AeroAPI v4+ Migration Guide

for Current FlightXML/AeroAPI v2/v3 Users

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FlightAware recently released AeroAPI Version 4 (v4) as the next generation of our previous FlightXML/AeroAPI flight data API product. AeroAPI v4 replaces AeroAPI Version 2 and 3 (v2/v3), which were previously also known as 'FlightXML'.

With the introduction of AeroAPI v4 we have modernized the interface, added new functionality and data resources, enhanced content and depth of data across the board, and are taking full advantage of the latest technologies and standards. It has been redesigned and reorganized to make it easier to use and facilitate future enhancements. This sets the stage for us to now rapidly innovate and quickly deliver additional new features moving forward.

AeroAPI v4.0 was introduced October 2021, with all subsequent minor releases (v4.x and beyond) being completely backwards compatible with v4.0. Visit the online product pages and documentation for a full rundown of our new AeroAPI v4 product offerings and features along with a side-by-side comparison of the various v4 subscription tiers that can be selected from to meet your individual business needs.

https://flightaware.com/commercial/aeroapi

To assist current AeroAPI/FlightXML version 2 and 3 customers (v2/v3) with the migration to v4, this Migration Guide highlights key differences, as well as function mappings to help you quickly adapt your application. Also be sure to take advantage of:

- Comprehensive online developer documentation and interactive portal to explore the new v4 endpoints.
  - https://flightaware.com/aeroapi/portal/documentation
- AeroAPI OpenAPI specification file that can be downloaded from the documentation portal and imported into tools like Postman. https://flightaware.com/commercial/aeroapi/resources/aeroapi-openapi.yml
  - https://flightaware.com/aeroapi/portal/resources
- AeroApps – a collection of sample applications and services demonstrating practical usage of v4 functionality with a fully functioning example application. Sample source code is available in python or java to jumpstart your development efforts.
  - https://flightaware.com/aeroapi/portal/resources
- Release notes highlighting new functionality that is being released on a regular cadence
  - https://flightaware.com/aeroapi/portal/revisionhistory

Important Dates

- October 2021 - AeroAPI Version 4 was introduced
  - Version 4 is intended to replace FlightAware's legacy FlightXML/AeroAPI Version 2 and version 3 Product offerings
- October 31, 2023 – FlightXML/AeroAPI Version 2 and Version 3 will be sunset
  - All FlightXML/AeroAPI v2 and v3 users must migrate to AeroAPI v4 prior to October 31, 2023 to ensure continuation of data services

Important Technical Requirements and Notes

- Access to AeroAPI v4 requires new AeroAPI account signup, which will result in new API keys that will be issued to ***be used exclusively with AeroAPI version 4 and beyond***. Select from one of the three AeroAPI v4 tiers that best meets your business needs. Pay close attention to the authorized uses for each of the three tiers, as well as premium data content that is included only with Premium and Standard tiers.
    - Tier selection and signup here:
        - https://flightaware.com/commercial/aeroapi/#compare-plans-section
    - Note: you will then have two sets of API keys, one for each AeroAPI version. v2, v3, and v4 API keys ***are not*** cross-compatible or interchangeable. They are each version specific.
- V4 is a Modern RESTful API, returning JSON responses. Note: SOAP/XML is no longer supported with v4.
- Minor programmatic changes ***will be required*** to migrate your application from v2/v3 to AeroAPI version 4. The interface has been modernized, new functionality and data incorporated, and resources re-organized to make AeroAPI easier to use. You will find greater flexibility in how you structure your data requests, including more filtering capabilities through the use of optional query parameters which will enable integration of FlightAware data into your application with greater efficiency.
- Previous AeroAPI versions, Version 2 and 3 (formerly known as FlightXML), ***will be sunset October 2023***. Please plan to allocate plenty of time to make the migration prior to this sunset data and begin taking advantage of new features.
- Once you have completed your migration to v4, simply cancel your v2/v3 subscription.

Key Enhancements and New Features in v4

Numerous enhancements and changes were made that are beneficial to all v2 and v3 users, which are highlighted below:

Historical Flight Tracking and Flight Status – Flights January 2011 onward

You will now have access to historical flight status and flight tracking information. This is a major new feature of v4, not previously included in either v2 or v3.

- A complete family of 'History' endpoints will provide you with historical flight information from January 1, 2011 onward. Over a decade of history!
    - Access flights by flight identifier (ICAO or IATA), by aircraft registration number, or by internal FA flight ID.
    - Obtain historical flight status and flight times (schedule, estimated, and actual OOOIs), along with full flight summary for flights of interest
    - Access full historical flight track, returned as an array all positions reported from origin to destination, including lat, long, timestamp, altitude, and speed
    - Access to base64 encoded image of full flight track on map, with optional data layers (wx radar, geographic boundaries, airports, and more)
    - Access to last known flight for a registration number of interest
- Up to 10 days of historical flight data accessible through most other (non-History) endpoints, including lists of flights departing from or arriving into an airport of interest, or lists of flights for an operating carrier. Use start/end query parameters to specify desired datetime ranges.
- Up to 3 months of historical schedule information (as published in OAG)

Alerting Enhancements

Alerting has been greatly enhanced to allow for more granular configuration of flight events, as well as additional flight events. In the coming months, many additional alerting features are planned for the roadmap as well. Most significant alert enhancements include:

- Can now separately configure an alert four all four OOOI times (OUT/OFF/ON/IN), being selective for those that you are interested in. Previously the OFF time was bundled with departure events, and the ON time was bundled with the arrival event. OUT and IN are new alert types in V4, not previously widely available in prior releases.
- Enhanced alerting content: Alert Payload has been enhanced to provide more comprehensive flight detail, including 23 new elements for full flight details when available. Most notably: all scheduled, estimated, and actual OUT/OFF/ON/IN times, blocked/cancelled/diverted/ flags gate info, baggage info, and terminal info when available.
- More flexible flight alert configuration setup, enabling you to set up a target url for alert delivery on a per alert basis at alert setup time (rather than a single url to be used for all alerts). This readily facilitates the desire to segregate alert delivery for multiple environments (dev/test/prod) or applications from a single FlightAware AeroAPI account.
- Alert delivery is now tracked by API Key based on the key that was used to configure the alert, and then also shown in the usage graph using the respective key breakdown. This will enable you to easily monitor usage for an application or environment.

Enhanced flight information

When flight information is returned either for an individual flight inquiry or as part of a comprehensive airport or operator request for list of flights, a full complement of flight information is now made available.

- This includes over 30 additional flight elements above what most v2 flight results returned, and 20 additional flight elements for most v3 flight results.
- Most notably, the scheduled/estimated/actual OOOI times (gate times now included) are consistently made available, as well as aircraft registration, ATC ident, codeshare info, seat configurations, gate assignment, baggage claim, and terminal information when known.

More information fused together - greater control over results

In general, more information is fused and packaged together as part of the response resulting in users needing to make fewer queries.

- Ability to retrieve all arrivals, departures, schedule arrivals, and scheduled departures (or combined) along with the comprehensive flight details in a single call for a specified airport. This greatly simplifies the task of getting the airport data you need in an efficient simplified manner (significant improvement for v2, but also improved upon for v3)
- Ability to further refine airport flight requests to get precisely the information you need:
    - Filter by both origin and destination (city pair)
    - Filter by airline code (specify ICAO airline code)
    - Filter by specific start/end date and time to narrow your window of interest
- Ability to get operator information and all flights for an operator ID, including the comprehensive flight information, for scheduled/enroute/arrivals/all with the /operator function. This greatly simplifies getting all the data you need efficiently on an operator basis.

- Flight disruption statistics: Ability to get summarized cancellation, delay, and total scheduled flights statistics based on either airports or airline entity type, including the ability to query for a specific entity by ICAO id.
- Airport delays: returns a list of airports that are experiencing delays, including data on what kind of delay (departure, arrival, enroute), ground stops, average delay in minutes, delay reason, etc.
- The inbound_fa_flight_id is now included as part of all **/flight** results (when known) without a separate call to **/InboundFlightInfo**.
- More comprehensive static airport information on airport lookup, including alternate ident (ICAO/IATA), elevation, city, state, and country code.

IATA and ICAO codes

IATA codes and ICAO codes are now included throughout AeroAPI for airports, operators, and Flight Idents.

- ICAO and IATA codes are always provided in response payload, along with the previously existing identifier (to ensure backwards compatibility)
- Where regionally applicable, the Location ID (LID) is also provided along with ICAO/IATA airport codes, providing complete flexibility to meet your needs.
- IATA and ICAO codes are both accepted as input parameters, however due to the ambiguous nature of IATA codes, it is always recommended to use ICAO codes as input parameters to ensure you obtain precisely what you are looking for.
- A few new endpoints were added to help you make the conversion from IATA to ICAO and to simplify your app development while reducing the potential for ambiguous output. (Canonical disambiguation for airports, operators, and flight idents)

Foresight Predictive ETAs and Taxi Out duration

Ability to obtain predictive flight times derived from FlightAware's Foresight machine learning algorithms.

- Available for a specific flight ID along with position info or flight summary, or by using the advanced search criteria for a custom filtered set of flights.
- Foresight predictions are provided via separate endpoint, such that the consumer can select when they would like predictive info included. Available to premium tier customers only.
- Many non-Foresight endpoints also include a new flag, foresight_predictions_available, which will provide greater insight as to when predictions have kicked in and are ready to access through the Foresight endpoints.

Field naming standardization

Field names were updated throughout the API specification to reflect their meaning more accurately, as well as align more closely with Firehose for consistency. Notable changes include:

- Consistently use term 'registration' number rather than 'tail' or 'reg' for aircraft specification.
- Renamed data element 'adhoc' to 'position_only' to more accurately reflect the field content (flights that only have position data available, no schedule/plan information).
- Standardized naming of all Out-Off-On-In fields, and used consistently throughout the API for all scheduled, estimated, predicted, and actual times.
- Standardize on use of term 'operator' to represent the operating carrier, also known as airline code or fleet. This includes flight information that is part of payload, as well as input parameters.

No more Epoch!

DateTime values are improved across the board. Previous versions of AeroAPI used epoch timestamps (seconds since 1/1/1970), which have all been transitioned to ISO 8601 date-times.

- Allows the API results to be much more human readable while still providing a recognized standard for computer use.
- Eliminates the conversion to/from epoch – enhancing ease of use.

Significant documentation and infrastructure upgrades

- RESTful API - Modern redesigned REST/JSON interface (No longer SOAP), reorganized to make things easier to discover and integrate with applications.
- Comprehensive online documentation for developers, include an interactive portal to test drive all functionality and aid in evaluation of functionality.
- Improved usage dashboard/reporting: https://flightaware.com/commercial/aeroapi/billing/activity/recent
- Introduction of AeroApps, which is a collection of apps and services demonstrating AeroAPI in action. Leverage the source code to jump start your own development efforts.

SLA and Pricing

The new infrastructure v4 runs on is more reliable and less prone to outages, improving reliability and resiliency across the board.

- Improved guaranteed SLA (99.5% monthly uptime) included with premium tier.
- Simplified pricing structure with the 3 tiers (personal, standard, premium), and all pricing based on endpoint usage and volume of calls.
- Generous volume discounting with sliding scales – to more you use the greater the discount.

Flight Intent Submission

FlightAware Global customers can now inform FlightAware of an upcoming (or recently departed) flight with a Flight Intent submission through AeroAPI. This is intended for GA/BA Global customers, and is solely for the purpose of improving FlightAware data accuracy (not transmitted to external entities). An early flight intent will provide earlier visibility of the flight within FlightAware products. (Limited to Global customers only)

Incremental Improvements Specific to v2 users

In addition to the key v4 improvements outlined above, the following are incremental improvements specific to v2 users:

- Over 30 additional flight elements/fields were made available throughout, whether searching by individual flight or by /Airport or /operator lists of flights. Most notably – aircraft registration, codeshares, ATC ident, route, aircraft capacity by class, gate, and terminal assignments.
- Access to Foresight predictive values now available to all customers

Incremental Improvements Specific to v3 Users

In addition to the key v4 improvements outlined above, the following are incremental improvements specific to v3 users:

- Customizable flight alerting capability (no alerting functionality in v3)
- Access to Foresight predictive values
- Ability to obtain image of a flight's track on a map
- Advanced flight searching capability
- Enhanced data content. Over 20 additional flight elements/fields were made available throughout, whether searching by individual flight or by Airport/Operator lists of flights. Most notably – aircraft registration, codeshares, ATC ident, route, aircraft capacity by class, gate, and terminal assignments.
- Guaranteed SLA and reliability (v3 was a beta release)

Mapping the Old to the New v4

Because the resources were reorganized a bit to make their usage both easier and more efficient (get more information with a single call), there is not always a straight 1-to-1 mapping between a previous release and the current. Resources are now organized into 6 logical categories, making it easier for you to find and leverage what you need. Detailed documentation for the new resources should be obtained directly from the AeroAPI online developer documentation. https://flightaware.com/aeroapi/portal/documentation#overview

Flights

All functionality related to obtaining or searching for flight status or flight tracks for a flight or subset of flights. Notable improvements include:

- Significantly more flight detail information included for each flight leg, all with a single call. Example: No need to get FlightInfo, FlightInfoEx, AirlineFlightInfo, GetFlightID, InboundFlightInfo separately with multiple calls.
- Advanced flight search capability

v4	v3	v2
/flights/{id}/map		MapFlightEx MapFlight
/flights/{id}/position		InFlightInfo
/flights/{id}/route	DecodeFlightRoute	DecodeFlightRoute
/flights/{id}/track	GetFlightTrack	GetLastTrack GetHistoricalTrack
/flights/{ident}	FlightInfoStatus FlightInfoStatus_OAG	FlightInfo FlightInfoEx FlightInfoStatus InboundFlightInfo AirlineFlightInfo GetFlightId
/flights/{ident}/canonical		
/flights/{ident}/intents		SubmitFlightPlan
/flights/search		Search
/flights/search/advanced		SearchBirdseyeInFlight
/flights/search/count		SearchCount
/flights/search/positions		SearchBirdseyePositions

Foresight

Access to FlightAware's machine learning based predictive values. Previously available only to a limited number of customers using v2.

v4	v3	v2
/foresight/flights/{id}/position		InFlightInfoWithForesight
/foresight/flights/{ident}		
/foresight/flights/search/advanced		SearchBirdseyeInFlightWithForesight

Airports

All functionality related to an airport, including static airport information as well as flight activity for an airport. Significant improvements include:

- More comprehensive static airport information is now available, include ICAO/IATA codes, along with url to directly obtain flights to/from and airport.
- Ability to retrieve all arrivals/departures/schedArrivals/schedDepartures for an airport either in a single call or separately. This greatly simplifies getting precisely the data you need efficiently.
- Significantly more flight detail information for each flight leg for each of the various airport lists. No need to do additional calls for flight details.

New v4	v3	v2
/airports		AllAirports
/airports/{id}	AirportInfo	AirportInfo
/airports/{id}/canonical		
/airports/{id}/delays	AirportDelays	AirportDelays
/airports/{id}/flights	AirportBoards AirportBoards_OAG	
/airports/{id}/flights/arrivals		Arrived
/airports/{id}/flights/counts	CountAirportOperations	CountAirportOperations
/airports/{id}/flights/departures		Departed
/airports/{id}/flights/scheduled_arrivals		Enroute
/airports/{id}/flights/scheduled_departures		Scheduled
/airports/{id}/flights/to/{dest_id}	FindFlight FindFlight_OAG	
/airports/{id}/nearby	NearbyAirports	
/airports/{id}/routes/{dest_id}	RoutesBetweenAirports	RoutesBetweenAirports RoutesBetweenAirportsEx RoutesBetweenAirportsEx2
/airports/{id}/weather/forecast	WeatherForecast	Taf NTaf TafEx
/airports/{id}/weather/observations	WeatherConditions	Metar MetarEx WeatherConditions
/airports/delays		
/airports/nearby	NearbyAirports	

Operators

All functionality related to fleet operators/airlines, including static operator information and flight lists for the operator of interest.

- Significantly more flight detail information for each flight leg for each of the various operator flight lists. No need to do additional calls for flight details.

v4	v3	v2
/operators		AllAirlines
/operators/{id}	AirlineInfo	AirlineInfo
/operators/{id}/canonical		
/operators/{id}/flights	FleetBoards FleetBoards_OAG	
/operators/{id}/flights/arrivals		FleetArrived
/operators/{id}/flights/counts		AirlineInfo
/operators/{id}/flights/enroute		FleetEnroute
/operators/{id}/flights/scheduled		FleetScheduled

Alerting

Setting up and managing custom alerts. Note: Flight Alerting was not available in v3.

- Now also includes the ability to set a unique target url (endpoint) for each alert that is configured. Previously, only one endpoint was configured which would apply to all alerts.

v4	v3	v2
/alerts		SetAlert
/alerts/{id} (GET/PUT/DELETE)		GetAlerts DeleteAlert
/alerts/endpoint (GET/PUT/DELETE)		RegisterAlertEndpoint

History

Access to historical flight information dating back to January 1, 2011. Note: Previous versions (v2 and v3) did not have any equivalent functionality to access historical data. This is all new functionality found with v4.

v4	v3	v2
/history/flights/{id}/map		
/history/flights/{id}/route		
/history/flights/{id}/track		
/history/flights/{ident}		
/history/aircraft/{registration}/last_flight		

Schedules and Miscellaneous Functions

Published flight schedule information (as published by OAG), as well as disruption count statistics and static aircraft lookups.

v4	v3	v2
/aircraft/{ident}/blocked	BlockIdentCheck	BlockIdentCheck
/aircraft/{ident}/owner	TailOwner	TailOwner
/aircraft/types/{types}	AircraftType	AircraftType
/disruption_counts/{entity_type}		FlightCancellationStatistics
/disruption_counts/{entity_type}/{id}	FlightCancellationStatistics	
/schedules/{date_start}/{date_end}	AirlineFlightSchedules AirlineFlightSchedules_OAG	AirlineFlightSchedules