

Proposed Network-Centric Architecture for the ACP

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Proposed Network-Centric Architecture

- The Advanced Communications Package [system] should appear to its users to be an Internet Protocol (IP) network.
 - Its behaviors should be *indistinguishable* from any other IP network.

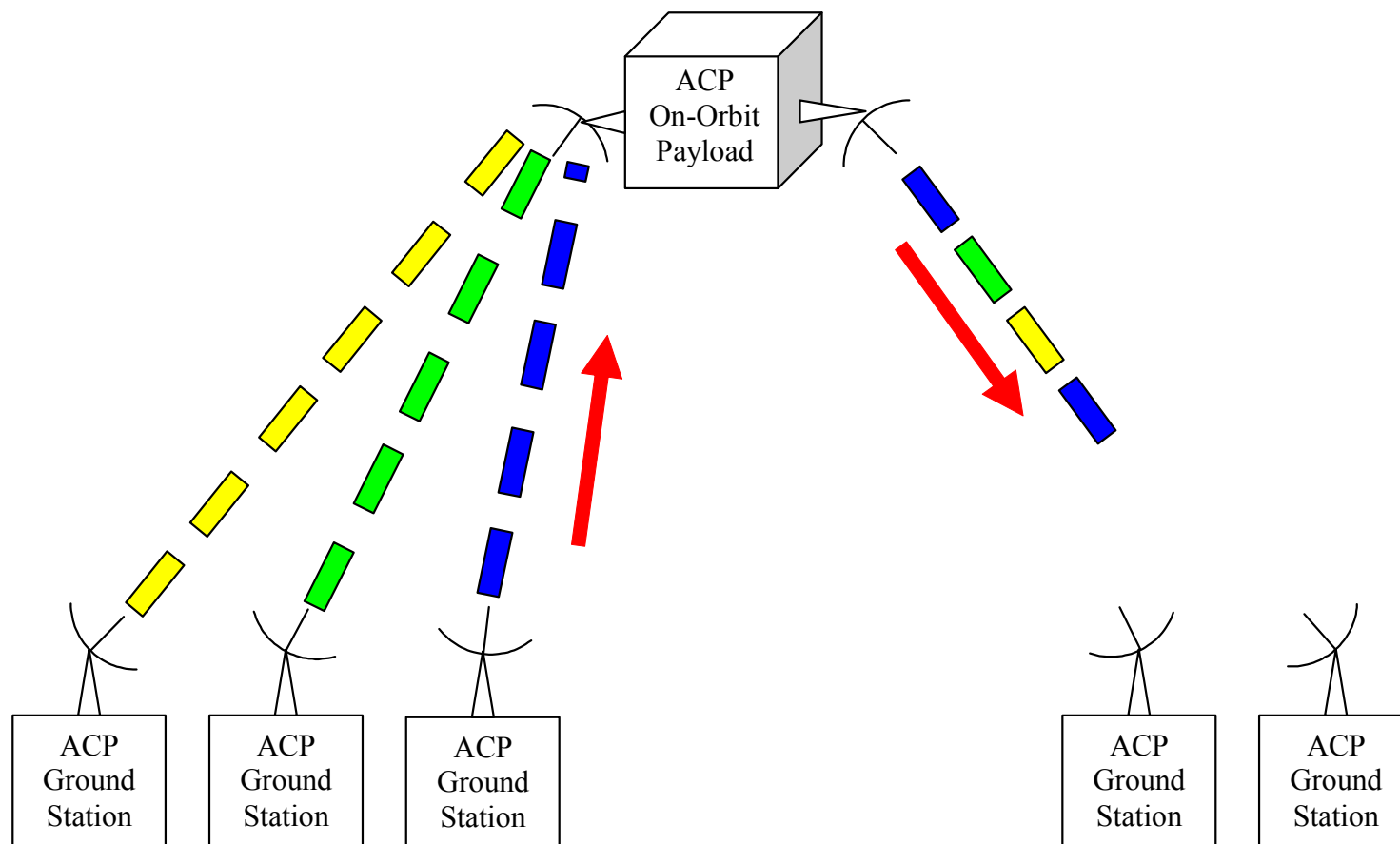
User View of ACP



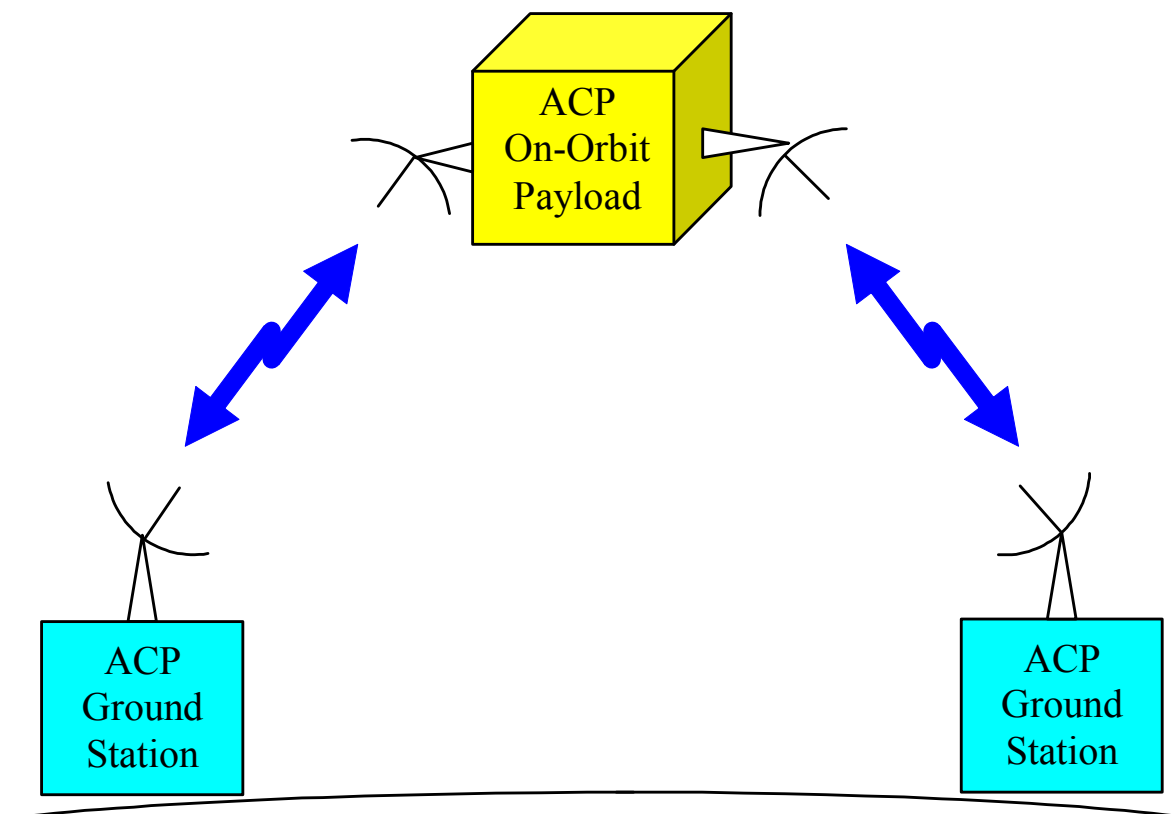
Questions



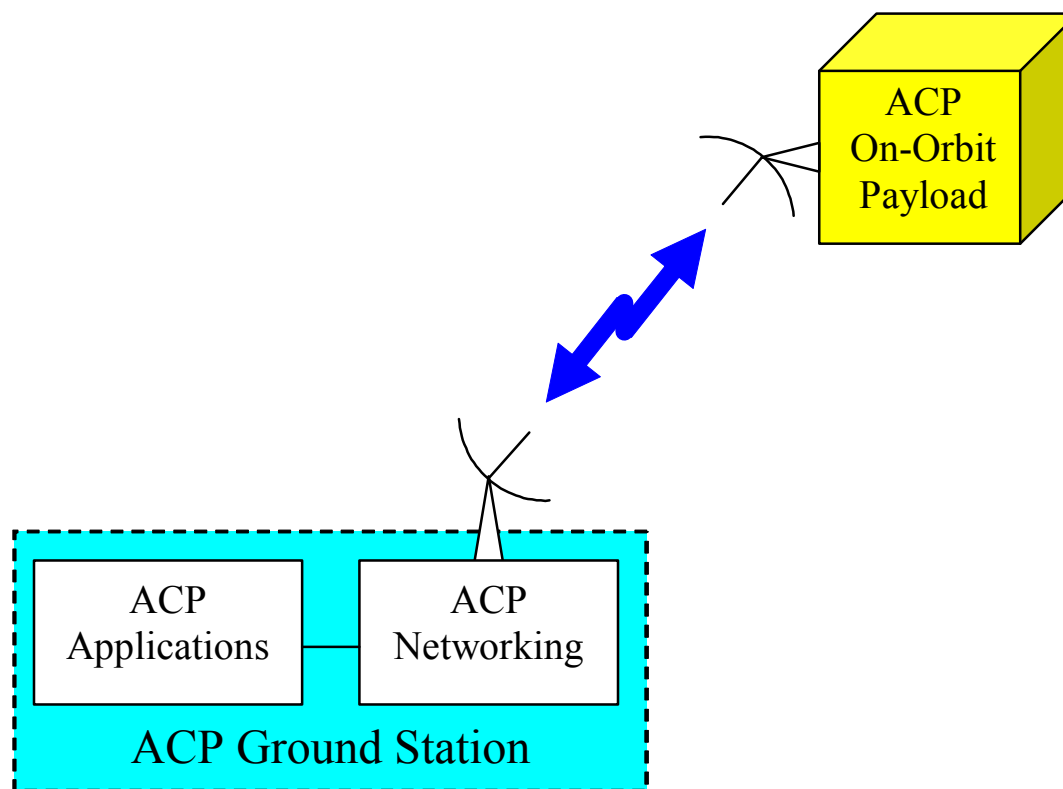
Advanced Communications Package



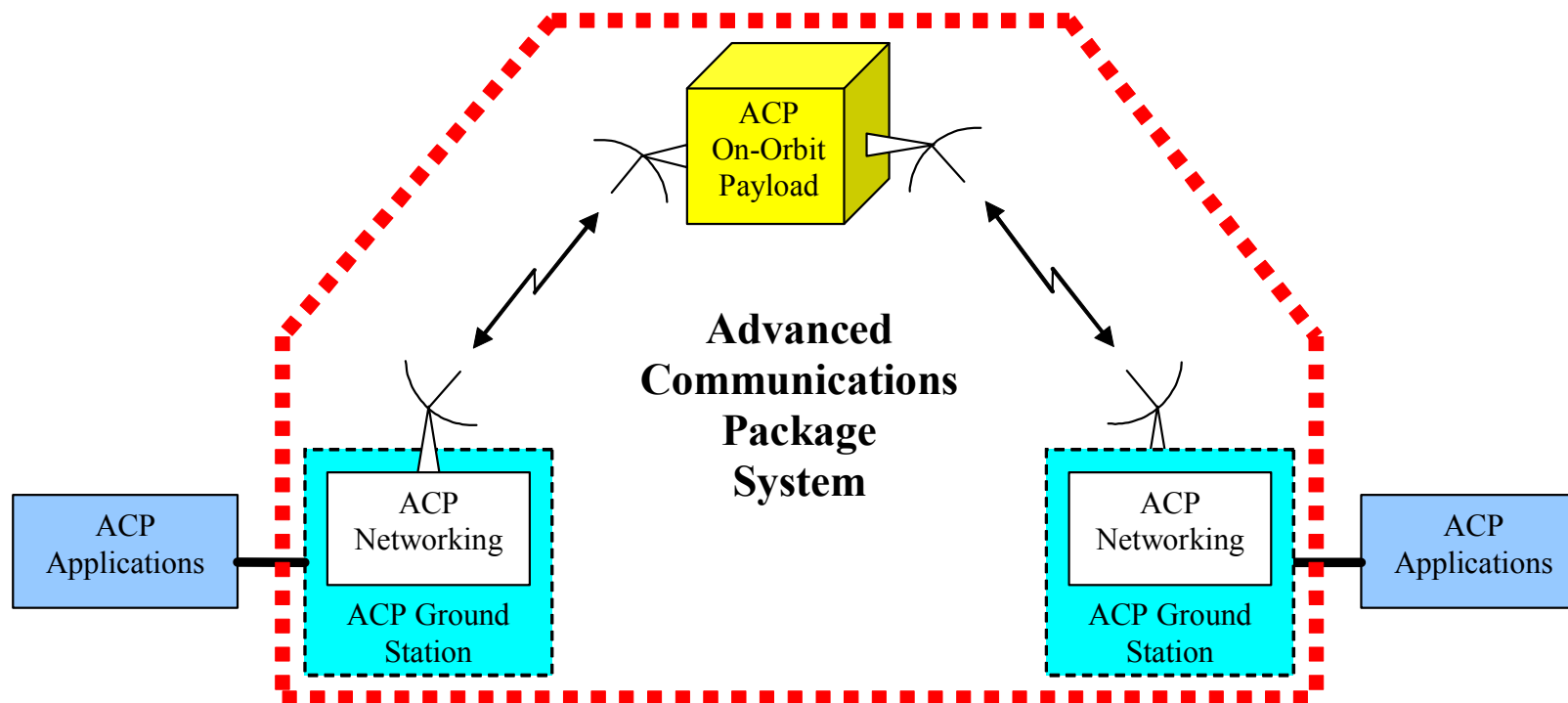
Advanced Communications ~~Package~~ System Abstract View



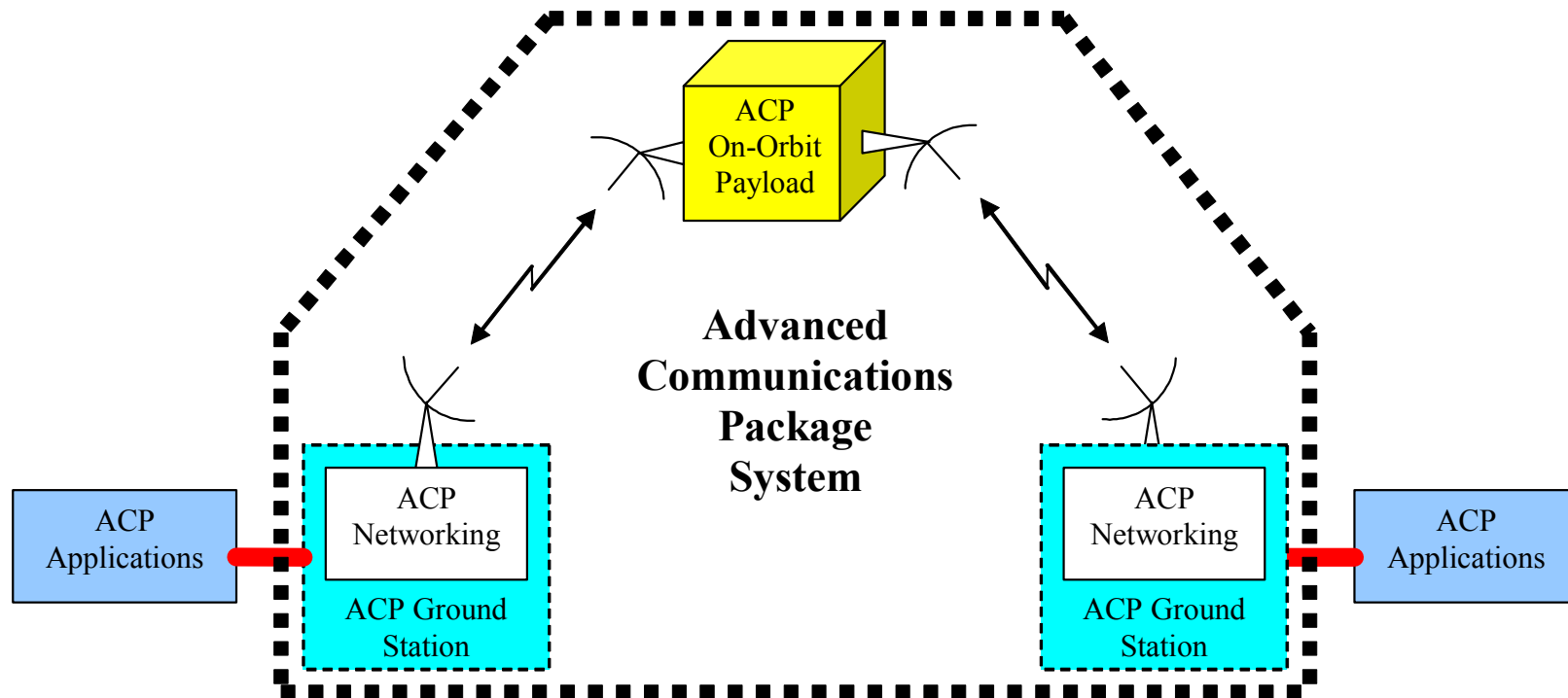
Advanced Communications ~~Package~~ System Subsystem View



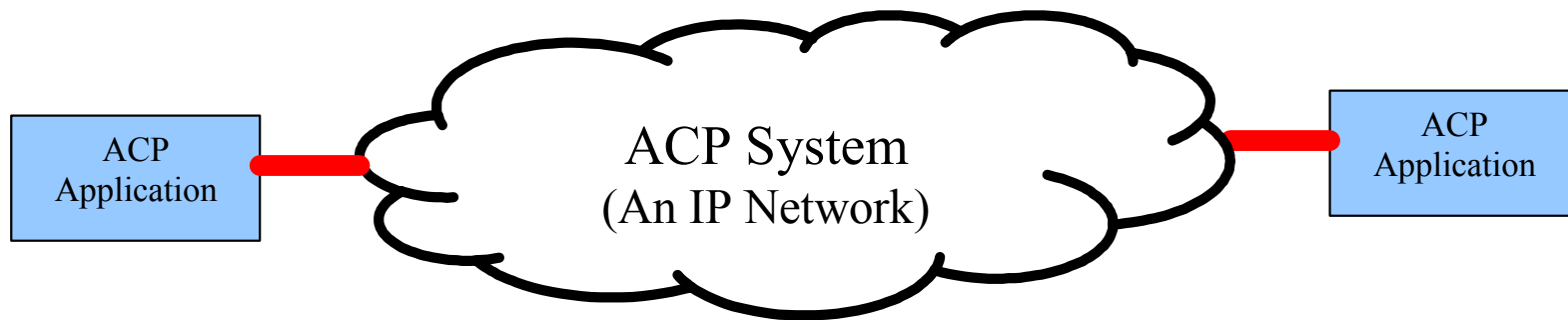
Advanced Communications ~~Package~~ System System Boundary



Advanced Communications ~~Package~~ System System Interface



Advanced Communications ~~Package~~ System Application Perspective



Advanced Communications ~~Package~~ System Application Perspective



Advanced Communications ~~Package~~ System Application Perspective



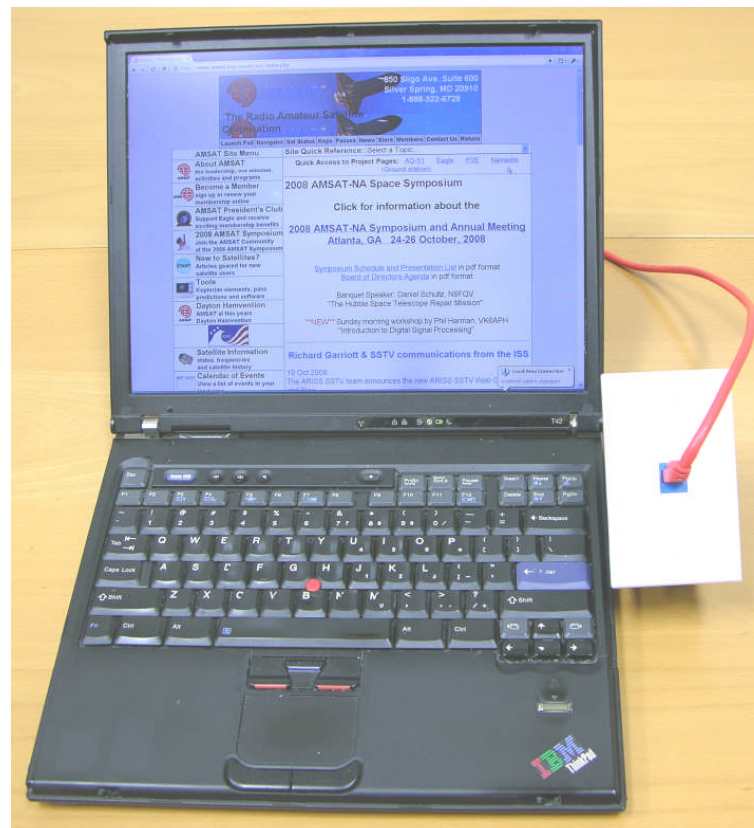
Advanced Communications ~~Package~~ System

- Lessons [allegedly] learned so far:
 - Design the ACP as a *system*, not as a package (or component)
 - Separate the ACP system from the applications (users)
 - Select a standard interface between the ACP system and the applications
 - Use IP

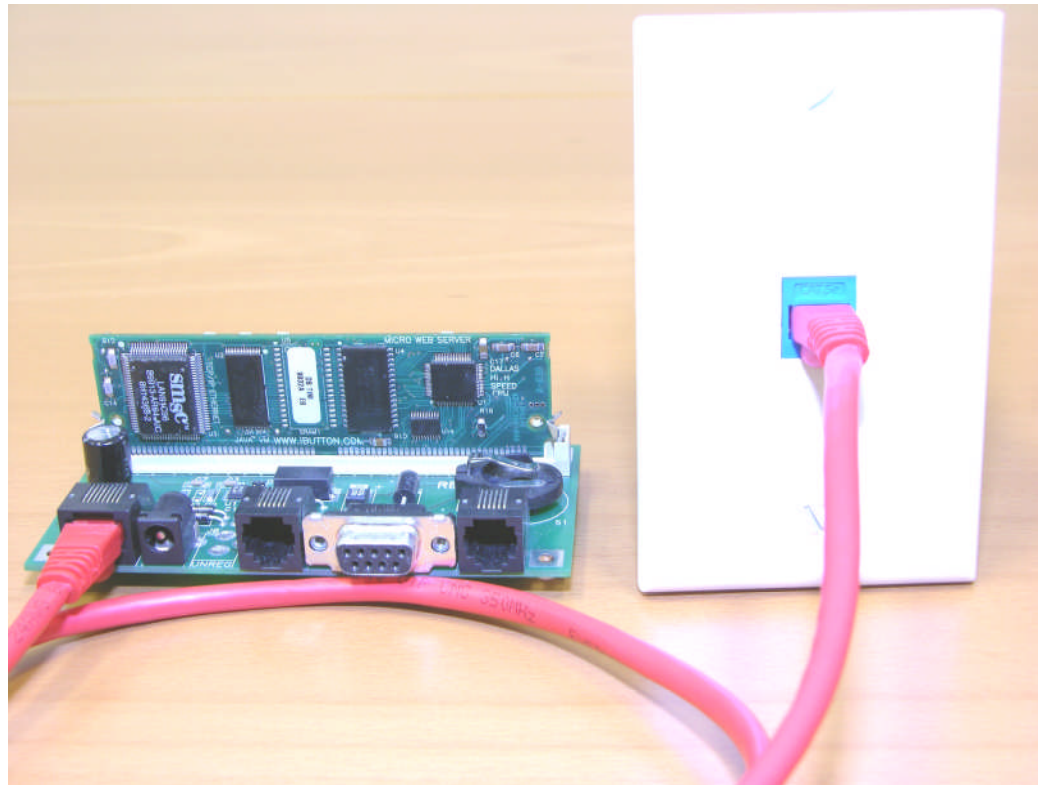
Advanced Communications ~~Package~~ System Benefits



Advanced Communications ~~Package~~ System Benefits



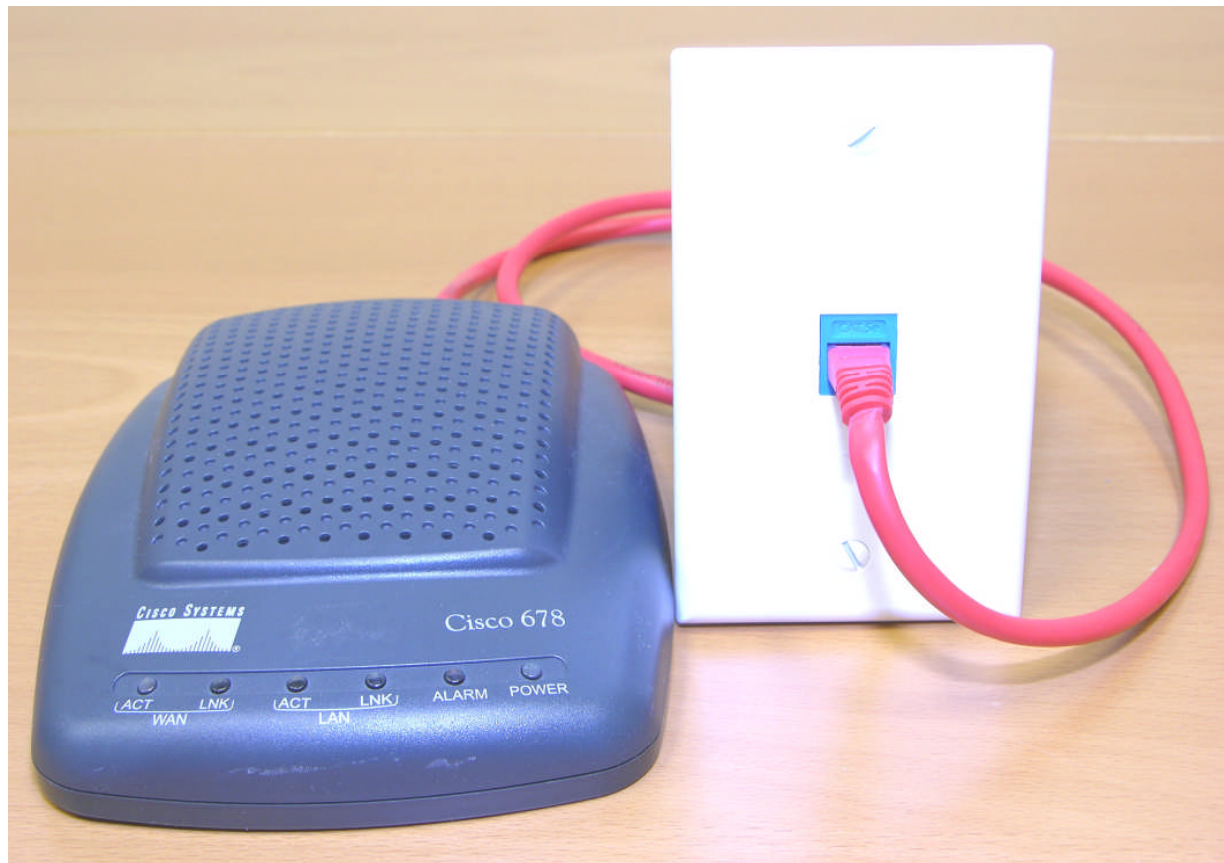
Advanced Communications ~~Package~~ System Benefits



Advanced Communications ~~Package~~ System Benefits



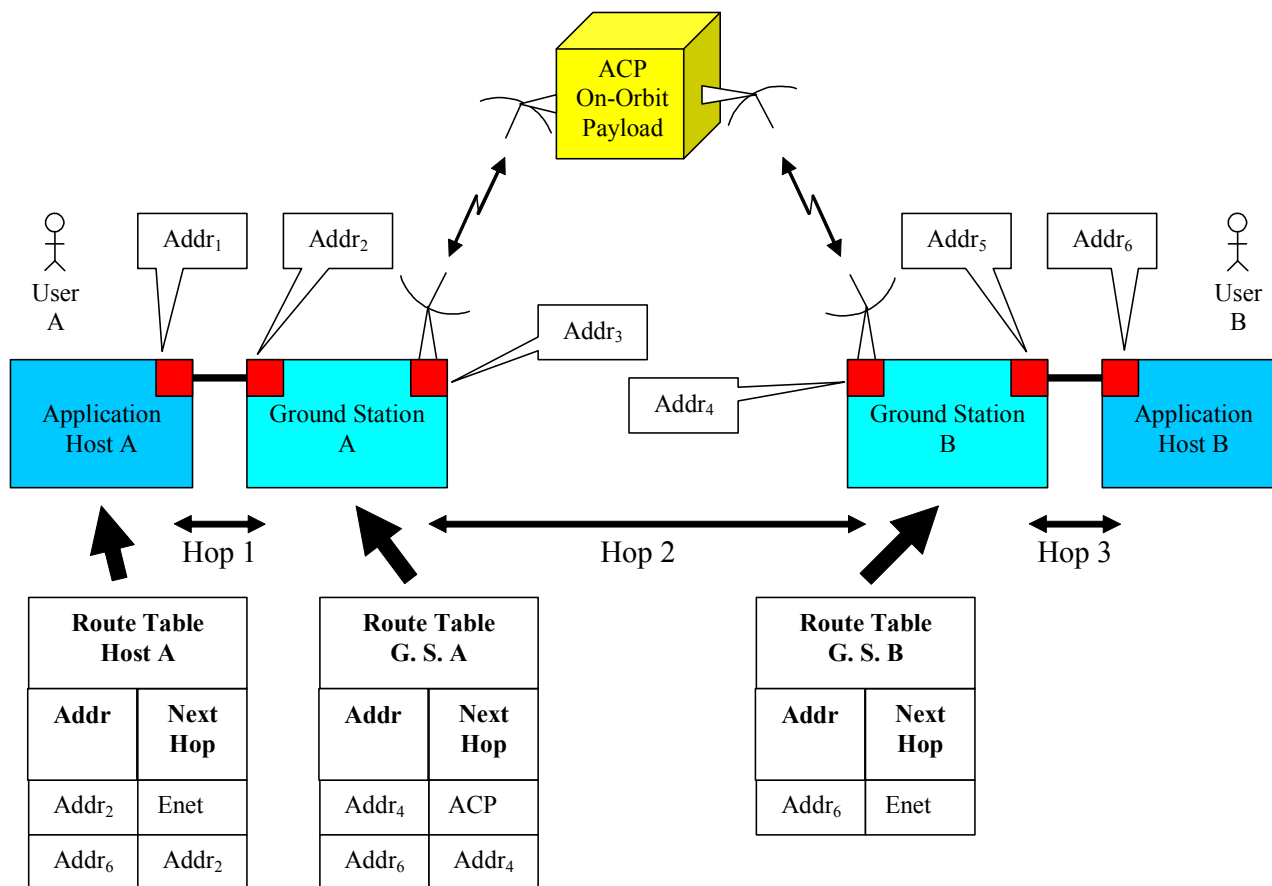
Advanced Communications ~~Package~~ System Benefits



Advanced Communications ~~Package~~ System Benefits of Boundary and Interface

- Reduces scope of ACP development
 - All the applications (e.g., devices or software) already exist!
- Opens development of new ACP applications to *anyone*!
- Attracts new members to amateur radio and amateur satellite communities

Advanced Communications ~~Package~~ System The Technical Stuff



Advanced Communications ~~Package~~ System The Technical Stuff



Advanced Communications ~~Package~~ System It Ain't Rocket Science



Advanced Communications ~~Package~~ System It's Computer Science

- Some issues warrant special attention (specifically modeling)
 - Buffering requirements for ACP on-orbit payload
 - Uplink media-access control (MAC) protocol

Advanced Communications ~~Package~~ System It's Computer Science

- Several new protocols need to be developed
 - Deliver specific information where it is needed
 - Protocol design can be tricky
 - Modeling sometimes useful
 - Really, really need to understand what subsystems need what information to make what decisions

Advanced Communications ~~Package~~ System ACP Development

- Probably required diverse, collaborative development team
- Open development teams have proven very successful for complex problems
 - IETF
- Write stuff down
 - Put it on the Web!

Questions

