2023 Akraino Spring Summit

Call for Proposal Form https://docs.google.com/forms/d/e/1FAIpQLSfqkeW_KBDqyFJXm58AVzfBTU4wyKY_gV_Rsm-DyCGXrKNnGQ/viewform?usp=sf_link

TENTATIVE SCHEDULE AT-A-GLANCE

Summit Registration: https://zoom.us/meeting/register/tJArce-tqj0sEtaq5yzKhBPPy7eVYUGZeBGp

Tuesday, March 28 (North America time zone friendly)	
09:00 – 10:30 PDT (UTC-7) 12:00 – 13:30 EDT (UTC-4) 18:00 – 19:30 CEST (UTC+2) 00:00 – 01:30 CST (UTC+8) *(Wednesday)*	**Keynote Sessions**
10:30 – 10:45 PDT (UTC-7) 13:30 – 13:45 EDT (UTC-4) 19:30 – 19:45 CEST (UTC+2) 01:30 – 01:45 CST (UTC+8) *(Wednesday)*	**Break**
10:45 – 12:00 PDT (UTC-7) 13:45 – 15:00 EDT (UTC-4) 19:45 – 21:00 CEST (UTC+2) 01:45 – 03:00 CST (UTC+8) *(Wednesday)*	**Keynote Sessions Resume**
12:00 – 13:00 PDT (UTC-7) 15:00 – 16:00 EDT (UTC-4) 21:00 – 22:00 CEST (UTC+2) 03:00 – 04:00 CST (UTC+8) *(Wednesday)*	**Lunch Talk**
13:00 – 15:00 PDT (UTC-7) 16:00 – 18:00 EDT (UTC-4) 22:00 – 0:00 CEST (UTC+2) (*Wednesday*) 04:00 – 06:00 CST (UTC+8) *(Wednesday)*	**Keynote Sessions Resume**

Wednesday, March 29 (APAC time zone friendly) (UTC+8)	
18:00 – 19:30 PDT (UTC-7) 21:00 – 22:30 EDT (UTC-4) 03:00 – 04:30 CEST (UTC+2) *(Wednesday)* 09:00 – 10:30 CST (UTC+8) *(Wednesday)*	**Keynote Sessions**
19:30 – 19:45 PDT (UTC-7) 22:30 – 22:45 EDT (UTC-4) 04:30 – 04:45 CEST (UTC+2) 10:30 – 10:45 CST (UTC+8)	**Break**
19:45 – 21:00 PDT (UTC-7) *22:45 – 24:00 EDT (UTC-4)* *04:45 – 06:00 CEST (UTC+2) (Wednesday)* *10:45 – 12:00 CST (UTC+8) (Wednesday)*	**Keynote Sessions Resume**

Planning / Preparation meeting

@ Tue Feb 7, 2023

Day 1:

Tuesday, 28 Mar 2023 PDT timezone (UTC-7)

Meeting Location: 2485 Augustine Dr, Santa Clara, CA 95054 (AMD Inc.)

Live Stream Link: https://zoom.us/meeting/register/tJArce-tqj0sEtaq5yzKhBPPy7eVYUGZeBGp

Visitor parking information : guest parking .docx

Time	**Topics**
9:00 am - 9:05 am	Welcome note – Jim Xu , TSC Chair Yin Ding , TSC Co-Chair
9:05 am - 9:25 am	**Topic** **Open Source Practice and Exploration of CFN Computing Force Networkin China Mobile** Hanyu Ding, China Mobile
9:25 am - 9:35 am	**FedML: federated learning open source library and MLOps at scale** Salman Avestimehr, CEO at FedML Inc.

Time: March 28, 2023 10:00 AM Pacific Time (US and Canada)

Join Zoom Meeting
https://zoom.us/j/93792248595?pwd=N3luQU1vRlVuZXc2SUEraHU4NUdQUT09

Proposed Agenda

Topics

- Telco
- Oil and gas
- Manufacturing
- Retail
- AI

Dates and Times

Day 1: AMER, 28 Mar

10am - 12pm

12pm - 1pm: Lunch time

1pm - 4:30pm

Location: Bay Area, specific host TBD

Sessions

20 minutes - without demo, including Q&A
30 minutes - with live demo, including Q&A

Session Notes

1) Demos can be software (with big screen or projector display), app (same), or physical (e.g. IoT sensors, cameras, robotics, etc)
2) Time periods may be shortened to 15 and 25 depending on presenter interest
3) If your presentation overlaps Topic Areas, for example Manufacturing and AI, please work with the organizers to figure out a best fit
4) In 2) and 3) above, allocating time and category, preference will be given to presentations including demos

Day 2: APEC, 29 Mar

Day 3: TBD

Currently there is not a Day 3 scheduled, unless presentation demand should exceed Days 1 and 2

Misc Notes

For comparison and scheduling purposes, here are other Edge Computing or related events in Feb-May time-frame

-MWC
Feb 27 - Mar 2
Barcelona

-International Conference on Fog and Edge Computing ICFEC
April 22-23
New York

9:35am - 9:55am	**Topic** **Predicting and Optimizing Food Factory Environments by Akraino CPS Robot blueprint family** Inoue Reo , Fujitsu **Abstract:** This presentation provides an example of applying LF Edge Akraino "Robot basic architecture based on SSES Blueprint" to a food factory. In food factories, the ambient temperature often affects the completion of products. In particular, in the production of bean curd skin "yuba", a traditional Japanese food, temperature is an important factor. Because heat denaturation of soy protein is utilized. However, food factory needs to take outside air to prevent high-humidity and condensation by cooking heating. As a result, the temperature becomes unstable. Therefore, it is a problem to predict and control the temperature change in the food plant. To solve this problem we used the Blueprint to build a sensor network and analyze data to create a temperature prediction model for the factory based on past outdoor temperatures and temperatures in the factory.
9:55am - 10:15am	**Topic** Using AIGC tools to descurbe generative meta-universe content in natural language and bring virtual digital people to life with their own personalities, memories and emotions. Alan Lee, CEO of Synfesys & Founder of FreeAI Coummunity

-Edge Computing Expo North America
May 17-18
Santa Clara

-ICFEC 2023 : The 7th IEEE International Conference on Fog and Edge Computing
May 1-4
Bangalore

Note -- late March looks like a very good time-frame for Akraino

10:15am-10:35am	**Topic** **Securing RIC (RAN Intelligent Controllers) in ONOS 5G Control Plane** Rahul Jadhav, AccuKnox **Abstract:** 5G Control Plane is moving to orchestrated deployments. While it brings the advantages of dev/deployment agility, the security usually takes a hit. As a telco provider, you need to be in a position to secure your infrastructure wherein multiple vendors are pushing rApps, xApps to the control plane. The session will highlight security risks emerging out of such advanced architectures, talk about possible solution space and show a demo of a solution based on KubeArmor (part of CNCF Sandbox). The session will talk about solutions involving ensuring workload isolation to contain blast radius, network segmentation using novel approach, and in general, the choice of using a Zero Trust mindset when thinking about the security in general.
10:35am-10:55am	**Break**

10:55am-11:15am	**Topic** **AI + Sustainability on Supermicro** Tina Tsou, Arm & Roger Chen, Supermicro **Abstract:** As the world faces unprecedented challenges in the form of climate change and environmental degradation, the use of artificial intelligence (AI) and other cutting-edge technologies are being explored to promote sustainable development. In this session, we will discuss how Supermicro and Ampere Computing, a leading provider of cloud and edge computing solutions, are leveraging AI to address sustainability challenges. The session will cover a range of topics, including Supermicro's and Ampere's AI-enabled solutions for energy-efficient data centers, sustainable agriculture, and smart transportation. We will explore the role of AI in improving energy efficiency, reducing carbon emissions, and optimizing resource usage. Additionally, we will discuss the use of AI in promoting circular economy models and reducing waste. Experts from Supermicro and Ampere will share insights on their innovative solutions and how these can be applied to address sustainability challenges across industries. The session will also include a Q&A session to facilitate discussion and encourage the exchange of ideas. Overall, the session will provide a unique opportunity to learn about the intersection of AI and sustainability and how Supermicro and Ampere are driving innovation to promote a more sustainable future.
11:15am-11:35am	**Topic** **Secure Edge** Wenhui Zhang, Bytedance **Abstract:** - Review current secure testing in Akraino CI/CD - Introduce kernel safety config tool and current Linux kernel hardening techniques - Review state of art secure runtimes - Discuss challenges and opportunities for securing the edge

11:35am-11:55am	**Akraino White Paper: Akraino Platform Security Architecture** Daniil Egranov, Arm & Akraino Security Sub-Committee **Abstract:** During Akraino blueprint development, blueprint owners may put a lot of effort into analyzing security threats and implementing security features in their projects. However, in many cases, blueprint owners assume that the blueprint execution environment is well protected and does not require their attention. Such assumptions may lead to attacks using platform-level vulnerabilities that interfere with the blueprint functionality and cause the loss of private or critical data. For this reason, the requirements for platform-level security should be considered an important part of blueprint requirements. The Akraino Platform Security Architecture Whitepaper describe core security requirements for Akraino platforms and blueprint execution environments. **Slides:** AkrainoSummitWhitepaper.pdf
11:55am-1:00pm	**Lunch Break**

1:00pm - 1:20pm	**TopicIntroduction to CPS Robot Blueprint Family** Fukano Haruhisa , Akraino TSC member, Fujitsu **Slides:**

1:20pm-1:40pm	**Topic**Engineering Training Platform: Enhancing Education through AI-Powered Solutions and Open Source Technologies Miguel Amigot, CTO, ibleducation.com **Abstract:** In today's rapidly evolving world, the need for effective and innovative educational platforms is more important than ever. In this conference talk, we will explore how the Akriano community can leverage state-of-the-art artificial intelligence (AI) solutions and open source technologies to build an engineering training platform that is not only effective and efficient but also ensures data privacy and ownership. Some of the key points that will be covered include: > *1. Utilizing large language models, such as ChatGPT, to develop AI-powered mentors and assistants that can provide 24/7 support for students, instructors, and customer support.* > *2. Ensuring data privacy through on-premise implementation and utilizing embeddings to preserve data ownership.* > *3. Integrating multiple communication channels, including chat, audio, and video, for versatile and comprehensive learning experiences.* > *4. Sharing examples of diverse use cases, including teaching assistants, student success, instructor support, customer support, and prescriptive analytics.* > *5. Building an AI-driven lifelong learning platform using open source technologies like Open edX, Apache Kafka, and more to prevent vendor lock-in and foster innovation.* > *6. Managing learner data and empowering educators with time-series based learning analytics and large language model-driven support.* > *7. Harnessing expert knowledge from organizations like NVIDIA, Tesla, NASA, IBM, DoD, and MIT to ensure a successful implementation of the proposed engineering training platform.* Join us as we delve into how the Akriano community can revolutionize engineering education using AI-driven solutions and open source technologies. Together, we'll explore the potential to enhance learning outcomes for students and engineers, while maintaining control over data and resources.

1:40pm - 1:55pm	**Topic:** Smart Data Transaction for CPS Blueprint Colin Peters Fujitsu **Abstract:** Smart Data Transaction for CPS is a blueprint seeing its second release as part of Akraino Release 7. In this talk the PTL of the blueprint introduces its features and what's new in Release 7. **Slides:**
1:55pm - 2:00pm	**Break**
2:00pm - 2:20pm	**Topic**Robotaxi Immobilization Jeff Brower, Signalogic **Abstract:** Public safety agencies are concerned first responder response to autonomous vehicle "immobilization". They need to communicate with the vehicle regardless of whether it retains cloud connectivity or its cloud software has crashed. They cannot depend on apps, they cannot accept large, heavy systems ... the solution has to be small and portable -- hand carried and battery powered -- and interface to the vehicle through its local teleoperation WiFi. To address this, Signalogic is developing small, low power automatic speech recognition (ASR) systems with no dependence on Internet connectivity. Safety commands are notorious for being super unpredictable -- conditions can be noisy, stressful, with variable command syntax and sequence, multiple citizens or law enforcement talking at once, etc. To solve this, we're using Kaldi with a large vocabulary (20,000+ words) and a range of signal processing techniques. Our next step is a lightweight language model (LM), suitable for small-form factor systems, that corrects grammar and vocabulary errors in the ASR output. For safety and legal liability reasons there must be zero inference dependence on cloud connectivity, but the system must still connect to the cloud when possible to upload logs, telemetry, and audio recordings.

2:20pm-2:40pm	**Title**: Advanced Backplane Technologies for Integrated Edge Cloud: Exploring PCIe, Ethernet, and Beyond **Abstract**: The rapid growth of edge computing and the ever-increasing demand for low-latency, high-performance applications have underscored the critical role of advanced backplane technologies. These technologies enable seamless integration of edge cloud infrastructures, ensuring optimal performance and reliability in a wide range of use cases. In this paper, we delve into the latest advancements in backplane technologies, particularly focusing on PCIe and Ethernet, and their applications in integrated edge cloud systems and beyond. We start by identifying the specific problems that need to be addressed for integrated edge cloud systems, considering the constraints imposed by the cluster size and numbers. Traditional scale-out technologies, such as increasing switch port density, are not suitable for integrated edge cloud systems due to the limited number of servers. As a result, integrated edge cloud systems for small-sized networked clusters require new networking approaches, efficient management, cloud-native architecture, and cost-effective solutions. Next, we present our proposed solution for a purely PCIe-based backplane networking system, as introduced in our R6 research. Following this, in our R7 research, we discuss an Ethernet implementation for integrated cloud systems. We provide details on the connections and hardware design for both solutions, highlighting their advantages and drawbacks. Finally, we explore the potential benefits of utilizing the Universal Chiplet Interconnect Express (UCIe) in backplane technology for integrated edge cloud systems. We discuss the opportunities and challenges this approach presents and consider the implications of UCIe adoption in the future development of backplane technologies for integrated edge cloud systems. In conclusion, advanced backplane technologies, particularly those based on PCIe and Ethernet, are essential for the seamless integration of edge cloud infrastructures. As edge computing continues to evolve, further research and innovation in backplane technology will be instrumental in unlocking new possibilities and pushing the boundaries of what can be achieved in integrated edge cloud systems and beyond.

2:40pm-2:45pm	Closing remarks – Jim Xu , TSC Chair

Day 2:

Wednesday, 29 Mar 2023 China Time (UTC+8)

Meeting Location: 14th Floor, Block A3, Building J1, Phase II of Hefei Innovation Industry, Shushan District (High-tech Zone), Hefei City, Anhui Province, China.

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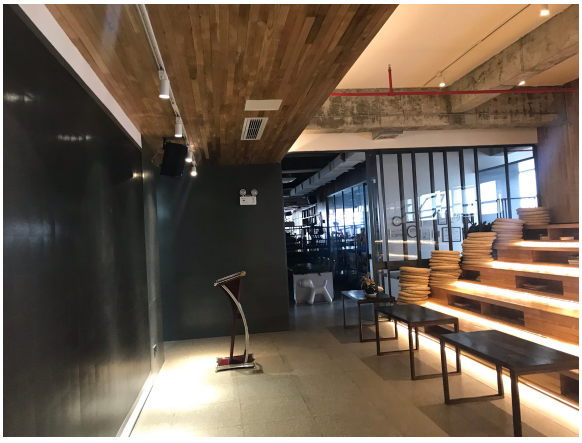

Recommended Hotel Lefuqiang Hotel, Block A, 229 Innovation Avenue, Hefei High-tech Industrial Development Zone, Shushan District, Hefei City, Anhui Province

If you need an invitation to enter China for visa application, please send your name, nationality and passport number to zhangxin@socnoc.ai

Host Company: Socnoc AI Inc. and Hefei High-tech Integrated Circuit Incubation Co., Ltd.

Live Stream Link: https://zoom.us/meeting/register/tJArce-tqj0sEtaq5yzKhBPPy7eVYUGZeBGp

Time	Topics
09:00am-09:20am	**Opening: Linux Foundation Edge: Ecosystem and Practice** **Linux** SpeakerTina Tsou, LF Edge Chairman of the Board, Director of Arm Infrastructure Ecosystem Tina Tsou Linux Foundation...and Practice.pdf

09:20am-09:40am	Topic: Transforming the Edge to a Virtual Cloud, and Practice on automobile, enterprise and factory Speaker: Moshe, CEO of AnlyLog Moshe Shadmon
09:40am-10:10am	OpenCloudOS: Building The Next Neutral Cloud Native Operating System Community Speaker: Bart Dong, OpenCloudOS Ambassador OpenCloudOS OpenCloudOS
10:10am-10:30am	Topic: China Unicom's researchs on co-construction & sharing of 5G MEC Dr. Chen Gao, China Unicom Research Institute Abstract: In this session, we provide a concise overview of the GMSA Operator Platform (OP) concept and the associated MEC Federation as adopted by ETSI ISG MEC. We explore the development of a versatile edge cloud by examining and summarizing how the critical technologies of OP can be applied to facilitate the collaborative construction and sharing of 5G MEC within China Unicom. Gao Chen, Senior Engineer at China Unicom Gao Chen GMSAOPETSI ISG MECMECOP5G MEC

10:30am-10:50am	Topic: KubeEdge Deep Dive: Architecture Design and Application Practice Speaker: Yue BaoHuawei Yue Bao AbstractKubeEdge is built upon Kubernetes and extends native containerized application orchestration and device management to hosts at the Edge. It applies many advantages of cloud-native to edge computing and now is CNCF's only incubation-level cloud-native edge computing project. This presentation will introduce the architecture design and core technologies of KubeEdge in detail. We will also lead you to review the development history of the KubeEdge community. Finally, this presentation will introduce several typical production and implementation cases of KubeEdge in scenarios such as intelligent transportation, CDN, and vehicle-cloud collaboration. KubeEdge KubeEdgeKubernetesCNCFKubeEdgeKubeEdgeKubeEdgeCDN
10:50am-11:00am	Break
11:00am-11:20am	ZTE's Exploration of On-site Edge Technology Speaker: Huang Meiqing, Senior System Planner at ZTE Corporation Edge

11:20am-11:40am	Deploying “ChatGPT” in edge Datacenter-practice and acceleration Jack Chen,Davy Zhang Ysemi Computing Abstract Ysemi computing is a company focusing on designing high performance cpu for cloud native servers edge servers with the latest arm server cpu core. The recent rise of ChatGPT has promoted the vigorous development of artificial intelligence on the application side, which also puts forward unprecedented demands on the computing power of computing devices. In this talk Ysemi team will share some practice and accelerating thinking when deploying ChatGPT-like systems in edge datacenter. ChatGPT : Jack Chen,Davy Zhang, Ysemi computing arm cpu , cpu ChatGPTYsemi ChatGPT
11:40am-12:00pm	AI Edge Infra SpeakerCC, Allegro Cloud CC

12:00pm-12:30pm	**Panel (with CAMARA): Monetization of Telcos Edge Cloud** **Abstract:** We've been exploring ways to leverage the business potential of edge cloud technology. Following the conclusion of MWC 2023, the topic of capability exposure has become increasingly important. More than 18 use cases burst out on MWC, and 21 operators have signed MoU. All these indicate that global operators are seeking a new way to generate revenue from edge cloud solutions. As a result, we have redirected our attention towards the potential for telecom edge cloud monetization. Akraino has a history of collaborating with other communities at edge in an open and friendly manner. In this panel, we will invite experts from both operators and vendors to jointly discuss the exposure of edge capabilities and the synergy between Akraino and CAMARA. guanyu zhu @Shuting Qing Gao Chen Leo Li MWC 2023Open Gateway MoUAkrainoPanelAkrainoCAMARA Gao Chen, Akraino TSC
12:50pm-02:00pm	Lunch
02:00pm-03:00pm	Visit China Speech Valley