1. Video Analytics Management

VAP integrates with different VA providers to allow the usage of their analytics through the standardized APIs.

There are two integration points to VAP:

1. **Plugin SDK** - integration through Default VA Gateway
2. VA Gateway Provider Interface (**GPI SDK**) - integration directly to VAP as a separate gateway

Below is the brief description of the three categories of VA providers:

CAT-1: Plugin-based

- Implementation based on SDK from the default VA Gateway
- Integration **Plugin SDK**

CAT-2: Internal Service

- Independent services relying on VAP's hardware resources
- Either Integration **Plugin SDK** or **GPI SDK**

CAT-3: External System

- A complete system running outside VAP system and resources
- Integration by **GPI SDK**

Refer to the integration document for more information on integrating different VA providers.

1.1 VA Gateway Providers

VAP serves as the platform to allow users to manage analytics from different VA gateways. But, the actual analytics processes are managed by the respective gateways.

A VA gateway has the following main responsibilities:

- Manage apps and their licenses if any
- Manage analytics processes
- Manage resource allocation

All functionality described in this document is based on VAP's default VA Gateway.

1.1.1 Gateway Provider Information

The list of integrated providers can be queried through the API. Each provider clients will have the following information.

Name	Description	Read-only
id	Provider's client ID	yes
agentId	Agent service handling this provider	yes
providerId	Provider's ID	yes
providerName	Provider's unique name	yes
type	ANALYTICS or SOURCE	yes
version	A map of versions applicable for this provider	yes
metadata	Non-standard information applicable only for this provider	yes
status	Status with name and message	yes

1.2 VA App Management

VA integrated from different providers are available on the platform as 'Apps'. If supported by the gateway provider, apps can be installed or uninstalled dynamically.

VAP's default VA gateway supports dynamic installation of apps by allowing providers to package their VA implementations as plugins using the official SDK.

Note! Some VA gateways come with built-in apps and does not allow app management, in which case app management features may not be available. Hence, using the default VA gateway is the recommended approach.

1.2.1 App Information

Each of the apps available on VAP will have the following information. Refer to the API document for the detailed formats.

Name	Description	Read-only
id	Unique app ID.	yes
name	App display name	no
description	Description	no
author	App's author. It could be a company or an individual	no
labels	Assigned app labels	no
providerClientId	Provider's client ID	yes
providerAppId	Internal app ID from the provider. Not globally unique.	yes
providerAppName	Internal app name from the provider	yes
version	Version	yes
availableOptions	Allowed parameters	yes
runRequirement	Requirements to start analytics. See below for the format	yes
metadata	Non-standard information applicable only for this provider	yes
enabled	Activated or deactivated	no

status	Status with name and message	yes
lastUpdated	Last updated time of any of the info above	yes

RunRequirement Details

Name	Description	Read-only
licenseRequired	Whether a license is required	yes
minMainMemory	Minimum main memory required to run this app (in MB).	yes
minGpuMemory	Minimum GPU required to run this app (in MB).	yes
capabilities	Capabilities required. No fixed format.	yes

1.2.1 Update App Info

The fields that are not read-only can be edited, whereas read-only fields come directly from the app package.

1.2.2 App Installation

If supported by the gateway, new apps can be installed by uploading the app package. The app package must be built using the SDK released by the VA Gateway provider.

For the default VA Gateway, new apps will need to go through benchmarking and verification process on VATB system in the staging environment. See VATB section for details.

Note! VATB system is available only for apps implemented using the SDK from the default VA gateway. Third-party gateway providers must ensure the new apps are verified before installing them on VAP.

1.2.3 App Uninstallation

If supported by the gateway, apps can be uninstalled. All running instances of the uninstalled app will also be automatically terminated.

This action is irreversible. Alternatively, apps can be deactivated as a non-permanent option.

1.2.4 App Deactivation

VA Apps can be deactivated by setting 'enabled' flag to 'false'. This will also deactivate all analytics instances of this app.

Setting the flag back to 'true' will activate the app again. The corresponding instances will subsequently be activated and will resume operation according to their schedule.

1.2.5 Upgrading apps

To be confirmed after finalizing upgrade procedure on Yee Fan's side

1.3 App License Management

App license management provides the option for app authors to enforce restrictions on the app usage, such as expiry or the number of concurrent instances.

There are a few important points to note:

- Each analytics instance requires exactly one license, which means 50 licenses allow 50 instances to be running concurrently.
- **FILE** type licenses are encrypted and only the app itself can decrypt it at runtime. Hence, neither VAP nor Default VA Gateway can introspect or edit the license restrictions.

1.3.1 Uploading app licenses

As indicated above, the app author will provide a fixed number of licenses to be used for the app. Instead of adding them one by one, the API allows the uploading of licenses in a zip package with the standardized format.

See the sample package in the samples folder.

1.3.2 Change license activation

Deactivating a license will stop the instance that is relying on it. The stopped instance will attempt to restart by switching to the next available license. If no more license is available, the instance will have the ERROR status.

If a deactivated license is activated again, the instance with the highest priority will try to be started.

1.3.3 Remove an app license

Removing a license will also kill the instance that is relying on it to run.

1.4 VA Instance Management

In order to add analytics, the VA app must be successfully installed first. In addition, if the app requires licenses to run, license keys or files must also be added.

1.4.1 VA Instance Information

Each of the analytics instances on VAP will have the information below.

Name	Description	Read-only
id	Instance ID	yes
type	REAL_TIME, POST_PROCESSING, ON_DEMAND	yes
appId	App ID	yes
settings	Instance settings. See below for the format.	no
status	Status with name and message	yes
metadata	Non-standard info specific to this instance	yes

`InstanceSettings`

Name	Description	Read-only
parameters	Run parameters	no
sourceOptions	Details about the source. See below.	no
schedule	Weekly schedule. 24/7 operation if not specified	no
enabled	To indicate activated or deactivated	no

1.4.2 Adding/Updating VA instances

When an instance is added or updated, it will be sent to the agent handling the target VA gateway. The agent will start or stop the analytics instance based on the configurations.

Configuration section below is applicable for both new and existing instances.

1.4.3 VA instance Configurations

Below are the configurable information that will determine how the instance will run.

- type
- Parameters (Optional depending on the app)
- sourceOptions
- schedule
- enabled (indicates activated or deactivated)

1.4.3.1 Types

There are three types of VA instances. Their characteristics are described below.

REAL_TIME

- Processes live video streams in real time. As such, they will be running either 24/7 or based on some operational schedule.
- Usually used for monitoring purposes or archiving data for further analytics
- Example usages: monitoring room occupancy level, intrusion detection

POST_PROCESSING

- Processes a recording video stream or file.
- Usually used for searching items of interest, or patterns
- Example usage: searching a number plate through recorded videos

ON_DEMAND

- Analytics running as a service to expose API for processing on-demand requests
- Example: face enrolment service

1.4.3.2 Schedule

Simple scheduling is supported through weekly recurrence rules. The current format supports daily and weekly schedules. If the schedule is not provided, the instance will run 24/7.

A schedule contains information below:

- Display name
- Time zone
- List of weekly periods

e.g.

```
{
   "name":"Every Monday 9am-6pm",
   "timeZone":"Asia/Singapore",
   "weeklyPeriods":[
      {
         "dayOfWeek":"MONDAY",
         "startMinutes":540,
         "endMinutes":1080
      }
   ]
}
```

1.4.3.3 Source Options

Analytics run on sources like video streams or videos files. The options below indicate which source to use and how to request it from the source provider.

Name	Description	Required
providerClientId	Source Provider's client ID	yes
type	VIDEO_STREAM or FILE	yes
request	Request details specific to this source provider. It may contain details such as deviceId, channelId, ttl, streamType, etc.	no

Source options may not be necessary depending on the instance type. For example, ON_DEMAND types usually do not need a source.