



Test and Evaluation/Science and Technology Program

The DNA of a Network Flight Recorder

Mark Wigent
Laulima Systems

Approved for public release; distribution is unlimited
412 TW-PA-18525

Acknowledgment of Support: This project is funded by the Test Resource Management Center (TRMC) Test and Evaluation/Science & Technology (T&E/S&T) Program through the U.S. Army Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) under Contract No. W900KK-13-C-0028. The Executing Agent and Program Manager work out of the AFTC

Disclaimer: Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Test Resource Management Center (TRMC) and Evaluation/Science & Technology (T&E/S&T) Program and/or the U.S. Army Program Executive Office for Simulation, Training, & Instrumentation (PEO STRI).



Network Recorder Use Cases



- Data dropouts
 - Instantaneous retrieval and retransmission of lost test data or for backfill to improve completeness of control-room data for quick-look data analysis
- Non-nominal modes of operation
 - Efficiently retrieve recorded data not previously sent to ground to better understand “trends” of non-nominal behavior observed during the test
- Inter-maneuver periods
 - Retrieval of data for quick-look analysis to ensure test objectives met and data gathered before moving on to next test point



Benefits



- Increased flexibility and efficiency of test
- Enables retrieval of individual recorded parameters as needed
- Backfill and ad hoc to ensure have met test objectives
- Having flexibility to send data only when it is needed rather than through the duration of the test increases efficiency with which limited spectrum is used



Network Recorder Requirements



- Network Data Recorder must:
 - Record and retrieve data concurrently
 - Record at high enough rate to capture all data onboard the test article
 - *For spectrum efficiency, retrieve individual measurands quickly, with specificity and selectivity, as retransmitted data competes with real-time telemetry stream for limited bandwidth*



IRIG 106 Chapter 10



- IRIG 106 Chapter 10 designed for interoperability, post-mission analysis, and mission reconstruction on the ground
- Not explicitly designed to enable real-time data retrieval



Characteristics of Ideal Network Recorder



- Physical interface – Ethernet
- Configuration and control – TmNS standards
- File Storage – Indexed centric storage to enable rapid, selective data retrieval