Outline
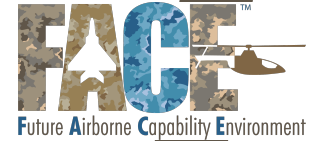
- FACE Conformance Program
  - What is it?
  - What can be certified?
- FACE Conformance Process
  - Steps in Conformance Process
  - Verification Authority
- Preparing for FACE Verification
- FACE Verification
  - Verification Fundamentals
  - Software Verification Package
- Conformance Resources

The FACE Conformance Program

The FACE Conformance Program

▸ Provides a trusted, accessible, and fair process to achieving FACE Conformance Certification.
▸ Defines:
  ▹ What can be certified
  ▹ What it means to be certified
  ▹ Process for achieving certification
▸ Allows for conformance to any valid published edition (not just the latest one).
▸ Meets the MOSA Principle of Certify Conformance.
▸ Provides a process that separates technical evaluation from business concerns:

  ▹ Verification, Certification, and Registration.

FACE Conformance Certification

What can be certified?

▸ Conformance is to software components, called a Unit of Conformances (UoC)

▸ Conformance is not of systems

Unit of Conformance (UoC)	A UoC is a software component or domain-specific data model designed to meet the applicable requirements defined in the FACE Technical Standard.

FACE Conformance Certification

What does it mean to be certified?

▸ Conformance is to the FACE Technical Standard

  ▹ There have been several editions released, 3.1 is the most recent

▸ A UoC meets 100% of the requirements in the FACE Technical Standard pertaining to the FACE Segment and capabilities that apply.

Claiming FACE Conformance	An entity cannot claim FACE Conformance without completing the process **AND** listing their product in the FACE Registry
FACE Registry	A Public listing of FACE Conformant Products
FACE Contract Guide	A reference for including FACE requirements into a solicitation or proposal

FACE Conformance Process

Steps in the Conformance Process

Preparation

- The software supplier becomes educated about FACE Conformance and develops a Unit of Conformance (UoC).

Verification

- An approved FACE Verification Authority verifies the FACE UoC was developed in accordance with the FACE Technical Standard.
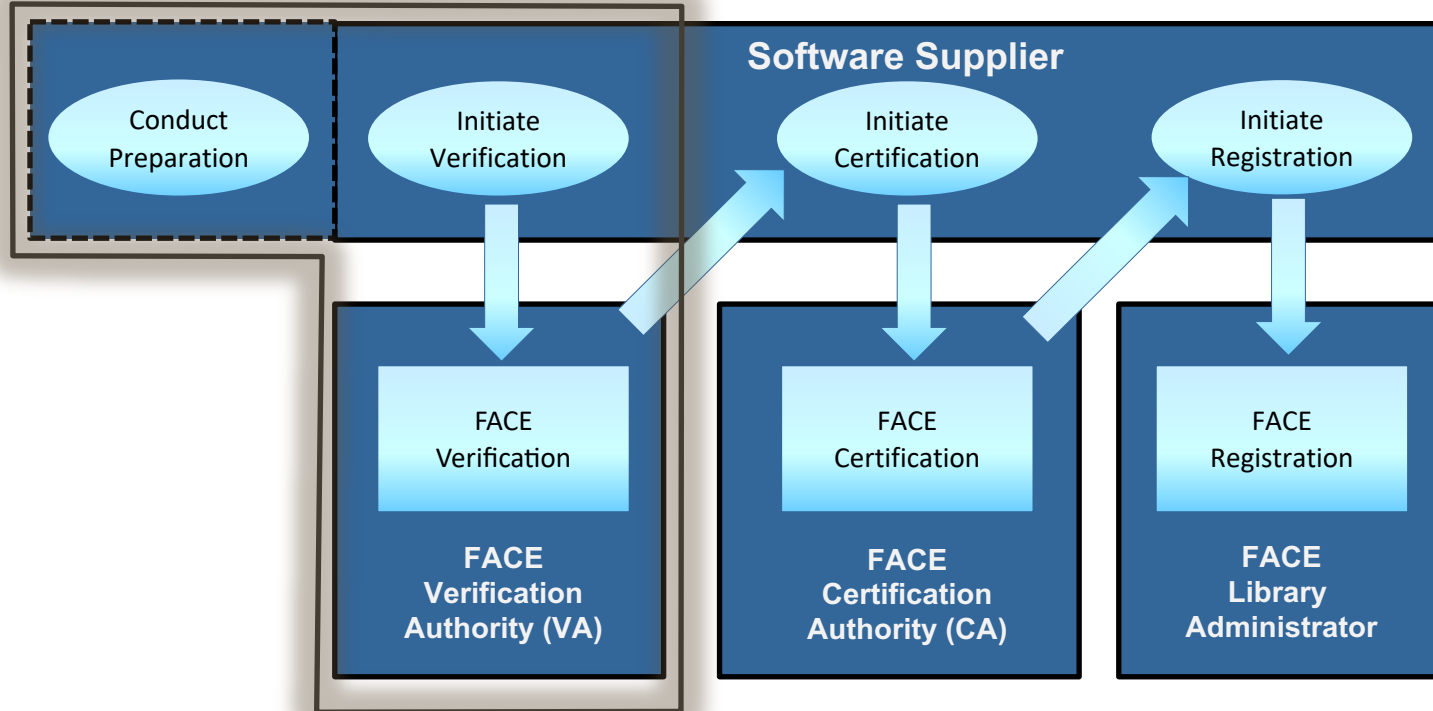
Certification

- The FACE Certification Authority issues a Conformance Certificate after legal agreements are completed.

Registration

- The Certified UoC is listed in the FACE Registry.
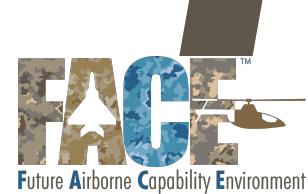
Steps in the Conformance Process

Supplier IP in the Conformance Process

The FACE Conformance Process was designed to protect the supplier's IP

Supplier	Verification Authority	Certification Authority	Registry
Product Description			
Executable Product			
Source Code			
Requirements, Designs, Test Reports (as Verification Evidence)			
Data Model			
Software Supplier Statement of Conformance			
Verification Matrix			
Test Suite Configuration Information			
Binaries for Testing (non-executable, generated from source)			
Statement of Verification			
	One of Many	Singular	Open Public Listing

FACE Verification Authority

- Verification is handled through a Verification Authority (VA),

  - a technical expert on the FACE Technical Standard and Verification process and

  - approved by the FACE Consortium Steering Committee

- The VA Serves as the Technical Evaluator of Conformance to the FACE Technical Standard

  - VA evaluates submitted software products through test suite execution (or witness) and inspection of provided artifacts – no other technical evaluation of products

  - VA Personnel must be experts on all editions of the FACE Technical Standard and conformance to those standards

- There are multiple VAs approved by the Steering Committee.

https://www.opengroup.org/face/approved-va

FACE Conformance Process

Conformance Preparation Step

Top To Do's in Preparation

▸ Select a Technical Standard Edition

▸ Understand each requirement in a filtered CVM

▸ Prepare a preliminary Software Supplier's Statement Conformance

▸ Develop your Data Model

▸ Establish your VA relationship early
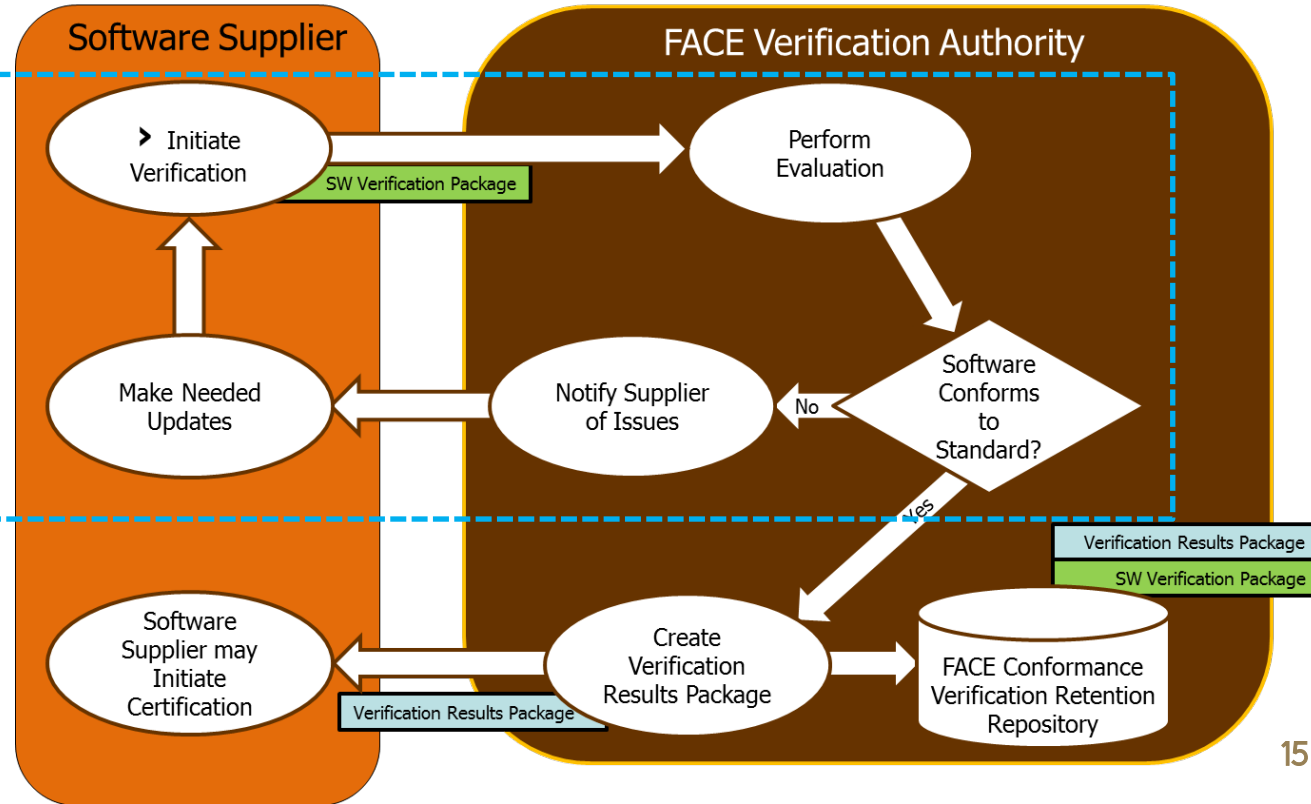
▸ Regularly run the CTS
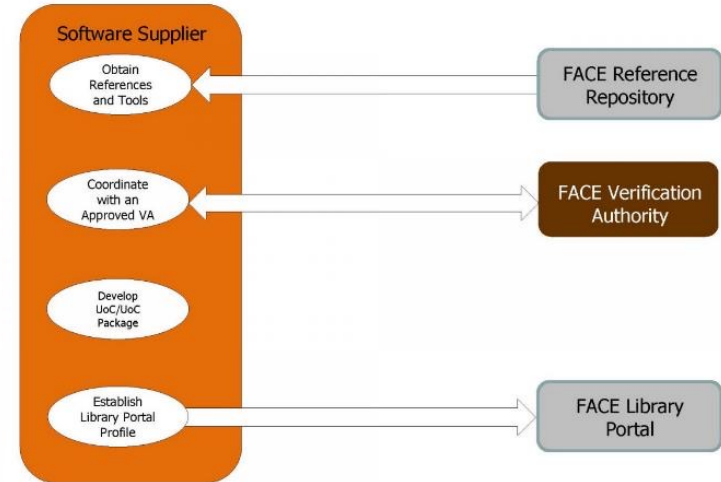
Development for FACE Conformance is not traditional development and requires additional artifacts that are not covered by traditional development activities.
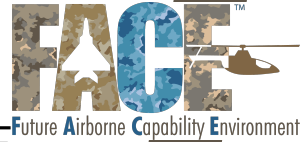
FACE Conformance Process

Conformance Verification Step

Verification

** Expectation is the Supplier will iterate multiple times as they prepare for "For the Record" testing

Interfaces not Performance

- FACE Conformance is a process to verify conformance to FACE Technical Standard requirements.
- Conformance is primarily to the FACE defined APIs
  - FACE Conformance testing does not require execution of the software
  - Conformance testing is a link test
- When functional requirements exist, the Software Supplier tests them
  - For Technical Standard requirements that cannot be verified by the Conformance Test Suite, the Supplier will provide evidence that the UoC meets the requirements
- Conformance is not an indication of functional software

Source not Binaries

▸ FACE Conformance is related to portable development (design/source)

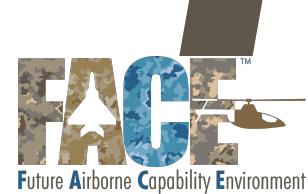 ▸ No need to recertify on a recompile to a new target if source code doesn't change

FACE Conformance Testing

Requirements, Designs, Source

Initial Target

Conformance Test

Future Target
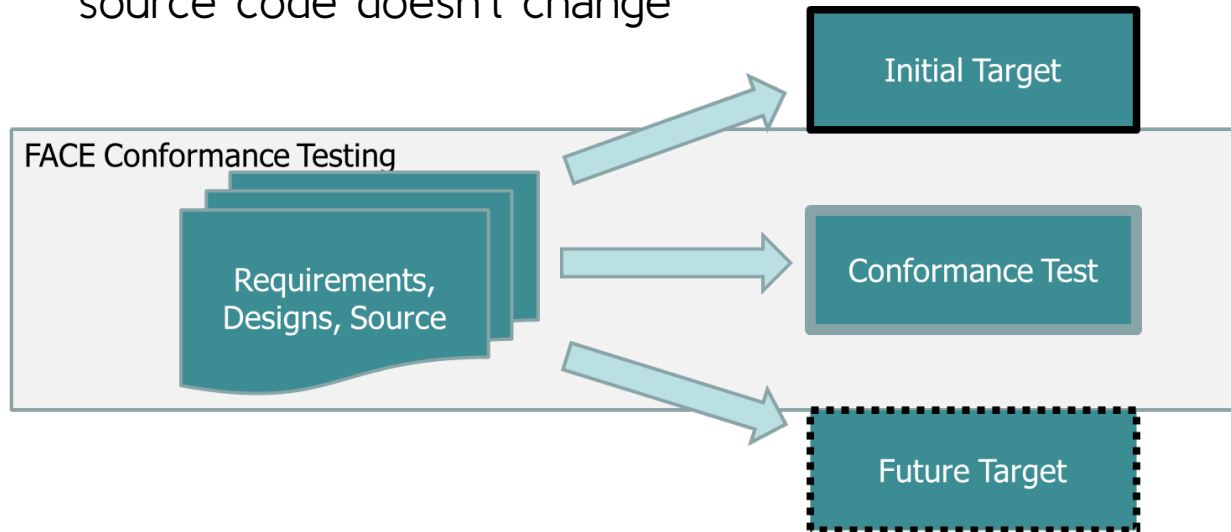
Software Verification Package

- Created by the Software Supplier
- Provided to the Verification Authority

Item	Description
Software Supplier Statement of Conformance	The Supplier's definition of the UoC in terms of FACE Conformance (profile, segment, conditional requirements, etc)
Conformance Verification Matrix (CVM)	The requirements in the Technical Standard in a spreadsheet with additional data guiding conformance to the standard, and providing a mechanism for a supplier to show conformance.
Verification Evidence	UoC Designs, Requirements, and Tests produced by the supplier in support of their claims to FACE Conformance. Verification Evidence is needed for requirements in the Technical Standard that can not be evaluated by the CTS
UoC Binaries for Testing	The UoC Source code compiled against the Gold Standard Library header files for link testing with the CTS
Data Model	Models data exchanged via the Transport Service Interface. The Data Model is evaluated for conformance, and generates TS interface stubs by the Test Suite.

Conformance Verification Matrix (CVM)

▸ Clarifies the set of requirements from the FACE Technical Standard a product must meet in order to be certified as FACE conformant

▸ Specifies the technique(s) to be used to verify each requirements

▸ Serves as guidance for …

  ▹ Verification Authority (VA) performing conformance verification

  ▹ Software Suppliers as they build Units of Conformance (UoCs)

▸ Has a different version for each edition of the FACE Technical Standard

Conformance Verification Matrix (CVM)

| Row ID	Verification Needed (Y/N/H/F)	FACE Segment	Technical Standard Requirements	Verification Method	Conformance Artifacts	Software Supplier Artifact Cross-Reference	Verification Notes	Conditional Requirements
F-843	Y	TSS	4. When using OSS Health Monitoring, a TSS UoC defined to operate in a POSIX operational environment shall use the OSS HMFM Interface described in Section 4.2.2.	Test	Test Suite			HMFM
F-844	Y	TSS	5. When using Programming Language Run-Times, a TSS UoC shall do so in accordance with Section 4.2.3.	Inspection	Per Referenced Section			Programming Language Run-Time
F-845	Y	TSS	6. When a TSS UoC uses a Component Framework, the TSS UoC shall use the Component Framework in accordance with Section 4.2.4.	Inspection	UoC Designs		This requirement applies to a UoC using a Component Framework provided by an OSS UoC.	Component Framework

Column labels: A (Row ID), B (Verification Needed), C (FACE Segment), D (Technical Standard Requirements), E (Verification Method), F (Conformance Artifacts), G (Software Supplier Artifact Cross-Reference), H (Verification Notes), I (Conditional Requirements)

▶ **Columns B, C and I**:

  ▶ Does this requirement pertain to a UoC?

▶ **Columns E and F**:

  ▶ What technique is used to verify this requirement?

20

Binaries for Testing
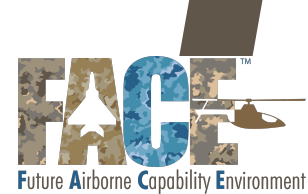
▸ The Conformance Test Suite generates representative implementation of the UoC FACE interface needs (Gold Standard Libraries).

▸ The Supplier creates binaries by compiling their source code to the Gold Standard Libraries (not the compiler provided libraries).

▸ These binaries (not the source) are provided to the VA for testing.

▸ These binaries are not intended to be executed, the test suite only generates stub functions for link testing.

FACE Conformance Test Suite (CTS)

- FACE Conformance Test Suite (CTS)

  - Verification tool adopted by FACE Consortium

  - Evaluates that a UoC uses and provides interfaces per the FACE Technical Standard

  - Responsible for verifying requirements in the CVM identified as "Test/Test Suite"

Row ID	Verification Needed (Y/N/H/F)	FACE Segment	Technical Standard for the FACE™ Reference Architecture Edition 2.1.1	Verification Method	Conformance Artifacts	Software Supplier Artifact Cross-Reference
361	Y	PSSS	9. All communication with the IOSS shall go through the I/O Services Interface.	Test	Test Suite	
372	Y	PCS TSS PSSS	1. Each FACE UoP shall be accompanied by a data model. This data model is the USM	Test	Test Suite	

Direct URL for CTS: https://www.opengroup.org/face/conformance-testsuites

Conformance Resources

Conformance Related Documents
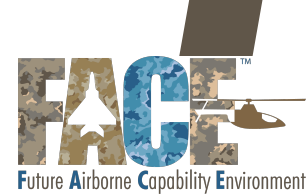
- Getting Started Guide
- FACE Conformance Policy

  - Conformance Guide

  - FACE Conformance Authorities Plan
- FACE Technical Standard (all editions)

  - Reference Implementation Guide (each edition)
- FACE Conformance Verification Matrix (for each standard edition)

  - Matrix User's Guide

FACE Resources: https://www.opengroup.org/face/docsandtools

Conformance Forms and Tools
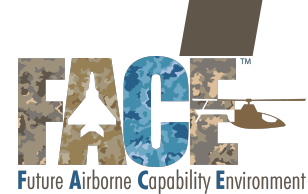
▸ Software Supplier Statement of Conformance

▸ Conformance Verification Matrix

▸ Statement of Verification

▸ Conformance Test Suite

  ▹ Users Manual+

▸ FACE Library Tools (Conformance Workflow Tool)

▸ FACE PR/CR Process

  ▹ PR/CR Website

  ▹ Approved Corrections List

FACE Resources: https://www.opengroup.org/face/docsandtools

Thanks!

Any questions?

You can find me at
robert.daniels@vanderbilt.edu

FACE Conformance Overview (YouTube): **tinyurl.com/FaceConformanceOverview**