

Synapse Bootcamp - Module 10

Filtering in Storm - Exercises

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Objectives

In these exercises you will:

- Use Storm to perform simple filter operations
- Use mathematical operators in Storm filters
- Use extended operators in Storm filters

Note: We are constantly updating Synapse and its Power-Ups! We do our best to make sure our course documents (slides, exercises, and answer keys) are up-to-date. However, you may notice small differences (such as between a screen capture in the documents and the appearance of your current instance of Synapse).

If something is unclear or if you identify an error, please reach out to us so we can assist!

Exercises

- All exercises use the **Research Tool** with the **Storm Mode Selector** set to **Storm mode**.
- Some example queries may wrap due to length.

The **Storm Quick Reference** on Filtering (included with the supplemental materials provided for this course) may be helpful for this (and future) exercises.

The online [filtering](#) reference includes detailed documentation and examples for all filter operations. It is part of the [Storm Reference](#) included with the [Synapse User Guide](#).

Simple Filters

Exercise 1

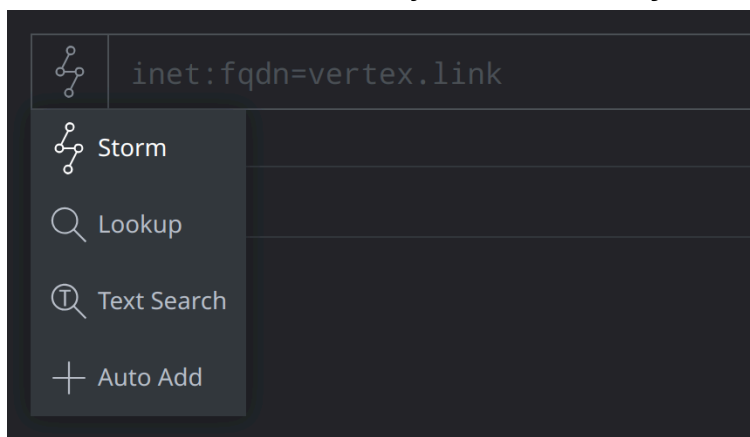
Objective:

- Use Storm to perform simple filter operations.

Part 1

You are reviewing an Accenture blog post on the MUDCARP threat group and want to examine the IOCs listed in the blog.

- In the **Research Tool**, ensure your **Storm Query Bar** is in **Storm mode**:



- Enter the following in the **Storm Query Bar** and press **Enter** to run the query to **lift** the **media:news** node for the blog and **traverse** the **refs** edges:

```
media:news:title="mudcarp's focus on submarine technologies"
-(refs)> *
```



media:news:title="mudcarp's focus on submarine technologies" -(refs)> *

Tabular

hash:sha256 (13)

hash:sha256
6f6ee01e9dc2d8c4c260ef4131fe88dc152e53ee8afd3e66e92d4e1bf5fd2e92
5860ddc428ffa900258207e9c385f843a3472f2fbf252d2f6357d458646cf362
7ba05abdf8f0323aa30c3d52e22df951eb5b67a2620014336eab7907b0a5cedf
c0b8d15cd0f3f3c5a40ba2e9780f0dd1db526233b40a449826b6a7c92d31f8d9
c7fa6f27ec4f4142ae591f2dd7c63d046431945f03c87dbed88d79f55180a46d
305f331bfb1e97028f8c92cbcb1dff2741dcddacc76843e65f9b1ec5a66f52bc

Scroll to Form

- file:base (2)
- file:path (2)
- hash:md5 (14)
- hash:sha1 (13)
- hash:sha256 (13)
- inet:fqdn (31)
- inet:ipv4 (3)
- inet:url (10)
- it:app:meta:rule (1)
- it:prod:softname (3)

The blog "references" a wide variety of data.

You are interested in any URLs (**inet:url** nodes) reported by Accenture.

Question 1: How can you **add a filter** to your existing query to **only** display the **inet:url** nodes?

Some of the URLs are malicious indicators, but some are simply references - other articles that support Accenture's reporting.

You want to focus on the **IOCs** that Accenture reported (e.g., things tagged **rep.accenture**).

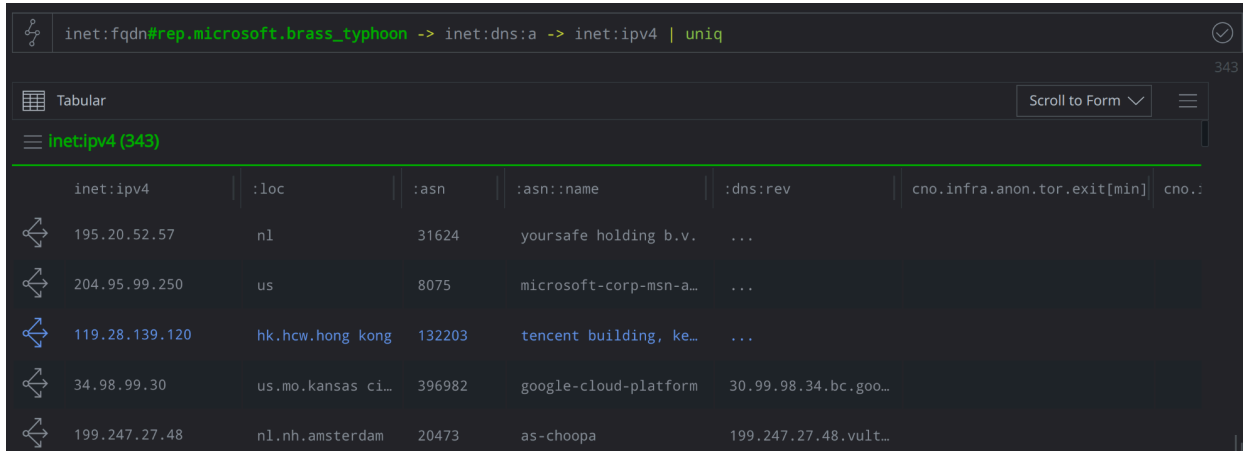
Question 2: How can you **add a filter** to your query to **only** display malicious URLs that Accenture reported?

Part 2

You are researching the Brass Typhoon threat group, examining the FQDNs associated with the group and the IPv4 addresses that the FQDNs resolve to.

- Enter the following in the **Storm Query Bar** and press **Enter** to run the query to pivot to the unique IPv4 addresses associated with Brass Typhoon FQDNs:

```
inet:fqdn#rep.microsoft.brass_typhoon -> inet:dns:a  
-> inet:ipv4 | uniq
```



inet:ipv4	:loc	:asn	:asn::name	:dns:rev	cno.infra.anon.tor.exit[min]	cno.:
195.20.52.57	n1	31624	yoursafe holding b.v.	...		
204.95.99.250	us	8075	microsoft-corp-msn-a...	...		
119.28.139.120	hk.hcw.hong kong	132203	tencent building, ke...	...		
34.98.99.30	us.mo.kansas ci...	396982	google-cloud-platform	30.99.98.34.bc.goo...		
199.247.27.48	n1.nh.amsterdam	20473	as-choopa	199.247.27.48.vult...		

You notice that many of the IPv4s are associated with AS **25820**. You want to limit your results to **only** show IPv4s on that AS.

Question 3: How can you **add a filter** to the above query to **only** show IPv4s on AS 25820?

Hint: Your original query contains a Storm command (`| uniq`). After running a Storm command, you need to use the **pipe character** (`|`) to tell Synapse you are switching from command mode **back** to query mode to add another query operation (in this case, a filter).

Looking at the **All Tags** tab, there are several tags associated with the IPv4s. You want to further limit your results to **only** the IP addresses reported by Microsoft.

```
NODE  ALL TAGS  ALL PROPS
▪ rep
▪ rep.mandiant
▪ rep.mandiant.ap41
▪ rep.mandiant.beacon
▪ rep.microsoft
▪ rep.microsoft.brass_typhoon
```

Question 4: How can you add a filter to your query to view **only** those IPs reported by Microsoft (**rep.microsoft**)?

Based on the **All Tags** tab in the Details Panel, some of the IPv4s were **also** reported by Mandiant. You're interested in the **overlap** between Microsoft's reporting and Mandiant's reporting.

Question 5: How can you add a filter to your query to view **only** those IPs reported by Microsoft (**rep.microsoft**) **and** Mandiant (**rep.mandiant**)? How many IPs were reported by both organizations?

Filters with Mathematical Operators

Exercise 2

Objective:

- Use mathematical operators to perform filter operations with Storm.

You are examining historical domain Whois records for APT1 FQDN **hugesoft.org**.




- Enter the following in the **Storm Query Bar** and press **Enter** to run the query to show the Whois records for this FQDN:

```
inet:fqdn=hugesoft.org -> inet:whois:rec
```

inet:fqdn=hugesoft.org -> inet:whois:rec

Tabular

inet:whois:rec (230)

	:fqdn	:asof ↓	:created	:updated	:expires
	hugesoft.org	2005/07/25 0...	2004/10/25 0...	2005/07/18 0...	2005/10/25 0...
	hugesoft.org	2005/08/13 0...	2004/10/25 0...	2005/08/03 2...	2005/10/25 0...
	hugesoft.org	2005/09/02 0...	2004/10/25 0...	2005/09/01 1...	2005/10/25 0...
	hugesoft.org	2005/09/11 0...	2004/10/25 0...	2005/09/01 1...	2005/10/25 0...

Hint: If you sort by the **:asof** column (the date the individual Whois record was captured), you can view the records in timeline order.

The domain was used by APT1, but was later sinkholed by Kleissner & Associates on January 11, 2014, based on the registration (**:created**) date for Kleissner's records.

You want to view the Whois records from **before** the date the domain was sinkholed.

Question 1: How can you **add a filter** to your query to **only** display WhoIs records created **before** January 11, 2014 (the date Kleissner & Associates registered / sinkholed the domain)?

Hint: Synapse stores dates as **integers** (specifically, as epoch milliseconds / millis). You can use operators such as "less than" or "greater than or equal to" to filter date/time properties.

Filters with Extended Operators

Exercise 3

Objective:

- Use extended operators to perform filter operations in Storm.

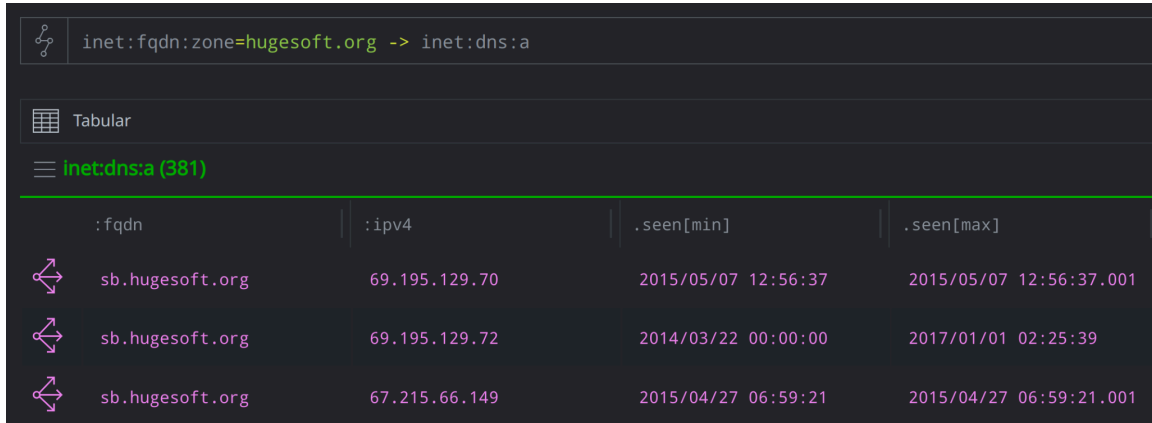
You are still researching the **hugesoft.org** FQDN. This APT1 domain is part of an internally tracked threat cluster **T19**. Based on tags on the FQDN, Vertex believes T19 controlled this FQDN between **October 2004** and **October 2013**:

```
NODE ALL TAGS ALL PROPS
├── inet:fqdn
│   └── hugesoft.org
├── :domain org
├── :host hugesoft
├── :issuffix false
├── :iszone true
├── :zone hugesoft.org
├── .created 2023/05/29 19:07:00.252
├── .seen (2014/08/26 10:22:28, 2019/07/22 11:25:45.972)
├── + Add Tags
├── cno.infra.dns.sink.holed.kleissner
│   └── (2014/01/11 18:18:17, 2017/01/11 18:18:17)
├── cno.infra.dns.sink.holed.snk1
│   └── (2017/03/30 05:04:26, 2018/03/30 05:04:26)
├── cno.threat.t19.own
│   └── (2004/10/25 00:00:00, 2013/10/25 00:00:00)
├── cno.threat.t19.own.seed
└── rep.mandiant.ap1
```

You want to see DNS A records for **hugesoft.org** and its subdomains.

- Enter the following in the **Storm Query Bar** and press **Enter** to run the query to show the DNS A records:

```
inet:fqdn:zone=hugesoft.org -> inet:dns:a
```



The screenshot shows a Storm Query Bar interface. At the top, the query `inet:fqdn:zone=hugesoft.org -> inet:dns:a` is entered. Below the query bar, the results are displayed in a tabular format. The table has four columns: `:fqdn`, `:ipv4`, `.seen[min]`, and `.seen[max]`. There are three rows of data, each with a double-headed arrow icon to the left of the `:fqdn` value.

:fqdn	:ipv4	.seen[min]	.seen[max]
sb.hugesoft.org	69.195.129.70	2015/05/07 12:56:37	2015/05/07 12:56:37.001
sb.hugesoft.org	69.195.129.72	2014/03/22 00:00:00	2017/01/01 02:25:39
sb.hugesoft.org	67.215.66.149	2015/04/27 06:59:21	2015/04/27 06:59:21.001

You want to limit your results to **only** DNS A resolutions observed during the time T19 controlled the domain (between **2004/10/25** and **2013/10/25**).

Question 1: How can you **add a filter** to the query above to **only** display DNS A records observed (**.seen**) between those dates?

Question 2: How many DNS A records are in your results after adding the filter operation?