Cases for ASTAR

# 1. Case #1

- path from Handle to handle on database

- no constrains

- query:

# example 1

PREFIX gas: <http://www.bigdata.com/rdf/gas#>

SELECT ?depth ?predecessor ?out {

SERVICE gas:service {

gas:program gas:gasClass "com.bigdata.rdf.graph.analytics.ASTAR" .

gas:program gas:in <http://sunflower.test/handle/IS111-RIPE> . # one or more times, specifies the initial frontier.

gas:program gas:target <http://sunflower.test/handle/AR17051-RIPE> . # only retain vertices along paths to these target vertices.

#gas:program gas:target <http://sunflower.test/handle/> . # only retain vertices along paths to these target vertices.

gas:program gas:out ?out . # exactly once - will be bound to the visited vertices.

gas:program gas:out1 ?depth . # exactly once - will be bound to the depth of the visited vertices.

gas:program gas:out2 ?predecessor . # exactly once - will be bound to the predecessor.

gas:program gas:maxIteration 10 . # optional limit on breadth first expansion.

gas:program gas:maxVisited 500 . # optional limit on the #of visited vertices.

gas:program gas:traversalDirection 'Undirected' . # optional limit on the #of visited vertices.

gas:program gas:nthreads 1 .

}

}

order by ?depth

Result (as expected)

depth predecessor out

0 " " <http://sunflower.test/handle/IS111-RIPE>

1 <http://sunflower.test/handle/IS111-RIPE> <http://sunflower.test/Handle>

2 <http://sunflower.test/Handle> <http://sunflower.test/handle/AR17051-RIPE>

for comparison - same request using BFS -

same result

depth predecessor out

0 " " <http://sunflower.test/handle/IS111-RIPE>

1 <http://sunflower.test/handle/IS111-RIPE> <http://sunflower.test/Handle>

2 <http://sunflower.test/Handle> <http://sunflower.test/handle/AR17051-RIPE>

**2. case #2**

I wish to print link -

adding it:

# example 2

PREFIX gas: <http://www.bigdata.com/rdf/gas#>

SELECT ?depth ?predecessor ?linkType ?out {

SERVICE gas:service {

gas:program gas:gasClass "com.bigdata.rdf.graph.analytics.ASTAR" .

gas:program gas:in <http://sunflower.test/handle/IS111-RIPE> . # one or more times, specifies the initial frontier.

gas:program gas:target <http://sunflower.test/handle/AR17051-RIPE> . # only retain vertices along paths to these target vertices.

#gas:program gas:target <http://sunflower.test/handle/> . # only retain vertices along paths to these target vertices.

gas:program gas:out ?out . # exactly once - will be bound to the visited vertices.

gas:program gas:out1 ?depth . # exactly once - will be bound to the depth of the visited vertices.

gas:program gas:out2 ?predecessor . # exactly once - will be bound to the predecessor.

gas:program gas:maxIteration 10 . # optional limit on breadth first expansion.

gas:program gas:maxVisited 500 . # optional limit on the #of visited vertices.

gas:program gas:traversalDirection 'Undirected' . # optional limit on the #of visited vertices.

gas:program gas:nthreads 1 .

}

?predecessor ?linkType ?out

}

output is unexpected:

| depth | predecessor | linkType | out |
| --- | --- | --- | --- |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.140.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.140.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.143.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.143.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.188.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.188.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.213.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.213.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.234.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.234.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.91.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.91.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.253.207.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.253.207.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.253.24.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.253.24.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/88.83.192.0%2F19>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/88.83.192.0%2F19>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.110.0.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.110.0.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.151.128.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.151.128.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.36.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.36.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.40.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.40.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.50.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.50.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.192.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.192.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.197.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.197.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.199.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.199.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.205.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.205.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.223.101.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.223.101.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.223.108.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.223.108.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.239.128.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.239.128.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.254.192.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.254.192.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.0.0%2F19>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.0.0%2F19>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.104.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.104.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.108.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.108.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.22.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.22.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.66.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.66.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.76.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.76.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.80.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.80.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.84.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.84.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 1 | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) | [rdf:type](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:rdf:type) | [<http://sunflower.test/Handle>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/Handle>) |

Strange things

a) Many predecessors – but ok

b) where is last line like

2 <http://sunflower.test/Handle> “ “ <<http://sunflower.test/handle/AR17051-RIPE>>

?

**3. case #3**

adding rules to exclude rdf:type

List<String> rej = Arrays.asList("rdf:type");

3-1) repeat request without linkType:  
  
# example 3

PREFIX gas: <http://www.bigdata.com/rdf/gas#>

SELECT ?depth ?predecessor ?linkType ?out {

SERVICE gas:service {

gas:program gas:gasClass "com.bigdata.rdf.graph.analytics.ASTAR" .

gas:program gas:in <http://sunflower.test/handle/IS111-RIPE> . # one or more times, specifies the initial frontier.

gas:program gas:target <http://sunflower.test/handle/AR17051-RIPE> . # only retain vertices along paths to these target vertices.

#gas:program gas:target <http://sunflower.test/handle/> . # only retain vertices along paths to these target vertices.

gas:program gas:out ?out . # exactly once - will be bound to the visited vertices.

gas:program gas:out1 ?depth . # exactly once - will be bound to the depth of the visited vertices.

gas:program gas:out2 ?predecessor . # exactly once - will be bound to the predecessor.

gas:program gas:maxIteration 10 . # optional limit on breadth first expansion.

gas:program gas:maxVisited 50 . # optional limit on the #of visited vertices.

gas:program gas:traversalDirection 'Undirected' . # optional limit on the #of visited vertices.

gas:program gas:nthreads 1 .

}

}

order by ?depth

result is as expected:

| depth | predecessor | linkType | out |
| --- | --- | --- | --- |
| 0 |  |  | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 1 | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |  | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |
| 2 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |  | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |
| 3 | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |  | [<http://sunflower.test/handle/AR17051-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/AR17051-RIPE>) |

3-2) adding linkType:

# example 3-1

PREFIX gas: <http://www.bigdata.com/rdf/gas#>

SELECT ?depth ?predecessor ?linkType ?out {

SERVICE gas:service {

gas:program gas:gasClass "com.bigdata.rdf.graph.analytics.ASTAR" .

gas:program gas:in <http://sunflower.test/handle/IS111-RIPE> . # one or more times, specifies the initial frontier.

gas:program gas:target <http://sunflower.test/handle/AR17051-RIPE> . # only retain vertices along paths to these target vertices.

#gas:program gas:target <http://sunflower.test/handle/> . # only retain vertices along paths to these target vertices.

gas:program gas:out ?out . # exactly once - will be bound to the visited vertices.

gas:program gas:out1 ?depth . # exactly once - will be bound to the depth of the visited vertices.

gas:program gas:out2 ?predecessor . # exactly once - will be bound to the predecessor.

gas:program gas:maxIteration 10 . # optional limit on breadth first expansion.

gas:program gas:maxVisited 50 . # optional limit on the #of visited vertices.

gas:program gas:traversalDirection 'Undirected' . # optional limit on the #of visited vertices.

gas:program gas:nthreads 1 .

}

?predecessor ?linkType ?out

}

order by ?depth

result is :

| depth | predecessor | linkType | out |
| --- | --- | --- | --- |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.140.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.140.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.143.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.143.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.188.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.188.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.213.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.213.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.234.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.234.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.91.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.91.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.253.207.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.253.207.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.253.24.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.253.24.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/88.83.192.0%2F19>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/88.83.192.0%2F19>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.110.0.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.110.0.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.151.128.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.151.128.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.36.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.36.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.40.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.40.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.50.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.50.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.192.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.192.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.197.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.197.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.199.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.199.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.205.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.205.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.223.101.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.223.101.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.223.108.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.223.108.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.239.128.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.239.128.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.254.192.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.254.192.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.0.0%2F19>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.0.0%2F19>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.104.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.104.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.108.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.108.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.22.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.22.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.66.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.66.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.76.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.76.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.80.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.80.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.84.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.84.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 1 | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) | [<http://sunflower.test/is\_admin\_c\_of>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/is_admin_c_of>) | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |
| 2 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) | [<http://sunflower.test/cidr\_country>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/cidr_country>) | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |

Again:

a)many predecessos

b) no last line (expected like in casee 3-1)

# 4. Case 4

adding one more rule – exclude **is\_admin\_c\_of**

List<String> rej = Arrays.asList("rdf:type","http://sunflower.test/is\_admin\_c\_of");

4-1) Without linkType -

# example 4-1

PREFIX gas: <http://www.bigdata.com/rdf/gas#>

SELECT ?depth ?predecessor ?linkType ?out {

SERVICE gas:service {

gas:program gas:gasClass "com.bigdata.rdf.graph.analytics.ASTAR" .

gas:program gas:in <http://sunflower.test/handle/IS111-RIPE> . # one or more times, specifies the initial frontier.

gas:program gas:target <http://sunflower.test/handle/AR17051-RIPE> . # only retain vertices along paths to these target vertices.

#gas:program gas:target <http://sunflower.test/handle/> . # only retain vertices along paths to these target vertices.

gas:program gas:out ?out . # exactly once - will be bound to the visited vertices.

gas:program gas:out1 ?depth . # exactly once - will be bound to the depth of the visited vertices.

gas:program gas:out2 ?predecessor . # exactly once - will be bound to the predecessor.

gas:program gas:maxIteration 10 . # optional limit on breadth first expansion.

gas:program gas:maxVisited 50 . # optional limit on the #of visited vertices.

gas:program gas:traversalDirection 'Undirected' . # optional limit on the #of visited vertices.

gas:program gas:nthreads 1 .

}

}

order by ?depth

we have found new connection:

| depth | predecessor | linkType | out |
| --- | --- | --- | --- |
| 0 |  |  | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 1 | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |  | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |
| 2 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |  | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |
| 3 | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |  | [<http://sunflower.test/handle/AR17051-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/AR17051-RIPE>) |

4-2) Now lets print with linkType:

# example 4-2

PREFIX gas: <http://www.bigdata.com/rdf/gas#>

SELECT ?depth ?predecessor ?linkType ?out {

SERVICE gas:service {

gas:program gas:gasClass "com.bigdata.rdf.graph.analytics.ASTAR" .

gas:program gas:in <http://sunflower.test/handle/IS111-RIPE> . # one or more times, specifies the initial frontier.

gas:program gas:target <http://sunflower.test/handle/AR17051-RIPE> . # only retain vertices along paths to these target vertices.

#gas:program gas:target <http://sunflower.test/handle/> . # only retain vertices along paths to these target vertices.

gas:program gas:out ?out . # exactly once - will be bound to the visited vertices.

gas:program gas:out1 ?depth . # exactly once - will be bound to the depth of the visited vertices.

gas:program gas:out2 ?predecessor . # exactly once - will be bound to the predecessor.

gas:program gas:maxIteration 10 . # optional limit on breadth first expansion.

gas:program gas:maxVisited 50 . # optional limit on the #of visited vertices.

gas:program gas:traversalDirection 'Undirected' . # optional limit on the #of visited vertices.

gas:program gas:nthreads 1 .

# EP - exclude predicate

# gas:program gas:epstring "abracadabra" .

# gas:program gas:epv <http://sunflower.test/Handle>

# gas:program gas:epv <rdf:type>

}

?predecessor ?linkType ?out

}

order by ?depth

and results are:

| depth | predecessor | linkType | out |
| --- | --- | --- | --- |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.140.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.140.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.143.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.143.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.188.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.188.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.213.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.213.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.234.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.234.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/86.102.91.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/86.102.91.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.253.207.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.253.207.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/87.253.24.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.253.24.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/88.83.192.0%2F19>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/88.83.192.0%2F19>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.110.0.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.110.0.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.151.128.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.151.128.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.36.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.36.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.40.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.40.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.17.50.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.17.50.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.192.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.192.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.197.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.197.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.199.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.199.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.221.205.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.221.205.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.223.101.0%2F24>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.223.101.0%2F24>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.223.108.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.223.108.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.239.128.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.239.128.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/89.254.192.0%2F18>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/89.254.192.0%2F18>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.0.0%2F19>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.0.0%2F19>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.104.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.104.0%2F21>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.154.108.0%2F22>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.154.108.0%2F22>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.22.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.22.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.66.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.66.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.76.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.76.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.80.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.80.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 0 | [<http://sunflower.test/asn\_cidr/90.157.84.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.84.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| 1 | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) | [<http://sunflower.test/is\_admin\_c\_of>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/is_admin_c_of>) | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |
| 2 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) | [<http://sunflower.test/cidr\_country>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/cidr_country>) | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |

Again – some strange things:

1) many predecessors (ok)

2) not complete listing (RU→ Handle again is lost)

and now – new phenomena:

| 0 | [<http://sunflower.test/asn\_cidr/90.157.84.0%2F23>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/90.157.84.0%2F23>) | [<http://sunflower.test/admin\_c>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/admin_c>) | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) |
| --- | --- | --- | --- |
| 1 | [<http://sunflower.test/handle/IS111-RIPE>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/handle/IS111-RIPE>) | **[<http://sunflower.test/is\_admin\_c\_of>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/is_admin_c_of>)** | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) |
| 2 | [<http://sunflower.test/asn\_cidr/87.117.128.0%2F21>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/asn_cidr/87.117.128.0%2F21>) | [<http://sunflower.test/cidr\_country>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/cidr_country>) | [<http://sunflower.test/country/RU>](http://172.17.0.1:9999/blazegraph/" \l "explore:kb:<http://sunflower.test/country/RU>) |

It is locked - we cannot follow that edge.

\* \* \*