SpaceWire
Upper Layer
Protocols

Glenn Rakow - NASA - GSFC
Richard Schnurr - NASA - GSFC
Daniel Gilley - Lockheed Martin
Steve Parkes - University of Dundee, UK
Agenda

- Statement of Purpose
- Proposal
  - Packet Header
  - Packet Header Format
- Implementation Framework
- Working Group
- Relationships
- Discussion
Statement of Purpose

- To provide a streamlined approach for developing SpaceWire Upper layer protocols which allows industry to drive standardized communication solutions for real projects
Proposal

- Agree upon a simple packet header that will allow flexibility in implementing a diverse range of protocols
Packet Header

- Identification of protocol up front
  - determine packet format and protocol

- Maintain header & data alignment 4 byte boundaries
  - Recommendation - not requirement
  - Simplifies processing of packet by User application
  - Pad header so that data starts on four byte boundaries
    - No need to realign bytes by the User application

- Helpful if SpaceWire User interface can determine if Logical address present or not
  - Not necessary with agreed upon format!
Packet Header Format

- First byte - SpaceWire Logical Address
- Second byte - Protocol ID
  - Reserved
    - 0x00
    - 0xFFF
      - Used to indicate expansion of the Protocol ID to a total of 32 bits (including original Protocol ID byte)
  - Assignment authority
    - ESA initially receives 32 protocol IDs for assignment
    - NASA initially receives 32 protocol IDs for assignment
Implementation Framework

- Define 2 main working groups to develop SpaceWire protocols
  - ESA
  - NASA
    - NASA Standard working group
      - Being proposed
        - http://standards.nasa.gov
      - Will be submitted for request to be adopted as a NASA standard

- Both groups can collaborate but will have independent authority in assigning identification of protocols
  - Allow independence
  - Allow quicker response
  - Provide for different customer base

- Reassign Protocol ID if not used for two years

- NASA would be the "bridge" to handle ITAR issues for US industry
  - Allow possible sharing with Europeans

- Abstract per Protocol submittal to aid in collaboration
Working Groups

- **ESA SpaceWire Working Group**
- **United States Working Group**
  - NASA
    - GSFC
    - Jet Propulsion Lab (JPL)
    - Glenn Research Center (GRC)
  - Department of Defense (DOD)
  - Lockheed Martin
  - Applied Physics Lab (APL)
  - Northrop Gruman Space Technology (NGST)
  - Honeywell
  - BAE SYSTEMS
  - Aeroflex
  - Etc.
Relationships

- ESA maintains the SpaceWire Standard
- All may be included in working groups but ESA and NASA have independent authority to assign a protocol IDs when in their best interest
- Encourage collaboration