Building block Configuration Guide

CUSTOMER

Package: Integration Suite Alerting Framework using SAP BTP Alert Notification Service

19-03-2024

English

Integration Suite Alerting Framework using SAP BTP Alert Notification Service

Contents

1 Prerequisites

1.1. Objectives

This document outlines the strategic solution design for the custom built BTP Alerting Framework within your SAP Integration Suite initiative. It establishes a unified and scalable approach, including exact build objects along with a consistent approach for Alerting using SAP BTP Alert Notification Service.

1.2. Document Scope

This section outlines the scope of alerting framework within the context of your digital transformation. The primary applications covered for alerting are as below:

- SAP Integration Suite – Cloud Integration SAP Integration Suite – API Management
- SAP Cloud Transport Management
- SAP BTP – Platform Events

SAP Integration Suite alerting will cover alerting for below mentioned different scenarios –

No	Capability Workstream
1	Failed (Error) Messages
2	Iflows in Error (Deployed) Status
3	Expiring Keystore Entries in next 30 Days
4	Expired Keystore Entries
5	JMS Issues – exhaustion, critical
6	Explicit/ External Alerts

2 SAP BTP Alert Notification Service

The SAP Alert Notification service within SAP BTP provides a unified API for both alert providers and consumers. Its purpose is to automatically send real-time notifications and alerts related to business and operational events of interest. This service is part of SAP BTP's DevOps portfolio and offers real-time information for both cloud-native and hybrid solutions. It ensures consistency across SAP BTP, enabling users to maintain the same configuration lifecycle and information model. The service excels in gathering technical data from SAP BTP services and can also handle custom scenarios within your application environment. All collected information, whether from the platform or custom scenarios, is transformed into a common "event" model. Customers can subscribe to events relevant to them and choose their preferred delivery channel, which can be email, a custom webhook, an external system, or an API-triggered event. The SAP Alert Notification service supports various integration options, including custom webhooks and integration with external systems like Slack, Microsoft Teams, VictorOps, and ServiceNow.

SAP Reference - https://help.sap.com/docs/alert-notification/sap-alert-notification-for-sap-btp/what-is-sap-alertnotification-service-for-sap-btp

3 SAP BTP Alert Notification Service – API Details

The Alert Notification Producer API is used to post custom events regarding integration suite. These events could be the reflection of important to the business and operations things that happen within the Integration Suite. In Alert Notification, events are divided in three categories:

- Alert
- Notification
- Exception

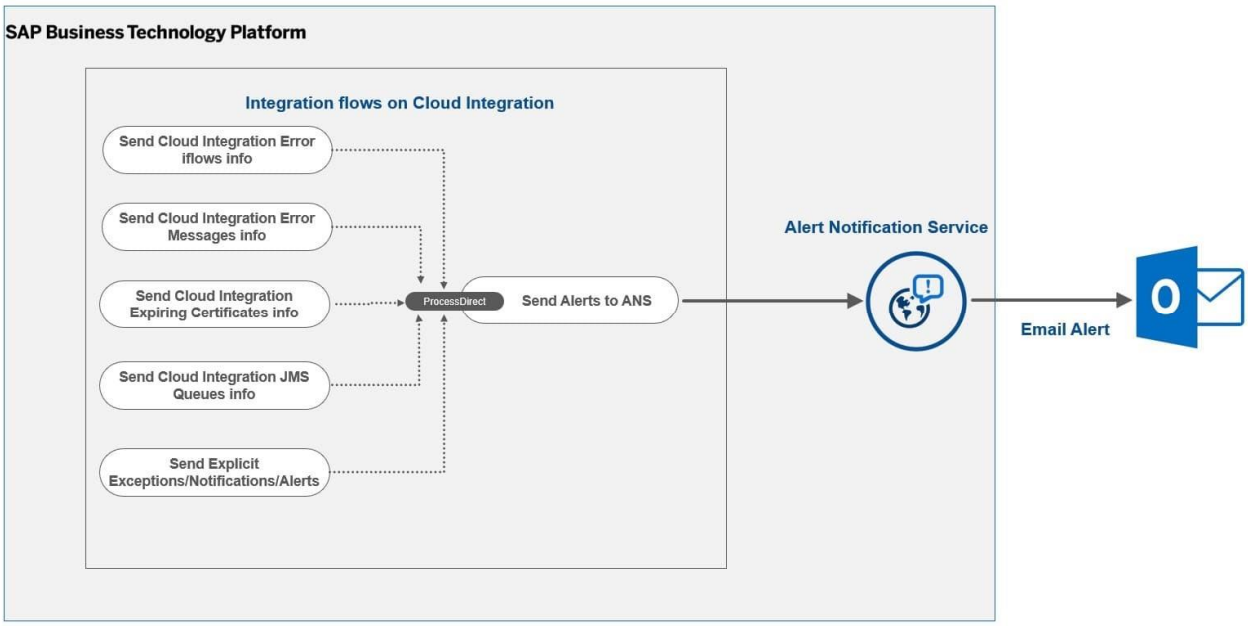
In addition, severity and priority can be adjusted according to needs.

API Business Hub - https://api.sap.com/api/cf_producer_api/overview

The above link gives extensive details about the producer API and all the available properties/options and different tags that can be used to post event to producer API.

More information about administration, integration, training, and education for the Alert Notification in SAP Help Portal – Link

4 High Level End to End Solution Design – Cloud Integration Alerting



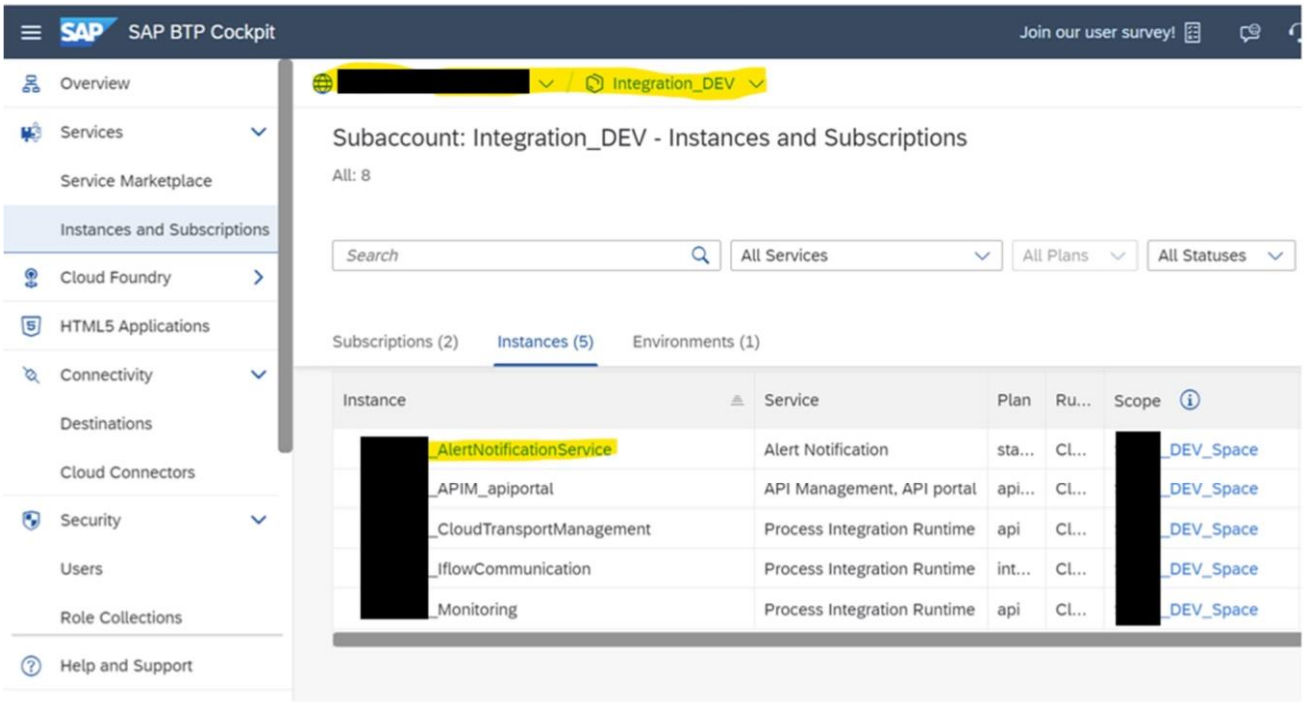
The custom alerting framework for Cloud Integration consists of 6 integration flows as below and various conditions/actions/subscriptions configured on SAP BTP Alert Notification Service.

1: Send Alerts to ANS
2: Send Cloud Integration Error iflows to ANS
3: Send Cloud Integration Error Messages to ANS
4: Send Cloud Integration JMS info to ANS
5: Send Cloud Integration Expiring Certificates to ANS
6: Send Explicit Exceptions-Notifications-Alerts to ANS

5 SAP BTP Alert Notification Service Configuration

An instance of Alert Notification Service should be setup in each of the Integration Tenant as shown below.
Below screenshot represents the Development Tenant – "Integration_DEV" with an Alert Notification Service subscription – "<Customer>_AlertNotificationService".

Initial Setup Reference for the Alert Notification Service - SAP Help



5.1 Conditions

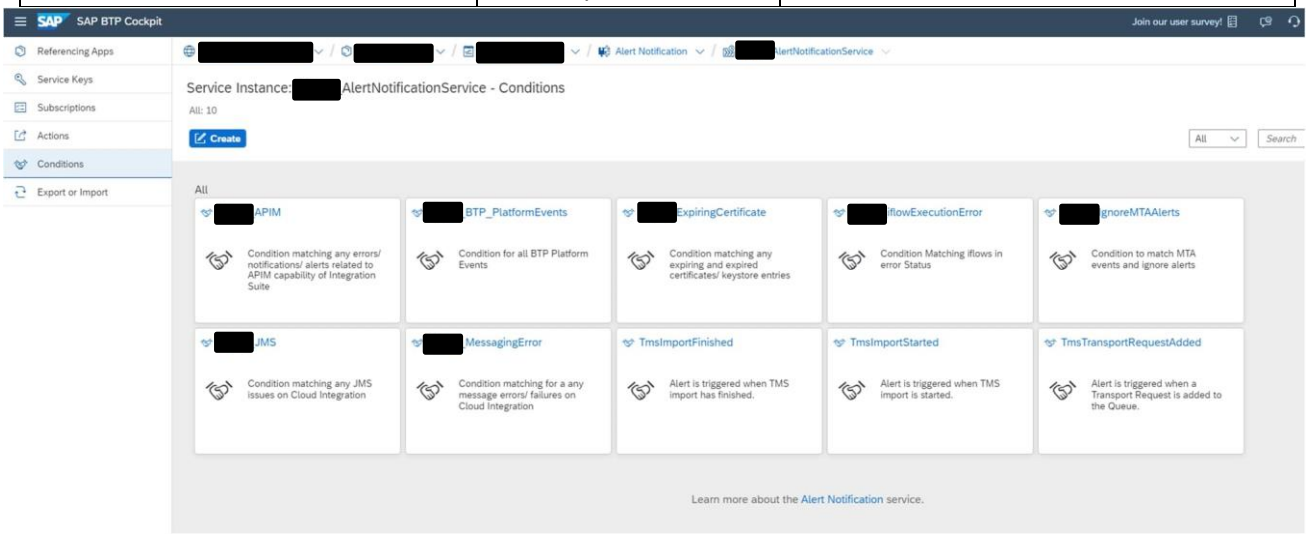
A Condition in SAP Alert Notification Service setup is an entity that represents under what condition one event is matched for delivery.

Managing Condition – SAP Help

In this setup we have several conditions that have been created as below

Condition	Property	Description
<Customer>_APIM	eventType CONTAINS "APIM"	Condition matching any errors/ notifications/ alerts related to APIM capability of Integration Suite
<Customer>_BTP_PlatformEvents	tags.ans:eventScope CONTAINS "CF_SPACE"	Condition for all BTP Platform Events (Built-In Events)
<Customer>_ExpiringCertificate	eventType CONTAINS "Expiry"	Condition Matching iflows in error Status
<Customer>_iflowExecutionError	eventType CONTAINS "CPIIntegrationFlowDeploymentFailure"	A user communicating with an onpremises hosted system by means of mobile device/browser applications.
<Customer>_JMS	eventType CONTAINS "JMS"	Condition matching any JMS issues on Cloud Integration

<Customer>_MessagingError	eventType CONTAINS “CPIIntegrationFlowExecutionFailure”	Condition matching for any message errors/ failures on Cloud Integration
TmsTransportRequestAdded	eventType EQUALS “TmsTransportRequestAdded”	Alert is triggered when a Transport Request is added to the Queue.
TmsImportStarted	eventType EQUALS “TmsImportStarted”	Alert is triggered when TMS import is started.
TmsImportFinished	eventType EQUALS “TmsImportFinished”	Alert is triggered when TMS import has finished.



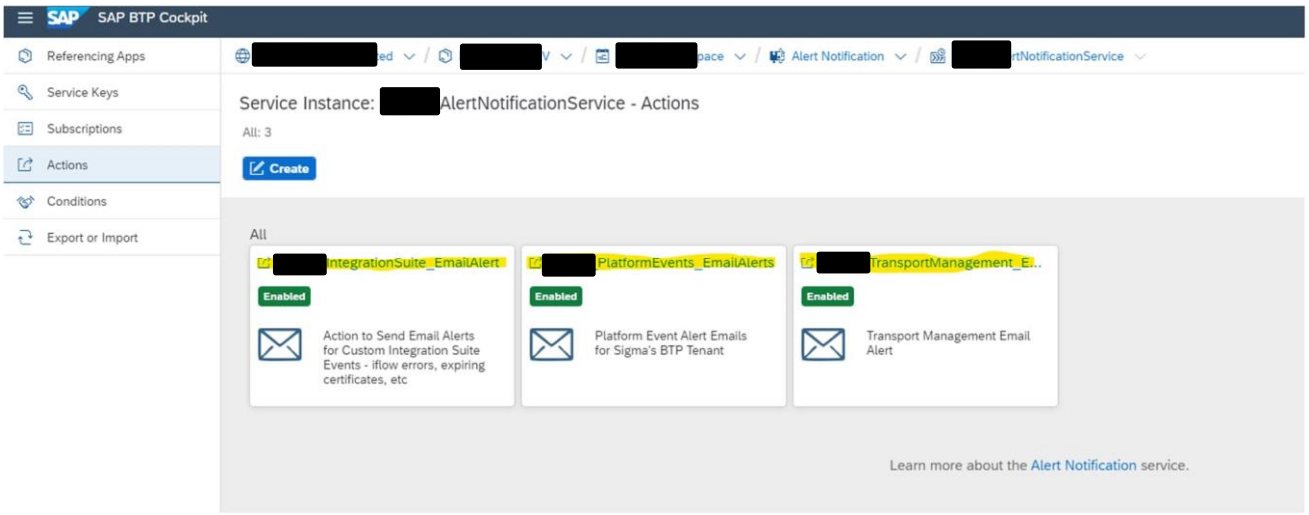
5.2 Actions

An Action in SAP Alert Notification Service setup is an entity that represents where an event will be delivered.

Managing Action – https://help.sap.com/docs/alert-notification/sap-alert-notification-for-sap-btp/managing-conditions?

In your setup we should have below actions that have been created.

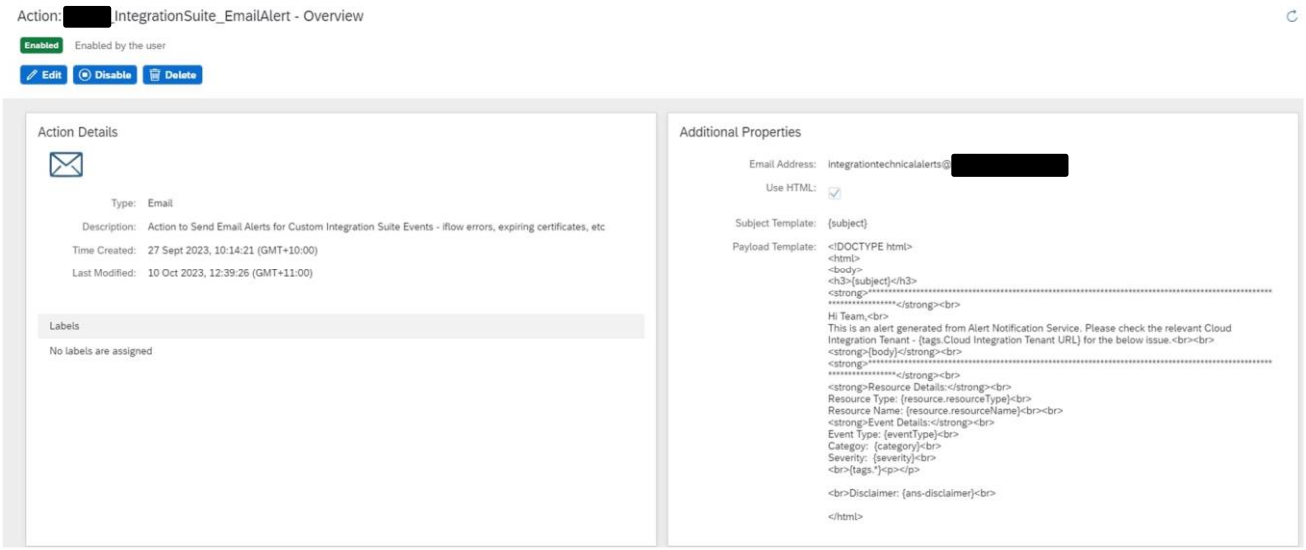
1. <Customer>_IntegrationSuite_EmailAlert
2. <Customer>_PlatformEvents_EmailAlerts
3. <Customer>_TransportManagement_EmailAlert



5.3 <Customer>_IntegrationSuite_EmailAlert

This action is of type – "Email" and is to send email alert for Custom Integration Suite Events.

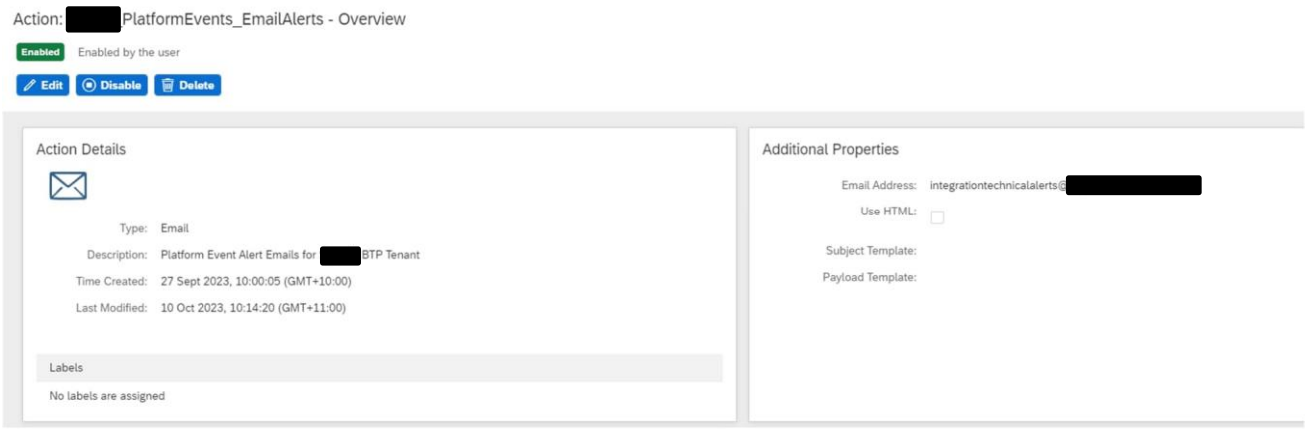
Additional Properties	
Email Address	integrationtechnicalalerts@<email.com>
Use HTML	✓
Subject Template	{subject}
Payload Template	<!DOCTYPE html> <html> <body> {subject} ********** ********** Hi Team, This is an alert generated from Alert Notification Service. Please check the relevant Cloud Integration Tenant - {tags.Cloud Integration Tenant URL} for the below issue. {body} ********** ********** Resource Details: Resource Type: {resource.resourceType} Resource Name: {resource.resourceName} Event Details: Event Type: {eventType} Category: {category} Severity: {severity} {tags.*} Disclaimer: {ans-disclaimer} </html>



5.4 <Customer>_PlatformEvents_EmailAlerts

This action is of type – "Email" and is to send email alert for Platform Events for <Customer>'s BTP Tenant.

Additional Properties	
Email Address	integrationtechnicalalerts@<Email.com>
Use HTML	<Blank>
Subject Template	<Blank>
Payload Template	<Blank>

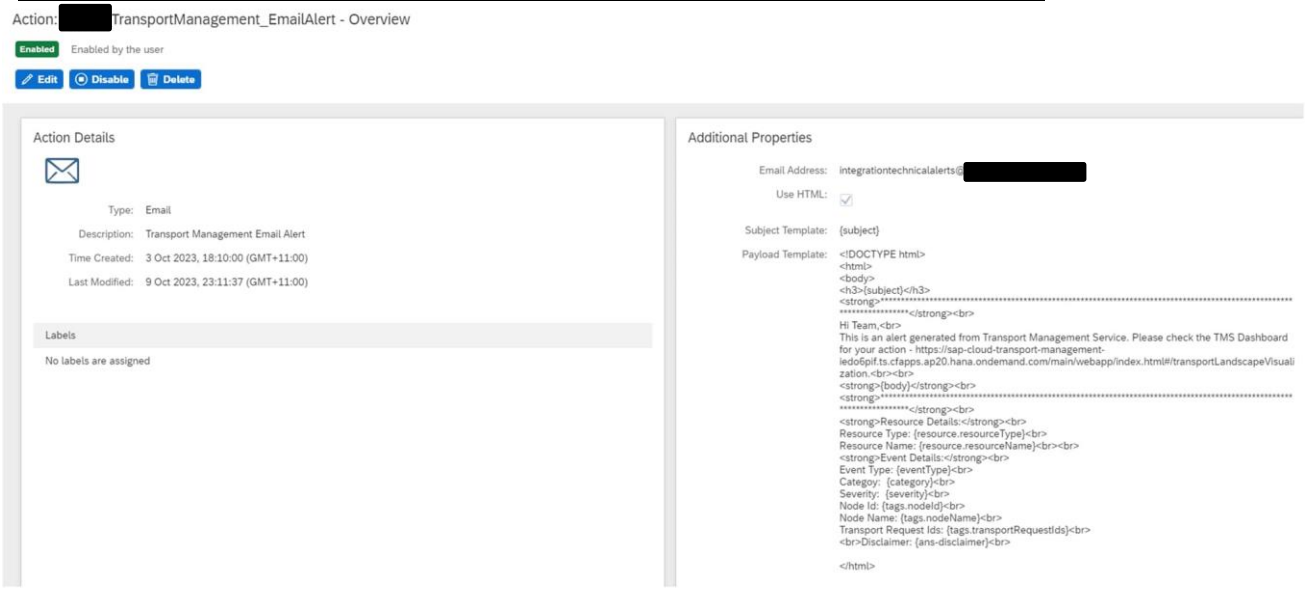


5.5 <Customer>_TransportManagement_EmailAlert

This action is of type – "Email" and is to send email alert for any Cloud Transport Management Events.

Additional Properties	
Email Address	integrationtechnicalalerts@<email.com>
Use HTML	✓
Subject Template	{subject}

Payload Template	<!DOCTYPE html> <html> <body> {subject} ********** ********** Hi Team, This is an alert generated from Transport Management Service. Please check the TMS Dashboard for your action - https://sap-cloud-transport-management-iedo6pif.ts.cfapps.ap20.hana.ondemand.com/main/webapp/index.html#/transportLandscapeVisualization. {body} ********** ********** Resource Details: Resource Type: {resource.resourceType} Resource Name: {resource.resourceName} Event Details: Event Type: {eventType} Categoy: {category} Severity: {severity} Node Id: {tags.nodeId} Node Name: {tags.nodeName} Transport Request Ids: {tags.transportRequestIds} Disclaimer: {ans-disclaimer} </html>



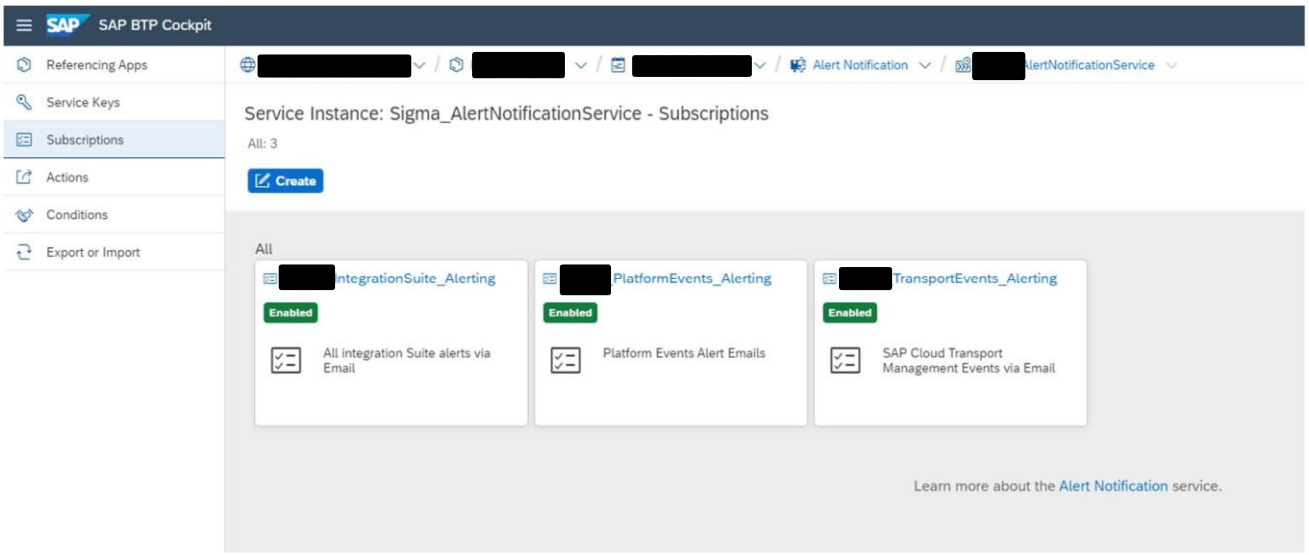
5.6 Subscriptions

A Subscription in SAP Alert Notification Service setup is an entity that that combines actions and conditions, defining what actions are executed upon what events.

Managing Subscription – https://help.sap.com/docs/alert-notification/sap-alert-notification-for-sap-btp/managingsubscriptions?

In your current setup you should have few subscriptions that have been setup as below

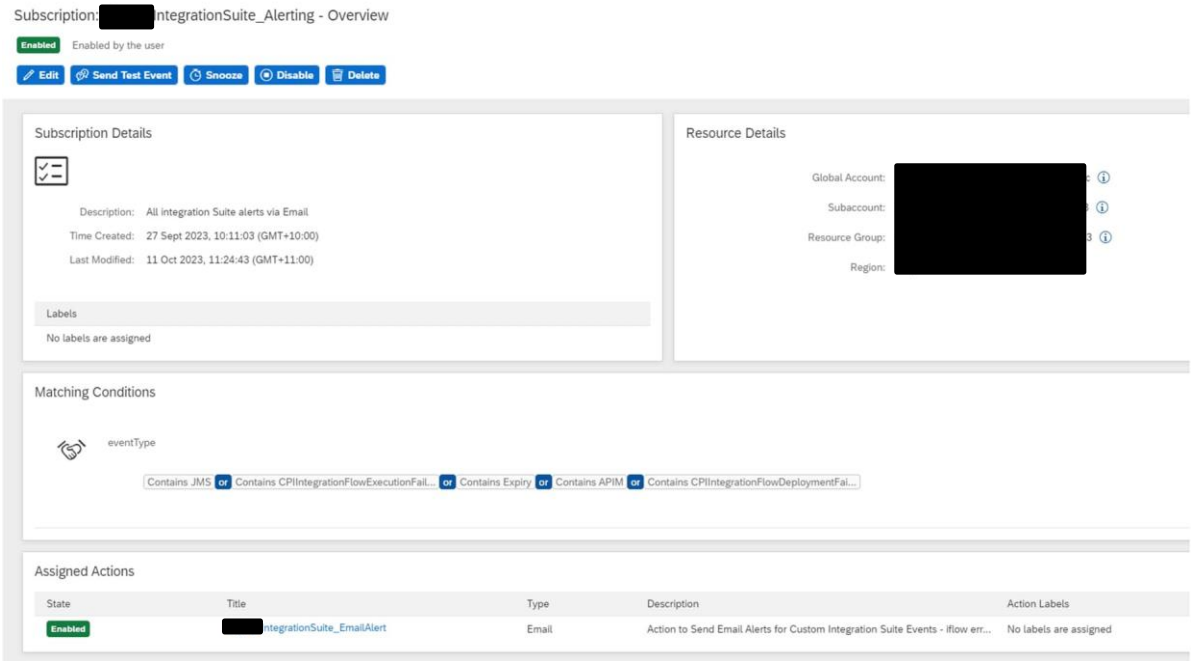
1. <Customer>_IntegrationSuite_Alerting
2. <Customer>_PlatformEvents_Alerting
3. <Customer>_TransportEvents_Alerting



5.7 <Customer>_IntegrationSuite_Alerting

This subscription is for all email alerts for Integration Suite.

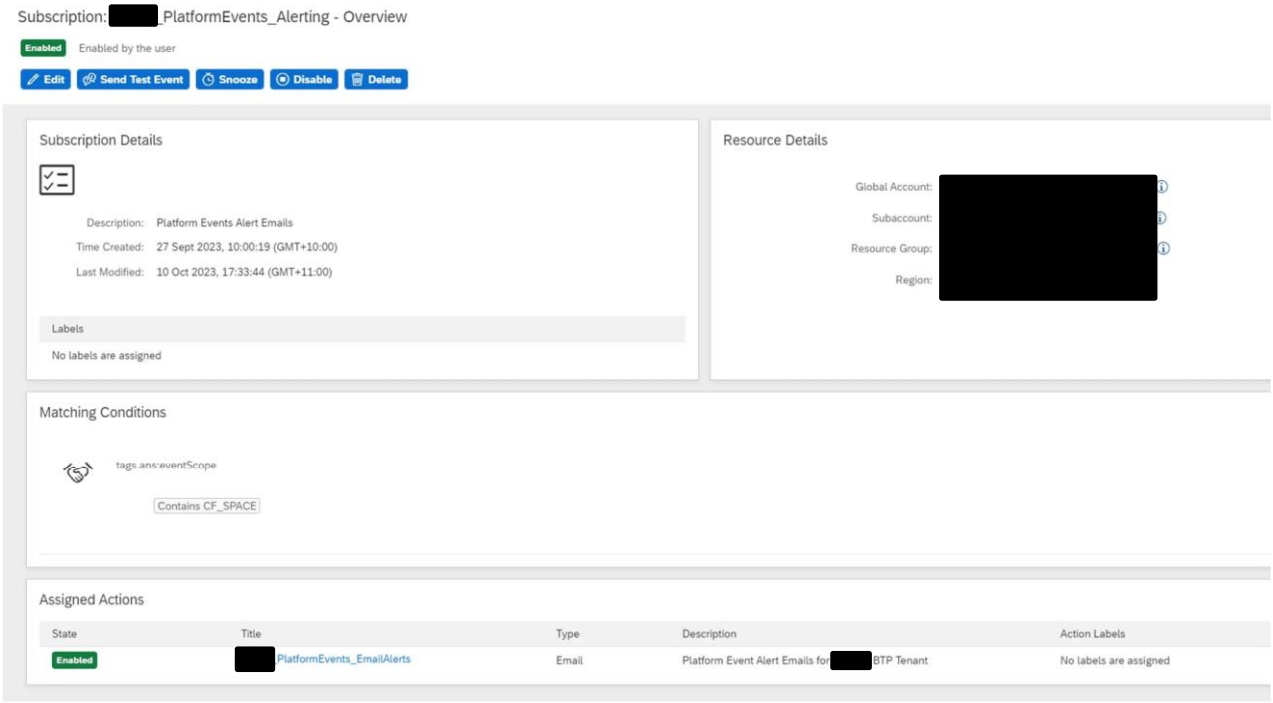
Subscription	Conditions	Actions
<Customer>_IntegrationSuite_Alerting	<Customer>_APIM <Customer>_ExpiringCertificate <Customer>_iflowExecutionError <Customer>_JMS <Customer>_MessagingError	<Customer>_IntegrationSuite_Email Alert



5.8 <Customer>_PlatformEvents_Alerting

This subscription is for all email alerts for Platform Events.

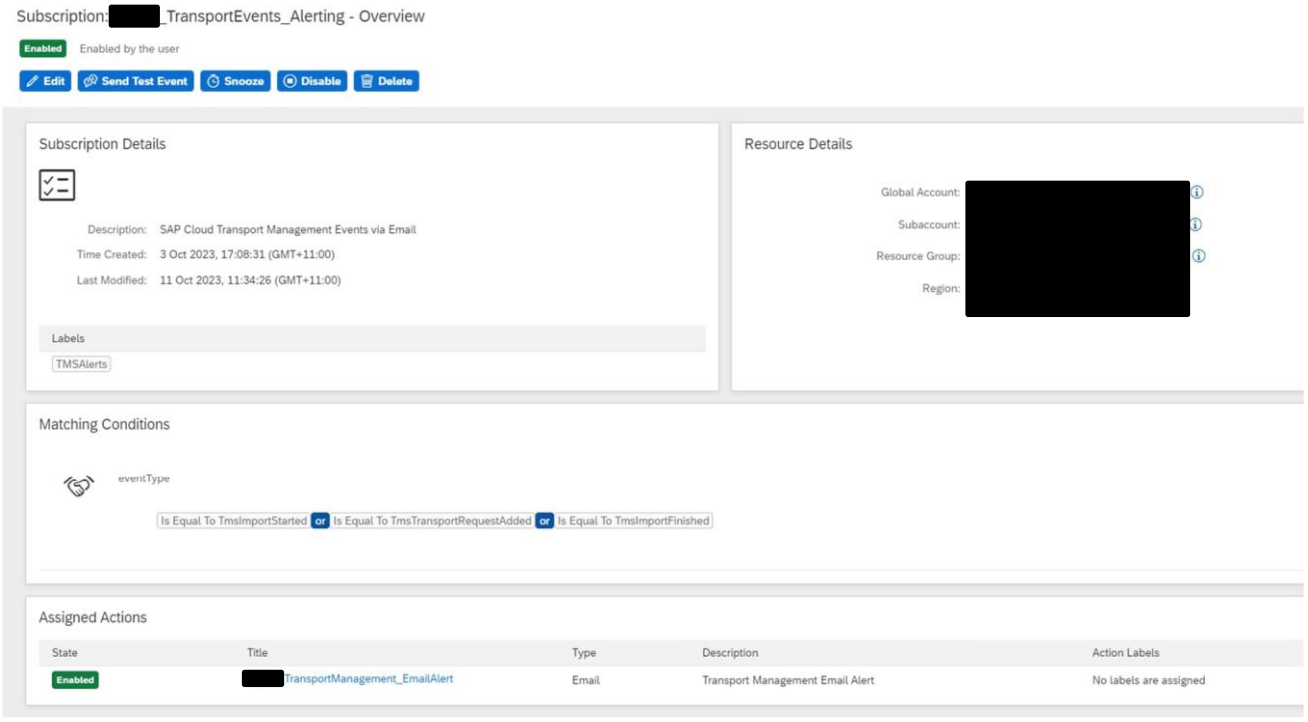
Subscription	Conditions	Actions
<Customer>_PlatformEvents_Alerting	<Customer>_BTP_PlatformEvents	<Customer>_PlatformEvents_EmailAlerts



5.9 <Customer>_TransportEvents_Alerting

This subscription is for all email alerts related to Cloud Transport Management Events.

Subscription	Conditions	Actions
<Customer>_TransportEvents_Alerting	TmsImportFinished TmsImportStarted TmsImportRequestAdded	<Customer>_TransportManagement_EmailAlert

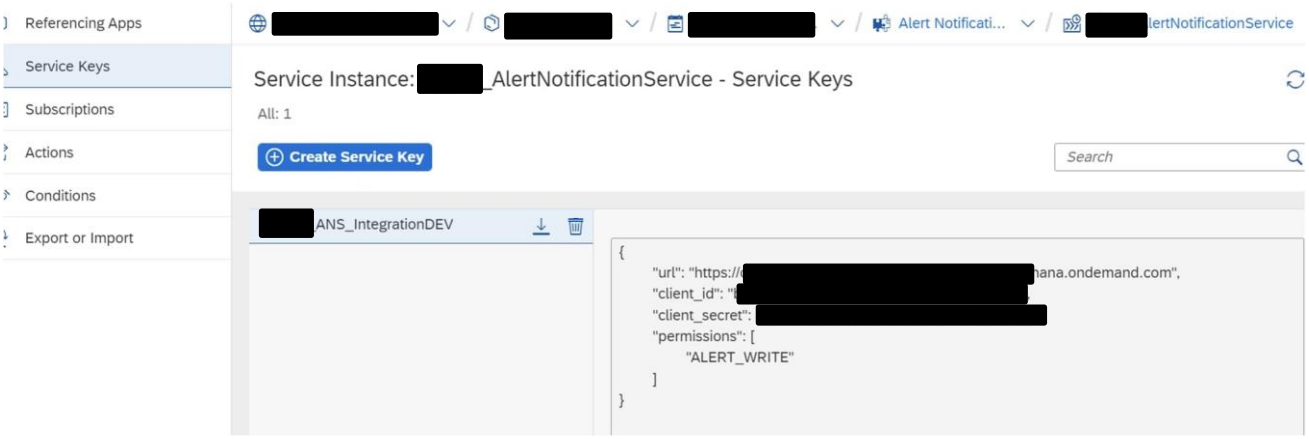


5.10 Service Key

A Service key must be already created as part of initial setup of Alert Notification Service. This service key needs to have roles assigned – “ALERT_WRITE” to be able to write custom events to ANS Endpoint.

SAP Help - https://help.sap.com/docs/alert-notification/sap-alert-notification-for-sap-btp/credential-management?

In your perspective this should be created as part of initial setup and is as below.



*****The above created Service Key – “<Customer>_ANS_IntegrationDEV” is deployed as a Security Credential (client_id/ client_secret) in Cloud Integration as and this would be used by cloud integration to post alerting events to ANS.*****

5.11 Alert Notification Configuration Backup

All the service configurations of Alert Notification Service viz. actions, conditions and subscriptions can be exported and imported for creating backup or setting up a new ANS environment.

SAP Help - https://help.sap.com/docs/alert-notification/sap-alert-notification-for-sap-btp/exporting-or-importingconfigurations

6 Configuration steps on SAP Cloud Integration

The custom alerting framework on Cloud Integration consists of 6 integration flows as below.

1: Send Alerts to ANS
2: Send Cloud Integration Error iflows to ANS
3: Send Cloud Integration Error Messages to ANS
4: Send Cloud Integration JMS info to ANS
5: Send Cloud Integration Expiring Certificates to ANS
6: Send Explicit Exceptions-Notifications-Alerts to ANS

All the above iflows are in Package – "Integration Suite Alerting Framework using SAP BTP Alert Notification Service".

6.1 Security Artefacts/ Credentials

As a pre-requisite for the alerting iflows to be able to read monitoring logs via API's and post data to ANS endpoint the following two security credentials must be created and deployed in Cloud Integration.

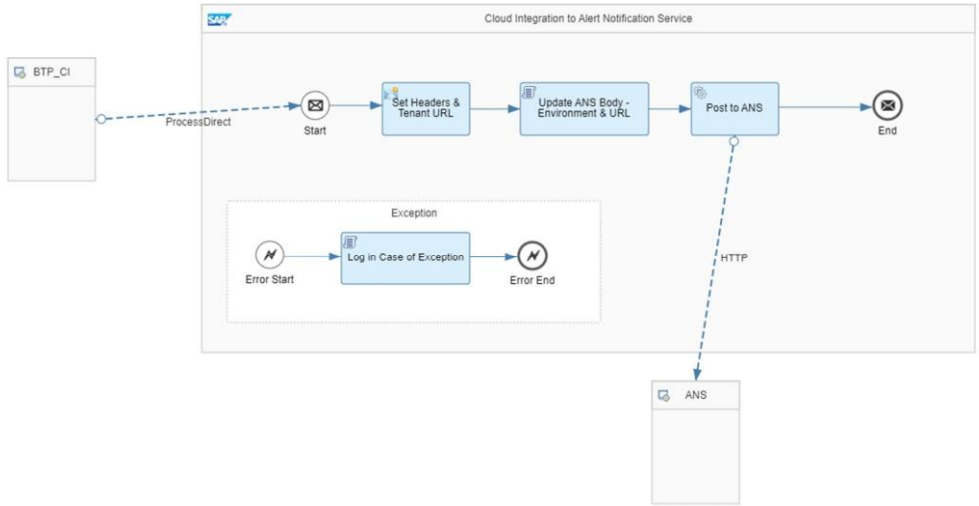
- ANS CREDENTIAL
  This is used by Cloud integration to post events to ANS Endpoint and uses the client ID and client Secret that are generated as part of Service Key Creation.

- CI MONITORING CREDENTIAL
  This is a user that has roles/authorizations to access the OData API to read Monitoring Data of Cloud Integration and will need to be created on your BTP Subaccount.

6.2 iflow: Send Alerts to ANS

This is the main and the most important iflow in the alerting framework package. This iflow exposes a ProcessDirect Endpoint to accept ANS format JSON and sends it across to Alert Notification Service for generating alerts. This iflow effectively is the connecting bridge between Cloud Integration and Alert Notification Service Endpoint.

****This iflow must be deployed the first among all the other iflows in the package as all other iflows pass data to this iflow. ****

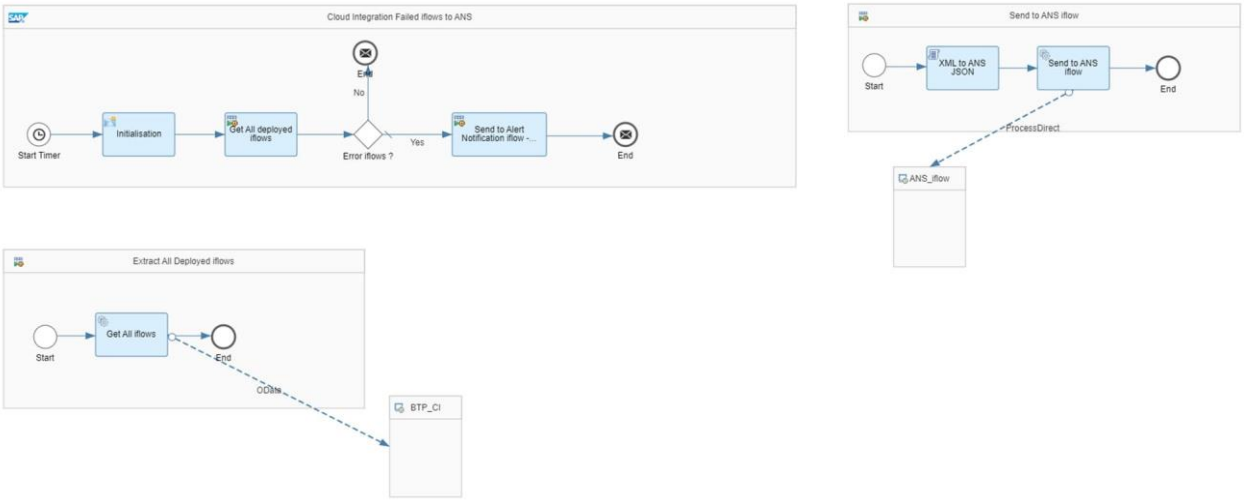


Configuration	Parameter Name	Parameter Value
Sender	Address	/sendToANS

Configuration	Parameter Name	Parameter Value
Receiver	Address	https://<ANS Name>.cfapps.<Region>.hana.ondemand.com/cf/producer/v1/resource-events
	Authentication	Basic
	Credential Name	e.g. ANS_DEV_CREDENTIAL
	Timeout (in ms)	60000
More	CI Environment - DEV/QAS/PRD	e.g. DEV
	CI Tenant URL	https://<CI Name>.integrationsuite.cfapps. .<Region>.hana.ondemand.com/shell/home

6.3 iflow: Send Cloud Integration Error iflows to ANS

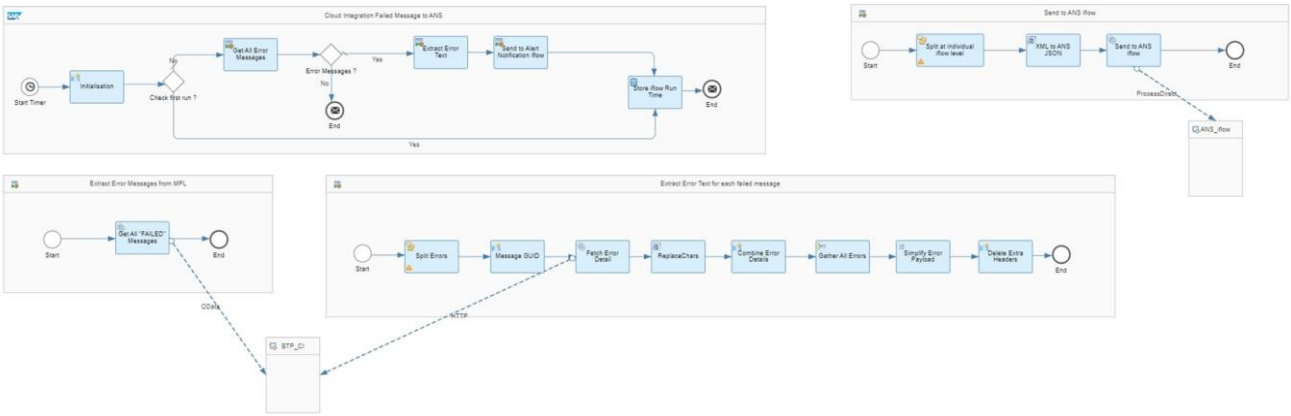
This iflow uses the standard Cloud Integration OData APIs - Integration Content API to fetch the status of all the deployed iflows. All the iflows in error status are extracted along with the developer's details and the time at which the iflow was deployed and this is posted to the iflow in section 5.1 via process direct to generate alerts via ANS.



Configuration	Parameter Name	Parameter Value
Timer	Timer	Run Once
Receiver (BTP_CI)	CI Hostname	https://<CI Name>.it-cpi016.cfapps. <Region>.hana.ondemand.com
	Authentication	OAuth 2 Client Credentials
	Credential Name	e.g. CI_MONITORINGUSER
	CSRF Protected	✓
Receiver (ANS_iflow)	Address	/sendToANS

6.4 iflow: Send Cloud Integration Error Messages to ANS

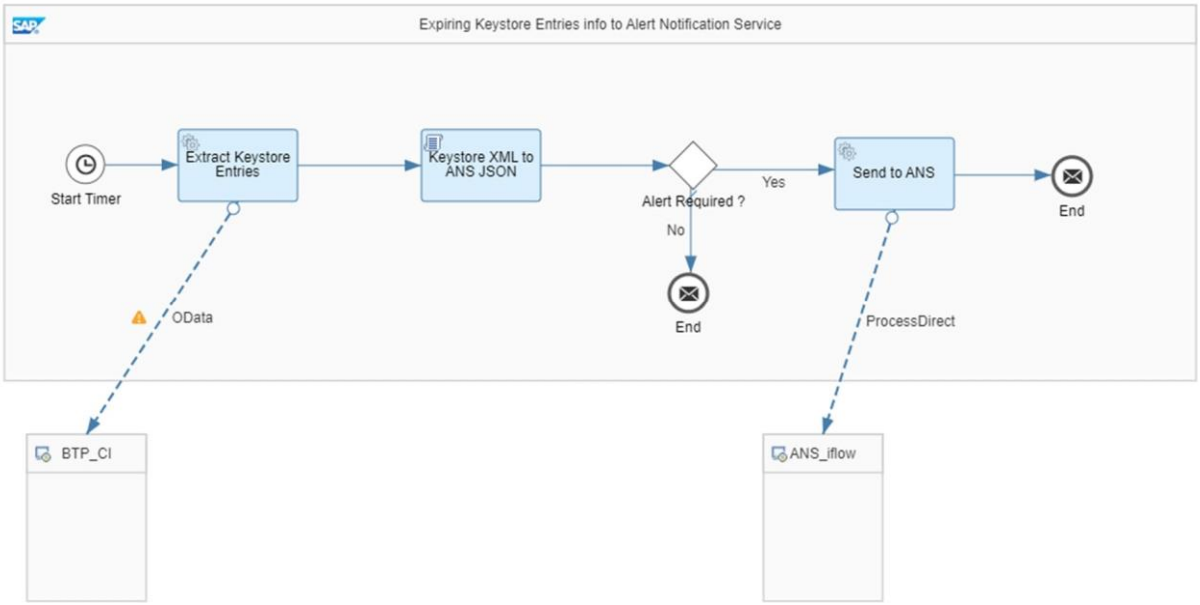
This iflow uses the standard Cloud Integration OData APIs – Message Processing Logs API to fetch all the failed messages, error texts in a given period of time. This iflow stores the last successful run time in a variable, compares that to current time and extracts error between that time. All the error messages are grouped per unique iflow name and posted in ANS compliant JSON format to the iflow in section 5.1 via process direct to generate alerts.



Configuration	Parameter Name	Parameter Value
Timer	Timer	Run Once
Receiver (BTP_CI) (Adapter Type: HTTP)	CI Hostname	https://<CI Name>.it-cpi016.cfapps.<Region>.hana.ondemand.com
	Authentication	OAuth 2 Client Credentials
	Credential Name	CI_MONITORINGUSER
	Timeout (in ms)	60000
Receiver (BTP_CI) (Adapter Type: HCIOData)	CI Hostname	https:// <CI Name>.it-cpi016.cfapps.<Region>.hana.ondemand.com
	Authentication	OAuth 2 Client Credentials
	Credential Name	e.g. CI_MONITORINGUSER
	CSRF Protected	✓
Receiver (ANS_iflow)	Address	/sendToANS

6.5 iflow: Send Cloud Integration Expiring Certificates to ANS

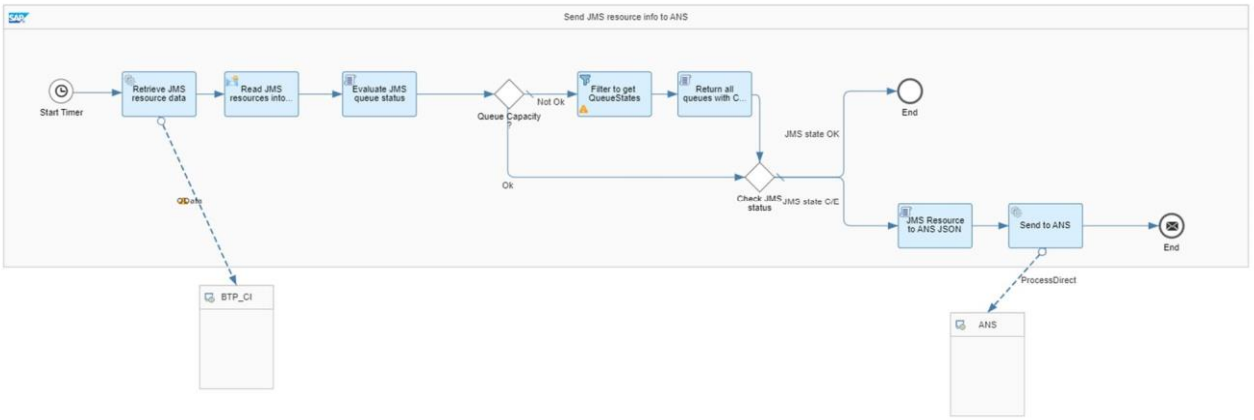
This iflow uses the standard Cloud Integration OData APIs – Security Content API to read all the cert details from keystore, extracts certificate expiring in next 30 days or already expired certificates, groups them and sends a ANS compliant JSON to the iflow in section 5.1 via process direct to generate alerts.



Configuration	Parameter Name	Parameter Value
Timer	Timer	Run Once
Receiver (BTP_CI) (Adapter Type: HCIOData)	CI Hostname	https:// <CI Name>.it-cpi016.cfapps.<Region>.hana.ondemand.com
	Authentication	OAuth 2 Client Credentials
	Credential Name	e.g. CI_MONITORINGUSER
	CSRF Protected	✓
	Reuse Connection	✓
Receiver (ANS_iflow)	Address	/sendToANS

6.6 iflow: Send JMS Resource Overload Info to ANS

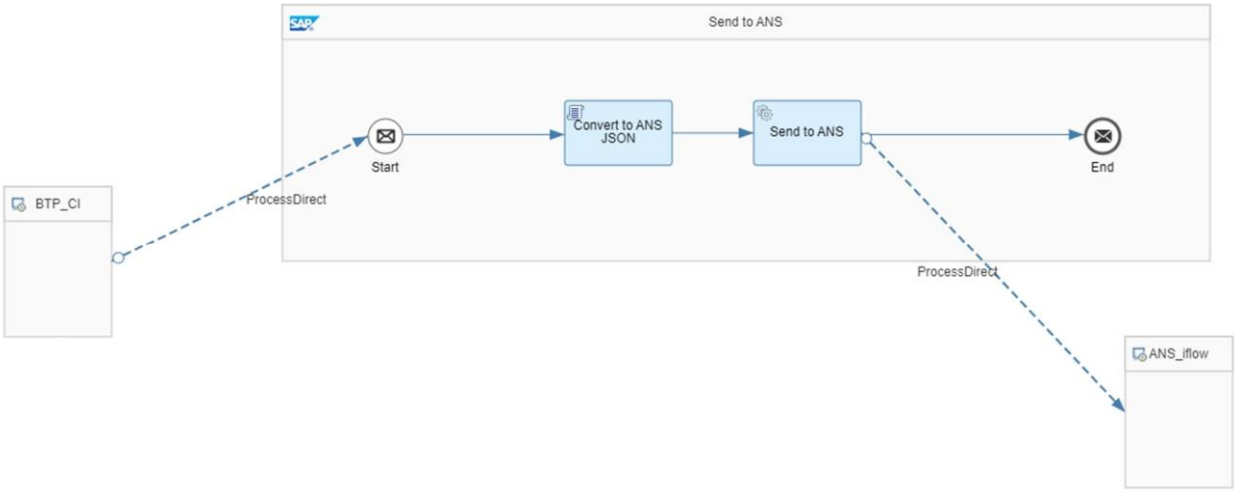
This iflow uses the standard Cloud Integration OData APIs – Message Stores API to fetch JMS resource capacity/ usage stats and if in case the JMS resources are critical (more than 80% usage) or exhausted sends an ANS compliant JSON to the iflow in section 5.1 via process direct to generate alerts.



Configuration	Parameter Name	Parameter Value
Timer	Timer	Run Once
Receiver (BTP_CI) (Adapter Type: HCIOData)	CI Hostname	https:// <CI Name>.it-cpi016.cfapps.<Region>.hana.ondemand.com
	Authentication	OAuth 2 Client Credentials
	Credential Name	e.g. CI_MONITORINGUSER
	CSRF Protected	✓
	Timeout (in min)	1
Receiver (ANS)	Address	/sendToANS

6.7 iflow: Send Explicit Exceptions-Notifications-Alerts to ANS

This iflow uses the exposes a process direct endpoint to accept XML from any other iflow to generate explicit notifications/ exceptions or alerts. This can be used in cases where the other available iflows do not capture error or even when a positive confirmation is required for a successful message. The original iflow design must cater to post an XML to this iflow which in turn transforms the XML to an ANS compliant JSON and send to the iflow in section 6.1 via process direct to generate alerts.



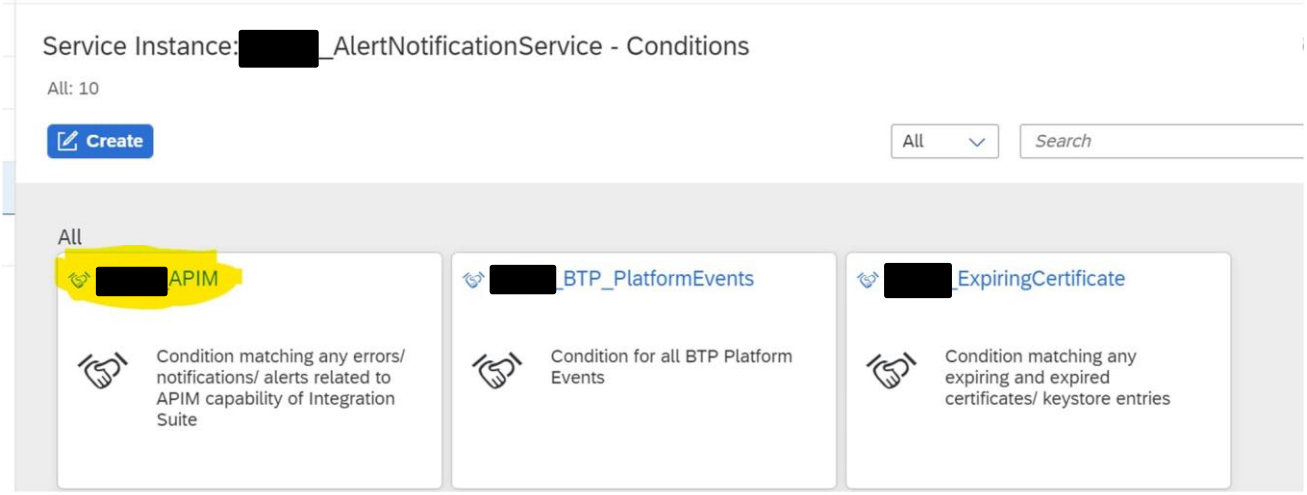
Configuration	Parameter Name	Parameter Value
Sender (BTP_CI)	Address	/sendExplicitAlertToANS
Receiver (ANS_iflow)	Address	/sendToANS

7 SAP API Management Alerting

Alerts can be generated out of APIs on APIM using different fault policies. An example of how that can be done is detailed below. This design would need to be incorporated in each of the API that needs alerting enabled.

The below design built for <Customer> has taken reference from an SAP Blog - https://blogs.sap.com/2019/07/30/sendnotification-when-target-endpoint-is-down-using-sap-cloud-platform-alert-notification-part-2/

Please ensure that the eventType field contains "APIM" example APIMTargetNotAvailable, APIMAuthenticationError etc as this has been setup as condition on Alert Notification Service for the alerts to be sent via email

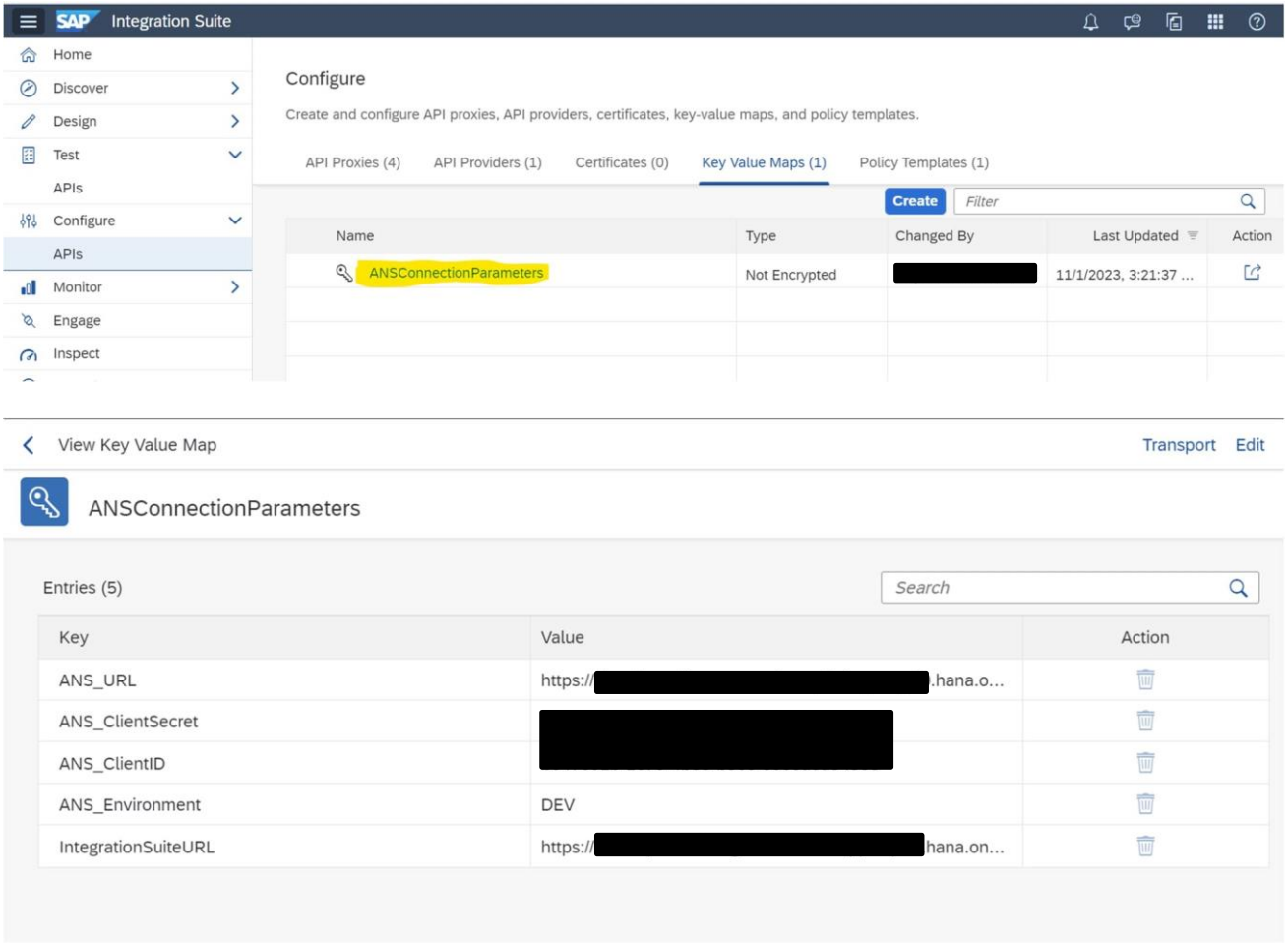


7.1 Key Value Map – ANSConnectionParameters

Alert Notification Service Parameters are stored in a dedicated Key Value Map in each of the individual environment at <Customer> with respective entries in the APIM section of Integration Suite as below -

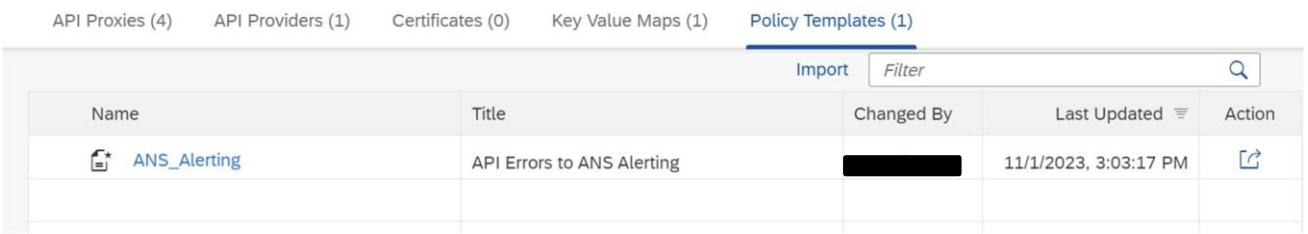
Key Value Map - ANSConnectionParameters

Development Entries	
ANS_URL	https://<ANS Name>-api.cfapps.<Region>.hana.ondemand.com/cf/producer/v1/resource-events
ANS_ClientSecret	TBD
ANS_ClientID	TBD
ANS_Environment	DEV
IntegrationSuiteURL	https://<CI Name>.integrationsuite.cfapps.<Region>.hana.ondemand.com/shell/home



7.2 Policy Template – ANS_Alerting

A custom policy template – ANS_Alerting has been created which consists of all the policies required for generating alerts out of APIM.

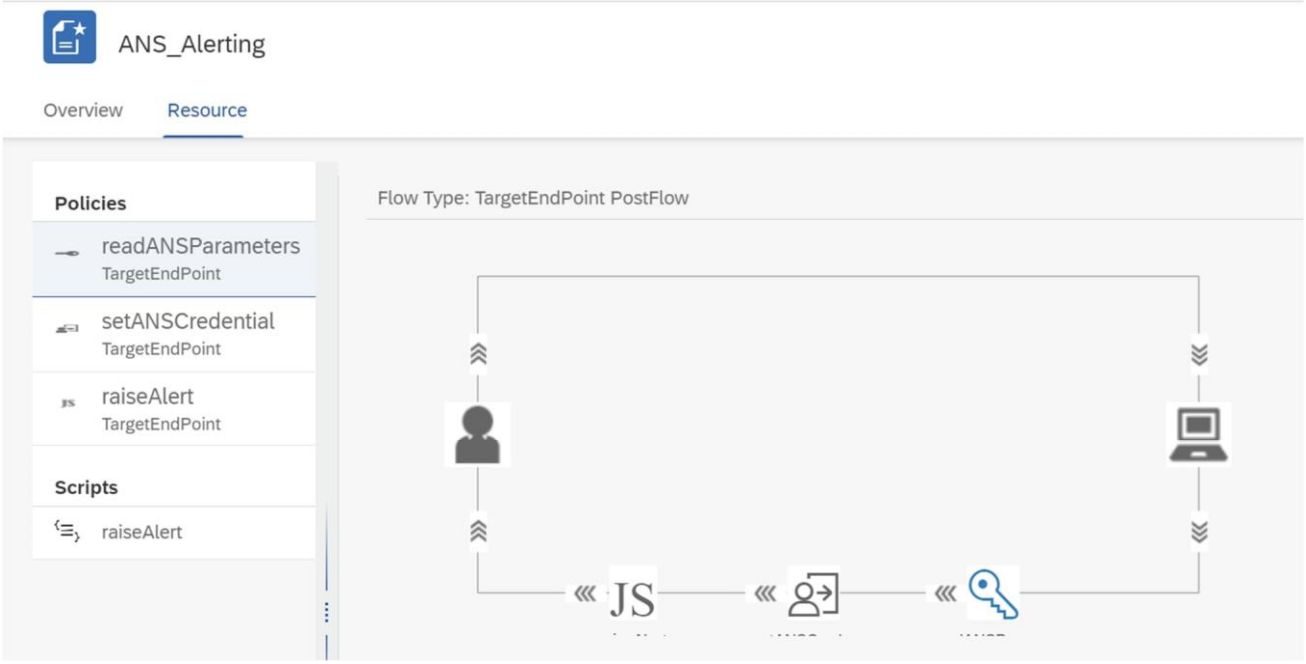


This policy template consists of three individual policies namely

readANSParameters – This policy reads all the ANS related parameters like ANS URL, ANS client ID, ANS Client secret, ANS Environment and the Integration Suite URL from the Key Value Map - ANSConnectionParameters mentioned in section 7.1

setANSCredential – This policy sets an authorization header from the ANS Client secret and client ID.

raiseAlert – This policy utilises a JavaScript to create a custom ANS Compliant JSON and posts to ANS endpoint for alert generation.



7.3 Apply Policy Template to API Proxy

For enablement of Alerting from an API proxy, the policy template created in section 7.2 would need to be applied to the API in the target Post Flow.

***The above step would enable alerting on the API proxy for any kind of HTTP issues (HTTP Return code >= 400) from the target server.

7.4 Sample Email Alert

Alert - DEV - APIM APIProxy 'External_to_CloudIntegration_Generic': Response Code:404|| Reason:Not Found

SA SAP Alert Notification service for SAP BTP <noreply+sap_cp_cf_ap21_ans@sap.com>
[redacted]

Reply | Reply All | Forward

Wed 1/11/2023 3:12 PM

Alert - DEV - APIM APIProxy 'External_to_CloudIntegration_Generic': Response Code:404|| Reason:Not Found

****

Hi Team,
This is an alert generated from Alert Notification Service. Please check the relevant Cloud Integration Tenant - https/[redacted].ondemand.com/shell/home for the below issue.

This is an explicit custom alert generated for API Proxy - 'External_to_CloudIntegration_Generic'. Logon to the API Portal dashboard for more information
****

Resource Details:
Resource Type: app
Resource Name: External_to_CloudIntegration_Generic

Event Details:
Event Type: APIMError
Category: NOTIFICATION
Severity: INFO

Cloud Integration Tenant URL = https:/[redacted].ondemand.com/shell/home
Proxy Request Complete URL = https:/[redacted]emand.com/CI/sendmessage
Proxy Request Path Suffix = /sendmessage
Proxy Target Complete URL = https://[redacted]nand.com/http/APIM/sendmessage
Proxy Target Path Suffix = /http/APIM/sendmessage
Target Response Code = 404
Target Response Reason = Not Found

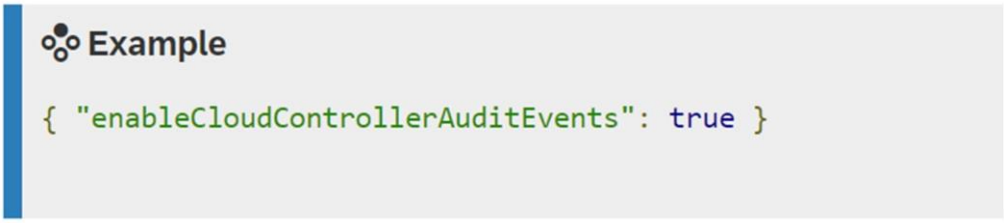
Disclaimer: This is an automated email sent by the SAP Alert Notification service for SAP BTP using the SAP infrastructure. You receive this on behalf of a service user, who has configured this email address as an alert recipient.

8 SAP BTP Platform Events Alerting

There are a number of built in platform events which are available for alerting via Alert Notification Service.

SAP Help – Built-In Events - https://help.sap.com/docs/alert-notification/sap-alert-notification-for-sap-btp/built-in-events?

To receive Cloud Foundry Platform events, we need to update the relevant SAP Alert Notification service instance with parameter enableCloudControllerAuditEvents set to true as below:



Other than the above settings, the actions in and conditions and subscriptions documented in section 5 of this document are required for the generation of the alert.