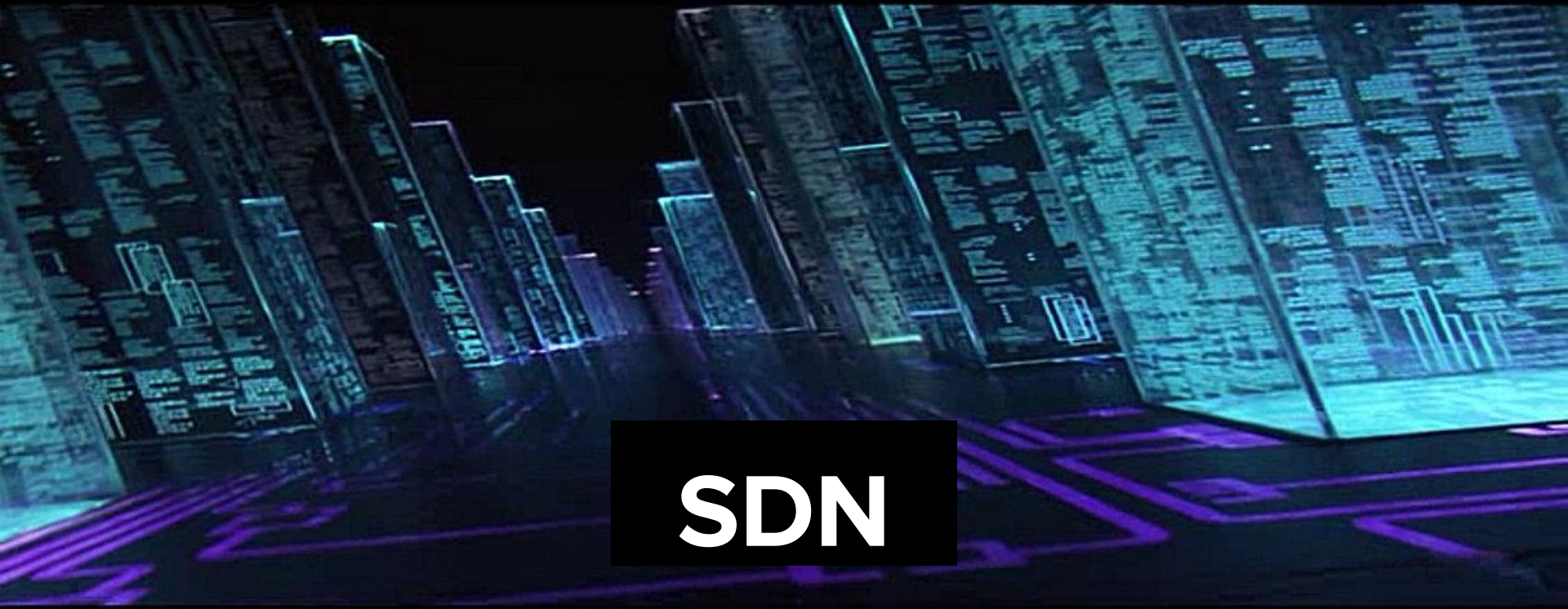

globo
.com
DCC
UFMG
openSUSE
CLUB-MATE
AlsaMixer v1.1.3
Live Once - YouTube - Mozilla Firefox
the strokes
object
string
value

Agenda

Contexto

Problema

Solução



SDN

Plano de dados

Plano de controle

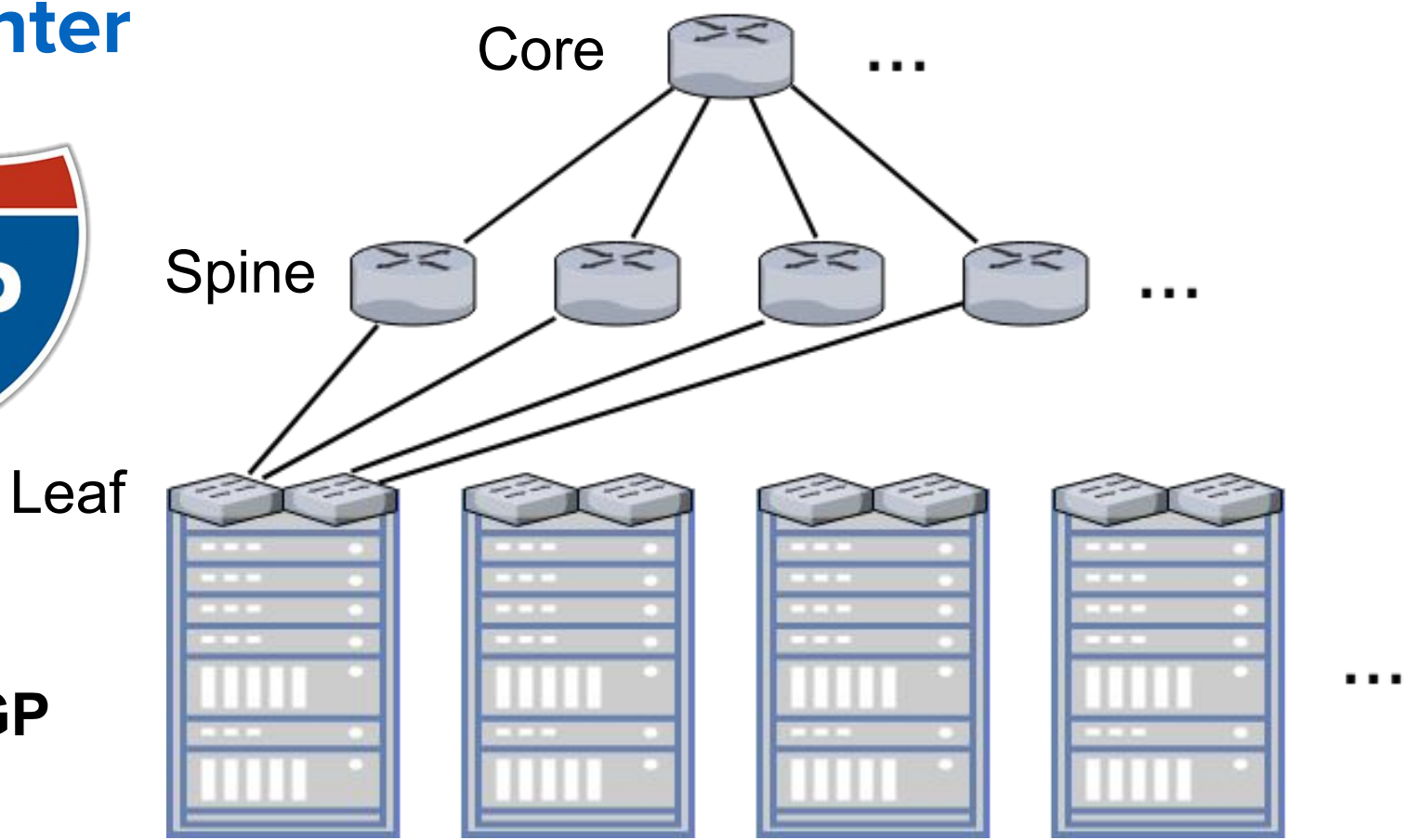
globo
.com
AZZO

Datacenter

5000
servers

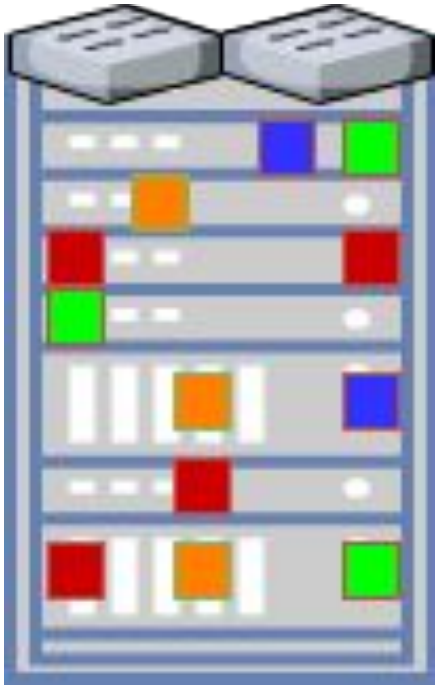
2.9 Tb/s
Bandwidth

Datacenter



ECMP BGP

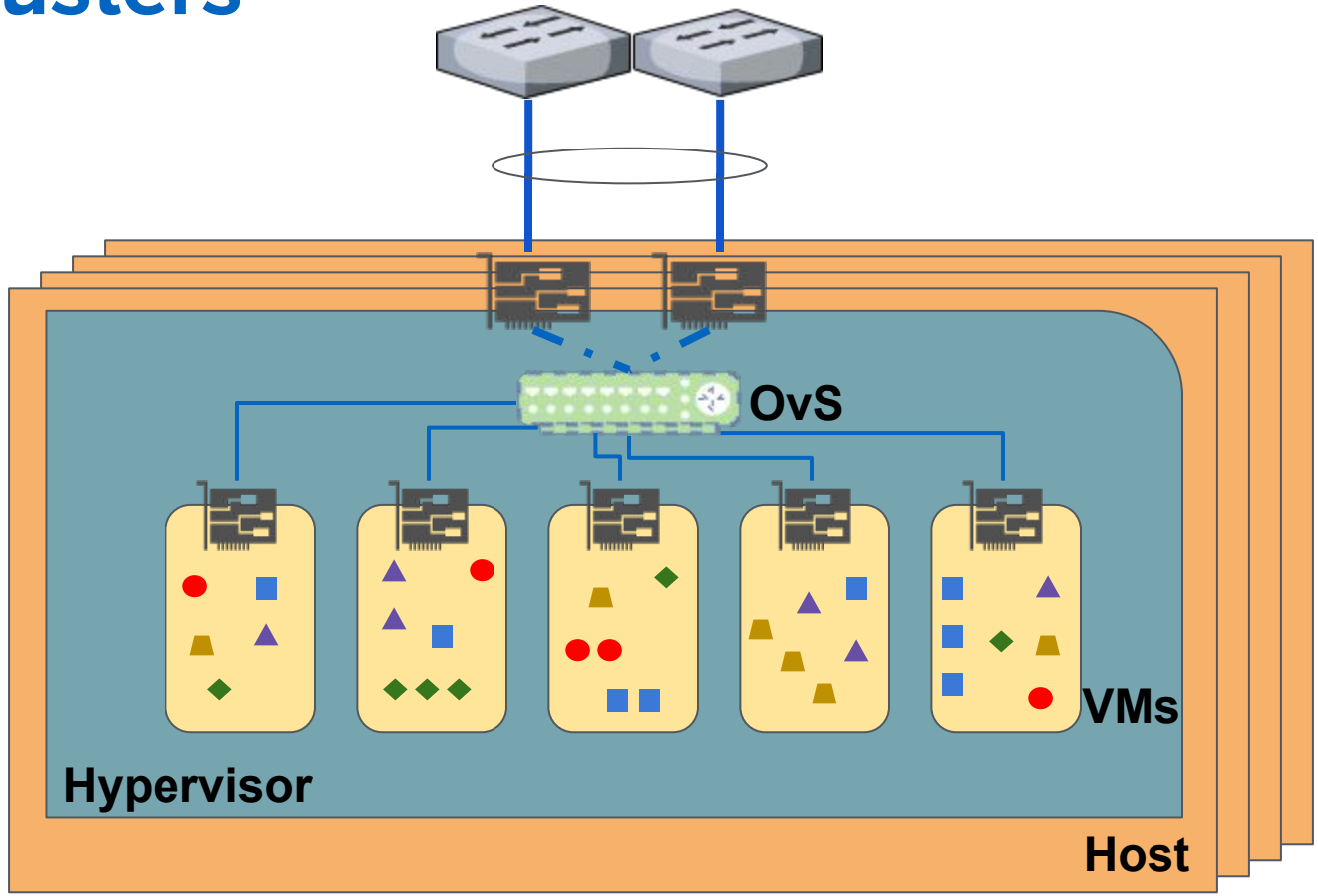
Fabric PoDs



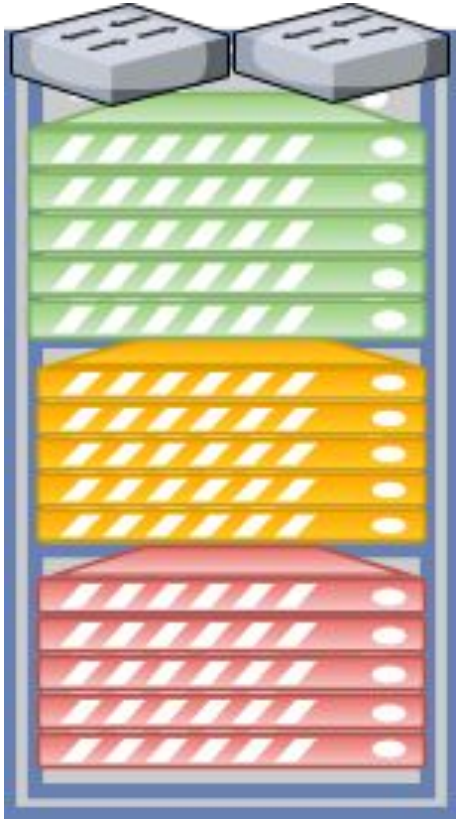
Cloud

Cloud

Xen Clusters



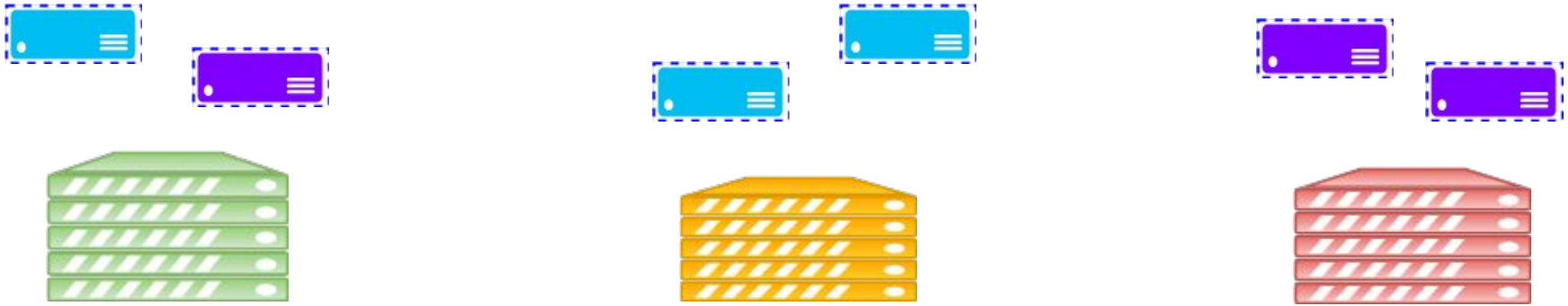
Xen Clusters



Ambientes

Backend - BE

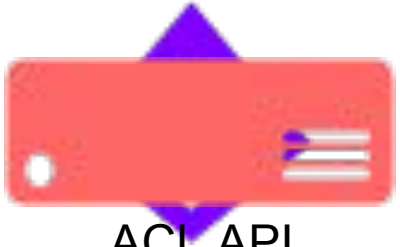
Frontend - FE



Access Control Lists

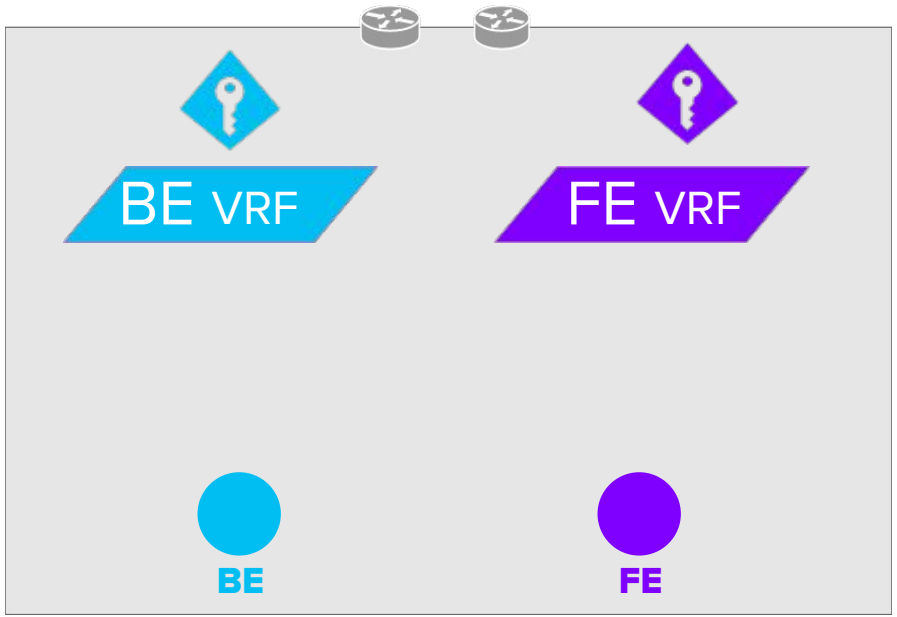
50000+

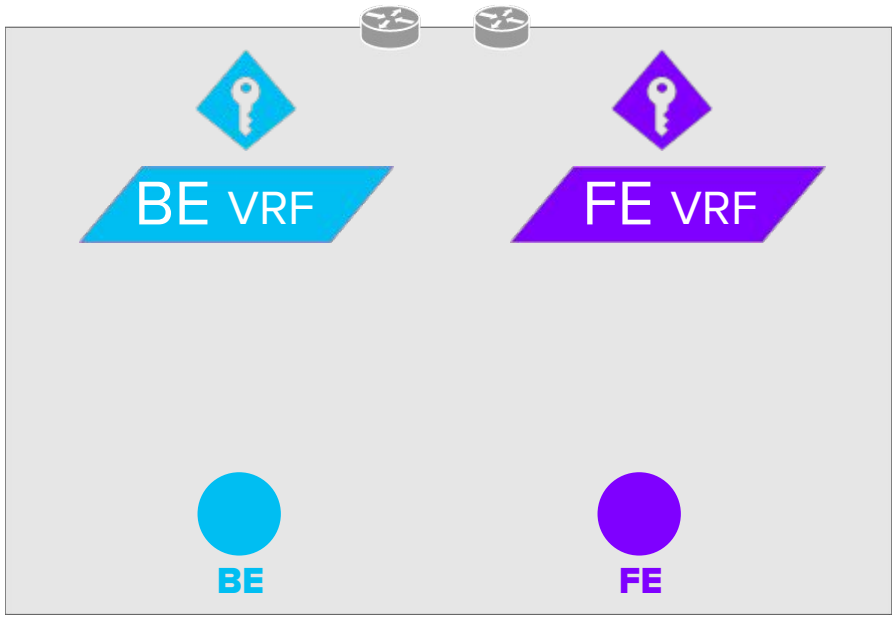
ACLs



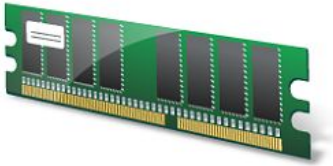
ACL API

Segmentação de ambientes





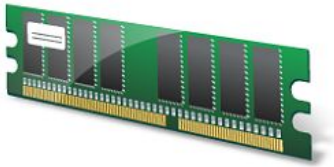
TCAM



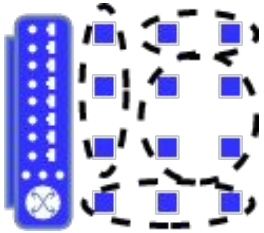
Custo alto

Substituição

Capacidade

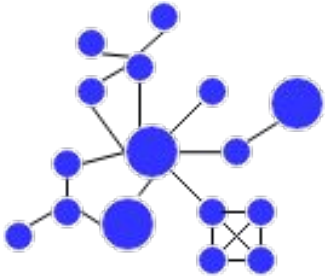


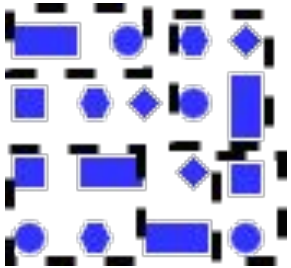
Evoluindo para SDN



6300+ Vlans

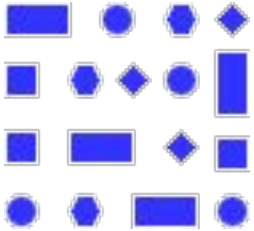
8000+ Redes





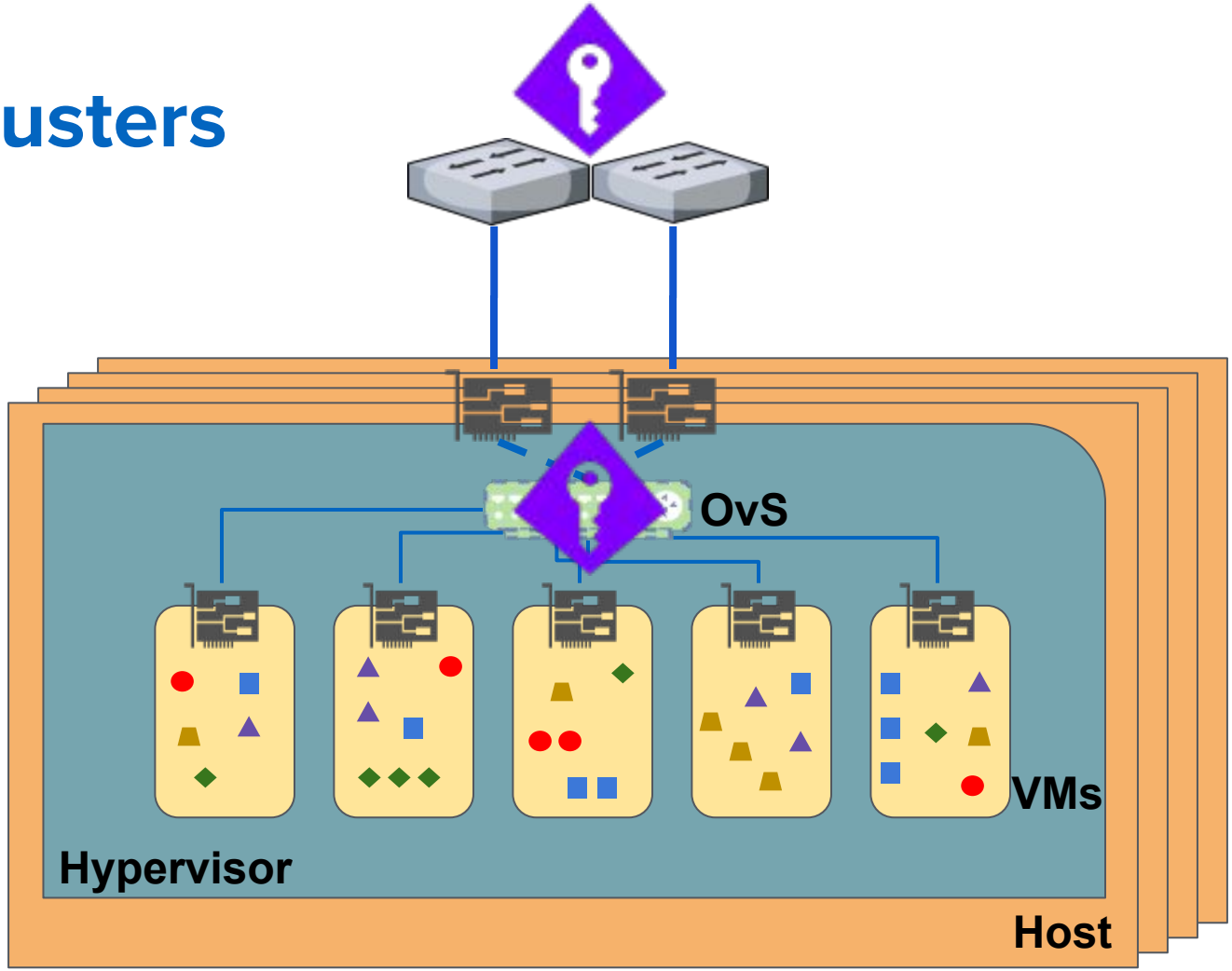
1700+ Ambientes

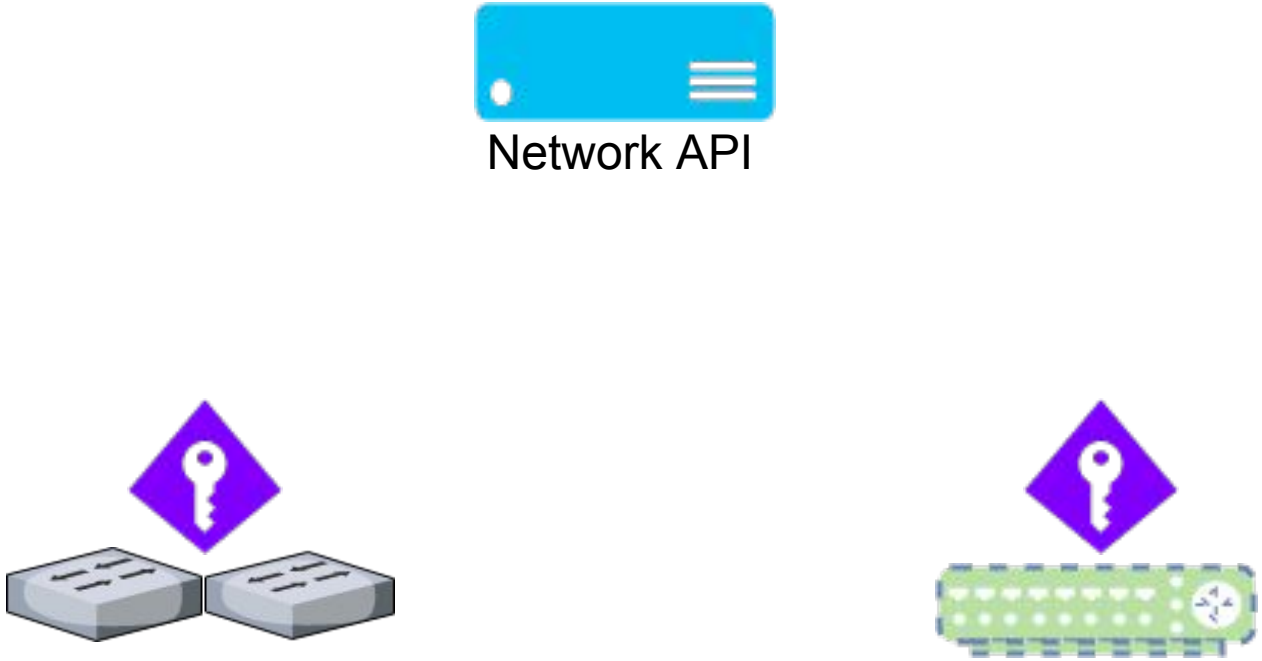
Network API



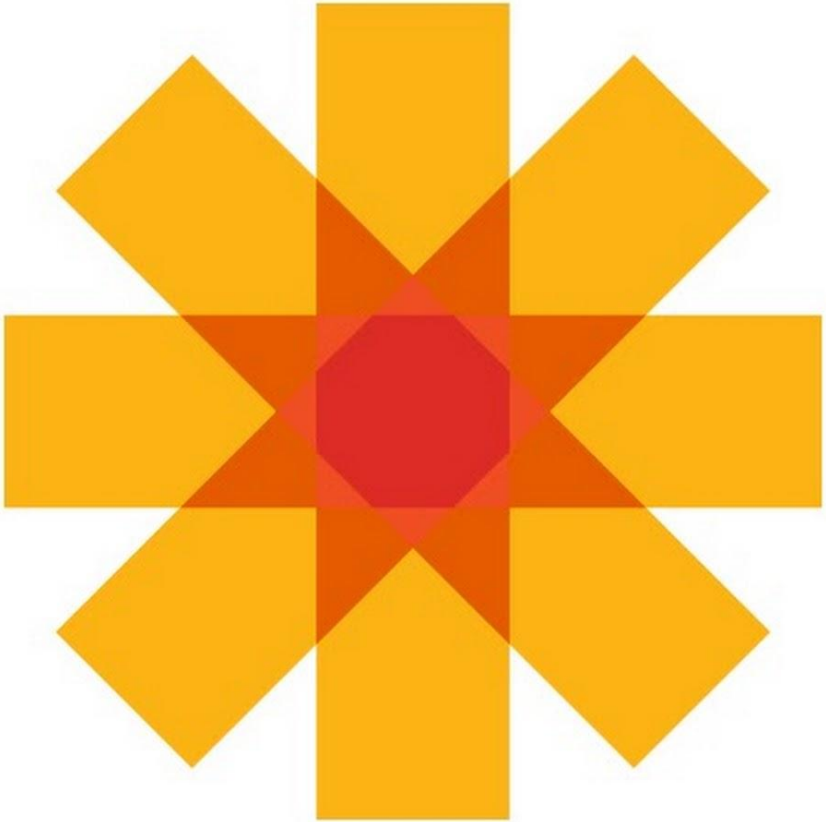
500+ Equipamentos

Xen Clusters

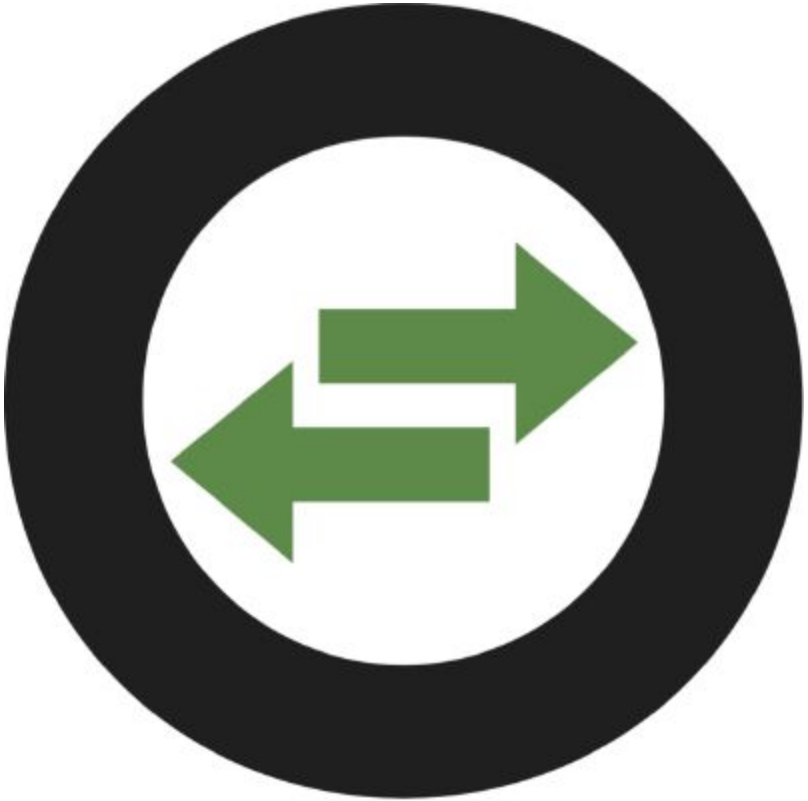


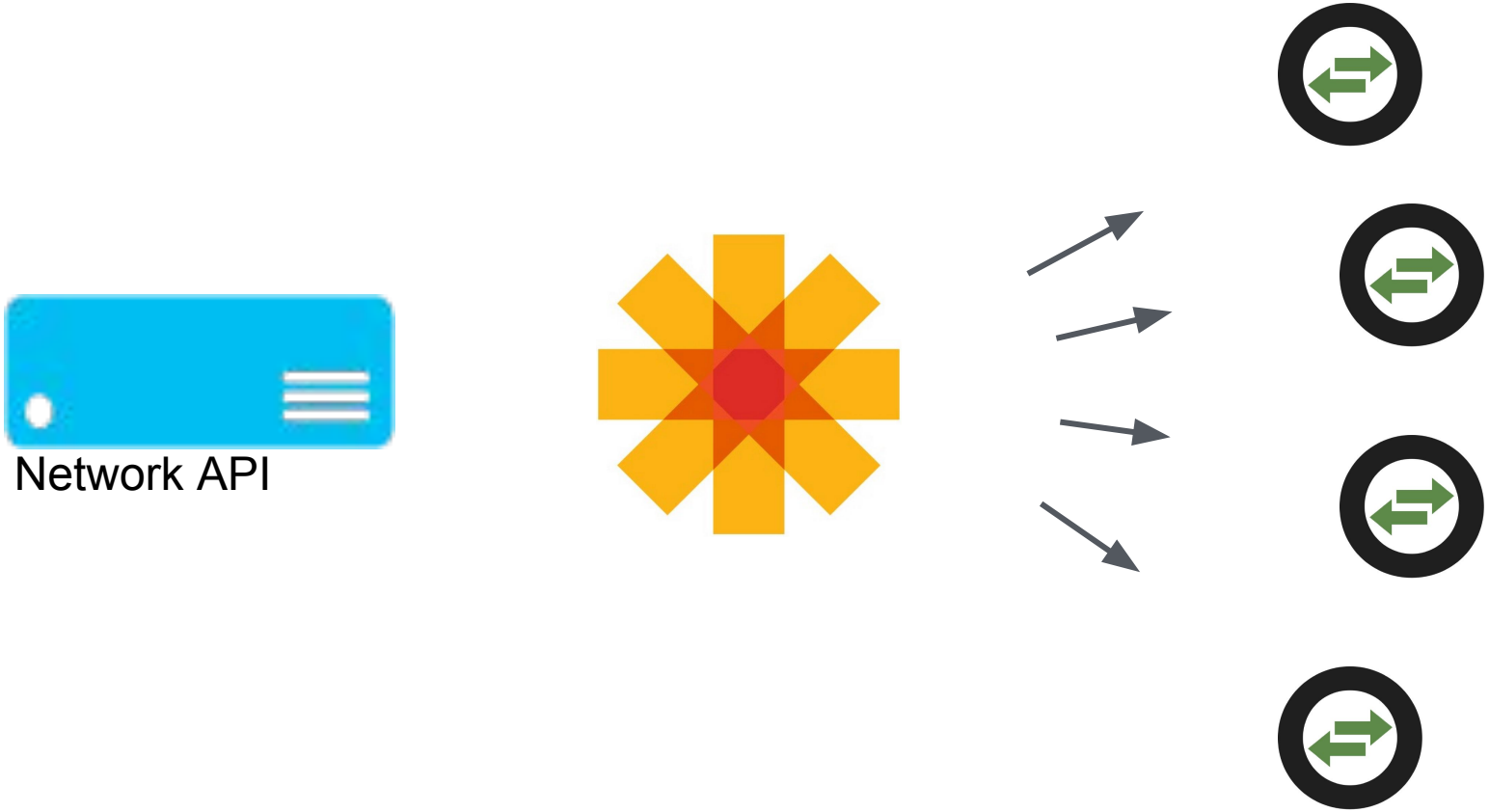

Network API

Controller

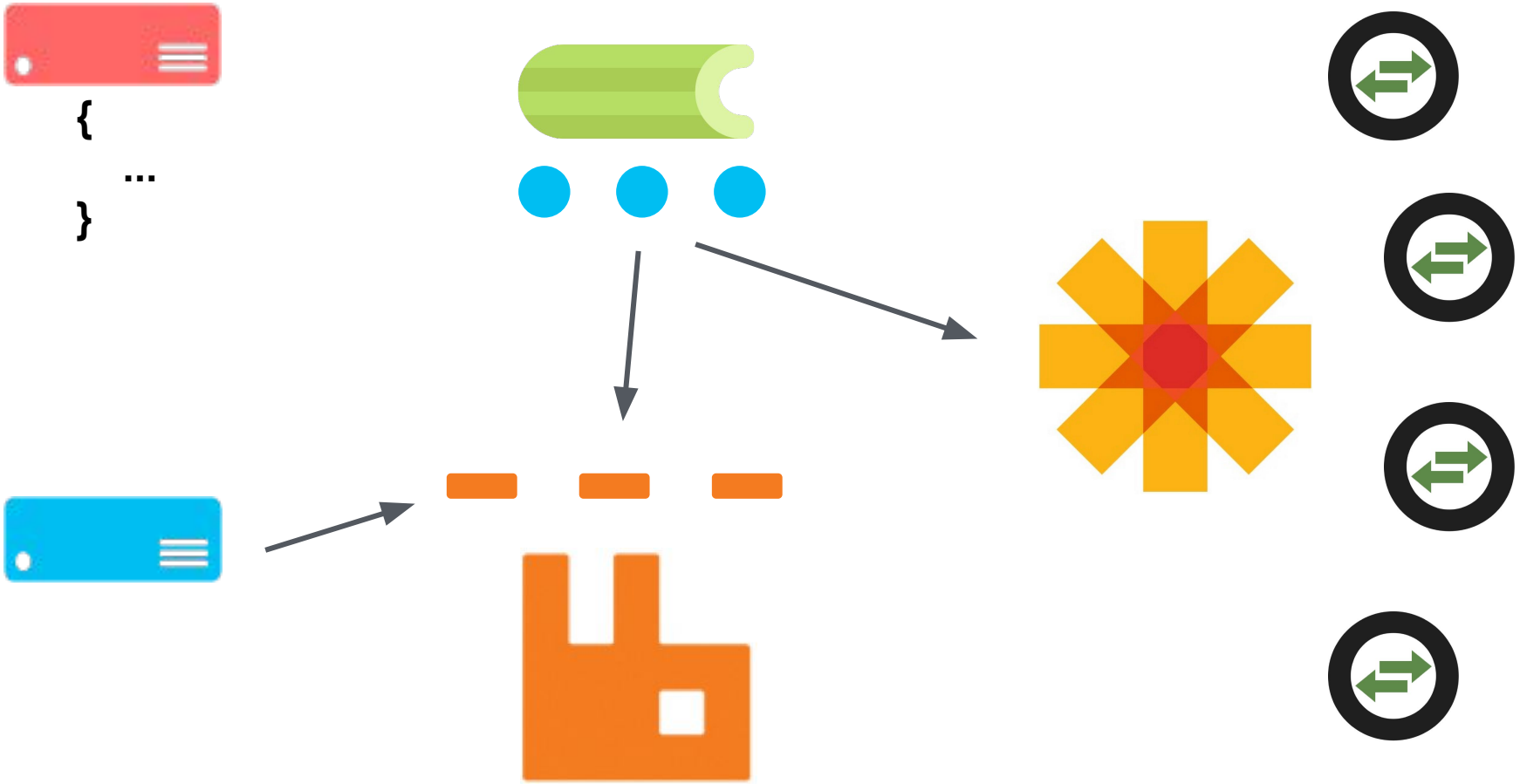


Virtual switch




Network API

```
{
    "kind": "backend#acl",
    "rules": [{
        "action": "permit",
        "description": "Access from application A on port 80",
        "destination": "10.0.42.0/24",
        "id": "222222",
        "owner": "user",
        "protocol": "ip",
        "source": "10.5.190.0/24"
    }]
}
```



Workers

16

workers

Controle SDN

72

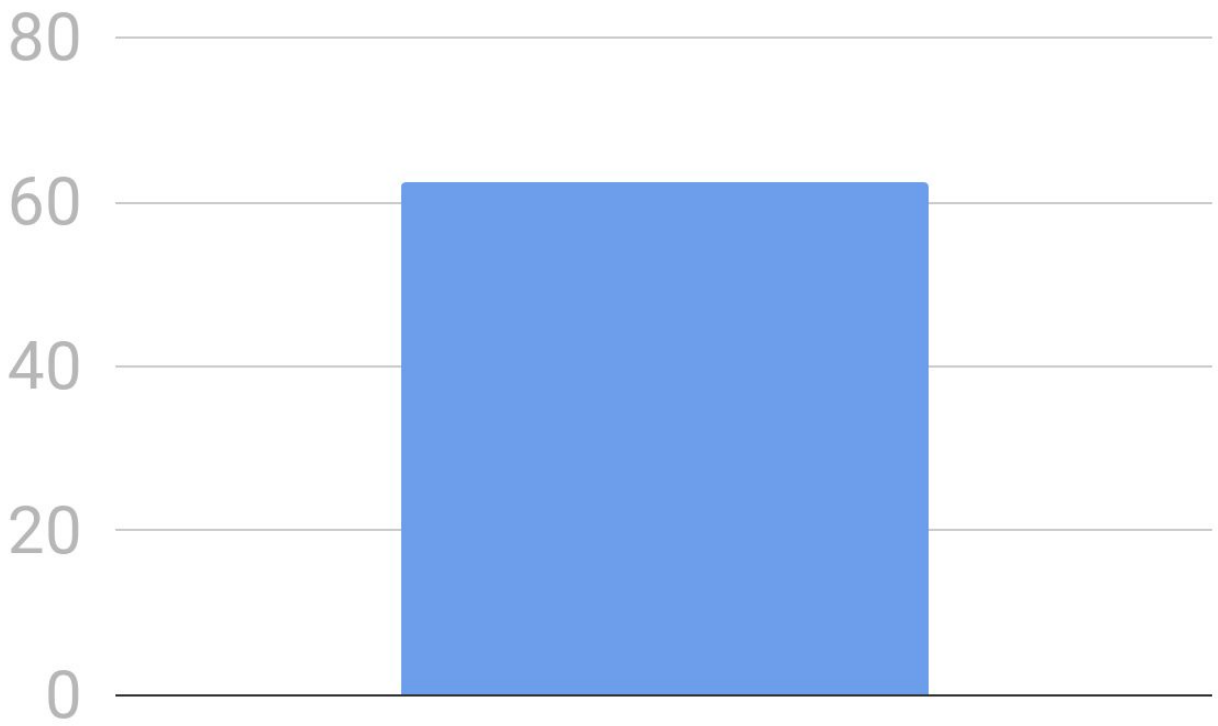
servers

9

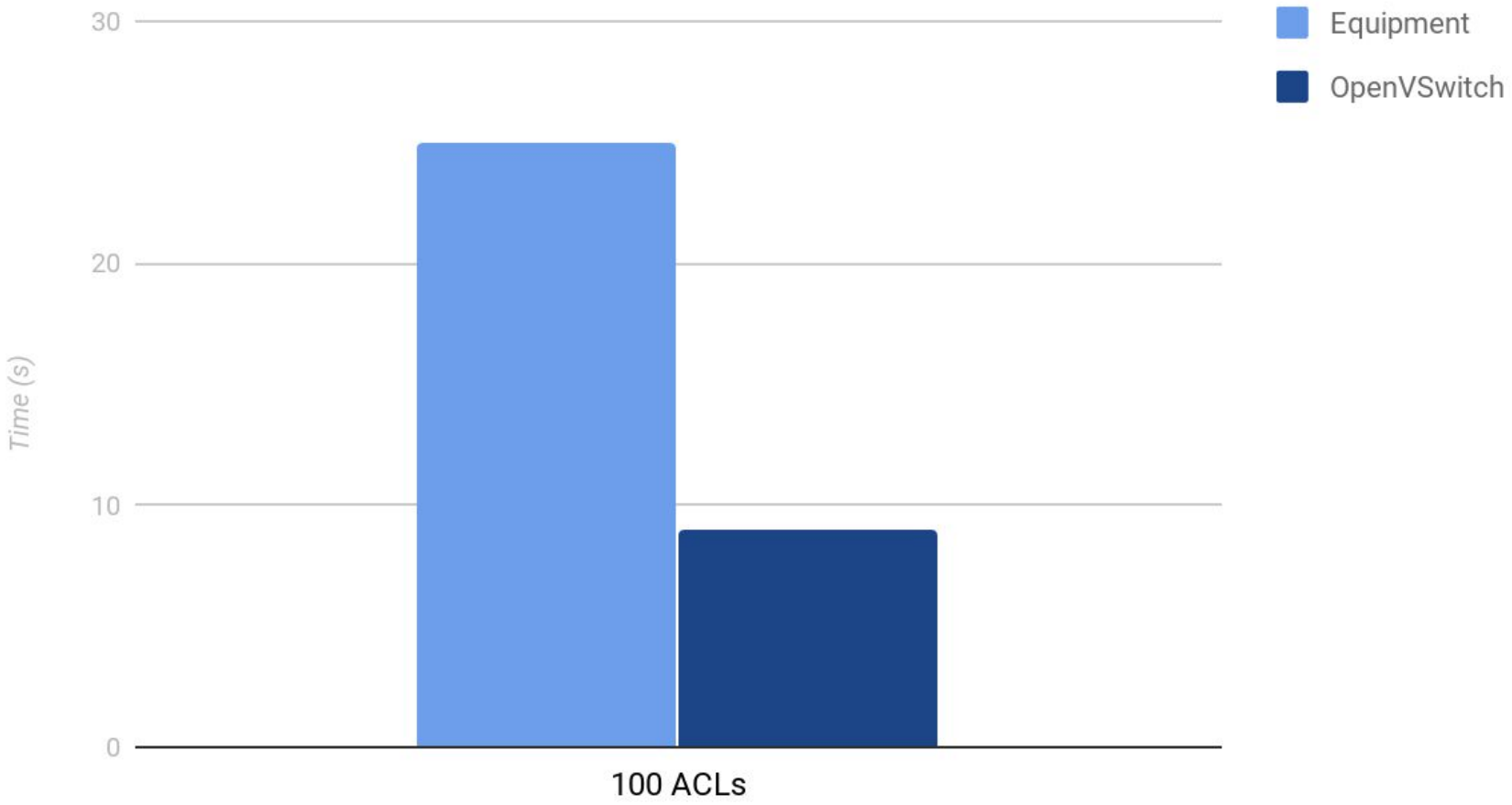
clusters

Requisições por segundo (controlador)

62.5
reqs/sec



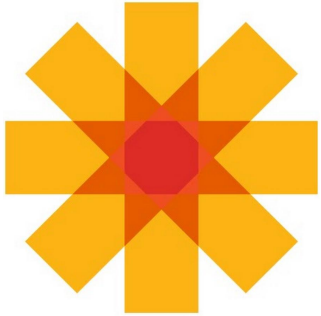
ACL Deployment time in seconds



Controle SDN

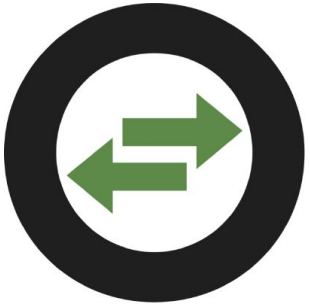
8

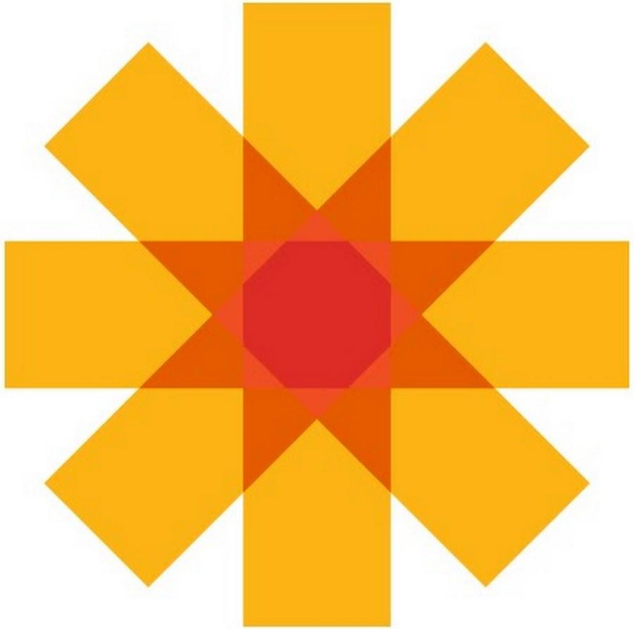
controladores



9

vSwitches
por ctrl





62 Req/s

222 ms

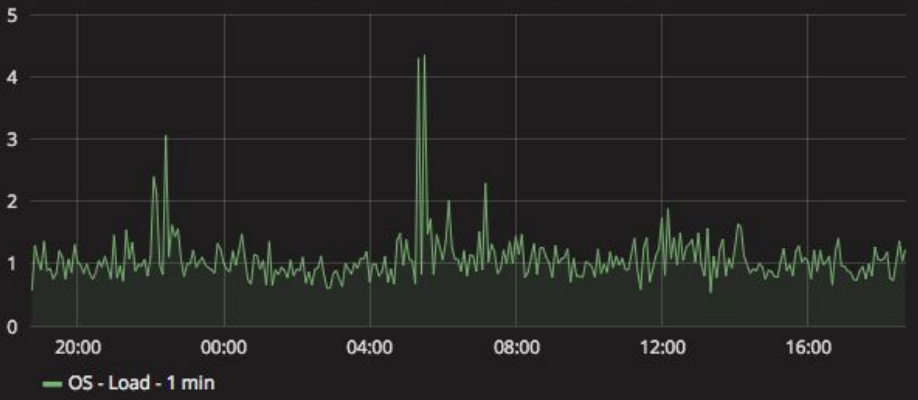
300K Flows

SDN - AH08

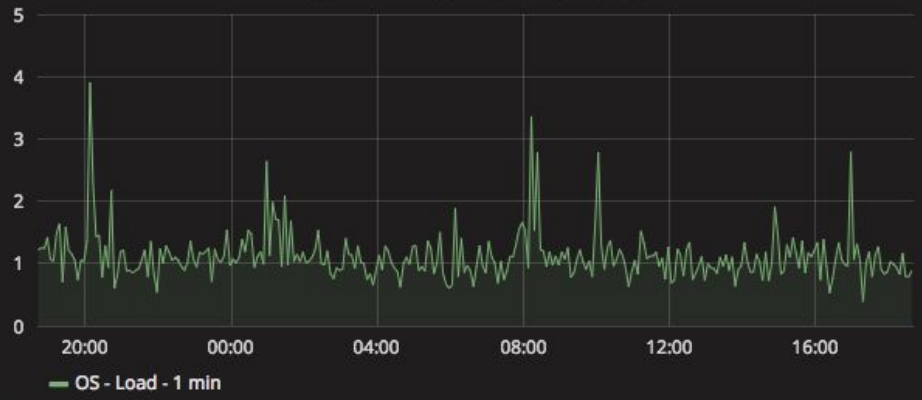
Zoom Out | Last 24 hours

AH08

CMAL21MP39XM04VM06 - CPU



CMAH21MP39XM04VM04 - CPU



Ping

Metric	Current
cmah08mp11lc07.globoi.com: ICMP ping	1
cmah08mp11lc06.globoi.com: ICMP ping	1
cmah08mp11lc05.globoi.com: ICMP ping	1
cmah08mp11lc04.globoi.com: ICMP ping	1
cmah08mp11lc03.globoi.com: ICMP ping	1
cmah08mp11lc02.globoi.com: ICMP ping	1
cmah08mp11lc01.globoi.com: ICMP ping	1

Panel Title

Metric	Avg
cmah08mp15lc07.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days
cmah08mp15lc06.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days
cmah08mp15lc05.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days
cmah08mp15lc04.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days
cmah08mp15lc03.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days
cmah08mp15lc02.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days
cmah08mp15lc01.globoi.com: OS - Device uptime	1 month, 2 weeks, 5 days

CMAH21MP39XM04VM05 - CPU

CMAL21MP39XM04VM05 - CPU

[SDN] - Ambiente BE

Zoom Out | Last 5 minutes

ambiente: Projeto/SDN/RJDEV-BE-AL08 | host: All

SDN Triggers

Host	Issue	Last change	Age	Info

cmal08mp01lc13.globoi.com		cmal08mp01lc14.globoi.com		cmal08mp01lc15.globoi.com		cmal08mp01lc16.globoi.com		cmal08mp11lc01.globoi.com		cmal08mp11lc02.globoi.com		cmal08mp11lc03.globoi.com		cmal08mp11lc04.globoi.com		cmal08mp11lc05.globoi.com		cmal08mp11lc06.globoi.com		cmal08mp11lc07.globoi.com		cmal08mp11lc08.globoi.com	
Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current
SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12
Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00
NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k
Vif	7.00	Vif	4.00	Vif	5.00	Vif	3.00	Vif	61.00	Vif	42.00	Vif	80.00	Vif	60.00	Vif	51.00	Vif	45.00	Vif	81.00	Vif	50.00
All	1.89 k	All	1.88 k	All	1.89 k	All	1.88 k	All	1.94 k	All	1.92 k	All	1.96 k	All	1.94 k	All	1.93 k	All	1.93 k	All	1.96 k	All	1.93 k

cmal08mp15lc01.globoi.com		cmal08mp15lc02.globoi.com		cmal08mp15lc03.globoi.com		cmal08mp15lc04.globoi.com		cmal08mp15lc05.globoi.com		cmal08mp15lc06.globoi.com		cmal08mp15lc07.globoi.com		cmal08mp15lc08.globoi.com		cmal08mp19lc01.globoi.com		cmal08mp19lc02.globoi.com		cmal08mp19lc03.globoi.com		cmal08mp19lc04.globoi.com	
Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current	Metric	Current
SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12	SDN	10.12
Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00	Client	20.00
NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k	NAPI	1.85 k
Vif	55.00	Vif	57.00	Vif	83.00	Vif	42.00	Vif	29.00	Vif	54.00	Vif	46.00	Vif	35.00	Vif	50.00	Vif	44.00	Vif	20.00	Vif	46.00
All	1.93 k	All	1.93 k	All	1.96 k	All	1.92 k	All	1.91 k	All	1.93 k	All	1.92 k	All	1.91 k	All	1.93 k	All	1.92 k	All	1.89 k	All	1.92 k

Sem atraso no primeiro pacote

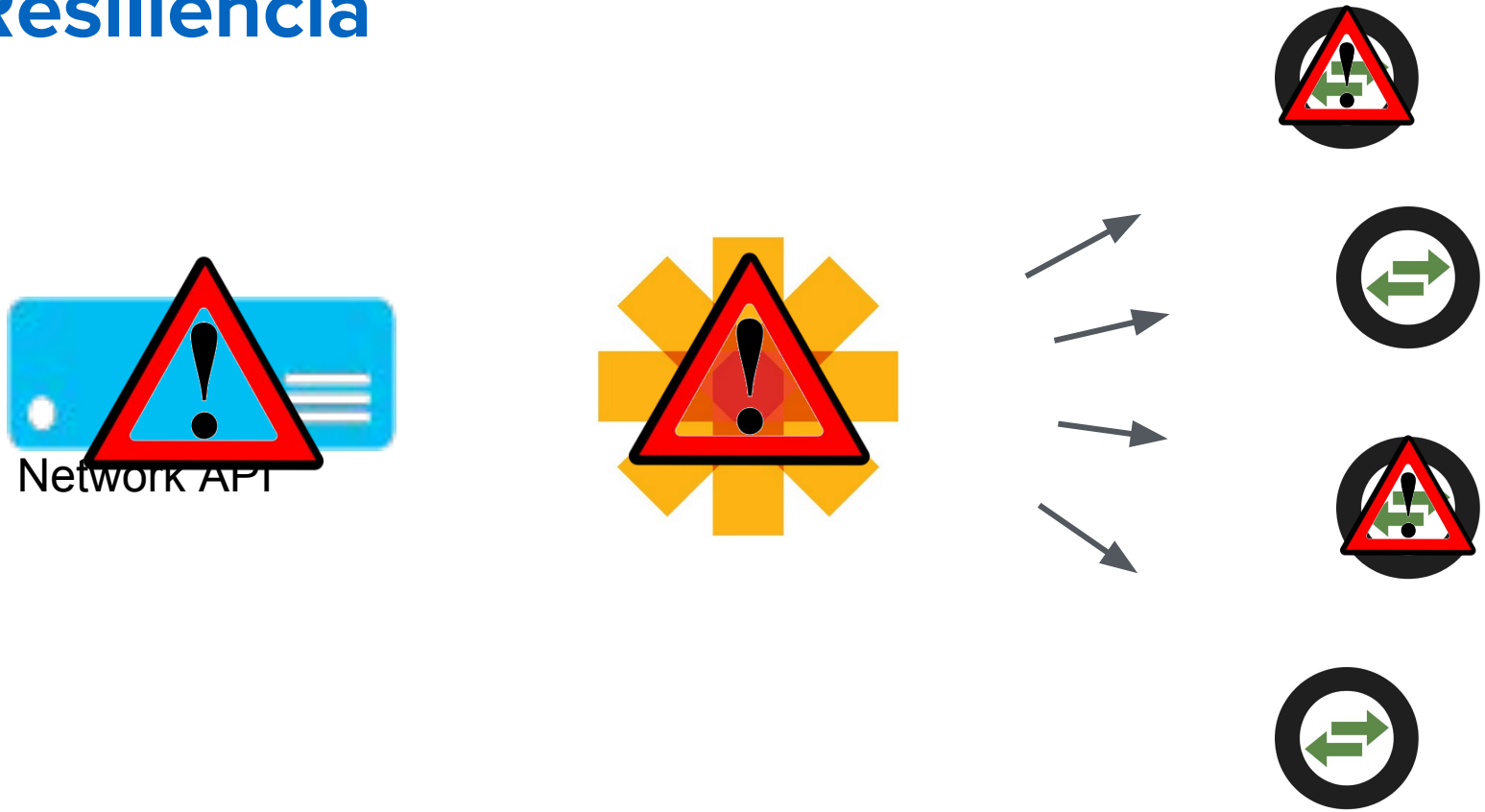
```
[root@blctrj02lc02 ~]# yum
```

Open vSwitches

Ambiente	Controlador	OVS	Redes do Filer	Outras redes
42	172.21.0.3	172.21.0.66	192.168.0.3/24	192.168.42.0/24;192.168.43.0/24
42	172.21.0.5	172.21.0.34	192.168.0.3/24	192.168.42.0/24,192.168.43.0/24
2	172.21.0.5	172.21.0.6	192.168.0.3/24	192.168.42.0/24;192.168.43.0/24
1	172.21.0.5	172.21.0.42	192.168.0.3/24	192.168.42.0/24
1	172.22.0.6	172.22.0.7	192.168.0.3/24	192.168.42.0/24,192.168.43.0/24

+

Resiliência



Transparente para os usuários

Integrar todos os serviços de cloud

NetworkAPI https://github.com/globocom/GloboNetworkAPI
Tsuru https://tsuru.io
DBaas https://github.com/globocom/database-as-a-service
ACL API
FSaas
DNSaaS
. . .

SOFTWARE

https://opensource.globo.com/

globo.com

Network as a service (NaaS), NFV e SDN

Desenvolvedor de Software

https://talentos.globo.com/#/oportunidades/network-as-a-service-naa-s-nfv-e-sdn-desenvolvedor-de-software/mp01cew

SUPORTE
TELECOM
3.49 Gbps
44.1 Gbps
2.075 G
Centro
Operações
Datacenter
SYN&
SYN-ACK&
ACK
TELECOM

gustavopantuza@gmail.com

https://github.com/pantuza

https://blog.pantuza.com

https://twitter.com/gpantuza