

ITU-T Focus Group on Autonomous Network

A Brief Overview

FG-AN: Overview

- ITU-T Focus Group on Autonomous Networks was established by ITU-T Study Group 13 at its virtual meeting, 17 December 2020.
- The Focus Group will draft **technical reports and specifications** for autonomous networks, including exploratory evolution in future networks, real-time responsive experimentation, dynamic adaptation to future environments, technologies, and use cases.
- The Focus Group will also identify relevant gaps in the standardization of autonomous networks.

The primary objective of the Focus Group is to provide an open platform to perform pre-standards activities related to AN.

FG-AN: What is Autonomy?

Automation

Independent operation of a system:

- within well-defined parameters
- based on a limited set of predefined rules or constraints

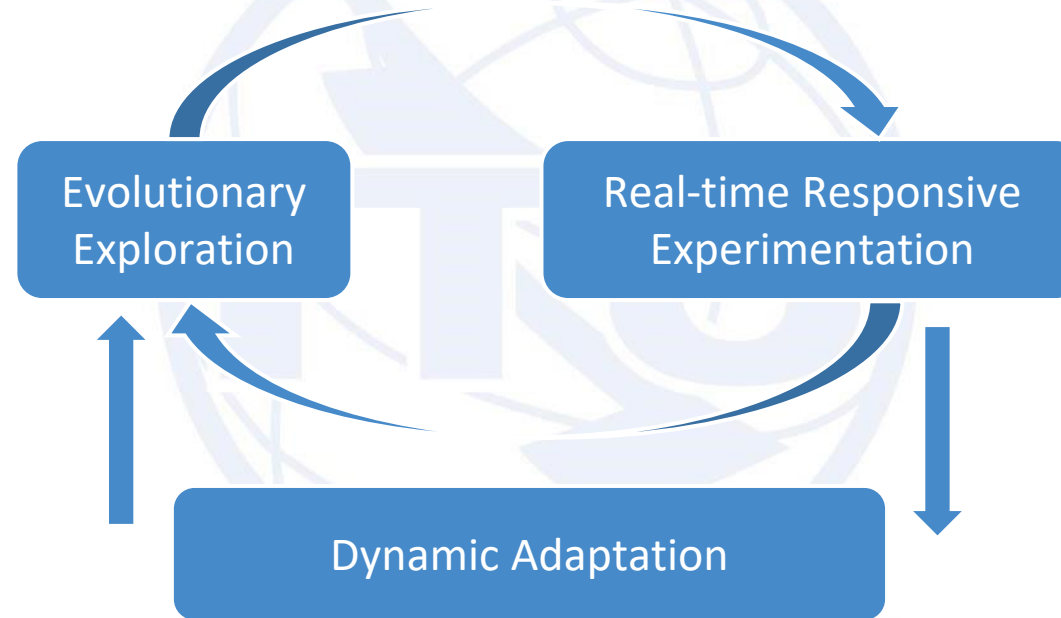


Autonomy

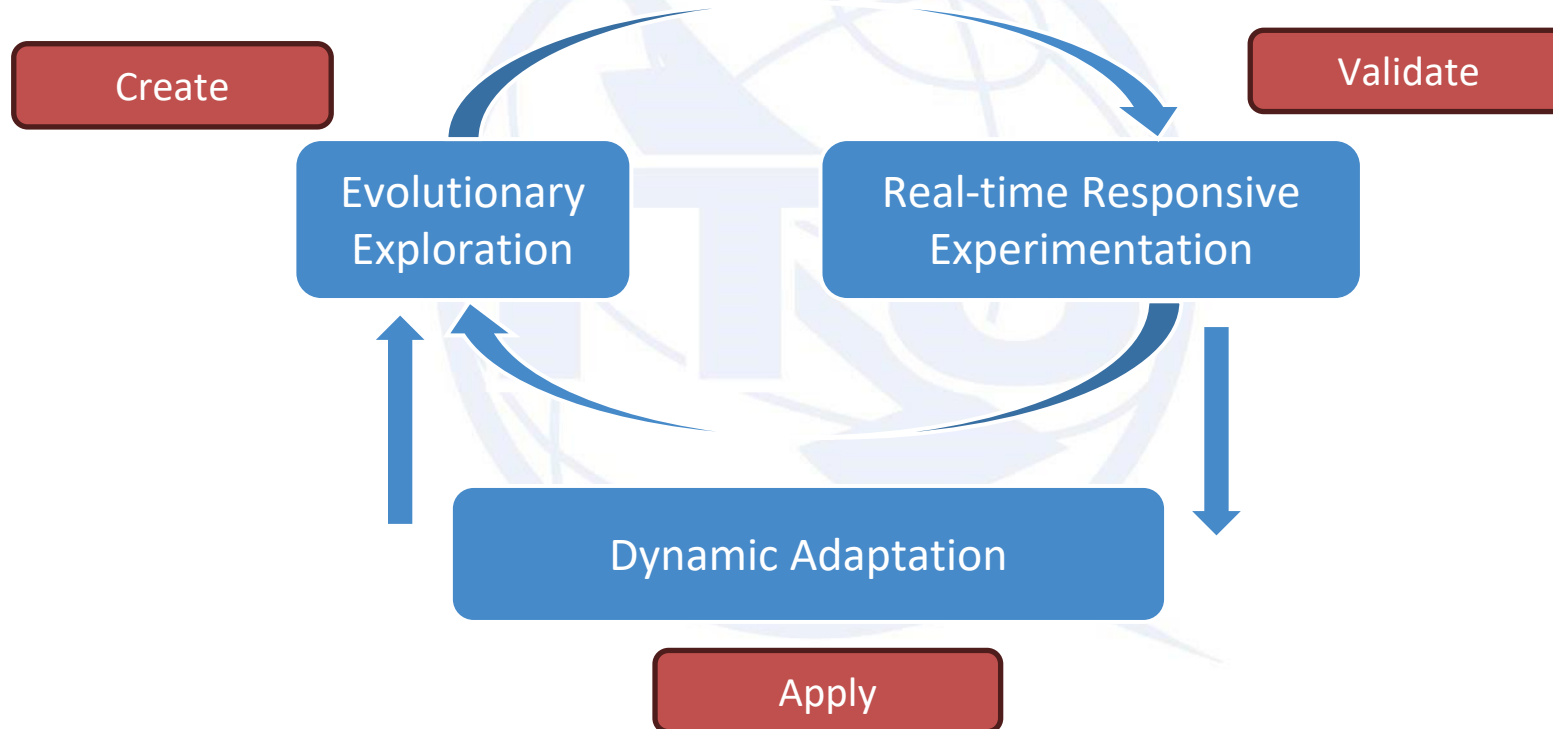
Implies:

- large degree of adaptation,
- learning and decision making by the system itself.

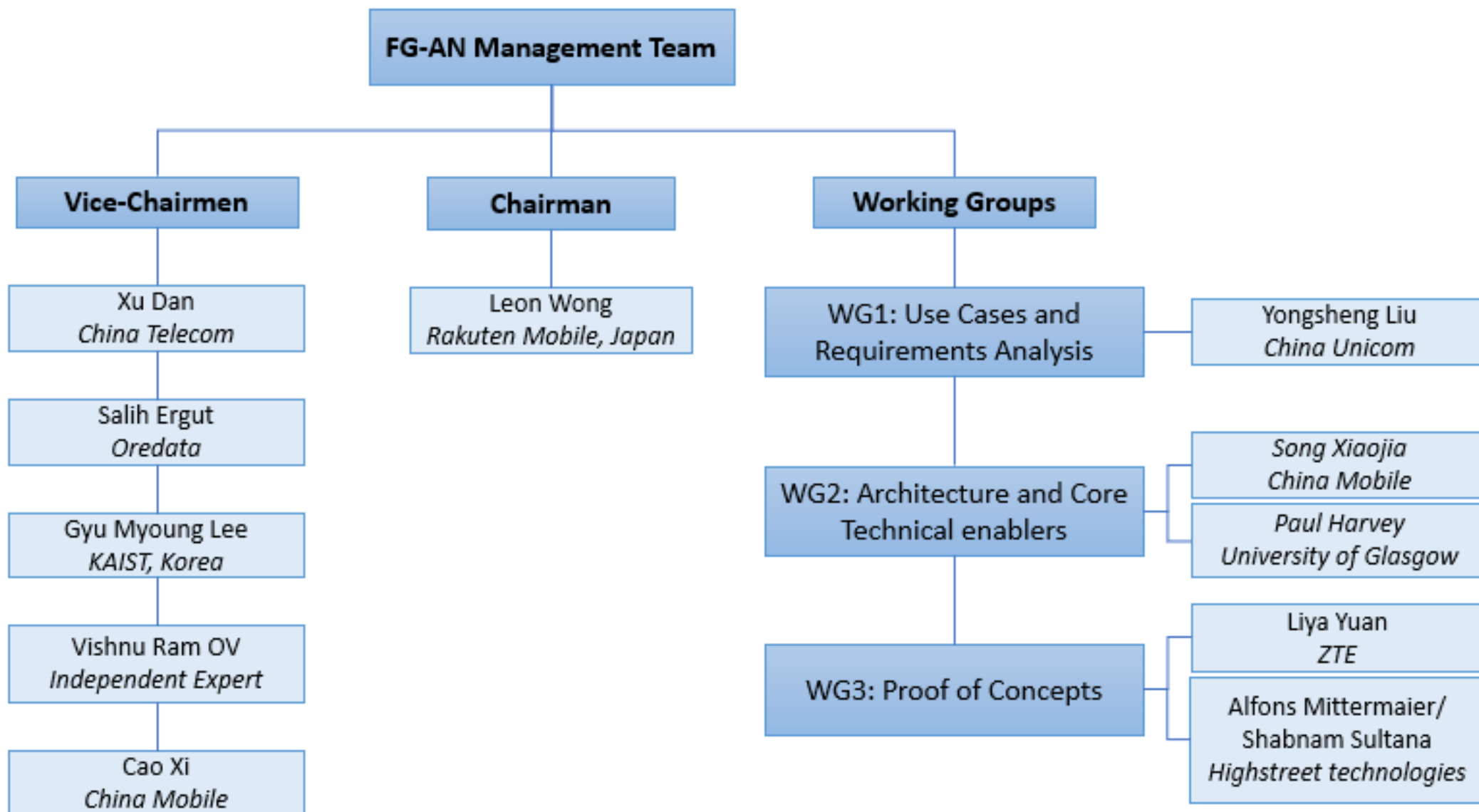
FG-AN: Key Concepts



FG-AN: Key Concepts



FG-AN: Overview



FG-AN: Progress

FG AN Meetings:

- 1st Virtual meeting, 2-4 Feb 2021
- 2nd Virtual meeting, 13-16 Apr 2021
- 3rd Virtual meeting, 15-17 Jun 2021
- 4th Virtual meeting, 1-3 Sept 2021
- 5th Virtual meeting, 3-5 Nov 2021
- 6th Virtual meeting, 26-28 Jan 2022
- 7th Virtual meeting, 30 Mar - 1 Apr 2022
- 8th Virtual meeting, 1-3 Jun 2022
- 9th Virtual meeting, 31 Aug – 2 Sep 2022
- 10th Virtual meeting, 1-2 Feb 2023
- 11th Virtual meeting, 19-22 Apr 2023
- 12th Virtual meeting, 13-15 Jul 2023
- 13th Virtual meeting, 28-29 Sep 2023
- 14th Virtual meeting, Jan 2024 (TBC)

FG-AN: Progress

Build-a-thon 2022:

Build-a-thon Workshop Kickoff, 3 Jun 2022

Build-a-thon Workshop 2.0, 2 Sep 2022

Build-a-thon Workshop 3.0, 7 Nov 2022

Build-a-thon 2023:

Build-a-thon Workshop Kickoff, 3 Feb 2023

Build-a-thon Workshop 2.0, 22 Apr 2023

Build-a-thon Workshop 3.0, 15 Jul 2023

Build-a-thon Workshop 4.0, 29 Sep 2023

ITU-T FG-AN Workshop:

ITU Workshop on “Advances in Evolutionary Autonomous Networks: Use Cases, Architecture and PoC”, 15 Nov 2022

ITU Workshop on “Advances in Autonomous Networks: 2023 and beyond”, 24 Oct 2023

In addition, FG AN has also presented in

Eighth SG13 Regional Workshop for Africa, 1 June 2021 on the topic of “*FG-AN: Opportunity for Africa*”

FG-AN: Progress

Weekly Meeting every Thursday 8:00 CET

Weekly / Bi-Weekly **Editing sessions** for progressing deliverables

Meetings will cover:

Use cases document + use case requirements + mappings to other deliverables

- Architecture framework
- Trust in Autonomous Networks
- PoC
- Knowledge Management in Autonomous Networks
- Standards gap analysis
- Discussion with experts from industry & academia

FG-AN: Deliverables

Input Documents: **355**

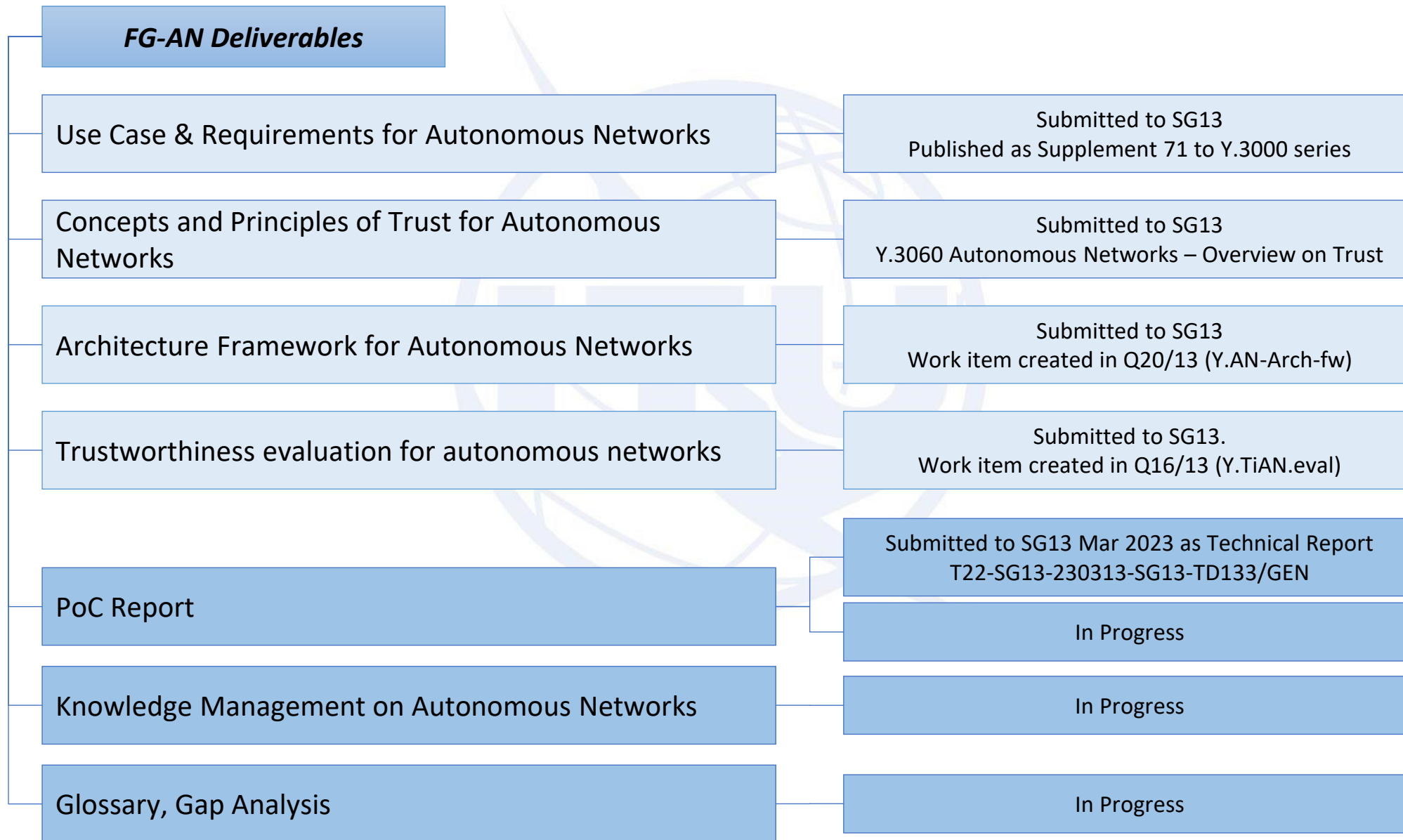
Weekly e-Meeting: **113**

Participants: >300 unique individuals

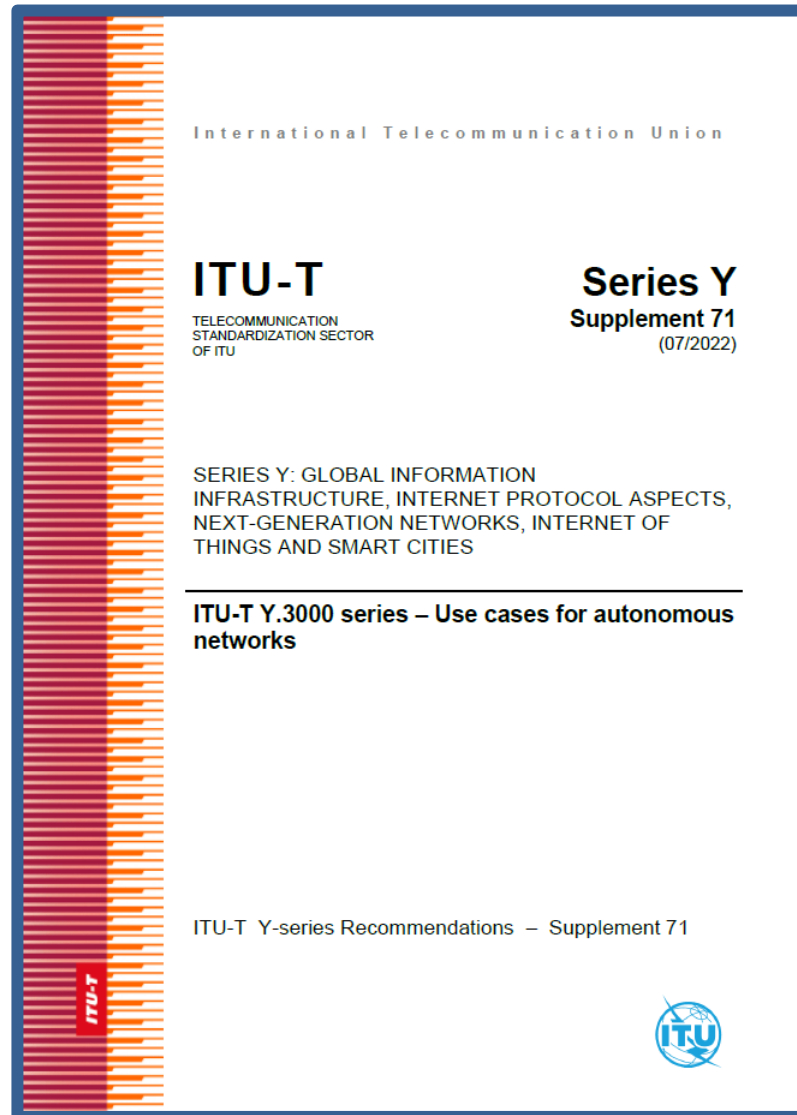
Countries: 38

- 20 Members state
- 25 Recognized Operating Agencies (ROA)
- 50 Scientific or Industrial Organizations (SIO)
- 45 Universities/Academia

FG-AN: Deliverables



FG-AN: Deliverables



Use Cases for Autonomous Networks

FG-AN output document (FGAN-O-013-R1)

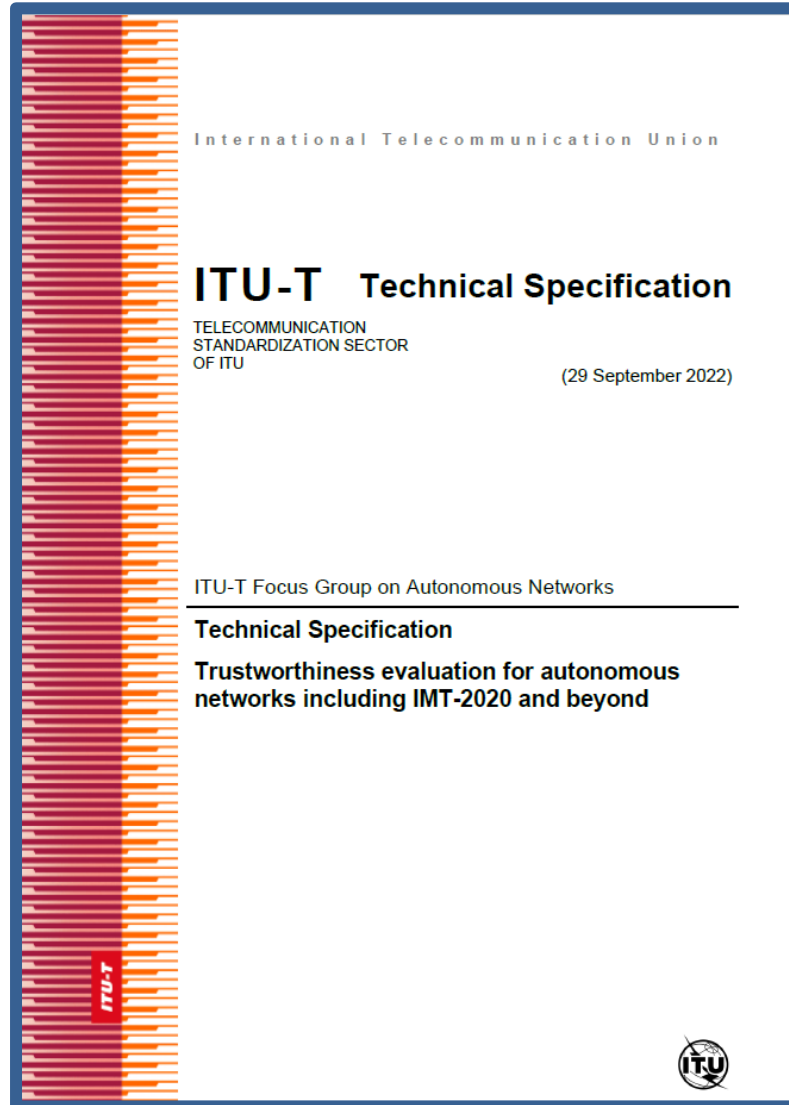
A collection of use cases presented and elaborated during FG-AN meetings.

These use cases were published as a Technical Specification and a draft use case deliverable submitted to ITU-T SG13.

Approved during ITU-T SG13 July 2022 meeting as “Y.Sup71 : ITU-T Y.3000 series - Use cases for autonomous networks”

<https://www.itu.int/rec/T-REC-Y.Sup71/en>

FG-AN: Deliverables



Evaluation of Trustworthiness of Autonomous Networks

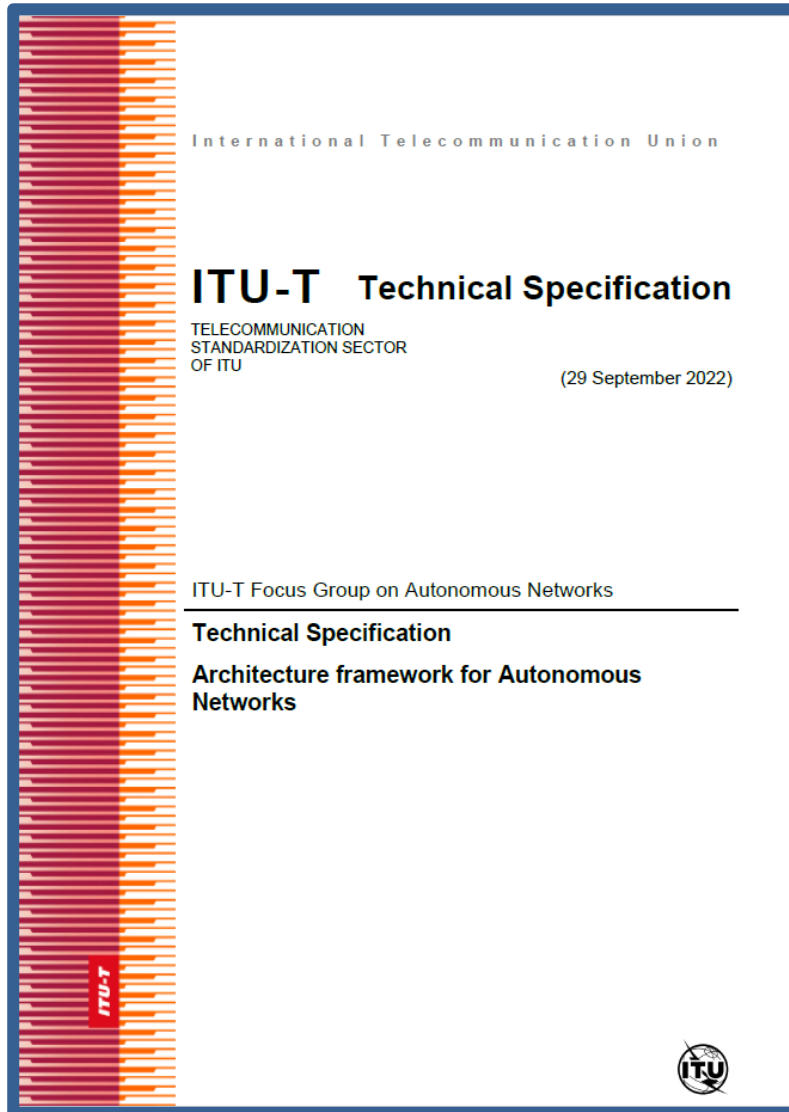
FG-AN output document (FGAN-O-024)

Provides the concepts, basic principles, metrics of evaluation, methodology for evaluation and evaluation models and use cases for trust in autonomous network.

The technical specification derived from this work has been transmitted to parent ITU-T SG13 as TD64/GEN:

<https://www.itu.int/md/T22-SG13-221114-TD-GEN-0064/en>

FG-AN: Deliverables



Architecture Framework of Autonomous Networks

FG-AN output document (FGAN-O-023)

Autonomous Networks (AN) architecture framework in relation to AN concepts.

The scope of this document includes:

- Requirements for the architecture
- Description of the architecture components
- Description of the architecture
- Sequence diagrams explaining the interactions between the architecture components

The technical specification derived from this work has been transmitted to parent ITU-T SG13 as TD63/GEN :

<https://www.itu.int/md/T22-SG13-221114-TD-GEN-0063/en>

FG-AN: Deliverables



INTERNATIONAL TELECOMMUNICATION UNION
TELECOMMUNICATION
STANDARDIZATION SECTOR
STUDY PERIOD 2022-2024

FOCUS GROUP ON AUTONOMOUS
NETWORKS (FG-AN)

AN-O-028

Original: English

Question(s): ITU FG AN WG3 Virtual, TBD, 2023

INPUT DOCUMENT

Source: Vishnu Ram OV, Rakuten Mobile, University of Glasgow, China Mobile

Title: Technical Report on Proof of Concept activities

Contact: Paul HARVEY
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United Kingdom
E-mail: paul.harvey@glasgow.ac.uk

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Contact: Vishnu Ram OV
Independent Expert
India
Tel: +91 9844178052
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Keywords: Autonomous networks; Build-a-thon, PoC

Abstract: This contribution proposes a report to ITU-T SG13 on the PoC activities conducted by ITU FG AN during the period of 2020-2021 and 2021-2022. This technical report will also be made available at ITU-T FG-AN webpage.

Technical Report on Proof of Concept activities

FG-AN output document

Provides the technical report on the PoC activities conducted by ITU FG AN during the period.

The technical report is currently in the process of being published as FG AN deliverables and has been submitted to ITU-T SG13.



FG-AN: Discussions

	INTERNATIONAL TELECOMMUNICATION UNION TELECOMMUNICATION STANDARDIZATION SECTOR STUDY PERIOD 2022-2024	FOCUS GROUP ON AUTONOMOUS NETWORKS (FG-AN)	AN-I-336
		Original: English	
Question(s):	WG2	Virtual, 12-13 July 2023	
INPUT DOCUMENT			
Source:	China Telecom		
Title:	Proposal for initiating a new work item on knowledge management for autonomous network		
Contact:	Ziting Zhang China Telecom China	Tel: +86 10 5090 2483 Email: zhangzt9@chinatelecom.cn	
Contact:	Dan Xu China Telecom China	Tel: +86 10 5090 2570 E-mail: xudan6@chinatelecom.cn	
Contact:	Haobin Wang China Telecom China	Tel: +86 10 5090 2366 E-mail: wanghb11@chinatelecom.cn	
Keywords:	Knowledge management; autonomous network; knowledge graph		
Abstract:	This contribution proposes to initiate a new work item to specify knowledge management in autonomous network. This proposal discusses the background, necessity, and motivation of knowledge management in autonomous network, and gap analysis with other projects related to this topic. <u>Finally</u> , the scope and baseline were provided.		

Knowledge Management for Autonomous Networks

FGAN contributions (FGAN-I-336/345/347)

Provides studies and discussions on the background, necessity, and motivation of knowledge management in autonomous network

The topic is currently in being discussed in FG-AN and in progress to become a deliverable from FG-AN.

FG-AN: Build-a-thon PoC

FG-AN Build-a-thon 2023: Problem Statement

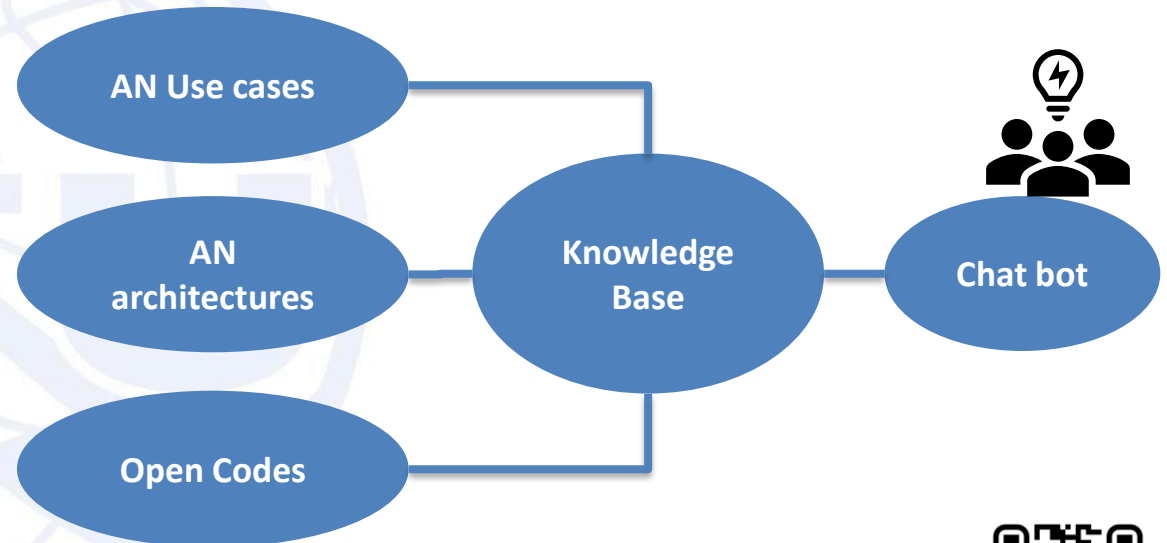
ITU Events

**Focus Group on
Autonomous
Networks
BUILD-A-THON**

Workshop 3.0

Friday, 14 July 2023
12:00 - 16:30 Geneva (CEST)

itu.int/en/ITU-T/focusgroups/an/



<https://github.com/vrra/FGAN-Build-a-thon>



ITU J-FET publications: Academic participations

ITUJournal

*Future and evolving
technologies*

2022 paper based on Build-a-thon PoC

Network resource allocation for emergency management based on closed-loop analysis

Authors: Guda Blessed, Ibrahim Aliyu, James Agajo, Thiago Lima Sarmiento, Cleverson Veloso Nat Novoa, Rebecca Aben-Athar, Mariano Moura, Lucas Matni, Aldebaro Klautau, Deena Mukundan, Div Mehmet Karaca, Doruk Tayli, Özge Simay Demirci, V. Udaya Sankar, Sai Jnaneswar Juvvisetty, V.M. Abhishek Dandekar, Shabnam Sultana, Jinsul Kim, Vishnu Ram OV

Status: Final

Date of publication: 22 September 2022

Published in: ITU Journal on Future and Evolving Technologies, Volume 3 (2022), Issue 2, Pages 1

Article DOI : <https://doi.org/10.52953/HVPI8935>

ITUJournal

*Future and evolving
technologies*

2023 paper based on Build-a-thon PoC

Build your own closed loop: Graph-based proof of concept in closed loop for autonomous networks

Authors: Jaime Fúster de la Fuente, Álvaro Pendás Recondo, Paul Harvey, Tarek Mohamed, Chandan Singh, Vipul Sanap, Ayush Kumar, Sathish Venkateswaran, Sarvasuddi Balaganesh, Rajat Duggal, Sree Ganesh Lalitaditya Divakarla, Vaibhava Krishna Devulapali, Ebeledike Frank Chukwubi, Emmanuel Othniel Eggah, Abel Oche Moses, Nuhu Kontagora Bello, James Agajo, Wael Alron, Fathi Abdeldayem, Melanie Espinoza Hernández, Abigail Morales Retana, Jackeline García Alvarado, Nicolle Gamboa Mena, Juliana Morales Alvarado, Ericka Pérez Chinchilla, Amanda Calderón Campos, Derek Rodríguez Villalobos, Oscar Castillo Brenes, Kodandram Ranganath, Ayushi Khandal, Rakshesh P Bhatt, Kunal Mahajan, Prikshit CS, Ashok Kamaraj, Srinwaynti Samaddar, Sivaramakrishnan Swaminathan, M Sri Bhuvan, Nagaswaroop S N, Blessed Guda, Ibrahim Aliyu, Kim Jinsul, Vishnu Ram

Status: Final

Date of publication: 14 September 2023

Published in: ITU Journal on Future and Evolving Technologies, Volume 4 (2023), Issue 3, Pages 503-536

Article DOI : <https://doi.org/10.52953/OPDK5666>



FG-AN: Thank you and Invitation to all

- **Homepage**
 - <https://www.itu.int/en/ITU-T/focusgroups/an/Pages/default.aspx>
- **Weekly meeting**
 - Every Thursday (08:00 CET)
- **Mailing list**
 - fgan@lists.itu.int

