

Cisco Encrypted Traffic Analytics Security Performance Validation

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March 2018 DR180222D

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1.0 Executive Summary

Enterprises seeking privacy and security rely on applications that use Secure Sockets Layer/Transport Layer Security (SSL/TLS) encryption for in-transit messaging where data is hidden and protected from unauthorized users. Communications, transactions and applications depend on encryption to shield its sensitive content from listening attackers.

It would seem this private communication method was foolproof for avoiding threats, but users have a false sense of protection. Encrypted traffic is now just another means of transporting malware, undetected in its encapsulated form. This can have catastrophic effects, and with each passing minute data is compromised. Average breach detection takes over six months and containment requires about two months – costing an organization upwards of \$3 million.

Most enterprises examine encrypted traffic by decrypting it first, using techniques such as Manin-the-Middle (MITM) proxy and security products like a firewall or intrusion prevention system. But this is time consuming and drains network performance and resources. Additionally, decrypted data is now vulnerable to attacks and complicates compliance due to its storage in unencrypted form.

To prove the capabilities of a solution that doesn't require decryption to discover threats in encrypted traffic, Cisco Systems engaged Miercom to perform an independent security efficacy and performance assessment of its Encrypted Traffic Analytics (ETA) solution for their line of new Catalyst 9000 switches, ISR/ASR/CSR routers in an enterprise network. Cisco ETA is a novel approach that uses metadata of encrypted traffic exported by the switches and routers in a NetFlow v9 record to identify behavioral anomalies which may indicate suspicious events. These flows are pushed to Cisco Stealthwatch Enterprise and its Global Threat Analytics, a cloud-based function of Stealthwatch Enterprise, for further analysis, risk assessment and action.

We evaluated the Cisco ETA feature for functionality and cohesion with the Cisco Catalyst switches, ASR1K routers, and Stealthwatch Enterprise enhancements in a large enterprise test environment of two systems - with and without Cisco ETA. By running a range of malware threats through each system, we determined the detection time and efficacy. From this we compared results to further deduce the positive impact of Cisco ETA deployment.

Key Findings and Conclusions

• Using the power of multi-layer machine learning, Stealthwatch creates a baseline of normal web and network activity for a host, and applies context-aware analysis to automatically detect anomalous behaviors. ETA further enhances this solution by dramatically improving speed and accuracy over time.

- Cisco ETA showed as much as 36 percent higher rates of detection than the non-ETA system, finding 100 percent of threats within three hours.
- In under five minutes, ETA detected nearly two-thirds of all malicious flows almost double that of the non-ETA path.
- For increased flows, ETA threat detection grew more accurate and identified 100 percent of threats after 2000 flows, outperforming the non-ETA path by 8 percent.
- With only 0 to 20 flows, ETA discovered over 9 times the amount of threats than the system without it.
- After the Fast Detections stage was completed, threats were ranked by severity and readily displayed with detailed information and remediating action once confirmed.
- Stealthwatch Enterprise with Cisco ETA displays a detailed view of detected threats for additional intelligence on threat sources and similar threats in the network infrastructure.
- Crypto Standard and Revision Levels of traffic can be monitored, assessed and displayed using the additional fields available in Stealthwatch Enterprise "Flow Search" capability to ensure Corporate Cryptographic Compliance and to assist in policy actions.

The test results confirm that Cisco's Encrypted Traffic Analytics delivers impressively fast, efficient and intelligent threat detection for highperforming enterprise security. We proudly award the Cisco Encrypted Traffic Analytics the **Miercom Performance Verified** certification.



Robert Smithers

CEO

Miercom

2.0 About the Product Tested

Encrypted Traffic Analytics (ETA)

ETA is an IOS-XE feature that includes Enhanced NetFlow and uses advanced behavioral algorithms to identify malicious traffic patterns hiding in encrypted traffic. Through the analysis of message metadata and telemetry, ETA'S analysis does not require message decryption.

As additional flows are examined, patterns of metadata form a baseline of normal traffic. Any irregularities which contrast with this baseline are called out. By using metadata instead of decrypted processing as other security solutions do, ETA focuses on relevant elements rather than every single message. This dramatically reduces the negative impact of security on performance, time and resources.

ETA Components

- **NetFlow** Identifies each flow using packet information (IP addresses, Layer 4 port numbers, timestamps, packet statistics)
- Stealthwatch Enterprise Collects information from proxy servers, endpoint telemetry, policy and access engines, traffic segmentation to establish baseline behavior across the network to correlate traffic with threat behavior. Stealthwatch Enterprise also uses machine learning via its Global Threat Analytics to create a history of normal traffic, identify anomalies in flow sequences, build a behavior baseline for each host or category and update its cloud-based intelligence with malware sources and signatures

With all these components, ETA creates a contextual map to detect inbound and outbound threats, as well as discover malware activity already operating on hosts within the protected network. Detected threats are assessed for risk severity and confirmed with detailed information.

An enterprise no longer has to wait months to discover encrypted breaches. Cisco ETA can deliver detection and remediation in just a few hours.

System Versions

ASR1001-X router: IOS XE 16.6.2 release with an enterprise license

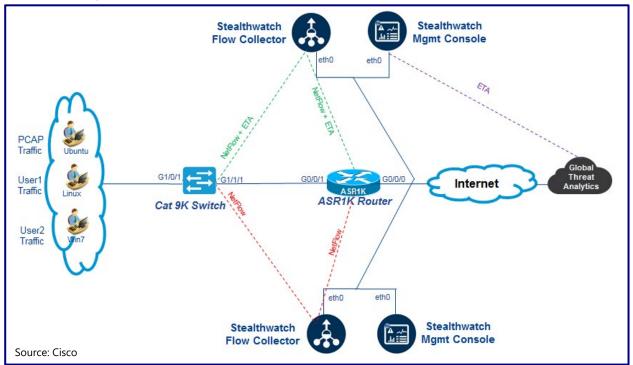
Cisco Catalyst 9300 switch (C9300-24P): IOSXE 16.6.2, Network Advantage & DNA Advantage licenses **Stealthwatch Enterprise (Flow Collector & Management Console) virtual appliances:** release with 6.9.2-01 ROLLUP patch installed on a Cisco UCS C200 M2

PCAP PC: Ubuntu 16.04.3 LTS installed on a Cisco UCS C200 M2

3.0 How We Did It

We tested the ability of Cisco ETA to identify and mitigate malware and exploits using a combination of generated and live malware. Threats were publicly available and privately captured, with some being unencrypted and others encrypted. Threats covered in our testing include exploits such as Trojans, Botnets, Ransomware and keyloggers. Additionally, we used malware samples that used TOR relay networks to evade detection. At least two-thirds of these threats used encrypted communications.

These samples were used to determine how quickly these known threats could be discovered. Threat flows were run at a normal traffic speed and lasted from a few minutes to several hours. The time of detection was measured with ETA on and off, for each flow routed through two separate systems.



Test Bed Setup

A set of laptops served as the source of different types of generated malware traffic. Timing was set to be as close to that of traffic configurations connected to the public internet. A selection of live generated and recorded traffic was used to emulate a variety of attack modes. Traffic was routed through a Cisco Catalyst 9300 switch and Cisco ASR1001-X router along two paths. On one path, ETA was enabled. On the other, ETA was disabled. Both paths had streams of NetFlow and Stealthwatch Enterprise data passed onto Stealthwatch Enterprise cloud-based Global Threat Analytics to demonstrate these machine learning abilities with and without ETA enabled.

4.0 Encrypted Traffic Analytics Malware Detection

4.1 Progressive Detection of Malicious Flows

Testing primarily consisted of encrypted flows sent in two directions – with and without ETA. Without ETA, encrypted malware is detected using non-encrypted portions of the messages. With ETA, flow telemetry gathers information on initial data packet exchange before an encryption session establishes, message size, direction and timing within each flow to sense irregularities in encrypted traffic that may contain malware.

With Stealthwatch Enterprise, as more messages enter on a flow. Telemetry is gathered and stored in the cloud and is analyzed by a multi-layer machine-learning system to provide increasingly observant feedback about abnormal traffic. This includes information an operator can use to adjust the threat level of the traffic. With time, these updates provide an increasingly accurate categorization of old and new threats.

Results

The machine learning curves shown below are built on multiple stages of detection which include a feedback loop. New malware is detected and information about these threats is fed back into the system to further identify attacks earlier in this cycle.









Testing covered Phase 1 and 2 of the full ETA Detection and Confirmation process. This "Fast Detections" portion, shown above in green, uses message headers and telemetry of bidirectional traffic flows captured by ETA to identify suspicious behavior. The remaining phases continue to detect, confirm and revise flow threat levels for new and legacy malware, as well as input from system operators on new potential threats. This feedback improves detection and remediation for real threats and identifies any false positives.

Summary

Testing observed Fast Detections made by cloud-based, machine learning malware detection using information gathered by ETA.

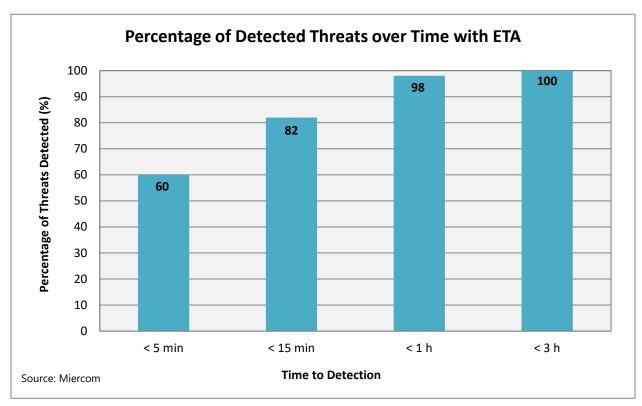
Global Detections

week(s)

4.2 Time to Detect Encrypted Malware with and without ETA

The system measured the time it takes to identify flows that are known malware threats. On the ETA path, threats were detected faster than the same flow detected on the non-ETA path as shown below.





The percentages of malicious flows detected over a three hour test period were recorded. The ETA path showed substantially higher detection rates than the non-ETA path, by as much as 36 percent. Within three hours, the ETA path detected all malicious flows. Without it, less than two-thirds were identified in the same timeframe. Immediate detection (under five minutes) and learning capabilities (over the course of three hours) of ETA showed impressive performance.

Summary

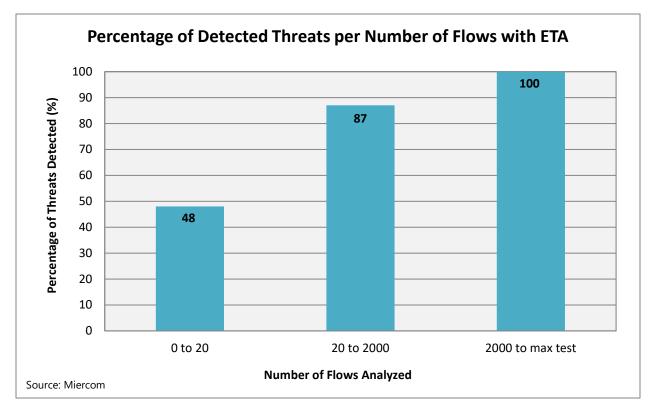
With ETA enabled, malicious flows are detected with speed and increased accuracy over time.

4.3 Role of Flows in Detection of Encrypted Malware with and without ETA

Detection accuracy was expected to improve as the number of flows increased. Flows with malicious messages contributed to the rise in accuracy by utilizing the feedback system of Phase 1 and 2 of Global Threat Analytics processing – known as Fast Detections.

The following two phases make use of the machine learning and operator feedback, allowing Detection and Confirmation of new incoming malware. These are discussed in the next section.

Results



With ETA, the first two hours of malware detection uses flow telemetry. Flows familiar to already detected flows are identified quickly. As flows increase, telemetry uses pattern anomalies to detect larger amounts of malicious flows over the course of 1-2 hours. For the first 20 flows, ETA found over 9 times the amount of threats as the path without ETA enabled. From 20 to 2000 flows, the non-ETA path is able to detect more threats, but its efficacy still falls 26 percent behind the ETA protected path. For 2000 flows or more, ETA found all threats and had an 8 percent higher rate of detection than its non-ETA counterpart.

Summary

More flows yield greater detection efficacy. ETA allows substantially higher detection rates even with just 0 to 20 flows. By 2000+ flows, it can find all threats while the non-ETA path cannot.

4.4 Detection Efficacy

Stealthwatch Enterprise's Global Threat Analytics is the core of ETA malware detection. While it discovers harmful activity already operating on protected network hosts, it is not designed to detect and block malware infection steps or executables in transit. Using a machine-learning system, a behavioral baseline is built for each host or category to determine changes and operator input. Any contrasting information is sent to the cloud for further analysis.

With more exposure to normal traffic, threats become increasingly apparent – as discussed in the previous section. This feedback loop continually updates the context of these threats, allowing Stealthwatch Enterprise create a ranking system of severity. Risk is rated 1 through 10, 10 being the most severe.

Low-level malware flows may go through an initial detection process, as shown below (left). As additional information is collected, this level may rise as pictured below (right). A confirmed threat is indicated by an encircled number.

Results



Figure 2: Stealthwatch Enterprise Detection and Confirmation

Source: Miercom

Threat severity reached the highest level of 10 where it was determined to be a ransomware attack. The number 10 risk-level was circled once confirmed as fitting all identifying characteristics of this type of attack.

Figure 3: Related Flows of a Detected Threat

MALWARE 100% confidence, in ≃CMST01 ★ NEW / TRIAGE ↔		AFFECTING unknown username 192.168.101.9 💬		OCCURRENT 29 minutes today - today
CTIVITIES AND FLOWS			SEVERITY FILTER: 3 8 7 6	4 3 2 1 Hide related
Activities (6 out of 7)	Domains (18 out of 20)	IPs (25 out of 26)	Autonomous systems (3 out of 4)	Time
	O lesnare.com	0 = 9.5MC 80.252.88.135		=
	static.248.24.243.136.clients.your-server.de (100%)	0 = 0 SMC 136.243.110.7		
8 (malicious host	O 5.9.12.146	O = 9.5MC 5.9.12.146		
	• 136.243.110.5	0 = 0 9.5MC 136.243.110.5		
8 O suspicious tis connection	O 136.243.110.79	O 💻 🛛 9.5MC 138.201.125.89	O Telecitygroup International Limited	
	O 138.201.125.89	O 🔳 9.5MC 138.201.125.90		
	O 138.201.125.90	0 a smc 138.201.125.93		
O suspicious connection	O dl5.iranmobile.org (69%)	O = 0.8MC 138.201.125.100 O = 0.8MC 138.201.125.95		
O suspicious connection	O dnsseed.dashdot.io (26%)	O		
		O 🗮 9.5MC 138.201.125.97	Hetzner Online GmbH	5,04
	O mobilpress.ru (100%)	O 🔳 9.5MC 138.201.125.105		mins
O suspicious connection	O ns2.okaaz.net (36%)	O 🔚 9.5MC 148.251.236.101		
	O ns21.cretaforce.gr (40%)	O 🧮 9. SMC 136.243.110.44		
		О 🥅 🛛 9, 8мс 136.243.110.69		
	O s69.igenteflow.com (52%)	O 🔚 9.5MC 138.201.125.99		
O suspicious connection	O s9.igenteflow.com (50%)	O 🗮 9.5MC 136.243.110.9	O Leaseweb USA, Inc.	
		O 🔚 9.5MC 138.201.125.94	C Lessewed USA, Inc.	-
	O static.83.110.243.136.clients.your-server.de (100%)	O 🔳 9.5MC 136.243.110.83		

Source: Miercom

Further detail can be found on each particular threat, showing where the flow originates and how it connects to known vulnerable systems used as sources for similar previous attacks.

DASHBOARD CONFIRMED DETECTED ९ 🖶 🛓 ≡ 1 HEALTH STATUS TOTAL AFFECTED 55 🚨 27 🔺 18 🚨 10 -RELATIVE THREAT EXPOSURE 1 WITHIN UNSPECIFIED SECTOR WITHIN SIMILARLY SIZED COMPANIES GLOBALLY above high high average HIGHEST RISK TOP RISK ESCALATIONS SPECIFIC BEHAVIORS 1 ? 1 4 O Click fraud * * 192.168.101.17 💮 8)7 192.168.101.18 💮 Malicious content distribution 1 O Click fraud + O Click fraud ttl today 0 2 hours A today * * 192.168.101.4 💮 7 192.168.101.15 💮 🖑 33 minutes ttî today A today 8 192.168.101.35 💮 7 10.11.27.102 💮

Figure 4: Actionable Confirmed Attribution

Source: Miercom

Over time, Stealthwatch Enterprise connects early detection with other related flows to reveal threat sources and similar threats. Possible events are displayed on a dashboard, separated as Detected and Confirmed. Events are further categorized by Threat Level. The interface continually informs operators of risk severity progression.

Figure 5: Detected Events List

DASHBOARD CONFIRMED DETER	CTED			৭ ≜ ≡
From: Jan 13, 2008 To: Jan 10, 2018	1 day 3 days 7 days 30 days 45 days			•• Incident Response Guide
55 TRIAGE 0 INVESTIGATING 0 REME	EDIATING 0 RESOLVED 55 ALL			
	liter			ad 🗸 Show low confidence 📮 🖓
INCIDENT	USER IDENTITY	 DURATION 	LAST SEEN	STATE
botnet in 2 CONFIRMED *	L 192,168.101.17	2 hours long 8 hours ago	Jan 10, 2018 13:44:59 GMT-08:00	NEW
8 malware	≜ 192.168.101.4	33 minutes long 8 hours ago	Jan 10, 2018 13:07:16 GMT-08:00	NEW
8 botnet	▲ 192.168.101.35	2 hours long 8 hours ago	Jan 10, 2018 13:44:59 GMT-08:00	NEW
8 botnet	▲ 192.168.101.15	2 hours long 8 hours ago	Jan 10, 2018 13:44:59 GMT-08:00	NEW
8 botnet	â 192.168.101.34	2 hours long 8 hours ago	Jan 10, 2018 13:44:58 GMT-08:00	NEW
8 malware	â 10.12.22.101	1 second long 7 hours ago	Jan 10, 2018 13:09:39 GMT-08:00	NEW
8 botnet	L 192.168.101.3	2 hours long 8 hours ago	Jan 10, 2018 13:43:59 GMT-08:00	NEW
8 malware	â 10.12.19.102	37 minutes long 7 hours ago	Jan 10, 2018 13:44:36 GMT-08:00	NEW
8 malware	å 10.12.26.102	13 minutes long 7 hours ago	Jan 10, 2018 13:24:58 GMT-08:00	NEW

Source: Miercom

Threats are sorted by incident, identity (e.g. IP address), attack duration, time last seen and state.

Figure 6: Confirmed Threat Detail

DASHBOARD CONFIRMED DETECTED					৭ ≜ ≡
Add notes	AFFECTING 1 user @ 100+ users in 100+ companies @	S OCCU 27 minut Jan 10 -	85	TRIAGE 8 risk #CMST01	NVESTIGATING REMEDIATING RESOLVED
Threat related to a family of advare bundle installers most common campaigns. Once in the system, this type of advare attempts to dow InstallCore advare and bundled software can negatively impact tore escalate into one over time. Perform a full scan of the device to rem	wnload and install additional potentially unwanted applica wsing experience, device's hardware performance, secur love any possible infection. Look for additional confirmed	tions (PUA), malicious browser extensions, rity, and privacy. This is a low risk behavior t	and may lead to malware infections. hat may indicate an infection or may	8 risk #CRDM01	2 last seen Jan 10, 2018 for 19 hours and counting
it. If nothing is found, monitor the user activity for further escalations				6 risk #CTDS02	1 test seen Jan 10, 2018 for 2 hours and counting
1 user affected by this threat during the last 46 days with unresolved incident a 192.168.101.2	S			5 risk #CADW03	i Iast seen Jan 10, 2018 for 27 minutes and counting
INFECTION HISTORY Number of users exhibiting malicious behaviors during the 44 days before yes 1	torday.		_		
Active Meetitows					
0 Dec 3 1	Dec 10 Dec 17	Dec 24 Dec	31 Jan 7		
EXAMPLE WEB REQUESTS EXPAND ALL Web requests representing threat behavior in your network.					
http://rp.robotitor.com/?v=2.0&subver=6.21&pcrc=1486312500					

Source: Miercom

Confirmed threats give more detail about the attack, showing a complete description of the threat, affected users, infection history, examples, and last occurrence.

Figure 7: Attack Source Information

8 MALWARE 75% confidence * NEW / TRIAGE -			4	AFFECTING unknown username 10.12.19.102				-	OCCURRENO 37 minutes oday - today
Add notes					SEVE	RITY FILTER:	98765	820	Hide related
Activities (3)		Domains (4)		IPs (2)	Autonomous system	ms (2)			Time
8 suspicious tis connection		kedfortmoleft.ru o arrepsinrab.com			 Mir Te 	lematiki Ltd			3 hrs,
O suspicious connection O suspicious connection		O ftp.irc24.ru (59%) O gedidnundno.com (48%)		О 🚃 9.5мс 193.33.133.88	O PJSC	Rostelecom			hrs, 53 mins
UPLOAD 22.0 KiB	DOWNLOAD 88.8 KIB	REQUESTS 1		DURATION 6 seconds	USER AGENTS 0		NO REFERRER 100%		HTTP 0
Client IP, Server IP, URL, SHA	Filter								φc
TY TIMESTAMP	CLIENT FIRST	CLIENT LARGE SERVER IP	SERVE . NETWORK PR	URL	DURATIOI PASSIVE DNS	CLIENT TOT	AL CLIENT TOTAL	SERVER BYTE	SERVER PAC
E Jan 10, 2018 13:10: 10.12.19.102	49188	49192 7 9 SMC 185.130.212.1	443 TCP	https://kedfortmoleft.ru	6 s ftp.irc24.ru (Prob	00504	108	90951	137

Source: Miercom

This view shows more detail on the attack source by activity, domains, IP addresses and systems as well as the affected user, by username and/or IP address.

Figure 8: Stealthwatch Enterprise Dashboard: Full View

cisco Stealthwatch	nitor Analyze Jobs	Configure Deci	a v							역 🧘 🌣 Desktop Client •
& Security Insight Dashboar										
Alarming Hosts O										- 2
Concern Index	Target Index	Recon	CBC	Exploitation	DDoS Source	DDoS Target	Data Hoarding	Exfiltration	Policy Violation	Anomaly
3								1		
-								-		_
Top Alarming Hosts			- /	Alarms by Type			- 🖍 Today's Alam	15		- 2
HOST 10.1.2.3 😑	CATEG	ORY		2.5	Alarms by Type				Today's Alarms	
Catch All 10.29.43.181 😑				a :			i			
Catch All	CI						-			
Catch All	CIE	3	View All Hosts >					High Concern Index: 1		ICMP Flood: 1
			View All Hosts >	8.5						
				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 01/06 01/07		01/18			
					ICMP Flood High Concern Ind	es .				
Cognitive Threat Analytics			- 2	Flow Collection Trend			- 🖍 Top Application	ans		- 2
AFFECTED USERS BY RISK Critical High	Medium	Low	Total		Flow Collection Trend				Top Applications	
0 4 27 4 0 192.168.101.17 -	18 🔺	10 📥	55 🛓							
Click fraud 192.168.101.4 G			ENCRYPTED	1						ICMPI 37-178
(8) 192.168.101.35 ⊕				22-			-	ICMP 49 976		
(8) 192 168 101 15 ⊕				1.						
(8) 192.168.101.34 ⊕				8 728.PM 7.50.PM	232 PM 234 PM 236 PM	7.38.PM 2.43.PM 2.4	42 PM			
(8) 10.12.22.101 ⊖			(ENCRYPTED) View Dashboard >		karangas-eta-fc				Undefined G	5P. 12.12N

Source: Miercom

The processing is completed using its Security Insight Dashboard where additional information can be found for Detection and Confirmation.

Summary

Threats are detected, ranked by risk based on growing information gathered by flows and confirmed with complete background on source, history, examples, timestamps and associated hosts or systems. The Stealthwatch Enterprise dashboard gives a full view using visual widgets.

5.0 Crypto Analytics

In corporate situations where there are cryptographic standards to be followed such as for PCI Compliance or Corporate IT governance to eliminate vulnerable applications, Stealthwatch Enterprise with ETA provides the data to determine if vulnerable applications are actually being used by corporate network users. This display shows the cryptographic protocol, and its version, so that corporate managers can see if users are up to date on their corporate standards.

In the magnified view, the "Encryption TLS/SSL Version" being used is "TLS 1.2". This may show other versions, such as "TLS 1.1" which may not be the approved version for corporate use, in which case the source and destination of such traffic can be identified and the Corporate standard enforced.

5.1 Corporate Cryptographic Compliance

This cryptographic assessment is displayed in Stealthwatch Enterprise and can be exported to third-party tools for monitoring and auditing of encryption compliance. It includes the encryption standard and revision level used. It is then up to the corporate policies to determine what actions to take.

-il ci	ISCO	ealthwa	atch									Desktop	Client ¥	TIME SINCE START 3m 34.44s - 9h 38m 51.64s (16)	
0	Des w Search I	ntoards Results (8		elyzne Jobs	Configure	Depicy				Seve So	arch] Save Result	Start N	lew Search	9h 38m 51.54s - 19h 14m 8.54s (43) 19h 14m 8.54s - 1d 4h 49m 26.04s (73) 1d 4h 46m 26.04s - 1d 14h 24m 43.24s (11) 1d 14h 24m 43.24s - 2d 0.44s (14) Select Multiple	
Edit		e Range: Last 2	Days								100% Complete	D	elete Search	ACTIVE DURATION	
Subj	ject: Orie	ntation: Either		-	-				-	Manage Colum	ns Filter Results	Export		0s - 2h 23m 53 2s (153) 2h 23m 53 2s - 4h 47m 46.4s (0) 4h 47m 46.4s - 7h 11m 39.8s (0) 7h 11m 39.6s - 9h 35m 32 8s (0) 9h 35m 32 8s - 1h 55m 26s (4)	
	START	DURATION	CONNECTION APPLICATION	CONNECTION BYTES	 ENCRYPTION TLSISSL VERSION 	ENCRYPTION KEY EXCHANGE	ENCRYPTION ALGORITHM AND KEY LENGTH	ENCRYPTION AUTHENTICATION ALGOR/THM	ENCRYPTION	PEER IP ADDRESS	PEER PORTIPROTOCOL	PEER HOST GROUPS	PEER BYTES	Select Multiple	
۲	Apr 20, 2017 12:05:48 PM	2m 11s	HTTPS (unclassified)	132.61K	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10	443/TCP	Catch All	92.54K	NTP (unclassified) (48)	
•	Apr 20, 2017 11:58:48 AM	6m 11s	HTTPS (unclassified)	309.67K	TLS 12	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443TCP	Catch All	216.14K	SSH/SCP (unclassified) (34) DNS (unclassified) (28) HTTPS (unclassified) (27) Undefined TCP (19)	
۲	Apr 20, 2017 11:48:48 AM	9m 11s	HTTPS (unclassified)	444.16K	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443/TCP	Catch All	309.55K	HTTP (unclassified) (1) Select Multiple	
•	Apr 20, 2017 11:34:48 AM	13m 11s	HTTPS (unclassified)	626.72K	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443/TCP	Catch All	437.98K	TRANSFER BYTES	
•	Apr 20, 2017 11:14:48 AM	19m 11s	HTTPS (unclassified)	871.41K	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443/TCP	Catch All	606.05K	98 - 38.41M (156) 38.41M - 76.82M (0) 76.82M - 115.23M (0)	
•	Apr 20, 2017 10:46:48 AM	27m 11s	HTTPS (unclassified)	1.21M	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40,10 🖯	443TCP	Catch All	861.54K	115.23M - 153.64M (0) 153.64M - 192.05M (1)	
•	Apr 20, 2017 10:06:48 AM	39m 11s	HTTPS (unclassified)	1.73M	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443TCP	Catch All	1.21M	Select Multiple	~
۲	Apr 20, 2017 9:10:48 AM	55m 11s	HTTPS (unclassified)	2.39M	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443/TCP	Catch All	1.67M	NONE (143) TLS 1.1 (2)	
•	Apr 20, 2017 7:51:48 AM	1h 18m 11s	HTTPS (unclassified)	2.85M	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443/TCP	Catch All	1.98N	TLS 1.2 (12) Select Multiple	
*	Apr 20, 2017 7:40:12 AM	10m 47s	HTTPS (unclassified)	503.88K	TLS 1.2	RSA	RSA_128	RSA	AES_128_CBC	10.0.40.10 🖯	443/TCP	Catch All	351.75K		Carr

Results

Source: Miercom

The red circle indicates where to find the summary of all crypto standards with revision levels and instance count for each.

About Miercom

Miercom has published hundreds of network product analyses in leading trade periodicals and other publications. Miercom's reputation as the leading, independent product test center is undisputed. Private test services available from Miercom include competitive product analyses, as well as individual product evaluations. Miercom features comprehensive certification and test programs including: Certified Interoperable, Certified Reliable, Certified Secure and Certified Green. Products may also be evaluated under the Performance Verified program, the industry's most thorough and trusted assessment for product usability and performance.

Customer Use and Evaluation

We encourage customers to do their own product trials, as tests are based on the average environment and do not reflect every possible deployment scenario. We offer consulting services and engineering assistance for any customer who wishes to perform an on-site evaluation.

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