Technology for Accelerating Digital Transformation

TOWARDS A NEW OPEN, INTEROPERABLE NETWORKING TECHNOLOGY ECOSYSTEM

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FACEBOOK

Transformational Trends in Networking Technology

1980s-1990s

Analog ➡ Digital

2010s

Hardware ➡ Software
(SDN, NFV)

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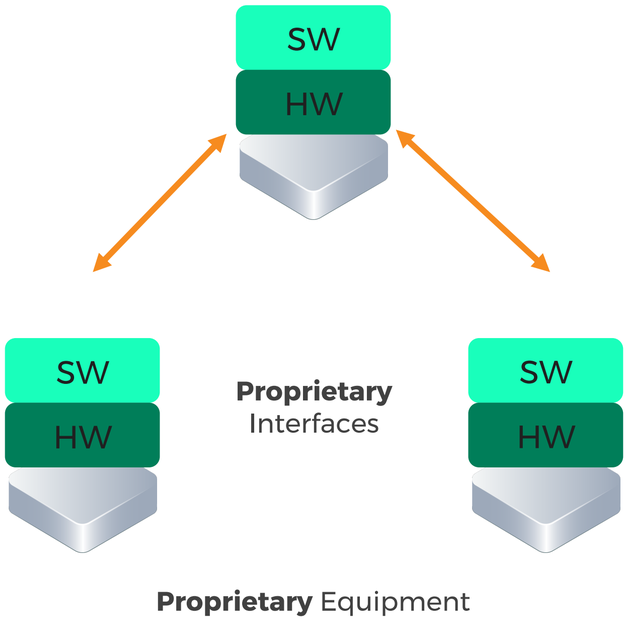
TODAY

Integrated & Proprietary

Disaggregated, Open & Interoperable
(modularity)

Traditional Integrated Network Design

Single-vendor, fully integrated networks



- Worked well in analog world
- Multiple competing vendors and standards drove 2G and 3G innovation and deployment
- Comfortable for network operators

CONNECTIVITY: THE CHALLENGE

NETWORK EXPENSE IS TYPICALLY PROPORTIONAL TO **NUMBER OF SITES**

MORE SITES INVOLVE...

ADDITIONAL CAPEX NEEDS

- New equipment
- Installation / deployment
- Backhaul networks

INCREASED OPEX

- Site operation and maintenance
- Energy consumption

Fewer Traditional Vendors = Less Competition

TIP – A Collaborative* Industry Driven, Approach to Building a New Telecom Supply Chain

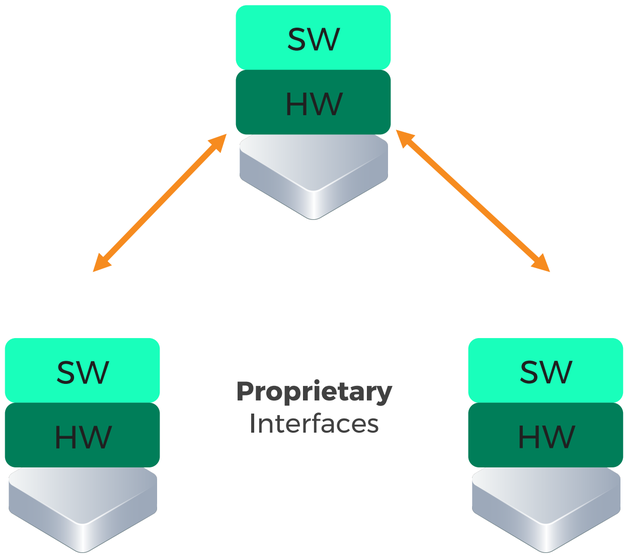
*Network Operators, OEMs, chip makes, system integrators, software designers, etc. all at the table together

The **Telecom Infra Project (TIP)** is a global community of 500+ companies and organizations working together to accelerate the development and deployment of open, interoperable, disaggregated technology solutions that deliver high quality connectivity; Industry led, self-regulatory process using and contributing to global standards.

The Solution: Open Disaggregated Networks Diversify the Supply Chain and Improve Network Economics

FROM

Single-vendor, fully integrated networks



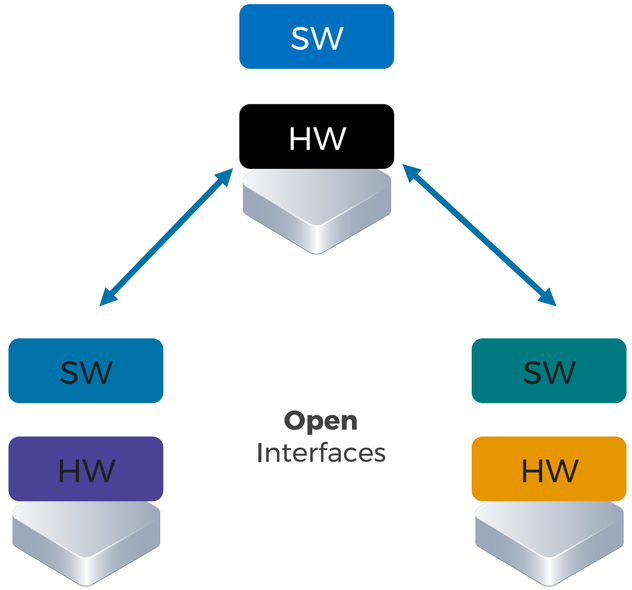
Proprietary Equipment

The combination of SW-HW disaggregation and open interfaces **helps the industry**:

- Build a more **sustainable supply chain**
- Improve network **economics**
- Accelerate **innovation** in connectivity

TO

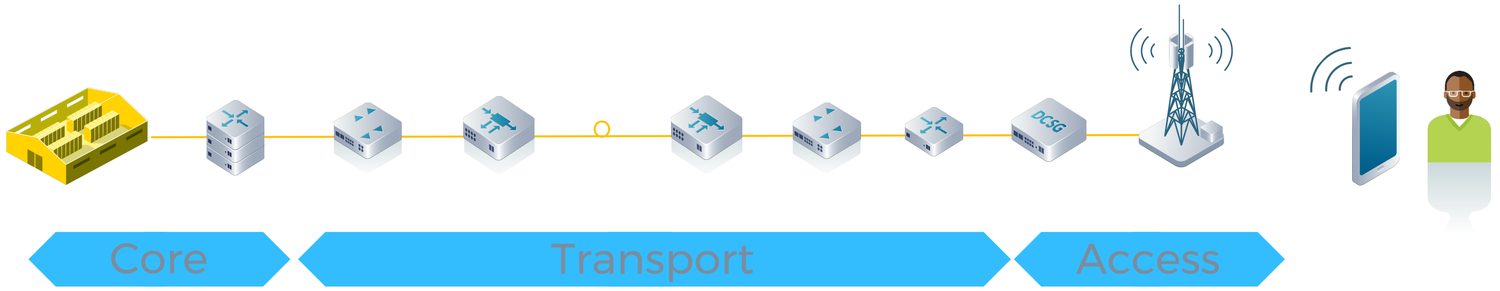
Multi-vendor, disaggregated networks



Hardware-Software disaggregation

OPENRAN & BEYOND

TIP is helping the industry accelerate the commercial deployment of open solutions across the network



- Open Core

- Open Optical & Packet Transport
- Wireless Backhaul
- mmWave
- Non-terrestrial Comms

- OpenRAN
- OpenWiFi
- Crowd Cell

Approx % Carrier Equipment CapEx markets

~10%

~35%

~55%

Open Network Solutions Becoming a Global Commercial Reality

IDEATE | DEFINE | BUILD | TEST | RELEASE | DEPLOY

Public Private Partnership and Role for Policymakers

Example: INDONESIA– 5 Pillars of Action

Test & validate TIP Open Technology in a TIP Community Lab

Prove the solutions in the field

Set the platform for building awareness through Events

Build the local talent pool & community

Startup acceleration with TIP TEAC & local players

CORE COMMUNITY

TELECOM INFRA PROJECT · GSMA · KOMINFO · BAKTI · TELKOMSEL · 3 · indosat ooredoo · XL axiata · smartfren. · Net1 INDONESIA

GROWING

ATSI · KEJORA · kairos Kairos Utama Indonesia

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Role for Policymakers Accelerating the Open, Disaggregated Technology Ecosystem Transition

- Leadership educating, supporting, fostering open technology shift
  - Convene workshops, showcases, forums
  - Open proceedings, inquiries
- Reduce regulation and red tape
  - Incentives for Open Technology deployment
  - Regulatory sandbox for innovation and trials
- Financial incentives and support
  - Reduced license fees and/or tax incentives for network operators
  - Financial incentives for startups, pre-commercial R&D, trial deployments
  - Purchase OpenRAN and other Open Tech for government networks
- Partner with private sector setting up labs, testing, validation
  - E.g., OpenRAN Centers of excellence

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