IBM Library/Drive Interface (LDI)

T10/02-021r0 (see also T10/02-022r0)

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Agenda

- LDI Physical - Overview and Recommendations
- LDI Protocol - A Comparison
- LDI Protocol - Recommendations
- LDI Messages - Overview
- LDI Messages - Recommendations

LDI Physical

- RS-422 interface supports:
  - Full duplex operation, asynchronous (transmit/receive simultaneously)
  - Baud rate of 9600 or 38400 (selectable via a feature switch on the tape drive)
  - Data Bits: 8
  - Parity: None
  - Stop Bits: 1 or 2 (selectable via a feature switch on the tape drive)
- Additional signals: drive present (for library) and LDI wrap tool present (for drive)
- Recommendations for ADI physical layer strategy:
  - Define mandatory signals based on those common to all vendor specs (minimum set)
  - Define connector and optional signals based on all other signals in vendor specs

LDI Protocol - A Comparison

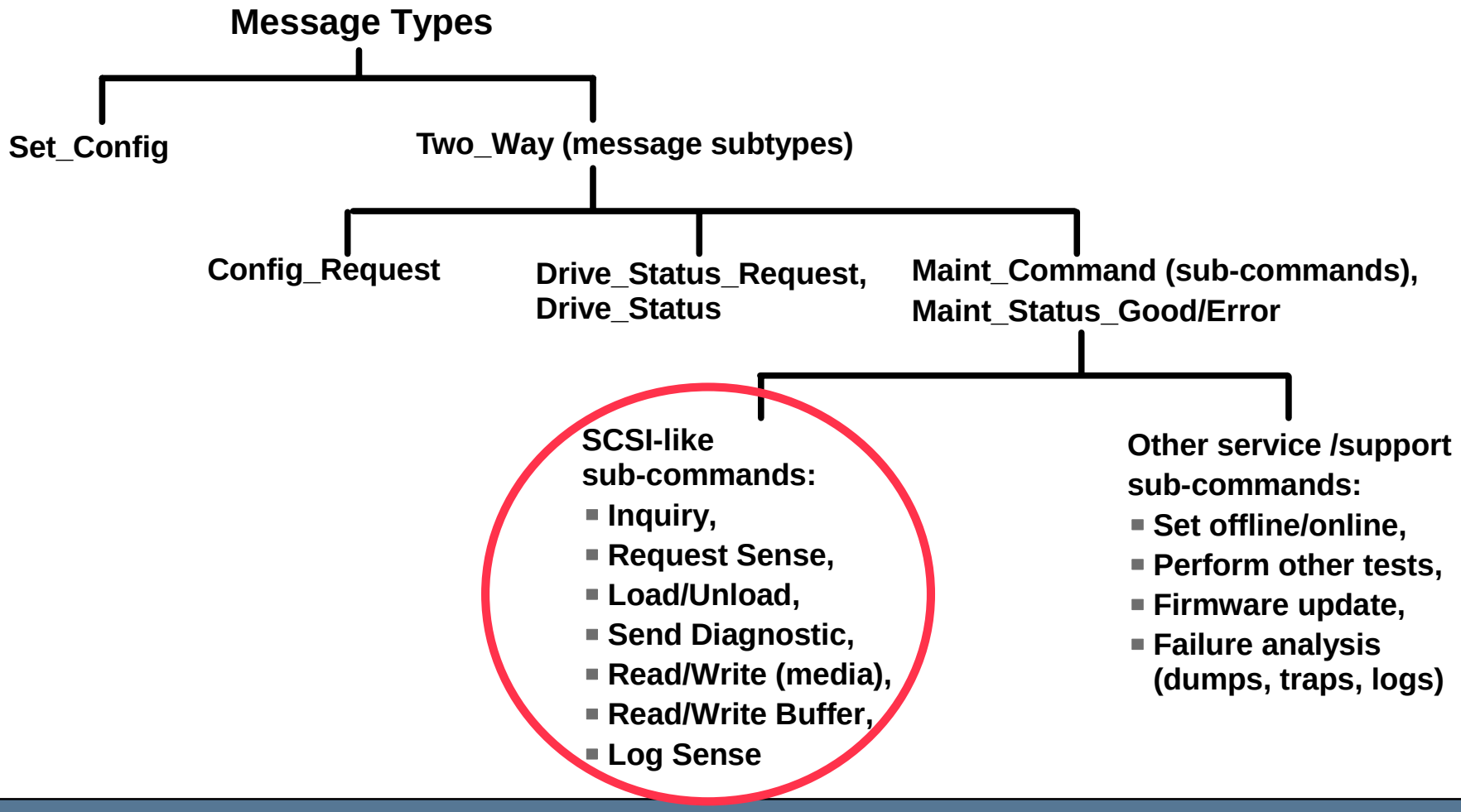
	HP	IBM	Quantum	Seagate
Byte Stuffing	N	Y	Y	N
Packet w/o EOF (SOF+Length)	N	N	N	Y
Packet w/EOF (SOF+Length+EOF)	Y	Y	Y	N
Checking	2-byte Checksum	1-byte Checksum	2-byte CRC	1-byte Checksum
Flow Control (byte/frame, exception/nominal, drive-only/both)	Byte level, exception, both	Frame-level, exception, both	Frame-level, exception, both	Byte-level, nominal, drive-only
Exceptions to packet wrapper	Acknowledgement, flow control	Acknowledgement	None	Acknowledgement
Acknowledgement Sequence Number	N	N	Y	N
Acknowledgement validity failure details	N	N	Y (except CRC)	Y
Acknowledgement timeout	Fixed, 200 ms	Fixed, 5 s	Variable, up to 12 s	Variable, up to 5 s

LDI Protocol - Recommendations

- Recommendations for ADI transport protocol strategy:
  - Need to maximize interface robustness within reason (firmware feedback required)
  - Might be too time-consuming to standardize based on existing vendor specs due to variations in approaches
  - Should consider identifying an existing serial protocol standard and defining an ADI 'profile' of that standard (minimum mandatory subset)

LDI Messages - Overview

- 3 layers due to legacy - not recommended for standard



LDI Messages - Recommendations

- Recommendations for ADI command strategy:
  - Define an ADI 'profile' from the SSC-2 command set and parameters
    - Minimum mandatory commands and parameters
    - Standard and ADI-specific inquiry pages for identifying the drive
    - ADI-specific mode pages for configuring the drive (must be non-intrusive)
    - Standard and ADI-specific log pages for logs, TapeAlert, status, statistics
    - Standard and ADI-specific buffer IDs for logs, status, firmware
    - Standard and ADI-specific attribute IDs for media attributes
    - Mandatory ADI-specific default behavior (opposite behaviors can be optional):
      - No unit attentions
      - No reservation conflicts
      - No "not ready" status
      - Non-intrusive to SCSI initators on data path interface
      - Graceful handling of differing library/drive firmware combinations (e.g. mode sense changeable values and "allow and ignore" un-supported parameters)
    - Vendor-unique extensions allowed through vendor-unique SCSI parameters
  - Consider future integration into SSC-x to ensure ADI commands and parameters are maintained by an active standards body