SPECIAL SESSION 05

The 34th Wireless and Optical Communications Conference

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Advances and Innovations in Computing Power Network

In the current booming development of artificial intelligence, the network has become a bottleneck for AI computing power, and the intelligent computing center network has emerged as a technological high ground in the era of artificial intelligence. The network performance is crucial for enhancing the efficiency of cluster computing power. Against this backdrop, the AI network engine created by the Global Scheduling Ethernet (GSE) has given birth to four original technologies, namely the Ethernet forwarding mechanism, high-precision load balancing, native lossless and low latency at the network layer. Its wide-area high-throughput characteristics have constructed an efficient data channel, and the artificial intelligent native network (AINN) has come into being. The integration of IP and optical technologies has entered a substantive stage, and research on the integration of fixed, mobile, and satellite networks has also made significant progress. Meanwhile, three major trends - the integration of computing and networking, intelligent native, and inherent security - are becoming increasingly prominent. Frontier fields such as networking based on large language models (LLM) and AI networking between data centers (Inter-DC) are continuously expanding the boundaries of the computing power network.

This special session will conduct in-depth discussions around these latest research and development trends in the computing power network, covering multiple key aspects such as architecture design, resource scheduling, security mechanisms, and performance optimization. It aims to bring together experts, researchers, and practitioners to exchange and showcase novel methods and innovative practices for enhancing the efficiency, scalability, and reliability of the computing power network.

Topics of the Special Session

- Distributed Computing Power Architecture in Edge Computing Scenarios and Its Collaborative Optimization with the Network
- Dynamic Resource Scheduling Algorithms and Network Load Balancing Strategies in Heterogeneous Computing Environments
- Security and Privacy Protection Technologies in Computing Power Network Transactions, Including Inherent Security Mechanisms
- Performance Evaluation and Benchmarking of Computing Power Network Systems Based on Technologies such as Global Scheduling Ethernet (GSE)
- Fault Tolerance and Resilience Strategies of Computing Power Networks in Complex Network Environments
- Innovative Applications Enabled by the Integration of Computing and Networking, such as the Practice of Intelligent Native Networks in Various Industries
- Interconnection and Integration Technologies of Multi-Cloud Computing Power Networks, Including the Construction and Optimization of Fixed-Mobile-Satellite Integrated Networks
- Application and Exploration of Networking Based on Large Language Models (LLM) in Computing Power Networks
- Key Technologies and Development Trends of AI Networking between Data Centers (Inter-DC)
- Other Frontier Topics Related to the Evolution and Application of Computing Power Networks

Session Chairs

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Planned Contributions ▶▶▶▶

1. Distributed Computing Power Allocation Model and Network Adaptation Strategy for Edge Devices.
2. Dynamic Resource Scheduling and Network Optimization Based on Reinforcement Learning in Heterogeneous Computing Clusters.
3. Secure and Efficient Data Transmission in Computing Power Networks under the Fully Scheduled Ethernet GSE Environment.
4. Performance Evaluation Metrics and Tools for Computing Power Networks Based on Intelligent Native Network (AINN).
5. Fault Tolerance Framework and Network Resilience Mechanism for High-Performance Computing Power Networks.
6. Innovative Applications of Computing and Networking Integration in Real-Time Video Analysis.
7. Interconnection Technologies and Fixed-Mobile-Satellite Integration Practices of Hybrid Cloud Computing Power Networks.
8. Intelligent Operation and Maintenance and Optimization of Computing Power Networks Based on Large Language Models (LLM).

Submission

Submission Deadline : **March 1, 2025**.

Submission Link: https://edas.info/newPaper.php?c=33162&track=129992

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Further information can be found on the conference website at: https://www.wocc.org