

SentinelOne

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Release Notes

Version	Date	Notes
1.0.0	12/2021	Initial Release

Overview

IBM Security SOAR app for SentinelOne

Functions

Name	Description
SentinelOne: Abort Disk Scan	Initiate a Full Disk Scan on an agent managed by SentinelOne.
SentinelOne: Connect to Network	Connect an endpoint managed by Sentinel to the network.
SentinelOne: Disconnect From Network	Disconnect an endpoint managed by SentinelOne from the network.
SentinelOne: Get Agent Details	Get details of a SentinelOne managed agent.
SentinelOne: Get Hash Reputation	Get the SentinelOne reputation of a hash.
SentinelOne: Get Threat Details	Get the details of a threat detected by SentinelOne.
SentinelOne: Initiate Disk Scan	Initiate a Full Disk scan on an agent managed by SentinelOne.
SentinelOne: Resolve Threat in SentinelOne	Resolve (close) a threat in SentinelOne.
SentinelOne: Restart Agent	Restart a endpoint managed by SentinelOne.
SentinelOne: Send SOAR Note to SentinelOne	Send a note created in SOAR to corresponding SentinelOne threat.
SentinelOne: Shutdown Agent	Shutdown an agent managed by SentinelOne.
SentinelOne: Update Notes From SentinelOne	Query SentinelOne threat and add any new threat notes to the SOAR incident.
SentinelOne: Update Threat Status	Update the incidentStatus and analystVerdict of a threat in SentinelOne.

The SentinelOne platform provides AI-powered prevention, detection, response, and threat hunting across user endpoints, containers, cloud workloads, and IoT devices.

This app escalates SentinelOne threat incidents into IBM Security SOAR as an incident/case.

Key Features

The SentinelOne app implements the following functionality in the IBM SOAR platform:

- Poll SentinelOne for threats and create a corresponding incident/case in the IBM SOAR platform for each threat.
- Get SentinelOne threat notes and add them as notes in corresponding IBM SOAR incident/case.
- Resolve a SentinelOne threat when the corresponding IBM SOAR incident is closed.
- Close an IBM SOAR incident/case when the corresponding SentinelOne threat is resolved in SentinelOne.
- Create artifacts from the SentinelOne threat in the IBM SOAR platform.
- Provide information on the SentinelOne agent (endpoint) in a data table.
- Allow the IBM SOAR user to perform the following actions on the SentinelOne agent:
 - connect/disconnect agent from network
 - shutdown/restart agent
 - initiate/abort full disk scan
- Get the agent or threat details and write the JSON returned from SentinelOne in a formatted incident note.

Requirements

This app supports the IBM Resilient SOAR Platform and the IBM Cloud Pak for Security.

Resilient platform

The Resilient platform supports two app deployment mechanisms, App Host and integration server.

If deploying to a Resilient platform with an App Host, the requirements are:

- Resilient platform **>= 40.2.81**.
- The app is in a container-based format (available from the AppExchange as a **zip** file).

If deploying to a Resilient platform with an integration server, the requirements are:

- Resilient platform **>= 40.2.81**.

- The app is in the older integration format (available from the AppExchange as a **zip** file which contains a **tar.gz** file).
- Integration server is running **resilient-circuits** $\geq 40.0.0$.
- If using an API key account, make sure the account provides the following minimum permissions:

Name	Permissions
Org Data	Read
Function	Read
Incident	Read, Edit, Create, Owner, Status
Incident Notes	Edit

The following Resilient platform guides provide additional information:

- *App Host Deployment Guide*: provides installation, configuration, and troubleshooting information, including proxy server settings.
- *Integration Server Guide*: provides installation, configuration, and troubleshooting information, including proxy server settings.
- *System Administrator Guide*: provides the procedure to install, configure and deploy apps.

The above guides are available on the IBM Knowledge Center at ibm.biz/soar-docs. On this web page, select your Resilient platform version. On the follow-on page, you can find the *App Host Deployment Guide* or *Integration Server Guide* by expanding **Resilient Apps** in the Table of Contents pane. The System Administrator Guide is available by expanding **System Administrator**.

Cloud Pak for Security

If you are deploying to IBM Cloud Pak for Security, the requirements are:

- IBM Cloud Pak for Security ≥ 1.4 .
- Cloud Pak is configured with an App Host.
- The app is in a container-based format (available from the AppExchange as a **zip** file).

The following Cloud Pak guides provide additional information:

- *App Host Deployment Guide*: provides installation, configuration, and troubleshooting information, including proxy server settings. From the Table of Contents, select Case Management and Orchestration & Automation > **Orchestration and Automation Apps**.
- *System Administrator Guide*: provides information to install, configure, and deploy apps. From the IBM Cloud Pak for Security Knowledge Center table of contents, select Case Management and Orchestration & Automation > **System administrator**.

These guides are available on the IBM Knowledge Center at ibm.biz/cp4s-docs. From this web page, select your IBM Cloud Pak for Security version. From the version-specific Knowledge Center page, select Case Management and Orchestration & Automation.

Proxy Server

The app supports a proxy server via the `https_proxy` and `http_proxy` app.config settings.

Python Environment

Python 3.6+ is supported. Additional package dependencies may exist for each of these packages:

- `jinja2`
- `resilient-circuits` $\geq 40.0.0$
- `resilient-lib`

Endpoint Developed With

This app has been implemented using:

Product Name	Product Version	API URL	API Version
SentinelOne	Queensland#11	https://SentinelOne-server/web/api/v2.1	2.1

Prerequisites

- A SentinelOne cloud account with Admin role.

Configuration

- To run the app, obtain an API token from the SentinelOne **My User** menu item in the **Options** menu and place in the app.config file.

Permissions

- SentinelOne Admin role is required in the SentinelOne account that IBM SOAR is communicating with as specified in the App configuration file.

Installation

Install

- To install or uninstall an App or Integration on the *Resilient platform*, see the documentation at ibm.biz/soar-docs.
- To install or uninstall an App on *IBM Cloud Pak for Security*, see the documentation at ibm.biz/cp4s-docs and follow the instructions above to navigate to Orchestration and Automation.

App Configuration

The following table provides the settings you need to configure the app. These settings are made in the app.config file. See the documentation discussed in the Requirements section for the procedure.

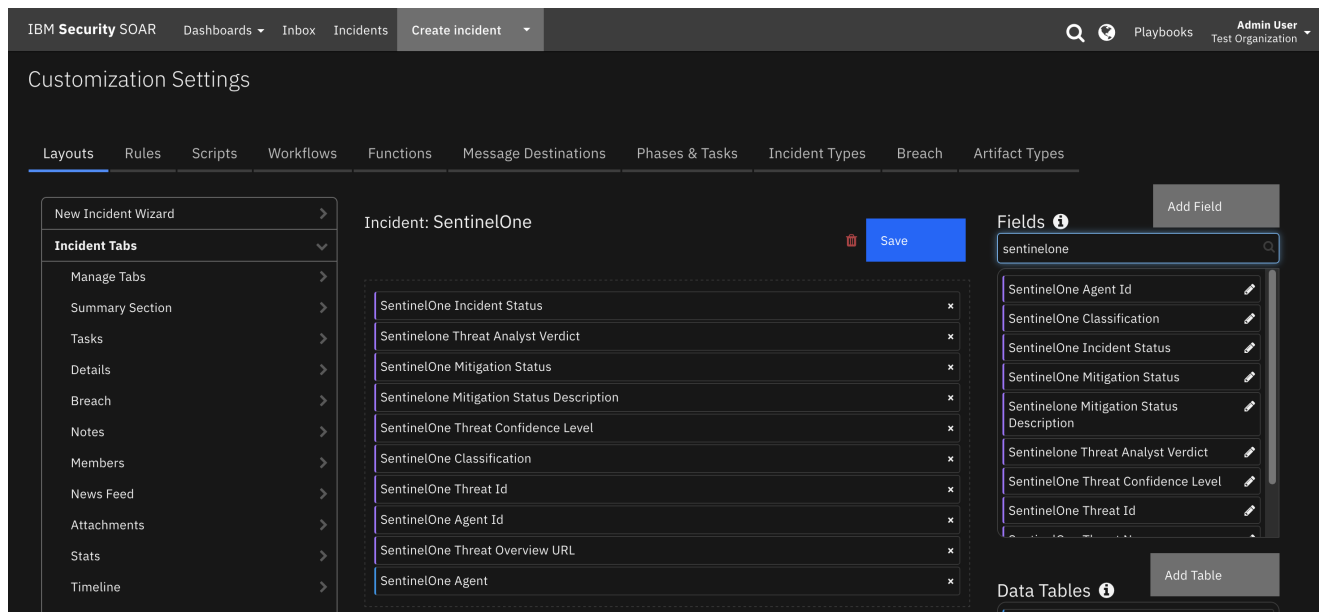
Config	Required	Example	Description
sentinelone_server	Yes	xxx.sentinelone.net	SentinelOne server
api_version	Yes	2.1	SentinelOne REST API version
api_token	Yes	xxxxxxx	SentinelOne user API token
polling_interval	Yes	60	Poller interval time in seconds. Value of zero to turn poller off
polling_lookback	Yes	120	Number of minutes to lookback for threat updates. Value is only used on the first time polling when the app starts
account_ids	No	123456789012345678	Comma seperated list of SentinelOne accountIds to query for threats
site_ids	No	987654321098765432	Comma seperated list of SentinelOne sitelds to query for threats
incident_statuses	No	resolved,in_progress,unresolved	Comma seperated list of SentinelOne incidentStatuses to query for threats[^1]
limit	No	25	Limit number of threats to return from query
sort_by	No	createdDate	The column to sort results by when querying threats
sort_order	No	desc	Sort direction to return threat query results: 'asc' or 'desc'
query_param	No	threat details	Full text search for fields when querying threats

Config	Required	Example	Description
send_soar_link_to_sentinelone	No	true	Send SOAR incident URL live link via threat note to SentinelOne
create_incident_template	No	/path/create_incident_template.jinja	Path to custom create incident jinja template
close_incident_template	No	/path/close_incident_template.jinja	Path to custom close incident jinja template
update_incident_template	No	/path/update_incident_template.jinja	Path to custom update incident jinja template
verify	No	/path/toclient_certificate.pem	Path to client SSL certificate

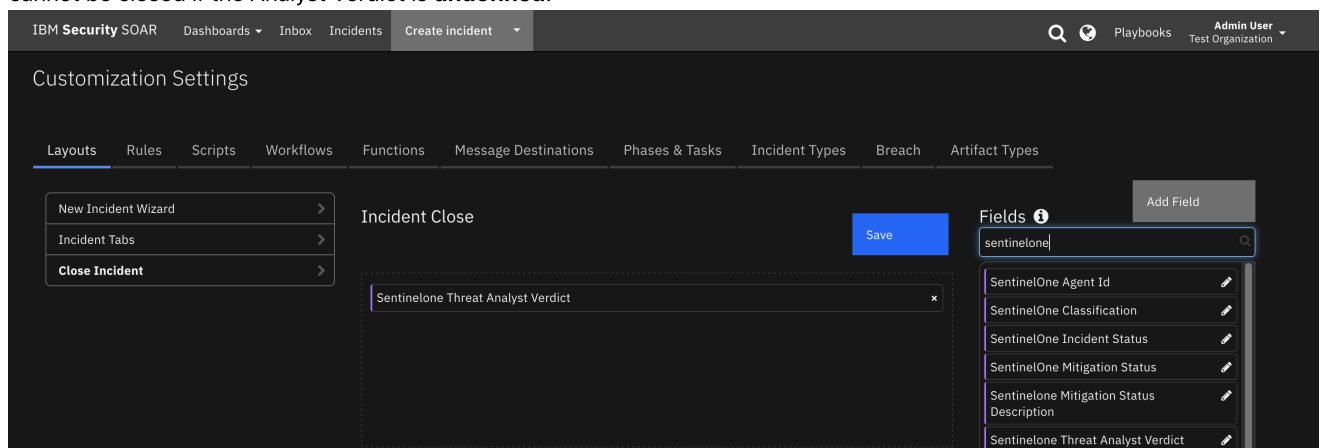
[^1]: Make sure to include incidentStatus **resolved** if the poller should close SOAR incidents that are marked as **resolved** in SentinelOne.

Custom Layouts

- Create a SentinelOne incident tab and import the Data Table and Custom Fields like the screenshot below:



- Create a Close Incident tab so that when a SOAR incident corresponding to a SentinelOne threat is closed in SOAR, the user can select a SentinelOne Threat Analyst Verdict to send to SentinelOne when the incident is closed. The SentinelOne threat cannot be closed if the Analyst Verdict is **undefined**.



Here is a screenshot of the SentinelOne custom Close Incident popup:

Close Incident

Please review the following fields for accuracy before continuing.

Sentinelone Threat Analyst Verdict ^{*} ⓘ

true_positive ▾

Required for Close

The following fields are required to have a value before you can close the incident.

Resolution ^{*} ⓘ

— ▾

Resolution Summary ^{*} ⓘ

Sans Serif ▾ Normal ▾ B I U ↺ ↻ ☰ ☷ ☹

A A 🔗 🖼 W ▾

Cancel

OK

NOTE: If a Close incident tab is created, all non-SentinelOne incidents also contain the SentinelOne Threat Analyst Verdict select field in the Close menu pop-up. Alternatively, an incident menu item rule **SentinelOne: Update Analyst Verdict and Threat Status** is provided that can be run manually to update the Analyst Verdict and Threat status in SentinelOne. When the rule is run to **resolve** a SentinelOne threat, choose an Analyst Verdict and set the Threat Status to **resolved**. SOAR updates the SentinelOne threat which in turn causes the incident to be closed in IBM SOAR on the next poll.

Function - SentinelOne: Abort Disk Scan

Initiate a Full Disk Scan on an agent managed by SentinelOne. If the agent *isActive* field is **No**, the agent action to abort a disk scan is not an option.

SentinelOne Agent

Search... 🔍

Print

Export

Computer Name	External IP	Site	Threat Count	Network Status	Is Active	OS Name	Agent Version	UUID	Agent ID	Domain	Created At	Registered At	Updated At	
iplunkUF1.fre.ibm.com	129.41.87.7	IBM	0	Disconnected	Yes	Linux	21.10.1.6	c3b1243a-5503-7d60-855c-3a84b36fec8d	1275280554924150118	unknown	2021-10-26T13:14:26	2021-10-26T13:14:48.9	2021-12-12T00:20:00	⋮

Displaying 1 - 1 of 1

SentinelOne: Abort Disk Scan

SentinelOne: Disconnect Agent From Network

SentinelOne: Initiate Disk Scan

SentinelOne: Restart Agent

SentinelOne: Shutdown Agent

SentinelOne: Update Agent in Data table

SentinelOne: Write Agent Details to Note

► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_agent_id	text	Yes	—	—

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

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```

results = {
  "content": {
    "data": {
      "affected": 1
    }
  },
  "inputs": {
    "sentinelone_agent_id": "12121212121212121"
  },
  "metrics": {
    "execution_time_ms": 4108,
    "host": "myHost",
    "package": "fn-sentinelone",
    "package_version": "1.0.0",
    "timestamp": "2021-12-13 11:22:36",
    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}

```

► Example Pre-Process Script:

```
inputs.sentinelone_agent_id = row.sentinelone_dt_agent_id
```

► Example Post-Process Script:

```

so_inputs = results.get("inputs")
agent_id = so_inputs.get("sentinelone_agent_id")
note = u"<b>SentinelOne: Abort Full Disk Scan </b><br> SentinelOne Agent Id: {0}".format(agent_id)
content = results.get("content")
if content:
    data = content.get("data")
    if data:
        if int(data.get("affected")) <= 0:
            note = u"{0} Full Disk Scan was NOT aborted.".format(note)
        else:
            note = u"{0} Full Disk Scan aborted.".format(note)
    else:
        note = u"{0} Full Disk Scan was NOT aborted. No 'data' returned from function".format(note)
else:
    note = u"{0} Full Disk Scan was NOT aborted. No content returned from function".format(note)

incident.addNote(helper.createRichText(note))

```

Function - SentinelOne: Connect to Network

Connect an endpoint managed by Sentinel to the network. If the agent *isActive* field is **No**, the agent action to connect is not an option.

SentinelOne Agent													
<div> <div>Search...</div> <div>Print</div> <div>Export</div> </div>													
Computer Name	External IP	Site	Threat Count	Network Status	Is Active	OS Name	Agent Version	UUID	Agent ID	Domain	Created At	Registered At	Updated At
iplunkUF1f re.ibm.com	129.41.87. 7	IBM	0	connected	Yes	Linux	21.10.1.6	c3b124 3a- 5503-7 d60-85 5c- 3a84b3 6fec8d	127528 055492 415011 8	unknown	2021-10- 26T13:14:	2021-10-26 T13:14:48.9	2021-12-1 2T00:20:0

Displaying 1 - 1 of 1

SentinelOne: Abort Disk Scan
SentinelOne: Disconnect Agent From Network
SentinelOne: Initiate Disk Scan
SentinelOne: Restart Agent
SentinelOne: Shutdown Agent
SentinelOne: Update Agent in Data table
SentinelOne: Write Agent Details to Note

► Inputs:

Name	Type	Required	Example	Tooltip
<code>sentinelone_agent_id</code>	text	Yes	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform `results` will be a Python Dictionary

```

results = {
  "content": {
    "data": {
      "affected": 1
    }
  },
  "inputs": {
    "sentinelone_agent_id": "1212121212121212121"
  },
  "metrics": {
    "execution_time_ms": 226,
    "host": "myHost",
    "package": "fn-sentinelone",
    "package_version": "1.0.0",
    "timestamp": "2021-12-13 11:21:53",
    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}

```

► Example Pre-Process Script:

```
inputs.sentinelone_agent_id = row.sentinelone_dt_agent_id
```

► Example Post-Process Script:

```

so_inputs = results.get("inputs")
agent_id = so_inputs.get("sentinelone_agent_id")
note = u"<b>SentinelOne: Connect to Network </b><br> SentinelOne Agent Id: {0}".format(agent_id)
content = results.get("content")
if content:

```



```

data = content.get("data")
if data:
    if int(data.get("affected")) <= 0:
        note = u"{0} is NOT connected to network".format(note)
    else:
        networkStatus = u"""&p style= "color:{color}">{status}</p>""".format(color="green",
status="connected")
        row["sentinelone_dt_network_status"] = helper.createRichText(networkStatus)
        note = u"{0} is connected to network".format(note)
    else:
        note = u"{0} no data returned from function".format(note)
else:
    note = u"{0} no content data returned from function".format(note)

incident.addNote(helper.createRichText(note))

```

Function - SentinelOne: Disconnect From Network

Disconnect an endpoint managed by SentinelOne from the network. If the agent *isActive* field is **No**, the agent action to disconnect is not an option.

The screenshot shows the SentinelOne Agent interface. At the top, there's a search bar and buttons for 'Print' and 'Export'. Below is a table with columns: Computer Name, External IP, Site, Threat Count, Network Status, Is Active, OS Name, Agent Version, UUID, Agent ID, Domain, Created At, Registered At, and Updated At. The first row shows an agent named 'iplunkUF1.f' with IP '129.41.87.7', Site 'IBM', Threat Count '0', Network Status 'connected', Is Active 'Yes', OS Name 'Linux', Agent Version '21.10.1.6', UUID 'c3b1243a-5503-7d60-855c-3a84b36fec8d', Agent ID '1275280554924150118', Domain 'unknown', Created At '2021-10-26T13:14:26', Registered At '2021-10-26T13:14:48.9', and Updated At '2021-12-12T00:20:00'. A context menu is open over the 'Is Active' column, showing options: 'SentinelOne: Abort Disk Scan', 'SentinelOne: Disconnect Agent From Network', 'SentinelOne: Initiate Disk Scan', 'SentinelOne: Restart Agent', 'SentinelOne: Shutdown Agent', 'SentinelOne: Update Agent in Data table', and 'SentinelOne: Write Agent Details to Note'. The 'Disconnect Agent From Network' option is highlighted.

► Inputs:

Name	Type	Required	Example	Tooltip
<code>sentinelone_agent_id</code>	text	Yes	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform `results` will be a Python Dictionary

```

results = {
    "content": {
        "data": {
            "affected": 1
        }
    },
    "inputs": {
        "sentinelone_agent_id": "1275282318251495460"
    },
    "metrics": {
        "execution_time_ms": 242,
        "host": "myHost",
        "package": "fn-sentinelone",
        "package_version": "1.0.0",
        "timestamp": "2021-12-13 11:21:08",
    }
}

```

```

    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}

```

► Example Pre-Process Script:

```
inputs.sentinelone_agent_id = row.sentinelone_dt_agent_id
```

► Example Post-Process Script:

```

so_inputs = results.get("inputs")
agent_id = so_inputs.get("sentinelone_agent_id")
note = u"<b>SentinelOne: Disconnect From Network </b><br> SentinelOne Agent Id:
{0}".format(agent_id)
content = results.get("content")
if content:
    data = content.get("data")
    if data:
        if int(data.get("affected")) <= 0:
            note = u"{0} was not disconnected from network".format(note)
        else:
            networkStatus = u"""&p style= "color:{color}">{status}</p>""".format(color="red",
status="disconnected")
            row["sentinelone_dt_network_status"] = helper.createRichText(networkStatus)
            note = u"{0} is disconnected from network".format(note)
    else:
        note = u"{0} no data returned from function".format(note)
else:
    note = u"{0} no content data returned from function".format(note)

incident.addNote(helper.createRichText(note))

```

Function - SentinelOne: Get Agent Details

Get details of a SentinelOne managed agent. The example workflow writes the SentinelOne agent JSON details to a formatted incident note.

SentinelOne Agent														<input type="text" value="Search..."/> <input type="button" value="Print"/> <input type="button" value="Export"/>	
Computer Name	External IP	Site	Threat Count	Network Status	Is Active	OS Name	Agent Version	UUID	Agent ID	Domain	Created At	Registered At	Updated At		
iplunkUF1.fre.ibm.com	129.41.87.7	IBM	0	Disconnected	Yes	Linux	21.10.1.6	c3b1243a-5503-7d60-855c-3a84b36fec8d	1275280554924150118	unknown	2021-10-26T13:14:26	2021-10-26T13:14:48.9	2021-12-12T00:20:00	<ul style="list-style-type: none"> SentinelOne: Abort Disk Scan SentinelOne: Disconnect Agent From Network SentinelOne: Initiate Disk Scan SentinelOne: Restart Agent SentinelOne: Shutdown Agent SentinelOne: Update Agent in Data table SentinelOne: Write Agent Details to Note 	

Displaying 1 - 1 of 1

► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_agent_id	text	Yes	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```
results = {
  "content": {
    "data": [
      {
        "accountId": "4343434343434343",
        "accountName": "SentinelOne",
        "activeDirectory": {
          "computerDistinguishedName": null,
          "computerMemberOf": [],
          "lastUserDistinguishedName": null,
          "lastUserMemberOf": []
        },
        "activeThreats": 0,
        "agentVersion": "21.10.1.6",
        "allowRemoteShell": false,
        "appsVulnerabilityStatus": "not_applicable",
        "cloudProviders": {},
        "computerName": "computerName",
        "consoleMigrationStatus": "N/A",
        "coreCount": 2,
        "cpuCount": 2,
        "cpuId": "AMD EPYC Processor (with IBPB)",
        "createdAt": "2021-10-26T13:18:19.135249Z",
        "detectionState": null,
        "domain": "unknown",
        "encryptedApplications": false,
        "externalId": "",
        "externalIp": "12.4.8.3",
        "firewallEnabled": true,
        "firstFullModeTime": null,
        "groupId": "607447413805059643",
        "groupIp": "12.4.8.x",
        "groupName": "Default Group",
        "id": "1275282318251495460",
        "inRemoteShellSession": false,
        "infected": false,
        "installerType": ".rpm",
        "isActive": true,
        "isDecommissioned": false,
        "isPendingUninstall": false,
        "isUninstalled": false,
        "isUpToDate": true,
        "lastActiveDate": "2021-12-13T16:23:27.067226Z",
        "lastIpToMgmt": "10.21.10.88",
        "lastLoggedInUserName": "",
        "licenseKey": "",
        "locationEnabled": false,
        "locationType": "not_supported",
        "locations": null,
        "machineType": "server",
        "mitigationMode": "protect",
        "mitigationModeSuspicious": "detect",
        "modelName": "QEMU Standard PC (i440FX + PIIX, 1996)",
        "networkInterfaces": [
          {
            "gatewayIp": null,
            "gatewayMacAddress": null,
```

```
    "id": "1275282318259884069",
    "inet": [
      "10.21.10.88"
    ],
    "inet6": [],
    "name": "eth0",
    "physical": "00:00:0A:15:0A:58"
  },
  {
    "gatewayIp": "9.46.92.1",
    "gatewayMacAddress": "00:00:0c:9f:f0:01",
    "id": "1275282318268272678",
    "inet": [
      "9.46.92.211"
    ],
    "inet6": [],
    "name": "eth1",
    "physical": "00:00:09:2E:5C:D3"
  }
],
"networkQuarantineEnabled": false,
"networkStatus": "connected",
"operationalState": "na",
"operationalStateExpiration": null,
"osArch": "64 bit",
"osName": "Linux",
"osRevision": "CentOS release 7.9.2009 (Core) 3.10.0-1160.49.1.el7.x86_64",
"osStartTime": "2021-12-11T22:40:32Z",
"osType": "linux",
"osUsername": "root",
"rangerStatus": "NotApplicable",
"rangerVersion": null,
"registeredAt": "2021-10-26T13:18:19.132188Z",
"remoteProfilingState": "disabled",
"remoteProfilingStateExpiration": null,
"scanAbortedAt": "2021-12-10T21:57:56.711226Z",
"scanFinishedAt": "2021-12-10T02:33:00.768224Z",
"scanStartedAt": "2021-12-13T16:22:40.612822Z",
"scanStatus": "started",
"siteId": "607447413779893818",
"siteName": "mySite",
"storageName": null,
"storageType": null,
"threatRebootRequired": false,
"totalMemory": 3789,
"updatedAt": "2021-12-13T16:22:40.616308Z",
"userActionsNeeded": [],
"uuid": "8329e587-bbe9-b906-a6a5-646e2686eba9"
}
],
"pagination": {
  "nextCursor": null,
  "totalItems": 1
}
},
"inputs": {
  "sentinelone_agent_id": "121212121212121"
},
"metrics": {
  "execution_time_ms": 277,
  "host": "myHost",
  "package": "fn-sentinelone",
  "package_version": "1.0.0",
  "timestamp": "2021-12-13 11:23:55",
  "version": "1.0"
},
```

```

"raw": null,
"reason": null,
"success": true,
"version": 2.0
}

```

► Example Pre-Process Script:

```
inputs.sentinelone_agent_id = incident.properties.sentinelone_agent_id
```

► Example Post-Process Script:

```

from java.util import Date

note = u"<b>SentinelOne: Add Agent to Data Table: </b> \n"
content = results.get("content")
if content:
    data = content.get("data")
    if data:
        data_len = len(data)
        note = u"{0} {1} agent added to SentinelOne Agent data table.".format(note, data_len)
        for agent in data:
            agent_row = incident.addRow("sentinelone_agents_dt")
            agent_row.sentinelone_dt_query_date = Date()
            agent_row.sentinelone_dt_agent_id = agent.get("id")
            networkStatus = agent.get("networkStatus")
            if networkStatus == "connected":
                display_color = "green"
            else:
                display_color = "red"
            networkStatus = u"""<p style= "color:{color}">{status}
</p>""".format(color=display_color, status=networkStatus)
            agent_row.sentinelone_dt_network_status = helper.createRichText(networkStatus)
            agent_row.sentinelone_dt_computername = agent.get("computerName")
            agent_row.sentinelone_dt_external_ip = agent.get("externalIp")
            agent_row.sentinelone_dt_site = agent.get("siteName")
            agent_row.sentinelone_dt_agent_version = agent.get("agentVersion")
            agent_row.sentinelone_dt_threat_count = agent.get("activeThreats")
            agent_row.sentinelone_dt_domain = agent.get("domain")
            agent_row.sentinelone_dt_os_name = agent.get("osName")
            agent_row.sentinelone_dt_uuid = agent.get("uuid")
            agent_row.sentinelone_dt_is_active = agent.get("isActive")
            agent_row.sentinelone_dt_registered = agent.get("registeredAt")
            agent_row.sentinelone_dt_created = agent.get("createdAt")
            agent_row.sentinelone_dt_updated = agent.get("updatedAt")
        else:
            note = u"{0} No data returned from function.".format(note)
    else:
        note = u"{0} No content data returned from function.".format(note)

incident.addNote(helper.createRichText(note))

```

Function - SentinelOne: Get Hash Reputation

Get the SentinelOne reputation of a hash. The example workflow writes the results to an incident note.

TasksDetailsBreachNotesMembersNews FeedAttachmentsStatsTimelineArtifactsEmailSplunk

EXO SentinelOne

Set timeframe Add Artifact +

Filters Artifact Types ~ Malware SHA-1 Hash x Clear filters

Flags	Hits	Threat Sources	Related Incident Count	Type	Value	Tags	Actions
			5	Malware SHA-1 Hash	1641df58c1027a00f670d41491a2eecff931604c	—	<div><div></div><div>Ignore Relationships</div><div>SentinelOne: Get Hash Reputation</div><div>Remove</div><div>SentinelOne: Get Hash Reputation</div></div>

Items per page 25 1-1 of 1 item

► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_hash	text	No	—	—

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```
results = {
  "content": {
    "data": {
      "rank": "0"
    }
  },
  "inputs": {
    "sentinelone_hash": "1641df58c1027a00f670d41491a2eecff931604c"
  },
  "metrics": {
    "execution_time_ms": 202,
    "host": "myHost",
    "package": "fn-sentinelone",
    "package_version": "1.0.0",
    "timestamp": "2021-12-13 11:27:14",
    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}
```

► Example Pre-Process Script:

```
inputs.sentinelone_hash = artifact.value
```

► Example Post-Process Script:

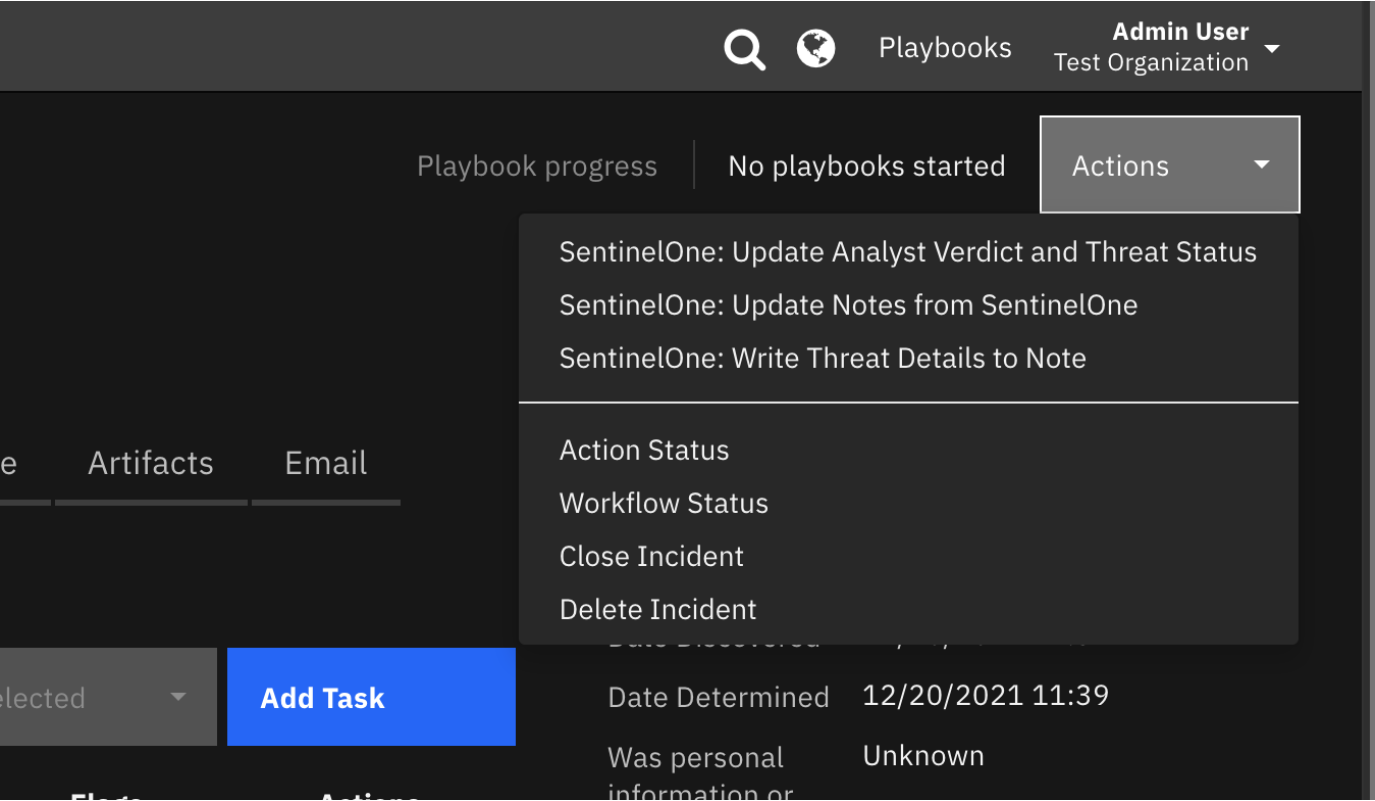
```
note = u"<b>SentinelOne: Get Hash Reputation: </b><br>"
```

```
content = results.get("content")
inputs = results.get("inputs")
hash_value = inputs.get("sentinelone_hash")
if content:
    data = content.get("data")
    if data:
        rank = data.get("rank")
        note = u"{0} Hash <b>{1}</b> has rank: <b>{2}</b>".format(note, hash_value, rank)
    else:
        note = u"{0} No data returned from function.".format(note)
else:
    note = u"{0} No content data returned from function.".format(note)

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

Function - SentinelOne: Get Threat Details

Get the details of a threat detected by SentinelOne. Results are written to a formatted incident note in the example workflow.



► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_threat_id	text	No	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```
results = {
    "content": {
        "data": [
            {
                "agentDetectionInfo": {
                    "accountId": "433241117337583618",
                    "accountName": "SentinelOne",
                    "agentDetectionState": null,
```

```

"agentDomain": "unknown",
"agentIPv4": "10.21.10.88,9.46.92.211",
"agentIPv6": "",
"agentLastLoggedInUserName": "",
"agentMitigationMode": "detect",
"agentOsName": "Linux",
"agentOsRevision": "CentOS release 7.9.2009 (Core) 3.10.0-1160.49.1.el7.x86_64",
"agentRegisteredAt": "2021-10-26T13:18:19.132188Z",
"agentUuid": "8329e587-bbe9-b906-a6a5-646e2686eba9",
"agentVersion": "21.10.1.6",
"externalIp": "129.41.87.3",
"groupId": "607447413805059643",
"groupName": "Default Group",
"siteId": "606060606060606060",
"siteName": "mySite"
},
"agentRealtimeInfo": {
  "accountId": "434343434343434343434343434343",
  "accountName": "SentinelOne",
  "activeThreats": 1,
  "agentComputerName": "SplunkHF1.fyre.ibm.com",
  "agentDecommissionedAt": null,
  "agentDomain": "unknown",
  "agentId": "1275282318251495460",
  "agentInfected": true,
  "agentIsActive": true,
  "agentIsDecommissioned": false,
  "agentMachineType": "server",
  "agentMitigationMode": "detect",
  "agentNetworkStatus": "connected",
  "agentOsName": "Linux",
  "agentOsRevision": "CentOS release 7.9.2009 (Core) 3.10.0-1160.49.1.el7.x86_64",
  "agentOsType": "linux",
  "agentUuid": "8329e587-bbe9-b906-a6a5-646e2686eba9",
  "agentVersion": "21.10.1.6",
  "groupId": "6060606060606060606060606060",
  "groupName": "Default Group",
  "networkInterfaces": [
    {
      "id": "1275282318268272678",
      "inet": [
        "9.46.92.211"
      ],
      "inet6": [],
      "name": "eth1",
      "physical": "00:00:09:2E:5C:D3"
    },
    {
      "id": "1275282318259884069",
      "inet": [
        "10.21.10.88"
      ],
      "inet6": [],
      "name": "eth0",
      "physical": "00:00:0A:15:0A:58"
    }
  ],
  "operationalState": "na",
  "rebootRequired": false,
  "scanAbortedAt": "2021-12-10T21:57:56.711226Z",
  "scanFinishedAt": "2021-12-10T02:33:00.768224Z",
  "scanStartedAt": "2021-12-13T16:22:40.612822Z",
  "scanStatus": "started",
  "siteId": "6060606060606060606060606060",
  "siteName": "IBM",
  "storageName": null,

```



```
    "storageType": null,
    "userActionsNeeded": [],
  },
  "containerInfo": {
    "id": null,
    "image": null,
    "labels": null,
    "name": null
  },
  "id": "1308905355630511064",
  "indicators": [
    {
      "category": "Persistence",
      "description": "Unsigned kernel module was loaded.",
      "ids": [
        384
      ],
      "tactics": [
        {
          "name": "Persistence",
          "source": "MITRE",
          "techniques": [
            {
              "link": "https://attack.mitre.org/techniques/T1547/006/",
              "name": "T1547.006"
            }
          ]
        }
      ]
    },
    {
      "category": "Persistence",
      "description": "New kernel module was added.",
      "ids": [
        399
      ],
      "tactics": [
        {
          "name": "Persistence",
          "source": "MITRE",
          "techniques": [
            {
              "link": "https://attack.mitre.org/techniques/T1547/006/",
              "name": "T1547.006"
            }
          ]
        }
      ]
    }
  ],
  "kubernetesInfo": {
    "cluster": null,
    "controllerKind": null,
    "controllerLabels": null,
    "controllerName": null,
    "namespace": null,
    "namespaceLabels": null,
    "node": null,
    "pod": null,
    "podLabels": null
  },
  "mitigationStatus": [],
  "threatInfo": {
    "analystVerdict": "true_positive",
    "analystVerdictDescription": "True positive",
    "automaticallyResolved": false,
```

```

    "browserType": null,
    "certificateId": null,
    "classification": "Malware",
    "classificationSource": "Static",
    "cloudFilesHashVerdict": "provider_unknown",
    "collectionId": "1140024784343285701",
    "confidenceLevel": "suspicious",
    "createdAt": "2021-12-11T22:41:17.533077Z",
    "detectionEngines": [
      {
        "key": "executables",
        "title": "Behavioral AI"
      }
    ],
    "detectionType": "dynamic",
    "engines": [
      "DBT - Executables"
    ],
    "externalTicketExists": false,
    "externalTicketId": null,
    "failedActions": false,
    "fileExtension": null,
    "fileExtensionType": null,
    "filePath": "/opt/CrowdStrike/falcon-sensor12803",
    "fileSize": 1617904,
    "fileVerificationType": null,
    "identifiedAt": "2021-12-11T22:41:17.461397Z",
    "incidentStatus": "in_progress",
    "incidentStatusDescription": "In progress",
    "initiatedBy": "agent_policy",
    "initiatedByDescription": "Agent Policy",
    "initiatingUserId": null,
    "initiatingUsername": null,
    "isFileless": false,
    "isValidCertificate": null,
    "maliciousProcessArguments": " falcon-sensor",
    "md5": null,
    "mitigatedPreemptively": false,
    "mitigationStatus": "not_mitigated",
    "mitigationStatusDescription": "Not mitigated",
    "originatorProcess": "systemd",
    "pendingActions": false,
    "processUser": "root",
    "publisherName": null,
    "reachedEventsLimit": null,
    "rebootRequired": false,
    "sha1": "1641df58c1027a00f670d41491a2eecff931604c",
    "sha256": null,
    "storyline": "2588b11a-e3cd-1677-7746-3f85cd99c850",
    "threatId": "1308905355630511064",
    "threatName": "falcon-sensor12803",
    "updatedAt": "2021-12-13T16:25:55.851553Z"
  },
  "whiteningOptions": [
    "path",
    "hash"
  ]
}
],
"pagination": {
  "nextCursor": null,
  "totalItems": 1
}
},
"inputs": {
  "sentinelone_threat_id": "1308905355630511064"
}

```

```

},
"metrics": {
  "execution_time_ms": 260,
  "host": "myHost",
  "package": "fn-sentinelone",
  "package_version": "1.0.0",
  "timestamp": "2021-12-13 11:26:02",
  "version": "1.0"
},
"raw": null,
"reason": null,
"success": true,
"version": 2.0
}

```

► Example Pre-Process Script:

```
inputs.sentinelone_threat_id = incident.properties.sentinelone_threat_id
```

► Example Post-Process Script:

```

# Put the results json into a workflow property so we can call the
# convert_json_to_rich_text script to print readable formatted json in an incident note.
inputs = results.get("inputs")
threat_id = inputs.get("sentinelone_threat_id")
content = results.get("content")
data = content.get("data")

header = u"SentinelOne Threat Id: {0} Details:".format(threat_id)

json_note = {
    "version": "1.1",
    "header": header,
    "json": data,
    "sort": False
}

workflow.addProperty('convert_json_to_rich_text', json_note)

```

Function - SentinelOne: Initiate Disk Scan

Initiate a Full Disk scan on an agent managed by SentinelOne. If the agent *isActive* field is **No**, the agent action to initiate a full disk scan is not an option.

The screenshot shows the SentinelOne Agent console interface. At the top, there is a search bar and buttons for 'Print' and 'Export'. Below this is a table with columns: Computer Name, External IP, Site, Threat Count, Network Status, Is Active, OS Name, Agent Version, Agent UUID, Agent ID, Domain, Created At, Registered At, and Updated At. The table contains one agent entry with the name 'iplunkUF1.f...re.ibm.com'. A context menu is open over the 'Agent ID' column, showing several actions: 'SentinelOne: Abort Disk Scan', 'SentinelOne: Disconnect Agent From Network', 'SentinelOne: Initiate Disk Scan', 'SentinelOne: Restart Agent', 'SentinelOne: Shutdown Agent', 'SentinelOne: Update Agent in Data table', and 'SentinelOne: Write Agent Details to Note'. The 'Initiate Disk Scan' option is highlighted. At the bottom left, it says 'Displaying 1 - 1 of 1'.

Computer Name	External IP	Site	Threat Count	Network Status	Is Active	OS Name	Agent Version	Agent UUID	Agent ID	Domain	Created At	Registered At	Updated At
iplunkUF1.f...re.ibm.com	129.41.87.7	IBM	0	Connected	Yes	Linux	21.10.1.6	c3b1243a-5503-7d60-855c-3a84b36fec8d	1275280554924150118	unknown	2021-10-26T13:14:26	2021-10-26T13:14:48.9	2021-12-12T00:20:00

► Inputs:

Name	Type	Required	Example	Tooltip
<code>sentinelone_agent_id</code>	text	Yes	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform `results` will be a Python Dictionary

```
results = {
    "content": {
        "data": {
            "affected": 1
        }
    },
    "inputs": {
        "sentinelone_agent_id": "1275282318251495460"
    },
    "metrics": {
        "execution_time_ms": 5678,
        "host": "myHost",
        "package": "fn-sentinelone",
        "package_version": "1.0.0",
        "timestamp": "2021-12-13 11:22:20",
        "version": "1.0"
    },
    "raw": null,
    "reason": null,
    "success": true,
    "version": 2.0
}
```

► Example Pre-Process Script:

```
inputs.sentinelone_agent_id = row.sentinelone_dt_agent_id
```

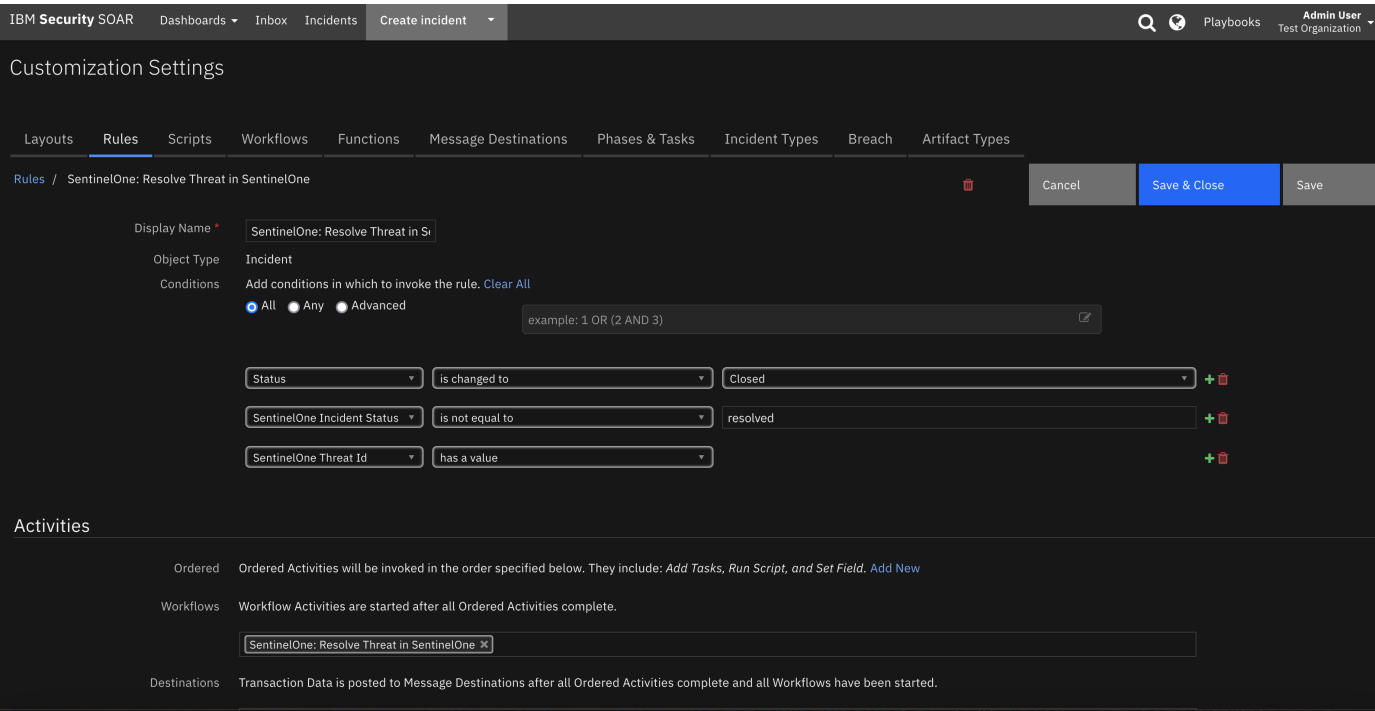
► Example Post-Process Script:

```
so_inputs = results.get("inputs")
agent_id = so_inputs.get("sentinelone_agent_id")
note = u"<b>SentinelOne: Initiate Full Disk Scan </b><br> SentinelOne Agent Id: {0}".format(agent_id)
content = results.get("content")
if content:
    data = content.get("data")
    if data:
        if int(data.get("affected")) <= 0:
            note = u"{0} Full Disk Scan was NOT initiated.".format(note)
        else:
            note = u"{0} Full Disk Scan initiated.".format(note)
    else:
        note = u"{0} Full Disk Scan was NOT initiated. No 'data' returned from function".format(note)
else:
    note = u"{0} Full Disk Scan was NOT initiated. No content returned from function".format(note)

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

Function - SentinelOne: Resolve Threat in SentinelOne

Resolve (close) a threat in SentinelOne.



► Inputs:

Name	Type	Required	Example	Tooltip
incident_id	number	No	—	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```
results = {
  "version": 2.0,
  "success": true,
  "reason": null,
  "content": {
    "success": true,
    "threat_id": "1313131313131313"
  },
  "raw": null,
  "inputs": {
    "incident_id": 2338
  },
  "metrics": {
    "version": "1.0",
    "package": "fn-sentinelone",
    "package_version": "1.0.0",
    "host": "myHost",
    "execution_time_ms": 1208,
    "timestamp": "2021-12-14 11:21:41"
  }
}
```

► Example Pre-Process Script:

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

► Example Post-Process Script:

```

if results.success:
    noteText = u'SentinelOne threat {0} resolved.'.format(results.content['threat_id'])
elif:
    noteText = u'ERROR: unable to resolve SentinelOne threat {0}.'.format(results.content['threat_id'])

incident.addNote(noteText)

```

Function - SentinelOne: Restart Agent

Restart a endpoint managed by SentinelOne. If the agent *isActive* field is **No**, the agent action to restart is not an option.

The screenshot shows the SentinelOne Agent interface. At the top, there's a search bar and buttons for 'Print' and 'Export'. Below is a table with columns: Computer Name, External IP, Site, Threat Count, Network Status, Is Active, OS Name, Agent Version, UUID, Agent ID, Domain, Created At, Registered At, and Updated At. A single agent is listed with the name 'iplunkUF1.f...re.ibm.com'. A context menu is open over the 'Agent ID' column, showing several actions including 'SentinelOne: Restart Agent'.

Computer Name	External IP	Site	Threat Count	Network Status	Is Active	OS Name	Agent Version	UUID	Agent ID	Domain	Created At	Registered At	Updated At
iplunkUF1.f...re.ibm.com	129.41.87.7	IBM	0	Connected	Yes	Linux	21.10.1.6	c3b1243a-5503-7d60-855c-3a84b36fec8d	1275280554924150118	unknown	2021-10-26T13:14:26	2021-10-26T13:14:48.9	2021-12-12T00:20:00

Displaying 1 - 1 of 1

► Inputs:

Name	Type	Required	Example	Tooltip
<code>sentinelone_agent_id</code>	text	Yes	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform `results` will be a Python Dictionary

```

results = {
    "content": {
        "data": {
            "affected": 0
        }
    },
    "inputs": {
        "sentinelone_agent_id": "1212121212121212"
    },
    "metrics": {
        "execution_time_ms": 3624,
        "host": "myHost",
        "package": "fn-sentinelone",
        "package_version": "1.0.0",
        "timestamp": "2021-12-13 11:23:30",
        "version": "1.0"
    },
    "raw": null,
    "reason": null,
    "success": true,
    "version": 2.0
}

```

► Example Pre-Process Script:

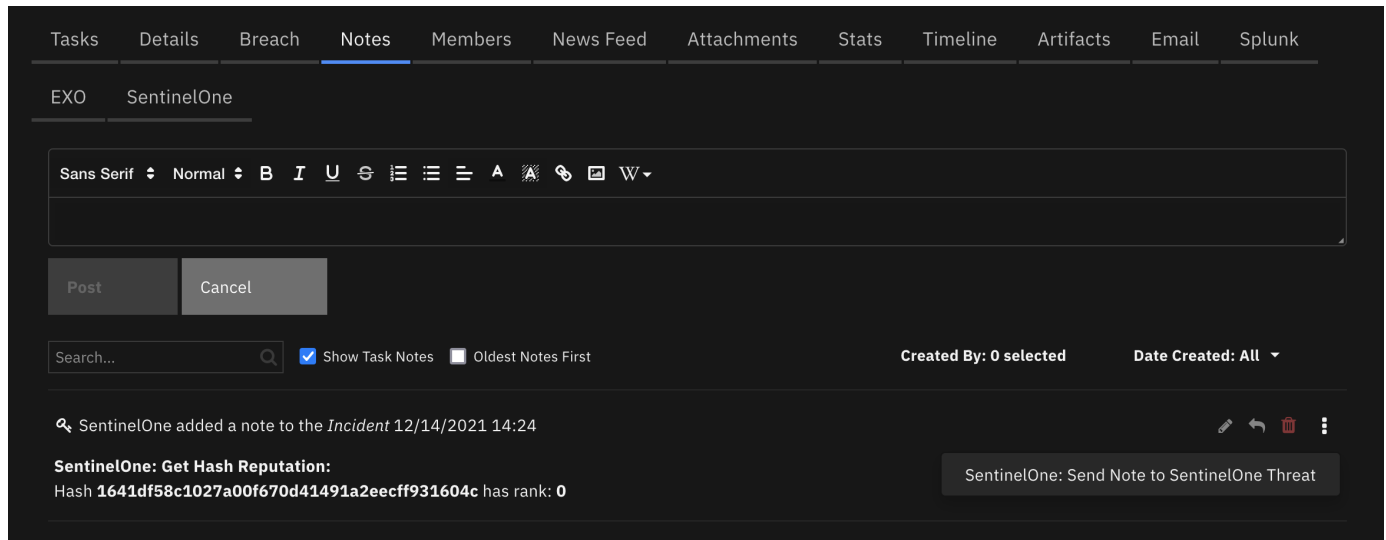
```
inputs.sentinelone_agent_id = incident.properties.sentinelone_agent_id
```

► Example Post-Process Script:

```
None
```

Function - SentinelOne: Send SOAR Note to SentinelOne

Send a note created in SOAR to corresponding SentinelOne threat. The example rule it a menu item run off a note in SOAR.



► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_note_text	text	No	-	-
sentinelone_threat_id	text	No	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```
results = {
  "content": {
    "reason": null,
    "success": true
  },
  "inputs": {
    "sentinelone_note_text": "\u003cb\u003eSentinelOne: Get Hash Reputation: \u003c/b\u003e\u003e\u003cbr / \u003e Hash \u003cb\u003e\u003e1641df58c1027a00f670d41491a2eecff931604c\u003c/b\u003e has rank: \u003cb\u003e\u003e0\u003c/b\u003e\u003e",
    "sentinelone_threat_id": "1308905355630511064"
  },
  "metrics": {
    "execution_time_ms": 5590,
    "host": "myHost",
    "package": "fn-sentinelone",
    "package_version": "1.0.0",
```

```

    "timestamp": "2021-12-13 11:28:04",
    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}

```

► Example Pre-Process Script:

```

inputs.sentinelone_threat_id = incident.properties.sentinelone_threat_id
inputs.sentinelone_note_text = note.text.content

```

► Example Post-Process Script:

```

# Import Date
from java.util import Date

# Edit note in SOAR to indicate it was sent to SentinelOne
if results.success:
    # Get the current time
    dt_now = Date()
    note.text = u"<b>Sent to SentinelOne at {0}</b><br>{1}".format(dt_now,
unicode(note.text.content))

```

Function - SentinelOne: Shutdown Agent

Shutdown an agent managed by SentinelOne. If the agent *isActive* field is **No**, the agent action to shutdown is not an option.

The screenshot shows the SentinelOne Agent management interface. At the top, there's a search bar and buttons for 'Print' and 'Export'. Below is a table with columns: Computer Name, External IP, Site, Threat Count, Network Status, Is Active, OS Name, Agent Version, UUID, Agent ID, Domain, Created At, Registered At, and Updated At. A single agent is listed with a status of 'Connected'. A dropdown menu is open over the agent, showing several actions: SentinelOne: Abort Disk Scan, SentinelOne: Disconnect Agent From Network, SentinelOne: Initiate Disk Scan, SentinelOne: Restart Agent, SentinelOne: Shutdown Agent, SentinelOne: Update Agent in Data table, and SentinelOne: Write Agent Details to Note. At the bottom left, it says 'Displaying 1 - 1 of 1'.

► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_agent_id	text	Yes	-	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```

results = {
  "content": {
    "data": {

```



```
        "affected": 0
    },
    },
    "inputs": {
        "sentinelone_agent_id": "1275282318251495460"
    },
    "metrics": {
        "execution_time_ms": 3426,
        "host": "myHost",
        "package": "fn-sentinelone",
        "package_version": "1.0.0",
        "timestamp": "2021-12-13 11:23:17",
        "version": "1.0"
    },
    "raw": null,
    "reason": null,
    "success": true,
    "version": 2.0
}
```

► Example Pre-Process Script:

```
inputs.sentinelone_agent_id = row.sentinelone_dt_agent_id
```

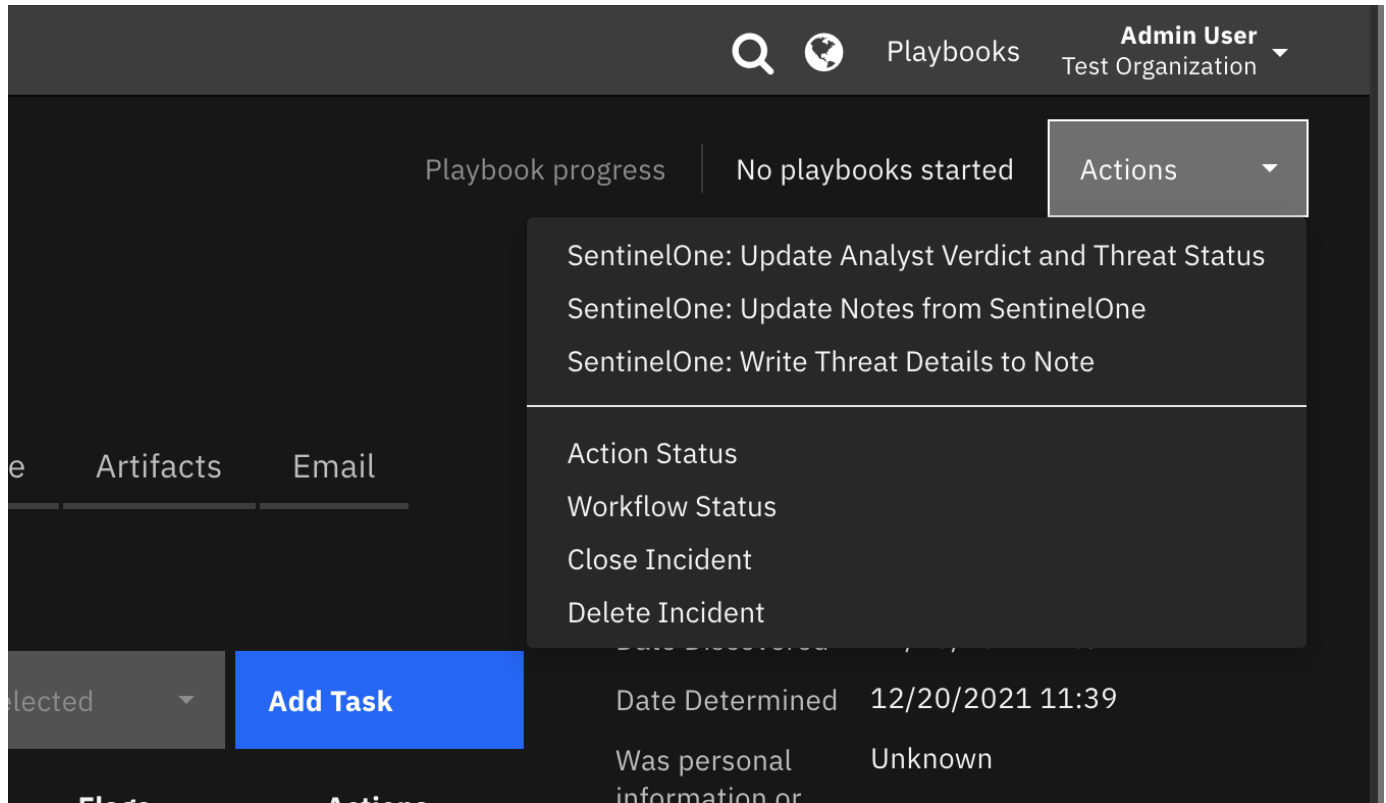
► Example Post-Process Script:

```
so_inputs = results.get("inputs")
agent_id = so_inputs.get("sentinelone_agent_id")
note = u"<b>SentinelOne: Shutdown Agent </b><br> SentinelOne Agent Id: {0}".format(agent_id)
content = results.get("content")
if content:
    data = content.get("data")
    if data:
        if int(data.get("affected")) <= 0:
            note = u"{0} Agent was NOT shutdown.".format(note)
        else:
            note = u"{0} Agent shutdown initiated.".format(note)
    else:
        note = u"{0} Agent shutdown was NOT initiated. No 'data' returned from
function".format(note)
else:
    note = u"{0} Agent shutdown was NOT initiated. No content returned from
function".format(note)

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

Function - SentinelOne: Update Notes From SentinelOne

Query SentinelOne threat and add any new threat notes to the SOAR incident.



► Inputs:

Name	Type	Required	Example	Tooltip
incident_id	number	No	—	-
sentinelone_threat_id	text	No	—	-

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform `results` will be a Python Dictionary

```
results = {
  "content": {
    "notes_created": 1,
    "success": true
  },
  "inputs": {
    "incident_id": 2334,
    "sentinelone_threat_id": "1308905355630511064"
  },
  "metrics": {
    "execution_time_ms": 1668,
    "host": "myHost",
    "package": "fn-sentinelone",
    "package_version": "1.0.0",
    "timestamp": "2021-12-13 11:28:59",
    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}
```

► Example Pre-Process Script:

```
inputs.incident_id = incident.id
inputs.sentinelone_threat_id = incident.properties.sentinelone_threat_id
```

► Example Post-Process Script:

```
None
```

Function - Sentinelone: Update Threat Status

Update the analyst verdict and the status of a threat in SentinelOne.

SentinelOne: Update Analyst Verdict and Threat Status

SentinelOne Threat Analyst Verdict * ⓘ

SentinelOne Threat Status *

true_positive

resolved

Cancel

Execute

► Inputs:

Name	Type	Required	Example	Tooltip
sentinelone_threat_id	text	Yes	–	–
sentinelone_threat_status	select	Yes	–	–
sentinelone_threat_analyst_verdict	select	Yes	–	–

► Outputs:

NOTE: this example may be in JSON format, yet on the SOAR Platform **results** will be a Python Dictionary

```
results = {
  "content": {
    "data": {
      "affected": 1
    }
  },
  "inputs": {
    "sentinelone_threat_id": "1308905355630511064",
    "sentinelone_threat_status": "in_progress"
  },
  "metrics": {
    "execution_time_ms": 5215,
    "host": "myHost",
    "package": "fn-sentinelone",
  }
}
```

```

    "package_version": "1.0.0",
    "timestamp": "2021-12-13 11:25:54",
    "version": "1.0"
  },
  "raw": null,
  "reason": null,
  "success": true,
  "version": 2.0
}

```

► Example Pre-Process Script:

```

inputs.sentinelone_threat_id = incident.properties.sentinelone_threat_id
inputs.sentinelone_threat_status = rule.properties.sentinelone_threat_status

```

► Example Post-Process Script:

```

so_inputs = results.get("inputs")
threat_id = so_inputs.get("sentinelone_threat_id")
status = so_inputs.get("sentinelone_threat_status")
note = u"<b>SentinelOne: Update Threat Status </b><br> SentinelOne Threat Id:
{0}".format(threat_id)
content = results.get("content")
if content:
    data = content.get("data")
    if data:
        if int(data.get("affected")) <= 0:
            note = u"{0} Threat Status <b>{1}</b> NOT updated in SentinelOne threat.".format(note,
status)
        else:
            note = u"{0} Threat Status <b>{1}</b> updated in SentinelOne threat.".format(note,
status)
    else:
        note = u"{0} Threat Status <b>{1}</b> NOT updated. No 'data' returned from
function".format(note, status)
else:
    note = u"{0} Threat Status <b>{1}</b> NOT updated. No content returned from
function".format(note, status)

incident.addNote(helper.createRichText(note))

```

Script - Convert JSON to rich text v1.1

This script converts a json object into a hierarchical display of rich text and adds the rich text to an incident's rich text (custom) field or an incident note. A workflow property is used to share the json to convert and identify parameters used on how to perform the conversion.

Typically, a function will create the workflow property 'convert_json_to_rich_text', and this script will run after that function to perform the conversion.

Features:

- Display the hierarchical nature of json, presenting the json keys (sorted if specified) as bold labels
- Provide links to found URLs
- Create either an incident note or add results to an incident (custom) rich text field.

Object: incident

► Script Text:

```
# (c) Copyright IBM Corp. 2010, 2020. All Rights Reserved.
VERSION = 1.1
"""
    This script converts a json object into a hierarchical display of rich text and adds the
    rich text to an incident's rich text (custom) field or an incident note.
    A workflow property is used to define the json to convert and identify parameters used on
    how to perform the conversion.
    Typically, a function will create workflow property and this script will run after that
    function to perform the conversion.
    Features:
        * Display the hierarchical nature of json, presenting the json keys as bold labels
        * Provide links to found URLs
        * Create either an incident note or add results to an incident (custom) rich text field.

    In order to use this script, define a workflow property called: convert_json_to_rich_text,
    to define the json and parameters to use for the conversion.
    Workflow properties can be added using a command similar to this:
    workflow.addProperty('convert_json_to_rich_text', {
        "version": 1.1,
        "header": "Artifact scan results for: {}".format(artifact.value),
        "padding": 10,
        "separator": u"<br />",
        "sort": True,
        "json": results.content,
        "json_omit_list": ["omit"],
        "incident_field": None
    })

    Format of workflow.property.convert_json_to_rich_text:
    {
        "version": 1.1, [this is for future compatibility]
        "header": str, [header line to add to converted json produced or None. Ex: Results from
        scanning artifact: xxx. The header may contain rich text tags]
        "padding": 10, [padding for nested json elements, or defaults to 10]
        "separator": u"<br />"|list such as ['<span>','</span>'], [html separator between json
        keys and lists or defaults to html break: '<br />'.
                                If a list, then the data is brackets by the
        pair specified]
        "sort": True|False, [sort the json keys at each level when displayed]
        "json": json, [required json to convert]
        "json_omit_list": [list of json keys to exclude or None]
        "incident_field": "<incident_field>" [indicates a builtin rich text incident field, such
        as 'description'
                                or a custom rich text field in the format:
        'properties.<field>'. default: create an incident note]
    }
"""

import re

# needed for python 3
try:
    unicode("abc")
except:
    unicode = str

rc = re.compile(r'http[s]?://(?:[a-zA-Z]|[0-9]|[$-_@.&+#\?]|[!*\\(\),]|(?:%[0-9a-fA-F][0-9a-fA-F]))+')

class ConvertJson:
    """Class to hold the conversion parameters and perform the conversion"""

    def __init__(self, omit_keys=[], padding=10, separator=u"<br />", sort_keys=False):
        self.omit_keys = omit_keys
```

```

self.padding = padding
self.separator = separator
self.sort_keys = sort_keys

def format_link(self, item):
    """[summary]
        Find embedded urls (http(s)) and add html anchor tags to display as links
    Args:
        item ([string])

    Returns:
        [str]: None|original text if no links|text with html links
    """
    formatted_item = item
    if item and not isinstance(item, (int, bool, float)):
        list = rc.findall(item)
        if list:
            for link in list:
                formatted_item = formatted_item.replace(link, u"<a target='blank'
href='{0}'>{0}</a>".format(link))

    return formatted_item

def expand_list(self, list_value, is_list=False):
    """[summary]
        convert items to html, adding indents to nested dictionaries.
    Args:
        list_value ([dict|list]): json element

    Returns:
        [str]: html converted code
    """
    if not isinstance(list_value, list):
        return self.format_link(list_value)
    elif not list_value:
        return u"None<br>"

    try:
        items_list = [] # this will ensure list starts on second line of key label
        for item in list_value:
            if isinstance(item, dict):
                result = self.convert_json_to_rich_text(item)
                if is_list:
                    items_list.append(u"<li>{}</li>".format(result))
                else:
                    items_list.append(result)
            elif isinstance(item, list):
                items_list.append(self.expand_list(item, is_list=True))
            elif is_list:
                items_list.append(u"<li>{}</li>".format(self.format_link(unicode(item))))
            else:
                items_list.append(self.format_link(unicode(item)))

        expand_list_result = self.add_separator(self.separator if not is_list else u"",
                                                items_list,
                                                is_list=is_list)

        if is_list:
            return u"<ul>{}</ul>".format(expand_list_result)
        else:
            return u"<div style='padding:5px'>{}</div>".format(expand_list_result)
    except Exception as err:
        return str(err)

def convert_json_to_rich_text(self, sub_dict):

```

```

"""[summary]
Walk dictionary tree and convert to html for better display
Args:
    sub_dict ([type]): [description]

Returns:
    [type]: [description]
"""
notes = []
if sub_dict:
    if isinstance(sub_dict, list):
        expanded_list = self.expand_list(sub_dict, is_list=True)
        notes.append(self.add_separator(self.separator, expanded_list))
    else:
        keys = sorted(sub_dict.keys()) if self.sort_keys else sub_dict.keys()

        for key in keys:
            if key not in self.omit_keys:
                value = sub_dict[key]
                is_list = isinstance(value, list)
                item_list = [u"<strong>{0}</strong>: ".format(key)]
                if isinstance(value, dict):
                    convert_result = self.convert_json_to_rich_text(value)
                    if convert_result:
                        item_list.append(u"<div style='padding:{}px'>{}".format(self.padding, convert_result))
                    else:
                        item_list.append(u"None<br>")
                else:
                    item_list.append(self.expand_list(value, is_list=is_list))
                notes.append(self.add_separator(self.separator, u"".join(unicode(v) for v in item_list), is_list=is_list))

result_notes = u"".join(notes)
if isinstance(self.separator, list):
    return result_notes
else:
    return result_notes.replace(
        u"</div>{0}".format(self.separator), u"</div>").replace(
        u"{0}</div>".format(self.separator), u"</div>")
    # tighten up result

def add_separator(self, separator, items, is_list=False):
    """
    apply the separator to the data
    :param separator: None, str or list such as ['<span>', '</span>']
    :param items: str or list to add separator
    :return: text with separator applied
    """
    _items = items

    if not _items:
        return "<br>"

    if not isinstance(_items, list):
        _items = [_items]

    if isinstance(separator, list):
        return u"".join([u"{}{}{}".format(separator[0], item, separator[1]) for item in _items])

    return u"{}{}".format(separator.join(_items), separator if not is_list else u"")

def get_properties(property_name):
    """
    Logic to collect the json and parameters from a workflow property.

```

```

Args:
    property_name: workflow property to reference
Returns:
    padding, separator, header, json_omit_list, incident_field, json, sort_keys
"""
if not workflow.properties.get(property_name):
    helper.fail("workflow.properties.{0} undefined".format(property_name))

padding = int(workflow.properties[property_name].get("padding", 10))
separator = workflow.properties[property_name].get("separator", u"<br />")
if isinstance(separator, list) and len(separator) != 2:
    helper.fail("list of separators should be specified as a pair such as ['<div>', '</div>']: {}".format(separator))

header = workflow.properties[property_name].get("header")
json_omit_list = workflow.properties[property_name].get("json_omit_list")
if not json_omit_list:
    json_omit_list = []
incident_field = workflow.properties[property_name].get("incident_field")
json = workflow.properties[property_name].get("json", {})
if not isinstance(json, dict) and not isinstance(json, list):
    helper.fail("json element is not formatted correctly: {}".format(json))
sort_keys = bool(workflow.properties[property_name].get("sort", False))

return padding, separator, header, json_omit_list, incident_field, json, sort_keys

## S T A R T
if 'workflow' in globals():
    padding, separator, header, json_omit_list, incident_field, json, sort_keys =
get_properties('convert_json_to_rich_text')

    if header:
        if isinstance(separator, list):
            hdr = u"{0}{1}{2}".format(separator[0], header, separator[1])
        else:
            hdr = u"{0}{1}".format(header, separator)
    else:
        hdr = u""

    convert = ConvertJson(omit_keys=json_omit_list, padding=padding, separator=separator,
sort_keys=sort_keys)
    converted_json = convert.convert_json_to_rich_text(json)
    result = u"{}{}".format(hdr, converted_json if converted_json else "\nNone")

    rich_text_note = helper.createRichText(result)
    if incident_field:
        incident[incident_field] = rich_text_note
    else:
        incident.addNote(rich_text_note)

```

Data Table - SentinelOne Agent

Here is an example of the SentinelOne Agent data table:

SentinelOne Agent

Search...

PrintExport

Query Date	Computer Name	External IP	Site	Threat Count	Network Status	Is Active	OS Name	Agent Version	UUID	Agent ID	Domain	Created At	Registered At	Updated At
12/10/2021 10:17:49	ms-Alienware-R9	152.2.6.113	IBM	0	connected	Yes	Linux	21.10.1.6	785db032-4782-6c4f-2e5d-61f1e818c622	1266775030632061040	unknown	2021-10-14T19:35:51.422050Z	2021-10-14T19:35:51.418819Z	2021-12-01T12:48:46.058685Z

Displaying 1 - 1 of 1

API Name:

sentinelone_agents_dt

Columns:

Column Name	API Access Name	Type	Tooltip
Agent ID	sentinelone_dt_agent_id	text	-
Agent Version	sentinelone_dt_agent_version	text	-
Computer Name	sentinelone_dt_computername	text	-
Created At	sentinelone_dt_created	text	-
Domain	sentinelone_dt_domain	text	-
External IP	sentinelone_dt_external_ip	text	-
Is Active	sentinelone_dt_is_active	boolean	-
Network Status	sentinelone_dt_network_status	textarea	-
OS Name	sentinelone_dt_os_name	text	-
Query Date	sentinelone_dt_query_date	datetimepicker	-
Registered At	sentinelone_dt_registered	text	-
Site	sentinelone_dt_site	text	-
Threat Count	sentinelone_dt_threat_count	number	-
Updated At	sentinelone_dt_updated	text	-
UUID	sentinelone_dt_uuid	text	-

Custom Fields

Label	API Access Name	Type	Prefix	Placeholder	Tooltip
SentinelOne Agent Id	sentinelone_agent_id	text	properties	-	-
SentinelOne Classification	sentinelone_classification	text	properties	-	-
SentinelOne Threat Confidence Level	sentinelone_confidence_level	text	properties	-	-

Label	API Access Name	Type	Prefix	Placeholder	Tooltip
SentinelOne Incident Status	<code>sentinelone_incident_status</code>	text	properties	-	-
SentinelOne Mitigation Status	<code>sentinelone_mitigation_status</code>	text	properties	-	-
SentinelOne Mitigation Status Description	<code>sentinelone_mitigation_status_description</code>	text	properties	-	-
SentinelOne Threat Analyst Verdict	<code>sentinelone_threat_analyst_verdict</code>	select	properties	-	SentinelOne threat analyst verdict
SentinelOne Threat Id	<code>sentinelone_threat_id</code>	text	properties	-	-
SentinelOne Threat Name	<code>sentinelone_threat_name</code>	text	properties	-	-
SentinelOne Threat Overview URL	<code>sentinelone_threat_overview_url</code>	textarea	properties	-	-

Rules

Rule Name	Object	Workflow Triggered
SentinelOne: Abort Disk Scan	sentinelone_agents_dt	<code>sentinelone_abort_disk_scan</code>
SentinelOne: Add Agent to Data Table	incident	<code>sentinelone_add_agent_to_data_table</code>
SentinelOne: Connect Agent to Network	sentinelone_agents_dt	<code>sentinelone_connect_to_network</code>
SentinelOne: Disconnect Agent From Network	sentinelone_agents_dt	<code>sentinelone_disconnect_from_network</code>
SentinelOne: Get Hash Reputation	artifact	<code>sentinelone_get_hash_reputation</code>
SentinelOne: Initiate Disk Scan	sentinelone_agents_dt	<code>sentinelone_initiate_disk_scan</code>
SentinelOne: Resolve Threat in SentinelOne	incident	<code>sentinelone_resolve_threat_in_sentinelone</code>
SentinelOne: Restart Agent	sentinelone_agents_dt	<code>sentinelone_restart_agent</code>
SentinelOne: Send Note to SentinelOne Threat	note	<code>sentinelone_send_soar_note_to_sentinelone</code>
SentinelOne: Send SOAR Note to SentinelOne	note	<code>sentinelone_send_soar_note_to_sentinelone</code>
SentinelOne: Shutdown Agent	sentinelone_agents_dt	<code>sentinelone_shutdown_agent</code>
SentinelOne: Update Agent in Data table	sentinelone_agents_dt	<code>sentinelone_update_agent_in_data_table</code>
SentinelOne: Update Notes from SentinelOne	incident	<code>sentinelone_update_notes_from_sentinelone</code>
SentinelOne: Update Analyst Verdict and Threat Status	incident	<code>sentinelone_update_threat_status</code>
SentinelOne: Write Agent Details to Note	sentinelone_agents_dt	<code>sentinelone_write_agent_details_to_note</code>

Rule Name	Object	Workflow Triggered
SentinelOne: Write Threat Details to Note	incident	sentinelone_write_threat_details_to_note

Troubleshooting & Support

Refer to the documentation listed in the Requirements section for troubleshooting information.

For Support

This is a IBM Community provided App. Please search the Community ibm.biz/soarcommunity for assistance.

Template Appendix

Below are examples of templates for creating, updating, and closing IBM SOAR incidents. Customize these templates and refer to them in the app.config file. These default jinja templates map IBM SOAR fields to SentinelOne threat and agent fields.

Each template should be reviewed for correctness in your enterprise. For instance, closing a SOAR incident may include additional custom fields which the default template does not include.

- incident_creation_template
- incident_close_template
- incident_update_template