Digital TMI

Creation, Storage, Retrieval, and Transmission of TMI Data

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ATCSCC Visitors

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• Traffic demo
Project Overview

- The goal of Digital TMI is to offer specific and reasonable suggestions for improvements to the creation, storage, retrieval, and transmission of Traffic Management Initiative data, which may facilitate day-of-operations decisions and historical analysis.

- The TMI Cube will offer a unified view of TMIs for all stakeholders. This will include historical, current, and near-future TMIs. The TMI Cube will be accessed through the FAA’s NAS Common Reference.

- Started August 2011, currently funded through August 2013 by Rich Jehlen’s group
Traffic Management Data

- The National Traffic Management Log (NTML) and Traffic Flow Management Data to Industry (TFMDI) are two primary sources.

- Currently, Traffic Management Initiative (TMI) data is generated, stored, and retrieved (mostly) to aid day-of-operations.

- TMI data serve their intended purposes well.

- Future sources? FPS?
Downside

• The major drawback to the current state of data in the NAS is the difficulty of historical analysis

• Examples
  – Non-trivial to extract meaningful relationships between the data within the NTML
  – Archive of TFMDI data not readily available and is stored only as a set of individual XML files

• Secondary drawback is the data living in (and accessed from) different systems
Fundamental, ‘Hard’ TMI Questions

• What are all the current TMIs affecting flights from ZOA to ZNY? To ATL?

• Given a choice between 3 routes, which one is least likely (based on history) to receive multiple TMIs?

• On May 3rd, 2011, how did the day’s TMI plan evolve? How many changes to the plan were required?
Approach

- Create a unified data source for TMIIs that is suitable for analysis and for ‘day-of’ operations

- Leverage existing/developing models and architectures
  - AIXM, GML, etc.
  - SWIM
Traffic Management information eXchange Model: TMX
### Reroute Advisory from NTML

- **Reroutes only occur in the ‘Advisories’ table of NTML.**
- **Few columns:**
  - Times
  - Cause
  - Text blob (example)
- **Difficult to parse, error-prone**

#### ATCSCC ADV/ZY 011 DCC 07/06/10 FCA RQD
- **NAME:** FCABKW: NO_BKW_2_EWR
- **CONSTRAINED AREA:** ZDC
- **REASON:** VOLUME
- **INCLUDE TRAFFIC:** ZFW/ZHU/ZME DEPARTURES TO EWR
- **FACILITIES INCLUDED:** ZFW/ZHU/ZME
- **FLIGHT STATUS:** ALL_FLIGHTS
- **VALID:** FCA ENTRY TIME FROM 061800 TO 062230
- **PROBABILITY OF EXTENSION:** LOW
- **REMARKS:** SEE DYNAMIC LIST FOR UPDATES.
- **ASSOCIATED RESTRICTIONS:** VIA NTML.
- **MODIFICATIONS:** RQD TO EWR ONLY TODAY.

#### ROUTES:

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10/07/06 11:35  FSB./lxstn08a 703-925-5308
Traffic Flow Management Data to Industry

- TFMDI is available similarly to ASDI
- XML-formatted reroute, FCA, and FEA data
- “Publish-Subscribe” system
  - New reroute is issued
  - Encoded in TFMDI XML format and saved
  - “Announced” to all clients that it is downloadable
- Example…
Translating TFMDI to TMXM

• Since both formats are well-structured, translation is not difficult
• Example…
MIT Data

- MIT sourced from NTML

- Important columns from RSTN database table:
  - Frfac
  - Tofac
  - Rstn Type (MIT, ALT, STOP, SPD, etc.)
  - Start/Stop Times
  - Rstntype (Departures, Arrivals, Enroute)
  - Airports (Arrival, Departure)
  - NAS Element (Usually a fix/waypoint?)
  - Various parameters (MIT value, ALT type, Spd, etc.)

- Not yet implemented in Digital TMI system
Ultimately, this will become a single DB query.
Playbook Reroute Data
Data Needs

- Historical TFMDI data
  - We collect all TFMDI data now
  - Only have a number of months in archive

- “Digitized” Playbook Reroute data
  - Only access to playbooks is via website
  - ATCSCC has ‘machine readable’ playbook data

- Scheduled NTML query
  - At least a daily query, but perhaps an hourly?
  - System is in place to do this already, need permissions

- TMA samples
  - Members of FCT noted importance of TMA data
  - Even though TMA data is not centralized, we’d like to examine it