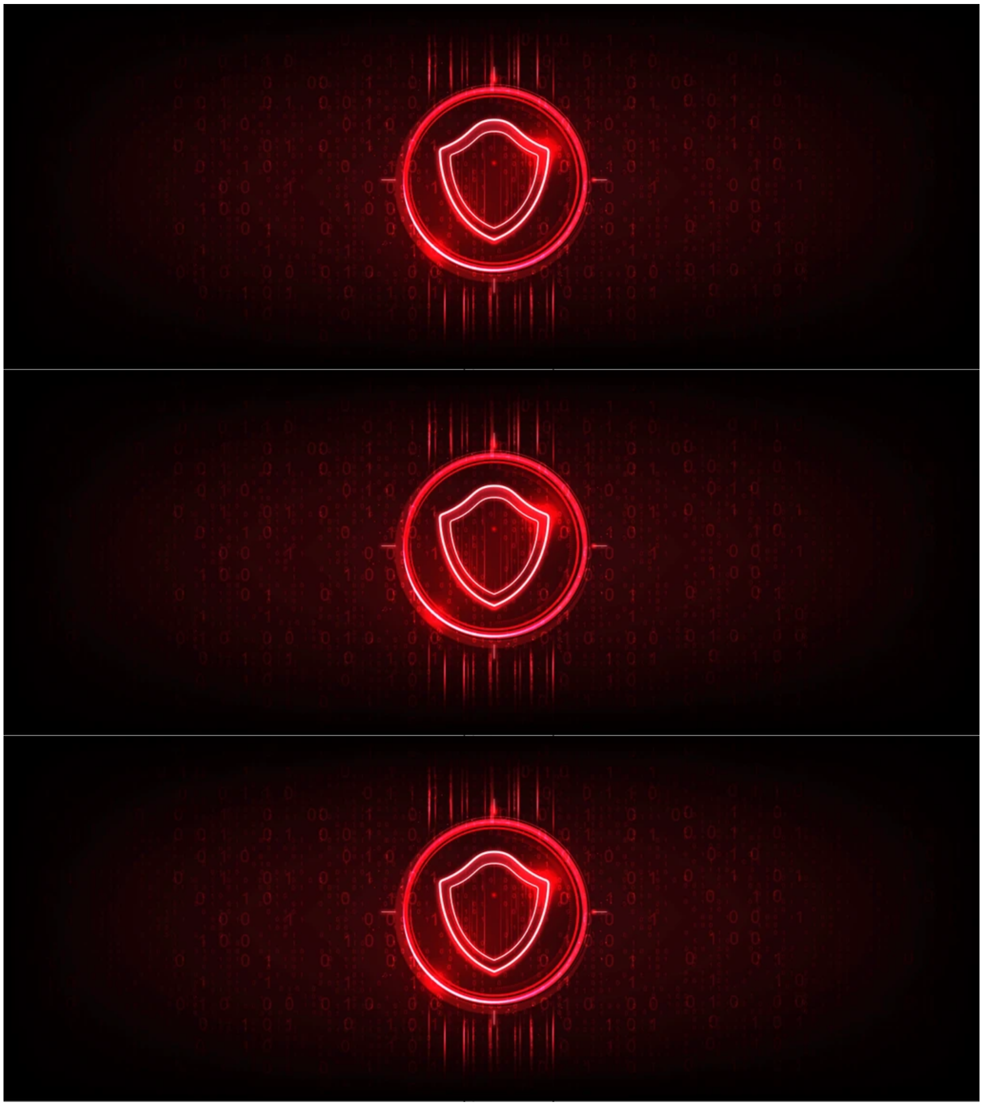
Uncovering New C2 Servers and Threats

hunt.io/blog/from-warm-to-burned-shedding-light-on-updated-warmcookie-infrastructure



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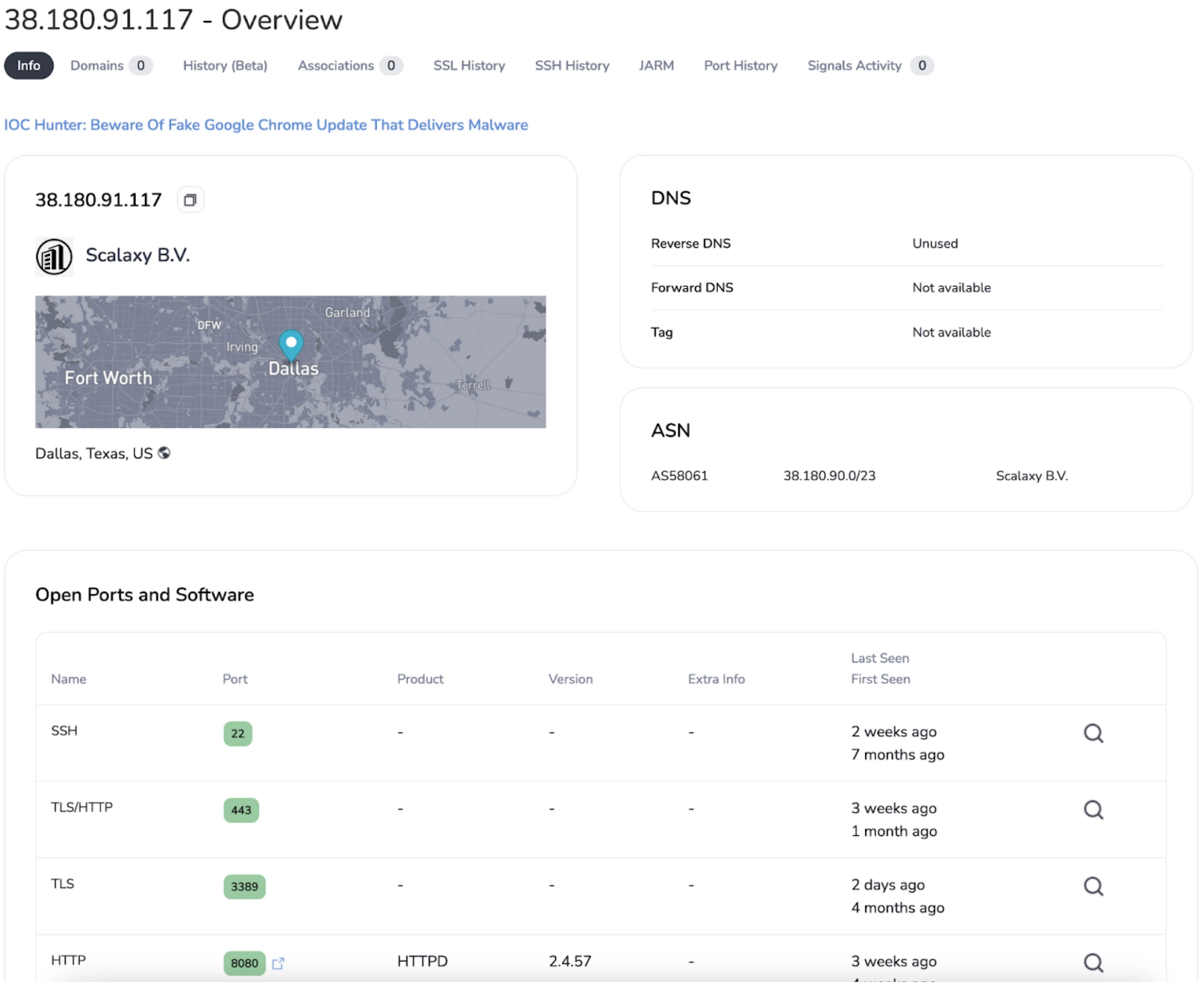
Introduction

On September 30, Gen Threat Labs posted a warning on X (formerly Twitter), highlighting a new wave of a FakeUpdate campaign using compromised websites to deliver the **WarmCookie backdoor**. Of note, an updated version of the backdoor adding capabilities was identified, accompanied by indicators of compromise (IoC), including an IP address.

Using this command-and-control (C2) server as a starting point, we identified a small subset of infrastructure sharing characteristics to the IP reported on X. Certificates and HTTP response patterns played a large role in our findings, which we'll discuss below.

Initial Findings and Research

The IP address **38.180.91[.]117**, identified by Gen Threat Labs as a WarmCookie C2 server, is hosted within the Scalaxy B.V. ASN. Four open ports were observed: 22, 443, 3389, and 8080. By querying this IP in Hunt, we can gain additional insight into its operational context, including details on port configurations and certificate history.



38.180.91.117 - Overview

IOC Hunter: Beware Of Fake Google Chrome Update That Delivers Malware

38.180.91.117

Scalaxy B.V.

Dallas, Texas, US

DNS

Reverse DNS	Unused
Forward DNS	Not available
Tag	Not available

ASN

AS58061	38.180.90.0/23	Scalaxy B.V.

Open Ports and Software

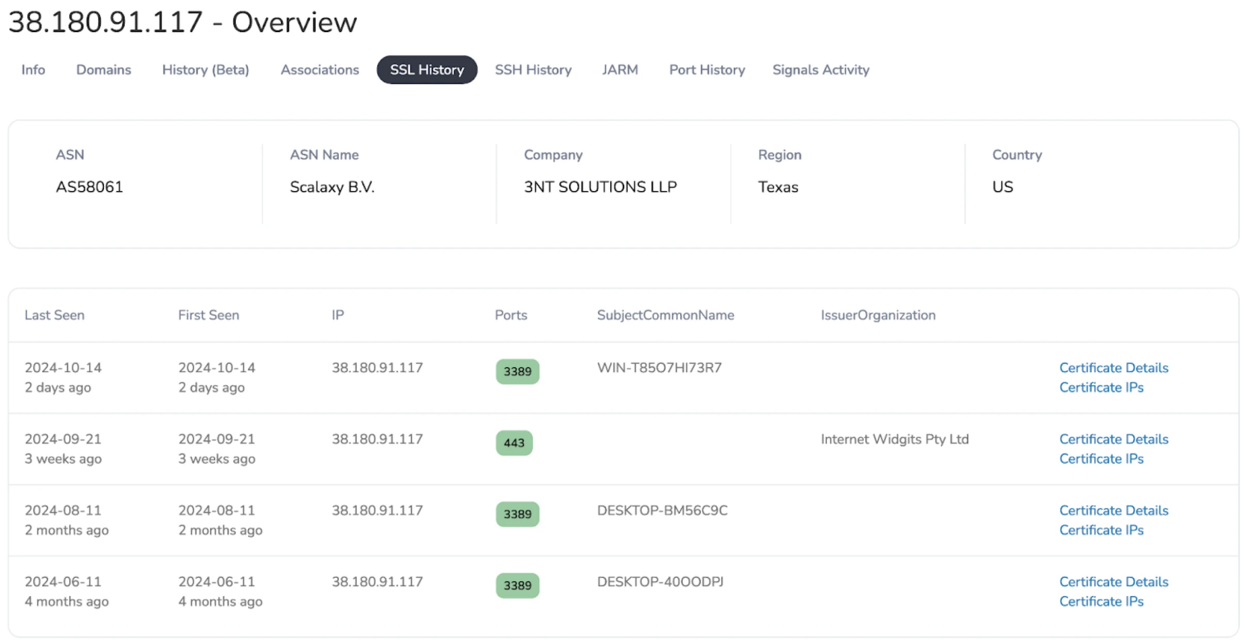
Name	Port	Product	Version	Extra Info	Last Seen First Seen
SSH	22	-	-	-	2 weeks ago 7 months ago
TLS/HTTP	443	-	-	-	3 weeks ago 1 month ago
TLS	3389	-	-	-	2 days ago 4 months ago
HTTP	8080	HTTPD	2.4.57	-	3 weeks ago

Figure 1: Overview of IP address 38.180.91[.]117 (The IOC Hunter link in the image will take you to the above mentioned X post)

Interestingly, no associated resolving domains were detected for this IP. However, a range of certificates, including both RDP and TLS, which shed light on its operational history. These certificates spanned from mid-June 2024, with the most recent first seen just two days prior to this analysis.

Additionally, HTTP responses helped in connecting other infrastructure to the updated WarmCookie backdoor. Together, these observations hint at a server that might not be static but instead adapting to changing operational requirements.

While the certificate history alone doesn't confirm we are looking at a repurposed server, it does suggest a high probability of regular maintenance or adaptation that could align with the malwares update cycle.



38.180.91.117 - Overview

ASN	ASN Name	Company	Region	Country
AS58061	Scalaxy B.V.	3NT SOLUTIONS LLP	Texas	US

Last Seen	First Seen	IP	Ports	SubjectCommonName	IssuerOrganization	
2024-10-14 2 days ago	2024-10-14 2 days ago	38.180.91.117	3389	WIN-T85O7HI73R7		Certificate Details Certificate IPs
2024-09-21 3 weeks ago	2024-09-21 3 weeks ago	38.180.91.117	443		Internet Widgits Pty Ltd	Certificate Details Certificate IPs
2024-08-11 2 months ago	2024-08-11 2 months ago	38.180.91.117	3389	DESKTOP-BM56C9C		Certificate Details Certificate IPs
2024-06-11 4 months ago	2024-06-11 4 months ago	38.180.91.117	3389	DESKTOP-40OODPJ		Certificate Details Certificate IPs

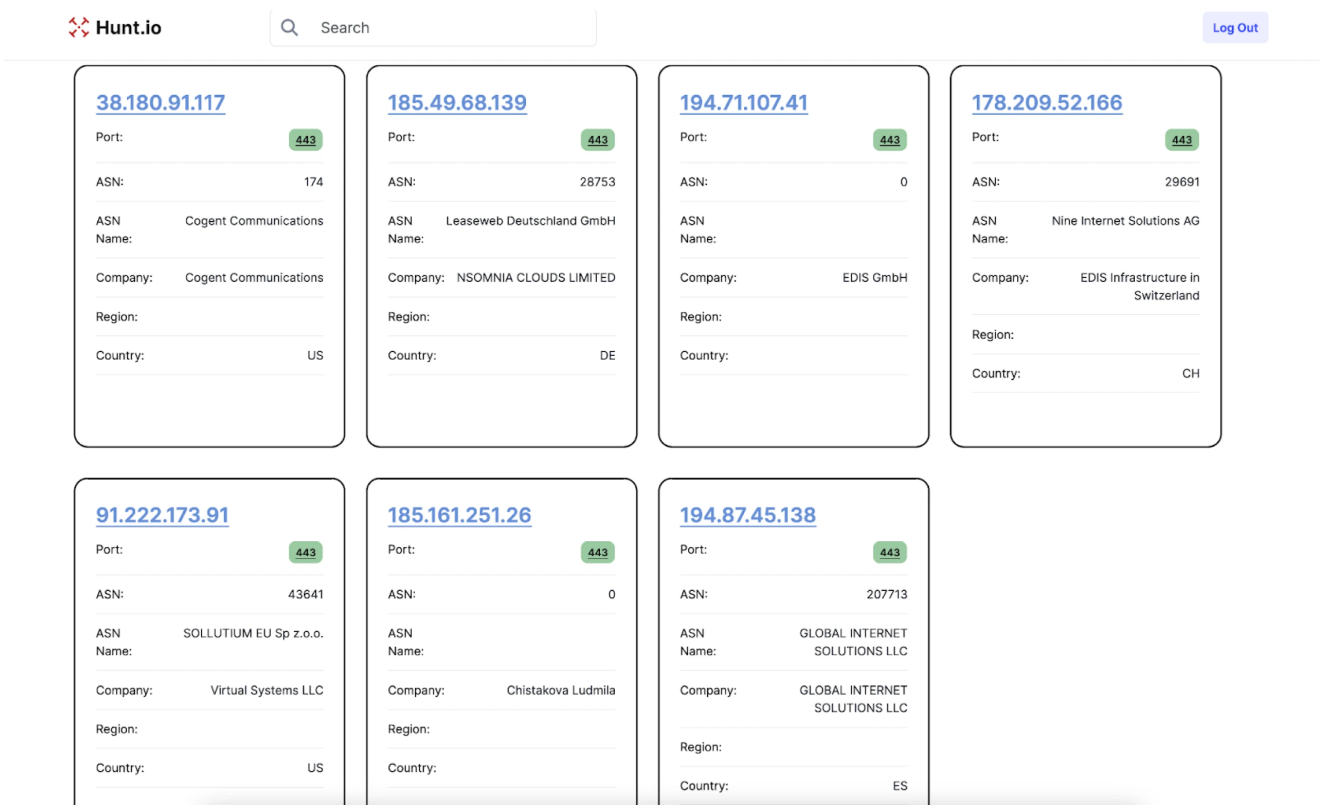
Figure 2: SSL History overview for the initial IP linked to WarmCookie

The distinct certificate properties and HTTP responses observed for this server provided key IOCs for expanding our investigation. Below, we'll discuss the additional IP's likely connected to this new version of WarmCookie.

Uncovering Additional Infrastructure

Using Hunt SQL, we executed a query primarily based on the certificate attributes, with the HTTP response adding for verification. This resulted in six additional servers sharing characteristics with the IP in the previous section. The IP addresses are listed below:

- 91.222.173[.]91
- 178.209.52[.]166
- 185.49.68[.]139
- 185.161.251[.]26
- 194.71.107[.]41
- 194.87.45[.]138



38.180.91.117
Port: 443
ASN: 174
ASN Name: Cogent Communications
Company: Cogent Communications
Region:
Country: US

185.49.68.139
Port: 443
ASN: 28753
ASN Name: Leaseweb Deutschland GmbH
Company: NSOMNIA CLOUDS LIMITED
Region:
Country: DE

194.71.107.41
Port: 443
ASN: 0
ASN Name:
Company: EDIS GmbH
Region:
Country:

178.209.52.166
Port: 443
ASN: 29691
ASN Name: Nine Internet Solutions AG
Company: EDIS Infrastructure in Switzerland
Region:
Country: CH

91.222.173.91
Port: 443
ASN: 43641
ASN Name: SOLLUTIUM EU Sp z.o.o.
Company: Virtual Systems LLC
Region:
Country: US

185.161.251.26
Port: 443
ASN: 0
ASN Name:
Company: Chistakova Ludmila
Region:
Country:

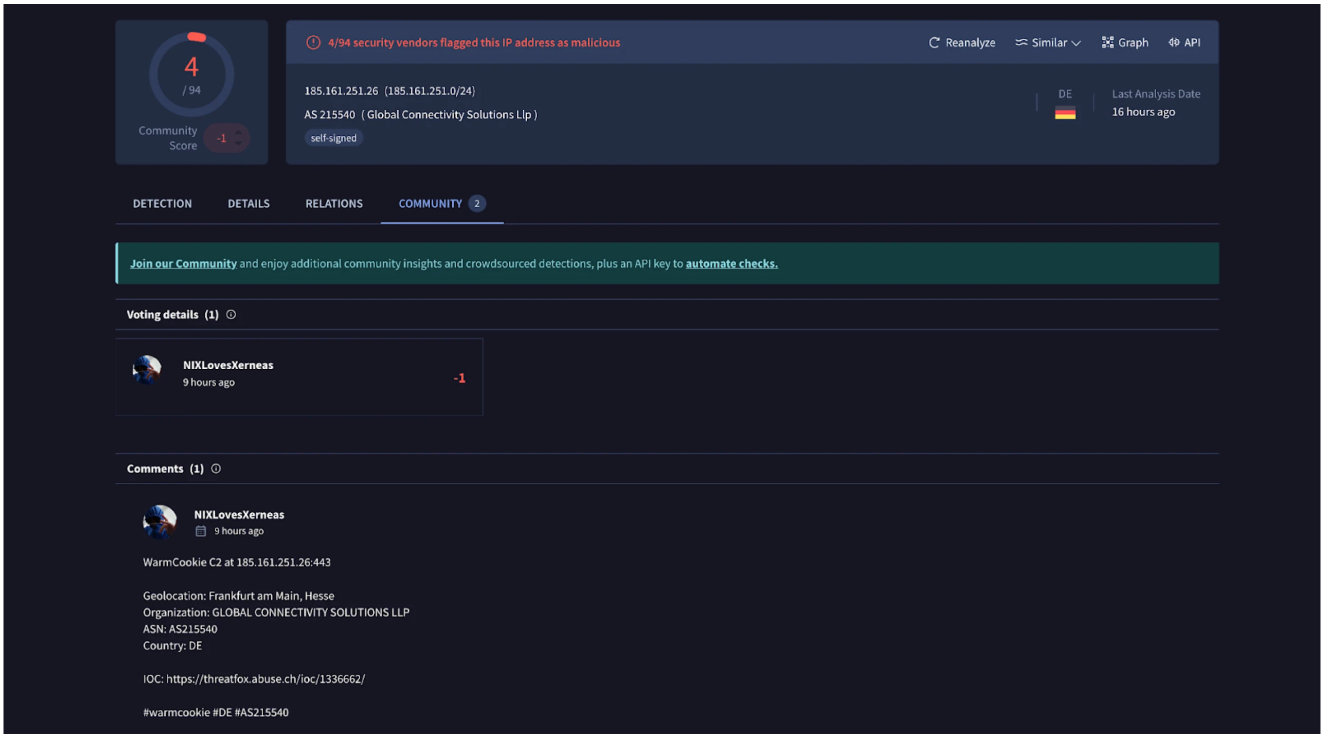
194.87.45.138
Port: 443
ASN: 207713
ASN Name: GLOBAL INTERNET SOLUTIONS LLC
Company: GLOBAL INTERNET SOLUTIONS LLC
Region:
Country: ES

Figure 3: Hunt results for additional infrastructure linked to 38.180.91[.]117

The small number of results strongly suggests that we were indeed tracking relevant infrastructure connected to the updated WarmCookie backdoor.

To further validate our findings, we cross-referenced our results with publicly available sources. Resources such as **VirusTotal** and ThreatFox proved particularly valuable in this process.

Our scans revealed servers active from late September onward, aligning closely with the IPs listed in ThreatFox, and public reporting.



4/94 security vendors flagged this IP address as malicious

185.161.251.26 (185.161.251.0/24)
AS 215540 (Global Connectivity Solutions Llp)

Last Analysis Date
16 hours ago

Join our Community and enjoy additional community insights and crowdsourced detections, plus an API key to automate checks.

Voting details (1)

NIXLovesXerneas
9 hours ago
-1

Comments (1)

NIXLovesXerneas
9 hours ago

WarmCookie C2 at 185.161.251.26:443

Geolocation: Frankfurt am Main, Hesse
Organization: GLOBAL CONNECTIVITY SOLUTIONS LLP
ASN: AS215540
Country: DE

IOC: https://threatfox.abuse.ch/ioc/1336662/

#warmcookie #DE #AS215540

Figure 4: Community results in VirusTotal for one of the recently found WarmCookie servers

Shared SSH Keys

Upon reviewing the IPs returned from our query, we found that most yielded nothing significant to pivot on. That was until we got to **91.222.173[.]91**, which using the Associations tab in Hunt revealed an interesting connection. This server shared an SSH key (fingerprint: **888f05c2856ad60c5ab1e9826b57b87ae697d16303304959930f4b7e149458ac**) with 24 other servers, suggesting a potential network tied to WarmCookie, or use of a standard server image with a pre-configured SSH key that was shared/leaked.

To better understand the associations and the extent of WarmCookies operational reach, we've provided a list of the IPs and any linked domains for defenders to comb through. If you come across something interesting (we did!) let us know.

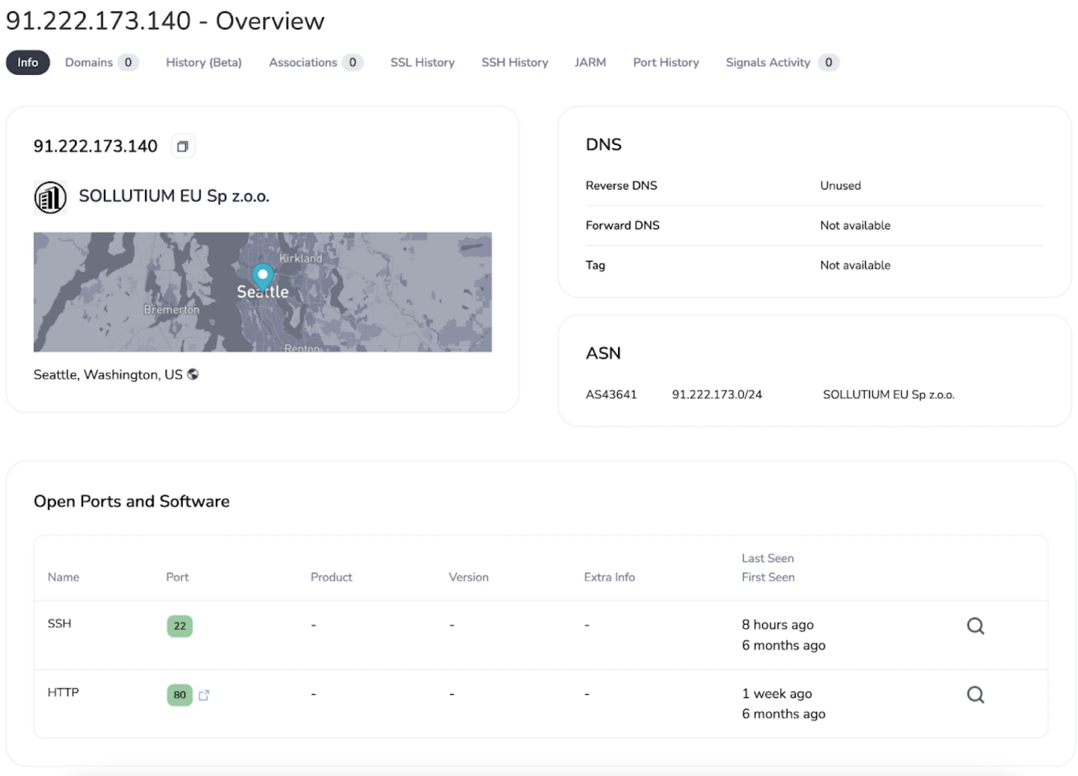
IPs Sharing SSH Keys

IP Address	ASN	Domain(s)
45.11.59[.]231	Virtual Systems LLC	N/A
45.134.174[.]245	SOLLUTIUM EU Sp z.o.o.	N/A
176.97.124[.]149	Virtual Systems LLC	N/A
195.66.213[.]111	Leaseweb Deutschland GmbH	N/A

IP Address	ASN	Domain(s)
45.11.59[.]207	SOLLUTIUM EU Sp z.o.o.	N/A
45.134.174[.]18	SOLLUTIUM EU Sp z.o.o.	N/A
45.134.173[.]22	Virtual Systems LLC	N/A
176.97.124[.]203	Virtual Systems LLC	N/A
45.134.174[.]137	SOLLUTIUM EU Sp z.o.o.	adbs.info.tntseminars[.]com mx1.info.tntseminars[.]com
91.222.173[.]245	SOLLUTIUM EU Sp z.o.o.	N/A
195.66.213[.]160	SOLLUTIUM EU Sp z.o.o.	N/A
45.134.174[.]135	SOLLUTIUM EU Sp z.o.o.	mx1.info.ukshowroom[.]com
31.42.177[.]38	SOLLUTIUM EU Sp z.o.o.	N/A
185.254.198[.]219	Virtual Systems LLC	dig-authentic.ipq[.]co Reverse DNS: abrushofchange[.]org
45.134.174[.]254	SOLLUTIUM EU Sp z.o.o.	Reverse DNS: dedicated.vsys[.]host
91.222.173[.]140	SOLLUTIUM EU Sp z.o.o.	N/A
91.205.2[.]219	SOLLUTIUM EU Sp z.o.o.	N/A
45.11.59[.]230	SOLLUTIUM EU Sp z.o.o.	N/A
195.66.213[.]243	SOLLUTIUM EU Sp z.o.o.	N/A
45.134.174[.]136	SOLLUTIUM EU Sp z.o.o.	mx1.info.toelicking[.]com Reverse DNS: rrfqm[.]site
45.134.174[.]134	SOLLUTIUM EU Sp z.o.o.	adbs.info.ultimacomputers[.]com mx1.info.ultimacomputers[.]com Reverse DNS: savemo[.]shop
45.134.174[.]73	SOLLUTIUM EU Sp z.o.o.	mx5.mailer.reasonablish[.]com Reverse DNS: duplified.com[.]co
45.134.173[.]21	Virtual Systems LLC	N/A

Table 1: Shared SSH key IPs & domains.

One of the IPs in the above table, **91.222.173[.]140**, hosted within the SOLLUTIUM EU Sp z.o.o. ASN, has been flagged as a **DarkGate C2** server with two recent files--Notepad++.exe and upd_1602649.msix--actively communicating with the IP.



91.222.173.140 - Overview

91.222.173.140

SOLLUTIUM EU Sp z.o.o.

Seattle, Washington, US

DNS

Reverse DNS	Unused
Forward DNS	Not available
Tag	Not available

ASN

AS43641	91.222.173.0/24	SOLLUTIUM EU Sp z.o.o.

Open Ports and Software

Name	Port	Product	Version	Extra Info	Last Seen First Seen
SSH	22	-	-	-	8 hours ago 6 months ago
HTTP	80	-	-	-	1 week ago 6 months ago

Figure 5: Overview of the suspected DarkGate C2 IP in Hunt

Given that WarmCookie has been observed in tandem with other known malware families, the presence of a DarkGate C2 within this infrastructure may not be entirely surprising. Still, this finding raises intriguing questions for further investigation, which we leave as an exercise for our readers.

Conclusion

In conclusion, our analysis of WarmCookie's updated infrastructure has uncovered key indicators, linked servers, and potential overlaps with other malware like DarkGate. While we've shared substantial findings that provide a deeper look into this evolving threat, we're withholding the full detection query to continue monitoring this activity.

While not a major player in the malware landscape, WarmCookie remains worth monitoring for its potential to gain more traction among threat actors.

Thank you for reading, and stay tuned for future updates as we continue tracking this and related threats.

Network Observables

IP Address	ASN	Host Country	Last Seen
38.180.91[.]117	Cogent Communications	US	2024-10-03
91.222.173[.]91	SOLLUTIUM EU Sp z.o.o.	US	2024-09-29
178.209.52[.]166	Nine Internet Solutions AG	CH	2024-10-03
185.49.68[.]139	Leaseweb Deutschland GmbH	DE	2024-09-23
185.161.251[.]26	GLOBAL CONNECTIVITY SOLUTIONS LLP	DE	2024-09-25
194.71.107[.]41	EDIS GmbH	BG	
194.87.45[.]138	GLOBAL INTERNET SOLUTIONS LLC	ES	

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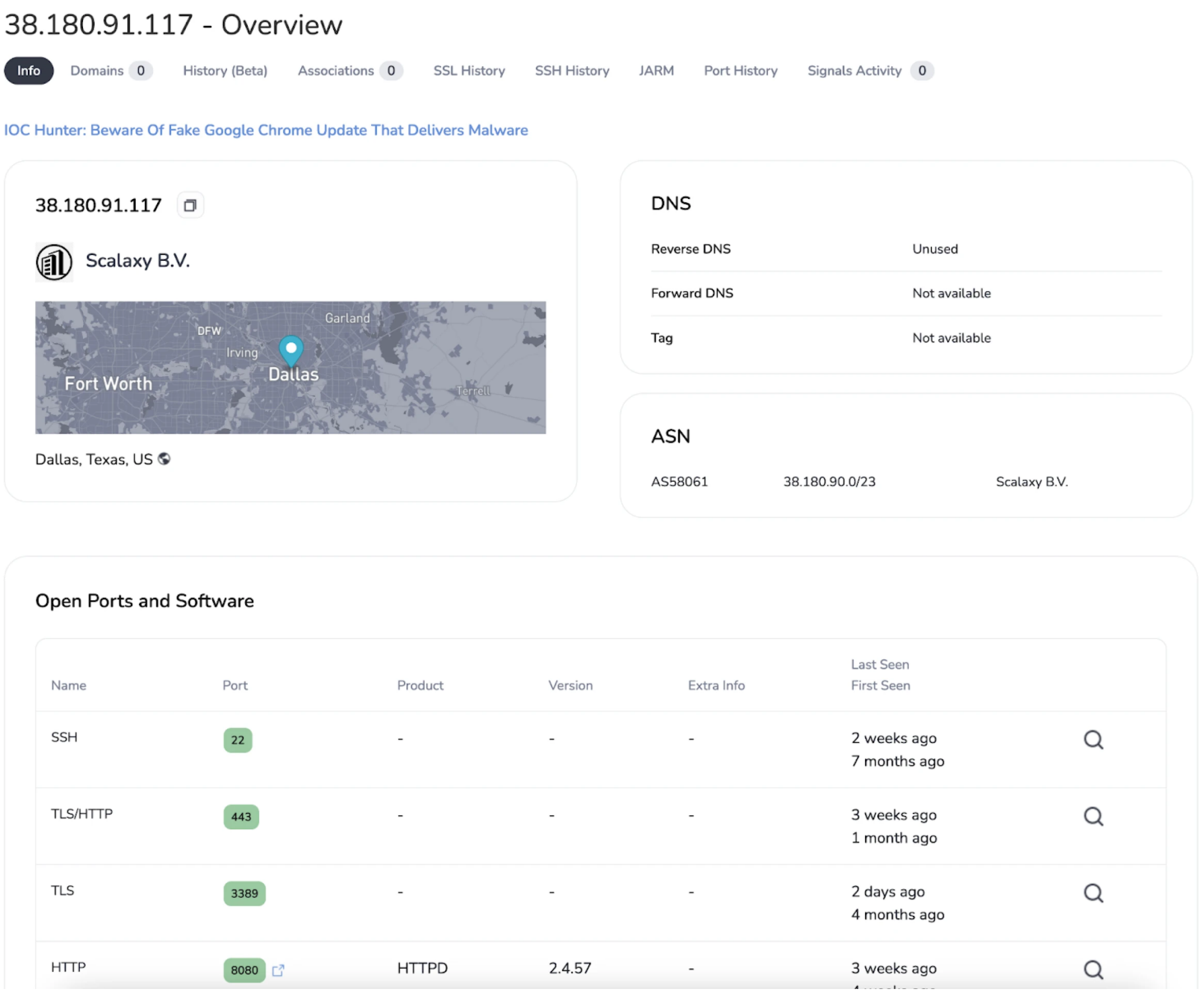
Initial Findings and Research

The IP address **38.180.91[.]117**, identified by Gen Threat Labs as a WarmCookie C2 server, is hosted within the Scalaxy B.V. ASN. Four open ports were observed: 22, 443, 3389, and 8080. By querying this IP in Hunt, we can gain additional insight into its operational context, including details on port configurations and certificate history.



38.180.91.117 - Overview

IOC Hunter: Beware Of Fake Google Chrome Update That Delivers Malware

38.180.91.117

Scalaxy B.V.

Dallas, Texas, US

DNS

Reverse DNS	Unused
Forward DNS	Not available
Tag	Not available

ASN

AS58061	38.180.90.0/23	Scalaxy B.V.

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Name	Port	Product	Version	Extra Info	Last Seen First Seen
SSH	22	-	-	-	2 weeks ago 7 months ago
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HTTP	8080	HTTPD	2.4.57	-	3 weeks ago

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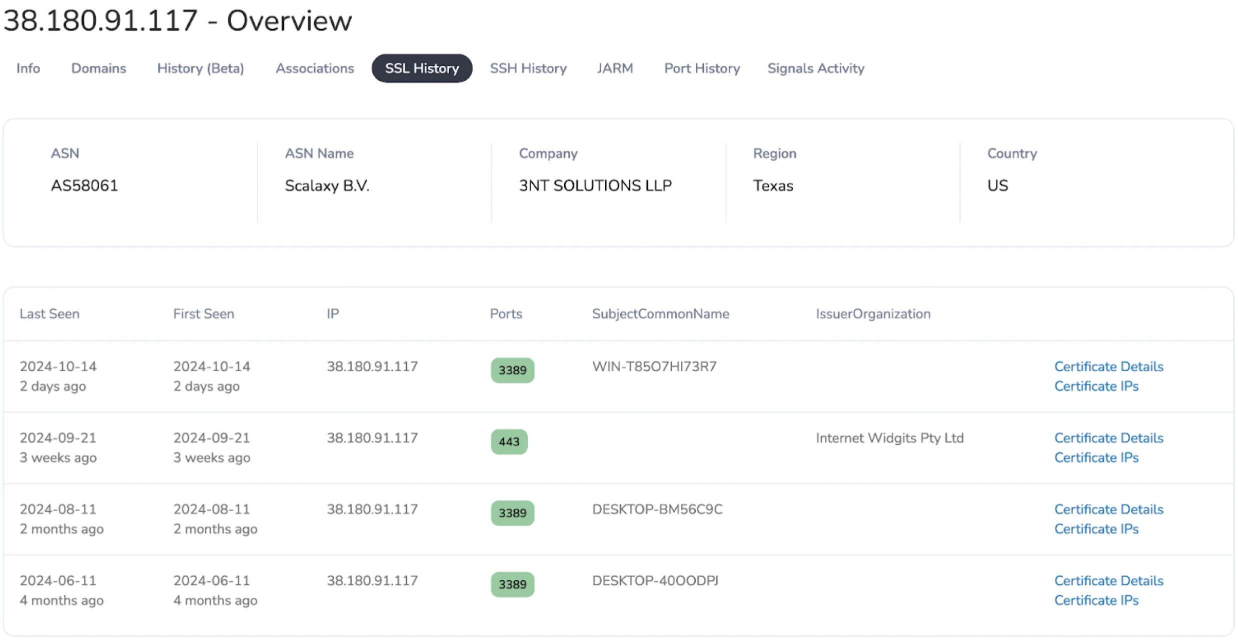

38.180.91.117 - Overview

ASN	ASN Name	Company	Region	Country
AS58061	Scalaxy B.V.	3NT SOLUTIONS LLP	Texas	US

Last Seen	First Seen	IP	Ports	SubjectCommonName	IssuerOrganization	
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Figure 2: SSL History overview for the initial IP linked to WarmCookie

The distinct certificate properties and HTTP responses observed for this server provided key IOCs for expanding our investigation. Below, we'll discuss the additional IP's likely connected to this new version of WarmCookie.

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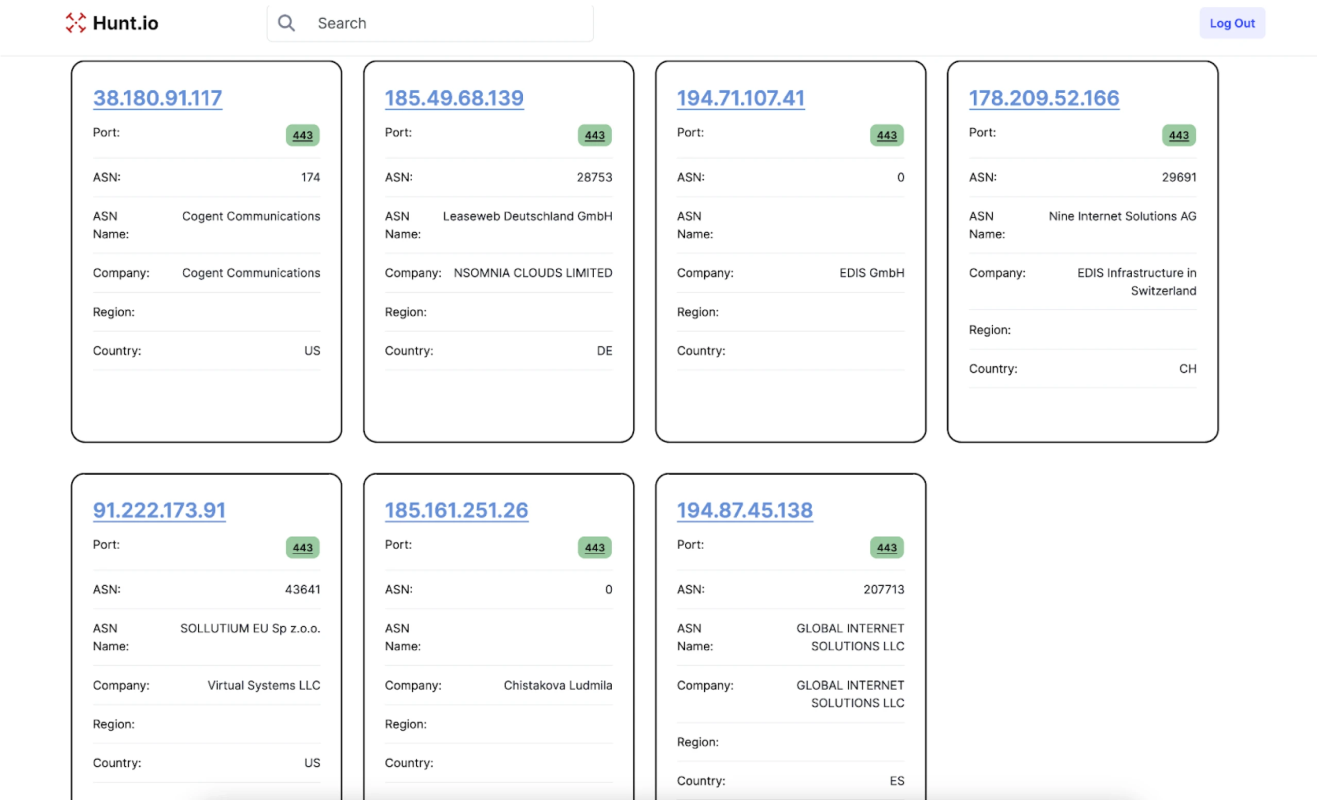
- 194.87.45[.]138



38.180.91.117
Port: 443
ASN: 174
ASN Name: Cogent Communications
Company: Cogent Communications
Region:
Country: US

185.49.68.139
Port: 443
ASN: 28753
ASN Name: Leaseweb Deutschland GmbH
Company: NSOMNIA CLOUDS LIMITED
Region:
Country: DE

194.71.107.41
Port: 443
ASN: 0
ASN Name:
Company: EDIS GmbH
Region:
Country:

178.209.52.166
Port: 443
ASN: 29691
ASN Name: Nine Internet Solutions AG
Company: EDIS Infrastructure in Switzerland
Region:
Country: CH

91.222.173.91
Port: 443
ASN: 43641
ASN Name: SOLLUTIUM EU Sp z.o.o.
Company: Virtual Systems LLC
Region:
Country: US

185.161.251.26
Port: 443
ASN: 0
ASN Name:
Company: Chistakova Ludmila
Region:
Country:

194.87.45.138
Port: 443
ASN: 207713
ASN Name: GLOBAL INTERNET SOLUTIONS LLC
Company: GLOBAL INTERNET SOLUTIONS LLC
Region:
Country: ES

Figure 3: Hunt results for additional infrastructure linked to 38.180.91[.]117

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To further validate our findings, we cross-referenced our results with publicly available sources. Resources such as **VirusTotal** and ThreatFox proved particularly valuable in this process.

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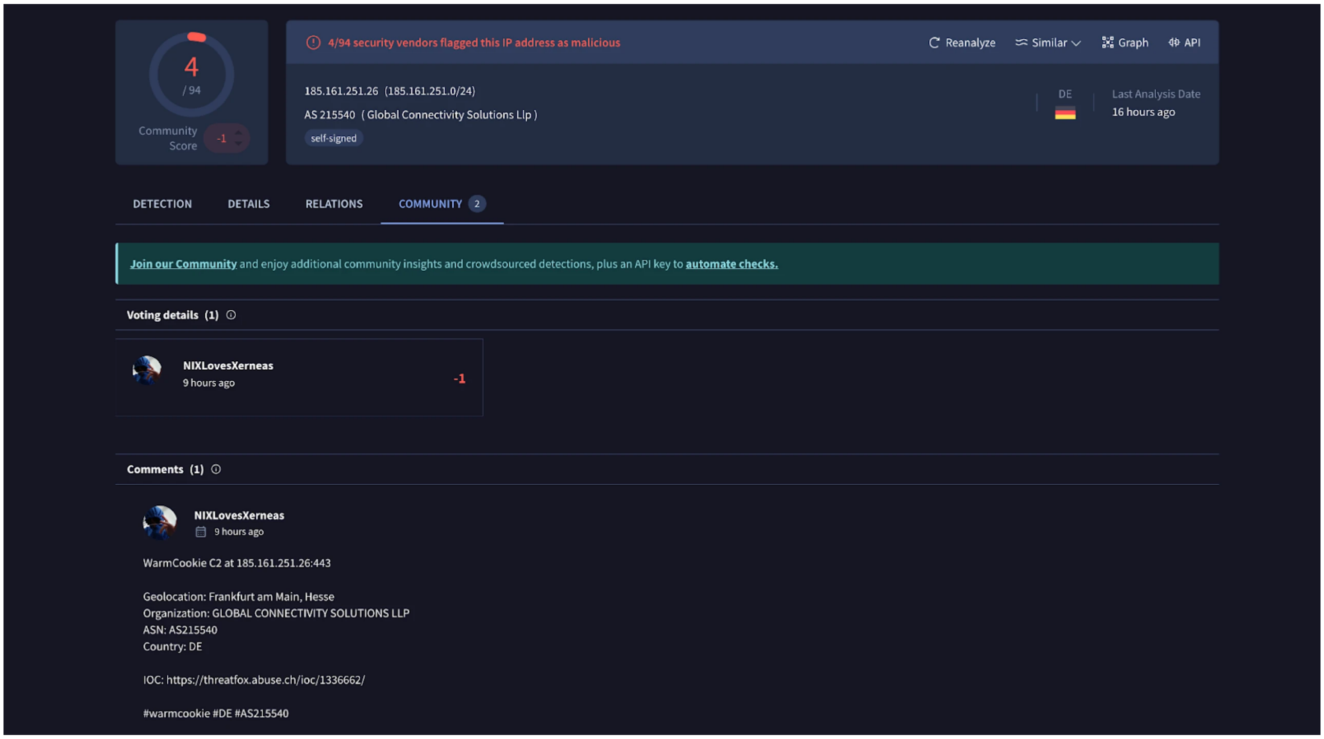

4 / 94

Community Score -1

4/94 security vendors flagged this IP address as malicious

185.161.251.26 (185.161.251.0/24)
AS 215540 (Global Connectivity Solutions Llp)
self-signed

DE

Last Analysis Date
16 hours ago

Join our Community and enjoy additional community insights and crowdsourced detections, plus an API key to automate checks.

Voting details (1)

NIXLovesXerneas
9 hours ago
-1

Comments (1)

NIXLovesXerneas
9 hours ago

WarmCookie C2 at 185.161.251.26:443

Geolocation: Frankfurt am Main, Hesse
Organization: GLOBAL CONNECTIVITY SOLUTIONS LLP
ASN: AS215540
Country: DE

IOC: https://threatfox.abuse.ch/ioc/1336662/

#warmcookie #DE #AS215540

Figure 4: Community results in VirusTotal for one of the recently found WarmCookie servers

Shared SSH Keys

Upon reviewing the IPs returned from our query, we found that most yielded nothing significant to pivot on. That was until we got to **91.222.173[.]91**, which using the Associations tab in Hunt revealed an interesting connection. This server shared an SSH key (fingerprint: **888f05c2856ad60c5ab1e9826b57b87ae697d16303304959930f4b7e149458ac**) with 24 other servers, suggesting a potential network tied to WarmCookie, or use of a standard server image with a pre-configured SSH key that was shared/leaked.

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176.97.124[.]203	Virtual Systems LLC	N/A
45.134.174[.]137	SOLLUTIUM EU Sp z.o.o.	adbs.info.tntseminars[.]com mx1.info.tntseminars[.]com
91.222.173[.]245	SOLLUTIUM EU Sp z.o.o.	N/A
195.66.213[.]160	SOLLUTIUM EU Sp z.o.o.	N/A
45.134.174[.]135	SOLLUTIUM EU Sp z.o.o.	mx1.info.ukshowroom[.]com
31.42.177[.]38	SOLLUTIUM EU Sp z.o.o.	N/A
185.254.198[.]219	Virtual Systems LLC	dig-authentic.ipq[.]co Reverse DNS: abrushofchange[.]org
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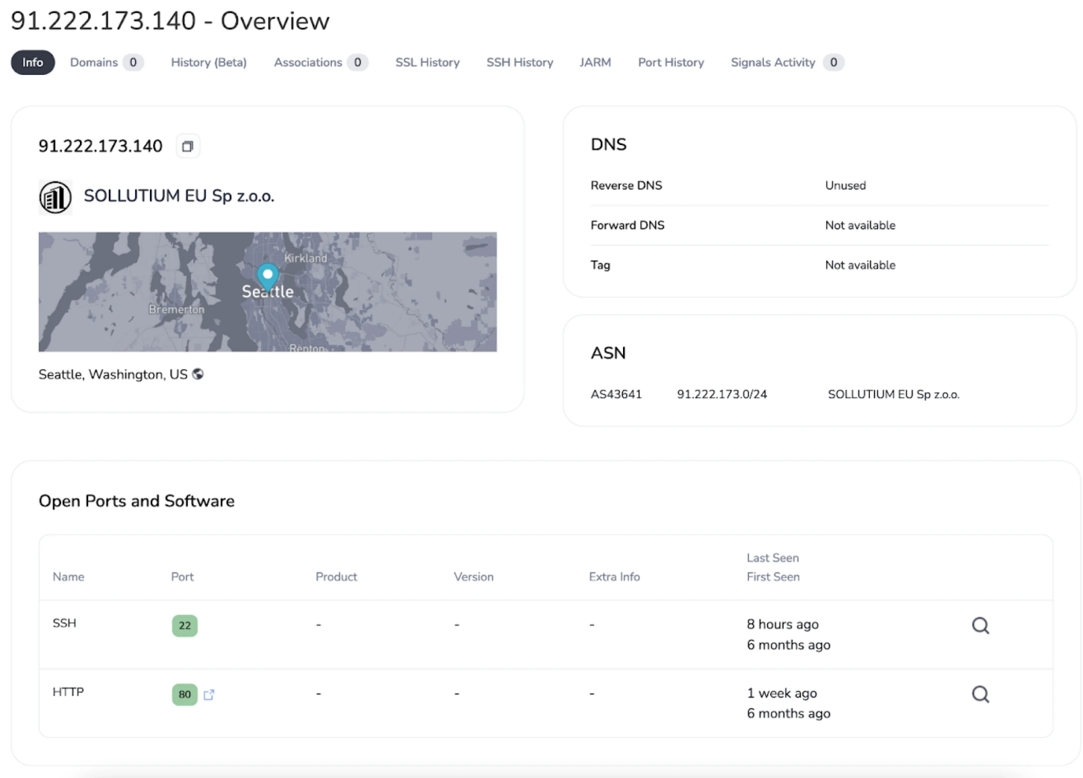
91.222.173[.]140	SOLLUTIUM EU Sp z.o.o.	N/A
91.205.2[.]219	SOLLUTIUM EU Sp z.o.o.	N/A
45.11.59[.]230	SOLLUTIUM EU Sp z.o.o.	N/A
195.66.213[.]243	SOLLUTIUM EU Sp z.o.o.	N/A
45.134.174[.]136	SOLLUTIUM EU Sp z.o.o.	mx1.info.toelicking[.]com Reverse DNS: rrfqm[.]site
45.134.174[.]134	SOLLUTIUM EU Sp z.o.o.	adbs.info.ultimacomputers[.]com mx1.info.ultimacomputers[.]com Reverse DNS: savemo[.]shop
45.134.174[.]73	SOLLUTIUM EU Sp z.o.o.	mx5.mailer.reasonablish[.]com Reverse DNS: duplified.com[.]co
45.134.173[.]21	Virtual Systems LLC	N/A

Table 1: Shared SSH key IPs & domains.

One of the IPs in the above table, **91.222.173[.]140**, hosted within the SOLLUTIUM EU Sp z.o.o. ASN, has been flagged as a **DarkGate C2** server with two recent files--Notepad++.exe and upd_1602649.msix--actively communicating with the IP.



91.222.173.140 - Overview

91.222.173.140

SOLLUTIUM EU Sp z.o.o.

Seattle, Washington, US

DNS

Reverse DNS	Unused
Forward DNS	Not available
Tag	Not available

ASN

AS43641	91.222.173.0/24	SOLLUTIUM EU Sp z.o.o.

Open Ports and Software

Name	Port	Product	Version	Extra Info	Last Seen First Seen
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Figure 5: Overview of the suspected DarkGate C2 IP in Hunt

Given that WarmCookie has been observed in tandem with other known malware families, the presence of a DarkGate C2 within this infrastructure may not be entirely surprising. Still, this finding raises intriguing questions for further investigation, which we leave as an exercise for our readers.

Conclusion

In conclusion, our analysis of WarmCookie's updated infrastructure has uncovered key indicators, linked servers, and potential overlaps with other malware like DarkGate. While we've shared substantial findings that provide a deeper look into this evolving threat, we're withholding the full detection query to continue monitoring this activity.

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178.209.52[.]166	Nine Internet Solutions AG	CH	2024-10-03
185.49.68[.]139	Leaseweb Deutschland GmbH	DE	2024-09-23
185.161.251[.]26	GLOBAL CONNECTIVITY SOLUTIONS LLP	DE	2024-09-25
194.71.107[.]41	EDIS GmbH	BG	
194.87.45[.]138	GLOBAL INTERNET SOLUTIONS LLC	ES	