Open. Together.

OCP
SUMMIT

EW: SONiC

Transponder Abstraction Interface (TAI)

Scott Emery (Cumulus Networks)
Wataru Ishida (NTT Electronics America)

OPEN Compute Project
SOLUTION PROVIDER®

OPEN COMMUNITY®

What’s the Problem?

NETWORKING

- Optical transceivers are complex and expensive parts of an optical system
  - 100’s or 1000’s of registers/memories
  - Most have SDKs, NDAs, Licensing, etc.
  - Each have different interfaces
- Optical transceiver vendors invest a lot of money to develop their parts
  - Want to maximize their investment, not give it away
  - Would like to operate in as many systems as possible
- System vendors invest a lot of money to develop systems
  - Want to maximize their investment
  - Would like to support as many optical components as possible
- Open optical packet transponder systems have created this opportunity for component and system vendors to work with a larger ecosystem

Has this problem already been solved?

Switching ASICs vs. Optical Transceivers

NETWORKING

- Both are very complex chips
- Both have many high speed interfaces
- Both commonly have embedded CPUs and are controlled by external CPUs
- Vendors of both don’t like to expose the details of their implementation
  - NDAs, Specs marked Confidential
- Both have 100s/1000s of registers/memories for status/control
- Both commonly have SDKs
- Optical modules can be modular, switching ASIC are fixed
  - Voyager optics are fixed, Cassini optics are modular
- Since TIP has the same “roots” as OCP, TIP looked to OCP for how to handle this...

SAI - Switch Abstraction Interface

NETWORKING

- A project within the OCP networking group
- Began in 2015
  - Significant adoption since inception
- Designed to be as light-weight as possible
  - Modeled after SDKs
- Uses CRUD operations (create, read, update, delete) over an extensible data model
  - Objects are created/deleted which have attributes that can be read/updated
  - Attributes can be easily extended
- TAI “stole” much of its philosophy from SAI
  - 99% of the time, the answer to “Why does TAI do …?” is “Because that’s the way SAI does it”
- https://github.com/opencomputeproject/SAI

SAI Becomes TAI

NETWORKING

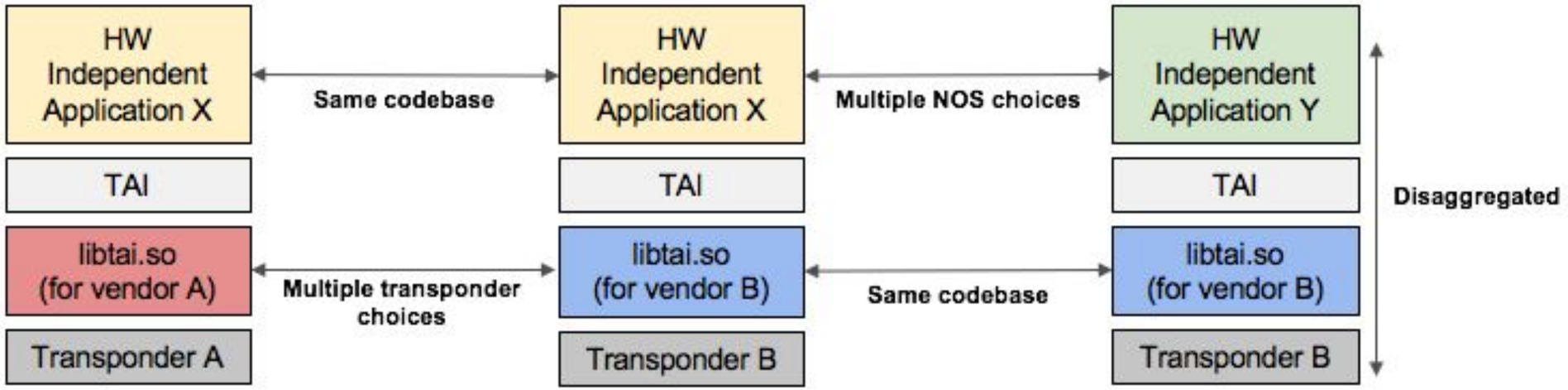
- **T**ransponder **A**bstraction **I**nterface
- Collection of C header files
- Implementation (C shared library - libtai.so) will be provided by each component vendor
- Users link libtai.so with their application
- Provides a common interface to optical modules
- libtai.so is binary blob, protecting optical vendors
- Current version:
  - https://github.com/Telecominfraproject/OOPT-TAI
- Supported NOS

- Working on propose adding TAI support in SONiC/ONL too

What is TAI?

NETWORKING

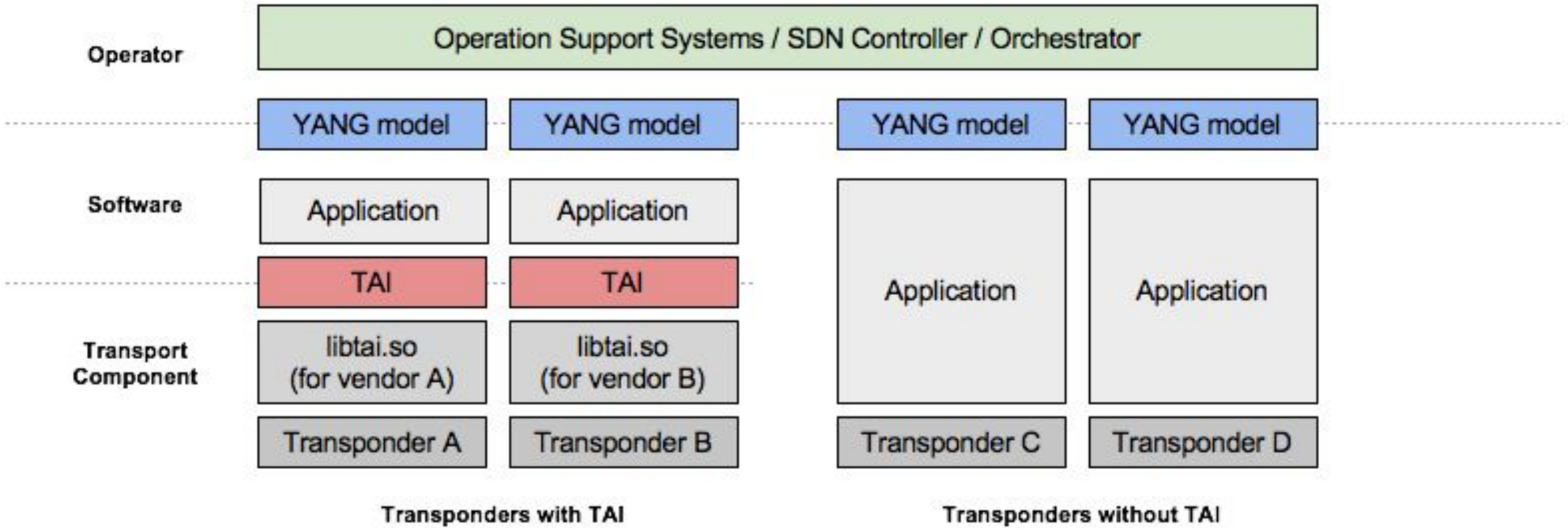
- TAI is an interface between optical transponders and system software
- Allows system software to operate with any TAI-compliant transponders
- Allows transponders to operate in any system which supports TAI
- By decoupling the transponders from the rest of the system, it allows each to innovate independently
- Available here:
  - https://github.com/Telecominfraproject/oopt-tai
  - https://github.com/Telecominfraproject/oopt-tai-implementations



What is not TAI?

NETWORKING

- TAI is not an API for operators like YANG models
- TAI is not trying to become a de jure standard or standardization body



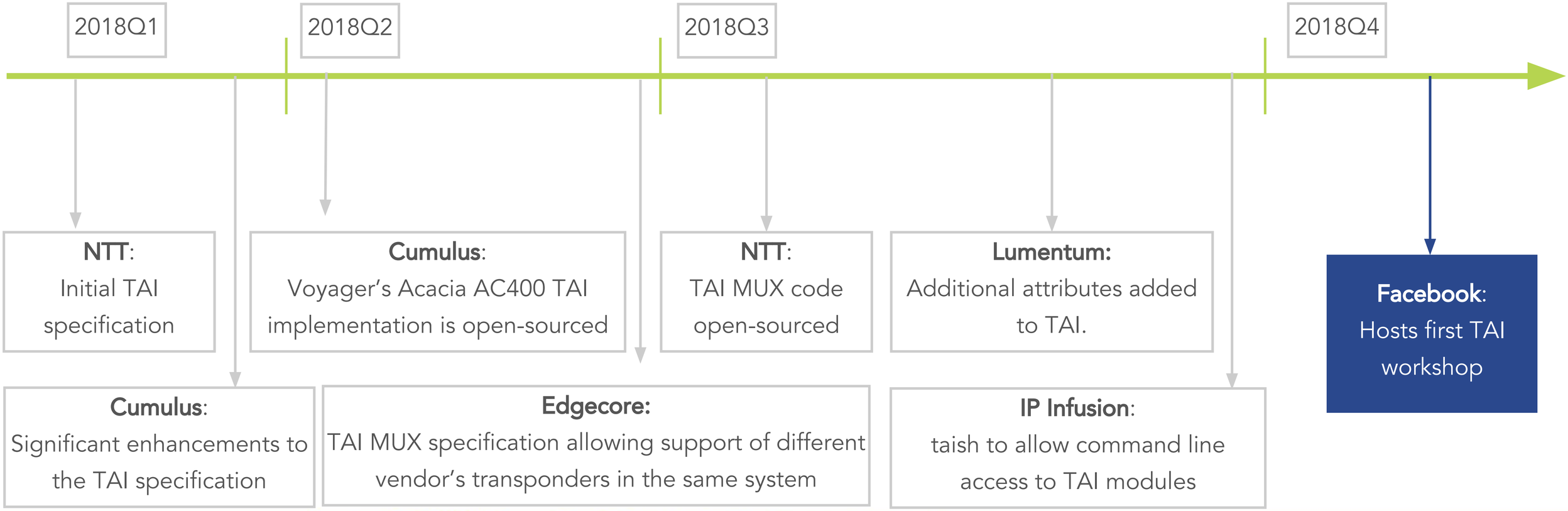
Differences between Switches and Transponders

NETWORKING

- Transponders are commonly modular - switching ASICs are fixed
  - Optical transceivers come and go as a system operates
    - Voyager transceivers are fixed
    - Cassini transceivers are modular
  - Switching ASICs are soldered down
    - There are no known open switch platforms where a switching ASIC can be removed/added in a running system
- There can be several, different optical transceivers in a system
  - Optical transceivers from different vendors can be present in the same system
    - Voyager has only one vendor - Acacia
    - Cassini supports ACO and DCO CFP2 modules from many vendors
  - Switches typically have a single ASIC from one vendor
- Both of these differences are handled in TAI, but not in SAI

TAI Timeline

NETWORKING



TAI Supporters

NETWORKING

NTT

CUMULUS

LUMENTUM

Edge-corE NETWORKS

ipinfusion

ACACIA COMMUNICATIONS, INC.

FUJITSU

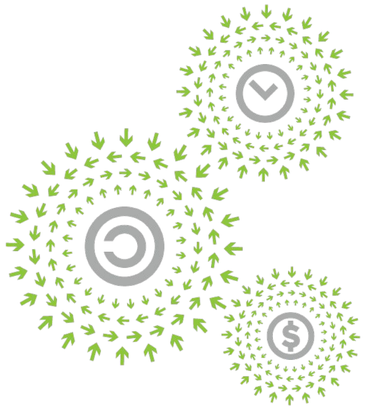
What’s next for TAI?

NETWORKING

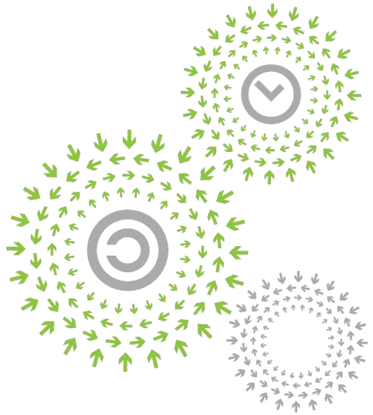
- More features to exploit rich hardware capability
- More features to ease transponder software development
- Become a good mediator between YANG models (operator’s API) and MSA MIS register maps (hardware API)
  - TAI does not just expose the MSA MIS
- Enlarge the community and accelerate the disaggregation of transponders


Open. Together.
OCP Global Summit | March 14–15, 2019
OCP
SUMMIT

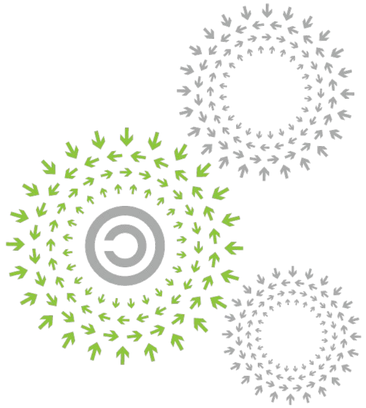
Please use one of these membership logo’s to designate your company’s membership level.



OPEN PLATINUM™



OPEN GOLD®



OPEN SILVER™

OPEN COMMUNITY®

Please use this logo if you or your supplier is an OCP Solution Provider.

Please use this logo if your Facility is an OCP Ready™ facility

Please use if your product has been recognized as an OCP validated product

Please use the appropriate icon representing the Project Group

SECURITY

SERVER

STORAGE

NETWORKING

RACK & POWER

MANAGEMENT

HPC

TELCO

DATA CENTER FACILITIES

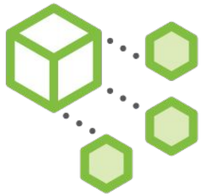
OPEN SYSTEMS FIRMWARE

The following project group logos are missing: OpenEdge, OpenRMC, ACS. If you need one of these, contact Archna@opencompute.org

Please use the appropriate icon representing the Regional Project Group

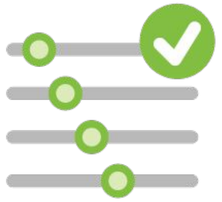
Please use the appropriate icon representing your type of contribution

Specifications



Reference Architecture

Embedded Software



Tested Configurations

Case Studies

White Papers

Design Files

Product Recognition

Facility Recognition

Workshops Summits

Testimonials Seminars

Videos