Digital IF Interoperability (DIFI) Consortium
Introduction

August 19, 2021
Standards Without Interoperability

Framework standards allow everyone to claim compliance but without interoperability. Result is vendor lock-in. Drives up development risk. Prevents economies of scale.
Digital IF Interoperability (DIFI) Consortium

• **Goal:** Wide adoption of an interoperable Digital IF standard
  • Match the interoperability that is native to analog IFs (e.g. L-band)
  • Create an open, simple, interoperable digital IF standard, and encourage its adoption throughout the industry
  • Encourage adoption of the standard throughout the industry

• **Purpose:**
  • Define an interoperable standard based on VITA-49
  • Design standard for easy adoption
  • Publish as an open, referenceable standard
  • Provide a way to certify compliance
  • Market the standard through the satellite industry

• **Structure:** simple as possible
  • Leverage IEEE-ISTO to manage the Consortium and specification
  • Free spec, straightforward certification, membership a good value
Organization Mission Statement

To enable the digital transformation of space, satellite, and related industries through a simple, interoperable Digital IF/RF standard that accelerates industry transformation from L-Band IF to Digital IF, while discouraging vendor lock-in.
Why Subset of VITA Specification

• Two most common standards: VITA-49 and eCPRI
  • Both are framework standards allowing unique implementations (i.e. neither ensure interoperability)
  • VITA-49.2 is an established ANSI standard that is simple and well suited for satcom

• VITA-49 is the only widely deployed Digital IF standard in satellite market today
  • 100+ Digital IF systems in operations today
  • Used across multiple different customers and applications
    • Choice of US military, Cloud, aaS for satellite applications
  • Specification tailored for satellite industry requirements
Approach to Specification

• Keep it simple and broadly applicable:
  • V1.0 is a minimum viable specification to achieve interoperability of IF/L-band
    • Data plane only
    • Signal and context packets only
  • Easy to adopt, implement, and certify
  • Limit road-blocks for adoption by vendors
  • Focus industry innovation on the hard problems
    • Hard problems include network transport, failover, etc.
    • Vendors can still differentiate
Certification Process

- Consortium provides basic certification software to validate packets
  - Provide software for testing and to allow self certification
  - Empower 3rd party certification organization(s)

Basic certification: Supported
Direct connection. Can be self or 3rd party certified

Cloud certification: Could support
Cloud test of input/output files
Certification Process Limitations

- Certification excludes testing of the LAN/WAN network
  - Networks are completely separate systems for the test environment, variable, complex
  - Consortium could provide advice on common network challenges associated with digital IF
  - Consortium could recommend companies/products that address digital IF and network challenges

*Network transport IP is not part of Spec or Consortium IP, area for industry innovation

Not supported:
Testing and certifying the LAN/WAN network*. 

DIFI Consortium Proprietary
Consortium Structure

**Board of Directors**
- Purpose to govern org, approve changes to specification, manage certification process
- Made up of elected member companies and a non-voting Chairman
  - Chairman does not vote, except to break a tie
  - 3-year term
  - Voting board members are operators and not vendors

**Standards Working Group**
- Suggest, evaluate, and provide recommendations to the board on changes to the standard
- All member companies can each have one person and an alternate on the working group.

**Certification Working Group**
- Owns certification software and process. (self certification or 3rd party certification)
- All member companies can each have one person and an alternate on the working group.

**Space Industry Specification Users (non-Members)**
- Specification and certification available to both member and non-member companies
- Once implementation is certified, they are encouraged to publicly announce that and put it on their product

**Consortium Membership**
- Two levels paying (corporate) and non-paying members (Gov’t & non-profits)
- All members participate in the WGs, only corporate members can be board members
- Any company can apply, must agree to support Consortium goal. Board has final approval rights.

**Membership Dues**
- Member companies ~$5K/yr,
- Board member ~$15k/yr
- Digital IF & modem vendors are encouraged to be working group members only
Teamed with IEEE-ISTO

• Parent organization
  • Establishment of the organization,
    • Legal structure, bi-laws, insurance, accounting, monthly financials, taxes, web site, etc.

• Run day-to-day operations
  • Assign a project manager, handle all accounting, billing, taxes, web site maintenance, and other operational functions

• Provide deep experience and credibility to organization and standard
VITA Group is supportive of Consortium plans
- Consistent with their goals of the organization
- Provided a legal release to allow use their information

Willing to help promote the organization
- Already doing a white paper on AWS
Thank You!