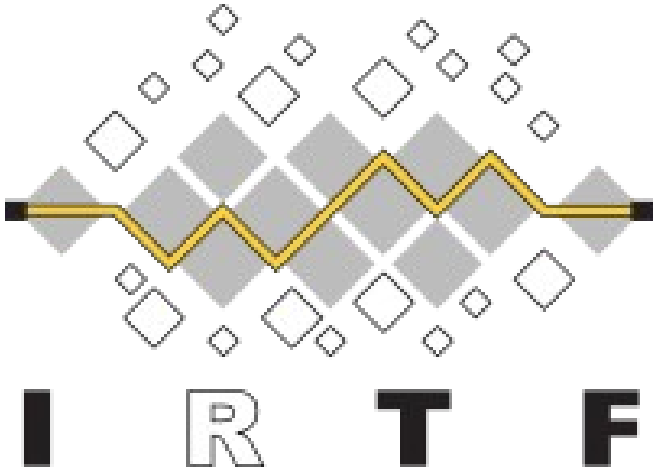

COIN
Computing in the Network

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IETF 110 – Virtual

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Connectivity Hints

- **Documentation and participation**
  - **Meeting material**: https://datatracker.ietf.org/rg/coinrg/meetings/
  - **Etherpad:** https://codimd.ietf.org/notes-ietf-110-coinrg
  - **Jabber:** xmpp:coinrg@jabber.ietf.org?join

- Please remember that **all sessions are being recorded**

- Please also:
  - Ensure your **video is off and wear headphones if you can**
  - **Keep yourself muted** unless you are speaking
  - We will monitor both the **chat and the queue for questions**

Note Well – Intellectual Property

- **The IRTF follows the IETF Intellectual Property Rights (IPR) disclosure rules**
- By participating in the IRTF, you agree to follow IRTF processes and policies:
  - If you are aware that any IRTF contribution is covered by patents or patent applications that are owned or controlled by you or your sponsor, you must disclose that fact, or not participate in the discussion
  - The IRTF expects that you file such IPR disclosures in a timely manner – in a period measured in days or weeks, not months
  - The IRTF prefers that the most liberal licensing terms possible are made available for IRTF Stream documents – see RFC 5743
  - Definitive information is in RFC 5378 (Copyright) and RFC 8179 (Patents, Participation), substituting IRTF for IETF, and at https://irtf.org/policies/ipr

Note Well – Privacy & Code of Conduct

- As a participant in, or attendee to, any IRTF activity you acknowledge that written, audio, video, and photographic records of meetings may be made public
- Personal information that you provide to IRTF will be handled in accordance with the Privacy Policy at https://www.ietf.org/privacy-policy/
- As a participant or attendee, you agree to work respectfully with other participants; please contact the ombudsteam (https://www.ietf.org/contact/ombudsteam/) if you have questions or concerns about this
- See RFC 7154 (Code of Conduct) and RFC 7776 (Anti-Harassment Procedures), which also apply to IRTF

Goals of the IRTF

- The Internet Research Task Force (IRTF) focuses on longer term research issues related to the Internet while the parallel organisation, the IETF, focuses on shorter term issues of engineering and standards making

- **The IRTF conducts research; it is not a standards development organisation**

- While the IRTF can publish informational or experimental documents in the RFC series, its primary goal is to promote development of research collaboration and teamwork in exploring research issues related to Internet protocols, applications, architecture, and technology
- See “An IRTF Primer for IETF Participants” – RFC 7418

COIN

- Our goal:

Create a dynamic computing-in and computing-on the network community to share and define research on how to use computing to improve performance for networks, applications, and users.

- Scope:
  - Evolution
  - Architectures
  - Protocols
  - Real-world use cases, applications, work in progress

- Focus:
  - The core-to-edge compute continuum and the melding of networking and computing and storage.

Today's Presentations

- ***Invited papers relevant to the evolution of COIN***
  - *Architectures*
  - *Computing in distributed systems (datasets, storage, edge devices)*
  - *Deployment*
- ***Short draft updates***
  - *There's a lot of research going on!*

Agenda (1): Research Presentations

1) **FlowLens (NDSS'21) - *Diogo Barradas***, U. Lisbon - joint work with Nuno Santos, Luís Rodrigues, Salvatore Signorello, Fernando M. V. Ramos and André Madeira
   https://www.ndss-symposium.org/ndss-paper/flowlens-enabling-efficient-flow-classification-for-ml-based-network-security-applications/
2) **Packet Subscription - *Theo Jepsen***, Stanford
   http://www.cs.yale.edu/homes/soule/pubs/conext2020-jepsen.pdf
3) **FogStore: Toward a Distributed Data Store for Fog Computing - *Harshit Gupta***, Georgia Tech
   https://arxiv.org/pdf/1709.07558.pdf
4) **Towards Session Consistency for the Edge - *Seyed Hossein Mortazavi*,** Eyal de Lara, University of Toronto
   https://usenix.org/system/files/conference/hotedge18/hotedge18-papers-mortazavi.pdf
   https://cse.buffalo.edu/faculty/tkosar/cse710_spring19/mortavazi-sec17.pdf
5) **The connected intelligent machines' technology journey - *Edgar Ramos*,** Ericsson
   https://www.ericsson.com/4af428/assets/local/reports-papers/consumerlab/reports/2020/ericsson-10-hct-report-connected-intelligent-machines.pdf

(15 mins each)

Agenda (2): Drafts, Discussion, Conclusion

Drafts

- **draft-sarathchandra-coin-appcentres-04 - *Dirk Trossen* - 10 minutes**
  "In-Network Computing for App-Centric Micro-Services"
  https://datatracker.ietf.org/doc/draft-sarathchandra-coin-appcentres/
- **draft-hsingh-coinrg-reqs-p4comp-03 - *Hemant Singh* - 10 minutes**
  "Requirements for P4 Program Splitting for Heterogeneous Network Node"
  https://datatracker.ietf.org/doc/draft-hsingh-coinrg-reqs-p4comp/
- **draft-hsingh-coinrg-p4use-00 - *Hemant Singh* - 5 minutes**
  "Use of P4 Programs in IETF Specifications"
  https://datatracker.ietf.org/doc/draft-hsingh-coinrg-p4use/

Discussion - 10 minutes

Conclusions and Future Plans

- Interim and IETF 111
- Drafts list
- Goal for the next Interim: Update Milestones
- Drafts in the list

Conclusion and Future Plans

- ***Interim Meeting in Late May: housekeeping***
  - *Review of the milestones*
  - *Review of the goals*
  - *2-3 few Invited talks (we have one already)*
- ***IETF 111 San Francisco Meeting (24-30 July)***
  - *Follow up to today's topics and overall IRTF evolution*
  - *Some goals: continue to discover and map the COIN landscape*
  - *Suggestions for a "theme" are welcome!*

Drafts (1)

- Drafts presented today:
  - draft-sarathchandra-coin-appcentres-04: **In-Network Computing for App-Centric Micro-Services**
  - draft-hsingh-coinrg-p4use-00 : **Use of P4 Programs in IETF Specifications**
  - draft-hsingh-coinrg-reqs-p4comp-03 **- Requirements for P4 Program Splitting for Heterogeneous Network Node**

- RG Document:
  - draft-kunze-coin-industrial-use-cases-04 : **Use Cases for In-Network Computing**

Drafts(2)

- Other drafts – Authors of expired drafts to advise on future intent (interim)
  - draft-kutscher-coinrg-dir-02 : **Directions for Computing in the Network**
  - draft-kunze-coinrg-transport-issues-03: **Transport Protocol Issues of In-Network Computing Systems**
  - draft-fink-coin-sec-priv-01: **Enhancing Security and Privacy with In-Network Computing**
  - draft-mcbride-edge-data-discovery-overview-05: **Edge Data Discovery for COIN**
  - draft-defoy-coinrg-mobile-discovery-00: **Impact of Mobility on Discovery in COIN**
  - draft-fu-coinrg-joint-optimization-req-00 : **Requirements of computing and network joint optimization and scheduling**
  - draft-li-coin-oam-framework-00 : **COIN Operation, Administration and Maintenance Framework**
  - draft-liu-coin-differential-reservation-01 : **Differential Computing Resource Reservation**
  - draft-liu-coinrg-requirement-03 : **Requirement of Computing in network**
  - draft-mcbride-data-discovery-problem-statement-00 : **Data Discovery Problem Statement**
  - draft-montpetit-coin-xr-03 : In Network Computing Enablers for Extended Reality – moved to the use cases draft
  - draft-he-coin-managed-networks-01 : In-Network Computing for Managed Networks: Use Cases and Research Challenges moved to the use cases draft

Goal for the Next Interim: Update Milestones

- Current Milestones
  - Dec 2019 Capture the SoTA of the COIN landscape
  - Dec 2019 Articulate COIN challenges
  - Apr 2020 Discuss/catalog COIN requirements and implications for network elements (including network services, network SW stacks, network HW design, etc.)
  - Apr 2020 Target COIN case studies, from architecture, implementation and use case standpoints
  - Apr 2020 Identify COIN network-related eco-system dependencies
  - Nov 2020 Work toward defining a COIN scope appropriate for the IRTF, within which new architectures, mechanisms and protocols can be proposed