



SWIM Closed Loop Automation

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About SWIM Closed Loop Automation

This release supports closed loop automation for software image management (SWIM) between Cisco DNA Center and ServiceNow. Closed-loop automation consists of a user configuring the provisioning of software device images in Cisco DNA Center. This configuration information is then communicated directly from Cisco DNA Center to ServiceNow as an immediate or scheduled change request. The ServiceNow administrator reviews the change request and either approves or rejects it in ServiceNow. The change request acceptance or rejection is then communicated back to Cisco DNA Center.

After receipt of an approved change request from ServiceNow, Cisco DNA Center performs the software update at that time (immediately) or at its scheduled future time.

After Cisco DNA Center successfully performs the software update, a notification (task completed) is sent back to ServiceNow. If the software update fails, then this is also communicated back to ServiceNow (task fail), so that the user can then manually perform the software update in Cisco DNA Center.



Note If the SWIM provisioning is stopped by the user in Cisco DNA Center during this process, a task termination notification is sent to ServiceNow.

Perform the following procedures to enable SWIM closed loop automation between Cisco DNA Center and ServiceNow:

1. Review the requirements to ensure that the prerequisites for this feature have been met. See [SWIM Closed Loop Automation Requirements, on page 2](#).
2. Review the SWIM closed loop automation workflow to ensure that the required Cisco DNA Center admin and ServiceNow admin tasks are performed for this feature. See [SWIM Closed Loop Automation Workflow, on page 2](#).

SWIM Closed Loop Automation Requirements

The following table lists the requirements for SWIM closed loop automation feature.

Table 1: SWIM Closed Loop Automation Requirements

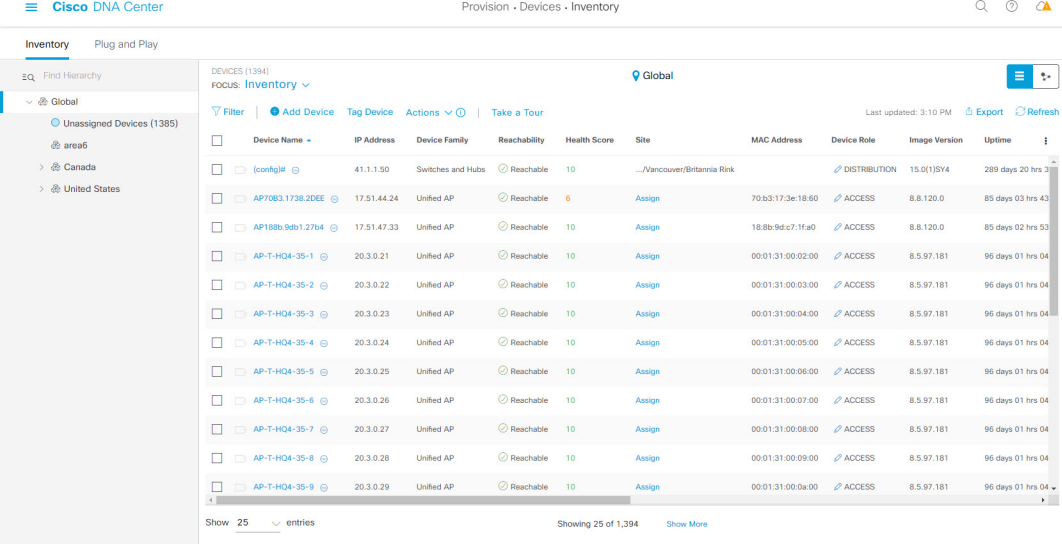
Software Product, App, or Procedure	Requirement
Cisco DNA Center	Release 2.2.2.
Service Now	The following ServiceNow release versions support this feature: <ul style="list-style-type: none"> • Paris • Orlando
Cisco DNA Center app	Cisco DNA app (version 2.0.0) This app is available through the ServiceNow website located at: https://store.servicenow.com/sn_appstore_store.do#!/store/application/03eb0f4ddb6ba00f27978b5ae96197b/2.0.0 The Cisco DNA app is to be installed in your ServiceNow instance by a ServiceNow administrator.
Cisco DNA Center to ServiceNow ITSM integration	Review the <i>Cisco DNA Center Integration with ServiceNow using the Cisco DNA App</i> workflow and use it to set up the integration. See Cisco DNA Center Integration with ServiceNow Using the Cisco DNA App .

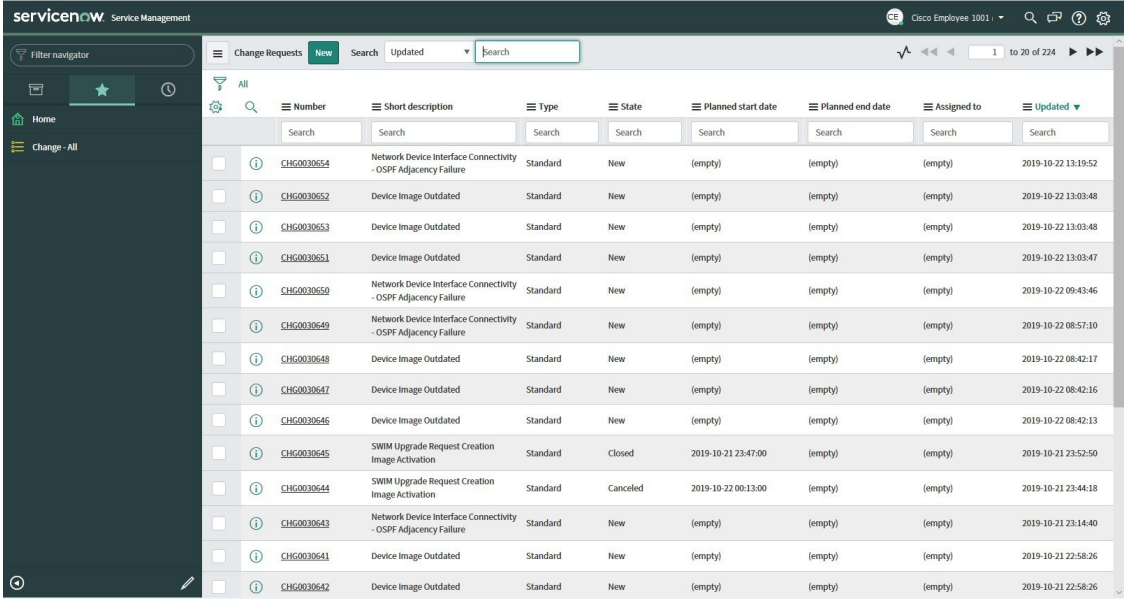
SWIM Closed Loop Automation Workflow

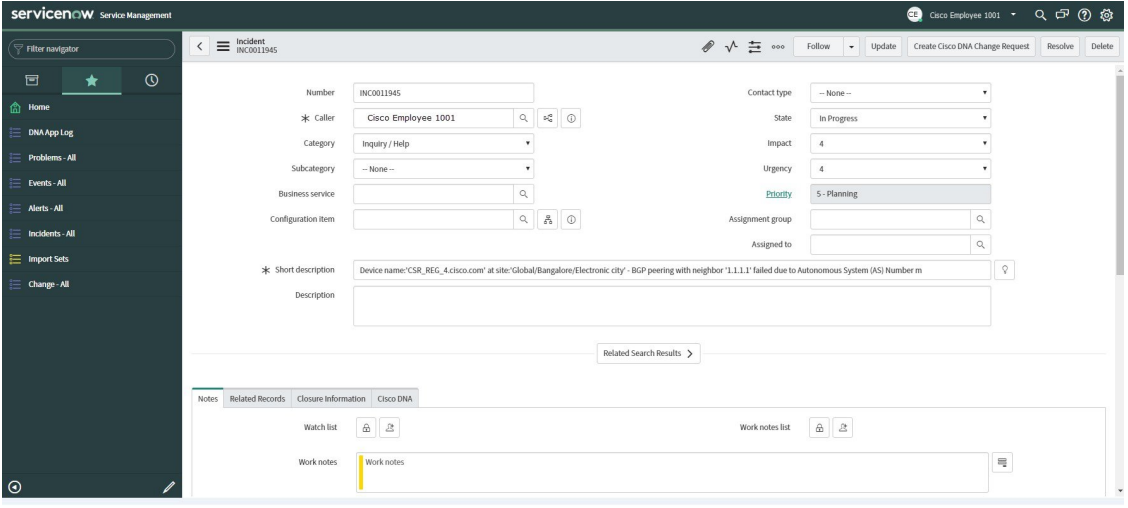
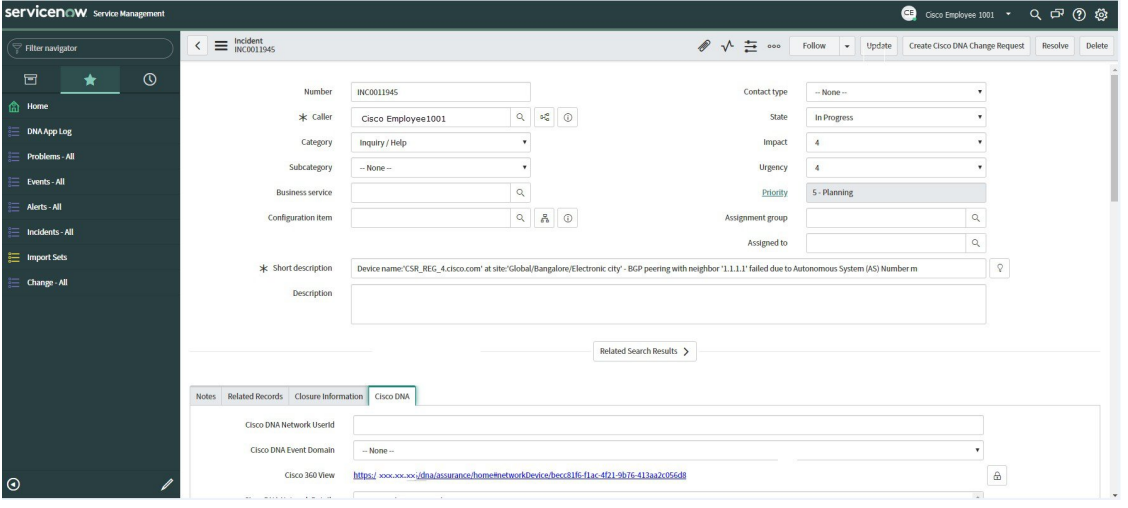
The following table describes the SWIM closed loop automation workflow between Cisco DNA Center and ServiceNow.

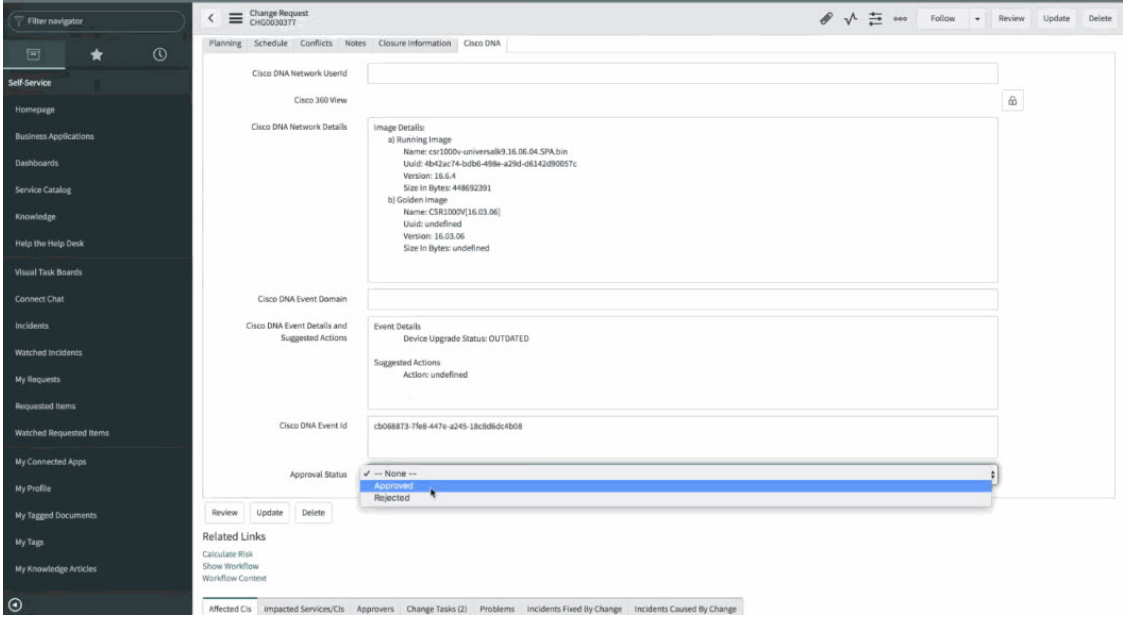
Table 2: SWIM Closed Loop Automation Workflow

Step	Description
Step 1	The Cisco DNA Center admin configures the Image Repository to prepare for the provisioning of devices in the network. Note See the Manage Software Images chapter in the Cisco DNA Center User Guide for information about setting up the Image Repository, as well as to review the software image provisioning process.

Step	Description
Step 2	<p>The Cisco DNA Center admin distributes the software image to a device or devices at the present time or schedules this activity for a later time.</p> <p>Note Before this step is done, ensure that the Cisco DNA Center Automation events for ITSM (ServiceNow) bundle is configured and activated.</p> <ul style="list-style-type: none"> • From the Cisco DNA Center home page, the admin clicks Provision. • From the Focus drop-down list, the admin chooses Software Images and selects the device with the image to upgrade. • From the Actions drop-down list, the admin chooses Software Images > Update Image and does the following: <ul style="list-style-type: none"> • Distribute: Clicks Now to start the distribution immediately or clicks Later to schedule the distribution at a specific time. • Clicks Next. • Activate: Clicks Now to start the activation immediately or clicks Later to schedule the activation at a specific time. • Confirm: Clicks Confirm to confirm the update. <p>Figure 1: Cisco DNA Assurance Provision</p>  <p>Note See the Manage Software Images chapter in the Cisco DNA Center User Guide for detailed information about this step.</p>

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Step 3	<p>Once a software image distribution is created in Cisco DNA Center (software image update to be activated immediately or later), then a SWIM event is created and communicated directly to the ServiceNow ITSM as a change request ticket. This is done through the use of APIs from the DNA app. The change request ticket status is new.</p> <p>The SWIM event appears in the ServiceNow GUI in the ServiceNow Change Requests table.</p> <p>Figure 2: ServiceNow Change Requests</p>  <table border="1" data-bbox="358 531 1479 1125"> <thead> <tr> <th>Number</th> <th>Short description</th> <th>Type</th> <th>State</th> <th>Planned start date</th> <th>Planned end date</th> <th>Assigned to</th> <th>Updated</th> </tr> </thead> <tbody> <tr> <td>CHG0030654</td> <td>Network Device Interface Connectivity - OSPF Adjacency Failure</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 13:19:52</td> </tr> <tr> <td>CHG0030652</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 13:03:48</td> </tr> <tr> <td>CHG0030653</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 13:03:48</td> </tr> <tr> <td>CHG0030651</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 13:03:47</td> </tr> <tr> <td>CHG0030650</td> <td>Network Device Interface Connectivity - OSPF Adjacency Failure</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 09:43:46</td> </tr> <tr> <td>CHG0030649</td> <td>Network Device Interface Connectivity - OSPF Adjacency Failure</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 08:57:10</td> </tr> <tr> <td>CHG0030648</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 08:42:17</td> </tr> <tr> <td>CHG0030647</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 08:42:16</td> </tr> <tr> <td>CHG0030646</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-22 08:42:13</td> </tr> <tr> <td>CHG0030645</td> <td>SWIM Upgrade Request Creation Image Activation</td> <td>Standard</td> <td>Closed</td> <td>2019-10-21 23:47:00</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-21 23:52:50</td> </tr> <tr> <td>CHG0030644</td> <td>SWIM Upgrade Request Creation Image Activation</td> <td>Standard</td> <td>Canceled</td> <td>2019-10-22 00:13:00</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-21 23:44:18</td> </tr> <tr> <td>CHG0030643</td> <td>Network Device Interface Connectivity - OSPF Adjacency Failure</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-21 23:14:40</td> </tr> <tr> <td>CHG0030641</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-21 22:58:26</td> </tr> <tr> <td>CHG0030642</td> <td>Device Image Outdated</td> <td>Standard</td> <td>New</td> <td>(empty)</td> <td>(empty)</td> <td>(empty)</td> <td>2019-10-21 22:58:26</td> </tr> </tbody> </table>	Number	Short description	Type	State	Planned start date	Planned end date	Assigned to	Updated	CHG0030654	Network Device Interface Connectivity - OSPF Adjacency Failure	Standard	New	(empty)	(empty)	(empty)	2019-10-22 13:19:52	CHG0030652	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-22 13:03:48	CHG0030653	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-22 13:03:48	CHG0030651	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-22 13:03:47	CHG0030650	Network Device Interface Connectivity - OSPF Adjacency Failure	Standard	New	(empty)	(empty)	(empty)	2019-10-22 09:43:46	CHG0030649	Network Device Interface Connectivity - OSPF Adjacency Failure	Standard	New	(empty)	(empty)	(empty)	2019-10-22 08:57:10	CHG0030648	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-22 08:42:17	CHG0030647	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-22 08:42:16	CHG0030646	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-22 08:42:13	CHG0030645	SWIM Upgrade Request Creation Image Activation	Standard	Closed	2019-10-21 23:47:00	(empty)	(empty)	2019-10-21 23:52:50	CHG0030644	SWIM Upgrade Request Creation Image Activation	Standard	Canceled	2019-10-22 00:13:00	(empty)	(empty)	2019-10-21 23:44:18	CHG0030643	Network Device Interface Connectivity - OSPF Adjacency Failure	Standard	New	(empty)	(empty)	(empty)	2019-10-21 23:14:40	CHG0030641	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-21 22:58:26	CHG0030642	Device Image Outdated	Standard	New	(empty)	(empty)	(empty)	2019-10-21 22:58:26
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Step	Description
<p>Step 4</p>	<p>In the Change Requests table, the ServiceNow admin clicks on the change request number (identifier) to open and review its status and data. In the ServiceNow GUI, the ServiceNow admin can edit the change request. For example, the admin can change the State from 'New' to 'Scheduled' and enter 'Change Management' for the Assignment group. The ServiceNow admin can also identify the SWIM change request with information in the Short Description field.</p> <p>Figure 3: Change Request</p>  <p>The screenshot shows the ServiceNow interface for a Change Request. The 'Number' field is 'INC0011945'. The 'Caller' is 'Cisco Employee 1001'. The 'Category' is 'Inquiry / Help'. The 'State' is 'In Progress'. The 'Impact' is '4'. The 'Urgency' is '4'. The 'Priority' is '5 - Planning'. The 'Short description' field contains the text: 'Device name: 'CSR_REG_4.cisco.com' at site: 'Global/Bangalore/Electronic city' - BGP peering with neighbor '1.1.1.1' failed due to Autonomous System (AS) Number m'. The 'Description' field is empty. The 'Assignment group' field is empty. The 'Assigned to' field is empty. The 'Cisco DNA' tab is selected in the bottom navigation bar.</p>
<p>Step 5</p>	<p>The ServiceNow admin now clicks the Cisco DNA tab in the change request. Important additional data synchronized from Cisco DNA Center to ServiceNow can be viewed in this tab.</p> <p>Figure 4: Cisco DNA Tab</p>  <p>The screenshot shows the ServiceNow interface for a Change Request, specifically the 'Cisco DNA' tab. The 'Number' field is 'INC0011945'. The 'Caller' is 'Cisco Employee 1001'. The 'Category' is 'Inquiry / Help'. The 'State' is 'In Progress'. The 'Impact' is '4'. The 'Urgency' is '4'. The 'Priority' is '5 - Planning'. The 'Short description' field contains the text: 'Device name: 'CSR_REG_4.cisco.com' at site: 'Global/Bangalore/Electronic city' - BGP peering with neighbor '1.1.1.1' failed due to Autonomous System (AS) Number m'. The 'Description' field is empty. The 'Assignment group' field is empty. The 'Assigned to' field is empty. The 'Cisco DNA' tab is selected in the bottom navigation bar. The 'Cisco DNA Network User ID' field is empty. The 'Cisco DNA Event Domain' field is empty. The 'Cisco 360 View' field contains the URL: 'https://xxx.xx.xx:8080/assurance/home/networkDevice/becc818f-11ac-4721-9b7c-613aa2056d8'.</p>

Step	Description
Step 6	<p>The ServiceNow admin now either approves or rejects the change request ticket in the ServiceNow GUI. In the Cisco DNA tab, the ServiceNow admin clicks the Approval Status field and clicks either Approved to approve the request or Rejected to reject the request.</p> <p>Note Before the change request is executed, it must be approved in ServiceNow. Only after an approval in ServiceNow will the change request be executed in Cisco DNA Center.</p> <p>Figure 5: Cisco DNA Approval Status Field</p> 
Step 7	<p>After the ServiceNow admin approves the ticket and the status of the change request is changed to 'Implement', a notification is sent to Cisco DNA Center. In case the ticket is rejected, then the update is sent to Cisco DNA Center in 'Scheduled' state itself and the ServiceNow ticket is automatically canceled.</p>
Step 8	<p>After a successful software image update in Cisco DNA Center, a notification (task completed) is sent back to ServiceNow. ServiceNow then closes the change request ticket. The change request ticket closure is done through the use of APIs from the DNA app.</p> <p>Note For a failed software update, ServiceNow proceeds to report the failure so that the ServiceNow admin can manually take action on the change request ticket. For a terminated software update, the change request ticket is canceled in ServiceNow. The reporting of both a failed software image update and a terminated software image update are also done through the use of APIs from the DNA app.</p>

Step 9

Description

The Cisco DNA Center admin can review the SWIM event by clicking on **Runtime Dashboard > Event Summary**.

Note By clicking the on individual events in the GUI window, the admin accesses additional GUI windows that permit direct access to the event in ServiceNow.

Figure 6: Event Summary

Domain	Event Name	Count
Know Your Network	BGP Tunnel Connectivity	6
Know Your Network	Network Device Interface Connectivity - OSPF Adjacency Failure	6

Step 10

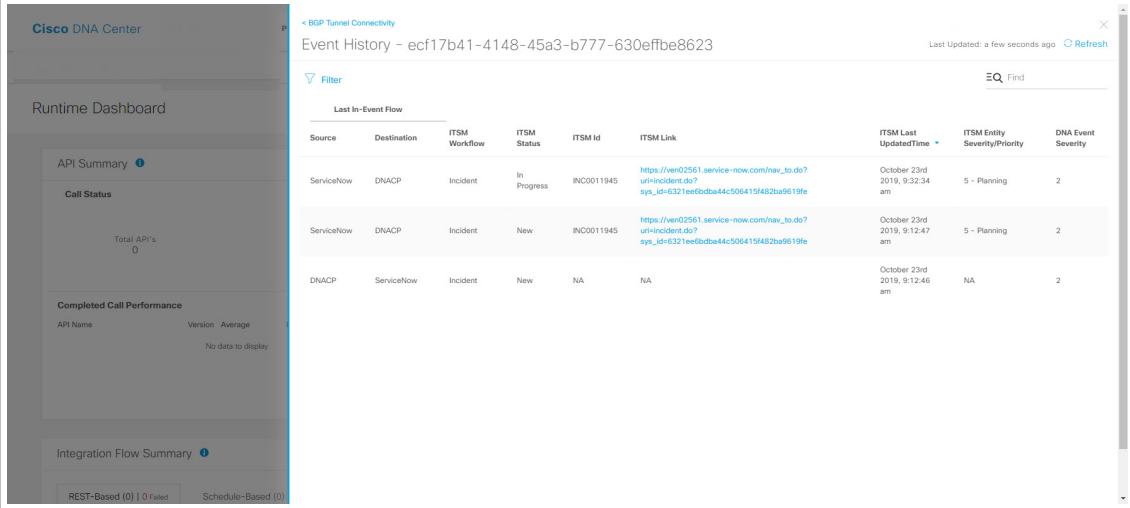
The Cisco DNA Center admin clicks on an event name (link) to view additional detailed data.

Figure 7: Event History

Event Id	Source	Destination	ITSM Workflow	ITSM Status	ITSM Id	ITSM Link	ITSM Last UpdatedTime	ITSM Entity Severity/Priority
4e1f17b41-4143-45a3-b773-630ef0e8623	ServiceNow	DNACP	Incident	In Progress	INC0011945	https://ven02561.service-now.com/nav_to.do?uri=incident.do?sys_id=6321ee6dbd44c506415f482ba9619fe	October 23rd 2019, 9:32:34 am	5 - Planning
697d35fa-64c4-4617-e596-50e64d979830	ServiceNow	DNACP	Incident	Resolved	INC0011943	https://ven02561.service-now.com/nav_to.do?uri=incident.do?sys_id=45db2c23db44c506415f482ba961974	October 23rd 2019, 9:00:39 am	5 - Planning
c6686c12-04ba-45a8-a034-9891ee424af	ServiceNow	DNACP	Problem	Closed/Resolved	PRB0040050	https://ven02561.service-now.com/nav_to.do?uri=problem.do?sys_id=8c89a63db44c506415f482ba9619db	October 23rd 2019, 8:38:13 am	4 - Low
667d5d31-5d8b-4e7d-bdc7-a9e5d9b172ae	ServiceNow	DNACP	RFC	Scheduled	CHG0030363	https://ven02561.service-now.com/nav_to.do?uri=change_request.do?sys_id=44f8cae7fb68c90475e5ad3ca96197a	October 23rd 2019, 7:31:23 am	4 - Low
2195484e-2b09-4e49-9c3c-1551a423bf03	ServiceNow	DNACP	Incident	Resolved	INC0011941	https://ven02561.service-now.com/nav_to.do?uri=incident.do?sys_id=a4d8fae27db6bc350475a5ad3ca96199e	October 23rd 2019, 7:20:14 am	5 - Planning
84edec3b-						https://ven02561.service-now.com/nav_to.do?uri=incident.do?sys_id=...	October 23rd	

Step | **Description**

Step 11 | The Cisco DNA Center admin clicks on an event ID number (link) to view only data associated with that specific event.
Figure 8: Event ID Data



Step 12 | The Cisco DNA Center admin clicks on the ITSM Link to return to the ServiceNow Service Management GUI and specific incident.
Figure 9: ServiceNow Incident

