Implementing Strategic Planning Capabilities within the Mars Relay Operations Service

Franklin Hy
Jet Propulsion Laboratory,
California Institute of Technology
March 2011
What Is Relay?
Old Manual Method
Multiple Assets Increase Coordination Difficulty
Potential for human error...
MaROS Ingredients

Command Line

Server

ReSTlet

Database

Web Browser Interface
Ingredient: Server

- Handles all business logic
  - Detects conflicts
  - Calculates latencies
- Uses MySQL to store data
- Access via Representational State Transfer (ReST)
Ingredient: ReSTlet

- Listens for web calls
- Multiple Clients
Ingredient: Command Line

- Support Legacy Machines
- Scriptable
- Publishes/extracts data
Ingredient: GUI
Ingredient: GUI
Deployment Recipe

• Phase 1
  – Strategic
  – Accountability

• Phase 2
  – Forward Link

• Phase 3
  – Tactical
Software Development Practices

• Weekly Working Group
  – MRO, ODY, MER, MSL
  – Requirements
  – Feedback

• Scrum
  – Brief daily tagups via skype
  – Weekly meeting
  – Sprints
Conclusion

The operations teams from the ongoing missions at Mars have been generous with their time to both help plan and test a new system that will meet the future challenges of both NASA and international Mars exploration.

Throughout this development and deployment process we have followed a few guiding principles:

• Ensure ubiquitous access through ReSTful and web interfaces;
• Design a system that is mission and even planet agnostic so that future missions may be added with little hassle, and the system itself may be redeployed for other planetary relay networks;
• Accept constant input and feedback between mission operators and the development team to ensure that there is a useful product that may be used for years to come.
Acknowledgements

• AIAA
• MaROS Working Group
• MaROS Development Team
  – Roy Gladden
  – Dan Allard
  – Mike Wallick
  – Paul Wang

• The work described in this paper was conducted at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.
Thank You!

Questions?