

User Guide: fn_utilities_v2.1.0

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Release History

Version	Date	Notes
2.1.0	3/2022	<ul style="list-style-type: none">• Support for PATCH method• Add rule to get owner contact info for Tasks• Bug fix for utilities_pdfid• Add a timeout parameter to call_rest_api function
2.0.6	7/2021	pin dependency 'chardet' at v4.0.0
2.0.2	2/2021	bug fixes for Shell Command
2.0.1	9/2020	bug fixes
2.0.0	7/2020	Numerous fixes, improved Rules and workflows and only Python 3 supported

Version	Date	Notes
1.0.15	5/2020	Bug fixes, App Host Support
1.0.14	5/2020	Shell Command support for Remote Linux Execution

App Host Setup

This app is available for use in App Host.

When using Shell Command, several Linux commands have been installed on the container including: dig, nslookup, traceroute and whois. These commands can be specified within the app.config file directly such as: `nslookup=nslookup "{{shell_param1}}"`. Other commands not loaded within the container can be accessed via remote shell execution. See the section [Function - Utilities: Shell Command](#) for more information.

Integration Server Setup

Note: this version of fn_utilities will only run in a Python 3 environment. This is due to changes in dependent python packages with Python 2's end of life. If you continue to use Python 2 in your Integration Server environment, use previous versions of this app.

Function - Utilities: Attachment Hash

Calculate hashes for a file attachment. Returns md5, sha1, sha256 and other hashes of the file content. Those hashes can then be used as artifacts or in other parts of your workflows.

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Workflows / Example: Attachment Hash Cancel Save & Close Save

Name *
API Name *
Description
Object Type *

Example: Attachment Hash

example_attachment_hash

An example that calculates hash artifacts from an attachment.

Attachment

Creator
Last Modified
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Associated Rules

Orchestration Engine

07/17/2019 14:20

Orchestration Engine

Example: Attachment Hash

Calculate hashes of a file attachment.
The results are added to the incident as new artifacts.

Utilities: Attachment Hash

► Inputs:

Name	Type	Required	Example	Tooltip
attachment_id	number	No	—	—

Name	Type	Required	Example	Tooltip
<code>incident_id</code>	number	Yes	—	-
<code>task_id</code>	number	No	—	-

► Outputs:

```
results = {
  'sha1': '6c97644ea50f922b8bb2671c772d006b2abf4c87',
  'created': 1563376076661,
  'sha224': 'fc76d04a9c02b99e72fd0ec519c1a713ebf4d1ac451cf2542d6c1f9b',
  'filename': 'sample_ioc.pdf',
  'sha256':
'578711d047bbce6542b5c4f17224d2042ae4ae93a045e0a7b27765f7be226be2',
  'content_type': 'application/pdf',
  'sha384':
'e6b21c2c6a7bd3e0143bfb8d16e354ccbbbe39df6a586bf6d28443319b4e432816c7a9317
90f264ac167de6cfd53444e',
  'size': 123852,
  'sha512':
'74150483cc49014ff7a83caa2afb71dad62fdb0ec567e4a34fd4fa87a1037b2c5373cc06d
f0c6ac18e6d399f5bf498e4643c216ad6c7d6b51ab1e506d6768b2a',
  'md5': 'fd83928b1530399aa355301ccab3620c'
}
```

► Example Pre-Process Script:

```
# Required inputs are: the incident id and attachment id
inputs.incident_id = incident.id
inputs.attachment_id = attachment.id

# If this is a "task attachment" then we will additionally have a task-id
if task is not None:
    inputs.task_id = task.id
```

► Example Post-Process Script:

```
# The result contains at least these three hashes

incident.addArtifact("Malware SHA-256 Hash", results.sha256, u"SHA-256
hash of '{}'.format(attachment.name))
incident.addArtifact("Malware SHA-1 Hash", results.sha1, u"SHA-1 hash of
'{}'.format(attachment.name))
incident.addArtifact("Malware MD5 Hash", results.md5, u"MD5 hash of
'{}'.format(attachment.name))
```

Function - Utilities: Attachment to Base64

Reads a file attachment in the incident, and produces a base64-encoded string with the file attachment content. This content can then be used in combination with other workflow functions to create an artifact, a new file attachment, or to analyze the contents using various tools.

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Workflows / Example: Attachment to Base64

Name *

Example: Attachment to Base64

API Name *

example_attachment_to_base64

Description

Convert an Attachment of any type to a Base64 Encoded string

Object Type *

Attachment

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: Attachment to Base64

Hand

Cursor

Arrow

Circle

Circle with dot

Diamond

Diamond with dot

Triangle

Triangle with dot

Star

Star with dot

Example: Attachment to Base64

This function will convert/transform any attachment to Base64 string and will return the converted string.

Start

Function

End

► Inputs:

Name	Type	Required	Example	Tooltip
artifact_id	number	No	—	-
attachment_id	number	No	—	-
incident_id	number	Yes	—	-
task_id	number	No	—	-

► Outputs:

```
results = {
  'content': 'JVBERi0xLjcNCiW1tbW1DQoxIDAgb2JqDQo8PC9UeXB1L0NhdG...',
  'size': 123852,
  'created': 1563376076661,
  'content_type': u 'application/pdf',
  'filename': u 'sample_ioc.pdf'
}
```

► Example Pre-Process Script:

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► Example Post-Process Script:

Function - Utilities: Attachment Zip Extract

That string can then be used as input to subsequent functions that might write it as a file attachment, such as a malware sample artifact.

► Inputs:

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Name	Type	Required	Example	Tooltip
<code>incident_id</code>	<code>number</code>	Yes	—	-
<code>task_id</code>	<code>number</code>	No	—	-
<code>zipfile_password</code>	<code>text</code>	No	—	-

► Outputs:

```
results = {
  'info': {
    'comment': '',
    'external_attr': 2175025152,
    'create_version': 21,
    'extract_version': 20,
    'header_offset': 110334,
    'volume': 0,
    'CRC': 1976166170,
    'compress_type': 8,
    'file_size': 123852,
    'date_time': 1562684228000,
    'filename': 'sample_ioc_1.pdf',
    'compress_size': 109933,
    'flag_bits': 8,
    'create_system': 3,
    'internal_attr': 0
  },
  'content':
  'JVBERi0xLjcNCiW1tbW1DQoxIDAgb2JqDQo8PC9UeXB1L0NhdGFsb2cvUGFnZXMgMiAwIFIVTGFuZyhlbi1VUyk...'
}
```

► Example Pre-Process Script:

```
# Required inputs are: the incident id and attachment id
inputs.incident_id = incident.id
inputs.attachment_id = attachment.id

# If this is a "task attachment" then we will additionally have a task-id
if task is not None:
    inputs.task_id = task.id

# The path within the zip that we want to extract
inputs.file_path = "docProps/thumbnail.jpeg"

# If the zipfile is password protected, specify here
# inputs.zipfile_password =
```

► Example Post-Process Script:

None

Function - Utilities: Attachment Zip List

Reads a ZIP file and produces a list of the compressed files, and a list with detailed information about each file.

Note: The contents of password protected Excel spreadsheets cannot be listed.

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Example: Zip List

Cancel

Save & Close

Save

Name *

Example: Zip List

API Name *

example_zip_list

Description

An example showing how to list the contents of a ZIP file attachment.

Object Type *

Attachment

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: Zip List

Function reads the attachment (by id) then produces a list of its contents, in a structured data format. The post-processing script writes these results into a note on the incident.

Utilities: Attachment Zip List

► Inputs:

Name	Type	Required	Example	Tooltip
attachment_id	number	No	—	-
incident_id	number	Yes	—	-
task_id	number	No	—	-

► Outputs:

```
results = {
  'namelist': ['sample_ioc_2.pdf', 'sample_ioc_1.pdf'],
  'infolist': [{
    'comment': '',
    'external_attr': 2175025152,
    'create_version': 21,
    'extract_version': 20,
    'header_offset': 0,
```

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```
'volume': 0,
'CRC': 1976166170,
'compress_type': 8,
'file_size': 123852,
'date_time': 1562684228000,
'filename': 'sample_ioc_2.pdf',
'compress_size': 109933,
'flag_bits': 8,
'create_system': 3,
'internal_attr': 0
}, {
  'comment': '',
  'external_attr': 2175025152,
  'create_version': 21,
  'extract_version': 20,
  'header_offset': 110334,
  'volume': 0,
  'CRC': 1976166170,
  'compress_type': 8,
  'file_size': 123852,
  'date_time': 1562684228000,
  'filename': 'sample_ioc_1.pdf',
  'compress_size': 109933,
  'flag_bits': 8,
  'create_system': 3,
  'internal_attr': 0
}]
}
```

► Example Pre-Process Script:

```
# Required inputs are: the incident id and attachment id
inputs.incident_id = incident.id
inputs.attachment_id = attachment.id

# If this is a "task attachment" then we will additionally have a task-id
if task is not None:
    inputs.task_id = task.id
```

► Example Post-Process Script:

```
# The output contains two lists:
# - "namelist", which is just a list of the filenames (paths) within the
  zip file,
# - "infolist", which has full information for each file, including its
  name, size, and so on.

# For this example, let's create two notes
```



```
# One with a list of the namelist
html = u"<div><p>Contents of {}:</p>".format(attachment.name)
for filename in results.namelist:
    html = html + u"{}<br>".format(filename)
html = html + "</div>"
incident.addNote(helper.createRichText(html))

# Another with more detailed information
html = u"<div><p>Contents of {}:</p>".format(attachment.name)
for fileinfo in results.infolist:
    html = html + u"{} ({} bytes, {} compressed) {}<br>".format(fileinfo.filename, fileinfo.file_size,
fileinfo.compress_size, fileinfo.comment)
html = html + "</div>"
incident.addNote(helper.createRichText(html))
```

Function - Utilities: Base64 to Artifact

Creates a new artifact from a Base64 string. You can also specify the artifact type and description.

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Cancel
Save & Close
Save

Name *
Utilities: Base64 to Artifact

API Name *
utilities_base64_to_artifact

Message Destination *
fn_utilities

Description
Create a new artifact from a Base64 string

Creator
Orchestration Engine

Last Modified
07/19/2019 16:17

Last Modified By
Orchestration Engine

Associated Workflows
Function is not currently referenced by any workflow.

Inputs

base64content
incident_id
artifact_file_type
file_name
content_type

Input Fields

Search...
artifact_file_type
artifact_id
attachment_id
attachment_name

► Inputs:

Name	Type	Required	Example	Tooltip
artifact_file_type	select	No	—	-
base64content	text	No	—	-

Name	Type	Required	Example	Tooltip
content_type	text	No	—	-
description	textarea	No	—	-
file_name	text	No	—	-
incident_id	number	Yes	—	-

► Outputs:

```
results = {
  'hits': [],
  'hash':
'8ed1d04c56843f357af60e98f6178c5b19e89306bc7f132e49a0951326d90bb9',
  'description': 'Test description',
  'creator': {
    'status': 'A',
    'password_changed': False,
    'display_name': 'Orchestration Engine',
    'is_external': False,
    'email': 'integrations@example.com',
    'lname': 'Engine',
    'create_date': 1542400059674,
    'last_login': 1563536472570,
    'fname': 'Orchestration',
    'last_modified_time': 1563536472571,
    'locked': False,
    'id': 38
  },
  'inc_owner': 71,
  'perms': None,
  'created': 1563536572548,
  'relating': None,
  'value': 'tmptpFuFK',
  'properties': None,
  'parent_id': None,
  'attachment': {
    'task_at_id': None,
    'vers': 4,
    'name': 'tmptpFuFK',
    'task_id': None,
    'created': 1563536572692,
    'inc_owner': 71,
    'task_members': None,
    'task_custom': None,
    'task_name': None,
    'inc_name': 'Test fn_utilities',
    'creator_id': 38,
    'content_type': 'application/pdf',
    'inc_id': 2095,
    'type': 'artifact',
```

```
    'id': 2,  
    'size': 220184  
  },  
  'inc_name': 'Test fn_utilities',  
  'creator_principal': {  
    'display_name': 'Orchestration Engine',  
    'type': 'user',  
    'id': 38,  
    'name': 'integrations@example.com'  
  },  
  'inc_id': 2095,  
  'type': 16,  
  'id': 1,  
  'actions': [],  
  'pending_sources': []  
}
```

► Example Pre-Process Script:

None

► Example Post-Process Script:

None

Function - Utilities: Base64 to Attachment

Creates a new attachment from a base64 string. You can also specify the file name and content type to use.

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Functions / utilities_base64_to_attachment

Cancel

Save & Close

Save

Name *

Utilities: Base64 to Attachment

API Name * ⓘ

utilities_base64_to_attachment

Message Destination *

fn_utilities

Description

Create a new attachment from a base64 string.

Creator

Orchestration Engine

Last Modified

07/19/2019 16:17

Last Modified By

Orchestration Engine

Associated Workflows

Example: Zip Extract

Inputs

base64content

incident_id

task_id

file_name

content_type

Input Fields ⓘ

Add Field

Search...

artifact_file_type

artifact_id

attachment_id

attachment_name

► Inputs:

Name	Type	Required	Example	Tooltip
base64content	text	No	—	-
content_type	text	No	—	-
file_name	text	No	—	-
incident_id	number	Yes	—	-
task_id	number	No	—	-

► Outputs:

```
results = {
  "task_at_id": null,
  "vers": 9,
  "name": "thumbnail.jpeg",
  "task_id": null,
  "created": 1563376723766,
  "inc_owner": 71,
  "task_members": null,
  "task_custom": null,
  "task_name": null,
  "inc_name": "Get example outputs fn-utilities",
  "creator_id": 38,
  "content_type": "image/jpeg",
  "inc_id": 2095,
  "size": 123852,
```

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```
"type": "incident",  
"id": 7,  
"uuid": "5a31ce96-954a-4d3f-a193-a83618055d22"  
}
```

► Example Pre-Process Script:

```
#  
inputs.base64content = workflow.properties.extracted_file.content  
  
inputs.incident_id = incident.id  
  
inputs.file_name = "thumbnail.jpeg"  
inputs.content_type = "image/jpeg"
```

► Example Post-Process Script:

None

Function - Utilities: Call REST API

This function calls a REST web service. It supports the standard REST methods: GET, HEAD, POST, PUT, DELETE, OPTIONS and PATCH.

The function parameters determine the type of call, the URL, and optionally the headers, cookies and body. The results include the text or structured (JSON) result from the web service, and additional information including the elapsed time.

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Save & Close

Save

Creator	Orchestration Engine
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Associated Rules	Example: Call REST API



Name	Type	Required	Example	Tooltip
rest_body	textarea	No	—	-
rest_cookies	textarea	No	—	-
rest_headers	textarea	No	—	-
rest_method	select	No	—	-
rest_url	text	No	—	-
rest_verify	boolean	Yes	—	Verify SSL certificate?

```
results = {
  'cookies': {
    '__cfduid': 'df6a42088e8cb3550f4b3266137fdea731563377650'
  },
  'links': {},
  'text': u '{\n  "userId": 1,\n  "id": 1,\n  "title": "delectus aut  
autem",\n  "completed": false\n}',
  'elapsed': 263,
  'apparent_encoding': 'ascii',
  'reason': 'OK',
  'ok': True,
  'url': 'https://jsonplaceholder.typicode.com/todos/1',
  'headers': {
    'Expires': 'Wed, 17 Jul 2019 19:34:11 GMT',
    'X-Content-Type-Options': 'nosniff',
```

```

        'X-Powered-By': 'Express',
        'Transfer-Encoding': 'chunked',
        'Set-Cookie':
'__cfduid=df6a42088e8cb3550f4b3266137fdea731563377650; expires=Thu, 16-
Jul-20 15:34:10 GMT; path=/; domain=.typicode.com; HttpOnly',
        'CF-Cache-Status': 'HIT',
        'Cache-Control': 'public, max-age=14400',
        'Vary': 'Origin, Accept-Encoding',
        'Content-Encoding': 'gzip',
        'Server': 'cloudflare',
        'Connection': 'keep-alive',
        'Etag': 'W/"53-hfEumeNh6Yirfjyjauc0PPT+s"',
        'Pragma': 'no-cache',
        'Access-Control-Allow-Credentials': 'true',
        'Date': 'Wed, 17 Jul 2019 15:34:11 GMT',
        'CF-RAY': '4f7d474ebce8ce2b-LHR',
        'Content-Type': 'application/json; charset=utf-8',
        'Age': '791',
        'Via': '1.1 vegur'
    },
    'json': {
        'completed': False,
        'userId': 1,
        'id': 1,
        'title': 'delectus aut autem'
    },
    'status_code': 200
}

```

► Example Pre-Process Script:

```

inputs.rest_method = "PATCH"

# Let's patch a URL that includes the artifact value
inputs.rest_url = u"http://httpbin.org/patch"

# For PATCH requests, the body is text
inputs.rest_body = '{"key": "' + artifact.value + '"}'

# HTTP headers can be specified as a multi-line string
inputs.rest_headers = """
Content-Type: application/json
X-Frooble: Baz
"""

# The 'rest_verify' parameter (Boolean) indicates whether to verify SSL
certificates.
# This should be True unless you need to connect to a self-signed or other
invalid cert.
inputs.rest_verify = True

```

► Example Post-Process Script:

```
# Set the artifact description to the Response (in plain text) of the REST
call

artifact.description = results.text
```

Function - Utilities: Domain Distance

Identifies similarity between a suspicious domain name and a list of valid domain names. Low distance result indicates a possible spoof attempt. For example, `www.ibm.com` and `www.1bm.com` would have a low distance. This can be used for URLs, DNS names and email addresses.

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[Workflows](#) / Example: Domain Distance

Name *

API Name *

Description

Object Type *

Creator [Orchestration Engine](#)

Last Modified 07/17/2019 14:20

Last Modified By [Orchestration Engine](#)

Associated Rules [Example: Domain Distance](#)

```

graph LR
    Start(( )) --> Function[Utilities: Domain Distance]
    Function --> End(( ))
            
```

The diagram shows a workflow with three circular nodes connected by arrows. The middle node is highlighted with a dashed blue box and contains the text "Utilities: Domain Distance". Above this node is a tooltip box containing the following text:

[Calculates the "word distance" between a suspect name and a list of names.
This can be useful for detecting spoofed URLs.
The distance is small if the names are similar.
For each different or switched character, the distance increases.
But "confusable Unicode characters" are treated as identical (they have zero distance).

To the left of the workflow diagram is a vertical toolbar with various icons for creating and editing workflow elements.

► Inputs:

Name	Type	Required	Example	Tooltip
<code>domain_list</code>	<code>text</code>	No	—	-
<code>domain name</code>	<code>text</code>	No	—	-

► Outputs:

```
results = {
    'distances': {
        'soarsystems.com': 6,
        'ibmcloud.com': 11,
        'ibm.com': 9,
```



```
    'bluemix.com': 9
  },
  'domain_name': 'ressystems.com',
  'closest': {
    'distance': 6,
    'name': 'soarsystems.com'
  }
}
```

► Example Pre-Process Script:

```
# if email address, return only domain portion
if "email" in artifact.type.lower():
    split_email = artifact.value.split("@")
    if len(split_email) > 1:
        inputs.domain_name = split_email[1]
    else:
        inputs.domain_name = artifact.value
else:
    # The domain name being tested
    inputs.domain_name = artifact.value

# The list of domains to test against
inputs.domain_list = "ibm.com, soarsystems.com, ibmcloud.com, bluemix.com"
```

► Example Post-Process Script:

```
# The result includes:
#   "domain_name" - the name being tested
#   "distances" - a dictionary of all the distances
#   "closest" - the closest match from the list.
# If the match distance is only 1 or 0, the domain name is very easily
# confused with one on the list!

if results.closest.distance <= 1:
    html = u"<div>Warning! Domain {} is easily confused with {}!
</div>".format(results.domain_name, results.closest.name)
    incident.addNote(helper.createRichText(html))
```

Function - Utilities: Email Parse

Extracts message headers and parts of the message body from an email message (.eml or .msg).

Any attachments found are added to the incident as artifacts if `utilities_parse_email_attachments` is set to True.

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Workflows / Example: Email Parsing (Attachment)
Cancel
Save & Close
Save

Name *
Example: Email Parsing (Attachment)
API Name *
example_email_parsing_attachment
Description
Example Workflow showing to parse an Email File (.eml or .msg) from Incident/Task Attachments. Sender and recipient email addresses are added as Artifacts. URLs and IPs found in the email headers or body are also added as Artifacts. The body of the email is added as a Note to the Incident. If attachments are found in the parsed email message, they are added as Email Attachment Artifacts.
Object Type *
Attachment

Creator
Admin User
Last Modified
07/17/2019 14:20
Last Modified By
Orchestration Engine
Associated Rules
Example: Email Parsing (Attachment)

Supporting Outlook .msg files

- This function relies on `mail-parser>=3.9.3`.

For Integrations Servers:

- To support parsing of Outlook email files (`.msg`), you need to install the `msgconvert` tool.
- `msgconvert` is a tool written in Perl and can be found in `Email::Outlook::Message` (Centos/RHEL).
- See <https://github.com/SpamScope/mail-parser> for more information on the packaged used.

Install `msgconvert` on CentOS/RHEL based systems:

```
$ sudo yum install cpan
$ sudo cpan -fTi install Email::Outlook::Message
```

For App Host Environments:

- The packages required to parse Outlook .msg files is built into the container.

► Inputs:

Name	Type	Required	Example	Tooltip
<code>artifact_id</code>	<code>number</code>	No	—	—
<code>attachment_id</code>	<code>number</code>	No	—	—
<code>base64content</code>	<code>text</code>	No	—	—

Name	Type	Required	Example	Tooltip
incident_id	number	Yes	–	–
task_id	number	No	–	–
utilities_parse_email_attachments	boolean	No	–	If set to True, attachments found in the email file will be attached as Artifacts

► Outputs:

```
results = {
  'inputs': {
    'incident_id': 2095,
    'attachment_id': 8,
    'utilities_parse_email_attachments': True
  },
  'metrics': {
    'package': 'unknown',
    'timestamp': '2019-07-17 16:38:18',
    'package_version': 'unknown',
    'host': 'xxx.ie.ibm.com',
    'version': '1.0',
    'execution_time_ms': 2132
  },
  'success': True,
  'content': {
    'body': 'After reviewing your profile with our management, we are pleased to...',
    'received': [{
      'from': 'info@example.com',
      'by': 'example.com Postfix',
      'delay': 0,
      'date_utc': '2017-11-16T05:48:58',
      'hop': 1,
      'date': 'Thu, 16 Nov 2017 13:48:58 +0800 SGT',
      'with': 'ESMTPSA',
      'id': '80EABD601B2'
    }, {
      'from': 'example.com unknown x.x.x.x',
      'by': 'secure1.example.com Postfix',
      'delay': 78.0,
      'date_utc': '2017-11-16T05:50:16',
      'hop': 2,
      'date': 'Thu, 16 Nov 2017 13:50:16 +0800 SGT',
      'with': 'ESMTP',
      'id': '4A2A41561A55'
    }, {
      'from': '103.15.233.228',
```

```

        'delay': 474.0,
        'date_utc': '2017-11-16T05:58:10',
        'hop': 3,
        'date': 'Thu, 16 Nov 2017 05:58:10 +0000',
        'by': 'removed'
    }],
    'from': [
        ['Monika Bakun', 'admin@example.com']
    ],
    'attachments': [{
        'binary': True,
        'mail_content_type': 'application/msword',
        'charset': None,
        'filename': 'SKMBT_C201711xxxx.doc',
        'content-id': '',
        'content_transfer_encoding': 'base64',
        'payload': 'e1xydGZIMigxMS0xMyksSHVhbm...'
    }],
    'plain_body': '["After reviewing your profile with our management,
we are pleased to..."]',
    'content-type': 'multipart/mixed;
boundary="=====1876313359==",
    'x-sf-rx-return-path': '<admin@example.com>',
    'to_domains': ['ibm.com'],
    'to': [
        ['Recipients', 'joe.bloggs@ibm.com']
    ],
    'html_body': '["<HTML><head><meta charset=iso-8859-1\\"/></head>
<BODY><P>After reviewing your profile with our management, we are pleased
to ...</BODY></HTML>"]',
    'x-sf-helo-domain': 'secure1.example.com',
    'x-sf-originating-ip': '0.0.0.0',
    'date': '2017-11-16T05:49:54',
    'timezone': '+0',
    'mime-version': '1.0',
    'has_defects': False,
    'subject': 'Request For Quotation'
},
    'reason': None,
    'version': '1.0'
}

```

► Example Pre-Process Script:

```

# Define incident_id and artifact_id
inputs.incident_id = incident.id
inputs.artifact_id = artifact.id

# Setting this to True will add any found attachments as an Email
Attachment Artifact
inputs.utilities_parse_email_attachments = True

```

► Example Post-Process Script:

```

import re

if not results.success:
    note_text = u"""Workflow 'Example: Email Parsing (Artifact)' Failed<br>
    <b>Reason:</b> {0}""".format(unicode(results.reason))

    incident.addNote(helper.createRichText(note_text))

else:
    email = results.content

    # Get Email Subject
    eml_subject = email.get("subject", "BLANK SUBJECT LINE")

    #####
    # Add Artifacts for Email Recipient: to #
    #####
    for eml_addr in email.get("to", []):
        incident.addArtifact("Email Recipient", eml_addr[1], eml_addr[0])

    #####
    # Add Artifacts for Email Recipient: cc #
    #####
    for eml_addr in email.get("cc", []):
        incident.addArtifact("Email Recipient", eml_addr[1], eml_addr[0])

    #####
    # Add Artifacts for Email Sender: from #
    #####
    for eml_addr in email.get("from", []):
        incident.addArtifact("Email Sender", eml_addr[1], eml_addr[0])

    #####
    # Add Artifacts for IPs found in Email Headers #
    #####
    for eml_header in email.get("received", []):

        the_header = eml_header.get("from", None)

        if the_header:
            ips = re.findall('(?:25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.){3}
            (?:25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)', the_header)
            unique_ips = set(ips)

            for an_ip in unique_ips:
                incident.addArtifact("IP Address", an_ip, u"Hop {0} at
                {1}\n\nHeader: {2}""".format(eml_header.get("hop", ""),
                eml_header.get("date_utc", ""), the_header))

    #####

```

```

# Add Artifacts for URLs found in Email Body #
#####
urls = []
for eml_body_content in [email.get("plain_body", ""),
email.get("html_body", "")]:
    urls.extend(re.findall('http[s]?://(?:[a-zA-Z]|[0-9]|[$-_@.&+]|[*\
(\),]|(?:%[0-9a-fA-F][0-9a-fA-F]))+', eml_body_content))

uniq_urls = set(urls)

for a_url in uniq_urls:
    # Remove any backslash as regex can add
    a_url = a_url.replace('\\', '')
    incident.addArtifact("URL", a_url, "Found in parsed Email")

#####
# Add the Email Body as a Note to the Incident #
#####
if email.get("body"):
    note_text = u"""<b>Parsed Email::</b><br>
                <b>Subject:</b><br>{0}<br>
                <b>From:</b><br>{1}<br>
                <b>To:</b><br>{2}<br>
                <b>Body:</b><br>{3}""".format(unicode(eml_subject),
                                             unicode(email.get("from", "N/A")),
                                             unicode(email.get("to", "N/A")),
                                             unicode(email.get("body", "N/A")))

    incident.addNote(helper.createRichText(note_text))

'''Uncomment this if you would like to add a (safer) plain_text only
Note
if email.get("plain_body"):
    note_text = u"""Parsed
Email::\n\nSubject:\n{0}\n\nFrom:\n{1}\n\nTo:\n{2}\n\nBody:\n{3}""".format
(unicode(eml_subject),
    unicode(email.get("from", "N/A")), unicode(email.get("to", "N/A")),
    unicode(email.get("body", "N/A")))

    incident.addNote(helper.createPlainText(note_text))
'''

```

Function - Utilities: Excel Query

Extracts ranges of data or named ranges specified by the user from a Microsoft Excel document.

The function uses a Python library called openpyxl (<http://openpyxl.readthedocs.io/en/stable/>) to interface with Excel files.

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Example: Create Artifacts From Excel Data

Cancel

Save & Close

Save

Name *

Example: Create Artifacts From Excel Data

API Name *

example_create_artifacts_from_excel_data

Description

Created artifacts with information extracted from an excel sheet.

Object Type *

Attachment

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: Use Excel Data

Utilities: Excel Query

► Inputs:

Name	Type	Required	Example	Tooltip
attachment_id	number	No	—	-
excel_defined_names	text	No	—	Accepts a list of comma separated names of defined ranges, e.g.: test1, test2
excel_ranges	text	No	—	Accepts a list of ranges in Excel notation, e.g.: "Sheet1"!A1:B2, 'Sheet2'!C3
incident_id	number	Yes	—	-
task_id	number	No	—	-

► Outputs:

```
results = {
  'titles': ['Sheet1'],
  'sheets': {
    '_keys': ['Sheet1'],
    'Sheet1': {
      '_keys': ['A3:B5'],
      'A3:B5': [
        ['user one', 'one@example.com'],
        ['user two', 'two@example.com'],
        ['user three', 'three@example.com']
      ]
    }
  }
}
```

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```
}  
}
```

► Example Pre-Process Script:

```
inputs.incident_id = incident.id  
inputs.attachment_id = attachment.id  
if task is not None:  
    inputs.task_id = task.id
```

► Example Post-Process Script:

```
# This example shows how to iterate over the sheets and create artifacts  
from the returned data  
...  
keys = results.sheets["_keys"]  
for sheet in keys:  
    ranges = results.sheets[sheet]["_keys"]  
    for range_name in ranges:  
        rng = results.sheets[sheet][range_name]  
        for row in rng:  
            incident.addArtifact("IP Address", row[0], "Sheet Region {0}  
Priority {1}".format(row[1], row[2]))  
...  
  
# This example shows how to iterate through the named ranges and create  
artifacts from them  
# It is pretty much the same as the previous example, with an exception of  
extra layer of iterating through the named ranges  
...  
keys = results.named_ranges["_keys"]  
for named_range in keys:  
    sheets = results.named_ranges[named_range]["_keys"]  
    for sheet in sheets:  
        range_names = results.named_ranges[named_range][sheet]["_keys"]  
        for range_name in range_names:  
            rng = results.named_ranges[named_range][sheet][range_name]  
            for row in rng:  
                incident.addArtifact("IP Address", row[0], "Named Range Region {0}  
Priority {1}".format(row[1], row[2]))  
...  
...
```

Function - Utilities: Expand URL

Takes a shortened URL and follows it through redirects as it expands. The results include each URL, which are added to a new artifact.

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Workflows / Example: Expand URL

Name *

Example: Expand URL

API Name *

utilities_expand_url

Description

Take a url (mostly shortened) and follow it through redirects as it's expanded

Object Type *

Artifact

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: Expand URL

Cancel

Save & Close

Save

► Inputs:

Name	Type	Required	Example	Tooltip
resilient_url	text	No	—	-

► Outputs:

```
results = {
  'urllist': ['https://example-domain-one.com', 'https://example-domain-two.com']
}
```

► Example Pre-Process Script:

```
inputs.resilient_url = artifact.value
```

► Example Post-Process Script:

```
# Add the url expansions to the Artifact Description
expansions = results.get("urllist", [])

artifact.description =
"Expansions:\n\n{0}".format("\n\n".join(expansions))
```

Function - Utilities: Extract SSL Cert From Url

This function takes in a HTTPS URL or DNS input, establishes a connection and then attempts to acquire the SSL certificate. If successful, the function then saves the certificate as an artifact of type 'X509 Certificate File'. Works on most URLs including those with self-signed or expired certificates.

The output of this function is a string representation of the certificate saved in PEM format.

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Example: Extract SSL Cert from URL

Cancel

Save & Close

Save

Name *

Example: Extract SSL Cert from URL

API Name *

example_extract_ssl_cert_from_url

Description

This workflow takes in a HTTPS URL and attempts to acquire its Certificate, saving it as an artifact. The workflow runs at the artifact level

Object Type *

Artifact

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: Extract SSL Certificate

Hand

Lightning Bolt

Circle

Target

Diamond

Circle with Cross

Circle with Arrow

Circle with Plus

Circle with X

Circle with Z

Circle with Y

Circle with W

Circle with V

Circle with U

Circle with T

Circle with S

Circle with R

Circle with Q

Circle with P

Circle with O

Circle with N

Circle with M

Circle with L

Circle with K

Circle with J

Circle with I

Circle with H

Circle with G

Circle with F

Circle with E

Circle with D

Circle with C

Circle with B

Circle with A

Input: HTTPS URL

SSL Certificate data; encoded in JSON

Utilities: Extract SSL Cert From ...

► Inputs:

Name	Type	Required	Example	Tooltip
https_url	text	Yes	-	-

► Outputs:

```
results = {
  'successful': True,
  'certificate': '"-----BEGIN CERTIFICATE-----\nMIIGjTCCBXxxxxxx==\n-----END CERTIFICATE-----\n"'
}
```

► Example Pre-Process Script:

```
inputs.https_url = artifact.value
```

► Example Post-Process Script:

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```
incident.addArtifact('X509 Certificate File', results.certificate, 'A certificate file gathered from provided the provided URL')
```

Function - Utilities: Get Contact Info

Retrieves contact information of the owner and members of an incident or task.

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Workflows / Example: Get Incident Contact Info

Name *Example: Get Incident Contact Info

API Name *example_get_incident_contact_info

DescriptionGet owner and member contact information for an Incident

Object Type *Incident

CreatorOrchestration Engine

Last Modified07/17/2019 14:20

Last Modified ByOrchestration Engine

Associated RulesExample: Get Incident Contact Info

Hand icon

Lightning bolt icon

Circle icon

Target icon

Plus icon

Minus icon

Person icon

Group icon

Start node

Utilities: Get Contact Info

End node

► Inputs:

Name	Type	Required	Example	Tooltip
incident_id	number	Yes	—	-
task_id	number	No	—	-

► Outputs:

```
results = {
  'owner': {
    'cell': None,
    'display_name': 'Admin User',
    'title': None,
    'lname': 'User',
    'phone': None,
    'fname': 'Admin',
    'email': 'admin@example.com'
  },
}
```

```
'members': []  
}
```

► Example Pre-Process Script:

```
inputs.incident_id = incident.id
```

► Example Post-Process Script:

```
# {'owner': {'fname': 'SOAR', 'lname': 'Sysadmin', 'title': '',  
'display_name': 'SOAR Sysadmin', 'email': 'b@a.com', 'phone': '781 838  
4848', 'cell': '978 373 2839'}, 'members': []}  
# {'owner': None, 'members': [{'fname': 'SOAR', 'lname': 'Sysadmin',  
'title': '', 'display_name': 'SOAR Sysadmin', 'email': 'b@a.com', 'phone':  
'781 838 4848', 'cell': '978 373 2839'}]}
```

Function - Utilities: JSON2HTML

Produces an HTML representation of JSON data. All data is converted into tables of key / value pairs or lists.

Provides an optional parameter `json2html_keys` to limit the JSON data to display.

For the example below, specifying `key1.key2.key3` only converts the JSON data associated with that key path.

The screenshot displays the Resilient interface for customizing the JSON2HTML function. The top navigation bar includes 'Dashboards', 'Simulations', 'Incidents', and a 'Create' button. The main header shows 'Customization Settings' with tabs for 'Layouts', 'Rules', 'Scripts', 'Workflows', 'Functions', 'Message Destinations', 'Phases & Tasks', 'Incident Types', 'Breach', and 'Artifacts'. The 'Workflows' tab is selected, showing 'Example: JSON2HTML'. On the right, there are buttons for 'Cancel', 'Save & Close', and 'Save'. The function configuration form includes fields for 'Name' (Example: JSON2HTML), 'API Name' (example_json2html), 'Description' (Example to extract json to html table), and 'Object Type' (Artifact). A metadata section on the right lists 'Creator' (Orchestration Engine), 'Last Modified' (07/17/2019 14:20), 'Last Modified By' (Orchestration Engine), and 'Associated Rules' (Example: JSON2HTML). Below the form, a workflow diagram shows a sequence of steps: a start node, a function node labeled 'Utilities: JSON2HTML', and an end node.

► Inputs:

Name	Type	Required	Example	Tooltip
json2html_data	text	Yes	–	json data to convert to html
json2html_keys	text	No	–	Limit portion of json to render. Example: key1[.key2[...]]

► Outputs:

```
results = {
  'content': u'<ul><li>1</li><li>2</li><li>3</li><li><table border="1">
<tr><th>keen1n</th><td>m1ch</td></tr><tr><th>ibm</th><td>None</td></tr>
</table></li></ul>'
}
```

► Example Pre-Process Script:

```
#data = { "data": artifact.value, "data_type": artifact.type,
"description": artifact.description if artifact.description is not None
else ""}
#inputs.json2html_data = str(data).replace('"', '').replace('u"', '') #
remove unicode references
#inputs.json2html_data = str(inputs.json2html_data).replace('"',
'').replace('u"', '') # remove unicode references
```

► Example Post-Process Script:

```
# example output
# {'content': '<ul><li>1</li><li>2</li><li>3</li><li><table border="1">
<tr><th>keen1n</th><td>m1ch</td></tr><tr><th>ibm</th><td>None</td></tr>
</table></li></ul>'}
```

Function - Utilities: Parse SSL Certificate

This function produces the structured data from a provided SSL certificate. Three inputs are accepted by the function. There are two defined ways to use this function for parsing certificates.

Option 1 involves providing a JSON-encoded representation of a certificate. In this case the certificate input parameter should be this JSON string.

Option 2 involves providing a certificate file for parsing. When the rule is triggered on an artifact, both the incident_id for that incident and the artifact_id for the specified certificate file must be provided.

NOTE: The Parse SSL Certificate function expects a certificate of type PEM. If you require a way to get a PEM formatted certificate from a URL, consider using this in conjunction with the Extract SSL Cert from URL function.

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Example: Parse SSL Certificate

Cancel

Save & Close

Save

Name *

Example: Parse SSL Certificate

API Name *

example_parse_ssl_certificate

Description

An example workflow that takes in a PEM encoded SSL certificate as input and returns structured information about the certificate.

Object Type *

Artifact

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: Parse SSL Certificate

Inputs: certificate OR artifact_id AND incident_id

Outputs: certificate data

Utilities: Parse SSL Certificate

Inputs:

Name	Type	Required	Example	Tooltip
artifact_id	number	No	—	—
incident_id	number	Yes	—	—
utilities_certificate	text	No	—	—

Outputs:

```
results = {
  'public_key': '-----BEGIN PUBLIC KEY-----\nMIIBIjANBgkqhkiG9xxxxx-----END PUBLIC KEY-----\n',
  'version': 2,
  'signature_algorithm': 'sha256WithRSAEncryption',
  'extensions': {
    'issuerAltNames': '[]',
    'subjectAltNames': '["*.ibm.com", "ibm.com"]',
    'basicConstraints': 'false'
  },
  'notBefore': '2018-03-16 00:00:00',
  'issuer': '"xxxx"',
  'expiration_status': 'Valid',
  'notAfter': '2020-03-15 12:00:00',
  'subject': '"[(\\'C\\', \\'US\\'), (\\'ST\\', \\'New York\\'), (\\'L\\', \\'Armonk\\'), (\\'O\\', \\'International Business Machines Corporation\\')',
```

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```
(\'CN\', \'*.ibm.com\'])'''  
}
```

► Example Pre-Process Script:

```
inputs.utilities_certificate = artifact.value  
inputs.artifact_id = artifact.id  
inputs.incident_id = incident.id
```

► Example Post-Process Script:

```
color = "#45bc27"  
  
if (results.expiration_status != "Valid"):  
    color = "#ff402b"  
noteText = """"<br>Certificate Subject :<b>{0}</b>  
                <b>Certificate Expiry After :</b>{1}</a>  
                <b>Expiration Status:</b> <b style="color: {2}">{3}</b>  
                <br>Issuer Details :<b>{4}</b>""".format(results.subject,  
results.notAfter, color, results.expiration_status, results.issuer)  
  
incident.addNote(helper.createRichText(noteText))
```

Function - Utilities: PDFiD

Produces summary information about the structure of a PDF file, using Didier Stevens' pdfid (<https://blog.didierstevens.com/programs/pdf-tools/>). The PDF file content should be provided as a base64-encoded string, for example the output from the "Attachment to Base64" function.

This function is useful in initial triage of suspicious email attachments and other files. It allows you to identify PDF documents that contain (for example) JavaScript or that execute an action when opened. PDFiD also handles name obfuscation. The combination of PDF automatic action and JavaScript makes a document very suspicious.

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Workflows / Example: PDFID

Cancel

Save & Close

Save

Name *

Example: PDFID

API Name *

example_pdfid

Description

An example of using the PDFID function to get summary information about a PDF file attachment.

Object Type *

Attachment

Creator

Orchestration Engine

Last Modified

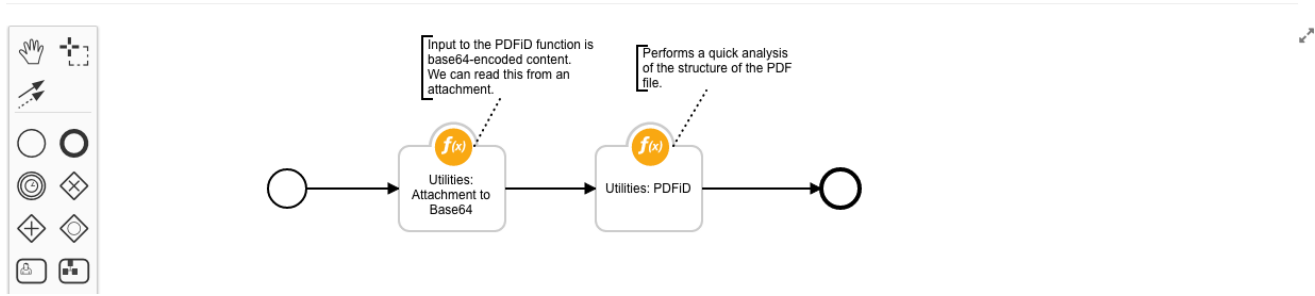
07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: PDFID



► Inputs:

Name	Type	Required	Example	Tooltip
base64content	text	No	—	-

► Outputs:

```
results = {
  '/JS': 0,
  'stream': 9,
  '/ObjStm': 1,
  'header': '%PDF-1.7',
  '/AcroForm': 0,
  'xref': 2,
  'endobj': 34,
  '/JavaScript': 0,
  '/XFA': 0,
  '/Page': 1,
  '/Colors > 2^24': 0,
  '/OpenAction': 0,
  'endstream': 9,
  'startxref': 2,
  '/EmbeddedFile': 0,
  '/Encrypt': 0,
  'isPdf': 'True',
  '/Launch': 0,
  'obj': 34,
  '/AA': 0,
  '/RichMedia': 0,
  '/JBIG2Decode': 0,
```



```
'trailer': 2
}
```

► Example Pre-Process Script:

```
# The input is the base64-encoded content that was read in a previous
# component
# That object has properties:
# - filename
# - content_type
# - size
# - created
# - content (the base64-encoded data)
inputs.base64content = workflow.properties.attachment_content.content
```

► Example Post-Process Script:

```
# The output of PDFiD is a dictionary with the fundamental elements of the
# PDF file.
# These include,
# - "isPdf" (True or False)
# - "header" (the PDF version header)
# - "obj", "endobj" and so on: the count of each element.
# More documentation can be found at
https://blog.didierstevens.com/programs/pdf-tools/

# Some sections of interest
interesting_sections = [
    'obj', 'endobj', 'stream', 'endstream', 'startxref', 'xref', 'trailer',
    '/AA', '/AcroForm', '/EmbeddedFile', '/Encrypt', '/JBIG2Decode', '/JS',
    '/JavaScript', '/Launch', '/ObjStm', '/OpenAction', '/Page', '/RichMedia',
    '/XFA'
]

if not results.isPdf:
    incident.addNote(helper.createRichText("Not a PDF file:
{}".format(attachment.name)))
else:
    # In this example we just write them to a note in the incident
    note_data = ["PDFiD report for {} ({}):".format(attachment.name,
results.header)]

    for section in interesting_sections:
        value = results.getValue(section)
        if value is not None:
            note_data.append("{}: {}".format(section, value))

    text = helper.createPlainText("\n".join(note_data))
    incident.addNote(text)
```

```
# Maybe extend this to alert if (/JS or /JavaScript) and (/AA or /OpenAction)
```

Function - Utilities: Resilient Search

This function searches the SOAR platform for incident data according to the criteria specified, and returns the results to your workflow. It can be used to find incidents containing data that matches any string, incidents currently assigned to a given user, or a very wide range of other search conditions.

NOTE: The search results may include data from incidents that the current SOAR user (the person who triggered the workflow) cannot access. Often your SOAR users have the **Default** role that allows them to only see incidents where they are members. This function runs with the permissions of your app account, which typically may have much wider access privileges. **Use with caution, to avoid information disclosure.**

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Example: Resilient Search

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Save

Name *

API Name *

Description

Object Type *

Example: Resilient Search

example_resilient_search

An example of searching Resilient.

Attachment

Creator

Last Modified

Last Modified By

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Orchestration Engine

07/17/2019 14:20

Orchestration Engine

Example: Resilient Search

Hand

Cursor

Eraser

Circle

Circle with X

Triangle

Triangle with X

Rectangle

Rectangle with X

Image

Grid

Search for any Resilient data.

This example searches for all incidents that have an attachment with the same name.

Start

Utilities: Resilient Search

End

► Inputs:

Name	Type	Required	Example	Tooltip
resilient_search_query	text	No	—	—
resilient_search_template	textarea	No	—	—

► Outputs:

```
results = {  
  'results': [{
```

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```
'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>',
  'inc_name': 'incident with same attachment 2',
  'task_id': None,
  'type_id': 'attachment',
  'obj_creator_id': 71,
  'inc_owner_id': 71,
  'obj_id': 12,
  'org_id': 201,
  'task_name': None,
  'score': 2.1267257,
  'match_highlights': [{
    'match_field_name': 'Content Type',
    'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>'
  }], {
    'match_field_name': 'Name',
    'match_field_value':
'<ResilientHighlight>sample_ioc_1</ResilientHighlight>.'
'<ResilientHighlight>pdf</ResilientHighlight>'
  }],
  'obj_create_date': 1563445289222,
  'obj_name': 'sample_ioc_1.pdf',
  'match_field_name': 'Content Type',
  'inc_id': 2097,
  'result': {
    'task_at_id': None,
    'uuid': 'ffb6bee8-7cef-47fa-a2cc-2daf57bd28a2',
    'vers': 4,
    'inc_name': 'incident with same attachment 2',
    'task_id': None,
    'created': 1563445289222,
    'task_members': None,
    'task_custom': None,
    'task_name': None,
    'actions': [],
    'inc_owner': {
      'type': 'user',
      'display_name': 'Admin User',
      'id': 71,
      'name': 'admin@example.com'
    },
    'creator_id': {
      'type': 'user',
      'display_name': 'Admin User',
      'id': 71,
      'name': 'admin@example.com'
    },
    'content_type': 'application/pdf',
    'inc_id': 2097,
    'size': 123852,
    'type': 'incident',
    'id': 12,
    'name': 'sample_ioc_1.pdf'
```

```

    }
  }, {
    'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>',
    'inc_name': 'Get example outputs fn-utilities',
    'task_id': None,
    'type_id': 'attachment',
    'obj_creator_id': 71,
    'inc_owner_id': 71,
    'obj_id': 13,
    'org_id': 201,
    'task_name': None,
    'score': 1.7914013,
    'match_highlights': [{
      'match_field_name': 'Content Type',
      'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>'
    }], {
      'match_field_name': 'Name',
      'match_field_value':
'<ResilientHighlight>sample_ioc_1</ResilientHighlight>.'
    }, {
      'match_field_name': 'Content Type',
      'match_field_value':
'<ResilientHighlight>pdf</ResilientHighlight>'
    }
  ],
  'obj_create_date': 1563445301367,
  'obj_name': 'sample_ioc_1.pdf',
  'match_field_name': 'Content Type',
  'inc_id': 2095,
  'result': {
    'task_at_id': None,
    'uuid': 'e8537737-1887-486f-92f5-76ea5091e970',
    'vers': 14,
    'inc_name': 'Get example outputs fn-utilities',
    'task_id': None,
    'created': 1563445301367,
    'task_members': None,
    'task_custom': None,
    'task_name': None,
    'actions': [],
    'inc_owner': {
      'type': 'user',
      'display_name': 'Admin User',
      'id': 71,
      'name': 'admin@example.com'
    },
    'creator_id': {
      'type': 'user',
      'display_name': 'Admin User',
      'id': 71,
      'name': 'admin@example.com'
    },
    'content_type': 'application/pdf',
    'inc_id': 2095,
    'size': 123852,
    'type': 'incident',
  }
}

```

```

        'id': 13,
        'name': 'sample_ioc_1.pdf'
    }
}, {
    'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>',
    'inc_name': 'incident with same attachment 1',
    'task_id': None,
    'type_id': 'attachment',
    'obj_creator_id': 71,
    'inc_owner_id': 71,
    'obj_id': 11,
    'org_id': 201,
    'task_name': None,
    'score': 1.3419329,
    'match_highlights': [{
        'match_field_name': 'Content Type',
        'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>'
    }], {
        'match_field_name': 'Name',
        'match_field_value':
'<ResilientHighlight>sample_ioc_1</ResilientHighlight>.'
'<ResilientHighlight>pdf</ResilientHighlight>'
    }],
    'obj_create_date': 1563445261781,
    'obj_name': 'sample_ioc_1.pdf',
    'match_field_name': 'Content Type',
    'inc_id': 2096,
    'result': {
        'task_at_id': None,
        'uuid': '034199ca-f3d2-4e4f-8542-886753bd859e',
        'vers': 4,
        'inc_name': 'incident with same attachment 1',
        'task_id': None,
        'created': 1563445261781,
        'task_members': None,
        'task_custom': None,
        'task_name': None,
        'actions': [],
        'inc_owner': {
            'type': 'user',
            'display_name': 'Admin User',
            'id': 71,
            'name': 'admin@example.com'
        },
        'creator_id': {
            'type': 'user',
            'display_name': 'Admin User',
            'id': 71,
            'name': 'admin@example.com'
        },
        'content_type': 'application/pdf',
        'inc_id': 2096,

```

```

        'size': 123852,
        'type': 'incident',
        'id': 11,
        'name': 'sample_ioc_1.pdf'
    }
}, {
    'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>',
    'inc_name': 'Get example outputs fn-utilities',
    'task_id': None,
    'type_id': 'attachment',
    'obj_creator_id': 71,
    'inc_owner_id': 71,
    'obj_id': 1,
    'org_id': 201,
    'task_name': None,
    'score': 0.517004,
    'match_highlights': [{
        'match_field_name': 'Content Type',
        'match_field_value':
'application/<ResilientHighlight>pdf</ResilientHighlight>'
    }],
    'obj_create_date': 1563376076661,
    'obj_name': 'sample_ioc.pdf',
    'match_field_name': 'Content Type',
    'inc_id': 2095,
    'result': {
        'task_at_id': None,
        'uuid': '3fc6114e-6465-4fc0-a150-1e961869d34b',
        'vers': 13,
        'inc_name': 'Get example outputs fn-utilities',
        'task_id': None,
        'created': 1563376076661,
        'task_members': None,
        'task_custom': None,
        'task_name': None,
        'actions': [],
        'inc_owner': {
            'type': 'user',
            'display_name': 'Admin User',
            'id': 71,
            'name': 'admin@example.com'
        },
        'creator_id': {
            'type': 'user',
            'display_name': 'Admin User',
            'id': 71,
            'name': 'admin@example.com'
        },
        'content_type': 'application/pdf',
        'inc_id': 2095,
        'size': 123852,
        'type': 'incident',
        'id': 1,

```

```
        'name': 'sample_ioc.pdf'
    }
}]
}
```

► Example Pre-Process Script:

```
# Search for other occurrences of the same file attachment in SOAR.

# The search template determines the type(s) of object to search, and the
# filter conditions.
# This can be used to search within a specific incident field, or to
# search only incidents that meet other criteria.
# Refer to SearchExInputDTO in the REST API documentation for additional
# details of this data structure.

# The search query can be a simple string.
inputs.resilient_search_query = attachment.name
```

► Example Post-Process Script:

```
# Search results include "results", which is a list of the search hits.
# There might be lots of results!

# In this example we add a note with information about each result.
result_info = []
for result in results.results:
    link = u'<a href="https://#incidents/{}">{}</a>'.format(result.inc_id,
result.inc_name)
    result_info.append(u'<p>{} - {}</p>'.format(link, result.obj_name))

if len(result_info)==0:
    html = "<div>No results</div>"
else:
    html = u"<div>{}</div>".format("".join(result_info))

incident.addNote(helper.createRichText(html))
```

Function - Utilities: Shell Command

This function allows your workflows to execute shell-scripts locally or remotely, and return the result into the workflow. The results include the `stdout` and `stderr` streams, the return code, and information about the execution time. If the output of the shell script is JSON, it is returned as structured data. Results can then be added to the incident as file attachments, artifacts, data tables, or any other uses.

These shell commands can be run on any linux or windows platform. Different modes supported:

- Remote Linux execution
- Remote Windows command and powershell execution
- Local command execution of Linux commands such as nslookup, dig, traceroute and whois
- Local execution of Windows Powershell commands if resilient-circuits is installed on a Windows platform.

The screenshot shows the 'Customization Settings' page in the Resilient interface. The top navigation bar includes 'Dashboards', 'Simulations', 'Incidents', and a 'Create' button. The 'Workflows' tab is selected, showing a list of workflows with 'Example: Shell Command' highlighted. The workflow details form includes fields for Name, API Name, Description, and Object Type. To the right, metadata shows the Creator, Last Modified date, and Associated Rules. Below the form is a visual workflow diagram showing a sequence of steps: a start node, a 'Utilities: Shell Command' step, and an end node. A tooltip for the 'Utilities: Shell Command' step explains that it runs a shell command, with results available as text or JSON, and provides an example using 'traceroute'.

- For security, the list of available shell commands must be **configured explicitly by the administrator**. To do this, edit the [fn_utilities] section of the **app.config** file.
- **NOTE:** The parameter values `{{shell_param1}}`, `{{shell_param2}}`, `{{shell_param3}}` may contain spaces, dashes and other characters. In your command configuration, they must be surrounded with double-quotes. Failure to properly quote your command parameters creates a security risk, since the parameter values usually come from artifacts and other untrusted data.

For local and remote Windows environments:

- Remote commands must specify a target Windows machine that has Windows Remote Management (WinRM) enabled. This can be done by running `winrm qc` in the remote computer's command prompt.
- Remote shells have a max memory that may not be sufficient to run your script; to change this value you must set `MaxMemoryPerShellMB`.
- For remote powershell scripts, the `shell_param1`, `shell_param2` and `shell_param3` values map to `$args[0]`, `$args[1]`, and `$args[2]` respectively in the Powershell script.

app.config examples:

- Linux Operating Systems basic examples:

```
# Remote Linux and Windows servers:
remote_computer=(usr1:password@192.168.1.186)
```



```
remote_computer_windows=(usr2:password@192.168.1.184)

# Remote Windows commands:
tracert_windows_ps=[\Users\ms\tracert.ps1]
tracert_windows_cmd=[tracert.exe -h 10 {{shell_param1}}]

# Remote Linux command:
tracert_linux=(tracert -m 10 '{{shell_param1}}')

# Local Linux server commands:
nslookup=nslookup "{{shell_param1}}"
dig=dig "{{shell_param1}}"
tracert_linux=tracert -m 15 "{{shell_param1}}"
```

- The following examples use the Volatility forensics framework. The first parameter is filename of the memory image, assuming \$VOLATILITY_LOCATION is set in the environment (such as in the system unit configuration). The second parameter is the Volatility profile ("Win7SP0x64" etc).

```
imageinfo=python /path/to/vol.py -f "{{shell_param1}}" imageinfo --
output=json
kdbgscan=python /path/to/vol.py -f "{{shell_param1}}" -- profile="
{{shell_param2}}" kdbgscan --output=json
psscan=python /path/to/vol.py -f "{{shell_param1}}" -- profile="
{{shell_param2}}" psscan --output=json
dlllist=python /path/to/vol.py -f "{{shell_param1}}" -- profile="
{{shell_param2}}" dlllist --output=json
```

Running Powershell Scripts Remotely:

To configure running scripts remotely, the user must make these changes to the config file:

- Specify acceptable powershell compatible extensions of script files, comma separated:
 - `remote_powershell_extensions=ps1,psc1`
- Specify the transport authentication method:
 - `remote_auth_transport=ntlm`
- Specify remote commands in the config file wrapped in square brackets []:
 - `remote_command=[C:\remote_directory\remote_script.ps1]`
- Specify a remote computer in the config file to run the script wrapped in parentheses ():
 - `remote_computer=(username:password@server)`

Examples of remote commands:

```
# Remote commands
remote_command1=[C:\scripts\remote_script.ps1]
remote_command2=[C:\scripts\another_script.ps1]

# Remote computers
```

```
remote_computer1=(domain\administrator:password@server1)
remote_computer2=(domain\admin:P@ssw0rd@server2)
```

- These remote commands can then be run in the workflow using the syntax `remote_command:remote_computer` as the input for `shell_command`. Examples:
 - `remote_command1:remote_computer1` runs `remote_command1` remotely on `remote_computer1`
 - `remote_command2:remote_computer1` runs `remote_command2` remotely on `remote_computer1`

► Inputs:

Name	Type	Required	Example	Tooltip
shell_command	text	Yes	–	shell_command if shell_remote false. remote_shell_command:remote_machine if shell remote true.
shell_param1	text	No	–	-
shell_param2	text	No	–	-
shell_param3	text	No	–	-
shell_remote	boolean	Yes	–	Yes if running a remote powershell script. No otherwise.

► Outputs:

```
results = {
  'start': 1563446215136,
  'stderr_json': None,
  'end': 1563446215476,
  'stderr': '',
  'stdout':
'Server:\t\t9.0.138.50\nAddress:\t9.0.138.50#53\n\nName:\tibm.com\nAddress
: 129.42.38.10\n\n',
  'stdout_json': None,
  'commandline': 'nslookup "ibm.com"',
  'exitcode': 0,
  'elapsed': 339
}
```

► Example Pre-Process Script:

```
# You can set the command on the "Input" panel or dynamically
# NOTE: The administrator must configure each command before you can run
it!
inputs.shell_command = "tracert"

```

```
# True if running a Remote server, otherwise False
inputs.shell_remote = False

# Parameters to the command. In this case we run traceroute to the
artifact
inputs.shell_param1 = artifact.value
```

► Example Post-Process Script:

```
# Outputs are:
# - "commandline": the command that ran
# - "start": timestamp, epoch milliseconds
# - "end": timestamp, epoch milliseconds
# - "elapsed": milliseconds
# - "exitcode": nonzero indicates that the command failed
# - "stdout": text output from the command
# - "stderr": error text output from the command
# - "stdout_json": object parsed from JSON output from the command
# - "stderr_json": object parsed from JSON error output from the command

if results.exitcode == 0:
    note_text = u"Command succeeded: {}\nStandard Out: {}\nStandard Error:
{}".format(results.commandline, results.stdout, results.stderr)
else:
    note_text = u"Command failed: {}\nStandard Out: {}\nStandard Error:
{}".format(results.commandline, results.stdout, results.stderr)

incident.addNote(helper.createPlainText(note_text))
```

Function - Utilities: String to Attachment

Creates a new file (.txt) attachment in the incident or task from a string that your workflow provides as input.

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Workflows / Example: String to Attachment

Cancel

Save & Close

Save

Name *

Example: String to Attachment

API Name *

example_string_to_attachment

Description

An example of creating an attachment from an inputted string

Object Type *

Artifact

Creator

Orchestration Engine

Last Modified

07/17/2019 14:20

Last Modified By

Orchestration Engine

Associated Rules

Example: String to Attachment

Hand

Cursor

Circle

Circle with dot

Circle with cross

Circle with plus

Circle with minus

Circle with asterisk

Circle with hash

Circle with percent

Circle with dollar

Circle with at

Circle with tilde

Circle with underscore

Circle with equals

Circle with plus

Circle with minus

Circle with asterisk

Circle with hash

Circle with percent

Circle with dollar

Circle with at

Circle with tilde

Circle with underscore

Circle with equals

Utilities: String to Attachment

► Inputs:

Name	Type	Required	Example	Tooltip
attachment_name	text	Yes	—	-
incident_id	number	Yes	—	-
string_to_convert_to_attachment	text	Yes	—	-
task_id	number	No	—	-

► Outputs:

```
results = {  
  'attachment_id': 14  
}
```

► Example Pre-Process Script:

```
# Required inputs are: the string to convert, the incident id and the  
attachment name  
inputs.string_to_convert_to_attachment = artifact.value  
inputs.incident_id = incident.id  
inputs.attachment_name = "A Test Attachment Name"  
  
# If this is a "task attachment" then we will additionally have a task-id  
if task is not None:  
  inputs.task_id = task.id
```

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► Example Post-Process Script:

None

Function - Utilities: Timer

This function implements a timer (sleep) function that when called from a workflow causes the workflow to pause for the specified amount of time. The function takes one of two parameters as input:

`utilities_time` or `utilities_epoch`.

The `utilities_time` parameter is a string that specifies the total amount of time to pause. The input string is of format `time value` concatenated with a `time unit` character, where character is:

- `s` for seconds
- `m` for minutes
- `h` for hours
- `d` for days

For example: `30s` = 30 seconds; `20m` = 20 minutes; `5h` = 5 hours; `6d` = 6 days

The `utilities_epoch` parameter is the epoch time which the timer function should sleep until that time has passed. An epoch time value is returned from the date time picker UI widget.

The timer function breaks down the total amount of time to pause into smaller sleep time intervals and checks in-between these sleep intervals whether the workflow has been terminated while the function is running. If the workflow has been terminated, the function will end execution.

Resilient Dashboards ▾ Simulations Incidents **Create** Admin User
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Customization Settings

Layouts Rules Scripts **Workflows** Functions Message Destinations Phases & Tasks Incident Types Breach Artifacts

Workflows / Example: Timer Cancel Save & Close Save

Name * Example: Timer

API Name * example_timer

Description This example workflow demonstrates how to call the Utilities Timer function using an epoch time as input to define when the timer should end.

Object Type * Incident

Creator Orchestration Engine

Last Modified 07/17/2019 15:44

Last Modified By Admin User

Associated Rules Example: Timer Epoch

Input: utilities_time string indicating how long function should sleep or utilities_epoch with end timer epoch

Output: workflow status when timer is stopped

► Inputs:

Name	Type	Required	Example	Tooltip
utilities_epoch	datetimepicker	No	–	Epoch specifying the time the timer should end
utilities_time	text	No	60s	Specify time to wait as a string value/units where units is 's' for seconds, 'm' for minutes 'h' for hours and 'd' for days. For example: 60 seconds : "60s"; 45 minutes : "45m"; 12 hours : 12h

► Outputs:

```

results = {
  'inputs': {
    'utilities_epoch': 1563446488000
  },
  'metrics': {
    'package': 'fn-utilities',
    'timestamp': '2019-07-18 11:41:27',
    'package_version': '1.0.10',
    'host': 'xxx.ibm.com',
    'version': '1.0',
    'execution_time_ms': 105319
  },
  'success': False,
  'content': {
    'status': 'running',
    'end_date': None,
    'is_terminated': False,
    'instance_id': 33,
    'reason': None,
    'start_date': 1563446381032
  },
  'raw': '{"status": "running", "end_date": null, "is_terminated": false, "instance_id": 33, "reason": null, "start_date": 1563446381032}',
  'reason': None,
  'version': '1.0'
}

```


► Example Pre-Process Script:

```

# Get the input date/time for timer end from the rule activity field
inputs.utilities_epoch = rule.properties.utilities_timer_end_time

```

► Example Post-Process Script:



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Admin User
Test Organization

- Set the app.config `xml_stylesheet_dir` setting as follows:

`xml_stylesheet_dir= /var/rescircuits/xmltransformation`
- Add your transformation file to the App Configuration tab to refer to the same directory as used in `xml_stylesheet_dir`.

[← Apps List](#)

fn_utilities

Status: Ready For Use!

DetailsCustomizationsConfiguration

App Settings / cdcatalog.xslt

Edit the settings in the file below. File Path specifies a directory path starting at root. If changing location,the system creates the directory if it does not exist. Use a forward slash (/) only to place the file at the root directory. When done, click Save and Push Changes to implement your changes and restart the app.

CancelSave and Push Changes

Created Date: 2020-04-23 13:22
Last Modified Date: 2020-04-23 13:22

File Name
cdcatalog.xslt

File Path
/var/rescircuits/xmltransformation

File Description
Purpose of the file.

File Content
Text or code as appropriate.

Show more

Theme lightFile Type Plain Text

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
3   <xsl:template match="/">
4     <html>
5       <body>
6         <h2>My CD Collection</h2>
7         <table border="1">
8           <tr bgcolor="#9acd32">
9             <th style="text-align:left">Title</th>
10            <th style="text-align:left">Artist</th>
11          </tr>
12          <xsl:for-each select="catalog/cd">
13            <tr>
14              <td><xsl:value-of select="title"/></td>
15              <td><xsl:value-of select="artist"/></td>
16            </tr>
17          </xsl:for-each>
18        </table>
19      </body>
20    </html>
21  </template>
22 </xsl:stylesheet>
```

► Inputs:

Name	Type	Required	Example	Tooltip
xml_source	text	No	—	xml document to transform or empty when using attachments
xml_stylesheet	text	Yes	transform.xslt	name of stylesheet to use for the transformation

► Outputs:

```
results = {
  'content': '<html><body><h2>My CD Collection</h2><table border="1"><tr
bgcolor="#9acd32"><th style="text-align:left">Title</th><th style="text-
align:left">Artist</th></tr><tr><td>Empire Burlesque</td><td>Bob
Dylan</td></tr><tr><td>Hide your heart</td><td>Bonnie Tyler</td></tr><tr>
<td>Greatest Hits</td><td>Dolly Parton</td></tr><tr><td>Still got the
blues</td><td>Gary Moore</td></tr></table></body></html>'
}
```

► Example Pre-Process Script:

```
inputs.xml_stylesheet = "cdcatalog.xslt"
# In most cases, the xml_soure will come from other sources.
# If need be, use fn_utilities to capture data from attachments
```



```
inputs.xml_source = """"
<?xml version="1.0" encoding="UTF-8"?>
<catalog>
  <cd>
    <title>Empire Burlesque</title>
    <artist>Bob Dylan</artist>
    <country>USA</country>
    <company>Columbia</company>
    <price>10.90</price>
    <year>1985</year>
  </cd>
  <cd>
    <title>Hide your heart</title>
    <artist>Bonnie Tyler</artist>
    <country>UK</country>
    <company>CBS Records</company>
    <price>9.90</price>
    <year>1988</year>
  </cd>
  <cd>
    <title>Greatest Hits</title>
    <artist>Dolly Parton</artist>
    <country>USA</country>
    <company>RCA</company>
    <price>9.90</price>
    <year>1982</year>
  </cd>
  <cd>
    <title>Still got the blues</title>
    <artist>Gary Moore</artist>
    <country>UK</country>
    <company>Virgin records</company>
    <price>10.20</price>
    <year>1990</year>
  </cd>
</catalog>
""""
```

► Example Post-Process Script:

```
# results.content is the string representation of the transformed xml
document
content = helper.createPlainText(results.content)
incident.addNote(content)
```

Rules

Rule Name	Object	Workflow Triggered
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Rule Name	Object	Workflow Triggered
Example: (Artifact) Attachment to Base64	artifact	example_artifact_attachment_to_base64
Example: Attachment Hash	attachment	example_attachment_hash
Example: Attachment to Base64	attachment	example_attachment_to_base64
Example: Call REST API	artifact	example_call_rest_api
Example: Domain Distance	artifact	example_domain_distance
Example: Email Parsing (Artifact)	artifact	example_email_parsing_artifact
Example: Email Parsing (Attachment)	attachment	example_email_parsing_attachment
Example: Expand URL	artifact	utilities_expand_url
Example: Extract SSL Certificate	artifact	example_extract_ssl_cert_from_url
Example: Get Incident Contact Info	incident	example_get_incident_contact_info
Example: Get Task Contact Info	task	example_get_task_contact_info
Example: JSON2HTML	artifact	example_json2html
Example: Parse SSL Certificate	artifact	example_parse_ssl_certificate
Example: PDFiD	attachment	example_pdfid
Example: Resilient Search	attachment	example_resilient_search
Example: Shell Command	artifact	example_shell_command
Example: String to Attachment	artifact	example_string_to_attachment
Example: Timer Epoch	incident	example_timer
Example: Timers in Parallel	incident	example_timer_parallel
Example: Use Excel Data	attachment	example_create_artifacts_from_excel_data
Example: XML Transformation	artifact	example_xml_transformation
Example: Zip Extract	attachment	example_zip_to_artifact
Example: Zip List	attachment	example_zip_list