

**NCDC**

20-21, June 2019 Beijing · China

# Network & Compute Developers Conference

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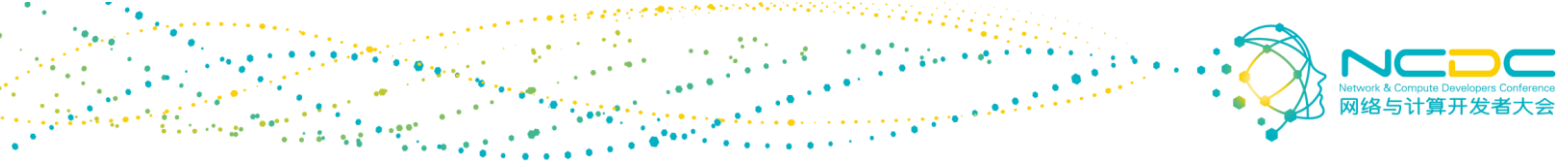
Dear Madam/Sir,

Greetings! Thank you for your support and encouragement to “Network and Compute Developers Conference (NCDC)” !

From June 20 to 21, 2019, the “NCDC-Network and Compute Developers Conference” , hosted by China Future Internet Engineering Center, successfully closed in Beijing. During the two-day conference, the latest hot topics in network and compute field were covered, and developer workshops and developer tutorials were launched successively, including ONAP, OpenStack, Tungsten Fabric, ONF, MEF, LF Edge, StarlingX, P4&Stratum. We have created a rich, interesting and impressed ecological event for the vast number of developers through “1 Main Forum + 1 Booth Talk + 6 Developer Workshops + 2 Developer Tutorials” .

As the first industry event concentrating on developers in the network and compute field, this conference has received great support from the industry. Here we would like to thank the Linux Foundation, OpenStack Foundation, ONF, MEF, China Electronics Standardization Institute, China Open Source Cloud League and other organizations for their strong support by bringing us many cutting-edge developer projects; thank Huawei, H3C, Mellanox, Tencent, China Mobile, China Unicom, China Telecom, China UnionPay and other enterprises and operators for their full sharing by bringing us their own practice and deployment in ecological construction and industrial cooperation; also thank the more than 800 registered audience for their full participation by interacting and exchanging to jointly promote the development and prosperity of the network and compute developer ecosystem!

During the conference, C114, IT168, SDNLAB, ZDNet, CommunicationsWorld, FromGeek.com, D1Net, CCTime, baike.com, eNet, CIWEEK, PConline, ElectFans, idcquan.com, CIO Times, China Webmaster, CSDN, ikanchai.com, OSCHINA and many other industry media reported on the conference in detail and attracted high attention of the industry.



There may still be many shortcomings in the process of organizing the NCDC-Network and Compute Developers Conference and during this meeting, but we still have the trust, understanding and support of everyone. Here we would like to express our heartfelt thanks to all the guests, organizers, manufacturers, media and audience who participated in and supported the conference. We believe that this is a new start for NCDC. With your strong support, the NCDC will be better and better, and become a platform for global developers to share, exchange, practice, interact, and cooperate for win-win results.

The world is different because of the network; the network is wonderful because of developers! When the open source and openness become the engine of innovation, when convergence and win-win situation become the common view of the industry, a network technology revolution characterized by openness, convergence and the intergenerational transition will come rapidly and lead us to the golden age of developers together!

Thank you again for your support! Let's look forward to a more exciting NCDC next year!

Organizing Committee of Network and Compute Developers Conference

Liu Dong, Chair of the Conference

June 2019

## The Network & Compute Developers Conference was Successfully Held

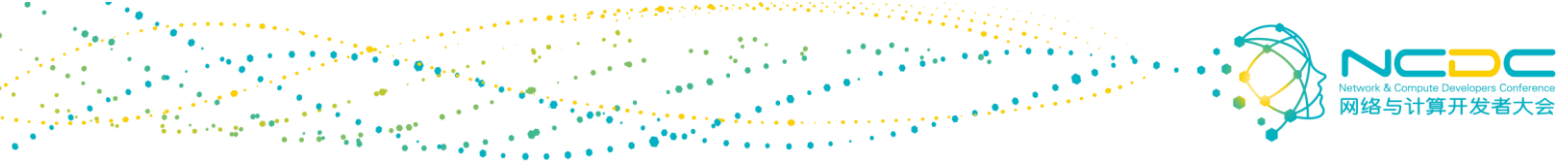
With the advent of the digital age, the scale of the Internet continues to expand. Various emerging network technologies, such as Network Function Virtualization (NFV), Software Definition Network (SDN), Edge Computing and cloud emerge in endlessly. The design and operation mode of network and computing infrastructure are changing quietly. Software, developers, ecology and other terms have become the key words of the new era. Openness and open source have become the mainstream. New industrial changes are at hand.



*Figure: Scene of "NCDC"*

From June 20 to 21, 2019, the Network and Compute Developers Conference (NCDC) hosted by BII-China Future Internet Engineering Center (CFIEC) was successfully held in Beijing. The conference covered the latest hot topics in the field of network and computing, such as ONAP, OpenStack, Tungsten Fabric, ONF, MEF, LF Edge, StarlingX, P4&Stratum and developer workshops and developer tutorials. It focused on the diversified developer ecology and shared a feast of network and computing technology with hundreds of developers.

**The Golden Era of Developers is Coming**

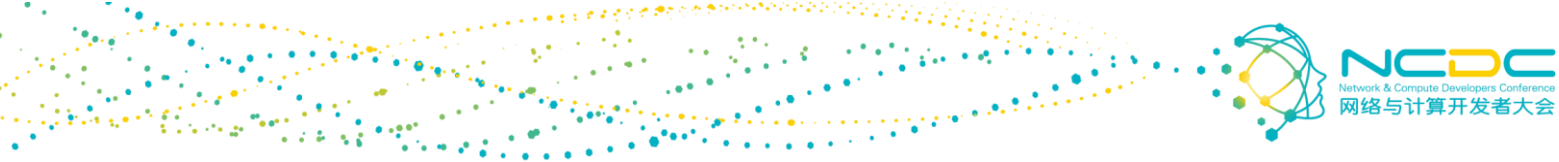


At the NCDC, “developer ecology” has become a hot topic, which has triggered in-depth discussions among many technical experts and field audiences. “The construction, development and prosperity of developer ecology will maximize the boundaries of the industry and set up a new digital connection. Meanwhile, it will form an innovative cooperation pattern and give the industry a brand new meaning. More importantly, the developer ecology will release the greatest value of openness and open source and lead us to a new and great era.” Said Liu Dong, Chairman of the Conference and Director of China Future Internet Engineering Center.

When talking about the current situation and future of developer ecology, Ren Xudong, General Manager and Chief Liaison Officer of Open Source Business of Huawei ICT Infrastructure, said, “Developers today are very happy, because we are facing a wave of digitization in the whole industry. This is an era of developers. Our infrastructure, including network and computing, shall be prepared for this era.”

### **Openness and integrated development boosts the digital transformation**

In fact, in the process of promoting the continuous development and prosperity of developer ecology, only by emphasizing openness and integration can we gather strength, stimulate industrial innovation vitality, and provide important support for the digital transformation of all walks of life. At the conference, technical experts from Huawei, H3C, Mellanox, Tencent, China Mobile, China Telecom and China Unicom shared their respective practices and deployments in ecological construction and industrial cooperation.



Wang Yachen, General Manager of Tencent Cloud Network and Director of LoRa Alliance, said in his speech, “We believe that wonderful things will happen by gathering together people with different skills, backgrounds and expertise, bringing more innovation and business opportunities” .

### **Equal attention paid to theory and practice causes the full participation of developers**

In addition to keynote speeches and other communication modes, rich and interesting interaction and practical teaching such as “Meet Higher-ups” and “Developer Training Camp” also attracted the full participation of developers.

In the link of “Booth Talk” , technical experts from various international organizations and open source projects personally stationed in the exhibition area, and had face-to-face technical exchanges with the audience. While in the link of developer tutorial, “practice” elements were integrated to provide field developers with practical training, in order to enable developers to master relevant skills in a short time, and enhance their technical competitiveness.

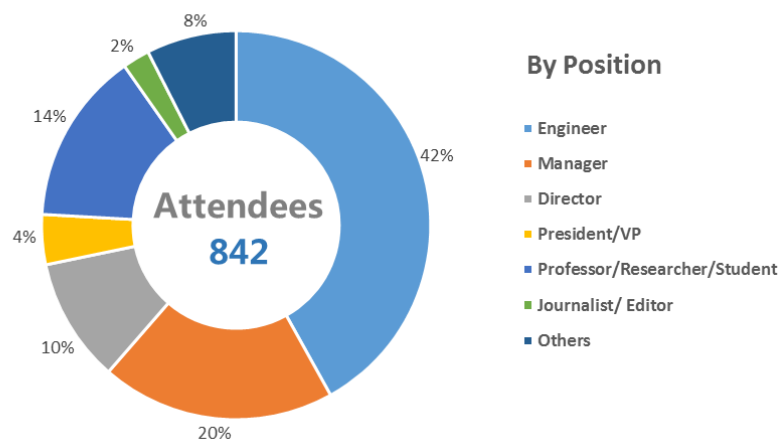
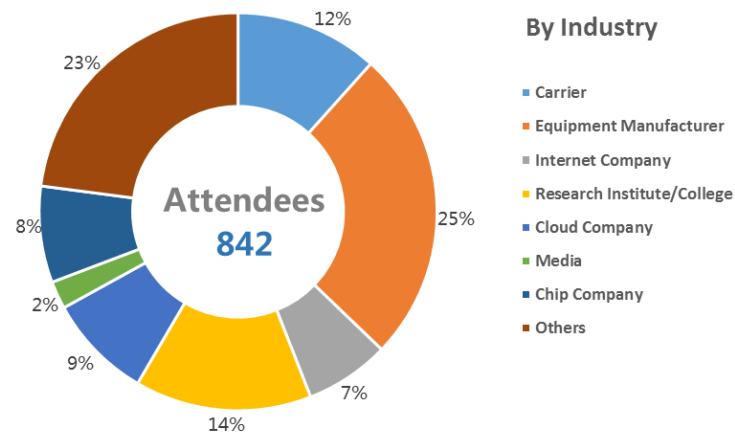
The world is different due to the network; the network is wonderful because of the developers! When open source and openness becomes the engine of innovation and integration and win-win result becomes the consensus of the industry, a network technology revolution characterized by openness, integration and intergenerational transformation will accelerate its arrival and lead us to the golden age of developers together!

# Audience Analysis

The number of attendees is 842. (Excluding speakers and some government officials):

By Industry		By Position	
Carrier	98	President/VP	35
Equipment Manufacturer	215	Director	87
Internet Company	58	Manager	164
IDC & Cloud Company	72	Engineer	353
Chip Company	66	Researcher	121
Research Institute/College	121	Editor/ Journalist	19
Media	19	Others	63
Others	193		
<b>Total</b>	<b>842</b>	<b>Total</b>	<b>842</b>

## Pie Chart Analysis





# NCDC-Network & Compute Developers Conference

## Agenda

June 20th 2019 NCDC Day-1

09:00-09:10

**Opening**

09:10-09:20

**Welcome Speech**

Liu Dong, Chairman of Organizing Committee, Director of CFIEC

09:20-11:00

**Keynote Speech (Grand Ballroom)**

**Moderator**

**Zhou Yue, China Future Internet Engineering Center**

**09:20-09:40 Developer-centered Construction for ICT Infrastructure**

Bill Ren, Chief Open Source Liaison Officer, ICT Infrastructure Open Source GM, Huawei;  
Board Member of LFN and LF Edge

Brief: The digital society relies on applications operating on the network, and the application of industry digitization and production digitization requires more certainty and differentiation for the network. The ICT Infrastructure is required to make developer stimulate industry applications and to carry out the reform, that is to build a uniform industrial automation platform and open framework and introduce the edge computing platform for the network to provide more programmable resources and more fine grits, achieving the developer-centered infrastructure.

**09:40-10:00 Tencent Things Network: Developer Ecology for Intelligent Connection of All Things**

Wang Yachen, General Manager of Tencent Cloud Network; Board Member of LF Edge; Board Member of LoRa Alliance

Brief: Tencent Things Network, as the developer community platform, provides the developers with open LoRaWAN website service and the community portal with rich contents, such as user guidance, development courses and application cases. The community platform aims to reduce the application development threshold of the Internet of Things industry, and gather the excellent Internet of Things solutions of partners to help the ecological construction of the Internet of Things. It will also provide service integration capabilities, such as WeChat applets, IoT Explorer and IoT-Hub, to help developers quickly create a large number of applications in the Internet of Things industry.

**10:00-10:20 Building an Open Ecological Networking Based on Connect+**

Kevin Huang, Senior Director, SDN Solution Architect, New H3C Group

Brief: In the context of "Internet +", today's enterprise digital transformation technology has been upgraded to the stage of "smart +", and the basis of "smart +" is all things. New H3C fusion ABC technology, with the cloud-sharing mode to enable Connect+. New H3C has been committed to building an open network architecture. While providing intelligent and platform-based capabilities, it has also actively built open ecosystems from open source standardization organizations, industry-university-research cooperation, and eco-partnerships.

**10:20-10:40 AI-enabled Open Carrier Network**

Wang Feng, Director of R&D Lab, China Telecom Beijing Research Institute

Brief: Intelligent network and intelligent operation are the inevitable trend of the development of operators' networks. Artificial intelligence (AI) plays an important role in this process. Operators start with the AI Empowerment Platform to create an intelligent ecosystem that integrates and unlocks AI service capabilities at multiple levels of computing power, data, framework, algorithms, and applications to fully promote the intelligent upgrade of carrier networks and services.

**10:40-11:00 Exploration and Thinking of Open Network**

Tang Xiongyan, ONF Board Member; Chife Scientist, Network Technology Research Institute, China Unicom

Brief: The speech will comprehensively introduce the current progress made by China Unicom in participating in the related organizations of open website, and the relevant plan, practice and achievement of China Unicom in network transformation. Tang Xiongyan, as ONF board member, will share her understanding and thinking on the business innovation and future website.

**11:00-12:00 Booth Talk (Special Event in the Exhibition Area)**

**12:00-13:30 Lunch (3rd Floor Lane Restaurant, with meal coupon)**

**13:30-17:10 ONAP Workshop (Grand Ballroom A)**

**Moderator Le Ma, China Future Internet Engineering Center**

**13:30-13:40 Welcome Speech + LFN Update**

Bill Ren, Chief Open Source Liaison Officer, ICT Infrastructure Open Source GM, Huawei; Board members of LFN and LF Edge

Brief: Share the latest progress of network related industries, especially the latest trends of the ONAP community. Then make a welcome speech.

**13:40-14:00 Publication of New Book *Specific Explanation and Application Practice of ONAP***

Yang Fuchuan, General Manager of Computer Business Second Division, Huazhang Branch of China Machine Press

Brief: This book comprehensively introduces the challenges and development trends of network automation, as well as the overview, design concepts of structure, design principles, details of implementing each module, key features, application scenarios and case practices of ONAP technology in detail. Readers can deeply understand ONAP technology and enhance their understanding of network automation and related fields through the book.

**14:00-14:30 What's New in ONAP Dublin Release**

Zeng Jianguo, Software Architect, Technology Planning in General Dev Dept, P&S Cloudify Network OSDT, Huawei

Brief: Introduced the new architecture enhancement in ONAP Dublin release, include the enhancements on Cloud Native, S3P Platform Maturity (Stability, Security, Scalability, Performance, Resiliency, Manageability, Usability). Also will introduce new features in the key projects(SDC, External API, SO, SDNC, DCAE, Policy) with use case.

**14:30-15:00 ONAP Application and Practice of China Unicom**

Cao Chang, Director of Intelligent Network and New Technology Laboratory, China Unicom

Brief: This report introduces the basic information of ONAP community and the current research projects, and then, aiming at the pain points of the industry Internet, introduces the practical cases of China Unicom by combining with the IPRAN+A scenario of China Unicom.

**15:00-15:30 Sharing The Practices of Customized NFV Orchestrator based on ONAP**

Wang Chengli, Project Manager, China Mobile Research Institute

Brief: Share the practices of customizing development of NFV Orchestrator based on ONAP in CMRI. The NFVO is containerized and based on microservices. It leverages VFC/MultiCloud/MSB projects from ONAP according to the real requirements in CMCC. In the session I will share some questions and advices from our side to try to help ONAP more maturity.

**15:30-16:00 The Practice in ONAP of China Telecom**

Wang Luman, Project Manager, China Telecom CTNet2025 Research Institute

Brief: In this session, we will discuss the driving force of China Telecom network intelligent transformation, share the thoughts on the evolution of future operation system and introduce the cooperation and practice of China Telecom on ONAP. Including the results of Benchmark integration test, the development progress of SFC project based on CCVPN, and the construction of China Telecom open lab.

**16:00-16:10 Break**

**16:10-16:30 ONAP VFC Project New Features & Planning**

Maopeng Zhang, MANO Senior Engineer, ZTE

Brief: Introduce ONAP VFC project new features, including function improvement, ETSI SOL standard alignment, and S3P, etc. Introduce VFC E/F version planning, including TOSCA based VNF auto deployment and validation, and workflow optimization, etc.

**16:30-16:50 Orchestration VNF and CNF with ONAP MultiCloud**

Bin Yang, ONAP MultiCloud PTL, Wind River

Brief: The vision of MultiCloud is to provide normalized interfaces to keep ONAP components be VIM/cloud agnostic. I would like to share some insight of this ongoing effort and the practice on how ONAP could make use of them to orchestrate VNFs/CNFs to OpenStack, Kubernetes cluster, and even public clouds.

**16:50-17:10 Publication of ONAP&OVP Experience Environment**

Zhou Jun, Project Manager of ONAP, Huawei.

Yang Guanzhi, OVP Project Manager, Huawei

Brief: Introduces how to deploy ONAP and OVP on Huawei public cloud, and publish the verification environment of ONAP and OVP, so to facilitate the trial of companies and individuals who is interesting in ONAP and OVP. OVP (OPNFV Verification Program), as a verification platform project under LFN, provides certification and verification of NFVi and xNF. Huawei enhances the OVP project, Provides cloud experience environment, making OVP easy to deploy, operate and verification.

13:30-16:20

**OpenStack Workshop (Grand Ballroom B)**

Moderator

Ma Zhenqiang, China Community Ambassador of the OpenStack Foundation

**13:30-13:40 Welcome Speech**

Li Haoyang, Manager of Chinese Community of OpenStack Foundation

Brief: Li Haoyang, Manager of Chinese Community, will deliver a welcome speech, which introduces that the strategy advancement of OpenStack Foundation towards open-sourcing infrastructure has met the the growing demand for infrastructure platforms of container, edge computing, and hybrid cloud fields, and also includes the current development status and future outlooks of global community and the overview of China's participation in global community.

**13:40-14:10 Value of Standards in Container Era**

Wang Zesheng, Engineer of China Electronics Standardization Institute

Brief: The mature container technology has a profound impact on the delivery and efficiency of cloud computing and the construction of the PaaS platform, providing important technical support for enterprises to deploy cloud native applications. Focusing on best practices, promoting the precipitation of technology to standards, guiding the direction of technology development, can reduce the technical barriers and fragmentation of container ecology.

**14:10-14:40 Status Introduction and Function Outlook of OpenStack Zun**

Feng Shengqin, Project Director of Openstack Zun; Senior Engineer of ZTE

Brief: Zun, as the management service for Openstack container, allows users to quickly start and operate container without management servers and clusters. It can seamlessly add the network, storage and authentication functions into the container management through integrating with Openstack core services such as Neutron, Cinder, and Keystone. In addition, users can use a unified API interface to manage the container without the need to care about the technology differences of different containers.

**14:40-15:10 Magnum's Arrangement for Container Kubernetes Clusters and Harbor Services without Difference in KVM and VMware through Cloudify**

Qiu Dayu, R&D Director of HUAYUN

Brief: With OpenStack in the enterprise private cloud and some public cloud landing and application. More users want to seamlessly upgrade to PaaS (kubernetes) on existing IaaS platforms, and achieve IaaS and PaaS integration. However, given the current state of enterprise IaaS hybrid, a large number of users are OpenStack (KVM), VMWare, and public. Cloud hybrid deployments and applications bring even greater challenges to Magnum's orchestration of kubernetes clusters. This talk about how Magnum and Cloudify orchestration tools combine to create kubernetes clusters and harbor virtual machines in mixed virtualization and hybrid cloud scenarios.

**15:10-15:40 Optimal Practice of Building Integrated Cloud Platform Based on OpenStack + Kubernetes**

Wang Bo, Senior Engineer of EasyStack

Brief: OpenStack and Kubernetes are two outstanding open source projects in the cloud computing space. OpenStack provides IaaS capabilities and Kubernetes provides container orchestration capabilities. The two are not mutually exclusive relationships, but can be well integrated to better solve problems. In this presentation, we will introduce several scenarios of combining OpenStack and Kubernetes, and select one of the typical scenarios to share our practical experience. Includes an introduction to related tools/technologies, an introduction to the overall architecture, and discussion and scenarios for some key issues.

**15:40-16:20 The Virtualization in Cloud Native Era: Kata Containers & Rust-VMM**

Wang Xu, Ant Financial Senior Staff Engineer

Tian Jun, Manager of Beijing Virtualization Group, Intel

Brief: In the container-centric cloud native era, the strong isolation between the virtualization technology and the immutable design of the container along with the cloud computing, Kata Containers is such a typical representative, on the other hand firecracker/rust-Vmm is a new VMM designed for the cloud native, and the virtualization technology of the cloud era is promising.

**13:30-17:30 Tungsten Fabric Workshop (Grand Ballroom C)**

**Moderator Zhang Xinyi, China Future Internet Engineering Center**

**13:30-14:30 Tungsten Fabric Architecture and Edge Use Cases**

Sukhdev Kapur, Tungsten Fabric Technical Steering Committee Voting Member, Senior Engineer, Juniper

Brief: In this talk we present Tungsten Fabric architecture and its remote compute feature that is targeted to address edge use cases. We will also present Akraino Edge Stack and how its community is addressing wide array of diverse edge use cases. We will cover the collaboration between Tungsten Fabric and Akraino communities to address various edge cases, to address Telco Cloud, Mobile gaming workloads, and Kubernetes based framework for vRAN & other applications.

**14:30-15:30 Tungsten Fabric Release R5.1 and Multi-stack Examples**

Raymond Lam, Tungsten Fabric Developer; Senior Systems Engineer, Juniper

Brief: The Tungsten Fabric 5.1 release's benefits include: 1. A strong commitment to code quality; 2. Networking feature enhancements for a variety of customer use cases; 3. High performance networking.

**15:30-16:30 Tungsten Fabric Building, Developing, and Debugging**

Edward Ting, Tungsten Fabric Technical Steering Committee Voting Member; Senior Software Development Manager,Lenovo

Brief: Tungsten Fabric R5.1 is the latest release. This is to walk through how to build Tungsten Fabric R5.1 from the source code, including: get the build environment, get the R5.1 source code and review the project structures as well as the commits, build all containers and build the images for different deployments. The built images will then be used by the SDN for a Kubernetes cluster.

**16:30-17:30 Panel**

## The End of Day1

June 21st 2019 NCDC Day-2

09:00-11:40

### MEF Workshop (Grand Ballroom A)

Moderator

Shi Fan, MEF China WG/Chair

#### 09:00-09:30 MEF3.0 and LSO Development

Shi Fan, MEF China WG/Chair ; Deputy Director, CTNET2025 Department , ChinaTelcom Corporation Limited Research Institute

Brief: This session show you what is the MEF3.0, the key technical trend and the hot topics in MEF, for instance SDWAN, 5G, IBN. It also focus on the LSO architecture, API and its developer and deployment in Telecom world, including certification, industry collaborations and proof of concept showcase. It will bring you a brief global view of MEF and the coming new orchestrated networking world.

#### 09:30-10:00 China Telecom's R&D and Practice in SDN/MEF

Nie Shizhong, Director of SDN Technology R&D Team, CTNET2025 Department , ChinaTelcom Corporation Limited Research Institute

Brief: In this speech, Nie Shizhong will introduce China Telecom's R&D and deployment in the SDN field, including: traffic mobilization of backbone networks and IDC networks, system development and deployment of intelligent lines, SD -WAN related research and deployment.

#### 10:00-10:30 Practice of China Unicom in Open Source

Zhang Shuai, SDN R&D Engineer of Future Network Research Department, Network Technology Research Institute, China Unicom

Brief: Introduce the evolution plan of China Unicom's CUBE-Net 2.0+ cloud architecture to intelligent network architecture. China Unicom combines the open source ONAP architecture with the MEF LSO interface to implement cross-operator orchestrator interconnection practices, leveraging the advantages of carrier network resources, and providing end-to-end SD-WAN solutions for cross-operator customers to meet user networking and access. To meet the needs of user networking, cloud access and cloud connectivity.

#### 10:30-11:00 Practice and Exploration of H3C in MEF

Huang Dun, System Architect of AD-NET Product Line of New H3C

Brief: 1. Brief Introduction of MEF. 2. H3C participation in the introduction for MEF field, mainly describing the overall structure of H3C SDN and the mapping relationship of MEF, and what products and entities of H3C each layer of MEF LSO corresponds to. 3. H3C' s Practice in MEF LSO, mainly introducing several major fields of MEF LSO that H3C participates in, such as SOF and ICM and so on. 4. Relationship between ONAP and MEF. 5. SOF layer introduces practices of H3C based on ONAP development. 6. Future outlook, describing some future outlooks and ideas of MEF.

#### 11:00-11:30 Huawei SD-WAN Network Architecture Introduction

Weiguo Hao, Huawei NCE Solution Architect

Brief: Huawei SD-WAN Solution introduces SDN to traditional WAN technologies. The Agile Controller, which is centrally deployed, implements centralized management, orchestration, and control of WANs. Specifically, SD-WAN decouples upper-layer network services from the lower-layer network architecture through WAN abstraction and modeling, implementing network automation. With an independent control plane deployed, SD-WAN helps separate the forwarding plane from the control plane to implement centralized network control. Through centralized network monitoring and visualization, WANs can be centrally managed in an E2E manner, implementing intelligent O&M.

#### 11:30-11:40 Q&A

09:00-12:10

## ONF Workshop (Grand Ballroom B)

Moderator

Jimmy Ou, ONF Ambassador

### 09:10-09:40 ONF Projects Introduce

Jimmy Ou, ONF Ambassador

Brief: ONF, as one of the sharers in the field of SDN (Software Defined Network), has many network-related open source projects, including OpenFlow, CORD in early period and SEBA, Stratum and other projects in later period. The content of this topic will share with you the recent updates of ONF project.

### 09:40-10:10 China Unicom CORD Research and Practice

Wang Youxiang, Technical Director, China Unicom Network Research Institute

Brief: China Unicom is a member of the CORD project board of directors. It has led the establishment of the China CORD Industry Alliance and has been actively conducting relevant technical research. The speech shared the research results and application practices of China Unicom in MCORD and RCORD, and introduced the follow-up plans.

### 10:10-10:40 Intelligent Network Accelerates Cloud Computing Virtualization

Feng Gaofeng, Director, HPC and Technical Marketing, Mellanox

Brief: With the rapid growing cloud computing market, datacenters use more and more complex virtualization technologies, which brings lots of convenience for datacenters and customers, while also brings huge performance pressure for servers and networks. Many datacenters turn to look for smart NIC technologies to use hardware for virtual switch processing offload. This session will introduce how to use the most efficient hardware offload technologies from NIC side to accelerate the cloud datacenter performance.

### 10:40-11:10 Open Network from the Perspective of Cloud Native Scenario

Zhou Yongkai, Special Researcher, National Engineering Laboratory of Electronic Commerce and Electronic Payment, China UnionPay

Brief: With the rise of lightweight and efficient virtualization technology like containers and the popularity of micro-services, the cloud computing is moving in the direction of "Cloud Native". In order to adapt to this trend, the network also needs to be modified accordingly to support the large-scale elastic capacity and service self-healing characteristics of the cloud native platform. The open network technologies will be widely used in Cloud Native scenarios.

### 11:10-11:40 How ONF SEBA drives the Development of Broadband Network technology

Jianhao Chen, ONF A-team Member; Edgcore Sr.Engineer

Brief: In the transition of the Broadband Network, there are many questions about how to make the user experience better and reduce the cost of the carrier, and the flexible deployment of related technologies such as GPON, XGS-PON, EPON, etc. They are all technical problems that ONF cares about in the Broadband Network. The topic is to let you know how Cloud Native and SDN to solve your problems in Broadband Network and promote the development of MEC, so as to understand the small universe of multi-access edge computing.

### 11:40-12:10 Mobile CORD Overview and Update

Weiyu Chen, ONF CORD Ambassador

Brief: Starting from the concept of basic CORD framework, this speech will give a further introduction of the potential to solve the current challenges faced by operators. We will also illustrate the potential benefits of M-CORD framework through these challenges, and introduce the recent status of M-CORD project and the presentation of ONF M-CORD team in MWC Barcelona 2019.

09:00-11:55

## LF Edge Workshop (Grand Ballroom C)

Moderator

Jiang Xiaoyu, Technology and Engineering Group, Tencent

### 09:00-09:25 LF Edge Constructs the Edge Computing Open Source Ecology of the Interconnection of All Things

Wang Yachen, General Manager of Tencent Cloud Network; Board Member of LF Edge, Board Member of LoRa Alliance

Brief: Linux Foundation Edge international open source project aims to build an open and interoperable edge computing framework, independent of hardware, chip, cloud or operating system for Internet of Things, telecommunications, cloud and enterprise scenarios. Tencent develops an intelligent edge computing network platform for 5G and IoT scenarios, realizes efficient collaboration between network and business, and actively promotes open source.

**09:25-09:50 Lightweight Edge ELIOT - Enabling Edge Industry and Constructing Developer Ecology**

Gabriel Yu, Senior Project Manager, Huawei

Brief: Lightweight edge is an important part of the Internet of Things and cloud. It combines hardware and software stacks to reduce system redundancy and ensure that the system runs under millions or billions of services. Therefore, the system needs careful design and optimization. ELIOT is a lightweight edge solution based on open source components. In the first version, it shows how to build a lightweight edge stack of MVP and how to achieve continuous application delivery based on it. It also discusses how the project evolved and collaborates with the upstream edge project.

**09:50-10:15 Akraino Overview and Edge Use Cases**

Sun Xuan, Senior Software Engineer of Intel

**10:15-10:40 OpenEdge, The General Framework of Edge Computing**

Leding Li, Chief Architect of Baidu Cloud IoT

Brief: Share Baidu's concepts, technologies and future directions on edge computing infrastructure, including the basic introduction and core architecture of OpenEdge open source project, Cloud Native's landing on edge, and Baidu's intelligent edge and intelligent cloud collaboration technologies, methods and typical applications for computing intelligence.

**10:40-11:05 Joint Practice of China Mobile Edge Computing Platform Sigma Platform and Akraino**

Jia Xuan, Project Manager, Network & IT Technology Research Center of China Mobile Research Institute

Brief: Introduce the Sigma platform for China Mobile Edge Computing, with reference to Akraino KNI's BP, combined with China Mobile's understanding of edge computing, describes the development and practice of the platform.

**11:05-11:30 ARM at the Edge: the IEC Blueprint of Akraino Edge Stack and Related Work**

Trevor Tao, Staff Software Engineer, ARM

Brief: Akraino Edge Stack intends to develop a fully integrated edge infrastructure solution, and the project is completely focused towards Edge Computing. The Akraino Edge Stack Release 1(R1) was announced the availability which delivers the first iteration towards new levels of flexibility to scale edge cloud services quickly, maximize efficiency, and deliver high availability for deployed services. Integrated Edge Cloud(IEC) is an accepted blueprint of Akraino edge stack integration projects. This session would introduce the IEC reference edge stack and architecture, running platform, use cases and deployment and CI/CD in Arkaino lab. The technique used in IEC implementation, its working status and future work plan would also be introduced.

**11:30-11:55 Cognition of Edge Computing and Cloud Edge Collaborative Application Practice**

Shi Xiaohou, R&D Engineer, China Telecom Research Institute

Brief: Edge computing is a complement and extension of cloud computing, providing a better computing platform for the Internet of Things, large video, etc. Edge computing is developing like a raging fire. From bustling to landing, it is inseparable from the integration of cloud edges. Cloud edge collaboration will maximize the application value of edge computing and cloud computing.

**12:20-13:30**

**Lunch (3rd Floor Lane Restaurant, with meal coupon)**

**13:30-16:30**

**P4 & Stratum Developers Tutorial (Grand Ballroom A)**

Brief: At the beginning of SDN, OpenFlow was the most popular, but it was found that OpenFlow could not satisfy the requirements of software definition very well, especially in dealing with the package protocol which was not defined in OpenFlow specification. Therefore, the P4 language came into being, describing the internal processing mode of switch pipeline and structure through P4 language to make "software define network" become true. The main purpose of this course is to get familiar with how to describe pipeline in P4 language through basic operations and exercises, and compile the written P4 script into binary to set P4 target. In addition, it includes how to control P4 target through P4 Runtime using ONOS, and how to use P4 Runtime shell to set stream table items without controller. And it will also mention the future of Stratum' s internal set-up mechanism.

**Instructors** Jimmy Ou, ONF Ambassador  
Weiyu Chen, ONF CORD Ambassador  
Jianhao Chen, ONF A-team Member; Edgecore Sr.Engineer

**13:30-14:30 Basic Teaching of P4**

**14:30-15:30 Introduction and Operation of P4Runtime**

**15:30-16:30 Control P4Runtime Data Plane through ONOS**

## 13:30-16:00 StarlingX Tutorial (Grand Ballroom A)

Brief: StarlingX platform is a complete, highly reliable and scalable edge cloud software stack, which integrates new services with many other open source projects into a whole edge cloud software stack to build a flexible edge cloud infrastructure for edge computing, industrial Internet of Things and telecommunications applications. StarlingX utilizes several mature open source project components, including Ceph, OpenStack and Kubernetes, with new services such as configuration and fault management as supplement. As a complete open source software stack, StarlingX ensures compatibility with various open source components, and will support container cloud and distributed cloud, providing high security, low latency, high availability and easy maintenance solutions for edge applications.

**Instructors** Huang Shuquan, Director of 99 Cloud Technology  
Hu Wei, Senior Software Engineer of Intel  
Sun Xuan, Senior Software Engineer of Intel

**13:30-13:45 Project Introduction & Documentation on StarlingX**

**13:45-14:00 Vessel-type StarlingX with Install integration**

**14:00-16:00 Hands-on Activites: Explore the Features, Services, and Functions of the StarlingX Project**

**The End of NCDC**



# Pictures Gallery

## 1. Speakers

### Plenary Conference (June 20<sup>th</sup> AM)

#### Welcome Speech



Liu Dong, Chairman of Organizing Committee,  
Director of CFIEC

#### Keynote Speech



Bill Ren, Chief Open Source Liaison Officer, ICT  
Infrastructure Open Source GM, Huawei;  
Board Member of LFN and LF Edge



Wang Yachen, General Manager of Tencent Cloud  
Network; Board Member of LF Edge;  
Board Member of LoRa Alliance



Kevin Huang, Senior Director, SDN Solution  
Architect, New H3C Group



Wang Feng, Director of R&D Lab, China Telecom  
Beijing Research Institute



Tang Xiongyan, ONF Board Member; Chife Scientist,  
Network Technology Research Institute,  
China Unicom



**Moderator** Yue Zhou, CFIEC

## ONAP Workshop (June 20<sup>th</sup> PM)



Bill Ren, Chief Open Source Liaison Officer, ICT  
Infrastructure Open Source GM, Huawei;  
Board members of LFN and LF Edge



Yang Fuchuan, General Manager of Computer  
Business Second Division,  
Huazhang Branch of China Machine Press



Zeng Jianguo, Software Architect,  
Technology Planning in General Dev Dept,  
P&S Cloudify Network OSDT, Huawei



Cao Chang, Senior Export of Future Network  
Research Department of China Unicom Network  
Technology Research Institute and Director of  
Intelligent Network and New Technology Laboratory



Wang Chengli, Project Manager, China Mobile  
Research Institute



Wang Luman, Project Manager, China Telecom  
CTNet2025 Research Institute



Maopeng Zhang, MANO Senior Engineer, ZTE



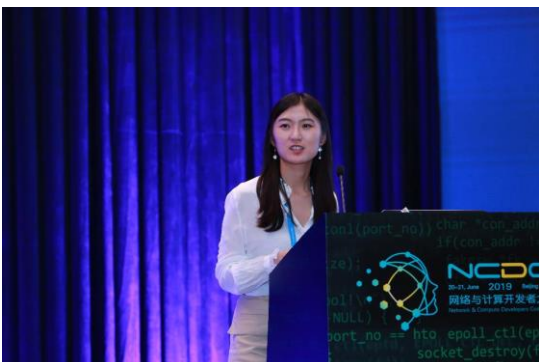
Bin Yang, ONAP MultiCloud PTL, Wind River



Zhou Jun, Project Manager of ONAP, Huawei.



Yang Guanzhi, OVP Project Manager, Huawei



Moderator Le Ma, CFIEC

## OpenStack Workshop (June 20<sup>th</sup> PM)



Li Haoyang, Manager of Chinese Community of OpenStack Foundation



Wang Zesheng, Engineer of China Electronics Standardization Institute



Feng Shengqin, Project Director of Openstack Zun; Senior Software Development Engineer of ZTE



Qiu Dayu, R&D Director of HUAYUN



Wang Bo, Senior Engineer of EasyStack



Wang Xu, Kata Containers Architecture Committee Member; Ant Financial Senior Staff Engineer



Tian Jun, Manager of Beijing Virtualization Group,  
Department of Intel System Software Platform



**Moderator** Ma Zhenqiang, China Community  
Ambassador of the OpenStack Foundation

## Tungsten Fabric Workshop (June 20<sup>th</sup> PM)



Sukhdev Kapur, Tungsten Fabric Technical Steering  
Committee Voting Member, Senior Engineer, Juniper



Raymond Lam, Tungsten Fabric Developer; Senior  
Systems Engineer, Juniper



Edward Ting, Tungsten Fabric Technical Steering  
Committee Voting Member; Senior Software  
Development Manager,Lenovo



**Moderator** Xinyi Zhang, CFIEC

## MEF Workshop (June 21<sup>st</sup> AM)



Shi Fan, MEF China WG/Chair ; Deputy Director, CTNET2025 Department , ChinaTelcom Corporation Limited Research Institute



Nie Shizhong, Director of SDN Technology R&D Team, CTNET2025 Department , ChinaTelcom Corporation Limited Research Institute



Zhang Shuai, SDN R&D Engineer of Future Network Research Department, Network Technology Research Institute, China Unicom



Huang Dun, System Architect of AD-NET Product Line of New H3C



Weiguo Hao, Huawei NCE Solution Architect



**Moderator** Shi Fan, MEF China WG/Chair ; Deputy Director, CTNET2025 Department , ChinaTelcom Corporation Limited Research Institute

## ONF Workshop (June 21<sup>st</sup> AM)



Jimmy Ou, ONF Ambassador



Wang Youxiang, Technical Director, Future Network Division, China Unicom Network Research Institute



Feng Gaofeng, Director, HPC and Technical Marketing, Mellanox



Zhou Yongkai, Special Researcher, National Engineering Laboratory of Electronic Commerce and Electronic Payment, China UnionPay



Jianhao Chen, ONF A-team Member; Edgecore Sr.Engineer



Wei-Yu Chen, ONF CORD Ambassador



**Moderator Jimmy Ou, ONF Ambassador**

## LF Edge Workshop (June 21<sup>st</sup> AM)



**Wang Yachen, General Manager of Tencent Cloud Network; Board Member of LF Edge, Board Member of LoRa Alliance**



**Gabriel Yu, Senior Project Manager, Huawei**



**Sun Xuan, Senior Software Engineer of Intel**



**Leding Li, Chief Architect of Baidu Cloud IoT**





**Jia Xuan**, Project Manager, Network & IT Technology  
Research Center of China Mobile Research Institute



**Trevor Tao**, Staff Software Engineer, ARM



**Shi Xiaohou**, R&D Engineer,  
China Telecom Research Institute



**Moderator Xiaoyu Jiang**, TEG, Tencent

## P4 & Stratum Developers Tutorial (June 21<sup>st</sup> PM)



**Instructor Jimmy Ou**, ONF Ambassador



**Instructor Wei-Yu Chen**, ONF CORD Ambassador



**Instructor** Jianhao Chen, ONF A-team Member;  
Edgecore Sr. Engineer

## StarlingX Tutorial (June 21<sup>st</sup> PM)



**Instructor** Huang Shuquan, Member of the  
Community Technical Steering Committee,  
Director of 99 Cloud Technology

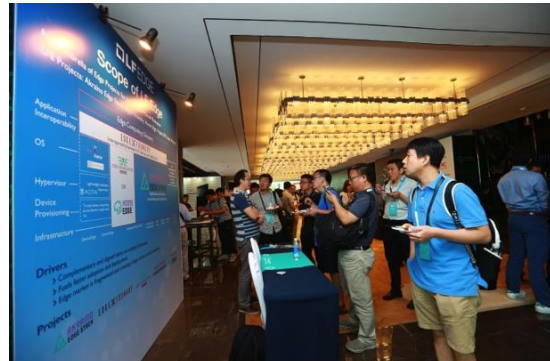


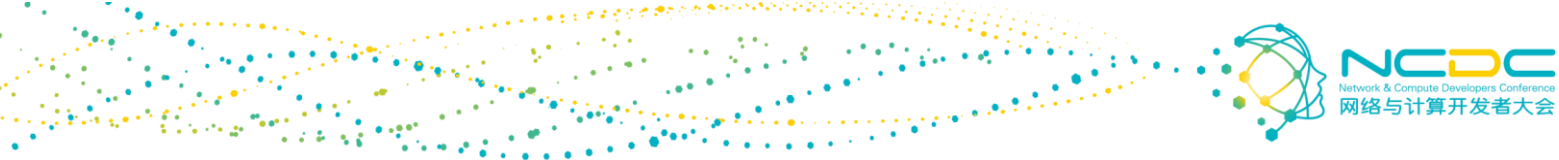
**Instructor** Hu Wei, Senior Software Engineer of Intel



**Instructor** Sun Xuan, Senior Software Engineer of  
Intel

## Conference Site





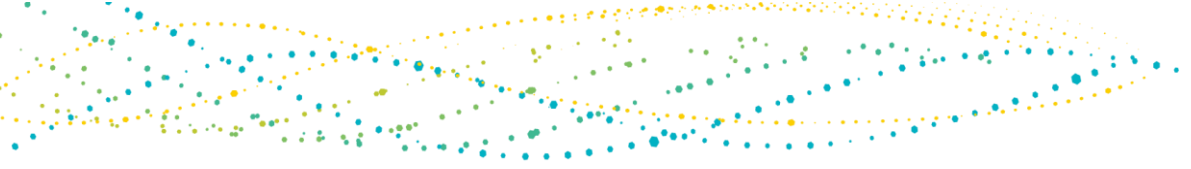
## Media Reports

The first “Network and Compute Developers Conference” closed successfully and gained strong support and full coverage from many media. CNIi, CommunicationsWorld, C114, SDNLAB, ZDNet, CCTime, CSDN, ChinaByte, eNet, IT168, baike.com, FromGeek.com, D1NET, China Webmaster, iResearch Global, PConline, Yesky.com, PCPOP.com, CIO Times, Yesky.com and many other industry media have presented this technology feast from different angles, different levels and all-round aspects on their websites and Wechat platforms. In the meeting, exploring the development of ecology and industry trend centered on developers has become the key points that the media focus on.

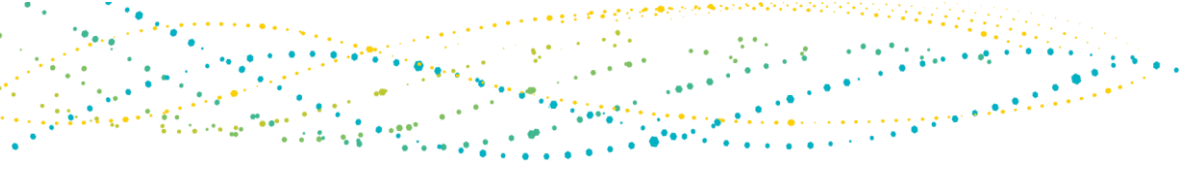
According to preliminary statistics, there are nearly 500 related reports on this conference. The key words of these reports cover developer ecology, the golden age of developers, ONAP, OpenStack, Tungsten Fabric, ONF, MEF, LF Edge, StarlingX, P4&Stratum and so on. Generally speaking, the media reports on this NCDC conference are extensive, impressed and fast. Dozens of vertical media follow up in the whole course to report. Not only the invited organizations and speakers were publicized extensively before the meeting, but also the grand event on the opening day of the conference was disseminated and spread in the first place, which aroused an impassioned response in the Internet and communication field and made the conference win a high degree of social attention at the first time it is held.

### 1. Online news reports (partial)

 鳳凰網 IFENG.COM	The Network & Compute Developers Conference was Successfully Held <a href="http://zmt.ifeng.com/manage/articlePreview?id=5d0c4c350184170001ef7d25">http://zmt.ifeng.com/manage/articlePreview?id=5d0c4c350184170001ef7d25</a>
	NCDC MEF Workshop to be Held in June in Beijing <a href="https://feng.ifeng.com/c/7mX1XflqB9L">https://feng.ifeng.com/c/7mX1XflqB9L</a>
 網易 NETEASE www.163.com	The Golden Era of Developers is Coming. Integration and Development Promote the Digital Transformation <a href="http://dy.163.com/v2/article/detail/EI6JBJGI05119N8K.html">http://dy.163.com/v2/article/detail/EI6JBJGI05119N8K.html</a>
 C114 www.c114.com.cn 中国通信网	The Golden Era of Developers is Coming. Integration and Development Promote the Digital Transformation <a href="http://m.c114.com.cn/w52-1090853.html">http://m.c114.com.cn/w52-1090853.html</a>



	<p>NCDC OpenStack to be Held in June in Beijing  <a href="http://www.c114.com.cn/expo/15/a1088408.html">http://www.c114.com.cn/expo/15/a1088408.html</a></p>
	<p>New Type of " Brain" of Next-Generation Network,          ONAP Workshop to be Held in Beijing  <a href="http://www.c114.com.cn/news/16/a1089561.html">http://www.c114.com.cn/news/16/a1089561.html</a></p>
	<p>Agenda Established! The Network &amp; Compute Developers Conference to Be Held  <a href="http://www.c114.com.cn/expo/15/a1090563.html">http://www.c114.com.cn/expo/15/a1090563.html</a></p>
	<p>The Network &amp; Compute Developers Conference was Successfully Held  <a href="http://www.enet.com.cn/article/2019/0621/A20190621943668.html">http://www.enet.com.cn/article/2019/0621/A20190621943668.html</a></p>
	<p>Agenda Established! The Network &amp; Compute Developers Conference To Be Held  <a href="http://www.enet.com.cn/article/2019/0618/A20190618865706.html">http://www.enet.com.cn/article/2019/0618/A20190618865706.html</a></p>
	<p>"Software Define Network" P4 &amp; Stratum Developers Tutorial          To Be Held in June in Beijing  <a href="http://www.enet.com.cn/article/2019/0603/A20190603065276.html">http://www.enet.com.cn/article/2019/0603/A20190603065276.html</a></p>
	<p>The Golden Era of Developers is Coming. Integration and Development Promote          the Digital Transformation  <a href="http://cloud.zhiding.cn/2019/0620/3118989.shtml">http://cloud.zhiding.cn/2019/0620/3118989.shtml</a></p>
	<p>Virtual Data Center CORD PlugFest To Be Held in June  <a href="http://cloud.zhiding.cn/2019/0522/3118176.shtml">http://cloud.zhiding.cn/2019/0522/3118176.shtml</a></p>
	<p>NCDC MEF Workshop To Be Held in June in Beijing  <a href="http://cloud.zhiding.cn/2019/0509/3117848.shtml">http://cloud.zhiding.cn/2019/0509/3117848.shtml</a></p>
	<p>The Golden Era of Developers is Coming. Integration and Development Promote          the Digital Transformation  <a href="https://www.sdnlab.com/23340.html">https://www.sdnlab.com/23340.html</a></p>
	<p>Agenda Established! The Network &amp; Compute Developers Conference to Be Held  <a href="https://www.sdnlab.com/23332.html">https://www.sdnlab.com/23332.html</a></p>
	<p>NCDC ONF Workshop to be Held by ONF,          Leader of Operator Open Source Solution, in Beijing in June  <a href="https://www.sdnlab.com/23293.html">https://www.sdnlab.com/23293.html</a></p>
	<p>The Golden Era of Developers is Coming. Integration and Development Promote          the Digital Transformation  <a href="http://www.cww.net.cn/article?id=453930">http://www.cww.net.cn/article?id=453930</a></p>
	<p>NCDC Countdown! Thorough Interpretation Network and Computing          Developers Feast  <a href="http://www.cww.net.cn/article?id=453624">http://www.cww.net.cn/article?id=453624</a></p>
	<p>NCDC ONF Workshop to be Held by ONF,          Leader of Operator Open Source Solution, in Beijing in June  <a href="http://www.cww.net.cn/article?id=452930">http://www.cww.net.cn/article?id=452930</a></p>
	<p>Global Network Technology and Compute Developer Reconvening  <a href="http://www.cww.net.cn/article?id=451799">http://www.cww.net.cn/article?id=451799</a></p>
	<p>The Golden Era of Developers is Coming. Integration and Development Promote          the Digital Transformation  <a href="http://www.fromgeek.com/it/247811.html">http://www.fromgeek.com/it/247811.html</a></p>
	<p>Agenda Established! The Network &amp; Compute Developers Conference to Be Held</p>



	<p><a href="http://www.fromgeek.com/media/247229.html">http://www.fromgeek.com/media/247229.html</a></p> <p>“Software Define Network” P4 &amp; Stratum Developers Tutorial To Be Held in June in Beijing  <a href="http://news.fromgeek.com/media/18819.html">http://news.fromgeek.com/media/18819.html</a></p> <p>NCDC OpenStack Workshop To Be Held in June in Beijing  <a href="http://news.fromgeek.com/media/18803.html">http://news.fromgeek.com/media/18803.html</a></p>
	<p>The Network &amp; Compute Developers Conference was Successfully Held  <a href="http://www.d1net.com/news/hyxg/558619.html">http://www.d1net.com/news/hyxg/558619.html</a></p> <p>Virtual Data Center CORD PlugFest To Be Held in June  <a href="http://www.d1net.com/news/hyxg/558107.html">http://www.d1net.com/news/hyxg/558107.html</a></p>
	<p>The Golden Era of Developers is Coming. Integration and Development Promote the Digital Transformation  <a href="http://www.cnii.com.cn/technology/2019-06/21/content_2172609.htm">http://www.cnii.com.cn/technology/2019-06/21/content_2172609.htm</a></p> <p>Agenda Established! The Network &amp; Compute Developers Conference to Be Held  <a href="http://www.cnii.com.cn/technology/2019-06/18/content_2171819.htm">http://www.cnii.com.cn/technology/2019-06/18/content_2171819.htm</a></p> <p>NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast  <a href="http://www.cnii.com.cn/technology/2019-06/13/content_2170996.htm">http://www.cnii.com.cn/technology/2019-06/13/content_2170996.htm</a></p> <p>NCDC ONF Workshop to be Held by ONF, Leader of Operator Open Source Solution, in Beijing in June  <a href="http://www.cnii.com.cn/technology/2019-06/03/content_2168880.htm">http://www.cnii.com.cn/technology/2019-06/03/content_2168880.htm</a></p> <p>NCDC OpenStack Workshop To Be Held in June in Beijing  <a href="http://www.cnii.com.cn/technology/2019-05/20/content_2165822.htm">http://www.cnii.com.cn/technology/2019-05/20/content_2165822.htm</a></p>
	<p>The Network &amp; Compute Developers Conference was Successfully Held  <a href="http://www.cctime.com/html/2019-6-20/1455751.htm">http://www.cctime.com/html/2019-6-20/1455751.htm</a></p> <p>Agenda Established! The Network &amp; Compute Developers Conference to Be Held  <a href="http://www.cctime.com/html/2019-6-18/1455035.htm">http://www.cctime.com/html/2019-6-18/1455035.htm</a></p> <p>NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast  <a href="http://www.cctime.com/html/2019-6-13/1454258.htm">http://www.cctime.com/html/2019-6-13/1454258.htm</a></p> <p>the Edge Computing Developers LF Edge Workshop To Be Held in June in Beijing  <a href="http://www.cctime.com/html/2019-6-10/1453495.htm">http://www.cctime.com/html/2019-6-10/1453495.htm</a></p> <p>China Virtual Data Center CORD PlugFest To Be Held in June  <a href="http://www.enet.com.cn/article/2019/0522/A20190522063865.html">http://www.enet.com.cn/article/2019/0522/A20190522063865.html</a></p> <p>NCDC MEF Workshop To Be Held in June in Beijing  <a href="http://www.enet.com.cn/article/2019/0509/A20190509063271.html">http://www.enet.com.cn/article/2019/0509/A20190509063271.html</a></p> <p>Global Network Technology and Compute Developer Reconvening  <a href="http://www.enet.com.cn/article/2019/0509/A20190509063271.html">http://www.enet.com.cn/article/2019/0509/A20190509063271.html</a></p>
	<p>NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast  <a href="https://www.csdn.net/article/a/2019-06-13/15975541">https://www.csdn.net/article/a/2019-06-13/15975541</a></p> <p>“Software Define Network” P4 &amp; Stratum Developers Tutorial To Be Held in June in Beijing  <a href="https://www.csdn.net/article/a/2019-06-04/15974997">https://www.csdn.net/article/a/2019-06-04/15974997</a></p>








	<p>NCDC OpenStack Workshop To Be Held in June in Beijing  <a href="https://www.csdn.net/article/a/2019-05-20/15943429">https://www.csdn.net/article/a/2019-05-20/15943429</a></p>
	<p>The Golden Era of Developers is Coming. Integration and Development Promote the Digital Transformation  <a href="https://network.pconline.com.cn/1269/12698988.html">https://network.pconline.com.cn/1269/12698988.html</a></p>
	<p>NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast  <a href="https://network.pconline.com.cn/1266/12664149.html">https://network.pconline.com.cn/1266/12664149.html</a></p>
	<p>The Network &amp; Compute Developers Conference was Successfully Held  <a href="http://hangyebk.baike.com/article-29908107.html">http://hangyebk.baike.com/article-29908107.html</a></p>
	<p>Agenda Established! The Network &amp; Compute Developers Conference to Be Held  <a href="http://hangyebk.baike.com/article-29905513.html">http://hangyebk.baike.com/article-29905513.html</a></p>
	<p>NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast  <a href="http://hangyebk.baike.com/article-29899373.html">http://hangyebk.baike.com/article-29899373.html</a></p>
	<p>China Virtual Data Center CORD PlugFest To Be Held in June  <a href="http://hangyebk.baike.com/article-29884809.html">http://hangyebk.baike.com/article-29884809.html</a></p>
	<p>NCDC MEF Workshop To Be Held in June in Beijing  <a href="http://hangyebk.baike.com/article-29868941.html">http://hangyebk.baike.com/article-29868941.html</a></p>
	<p>“Software Define Network” P4 &amp; Stratum Developers Tutorial To Be Held in June in Beijing  <a href="http://www.d1net.com/news/hyxcg/558334.html">http://www.d1net.com/news/hyxcg/558334.html</a></p>
	<p>Global Network Technology and Compute Developer Reconvening  <a href="http://www.cnii.com.cn/technology/2019-05/08/content_2163028.htm">http://www.cnii.com.cn/technology/2019-05/08/content_2163028.htm</a></p>
	<p>the Edge Computing Developers LF Edge Workshop To Be Held in June in Beijing  <a href="http://www.pcpop.com/article/5217618.shtml">http://www.pcpop.com/article/5217618.shtml</a></p>
	<p>New Type of “ Brain” of Next-Generation Network, ONAP Workshop to be Held in Beijing  <a href="http://www.pcpop.com/article/5215157.shtml">http://www.pcpop.com/article/5215157.shtml</a></p>
	<p>The Edge Cloud Software Stack Project StarlingX Workshop To Be Held in June in Beijing  <a href="http://www.pcpop.com/article/5207359.shtml">http://www.pcpop.com/article/5207359.shtml</a></p>
	<p>NCDC OpenStack Workshop To Be Held in June in Beijing  <a href="http://www.pcpop.com/article/5204377.shtml">http://www.pcpop.com/article/5204377.shtml</a></p>
	<p>New Type of “ Brain” of Next-Generation Network, ONAP Workshop to be Held in Beijing  <a href="http://news.iresearch.cn/yx/2019/06/292267.shtml">http://news.iresearch.cn/yx/2019/06/292267.shtml</a></p>
	<p>The Edge Cloud Software Stack Project StarlingX Workshop To Be Held in June in Beijing  <a href="http://news.iresearch.cn/yx/2019/05/291212.shtml">http://news.iresearch.cn/yx/2019/05/291212.shtml</a></p>
	<p>NCDC OpenStack Workshop To Be Held in June in Beijing  <a href="http://news.iresearch.cn/yx/2019/05/290785.shtml">http://news.iresearch.cn/yx/2019/05/290785.shtml</a></p>

	Global Network Technology and Compute Developer Reconvening <a href="http://news.iresearch.cn/yx/2019/05/289729.shtml">http://news.iresearch.cn/yx/2019/05/289729.shtml</a>
	Virtual Data Center CORD PlugFest To Be Held in June <a href="http://www.enet.com.cn/article/2019/0522/A20190522063865.html">http://www.enet.com.cn/article/2019/0522/A20190522063865.html</a>
	NCDC MEF Workshop To Be Held in June in Beijing <a href="http://www.enet.com.cn/article/2019/0509/A20190509063271.html">http://www.enet.com.cn/article/2019/0509/A20190509063271.html</a>
	Global Network Technology and Compute Developer Reconvening <a href="http://www.enet.com.cn/article/2019/0509/A20190509063271.html">http://www.enet.com.cn/article/2019/0509/A20190509063271.html</a>
	The Network & Compute Developers Conference was Successfully Held <a href="http://news.idcquan.com/scqb/165558.shtml">http://news.idcquan.com/scqb/165558.shtml</a>
	Agenda Established! The Network & Compute Developers Conference to Be Held <a href="http://news.idcquan.com/scqb/165252.shtml">http://news.idcquan.com/scqb/165252.shtml</a>
	"Software Define Network" P4 & Stratum Developers Tutorial To Be Held in June in Beijing <a href="http://news.idcquan.com/scqb/164517.shtml">http://news.idcquan.com/scqb/164517.shtml</a>
	The Golden Era of Developers is Coming. Integration and Development Promote the Digital Transformation <a href="http://www.elecfans.com/iot/961265.html">http://www.elecfans.com/iot/961265.html</a>
	NCDC ONF Workshop to be Held by ONF, Leader of Operator Open Source Solution, in Beijing in June <a href="http://www.elecfans.com/iot/951368.html">http://www.elecfans.com/iot/951368.html</a>
	NCDC MEF Workshop To Be Held in June in Beijing <a href="http://www.elecfans.com/application/Communication/932225.html">http://www.elecfans.com/application/Communication/932225.html</a>
	The Golden Era of Developers is Coming. Integration and Development Promote the Digital Transformation <a href="http://www.ciotimes.com/IT/175885.html">http://www.ciotimes.com/IT/175885.html</a>
	NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast <a href="http://www.ciotimes.com/IT/175353.html">http://www.ciotimes.com/IT/175353.html</a>
	The Network & Compute Developers Conference was Successfully Held <a href="http://www.chinaz.com/news/mt/2019/0621/1025821.shtml">http://www.chinaz.com/news/mt/2019/0621/1025821.shtml</a>
	Agenda Established! The Network & Compute Developers Conference to Be Held <a href="http://www.chinaz.com/news/mt/2019/0618/1024766.shtml">http://www.chinaz.com/news/mt/2019/0618/1024766.shtml</a>
	NCDC Countdown! Thorough Interpretation Network and Computing Developers Feast <a href="http://www.chinaz.com/news/mt/2019/0611/1023106.shtml">http://www.chinaz.com/news/mt/2019/0611/1023106.shtml</a>
	NCDC Tungsten Fabric Workshop To Be Held in June in Beijing, Focuses on 5G Network Edge Cloud <a href="http://www.chinaz.com/news/mt/2019/0514/1016312.shtml">http://www.chinaz.com/news/mt/2019/0514/1016312.shtml</a>
	The Edge Cloud Software Stack Project StarlingX Workshop To Be Held in June in Beijing <a href="http://news.yesky.com/hotnews/377/751357377.shtml">http://news.yesky.com/hotnews/377/751357377.shtml</a>





	<p>NCDC Tungsten Fabric Workshop To Be Held in June in Beijing, Focuses on 5G Network Edge Cloud <a href="http://news.yesky.com/hotnews/380/538619380.shtml">http://news.yesky.com/hotnews/380/538619380.shtml</a></p>
	<p>NCDC MEF Workshop To Be Held in June in Beijing <a href="http://news.yesky.com/hotnews/46/394424546.shtml">http://news.yesky.com/hotnews/46/394424546.shtml</a></p>
	<p>New Type of " Brain" of Next-Generation Network, ONAP Workshop to be Held in Beijing <a href="http://telecom.chinabyte.com/233/14617733.shtml">http://telecom.chinabyte.com/233/14617733.shtml</a></p>
	<p>The Edge Cloud Software Stack Project StarlingX Workshop To Be Held in June in Beijing <a href="http://telecom.chinabyte.com/213/14615713.shtml">http://telecom.chinabyte.com/213/14615713.shtml</a></p>
	<p>NCDC OpenStack Workshop To Be Held in June in Beijing <a href="http://telecom.chinabyte.com/290/14614790.shtml">http://telecom.chinabyte.com/290/14614790.shtml</a></p>
	<p>NCDC Tungsten Fabric Workshop To Be Held in June in Beijing, Focuses on 5G Network Edge Cloud <a href="http://telecom.chinabyte.com/225/14613725.shtml">http://telecom.chinabyte.com/225/14613725.shtml</a></p>
	<p>NCDC MEF Workshop To Be Held in June in Beijing <a href="http://telecom.chinabyte.com/348/14612848.shtml">http://telecom.chinabyte.com/348/14612848.shtml</a></p>
	<p>Global Network Technology and Compute Developer Reconvening <a href="http://telecom.chinabyte.com/113/14612613.shtml">http://telecom.chinabyte.com/113/14612613.shtml</a></p>
	<p>the Edge Computing Developers LF Edge Workshop To Be Held in June in Beijing <a href="http://software.it168.com/a2019/0606/5215/000005215752.shtml">http://software.it168.com/a2019/0606/5215/000005215752.shtml</a></p>
	<p>New Type of " Brain" of Next-Generation Network, ONAP Workshop to be Held in Beijing <a href="http://software.it168.com/a2019/0605/5215/000005215167.shtml">http://software.it168.com/a2019/0605/5215/000005215167.shtml</a></p>
	<p>NCDC ONF Workshop to be Held by ONF, Leader of Operator Open Source Solution, in Beijing in June <a href="http://tech.it168.com/a2019/0604/5170/000005170056.shtml">http://tech.it168.com/a2019/0604/5170/000005170056.shtml</a></p>
	<p>NCDC OpenStack Workshop To Be Held in June in Beijing <a href="http://cloud.it168.com/a2019/0520/5169/000005169827.shtml">http://cloud.it168.com/a2019/0520/5169/000005169827.shtml</a></p>
	<p>New Type of " Brain" of Next-Generation Network, ONAP Workshop to be Held in Beijing <a href="http://www.cctime.com/html/2019-6-5/1452995.htm">http://www.cctime.com/html/2019-6-5/1452995.htm</a></p>
	<p>"Software Define Network" P4 &amp; Stratum Developers Tutorial To Be Held in June in Beijing <a href="http://www.cctime.com/html/2019-6-4/1452823.htm">http://www.cctime.com/html/2019-6-4/1452823.htm</a></p>
	<p>NCDC OpenStack Workshop to be Held in Beijing in June <a href="http://www.cctime.com/html/2019-5-22/1450243.htm">http://www.cctime.com/html/2019-5-22/1450243.htm</a></p>
	<p>Global Network Technology and Compute Developer Reconvening <a href="http://www.cctime.com/html/2019-5-8/1447457.htm">http://www.cctime.com/html/2019-5-8/1447457.htm</a></p>

	<p>the Edge Computing Developers LF Edge Workshop To Be Held in June in Beijing <a href="http://www.ccidnet.com/2019/0610/10470035.shtml">http://www.ccidnet.com/2019/0610/10470035.shtml</a></p>
	<p>NCDC Tungsten Fabric Workshop To Be Held in June in Beijing, Focuses on 5G Network Edge Cloud <a href="http://www.pcpop.com/article/5200819.shtml">http://www.pcpop.com/article/5200819.shtml</a></p>
	<p>NCDC MEF Workshop To Be Held in June in Beijing <a href="http://www.pcpop.com/article/5198081.shtml">http://www.pcpop.com/article/5198081.shtml</a></p>
	<p>Global Network Technology and Compute Developer Reconvening <a href="http://www.pcpop.com/article/5197644.shtml">http://www.pcpop.com/article/5197644.shtml</a></p>
	<p>Global Network Technology and Compute Developer Reconvening <a href="http://mini.eastday.com/a/190508095112220-2.html">http://mini.eastday.com/a/190508095112220-2.html</a></p>
	<p>the Edge Computing Developers LF Edge Workshop To Be Held in June in Beijing <a href="http://science.china.com.cn/2019-06/06/content_40778855.htm">http://science.china.com.cn/2019-06/06/content_40778855.htm</a></p>
	<p>NCDC Tungsten Fabric Workshop To Be Held in June in Beijing, Focuses on 5G Network Edge Cloud <a href="https://m.tech.china.com/kuai/2019/0515/290057.html">https://m.tech.china.com/kuai/2019/0515/290057.html</a></p>

## 2. We-Media reports (partial)

### NCDC大会倒计时 全景解读网络与计算开发者盛宴

大数据 1周前



6月20日-21日，备受业界关注的“NCDC网络与计算开发者大会”即将盛大亮相。在为期两天的时间内，大会将网罗全球热点网络与计算项目，通过“1场主论坛+一次大咖对话+6场开发者论坛+2场开发者训练营”，探讨开发生态与未来。这将是一场干货十足的开发者盛会。

这场盛会聚集了全球最热门的开源社区及开发者项目：Linux基金会、OpenStack基金会、ONF开放网络基金会、MEF、ONAP、Tungsten Fabric、LF Edge、P4、Stratum、StarlingX.....赚足你的眼球！

### StarlingX开发者训练营——解锁边缘计算技能

StarlingX StarlingX 今天



在上周NCDC网络与计算开发者大会上，由OpenStack基金会特别发起的“StarlingX开发者训练营”项目成为整个大会的焦点。来自各个企业的开发者在四个小时里高效密集地体验了这项技术。通过系统培训和实操性练习，短时间内让开发者们掌握了基于StarlingX的相关技能。在此次StarlingX开发者训练营中，就“如何安装StarlingX”、“OpenStack如何在Kubernetes上运作”、“如何使用StarlingX服务和组件”、“如何管理CPU，内存，大页面等的进销存”、“主机生命周期管理”、“通过故障管理服务查询自定义警

### NCDC网络与计算开发者大会的内容都在这里了

中国云报 6天前

在“网络软件化”（Network Softwarization）蓬勃发展的趋势之下，网络与计算基础架构的设计及运营方式正在发生改变，开发将成为关键词，驱动并引领未来互联网的发展方向。2019年6月20日-21日，全球首个网络与计算领域开发者大会NCDC网络与计算开发者大会（[www.theNCDC.com](http://www.theNCDC.com)）将在北京维景国际大酒店举行。

在这次NCDC大会上，主办方下一代互联网国家工程中心将联合包括Linux基金会、OpenStack基金会、ONF、MEF、ONAP、Tungsten Fabric、LF Edge、P4、Stratum、StarlingX在内的全球网络及计算领域国际组织、开发社群、开源项目，在2天的时间内，通过主题演讲、遇见大咖、开发者论坛、开发者训练营等众多环节，为开发者打造一场有内容、有参与、有

## 限量网络与计算开发者大会 (NCDC) 免费门票, 还有定制背包拿哟

中国云报 6月4日

▼ 更多精彩推荐, 请关注我们 ▼

2019年6月20-21日, 下一代互联网国家工程中心将联合全球网络及计算领域国际组织、开发社群、开源项目, 共同举办首届“网络与计算开发者大会”(Network & Compute Developers Conference, 简称NCDC)。

NCDC大会为期2天, 有内容、有深度、有意思、有态度。“主题演讲”汇聚多个国际项目负责人, 聚焦行业热点, 畅谈网络和计算的发展趋势, 并着眼广大开发者, 分析网络软件化趋势下的开发者现状、贡献和回报, 深入阐释何谓“开发者的黄金时代”。

“开发者论坛”网罗全球热点网络与计算领域

## OpenStack Meetup聚焦: 容器基础设施技术的整合与发展

OpenStack 4天前



本年度第二季的OpenStack Meetup北京站活动6月20日落下帷幕。本季度, OpenStack社区与下一代互联网国家工程中心联合协作, 依托首届网络与计算开发者大会(Network & Compute Developers Conference)平台, 围绕着面向容器的基础设施技术的整合与发展, 进行了一个下午的技术专题分享。

6月20日下午, OpenStack基金会StarlingX社区经理Ildiko女士、OpenStack基金会中国社区经理李昊阳先生、中国开源云联盟常务副秘书长杨丽蕴女士出席了本年度第二季OpenStack社区Meetup北京站暨OpenStack开发者论坛活动现场。会上, 中国开源云联盟常务副秘书长杨丽蕴女士

## OpenStack Meetup@Beijing Update

OpenStack 1周前



### 社区朋友们:

大家好! 2019 OpenStack社区Meetup北京站将于本月20日下午开幕, 本次活动邀请到了OpenStack基金会StarlingX社区经理Ildiko女士、OpenStack基金会中国社区经理李昊阳先生、中国开源云联盟常务副秘书长杨丽蕴女士参加, 也邀请到了中国电子技术标准化研究院、中兴、华云、EasyStack、蚂蚁金服和英特尔众多技术大咖分享容器技术干货, 如果大家有兴趣与基金会的朋友们现场交流, 欢迎报名参加。

## “NCDC网络与计算开发者大会”成功举办 开发者生态成热点

下一代互联网工程中心 5天前

随着数字时代的来临, 互联网规模持续扩大, 应运而生的网络功能虚拟化(NFV)、软件定义网络(SDN)、边缘计算、云等各种新兴网络技术更是层出不穷, 网络与计算基础设施的设计及运营方式正在悄然改变。软件化、开发者、生态等成为新时代的关键词, 开放、开源成为主流, 新的产业变革正向我们走来。

2019年6月20日-21日, 由下一代互联网国家工程中心主办的“NCDC网络与计算开发者大会”在北京成功举行。大会涵盖网络与计算领域最新热点话题, ONAP、OpenStack、Tungsten Fabric、ONF、MEF、LF Edge、StarlingX、P4&Stratum等开发者论坛及开发者训练营相继开展, 聚焦多元化的开发者生态, 与数百位开发者一道, 共享一场网络与计算技术盛宴。



## 2019 StarlingX开发者训练营开 启报名

StarlingX StarlingX 6月6日

### 关于本次训练营活动

StarlingX平台是一个完整、高可靠、可扩展的边缘云软件堆栈, 它将新服务与许多其他开源项目结合到一个整体边缘云软件堆栈中, 为边缘计算、工业物联网和电信应用构建一个有弹性的边缘云基础设施。2018年10月, OpenStack社区发布了StarlingX首个版本, 目前StarlingX已经具备了完整的边缘基础设施的部署与管理功能。StarlingX利用了包括Ceph、OpenStack和Kubernetes在内的多个成熟开源项目组件, 并用诸如配置和故障管理之类的新服务加以补充。作为一个完整开源的软件堆栈, StarlingX确保了和各种开源组件之间的兼容性, 并将实现对容器云、分布式云的支持, 为边缘应用提供了高安全性、低时延、高可用性、易维护的解决方案。目前, 英特尔、风河、九州云、中国银联、中国联通和烽火等多家国内外公司都参与到StarlingX的社区贡献中, 并且持续对StarlingX进行测试验证与优化。StarlingX作为OpenStack基金会的四个主

## NCDC大会倒计时 全景解读网络与计算开发者盛宴

百格活动 百格活动 1周前

6月20日-21日, 备受业界关注的“NCDC网络与计算开发者大会”即将盛大亮相。在为期两天的时间内, 大会将网罗全球热点网络与计算项目, 通过“1场主论坛+一次大咖对话+6场开发者论坛+2场开发者训练营”, 探讨开发生态与未来。这将是一场干货十足的开发者盛会。

这场盛会聚集了全球最热门的开源社区及开发者项目: Linux基金会、OpenStack基金会、ONF开放网络基金会、MEF、ONAP、Tungsten Fabric、LF Edge、P4、Stratum、StarlingX.....赚足你的眼球!

*For more media reports please search for "NCDC-Network & Compute Developers Conference" on your search engine.*

```
int nfds = epoll_wait(epfd, events, MAX_EVENTS, 3000);
roller[i].addr); if(nfds > 0) {
for(i = 0; i < nfds; i++) {
ess: %s", controller[i].addr
fd = events[i].data.fd; pport = pport->next;
fksw_conn* ofconn = get_ofconn_from_sockfd(fd);
if(ofconn != NULL){
size_t alignment, size_t size){
port.port_no == htonl(port_no) char *con_addr = get_controller_from_sockfd(fd);
NULL; if(con_addr != NULL)
(&p, alignment, size);
fakesw *fk = (fakesw *)ofconn->self_p;
ofconn->sock_fd = 0;
sync_fetch_and_add(&n_disconnected, 1);
create memory pool!\n");
if(pport->next != NULL) {
port.port_no == htonl(port_no)
socket_destroy(fd);
if(NULL == fksw_mempool){
while(pport->next != N
sizeof(fksw_con
mempool_create(24)if(pport->port po
likely(events[
IN)) {
pport = pport->ne
size_t alignment, size_t size){
parse
port(fakesw* fksw, int port){
void
pport = fksw->pports;
last_pport = NULL;
!= NULL){
p =
if(pport->port, port_no == htonl(port)) if(N
void
mempool_destroy(mempool_t *pool){
if(last_pport != NULL){
last_pport->next = pport->next;
fksw->n_ports--;
} else {
uint16_t fksw_no;
int i, j;
topo_mod = topo;
int error = NO
for(i = 0; i < n_fake
fksw_peer *peer =
peer = fake
master_id =
while(peer != NULL)
pport =
fakesw_port;
error = send_port_status
if(error
OFsuite syslog(LV_WARN
peer = peer->next;
peer
while (!ON_EXIT) {
if(pport->port.port_no == htonl(port_no))
return NULL;
if(module_log[LOG_DEBUG] && SWITCHO
int no_delay = 1;
pport = add_fakesw_port(fake_s
PR_ADD);
for(i = 0; i < nfds; i++) {
int so_sndbuf = 1024000;
error = send_port sta
fd = events[i].data.fd;
int so_rcvbuf = 1024000;
fake_sw = (fakesw*
fksw_conn* ofconn = get_ofconn_from_sockfd(fd);
fake_sw[fksw_no]
fake_sw[fksw_no]
if(unlikely(events[i].events & EPOLLRDHUP))
for(i = 0; i <
int error = NO_ERROR; char *con_addr = get_controller_from_sockfd(fd);
uint16_t
if(con_addr != NULL){
controller*(n_auxiliary+1) fakesw *fk = (fakesw *)ofconn->self_p;
ofconn->sock_fd = 0;
sync_fetch_and_add(&n_disconnected, 1);
OFsuite syslog(LV_INFO, "OFsuit
```



TEL: 8610-56381692

Email: info@conference.cn