IFIP WG6.6 & IEEE CNOM Joint Meeting
(@IM 2021, online)

May 18, 2021

Meeting Overview

1. Action points from previous meeting
2. Overview of achievements
3. CNOM officer elections
4. Conference statistics and upcoming events
5. Conference ranking
6. Organization of activities in times of Covid-19-measures
7. Update of Network and Service Management taxonomy
8. SIGs (Special Interest Groups): overview and proposals
9. CNOM Awards
10. IEEE Distinguished Lecturer Program
11. ComSoc Student Competition
12. Opportunities for young researchers

CNOM

- IEEE organization into Societies
  - IEEE Communication Society composed of Technical Committees
    - **CNOM** (Committee on Network Operations and Management) Technical Committee dealing with network management and operations, and ultimately representing this community in IEEE structure

CNOM

- CNOM officers (since 04/2019)
  - Chair: Filip de Turck, Ghent University, Belgium
  - Vice-chair: Marinos Charalambides, University College London, UK
  - TPC chair: Carol Fung, Virginia Commonwealth University, USA
  - Secretary: Carlos Raniery P. dos Santos, Federal University of Santa Maria, Brazil

CNOM

- How to participate?
  - Subscribing to the CNOM mailing list
    - http://cnom.committees.comsoc.org go to "Members"
  - Becoming an *Active Member* by satisfying at least one of these conditions in the last two years:
    - Attended (physically or remotely) at least one CNOM meeting
    - Served as TPC or OC member of NOMS/IM, APNOMS, LANOMS
    - Served as an editorial board member or editorial advisory board member of JNSM, TNSM, or IJNM
  - Representing CNOM on ICC and GlobeCom Symposia
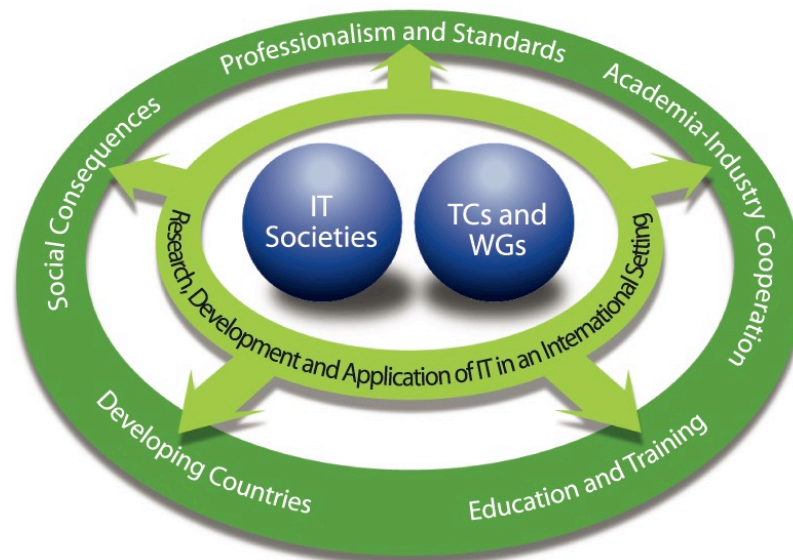   - ICC 2021/2022
    - GlobeCom 2021/2022

**TC 6
WG 6.6
Network &
Service
Management**

ifip

- Non-governmental, not-for-profit umbrella organization of national learned societies working in the field of Information Technology

- Established in 1960 under the auspices of UNESCO as a result of the first World Computer Congress held in Paris in 1959

ifip

Technical Committees

TC1   Foundations of Computer Science

TC2   Software: Theory and Practice

TC3   Education

TC5   Information Technology Applications

TC6 Communication Systems

TC7   System Modeling and Optimization

TC8   Information Systems

TC9   ICT and Society

TC10   Computer Systems Technology

TC11   Security and Privacy Protection in Inf. Processing Systems

TC12   Artificial Intelligence

TC13   Human-Computer Interaction

TC14   Entertainment Computing

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Technical Committee TC6

WG 6.1 Architectures and Protocols for Distributed Systems

WG 6.2 Network and Internetwork Architectures

WG 6.6 Management of Networks and Distributed Systems

WG 6.7 Smart Networks

WG 6.8 Mobile and Wireless Communications

WG 6.9 Communications Systems for Developing Countries

WG 6.10 Photonic Networking

WG 6.11 Communication Aspects of the E-World

WG 6.12 Services-Oriented Systems

WG6.6 Activities

- Joint work with IEEE CNOM
- Open platform for community building, animation, promotion and structure setting
- Co-organizing of conferences
- Promoting of journals
- Sponsoring excellence
    - Best paper awards (3-4 per year)
    - Student travel grants (+/- 10 per year)
- IFIP fees paid by the supported workshops and conferences are « re-invested » in our conferences for our community
- All the WG6.6 and CNOM involvement is volunteered
- On the IFIP WG6.6 side: encouraging the alignment of the WG6.6 supported conferences to the TC6 strategy on the Open Digital Library

What does « WG6.6 Member » mean?

- IFIP WG 6.6 Officer
  - Chair: Rémi Badonnel – TELECOM Nancy, France (since 04/2019)
- Actively volunteer to
  - Contribute to reviews of the community conferences, workshops and journals
  - Encourage and do submissions to the community events and journals
  - Join TPCs and OCs
  - Be active in the mailing-lists
  - Participate to our conferences and meetings

How to get involved?

- Participate to the WG6.6 meetings in our conferences
    - NOMS, IM, CNSM, TMA
- React and talk on the mailing list (222 pers.)

    ifip_nm@lists.utwente.nl

- Visit our IFIP WG6.6 website

    wg66.ifip.org

- Follow us on twitter

    @ifipwg66

IFIP WG6.6 and CNOM Report

2. Overview of achievements

2. Overview of achievements

- Link to PDF document

IFIP WG6.6 and CNOM Report

3. CNOM officer elections

3. CNOM Officer Elections

- Chair candidates:
  - Noura Limam
  - Laurent Ciavaglia
- Vice Chair candidates:
  - Marinos Charalambides
  - Zin Zhao
- TPC Chair candidates:
  - Carol Fung
  - Salil Kanhere
  - Yulei Wu
  - Zuqing Zhu
- Secretary candidates:
  - Carlos Raniery P. dos Santos
  - Weverton Cordeiro

IFIP WG6.6 and CNOM Report

4. Conference statistics and upcoming events

4. Conference Statistics and Upcoming Events

	Submitted	Accepted	A.R.	Attendees	Proceedings
NOMS 2020	243	72	29,6%	297	IFIP DL, Xplore
TMA 2020	54	18	33.3%	115	IFIP DL, Xplore
NETSOFT 2020	90	18	20.0%	380	Xplore
CNSM 2020	106	21	19.8%	152	IFIP DL, Xplore

4. Conference Statistics and Upcoming Events

	Submitted	Accepted	A.R.	Attendees	Proceedings
IM 2021	174	46	26,4%	?	IFIP DL, Xplore
Networking 2021	?	?	?	?	IFIP DL, Xplore
Netsoft 2021	?	?	?	?	Xplore

4. Conference Statistics and Upcoming Events

- TC6: Networking 2021 (IFIP/IEEE)
  - June 21-24, 2021, Helsinki, Finland
- NetSoft 2021 (IEEE)
  - June 28-July 2, 2021, Tokyo, Japan
- TMA 2021 (IFIP)
  - September 13-15, 2021, online
- CNSM 2021 (IEEE/IFIP)
  - October 25-29, 2021, Izmir, Turkey

Networking 2021

- 21-24 June, 2021

- Helsinki, Finland

- General Chairs

  - Raimo Kantola, Aalto University

  - Lars Eggert, Netapp

https://networking.ifip.org/2021/

Netsoft 2021

- 28 June – 2 July, 2021, Tokyo, Japan
- Chairs
  - General Chairs
    - Kohei Shiomoto, Young-Tak Kim
  - Vice General Co-Chair
    - Kazuhiko Kinoshita

IEEE NETSOFT

https://netsoft2021.ieee-netsoft.org

TMA 2021

- 13-15 September, 2021, online

- Chairs
  - General Chair
    - Oliver Hohlfeld

https://tma.ifip.org/2021/

CNSM 2021

- 25-29 Octover, 2021, Izmir, Turkey
- Chairs
  - General Chairs
    - Prosper Chemouil
    - Mehmet Ulema

http://www.cnsm-conf.org/2021/
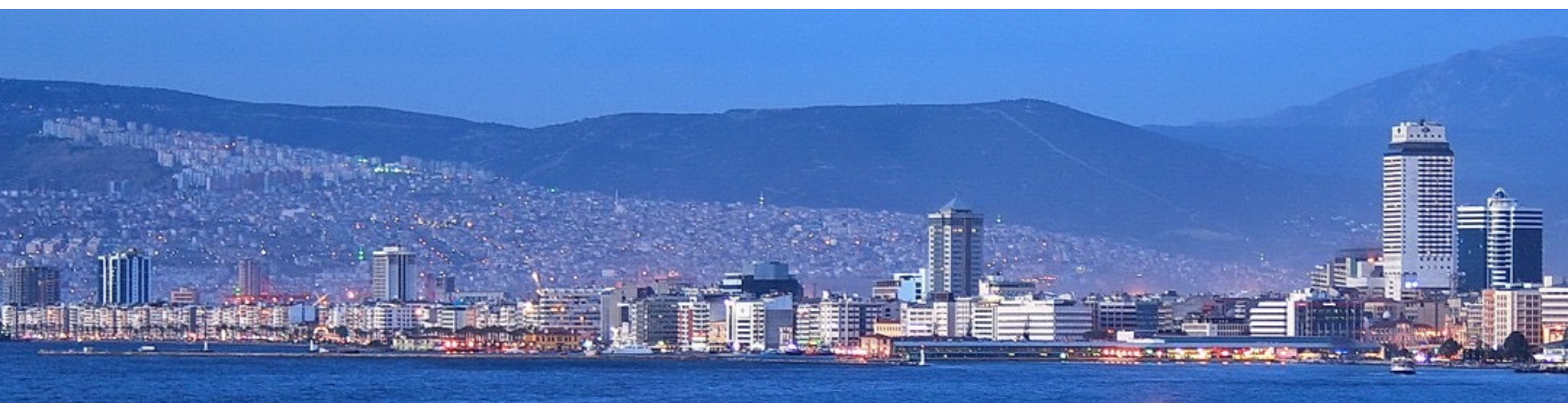
Call for Symposium Chairs and nominations

- IEEE ICC 2022
  - Seoul, South Korea
  - 16-20 May, 2022

- Globecom 2022
  - Rio de Janeiro, Brazil
  - 4-8 December, 2022

5. Conference ranking

5. Conference ranking

- CORE conference ranking
  - The Computing Research and Education Association of Australasia (CORE), is an association of university departments of computer science in Australia and New Zealand
  - https://www.core.edu.au/conference-portal
- In December 2020, a detailed application was prepared and submitted for:
  - IM, NOMS, Netsoft, CNSM (CORE A)
  - TNSM (CORE A*)

6. Organization of activities in times of Covid19-measures

6. Organization of activities in times of Covid-19 measures

- Physical/Hybrid/Onlineevents

- Allfeedback/suggestionswelcome

IFIP WG6.6 and CNOM Report

7. Update of Network and Service Management Taxonomy

7. Network and Service Management Taxonomy

- Originally proposed in 2008
  - Updated in 2015 and 2017

- Result of a collaborative work of:
  - Flamingo FP7 Project
  - IEEE CNOM
  - IFIP WG6.6
  - IRTG NMRG
  - Emanics Network of Éxcellence

- Improve the scientific quality of papers published in our field
  - Fully supported by JEMS and can be easily adapted to other systems

7. Network and Service Management Taxonomy

- Different topics are assigned to one of seven categories
  - What is being managed:
    1. Network Management
    2. Service Management
    3. Business Management
  - Which functional areas are covered:
    4. Functional Areas
  - How something is managed:
    5. Management Approaches
    6. Technologies
    7. Methods

7. Network and Service Management Taxonomy

- Carlos Raniery Paula dos Santos, et al. **Taxonomy for the Network and Service Management Research Field.** *Journal of Network and Systems Management*, Volume 24, Issue 3, July 2016, pp. 764-787

- Jeroen van der Hooft, et al. **Updated Taxonomy for the Network and Service Management Research Field.** *Journal of Network and Systems Management*, Volume 26, Issue 3, July 2018, pp. 790–808
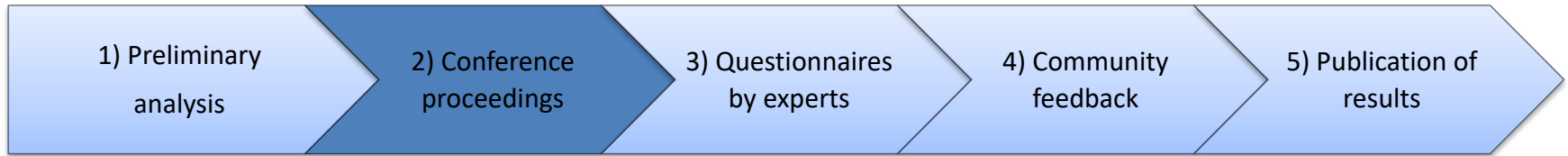
https://cnom.committees.comsoc.org/resources/taxonomy/

7. Network and Service Management Taxonomy

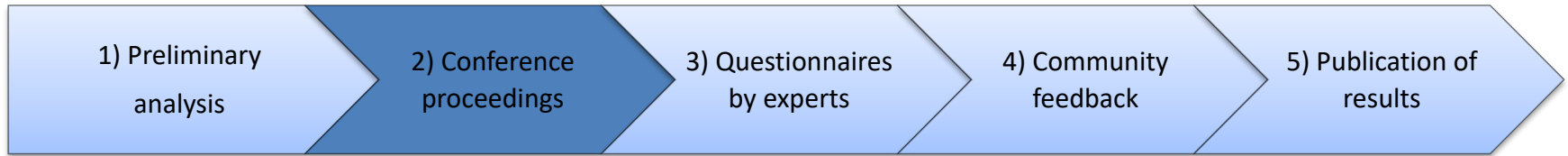| 1) Preliminary analysis	2) Conference proceedings	3) Questionnaires by experts	4) Community feedback	5) Publication of results

- Filip De Turck, Juergen Schoenwaelder, Marinos Charalambides, Jeroen Van der Hooft, Jeroen Famaey, Rémi Badonnel, Carol Fung, Lisandro Z. Granville, Carlos Raniery P. dos Santos

- The seven main categories were maintained
- Call for Papers from the last events
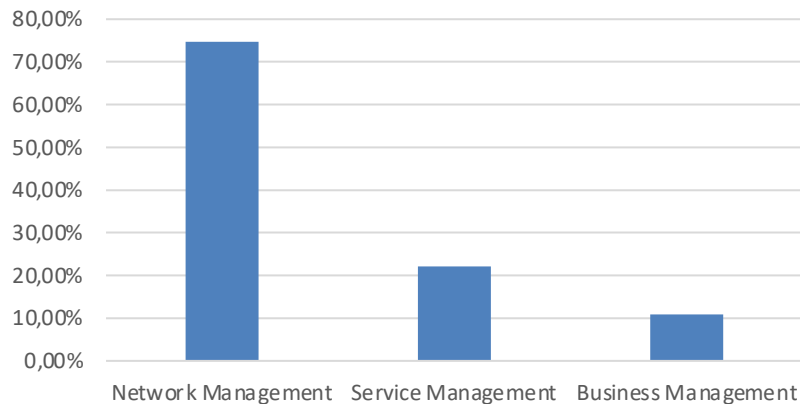
7. Network and Service Management Taxonomy

1) Preliminary analysis	2) Conference proceedings	3) Questionnaires by experts	4) Community feedback	5) Publication of results

- 884 papers were analyzed
  - CNSM, IM, NOMS (2018-2020)
  - Main tracks only
  - Accepted/rejected papers

7. Network and Service Management Taxonomy
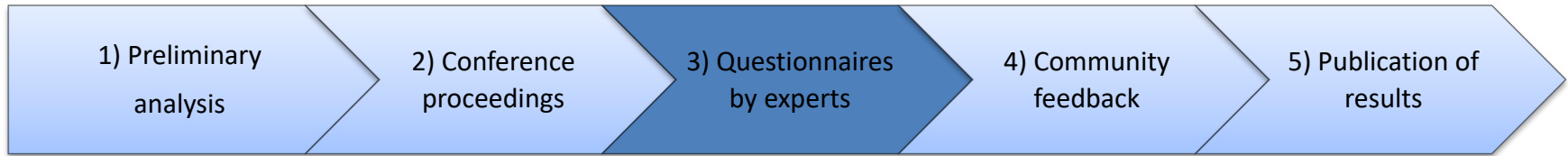
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WHAT IS BEING MANAGED

Functional Areas

7. Network and Service Management Taxonomy

1) Preliminary analysis	2) Conference proceedings	3) Questionnaires by experts	4) Community feedback	5) Publication of results
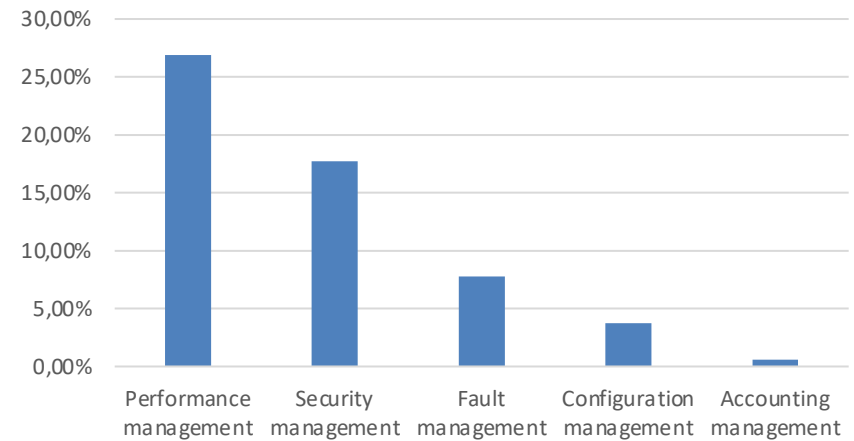
- TPC members from IM/NOMS/CNSM
- Answered by 105 experts

0-5 years 18%, 5-10 years 26%, 10-15 years 17%, 15-20 years 16%, 20+ 23%

Academia 88%, Industry 11%, Government 0%, Standardization body 0%, NREN 1%

7. Network and Service Management Taxonomy

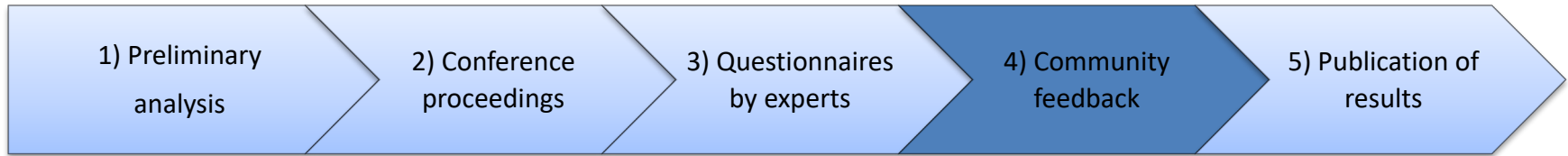| 1) Preliminary analysis | 2) Conference proceedings | 3) Questionnaires by experts | 4) Community feedback | 5) Publication of results |
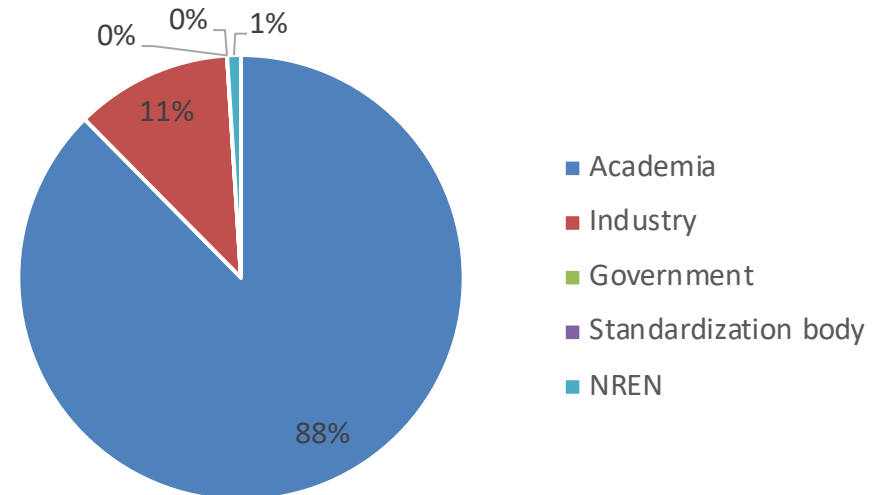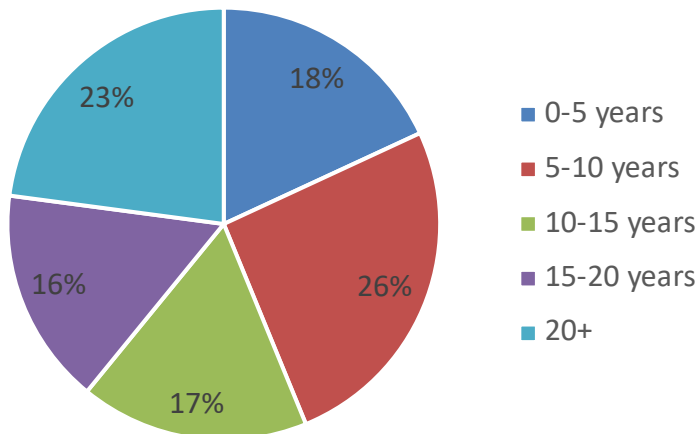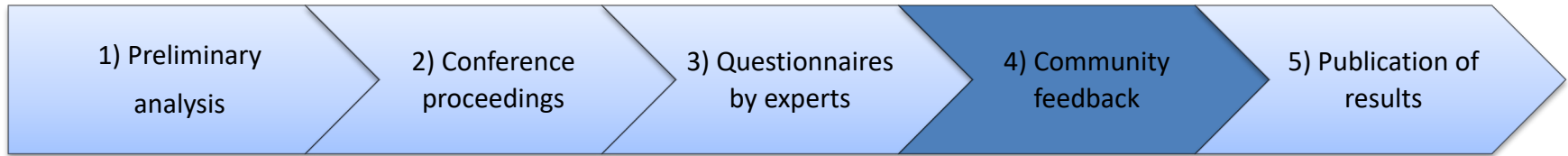
Network Management
- IP Networks
- Access networks
- Data center networks
- Enterprise and campus networks
- Home networks
- Information-centric networks
- Optical networks
- Virtual networks
- Wireless and cellular networks
- > Industrial Networks
- > Internet of Things and Sensor Networks
- + Wide area networks
- + Fog and Edge Networks
- + Vehicular networks
- - Overlay networks
- - Software-Defined networks

Service Management
- Multimedia services
- Content delivery services
- Cloud computing services
- Internet connectivity and Internet access services
- Internet of Things services
- Security services
- Context-aware services
- Information technology services
- + Service Assurance

7. Network and Service Management Taxonomy

1) Preliminary analysis → 2) Conference proceedings → 3) Questionnaires by experts → 4) Community feedback → 5) Publication of results

Business Management
- Economic aspects
- Multi-stakeholder aspects
- Lifecycle aspects
- Process and workflow aspects
- Legal perspective
- Regulatory perspective
- Privacy aspects
- + SLA Management
- + Organizational aspects

Functional Areas
- Fault management
- Configuration and Deployment management
- Accounting and Billing management
- Performance management
- Security management

Management Paradigms
- Centralized management
- Distributed Management
- Autonomic and cognitive management
- Pro-active management
- Federated management
- Hierarchical management
- Quality of experience-centric management
- Energy-aware Management
- > Policy- and Intent-based management
- + Model-driven Management

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1) Preliminary analysis	2) Conference proceedings	3) Questionnaires by experts	4) Community feedback	5) Publication of results

Technologies
- Cloud computing and cloud storage
- Data, information, and semantic models
- Information visualization
- Middleware
- OSS/BSS
- Orchestration
- Overlay networks
- Software-defined networking
- Network function virtualization
- Communication protocols
- + Control and data plane programmability
- + Distributed ledger technology
- + Cloud-native networking

Methods
- Mathematical logic and automated reasoning
- Mathematical optimization
- Control theory
- Probability theory, stochastic processes, and queuing theory
- Evolutionary algorithms
- Economic theory and game theory
- Monitoring and measurements
- Data mining and (big) data analysis
- Computer simulation experiments
- > Testbed experimentation and field trials
- > Artificial intelligence and machine learning
- + Software Engineering methodologies

| 1) Preliminary analysis | 2) Conference proceedings | 3) Questionnaires by experts | 4) Community feedback | 5) Publication of results |

7. Network and Service Management Taxonomy

1) Preliminary analysis	2) Conference proceedings	3) Questionnaires by experts	4) Community feedback	5) Publication of results

- CNOM Meeting @IM 2021
- Additional meetings
- Contact: Carlos Raniery P. dos Santos (UFSM, Brazil)
  - csantos@inf.ufsm.br

7. Network and Service Management Taxonomy

| 1) Preliminary analysis | 2) Conference proceedings | 3) Questionnaires by experts | 4) Community feedback | 5) Publication of results |
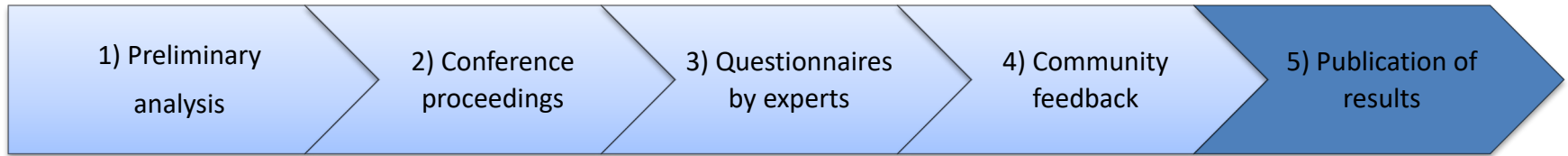
- Submission of the report later this year
  - JNSM

IFIP WG6.6 and CNOM Report

8. Special Interest Groups

8. Special Interest Groups

- Organise workshops, journal special issues, conference talks, vision papers

- Foster interaction with industry

- Activities span across TCs

- Current/past SIGs
  - https://itc.committees.comsoc.org/special-interest-groups/

- Candidates:
  - AI for network management
  - Softwarized networks
  - Privacy/identity management

IFIP WG6.6 and CNOM Report

9. CNOM Awards

9. CNOM Awards

- CNOM Best Paper Award

- Subcommittee
  - Carol Fung (chair), Takeru Inoue, Maurice Khabbaz, Jinho Hwang, Ai-Chun Pang

- 10 nominations

Title: A Graph-Based Machine Learning Approach for Bot Detection

Authors: Abbas Abou Daya, Mohammad A. Salahuddin, Noura Limam and Raouf Boutaba (University of Waterloo, Canada), IM 2019

9. CNOM Awards

- CNOM Test of Time Paper Award

- Subcommittee
  - Yixin Diao, Deep Medhi, Salil Kanhere, Lea Skorin-Kapov, Carlos Raniery P. dos Santos

- 10 nominations

Title: Shares and utilities based power consolidation in virtualized server environments

Authors: Michael Cardosa, Madhukar R. Korupolu, Aameek Singh (University of Minnesota, USA. IBM Almaden Research Center, USA), IM 2009

9. CNOM Awards

- CNOM Young Professional Award
- Subcommittee
  - Noura Liman, Prosper Chemouil, Zuqing Zhu, Xiaoming Fu, Taghrid Samak
- 16 nominations

Daphné Tuncer (Imperial College London, UK)

Shihabur Rahman Chowdhury (Huawei Research, Canada)

IFIP WG6.6 and CNOM Report

10. IEEE Distinguished Lecturer Program

10. IEEE Distinguished Lecturers

- Nomination of DLs on behalf of the TC. Each TC is encouraged to nominate up to 4 DLs.

  - *https://www.comsoc.org/about/memberprograms/distinguished-lecturers*

- Some important facts about the process:

  - DLs must be a Senior Member of IEEE or higher.
  - DLs must be a member of ComSoc.
  - DLs must be willing to create a conference tutorial if requested.
  - A nominee may be nominated by either a person or a TC, but a TC nomination is preferred.
  - Nominators must be IEEE ComSoc members and IEEE Senior Member or higher, TC chair preferred.
  - Nominations are due each year by September. The Distinguished Lecturers Selection Committee will begin processing nominations at that time.

IFIP WG6.6 and CNOM Report

11. ComSoc Student Competition

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This year, the 6th edition of the IEEE ComSoc Student Competition "**Communications Technology Changing the World**" takes place, coordinated by Nelson Fonseca and Stefano Bregni.

The Competition is open to graduate and undergraduate students, who are members of the IEEE Communications Society.

Its purpose is to recognize students or teams of students who demonstrate the capacity to improve the lives of people, through the application of communication technology and the development of projects that meet the human needs of people.

The First Prize consists of $2000 + plaque.
Winner(s) will be invited to receive it at IEEE GLOBECOM.
See all details at:
  http://www.comsoc.org/communications-technology-changing-world
The deadline for submissions is each year mid-August (next one in 2021).

The IEEE ComSoc Student Competition has been a great success since its first edition in 2013.

IFIP WG6.6 and CNOM Report

12. Opportunities for Young Researchers

12. Opportunities for Young Researchers

- Please contact CNOM / IFIP WG 6.6 officers
- Open to contributions at future conferences
- Meet experts and broaden your network
- Build your CV

IFIP WG6.6 & IEEE CNOM Joint Meeting

International Symposium on Integrated Network Management
May 17-21, 2021