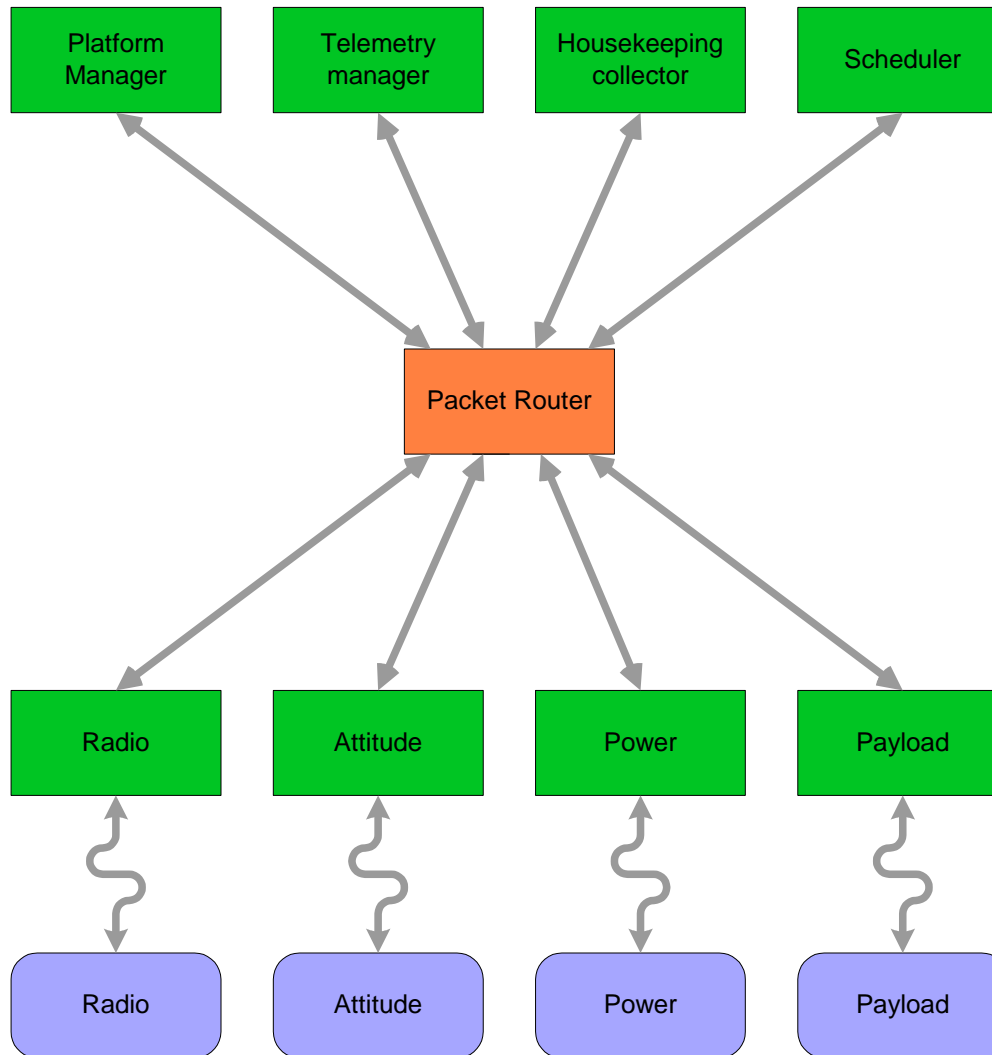




Onboard software





Software architecture

- One C program consisting of
 - The eCOS kernel
 - Packet router library
 - 9 software modules:
 - Platform manager
 - Scheduler
 - Housekeeping collector
 - Telemetry manager
 - Protocol (incl. Radio interface)
 - Attitude
 - Power
 - Camera
 - Tether



The module concept

- What is a module?
 - The basic idea of modules is to isolate the different parts of the system in order to simplify the system development and error handling
- Properties
 - Operates autonomously
 - Communicates with the rest of the system through the Packet Router using packets and the communication facilities of the Packet Router
 - Contains several parallel threads of execution
 - All modules share the same memory space

Module developer toolbox



- Module development and testing using the Linux synthetic target
- Common CVS (Concurrent Versions System) server
- Module Developer Kit version 2.0



Developing modules

- In order to co-exist with other modules a module must comply to the rules regarding:
 - Naming conventions
 - Memory usage & allocation
 - Software watchdog
 - Receiving/sending packets
 - Telecommands
 - Telemetry
 - Inter-module communication



About Redhat eCOS

- Small memory footprint (10-100 kb)
- Open source, royalty-free, license-free
- Highly customizable
- Real-time kernel including:
 - Interrupt handling
 - Exception handling
 - Thread support
 - Rich set of synchronization primitives
 - Timers, counters, and alarms