
GARLAND
TECHNOLOGY
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Since 2011
Easy. Scalable. Quality.

Garland Technology

Providing the Visibility Foundation

Network Administrators and SecOps team need to ensure that the data being fed into their analytic and security tools is complete and accurate.

Garland Technology specializes in providing the products needed to deliver every “bit, byte & packet” to the monitoring and security tools, on-prem or in the cloud.

Garland Technology is global

MADE IN THE U.S.A.

3,000 customers and over
100 partners globally

New York | Texas | UK | Poland | Australia

Garland office

Deployed
in every vertical

Telcos • Government • Healthcare • Defense • Manufacturing • Financial • Retail • Energy • Entertainment • Technology • Pharmaceuticals • Education • Transportation • Gaming • Any enterprise IT network

GARLAND TECHNOLOGY

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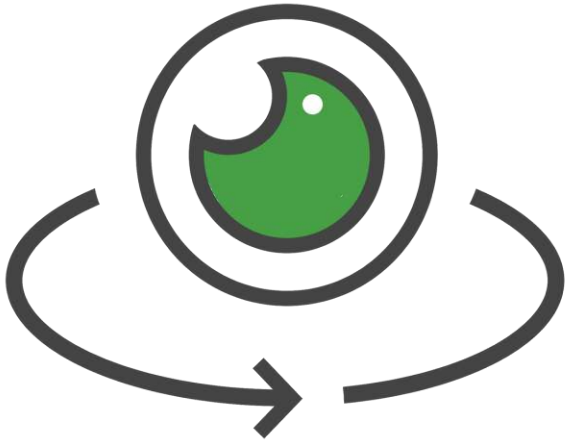
Who has gained visibility with Garland

It starts with the packet

- **Complete Visibility Truth**, passing all live wire data
- **Guaranteed 100% Uptime** for active, inline security tools
- **Ensure No Packets Loss**, for out-of-band tools
- **Flexible Cloud Packet** access

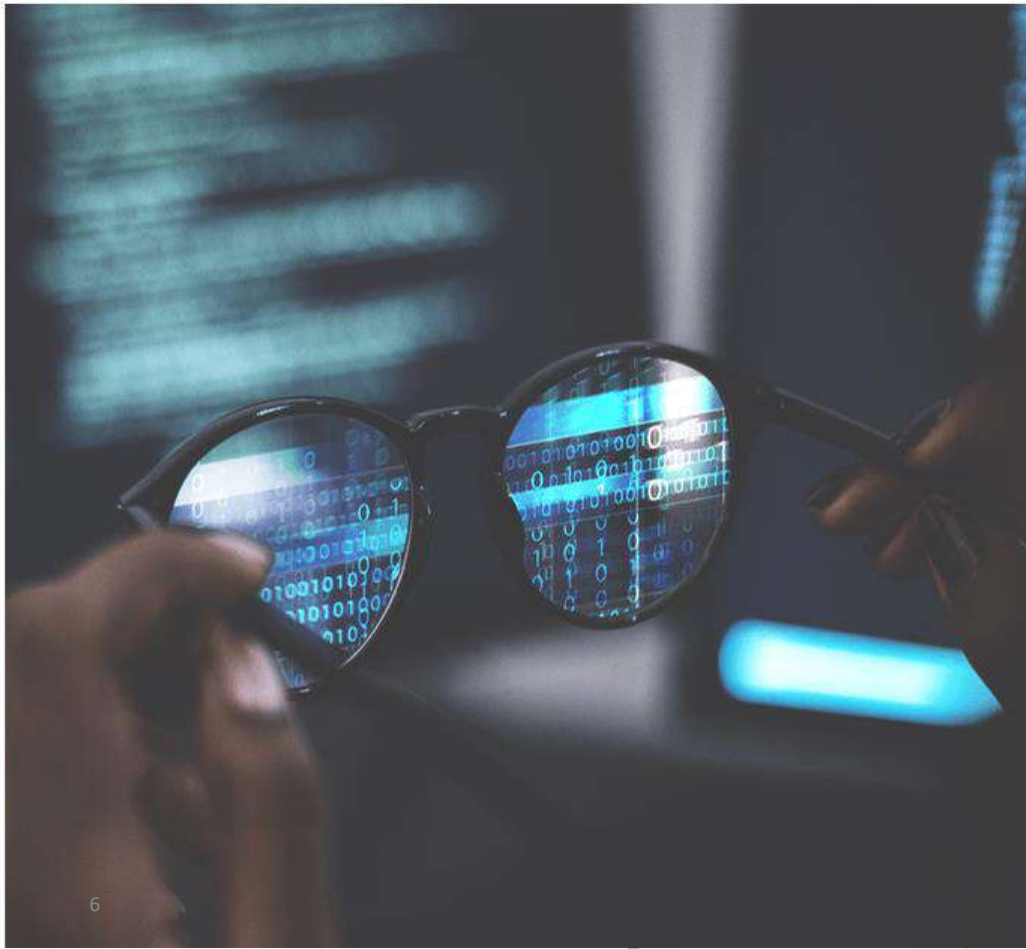


360° Visibility

- **Optimize** your security and monitoring tools
- **Maximize** and enhance your existing infrastructure
- **Easily upgrade** existing speeds, save on new tools
- **Easy migration** to Private and Public Cloud

Network Visibility Provides

- Awareness of:
  - Everything connected to the network
  - Everything flowing through and into the network
- Benefits include:
  - Improved Network & Application performance
  - Reduced troubleshooting time & cost
  - Identification of malicious behavior and potential threats
  - Regulatory compliance
  - Successful business transformation



Your 360°

Network **Visibility Fabric**

Starts with Garland Technology

Physical Layer TAPs

- 100% visibility for out-of-band monitoring tools
- Continued development [First to release OM5, customized solutions]

Purpose-built Packet Brokers

- Aggregation layer supports filtering, aggregation, and load balancing
- Advanced features support deduplication, packet slicing, time stamping and more

Inline Edge Security

- Reduce the risk of downtime
- Adds resiliency and peace of mind
- Innovative Inline hybrid packet broker

Cloud

- Private

Network Visibility Fabric

"You can't troubleshoot or protect what you can't see or manage"

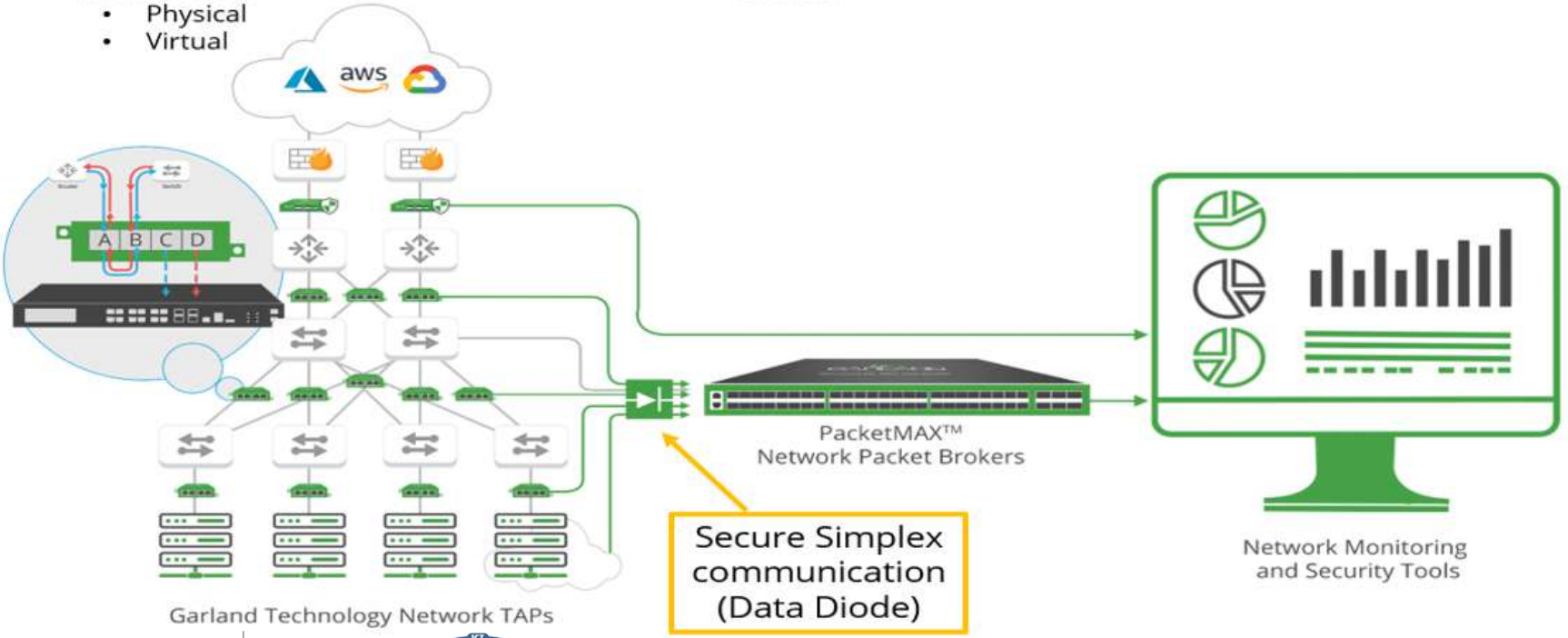
- **Two components**
  - Out-of-Band network infrastructure
    - Provides packet level visibility for monitoring appliances
      - Invisible, non-disruptive and **secure** method of mirroring packets from across the network to monitoring and security tools (IDS etc)
  - In-Line infrastructure
    - Inline tool connection method
      - Protects the network, reduces operational burden and costs and improves the effectiveness of in-line security tools (NGFW, IPS etc.)

Scalable visibility fabric for your architecture

Eliminate network and security blind spots, while adding resiliency and high performance for both inline and out-of-band environments

- SPAN/Mirror Ports
- Network TAP's
  - Physical
  - Virtual

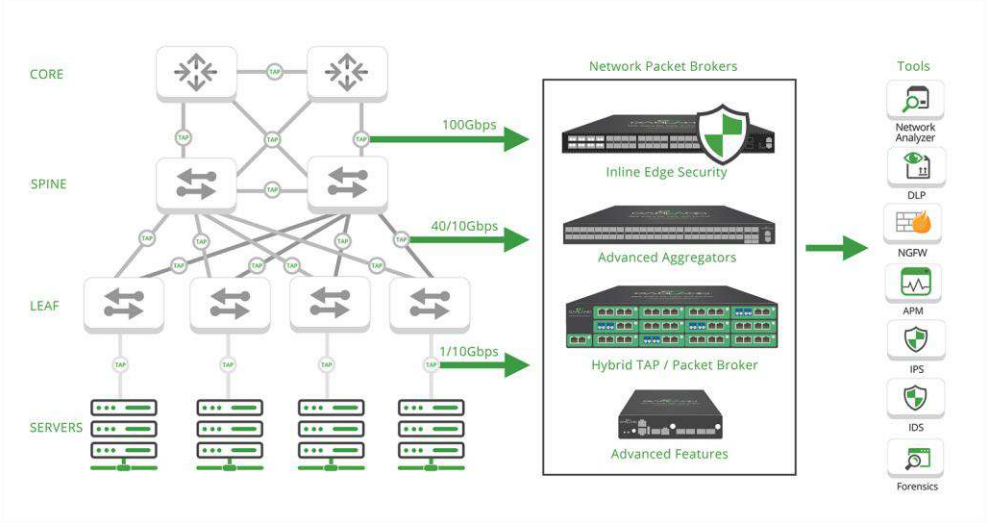
- Network Packet Brokers



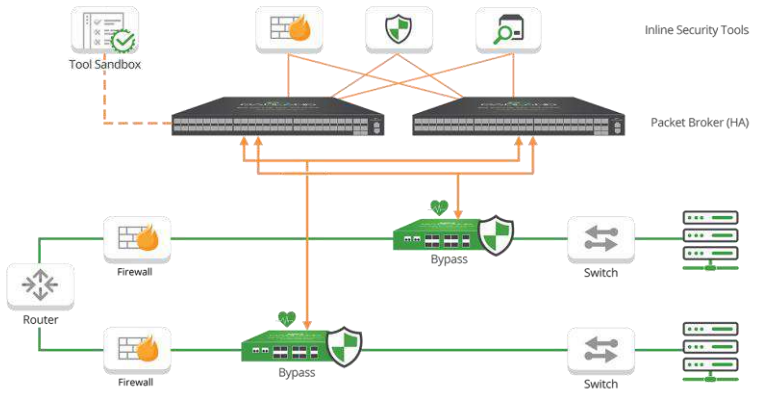
Scalable visibility fabric for your architecture

Eliminate network and security blind spots, while adding resiliency and high performance for both inline and out-of-band environments

Out-of-Band / Passive



Inline / Active



Technology Partnerships

Our TAP to Tool™ philosophy empowers the solution by architecting to the tool

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How Garland Technology works with your **Monitoring Solutions**

Deploying or managing one of these tools?

- Wireshark
- APM
- Packet Capture
- Network Analyzer
- IDS
- Lawful Intercept
- Forensics
- DPI
- SIEM
- Content Filter
- Packet Injection
- Network Packet Broker

Work with any of these companies?

riverbed, cisco Partner, ExtraHop, Flowmon, A10, SYNESIS, PROTECTWISE, Symantec, NexDefense, NETFORT, CYPHORT, esentire, edge-corE NETWORKS, cirries, Quantea, LiveAction, performance vision, VIRTUAL INSTRUMENTS, wirex, cpacket, ForeScout, RSA EXFO, SCADAfence, NEXT COMPUTING, radware, napatech, Gearbit

Recommended Garland Products

Breakout Network TAPs
- Passive Fiber & Copper

Aggregator Network TAPs
- UniversalTAPs

Xtra TAPs
- All-in-1 Advanced TAP

Network Packet Brokers

Advanced Aggregators
- High Density filtering, aggregation and load balancing

Advanced Features
- DeDup, time stamping

Hybrid NPB System
- Under 200 Ports
- Inline Security

How Garland Technology works with your **Security Solutions**

Deploying or managing one of these tools?

- NGFW
- WAF
- IPS
- DDoS
- DLP
- SSL Decryptor
- Packet Capture
- Packet Injection

Work with any of these companies?

Cisco Partner – Solution Partner
paloalto
McAfee
IMPERVA
Check Point – Software Technologies Ltd.
A10
corelight
ForeScout
ExtraHop
AllianceONE Member
radware
wirex
BLUVECTOR
##SCADAfence

Recommended Garland Inline Edge Security Products

EdgeSafe: Bypass TAPs
- Failsafe & heartbeat technology
- 1G/10G/40G/100G

EdgeLens® In-line Security
- Hybrid Packet Broker

Network Packet Brokers

Advanced Aggregators
- High Density filtering, aggregation and load balancing

Advanced Features
- DeDup, time stamping

Hybrid NPB System
- Under 200 Ports

Portfolio

"You can't troubleshoot or protect what you can't see or manage"

Hybrid TAP/Packet Broker

Network Packet Brokers

Network TAP's

Virtual TAP's

Inline Bypass

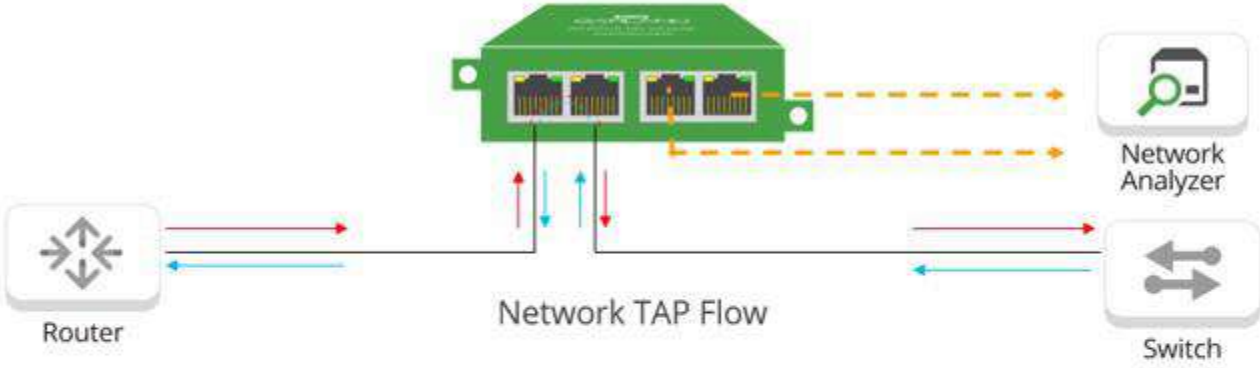
Hybrid Inline Packet Broker

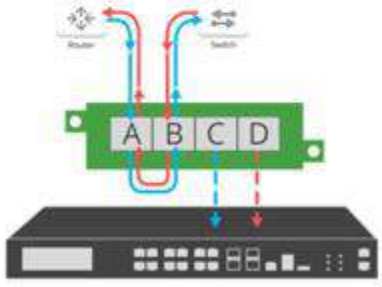
Network TAPs

Provide Complete Visibility for High-performance Monitoring Solutions

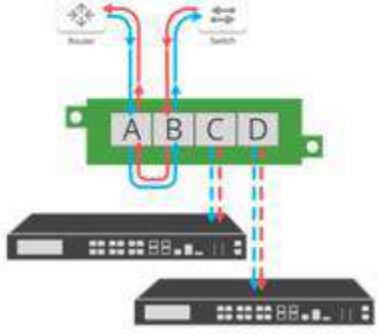
- Purpose-built for packet visibility
- Can mirror 100% full duplex traffic
- 100% secure, can't be hacked
- Passive or Active with failsafe, doesn't impact network operation

100% Secure and Complete Visibility

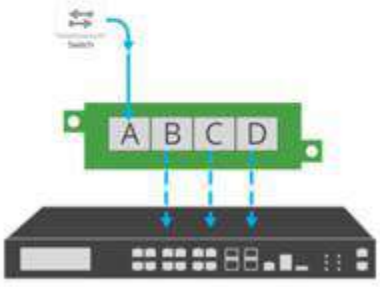




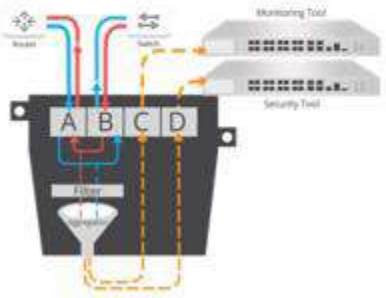
TAP "Breakout"



Aggregation



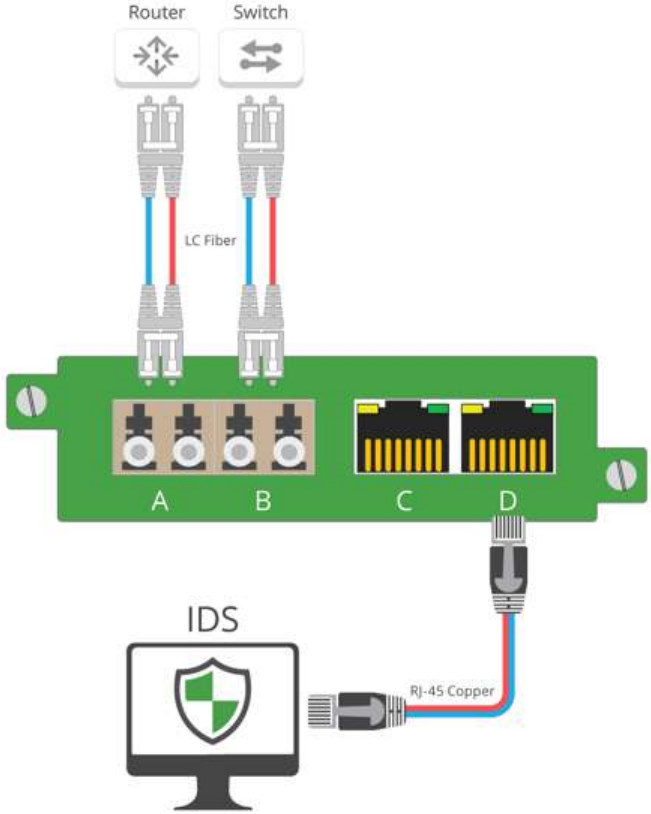
Regeneration



Filtering

Media Conversion

- **Media Conversion with Network TAPs**
  - Media conversion from SX and LX fiber to RJ45 copper or SFP
  - Media conversion from 100Base-FX and 100BASE-LX to RJ45 copper
  - Media conversion from SR and LR to SFP+ (Copper, SR or LR)

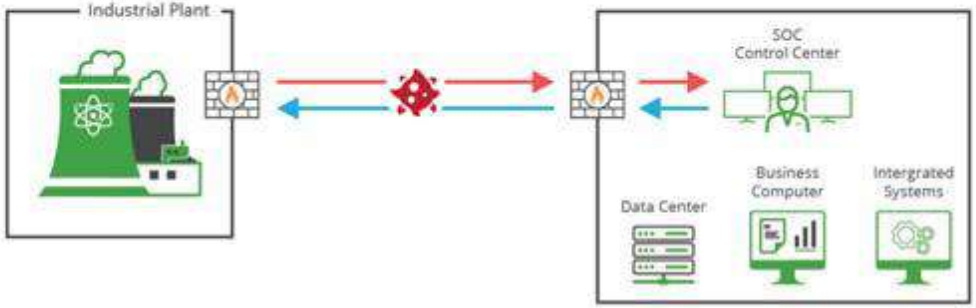


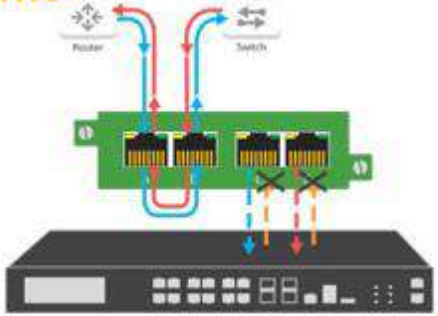
Secure Simplex Mirroring

- **Avoiding security vulnerabilities**
  - Network TAP's have no MAC address that can be accessed through the network ports
  - Data Diode (Simplex) Network Tap's guarantee data (malicious or other) can never be injected into the operational network
    - SPAN/Mirror ports on switches & routers expose a security vulnerability – they have a **Receive** as well as a Transmit ability

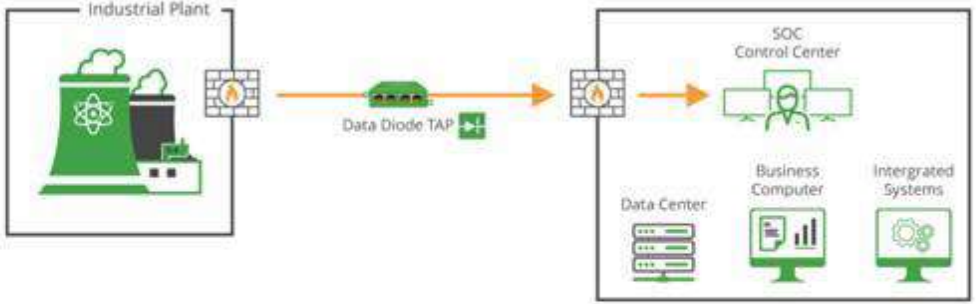
Data Diode TAPs

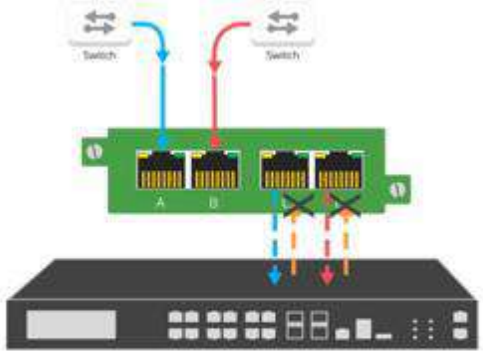
Secure One-Way (Simplex) Traffic





Data Diode Network TAP

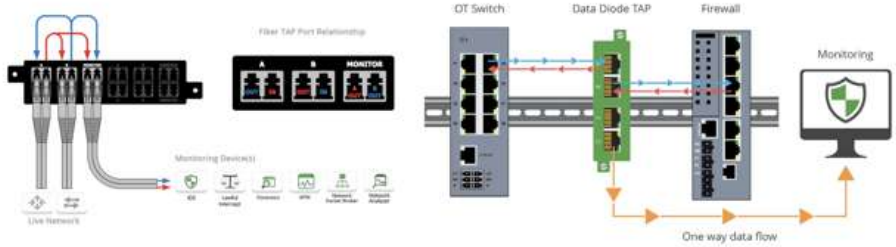


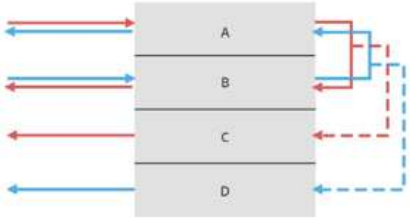


Data Diode SPAN TAP

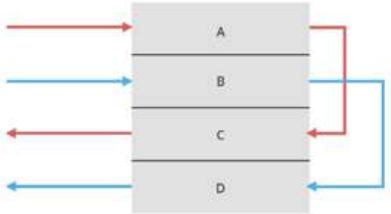
Garland Technology Data Diode TAPs

- **Passive Fibre TAP's**
  - Utilise optical splice technology which blocks incoming data (light) on the monitor ports
  - Prevents data (threats) being injected from the monitor ports into the network
- **Passive Copper TAP's**
  - Monitor ports have no physical RX connection
- **Active Copper & Fibre TAP's**
  - Monitor ports have no physical RX connection
  - Exception
    - Bypass or TAP's specifying data insertion ability





This diagram depicts a 4 port (A, B, C, D). The Data Diode Network TAP shows portA flow out of portB, and sends a copy out of portC and PortB flow out of PortA, and sends a copy out of portD.



This diagram depicts a 4 port (A, B, C, D). The Data Diode SPAN TAP shows the traffic of portA flow out of portC and PortB flow out of PortD.


Innovation
Performance & Reliability
Highest Quality
Network TAPs
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Portoflio

- **Passive Fibre TAP's**
  - Chassis, Fixed 1U and Portable (1/4) options
  - 1G – 400G speed
  - MMF & SMF
    - OS1 & OS2
    - OM1, OM2, OM3, OM4 & OM5
  - LC, MPO/MTP connectors
  - Breakout & Regeneration, BiDi
  - Data Diode design
- **Passive Copper Breakout TAP**
  - Portable (1/4) form factor
  - 10/100m
  - Breakout
  - Data Diode design

Portoflio

+ Active TAP's

- + Chassis, 1U ½ width, Portable (1/4) and Field options
- + 100M, 1G and 10G speed
- + Copper, MMF & SMF
- + USB, Mighty Mouse, RJ45, SFP, SFP+ & LC connectors
- + Breakout, Aggregation & Regeneration options
- + Data Diode designs
- + LFP, LSS and PoE
- + Filtering

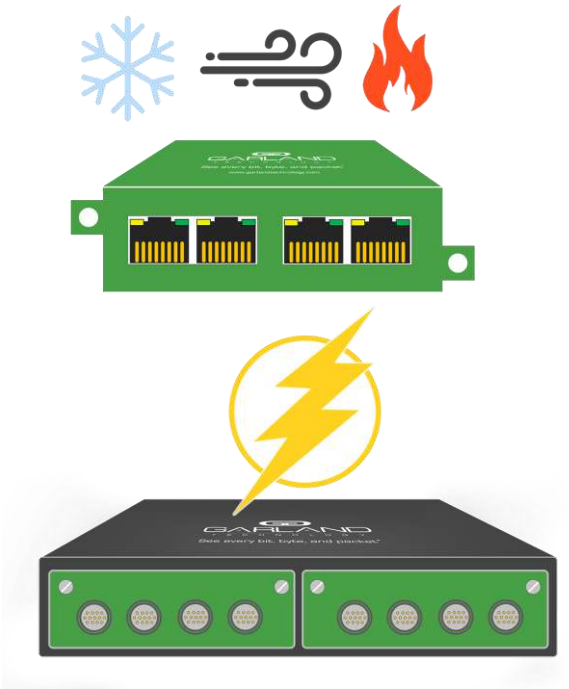
+ Industrial accessories

- + DIN Rail mounting for portable TAPs
- + DC – DC converter
- + Fixed lock power connectors

Visibility for Specialized and Extreme Environments

From Extreme Temperatures, to Secure Rugged Connections

- Rugged metal construction
- Environmental durability: withstand exposure to corrosive, high-heat, and high-pressure weather environments.
    - TAPs Engineered for extreme temperature variations -40C to +85C / -40F to +185F
- Designed to specific requirements to address electromagnetic interference (EMI).
- Secure connections and power connectors
    - Mighty Mouse connectors
    - Power Lock connectors

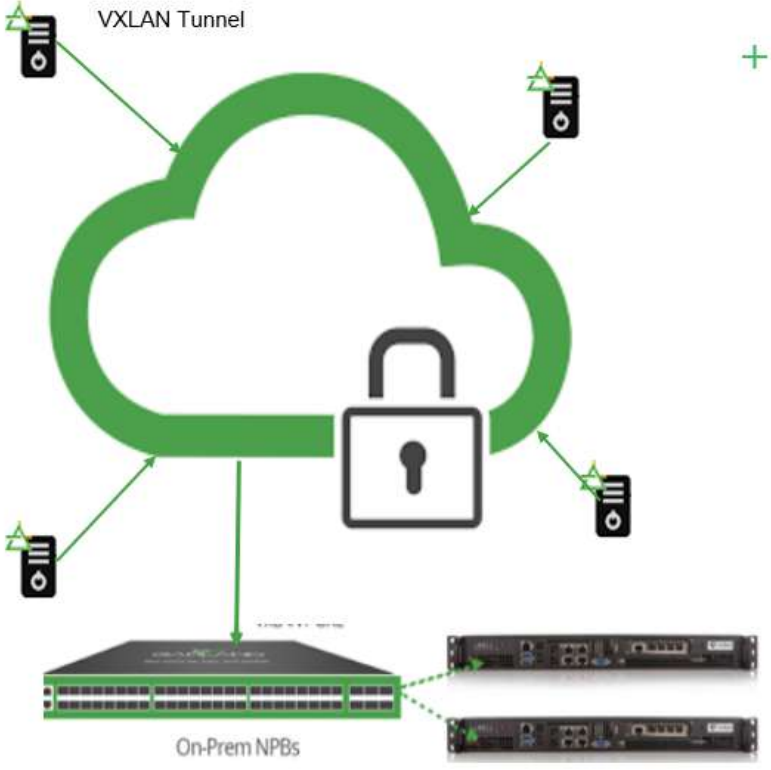


Data Diode Portfolio

Unidirectional traffic for network monitoring without exposing additional risk

Data Diode Network TAPs	**Data Diode** SPAN TAPs	**AggregatorTAP:** Data Diode	**RegenTAP:** Dual Breakout SPAN 1x4
			
10/100/1000M and 1G/10G	**10/100/1000M**	**10/100/1000M**	**1G/10G**
• Copper RJ45 [n / m] • 100Base-FX [n] • Single-mode [n] • Multi-mode [n] • SFP [m]	• Copper RJ45 [n]	• Copper RJ45 [n] • SFP [m]	• (10) SFP+
• Portable	• Portable	• ½ Rack 1U Chassis	• ½ Rack 1U Chassis
• **Protect network traffic** • Unidirectional traffic flow • Traffic control is enforced at the physical level	• **Protect SPAN port traffic** • Unidirectional traffic flow • Traffic control is enforced at the physical level	• **Protect network/SPAN traffic** • Unidirectional traffic flow • Traffic control is enforced at the physical level • TAP Aggregation 4x2 (8x1 SPAN)	• **Protect SPAN port traffic** • Unidirectional traffic flow • Ideal for direct connect, SFP, QSFPs, active cable infrastructures.

Virtual TAP



- **Visibility into Inter-host communications**
  - Hypervisor Independent
  - Secure Simplex Functionality
  - Support for:
    - Windows Server 2019
    - Linux via Docker
    - Native Linux - Red Hat, Ubuntu, SUSE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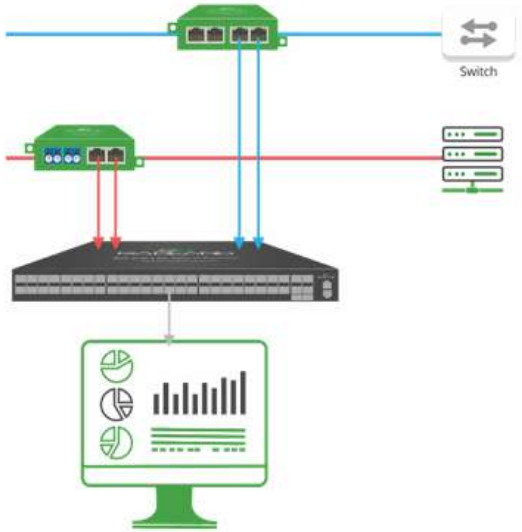
Network Packet Brokers

- **Mechanism to aggregate, shape & direct monitored traffic to Tools**
- **Reduce cost and complexity**
  - Speed troubleshooting
  - Detect breaches faster
  - Reduce burden on security tools
  - Extend the life of monitoring tools
  - Support regulatory compliance



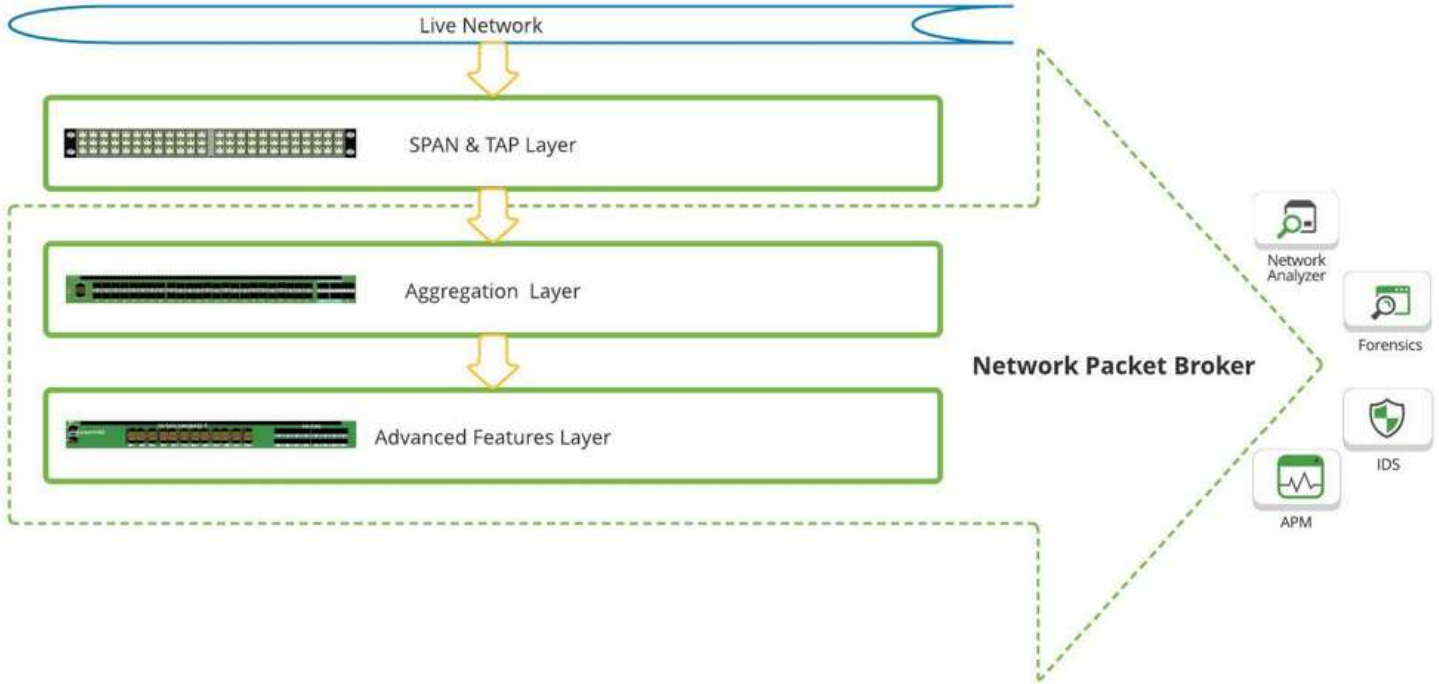
PacketMAX Packet Brokers

Support your packet broker needs or enhance your existing infrastructure

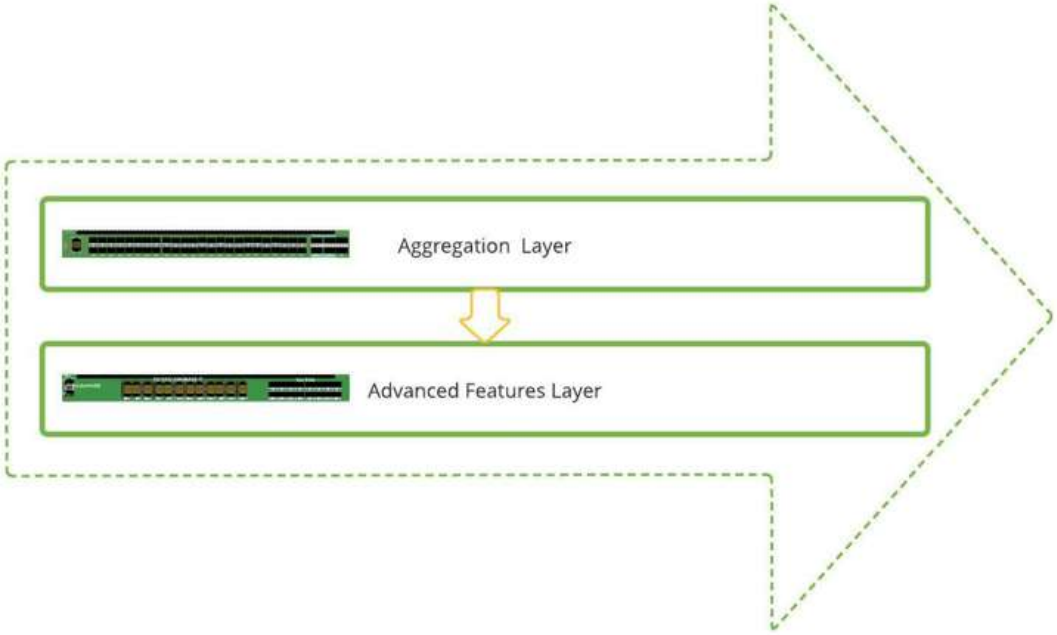
- **Scalability and Flexibility**: Deploy what you need, when you need it. Modular solutions for future growth.
- **Simple**: With easy set management, or by incorporating Restful API, put the focus on the tools.
- **Optimize your investment**: With better performance, protect and extend your current environment.
- **Open Vendor**: We support multi-source agreement (MSA) transceivers/optics, no vendor lock-in.
- **No licensing or port fees**

Network Packet Brokers

+ Layered functionality



Network Packet Brokers



Aggregation & Regeneration - N to 1, 1 to N, N to N
Filtering - Layer 2, 3 & 4
Loadbalancing - HASH, Round Robin etc.
Decapsulation - GRE, VXLAN, MPLS, VLAN,ERSPAN etc.
Tunneling Encapsulation - GRE, VXLAN
Tagging/Stripping - VLAN
Packet Slicing - Payload removal
Timestamping - NTP, PTP
Deduplication - Multilevel anaylsis & removal of duplicates
Metadata Engine - IPFIX, Netflow generation
Application Session Filtering - User defined filters etc
Decryption - SSL decryption
Integrated TAP - Hybrid TAP/NPB
Inline Tool Connectivity - Fail safe, Heartbeats, load balancing, serial chaining

Network Packet Broker Portfolio

Deploy what you need, when you need it

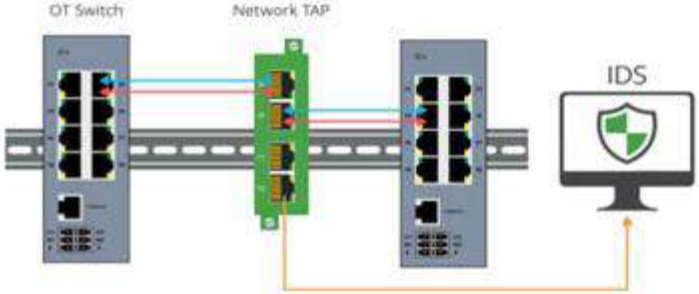
PacketMAX™ Advanced Aggregator	**PacketMAX**™ Garland Advanced Aggregator	**PacketMAX**™ Advanced Features	**PacketMAX**™ Advanced Features Dedup
			
1G/10G/25G/40G/100G	**1G/10G**	**1G/10G/40G/100G**	**10G/40/100G**
• RJ45 • SFP+ • QSFP+ • QSFP28	• SFP+	• RJ45 • SFP+ • SFP28 • QSFP+ • QSFP28	• SFP+ • QSFP+ • QSFP28
• 1U or 2U Chassis	• ½ Rack 1U Chassis • 1U Chassis	• 1U Chassis	• ½ Rack 1U Chassis
• Reduce and optimize traffic to improve tool performance • Filtering, Aggregation and Load Balancing • Start and Terminate GRE and L2GRE Tunnels • 2k filters • No additional per-port license fees	**• Reduce and optimize traffic with a small form factor** • Filtering, Aggregation and Load Balancing • 1U with innovative 13" depth • No additional per-port license fees	**• Reduce and optimize traffic to improve tool performance** • High density Filtering (Ingress & Egress), Aggregation and Load Balancing • Time stamping • Packet Slicing • GRE, ERSPAN, VxLAN, L2RE Encap/Decapsulation • VLAN Tagging, VLAN/MPLS stripping • Deduplication *Specific models (Q2)	**• Reduce and optimize traffic to improve tool performance** • Large window deduplication • FPGA Based design for increased flexibility • Time Stamping: 5 nS resolution • Programmable Packet Slicing

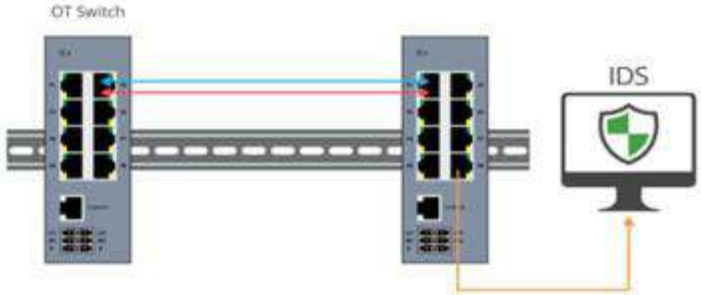
TAP Packet Broker Hybrid Portfolio

Deploy what you need, when you need it

XtraTAP™ Modular Packet Broker	XtraTAP™ All-In-1	XtraTAP™ Portable Packet Broker	XtraTAP™ Packet Broker	XtraTAP™ Packet Broker
				
10/100/1000M	**1/10G**	**1G/10G**	**1G/10G**	**40G**
• Copper RJ45 [n / m] • Single-mode [n] • Multi-mode [n] • SFP [m]	• Single-mode [n] • Multi-mode [n] • SFP+ [m]	• Single-mode [n] • Multi-mode [n] • SFP+ [m]	• Single-mode [n] • Multi-mode [n] • SFP+ [m] • Tools: 40G/10G/1G	• SR4 [n] • LR4 [n] • SFP+ / QSFP+ [m] • Tools: 40G/10G/1G
• 1U or 2U Modular Chassis	• Portable	• Portable	• High Density 1U Chassis	• High Density 1U Chassis
• TAP with packet broker features • Supports filtering, aggregation, bypass or breakout TAP modules • Failsafe • Multi-Tier Filtering supports MAC, VLAN, IP, DSCP, TCP, UDP	**• TAP with packet broker features** • Provide 100% full duplex traffic visibility • Advanced filtering for Layer 2, Layer 3 and Layer 4 • Supports tap filtering, 'breakout,' aggregation, and regen modes	**• Portable packet broker** • Four port SFP+ design • Ultimate flexibility: Configure TAP modes, ports, speeds and media • Advanced filtering for Layer 2, Layer 3 and Layer 4	**• TAP + packet broker features in 1** • Provide 100% full duplex traffic visibility • Filtering, Aggregation and Load Balancing • Hardware base chaining • Remote mngt	**• TAP + packet broker features in 1** • Provide 100% full duplex traffic visibility • Filtering, Aggregation and Load Balancing • Hardware base chaining • Remote mngt

TAPs VS SPAN





- Ensures no dropped packets, passing physical errors and supports jumbo frames
- Does not alter the time relationships of frames
- Passive or failsafe, ensuring no single point of failure (SPOF)
- Data Diode TAPs provide unidirectional traffic to protect against back flow of traffic into the network
- TAPs are secure, do not have an IP address or MAC address, and cannot be hacked

- Can take up high value ports on the switch
- Some legacy switches do not have SPAN available
- SPAN ports can drop packets
- Will not pass corrupt packets or errors
- Bidirectional traffic opens back flow of traffic into the network, making switch susceptible to hacking
- Administration/programming costs for SPAN can get progressively more time intensive and costly

Two Ways to Mirror Traffic

TAP

- Does not drop packets, regardless of bandwidth
- Plug & Play, set-up once and never touch again
- Does not alter the time relationships of frames
- Does not impact the live network while monitoring

SPAN

- Packets are dropped when ports are oversubscribed
- Easily misconfigured or turned off
- Can change the timing of the frame interactions
- Degrades performance of live network

The EDGE of the Network **Is Green**

From the Inventor of Bypass Technology

Edge / remote locations

Data center

Enterprise

GARLAND TECHNOLOGY

Value-Added Distributor
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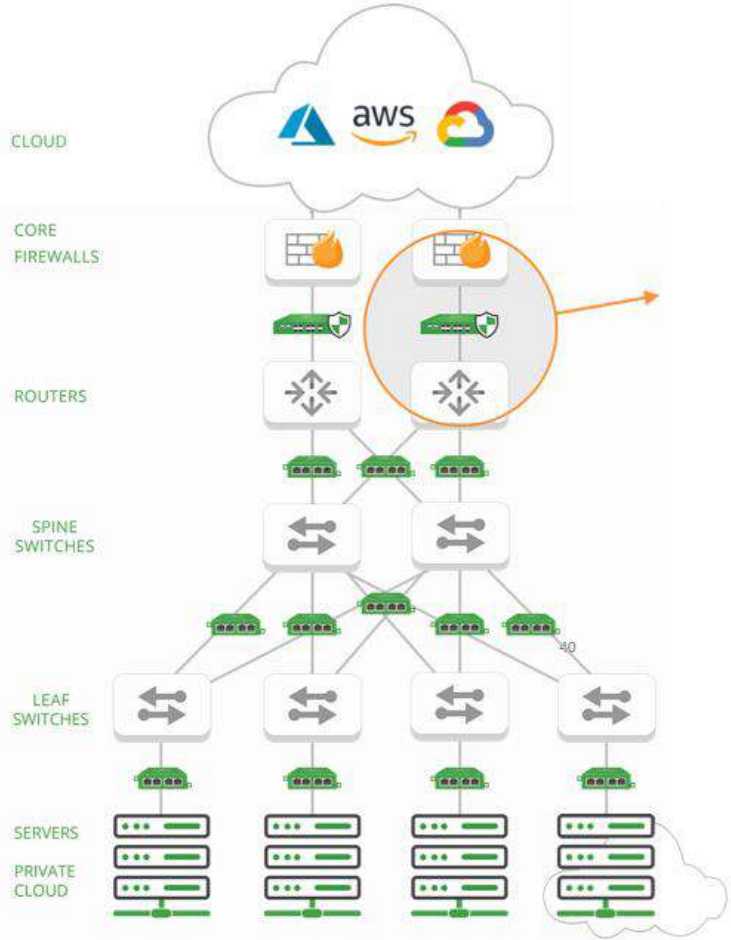
ICT OTD PREFER EXPERIENCE ONLINE Since 2011

How to Improve IT Security Threat Detection and Prevention Deployments

Implementing Inline Visibility Architecture

Inline Edge **Security Deployments**

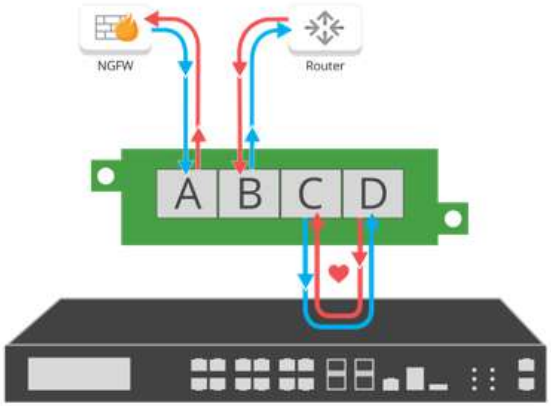


Inline Bypass TAPs

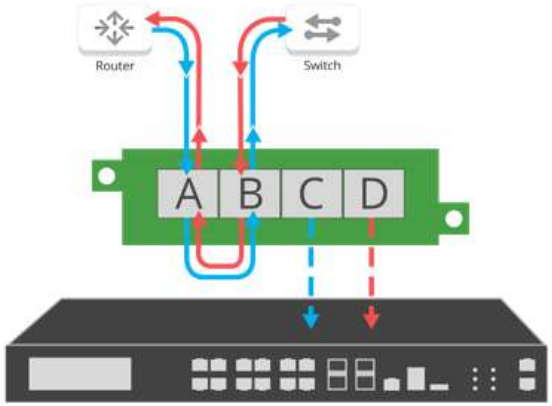
Managing Multiple tools

Benefits of Inline Bypass

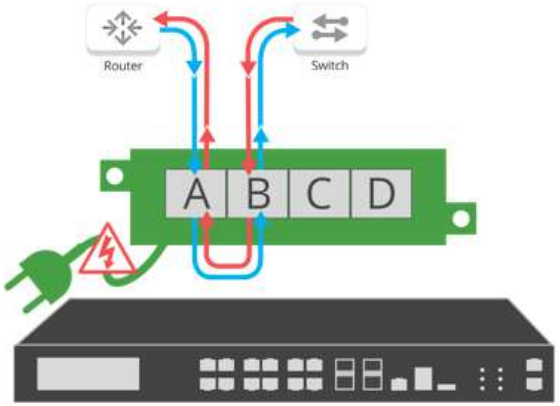
Deploying and managing your inline appliance



Inline Bypass



Out-of-Band Tap 'Breakout'



Failsafe

41

- No maintenance windows - Peace of mind without network downtime.
- Operational - Expedited problem resolution of unplanned downtime
- Network resilience - flexibility to bypass the tool and keep the network up, or failover to HA solution.

Reduce Network Downtime

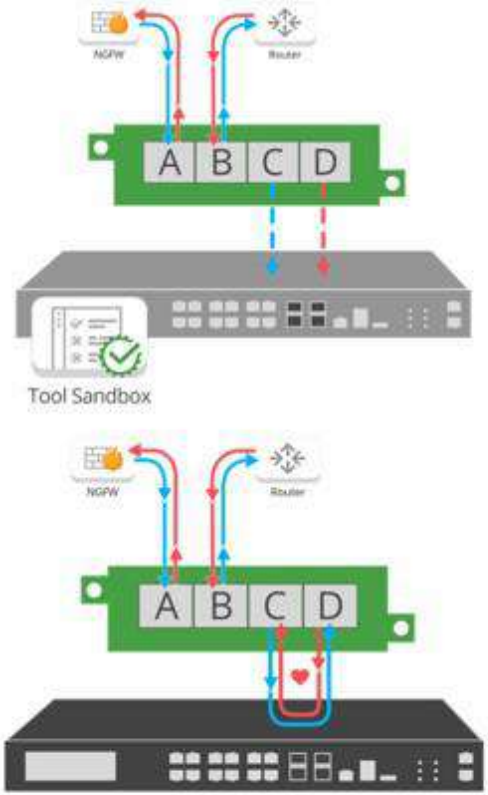
IT Security Solutions Use Case

Challenge: Managing the risk of downtime is a critical consideration when deploying security tools.

- Oversubscribed devices, degrade network performance
- Device failures can bring down the network
- Deploying new technologies into the network
- Scheduling off hour planned downtime

Solution: Bypass TAP "inline lifecycle management" allows you to:

- Easily take tools out-of-band for updates, installing patches, maintenance or troubleshooting to optimize and validate
- Administrative isolation - No maintenance windows
- Tool Sandbox - Pilot or deploy new tools



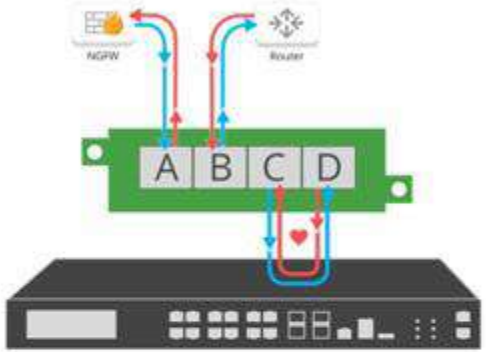
Eliminate Single Points of Failure

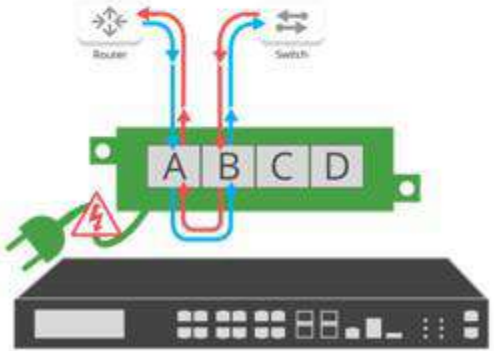
IT Security Solutions Use Case

Challenge: Because Inline tools (IPS, firewalls) sit in the live network, the challenge of deploying these tools is to not create a possible single point of failure (SPOF) in the process.

Solution: Bypass TAPs provide the ability to manage your inline tool any time without having to take down the network or impact business availability for maintenance or upgrades — ensuring this inline security tool is not a point of failure in the network:

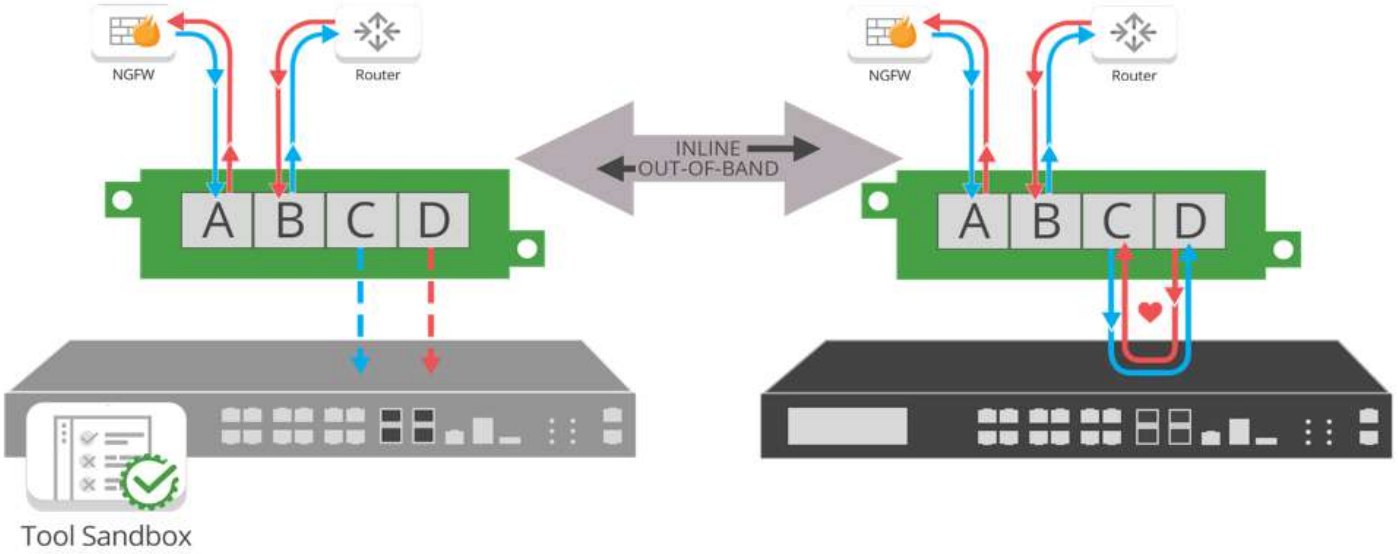
- Failsafe deployment of inline tools
- Configurable security tool heartbeats
- Eliminates single points of failure within your network
- No maintenance windows





Inline Lifecycle Management

Manage your inline tool any time without having to take down the network



- Tool Sandbox - Pilot or deploy new tools
- Evaluate & Optimize the tool out-of-band
- Validation push active inline
- Troubleshooting & Maintenance

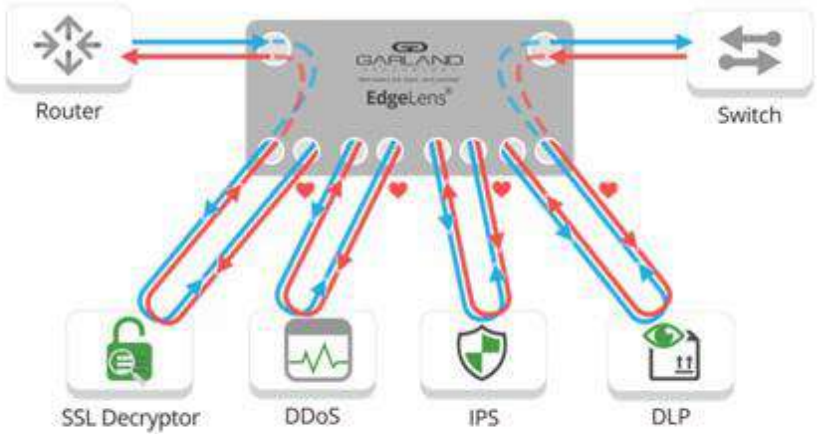
Managing Multiple Inline Tools

IT Security Solutions Use Case

Challenge: Deploy and manage a growing list of security tools, including IPS, WAFs, firewalls, SIEM, DDoS, and SSL encryption.

Solution: Inline Tool Chaining allows you to manage the availability of your inline and out-of-band tools

- Chaining allows you to pass traffic through multiple inline tools
- independently monitor the health of each inline tool with bypass heartbeats
- load balance to the other tools 1:1 or 1:N tools
- Additionally send traffic to out-of-band monitoring tools



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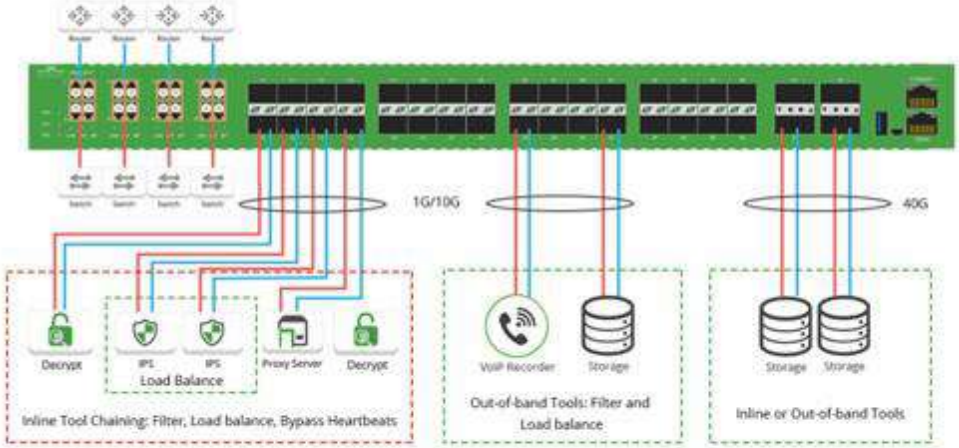


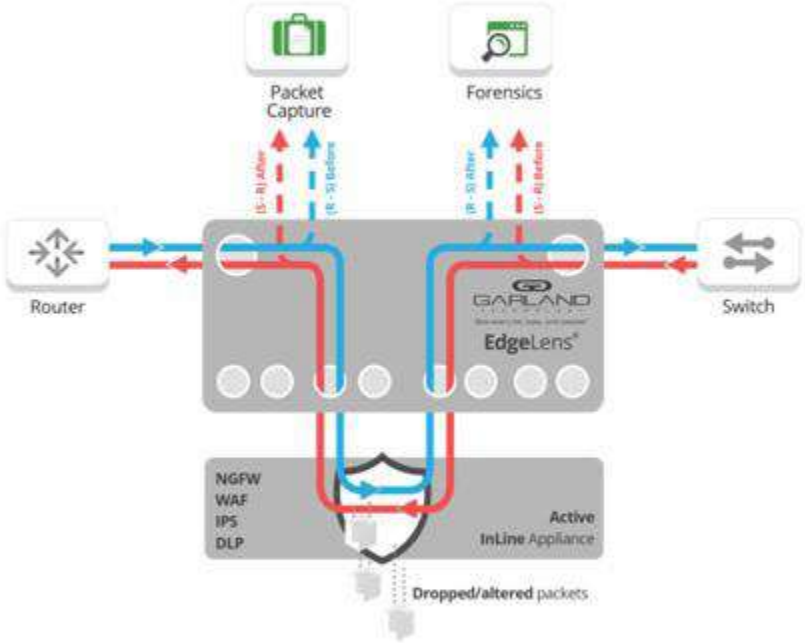
Optimizing Inline Tool performance

IT Security Solutions Use Case

Challenge: How to troubleshoot if inline tools (IPS, firewalls) are configured and optimized properly.

Solution: Before and After Optimization & Validation allows you to provide visibility to out-of-band packet capture, storage and analysis tools

- Analyze packet data before and after your inline device to ensure optimal tool performance to validate any updates or troubleshoot why threats weren't blocked
- Enable real-time proof-of-concept evaluations without impacting the network
- Validate changes or updates that your tool is configured properly



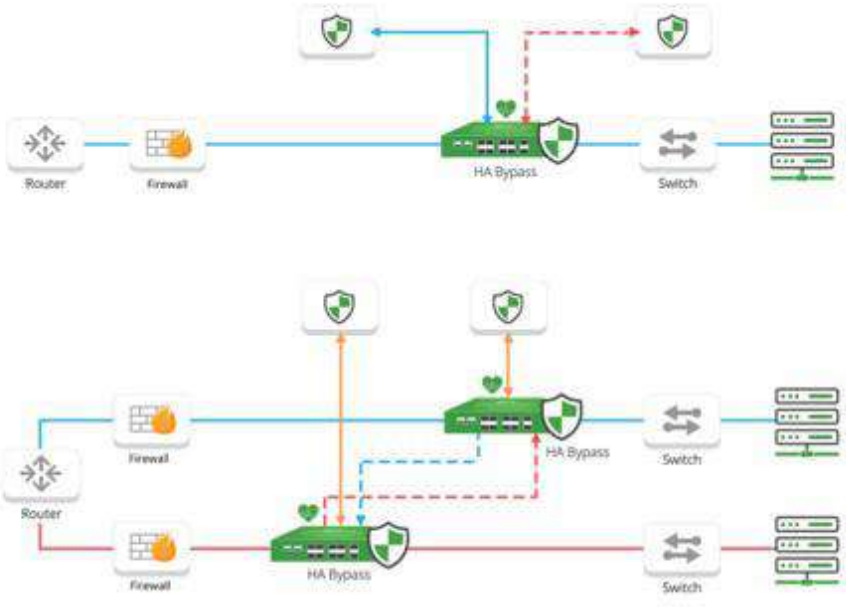
Adding Redundant HA Solutions

IT Security Solutions Use Case

Challenge: Architect an Intrusion Prevention Systems (IPS) for critical links with High Availability (HA) or redundant designs.

Solution: Garland offers two options for incorporating High Availability (HA) solutions into your network

- Active Standby (Active/Passive) deploys to a secondary tool, providing failover from primary device to backup appliance.
- The Active/Active Crossfire design incorporates a secondary tool and redundant link, providing the ultimate failover if either active device fails.



Inline Bypass TAPs

Providing Ultimate Reliability for Inline Edge Security

- Prevent inline tools from being single point of failure (SPOF)
- Tool Sandbox - Pilot or deploy new tools
- Manage multiple inline tools
- High Availability [HA] solution

Inline Bypass TAP Portfolio

Adding the resiliency modern networks need to be secure, from the inventor of bypass

EdgeSafe™ Bypass TAPs	**EdgeSafe**™ 1G Bypass Modular TAPs	**EdgeSafe**™ Integrated Bypass TAPs	**EdgeSafe**™ Bypass TAPs	**EdgeSafe**™ 40G / 100G Bypass Modular TAPs
				
100/1000M (1G)	**10/100/1000M (1G)**	**100/1000M (1G)**	**1G/10G**	**40G/10G 100G**
• Copper RJ45 [n / m] • Single-mode [n] • Multi-mode [n] • SFP [m]	• Copper RJ45 [n / m] • Single-mode [n] • Multi-mode [n] • SFP [m]	• Copper RJ45 [n / m] • Single-mode [n] • Multi-mode [n]	• Single-mode [n] • Multi-mode [n] • SFP+ [m]	• Single-mode [n] • Multi-mode [n] • SFP+ / QSFP+ / QSFP28 [m]
• Portable	• 1U or 2U Chassis	• 1U Chassis	• Portable	• 1U Chassis
• Reduce downtime for inline tools w/ small form factor • Bypass Heartbeats / Failsafe • Media conversion • Link Failure Propagation (LFP) • Plug & Play / Remote mngt	**• Reduce downtime for inline tools w/ modular form factor** • Bypass Heartbeats / Failsafe • 4x 1U or 12x 2U Bypass TAPs • Media conversion • Link Failure Propagation • Remote mngt	**• Eliminate downtime with High Availability (HA) bypass** • Bypass Heartbeats / Failsafe • 6 Monitoring ports • Media conversion • Link Failure Propagation (LFP)	**• Reduce downtime for inline tools w/ small form factor** • Bypass Heartbeats / Failsafe • *[Exclusive] Bypass filtering* • Link Failure Propagation • Plug & Play • Remote mngt	**• Reduce downtime for inline tools w/ modular form factor** • Bypass Heartbeats / Failsafe • 6x 10G; 3x 40G TAPs or (2x) 100G TAPs • Media conversion • Link Failure Propagation (LFP) • Remote mngt

Inline Hybrid Packet Broker Portfolio

Simplify your security stack, from the inventor of bypass

EdgeLens® Focus Inline Security Packet Broker	**EdgeLens®** Inline Security Packet Broker	**EdgeLens®** Inline Security Packet Broker	**EdgeLens®** Inline Security Packet Broker
			
1G/10G	**1G/10G**	**40G**	**100G (Q1 '22)**
• Single-mode [n] • Multi-mode [n] • SFP+ [m]	• Single-mode [n] • Multi-mode [n] • SFP+ [m] • Tools: 40G/10G/1G	• SR4 [n] • LR4 [n] • SFP+ / QSFP+ [m] • Tools: 40G/10G/1G	• SR4 [n] • LR4 [n] • QSFP+ / QSFP28 [m] • Tools: 100G/40G/25G/10G
• ½ Rack 1U Chassis	• High Density 1U Chassis	• High Density 1U Chassis	• High Density 1U Chassis
• Manage multiple inline and out-of-band tools in half rack • Bypass Heartbeats / Failsafe • High Availability (HA) • Filtering, Aggregation and Load Balancing • Hardware base chaining • Remote mngt	**• Manage multiple inline and out-of-band tools in 1U** • Bypass Heartbeats / Failsafe • High Availability (HA) • Filtering, Aggregation and Load Balancing • Hardware base chaining • Remote mngt	**• Manage multiple inline and out-of-band tools in 1U** • Bypass Heartbeats / Failsafe • High Availability (HA) • Filtering, Aggregation and Load Balancing • Hardware base chaining • Remote mngt	**• Manage multiple inline and out-of-band tools in 1U** • Bypass Heartbeats / Failsafe • High Availability (HA) • Filtering, Aggregation and Load Balancing • Hardware base chaining • Remote mngt

Solutions that work

Access and Visibility

ICS Visibility Architecture

ICS Security Solutions Provide:

- Real-time Threat Detection
- Asset discovery and management of devices and firmwares
- Ensure Compliance Standards
- Operational visibility and risk reduction

Security Solutions Need Visibility

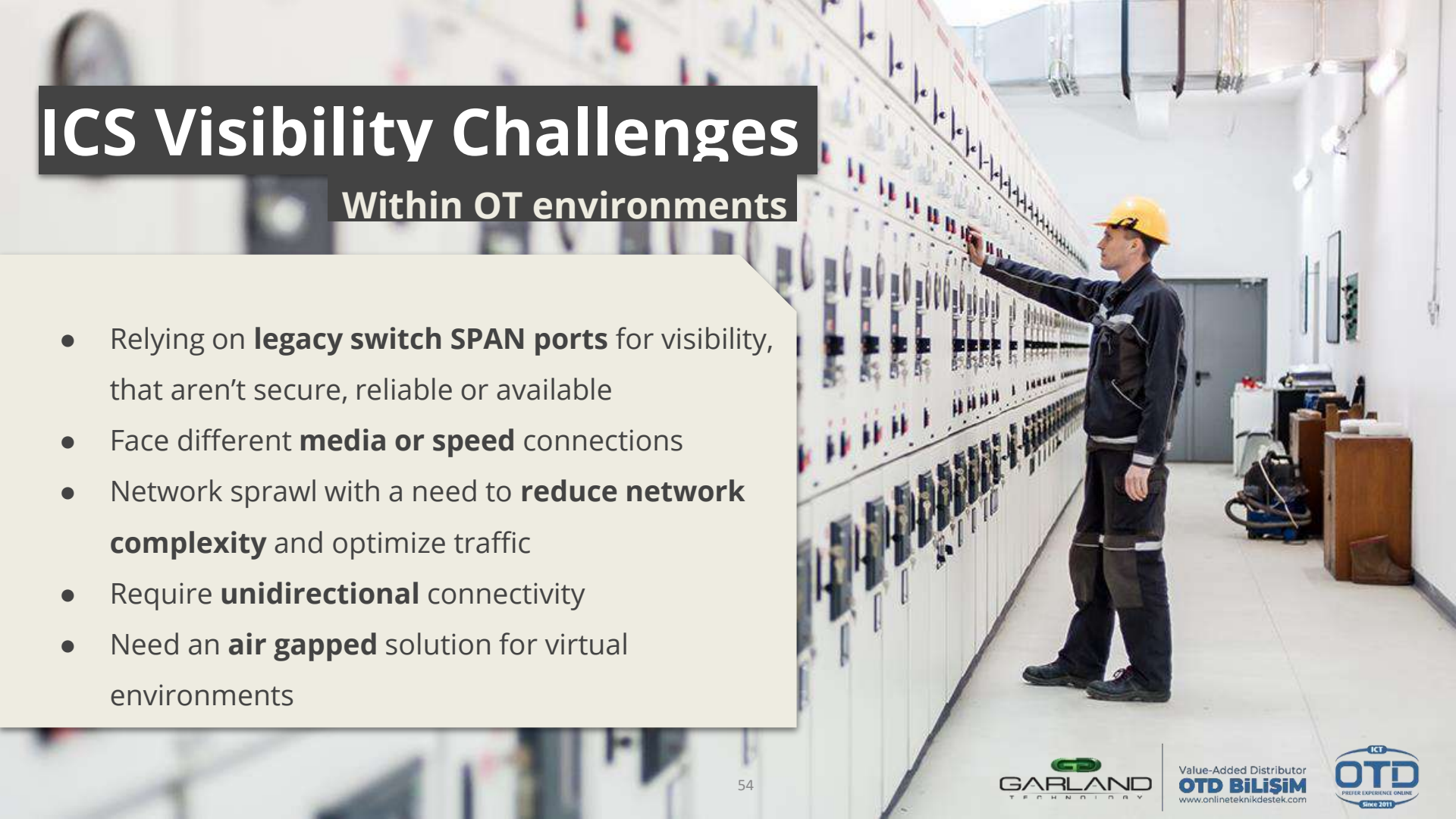
You cannot secure, what you cannot see

- Security solutions are only as good as the data they analyze
- Blindspots hide threats and anomalies

ICS Visibility Challenges

Within OT environments

- Relying on **legacy switch SPAN ports** for visibility, that aren’t secure, reliable or available
- Face different **media or speed** connections
- Network sprawl with a need to **reduce network complexity** and optimize traffic
- Require **unidirectional** connectivity
- Need an **air gapped** solution for virtual environments



Garland Technology solves these challenges

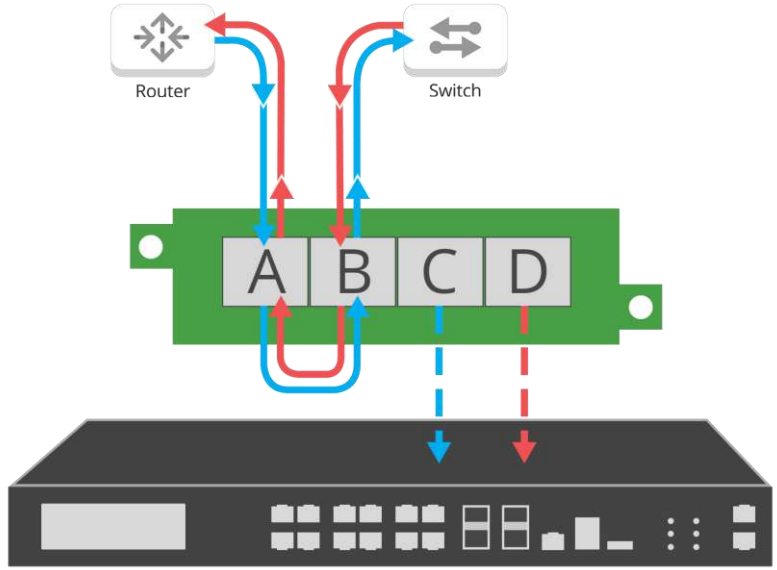
- Providing ICS Security tools 100% packet visibility
- Accommodate media and speed conversion
- Streamline network complexity through traffic aggregation
- Ensuring unidirectional connectivity with Data Diode TAPs
- Air-gap virtual traffic mirroring vTAP

Provide ICS Security tools 100% packet visibility

Eliminate Blind Spots and Improve Tool Performance

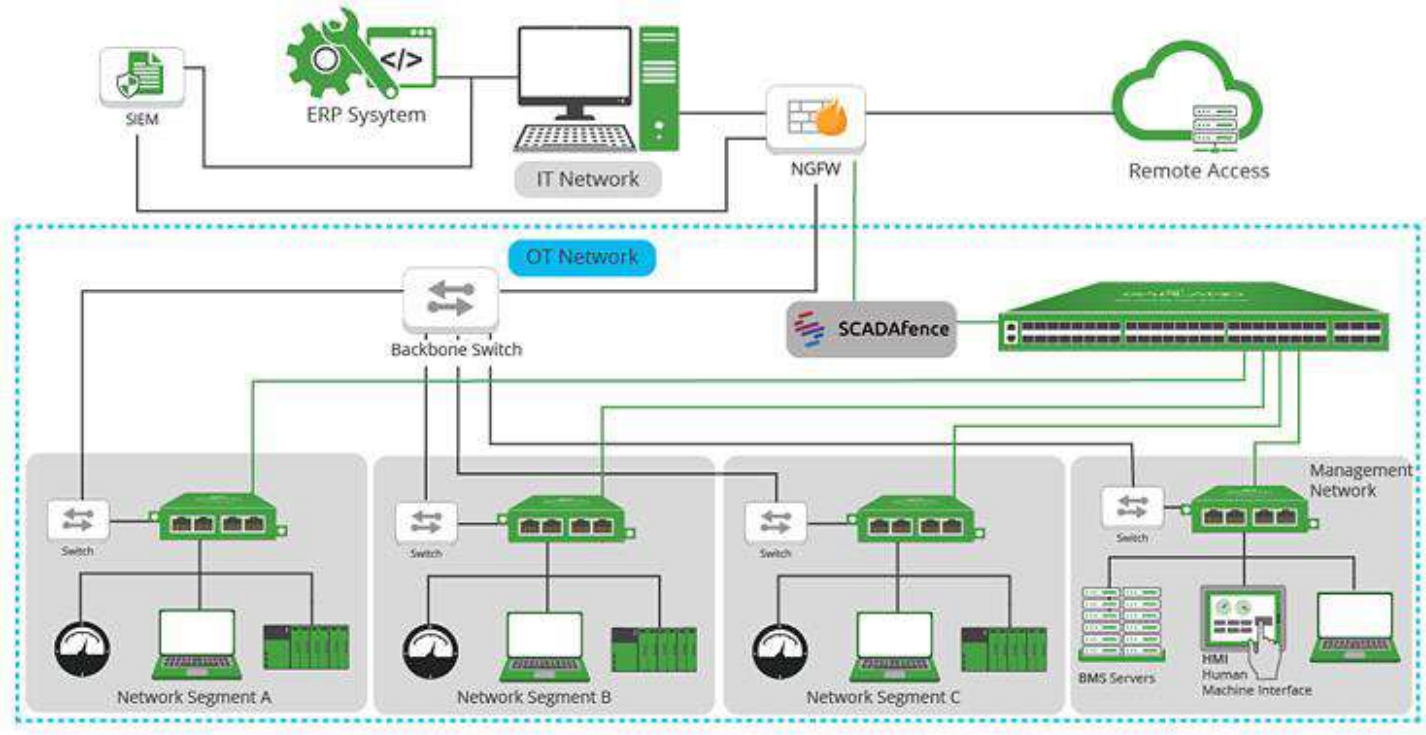
Network TAPs

- 100% Full duplex copy of network traffic
- Scalable and can either provide a single copy, multiple copies (regeneration), or consolidate traffic (aggregation) to maximize the production of your monitoring tools.
- Does not affect the network / Passive or failsafe
- Rugged and reliable, DIN rail, DC power converters
- Easy, plug and play



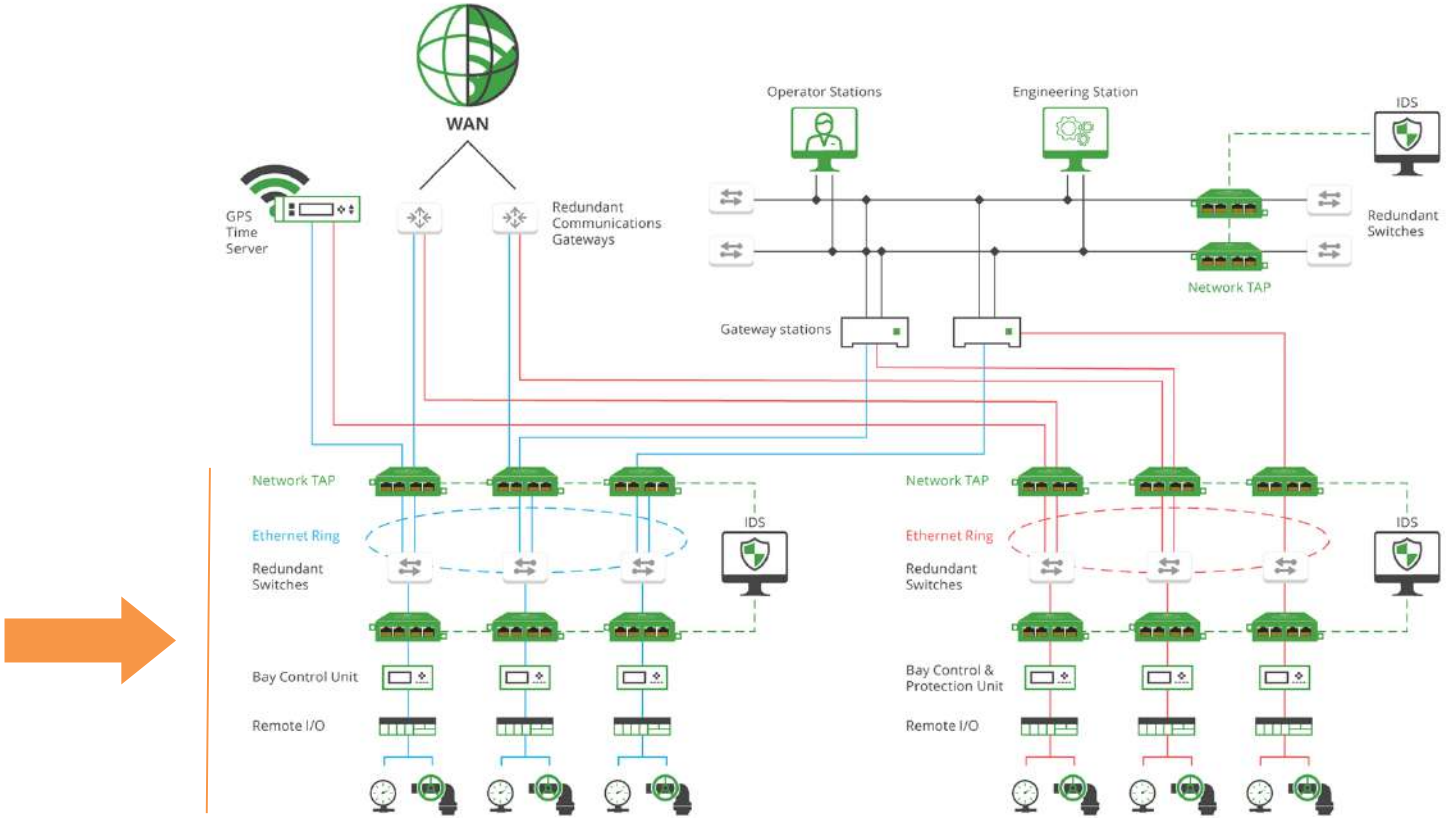
SCADAfence

Continuous Monitoring for Industrial Environments



OT Environment Use Case

Utilities: Power, Water, and Wastewater Redundant Network Visibility Fabric



OT Environment Use Case

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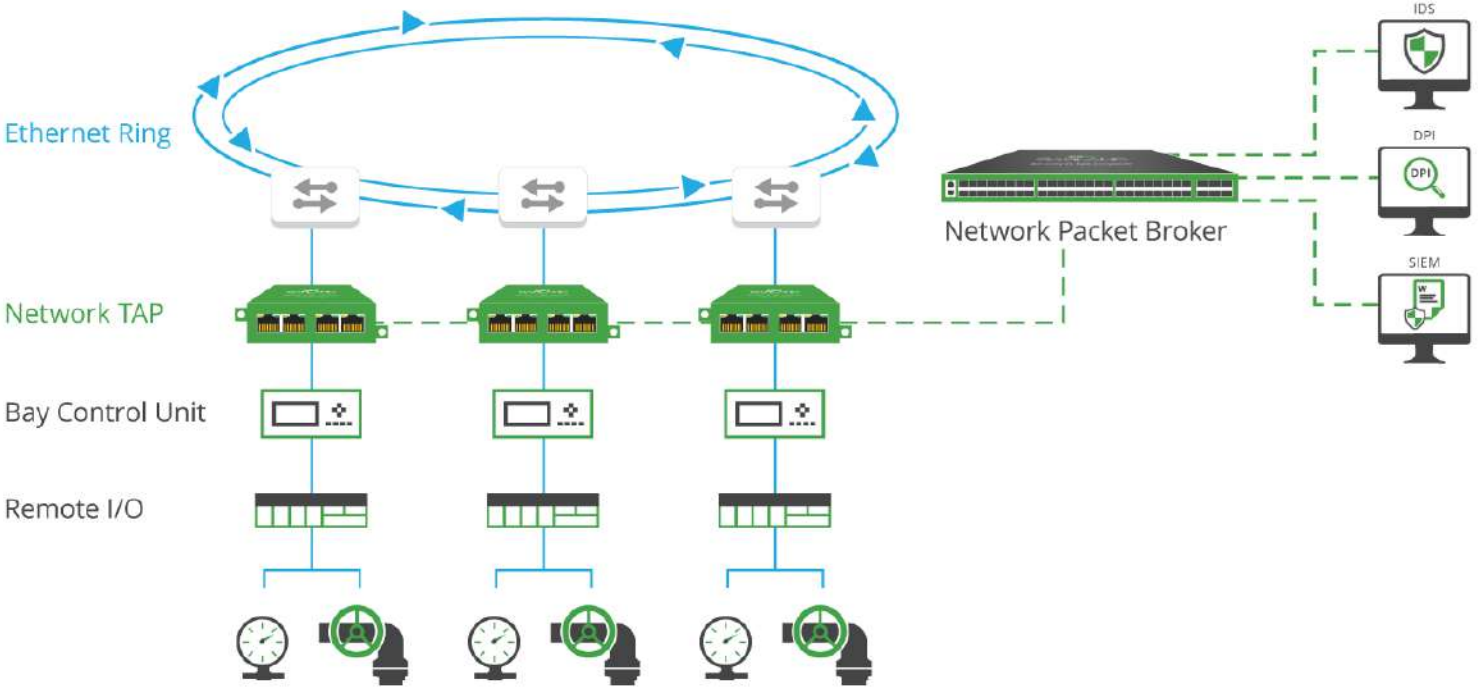
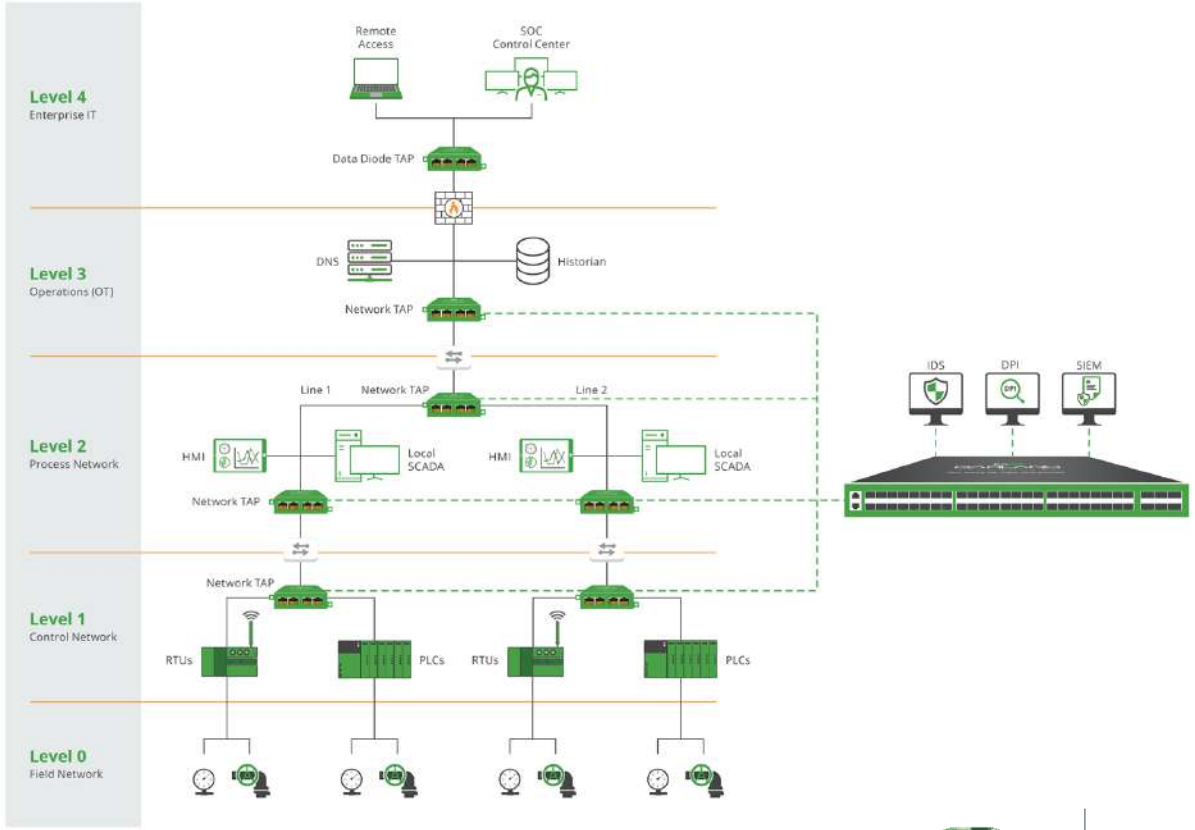


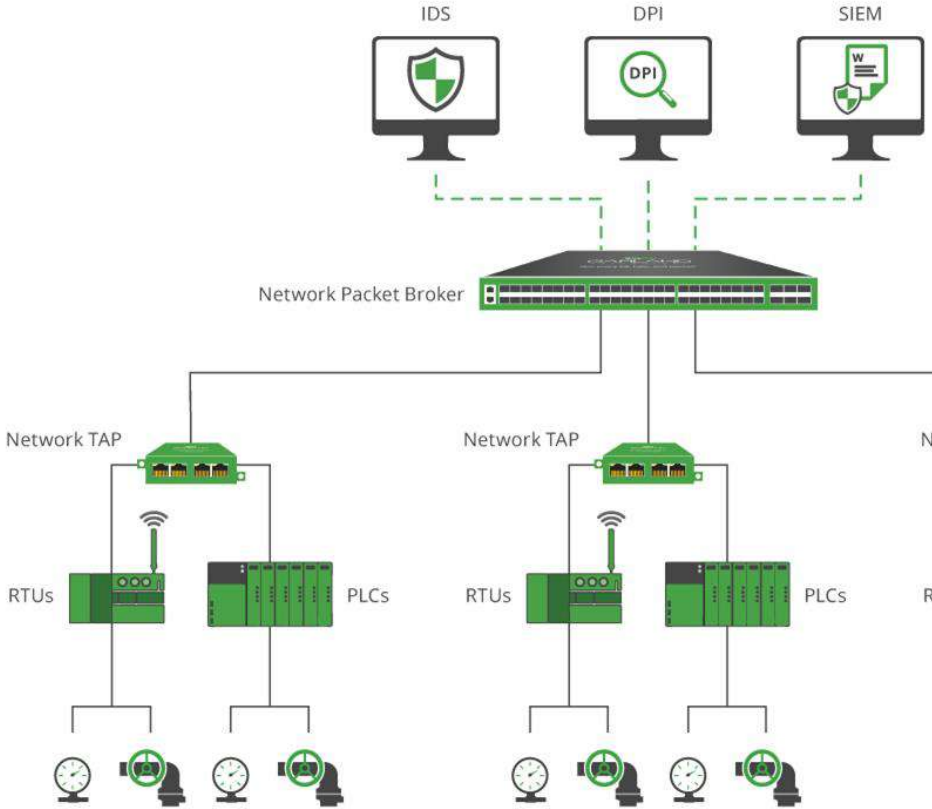
OT Environment Use Case

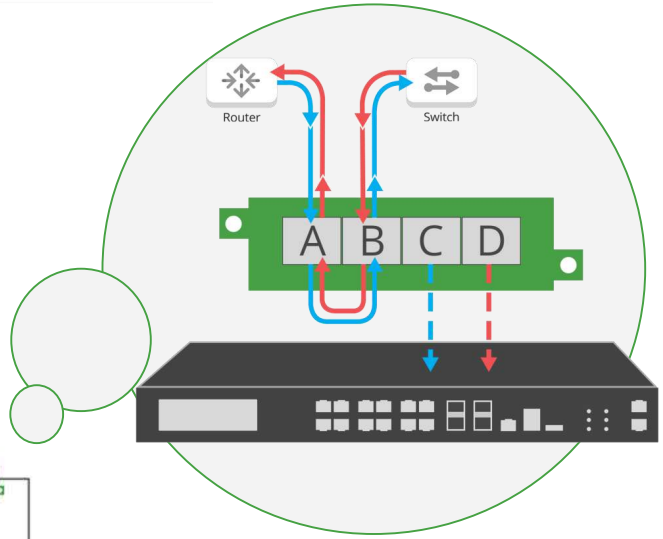
Oil & Gas Purdue Model Visibility Fabric



OT Environment Use Case

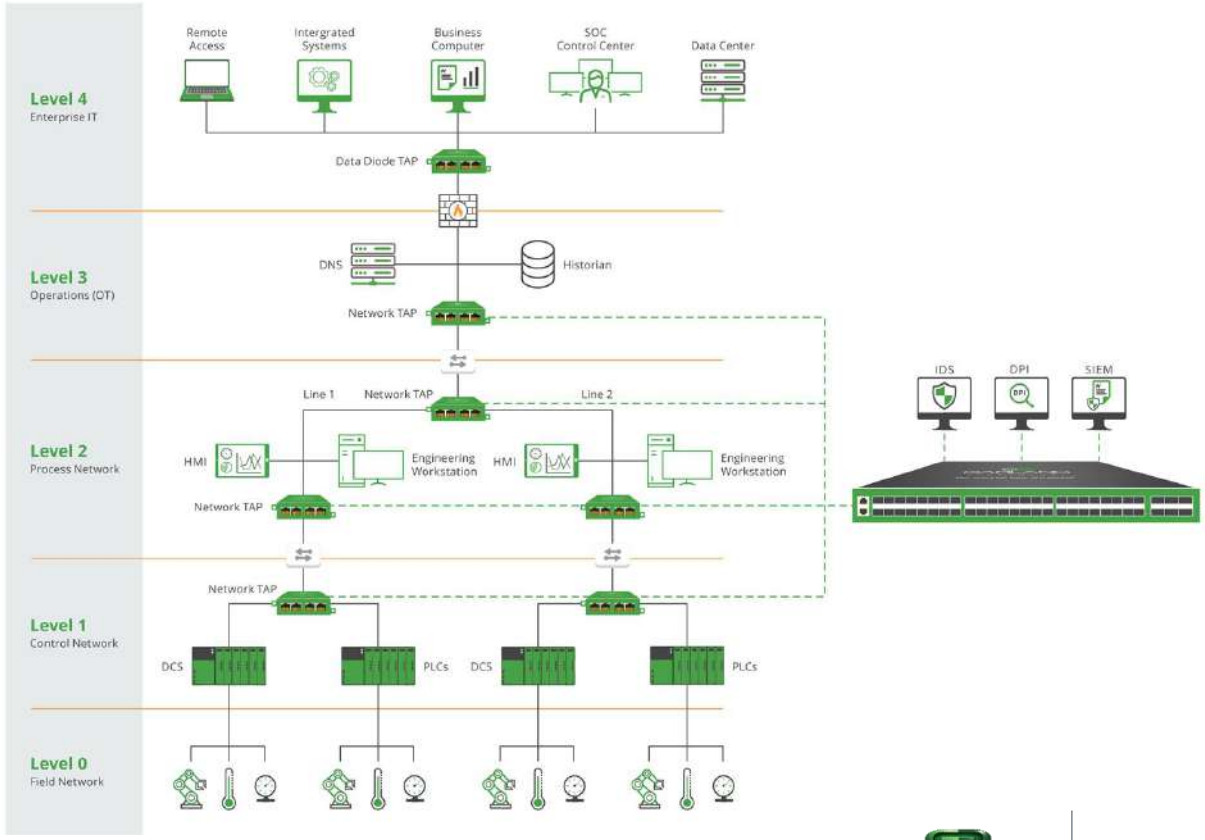
Oil & Gas Visibility Fabric





OT Environment Use Case

Manufacturing and Pharmaceuticals Visibility Fabric



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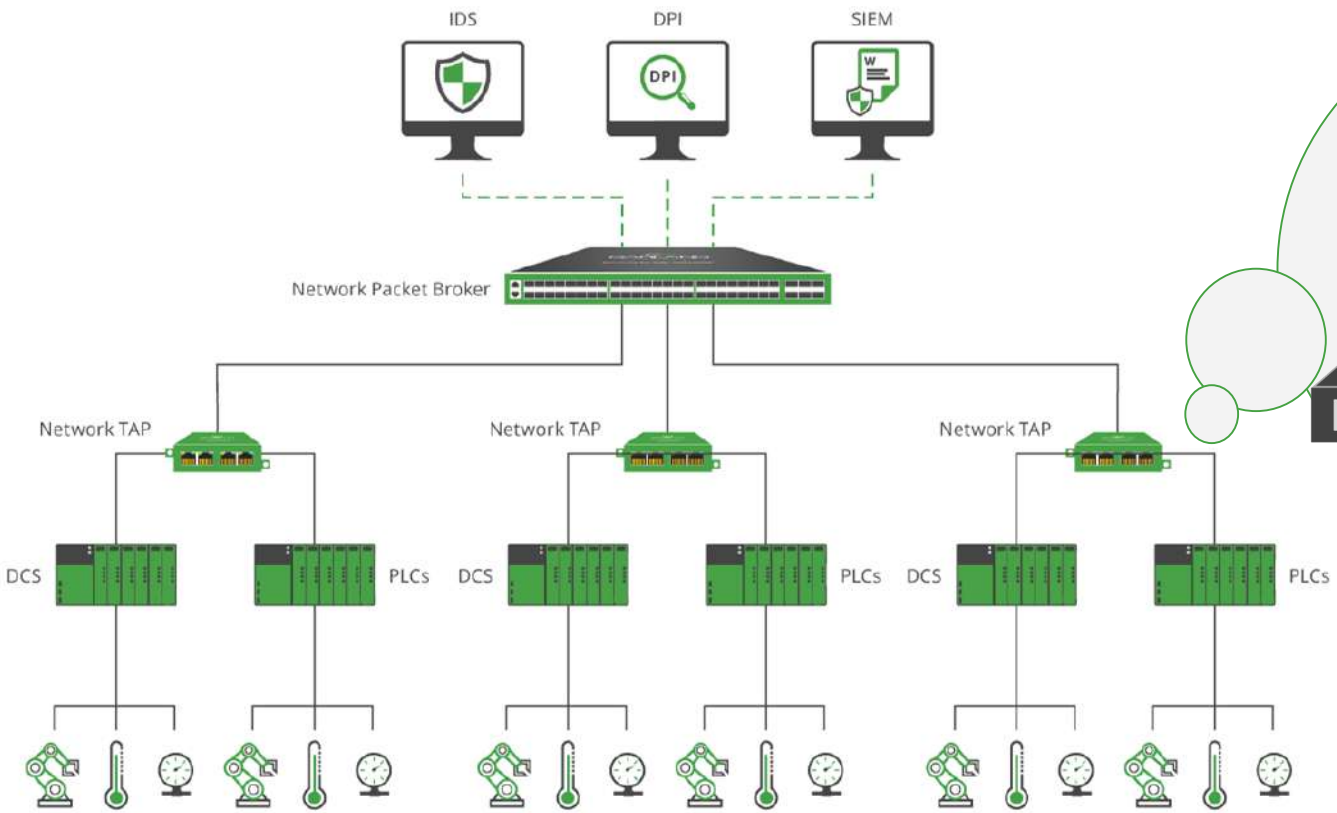
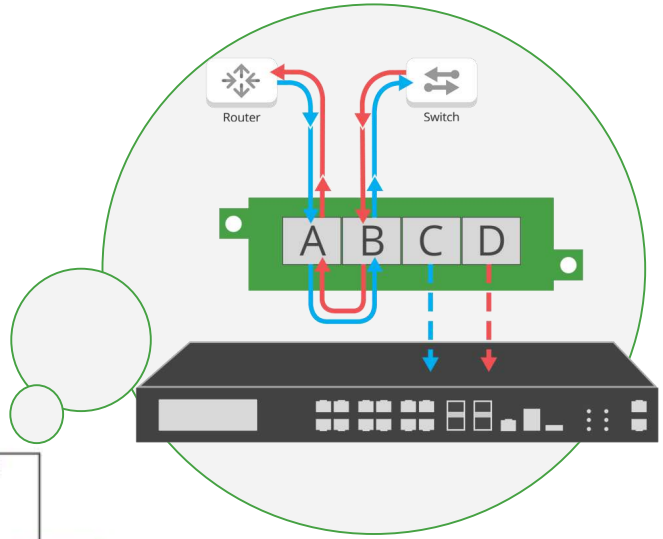
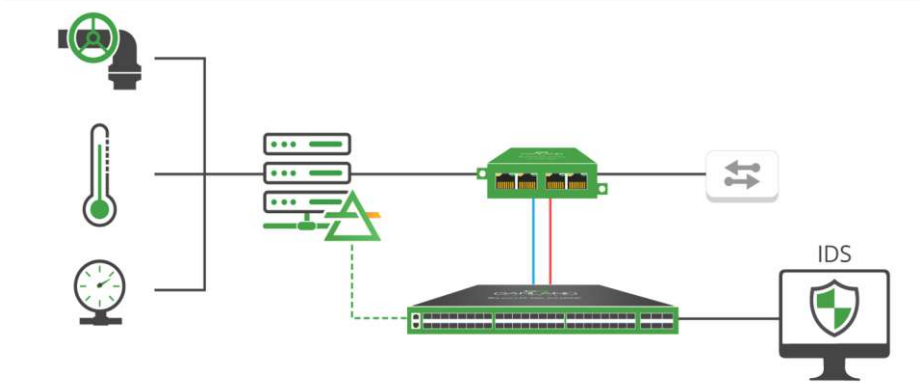


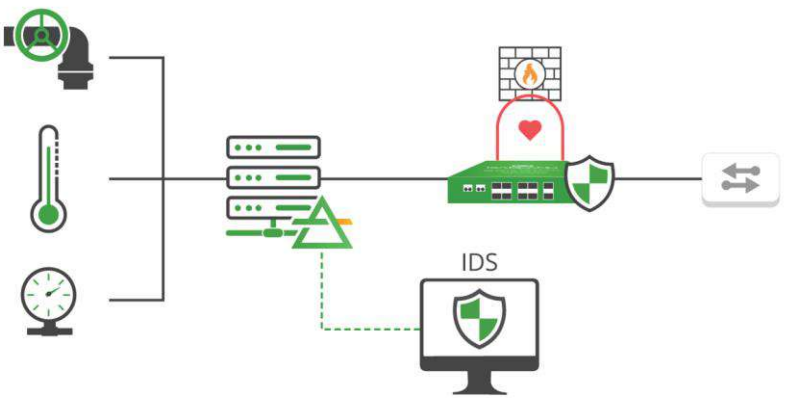


OT Environment Use Case

Substation SCADA Virtualization and Firewall Optimization



- Captures Virtual SCADA packets
- TAP physical interface data
- Aggregates both physical and virtual data
- Transports Substation data to main data centers
- Full substation data visibility



- SW updates to firewalls causes network downtime
- Loss of substation data visibility
- Bypass TAP maintains network availability
- Improved visibility during security updates

Implementing Out-of-Band Visibility Architecture

CASE STUDIES

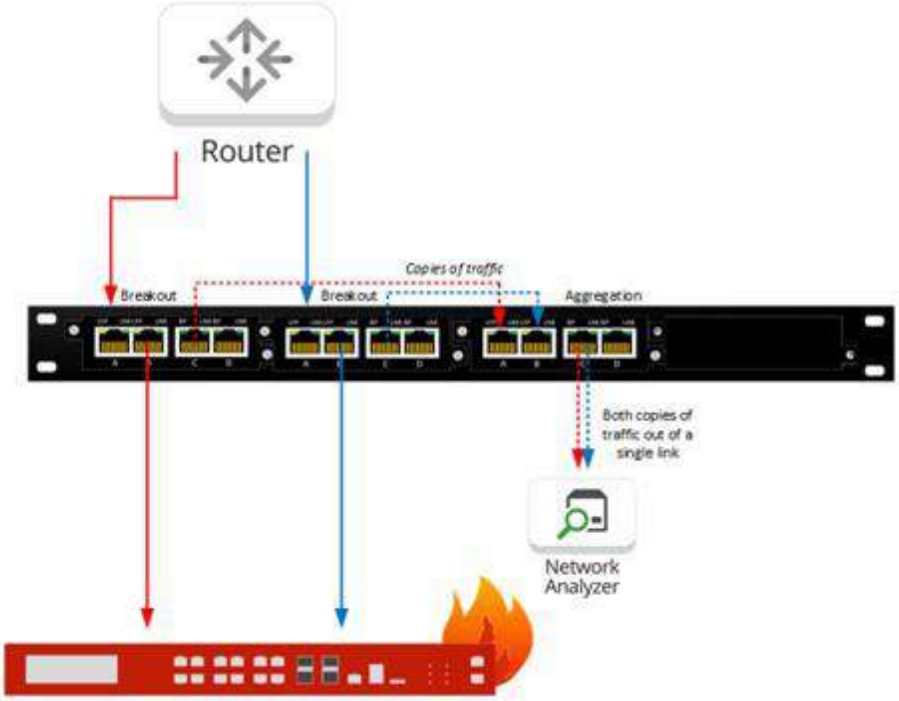
Healthcare IT Security

Gaining Full Visibility During an Instant Response Data Breach

Cyber Defense Group, a healthcare group's incident response team stopped a data breach with Garland.

Solution: Network TAPs provided 100% visibility

Garland allowed CDG to quickly gain visibility to the proprietary tools they use for full packet capture in the cloud, intrusion detection (IDS), enterprise security monitoring, NGFW and log management to properly resolve the data breach.

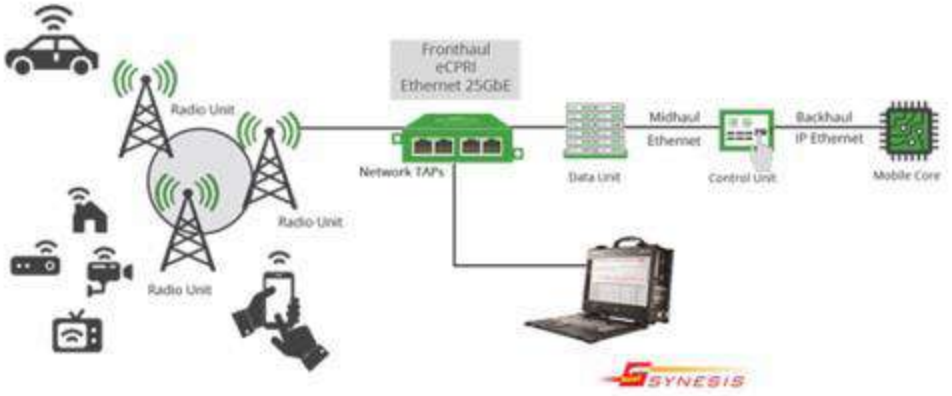


Monitoring 5G Environments

Troubleshooting User Performance Issues at the Fronthaul

A mobile wireless provider launching a national 5G network gained full packet-level visibility for thorough testing and monitoring at elevated speeds.

Solution: Garland's 25G Passive Fiber Network TAPs feeding SYNESIS 25G Portable, provided packet capture visibility at a moment's notice



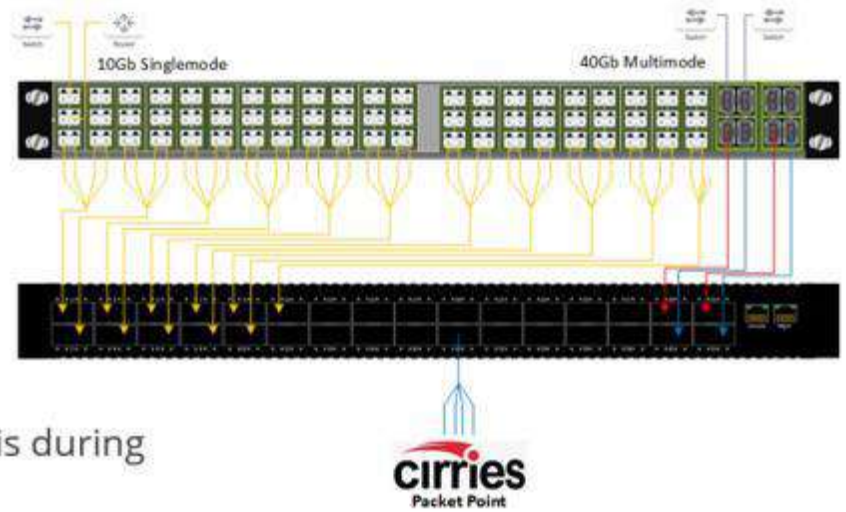
- Replaced existing 10G TAPs, that couldn't accommodate 25G
- Eliminated need for large space and power requirements versus rackmount systems
- Complete "zero packet loss" visibility provided confidence in analysis results
- Lowered CapEx cost for portable high-density equipment
- Lowered OpEx cost for onsite personnel

Monitoring Telecommunications

Improve Visibility to Enhance Remediation and Resolve Vulnerability

Prepaid Wireless Group added Garland visibility to improve network remediation and resolve network vulnerability

Solution: Deployed Garland's 40G passive fiber SelectTAP and PacketMAX feeding Cirries' PacketPoint, packet capture appliances.



- Streamlined data collection workflows for analysis during troubleshooting and security incident response
- Improved visibility provided network troubleshooting and resolution.
- Reduced complexity and Improve network performance

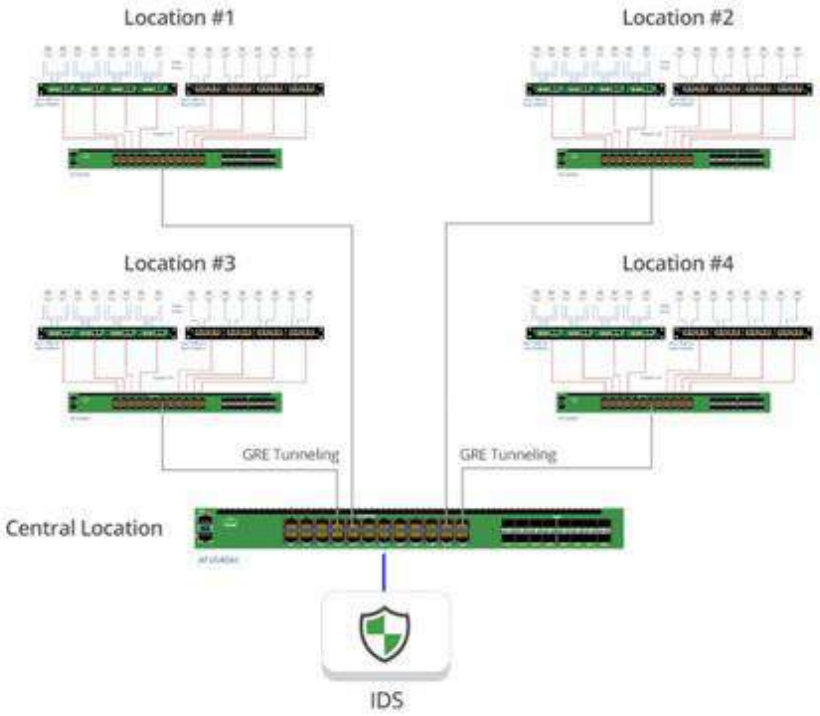
Industrial Infrastructure

Providing Visibility and Reducing Network Complexity

A leading O&G company looking to reduce connectivity complexity, enabling higher performance - helping to bridge the OT and IT

Solution: A combination of AggregatorTAPs and PacketMAX packet brokers deployed throughout the network, feeding back to a central location.

- Reduce complexity and administrative overhead
- Enable infrastructure upgrades
- Improved the network performance
- Improve effectiveness of tool performance



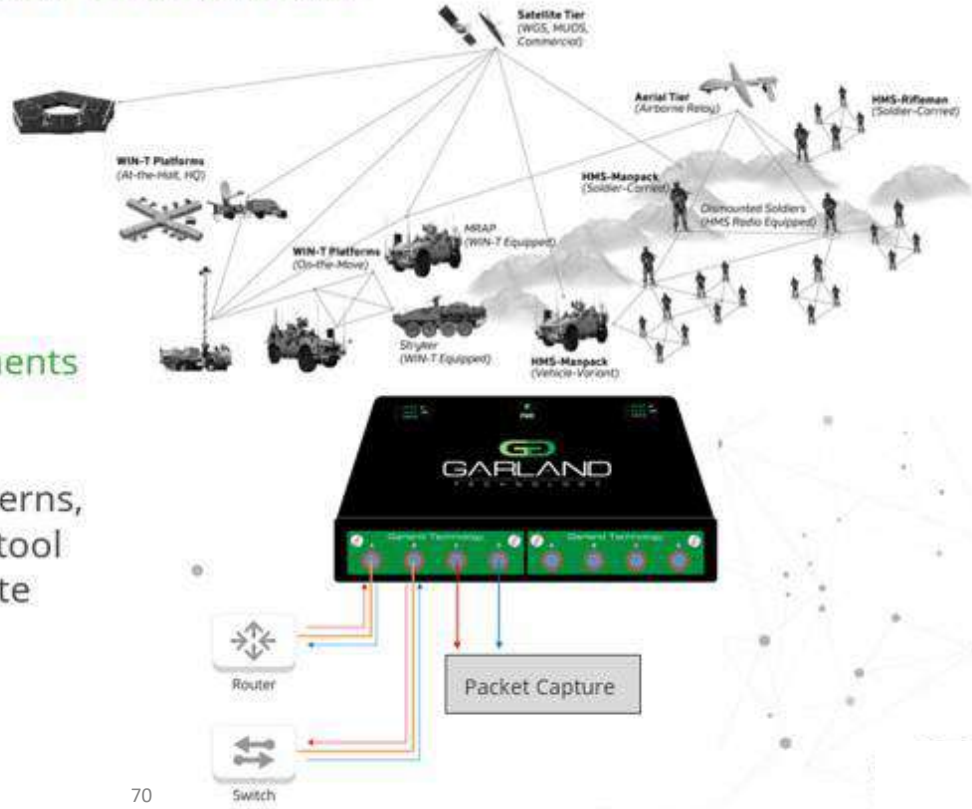
Federal Full Packet Capture

Custom Solutions for Mission Critical Data

The Department of Defense turns to Garland for custom, durable, high-quality, fast turnaround.

Solution: Custom TAPs for Extreme Environments

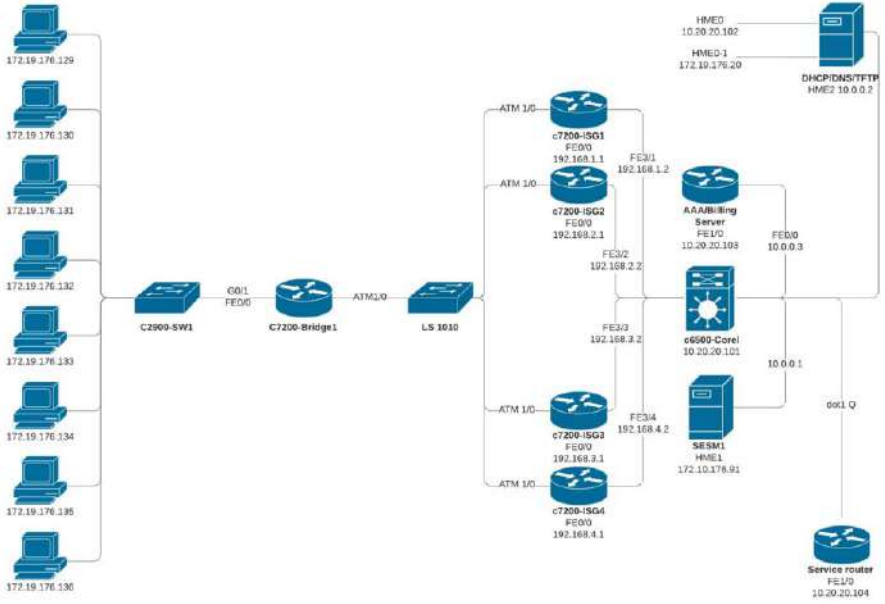
Garland developed custom-built TAPs to withstand environmental and durability concerns, to feed operational data to a packet capture tool and onto hard drives, ensuring 100% complete mission critical data was collected.



IT Visibility Architecture

Security/Monitoring Fabric

Providing Visibility to ensure Performance & Security



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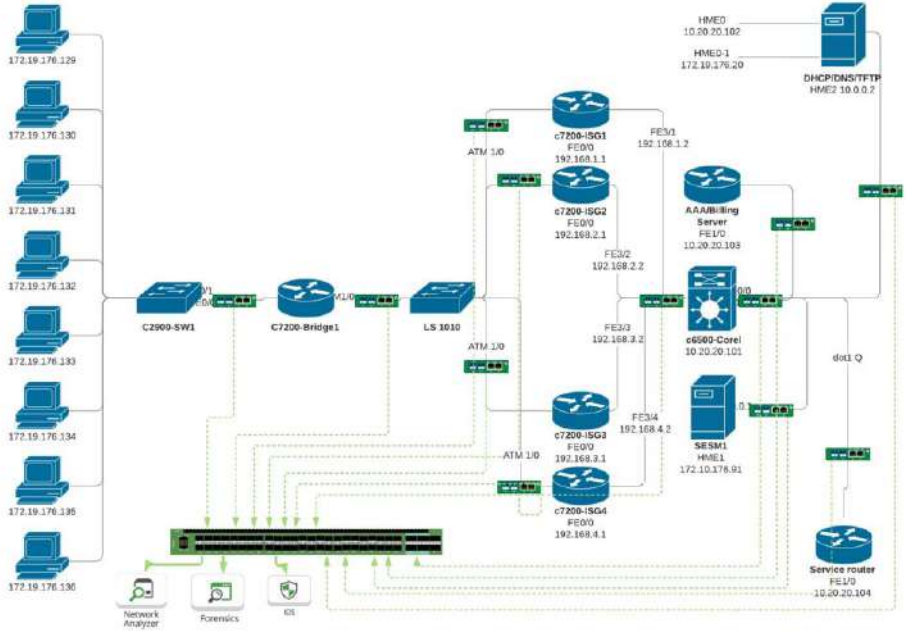
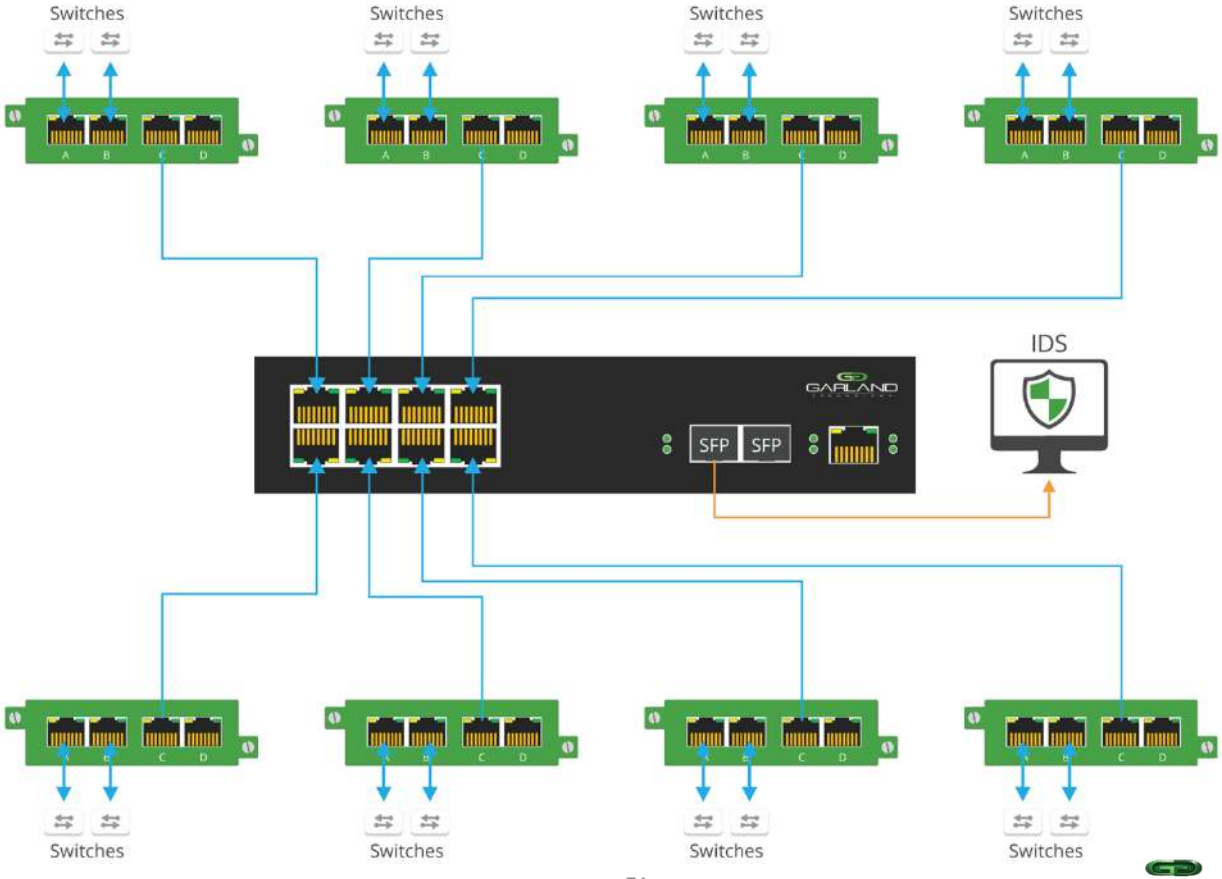
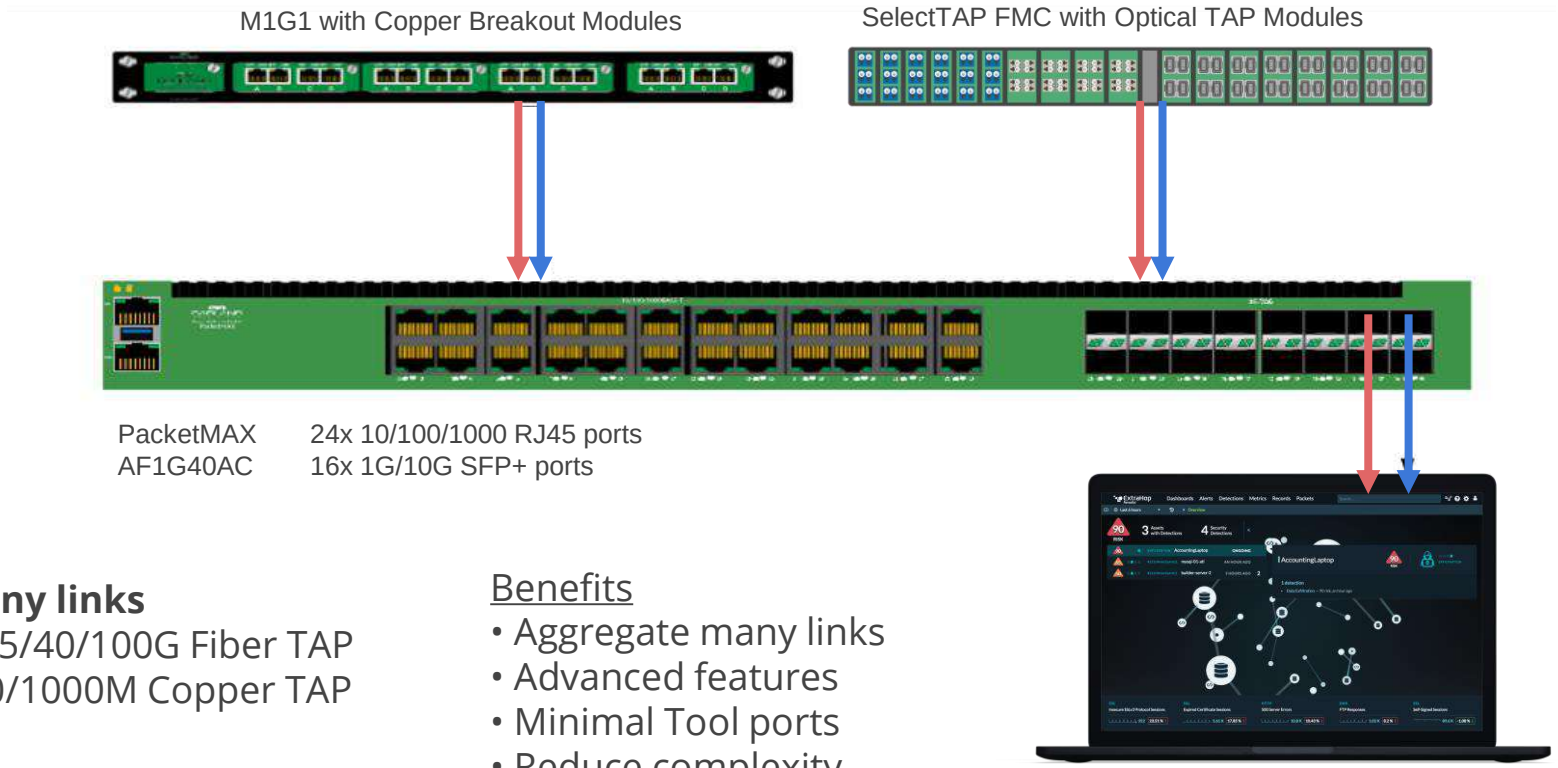


Use Case: TAP 8 links in different locations and aggregate down to one monitoring port.



Medium sites

TAP + Aggregation 1-100G Monitoring



TAP many links

- 1/10/25/40/100G Fiber TAP
- 10/100/1000M Copper TAP

Benefits

- Aggregate many links
- Advanced features
- Minimal Tool ports
- Reduce complexity

Large sites

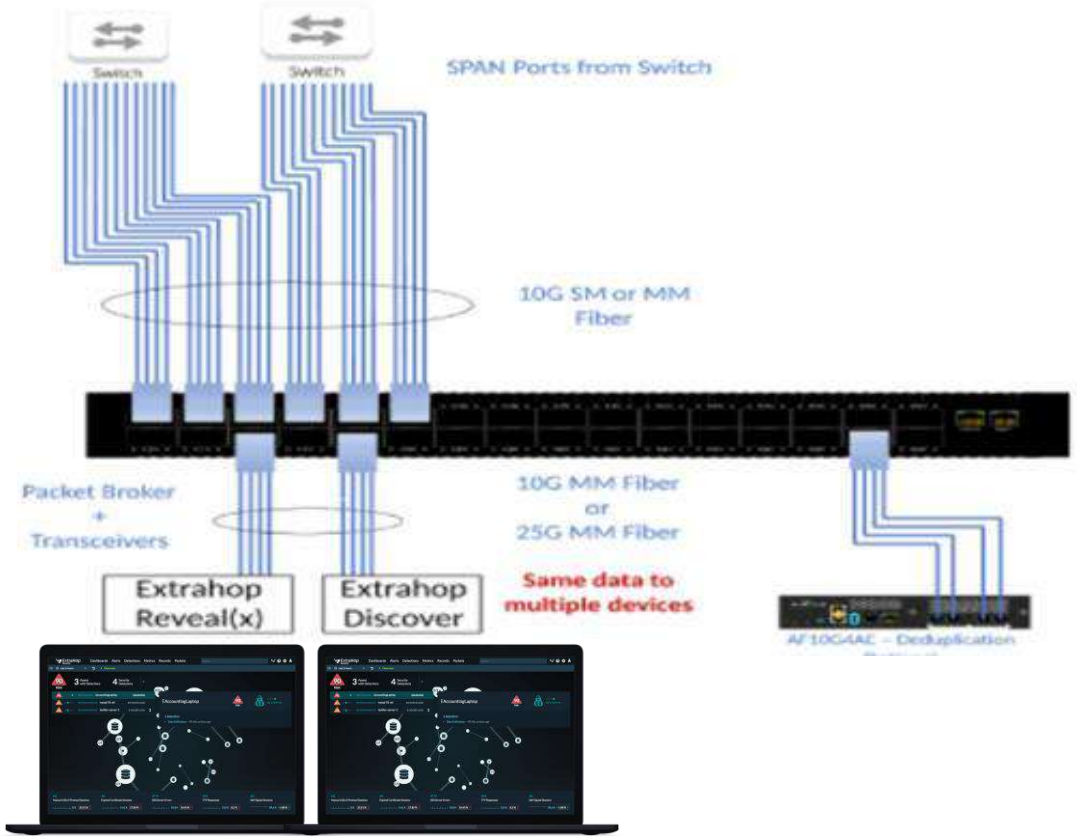
TAP + Aggregation 1-100G Monitoring

10G links

- Aggregate many TAP links
- Aggregate many SPAN links

Benefits

- 100% wire data visibility
- Advanced aggregation and load balancing
- Deduplication
- Load balance 25G links to Tool
- Media Conversion



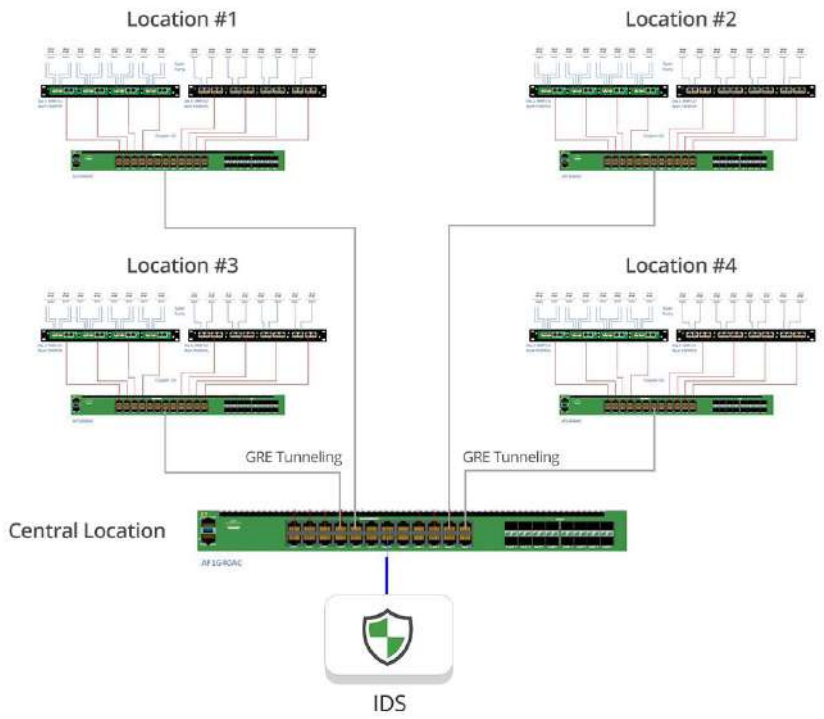
Multi-location Intrusion Detection Solution

Providing Visibility and Reducing Network Complexity

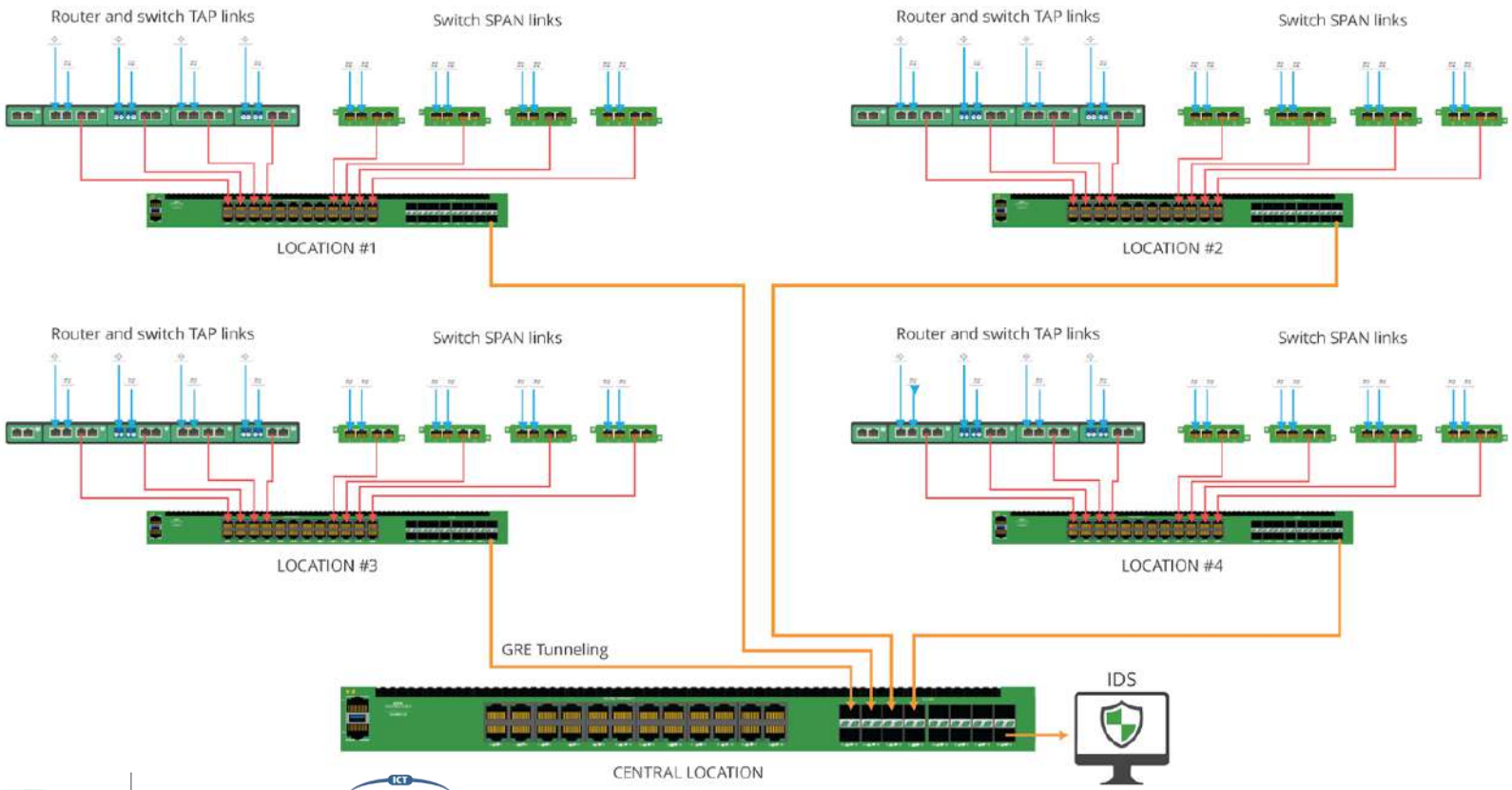
An example solution with a single IDS monitoring multiple locations

Solution: A combination of Network TAPs and PacketMAX packet brokers deployed throughout the network, feeding back to a central location.

- Reduce costs, complexity and administrative overhead
- Enable infrastructure upgrades
- Improve effectiveness of tool performance



Use Case: TAP and SPAN many links in various locations and GRE Tunnel back to a central location.



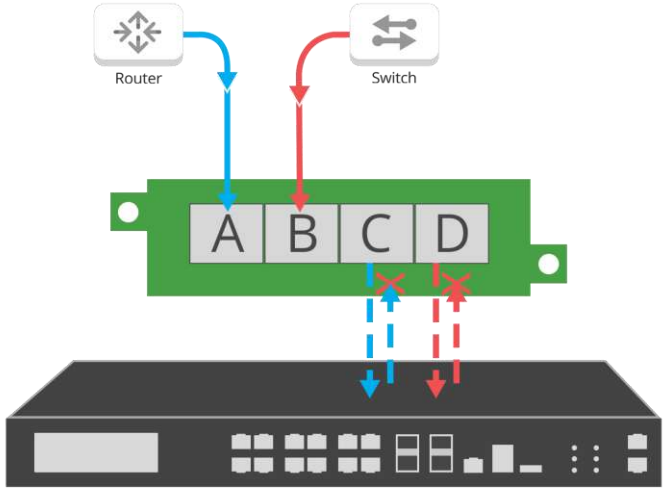
Infrastructure Protection

Providing added Visibility for Airgapped Unidirectional Pathways

Secure out-of-band analysis

Solution: Data Diode TAPs:

- Disallows bidirectional traffic to protect against back flow of traffic into the network
- Secure — TAPs do not have a IP address, or MAC address and cannot be hacked.
- Protects additional source of data streams like switch SPAN ports and network links
- Network traffic control is enforced at the physical level

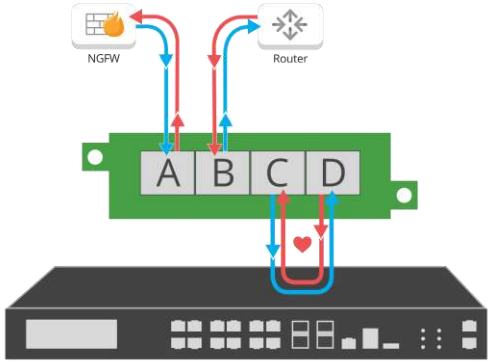


Connecting Inline Security Devices

IT Security Solutions Use Case

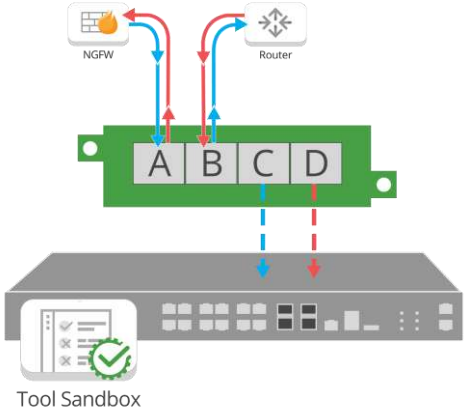
Challenge: Managing the risk of downtime is a critical consideration when deploying security tools.

- Device failures can bring down the network
- Deploying new technologies into the network
- Scheduling off hour planned downtime



Solution: Bypass TAP “inline lifecycle management”

- Easily take tools out-of-band for updates, installing patches, maintenance, or troubleshooting
- Simplify tool piloting and deployment
- Administrative isolation
  - No maintenance windows
  - Reduced network impact and downtime



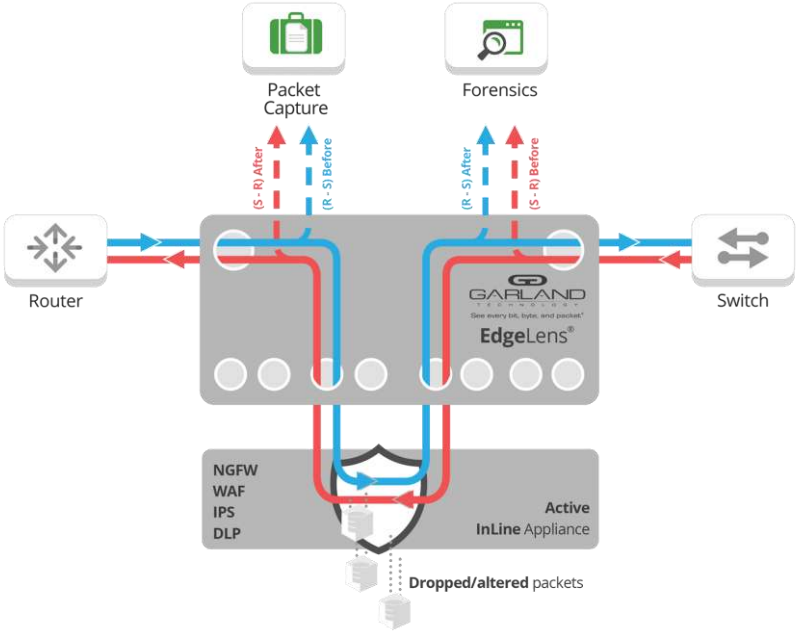
Optimizing Inline Tool Performance

IT Security Solutions Use Case

Challenge: How to troubleshoot inline tools (IPS, firewalls etc) are configured and optimized properly.

Solution: Before and After Optimization & Validation allows you to provide visibility to out-of-band packet capture, storage and analysis tools

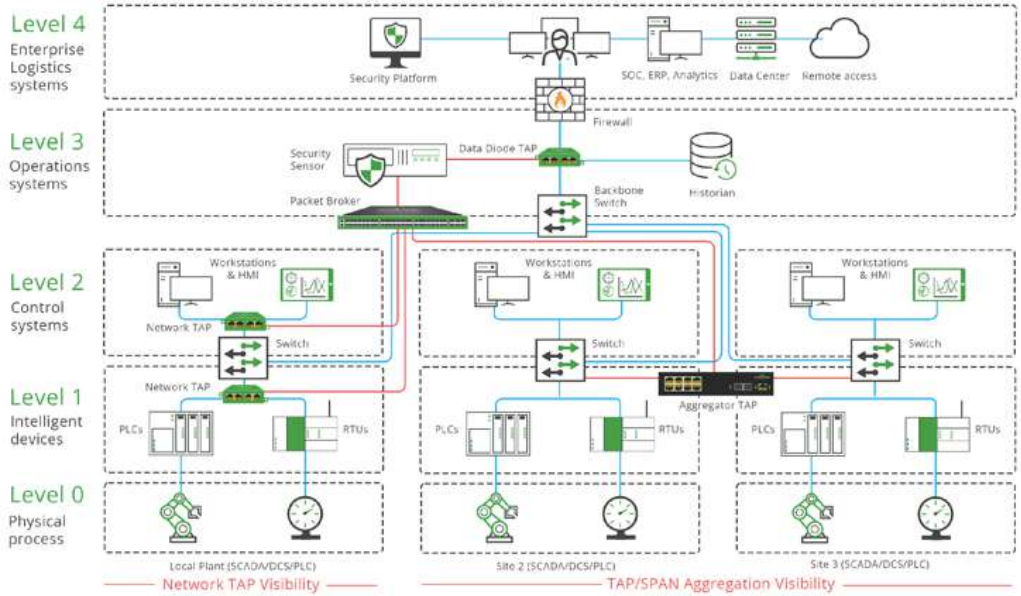
- Analyze packet data before and after your inline device to ensure optimal tool performance to validate any updates or troubleshoot why threats weren't blocked
- Enable real-time proof-of-concept evaluations without impacting the network
- Validate tool changes or updates are configured properly




Out-of-band
Customer Solutions

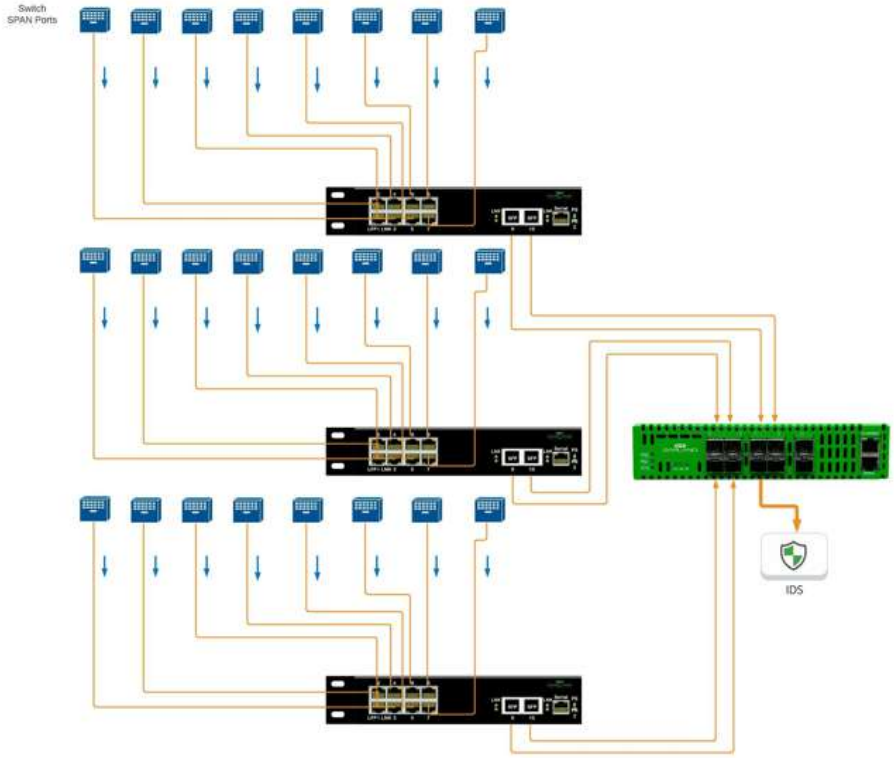
OT Environment

- **Situation**
  - Large manufacturing customer with no security in OT environment
- **Requirement**
  - Implement an IDS solution
- **Solution**
  - Portable copper TAP's with DIN Rail mounting
  - High Density Aggregation TAP
  - Network Packet Broker
- **Benefit**
  - Secure access to data
    - Data Diode Taps
  - Reduced implementation cost
    - No reconfiguration of existing equipment required
  - Highest level of security
    - No blind spots



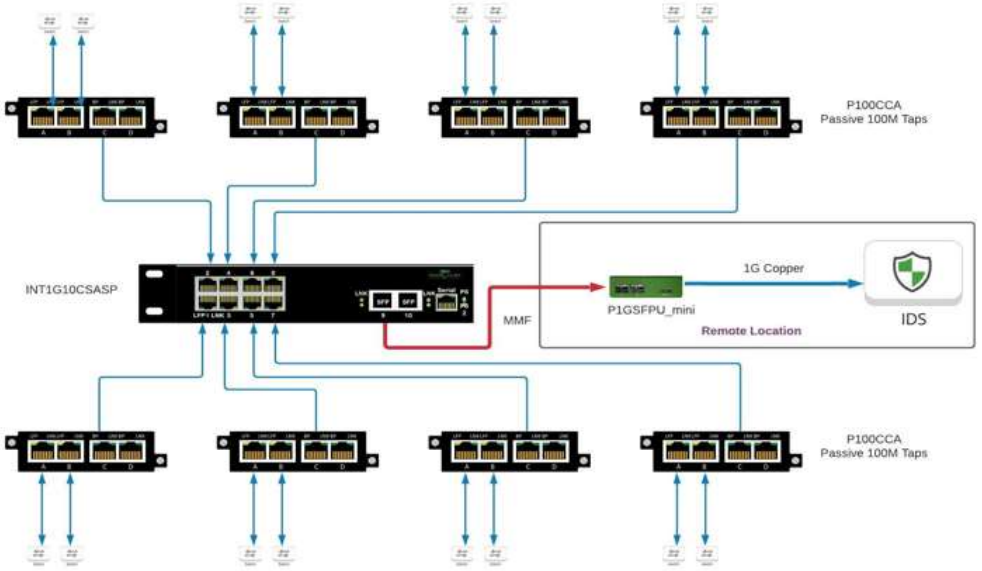
OT Environment

- **Situation**
  - Large Utility with no security in OT environment
- **Requirement**
  - Implement an IDS solution
  - Wishes to use SPAN but concerned about security
- **Solution**
  - High Density SPAN Aggregation TAP (Data Diode)
  - Network Packet Broker
- **Benefit**
  - Increased security
    - SPAN ports protected with Data Diode TAP's
  - Reduced cost
    - Smaller IDS platform required



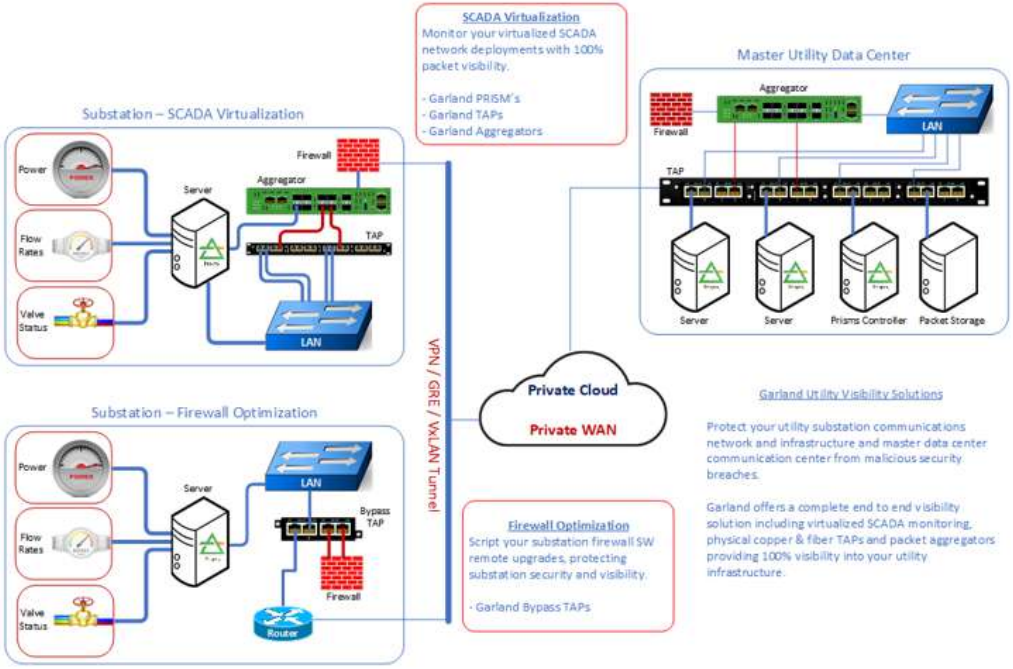
OT Environment

- **Situation**
  - Large Utility required monitoring of OT environment
- **Requirement**
  - Mirror traffic from 100M environment
  - Critical - no packet loss in live network in the event of a TAP failure
  - IDS located remotely
- **Solution**
  - Passive 100m copper TAP;s
  - High Density SPAN Aggregation TAP (Data Diode)
  - FieldTAP
- **Benefit**
  - Guaranteed no packet loss
    - Passive TAP design
  - Low cost media conversion
    - FieldTAP



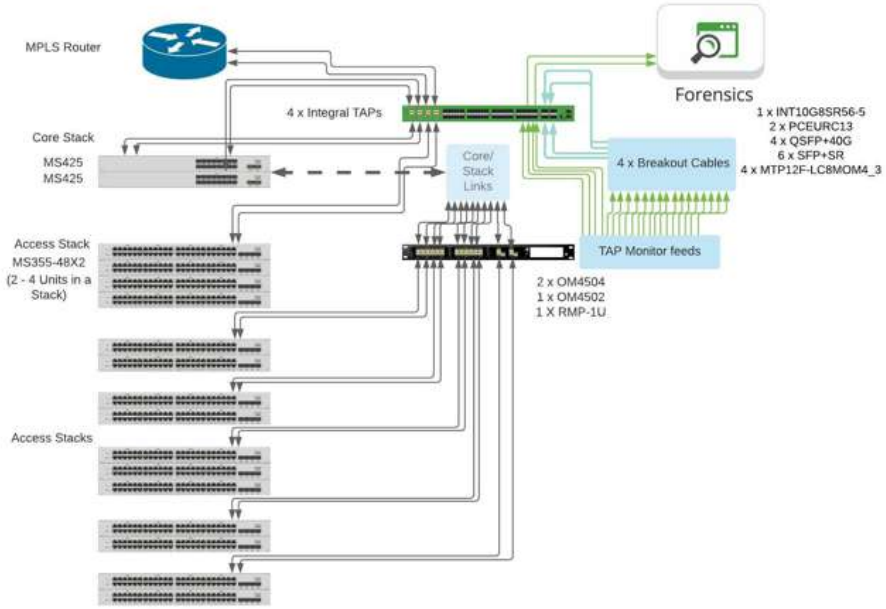
OT Environment

- **Situation**
  - Large Energy provider with no security in OT environment
- **Requirement**
  - Implement an IDS solution
  - No blind spots
  - Satisfy regulatory requirements
- **Solution**
  - Data Diode Network TAPs
  - Data Diode Virtual TAP's
  - Network Packet Brokers
- **Benefit**
  - Increased security
    - Complete secure visibility



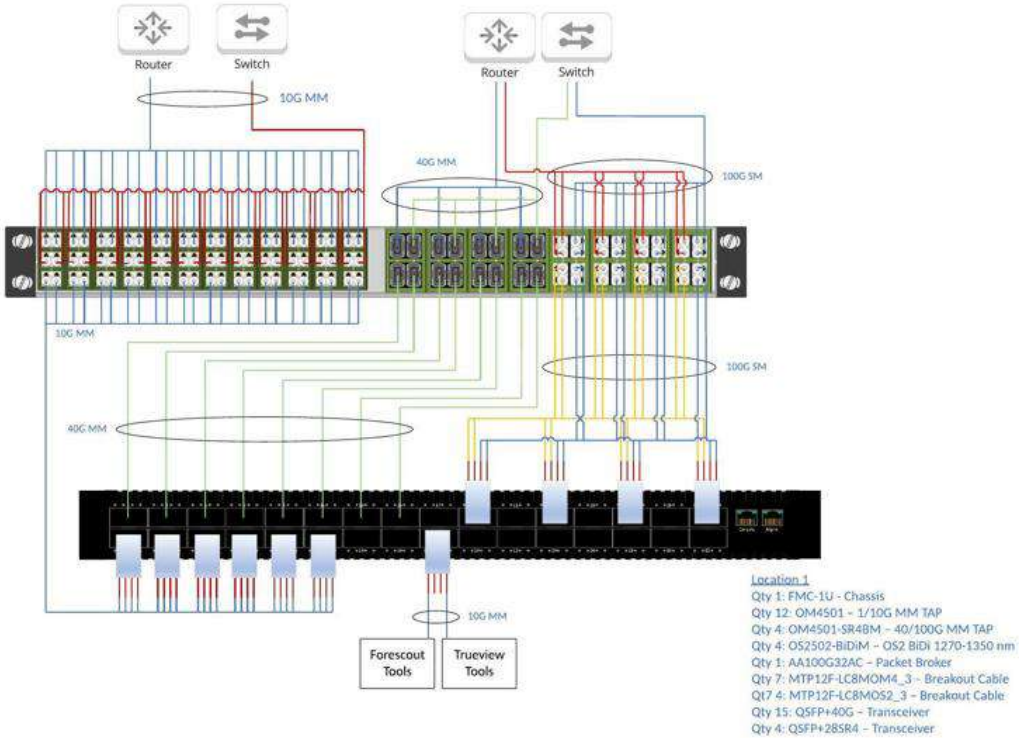
Enterprise Environment

- **Situation**
  - Large Insurance Company
- **Requirement**
  - Implement a multi location IDS solution
  - Cisco Meraki environment has limited SPAN ability
  - Wanted security monitoring between Access Stacks
- **Solution**
  - Secure passive fibre TAPs
  - Network Packet Broker with integral fibre TAPs
- **Benefit**
  - Increased security
    - Visibility between Core and Access Stacks
    - Guaranteed 100% packet visibility
  - Reduced cost
    - Smaller IDS platform required
    - NPB included TAP's
  - Reduced Space required
    - 2U Space on large sites, 1U on smallest sites
  - Operational cost saving
    - Consistent product family across all locations
    - No SPAN port management overhead



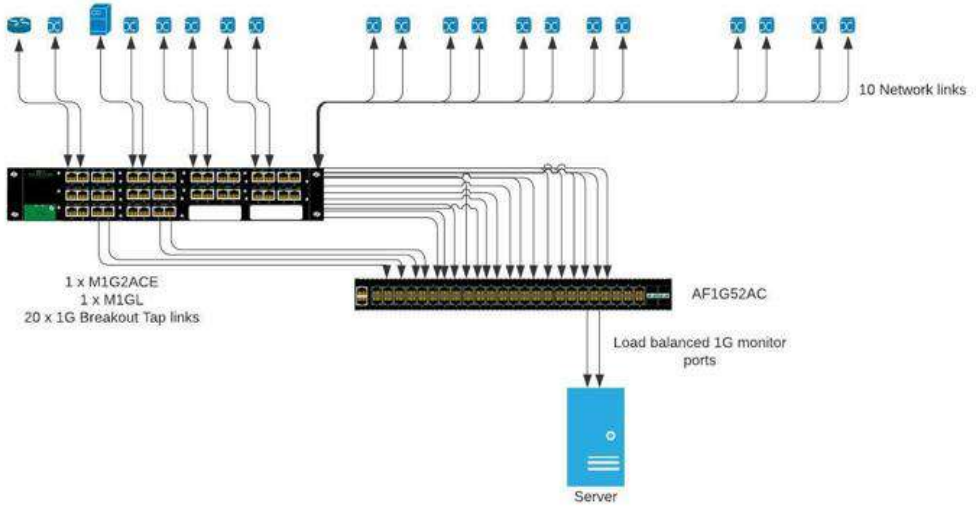
Enterprise Environment

- **Situation**
  - Large Healthcare Provider
- **Requirement**
  - Implementing a Forescout IDS solution together with Netscout TruView
  - Required visibility of all Router to Switch links
  - Mixture of 10G, 40G and 100G MMF and SMF BiDi
- **Solution**
  - Secure passive fibre TAPs
  - High Density 10/40/100G Network Packet Broker
- **Benefit**
  - Increased security
    - Visibility between Router and Switches
    - Guaranteed 100% packet visibility
    - Secure Data Diode mirroring of data
  - Reduced cost
    - Extremely cost effective
  - Minimum Space required
    - 2U Space on large sites
  - Operational cost saving
    - No SPAN port management overhead



Enterprise Environment

- **Situation**
  - Medium Size Finance Customer
- **Requirement**
  - Implementing an IDS with capacity for 2 x 1G links
  - Observe data on 10 x 1G copper links
- **Solution**
  - M1G2ACE chassis with 10 copper Breakout TAPs
  - High Density 1G Network Packet Broker
- **Benefit**
  - Increased security
    - Visibility of key links
    - Guaranteed 100% packet visibility
    - Secure Data Diode mirroring of data
  - Investment protection
    - Ability to connect an IDS or another tool via 10G
  - Operational cost saving
    - No SPAN port management overhead



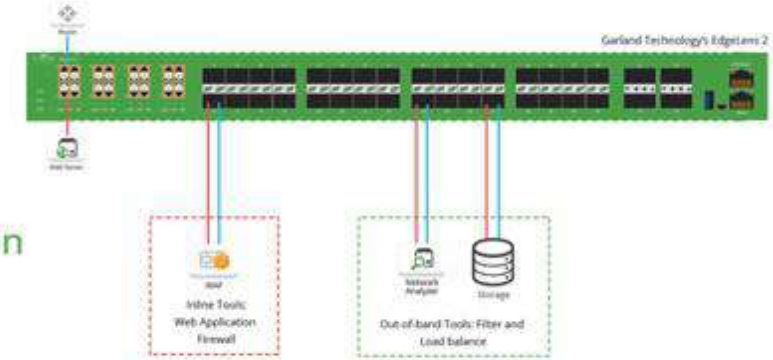
Implementing Inline Visibility Architecture

CASE STUDIES

Financial Services

Providing inline threat prevention optimization and analysis

Large investment company looking to optimize their threat prevention strategy by adding inline tool analysis



Solution: Garland's EdgeLens transformed their network security capabilities with the "Historical Look-back" solution

Allowed them to analyze WAF performance to see if it is configured properly or if it may be missing the threat

- Analyzing packet data before and after the inline device to ensure optimal tool performance
- Validate any updates or troubleshoot why threats weren't blocked.

Financial Banking

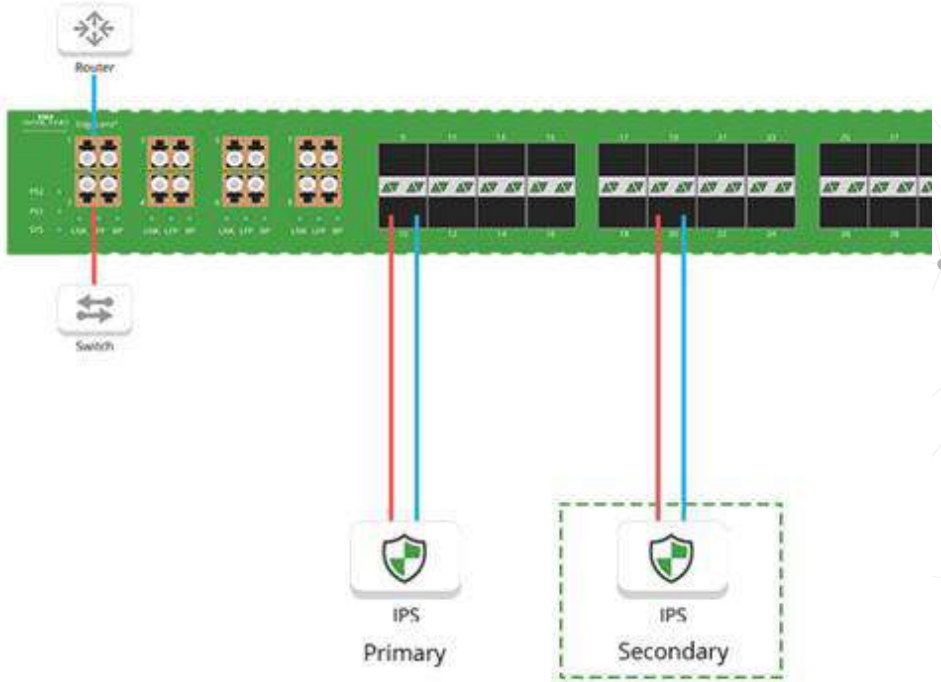
Ensuring Complete High Availability (HA) Redundancy for Critical Links

Large financial corporation ensured all critical links with Garland's HA redundancy so there is no business interruption or downtime, while protecting sensitive data.

Solution: Garland's EdgeLens deployed redundant IPS tools in an active standby scenario.

- One primary or "active" IPS
- And a secondary or "passive" IPS

In the event the primary appliance goes down, the secondary appliance will automatically take over as primary.



TAP to Tool™ Architecture

Securing and monitoring your network is the ultimate goal

Garland is an enabling technology. Our philosophy is to not lose sight of that goal by architecting to the tool, not competing with them.

TAPs | Foundation of Visibility: Starts with Network TAPs

-Provide 100% raw packet data

-Aggregation, regeneration, bypass functionality

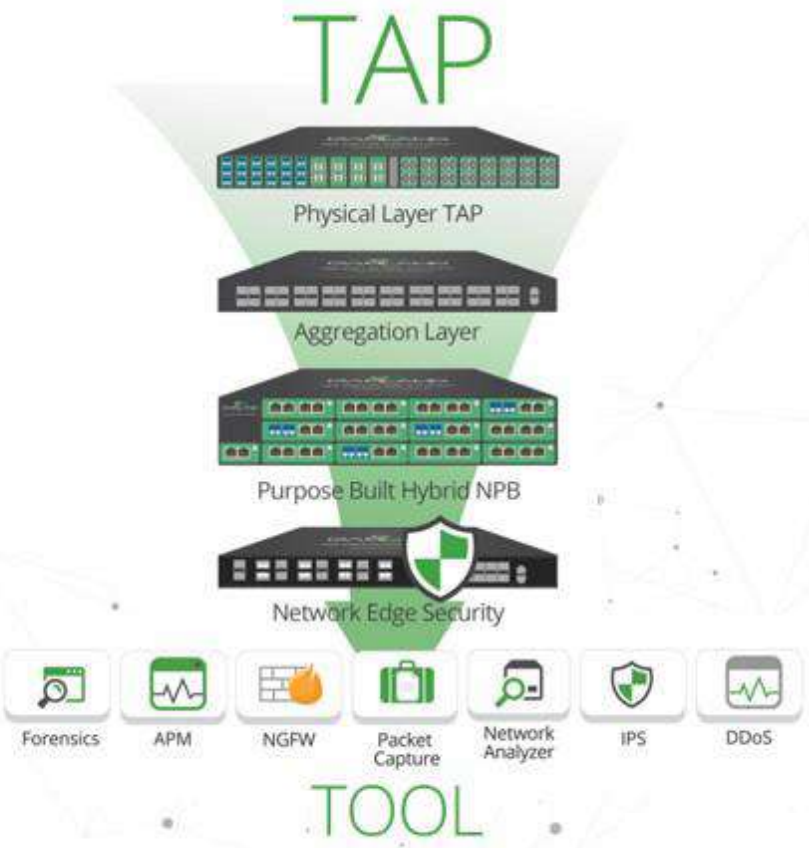
Network Packet Brokers: Deploy what you need

-Advanced Aggregation - Filters, Aggregation, and load balancing

-Advanced Features - Dedup, packet slicing, time stamping, etc

-Hybrid - Integrated TAPs with packet broker functionality

Tools | Feed your: Network Analyzers, IDS, SSL Decryption, NGFW, Packet capture, APM, IPS, DDoS



Thank you

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