OAAX: One Standard for AI Vision on Any Compute Platform

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Network Optix

OAAX

Open

AI Accelerator

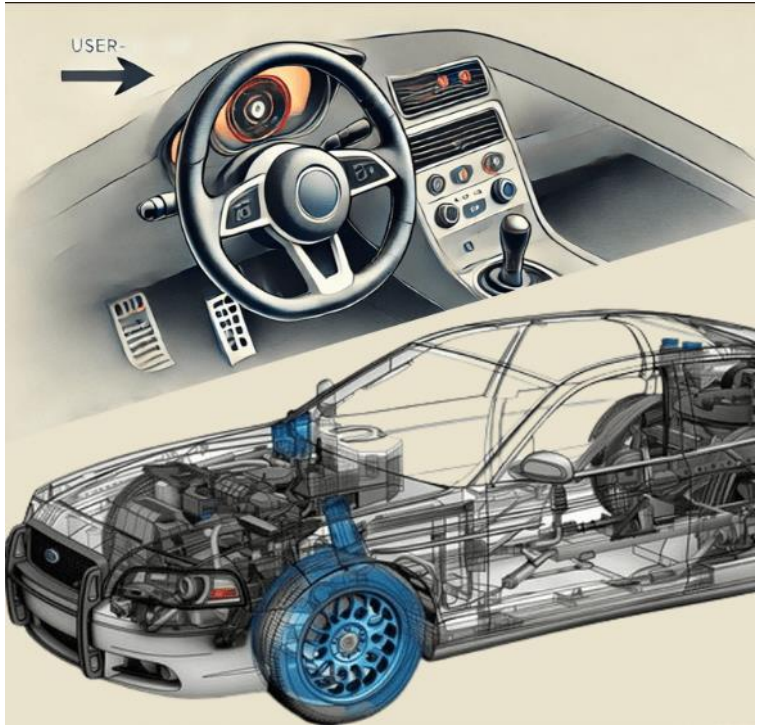
eXchange

Outline

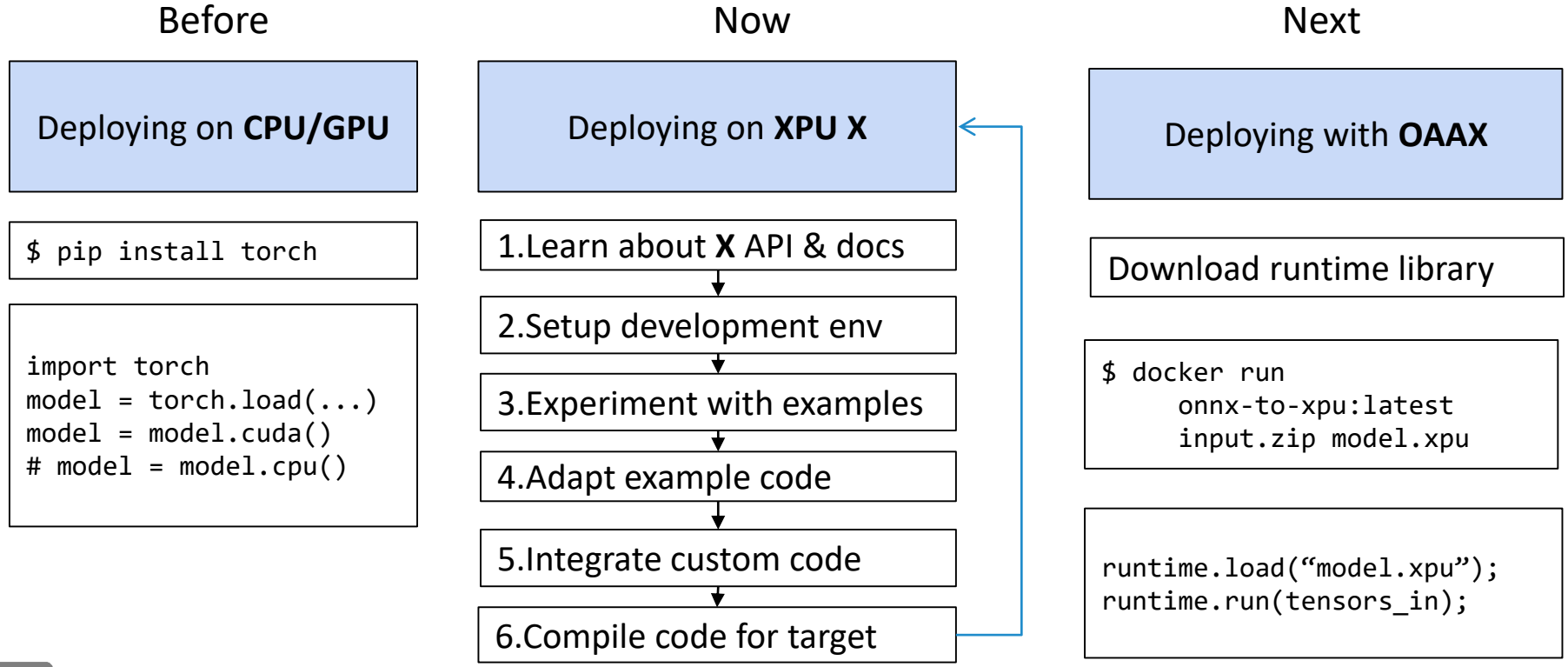
- The problem OAAX addresses
- Proposed solution
- OAAX's impact on chipmakers and users
- Ecosystem and collaboration
- OAAX in practice
- Roadmap and future development
- Get involved: Linux Foundation project & community resources

The value of standardized interfaces

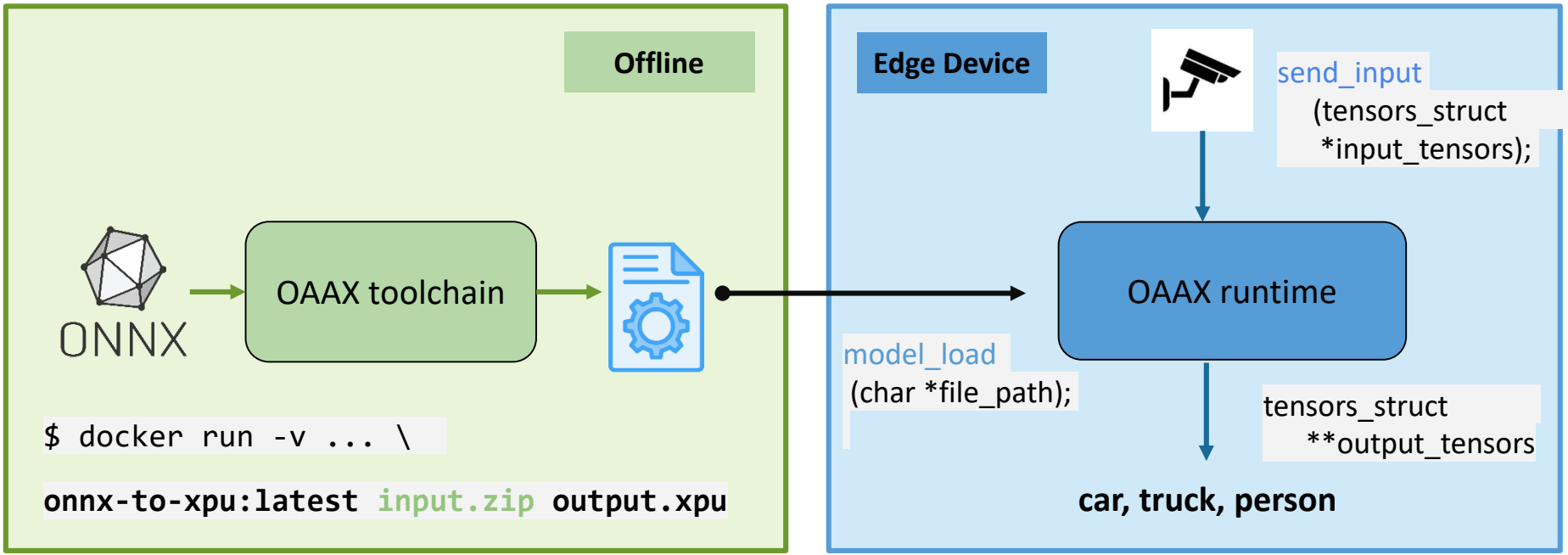
- The standard design of cars:
  - has consistent features like pedals, gears, dashboard, trunk...
  - boosts usability and mass adoption
  - eliminates the need for training or license for each car brand
- Likewise, OAAX:
  - has a unified interface
  - boosts mass adoption of AI accelerators
  - allows ease of integration of any OAAX-compliant AI accelerator



The problem that gave rise to OAAX



Solution using OAAX



OAAX proposes a standardized interface to **compile a model** and a process to **run it**.

Impact of OAAX

OAAX for users

- Makes it easier to deploy AI models
- Reduces time, effort and money for deploying a trained model
- Allows them to focus on training models
- Enables smooth transition from one AI Accelerator to another
- Reduces time to market for companies

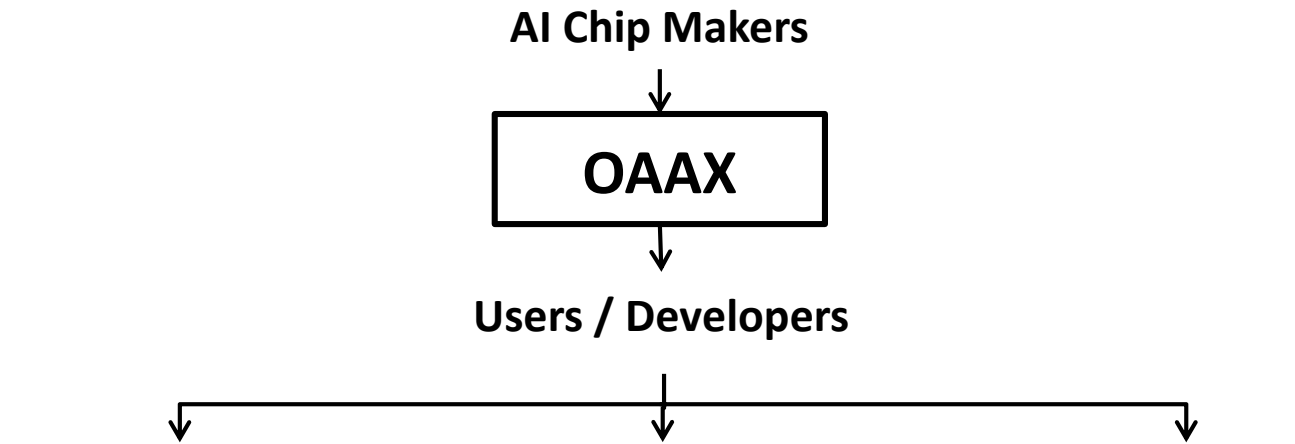
OAAX for AI chip makers

- Simplifies the process of showcasing their hardware, saving time and effort
- Enables new XPUs to compete on equal footing with existing ones
- Allows them to access broad segment of users
- Enables them to access the ecosystem of examples and tools already developed

Current state of OAAX

- **OAAX simplifies AI deployment**: It enables effortless deployment of AI models across various hardware platforms.
- **Proven in real-world use**: As the first adopter, Network Optix uses OAAX to deploy AI models from the Nx Cloud to Nx supported servers and devices at the edge.
- **Open and collaborative**: OAAX is a project under the Linux Foundation.
- **Broad hardware support**: OAAX provides toolchains and runtimes at different levels of maturity for a growing list of AI accelerators, including:

Ecosystem of OAAX

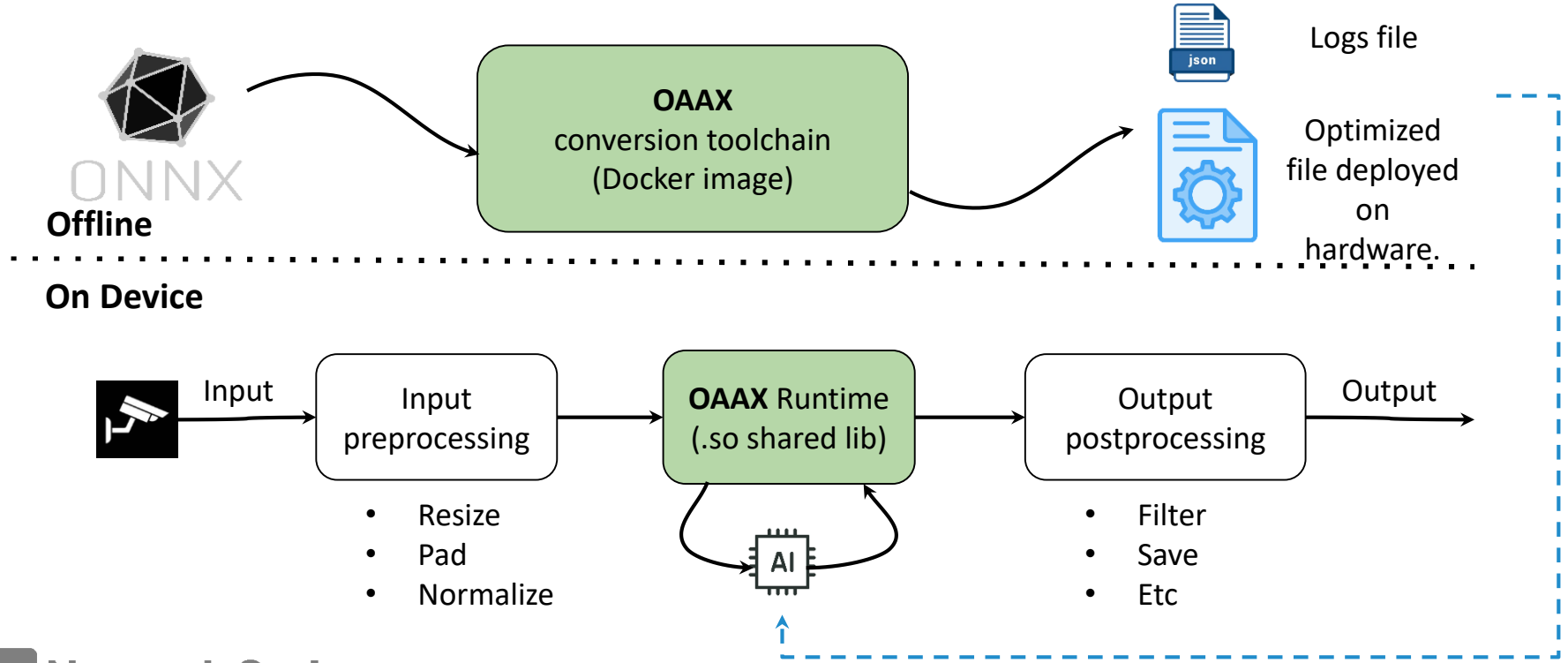


End Users:
- AI enthusiasts
- Researchers
- Companies

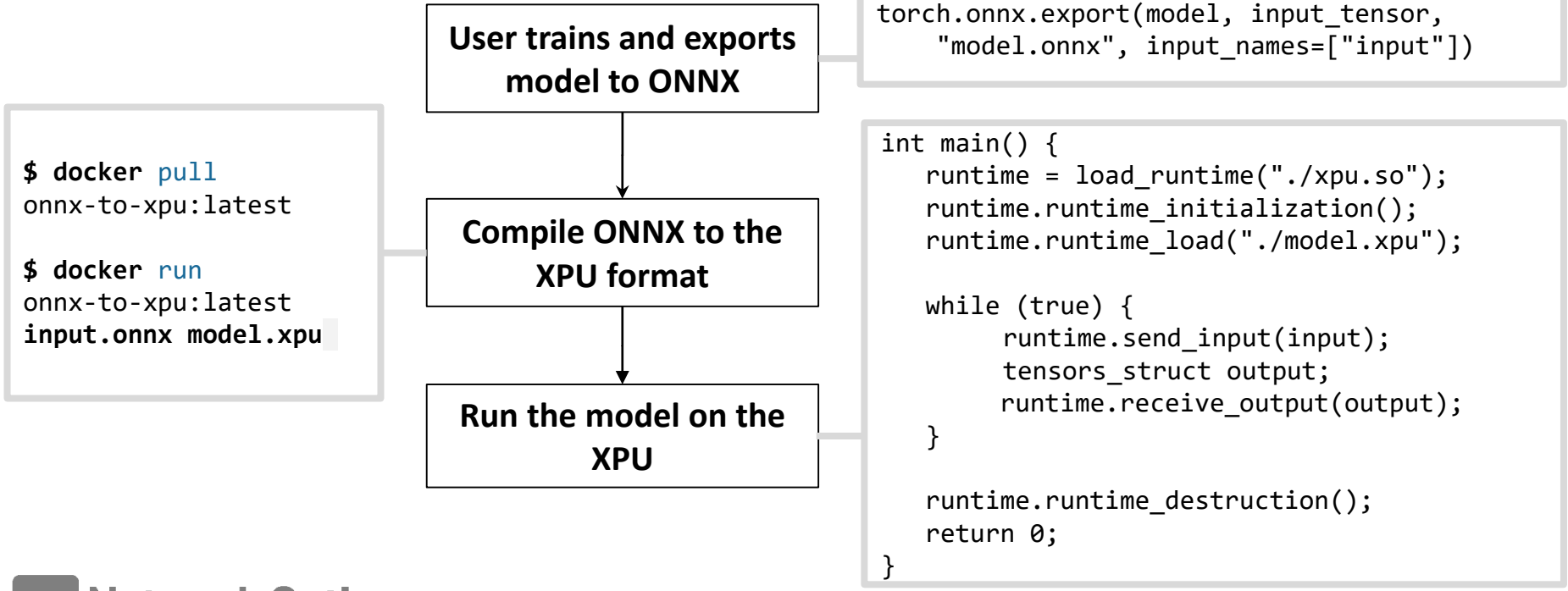
Companies:
- Network Optix
- Edge Impulse
- Automobile

AI Frameworks:
- PyTorch
- TensorFlow
- Huggingface

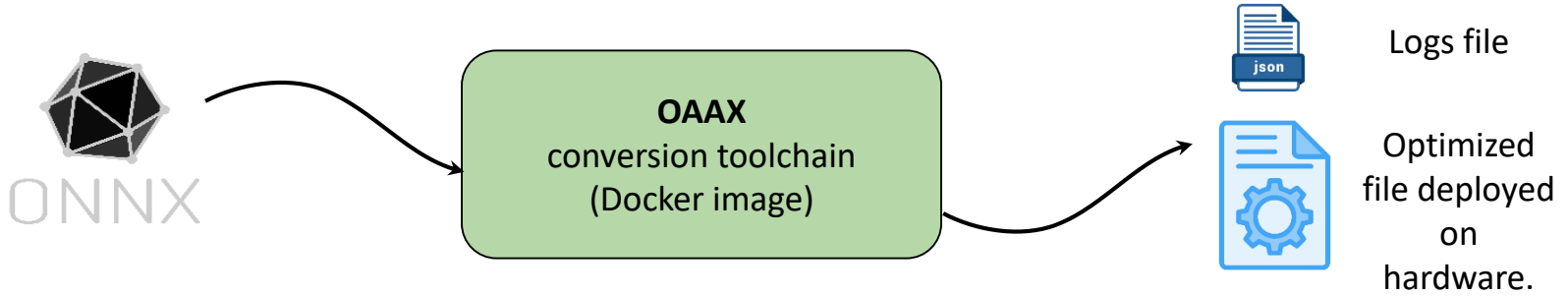
OAAX in practice – general overview



OAAX from a user perspective



Conversion toolchain interface

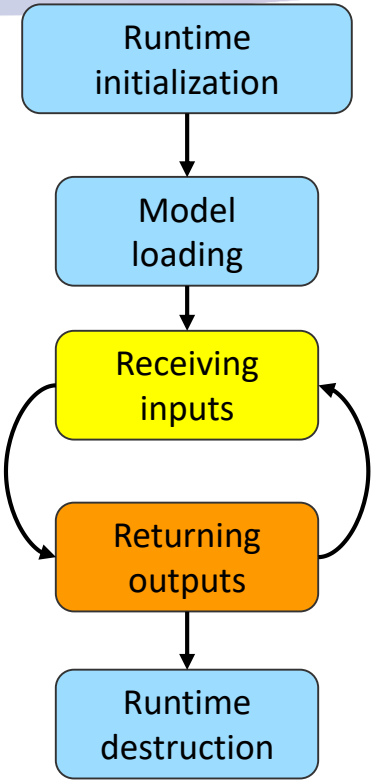


A process to go from a generic model specification (ONNX), to a specification that can be executed by the target specific runtime.

- Implemented as a standalone **Docker image**: easy to distribute and to maintain, while being totally flexible regarding the implementation of the conversion process.
- Usage:

```
> docker run -v .:/app onnx-to-xpu:latest /app/input.onnx /app/output.xpu
```

Runtime interface - process



int runtime_initialization();

int runtime_model_loading(const char *file_path);

int send_input(tensors_struct *input_tensors);

int receive_output(tensors_struct *output_tensors);

int runtime_destruction();

Runtime interface - definition

```
int runtime_initialization();

int runtime_initialization_with_args(int      length,
                                     char**   keys,
                                     void**   values);

int runtime_model_loading(const char*  path);

int send_input(tensors_struct*  input_tensors);

int receive_output(tensors_struct**  tensors_out);

int runtime_destruction();
```

```
typedef struct tensors_struct {
      size_t             num_tensors;
      char**             names;
      tensor_data_type*  data_types;
      size_t*            ranks;
      size_t**           shapes;
      void**             data;
} tensors_struct;
```

The interface is:

- Minimalist.
- Abstract.
- Works for any kind of AI model: vision, LLM, multimodal.

OAAX roadmap

- Support more AI chips: SiMa, Axelera, RockChip, etc.
- Improve the standard to accommodate for needs of both users & AI chip makers.
- Implement tools to make it easier for users to the toolchains & runtimes at scale.
  - Auto-detection of supported AI accelerators on a machine.
  - Download the correct runtime and toolchain programmatically.
  - Benchmark and profiling.

OAAX Linux Foundation Project

Support the Future of Open AI Acceleration!

OAAX is now a **Sandbox Project** under the **Linux Foundation AI & Data**.

We're building an open, collaborative ecosystem for AI acceleration —
and we invite developers, companies, and innovators like you to join us!

- Contribute your expertise
- Collaborate on groundbreaking solutions
- Help shape the future of AI infrastructure
- **Support OAAX — Let's build the future, together!**

OAAX Linux Foundation Project – Reach out

• **Sponsor:**	Network Optix	https://networkoptix.com
• **Tech lead:**	Ayoub Assis	aassis@networkoptix.com
• **OAAX Team:**	Robin van Emden	rvanemden@networkoptix.com
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	Maurits Kaptein	mkaptein@networkoptix.com

OAAX Linux Foundation Project – Resources

Links to OAAX related resources:

GitHub repository:

https://github.com/OAAX-standard

Project home:

https://www.oaax.org/

Linux Foundation AI & Data project site:

https://lfaidata.foundation/projects/oaax

2025 Embedded Vision Summit

We warmly invite you to visit us at the **Network Optix** booth, **#302**.

We'd love to connect and show you what we're working on!

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