



Architecture diagrams for travel

Flight Planning Using Data Lakes and AI/ML



Flight Planning Using Data Lakes and AI/ML: Architecture diagrams for travel

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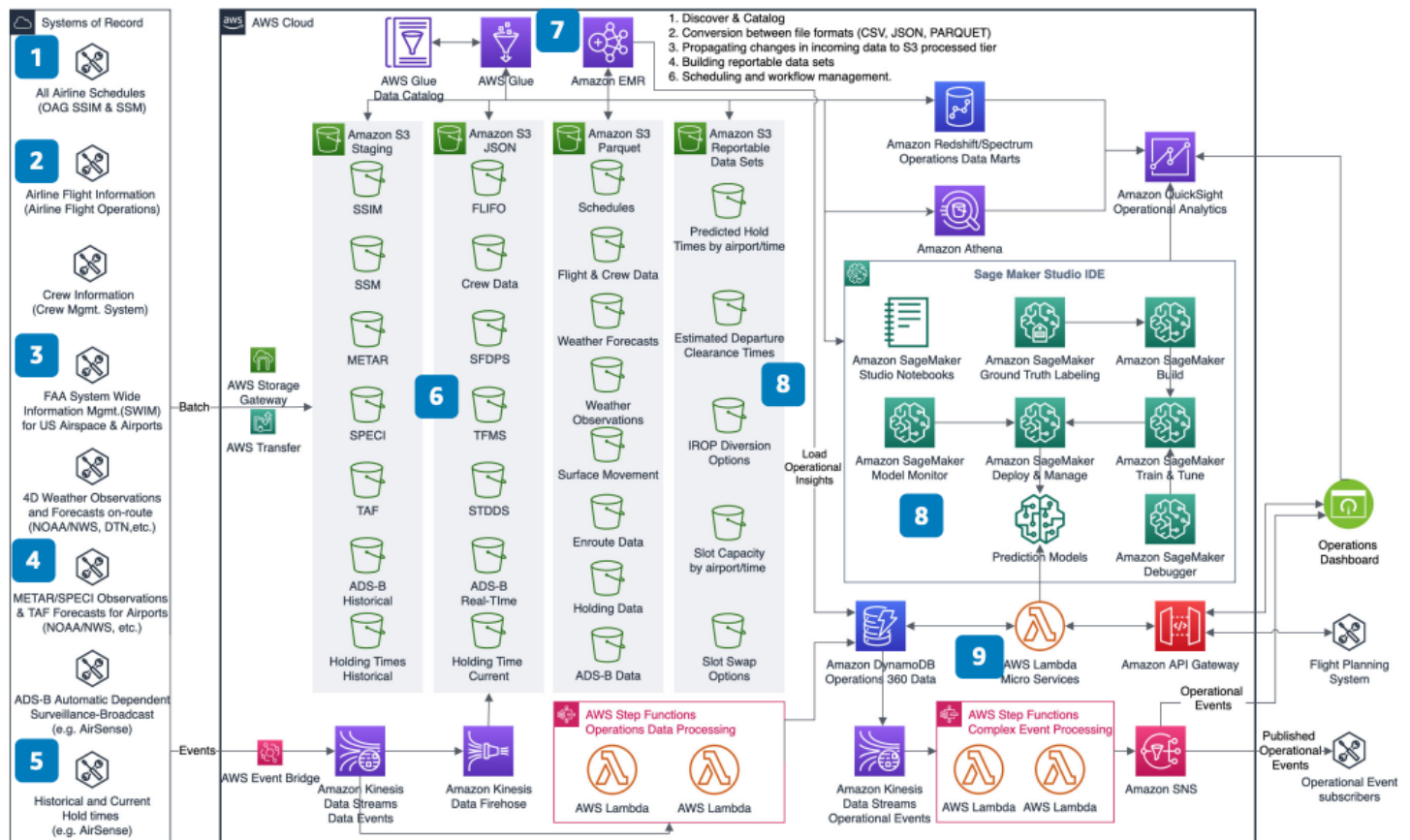
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Publication date: July 16, 2020 ([Diagram history](#))

With this architecture, you can improve hold time prediction and departure clearance time estimation. Use published schedules, flight information, airport weather, historical hold times, and aircraft data. You combine batch and real-time feeds in a tiered data lake for predictive modeling.

Flight planning data lakes diagram



The following steps describe the architecture:

1. Use published schedules from OAG for a full picture of arriving flights by time of day.
2. Augment with actual flight data through real-time flight information feeds.
3. Use flight plans, surface movement, and on-route information from FAA System Wide Information Management (SWIM). This provides an airspace and taxiway picture.

4. Use Meteorological Aerodrome Report (METAR) weather observations and Terminal Aerodrome Forecast (TAF) data. Correlate hold time to weather conditions.
5. Use historical hold times to build predictive models. Train models by airport, time of day, and weather conditions.
6. Build a tiered data lake on [Amazon S3](#). Ingest and process both batch and real-time feeds.
7. Use [AWS Glue](#) and [Amazon EMR](#) to discover, catalog, and process data into Apache Parquet format.
8. Use [Amazon SageMaker AI](#) to build, train, tune, and deploy predictive models. Use Debugger and Model Monitor for model quality.
9. Build an operational data store for real-time predictions. Integrate predictions into flight planning systems.

Further reading

For additional information, see the following resources:

- [AWS Architecture Icons](#)
- [AWS Architecture Center](#)
- [AWS Well-Architected](#)

Diagram history

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Change	Description	Date
Initial publication	Reference architecture diagram first published.	July 16, 2020

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