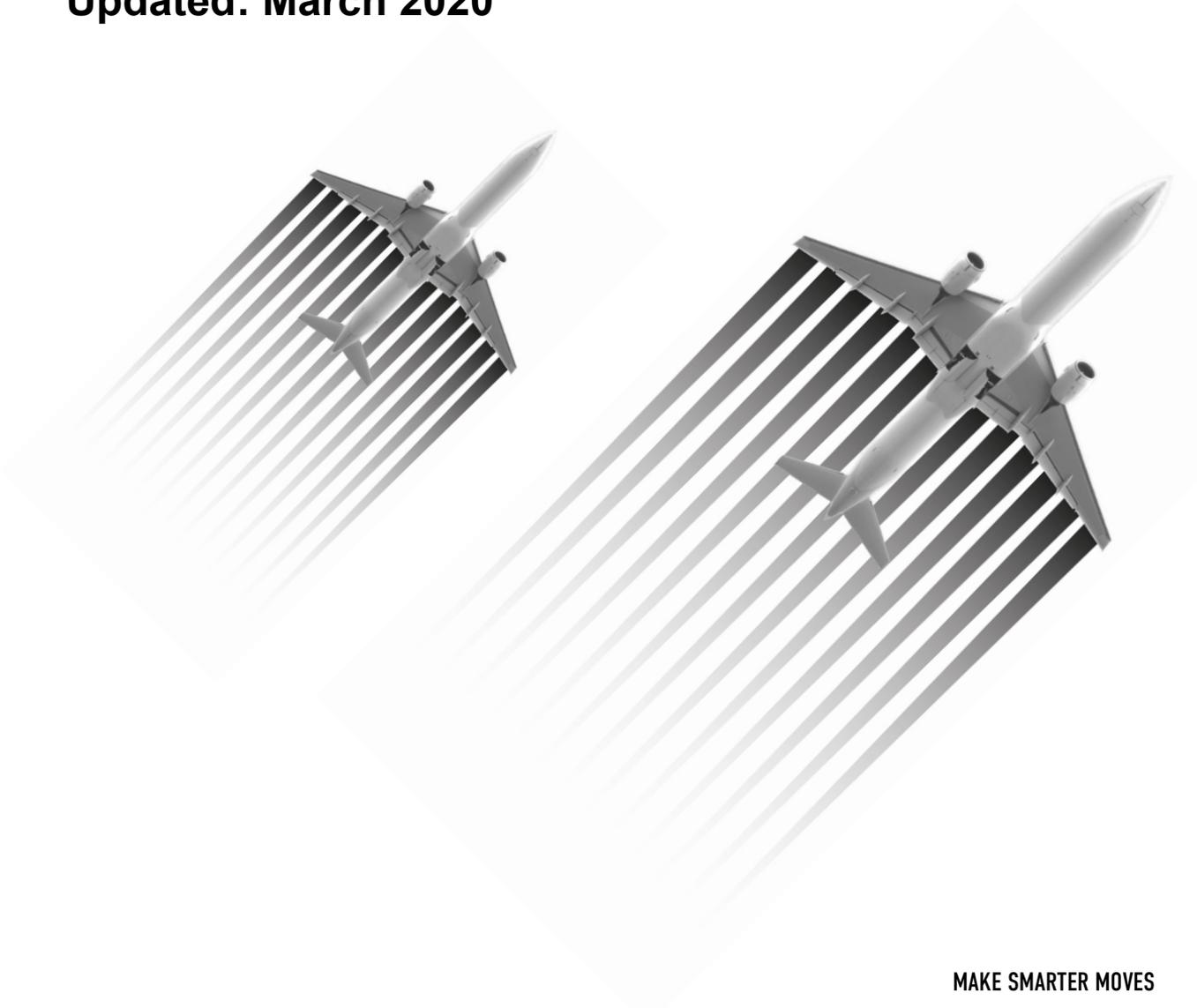


OAG SCHEDULES DYNAMIC PRODUCT OVERVIEW

Updated: March 2020



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1 Overview

The purpose of this document is to provide an overview of the OAG Dynamic Schedules (real time schedules distribution) feed and provide a clear presentation of the data content, message format and delivery options available to the customer via the OAG Dynamic feed.

OAG receives daily flight updates with an average of 100,000 flight updates per day. Over 90% of the entire database is refreshed every week. Our database receives on average an update every one second.

Over the years, OAG Aviation Worldwide Ltd has made significant investments in new technologies, including areas such as our content management system, allowing us to broaden our portfolio of products and services.

2 OAG Dynamic Schedules – real time schedules distribution feed

OAG Dynamic Schedules is OAG's premier schedules delivery service, that is unmatched by any other schedules content supplier in the world.

OAG Dynamic Schedules provides a real time single source for global flight schedules and each feed is custom designed for the world's leading reservation systems to ensure accuracy and topicality of flights schedules at all times.

Over the years we have seen an increase in the number of schedules changes. This solution would provide real-time schedules updates to deliver the most up to date information for customer satisfaction. It can help to minimise costs from erroneous bookings arising from data that is not synchronised. In turn, enable rebooking/ticketing based on the most up to date information

3 OAG Database Overview

As new schedules are submitted to OAG, the data is instantly put through rigorous validation checks.

Once the data has successfully passed through validation, OAG processing identifies the schedules changes, and then publishes and distributes the changes to OAG Dynamic Schedules customers.

OAG Dynamic Schedules distributes updates 24/7, 365 days a year.

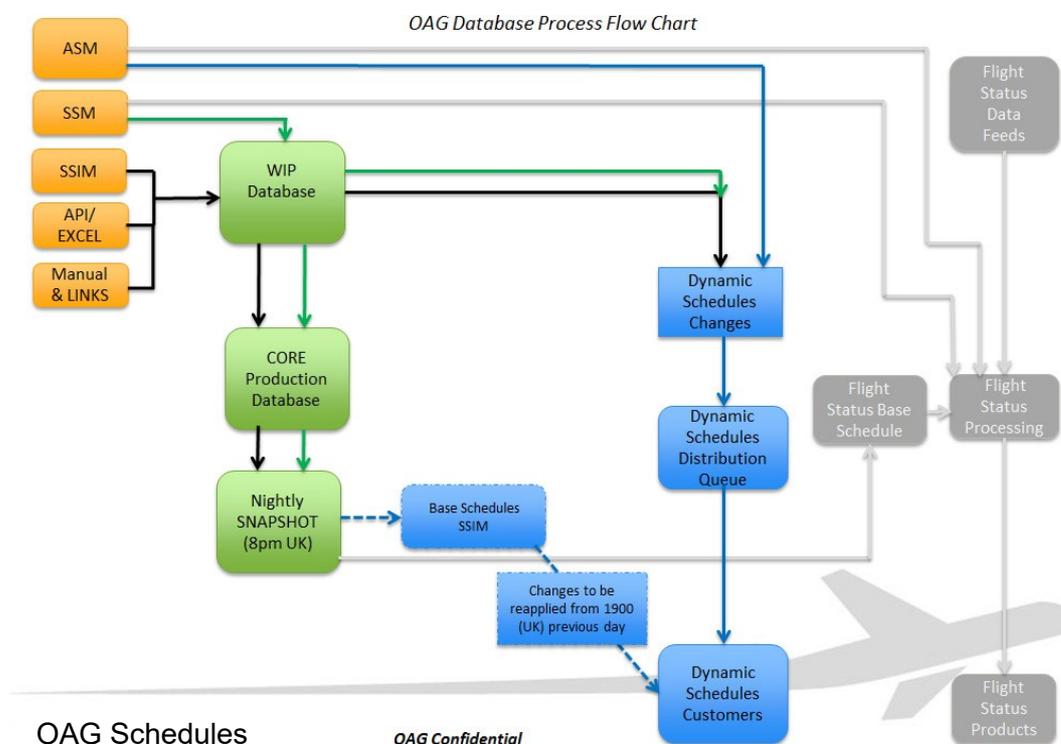
We receive data via various formats, including industry standard formats, such as -

- ASM (Adhoc Schedules Message),
- SSM (Standard Schedules Message),
- SSIM (Standard Schedules Information Manual).

The data feeds are processed in our WIP (Work In Progress) Database where changes are available for immediate distribution to our OAG Dynamic Schedules customers.

During the initial set up process, we will provide our customer with a base schedules SSIM file. This SSIM file is created from our CORE Production Database. Once this baseline SSIM file is loaded in the customer's database, we will switch on OAG Dynamic Schedules feed. When the feed is started, it will contain changes from the point where the baseline SSIM file was created to ensure you receive all the changes and are in sync with the OAG database.

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Please note the grey part of the flow chart relates to customers who are also subscribing to OAG Dynamic Status feed.

4 Customer Specifications

Dynamic feed can be customised to fit your technical and commercial needs

Coverage:

Global feed or specific airlines only

Data Format:

OAG distributes the data feed in IATA (International Air Transport Association) standard formats. The two formats are:

- SSM/ASM [IATA Standard Schedules Information Manual (SSIM) chapters 4 & 5]
- XML [in IATA Schedules Information Data Exchange (SIDX) format]

Transmission Method:

OAG is able to deliver the OAG Dynamic Schedules via various methods of transport, these are listed below:

- FTP PUSH (To customers FTP Server)
- FTP PULL (Data files are placed on an OAG FTP server, customer picks up the files from the OAG Server).
- SFTP PULL (Data files are placed on a OAG SFTP server, customer picks up the files from the OAG Server).
- HTTP PUSH (POST to customer server)
- HTTPS PUSH (POST to customer server)
- MQSeries Client PUSH over IPSEC VPN
 - (OAG acts as an MQSeries client sending to the customers MQSeries Server).
- MQSeries Server PUSH over IPSEC VPN
 - (OAG links its MQSeries Server to the Customers MQSeries Server). Note this configuration is a custom configuration, so compatibility checks need to be carried out first.
- IPSEC VPN (This creates a secure tunnel between OAG and the Customers Network), it is optional for FTP, HTTP, HTTPS and is required for MQSeries delivery methods.

Other custom requirements and specifications must be discussed and agreed by both parties prior to customer implementation.

5 OAG Dynamic Schedules Message Formats

OAG Dynamic Schedules delivers schedules changes in either SSM/ASM or XML formats.

SSM & ASM

SSM (Standard Schedules Message)

OAG Dynamic Schedules SSM message formats conform to IATA SSIM Chapter 4. The following IATA SSM message types are supplied:

Message	Type	Message Description
SSM	NEW	New - Issued when new flight information is submitted
SSM	CNL	Cancel - Issued when existing flight information is cancelled
SSM	RPL	Replace - Issued when existing flight information is updated/changed
SSM	SKD	Schedule Update

ASM (Ad hoc Schedules Message)

OAG Dynamic Schedules delivers all ASM message formats, according to IATA SSIM Chapter 5 standards. All ASM messages are delivered exactly as per the format that has been supplied to OAG. The following IATA ASM message types are supplied:

Message	Type	Message Description
ASM	NEW	Insertion of New Flight Information
ASM	CNL	Cancellation
ASM	RIN	Reinstatement
ASM	RPL	Replacement of Existing Flight Information
ASM	ADM	Change of Existing Information Expressed by the Use of Data Element Identifier Only
ASM	CON	Change of Aircraft Configuration/Version
ASM	EQT	Change of Equipment Information
ASM	RRT	Change of Routing
ASM	TIM	Change of Time Information

Acknowledgement (ACK) and Not Actioned (NAC) Messaging

Please note that OAG Dynamic Schedules feed does not currently have provision to receive ACK & NAC message notifications from OAG Dynamic Schedules customers.

XML

OAG Dynamic Schedules in XML format conforms to the IATA Schedules Information Data eXchange (SIDX) format. The following message types are supplied:

Message	Type	Message Description
XML	UPD	Update/New - Issued when new flight information is submitted or existing flight information is changed
XML	CNL	Cancel - Issued when existing flight information is cancelled

6 Schedules Baseline

As mentioned above, before live use of the OAG Dynamic feed, OAG recommends that the customer first receives and loads an appropriate data to baseline the schedules to be in sync with OAG database. This may be via a set of messages or a SSIM file. For a customer receiving a global Dynamic feed this would be a full SSIM file. This data will serve as a baseline schedule before the Dynamic updates are applied

OAG recommends having the baseline file prior to the Dynamic feed commencing (per carrier); once the data is loaded, you should then revert to mainly using the Dynamic updates to keep each carrier's schedule up-to-date

Starting the OAG Dynamic Schedules Feed:

- OAG will start the OAG Dynamic Schedules feed only after the customer confirms they have successfully consumed the baseline SSIM file or messages.
- The SSIM file will be created and sent to the customer on an agreed date. OAG will await confirmation that the customer's database has been baselined. Meanwhile OAG Dynamic Schedules will be posting messages (ready to be used once the baseline data has been loaded).
- Once the baseline data has been loaded and OAG has received confirmation of this, OAG will liaise with the customer to switch on the live OAG Schedules Dynamic data feed. Once the live feed is activated, the customer should mainly rely on the OAG Dynamic schedules feed for all schedule updates and changes.

Should for any reason the customer's database becomes out of sync and a new baseline data delivery is required, OAG will work with the customer to co-ordinate the creation on a new baseline data delivery and stop the OAG Dynamic Schedules feed whilst the customer loads the new baseline data delivery and the above process to co-ordinate the start of the OAG Dynamic Schedules feed will be repeat

7 Database Fragmentation

OAG Dynamic Schedules does not rationalise the schedules data it delivers.

As schedule changes are filed by airlines at flight number & itinerary variation level, OAG Dynamic will automatically deliver these without consolidating the updates into whole flight numbers/flight number ranges. That is we will only deliver the changes which then need to be applied accordingly.

As a result, it is expected the data within the customer's database could become fragmented (I.e. effective periods / days of operation may be split over several itinerary variations per flight number) or consolidated as the changes are applied.

Some illustrative examples of this can be supplied when requested.