Towards Open Innovation Ecosystems: IOWN Global Forum's Liaison Program

IOWN GLOBAL FORUM™

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PART 1: About IOWN Global Forum

I. Introduction

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Chair, IOWN Global Forum Liaison Working Group

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The world today has experienced faster than ever growth, thanks to advancements in communication and computing technologies. Another quantum leap in computing and communication capabilities is expected to help enable the world to reach the Sustainable Development Goals set by the United Nations to achieve a better and more sustainable future for all.

This effort will demand industry-wide collaboration, global behavior shifts, and tremendous advances in technology. The IOWN Global Forum is committed to developing the technologies needed to deliver on this promise of a better world, a world that improves how humans live and interact with technology and each other.

The IOWN Global Forum's objective is to accelerate innovation and adoption of a new communication infrastructure to meet our future data and computing requirements through the development of new technologies, frameworks, specifications, and reference designs in areas such as photonic networks, distributed computing, digital twin computing, as well as use cases and best practices for each of these technology segments.

The IOWN Global Forum and its members are fully aware and supportive of the cooperative and open approaches in the established scientific, technological, and standardization communities that have led to the successful innovation of services and solutions. The IOWN Global Forum is determined to be an active member and citizen-in-good-standing of these communities.

As a result, the Forum intends to cooperate closely and engage collaboratively with external organizations operating in these arenas to align and complement the various aspects of its respective work and standardization efforts. To enable these partnerships, the IOWN Global Forum has established a liaison program and has begun engagements with several partner organizations.

In order to inform potentially interested liaison organizations about this program, the IOWN Global Forum has compiled the following information on the types of agreements in which the Forum has already engaged, how to get started connecting with our organization, and other potential means of interacting with our organization.

Please use this document as an initial source to understand the IOWN Global Forum's goals, structure, and the mechanisms used to initiate and maintain liaison relationships. Do not hesitate to address any comments, questions, or suggestions you have to the IOWN Global Forum's Liaison Working Group: liaison@iowngf.org – or any member of the Forum's leadership.

II. Vision 2030: A Smarter, Better World For All

The IOWN Global Forum aims to bring together like-minded companies to create a smarter world that improves the daily lives of billions of people. Its vision is to create a pervasive next-generation communication infrastructure with inherent intelligence that addresses critical societal challenges tuned to people's immediate environment, thus enriching day-to-day experience, by 2030.

Collaborating with best-in-class partners across multiple industries, the IOWN Global Forum will focus on challenges facing society, including our ever-increasing power consumption and the demands of data transfer, storing, and processing.

The IOWN Global Forum's Vision 2030 seeks to remove barriers to achieving a smarter world by looking beyond current technologies to build a new communications infrastructure capable of offering new services and fostering sustainability (Figure 1).

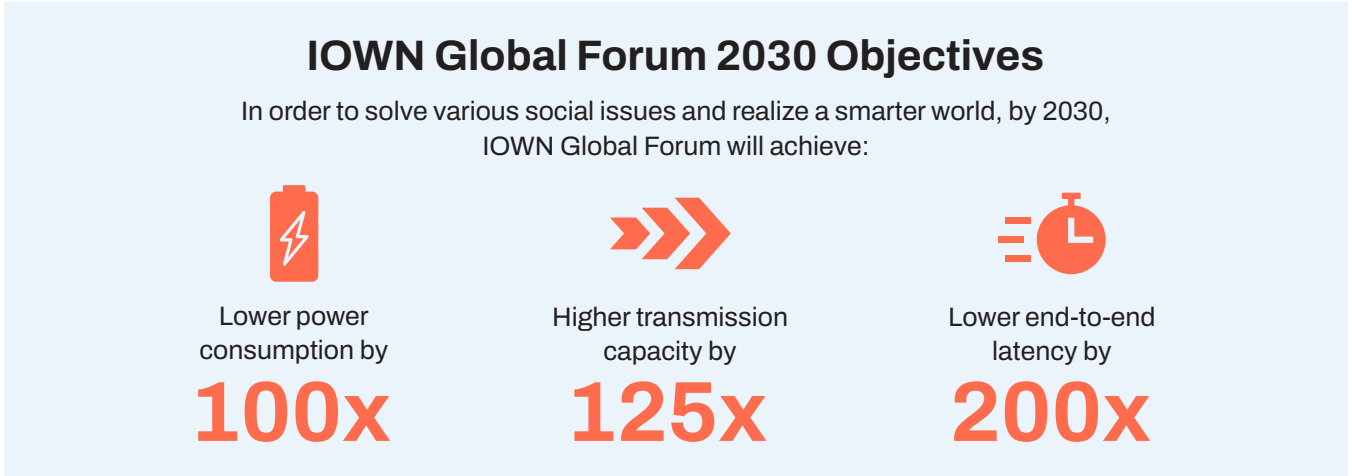


Figure 1: IOWN Global Forum Vision 2030 Objectives

III. The IOWN Global Forum's Roadmap

The release of the Vision 2030 Roadmap summarizes the IOWN Global Forum's vision to realize reliable, high-speed, low-latency data and communications paths over an all-optical data transport layer using a data-centric infrastructure. The IOWN Global Forum's technical reference documents focus on the network architecture framework and methodologies for moving data in faster and more energy-efficient ways than what is available today.

Now the organization's focus will shift to developing the technical specifications needed to build reference implementations and Proof of Concept (PoC) projects based on IOWN technologies. The learnings gained from these work items will inform a clearer view of how the group's technical concepts, such as Open All-Photonics Network (Open APN), Data-Centric Infrastructure (DCI), and Data Hub, will be implemented in future real-world applications (Figure 2).

Open APN, DCI, and Data Hub are designed to be flexible enough to evolve with the ongoing development of optical/radio communication and photonic-electronic convergence technologies. Use cases such as real-time volumetric capturing and technical work items such as in-vehicle APN and co-packaged optics for DCI are currently being reviewed as possible new work items.

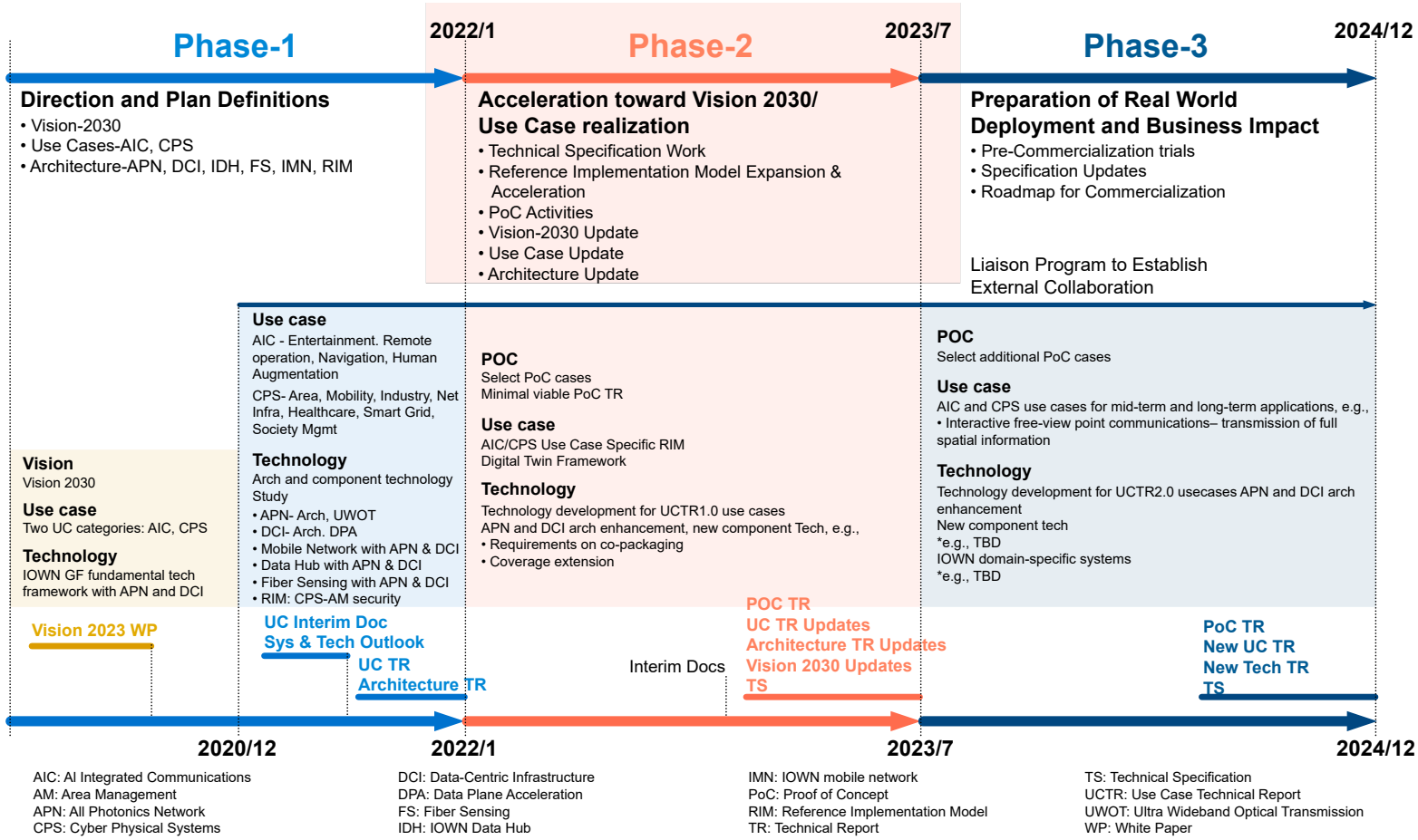
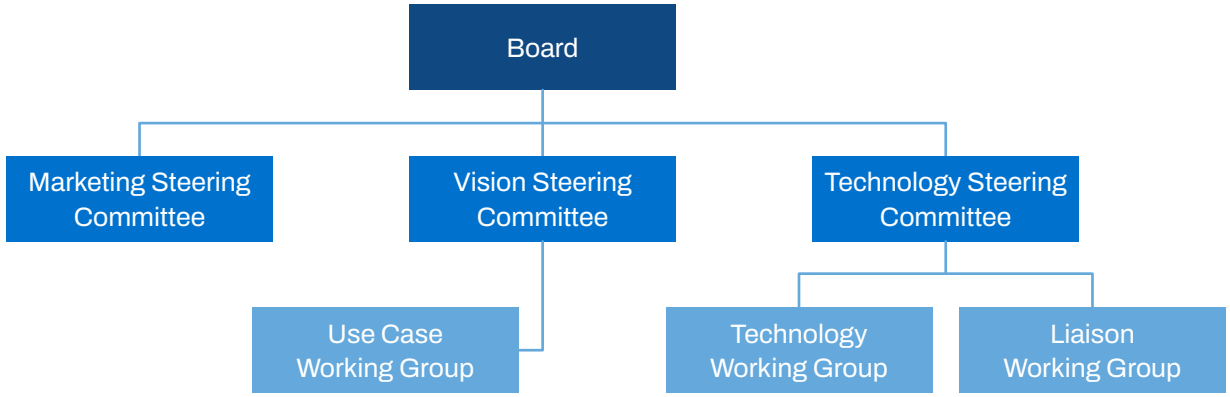


Figure 2: Roadmap Vizualizations

IV. Organization Chart

A diagram displaying the corporate structure of the IOWN Global Forum.



Description of Functions

- **Board of Directors:** Make final decisions regarding the direction of the Forum.
  - **Steering Committees**
    - **Marketing Steering Committee:** Design and execute marketing activities to raise awareness of the IOWN Global Forum and recruit member candidates.
    - **Vision Steering Committee:** Oversee, coordinate, and align Working Groups (WG) related to users, customers, businesses values, and services.
      - **Use Case Working Group:** Discuss potential use case ideas and requirements.
    - **Technology Steering Committee:** Oversee the Working Groups' operations, facilitate communication between the Working Groups, and resolve inter-Working Group issues.
      - **Technology Working Group:** Discuss fundamental technology necessary for the world of IOWN.
      - **Liaison Working Groups:** Enhance the outside visibility of the forums liaisons approach and activities and prepare, setup, and maintain official liaison relationships relevant to the Forum's work.

PART 2:
About Liaisons

I. Messages from Working Group Chairs

Use Case Working Group

Katsutoshi Itoh

Chair, IOWN Global Forum Use Case Working Group

GM-Head of Connectivity and RF Sensing Technologies, R&D Center, Sony Group Corporation

The ongoing pandemic, climate change, and growing geopolitical tensions have made applications we once thought of as a future need become an immediate necessity for millions of people around the world. The ability to communicate and operate from remote locations, as well as collect and analyze data to predict future outcomes are applications that require ultra-high bandwidth, ultra-low latency data transport with advanced computing power, and a reduced carbon footprint. These are precisely the technologies that the IOWN Global Forum aims to develop.

While elasticity is the key to addressing diverse service needs as an infrastructure platform, an all-around solution needs to be built up by identifying and implementing critical requirements. The objective of the Use Case Working Group is to 1) collect use cases addressing future business and society needs, 2) identify critical requirements that arise from use cases, 3) conduct analysis on technology gaps for enabling identified requirements, and 4) drive realization/commercialization of the prospective use cases.

The Use Case Working Group has released two documents addressing beyond-human autonomy in the Cyber-Physical System (CPS) Use Case, and human-centric applications in the AI Integrated Communications (AIC) Use Case, which leverage the predicted next-generation optical network. A series of use case-specific reference implementations and activities leading to a viable PoC are expected to be announced within the years 2022 and 2023.

The Use Case Working Group welcomes new member companies and organizations to bring in new ideas and use cases for us to consider and evaluate how IOWN technologies may fulfill your needs. Since many use cases call for the integration of multiple technologies spanning from wireless transport to digital twin computing, the IOWN Global Forum aims to position itself as a complement to multiple ongoing industry initiatives. Furthermore, as compulsory requirements for IOWN technology include scalability beyond today's imagination, energy efficiency to reduce carbon footprint, and economical efficiency, the IOWN Global Forum intends to engage with organizations and communities addressing evaluation-benchmark methodologies reflecting sustainability needs.

I. Messages from Working Group Chairs (continued)

Technology Working Group

Masahisa Kawashima

Chair, IOWN Global Forum Technology Working Group

Head of IOWN Development Office R&D Planning Department, NTT

The latest advances in the evolution of network technologies are focusing on increasing the performance of data links, i.e., Layers 2 and 1, while the network layer, i.e., Layer 3, remains virtually unchanged. As the result, today's network infrastructures are very fast operating at a local level but are much slower globally. To remedy the above situation, IOWN Global Forum Technology Working Group is working to define a new architecture for network infrastructure that has an optically-switched high-capacity and low-latency network, called All Photonics Network (APN), as its core.

As APNs deliver data to computing systems at the speed of light, the Working Group is also working to define the architecture of new computing infrastructure, called Data-Centric Infrastructure (DCI), that can streamline data transferring and processing at the lightspeed.

The ultimate objective of the Working Group is to define a full-stack and end-to-end technology suite to realize future performance-demanding applications, taking full advantage of APN and DCI. To accomplish this, the Working Group is also addressing several work items, which include IOWN Data Hub, IOWN for Mobile Networks, Fiber Sensing with APN, and IOWNsec (Security).

II. Working in Partnership

IOWN Global Forum is working with other organizations to align concepts, specifications, and technologies across the industry, avoid duplication of effort, and ensure the Forum's work is widely accepted and implemented. Our work with partners can range from an informal exchange of information to the contribution of specifications and the development of joint specifications. We have developed and modeled different types of partnership interactions to meet the different needs of our Task Forces, Working Groups, and partners.

II. Types of Partnerships

IOWN Global Forum envisions multiple types or levels of partnerships that would require respective liaison agreements. For the first two types, the forum has prepared default terms that can be used to finalize an individual agreement. Two other types of partnership are also possible, but due to their unique nature and complexity, they are considered on a case-by-base basis. As a result, we list some of the basic features that should be expected, but we have not prepared a default agreement in advance.

Type-1: Liaison Agreement (no exchange of confidential information included)

- An official agreement of a liaison partnership
- Both organizations use the liaison to update and inform about matters of interest or request information (via liaison statements)
- Information exchanged may include non-confidential information (e.g., dates of meeting/publications, roadmap, work program ...)
- Both organizations may define special areas of common interest that may qualify further the scope and intent of the liaison

II. Types of Partnerships (continued)

Type-2: Liaison Agreement (including the exchange of confidential information)

- An official agreement of a liaison partnership
- Both organizations use the liaison to update and inform about matters of interest or request information (via liaison statements)
- The agreement enables technical collaboration on identified common areas of mutual interest about which both parties wish to communicate and share knowledge (which may include the exchange of Confidential Information via liaison statements)
- Both organizations will define special areas of common interest that will qualify the scope and intent of the liaison
- Both organizations may attend each other's meetings, in the context of exchanging information, on a request basis
- A partner of this type of agreement needs to be a legal entity

Type-3: Liaison Agreement (publishing specifications through an established process of an SDO)

- An official agreement of a liaison partnership
- A Liaison Agreement of this type will enable the publication of technical specifications/reports developed by the IOWN Global Forum via the external SDO.
- Both parties need to agree on the process of publication of the technical specifications/report including but not limited to
  - the handling of the text of technical specifications/reports (e.g., format, terminology, etc.)
  - IPR associated with the technical specifications/reports
  - procedures for possible future revision
- A partner of this type of agreement needs to be a legal entity

Type-4: Liaison Agreement (doing joint/collaborative work)

In addition to the determinations of a Type 2 Liaison Agreement

- This Liaison Agreement enables both parties to establish a joint activity to produce outcomes utilizing expertise of both organizations
- The joint activity may be a Joint Working Group or Joint Task Force and should be tailored considering the working structure and method of both parties
- The Liaison Agreement will include the structure of the joint activity, its work method, approval process of the deliverables, and IPR issues.
- A partner of this type of agreement needs to be a legal entity

IV. Eligibility criteria for organization liaisons

The IOWN Global Forum will be open for liaison by any corporation, partnership, association, trust, governmental body, or other entity having an interest in establishing liaison relationships in the activities of the IOWN Global Forum.

V. Approval process of Deliverables

The IOWN Global Forum develops and adopts Final Deliverables according to the following steps:

1. Development of Draft Deliverables: A Working Group develops a draft deliverable using a draft-comment-revise cycle. All comments received toward the deliverable are disposed of, either through acceptance, rejection, or deferral to a future version of the deliverable. Disposition of comments is generally performed via either consensus or a formal voting procedure.

2. Working Group Review: When a draft deliverable is stable and ready for the Working Group review process, all members of the Working Group are asked to return final comments on the draft deliverable. After all comments are resolved and approved via the voting process, the draft deliverable is submitted to the supervising Steering Committee.

3. Steering Committee Review: Steering Committee reviews the draft deliverable for conformance to documentation rules such as numbering and disclaimers, and for conformance with the Working Group's final statement of work. After the review, the Steering Committee votes to recommend the draft deliverable to the Board of Directors for publication. The Steering Committee may also request changes to the Draft Deliverable.

4. Board Review: Board of Directors reviews the draft deliverable. If a meaningful review by members of the IOWN Global Forum is needed, the Board adopts a resolution for a review period.

5. Member Review: A notice of review period and the draft deliverable are distributed to each member of the IOWN Global Forum to review it from the point of view of IPR policy.

6. Final Deliverables: Upon completion of processes (4) and (5), the Board of Directors determines whether the draft deliverable should be returned to the Working Group for further revisions or be considered for adoption as a Final Deliverable. The Board also determines whether and when the Final Deliverable may be released internally or externally.

VI. IOWN Global Forum Liaison Manager

The IOWN Global Forum defines the role of so-called "Liaison Managers" - individuals in charge of managing the relationship between the IOWN Global Forum and a Liaison Partner. Ideally, such an individual should be a part of both organizations. At a minimum, his or her company must be a member of both organizations.

PART 3: Introduction of Task Forces

1. Open APN Architecture Task Force

Activity Summary: Open APN Architecture Task Force (OAA-TF) identifies key requirements, develops/updates the functional architecture, clarifies the set of control plane interfaces, and maximizes the overall efficiency of Open APN.

2. Data-Centric Infrastructure Task Force

Activity Summary: DCI Task force studies and develops Data-centric Infrastructure (DCI) which is a distributed and disaggregated computing infrastructure with heterogeneous computing devices and high-speed and/or low-latency interconnects.

3. Open APN Wavelength Availability Task Force

Activity Summary: Open APN Wavelength Availability Task Force (OAW-TF) studies technical issues to realize Open APN in which wavelength resources are available to a larger number of end users.

4. Open APN Fiber Sensing Task Force

Activity Summary: Open APN Fiber Sensing Task Force (OAF-TF) studies the specific functional requirements for Open APN from the fiber sensing perspective so that fiber sensing technologies can be co-operated with the IOWN Global Forum Open APN architecture and utilized for realizing various use cases of the IOWN Global Forum.

5. IOWN for Mobile Networks Task Force

Activity Summary: IOWN for Mobile Network (IMN) Task force studies and develops new features and proposals to optimize transport networks for cost-effective deployment and operation efficiency and to improve network performance supporting mobile networks evolving toward 5G advanced and 6G.

6. IOWN Data Hub Task Force

Activity Summary: The IOWN Data Hub Task Force defines a data management and sharing infrastructure called IOWN Data Hub that enables fast and trusted data usage, processing, and exchange between multiple parties. The IOWN Data Hub will provide a wide range of functionalities exposed as a service so that application providers can quickly build and deploy their applications on top of it.

PART 3: Introduction of Task Forces (continued)

7. Digital Twin Framework Task Force

Activity Summary: The Digital Twin Framework Task Force studies the requirements of Digital Twins in IOWN Global Forum Use Cases and defines a framework of interoperable Digital Twins based on the IOWN Global Forum architecture, so that Digital Twin technologies can be utilized for and across various use cases of the IOWN Global Forum.

8. IOWN Security Task Force

Activity Summary: IOWN Security Task Force studies wide aspects of security with a focus on data protection for IOWN to solve the following problems, but not limited to:

- Security threats and vulnerability of Open APN architecture;
- Security demands for data plane acceleration, e.g., RDMA over Open APN;
- Security demands for data handled in the IOWN platforms, e.g., IOWN Data Hub, etc.

9. Reference Implementation Task Force

Activity Summary: The Reference Implementation Model (RIM) Task Force develops reference implementation models which leverage the architecture and technology proposed by the IOWN Global Forum and contribute to the early realization of attractive IOWN Global Forum use cases in the AI Integrated Communications and the Cyber-Physical Systems. The RIM Task Force will also evaluate reference implementation models, identify potential technical issues, and contribute to further improving the architecture and technical specifications of the IOWN Global Forum.

10. In-Vehicle Communication Task Force

Activity Summary: In-Vehicle Communication Task Force provides a venue for open discussion on In-Vehicle Communication Architecture between subject matter experts (use case and enabler/technology side). Discussion topics include use case description, key requirements, and applicability of IOWN Technologies.

Contact Information

For more information on IOWN Global Forum and its policies and procedures, please visit https://iowngf.org/ or contact info@iowngf.org. At this time, all liaison communications to the IOWN Global Forum from both established and prospective partners should be sent to liaison@iowngf.org.

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