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2019

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1. E	E

2.	E	E	
3.	E	E	
4.	E	E	
5.	E	E	
6.	E	E	
7.	E	E	
8.	E	E	
9.	E	E	
10.	E	E	
.....23			
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		E	E
		E	E
.....30			
E	E	E	
E	E	E	

AWS

Amazon CloudFront

Amazon RDS

Amazon QuickSight

AWS Amplify

AWS Server Migration

Service

Azure

AWS

5G

2018

OpenStack Stein

EasyStack

“

TOP100” 2018

SDN NFV

CCBN2019

IPF2019

NFV

5G

Linkerd 2.3

Kubernetes

CNCF

Kubernetes

Prometheus

Envoy

CoreDNS

containerd

Fluentd

Google

Google Cloud Next 2019

Cloud Run

Traffic Director

Kubecost

k8s

kubernetes

4

2019

40

iLnpP2P

1

3

Palo Alto

(SRM)

RedSeal

CASB

Bitglass

7000

D

Aqua Security

6200

C

VDOO

3200

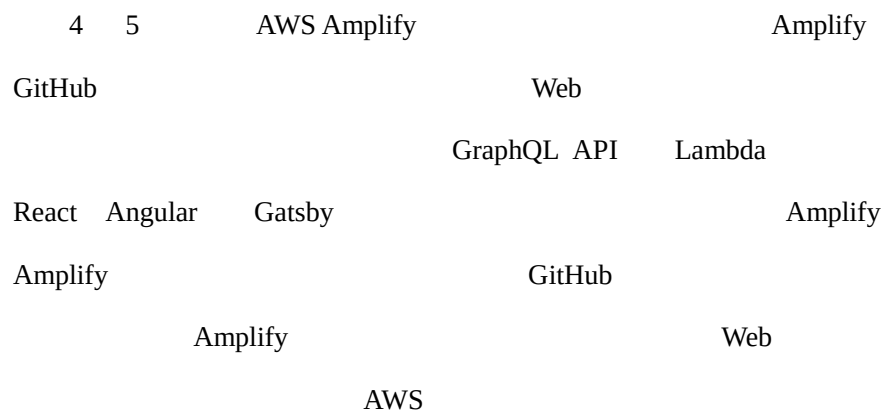
B

2019 4 29

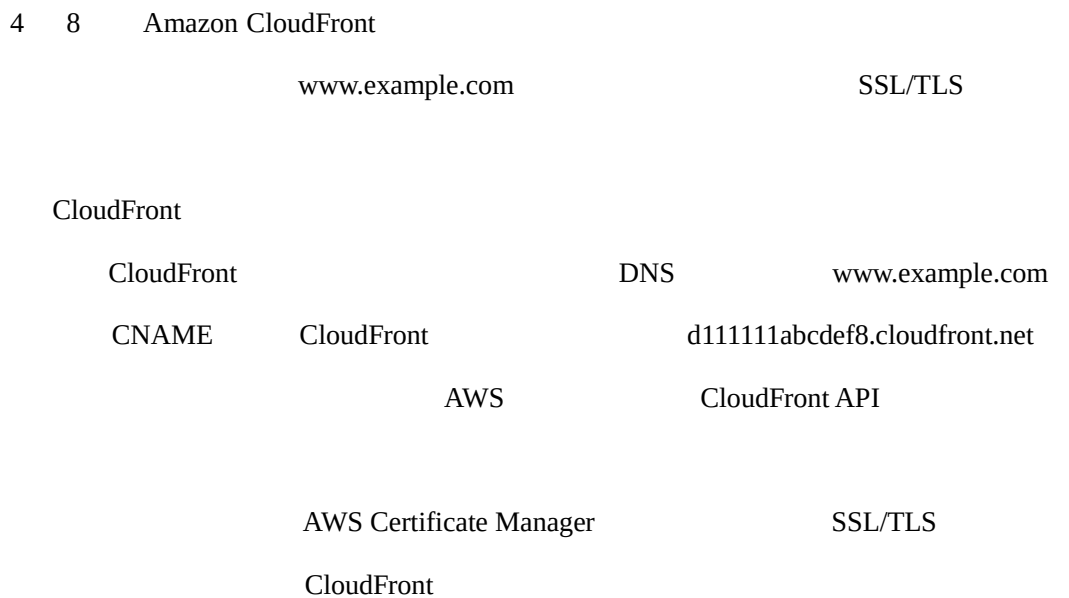
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1. AWS

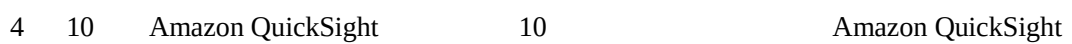
1.1 AWS Amplify



1.2 Amazon CloudFront



1.3 Amazon QuickSight



QuickSight

50 90 95

n

1.4 Amazon RDS

4 12 Amazon Relational Database Service (RDS)

Amazon RDS

Amazon RDS

RDS for Oracle RDS for PostgreSQL

RDS for MySQL

I/O

1.5 AWS Server Migration Service

Azure

AWS

4 18 AWS Server Migration Service (SMS)

Microsoft Azure

(VM) AWS

Microsoft Azure

AWS

AWS Server Migration Service

AWS

VMware

vSphere Microsoft Hyper-V

VM

Server

Migration Service

Microsoft Azure

VM

Azure

VM

Server Migration Service

2. VMWare

3. GOOGLE

3.1

4 2

LoRa

10~50

PaaS

5.2

5G

4 24

5G

5G

4K

VR/AR

5G

5G

4K

8K

5G

5G

5G

5G+4K

5G+8K

8K

8K

8K

5G

4K

4K

5.3 2018

4

25

Gartner

2018

19.6%

11%

8%

2017

4.7

2018

213.4

20

1-2

All in Cloud

6.

6.1

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18

6.2

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25

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AI

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7.

7.1

4 26 2019

5G

ICT

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ModelArts

AI

5G

HCS online

+

2019

04

5G

IoT

5G

IoT VR 8K AI

5G

100%

IoT

AI

150ms

CTO

CTO

5G

1. Openstack

1.1 OpenStack Stein

4 12 OpenStack 19

Stein 75

1000 OpenStack VMs

GPUs

Stein

-

- 5G NFV

-

OpenStack Stein Kubernetes

2018 OpenStack Kubernetes OpenStack

OpenStack 61%

Stein OpenStack

- OpenStack Magnum Kubernetes Kubernetes

10-12 5

- OpenStack Manila Cinder Keystone

Kubernetes OpenStack

- Neutron OpenStack

- Ironic

5G NFV

- Neutron API

StarlingX

-

Rocky

Stein

Neutron

OpenStack Nova

- API OpenStack QoS
aliases QoS

- Blazar API

- Placement Stein Nova

API 50% Train Nova Placement

Nova Placement

- Sahara Hadoop +

Jonathan Bryce, OpenStack

OpenStack

Kubernetes

2. Easystack

2.1 EasyStack

TOP100

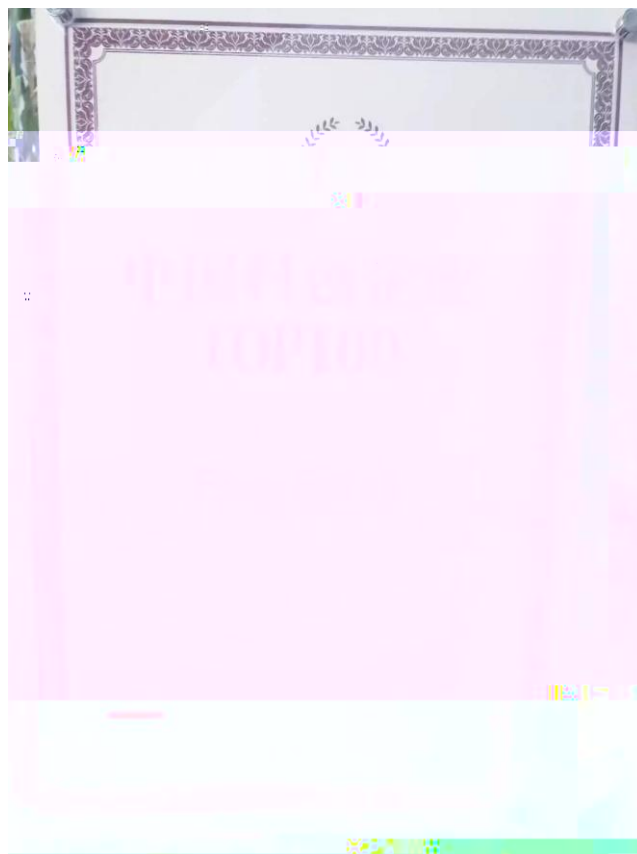
4 4

TOP100

100

EasyStack

TOP100



3. 99CLOUD

3.1 2018

SDN NFV

4 17

SDN/NFV/AI

IT168

C114

2018

SDN NFV

SDN

46

1.

1.1

V7.0

3

111

7

203

640

V7.0

1

CPU

2

3

web

DDOS

1U 2U

ATCA

1.2

4 18

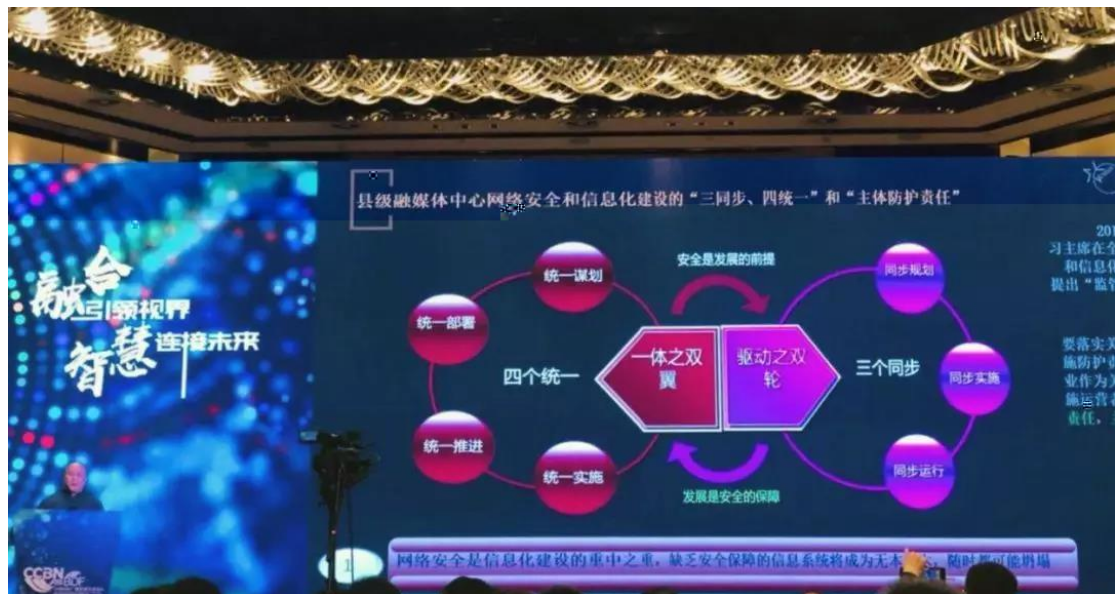
101

14

1.3

CCBN-BDF

CCBN2019



GPU

IaaS

PaaS SaaS

IaaS

IaaS

PaaS

PaaS

SaaS

SaaS

3.

3.1

|

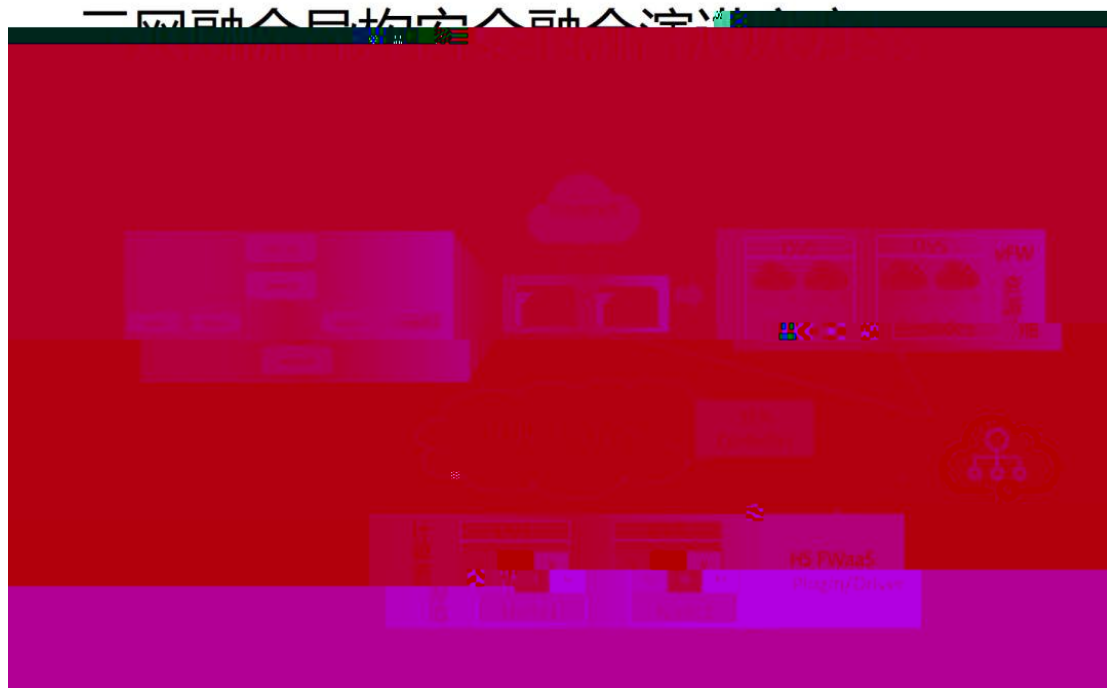
NFV

4 18

2019

SDN/NFV/AI

NFV



+

SDN

4.

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5G

2019

5G

5G () 5G

5G 5G ()

5G

5G XaaS()

NFV

5G 5G ()

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5G (

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5G

5G

5G

6



+

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5G

AI

5G

5G

DDoS IPS/IDS IP/Domain/URL

Docker

DeepSecurity

SDN/NFV

Docker

SDN

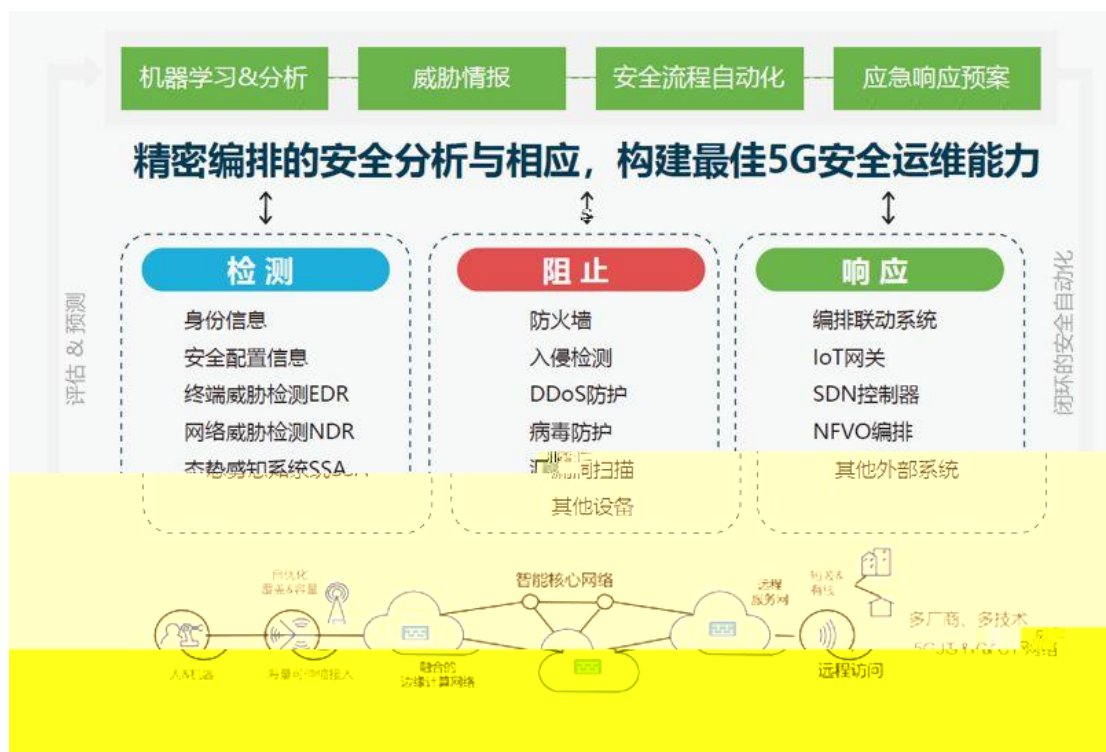
ETSI

VNFSecurity

MANO

SDN/NFV

5G



5.

5.1

6.

7.

7.1

IDC

2018

13.4%

ICG

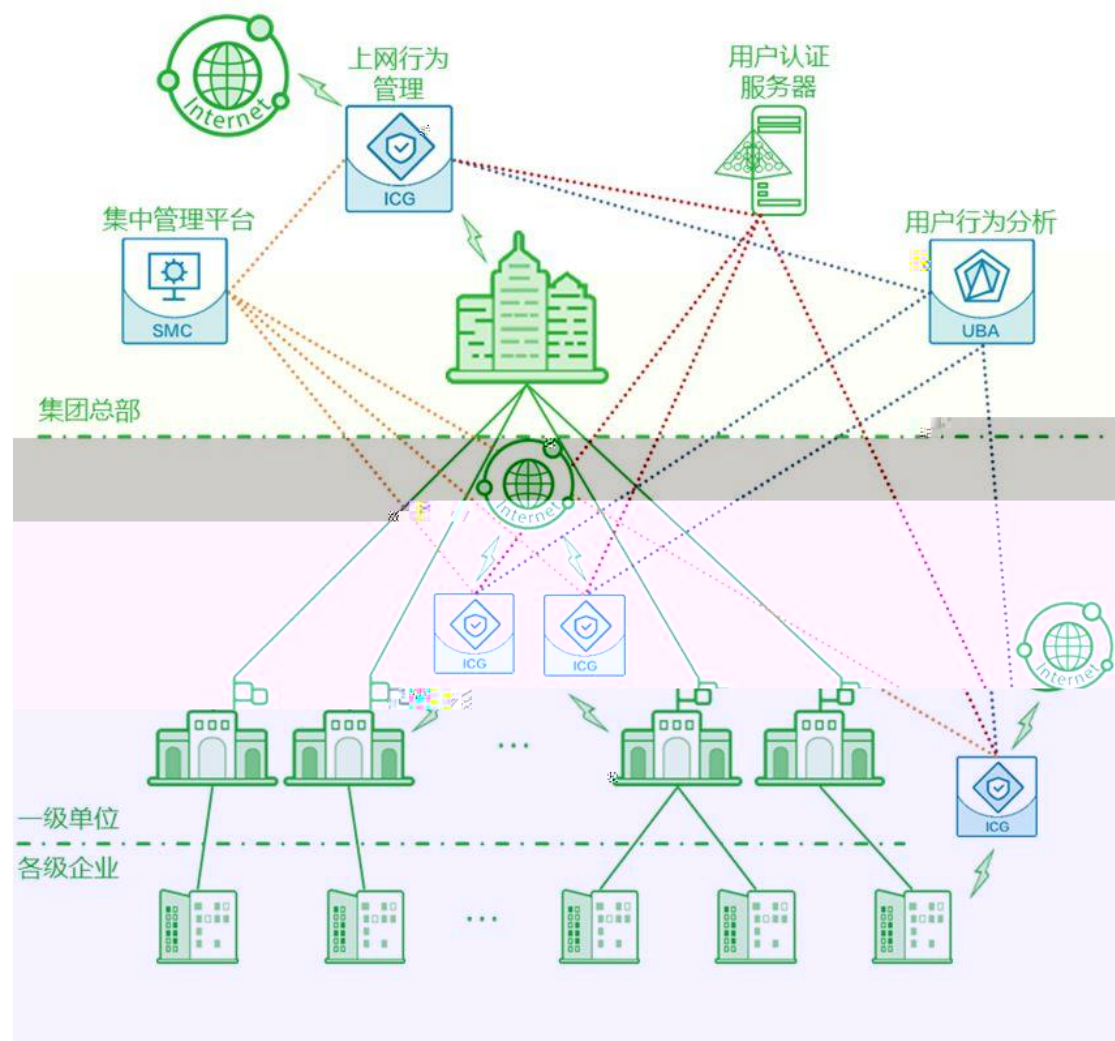
2004

200

ATCA

30

200



BAAS

2019

NGSOC

8.

8.1

4 18

2) TLS Kubernetes

24

3) TLS

2.3 Linkerd

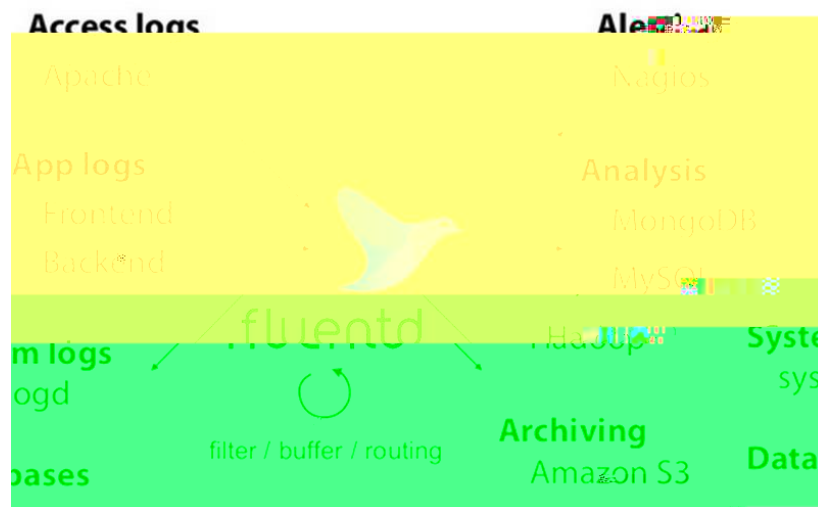
Kubernetes

2. Fluentd CNCF

CNCF 2019 4 11 Fluentd

CNCF 6 Kubernetes Prometheus

Envoy CoreDNS containerd



Fluentd 2011 Treasure Data Sadayuki Sada Furuhashi

2016 11 Fluentd 6 CNCF

Fluentd RDBMS NoSQL IaaS SaaS

Hadoop

3. Google Cloud Run Traffic Director

Google Cloud Next 2019

Google Cloud

Cloud Run Traffic Director

Cloud Run

Knative + Kubernetes + gVisor

Serverless

HTTP

Kubecost

(S3)

AWS

Prometheus

5. kubernetes

CVE-2019-1002101 kubectl cp

kubernetes kubectl cp (CVE-2019-1002101)

kubectl Kubernetes 1.11.9,1.12.7,1.13.5 1.14.0

kubectl cp

1)

2) stream

3) apiserver kubelet runtime

4) stream tar

kubernetes/pkg/kubectl/cmd/cp.go

copyToPod

copyFromPod

tar

kubectl cp

Kube-proxy IPVS flag ipvs-strict-arp

kube-proxy ipvs clusterIP/externalIP

kube-ipvs0

dummy ipvs

1.13

echo 1 >/proc/sys/net/ipv4/conf/all/arp_ignore

echo 2 > /proc/sys/net/ipv4/conf/all/arp_announce

IPVS

kube-ipvs0 dummy

ip ARP

pr

#70530

ipvs

load balancer

service

(issue:#59976)

buf fix

loadbalancer

CNI

ARP

1.13

issue#72779 kube-proxy v1.13.0 and 1.13.1 brokes services with externalIPs

issue#71555 kube-proxy/IPVS: arpignore and arpannonce break some CNI plugins

bug fix	kube-proxy	ipvs-strict-arp	0
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ARP	1
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CVE-2019-3874

Matteo Croce Natale Vinto Andrea Spagnolo

Kubernetes Pod Root

4. iLnkP2P

iLnkP2P

iLnkP2P

ID

Paul Marrapese

iLnkP2P

200

39%

19%

7%

ID

FFFF

GGGG HHHH IIII MMMM ZZZZ

5.

2019

2019

4

10

5

IPTV OTT

OTT

6.

86% 97%

2.

2.1 Aqua Security 6200 C

4 3 Aqua Security Insight Partner 4 6200 C
Aqua Security

2.2 Bitglass 7000 D

4 8 Bitglass Future Fund 4 7000 D
Bitglass CASB

2.3 VDOO 3200 B

4 24 VDOO 83North 7 3200 B VDOO