SECURITY AS A SERVICE

SaSe SDWAN
EMPOWERING CONNECTIVITY

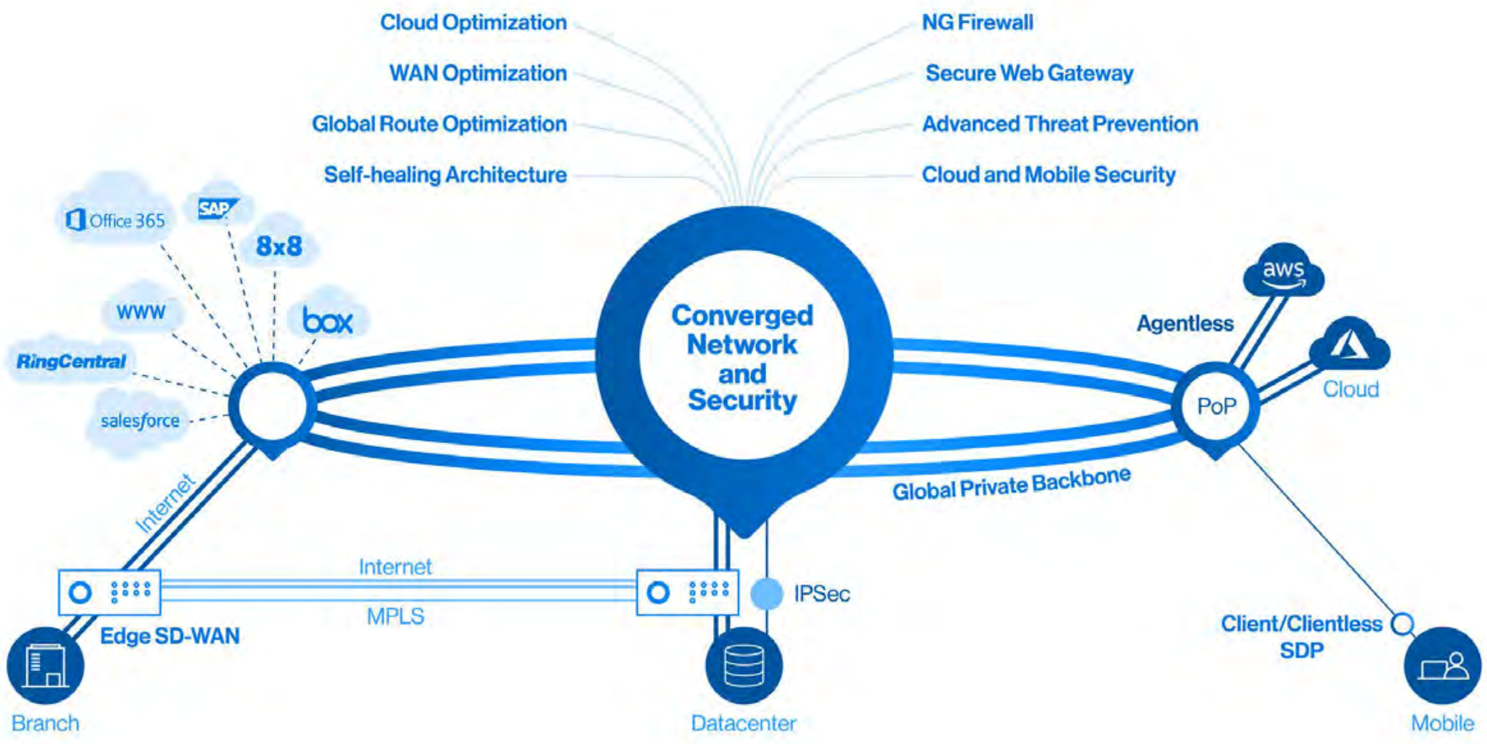
FOCUSNET TECHNOLOGY

Powered By CATO NETWORKS

Contents

Overview

Cato Networks provides a global and secure managed SD-WAN Service — the Cato Cloud. Cato Cloud was built from the ground up to enable networking and security teams to effectively protect the corporate network from today's rapidly changing threat landscape. Cato's unique characteristic is the convergence of the networking and security pillars into a single platform. Convergence enables Cato to collapse multiple security solutions such as a next generation firewall, secure web gateway, anti-malware, and IPS into a cloud service that enforces a unified policy across all corporate locations, users and data.



Because Cato is delivered as a cloud service, customers are relieved of the burden of upgrades and updates - a big resource hog. Customers also don't need to size or scale network security. All traffic passing to Cato's licensed security services will be handled according to the customer-specific security policy while Cato is taking care of the underlying infrastructure.

As part of the service, Cato employs a dedicated research team of security experts, Cato Research Labs, who continuously monitor, analyze and tune all the security engines, risk data feeds, and databases to optimize customer protection. Enterprises of all sizes are now able to leverage the security and threat detection expertise of Cato Research Labs and a hardened cloud platform to improve their security posture.

Last-and Middle-mile Security Architecture

Cato PoP Instances: Traffic Processing Engine

PoP Structure

At the core of the Cato Cloud is a cloud network, comprised of geographically distributed Points of Presence (PoPs) each running multiple processing servers. Each PoP runs a purpose-built software stack that applies routing, encryption, optimization, and advanced security services on all traffic. The PoP is comprised of multiple, powerful commodity off the shelf servers (COTS) running the same software stack.

PoP Scalability and Resiliency

Cato PoPs are designed to handle massive loads of traffic. Cato can scale processing capacity by adding server instances to the same PoP (vertical scaling) or adding PoPs in new locations (horizontal scaling). Since Cato maintains the infrastructure, customers are freed from sizing their network security environment. All licensed capacity, even if encrypted, is guaranteed to be processed by the Cato PoPs for all licensed security services.

If a PoP server instance fails, the impacted edges automatically reconnect to an available server within the same PoP. In case of a full PoP failure, the impacted edges will connect to the nearest available PoP. Regardless of which PoPs enterprise resources connect to, the Cato Cloud always maintains a consistent logical enterprise network, creating a substantial degree of availability and resiliency.

Built-in PoP DDoS Protection

Cato PoPs are built to process large amount of traffic simultaneously. Elastic capacity enables Cato Cloud to accommodate customer growth and withstand various types of flood attacks. To reduce the attack surface, only authorized sites and mobile users can connect and send traffic to the backbone. The external IP addresses of the PoPs are protected with specific anti-DDoS measures, such as SYN cookies mechanisms and rate control mechanisms. Cato owns a block of IPs in part for automatically reassigning targeted sites and mobile users to unaffected addresses.

Encrypted PoP Full Mesh

All PoPs are interconnected using fully-meshed, encrypted tunnels.The encryption algorithm is AES-256 and uses restricted symmetric keys (per PoP instance). Keys are rotated every 60 minutes to reduce key exposure.

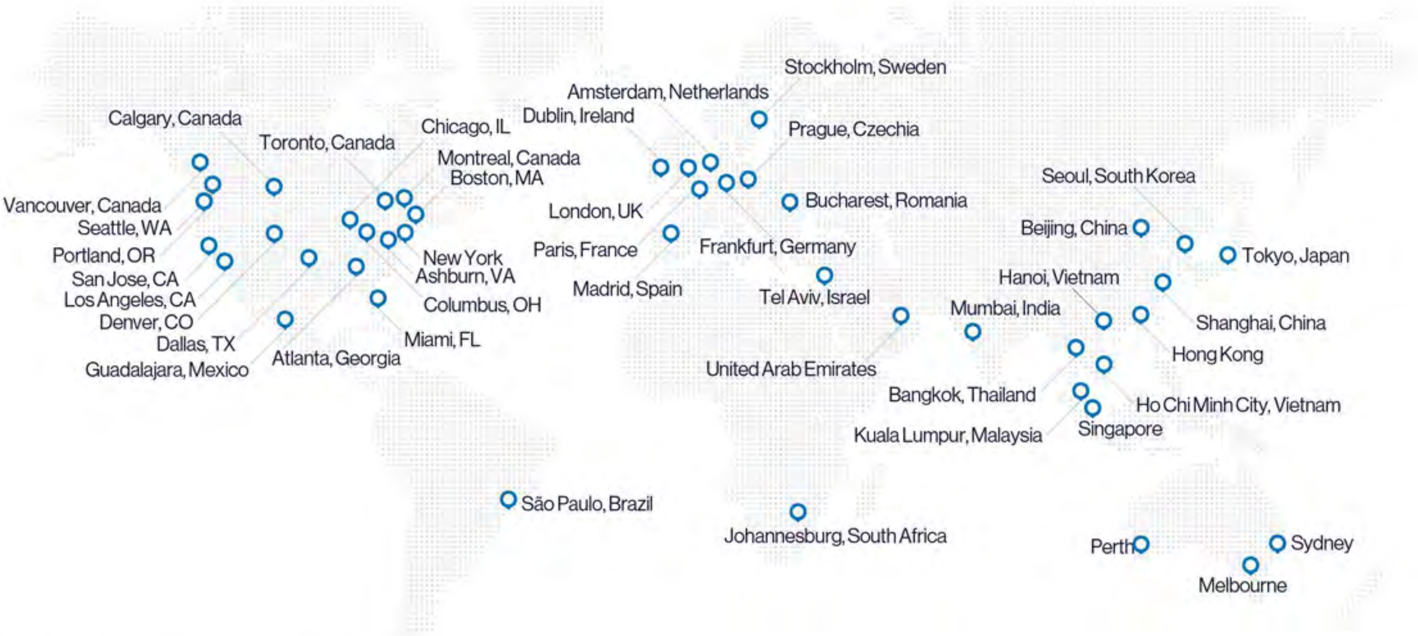
Deep Packet Inspection

The Cato PoP software includes a Deep Packet Inspection (DPI) engine built to process massive amounts of traffic at wire speed, including packet header or payload. The DPI engine is used by multiple Cato security services including NGFW anti-malware, IDS/IPS and network control (SD-WAN).

Our DPI engine automatically identifies thousands of applications and millions of domains on the first packet. This robust library is continuously enriched by third-party URL categorization engines and machine learning algorithms that mine a massive data warehouse built from the metadata of all traffic flows traversing Cato Cloud. Customers can also configure policies to identify custom applications or have that done for them by Cato engineers.

TLS Inspection

The Cato PoP can perform DPI on TLS-encrypted traffic for advanced threat protection service's such as anti-malware and IDS/IPS. TLS inspection is essential as a larger share of all Internet traffic is now encrypted, and malware uses encryption to evade detection. With TLS Inspection enabled, Cato decrypts and inspects encrypted traffic. Everything is done at the PoP so there are no performance constraints. To decrypt, the customer must install Cato certificates across its network. Customers can create rules to selectively apply TLS inspection to a subset of the traffic, such as filtering packets by application, service, domain, or category, or excluding packets from trusted applications or for reasons of regulatory compliance. Even if decryption is not applied or configured, all traffic is subject to NGFW, URL filtering, and IPS rules involving packet metadata, such as IP addresses and URLs.



Cato PoPs - Advanced Security Everywhere

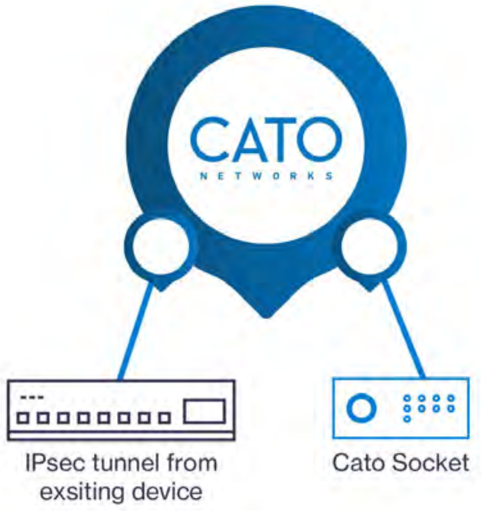
Cato Edges

Cato Socket and Appliance Connectivity

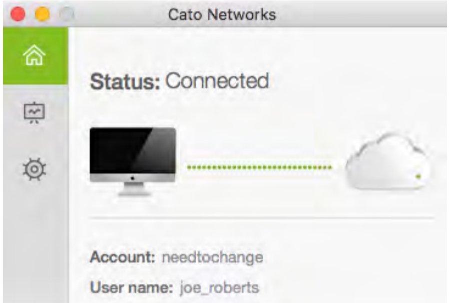
Customers connect to Cato through encrypted tunnels. A tunnel can be established in multiple ways. The Cato Socket is a zero-touch appliance deployed at physical locations. The Cato Socket dynamically connects to the nearest PoP across a DTLS tunnel for optimum security and efficiency. If a tunnel disconnects due to a PoP failure, the Cato Socket reestablishes the tunnel to nearest available PoP. Alternatively, customers can use IPsec- or GRE-enabled devices, such as UTMs or firewalls, to connect to the nearest PoP.

Sockets are secured by:

- Blocking all external traffic, only responding to authenticated traffic
- Restricting administrative access from internal interface via HTTPS or SSH
- Forcing administrators to set new passwords upon first-time login
- Storing no data from processed packets
- Encrypting all communications
- Securely distributing updates over an encrypted communication, cryptographically authenticated (digitally signed software packages)



Cato Client for Laptops and Mobile Devices


Cato Networks

Status: Connected

Account: needtochange

User name: joe_roberts

The Cato Client runs on mobile devices, including personal computers, tablets and smartphones covering Windows, Mac, iOS and Android. Cato Client uses device VPN capabilities to tunnel to Cato. Support is alsoavailable for additional VPN clients.

Onboarding of mobile Users can be initiated via integration with Active Directory, or through user configuration in the management application. Users are invited to register to Cato via email. Users provision themselves in several steps through a dedicated portal. User authentication can be done in several ways:

Username and Password: As part of the onboarding process and depending on the selected authentication method, users can set their authentication password. Cato ensures password confidentiality at all times, whether at rest or in transit

Multi-factor Authentication (MFA): Cato provides several methods of MFA, including SMS and Google Authenticator.

Single Sign-on (SSO): Cato supports integration with the corporate identity management system, authenticating users with their corporate credentials.

Security as a Service

Cato Security as a Service is a set of enterprise-grade and agile network security capabilities, built directly into the cloud network as part of a tightly integrated software stack. Current services include a next-generation firewall (NGFW), secure web gateway (SWG), advanced threat prevention, security analytics, and a Managed Threat Detection and Response (MDR) service. Because Cato controls the code, new services can be rapidly introduced without impact on the customer environment. Customers can selectively enable the services, configuring them to enforce corporate policies.

Next-generation Firewall

The Cato NGFW inspects both WAN and outbound Internet traffic. It can enforce granular rules based on network entities, time restrictions, type of traffic.

Application Awareness

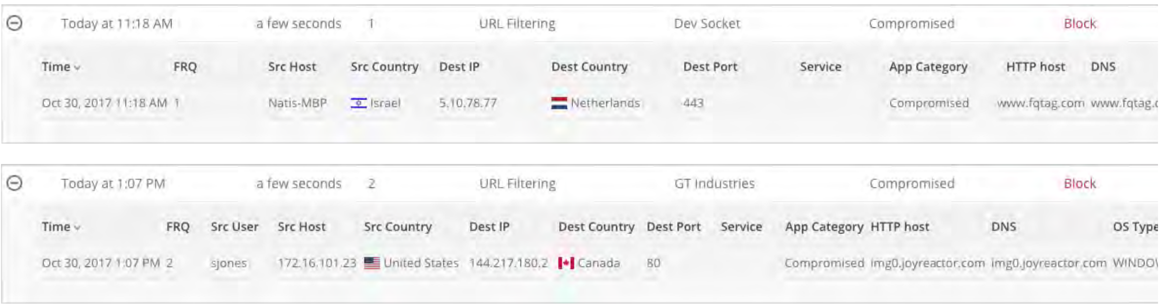
Cato NGFW provides full application awareness, regardless of port, protocol, evasive techniques, or SSL encryption. The DPI engine classifies the relevant context, such as application or services, as early as the first packet and without SSL inspection. The relevant information is extracted from network metadata. Cato Research Labs continuously enriches the application database to expand coverage.

The DPI-classified context is available throughout Cato whether for network and security monitoring; network visibility for identifying "Shadow IT" and other trends; or for enforcement, such as enforcing block/allow/monitor/prompt rules.

Cato provides a full list of signatures and parsers to identify common applications. In addition, custom application definitions identify account-specific applications by port, IP address or domain. Both types of application definitions are available for use by the security rules running in Cato.

User Awareness

Cato enables admins to create contextual security policies by defining and enabling access control to resources based on individual users, groups, or roles. In addition, Cato's built-in analytics can be viewed by site, user, group or application, to analyze user activity, security incidents and network usage.



⊖ Today at 11:18 AM a few seconds 1 URL Filtering Dev Socket Compromised Block

Time ⌄	FRQ	Src Host	Src Country	Dest IP	Dest Country	Dest Port	Service	App Category	HTTP host	DNS
Oct 30, 2017 11:18 AM	1	Natis-MBP	Israel	5.10.78.77	Netherlands	443		Compromised	www.fqtag.com	www.fqtag.c

⊖ Today at 1:07 PM a few seconds 2 URL Filtering GT Industries Compromised Block

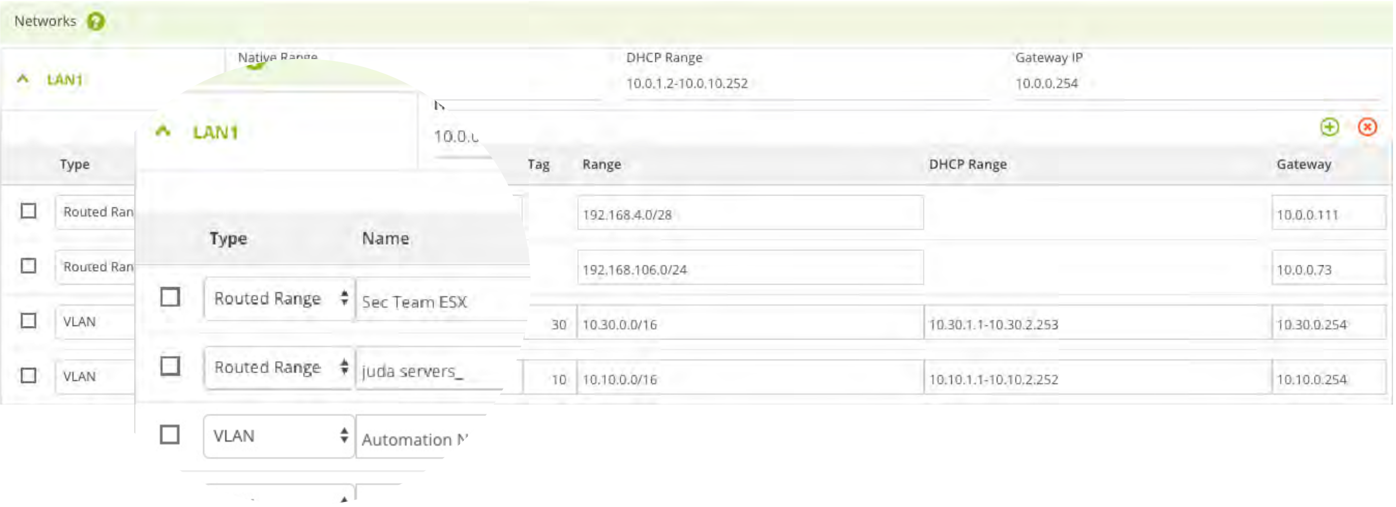
Time ⌄	FRQ	Src User	Src Host	Src Country	Dest IP	Dest Country	Dest Port	Service	App Category	HTTP host	DNS	OS Type
Oct 30, 2017 1:07 PM	2	sjones	172.16.101.23	United States	144.217.180.2	Canada	80		Compromised	img0.joyreactor.com	img0.joyreactor.com	WINDO

LAN Segmentation

Cato NGFW supports the definition of LAN segments as part of the site context. Cato supports several types of LAN segments:

- **VLANs:** VLAN tags are stripped as packet enter the Cato Cloud, then upon re-entering the LAN the VLAN tag is re-applied
- **Routed Range:** LAN segments that are connected through a router into a Socket
- **Direct Range:** LAN segments that are directly connected to the Socket, not via a router, and are different than the site's native range

By definition, no traffic is allowed between different segments. Allowing such connections requires the creation of local segmentation rules, enforced by the Cato Socket, or the creation of WAN firewall rules that are enforced by the Cato Cloud with full inspection of the traffic.



Networks

LAN1

Native Range	DHCP Range	Gateway IP
	10.0.1.2-10.0.10.252	10.0.0.254

	Type	Tag	Range	DHCP Range	Gateway
□	Routed Ran		192.168.4.0/28		10.0.0.111
□	Routed Ran		192.168.106.0/24		10.0.0.73
□	VLAN	30	10.30.0.0/16	10.30.1.1-10.30.2.253	10.30.0.254
□	VLAN	10	10.10.0.0/16	10.10.1.1-10.10.2.252	10.10.0.254

LAN1

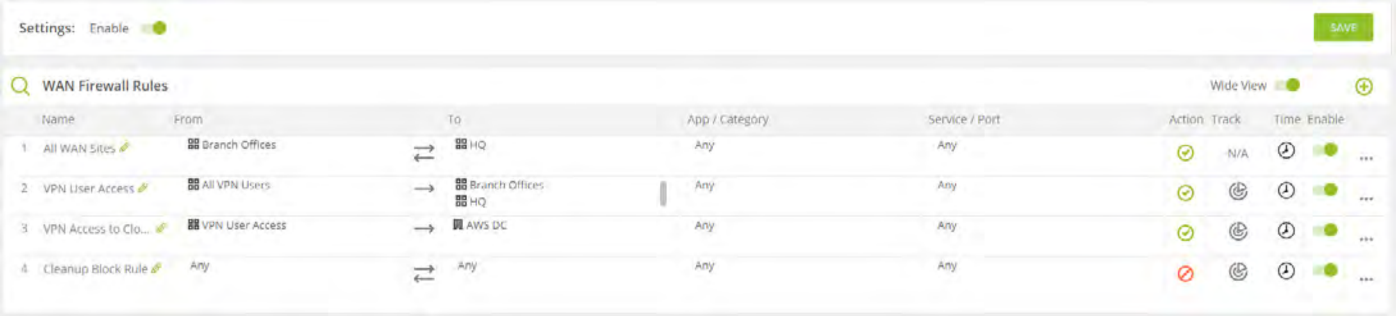
10.0.ı

	Type	Name
□	Routed Range	Sec Team ESX
□	Routed Range	juda servers_
□	VLAN	Automation N

LAN Segmentation Specifications

WAN Traffic Protection

Using the WAN firewall, security admins can allow or block traffic between organizational entities such as sites, users, hosts, subnets, and more. By default, Cato's WAN firewall follows a whitelisting approach, having an implicit any-any block rule. Administrators can either follow this approach or switch to blacklisting.



Settings: Enable ●

SAVE

WAN Firewall Rules

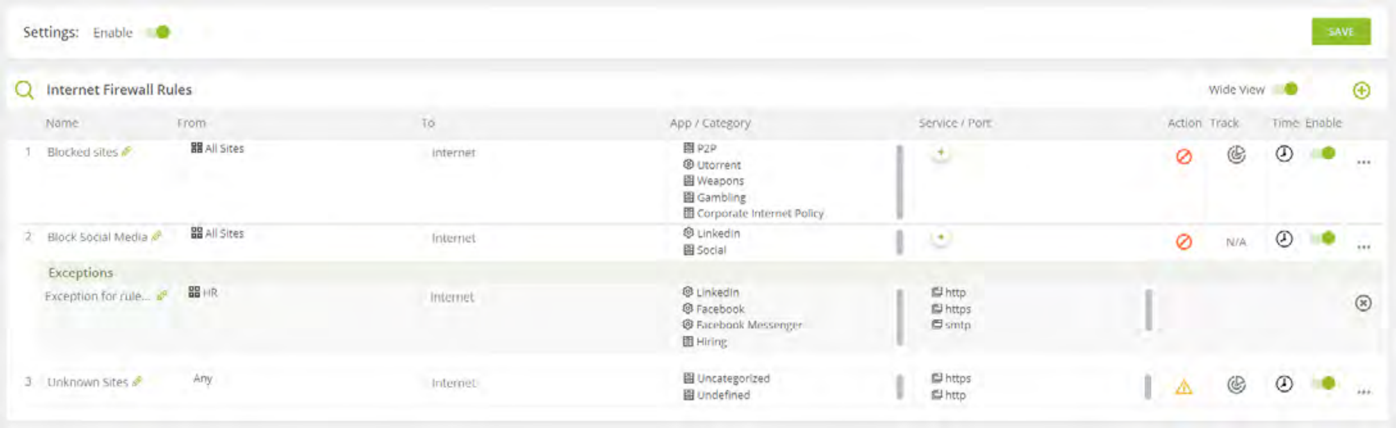
Wide View ●

	Name	From		To	App / Category	Service / Port	Action	Track	Time	Enable
1	All WAN Sites	Branch Offices	⇄	HQ	Any	Any	✓	N/A	🕓	●
2	VPN User Access	All VPN Users	→	Branch Offices HQ	Any	Any	✓		🕓	●
3	VPN Access to Clo...	VPN User Access	→	AWS DC	Any	Any	✓		🕓	●
4	Cleanup Block Rule	Any	⇄	Any	Any	Any	⊘		🕓	●

WAN Sites Access Rules

Internet Traffic Protection

Using the Internet firewall, security admins can set allow or block rules between network entities such as sites, individual users, subnets, and more to various applications, services, and websites. By default, Cato's Internet firewall follows a blacklisting approach, having an implicit any-any allow rule. Thus, to block access, you must define rules that explicitly block connections from one or more network entities to applications. Admins can switch to whitelisting if necessary.



Settings: Enable ●

SAVE

Internet Firewall Rules

Wide View ●

	Name	From	To	App / Category	Service / Port	Action	Track	Time	Enable
1	Blocked sites	All Sites	Internet	P2P Utorrent Weapons Gambling Corporate Internet Policy	+	⊘		🕓	●
2	Block Social Media	All Sites	Internet	Linkedin Social	+	⊘	N/A	🕓	●
	Exceptions								
	Exception for rule...	HR	Internet	Linkedin Facebook Facebook Messenger Hiring	http https smtp				
3	Unknown Sites	Any	Internet	Uncategorized Undefined	https http	⚠		🕓	●

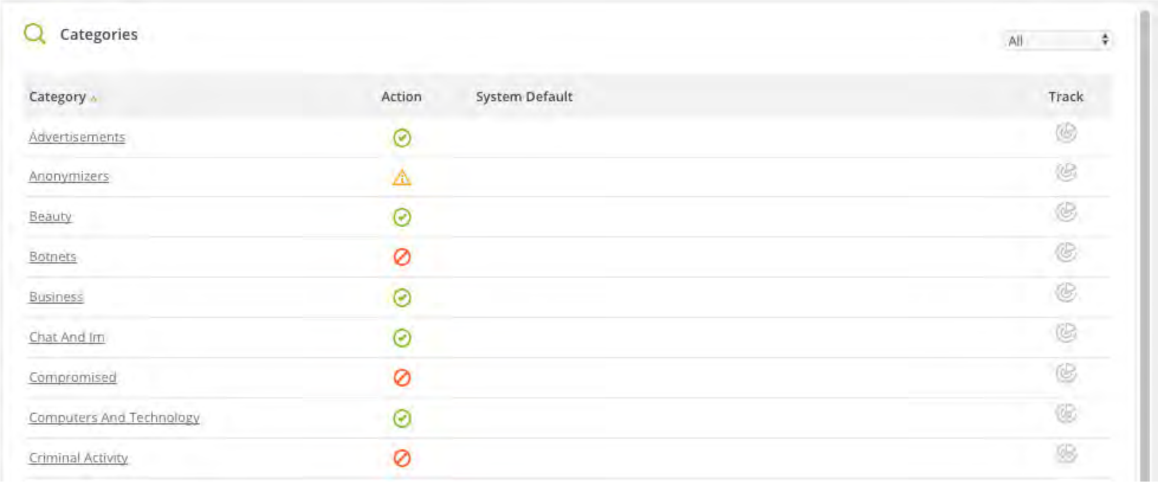
Internet Applications Access Rules

Secure Web Gateway

Secure Web Gateway allows customers to monitor, control and block access to websites based on predefined and/or customized categories. Cato creates an audit trail of security events on each access to specific configurable categories. Admins can configure access rules based on URL categories.

URL Categorization and Filtering Rules

Out of the box, Cato provides a predefined policy of dozens of different URL categories including security-oriented categories such as Suspected Spam and Suspected Malware. As part of the default policy, each category is set with a customizable default actions. Cato enables admins to create their own categories and use them in custom rules, enhancing the granularity of web access control.



Categories

All

Category	Action	System Default	Track
Advertisements	✓		◎
Anonymizers	⚠		◎
Beauty	✓		◎
Botnets	⊘		◎
Business	✓		◎
Chat And Im	✓		◎
Compromised	⊘		◎
Computers And Technology	✓		◎
Criminal Activity	⊘		◎

URL Categories and Default Action

URL Filtering Actions

Each category of URL filtering rule has the following actions:

- **Allow:** lets the user access the target URL.
- **Block:** prevents the user from accessing the target URL, redirecting to dedicated blocking page.
- **Monitor:** lets the user access the target URL and records the access event in the event log.
- **Prompt:** redirects the user to a dedicated warning page about the URL. The user can decide whether or not to proceed. This event is recorded in the event log.

Anti-malware

As part of Cato's Advanced Threat Protection, Cato offers several premium services. One of these is anti-malware protection. Customers can use this service to inspect both WAN and Internet traffic for malware. Anti-malware processing includes:

Deep Packet Inspection of traffic payload for clear and encrypted traffic (if enabled). File objects are extracted from the traffic stream, inspected, and blocked, where appropriate.

True Filetype Detection is used to identify the actual type of a file going over the network regardless of its file extension or the content-type header (in case of HTTP/S transfer). Cato uses this capability to detect all potential high-risk file types, defeating evasion techniques that are used by either attackers or misconfigured web-applications. This engine is also used by Cato IPS providing more context during flow analysis and acts as a key factor in detection of malicious network behavior.

Malware Detection and Prevention leverages multi-layered and tightly-integrated anti-malware engines. First, a signature and heuristics-based inspection engine, which is kept up-to-date at all times based on global threat intelligence databases, scans files in transit to ensure effective protection against known malware.

Second, we've partnered with SentinalOne, an industry leader, to leverage machine learning and artificial intelligence to identify and block unknown malware. Unknown malware can come as either zero-day attacks or, more frequently, as polymorphic variants of known threats that are designed to evade signature-based inspection engines. With both signature and machine learning-based protections, customer data remains private and confidential, as Cato does not share anything with cloud-based repositories.

Processing happens at line speed, without imapct to the end user experience. When a malicious file is detected, user access will be blocked, and the user will be redirected to a block page.

Customers have the ability to configure Cato's anti-malware service to either monitor or block. It is possible to apply exceptions for specific files for a set duration.

IPS

Cato's Intrusion Prevention System (IPS) inspects inbound and outbound, WAN and Internet traffic, including SSL traffic. IPS can operate in monitor mode (IDS) with no blocking action taking place. In IDS mode, all traffic is evaluated and security events are generated.

IPS Protection Engines

The Cato IPS is comprised of several layers of protection:

Behavioral signatures: Cato IPS looks for deviation from normal or expected behavior of the system or the user. Normal behavior is identified by using Cato's big data analytics and our deep traffic visibility across many networks. For example, an outgoing HTTP connection to an unknown URL containing a suspicious TLD. Following research that was conducted by Cato Research Labs, such traffic is likely to be malicious.

Reputation Feeds: Leveraging both in-house and external intelligence feeds, the Cato IPS can detect or prevent inbound or outbound communication with compromised or malicious resources. Cato Research Labs analyzes many different feeds, validates them against traffic in the Cato Cloud, and sanitizes them to reduce false positives before applying them to production customer traffic. Feeds are updated on an hourly basis without any involvement of the customer.

Protocol Validation: Cato IPS validates packet conformance to the protocol, reducing attack surface from exploits using anomalous traffic.

Known Vulnerabilities: Cato IPS protects against known CVEs, and rapidly adapts to incorporate new vulnerabilities into the IPS DPI engine. An example of this capability is how Cato IPS blocks the Eternal-Blue exploit used extensively to spread ransomware within organizations. (For more information, see here and here.)

Malware Communication: Cato IPS can stop outbound traffic to C&C servers based on reputation feeds, and network behavioral analysis.

Geolocation: Cato IPS enforces a customer-specific geo-protection policy, optionally stopping traffic based on the source and/or destination country.

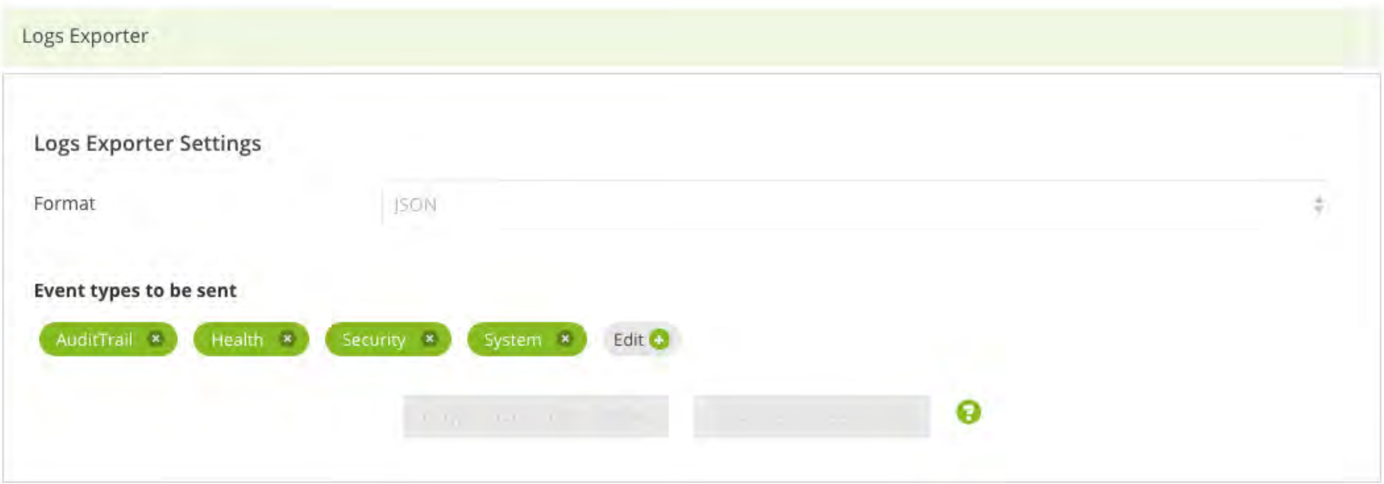
Network Behavioral Analysis: Cato IPS can detect and prevent inbound/outbound network scans.

IPS Managed Service

One of the unique characteristics of the Cato IPS is that it is provided as a service with zero involvement required from the customer. Cato Research Labs updates, tunes and maintains IPS signatures, both those developed in house (based on big-data collection and analysis of customers' traffic), and those originating from external security feeds. Cato Cloud scales to support signature processing so customers don't have to balance protection and performance to avoid unplanned upgrades as processing load exceeds available capacity.

Security Events API

Cato continuously collects networking and security event data for troubleshooting and incident analysis. A year of data is kept by default. Admins can access and view this data through the Cato Management Application. Cato allows customers to export event log files (in either JSON or CEF format) for integration with a SIEM system or storage in a remote location. The log files are stored in a secure location, and each account is privately separated from other accounts.



Logs Exporter

Logs Exporter Settings

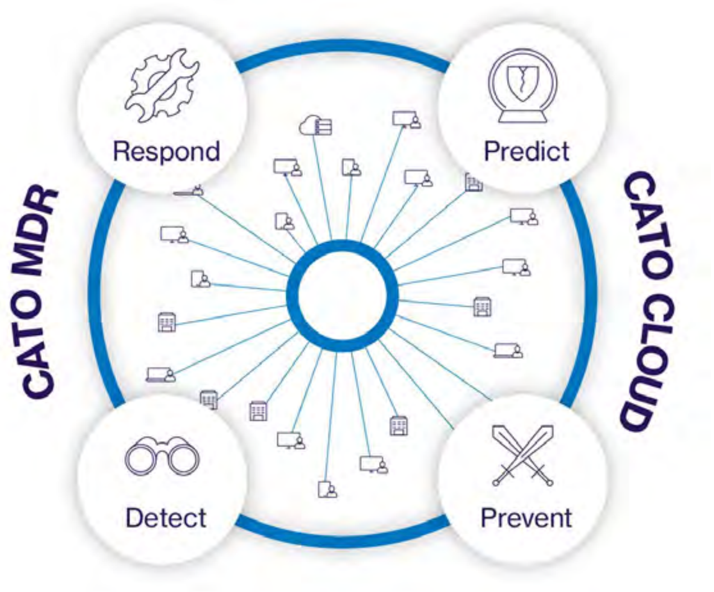
Format: JSON

Event types to be sent

The Log Exporter (JSON shown)

Managed Threat Detection and Response

Cato MDR enables enterprises to offload the resource-intensive and skill-dependent process of detecting compromised endpoints to the Cato SOC team. Cato seamlessly applies a full MDR service to customer networks. Cato automatically collects and analyzes all network flows, verifies suspicious activity, and notifies customers of compromised endpoints. This is the power of networking and security convergence to simplify network protection for enterprises of all sizes.



The MDR service adds means of detection and response to the prediction and prevention means delivered by Cato Cloud

Cato MDR Service Capabilities

Zero-footprint Network Visibility

Cato gathers complete metadata for every Internet and WAN flow initiation, including originating client, timeline, and destinations. All without deploying any network probes.

Automated Threat Hunting

Advanced algorithms look for anomalies in Cato's flow data warehouse and correlate them with threat intelligence sources. This machine learning driven process produces a small number of suspicious events for further analysis.

Expert Threat Verification

Cato security researchers review flagged endpoints and traffic over time and assess the risk. The Cato SOC will only alert on actual threats.

Threat Containment

Verified live threats can be contained automatically by configuring customer network policies to block C&C domains and IP addresses or disconnect a compromised machine or user from the network.

Remediation Assistance

The Cato SOC will advise on the threat level of risk, recommended remediation, and a follow up until the threat is eliminated.

Reporting and Tracking

Every month, the Cato SOC will issue a custom report summarizing all threats detected, their descriptions and risk levels, as well as impacted endpoints.

Summary

Cato's Security as a Service enables organizations of all size to apply enterprise-grade traffic everywhere. Datacenters, branches, mobile users, and cloud resources can be protected under a unified policy and with the same set of defenses. As a cloud service, Cato seamlessly optimizes and adapts security controls for emerging threats without any customer involvement. Traditional chores associated with appliance-based security, such as capacity planning, sizing, upgrades, and patches, are no longer needed, offloading that responsibility from security teams.

SaSe SDWAN

EMPOWERING CONNECTIVITY

FocusNet underpinned by CATO Networks is empowering enterprises with the visibility and control they need to connect, secure, and run their networks, with the support of expert managed services.

Would you like to see the platform in action?

GET A DEMO

Get in touch with our SaSe SD-WAN specialist today.

sdwan@focusnet.com.au

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