# CCSDS USLP Activities
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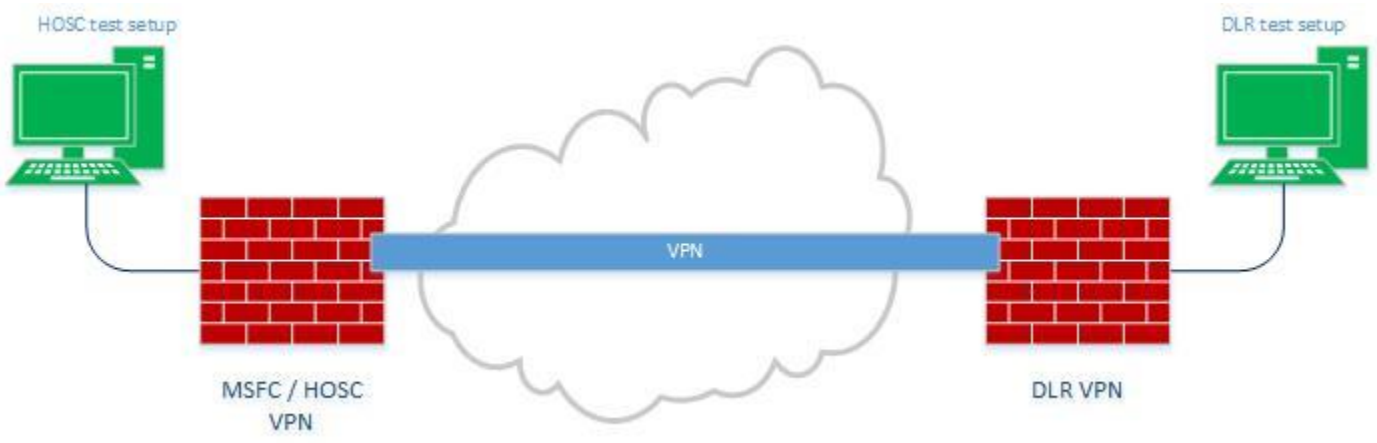
# Outline

- USLP implementation
  - Overview
    - Participants
    - Test configuration
  - Current status
  - Plan for testing

# Overview

- Two USLP implementations are being developed by DLR and MSFC/NASA
  - Stefan Veit at DLR
  - Kevan Moore at MSFC/NASA (Huntsville Operations Support Center)
  - 3rd test team in the UK is generating an implementation
    - Preliminary connection information has been exchanged between parties
    - HOSC paper work is ready for approval

- The implementations are being conducted remotely over a VPN
- Each end has been developing and testing incrementally
- Current testing has been on Red-2 with Red-3 updates



# Current Status

- Test configuration use a reciprocal test mechanism
  - Tester 1 generates a test activity and forwards to Tester 2
  - Tester 2 receives and operates on the data and retransmits to tester 1
  - Tester 1 receives and operates on the data

- Allows multiple test
  - Multiple independent test with only minor participation of a secondary tester.
  - In the process of generating the formal test plan for acceptance of USLP

- Test goal is non-performance related
    - Functional testing
    - Basic framework
    - Earliest opportunity

# Plan for testing

- Using a two pass scenario for testing
  - First pass is a procedure check for completeness
  - Second pass is on automatic and will vary conditions more widely
- Doing fixed and variable length frames
  - Using a known pattern for checking
  - Use of CRC for automated checking
- Permutation of absence/presence of every optional field has been tested
- The next phase will be used to generate a yellow book
  - Requires support beyond the current test configuration

# PICS compliance

- Red 3 PICS has been evaluated for compliance. Following is a status of Annex A.
  - Overall evaluation and verification of compliance is greater than 70% by both parties
  - Some requirements will be untestable under the current techniques
    - FECF defined in Annex B
    - Performance numbers over a space link
  - Most construction areas have been evaluated

# PICS Summart

| Annex A REQUIREMENTS LIST | MSFC | | DLR | |
|---|---|---|---|---|
| | | | | |
| Table A-1: USLP Service Data Units | 6 | 100% | 6 | 100% |
| | | | | |
| Table A-2: Service Parameters | | | | |
| MAP Packet Service Parameters | 5 | 62.50% | 3.5 | 43.75% |
| MAPA Packet Service Parameters | 4 | 66.67% | 3.5 | 58.33% |
| MAP Octet Stream Service Parameters | 3 | 60.00% | 3.5 | 70.00% |
| MC_OCF Service Parameters | 2 | 66.67% | 3 | 100.00% |
| VCF Service Parameters | 2 | 66.67% | 3 | 100.00% |
| MCF Service Parameters | 2 | 66.67% | 3 | 100.00% |
| Insert Service Parameters | 2 | 66.67% | 3 | 100.00% |
| COPs Management Service Parameters | 0 | 0.00% | 0 | 0.00% |
| | | | | |
| Table A-3: Service Primitives | | | | |
| MAP Packet Service Primitives | 3 | 100.00% | 2 | 66.67% |
| MAPA Service Primitives | 3 | 100.00% | 2 | 66.67% |
| MAP Octet Stream Service Primitives | 2 | 100.00% | 2 | 100.00% |
| MC_OCF Service Primitives | 2 | 100.00% | 2 | 100.00% |
| VCF Service Primitives | 2 | 100.00% | 2 | 100.00% |
| MCF Service Primitives | 2 | 100.00% | 2 | 100.00% |
| Insert Service Primitives | 2 | 100.00% | 2 | 100.00% |
| COPs Management Service Primitives | 0 | 0.00% | 0 | 0.00% |

# PICS Summart

| Annex A REQUIREMENTS LIST | MSFC | | DLR | |
|---|---|---|---|---|
| | | | | |
| Table A-4: USLP Protocol Data Unit | 6 | 100.00% | 6 | 100.00% |
| | | | | |
| Table A-5: Protocol Procedures | 16 | 100.00% | 14 | 87.50% |
| | | | | |
| Table A-6: Management Parameters | | | | |
| Parameters for a Physical Channel | 9 | 75.00% | 8 | 66.67% |
| Managed Parameters for a Master Channel | 3 | 75.00% | 4 | 100.00% |
| Managed Parameters for a Virtual Channel | 10 | 66.67% | 9 | 56.25% |
| Managed Parameters for a MAP Channel | 3 | 100.00% | 3 | 100.00% |
| Managed Parameters for a Packet Transfer | 3 | 100.00% | 0 | 0.00% |
| | | | | |
| Table A-7: Protocol Specification with SDLS Option | 12 | 85.71% | 12 | 85.71% |
| | | | | |
| Table A-8: Additional Managed Parameters with SDLS Option | 4 | 100.00% | 4 | 100.00% |
| | | | | |
| Table A-9: Frame Error Control Field Coding Procedures | 0 | 0.00% | 0 | 0.00% |

# BACKUP

# Current Status

- MSFC HOSC
  - Based on CCSDS Red-2 and 3
  - 64 bit
  - Executing on SuperMicro/KVM virtual servers (Will be migrating to DELL/VMWare virtual servers)
  - Linux based on RHEL5.11 (Moving to RHEL 7)