criticalstack

BRO-IDS
HIGH SPEED TAPPING

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BRO DEPLOYMENT OVERVIEW

Planning & Preparation

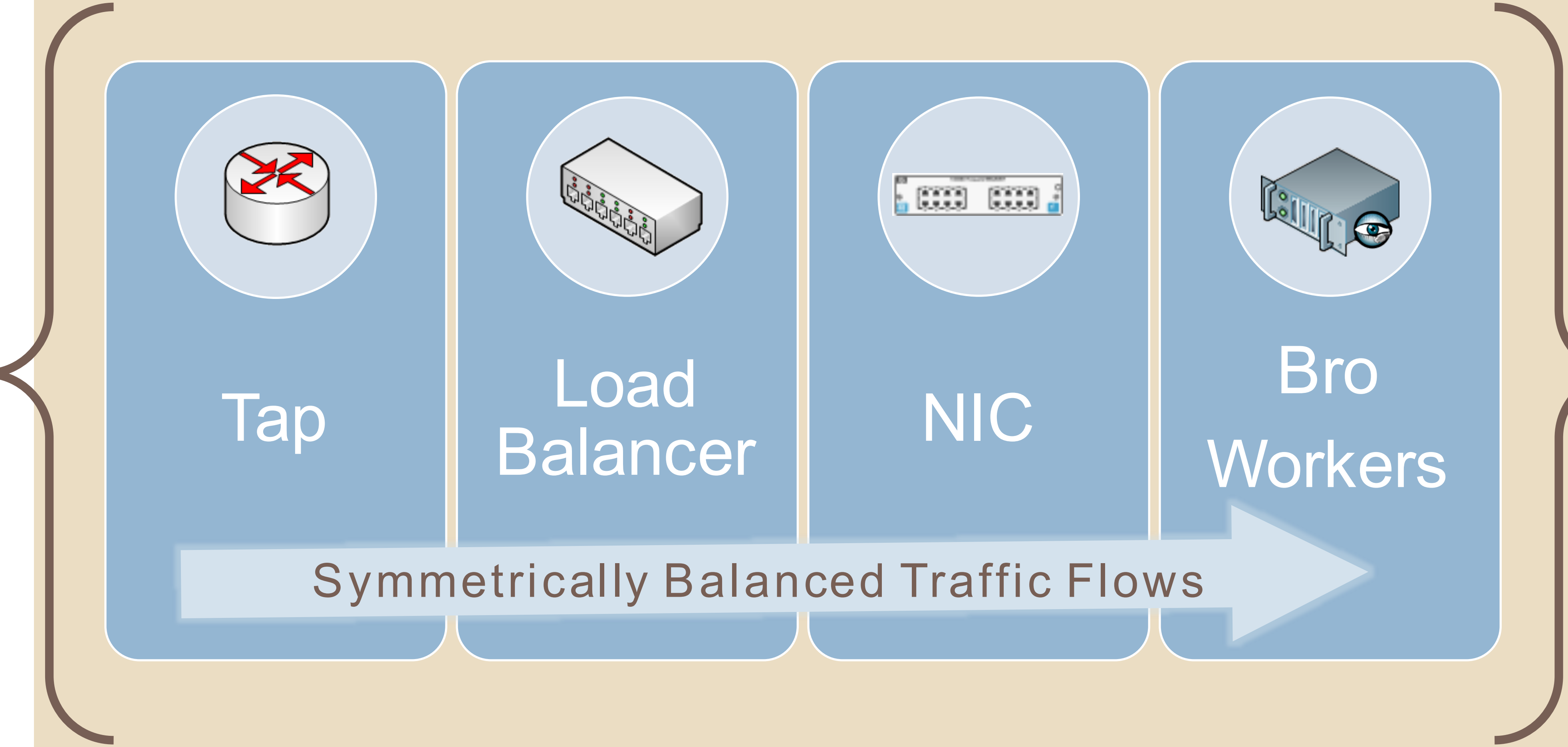
- Network Overview
- Requirements
  - Regulatory Domain: Contractual / Legal
- Replay Traffic
- Measure & Project
- Pilot
- Provision
- Sensor Tuning- continual process

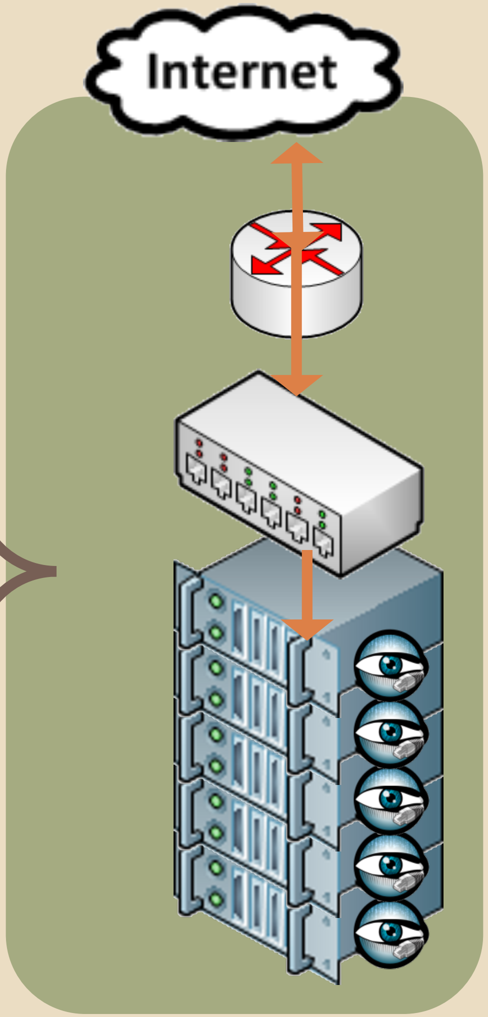
Sensor Deployment

- Tap
- Load Balancer
- NIC
- Bro Workers

BRO-IDS CLUSTER OVERVIEW

4 Basic Components





TAP OPTIONS

Heavily influenced by Net Topology

Span Port

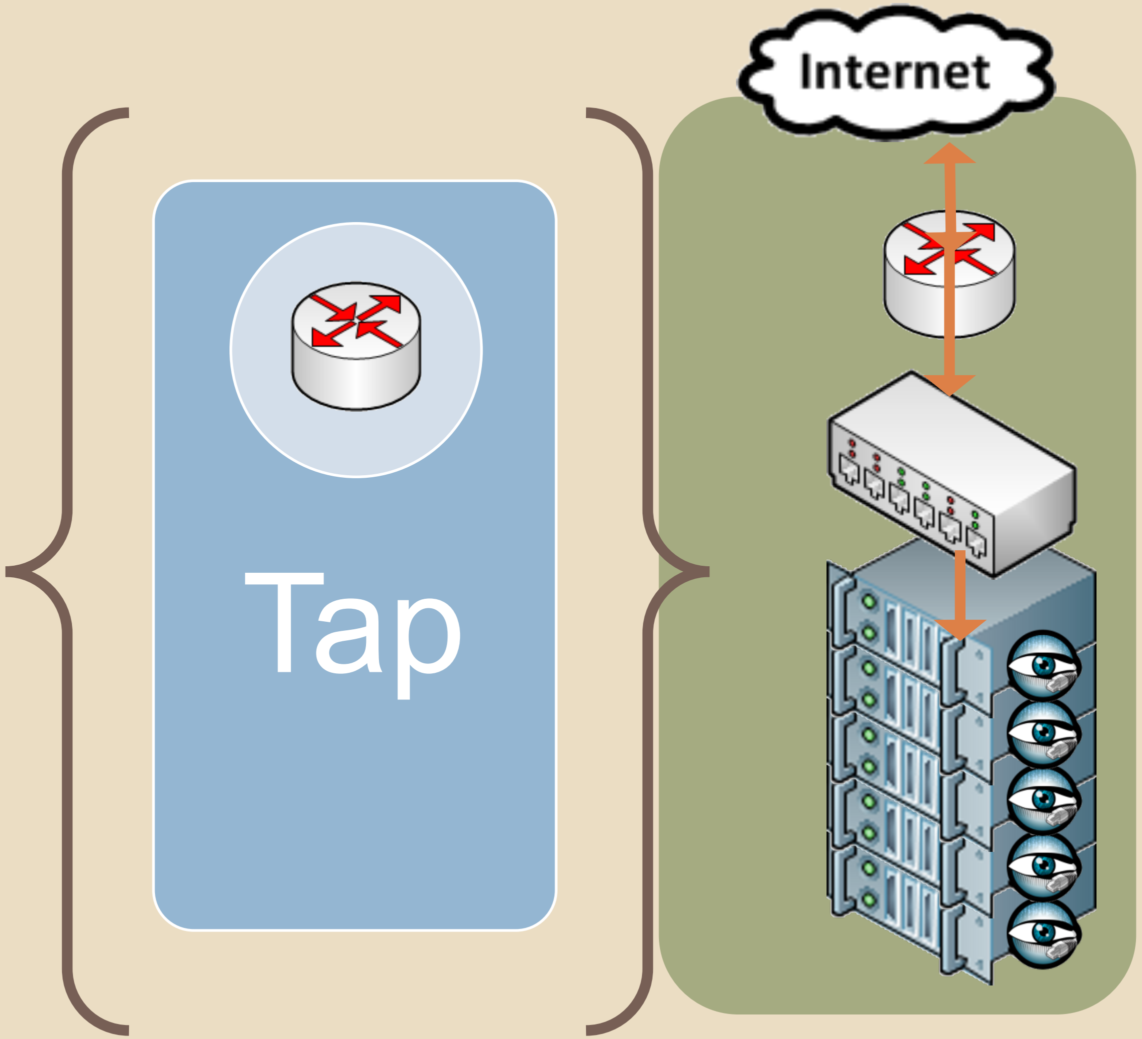
+ Inexpensive
+ Commodity
+ Already in Place

- Complexity
- Packet Drops

Hard Tap

+ Performance
+ Features
+ Multiple Sensors
+ ALSO Balance?

-Cost



TAP VENDORS

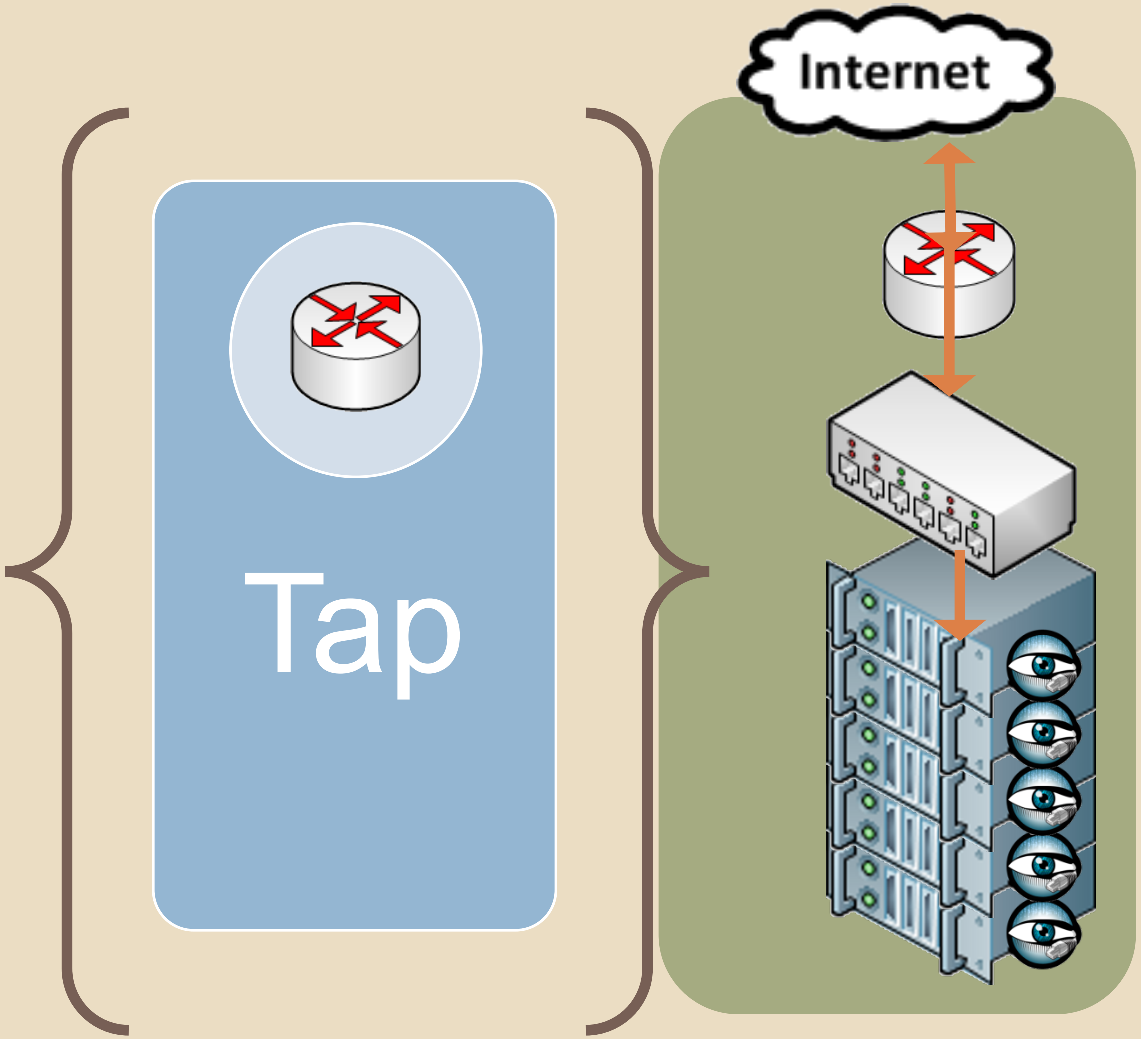
May also load balance

Span Port

- + Cisco
- + HP
- + Juniper
- + Extreme
- + Other..

Hard Tap

- + cPacket
- + VSS Monitoring
- + Net Optics
- + Gigamon
- + Apcon



Tap

Internet

LOAD BALANCERS

Moving Target

Dedicated

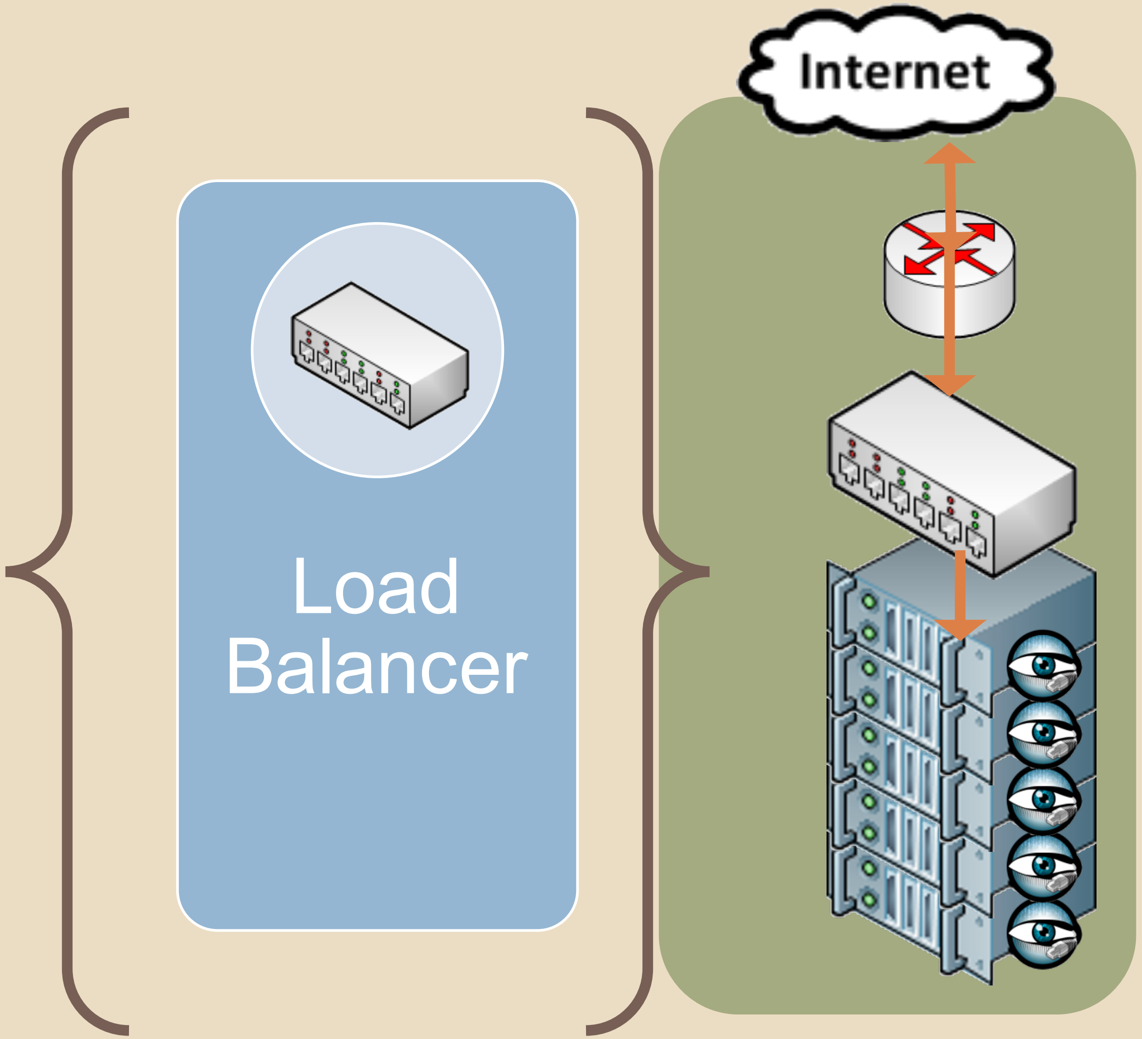
+ Performance
+ Features
- 3/4/5 Tuple
- Cost

OpenFlow

+ Cost
- Hash Based Balancing
- Hot Spotting

Hybrid Options

+ Fast Moving Space
- Hash Based balancing



LOAD BALANCERS VENDORS

Dedicated

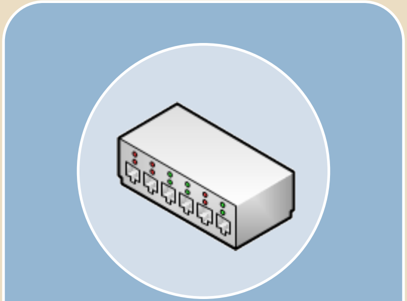
+ cPacket
+ VSS Monitoring
+ Apcon
+ Gigamon

OpenFlow

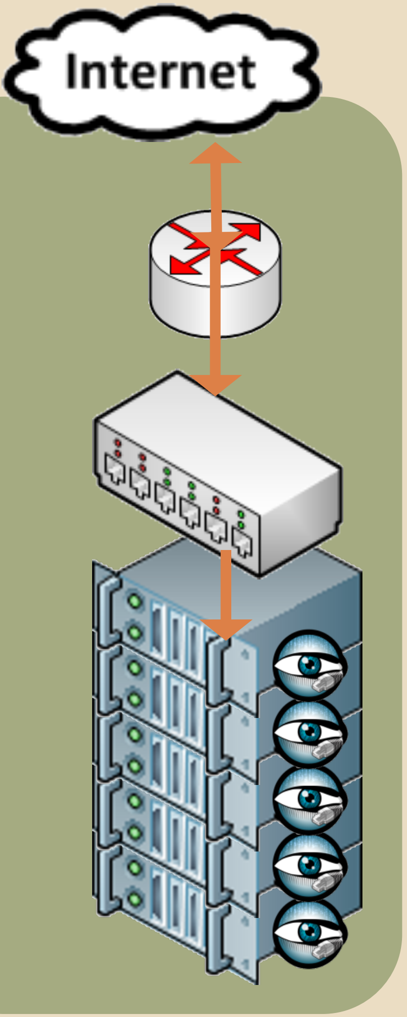
+ Arista
+ IBM
+ HP
+ Brocade
+ Big Switch

Hybrid Options

Ex: Arista Switches → hash based Load Balancers



Load Balancer



NIC OPTIONS

Requires OS Zero Copy Mechanism

1 Gpbs

+ Cost
+ Commodity
+ OS Support
+ Availability

- Throughput

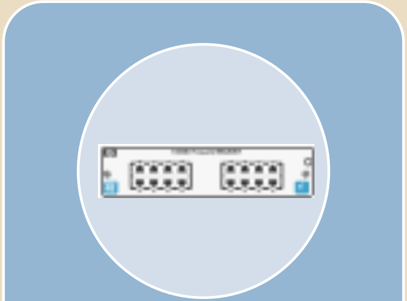
10 Gpbs

+ Cost
+ Commodity
+ OS Support

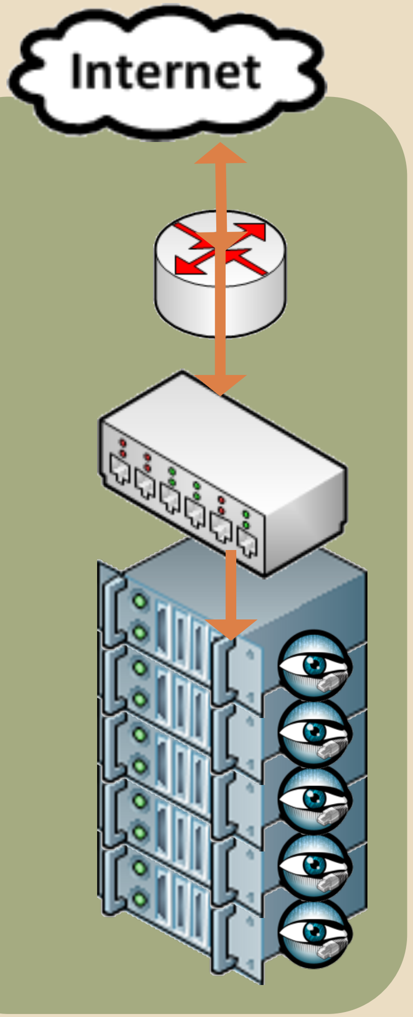
- Availability

Hybrid Options

+ Performance → Endace DAQ
+ Incredible Efficiencies
- Cost



NIC Options



BRO WORKERS

1 Process per 1 Core

Bro Model is Multithreaded

Hardware

+ Commodity

+ High Core Count

+ Memory

+ Any Vendor

+ Usually Multiple Nodes

OS

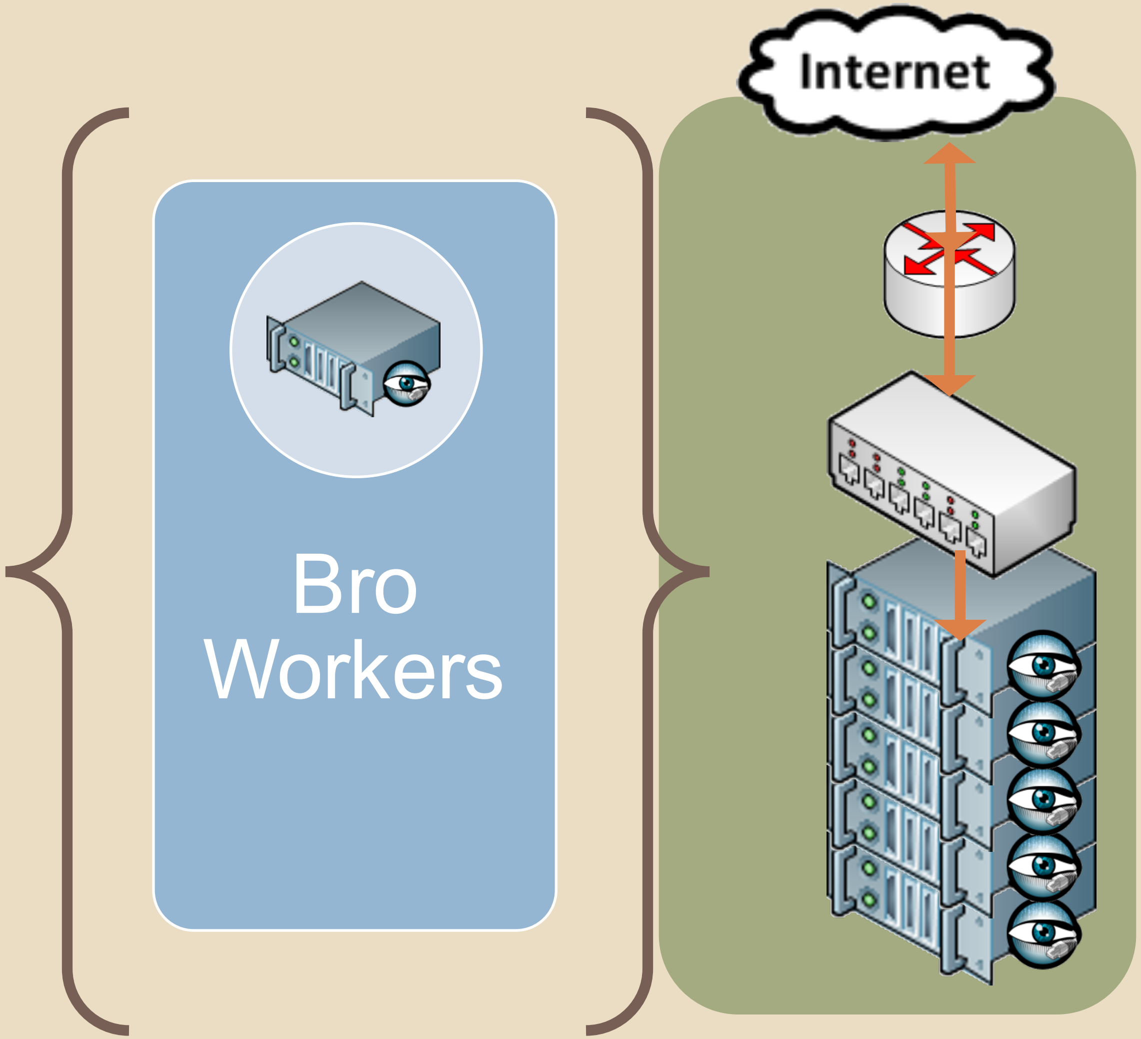
+ BSD/Linux

+ 0-Copy

++ pfring

++ DAQ..

++ AF_Packet

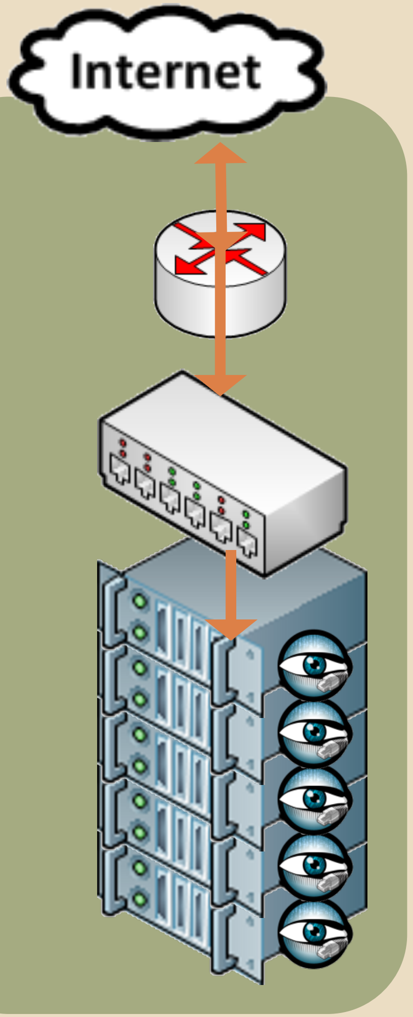


BRO CASE STUDIES

Wide Variety in Installs

+ Widely deployed in high speed REN
+ Internet 2, Research Networks
+ 15 Year Production Deployments
+ 10 Gbps in 2006
+ 40 Gbps in 2010

+ 100 Gbps- Deployed, 2014

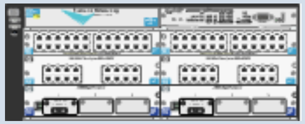


BRO CASE STUDY

- + Sustained 9 Gbps
- + 12 Dell r610, 48 Gb RAM, 2 x Quad Core Intel E5620 RHEL 6.2
- + 2 Proxy Nodes, 1 Manager Node w/ 10 Gig Nic
- + 40 Tb Log Storage, 500 Gb Raid 10 SSD Scratch
- + Visualization: Arcsight, Splunk, Native

Load Balancer

cPacket cFlow

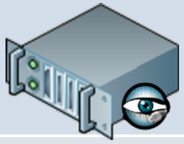


HP Switch

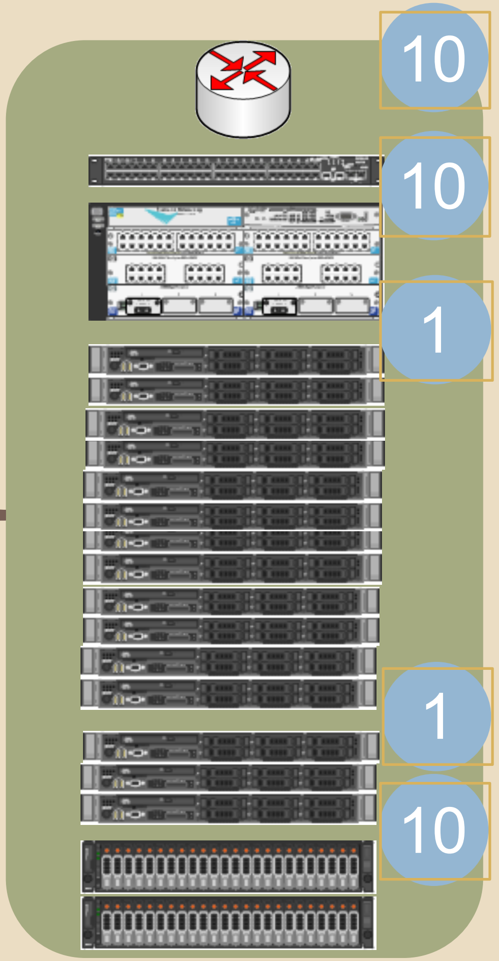
3 10 Gbps

30 1Gbps

Qty 2 Intel Gigabit ET



4 Workers Per Node

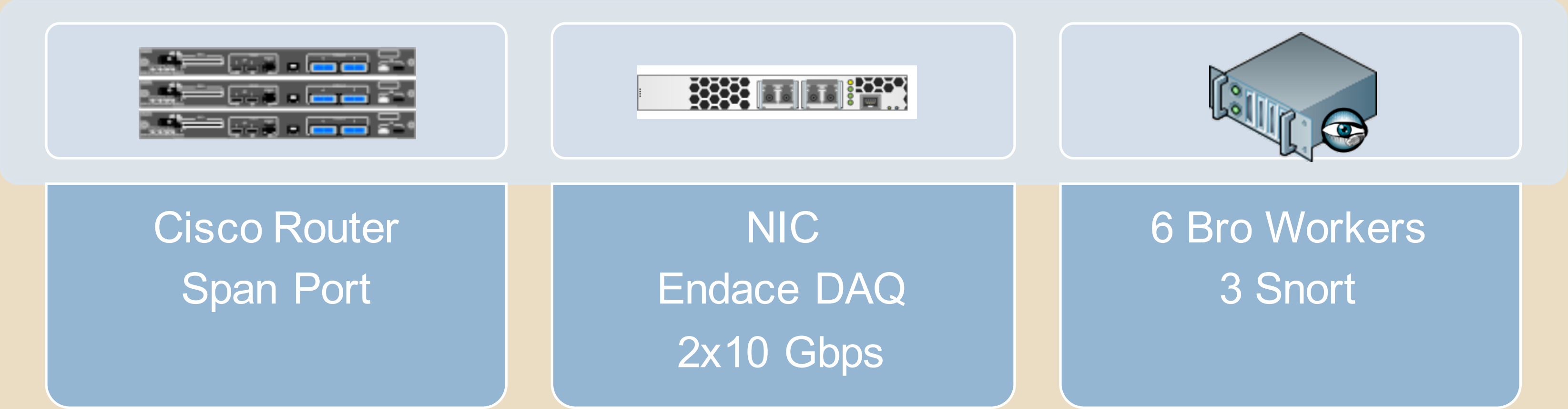


BRO NETWORK SECURITY MONITOR

BRO CASE STUDY

criticalstack

- + Sustained 4 Gbps
- + 1 Dell r710, 72 Gb RAM, 2 x Quad Core Intel x5677
- + 1 Endace DAQ
- + RHEL 6.2
- + 20 Tb Log Storage
- + Visualization: Splunk, Native


Cisco Router
Span Port
NIC
Endace DAQ
2x10 Gbps
6 Bro Workers
3 Snort