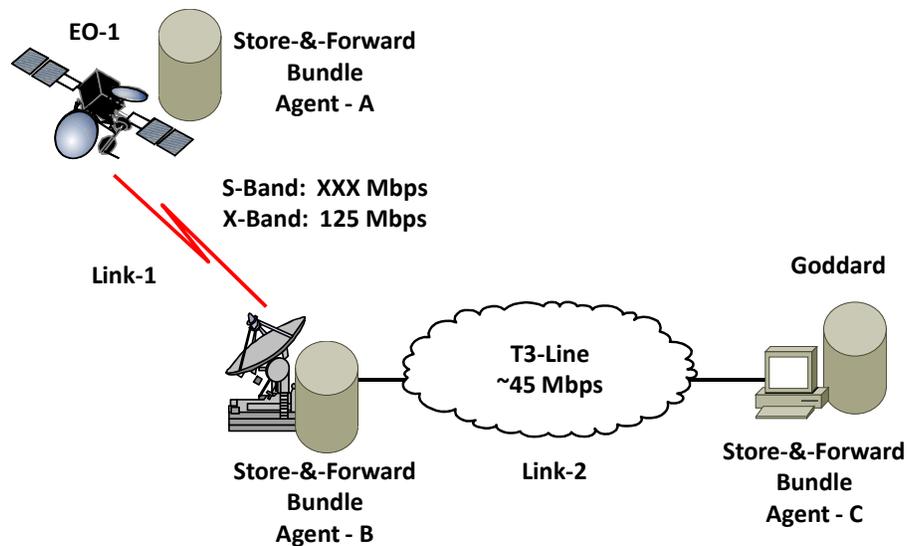


Figure 1 illustrates the operational scenario for the EO-1 mission. The network is fairly simple.

- Data is stored onboard and downloaded to ground stations in either Alaska, or Svalbard, Norway.
- Downlink can be via S-Band or X-Band.
- Passes are approximately 10 minutes in duration.
- The data sets onboard EO-1 are 5 to 10 GBytes.
- A T-3 line runs between the ground stations and Goddard. (Originally, the data was just shipped on media).
- Once data reaches Goddard, it is redistributed via standard applications (e.g. FTP).



EO-1 Contact times ~ 10 Minutes over Alaska or Svalbard, Norway

Terminology: Link-1 refers to both uplink and downlink. The combined links may be highly asymmetric, unidirectional, etc...

Link-1-AB is the satellite to ground downlink

Link-1-BA is the ground to satellite uplink

Questions:

1. What is the downlink rate on the S-Band link?
2. What are the characteristics of the Link-1-BA uplink? (Is there one?)
3. How is the onboard data stored (e.g. files)?
4. How is the data stored at the ground station (e.g. files)?
5. How is data reliability ensured if at all?
6. Any security needs such as authentication or encryption?

DTN Tests

Variables:

1. no custody transfer, custody transfer
2. downlink characteristics (data rates, BER, delay)
3. uplink characteristics (data rates, BER, delay)
4. storage (RAM, DISK, FLASH)
5. DTN Convergence Layers for Link-1
6. Transfer protocol (e.g. CFDP, CFDP/DTN, DTN direct, other)
7. Data set size
8. No authentication and with authentication? (might not map to EO-1, but might be nice to stress BAB.)

Parameters to monitor (not all inclusive):

1. Bundle statistics (e.g. queued, sent, received, dropped)
2. CPU usage
3. Lower link parameters (e.g. packets sent, lost)

Procedures:

1. Create Onboard Data prior to contact with the ground station
2. Bring Link-1 up
3. Bundles should transfer to Bundle Agent B (ground station)
4. Link-2 is always up.
5. Bundles should transfer to Bundle Agent C
6. Ensure the data set received at C matches the data set sent by A