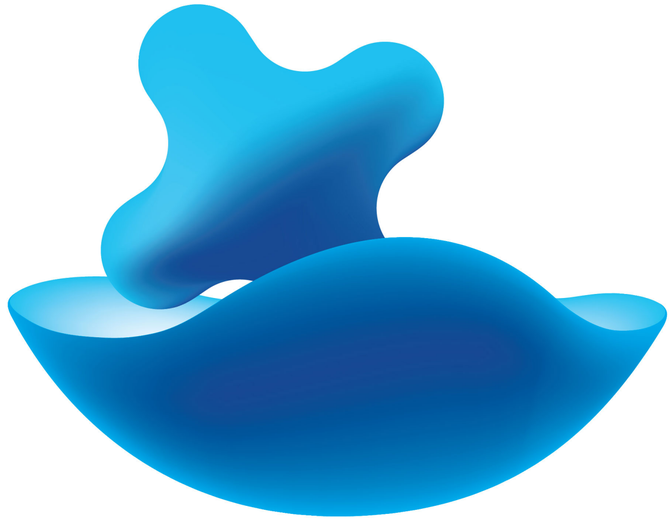
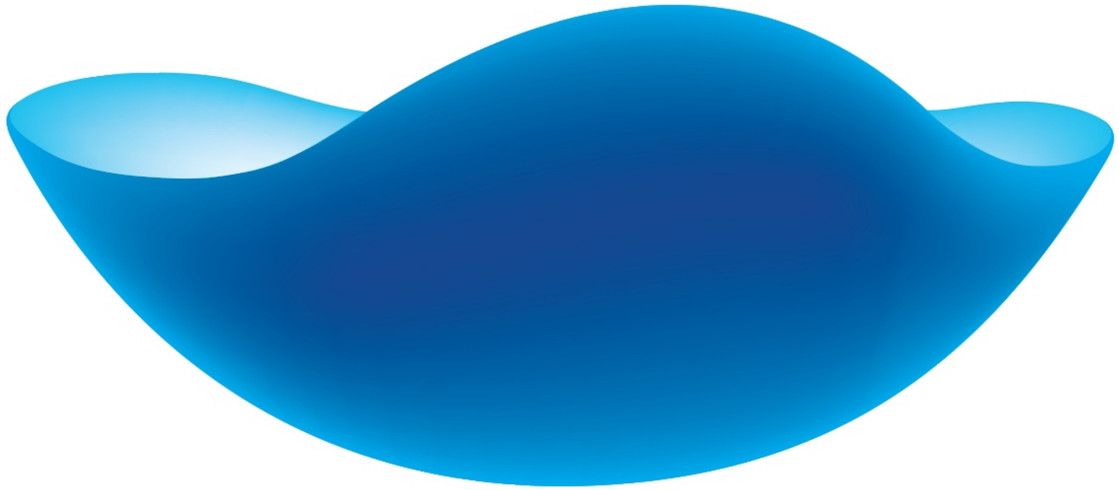


XCLOUD
NETWORKS

Alex Saroyan, CEO & Co-founder
alex@xcloudnetworks.com
https://xcloudnetworks.com
+37455988506

ANATOMY OF BARE METAL SWITCHES



PROBLEMS OF WELL-KNOWN VENDOR APPROACH

- Very hard or impossible to customize
- No selection of Operating System
- Vendor lock-in
- Management software is vendor specific
- High Total Cost of ownership

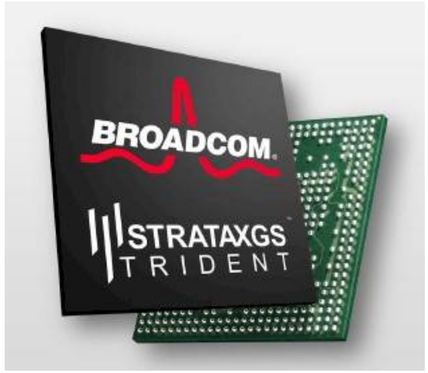
This is A White-box or Bare Metal Switch

With Full line-rate L2/L3 Ports, 1.44 Tbps switching capacity, 720ns latency, Hot-swappable 2 power supplies, 4+1 Fans

48 X 10G SFP+

6 X 40G QSFP

This switch is Based on Broadcom Trident 2+ ASIC



All Those switches are built on the same ASIC - thus they all have similar hw capabilities

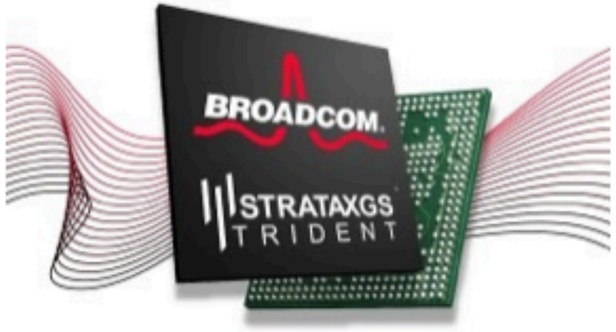
Extreme Summit X770

HP 5930

Dell S6000

Nuage 7850 VSG

Juniper QFX 3500



Trident II

Cumulus Networks

HCL: Agema, Edge-Core, Penguin Computing, Quanta

Cisco Nexus 3100

Cisco Nexus 9000

Arista 7500E

Arista 7250X

BUT this switch cost 2-5 times less comparing with big vendors

48 X 10G SFP+

6 X 40G QSFP

It allows to install NOS of our choice
Like we can install OS of our choice when we buy some servers

48 X 10G SFP+

6 X 40G QSFP

2-5 times lower price

There are at least 8 vendors which offer similar switches for similar price

48 X 10G SFP+

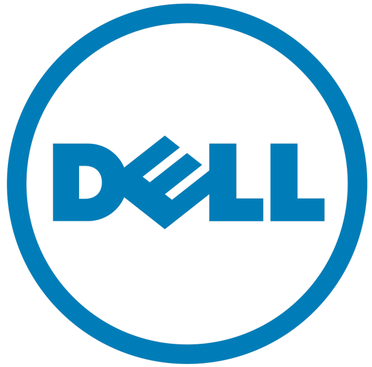
6 X 40G QSFP

2-5 times lower price

NOS of your choice

Hewlett Packard
Enterprise

Edge-corE
NETWORKS


DELL

SUPERMICRO

Mellanox
TECHNOLOGIES

Agema

PENGUIN
COMPUTING

QCT

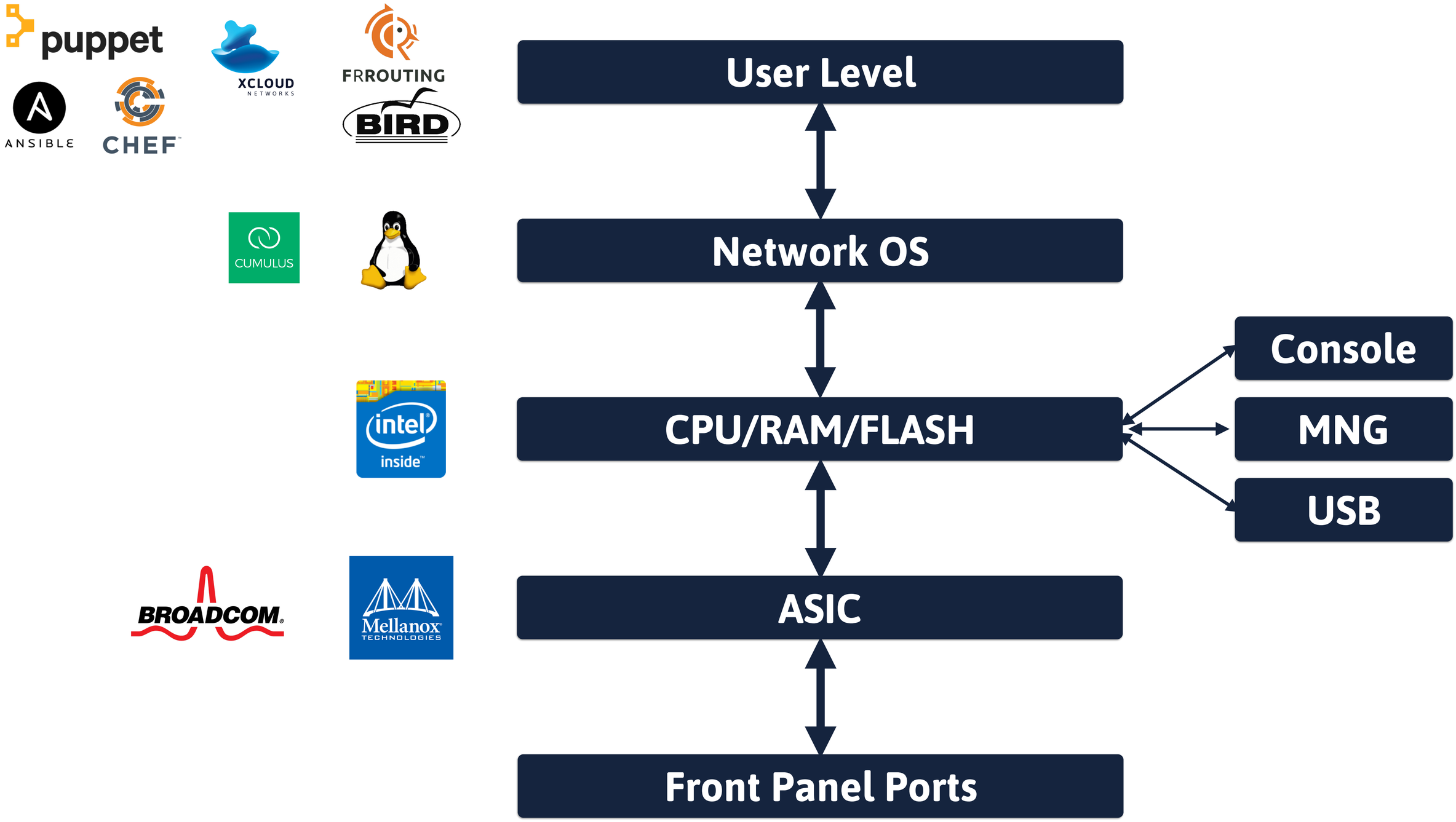
Not Locking to vendor

48 X 10G SFP+

6 X 40G QSFP

2-5 times lower price

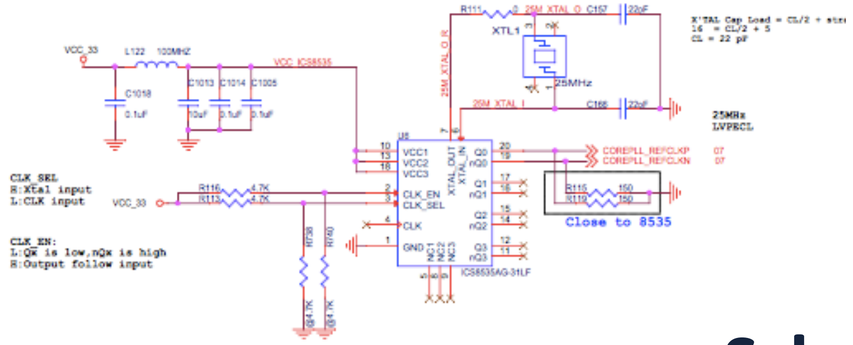
NOS of your choice

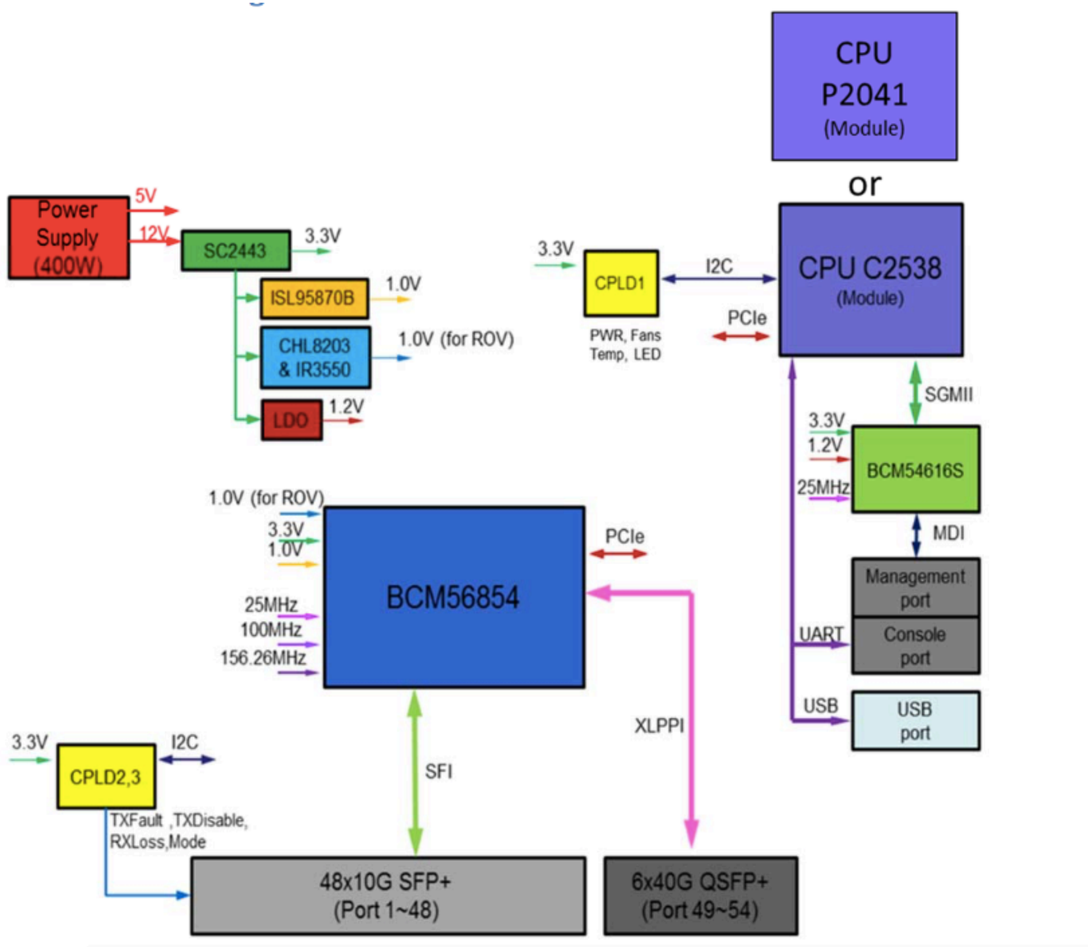

puppet
XCLOUD NETWORKS
FRROUTING
BIRD
ANSIBLE
CHEF
CUMULUS
intel inside
BROADCOM
Mellanox TECHNOLOGIES
User Level
Network OS
CPU/RAM/FLASH
ASIC
Front Panel Ports
Console
MNG
USB

How Open are these switches ?

OPEN
Compute Project

- **Permissive**
- **Reciprocal**





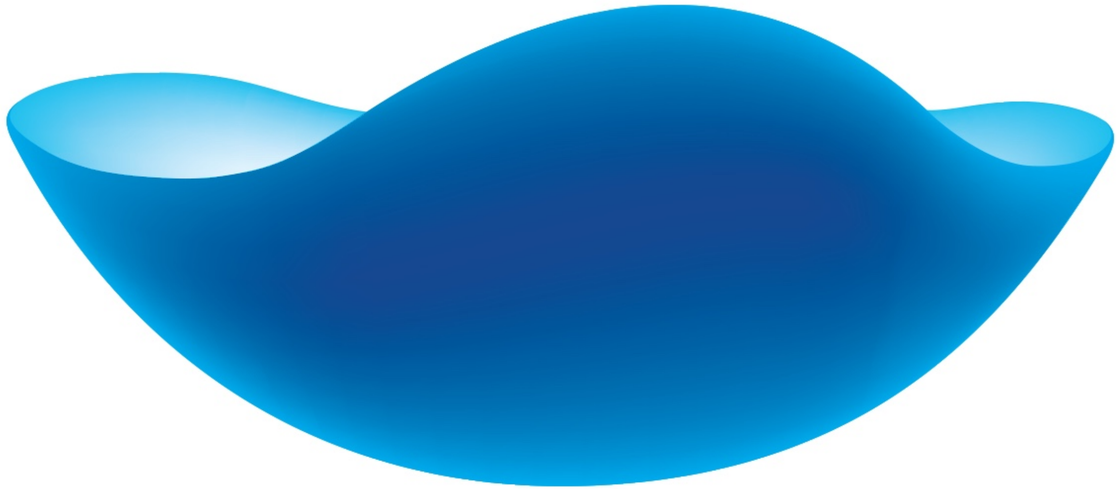
- **Schematics**
- **Gerber files**
- **BOM files**

Some popular ASICs

	Broadcom Trident 2/2+	Broadcom Tomahawk	Mellanox Spectrum
Ports	48 x 10G SFP+, 6 x 40G QSFP+ 48 x 10G T+, 6 x 40G QSFP+ 32 x 40G QSFP+	32 x 100G QSFP28	48 x 10G SFP+, 8 x 100G - QSFP28 48 x 25G SFP28, 8 x 100G - QSFP28 32 x 40G QSFP+
Size	1U	1U	1U, 0.5U
ACLs	3000 (T2+)	512	3000
MACs	160K	72K	180K
Prefixes	128K IPv4 or 20K IPv6	128K IPv4 or 20K IPv6	176K IPv4 or 64K IPv6
Latency	720ns	450ns	300ns
SDK	NDA	NDA	OPEN

*Limits vary depending on setup (l2 heavy / l3 heavy / v6 heavy / etc...)

KILLER ASICS OUT THERE



- 6.4Tbps of Ethernet switching and IP routing
- Flexible port configurations:
  16 X 400GbE
  32 X 200GbE
  64 X 100GbE
  128 X 10/25/50GbE
- 9.52B packets-per-second
- Sub 300ns latency
- Low power consumption of less than 7 watts per 200GbE port
- 42MB dynamically-shared, flexible packet buffering
- 512K MAC/IP/ECMP extendable by +2M IP Routes

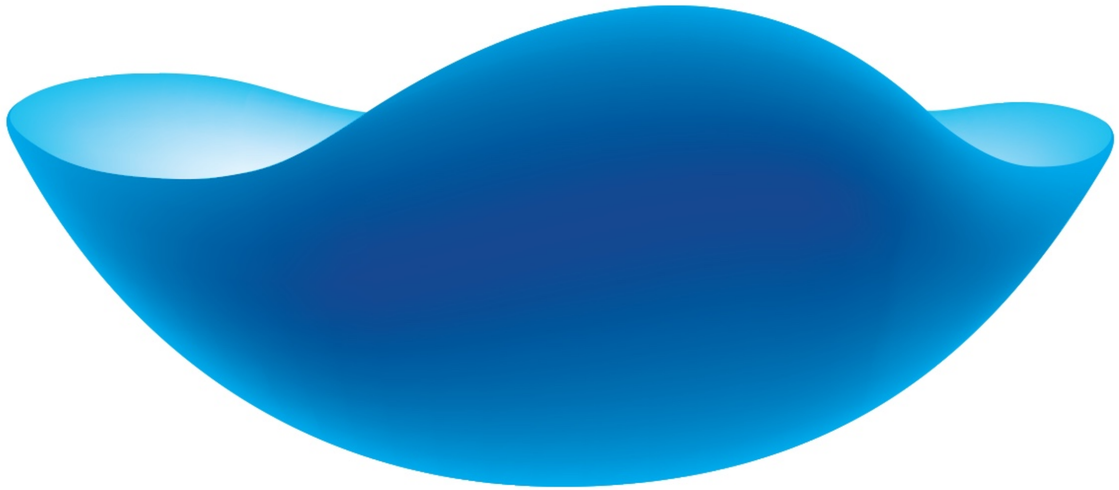
BAREFOOT NETWORKS

PISA: Protocol Independent Switch Architecture

P4: Programming Protocol-Independent Packet Processors

- Data plane is not aware of any protocol
- Protocols to programmed according to particular needs
- Data plane resources to be assigned according to needs

CONTROL PLANE



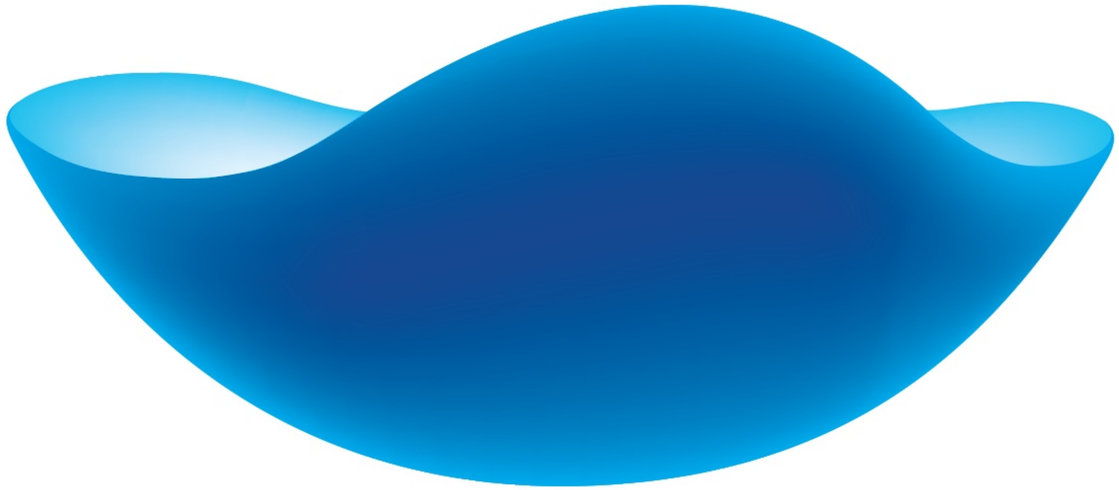
CONTROL PLANE - Bridge / Vlan

```
auto bond0
iface bond0
        mtu 9000
        bond-slaves swp1 swp2 swp3 swp4

auto vni-3
iface vni-3
        vxlan-id 3
        mtu 9000
        vxlan-local-tunnelip 1.1.1.1

auto br-3
iface br-3
        bridge-stp off
        bridge-mcsnoop 0
        bridge-ports vni-3 bond0.300
```

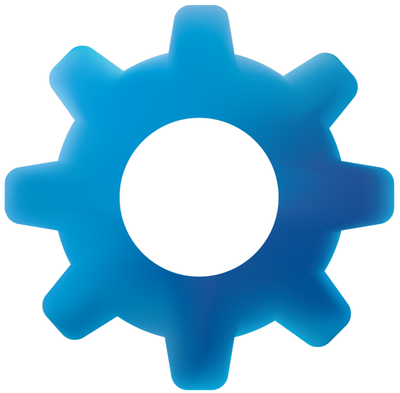
CONTROL PLANE - BGP

```
router bgp 65001
 neighbor swp10 interface remote-as 65500
 neighbor swp10 bfd

 neighbor 1.0.0.1 remote-as 65505
 neighbor 1.0.0.1 timers 10 30
 !
 address-family ipv4 unicast
  redistribute connected route-map lo
  neighbor swp10 prefix-list swp3-in in

  neighbor 1.0.0.1 prefix-list to-backbone out
   exit-address-family
!
ip prefix-list to-backbone seq 5 permit 2.0.0.0/8

ip prefix-list swp3-in seq 5 permit 2.0.0.0/8
```

OPERATIONS AND MAINTENANCE



OPERATIONS AND MAINTENANCE



- It’s like Linux - so most of the standard Linux automation / management tools are available
- It’s not Server it’s still a switch
- There are management softwares available which can bring ease of cloud style principles preserving Freedom of choosing among HW vendors

XCLOUD
NETWORKS

THANK YOU

XCLOUD
NETWORKS

*QUESTIONS ?