# System of System Integration Technology and Experimentation (SoSITE)

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Technology and experimentation to enable rapid and custom integration of any distributed architecture

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Presented by: Chris “Lude” Kibble (SoSITE SETA)

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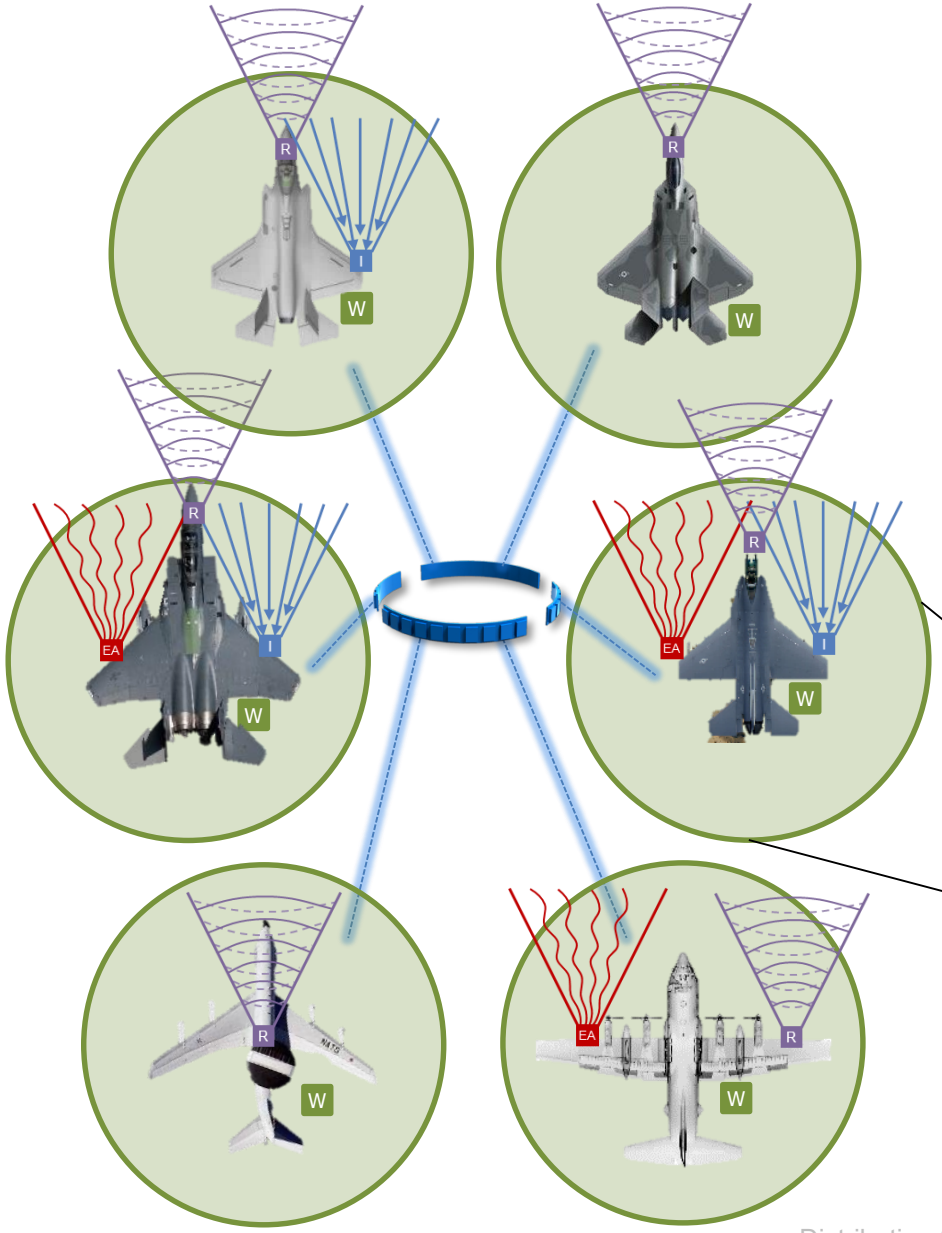
# Interoperability Issues Abound in the DoD

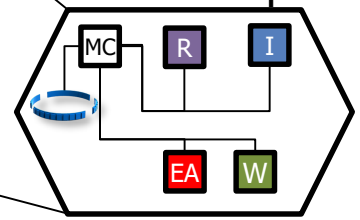



## Adding interoperability between aircraft takes years

- Aircraft are upgraded independently creating unique messages
- Machine-to-machine interfaces in an aircraft are highly coupled
- Even coupling between versions of the same spec (e.g., Link-16) is problematic

## This interoperability problem occurs within the aircraft as well

- Components are tightly coupled together using a local message standard that doesn't match the documentation
- Adding new technology (e.g., sensor) requires upgrades to multiple components, increasing expense and time

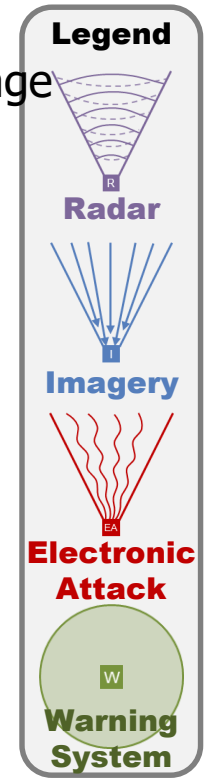



Each aircraft is collection of independent subsystems designed at different eras requiring interoperability

Interoperability is programmed into each system
System upgrades compete in 2-3 year block cycles

## Global standards have similar issues

- No interoperability between generations of the standard
- Uncertain interoperability between implementations

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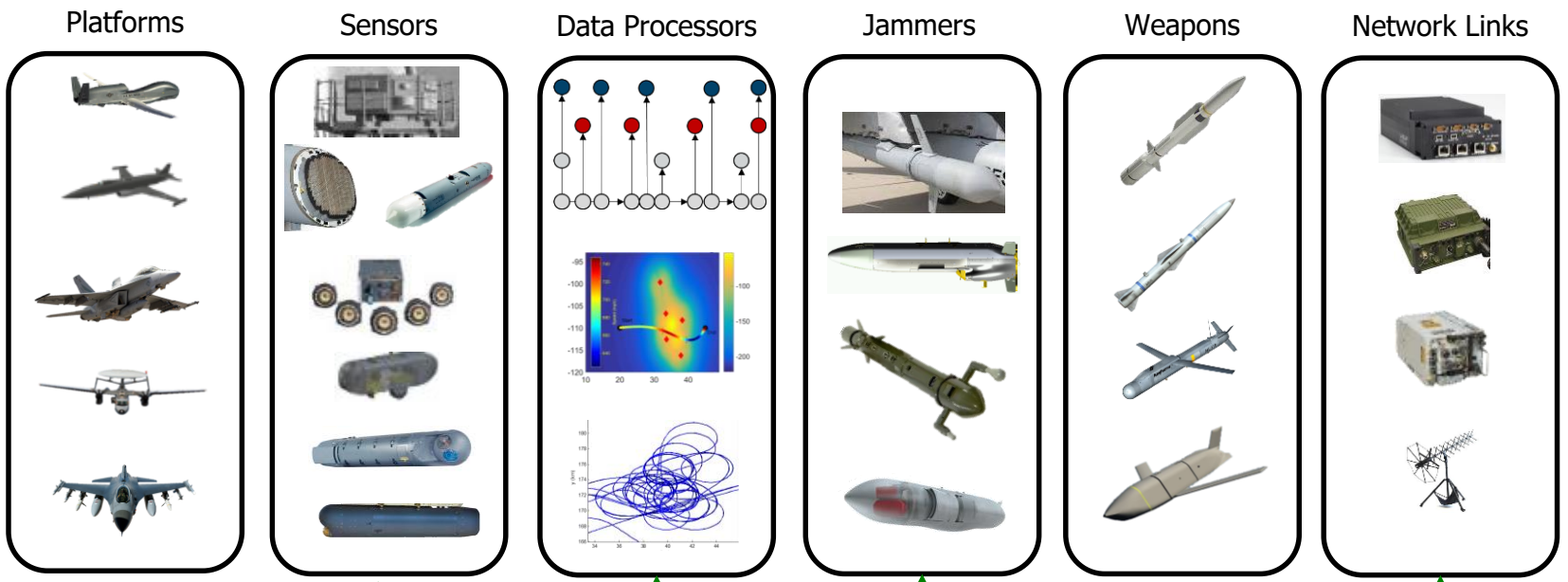
# DoD yearly programs

**~90** Yearly Major (ACAT I) programs

**$93.2B**




**~2,300** Yearly non-Major programs

**$144.4B**

Every program grades to their own requirements and coordinates external integration

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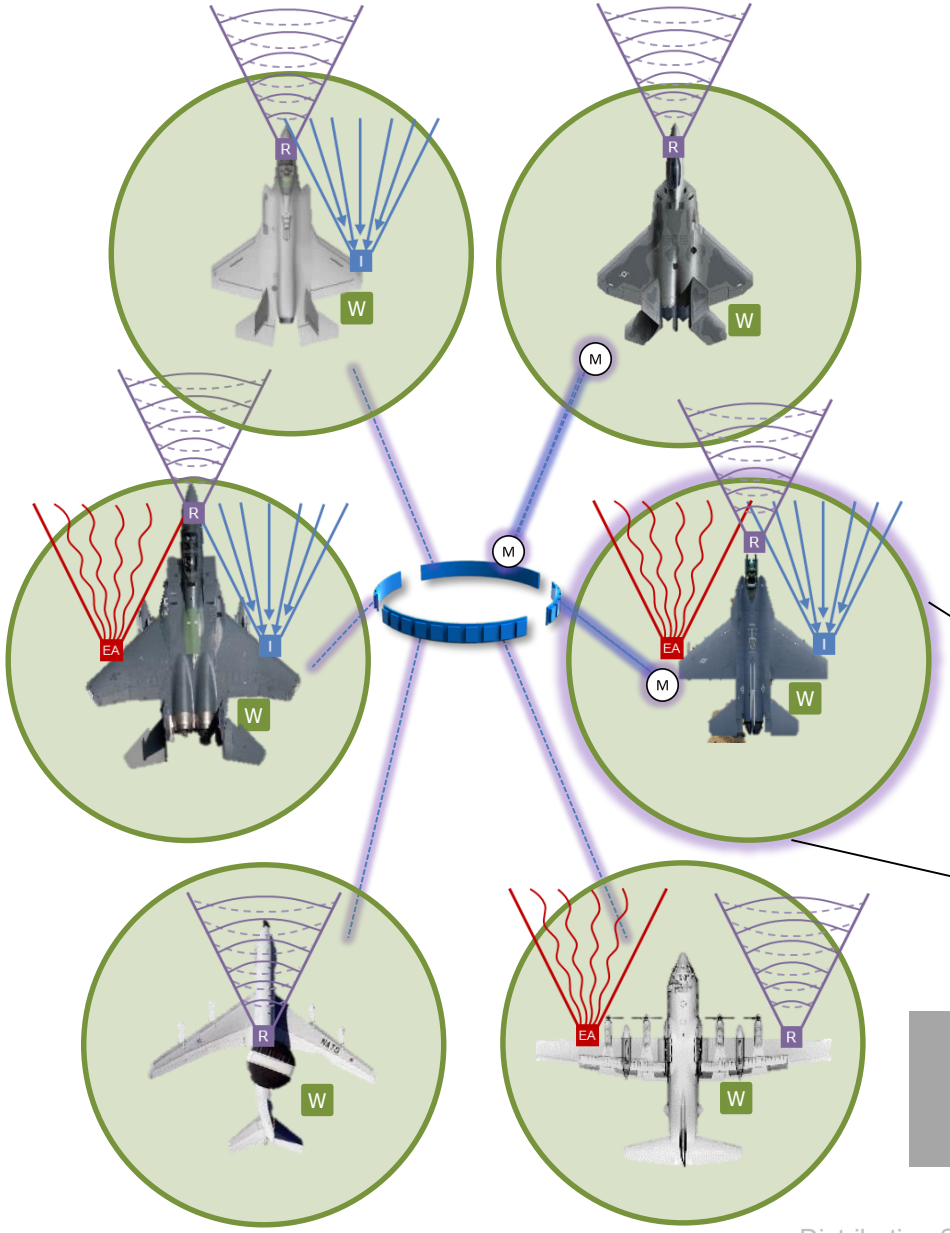
# STITCHES is a toolchain to generate interoperability

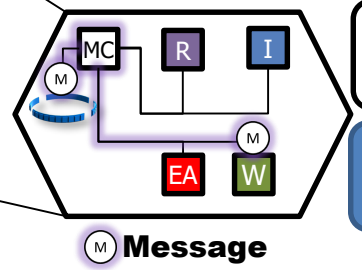



**STITCHES efficiently generates message translators**

- System software is modified once for STITCHES compatibility
- Generated code is uploaded like mission data files (MDFs)
- Allows for fast and easy reconfiguration of mission capabilities

**Auto-generate efficient glue code to**

- Interoperate between new subsystems and existing components; old and new generations of the "same" open specification
- Transform platform data to comm's message formats or encode any message inside fixed format standards like Link-16




A mission computer's (MC) software is modified to allow STITCHES MDFs to translate and control data flow

Any data on buses connected to STITCHES MDFs may be translated and rerouted inside or outside an aircraft

STITCHES MDFs **efficiently translate data** and **control data flow** in order to create interoperability between and within connected platforms

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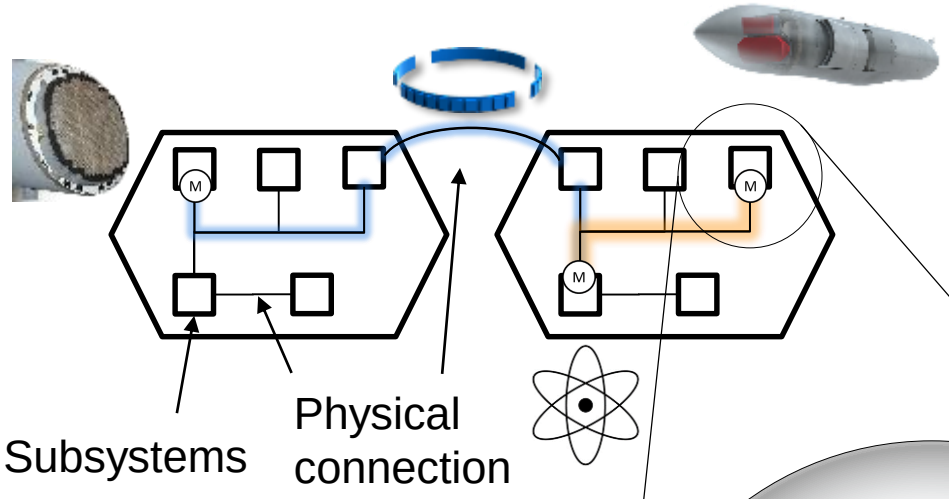
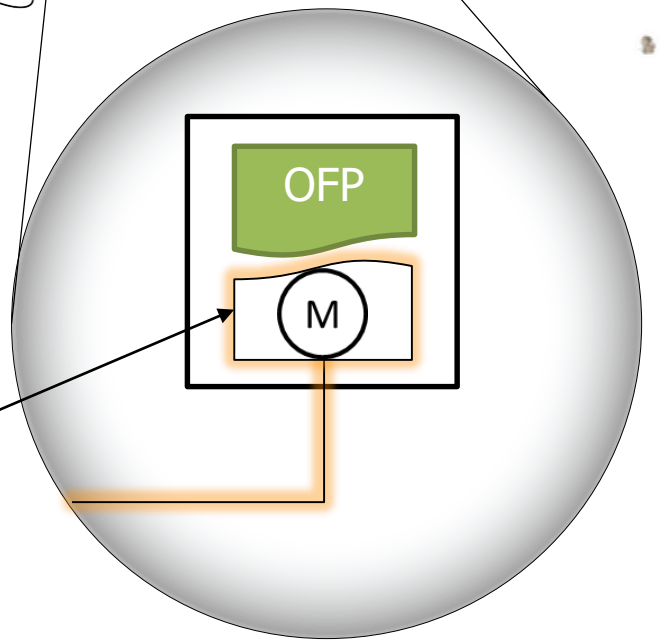
# SoSITE integrates via a new toolchain called STITCHES

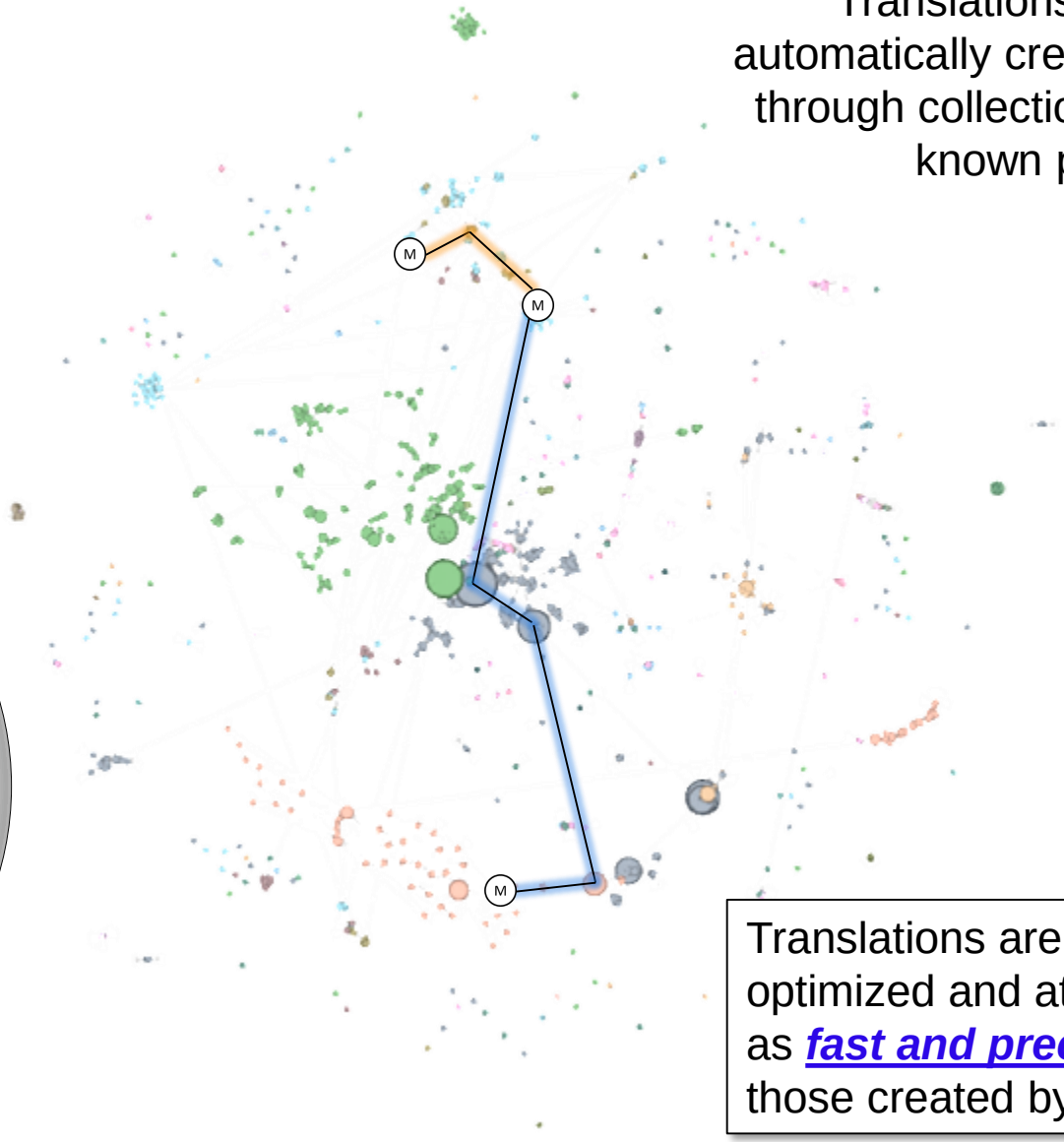
A System of System is created by a user




**Automatically** created translations are separated from the OFP

Translations are automatically created through collection of known pairs




Translations are optimized and at ***least*** as ***fast and precise*** as those created by hand

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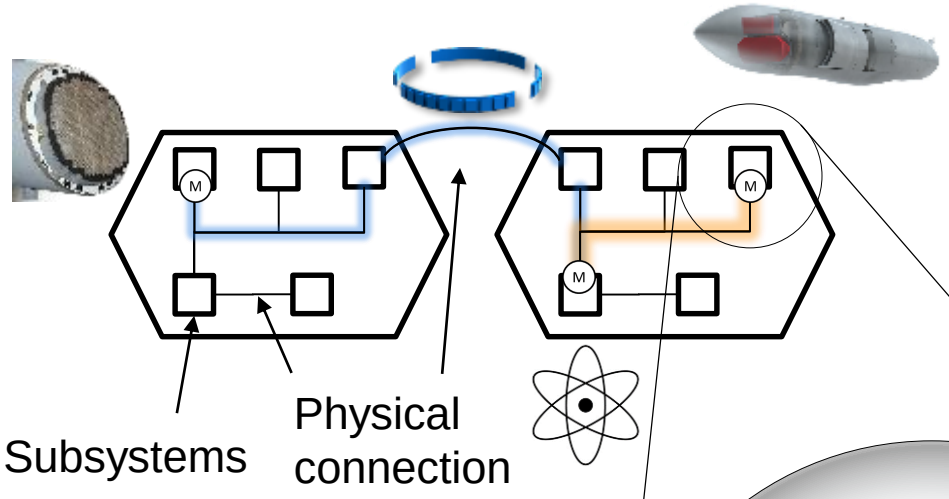


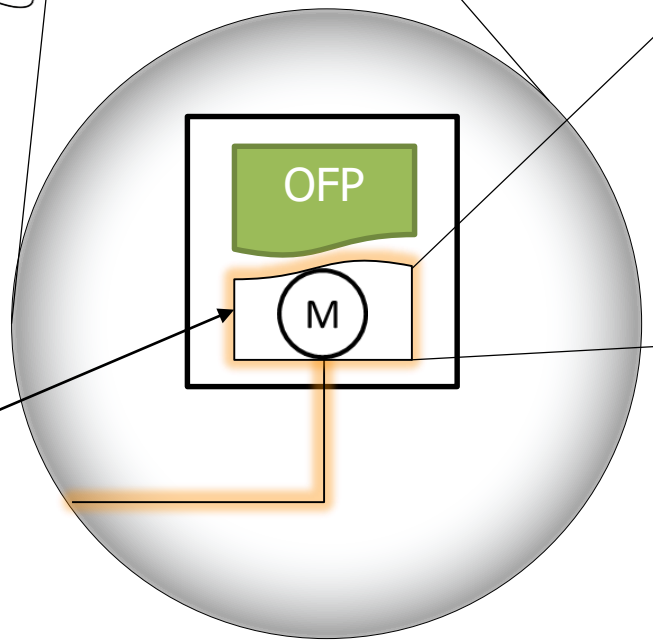


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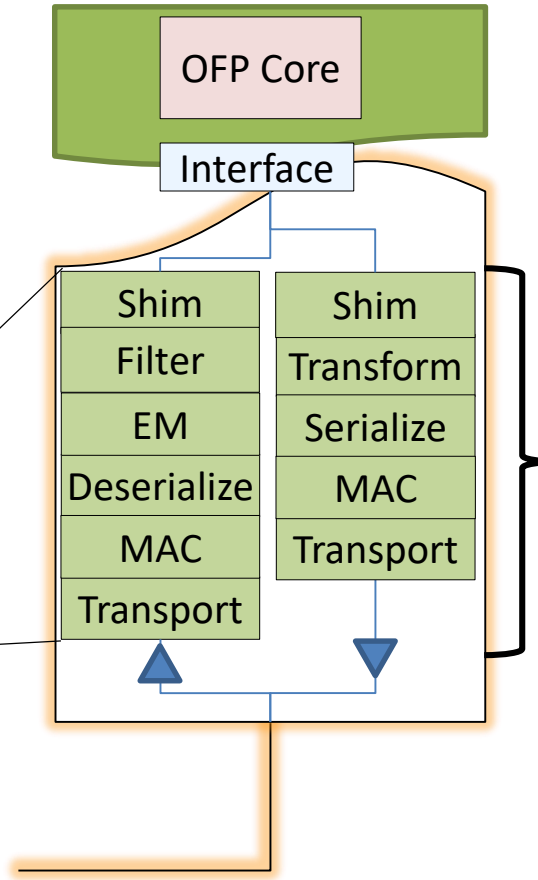


Interfaces automatically created producing STITCHES MDFs

**Includes**

Cross domain rulesets
Translation
Authentication
Bus monitors
Data filters

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