# UTM TCL2 Software Design

**Daniel Mulfinger** 

# What is the UTM Software?

- Research Prototype Software
- Implements the UTM Concept of Operations
- Web Application
- Two pieces
  - UTM Core
  - Set of Services
- ~25K lines of code
- Agile-based with 4-week sprints

## **Design Principles**

Research prototype, but built with long-term view

 Use state-of-the art software design conventions

• Test-driven design (TDD)

# **Technologies Used**

- Java
- Spring Framework
- Apache ActiveMQ
- Apache Tomcat
- STOMP Stomp 🛸
- PostgreSQL + PostGIS
   PostGIS
- **JTS Topology Suite**
- **REST (Representational State Transfer)**
- Jenkins
- Atlassian
- Atlassian SonarQube sonarqube<sup>•</sup>



**ActiveMQ** 



UTM Web Application

## **User Roles**

- Operator
  - UAS operator
  - Submits/flies operations
- Manager
  - Sees complete picture
  - Can add manager constraints or override existing constraints
  - Can submit/close operations
  - Send messages to clients
- Public
  - Limited access

## NASA Front-End Implementations

 Mission Planner compatible Python Client

• UTM Manager IOS App

• UTM Web Viewer







#### Software Demo

- Walk through screen shots
- (UTM Python Client w/iPad App)





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## Software Releases

- Products available via Software Usage Agreement for partners with Space Act Agreement or other qualifying contract:
  - UTM Server (virtual machine, no source code)
  - Python Reference Client (includes source code)
  - UTM Manager Display (IOS App, no source code)

• Dates:

TCL 1 – Dec 2015

TCL 2 – Dec 2016 (anticipated)

# Write your own client?

- Submit an RFI response or sign Space Act Agreement
- Request TCL2 Client ICD and credentials
- Create client
- Test according to UTM Client Test Plan document

### **API Documentation**



Client Interface Control Document

#### Online documentation – Swagger compatible

#### Questions?

daniel.g.mulfinger@nasa.gov