

# Next Steps: Laying the Groundwork for Bundle Protocol v7

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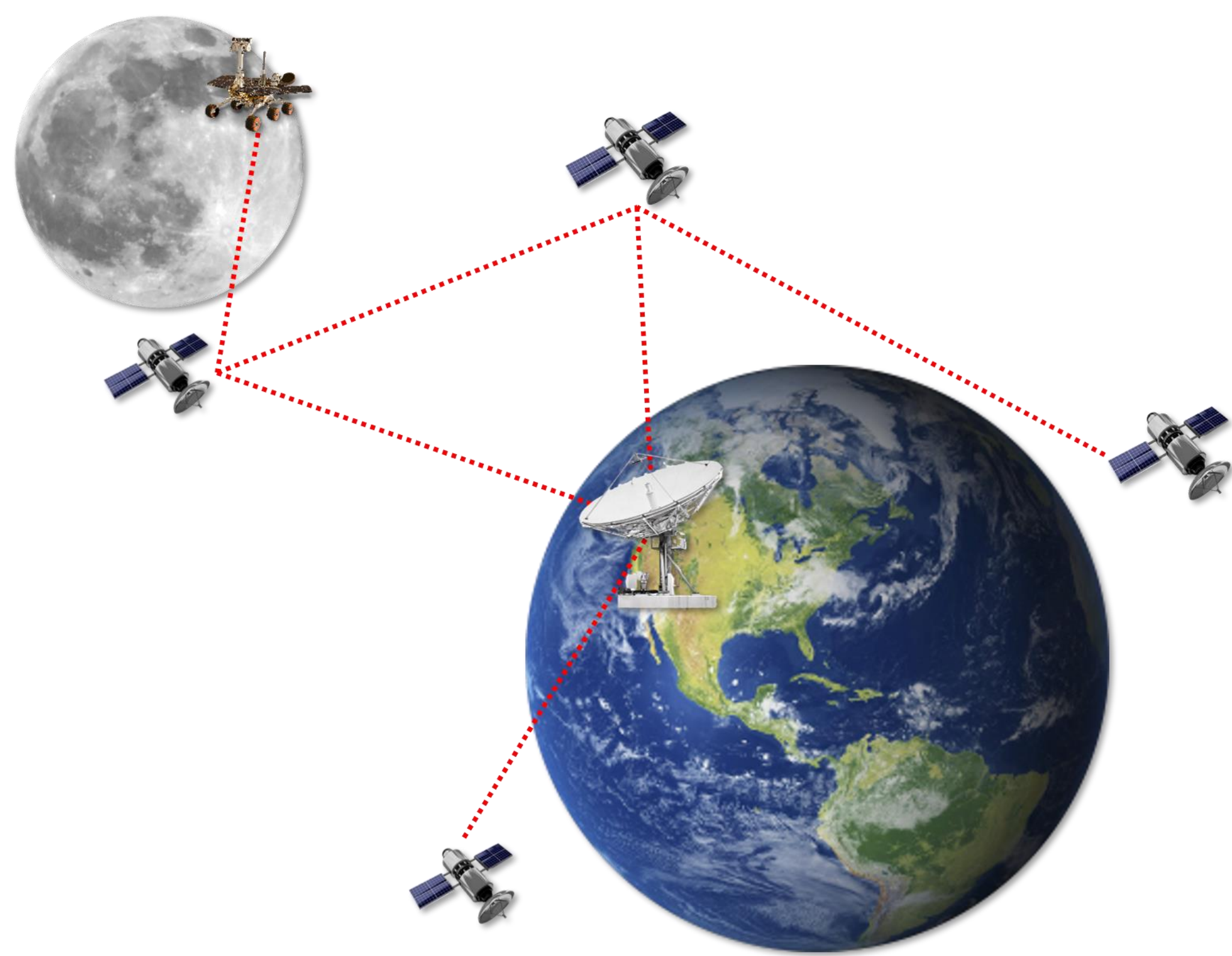
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## Project Goal

The DTN Standard Interface Design team worked to create a dictionary of terms for bundle components and functional decomposition of Bundle Protocol (BP), the transport layer of DTN. These efforts aided in the standardization of BP interfaces and supported parallel network management and configuration work.



## Applications

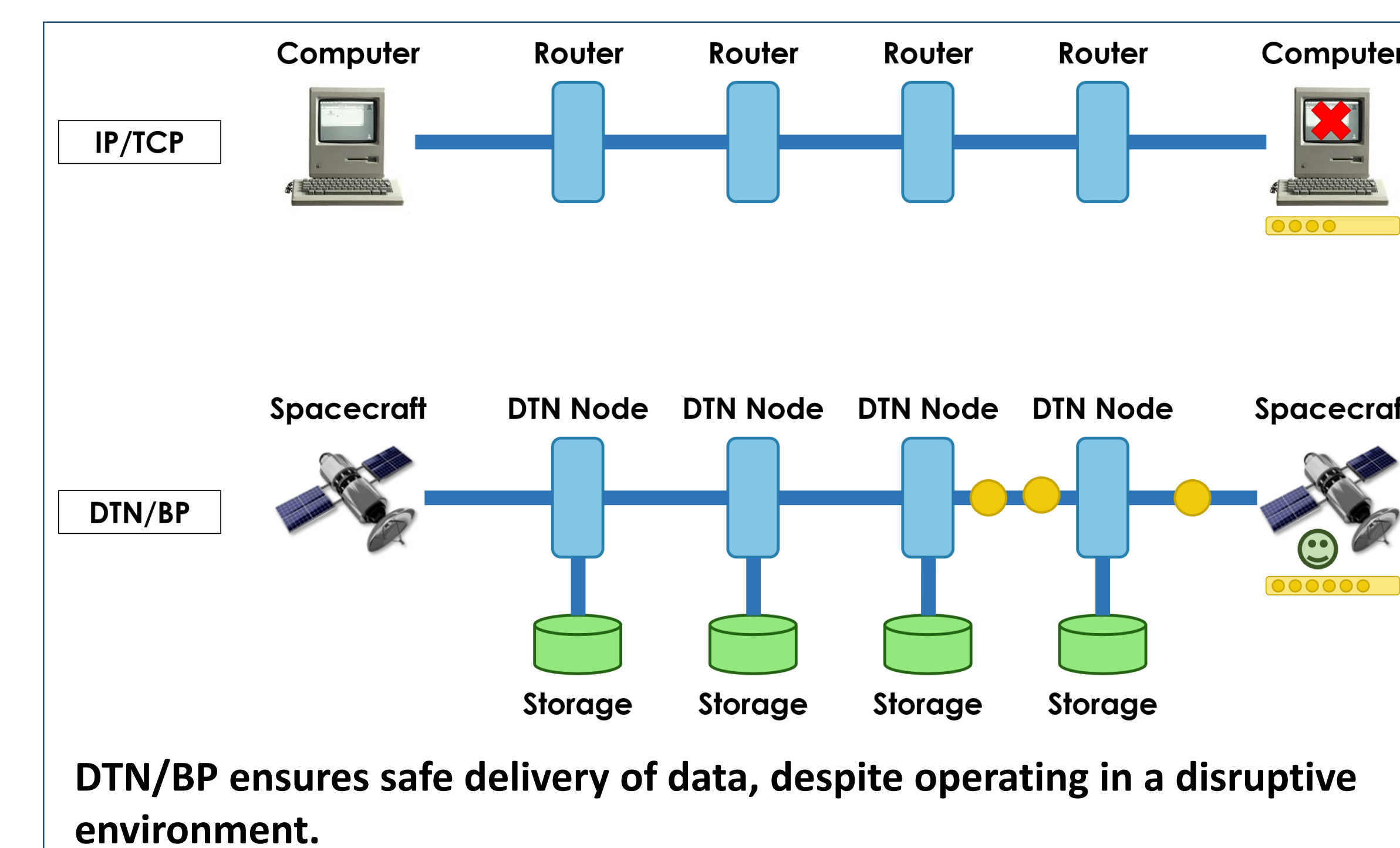
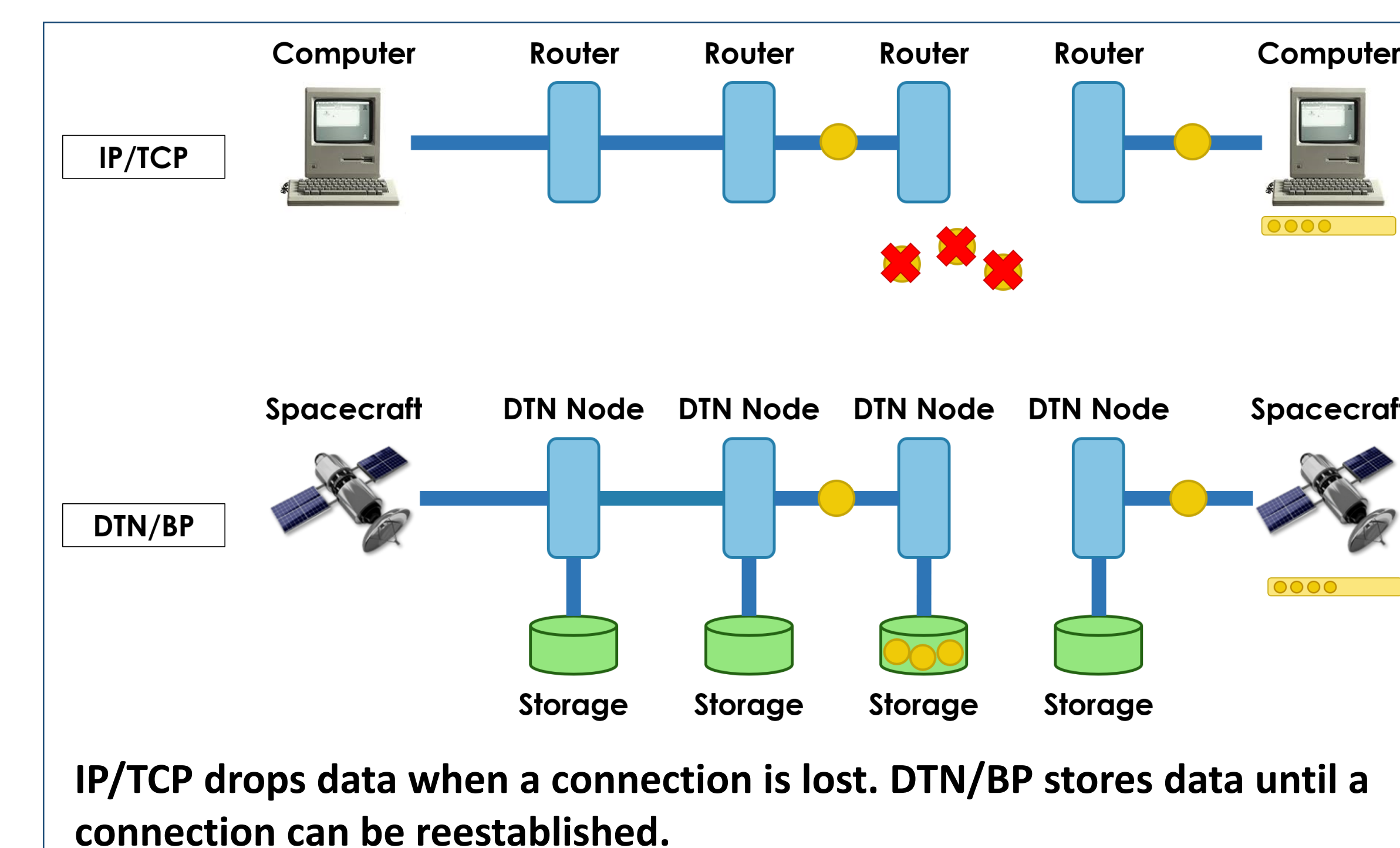
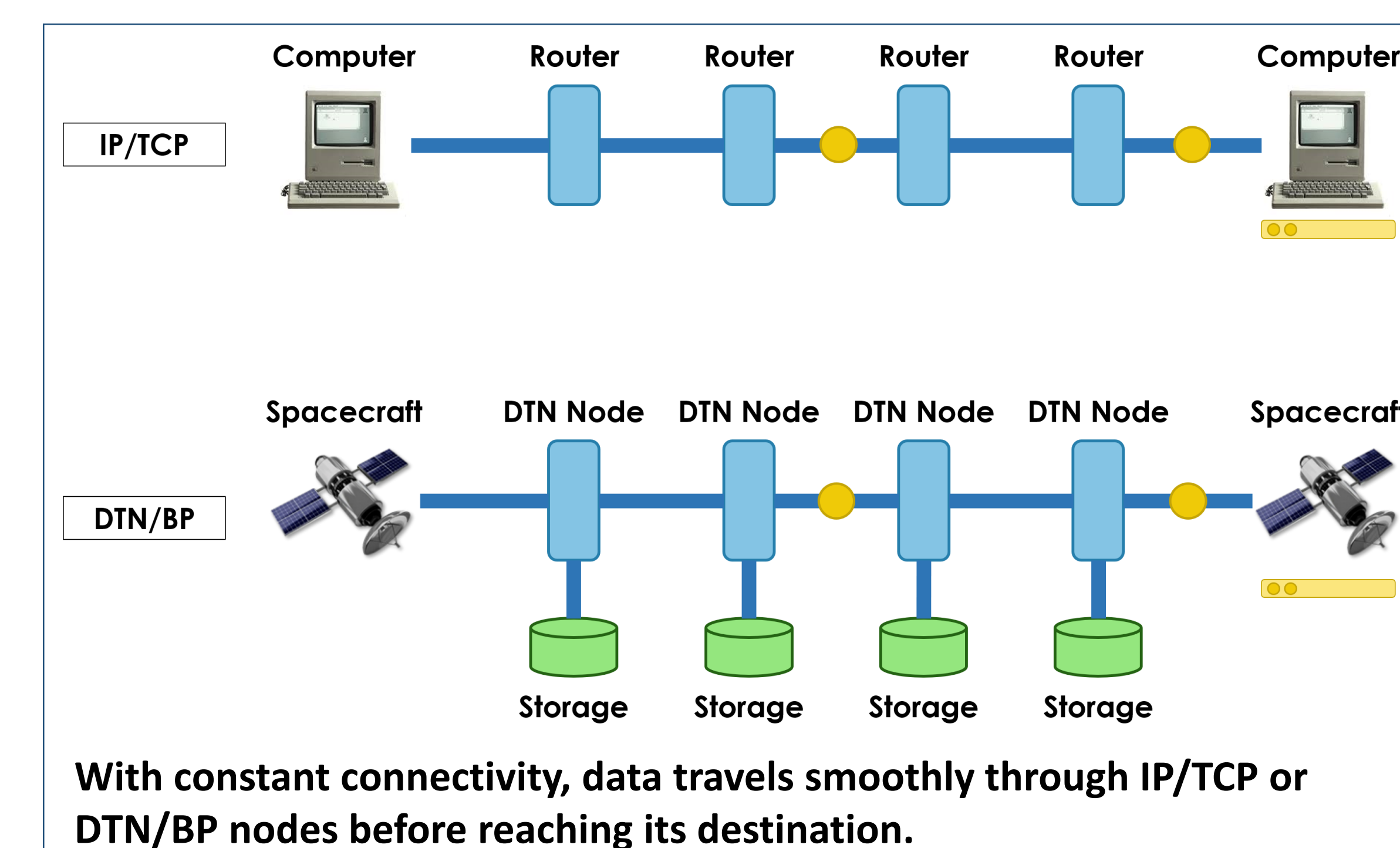
- LunaNet, a lunar communications and navigation architecture that will bring networking, positioning, navigation, timing and science services to the Moon
- Solar System Internet (SSI), an interplanetary network that will expand crewed and uncrewed space exploration opportunities
- Any environment subject to frequent delays or disruptions

## Delay/Disruption Tolerant Networking (DTN)

- Extends terrestrial internet-style communication to space
- Delivers data with lower latency and provides higher throughput in disruptive networks
- Characterized by multi-hop transmission and store-and-forward mechanisms
- Takes advantage of scheduled, predicted, and opportunistic connectivity

## How it Works

- Similar to Transmission Control Protocol (TCP) packets in the Internet Protocol (IP), a DTN spacecraft uses Bundle Protocol (BP) to generate a bundle. A bundle is data and information about where that data needs to go wrapped into one package.
- Also like IP/TCP, once connections are established, the bundle travels through various nodes (other spacecraft, relay satellites, ground stations, etc.) until it reaches its final destination.
- In space, however, connections are frequently disrupted by errors, increased distance between nodes, and decreased line of sight between spacecraft. When a connection is lost, IP/TCP drops the packets and data is thrown away. DTN Nodes, however, will store the bundle in local storage until a connection can be reestablished. Then, transmission resumes.
- When the bundle reaches its destination, the data is unwrapped and ready for use.



For more information, visit: <https://www.nasa.gov/content/dtn>