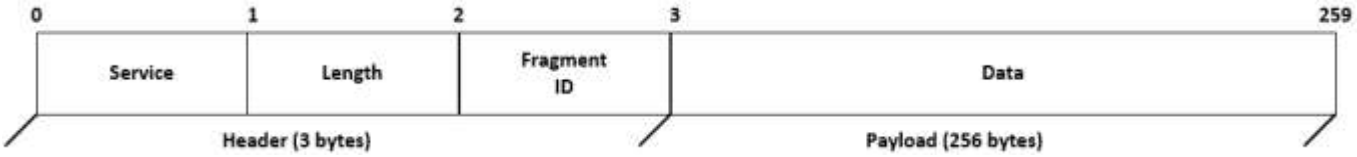
Spec Overview

The Nanosatellite Space Protocol (NOSP) was designed for lightweight communications to Low Earth Orbit (LEO) satellites. This specification is a first draft and still in development but has been designed securely to restrict control service access and prevent software vulnerabilities in the protocol implementation. The protocol has been written in C for performance reasons and backwards compatibility with legacy satellites components.

The protocol has 3 fields in the header and a payload field per figure 1 below.

Figure 1 - The NOSP structure



The protocol field valid values are described in table 1 below.

Table 1 – The NOSP field valid ranges

Service	Length	Fragment ID	Data
1 - Bus	must be 0	must be 0	must be 0
2 – Payload	must be 0	must be 0	must be 0
3 – Telemetry	max value of 255	must be <12	must be 256
4 – Control	max value of 255	must be 0	max value of 255
5 - Disconnect	must be 0	must be 0	must be 0

Service Description

The bus service takes no payload and simply returns the status of the bus functionality

The payload service takes no payload and simply returns the status of the payload functionality

The telemetry service allows a user to upload a configuration file to modify the payload functionality

The control service allows the user to control the satellite and is access restricted

The disconnect service is used to terminate telemetry service once last file uploaded

Note: except for the telemetry service, the Satellite will disconnect client after each service transaction has completed to save bandwidth.

Telemetry Service

The Telemetry service allows a configuration file to be uploaded to the Satellite with a max file size of 3072 bytes. Due to the protocol design this file must be transmitted as chunks of 256 bytes within the

data field of the protocol for processing efficiency on the Satellite. The Fragment ID field identifies the file chunk number which must start at 0 and increase consecutively by increments of 1.

Multiple files can be uploaded, and you should send a disconnect service packet once you are finished sending last fragment of last file upload.