

Synapse Bootcamp - Module 11

Building Queries in Storm - Answer Key

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Answer Key

Storm Commands

Exercise 1 Answer

Objective:

- Use common Storm commands to help answer analytical questions.

Question 1: What Storm command can you add to the end of your query to find a file with the **earliest** compile (**:mime:pe:compiled**) time?

- You can find the earliest compile time with the following query:

```
file:bytes#rep.crowdstrike.putterpanda  
| min :mime:pe:compiled
```

The **min** command returns a node with the lowest / smallest / earliest value for the specified property:

```
file:bytes#rep.crowdstrike.putterpanda | min :mime:pe:compiled
```

Question 2: What is the earliest compile date/time?

- The earliest compile time is **2007/06/11 13:55:55:**



```
file:bytes#rep.crowdstrike.putterpanda | min :mime:pe:compiled
```

Tabular saved

file:bytes (1)

file:bytes	:mime	:mime:pe:compiled
sha256:30e113f403c534...	application/vnd.microsof...	2007/06/11 13:55:55

Question 3: What Storm query / command can you use to determine the total number of indicators (without displaying the nodes)?

- You can determine the total number of Putter Panda indicators with the following query:

```
#rep.crowdstrike.putterpanda | count
```



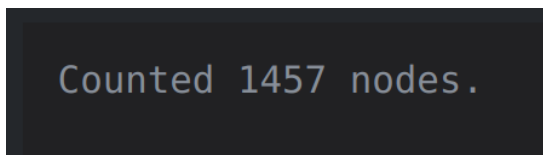
The **count** command tells Synapse to return the total **without** displaying the nodes by default.

The total is displayed in the **Console Tool**.

Tip: You can optionally display both the total (in the Console Tool) **and** the nodes (in the Research Tool) with the **count --yield** command.

Question 4: How many indicators are there?

- There are **1457** indicators:

A screenshot of a terminal window with a dark background. The text `Counted 1457 nodes.` is displayed in a light gray monospace font.

Building a Storm Query

Exercise 2 Answer

Objective:

- Understand how to build a Storm query step-by-step as you explore data and conduct analysis.

Question 1: What kinds of nodes are connected to the article?

- The article is connected to various nodes, including:
 - Hashes (**hash:sha256**)
 - Email addresses (**inet:email**)
 - IPv4 addresses (**inet:ipv4**)
 - Servers (**inet:server**)
 - URLs (**inet:url**)
 - Files (**file:bytes**)
 - Software / malware names (**it:prod:softname**)
 - Organization / threat names (**ou:name**)
 - Threat groups (**risk:threat**)
 - Malware / tools (**risk:tool:software**)

Question 2: What Storm operation can you add to your original query to only view the **inet:ipv4** nodes?

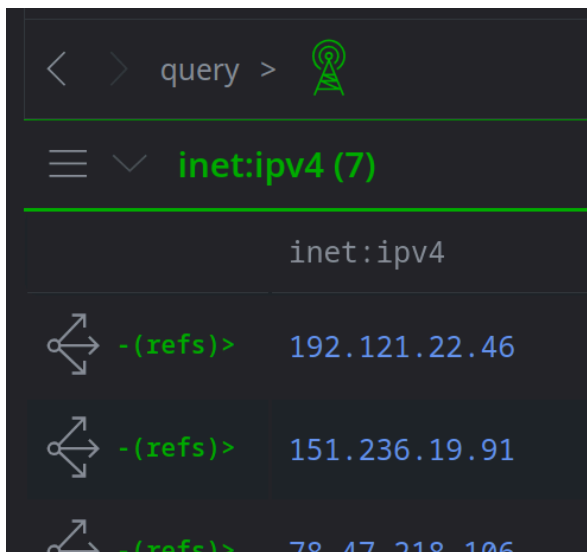
- Add the following Storm operation to show the IPv4s referenced in the article:

```
media:news:title^=crambus -(refs)> inet:ipv4
```

You added an **edge traversal** operation to your Storm query.

Tip: when you use the **Explore** button, the **link column** appears. The value in the link column shows how you arrived at these target nodes from your source nodes.

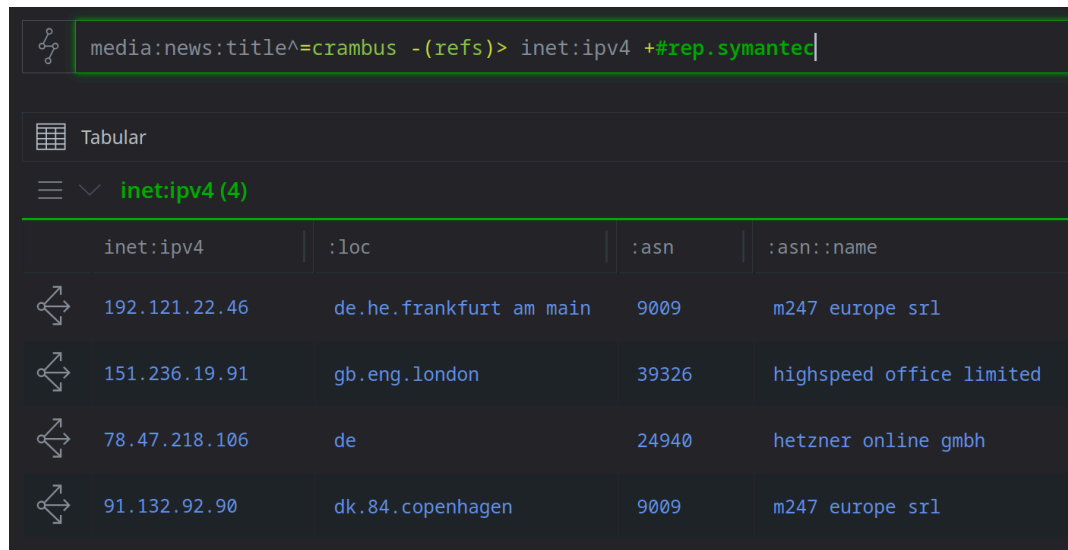
In this case, the link column shows the **inet:ipv4** nodes are linked to the **media:news** node by a **-(refs)>** edge:



Question 3: What Storm operation can you add to this query to **only** view the IOCs reported by Symantec (**rep.symantec**)?

- Add the following Storm operation to only show the IOCs:

```
media:news:title^=crambus -(refs)> inet:ipv4 +rep.symantec
```



The image shows a Storm query interface. At the top, a query bar contains the text: `media:news:title^=crambus -(refs)> inet:ipv4 +#rep.symantec`. Below the query bar, there is a 'Tabular' view button. Underneath, a dropdown menu shows 'inet:ipv4 (4)'. The main area displays a table with four columns: 'inet:ipv4', ':loc', ':asn', and ':asn::name'. There are four rows of data, each preceded by a double-headed arrow icon.

inet:ipv4	:loc	:asn	:asn::name
192.121.22.46	de.he.frankfurt am main	9009	m247 europe srl
151.236.19.91	gb.eng.london	39326	highspeed office limited
78.47.218.106	de	24940	hetzner online gmbh
91.132.92.90	dk.84.copenhagen	9009	m247 europe srl


You added a **filter** operation to your Storm query.

Question 4: What Storm operation can you add to your query to **pivot** to the **inet:server** nodes?



- Add the following Storm operation to pivot to the **inet:server** nodes:

```
media:news:title^=crambus -(refs)> inet:ipv4 +#rep.symantec  
-> inet:server
```

 media:news:title^=**crambus** -(refs)> inet:ipv4 **+#rep.symantec** -> inet:server

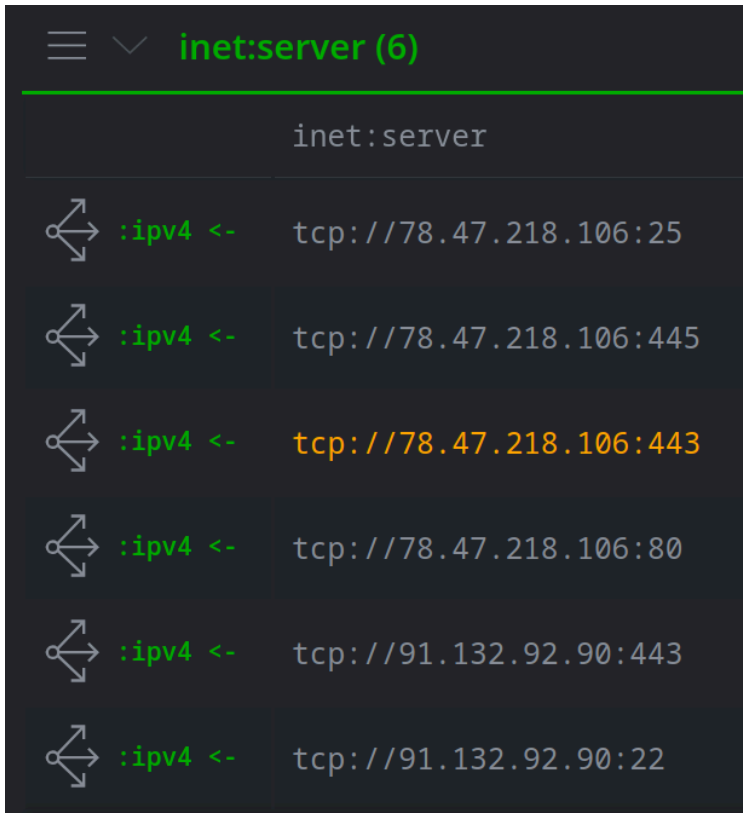
 Tabular

  **inet:server (6)**







	inet:server	:proto	:ipv4	:port
	tcp://78.47.218.106:25	tcp	78.47.218.106	25
	tcp://78.47.218.106:445	tcp	78.47.218.106	445
	tcp://78.47.218.106:443	tcp	78.47.218.106	443
	tcp://78.47.218.106:80	tcp	78.47.218.106	80
	tcp://91.132.92.90:443	tcp	91.132.92.90	443
	tcp://91.132.92.90:22	tcp	91.132.92.90	22

You added a **pivot** operation to your Storm query.

Once again the **link column** showed how the target (**inet:server**) nodes are linked to the source nodes (**inet:ipv4**) nodes:



The screenshot shows a table with a header row labeled 'inet:server'. Below the header, there are six rows, each representing a link from a source node to a target node. Each row starts with a pivot symbol (a circle with three arrows pointing outwards) followed by ':ipv4 <-'. The target node is listed to the right of the pivot. The target nodes are: tcp://78.47.218.106:25, tcp://78.47.218.106:445, tcp://78.47.218.106:443, tcp://78.47.218.106:80, tcp://91.132.92.90:443, and tcp://91.132.92.90:22.

	inet:server
 :ipv4 <-	tcp://78.47.218.106:25
 :ipv4 <-	tcp://78.47.218.106:445
 :ipv4 <-	tcp://78.47.218.106:443
 :ipv4 <-	tcp://78.47.218.106:80
 :ipv4 <-	tcp://91.132.92.90:443
 :ipv4 <-	tcp://91.132.92.90:22

In this case, the pivot "arrow" symbol shows the nodes are linked by a property **pivot** (vs. an edge **traversal**). The "arrow" points to the left because the **inet:server:ipv4** property "points to" the **inet:ipv4** nodes we Explored from.

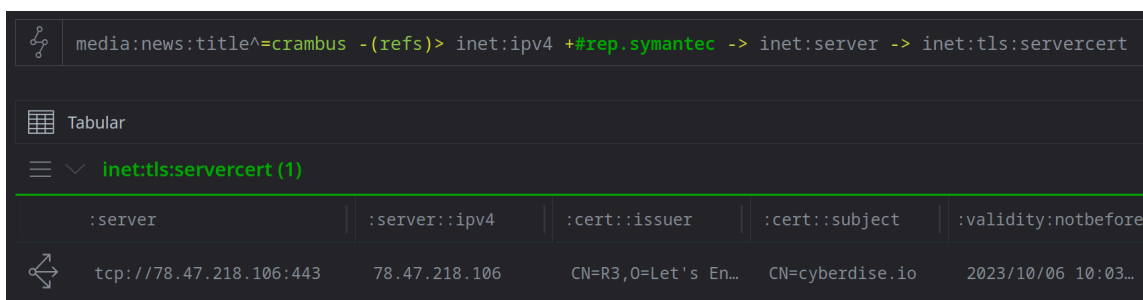
Note that regardless of the "direction" of the arrow in the link column, we use a "right pointing" arrow in our Storm query because all Storm pivots navigate from "left to right".

(The only exception is the left-pointing "wildcard pivot in" where the target **must** be the wildcard (*) symbol.)

Question 5: What Storm operation can you add to your query to **pivot** to the **inet:tls:servercert** node?

- Add the following Storm operation to pivot to the **inet:tls:servercert** node:

```
media:news:title^=crambus -(refs)> inet:ipv4 +rep.symantec
-> inet:server -> inet:tls:servercert
```



The screenshot shows a query interface with a Storm operation: `media:news:title^=crambus -(refs)> inet:ipv4 +rep.symantec -> inet:server -> inet:tls:servercert`. Below the query, the view is set to 'Tabular' and shows the results for the **inet:tls:servercert (1)** node. The results are displayed in a table with the following columns and data:

:server	:server::ipv4	:cert::issuer	:cert::subject	:validity:notbefore
tcp://78.47.218.106:443	78.47.218.106	CN=R3,O=Let's En...	CN=cyberdise.io	2023/10/06 10:03...

You added another **pivot** operation to your query.

Working with Bookmarks

Exercise 3 Answer

Objective:

- Save a useful query as a bookmark.
- Add the bookmark to your Favorites for easy access.

Question 1: How many files did your query find?

- The query identified **179** files.

Note: This answer is based on the baseline Synapse demo instance. Your answer may vary depending on the data that has been added to your demo instance so far in this course.

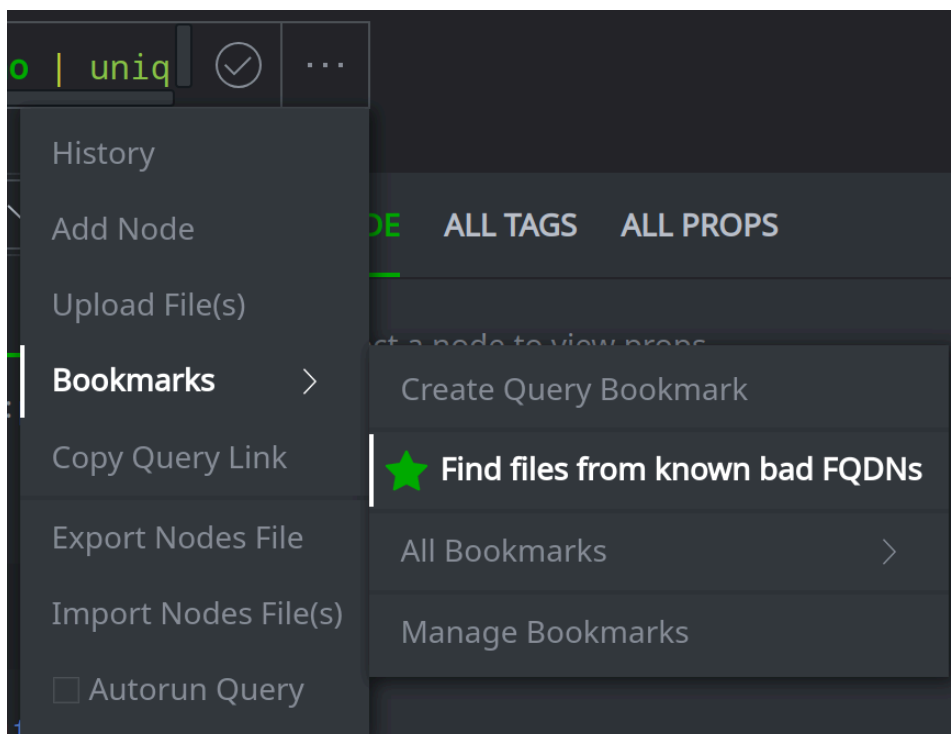
Some of the files have **rep** tags (from companies like Trend Micro or VirusTotal). But they do not have **cno** tags, which means they have not been reviewed or tagged internally by Vertex. We may want to do things like:

- Confirm the files are malicious and tag them **cno.mal**
- Associate the files with various malware families (**cno.mal.***)

- Attribute the files to various threat clusters (**cno.threat.***)

Question 2: Where is your bookmarked query located now?

- When you add the bookmarked query to your Favorites, it is accessible directly from the **Bookmarks** menu:



For reference, the following table breaks down the Bookmarked Storm query step-by-step:

Query Element	Operation
inet:fqdn#rep	Lift all malicious FQDNs reported by third-parties (tagged rep)
inet:fqdn#cno	Lift all malicious FQDNs tracked internally by Vertex (tagged cno)
 uniq	Deduplicate the results
 :zone -> inet:fqdn:zone	Pivot to any / all subdomains of those FQDNs

Query Element	Operation
	<ul style="list-style-type: none"> includes the original FQDNs themselves includes any untagged subdomains
uniq	Deduplicate the results
-> inet:dns:request	Pivot to any DNS requests for those FQDNs
-> file:bytes	Pivot to any files associated with those DNS queries
-#cno	Filter out files that are already tracked by Vertex
uniq	Deduplicate the results

Working with Storm Editor

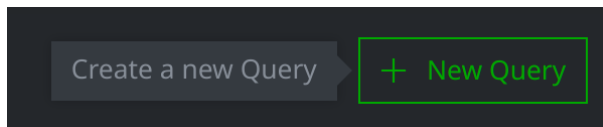
Exercise 4 Answer

Objective:

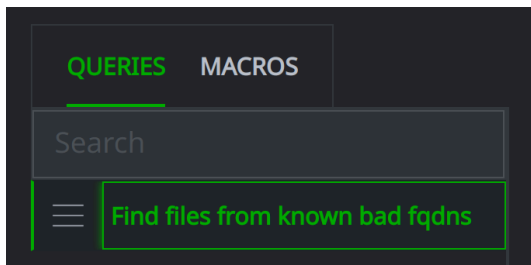
- Use Storm Editor to write and test a Storm query.
- Add comments to the query.

For this exercise, examine the features of the Storm Editor Tool and its ability to compose, test, save, and run Storm queries.

- The + **New Query** button allows you to create a new query:



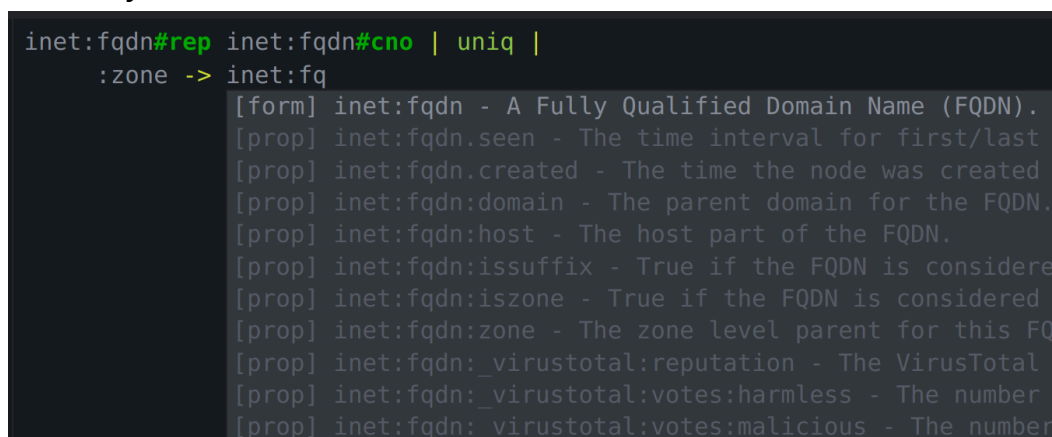
- You must specify a name for the query:



Once the name is saved, it cannot be changed.

Note: if you need to rename a query, use the query's **hamburger menu** to **Make a copy** and give the copy a name you like. You can then **Delete** the original query.

- **As you type**, Synapse will generate **auto-complete suggestions** wherever it is able to identify them:

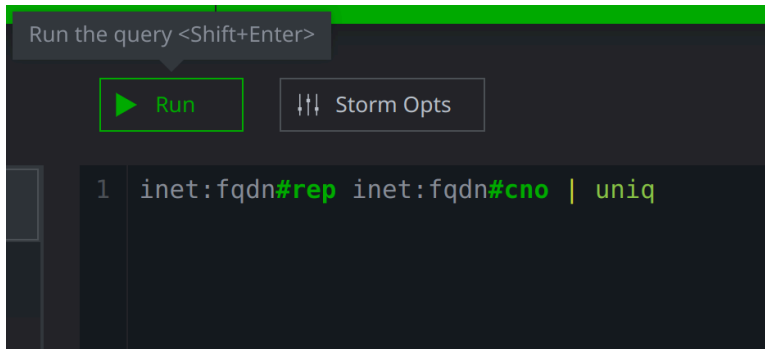


Auto-complete will attempt to match:

- Form names
- Property names
- Tag names
- Storm commands
- Storm library names
- Variable names
- Macro names

Auto-complete suggestions will get more specific as you type.

- The **Run** button will execute your query in its current state (as will pressing the **Shift-Enter** key combination):



This makes it easy to test your query. Synapse will let you know of any problems (such as a syntax error). If the query runs, Synapse will display any results in the console window underneath the Storm Editor window.

NOTE: Your query runs **for real**. If your query simply lifts data and returns nodes, that is not a problem. But **use caution** with any queries that make changes! We strongly recommend that you test queries in a **forked view** before deciding they are ready for production.

- You can add comments throughout the query:

```
1  /*
2  First we'll lift the FQDNs tagged with #rep and #cno, and remove
3  duplicates
4  */
5  inet:fqdn#rep inet:fqdn#cno | uniq |
6  /*
7  Then we'll pivot to lift any related FQDNS, again removing duplicates
8  */
9      :zone -> inet:fqdn:zone | uniq |
10 /*
11 Then we'll pivot to DNS requests
12 */
13     -> inet:dns:request
14 /*
15 This is a lot of commenting. I think I need a snack.
16 */
17     -> file:bytes -#cno | uniq
18
```