User Guide: fn_utilities_v2.1.0

Table of Contents

Release History

Version	Date	Notes
2.1.0	3/2022	Multi updates: Support for PATCH method, Add rule to get owner contact info for Tasks, Bug fix for utilities_pdfid
2.0.6	7/2021	pin dependency 'chardet' at v4.0.0
2.0.3	2/2021	bug fix for email parser
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
1.0.15	5/2020	Bug fixes

Version	Date	Notes
1.0.14	5/2020	Shell Command support for Remote Linux Execution

App Host Setup

This app is available for use in App Host.

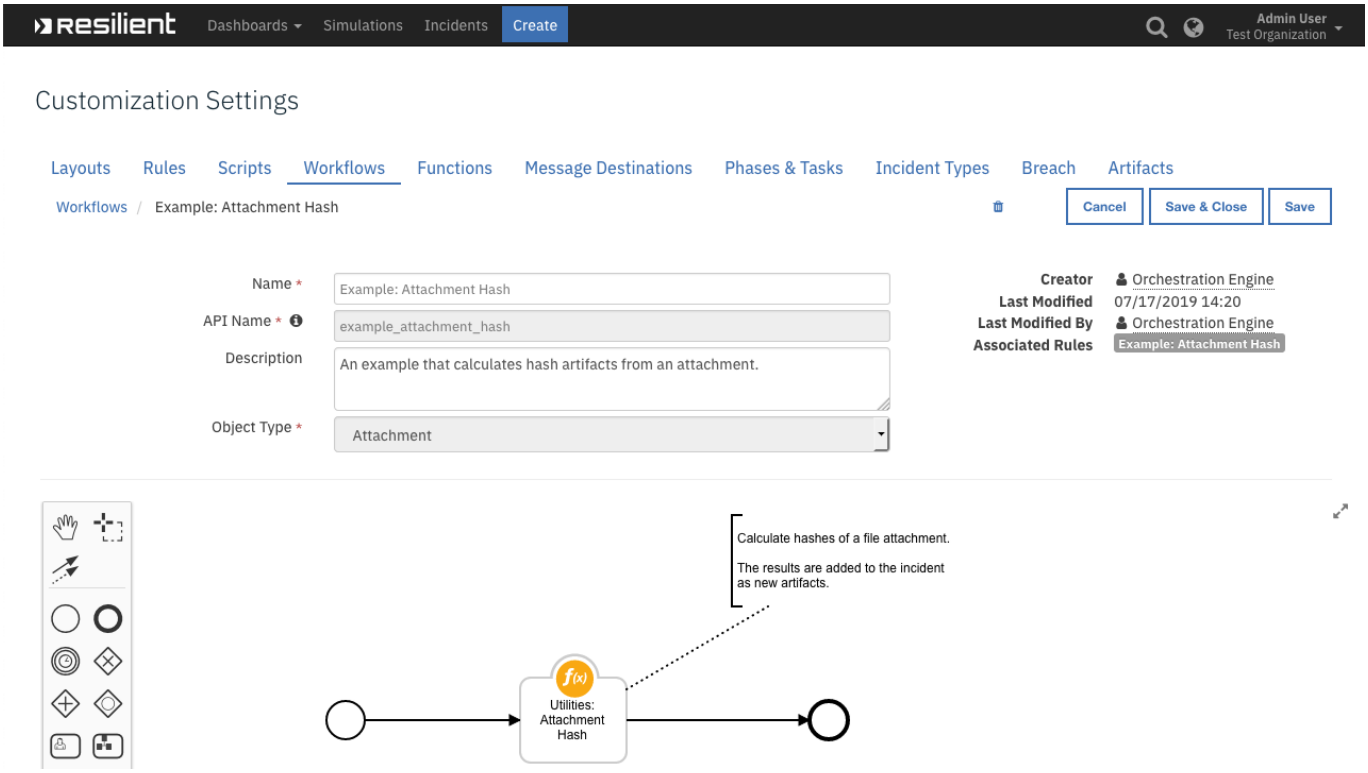
When using Shell Command, several Linux commands have been installed on the container including: dig, nslookup, traceroute and whois. These commands can be specified within the app.config file directly such as: `nslookup=nslookup "{{shell_param1}}"`. Other commands not loaded within the container can 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.



▶ Inputs:

Name	Type	Required	Example	Tooltip
`attachment_id`	`number`	No	–	-
`incident_id`	`number`	Yes	–	-

Name	Type	Required	Example	Tooltip
task_id	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:

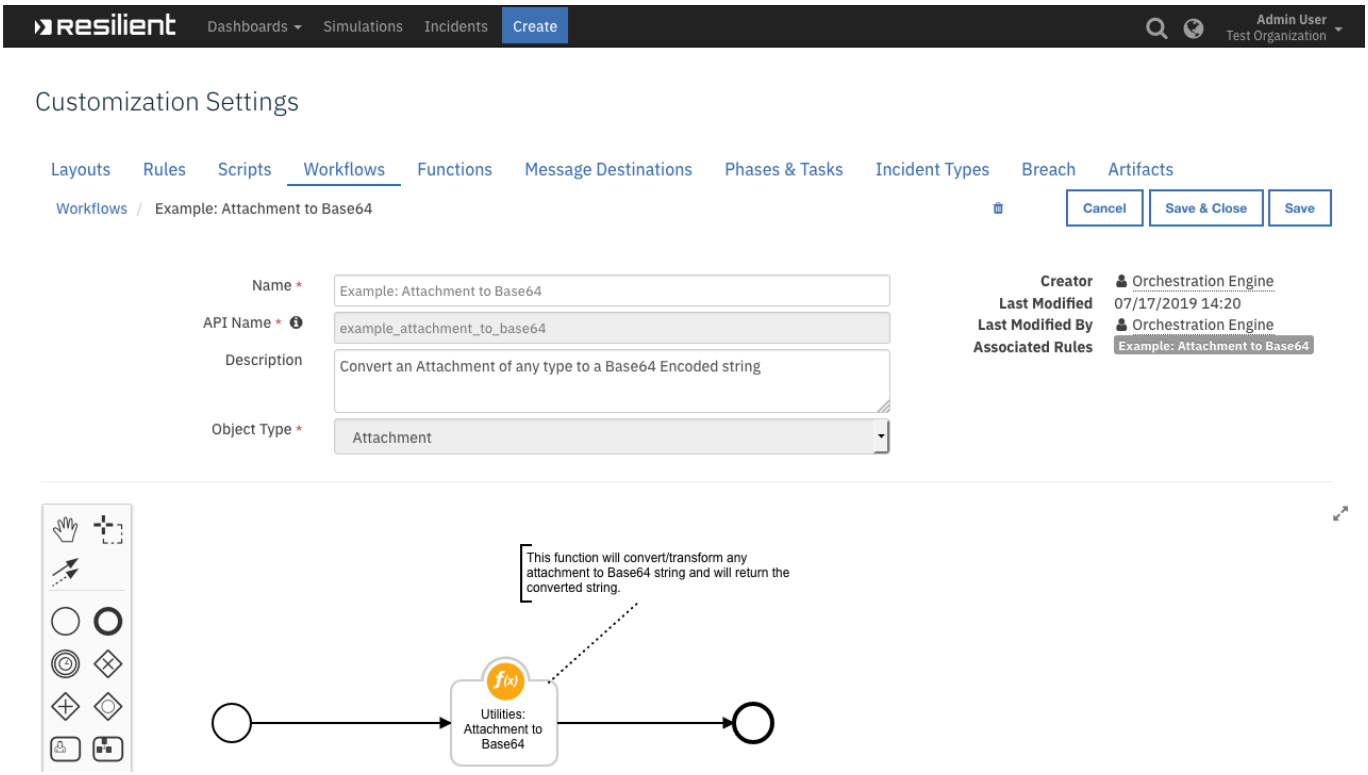
```
# Required inputs are: the incident id and attachment id
inputs.incident_id = incident.id
inputs.attachment_id = attachment.id

# 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.



▶ 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': 'JVBERi0xLjcNCiW1tbW1DQoxIDAgb2JqDQo8PC9UeXBlL0NhdG...',
    'size': 123852,
    'created': 1563376076661,
    'content_type': u 'application/pdf',
    'filename': u 'sample_ioc.pdf'
}
```

▶ Example Pre-Process Script:

```
# Required inputs are: incident_id artifact_id
inputs.incident_id = incident.id
```

```
inputs.artifact_id = artifact.id
```

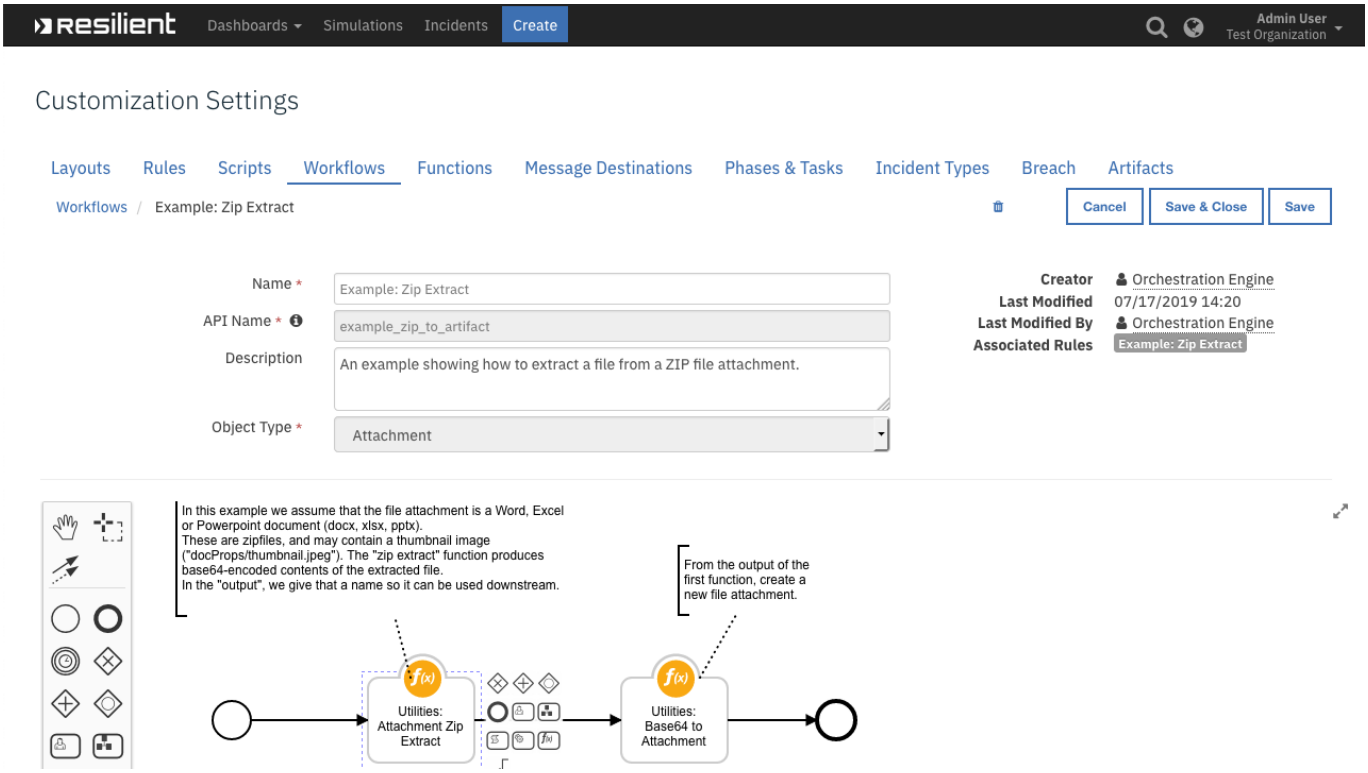
▶ Example Post-Process Script:

```
if results.get("content", None) is not None:

  file_name = unicode(results.get("filename", ""))
  note_text = u"File {0} converted to Base64 Format".format( file_name )

  incident.addNote(note_text)
```

Function - Utilities: Attachment Zip Extract

Extracts a file from a ZIP file attachment, producing a base64 string.

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:

Name	Type	Required	Example	Tooltip
attachment_id	number	No	–	-
file_path	text	No	–	-
incident_id	number	Yes	–	-
task_id	number	No	–	-

Name	Type	Required	Example	Tooltip
zipfile_password	text	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':
'JVBERi0xLjcNCiW1tbW1DQoxIDAgb2JqDQo8PC9UeXBlL0NhdGFsb2cvUGFnZXMgMiAwIFIvT
GFuZyhlbi1VUyk...'
}
```

▶ 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 =
```

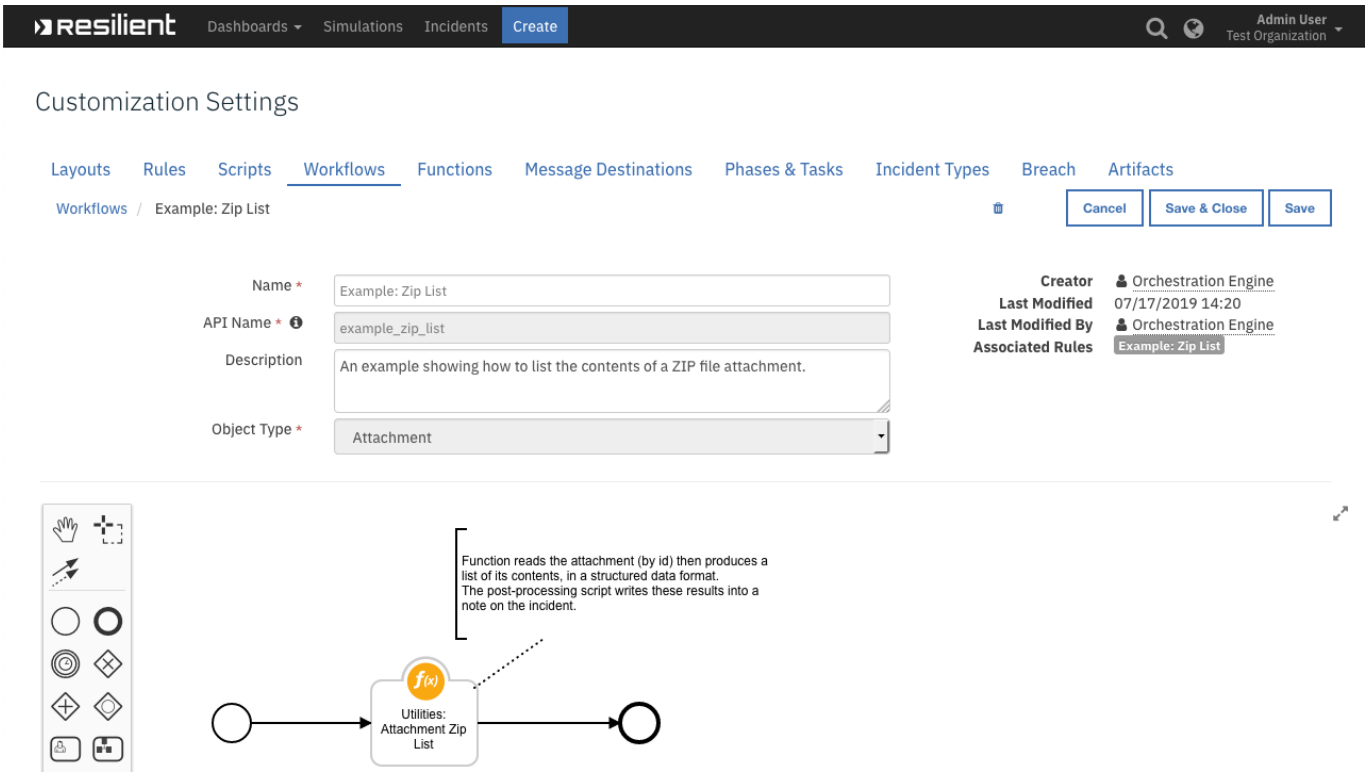
▶ Example Post-Process Script:

```
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.



▶ 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,
    '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
```

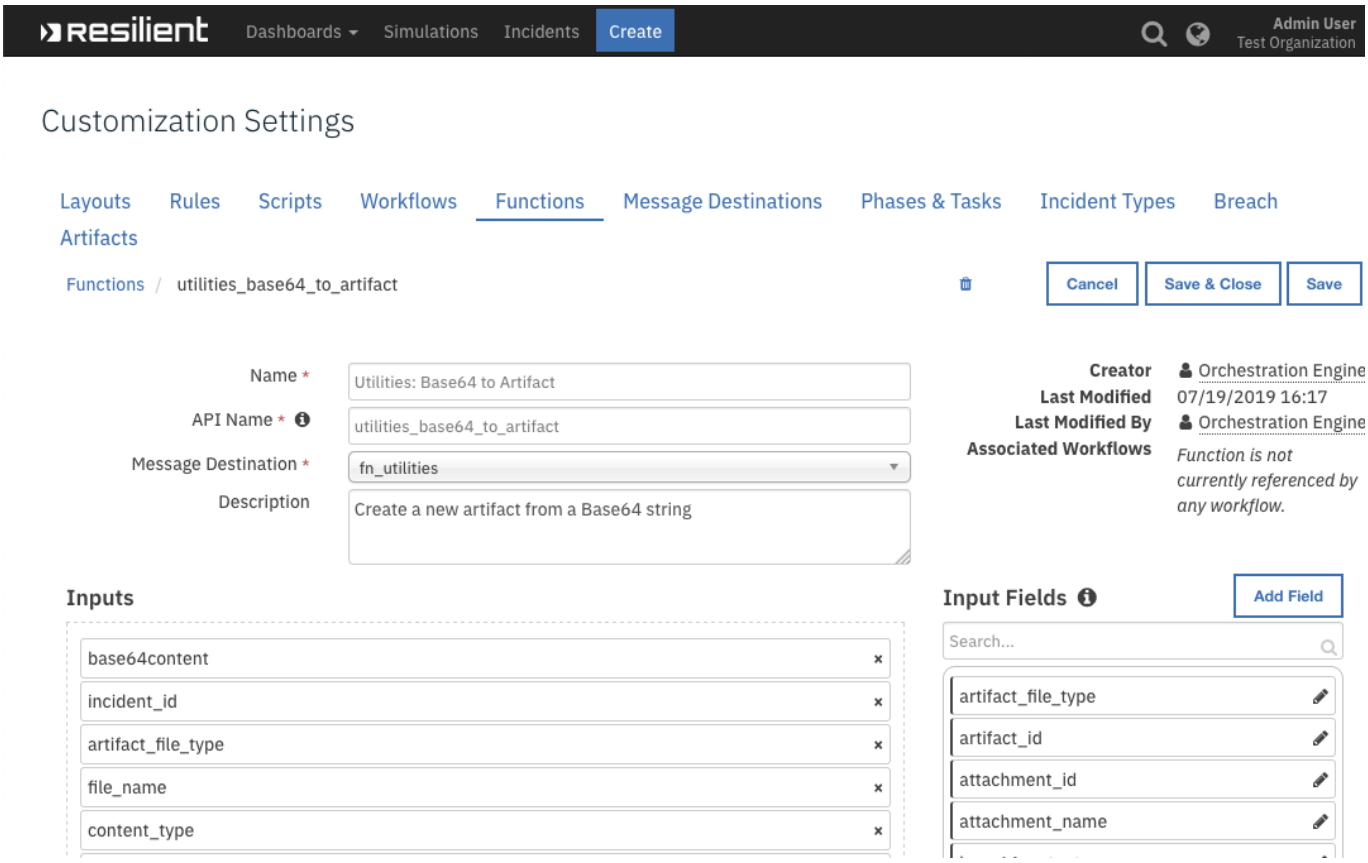
▶ Example Post-Process Script:

```
# 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.



▶ Inputs:

Name	Type	Required	Example	Tooltip
artifact_file_type	select	No	–	-
base64content	text	No	–	-
content_type	text	No	–	-
description	textarea	No	–	-

Name	Type	Required	Example	Tooltip
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:

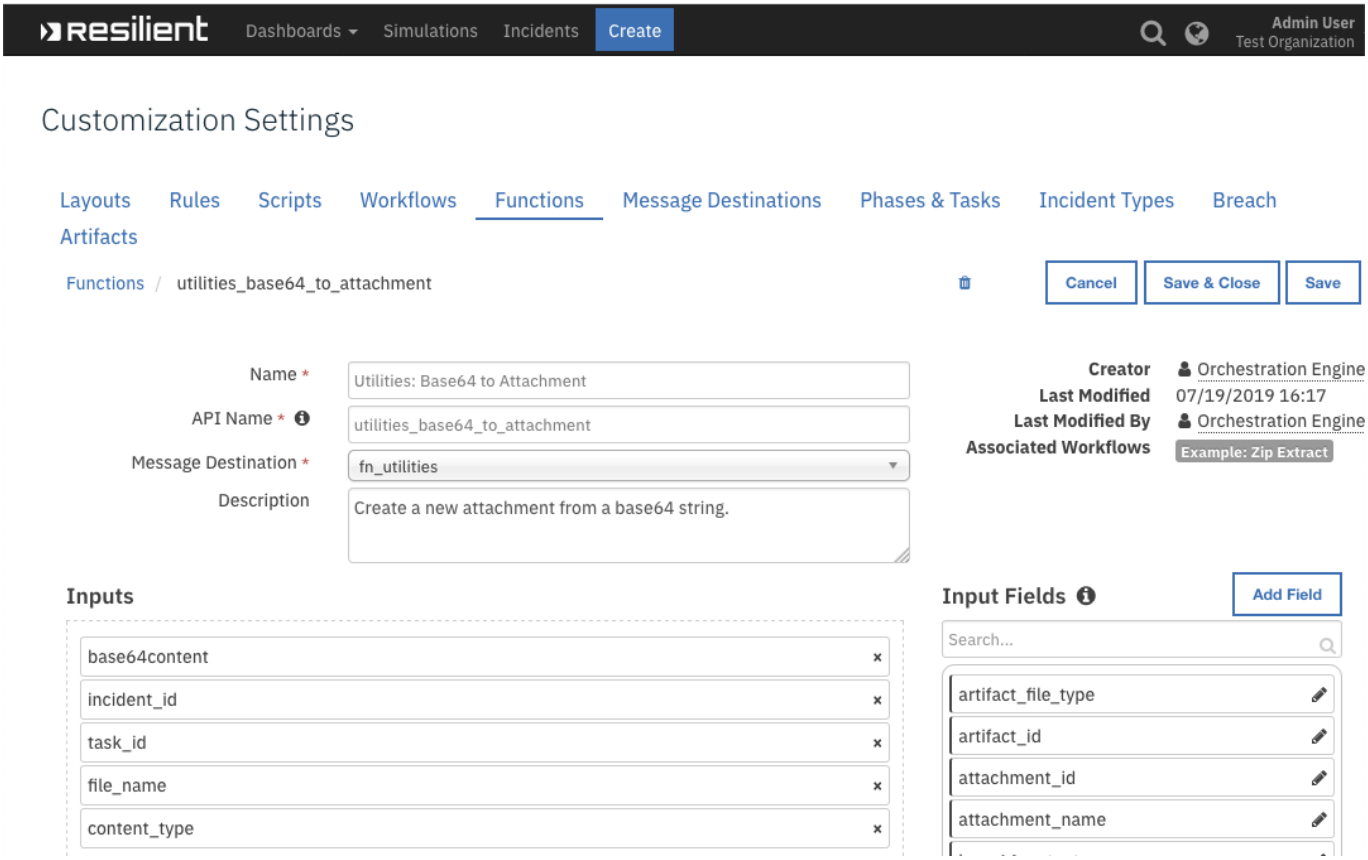
```
None
```

▶ 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.



▶ 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,
```

```
  "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"
```

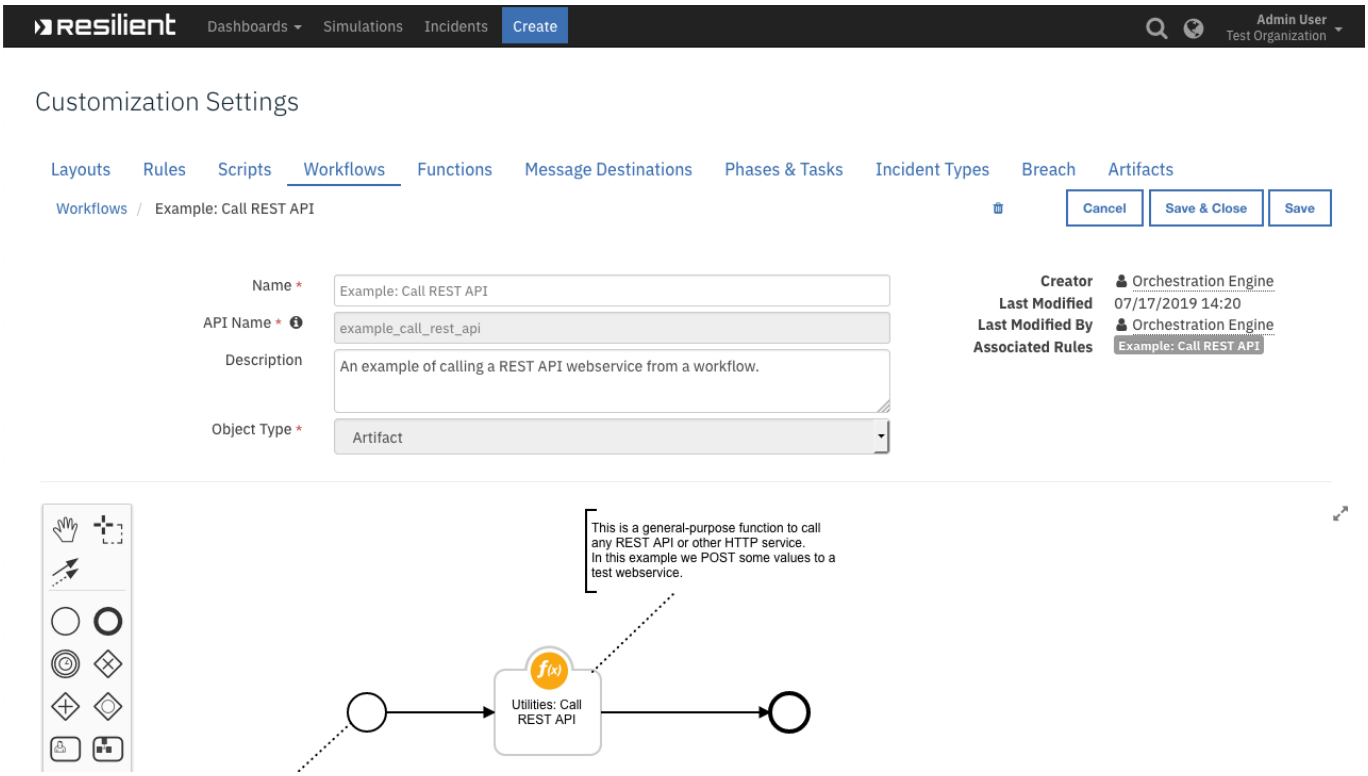
▶ Example Post-Process Script:

```
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.



▶ Inputs:

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?

▶ Outputs:

```
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-hfEnumeNh6YirfjyjaujcOPPT+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:

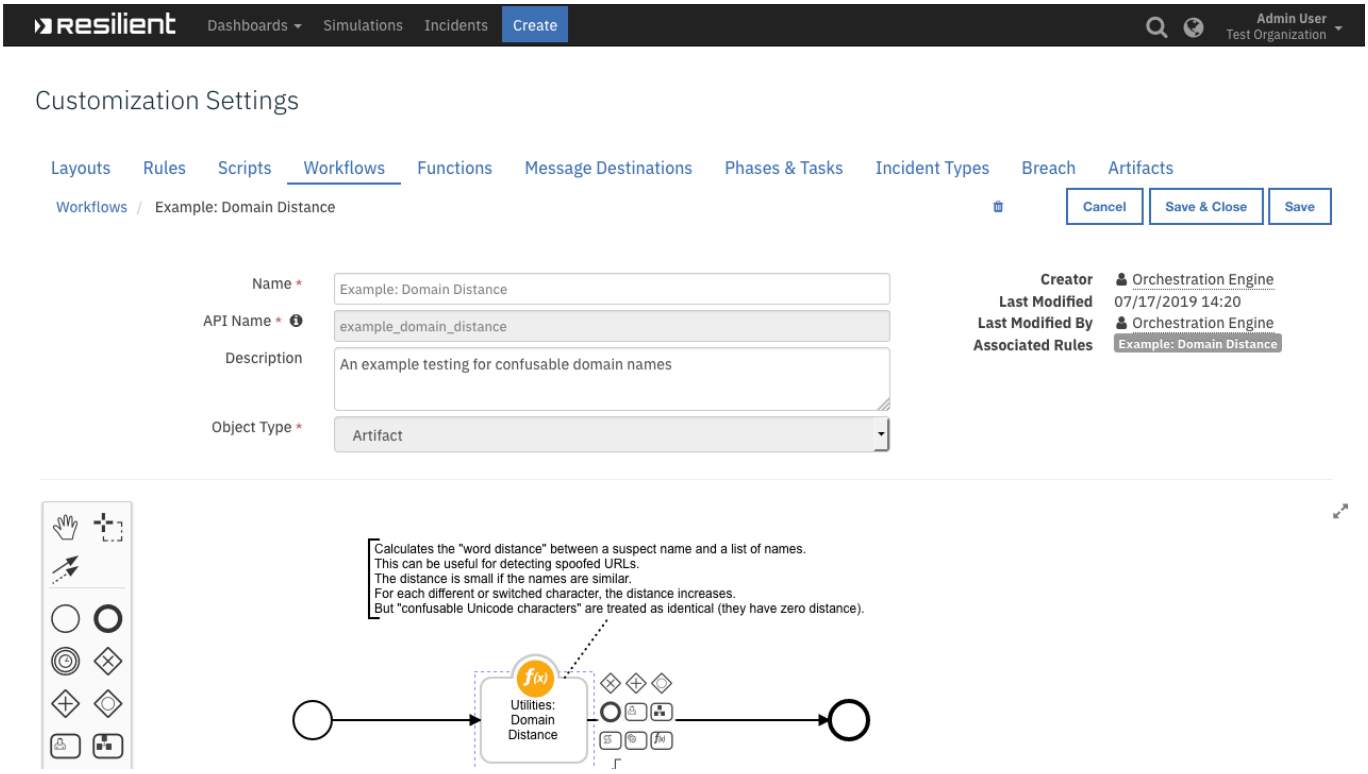
```
inputs.rest_method = "PATCH"

# 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 used for URLs, DNS names and email addresses.



▶ Inputs:

Name	Type	Required	Example	Tooltip
domain_list	text	No	–	-
domain_name	text	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"
```

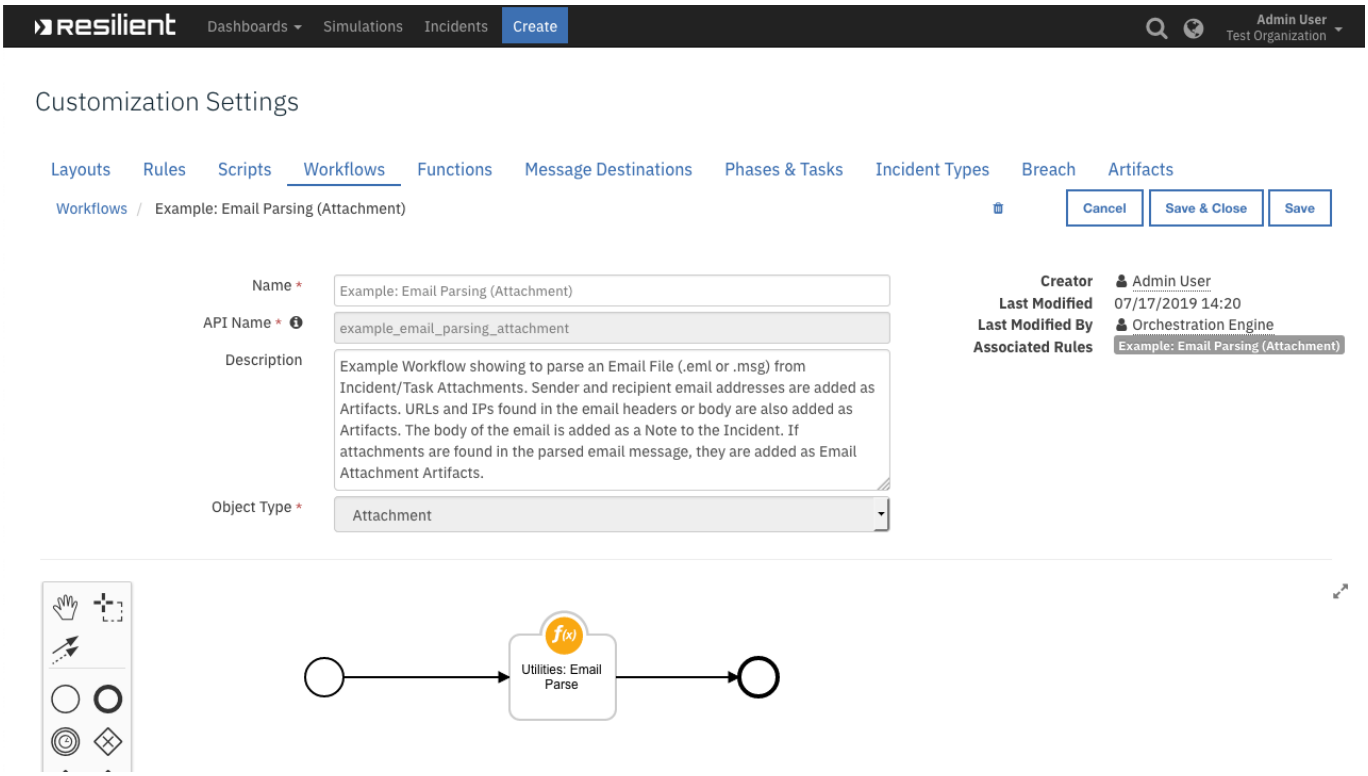
▶ Example Post-Process Script:

```
# The result includes:
#   "domain_name" - the name being tested
#   "distances" - a dicctionary 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.



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
`artifact_id`	`number`	No	–	-
`attachment_id`	`number`	No	–	-
`base64content`	`text`	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': 'exmaple.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:

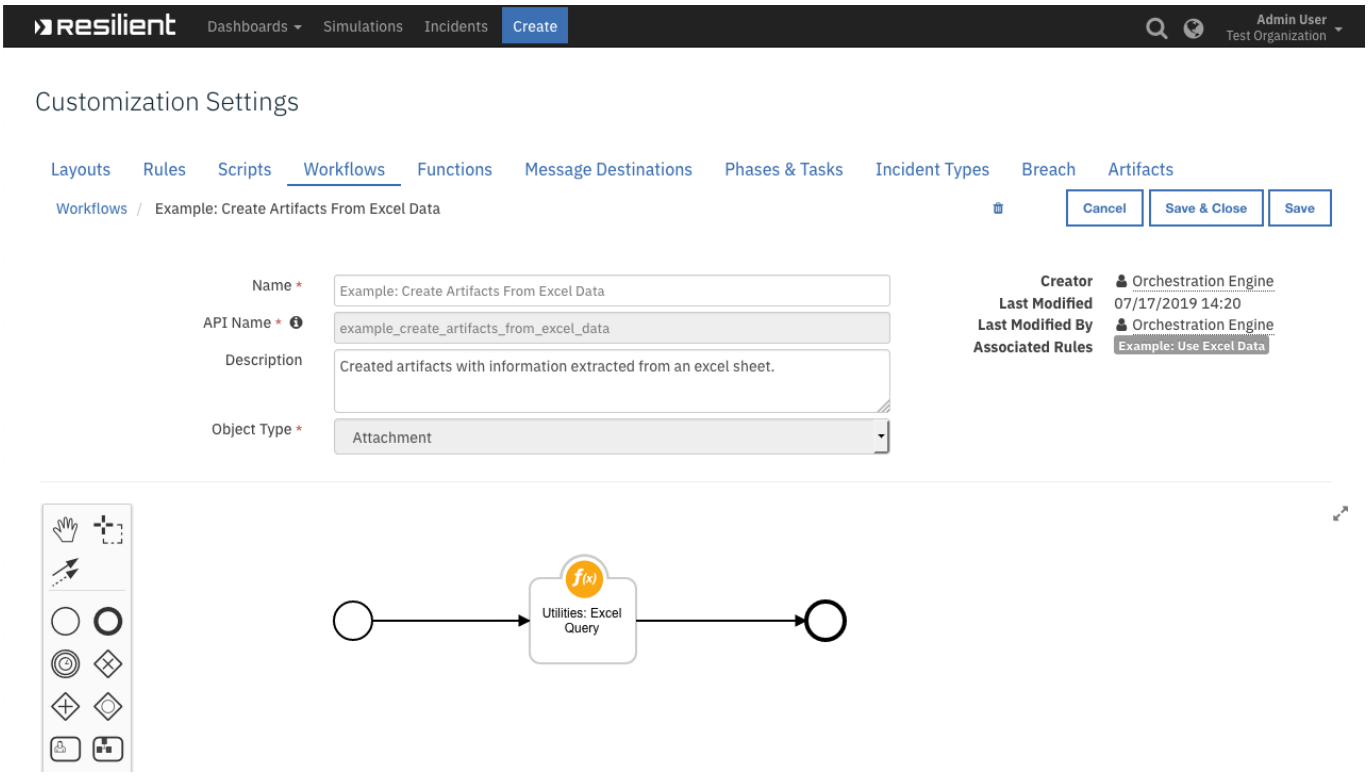
```
import re

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.



▶ 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.: "Shee1"!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']
            ]
        }
```

```
    }
}
```

▶ Example Pre-Process Script:

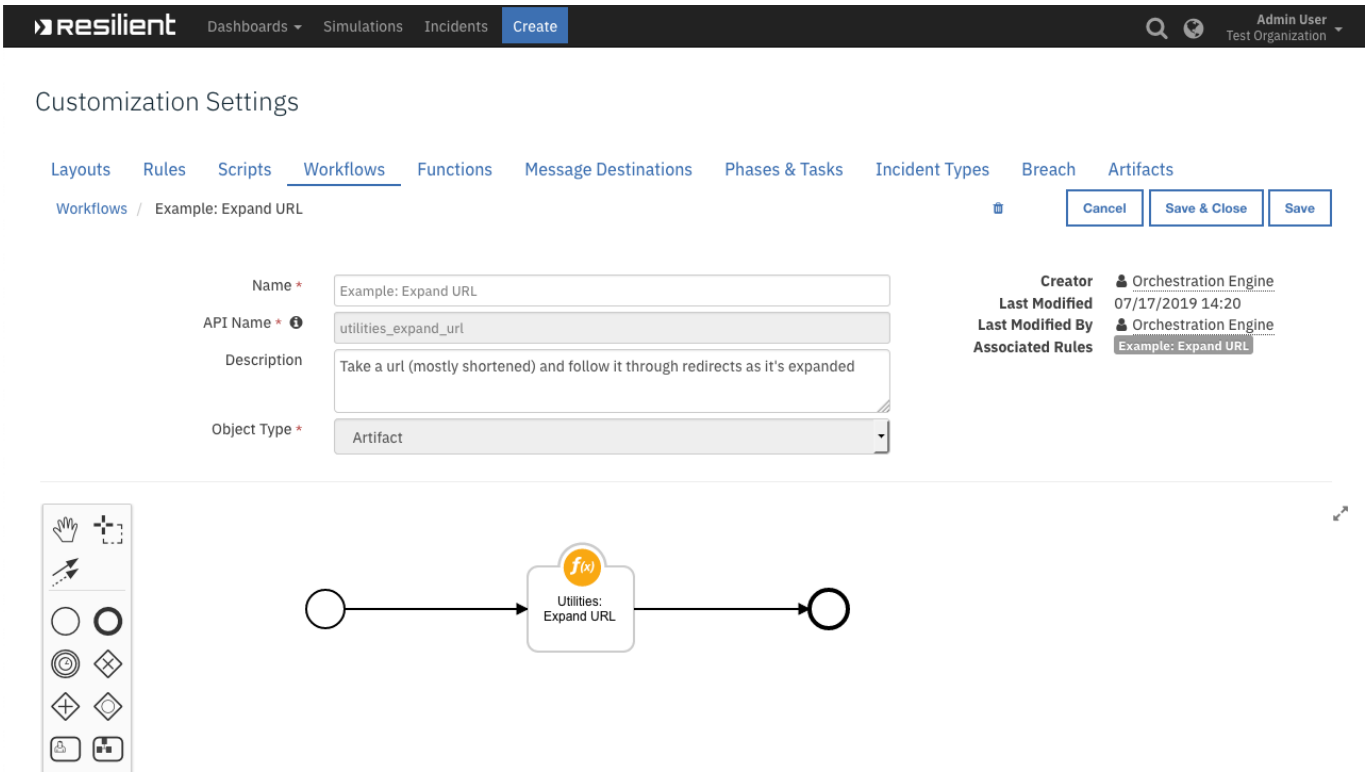
```
inputs.incident_id = incident.id
inputs.attachment_id = attachment.id
if task is not None:
  inputs.task_id = task.id
```

▶ 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.



▶ 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
```

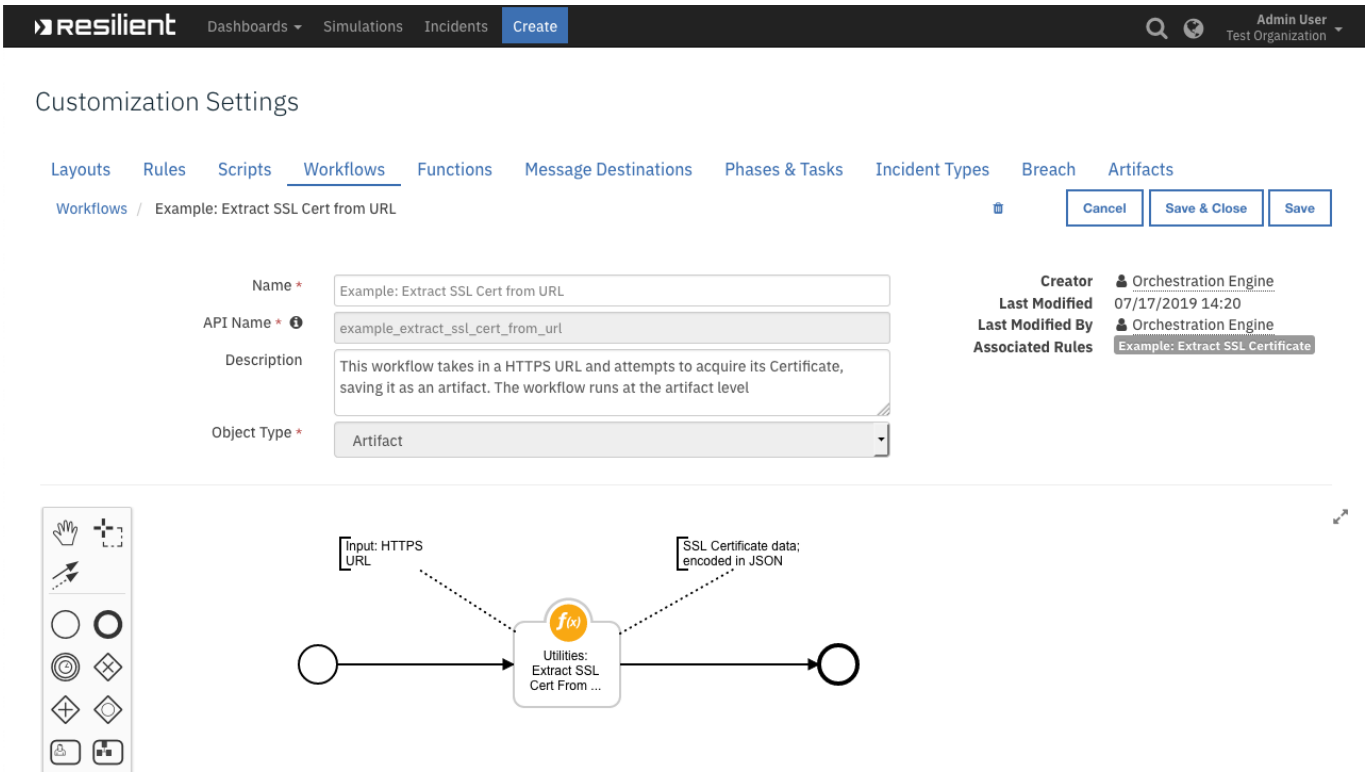
▶ Example Post-Process Script:

```
# 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.



▶ 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:

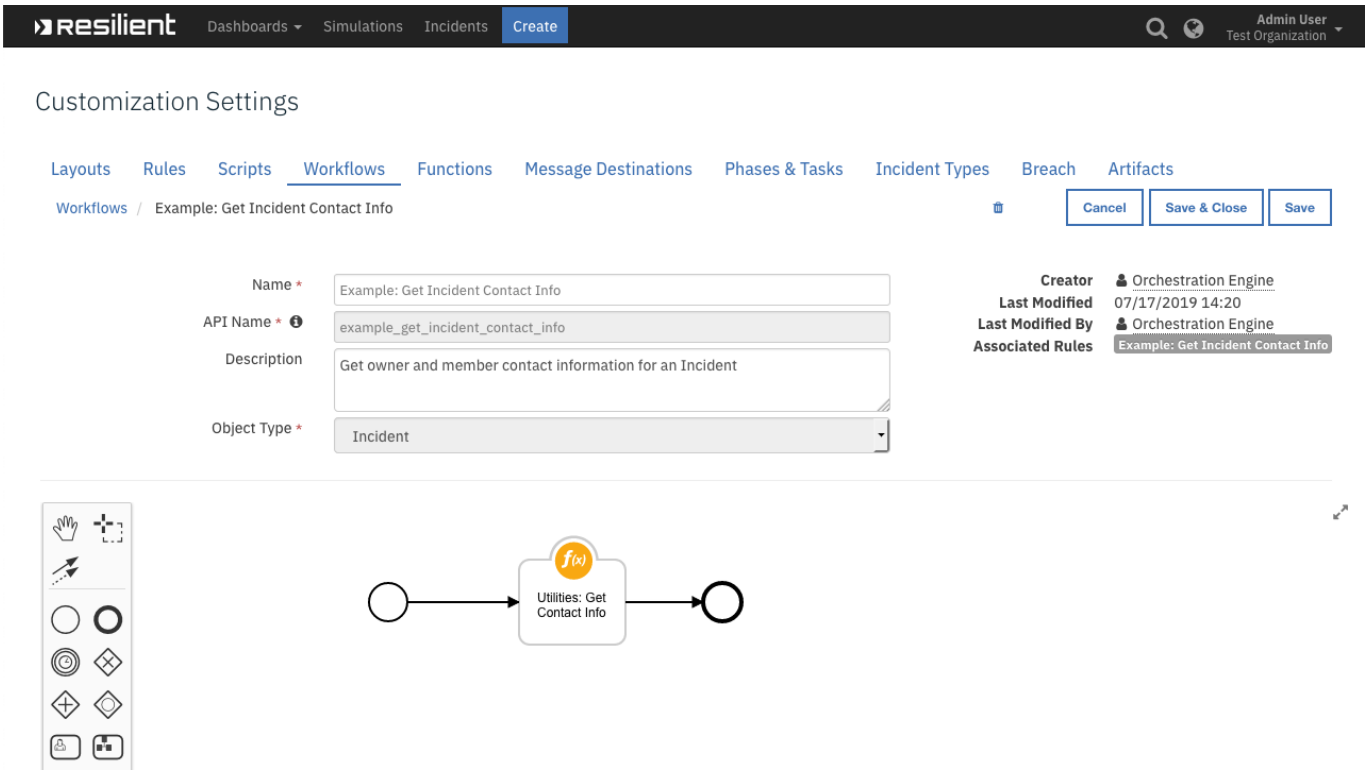
```
inputs.https_url = artifact.value
```

▶ Example Post-Process Script:

```
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.



▶ 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:

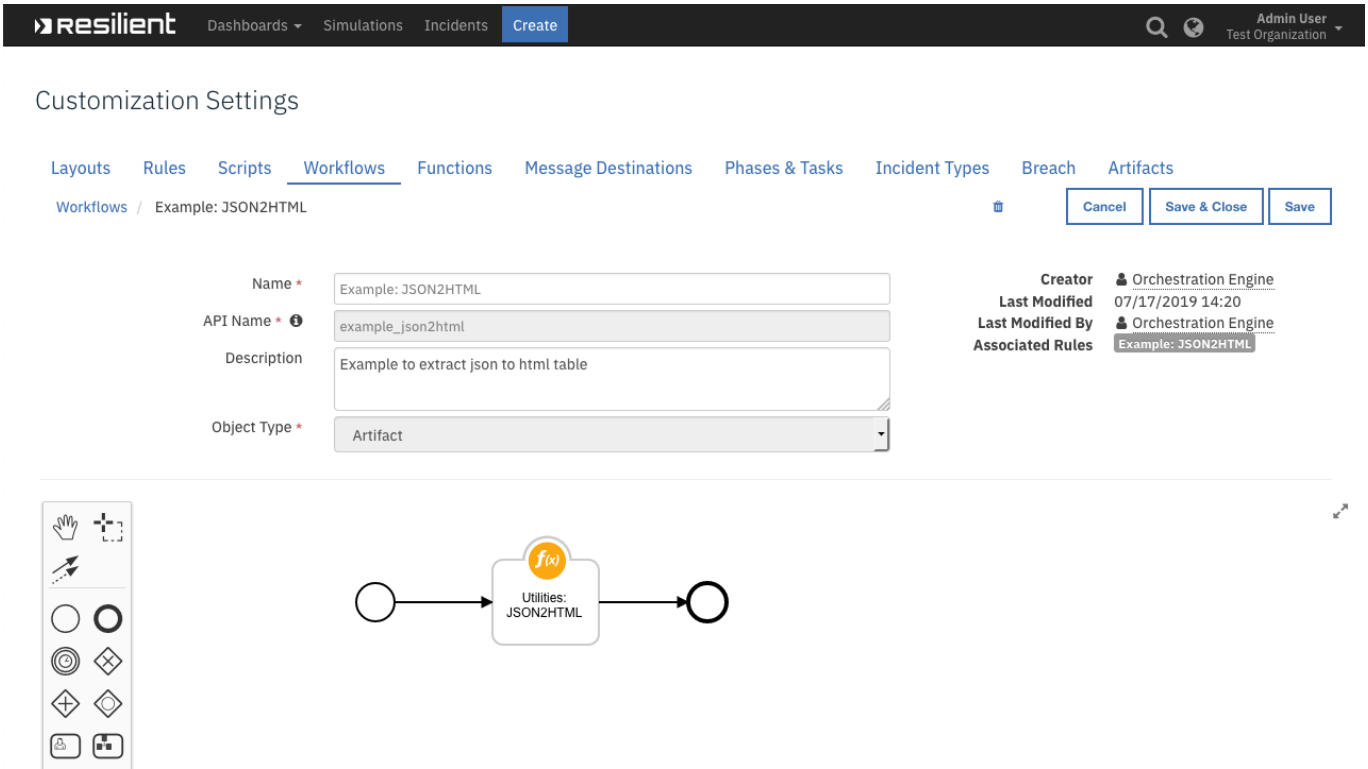
```
# {'owner': {'fname': 'SOAR', 'lname': 'Sysadmin', 'title': '',
'display_name': 'SOAR Sysadmin', 'email': 'b@a.com', 'phone': '781 838
4848', 'cell': '978 373 2839'}, 'members': []}
# {'owner': None, 'members': [{'fname': 'SOAR', 'lname': 'Sysadmin',
'title': '', 'display_name': 'SOAR Sysadmin',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



▶ 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>'}
```

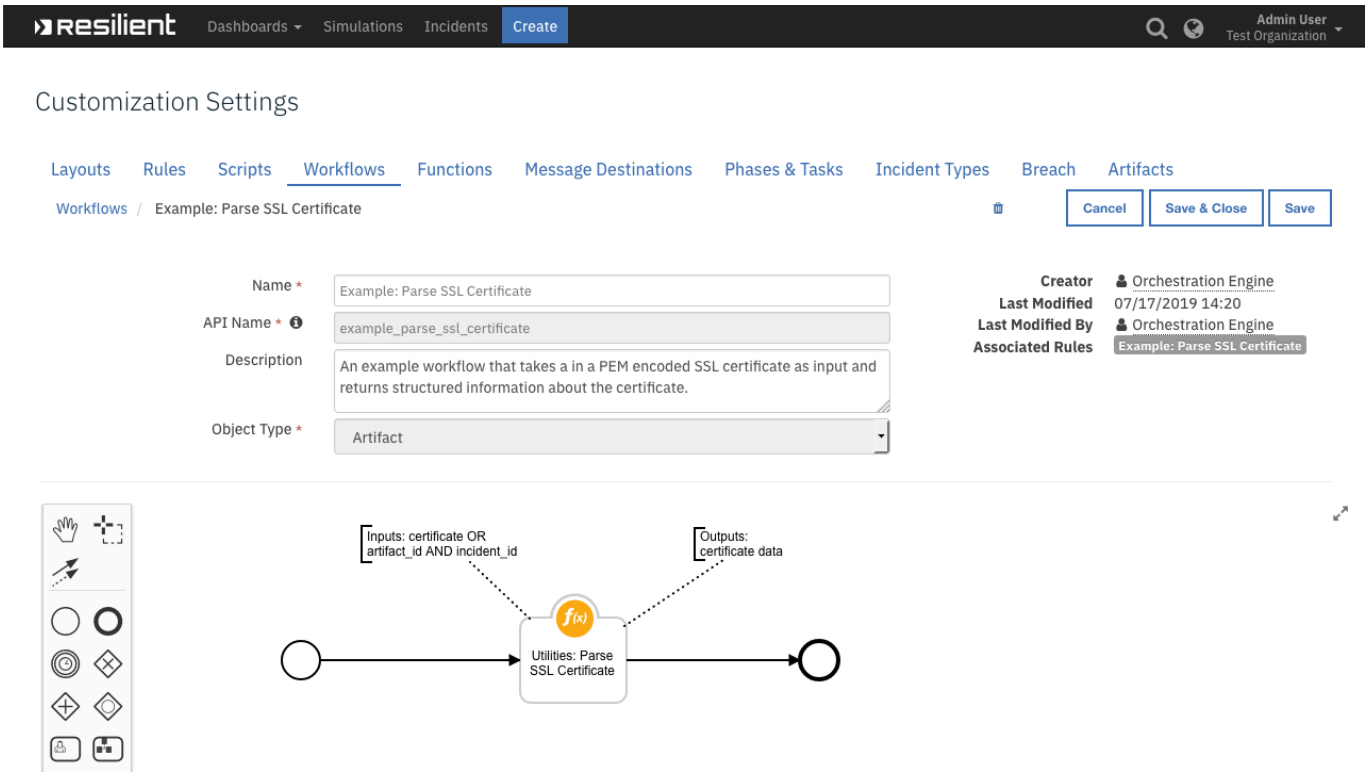
Function - Utilities: Parse SSL Certificate

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.



▶ 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-----\nMIIBIjANBgkqhkiGxxxxx-----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\'),
```

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

▶ Example Pre-Process Script:

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

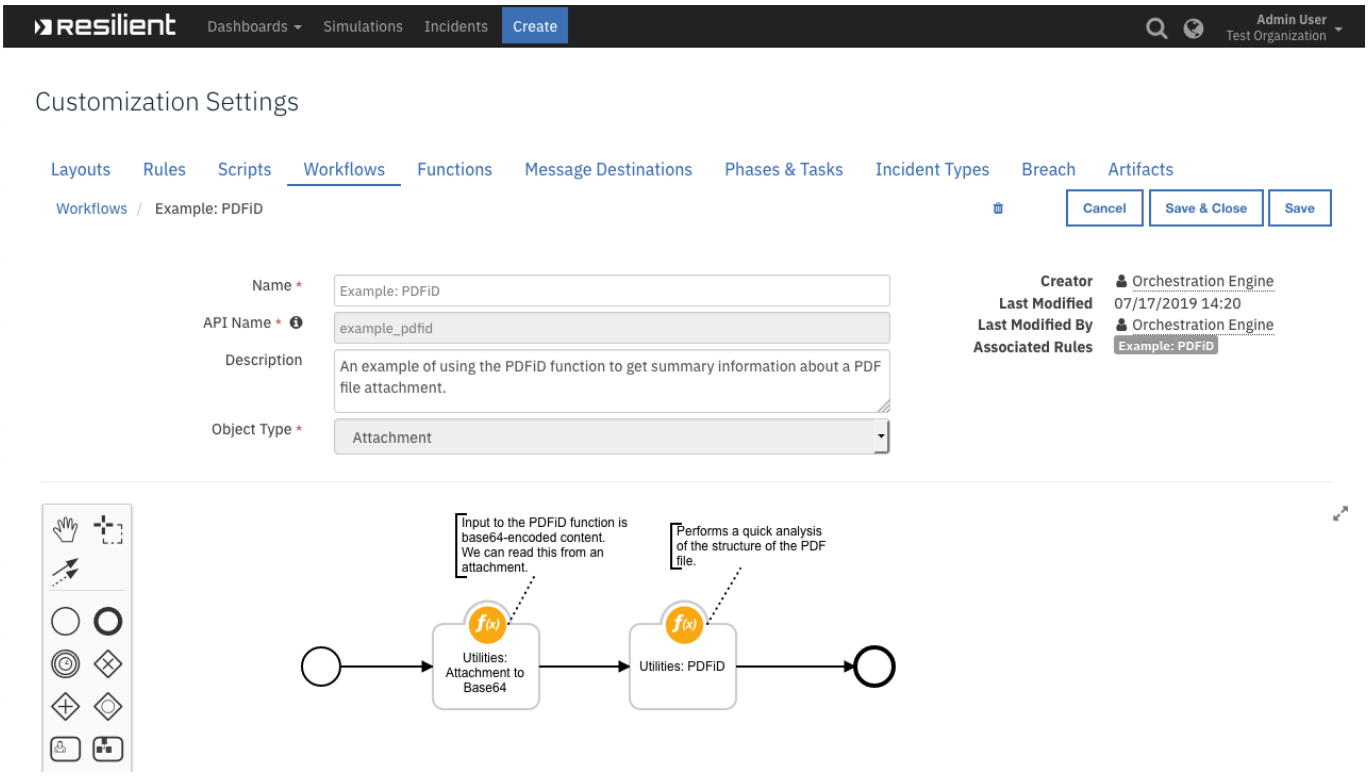
▶ Example Post-Process Script:

```
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.



▶ 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:

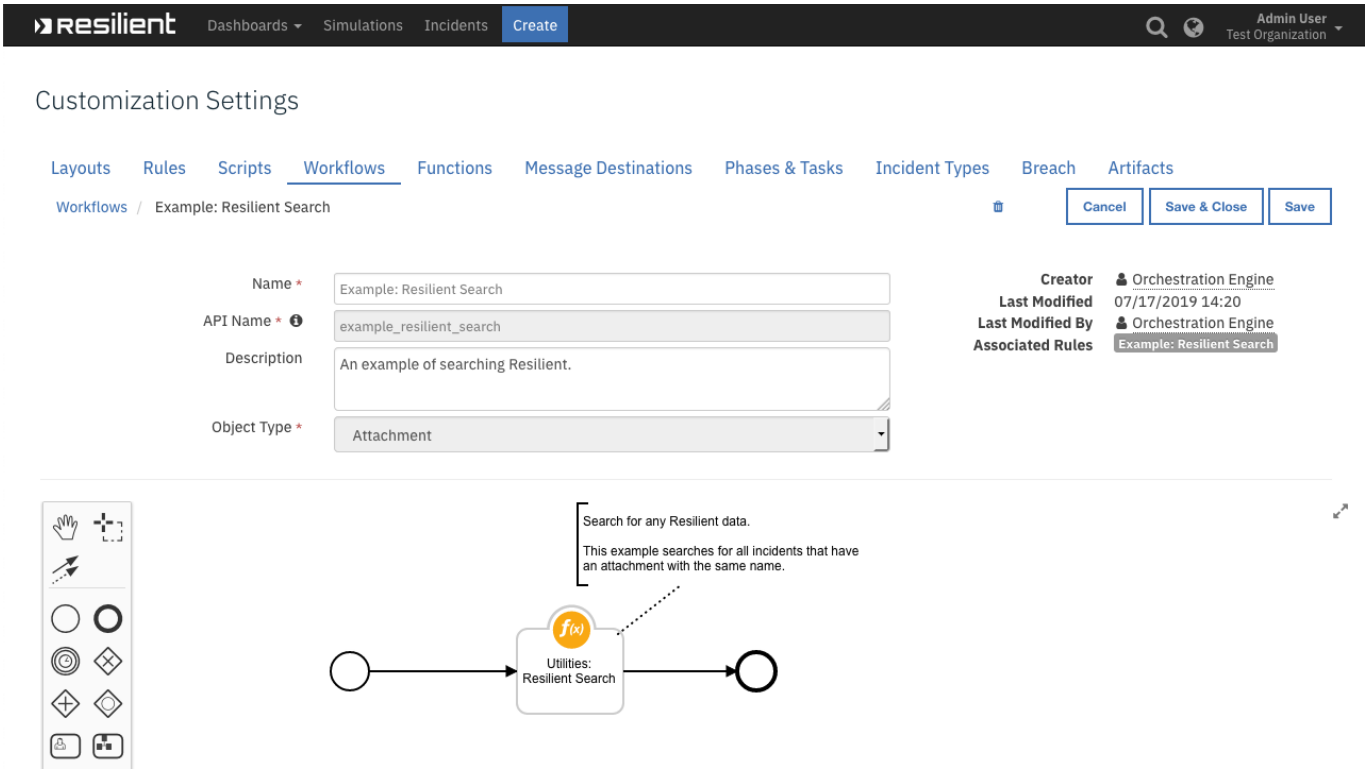
```
# The output of PDFiD is a dictionary with the fundamental elements of the
PDF file.
# These include,
#  - "isPdf" (True or False)
#  - "header" (the PDF version header)
#  - "obj", "endobj" and so on: the count of each element.
# More documentation can be found at
https://blog.didierstevens.com/programs/pdf-tools/

# 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.**



▶ Inputs:

Name	Type	Required	Example	Tooltip
`resilient_search_query`	`text`	No	–	-
`resilient_search_template`	`textarea`	No	–	-

▶ Outputs:

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

```
      '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>.
<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:

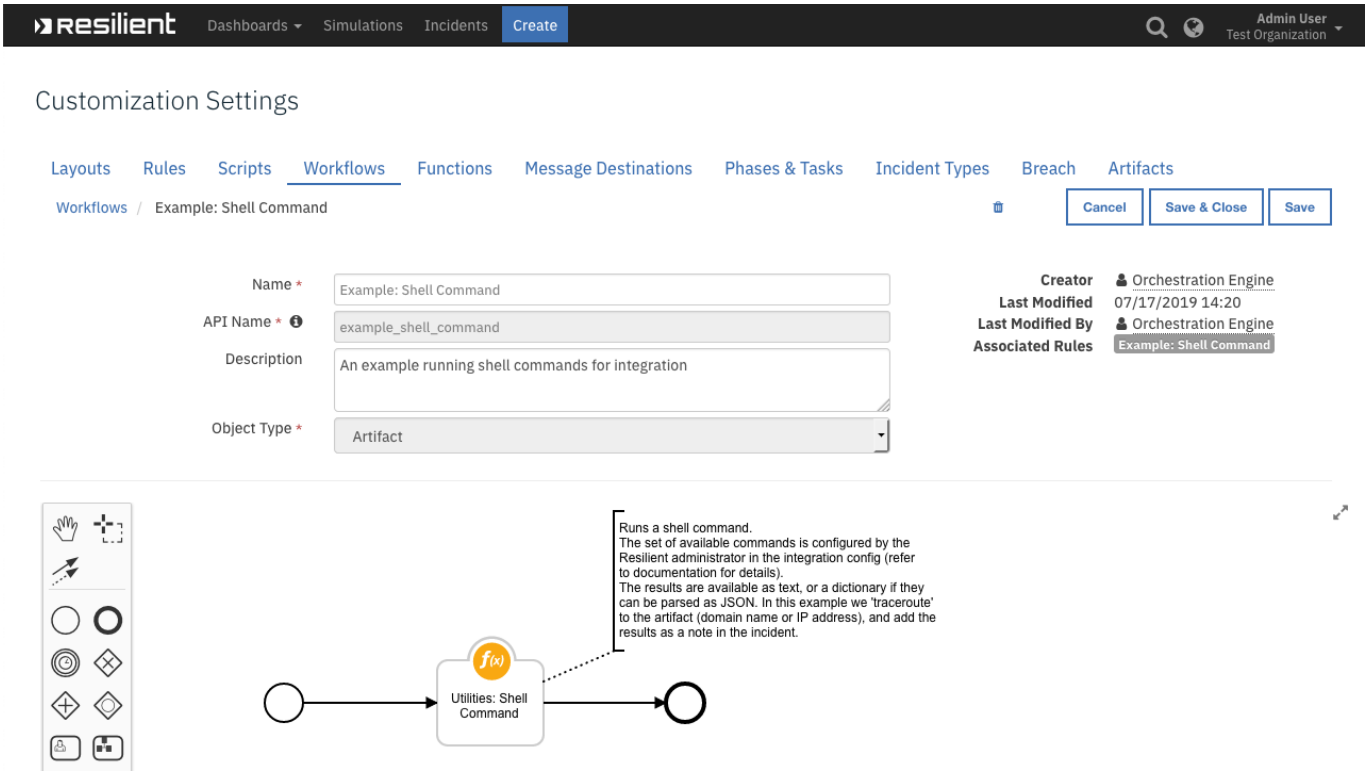
```
# Search results include "results", which is a list of the search hits.
# There might be lots of results!

# 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.



- 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:
traceroute_windows_ps=[\Users\ms\traceroute.ps1]
traceroute_windows_cmd=[tracert.exe -h 10 {{shell_param1}}]

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

# Local Linux server commands:
nslookup=nslookup "{{shell_param1}}"
dig=dig "{{shell_param1}}"
traceroute=traceroute -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 /pathto/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 = "traceroute"
```

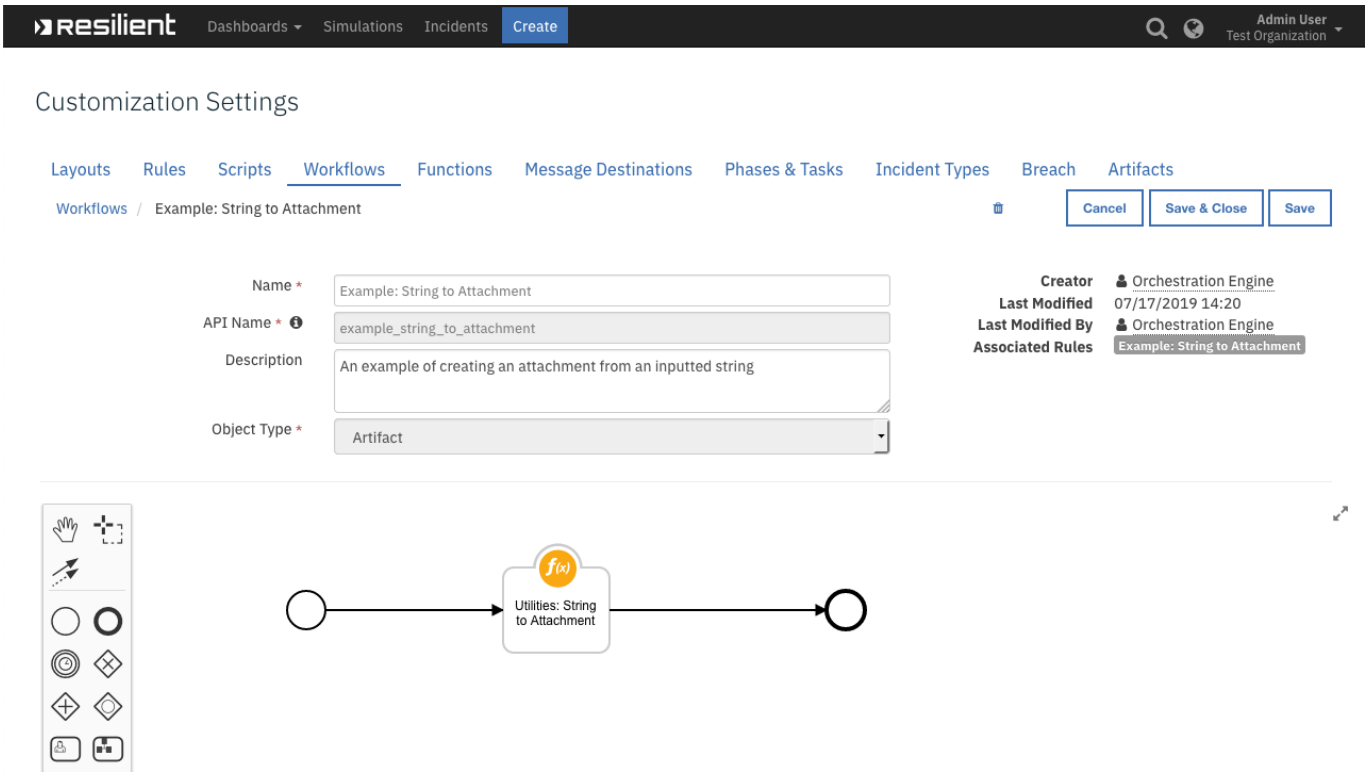
```
# True if running a Remote server, otherwise False
inputs.shell_remote = False

# 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.



▶ 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
```

▶ 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`.

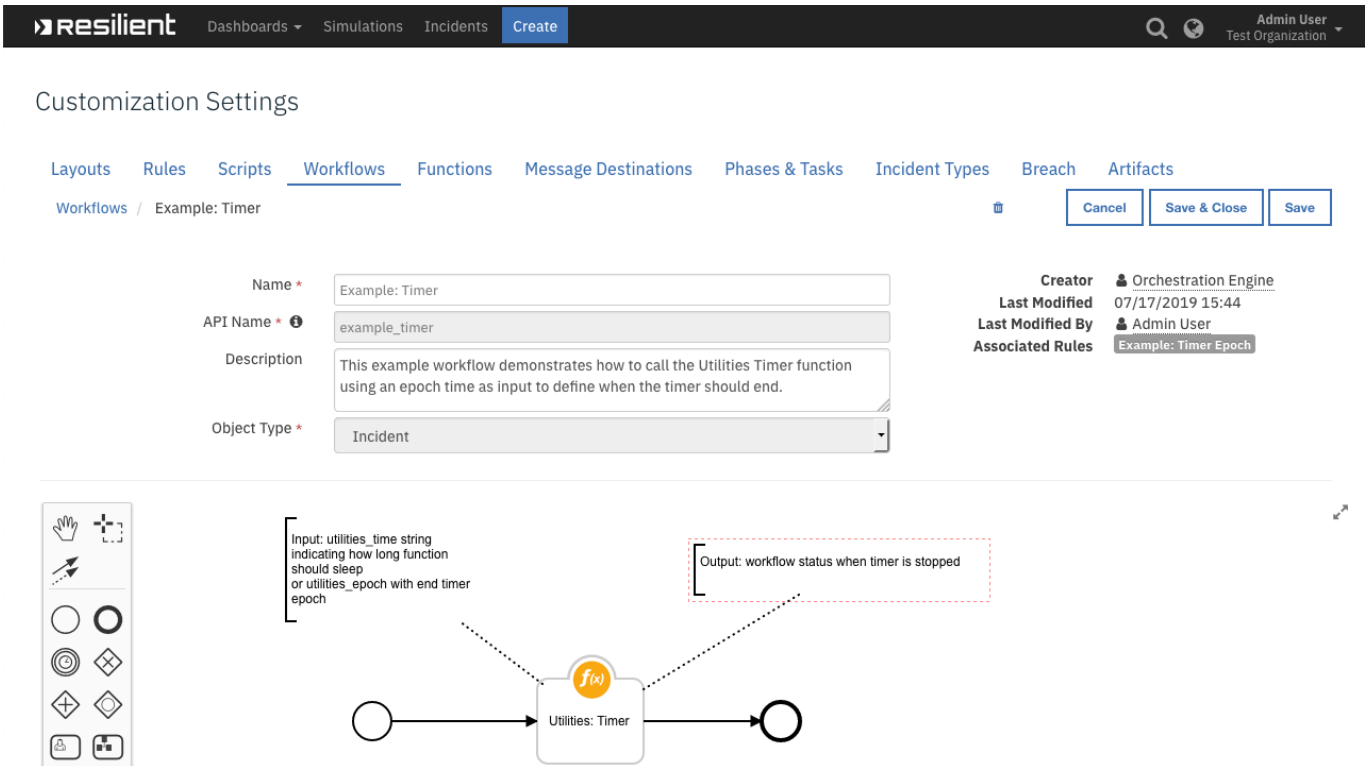
The utilities_time parameter is a string that specifies the total amount of time to pause. The input string is of format `time value` concatenated with a `time unit` character, where character is:

- `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.



▶ 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:

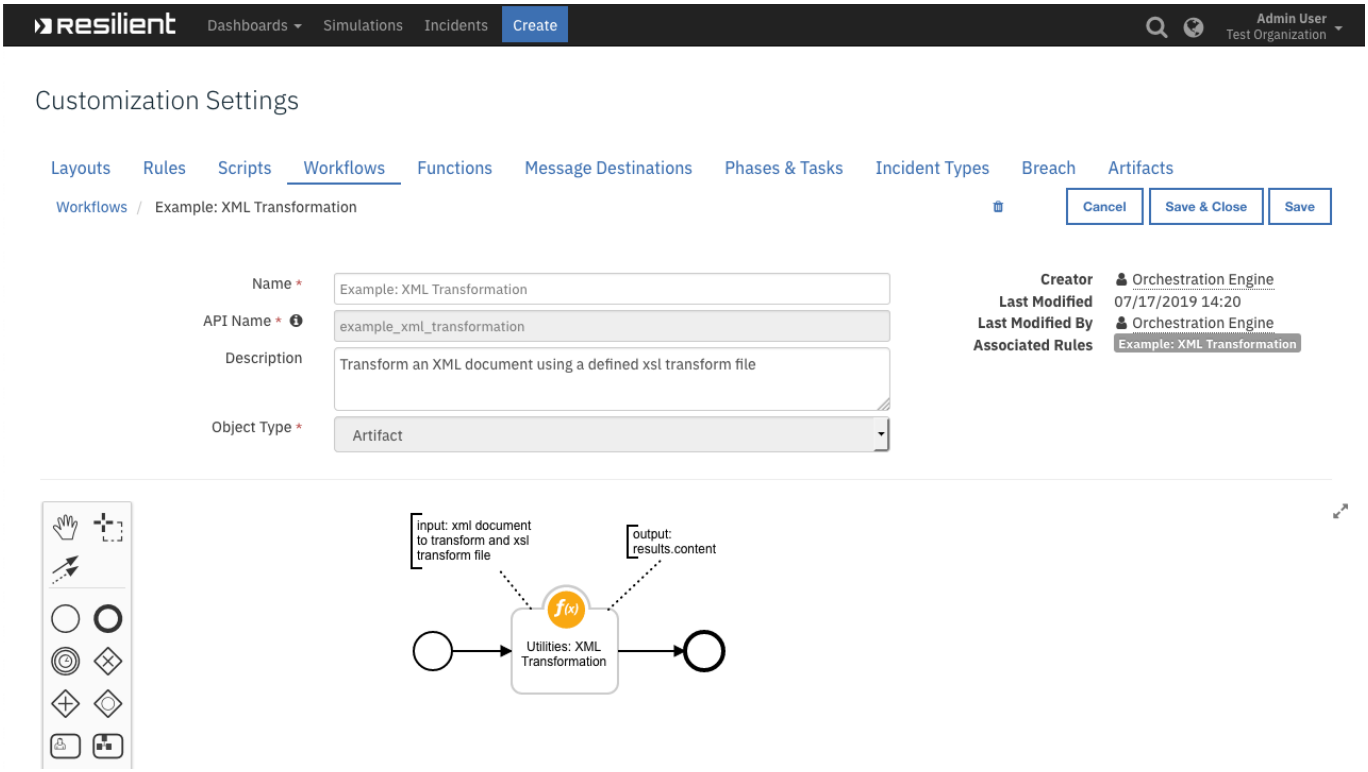
```
# Get the input date/time for timer end from the rule activity field
inputs.utilities_epoch = rule.properties.utilities_timer_end_time
```

▶ Example Post-Process Script:

None

Function - Utilities: XML Transformation

Transforms an XML document using a pre-defined xsl stylesheet and returns the resulting content.

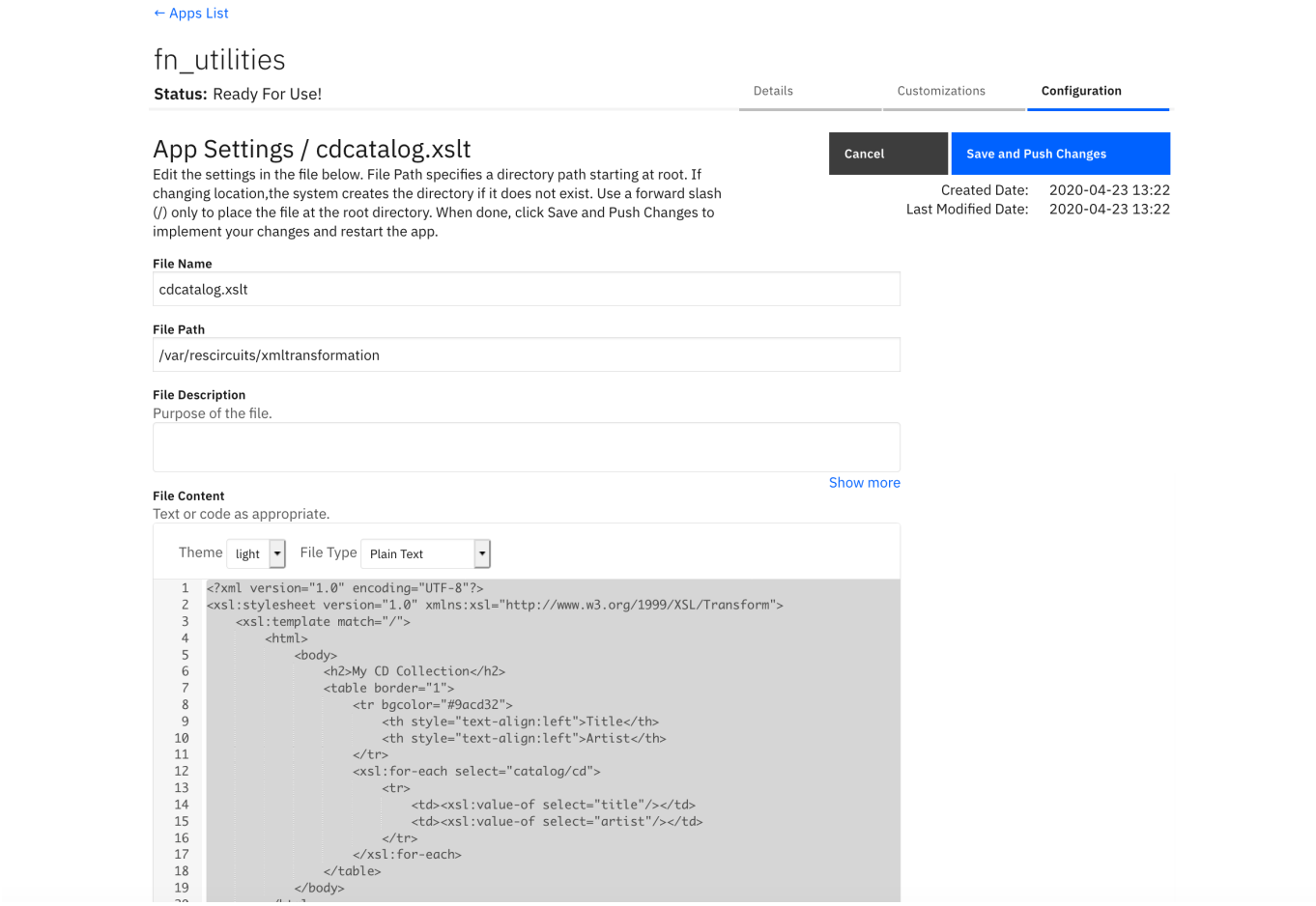


For App Host Environments:

- 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`.



▶ 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

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: 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`