Boutique Network, Global Uniform Service

Services promote the improvement of SDN Technology

Aofei Data NaaS Solution

Practice of Intelligent Network Construction

Alex Yang

Aofei Data COO

Agenda

1 2 3 4

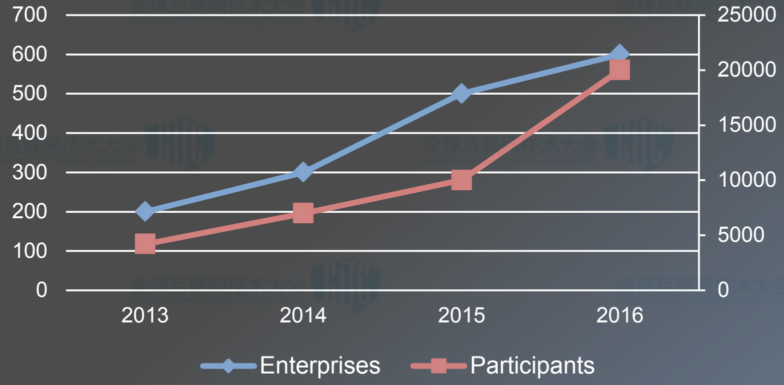
- Intention of Participating GITC 2016
- Boutique Network, Global Uniform Service
- Introduction of Aofei International Business
- Blessings and Expectations

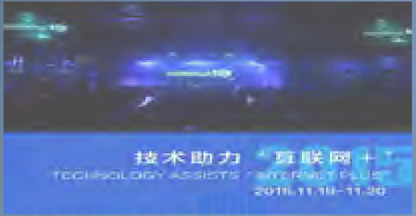
全球互联网技术大会

① Intention of Participating GITC 2016

Intention of Participating

Participating situation




技术助力“互联网+”
TECHNOLOGY ASSISTS

- Meet Industry Elites
- Broaden Technical Communication
- Reinforce Business Cooperation
- Propagate Industry Development

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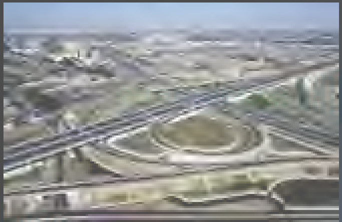
② Boutique Network, Uniform Service

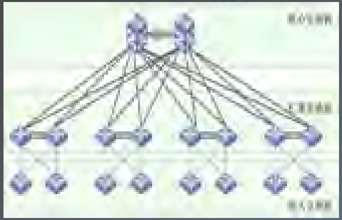
Boutique Network, Uniform Service

Urban traffic and SDN

Road Planning → Urban Expressway → BRT → Intelligent Transportation



Network Planning → Expansion → QoS/SLA → Initial SDN



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Boutique Network, Uniform Service

Urban traffic and SDN

Which is Driver's Best Path? Optional Paths, Road Situation, Choice Cost…

5公里
30
31
34
天河路 - 环市东路 - 内环路

Advantages +

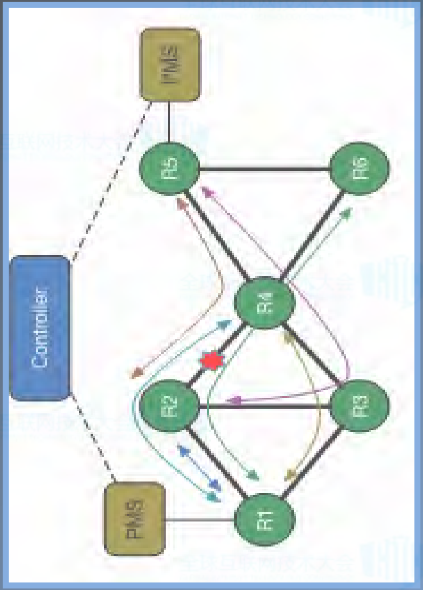
Centralized Control

Differentiated Services

User Defined

Path Visibility

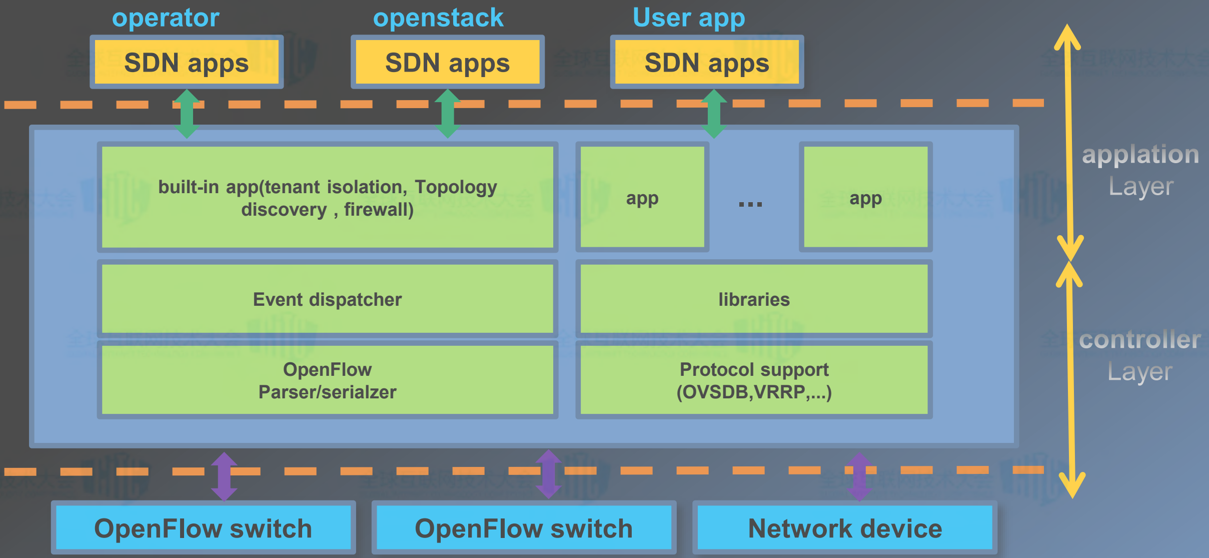
Dynamic Perception


PMS
Controller
R5
R6
R4
R2
R3
R1
PMS

Which is Packet's Best Path? Optional Paths, Traffic Situation, Choice Cost…

Boutique Network, Uniform Service

Definition of SDN

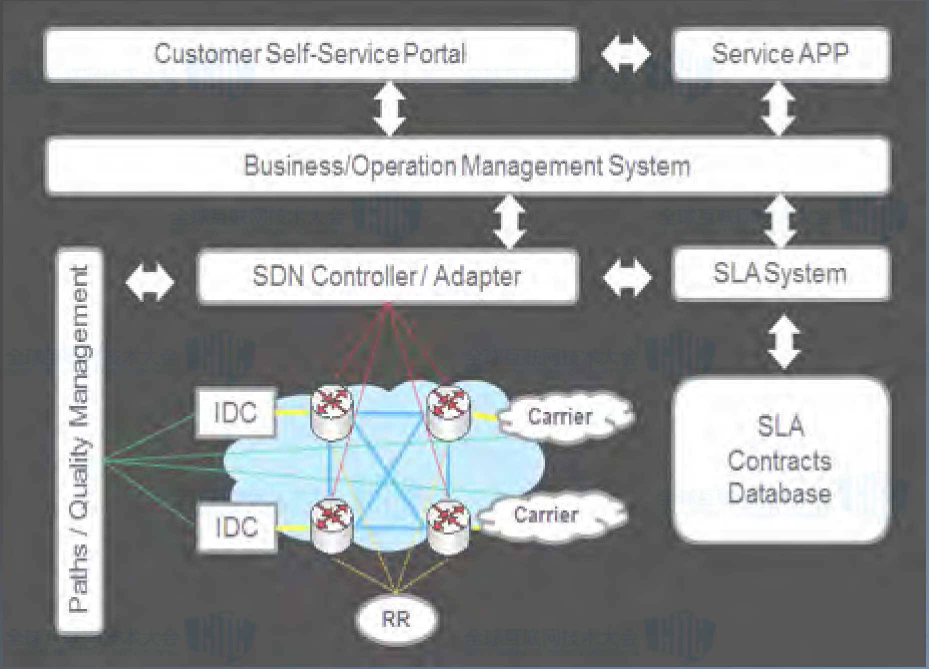

operator
openstack
User app
SDN apps
SDN apps
SDN apps
built-in app(tenant isolation, Topology discovery , firewall)
app
…
app
Event dispatcher
libraries
OpenFlow Parser/serialzer
Protocol support (OVSDB,VRRP,...)
OpenFlow switch
OpenFlow switch
Network device
applation Layer
controller Layer

- Open programmable API – Agile
- Central management
- Programmatic configuration
- Open standards-based and vendor-neutral

Boutique Network, Uniform Service

SDN Service Architecture

According to different business models, Aofei domestic and international network use different intelligent network scheduling technologies, meeting diverse needs of business.


Customer Self-Service Portal
Service APP
Business/Operation Management System
Paths / Quality Management
SDN Controller / Adapter
SLA System
IDC
IDC
Carrier
Carrier
SLA Contracts Database
RR

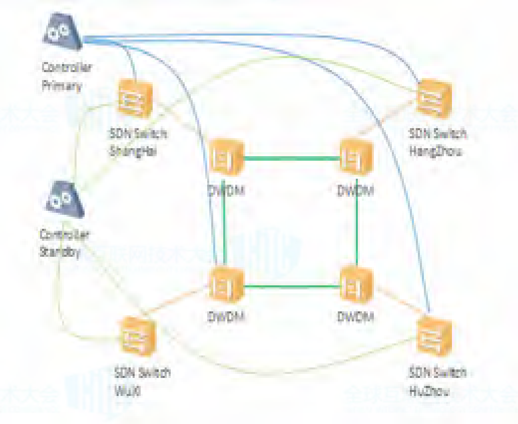
- Centralized Control
- Service Association
- Traffic Models
- EC form Service
- Transparent Service
- Process Scheduling
- Future Characteristics

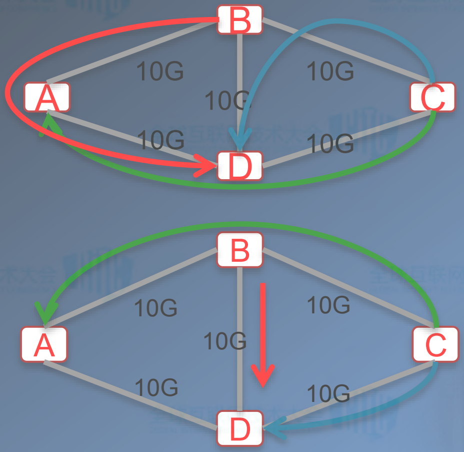
Boutique Network, Uniform Service

Domestic traffic scheduling

Design Concept

- Allow customers to use network services like electricity or water.
- Service/Software definition WAN, open and close Wan Service.
- Electric Commerce Portal, customers self tuning bandwidth and QoS.
- Centralized algorithm control, global traffic optimal scheduling.


Controller Primary
SDN Switch ShangHai
SDN Switch HangZhou
DWDM
DWDM
Controller Standby
DWDM
DWDM
SDN Switch WuXi
SDN Switch HuZhou


B
A
C
D
10G
10G
10G
10G
10G
B
A
C
D
10G
10G
10G
10G
10G

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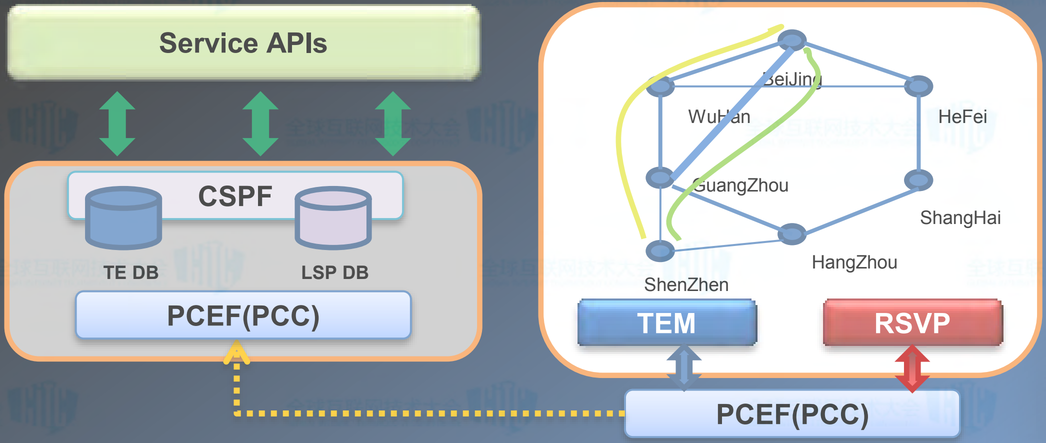
Boutique Network, Uniform Service

Network architecture algorithm

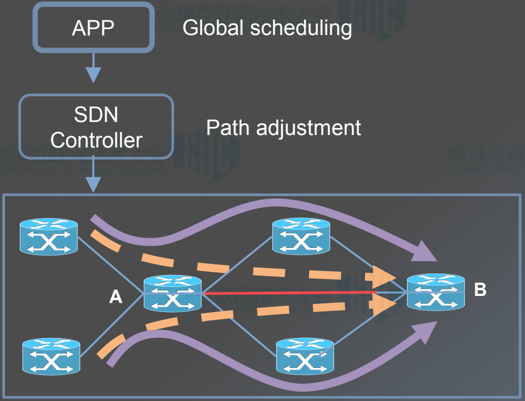
- PM sends traffic information collection to probe system according to the user configuration cycle and strategy.
- SNMP collects of tunnel traffic from PCC, and calculates the bandwidth utilization of the links.
- PM summaries and presents the traffic information report from probe system based on user strategy.
- Optimized information sent to the tunnels to meet the optimum conditions.
- AC calculates the optimized path according to the optimization information from PM.
- PCC sets up the accurate path based on the AC path results, using RSVP-TE protocol.
- After establishment of the new LSP, traffic is switched to a new LSP and former LSP is deleted.

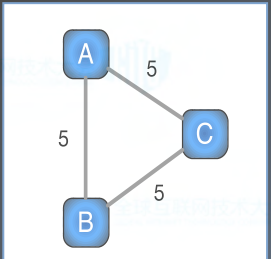

Service APIs
CSPF
TE DB
LSP DB
PCEF(PCC)
BeiJing
WuHan
HeFei
GuangZhou
ShangHai
HangZhou
ShenZhen
TEM
RSVP
PCEF(PCC)

Boutique Network, Uniform Service

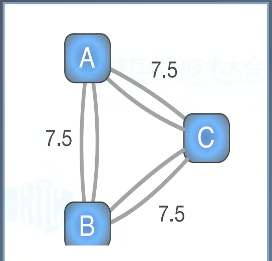
Network architecture algorithm

- Network architecture centralized optimization design to enhance the utilization rate.

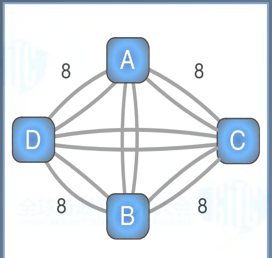

APP
Global scheduling
SDN Controller
Path adjustment
A
B



Utilization ratio 50%

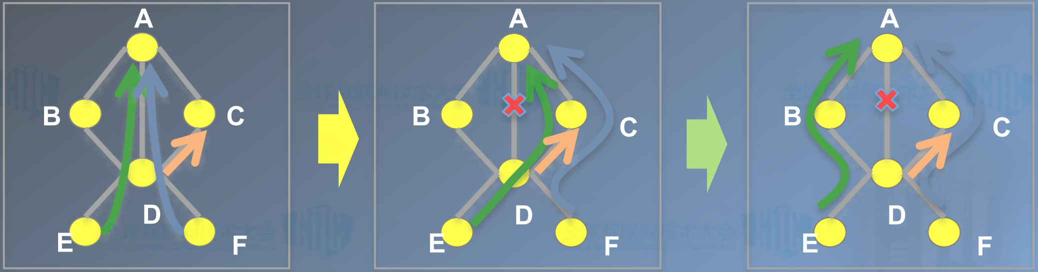


Utilization ratio 75%



Utilization ratio 80%

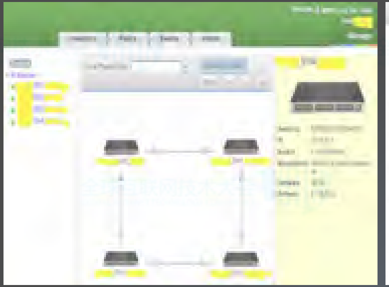
- Limitation for network device path algorithm, Solution by global control.

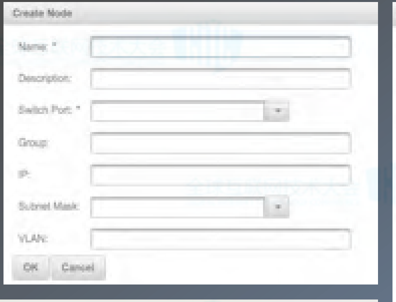

A
B
C
D
E
F
A
B
C
D
E
F
A
B
C
D
E
F

Boutique Network, Uniform Service

Domestic traffic scheduling

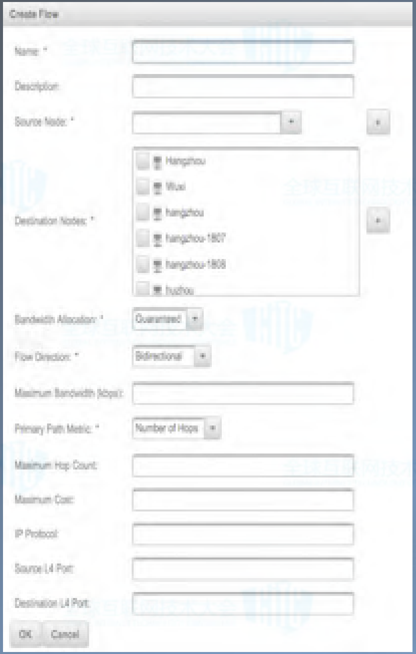
- Automatic discovery of network topology
- Rapid launch of new business
- Business centralized control
- Business automatic protection
- Controller redundancy protection
- Open API interface





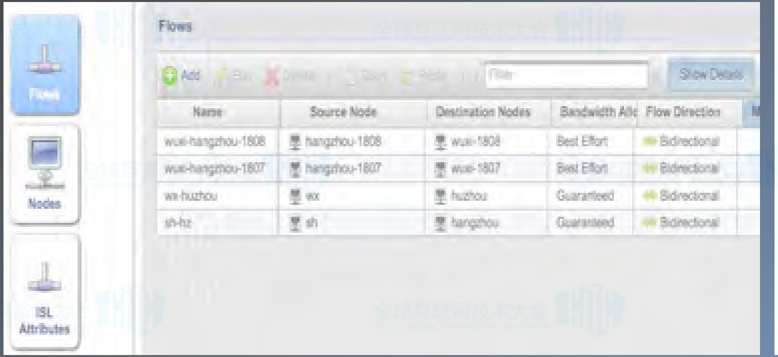
Create Node

Name: *
Description:
Switch Port: *
Group:
IP:
Subnet Mask:
VLAN:



Create Flow

Name: *
Description:
Source Node: *
Destination Nodes: *
☐ Hangzhou
☐ Wuxi
☐ hangzhou
☐ hangzhou-1807
☐ hangzhou-1808
☐ huzhou
Bandwidth Allocation: * Guaranteed
Flow Direction: * Bidirectional
Maximum Bandwidth (kbps):
Primary Path Metric: * Number of Hops
Maximum Hop Count:
Maximum Cost:
IP Protocol:
Source L4 Port:
Destination L4 Port:



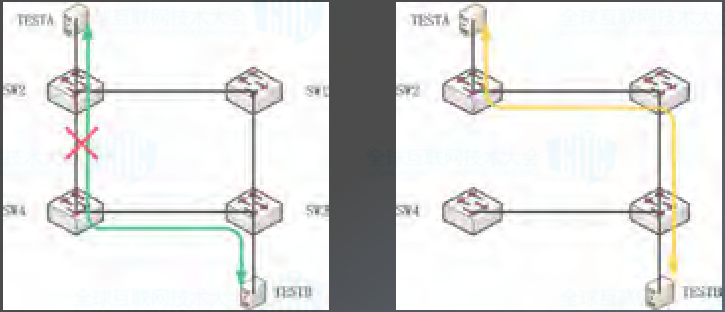
Flows

Name	Source Node	Destination Nodes	Bandwidth Allc	Flow Direction
wuxi-hangzhou-1808	hangzhou-1808	wuxi-1808	Best Effort	Bidirectional
wuxi-hangzhou-1807	hangzhou-1807	wuxi-1807	Best Effort	Bidirectional
wx-huzhou	wx	huzhou	Guaranteed	Bidirectional
sh-hz	sh	hangzhou	Guaranteed	Bidirectional

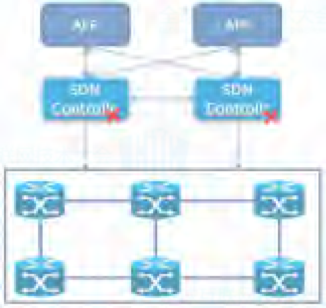
Boutique Network, Uniform Service

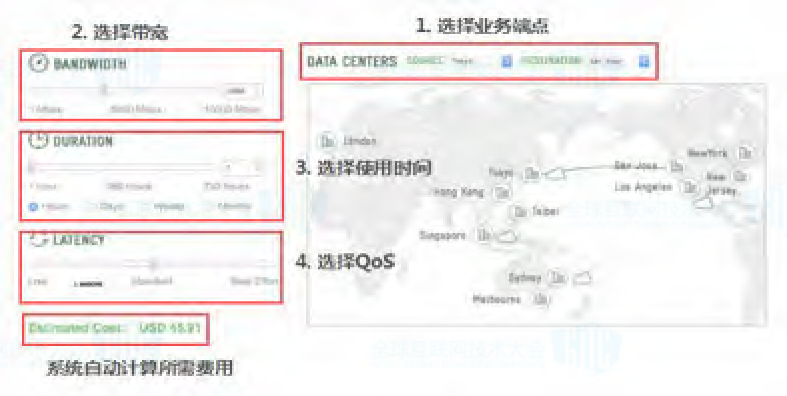
Domestic traffic scheduling

automatic protection


TESTA
SW2
SW1
SW4
SW3
TESTB
TESTA
SW2
SW1
SW4
SW3
TESTB

controller redundancy


APP
APP
SDN Controller
SDN Controller



2. 选择带宽

1. 选择业务端点

3. 选择使用时间

4. 选择QoS

BANDWIDTH

DURATION

LATENCY

DATA CENTERS

Estimated Cost: USD 45.91

系统自动计算所需费用

London
Tokyo
Hong Kong
Taipei
Singapore
Sydney
Melbourne
San Jose
Los Angeles
New York
New Jersey

rapid service

customized service

transparent service

Boutique Network, Uniform Service

Global traffic scheduling

- Launched a comprehensive network of NaaS service.
- Analysis the main direction of the submarine cable quality.
- Analysis the key operators regional coverage.
- Modeling multi transits network quality based on global probes and big data analysis system.
- International intelligence network based on network quality and service definition.

Network status

- Global Network
- Multiple transits options
- Quality differentiated price

Business needs

- Best quality
- Widest coverage
- Lowest cost

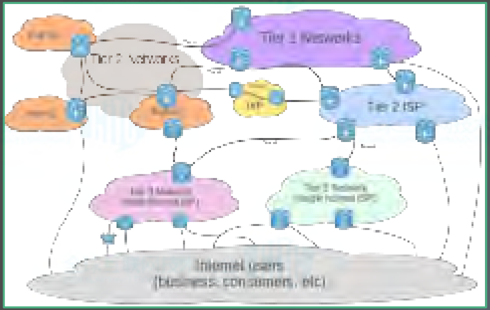
Technical requirements

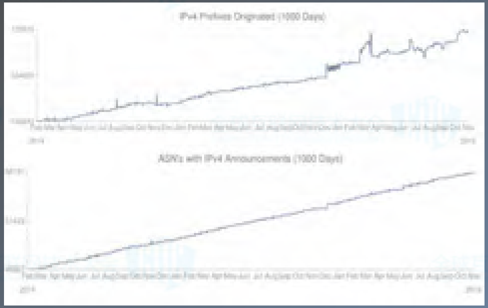
- Automation strategy
- Diversified methods
- Global control

Boutique Network, Uniform Service

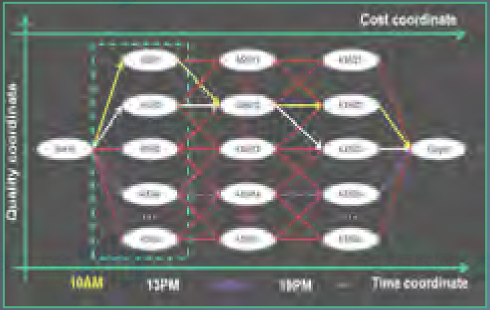
Global traffic scheduling

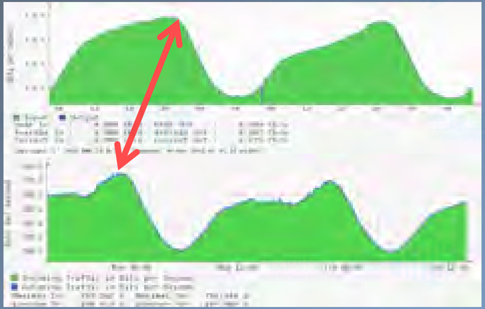
The size of the Internet continues expanding, there are 54000+ network and 730000+ route prefixes in the global internet until Nov 2016. Network strategy is becoming more complex and elaborate.


Tier 1 Networks
Tier 2 Networks
ISP
Tier 2 ISP
Internet users
(business, consumers, etc)



Aofei International Network global traffic scheduling policy based on its multiple ip transits and big data analysis abilities to construct global dynamic boutique network.

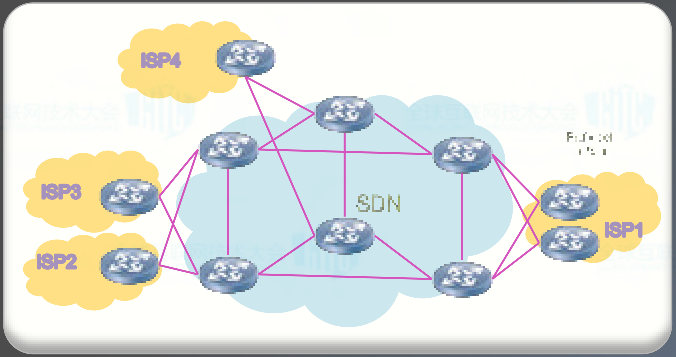

Cost coordinate
Quality coordinate
10AM
13PM
19PM
Time coordinate



Boutique Network, Uniform Service

Global traffic scheduling

Aofei International Network meets the business definition attributes, providing the best business path according to the quality, time, cost and other dimensions.



In

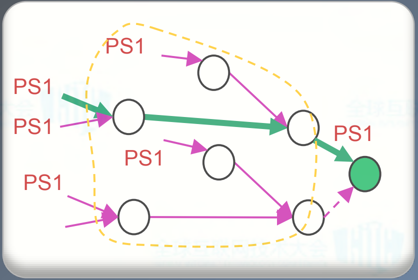
Select optimal(maybe multiple) external routes from EBGP.

Compute path meet constrains.

- Link usage threshold
- Explicit route(loose or strict)
- Quality
- Load balance
- Settlement cost
- ……

Change BGP routes attributes to meet path computed.

Out



BEST PATH

Boutique Network, Uniform Service

Global SLA System

Basic Services	■ 7×24 monitoring services from technical and security staff on duty ■ Regular facility environment (including customer equipment) inspection service ■ Simple hardware fault diagnosis
Security Services	■ Firewall: Prevent hackers ,virus attacks and health examination ■ DDOS flow cleaning: Filter DDOS attack traffic
Maintenance Services	■ Device hardware maintenance ■ Management services for network system ■ Management services for database performance
Operating Services	■ Provide procurement, installation, administration, and maintenance services for server systems
Recovery services	■ Provide synchronous data backup and recovery service solutions

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③ Aofei International Business

Aofei International Business

Business Overview

Aofei International Business

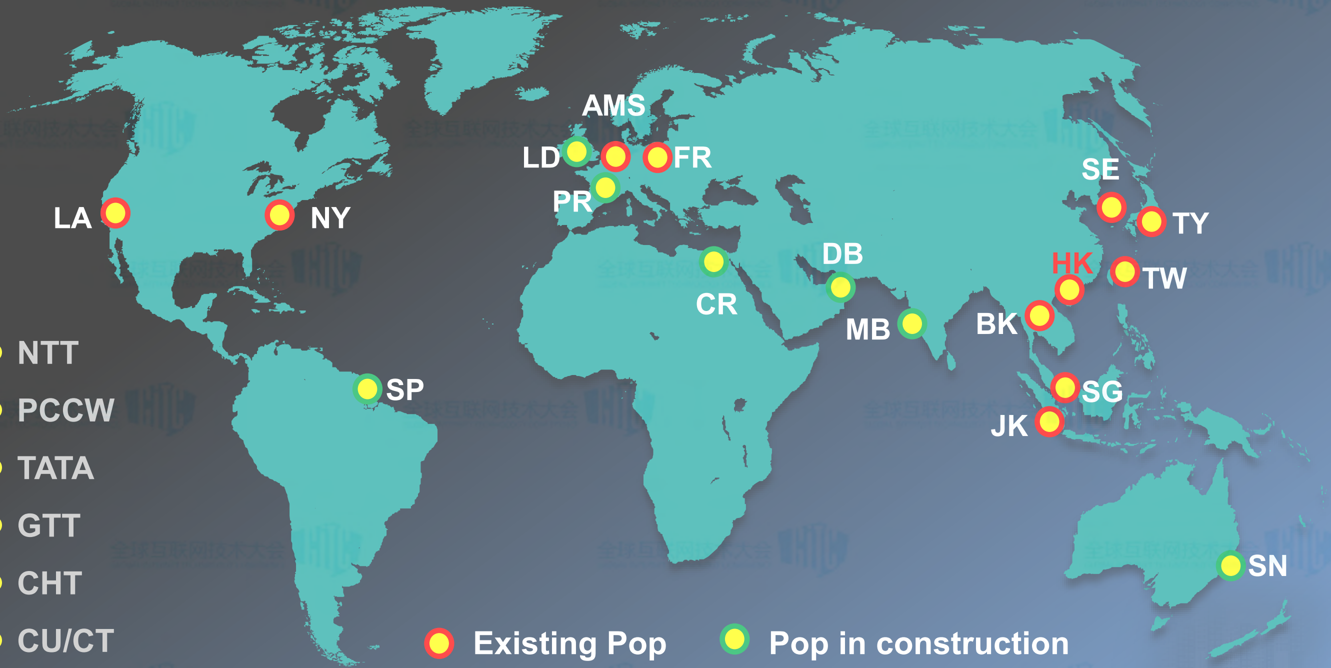
- Global IEPL
- Global MPLS
- Global IP Transit
- Global IX Transit
- Global DCs
- Global CDN/Cloud
- Global SI.

- Insist on the operating philosophy of "Boutique Network , Global Uniform Service“.
- International Network with HK as the core, covering 5 continents over 15 countries.
- Providing service based on abundant submarine cables, quality carriers and professional teams.
- Sustained service quality assurance , global unified SLA service system.

Aofei International Business

Global Network

Aofei International Network plan to covers 5 continents over 15 countries.


AMS
LD
FR
PR
LA
NY
SE
TY
DB
HK
TW
CR
MB
BK
SP
SG
JK
SN
● Existing Pop
● Pop in construction

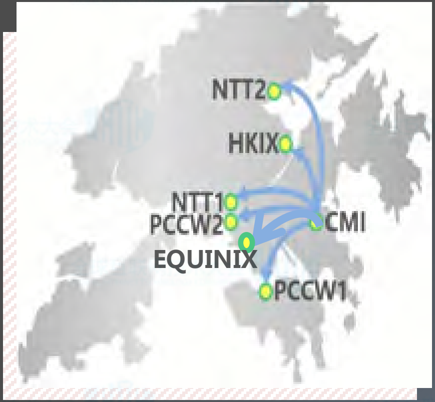
- NTT
- PCCW
- TATA
- GTT
- CHT
- CU/CT
- …

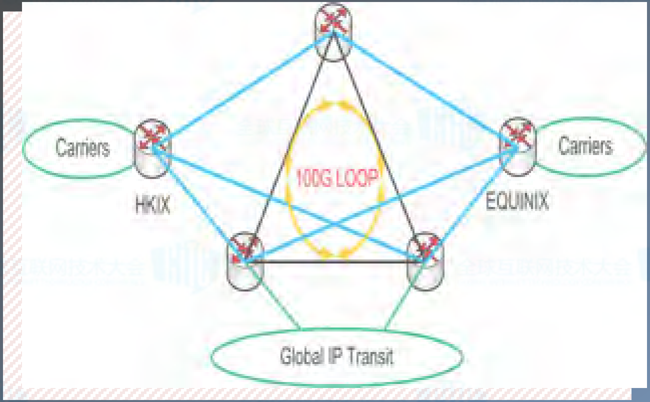
The Original Power of Technology

Aofei International Business

HK Network

Aofei International Network with HK as the core, which has abundant ip transits and local loop resource.


NTT2
HKIX
NTT1
PCCW2
CMI
EQUINIX
PCCW1


Carriers
HKIX
100G LOOP
Carriers
EQUINIX
Global IP Transit

IP-transit

Using NTT , PCCW, TATA global routing access, multi operators backup and export traffic verify conditions.

Local-loop

Aofei data has 5 major POPs in HK, using the WDM, dark fibers to achieve full interconnection, Intranet capacity reach to 100G

IXPs

Access to the main internet exchanges HKIX and Equinix, ensuring excellent network robustness and network quality.

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Aofei International Business

Oversea DCs

Aofei high quality oversea DCs are distributed in Asia, Europe, America, TW and so on.

METRO IBX（AMS）

Address : Frankford
Built-up area: 30000+ SMs
Reliability: Tier IV
Cooperation Partner : Equinix

METRO IBX（LA）

Address : Los Angeles
Built-up area: 20000+ SMs
Reliability: Tier IV
Cooperation Partner : Equinix

METRO IBX（GER）

Address : Frankford
Built-up area: 35000+ SMs
Reliability: Tier IV
Cooperation Partner : Equinix

INDOSAT
DATA CENTER

JiXin Cloud Center

Address : TaiPei
Built-up area : 3000+ SMs
Reliability : Tier III
Cooperation Partner : TIGC

Jakarta Data Center

Address : Jakarta
Built-up area : 2000+ SMs
Reliability : Tier III
Cooperation Partner : Indosat

Kim Chuan Center

Address : Singapore
Built-up area : 30000+ SMs
Reliability : Tier IV
Cooperation Partner : Singtel

Equinix(TY, NY, SG) , KNIX(SE) , Chief(TW)…

Aofei International Business

HK DCs

Aofei Data operates 3 major data centers in HK, including CMI, NTT and MCX10 and some racks in Sha Tin, Wan Chai, Kwai Fong etc.

CMI

Address : Tseung Kwan O
Built-up area : 24355 Square meters
Reliability : Tier III+
Cooperation Partner : China Mobile

NTT

Address : Tai Po
Built-up area: 23566 Square meters
Reliability: Tier III+
Cooperation Partner : NTT

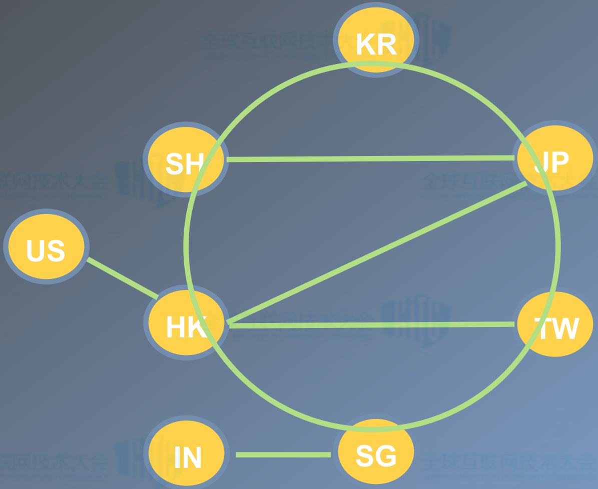
MCX10

Address : Kwai Chung
Built-up area: 18000 Square meters
Reliability: Tier III+
Cooperation Partner : PCCW

Aofei International Business

IEPL/MPLS Service

Relying on the rich resources of cable and POP nodes, Aofei International Network has a wide interconnection in major southeast asian countries with submarine cables, including APG, EAC, SMW-3, APCN-2 etc. Aofei Network can provide customers with 2 layers of IEPL and 2.5 layers of MPLS business networking.



Service assurance : International IEPL/MPLS 1 Hours Delivery.

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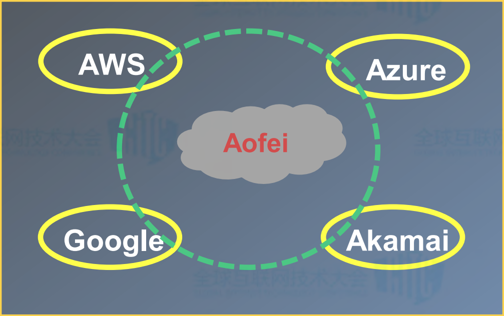
Aofei International Business

Mix Cloud Service

Aofei International Network has already access the Amazon AWS, Microsoft Azure, Google and Akamai. Relying on our own strong cloud service system, provide customers with convenient Mix Cloud Services.

Self-service Cloud System

Powerful Network Connection



Strength

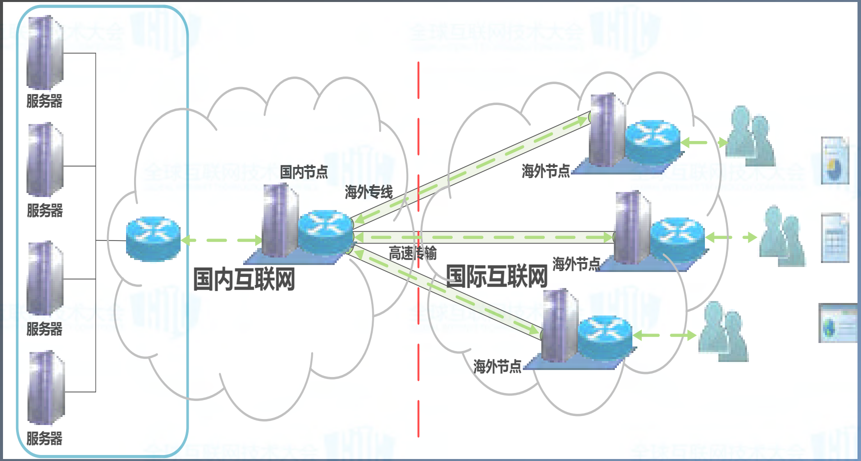
- Online self-service and optional server template
- Powerful user management and monitoring
- Various value-added services
- Support network virtualization and mixed deployment of cloud and physical host

Aofei International Business

Overseas CDN Business

In order to carry out better support of CDN international business, Aofei International Network nodes are using international direct IEPL between the world's major POPs, including HK,TW,JP,SG,KR,US,GE and so on.

HK
SG
…
CDN
JP
GE
US


服务器
服务器
服务器
服务器
国内节点
海外专线
高速传输
国内互联网
国际互联网
海外节点
海外节点
海外节点

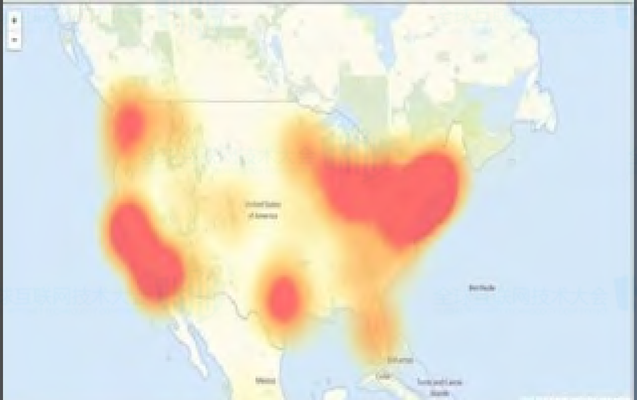
Content scheduling : Aofei global main Pops connection through the IEPLs

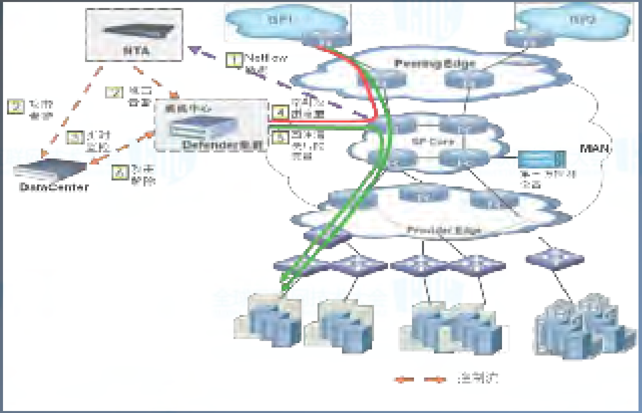
Eyeballs coverage: International dynamic boutique network support CDN business

Aofei International Business

Anti DDoS Service

DDos attacks have formed a black industry chain, with the development of the IOT business, more and more sources and types of attacks emerge , creating serious threats to the security of the Internet business. DDos attack happened in the United States in the October 22nd, Hackers used millions IOT equipments to launch attacks, the scale reached **1T**




ISP1
ISP2
NTA
1 Netflow
Peering Edge
DataCenter
Defender
SP Core
MAN
Provider Edge

- Aofei Global network deployment anti DDos system, maximum cleaning capacity of more than 100G.
- Real time detection, fast linkage.
- Distributed colony deployment, centralized control, the whole process using BGP traction.
- Combined with business needs, custom flow cleaning strategy.

④ Wishes and Expectations

Wishes and Expectations

Best Wishes for GITC 2016

No Cooperation , No Internet

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www.ofidc.com

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