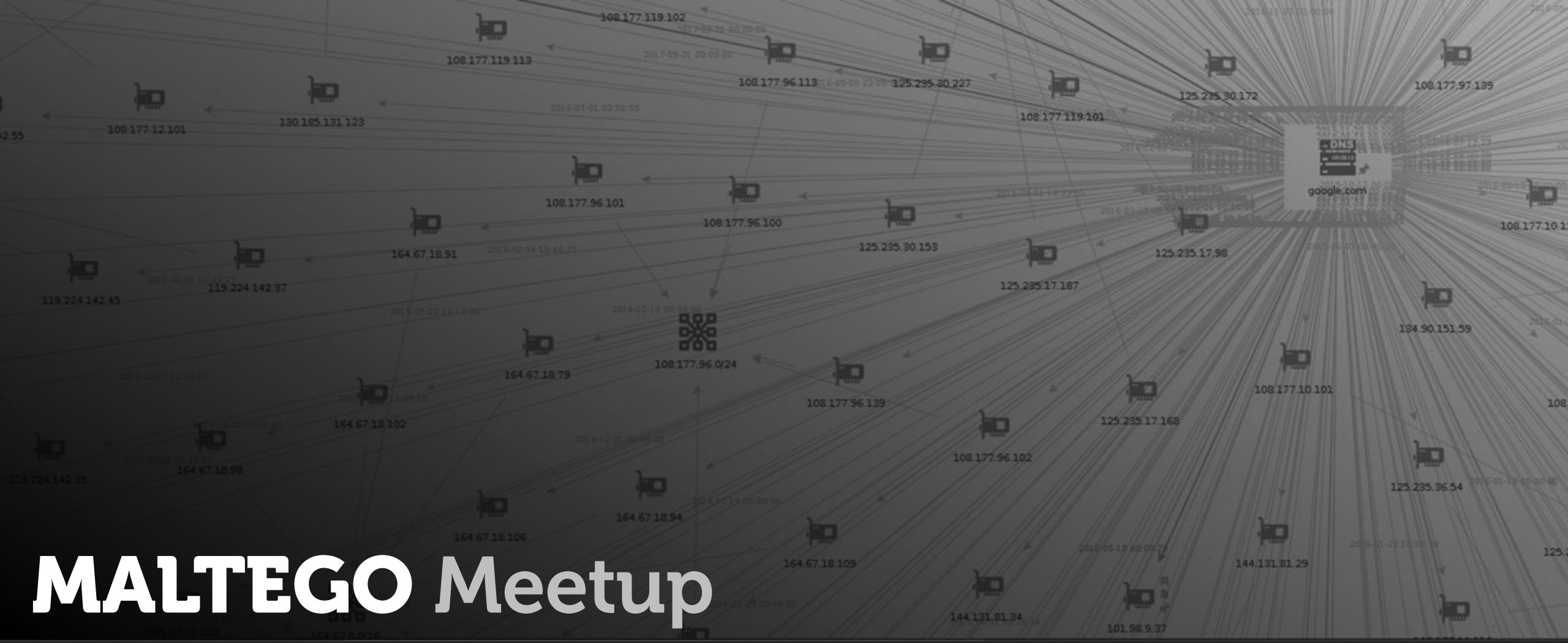


MALTEGO Meetup

PARIS - Wednesday, November 28th 2018
Felix Aimé (@felixaime)



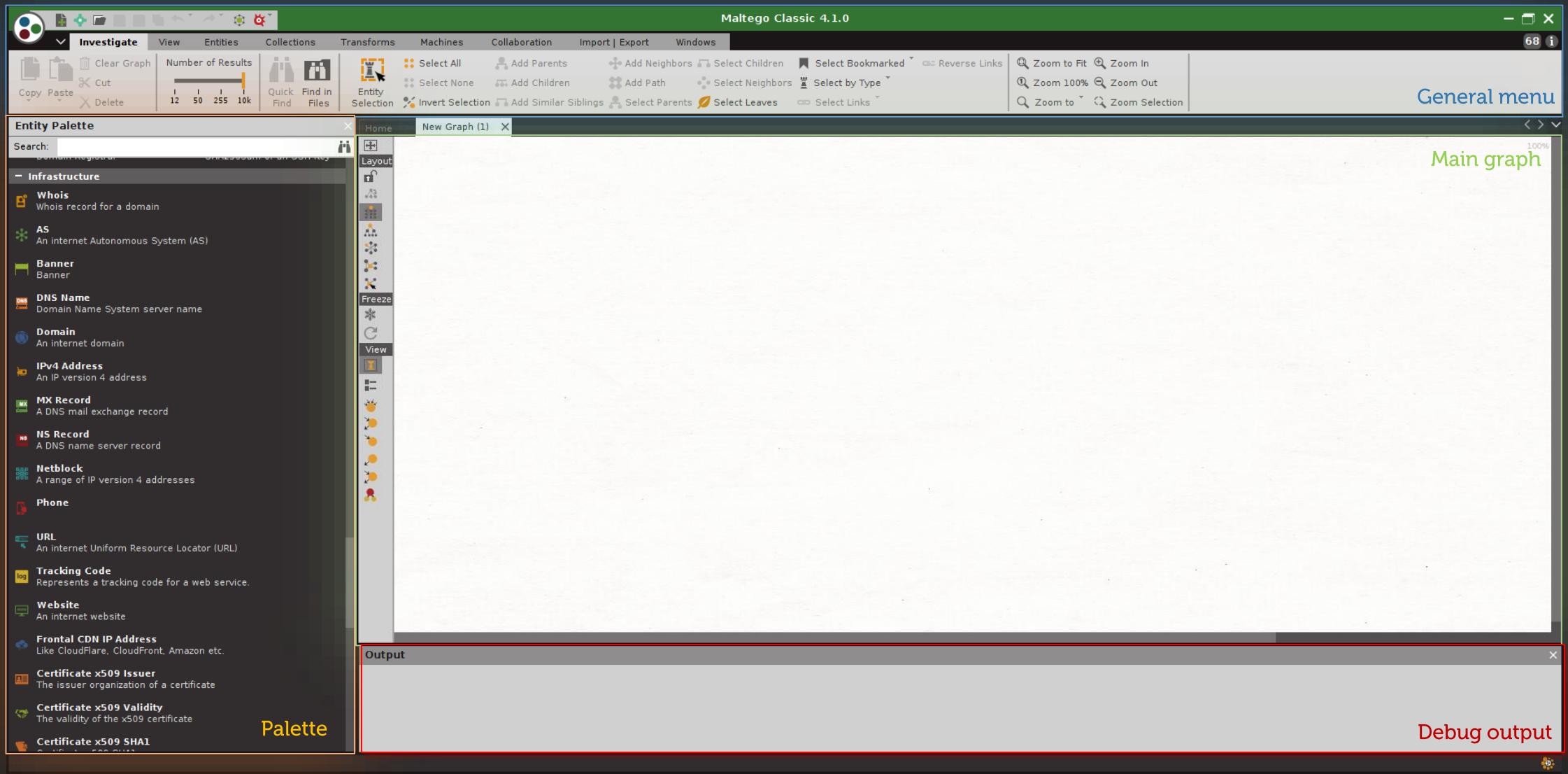
AGENDA

1. Maltego presentation for newbies
2. Transforms surgery
3. Analysts tips and tricks
4. Developpers tips and tricks

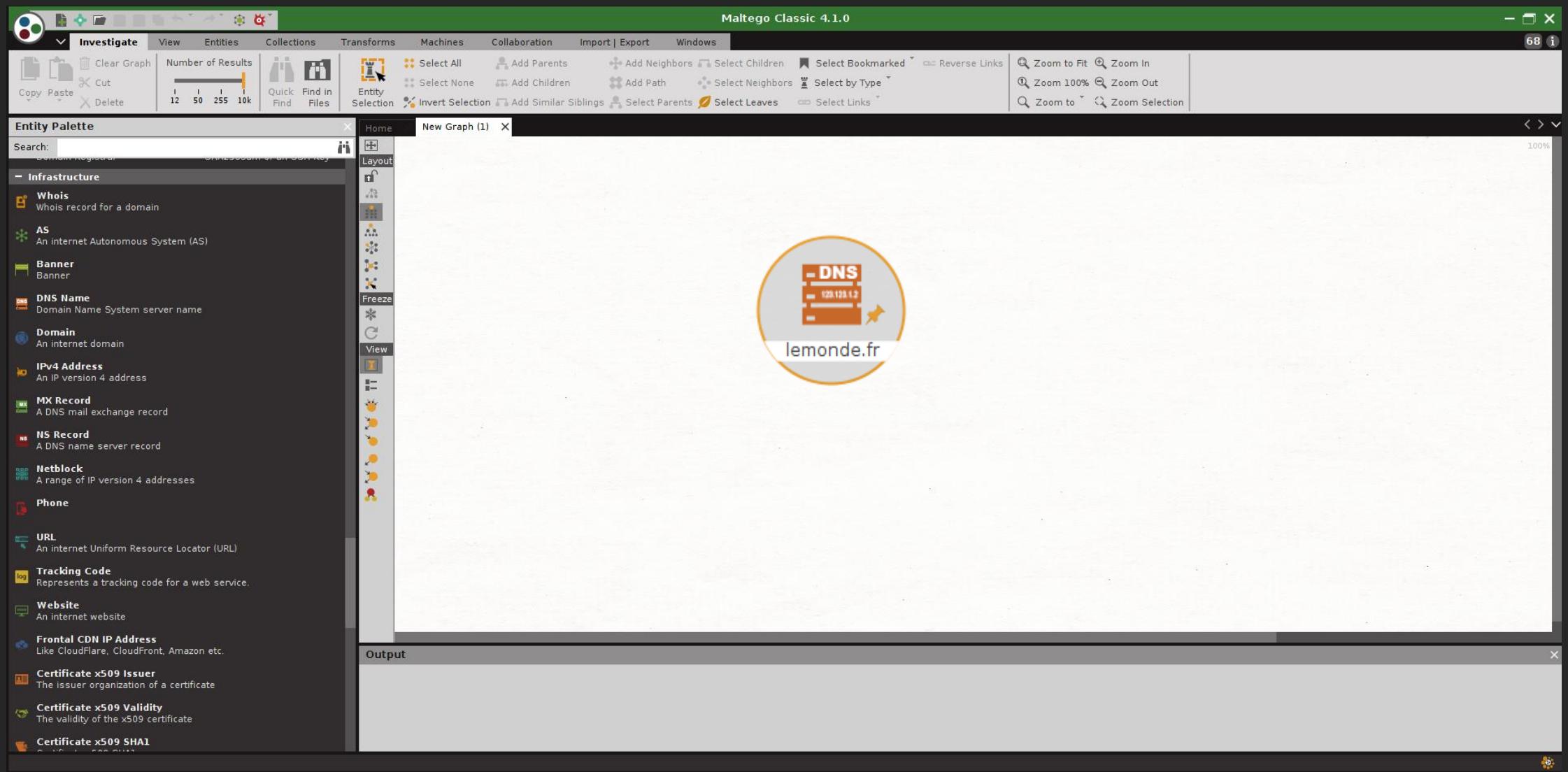
Maltego presentation for newbies :

Maltego it's like IDA,
without scripts it's an empty shell.

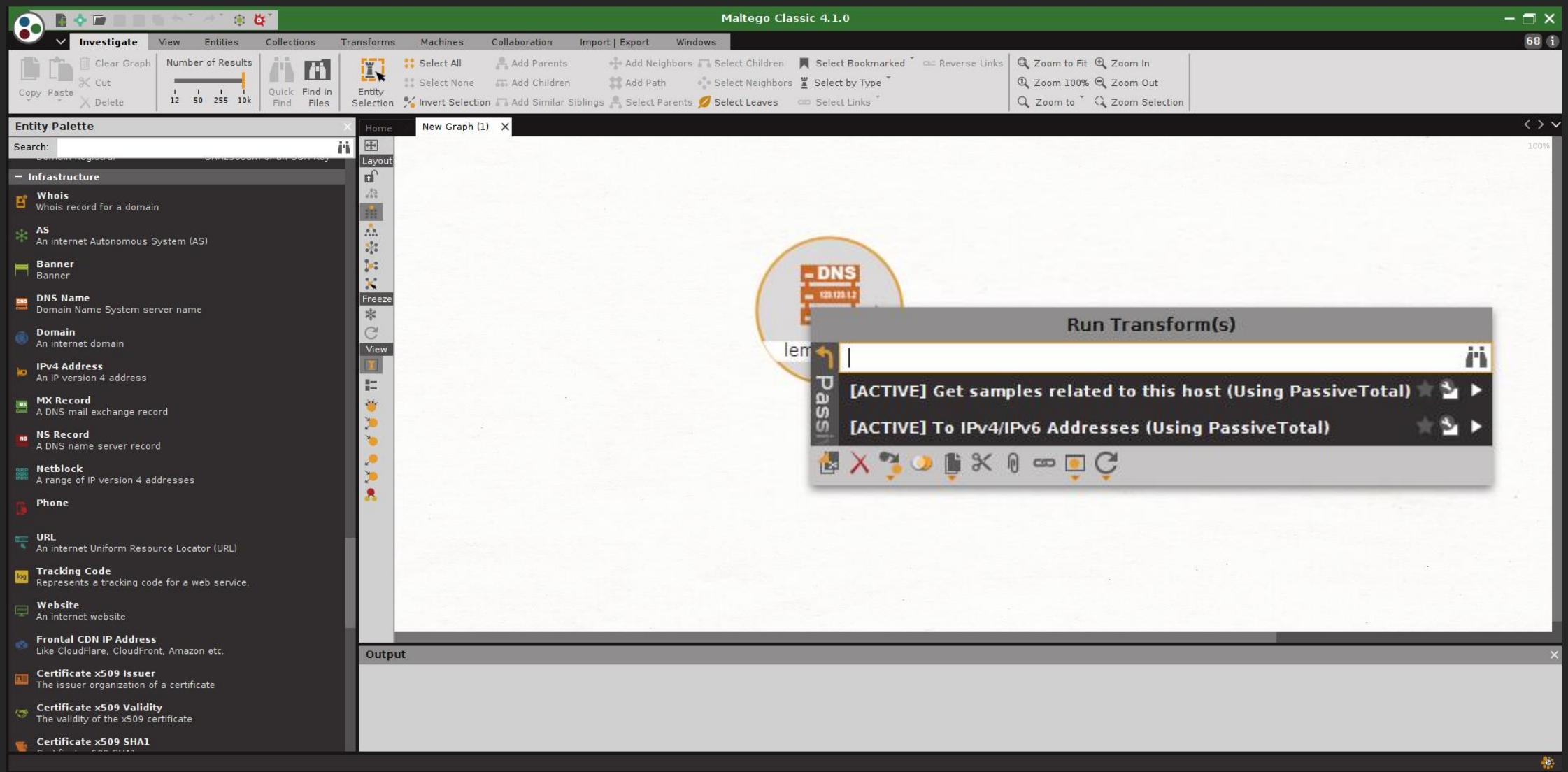
Maltego presentation for newbies: interface



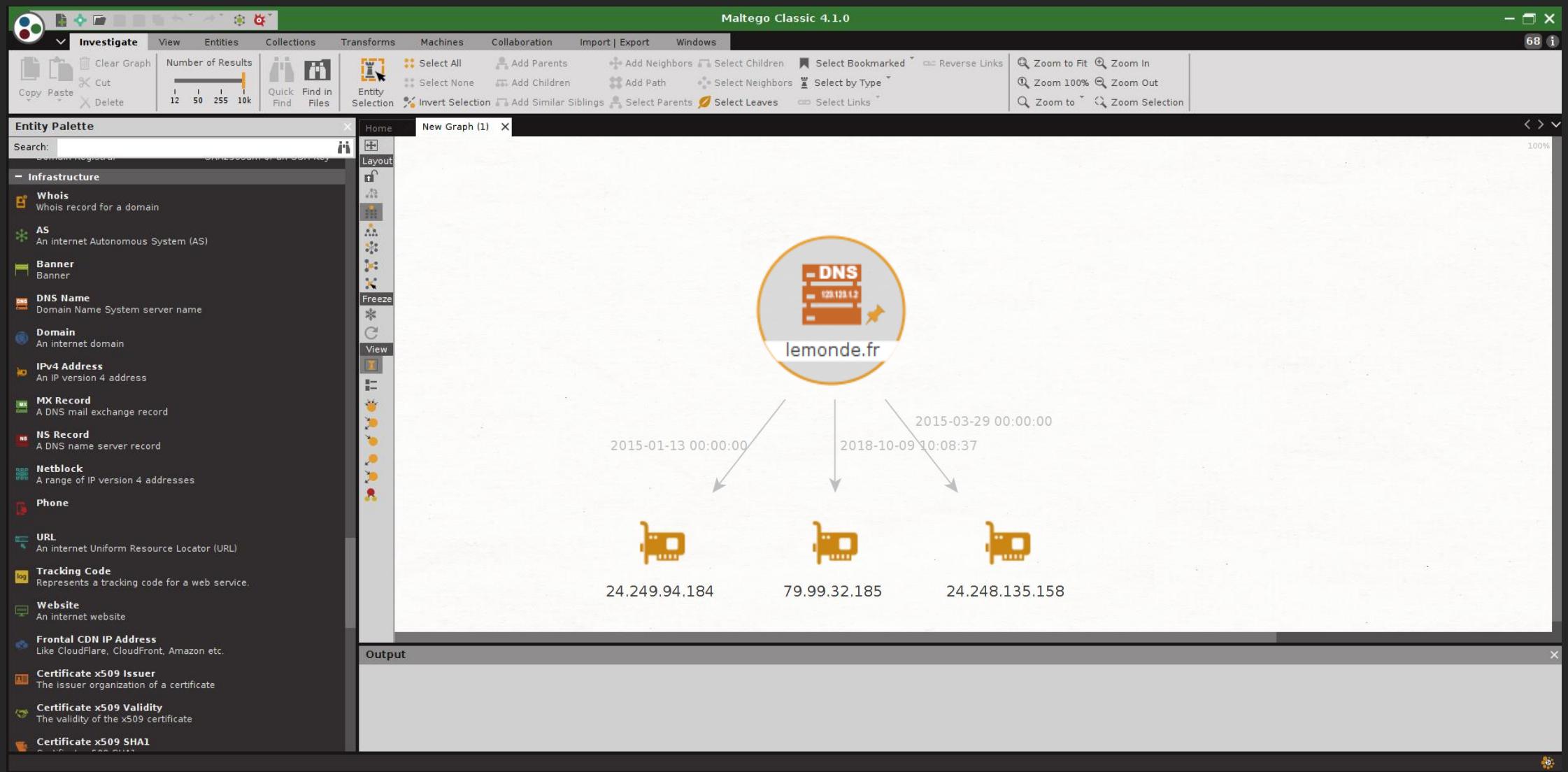
Maltego presentation for newbies: interface



Maltego presentation for newbies: interface



Maltego presentation for newbies: interface



Maltego presentation for newbies: golden rules

You can create your own entities.

Maltego presentation for newbies: golden rules

You can create your own transforms.

Maltego presentation for newbies: golden rules

An entity can be any atomic object.

Maltego presentation for newbies: golden rules

A transform is a specific operation that can be applied on an entity.

Maltego presentation for newbies: golden rules

A transform can be applied on different entities.

Demo.

Local Transfroms.

Local transform development: an overview.

A transform is simply a local script
which outputs maltego XML.

Local transform development: an overview.

In terminal it looks like that.

Local transform development: an overview.

```
$python3.5 passivedns.py lemonde.fr
<MaltegoMessage>
<MaltegoTransformResponseMessage>
<Entities>
<Entity Type="maltego.IPv4Address">
<Value>195.154.120.129</Value>
<Weight>100</Weight>
<AdditionalFields>
<Field MatchingRule="" Name="link#maltego.link.label" DisplayName="Label">2012-07-05 - 2018-11-25</Field>
</AdditionalFields>
</Entity>
<Entity Type="maltego.IPv4Address">
<Value>93.184.220.20</Value>
<Weight>100</Weight>
<AdditionalFields>
<Field MatchingRule="" Name="link#maltego.link.label" DisplayName="Label">2015-01-22 - 2018-05-18</Field>
</AdditionalFields>
</Entity>
</Entities>
<UIMessages>
</UIMessages>
</MaltegoTransformResponseMessage>
</MaltegoMessage>
```

Local transform development: an overview.

```
$python3.5 passivedns.py lemonde.fr
<MaltegoMessage>
<MaltegoTransformResponseMessage>
<Entities>
<Entity Type="maltego.IPv4Address">
<Value>195.154.120.129</Value>
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</UIMessages>
</MaltegoTransformResponseMessage>
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```

Local transform development: an overview.

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</AdditionalFields>
</Entity>
</Entities>
<UIMessages>
</UIMessages>
</MaltegoTransformResponseMessage>
</MaltegoMessage>
```

Local transform development: an overview.

Paterva has developped many libraries for different languages.

Local transform development: in Python.

```
1 import TransformLib
2 import json
3 import sys
4
5 res = request.get("http://127.0.0.1:8888/pdns/%s" % (sys.argv[1]))
6 t = TransformLib.MaltegoTransform()
7
8 for result in json.loads(res.content.decode('utf8')):
9     e = t.MaltegoEntity()
10    e.setType("maltego.IPV4Address")
11    e.setValue(result["ip_addr"])
12    t.addEntityToMessage(e)
13
14 t.returnOutput()
```

Local transform development: in Python.

```
1 import TransformLib
2 import json
3 import sys
4
5 res = request.get("http://127.0.0.1:8888/pdns/%s" % (sys.argv[1]))
6 t = TransformLib.MaltegoTransform()
7
8 for result in json.loads(res.content.decode('utf8')):
9     e = t.MaltegoEntity()
10    e.setType("maltego.IPV4Address")
11    e.setValue(result["ip_addr"])
12    t.addEntityToMessage(e)
13
14 t.returnOutput()
```

Local transform development: Python way.

```
1 import TransformLib
2 import json
3 import sys
4
5 res = request.get("http://127.0.0.1:8888/pdns/%s" % (sys.argv[1]))
6 t = TransformLib.MaltegoTransform()
7
8 for result in json.loads(res.content.decode('utf8')):
9     e = t.MaltegoEntity()
10    e.setType("maltego.IPV4Address")
11    e.setValue(result["ip_addr"])
12    t.addEntityToMessage(e)
13
14 t.returnOutput()
```

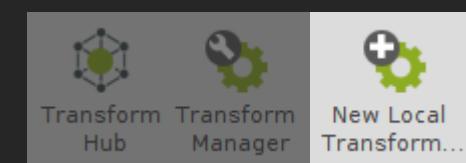
Local transform development: Python way.

```
1 import TransformLib
2 import json
3 import sys
4
5 res = request.get("http://127.0.0.1:8888/pdns/%s" % (sys.argv[1]))
6 t = TransformLib.MaltegoTransform()
7
8 for result in json.loads(res.content.decode('utf8')):
9     e = t.MaltegoEntity()
10    e.setType("maltego.IPV4Address")
11    e.setValue(result["ip_addr"])
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13
14 t.returnOutput()
```

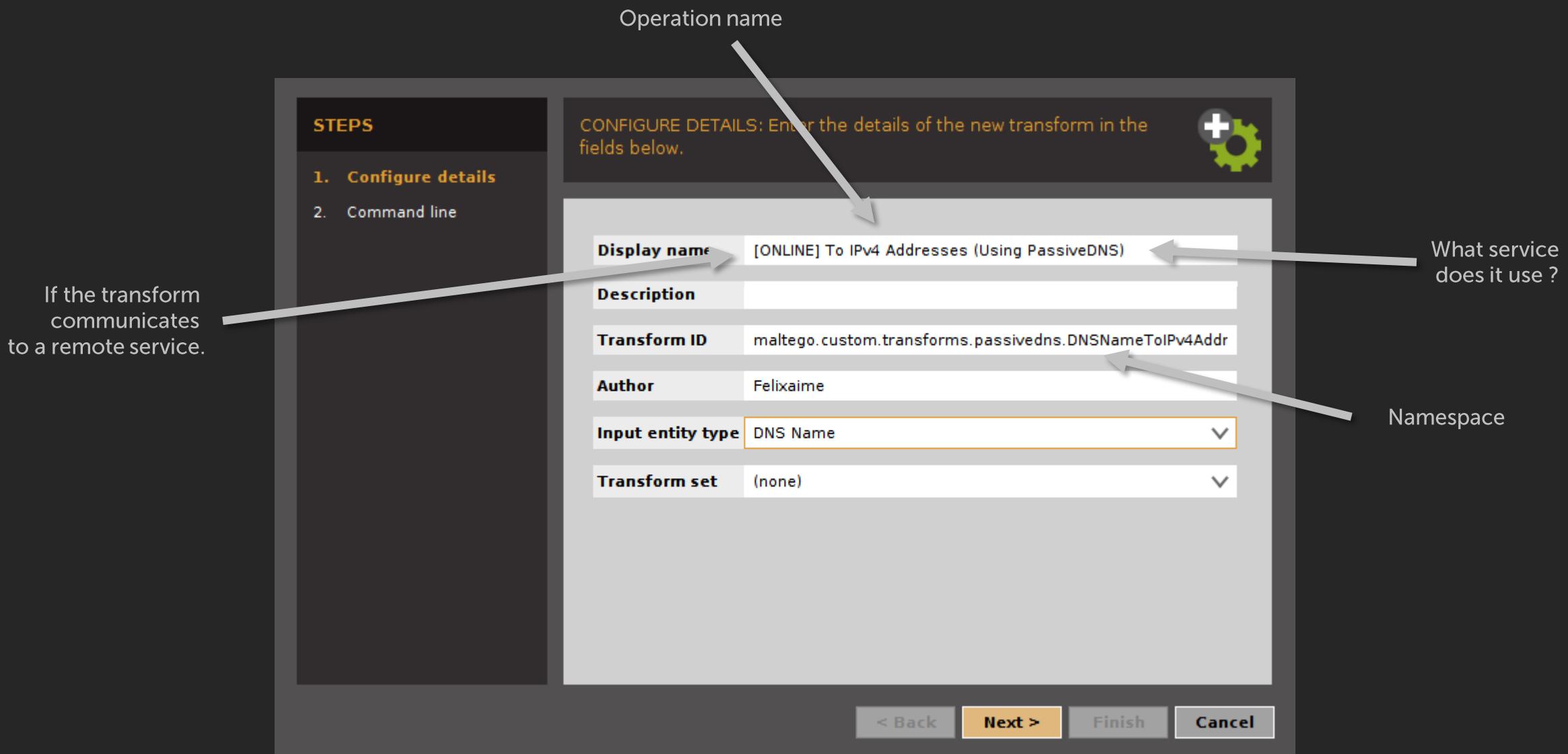
Local transform development: Python way.

```
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3 import sys
4
5 res = request.get("http://127.0.0.1:8888/pdns/%s" % (sys.argv[1]))
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```

Local transform development: Installation



Local transform development: Installation



Local transform development: Namespaces

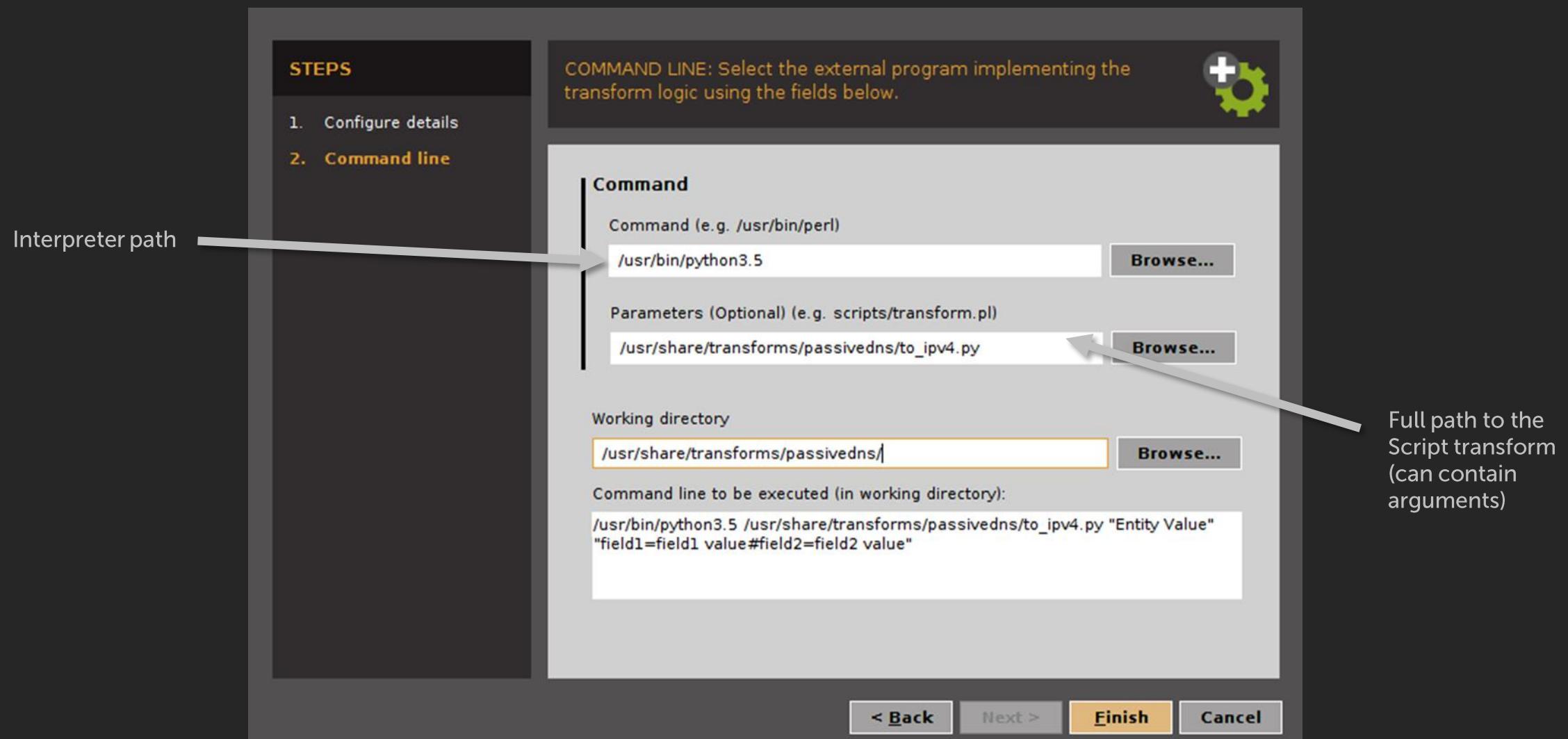


maltego.custom.transforms.<service>.<SrcEntity>To<DstEntity>



DNSNameToIP

Local transform development: Installation



Local transform development: Where to store transforms?



/usr/share/transforms/<service>/transform.py –method=dnsname_to_ipv4



/home/mike/scripts/transforms/toipv4.py

Local transform development: an overview.

And that's all folks, you've your PDNS in
your Maltego instance.

Transforms surgery.

CASE #1

Directory Explorer & Metadata extraction

Case #1: Directory Explorer & Metadata extraction

2 Transforms (Explorer, Exiftool)

3 Entities (Directory, File, Software, Date)

Case #1: Step one, Directory Explorer

```
import TransformLib
import sys
import os

transform = TransformLib.MaltegoTransform()
current_directory = sys.argv[1]

for item in os.listdir(current_directory):
    if os.path.isdir(os.path.join(current_directory, item)):
        e = TransformLib.MaltegoEntity()
        e.setType("maltego.custom.entities.explorer.directory")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)
    else:
        e = TransformLib.MaltegoEntity()
        e.setType("maltego.custom.entities.explorer.file")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #1: Step one, Directory Explorer

```
import TransformLib
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        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)
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        e.setType("maltego.custom.entities.explorer.directory")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)
    else:
        e = TransformLib.MaltegoEntity()
        e.setType("maltego.custom.entities.explorer.file")
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transform.returnOutput()
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        e.setType("maltego.custom.entities.explorer.directory")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)
    else:
        e = TransformLib.MaltegoEntity()
        e.setType("maltego.custom.entities.explorer.file")
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        transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #1: Step one, Directory Explorer

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import os

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        transform.addEntityToMessage(e)
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        e.setType("maltego.custom.entities.explorer.file")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #1: Step one, Directory Explorer

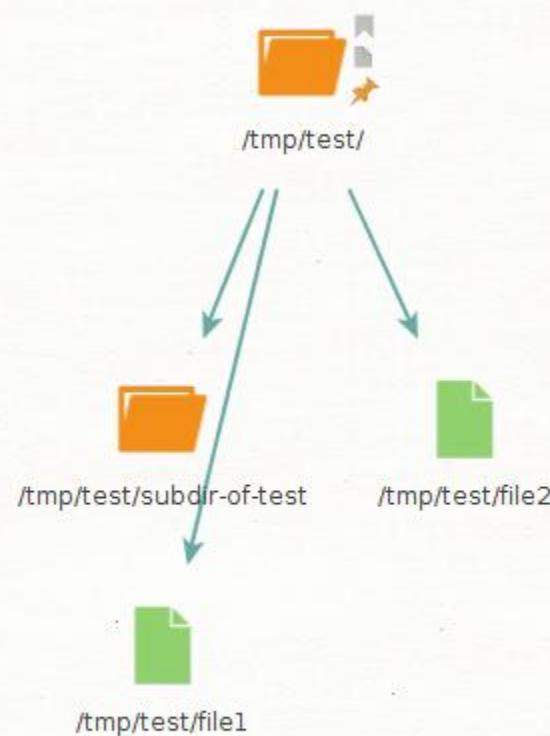
```
import TransformLib
import sys
import os

transform = TransformLib.MaltegoTransform()
current_directory = sys.argv[1]

for item in os.listdir(current_directory):
    if os.path.isdir(os.path.join(current_directory, item)):
        e = TransformLib.MaltegoEntity()
        e.setType("maltego.custom.entities.explorer.directory")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)
    else:
        e = TransformLib.MaltegoEntity()
        e.setType("maltego.custom.entities.explorer.file")
        e.setValue(os.path.join(current_directory, item))
        transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #1: Step one, Directory Explorer



Case #1: Step one, Directory Explorer

To improve it: put the full path in additional fields.

(See the full transform in the resources directory)

Case #1: Step two, Exiftool to Maltego.

```
$ exiftool 9f270b1cef15fa30f3b [...] ba99158ee4d4ba8c815.doc
```

ExifTool Version Number	:	10.80
File Name	:	9f270b1cef15fa30f3b [...] ba99158ee4d4ba8c815.doc
Directory	:	.
File Size	:	848 kB
Date/Time	:	File Modification 2018:08:07 15:46:36+02:00
File Access Date/Time	:	2018:11:26 18:20:10+01:00
File Inode Change Date/Time	:	2018:08:07 15:46:43+02:00
File Permissions	:	rw-rw-r-
File Type	:	DOC
File Type Extension	:	doc
MIME Type	:	application/msword
Author	:	James
Template	:	Normal.dotm Last
Modified By	:	john
Revision Number	:	2
Software	:	Microsoft Office Word
Total Edit Time	:	6.0 minutes
Create Date	:	2018:03:15 09:09:00
Modify Date	:	2018:03:15 09:26:00

Case #1: Step two, Exiftool to Maltego.

```
$ exiftool 9f270b1cef15fa30f3b [...] ba99158ee4d4ba8c815.doc
```

ExifTool Version Number	:	10.80
File Name	:	9f270b1cef15fa30f3b [...] ba99158ee4d4ba8c815.doc
Directory	:	.
File Size	:	848 kB
Date/Time	:	File Modification 2018:08:07 15:46:36+02:00
File Access Date/Time	:	2018:11:26 18:20:10+01:00
File Inode Change Date/Time	:	2018:08:07 15:46:43+02:00
File Permissions	:	rw-rw-r-
File Type	:	DOC
File Type Extension	:	doc
MIME Type	:	application/msword
Author	:	James
Template	:	Normal.dotm Last
Modified By	:	john
Revision Number	:	2
Software	:	Microsoft Office Word
Total Edit Time	:	6.0 minutes
Create Date	:	2018:03:15 09:09:00
Modify Date	:	2018:03:15 09:26:00

Case #1: Step two, Exiftool to Maltego.

```
import TransformLib
import subprocess
import sys

transform = TransformLib.MaltegoTransform()
current_file = sys.argv[1]

p = subprocess.run( [ "exiftool", current_file ], shell=False, stdout=subprocess.PIPE, timeout=10)
res = (p.stdout).decode("utf-8")

for line in res.splitlines():
    try:
        metadata_key = line.split(" : ")[0].strip()
        metadata_value = line.split(" : ")[1].strip()

        if "Author" in metadata_key:
            e = TransformLib.MaltegoEntity()
            e.setType("maltego.Alias")
            e.setValue(metadata_value)
            self.transform.addEntityToMessage(e)
        # elif "Creator" in metadata_key...
    except:
        continue
    self.transform.returnOutput()

transform.returnOutput()
```

Case #1: Step two, Exiftool to Maltego.

```
import TransformLib
import subprocess
import sys

transform = TransformLib.MaltegoTransform()
current_file = sys.argv[1]

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transform.returnOutput()
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            e = TransformLib.MaltegoEntity()
            e.setType("maltego.Alias")
            e.setValue(metadata_value)
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    except:
        continue
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transform.returnOutput()
```

Case #1: Step two, Exiftool to Maltego.

```
import TransformLib
import subprocess
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transform.returnOutput()
```

Case #1: Step two, Exiftool to Maltego.

```
import TransformLib
import subprocess
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transform = TransformLib.MaltegoTransform()
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        metadata_key = line.split(" : ")[0].strip()
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        if "Author" in metadata_key:
            e = TransformLib.MaltegoEntity()
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            self.transform.addEntityToMessage(e)
        # elif "Creator" in metadata_key...
    except:
        continue
    self.transform.returnOutput()

transform.returnOutput()
```

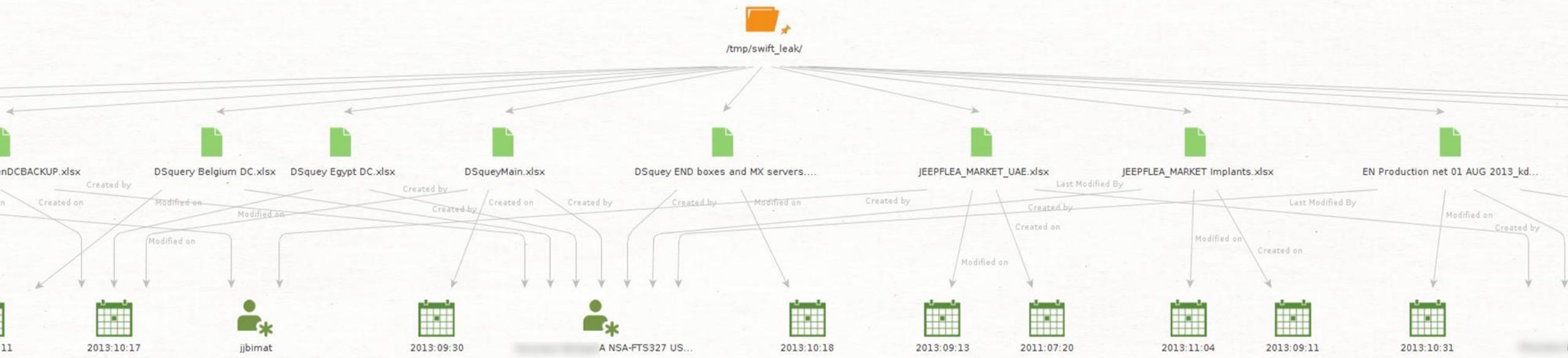
Case #1: Step two, Exiftool to Maltego

To improve it: add as label the metadata key.

(See the full transform in the resources directory)

Demo

`./transforms/exiftool/transform.py`



EXAMPLE: SIMPLE METADATA EXTRACTION FROM TSB LEAKS

CASE #2

Getting TOR node fingerprint and nickname
from an IPv4 Address

Case #2: Web scrapping using requests and LXML.

The screenshot shows the Onionite web interface. At the top, there is a navigation bar with a logo, a search input field containing 'Search onionr.info', and a heart icon. Below the header, the text 'Search results for 'onionr.info'' is displayed. A table follows, listing a single relay entry:

#	Nickname	Bandwidth	Uptime	Country	Flags	Type
1	[REDACTED]	1.02 MB/s	451d 7h	Netherlands	⚡ 📈 ✅ 🌐 🚀 ✅	Relay

Case #2: Web scrapping using requests and LXML.

```
from lxml import etree
import TransformLib
import requests
import sys

transform = TransformLib.MaltegoTransform()
res = requests.get("https://onionite.now.sh/?s=%s" % (sys.argv[1]))
tree = etree.fromstring(res.content, etree.HTMLParser())

for td in tree.xpath("/html/body/main/table/tbody/tr"):

    e = TransformLib.MaltegoEntity()
    e.setType("maltego.custom.entities.infrastructure.TorExitNode")
    e.addAdditionalFields(fieldName="nickname",
                          displayName="Nickname",
                          value=str(td[1][0].text),
                          matchingRule="strict")
    e.setValue(td[1][0].attrib['href'][-40:])
    transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #2: Web scrapping using requests and LXML.

```
from lxml import etree
import TransformLib
import requests
import sys

transform = TransformLib.MaltegoTransform()
res      = requests.get("https://onionite.now.sh/?s=%s" % (sys.argv[1]))
tree     = etree.fromstring(res.content, etree.HTMLParser())

for td in tree.xpath("/html/body/main/table/tbody/tr"):

    e = TransformLib.MaltegoEntity()
    e.setType("maltego.custom.entities.infrastructure.TorExitNode")
    e.addAdditionalFields(fieldName="nickname",
                          displayName="Nickname",
                          value=str(td[1][0].text),
                          matchingRule="strict")
    e.setValue(td[1][0].attrib['href'][-40:])
    transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #2: Web scrapping using requests and LXML.

The screenshot shows the Onionite web interface. At the top, there's a navigation bar with a logo, a search bar containing 'Search results for', and a heart icon. Below the search bar is a table with columns: #, Name, Bandwidth, Uptime, Country, Flags, and Type. A single row is visible, showing details for a relay named 'severalwdadwajunior'.

A context menu is open over the first row of the table. The menu items are: Add attribute, Edit attribute, Edit as HTML, Delete element, Copy, Cut element, Copy element, Paste element, Copy outerHTML, Copy selector, and Copy XPath. The 'Copy' option is highlighted with a red background.

On the left side, there's a sidebar with a tree view of the page's HTML structure. The main content area shows the table and a developer tools panel on the right. The developer tools panel includes tabs for Application, Security, Audits, Styles, Computed, Event Listeners, DOM Breakpoints, Properties, and Accessibility. The Styles tab displays CSS rules for various elements, such as 'element.style' and 'main a:hover'. An arrow points from the 'Copy' menu item towards the developer tools panel.

#	Name	Bandwidth	Uptime	Country	Flags	Type
1	severalwdadwajunior	1.02 MB/s	451d 7h	Netherlands		Relay

```
<!doctype html>
<html lang="en">
  <head>...</head>
  <body class="...>
    <header role="ban...
      <main role="main">
        <h2>Search result...
          <table>
            <thead>...</thead>
            <tbody>
              <tr>
                <td>1</td>
                <td><a href="...>severalwdadwajunior</a> == $0</td>
                <td>1.02 MB/s</td>
                <td>451d 7h</td>
                <td>Netherlands</td>
              </tr>
            </tbody>
          </table>
        </main>
      </header>
    </body>
</html>
```

Case #2: Web scrapping using requests and LXML.

```
from lxml import etree
import TransformLib
import requests
import sys

transform = TransformLib.MaltegoTransform()
res      = requests.get("https://onionite.now.sh/?s=%s" % (sys.argv[1]))
tree     = etree.fromstring(res.content, etree.HTMLParser())

for td in tree.xpath("/html/body/main/table/tbody/tr"):

    e = TransformLib.MaltegoEntity()
    e.setType("maltego.custom.entities.infrastructure.TorExitNode")
    e.addAdditionalFields(fieldName="nickname",
                          displayName="Nickname",
                          value=str(td[1][0].text),
                          matchingRule="strict")
    e.setValue(td[1][0].attrib['href'][-40:])
    transform.addEntityToMessage(e)

transform.returnOutput()
```

Case #2: Web scrapping using requests and LXML.

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from lxml import etree
import TransformLib
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```

Case #2: Web scrapping using requests and LXML.

Title : [ONLINE] To TOR Exit node (Using Onionite)

Input entity : maltego.custom.entities.infrastructure.entities.TorExitNode

namespace : maltego.custom.transforms.infrastructure.onionite.IPv4toExitNode

Command : /usr/bin/python3.5

Parameters : /usr/share/transforms/onionite/transform.py --method=ipv4_to_exitnode

Title : [ONLINE] To NickName (Using Onionite)

Input entity : maltego.custom.entities.infrastructure.entities.TorExitNode

namespace : maltego.custom.transforms.infrastructure.onionite.TorExitNodeToNickname

Command : /usr/bin/python3.5

Parameters : /usr/share/transforms/onionsite/transform.py --method=exitnode_to_nickname

Title : [ONLINE] To TOR Exit nodes (Using Onionite)

Input entity : maltego.custom.entities.infrastructure.TorNicknameToExitNodes

namespace : maltego.custom.transforms.infrastructure.onionite.IPv4toExitNodes

Command : /usr/bin/python3.5

Parameters : /usr/share/transforms/onionite/transform.py --method=nickname_to_exit_nodes

Title : [ONLINE] To IPv4 Addresses (Using Onionite)

Input entity : maltego.custom.entities.infrastructure.entities.TorExitNode

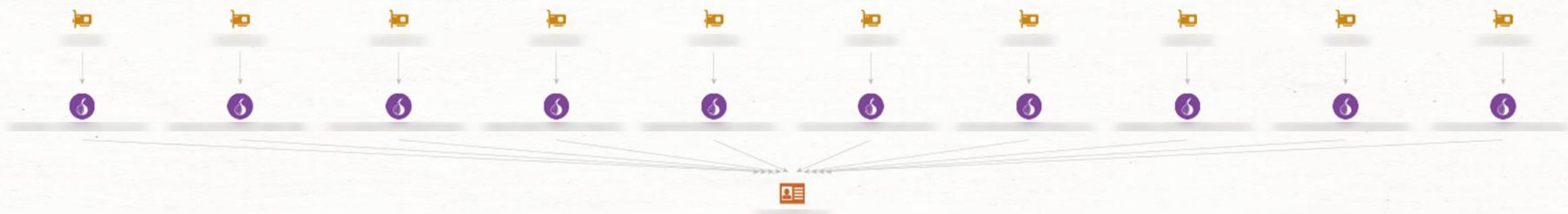
namespace : maltego.custom.transforms.infrastructure.onionite.ExitNodeToIPv4

Command : /usr/bin/python3.5

Parameters : /usr/share/transforms/onionite/transform.py --method=exit_node_to_ipv4

Demo

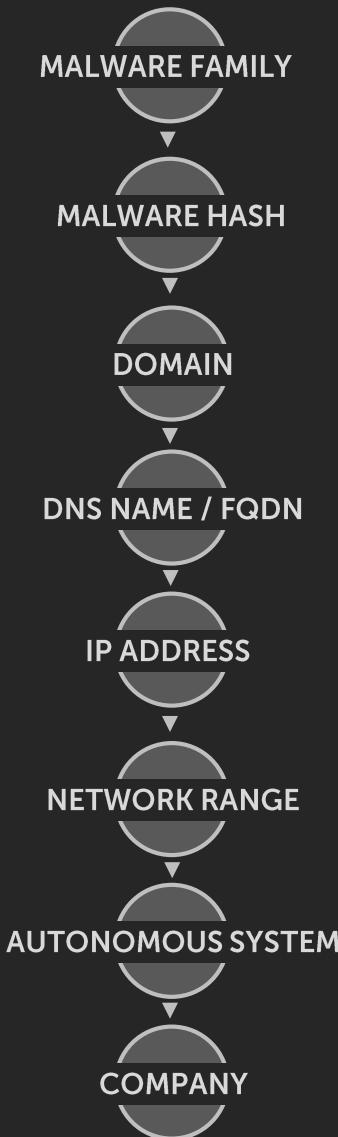
`./transforms/onionite/transform.py`



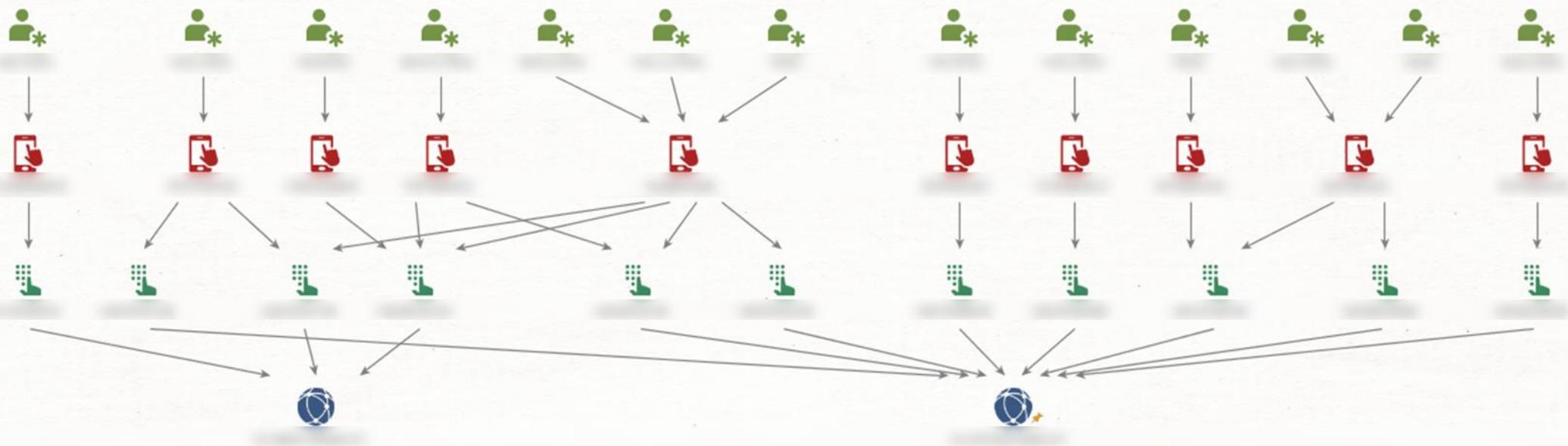
EXAMPLE: USE OF A SAME NICKNAME FOR TOR NODES BY AN INTRUSION SET.

Analyst tips & Tricks

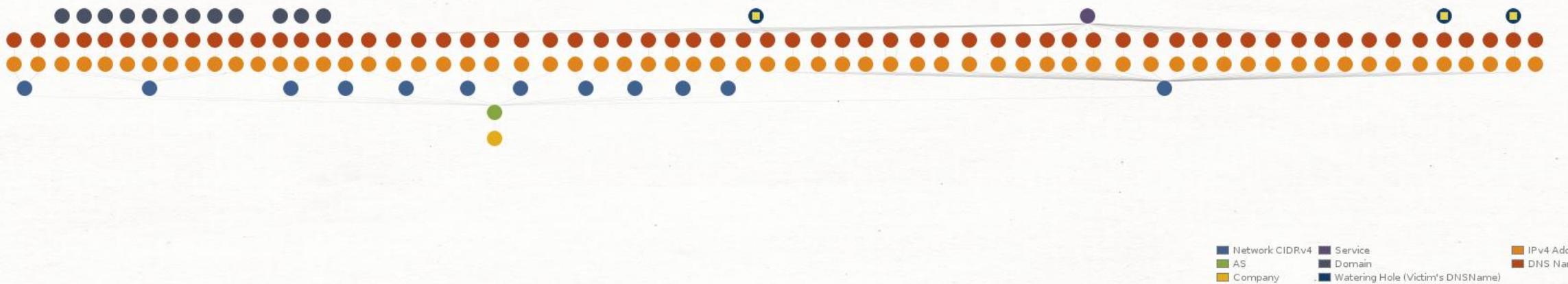
ANALYST TIP #1
Stack your graph.



* This is just an example.



EXAMPLE: USERS RELATED TO MOBILE IMPLANTS AND THEIR C2s.



EXAMPLE: A WATERING HOLE CAMPAIGN, EACH DNSNAME IS A DELIVERY SERVER

ANALYST TIP #2

Use keyboard shortcuts.



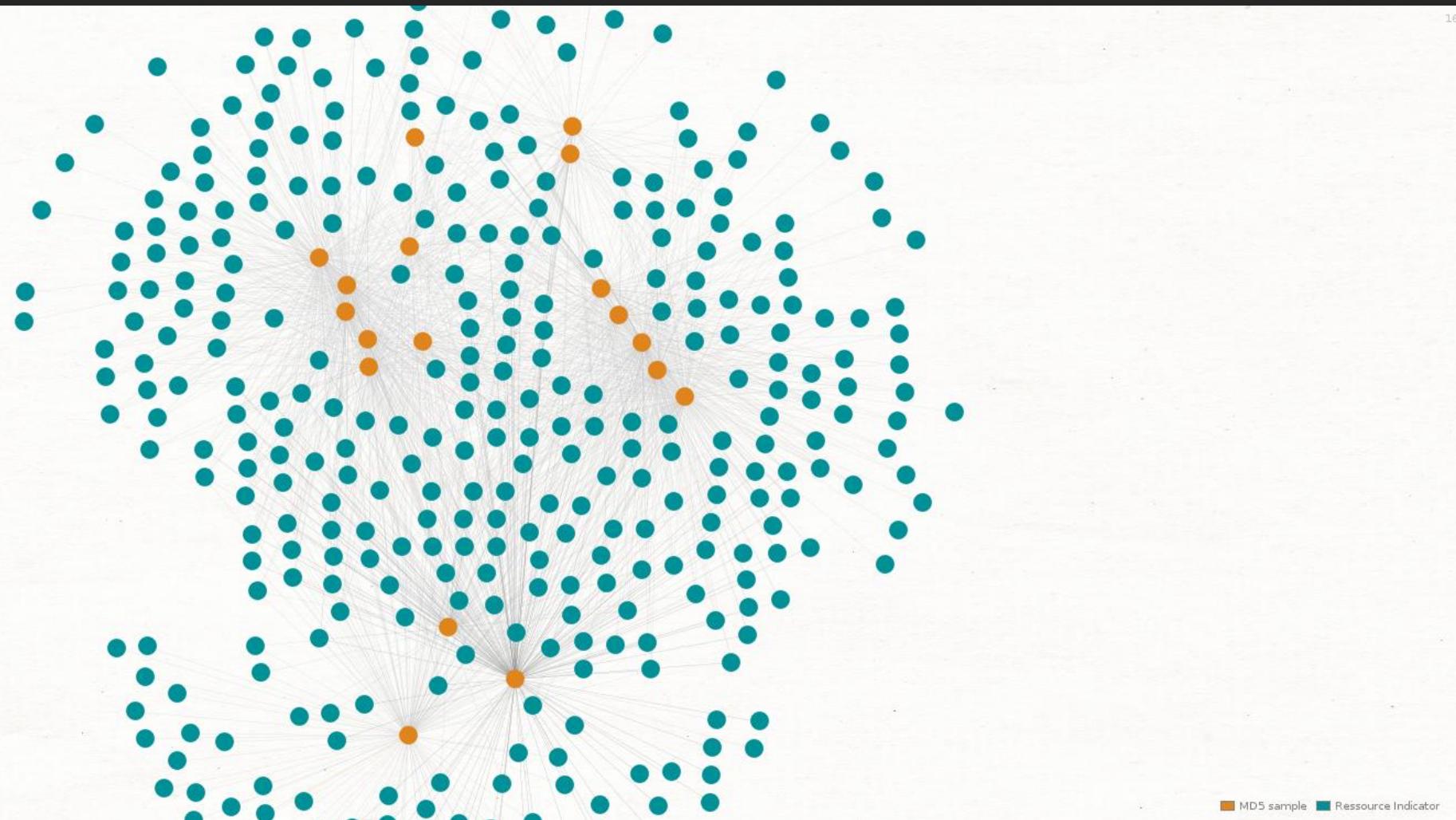
ANALYST TIP #3

Use physical view for easy-correlation.

EXAMPLE: FOR MALWARE CLUSTERIZATION

ANALYST TIP #3
Use organic view for
quick and dirty correlation.

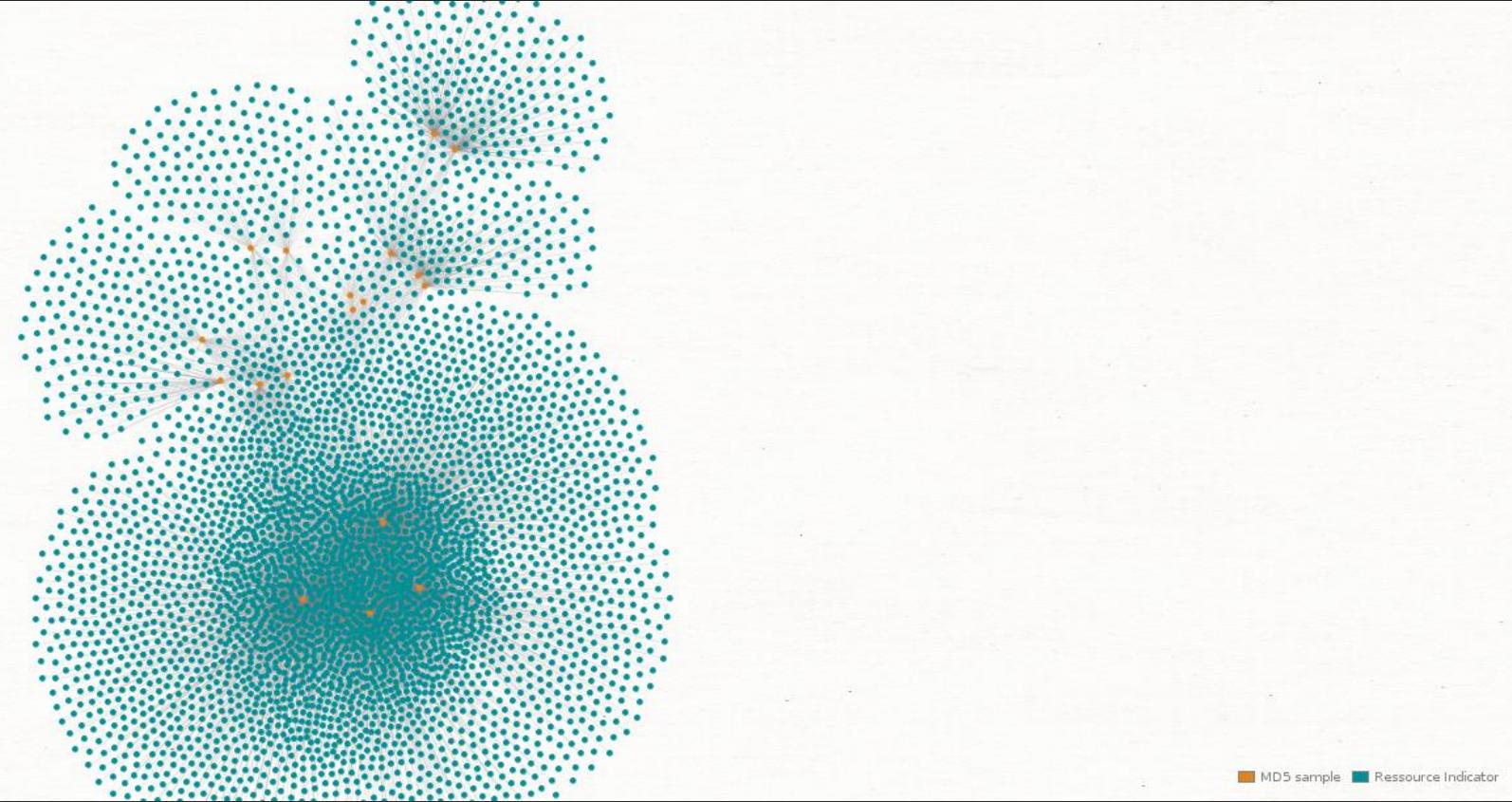
EXAMPLE: FOR MALWARE CLUSTERIZATION



EXAMPLE: PIRPI CLUSTERIZATION BASED ON IMPORTS



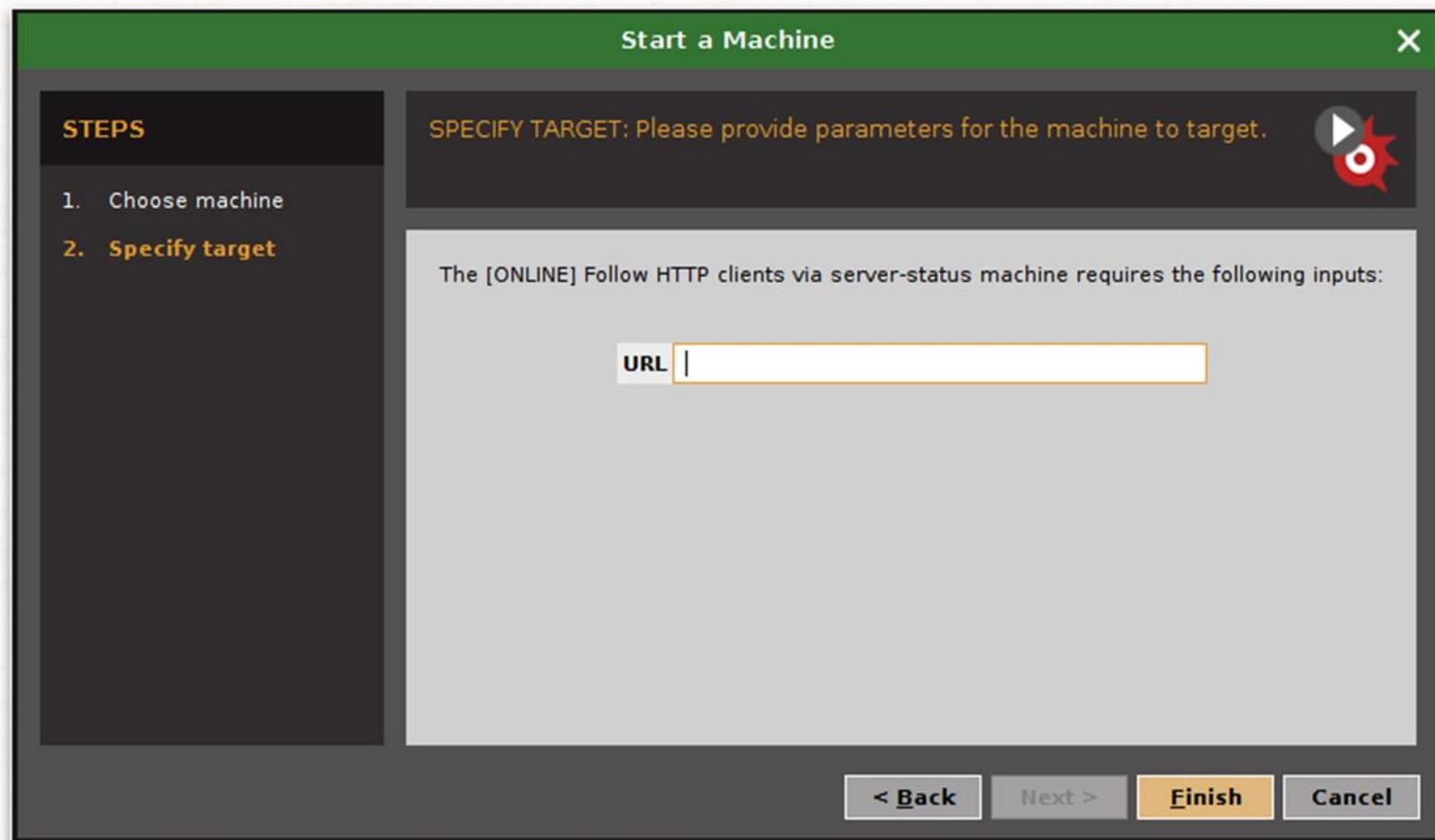
EXAMPLE: PIRPI CLUSTERIZATION BASED ON IMPORTS



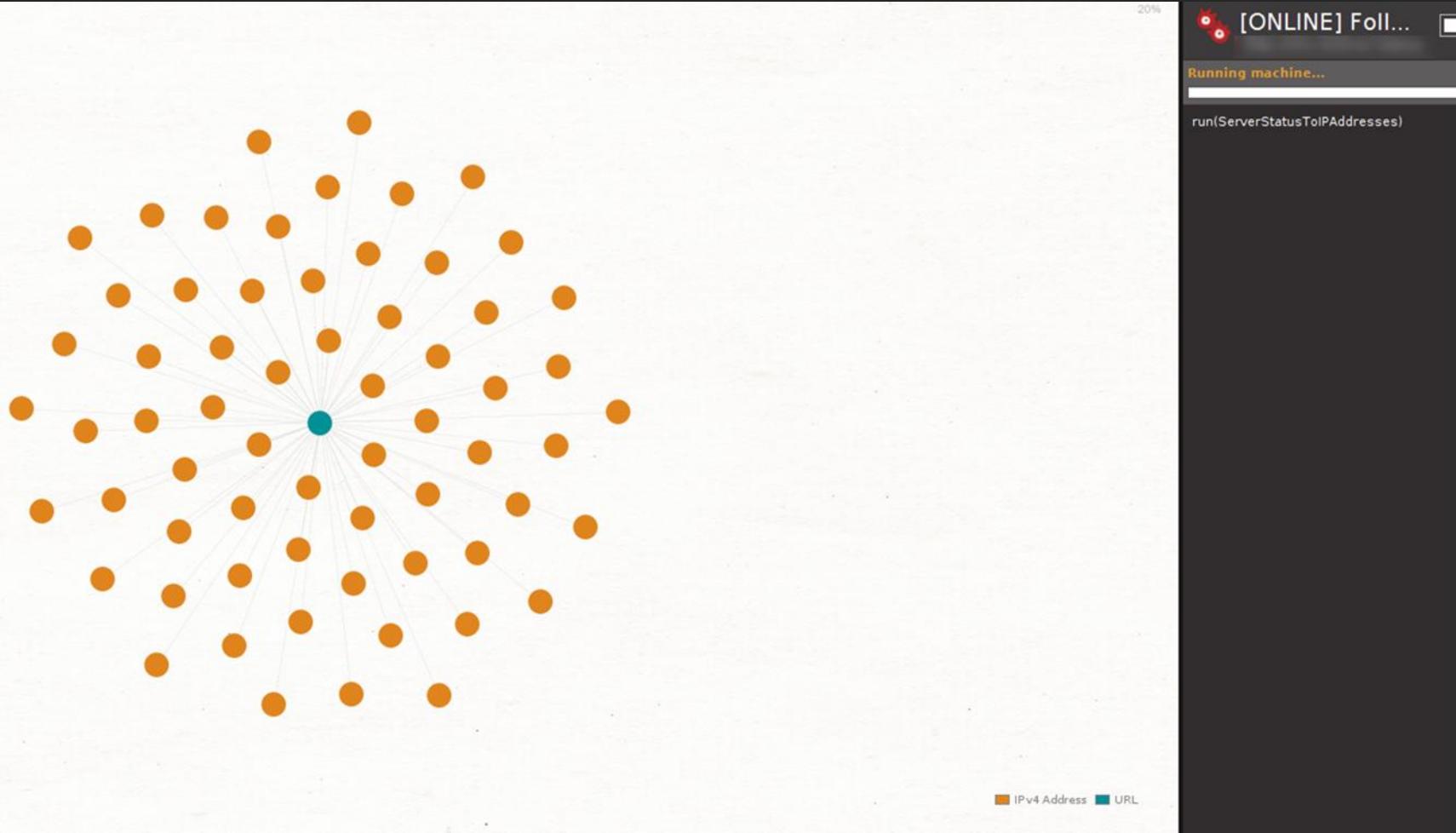
EXAMPLE: PIRPI CLUSTERIZATION BASED ON STRINGS

ANALYST TIP #4

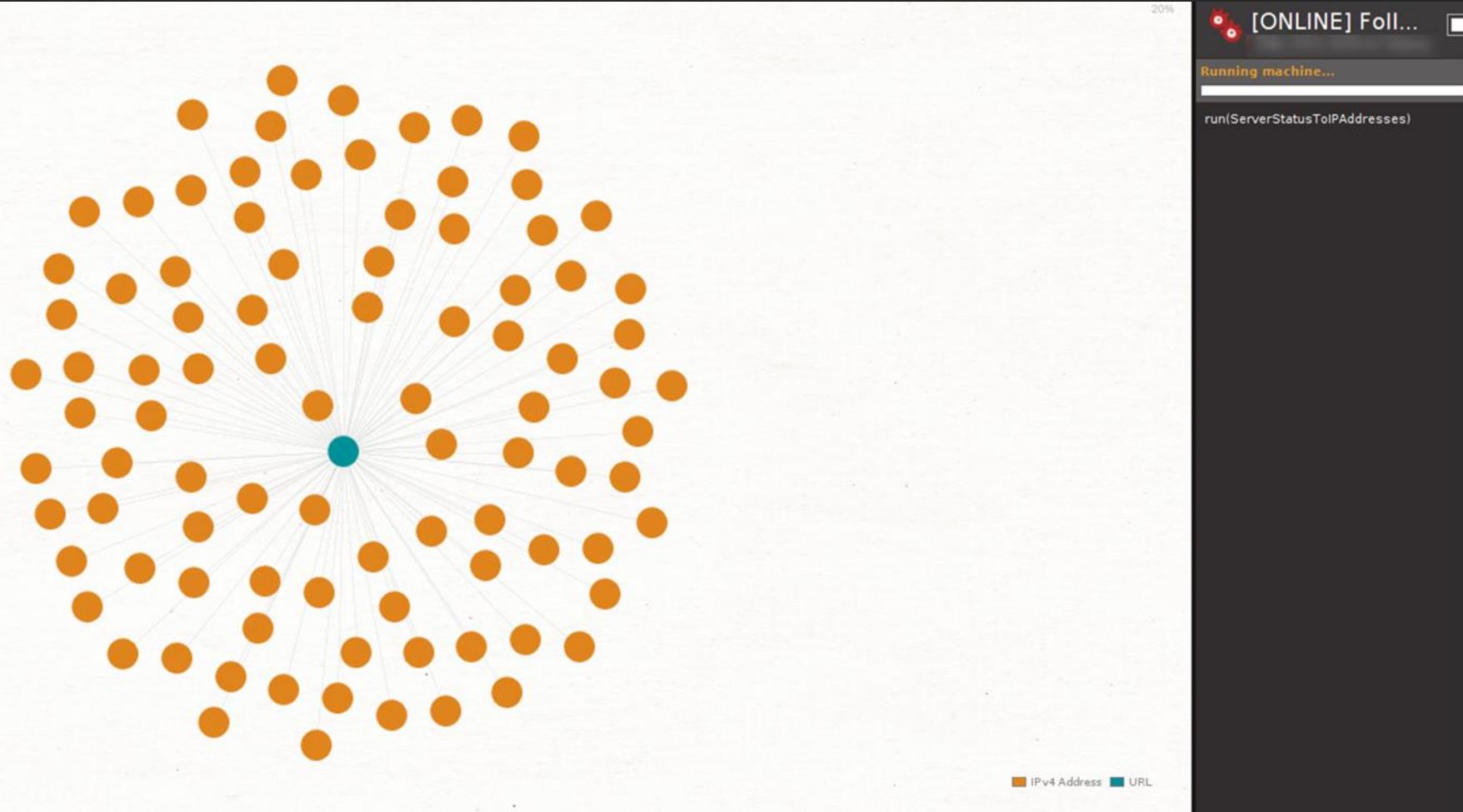
For real-time based graph, use machines.



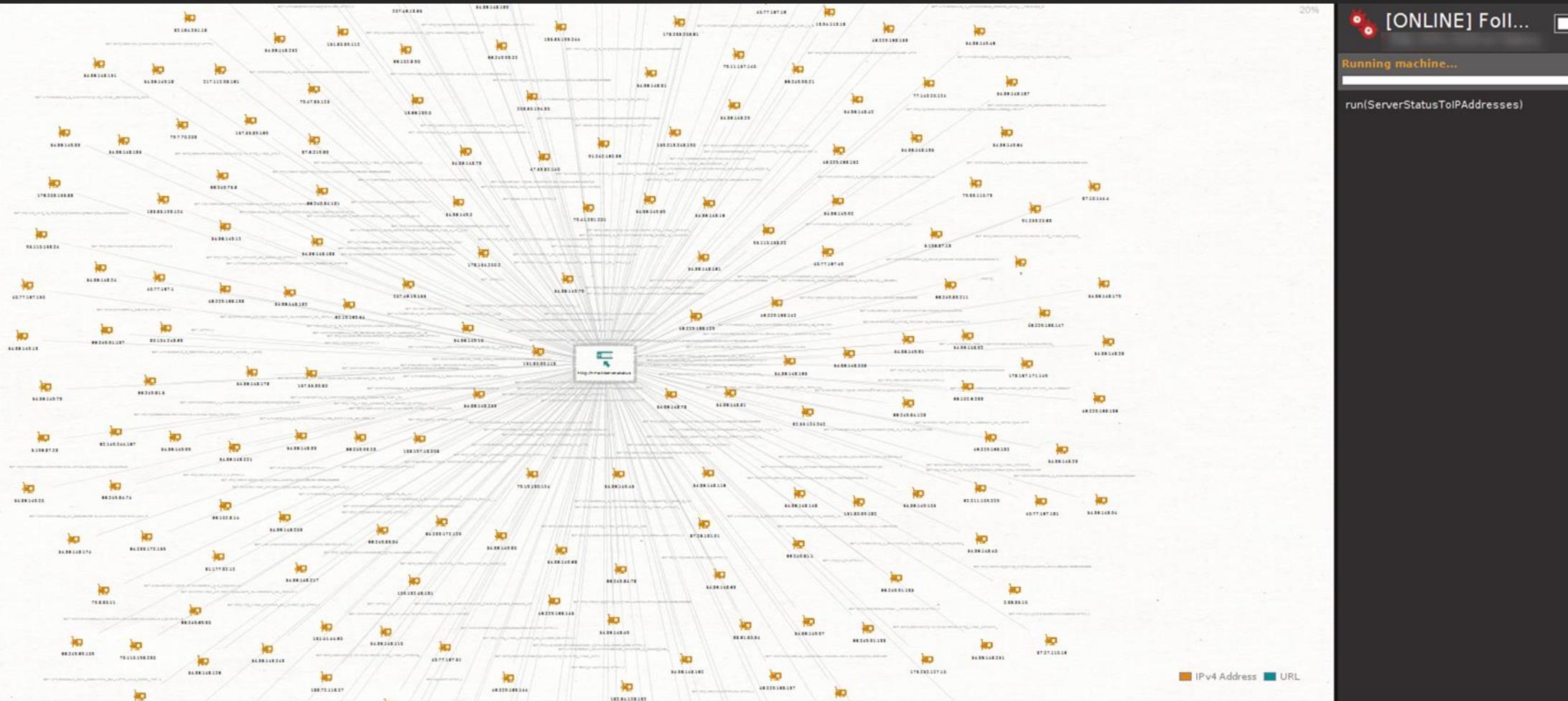
EXAMPLE: GETTING HTTP CLIENTS BY REQUESTING A C2 WITH APACHE SERVER-STATUS MOD ENABLED



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EXAMPLE: GETTING HTTP CLIENTS BY REQUESTING A C2 WITH APACHE SERVER-STATUS MOD ENABLED

Dev. tips & tricks

DEVELOPPER TIP #1

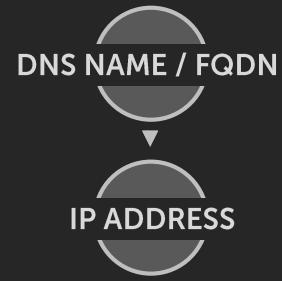
Think about link direction



[ONLINE] IP Address to DNSNames







```
t = TransformLib.MaltegoTransform()
e = TransformLib.MaltegoEntity()

e.setType("maltego.DNSName")
e.setValue(domain)
e.addAdditionalFields('link#maltego.link.direction',
                     'link#maltego.link.direction',
                     'loose',
                     'output-to-input')

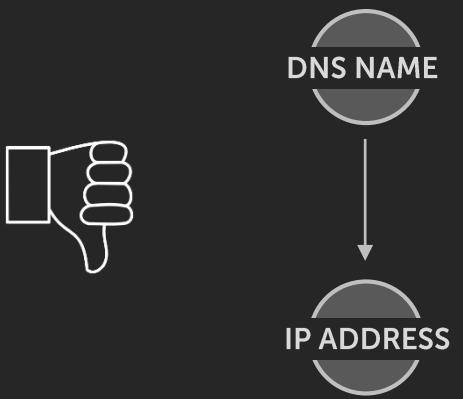
t.addEntityToMessage(e)
t.returnOutput()
```

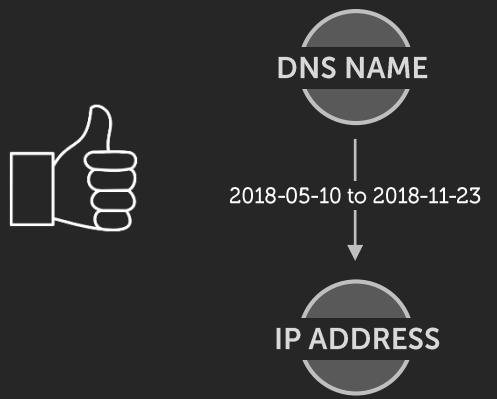
DEVELOPPER TIP #2

Think about link label

[ONLINE] IP Address to DNSNames







```
t = TransformLib.MaltegoTransform()
e = TransformLib.MaltegoEntity()

e.setType("maltego.DNSName")
e.setValue(domain)
e.setLinkLabel("%s - %s" % (first_seen, last_seen))
e.addAdditionalFields('link#maltego.link.direction',
                      'link#maltego.link.direction',
                      'loose',
                      'output-to-input')

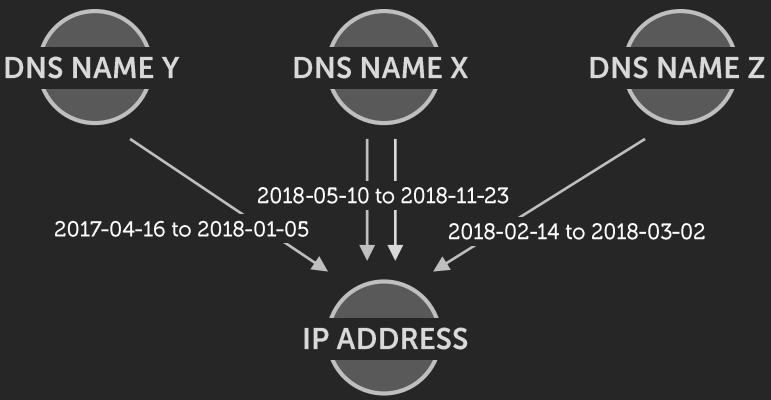
t.addEntityToMessage(e)
t.returnOutput()
```

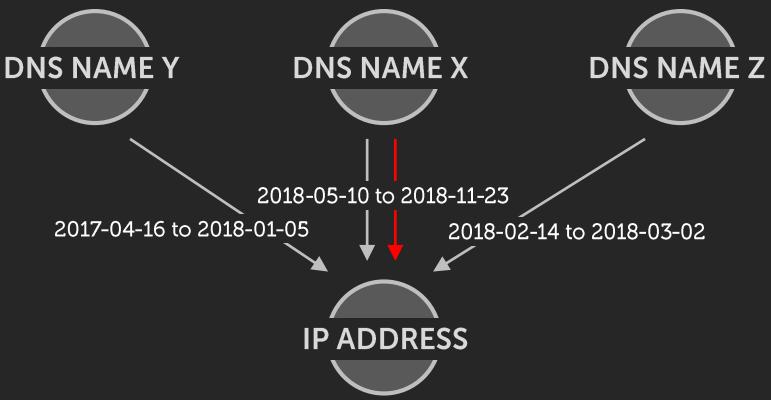
DEVELOPPER TIP #3

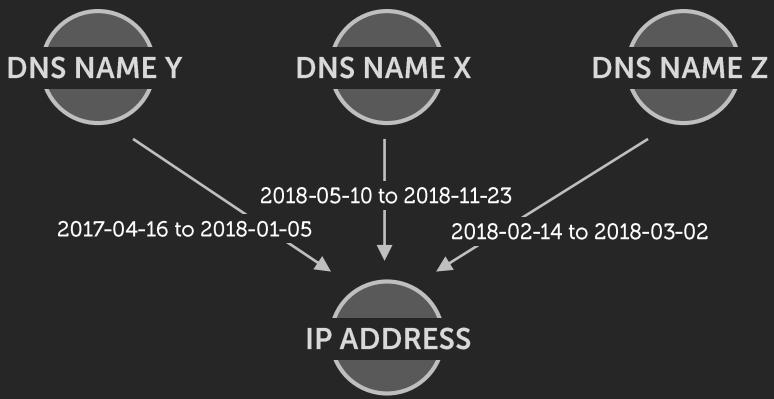
Avoid link loopback.



[ONLINE] To associated DNS Names







```
def additional_fields_to_dict():
    """
        Translate additional fields to dict.
    """
    rtn = {"parent.entity.value" : ""}
    for i, field in enumerate(sys.argv[3].split("#")):
        field = field.split("=")
        if i == 0:
            rtn["entity.value"] = field[1]
        else:
            rtn[field[0]] = field[1]
    return rtn

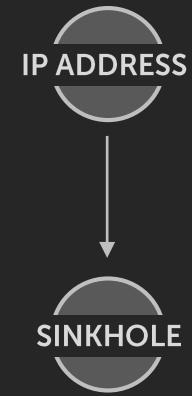
parent_fields = additional_fields_to_dict()

if parent_fields["parent.entity.value"] != entity_value:
    e = TransformLib.MaltegoEntity()
    e.setType("maltego.Entity")
    e.addAdditionalFields(fieldName="parent.entity.value",
                          displayName="Parent Entity",
                          value=entity_value)
    e.setValue(entity_value)
    transform.addEntityToMessage(e)
```

DEVELOPPER TIP #4
Use transforms to push data
to your databases.

[OFFLINE] Tag as a sinkhole server





[OFFLINE] Qualify this IP Address



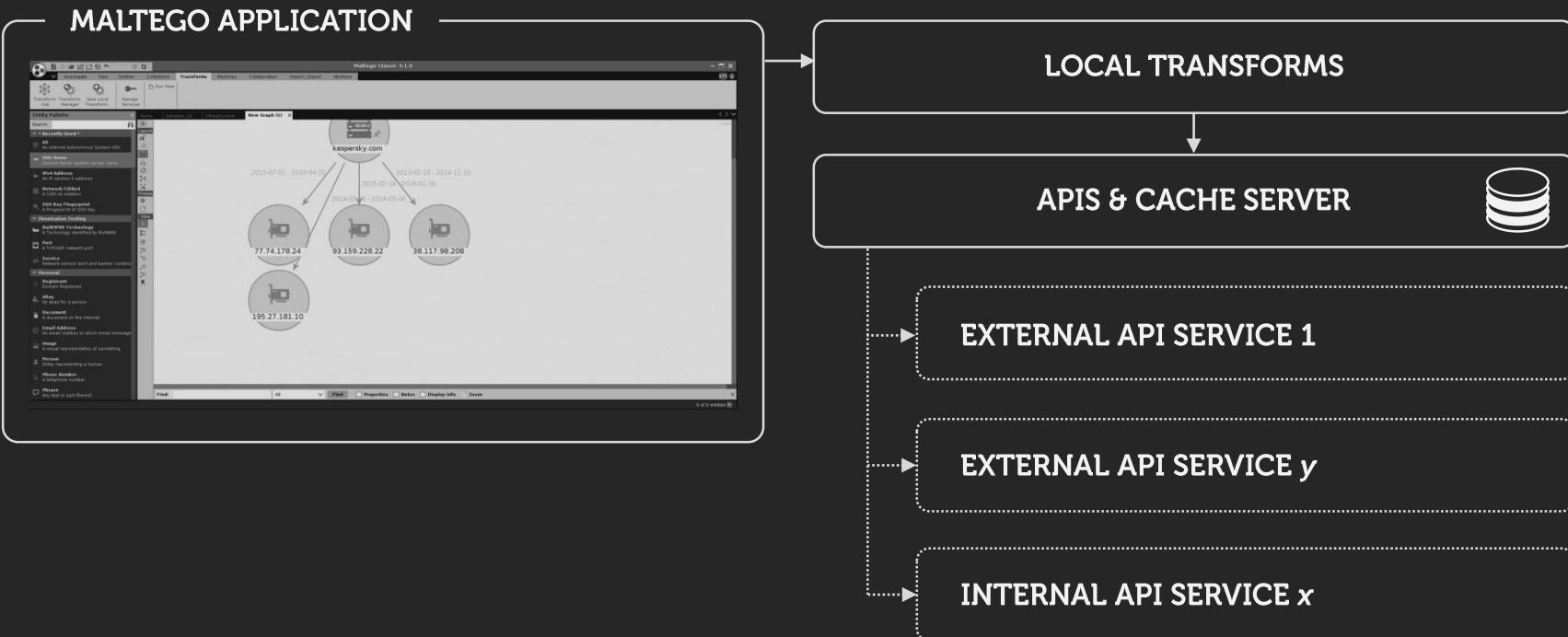


DEVELOPPER TIP #5

Think about additional fields and notes.

DEVELOPPER TIP #5

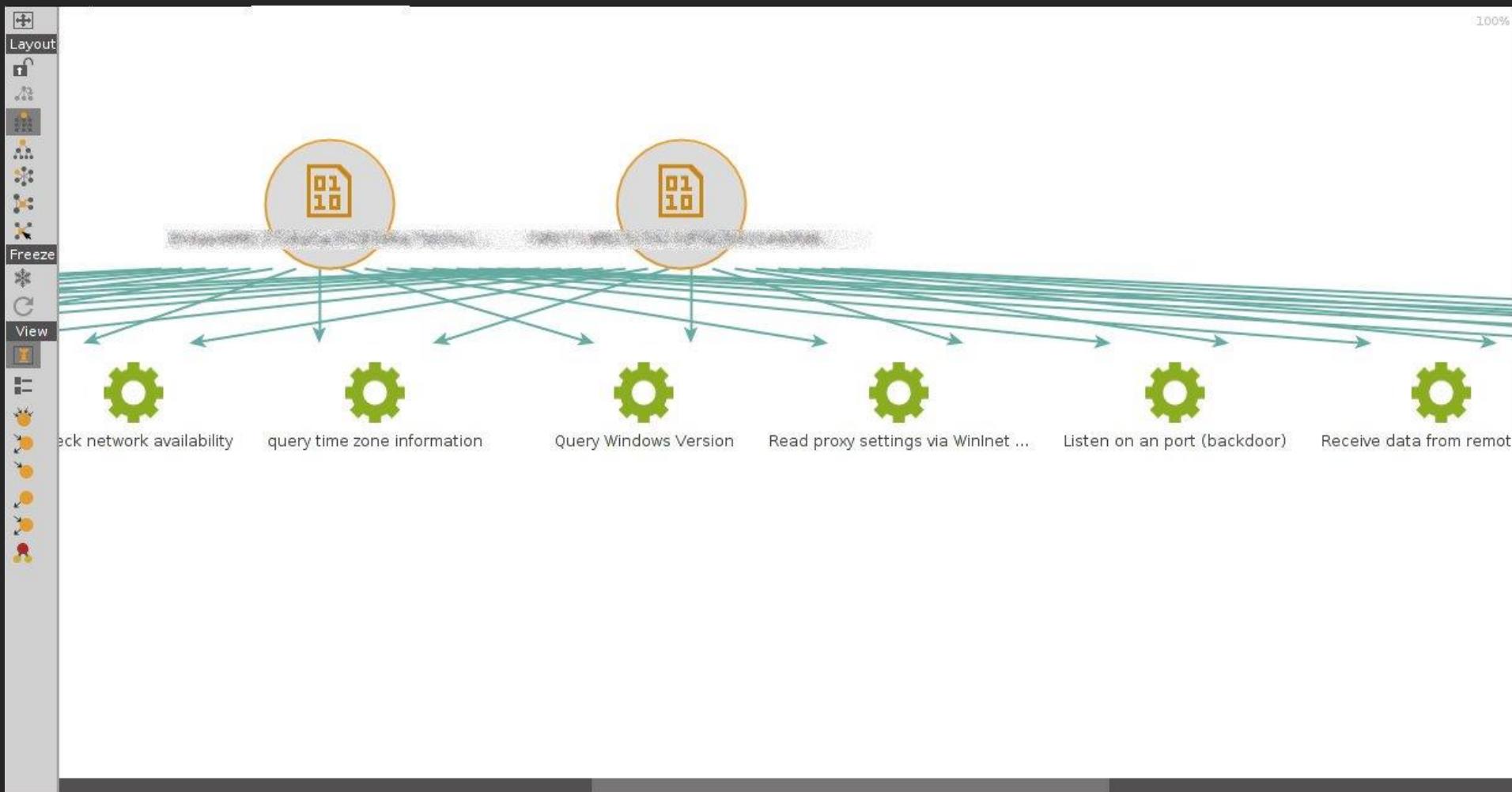
Use a multi-layered architecture.



EXAMPLE: SOME « HOME MADE » INFRASTRUCTURE

DEVELOPPER TIP #5

Don't hesitate to be creative and integrate
your own databases, applications and tools.



EXAMPLE: GETTING FEATURES FROM MALWARES HASHES (IDAscope DB & VTI)

End.