TRON Forum Admission Guide

TRON Forum

TRON Forum (Location: Shinagawa, Tokyo, Chair: Ken Sakamura, Dean, Faculty of Information Networking for Innovation and Design (INIAD), Toyo University) has been established in 2002 to promote TRON Project which aims to realize the open IoT (Internet of Things) free from constraints of organizations and applications based on "open source," "open data" and "open API." The forum has conducted vigorous activities led by Chair Sakamura focusing on T-Engine Project that aims to improve the development environment of embedded systems and operating Ubiquitous ID Center which promotes and disseminates ubiquitous ID architecture and its component technologies such as ucode.
The forum has received good reviews worldwide for its activities.

For example, Chair Ken Sakamura was honored with an ITU150 Award [*] in May 2015 for proposing TRON open architecture, the origin of ubiquitous networking and the IoT. He was the only winner in Asia among the six winners that included Bill Gates.

In 2018, TRON Forum has contributed to create the real-time OS standard for small embedded systems such as IoT terminal devices, "IEEE 2050-2018" (IEEE is the world's largest organization for electric and electronic engineers). In 2019, it has created "TRON IoT Vulnerability Advisory Center". Its activity has expanded in many directions.

TRON Forum Chair: Ken Sakamura

[*]On the occasion of the 150th Anniversary of ITU (International Telecommunication Union, the United Nations specialized agency for ICTs, HQ: Geneva, Switzerland), ITU150 Awards were launched to recognize individuals past and present from government, ICT industry, academia, and civil society that have contributed to improving lives of world citizens through ICT innovations developed, promoted or implemented by ITU. (http://www.itu.int/en/150/Pages/awards.aspx)

Member Benefits

Member categories

TRON Forum offers the member categories shown in Table 1: Executive Committee, A-, i-, B-, e-, O-, Academic, Supporting and Liaison.

- Those who want to participate in the Executive Committee which decides the operation policies of the forum should join as Executive Committee members.
- Companies which would like to conduct standardization activities through discussions in WGs should join as Executive Committee or A-members.
- Companies in the IoT-related business should participate in the forum as Executive Committee/A-/i-members. Companies in the open data-related business should participate in the forum as Executive Committee/A-/O-members.
- Companies in the embedded systems industry in need of receiving the outputs of the forum's activities early should participate in the forum as B-members.
- e-member category should meet the needs of those involved in the promotion of ubiquitous computing.
- Those in academic activities can participate in the forum as Academic members without membership fee. They may also participate as i- and/or O-members at their request.

The forum members can access software and related documents, etc. prior to the eventual release to the public, and access members-only documents.

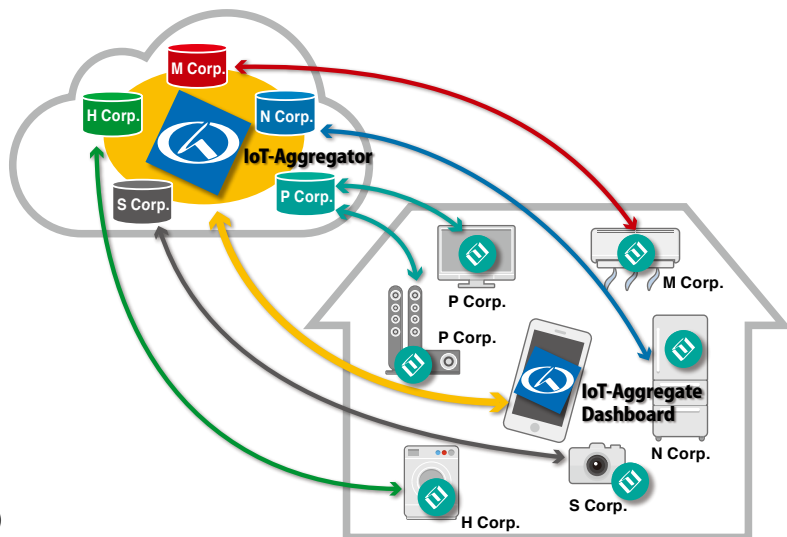**Table 1　Member categories and activities of TRON Forum**

Member category / Activity content	Executive Committee members	A-members	i-members	B-members	e-members	O-members	Academic members	Liaison members	Supporting members
Participation in Executive Committee meetings	○	×	×	×	×	×	×	×	×
Participation in General meetings	○	○	○	○	○	○	×	△*1	○
Participation in Marketing Committee meetings	○	○	×	×	×	×	×	△*1	×
Participation in WGs	○	○	×	×	×	×	×	△*1	×
Participation in IoT WG	○	○	○	×	×	×	○	△*1	×
Participation in Open Data WG	○	○	×	×	×	○	○	△*1	×
Participation in Seminars	○	○	○	○	○	○	○	△*1	○
Executive Committee-members-only website	○	×	×	×	×	×	×	×	×
A-members-only website	○	○	×	×	×	×	×	×	×
i-members-only website	○	○	○	×	×	×	○	×	×
B-members-only website	○	○	○	○	×	×	×	×	×
e-members-only website	○	○	○	×	○	×	×	×	×
O-members-only website	○	○	×	×	×	○	○	×	×
Academic members-only website	○	×	×	×	×	×	○	×	×
Liaison members-only website	○	×	×	×	×	×	×	○	×
Supporting members-only website	○	×	×	×	×	×	×	×	○
ucode Allocation (General)	○	○	○	×	○	×	○	×	○
ucode Allocation (Provider)	○	○	○	×	○*2	×	×	×	○
Monthly e-mail magazine distribution	○	○	○	○	○	○	○	○	○

*1: Can participate if approved by the Executive Committee　*2: If pay three shares or more

The IoT (Internet of Things)

TRON Project was the world's first to conduct the research and development (R&D) and technology standardization activities of ubiquitous computing and embedded systems, the important technologies to support the IoT. The project has been doing it since 1984, more than 30 years ago. The project has produced fruitful results such as ITRON specification OS and T-Kernel which are real-time OS kernels, ubiquitous ID architecture which is the application platform of ubiquitous computing, and a de-facto standard ucode which is an ID system for ubiquitous computing.

In recent years, these results of the technology development have been distributed to the world, and have been used widely in the fields called with the keywords such as the IoT (Internet of Things), M2M (Machine-to-Machine) and CPS (Cyber-Physical System). TRON Forum has established IoT WG (IoT WG Chair: Ken Sakamura, Dean, Faculty of Information Networking for Innovation and Design (INIAD), Toyo University) to deploy the research results even further. We look forward to your participation.

TRON IoT Vulnerability Advisory Center

Embedded systems development community needs a mechanism to respond to security incidents such as URGENT/11, a set of vulnerabilities found for an implementation of TCP/IP protocol.

TRON Forum has established TIVAC to collect and disseminate widely general security information concerning the IoT and embedded systems on top of TRON-specific issues.

Open data

Open data is data version of public infrastructure: API to access highly public data, etc. is published, and such data is made available via network. TRON Forum has established Open Data WG (ODWG, Chair: Ken Sakamura, Dean, Faculty of Information Networking for Innovation and Design (INIAD), Toyo University) to promote open data.

Embedded systems

TRON Forum B-member category should meet the needs of manufacturers of embedded products, providers of developer tools, OSs and middleware, and those who conduct business in the embedded systems ecosphere such as semiconductor vendors, etc. There are "Members only material," "Members only software," etc. such as T-Kernel 2.0 AeroSpace and T-Kernel Test Suite released only to the members involved in embedded systems.

Ubiquitous computing

If you are interested in ubiquitous ID architecture that uses ucode, which is an ID system to allocate unique ID to objects, places and concepts across the boundaries of companies and industrial sectors, please participate in the forum as e-member. e-members can receive allocation of 48-bit (281 trillion) ucode space without additional fees.

WG activities

There are Working Groups (WGs) in TRON Forum as below. Executive Committee members and A-members can participate in all the WGs. (i-members and O-members can participate in related WGs.) We look forward to your active participation in the forum's standardization activities.

- **T3 WG** ············· Studies the specifications of the "T3 generation" real-time OSs such as T-Kernel 3.0 and μT-Kernel 3.0.

- **IoT WG** ············· Discusses issues to realize Aggregate Computing model proposed by Chair Sakamura. Has established "Open API SWG" this year to study and propose the practical use of specifications and technologies.

- **Quasi-zenith Satellite WG** ··········· Studies the development of the middleware that runs on TRON OS, regarding Quasi-Zenith Satellite with high-precision positioning technology with sub meter or centimeter accuracy.

- **Open Data WG** ············· Studies and proposes various technologies related to open data.

- **Academic and Education WG** ··········· Acts as instructors of seminars and reviews the content of seminars.

- **Research and Study WG** ············· Conducts surveys and reports on the usage trends of real-time OS (RTOS).

- **ITRON WG** ············· Maintains ITRON specification.

TRON Forum Annual Fee and Validity Period of Membership

TRON Forum's activities are held on an annual basis from April 1 to March 31. Irrespective of the timing of participation, the membership is valid only for the applicable year.

The annual fee for each member category is as follows;

Executive Committee members	A-members that pay 3,000,000 yen or more
A-members	one share 1,000,000 yen/year (please pay one or more shares)
i-members	one share 300,000 yen/year (please pay one or more shares)
B-members	one share 100,000 yen/year (please pay one or more shares)
e-members	one share 100,000 yen/year (please pay one or more shares)
O-members	one share 100,000 yen/year (please pay one or more shares)
Academic members	Free/year
Liaison members	Free/year
Supporting members	Please contact us.

TRON Forum Training Seminars

TRON Forum holds various seminars, lectures and lectures with hands-on practice regarding embedded systems, ubiquitous computing, the IoT and open data. The forum members can participate in these seminars for free although there is a limit on the number of participants who can attend for free depending on the member categories.

If you are interested in participating in the seminars, please check the up-to-date seminar information on the forum website.

- The seminars will be held only in Japanese.

Table 2   TRON Forum Seminars

Seminar
[Lecture] Introduction to T-Kernel/ITRON Specification OS
[Hands-on Practice] Intermediate Course: ITRON Specification OSar
[Hands-on Practice] Introduction to µT-Kernel (by Renesas Electronics Corporation)
[Lecture] uID Seminar
[Saturday seminar] Introduction to Embedded Real-time OS (Introduction to µT-Kernel) (by Renesas Electronics Corporation)
[Hands-on Practice] Introduction to µT-Kernel (by Fujitsu Computer Technologies Limited)
[Lecture] Use of Open Data

The seminars will be held at Daiwa Ubiquitous Computing Research Building, the University of Tokyo in the Hongo Campus.

Inquiries

TRON Forum Secretariat

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