Synapse Bootcamp

Module 12

Modifying Data with Storm

v0.4 - May 2024

Objectives

- Understand how to use edit brackets in Storm
- Know how the Storm pipeline affects edit operations
- Understand how edit parentheses can be used to scope edits
- Use Storm edit operations to:
  - Create nodes
  - Set, modify, and remove properties
  - Add and remove tags

Modifying Data in Storm

Storm Operations

Operation	Meaning	Common Storm Operator	UI Equivalent
Lift	Select data (nodes) from Synapse	Query bar - Storm	Query bar - Lookup / Text Search `query` and copy menu options
Pivot	Move between nodes that share the same **property value**	-> or <- *	Explore button `pivot` menu option
Traverse	Move between nodes that are linked by an **edge**	-(*)> or <(*)-	Explore button
Filter	Include / exclude a subset of nodes	+ or -	n/a (column filters; `query` / `select` menu options)
Run	Execute a Storm command	| <command>	Node Action
Modify / Edit	Modify or delete properties Add or remove tags Add nodes	[ ] or [( )]	Inline property edit; delete menu option Add / remove tags menu options Lookup or Auto Add / Add Node

Edit Brackets

- Storm uses square brackets (**[ ]**) to enclose **edit** operations
  - Also known as "data modification"
- "Edit" means any change:
  - Add / create nodes
  - Set, modify, or delete properties
  - Add or remove tags or tag timestamps
- A set of brackets represents a single **edit operation**
  - The brackets can enclose multiple changes

Adding / Modifying Data

Adding Nodes

- When creating a node, the only thing **required** is the **primary property**
  - Other properties are optional / can be set later
- Creating a node requires:
  - **Edit brackets**
  - The **form** name
  - The **equals** sign (=)
  - The primary property **value**

```
[ inet:email = info@vertex.link ]
```

- If the node already exists, Synapse simply **lifts** the node
  - Synapse checks (deconflicts) based on the primary property

Adding Nodes

- Add simple node

```
[ inet:fqdn = vertex.link ]
```

- Add composite node

```
[ inet:dns:a = (vertex.link,137.184.16.9) ]
```

- Add guid node

```
[ ou:org = * ]
```

  - Using an asterisk (*) will generate an **arbitrary** guid

Storm gen .* commands can be used to **deconflict** and **create** some guid forms.

Adding Multiple Nodes

- Edit brackets can be used to make multiple changes
  - No need to place individual changes in separate brackets
- These two queries perform the **same** actions:

```
[ inet:fqdn=vertex.link ] [ inet:dns:a=(vertex.link,137.184.16.9) ] [ ps:contact=* ]
```

```
[ inet:fqdn=vertex.link  inet:dns:a=(vertex.link,137.184.16.9)  ps:contact=* ]
```

- In each case we provide the node's **primary property** to create it

Setting Properties

- Set or modify the same way
- Requires:
  - The node(s) whose property you want to set
  - Edit brackets
  - The **relative** property name
  - The **value** of the property

```
inet:ipv4=8.8.8.8 [ :loc='us.ca.mountain view' ]
```

Node

Relative property name

Value

Setting Properties

- Add node and set property

```
[ ou:org=* :name='The Vertex Project' ]
```

- Set property on existing node

```
ou:org:name='The Vertex Project' [ :loc=us.va.reston ]
```

- Set multiple properties on existing node

```
ou:org:name='The Vertex Project' [ :loc=us.va.reston :founded=2016 ]
```

Removing Properties

- Removing a property **deletes** it entirely
  - Delete in the layer where it resides
- Requires:
  - The node(s) whose property you want to remove
  - Edit brackets
  - The **minus** sign (-)
  - The **relative** property name

```
inet:ipv4=8.8.8.8 [ -:loc ]
```

Node

Relative property name (with minus)

Adding / Modifying Data - Demo

Applying / Removing Tags

Applying Tags

- Requires:
  - The node(s) you want to apply the tag to
  - Edit brackets
  - The **plus** sign (+)
  - The **hashtag** sign (#)
  - The **tag name**

```
inet:ipv4=8.8.8.8 [ +#cno.infra.dns.google ]
```

- Synapse automatically creates the `syn:tag` node(s) if they don't exist

Applying Tags

- With node creation

```
[ inet:ipv4=47.56.228.89 +#rep.secureworks.shadowpad ]
```

- To existing node

```
inet:ipv4=47.56.228.89 [ +#rep.secureworks.shadowpad ]
```

- Add multiple tags to existing node

```
inet:ipv4=47.56.228.89 [ +#rep.secureworks.shadowpad
   +#rep.secureworks.bronze_university ]
```

Applying Tags with Timestamps

- Requires:
  - The **equals** sign and a **single** date/time, **or**
  - The **equals** sign and a **pair** of date/times in **parentheses**
- Can **modify** a timestamp the same way as adding
  - Subject to interval (ival) behavior

```
ou:org:name=vertex [ +#super.cool.company=2016/06/01 ]
```

```
ou:org:name=vertex [ +#super.cool.company=(2016/06/01, now) ]
```

Removing Tags / Tag Timestamps

- Requires:
  - The node(s) you want to remove the tag from
  - The **minus** sign (-)
  - The **hashtag** sign (#)
  - The **tag name**

```
inet:ipv4=8.8.8.8 [ -#cno.infra.dns.google ]
```

- Synapse removes the tag you specify
  - "From here down"
- To remove a **tag timestamp**, remove the **tag** element associated with the timestamp

Removing Tags

- For a node with the tag `#cno.infra.dns.google`
  - Remove the **base** tag ('google'):

```
inet:ipv4=8.8.8.8 [ -#cno.infra.dns.google ]
```

    Remaining tag: `#cno.infra.dns`

  - Remove the **full** tag:

```
inet:ipv4=8.8.8.8 [ -#cno ]
```

    Remaining tag: none

Removing Tag Timestamps

- IPv4 with `#cno.infra.dns.google=(2022/01/15, 2022/04/07)`
  - Remove timestamp by removing base tag (leaves tag `#cno.infra.dns`):

```
inet:ipv4=8.8.8.8 [ -#cno.infra.dns.google ]
```

  - We now have:

```
inet:ipv4=8.8.8.8 with #cno.infra.dns
```

  - If the node should still have the tag (without timestamps), re-add it:

```
inet:ipv4=8.8.8.8 [ +#cno.infra.dns.google ]
```

  - To **shrink** the time window, re-add the tag with the new dates:

```
inet:ipv4=8.8.8.8 [ +#cno.infra.dns.google=(2022/02/15, 2022/04/07) ]
```

Applying / Removing Tags - Demo

Adding / Removing Light Edges

Adding Light Edges

- Requires:
  - The node(s) you want to link via the edge
  - Edit brackets
  - The **plus** sign (+)
  - The **edge name** in parentheses (e.g., (`refs`))
  - The **edge direction** arrow (> or <)
  - The node(s) you want to link enclosed in **curly braces** ({ })

```
hash:sha1#rep.eset.sednit [ <(refs)+ { media:news:title='en route with sednit' } ]
```

```
media:news:title='en route with sednit' [ +(refs)> { hash:sha1#rep.eset.sednit } ]
```

For many common use cases, Synapse creates light edges for you!

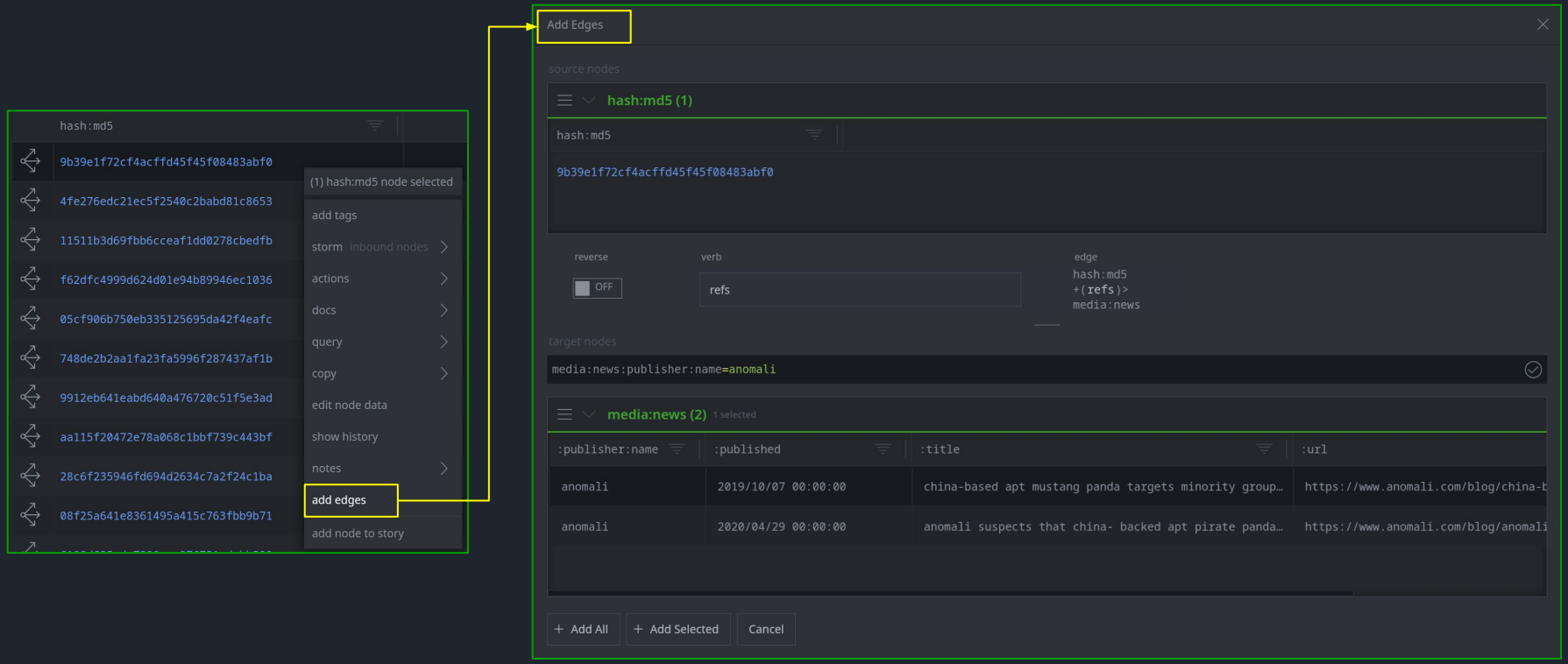
Removing Light Edges

- Requires:
  - The node(s) you want to link via the edge
  - Edit brackets
  - The **minus** sign (-)
  - The **edge name** in parentheses ((`refs`))
  - The **edge direction** arrow (> or <)
  - The node(s) you want to unlink enclosed in **curly braces** ({ })

```
hash:sha1#rep.eset.sednit [ <(refs)- { media:news:title='en route with sednit' } ]
```

```
media:news:title='en route with sednit' [ -(refs)> { hash:sha1#rep.eset.sednit } ]
```

Add Edges Dialog



Adding Light Edges - Demo

Edits and the Storm Pipeline

Edits and the Storm Pipeline

- Storm operations are chained to form longer queries
  - The chain is a **pipeline** through which nodes pass
  - Any **edit operation** is also part of the pipeline
- Edit brackets **do not** separate or isolate changes
  - Applies `#cno.mal` to **both** FQDNs:

```
inet:fqdn=google.com [ inet:fqdn=evil.com +#cno.mal ]
```

  - Sets `:loc=au` for 1.2.3.4, then sets `:loc=de` for **both** IPv4s:

```
[ inet:ipv4=1.2.3.4 :loc=au ] [ inet:ipv4=5.6.7.8 :loc=de ]
```

Edit Parentheses

- You can use **parentheses** inside edit brackets
  - Parentheses **isolate changes**

```
inet:fqdn=google.com [ ( inet:fqdn=evil.com +#cno.mal ) ]
```

```
[ ( inet:ipv4=1.2.3.4 :loc=au ) ( inet:ipv4=5.6.7.8 :loc=de ) ]
```

- **Nodes** remain in the pipeline
  - Edits **outside** parentheses apply to all nodes

```
[ ( inet:ipv4=1.2.3.4 :loc=au ) ( inet:ipv4=5.6.7.8 :loc=de ) +#woot ]
```

Edits and Bulk Changes

- An edit operation can be used like any other operation
  - Added to a Storm query / query pipeline
- The edit can operate on **any number** of inbound nodes
  - Make modifications at scale

```
[ inet:ipv4=213.24.76.0/24 ]
```

```
media:news [ -:author ]
```

```
file:bytes.created@=(now,'-1 day') +#rep [ +#thesilence.triage ]
```

Synapse UI and Storm

Synapse UI	Storm Editing
Multiple methods to add (Lookup mode, Add Node dialog)	Single method (edit brackets / parentheses)
Multiple methods to edit (inline, edit menu, add / remove tags)	Single method (edit brackets / parentheses)
Good for making changes to one or a small number of nodes	Good for making changes at scale

Summary

- In Storm **edit brackets** enclose operations that add or modify data
  - Add nodes
  - Set/modify/delete properties
  - Add/remove tags
  - Add/remove tag timestamps
- An **edit operation** acts like any other operation in the Storm **pipeline**
  - One or more nodes are **inbound to** (or specified within) the edit brackets
  - The edit operation takes place on **all** inbound nodes
- **Edit parentheses** can be used to segregate specific edit operations
- Storm edit operations are convenient for making changes **at scale**