Future ATM Concepts Evaluation Tool (FACET)

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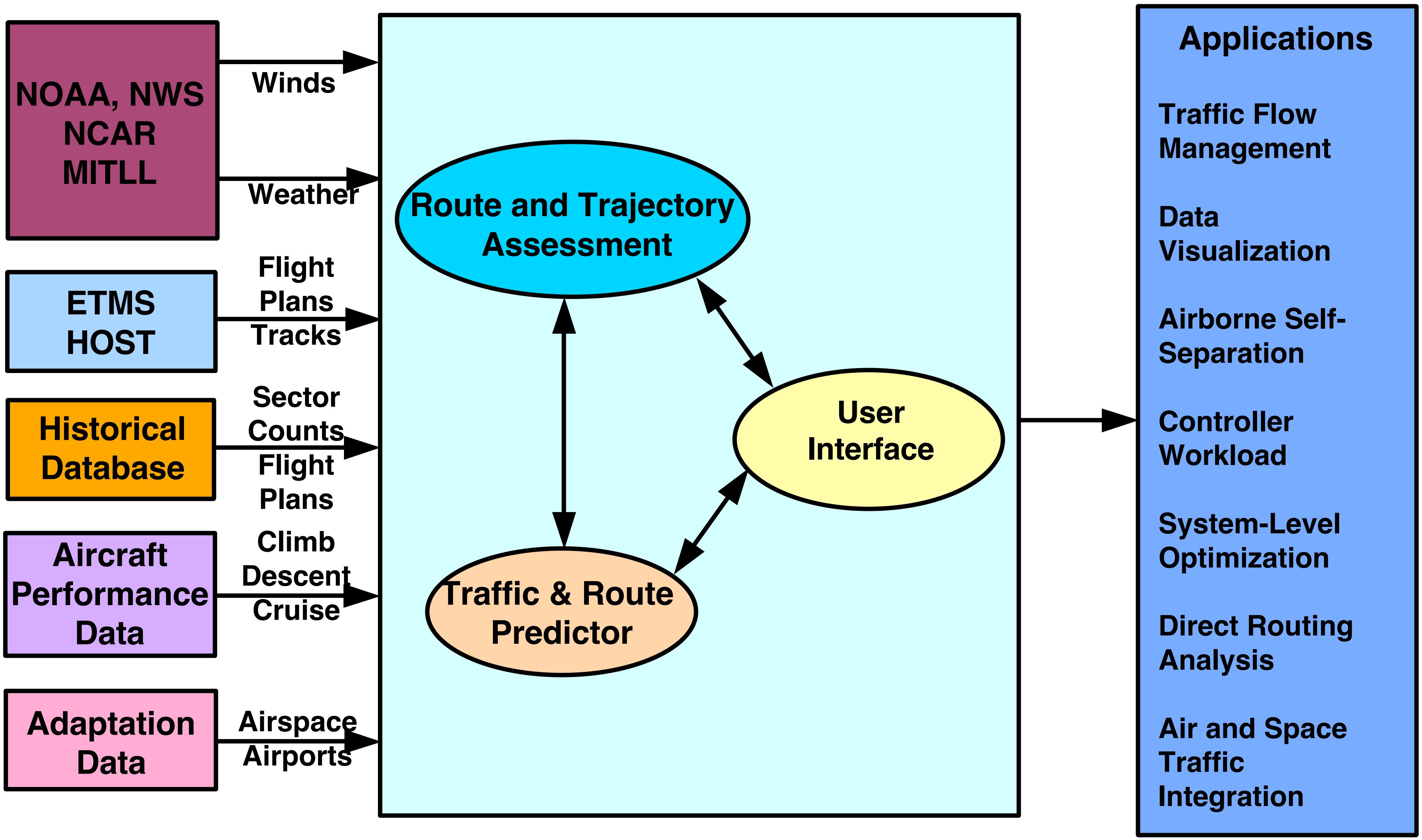
FACET Capability

- Environment for exploring advanced ATM concepts
- Balance between fidelity and flexibility
  - “What-if” decision-making capability for a large complex system (~10,000 aircraft, ~1,000 decision-makers, ~100 major airports)
  - Scope varies from a national scene to individual aircraft
  - Software written in “C” and “Java” programming languages
    - Runs on various computer platforms
- Used for real-time planning applications, ATM concept evaluation, data visualization, and off-line analysis
- 4 Operational Modes: Playback, Simulation, Hybrid, Live

FACET Architecture

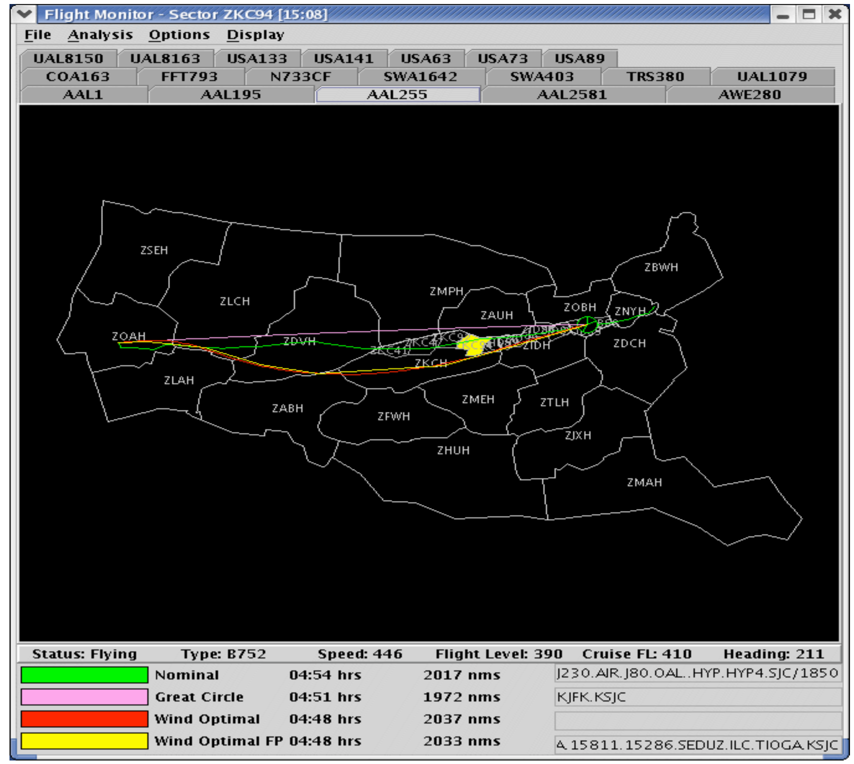


FACET for FAA Use

- "What-if" decision support capability for evaluating TFM options to avoid bad weather/congestion and reduce delay
  – Re-routes, Aircraft spacing, ground delay
- Real-time reroute conformance monitoring functionality deployed in ETMS 8.0 release in Q2 of 2005
- Adaptation of NASA technology in existing FAA operational systems is the biggest measure of success for ATM projects!
- Evaluating use of FACET for Historic Playback capability
- Assessment of "what-if" of Traffic Management Initiatives
- Integration with Jupiter Simulation Environment for Airspace Flow Program (AFP) impact analysis

FACET for Airline Use

- March 2001: Airline Dispatcher's Federation (ADF) team requested
  NASA to develop dispatcher tools
- FACET adapted to work with Aircraft Situation Display to Industry (ASDI) data
- Working with ADF and Ohio State University to develop requirements and identify research issues

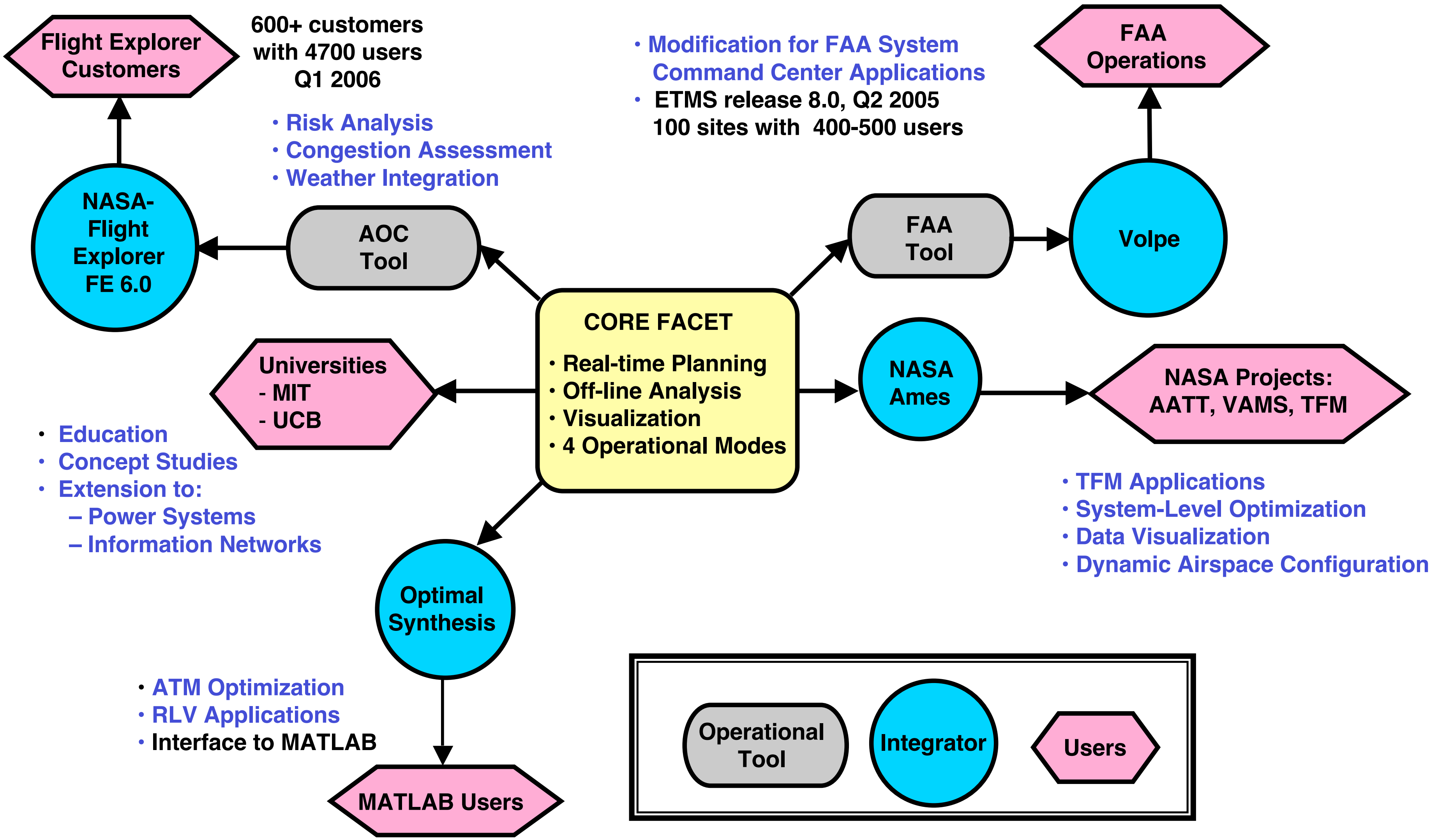


- **Enable efficient operations planning by airlines**
  - **Integration of weather and traffic information**
  - **Risk assessment**
  - **Departure planning and congestion management**

FACET Commercialization

- **Ames Commercial Technology Office licensing the software to Flight Explorer**
- **Flight Explorer**
  - **Leading vendor of Aircraft Situation Display**
  - **Customers include 80% major U.S. airlines, 22 regional airlines, all Cargo airlines, executive jet operators**
- **FACET integrated with Flight Explorer in FE 6.0 release in Q1 2006**
- **Predicted Sector Congestion and Airport Rates available to users**

FACET Users



Flight Explorer Customers
600+ customers with 4700 users Q1 2006
• Risk Analysis
• Congestion Assessment
• Weather Integration
• Modification for FAA System Command Center Applications
• ETMS release 8.0, Q2 2005 100 sites with 400-500 users
FAA Operations
NASA- Flight Explorer FE 6.0
AOC Tool
FAA Tool
Volpe
CORE FACET
• Real-time Planning
• Off-line Analysis
• Visualization
• 4 Operational Modes
Universities - MIT - UCB
NASA Ames
NASA Projects: AATT, VAMS, TFM
• Education
• Concept Studies
• Extension to:
– Power Systems
– Information Networks
• TFM Applications
• System-Level Optimization
• Data Visualization
• Dynamic Airspace Configuration
Optimal Synthesis
• ATM Optimization
• RLV Applications
• Interface to MATLAB
MATLAB Users
Operational Tool
Integrator
Users

FACET
Software
Demonstration