Saint-Petersburg State University of Aerospace Instrumentation

SUAI

STP-ISS transport protocol for SpaceWire onboard networks

RESHETNEV COMPANY

STP-ISS is a transport layer protocol that describes the informational and logic interaction between onboard devices, packets' formats and packet transmission rules for the SpaceWire network. There are two backward compatible revisions of STP-ISS protocol which provide different sets of mechanisms and implementation complexity.

Duplicate control commands detection

Configuration flexibility
Setting of protocol's parameters in dependence on requirements

Transport connections
Up to 16 transport connections in each direction of data transfer

STP-ISS

User data types:
- Application messages
- Control commands
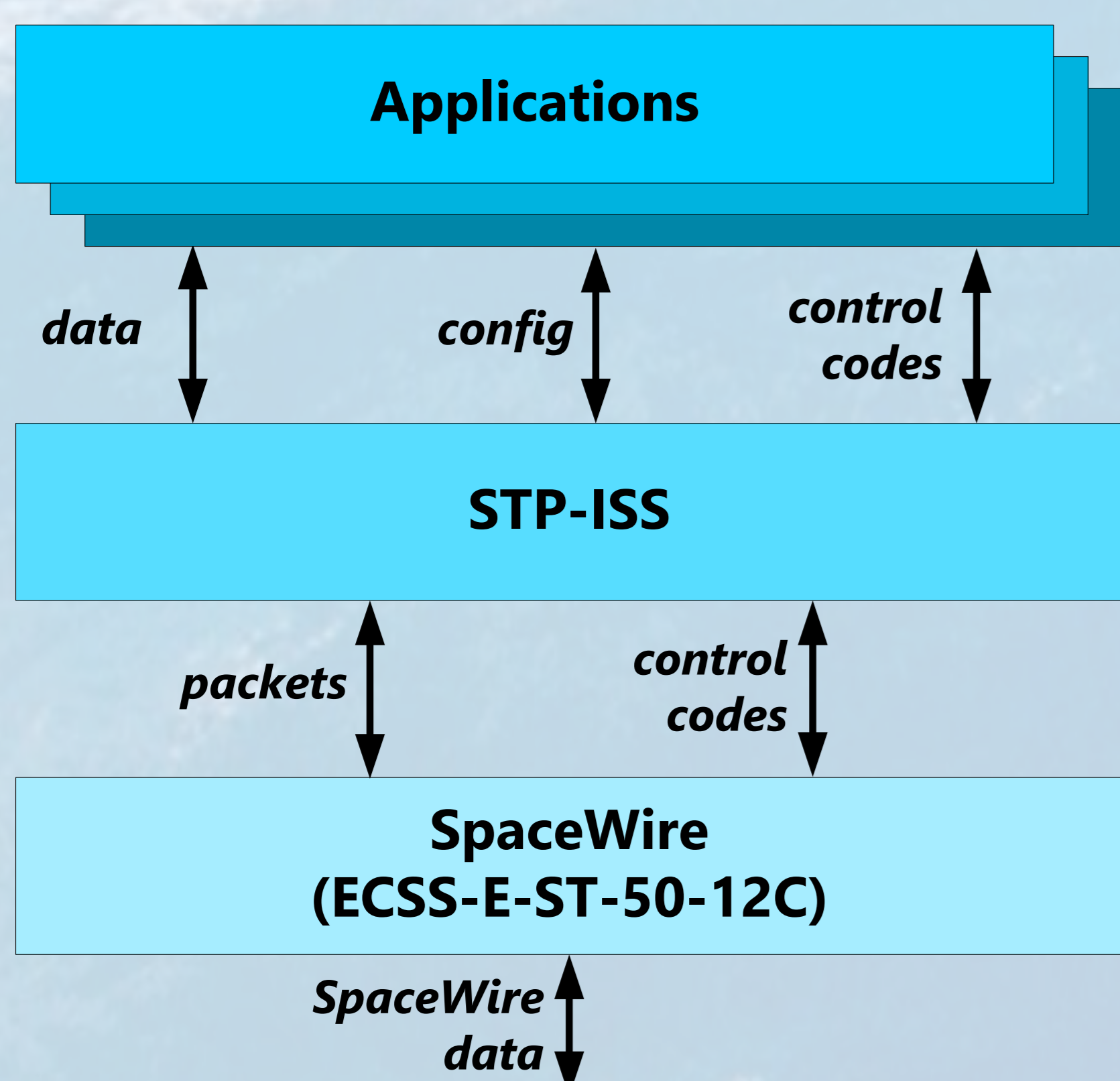- SpaceWire control codes

Quality of service:
- Priorities
- Guaranteed data delivery
- Best Effort
- Scheduling

Credits exchange
Credits mechanism for connection-oriented data transmission

STP-ISS Architecture

Applications

data | config | control codes

STP-ISS

packets | control codes

SpaceWire
(ECSS-E-ST-50-12C)

SpaceWire data

Hardware implementation

Mandatory:
- Priority QoS (1 priority minimum)
- Best effort QoS
- Transmit buffer (at least for one type of messages)
- Receive buffer (at least for one type of messages)
- Possibility to implement RX or TX side only

Optional:
- Guaranteed QoS
- Scheduling QoS
- Connection-oriented data transmission
- Duplicate control commands detection
- Backwards compatibility

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