Flightaware Firehose in JSON format

ICM Raw Data

HIVE Scripts

to generate summary
files **ICAO Azure
Storage**

Read ADS-B data (in
Mongo DB), correlate,
insert FIR, and re-
organize into 5 work files:
departure, arrival,
position, cancellation,
flight Plan

Write 5 work files
to Cloud storage

Load to SQL for
Visualization App.

**ICAO
Server**

**ICAO
Server**
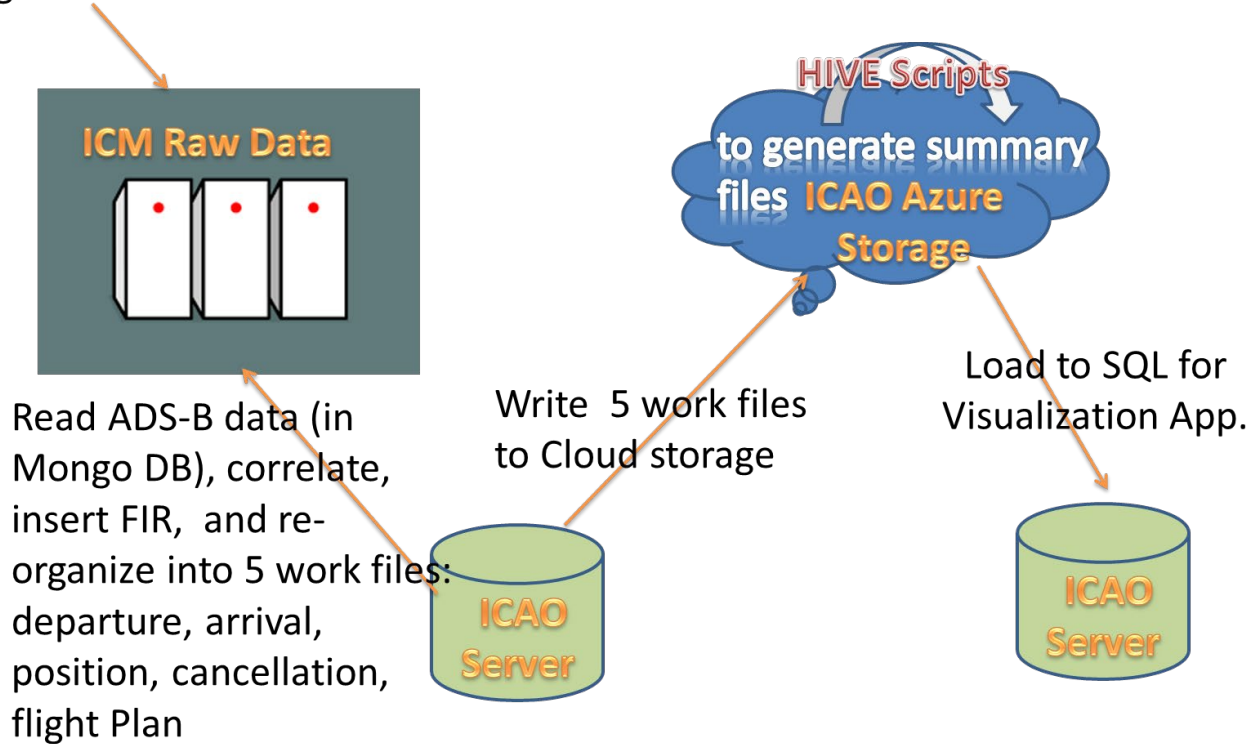
Work Data

Departures	Departure scheduled time, actual time, and aircraft type
Arrivals	Arrival scheduled time and actual time
Positions	Radar track and positions data
Cancellations	Cancelled scheduled flights
Flight Plan	Flight plans filed prior to the flight and its amendments during the flight

All Cargo Operations

Identify and extract all cargo carriers and operations

- Pre-Defined reference table of all cargo carriers
- Identification of flight number convention and patterns of all cargo operations for carriers which operate passenger and all cargo under the same carrier code
- Identification of tail number of cargo aircraft

Air Cargo Insights

- Production of insights about air cargo operations
- Calculations of key metrics and parameters to calculate economic contributions of air cargo
- Create a link between cargo operations, ICAO reported data, and UN Comtrade data to map flow of goods by type and category (dangerous goods etc.)
- Assist in planning of infrastructure investments and planning (customs , safety etc.)

Fuel Consumption/Operation Types/Schedules

Calculation of Fuel Consumption and carbon emissions

- Fuel and carbon models are calculated using actual patch flown and other variables associated with each aircraft type

Operation Categories

- All operations are divided into categories such as general aviation, business (corporate), passenger, and cargo based on type of aircraft

Scheduled/non Scheduled Services

- ADSB operations are cross referenced with OAG schedules to determine scheduled portion of operations

Air Navigation Billing

Calculation of air navigation charges

- Calculation of air navigation charges based on the actual route flown within each FIR
- FIR charges from doc 7100 in conjunction with actual positions extracted from ADSB used to produce a state of the art billing application
- Charges available to access either by FIR or carrier

Search Billing Of FIR

State: Canada FIR: FIR MONTREAL Date: 2018-10-10 [Submit]

FIR MONTREAL, 2018-10-10, 2335 Records, Total 6378.67 USD

| Carrier Name	Departure	Arrival	Flight No	Charge Type	Amount (US)
JAZZ AVIATION LP (JZA)	CYUL	CYOW	JZA8977	EnRoute	0.10
BRITISH AIRWAYS (BAW)	CYYZ	EGKK	BAW2270	EnRoute	18.86
PORTER AIRLINES INC. (POE)	CYTZ	CYUL	POE489	EnRoute	0.40
PORTER AIRLINES INC. (POE)	CYTZ	CYUL	POE489	Terminal	1.11
UNITED AIRLINES, INC. (CHICAGO, IL) (UAL)	KEWR	EGPH	UAL36	EnRoute	5.82
WESTJET ENCORE (WEN)	CYOW	CYYZ	WEN3479	EnRoute	-0.33
WESTJET ENCORE (WEN)	CYOW	CYYZ	WEN3479	Terminal	1.11
JAZZ AVIATION LP (JZA)	CYOW	CYHZ	JZA8636	EnRoute	1.00
AIR FRANCE (AFR)	CYUL	LFPG	AFR347	EnRoute	10.45
SKY REGIONAL AIRLINES INC. (SKV)	CYUL	KEWR	SKV7744	EnRoute	-0.06
SKY REGIONAL AIRLINES INC. (SKV)	CYUL	KEWR	SKV7744	Terminal	1.37
JAZZ AVIATION LP (JZA)	CYZV	CYWK	JZA8698	EnRoute	0.52
PORTER AIRLINES INC. (POE)	CYUL	CYHZ	POE483	EnRoute	0.26
SKY REGIONAL AIRLINES INC. (SKV)	CYUL	KLGA	SKV7642	EnRoute	-0.06
SKY REGIONAL AIRLINES INC. (SKV)	CYUL	KLGA	SKV7642	Terminal	1.37
CONDOR FLUGDIENST GMBH, FRANKFURT (MAIN) (CFG)	CYQB	CYHU	CFGCP	EnRoute	0.24

Visualization Application

FIR Visualization

- Visualization of all flights within 1 hour time bands for each FIR
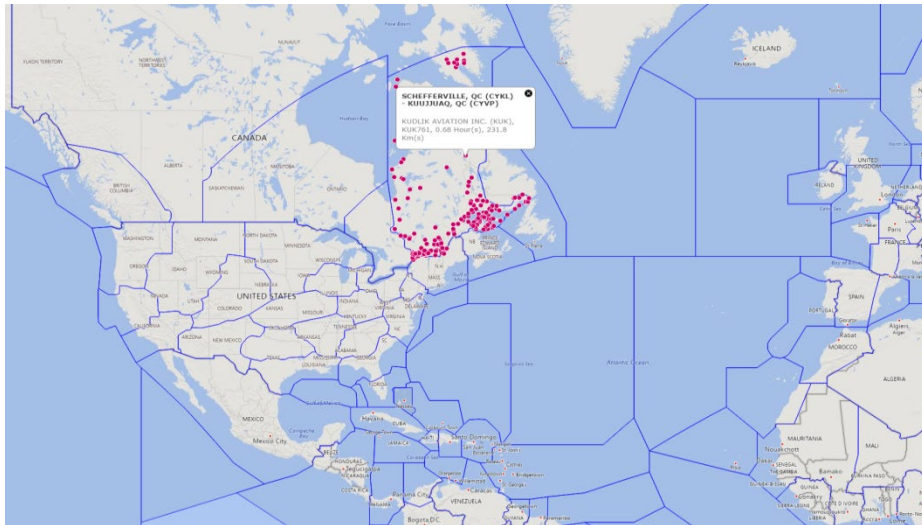
Flight Route Visualization

- Visualization of patch flown by each flight
- Predictive analysis to determine optimal routes given FIR constraints
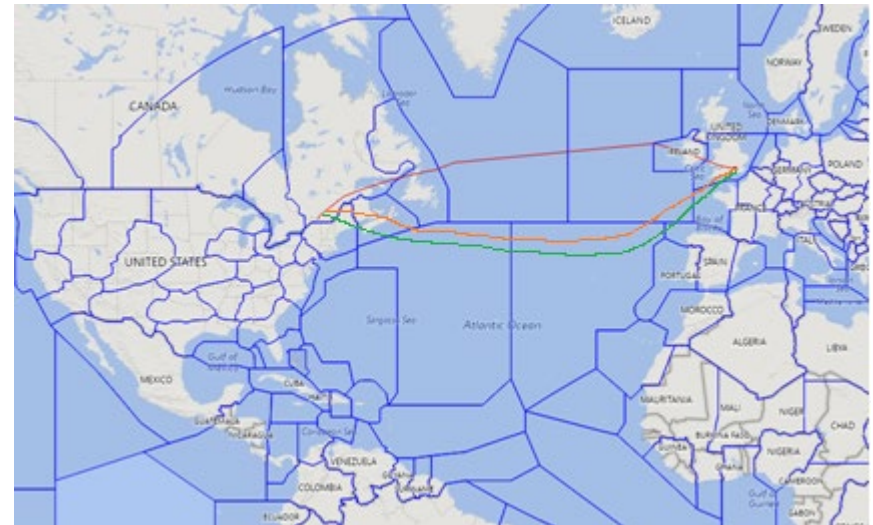
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THANK YOU