Interface Exchange framework (IFEX)

- Quick introduction and “why”
  (no details)

v2.0
July 2023
Context

Too many interface description languages and IPC/RPC technologies!

Create another “one to rule them all”? (yes it is ironic... "XKCD standards")

But! The main challenge is not creating or avoiding “a new IDL” – it is determining the semantic equivalences and differences between existing technologies → (to efficiently connect them and swap one for another).

IFEX project is a place to do the difficult semantic-mapping work

While doing so, it creates translating tools between formats

... and it results in a simple but powerful interface description format (because it is forced to include “all” features of the other alternatives) (more importantly because it uses Layers, to separate individual concerns)
N-to-N

HTTP/REST/OpenAPI
AsyncAPI
ARXML
Franca IDL
Protobuf/gRPC
Thrift
Other...

And so on... (N times N)
Bigger view

Not just an IDL. A common interface-description-**model**. A project to investigate, connect and unify interface/communication technologies.
Q: Why not just select an existing IDL and put that in the middle of N-1-N?
A: None of them have ALL the features of the others
A: Few care about overall picture, compatibility with other choices
A: None (*except Franca) have a strongly layered approach required to manage complexity and IDL scope-creep.

- IFEX adopts this important concept and extends it
- Avoid deployment details and related meta-data to pollute the core IDL. Put those details in composable layers
- => keeps the fundamental “interface-description” reusable
Details and F-A-Q

Q: Isn’t it a lot of work to create code generators for the IFEX IDL?

A: Some work for sure. We only write new what is necessary.

A: Reuse: Translating to an existing IDL means we can often use “their” code generators. IFEX source → <IDL A> → [reuse existing tools for IDL A]! In some areas, it is more a requirement (approved AUTOSAR tools need ARXML)
Status July 2023 (1)

You might know it as “VSC” –> we now call the technology **IFEX**

IFEX is a collaborative Open-Source development
(*AUTOSAR parts not yet(?) published)

Core IDL/model specification (“v 1.0” status) is complete/comprehensive and mostly stable

→ Only minor updates expected from now on

(Note: “Layers“ definition is continuous, as support for translations grow)

Layers can be extended to many concepts:

• Variability in deployment

• Access control rules, security implementations, etc.
Implementations and principles for IFEX tooling exists. Python implementations – lightweight and easy to get into.

New tools can be developed following the existing patterns.

Existing support:

Translation into formats like DTDL, SDS-BAMM, Protobuf (gRPC), AUTOSAR XML (early stage) exists

Thrift and D-Bus coming

Translation from formats ongoing. Can be a bit more challenging. Prioritized on a need basis.
Find out more

This presentation does not cover many details about IFEX.

The project has been active for a few years so many of your concerns are known – but please ask and we will clarify and discuss.

Read the specification of the IFEX Core IDL.

Ask IFEX developers for deeper discussions.