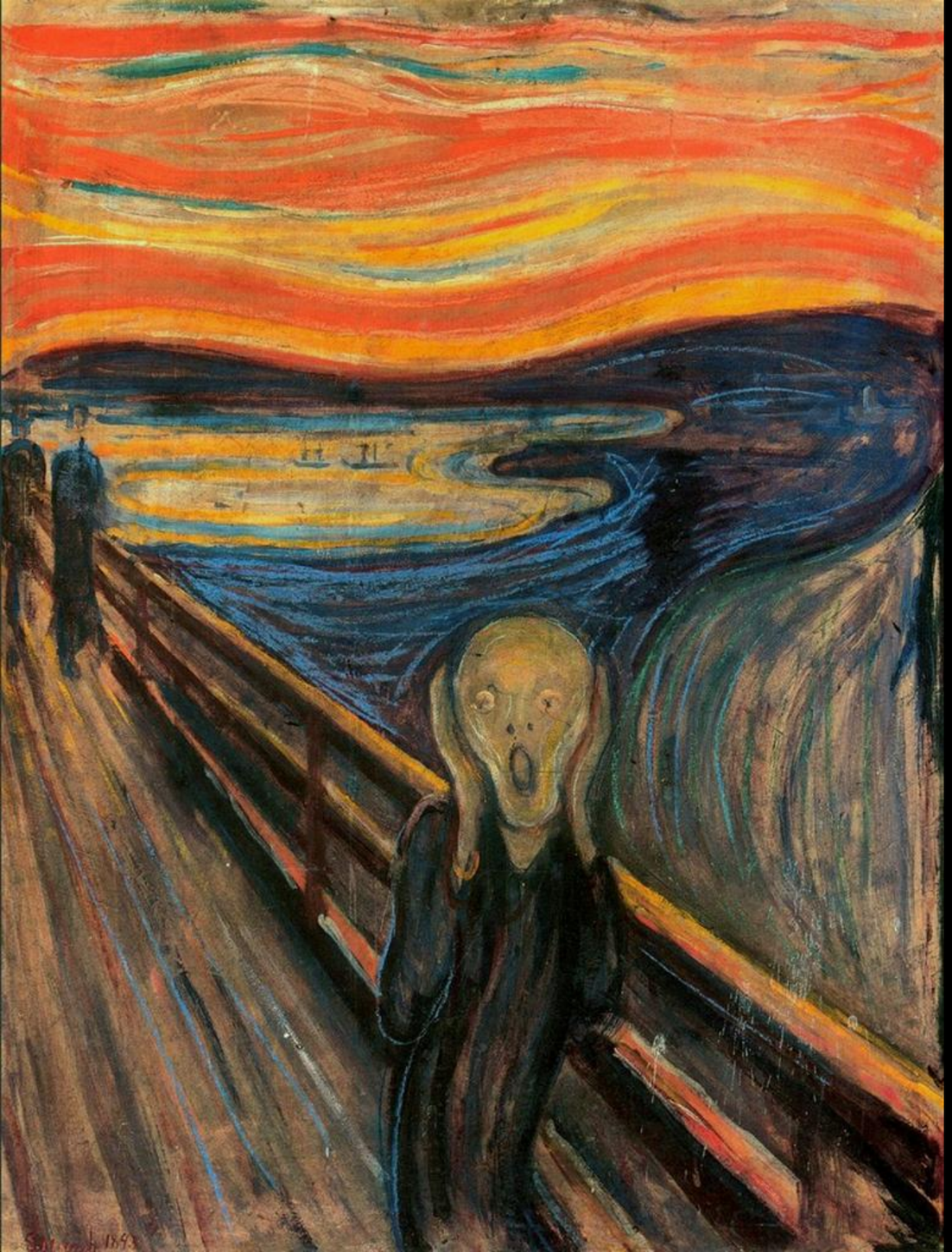
SDN: TIME TO ACCELERATE THE PACE…

Justin Joubine Dustzadeh

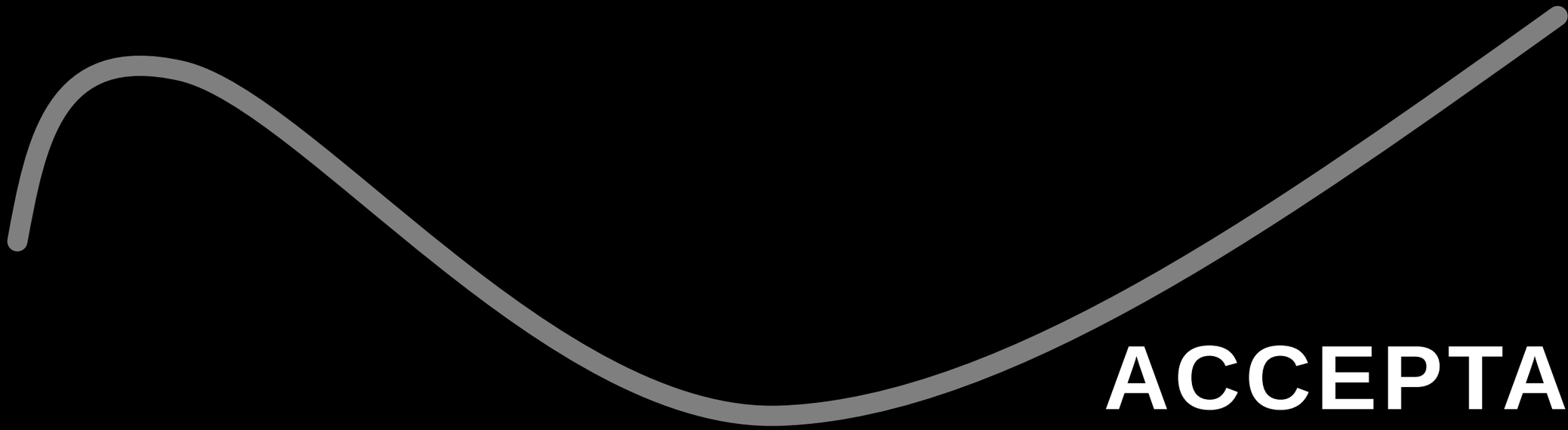
CTO & VP Technology Strategy, Networks

HUAWEI



SDN ACCEPTANCE

THE 5 STAGES…



ACCEPTANCE

DENIAL

BARGAINING

ANGER

DEPRESSION

Source: Elizabeth Kübler-Ross

WHO IS HUAWEI?

(Wah-Way)

HUAWEI

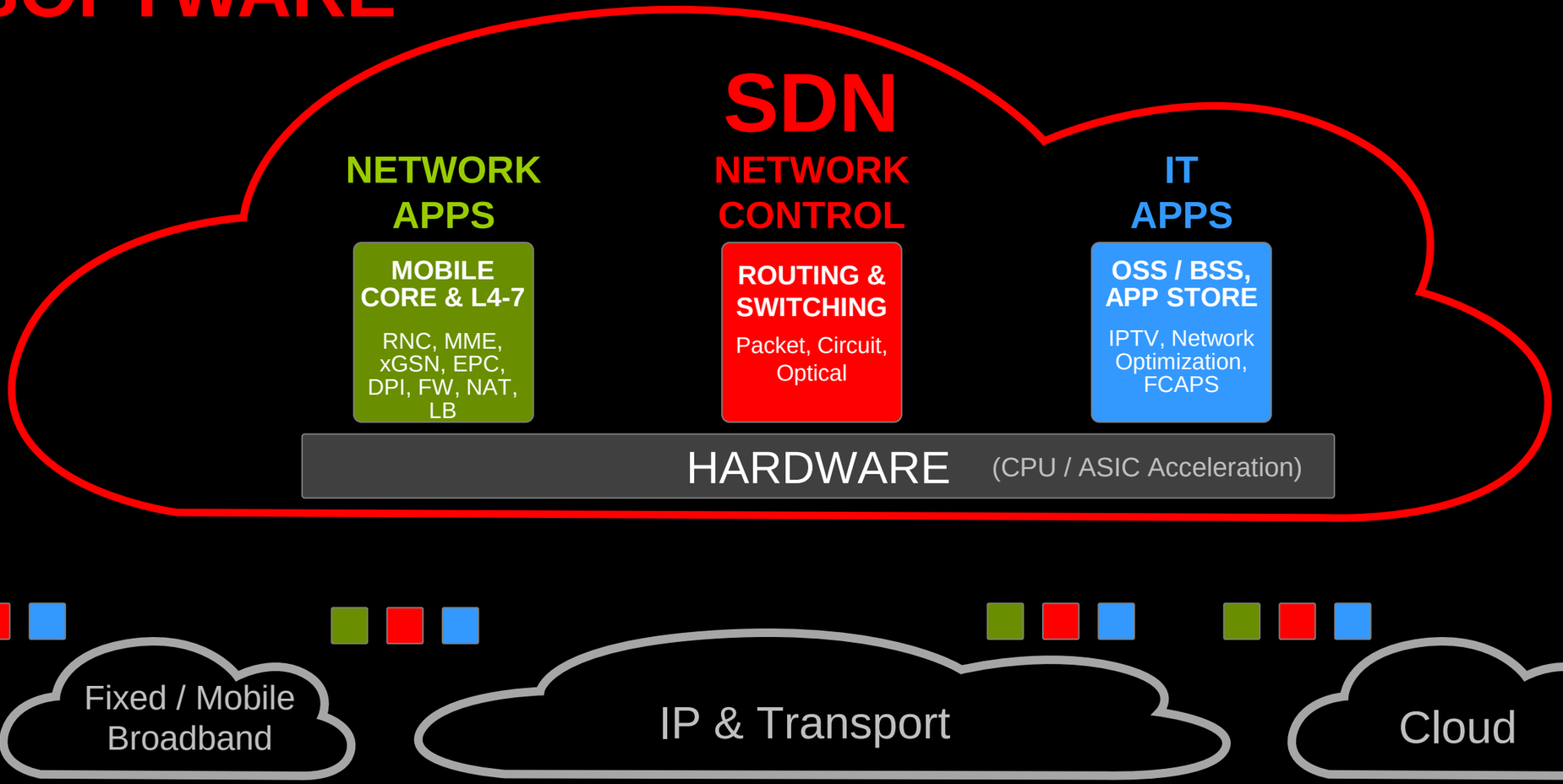
YOUNG & GROWING

END-TO-END

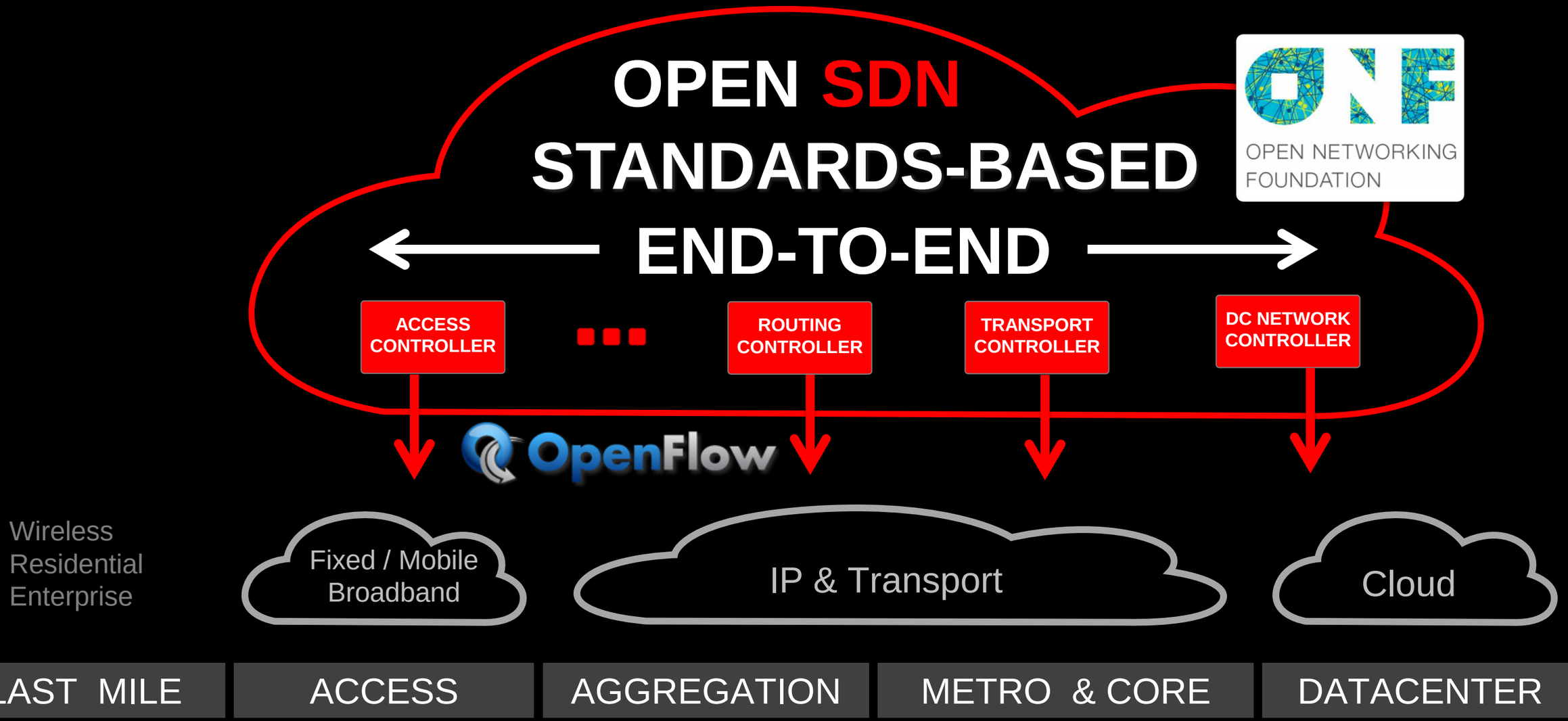
BELIEVE IN SOFTWARE

WHY BET ON SDN?

SoftCOM: CARRIER NETWORKS EVOLUTION TOWARD SOFTWARE



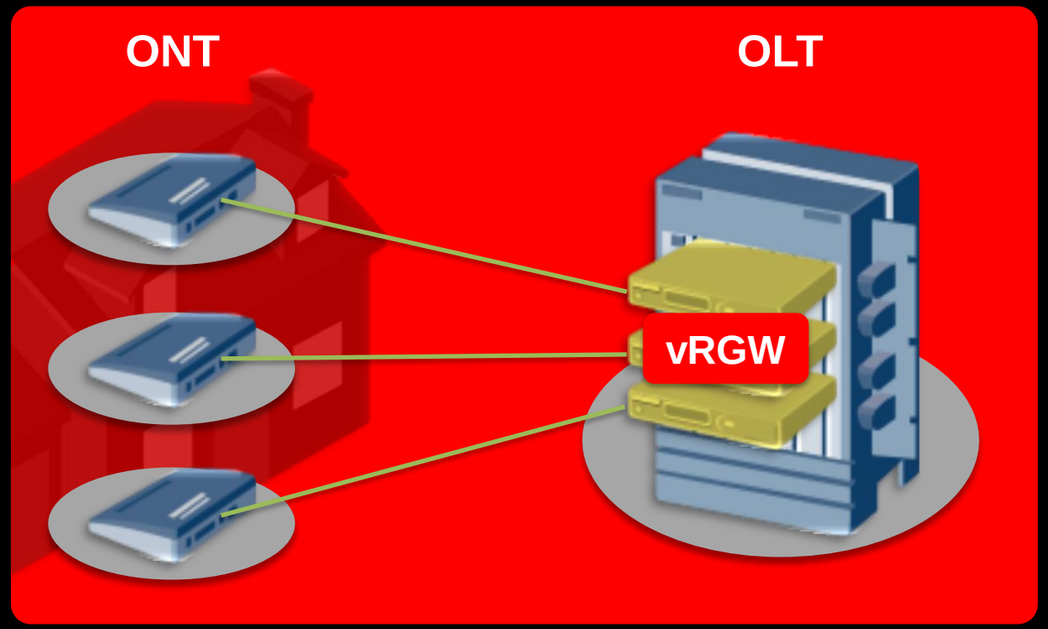
CARRIER SDN


OPEN SDN
STANDARDS-BASED
END-TO-END
OPEN NETWORKING FOUNDATION
ACCESS CONTROLLER
ROUTING CONTROLLER
TRANSPORT CONTROLLER
DC NETWORK CONTROLLER
OpenFlow
Wireless
Residential
Enterprise
Fixed / Mobile Broadband
IP & Transport
Cloud
LAST MILE
ACCESS
AGGREGATION
METRO & CORE
DATACENTER

SDN USE-CASES

CUSTOMER COLLABORATIONS AND LESSONS LEARNED

USE-CASE: VIRTUAL RESIDENTIAL GATEWAY



CUSTOMER TRIAL: Deploy Virtual RGW in OLT

Telefonica

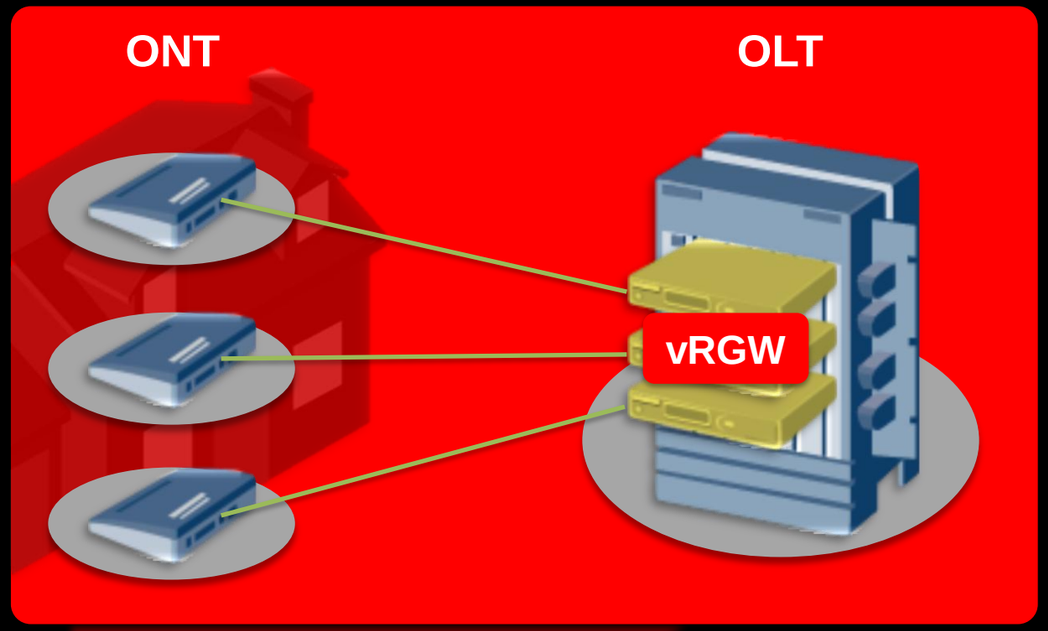
CUSTOMER

- Telefonica
- Worldwide
- $135B USD revenue
- 316M subscribers

CHALLENGE

- High OPEX for wireline home users (5M fixed broadband users in Spain).
- Replacement and upgrades to RGW drive high CAPEX and limit new service deployment.

USE-CASE: VIRTUAL RESIDENTIAL GATEWAY



Wireless
Residential
Enterprise

Fixed Broadband

IP & Transport

Cloud

LAST MILE	ACCESS	AGGREGATION	METRO & CORE	DATACENTER

USE-CASE: VIRTUAL RESIDENTIAL GATEWAY

Telefonica

HUAWEI

MA5600T

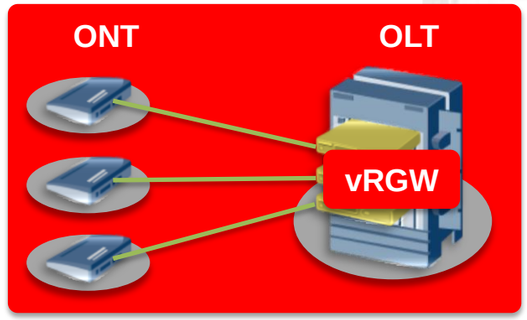
IMPLEMENTATION:

Huawei MA5600T OLT

Released in 2012 with dual vRGW cards

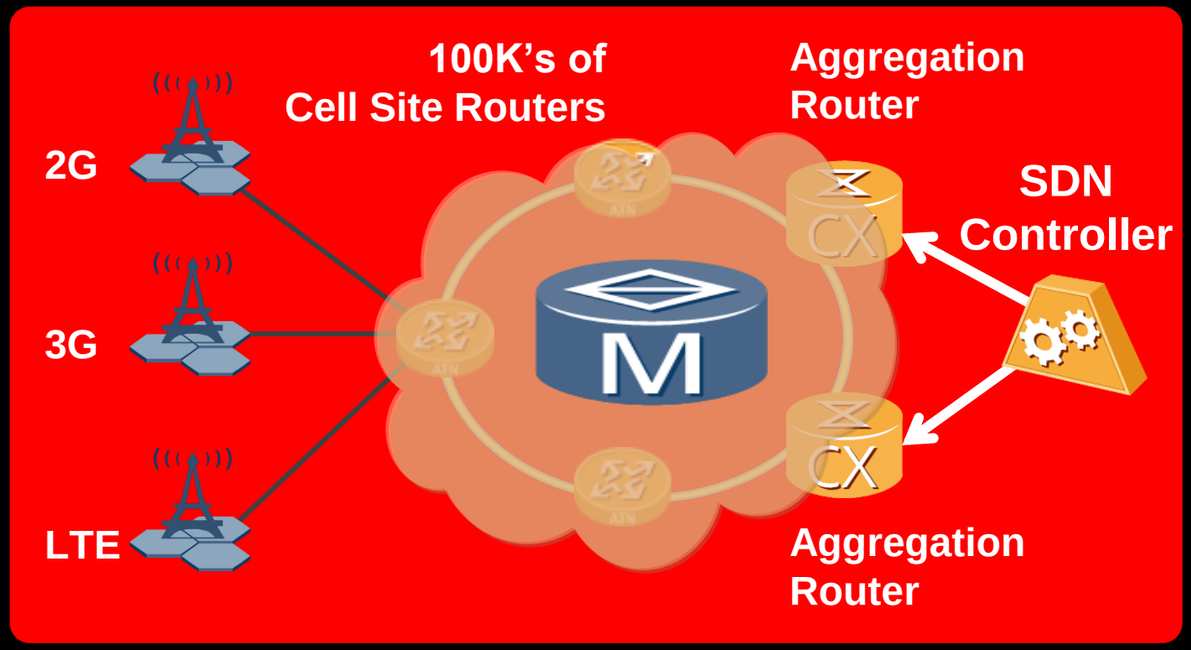
STATUS: LIVE vRGW PILOT

Running with small number of friendly users



OPEX REDUCTION	**Fewer service calls & faulty returns expected**
CAPEX REDUCTION	**Consolidated HW & reduced replacement costs expected**
NEW SERVICE REVENUE	**Rapid deployment and increased margin expected**

USE-CASE: SDN-BASED IP RAN (MOBILE BACKHAUL)



SDN INNOVATION COLLABORATION WITH CHINA TELECOM: Optimize IP RAN & Simplify LTE Deployment

中国电信 CHINA TELECOM

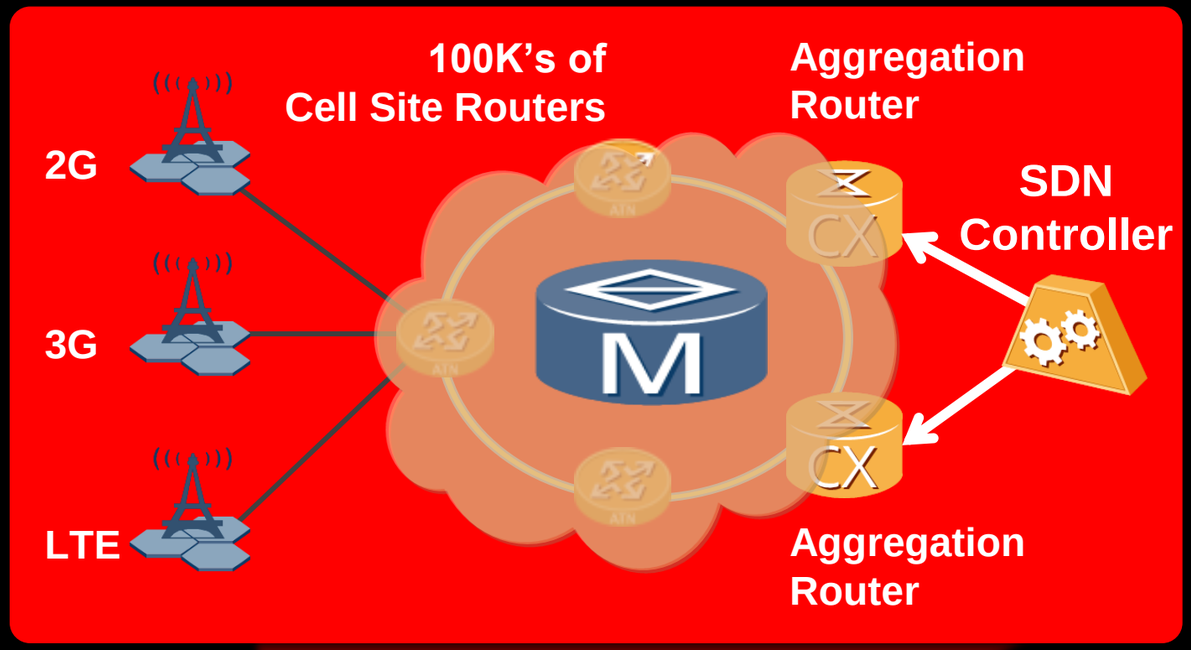
CUSTOMER

- China Telecom
- Mainland China
- $39B USD revenue
- 161M mobile subscribers
- 90M fixed subscribers

CHALLENGE

- O&M scaling challenges as move from 41 IP RAN local networks to larger scale LTE deployment.
- Each Aggregation Router extending to more than 10K Cell Site Routers.

USE-CASE: SDN-BASED IP RAN (MOBILE BACKHAUL)



Wireless
Residential
Enterprise

Mobile
Broadband

IP & Transport

Cloud

LAST MILE	ACCESS	AGGREGATION	METRO & CORE	DATACENTER

USE-CASE: SDN-BASED IP RAN (MOBILE BACKHAUL)

中国电信 CHINA TELECOM

IMPLEMENTATION:

Huawei ATN910 (Cell Site Router)
Huawei CX600-X2 (Aggregation Router)

HUAWEI

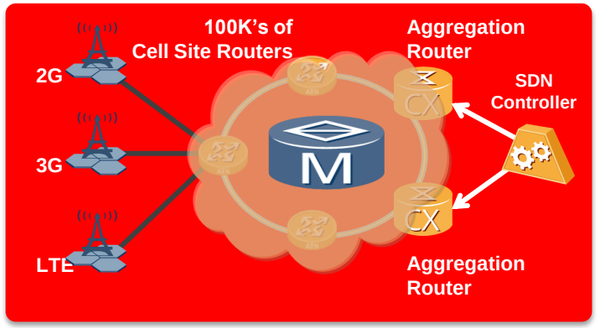
ATN910

HUAWEI

CX600-X2

STATUS:

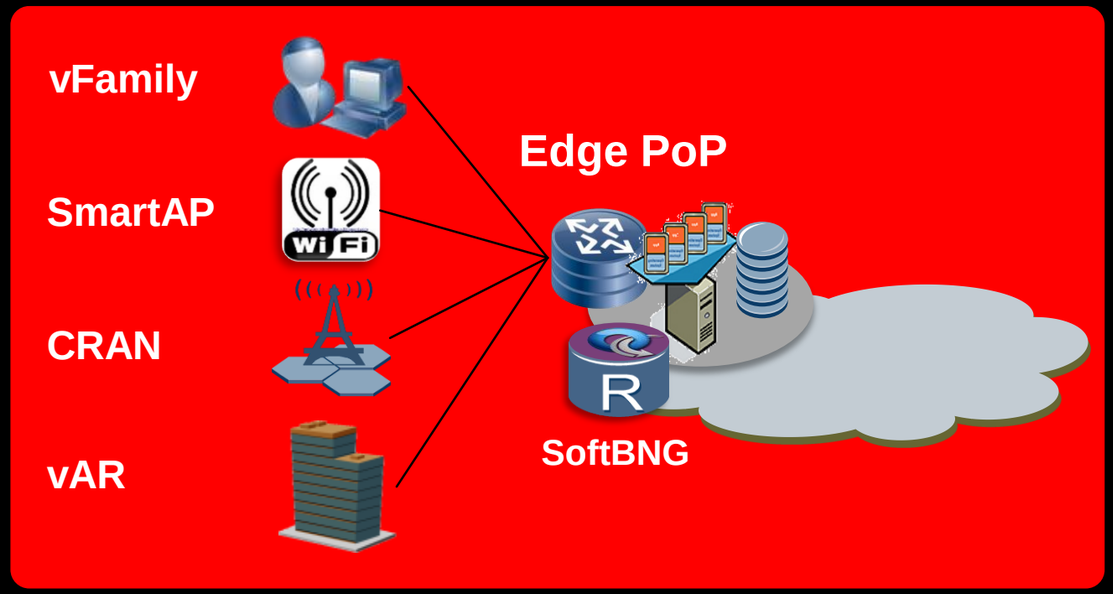
COMMERCIAL TRIAL – MAY 2013



80-90% OPEX REDUCTION

- Cell site router plug-and-play improves efficiency by **87%**
- Service provisioning improved by **91%**
- Auto trouble shooting for each fault location improved by **96%**

USE-CASE: NEXT-GENERATION POINT OF PRESENCE



CUSTOMER COLLABORATION: NFV-Based PoP Concentration for Fixed and Mobile Access

france telecom

orange™

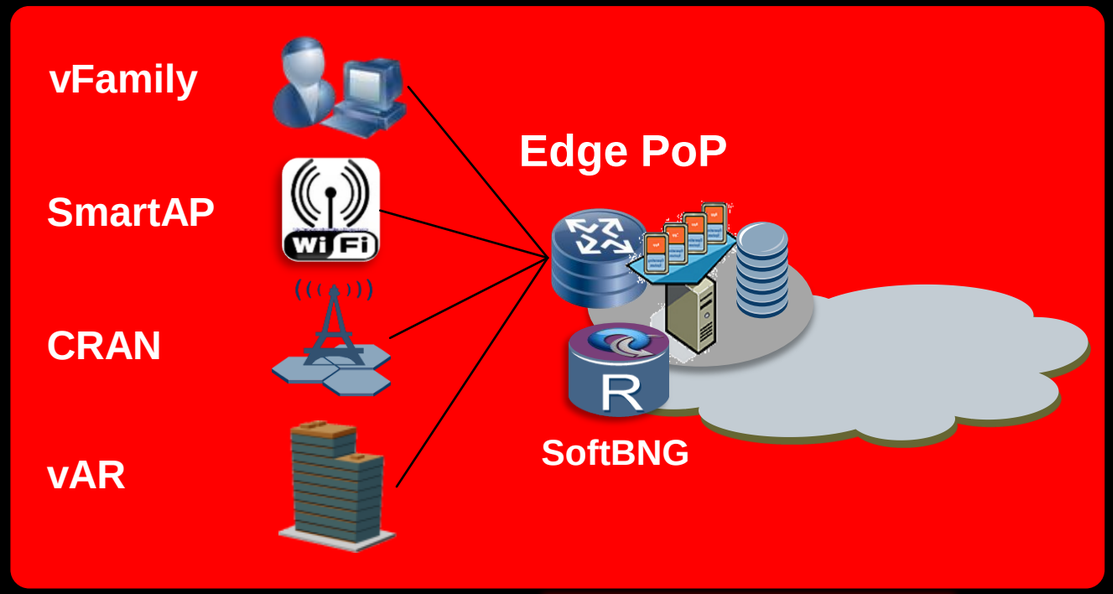
CUSTOMER

- France Telecom / Orange
- Worldwide
- $44B USD revenue
- 231M subscribers

CHALLENGE

- Improve QoE for both fixed and mobile customers while reducing provider cost and increase service flexibility.

USE-CASE: NEXT-GENERATION POINT OF PRESENCE



Wireless
Residential
Enterprise

Fixed / Mobile Broadband

IP & Transport

Cloud

LAST MILE	ACCESS	AGGREGATION	METRO & CORE	DATACENTER

USE-CASE: NEXT-GENERATION POINT OF PRESENCE

IMPLEMENTATION:

Huawei NetEngine 40E and IT Servers

STATUS:

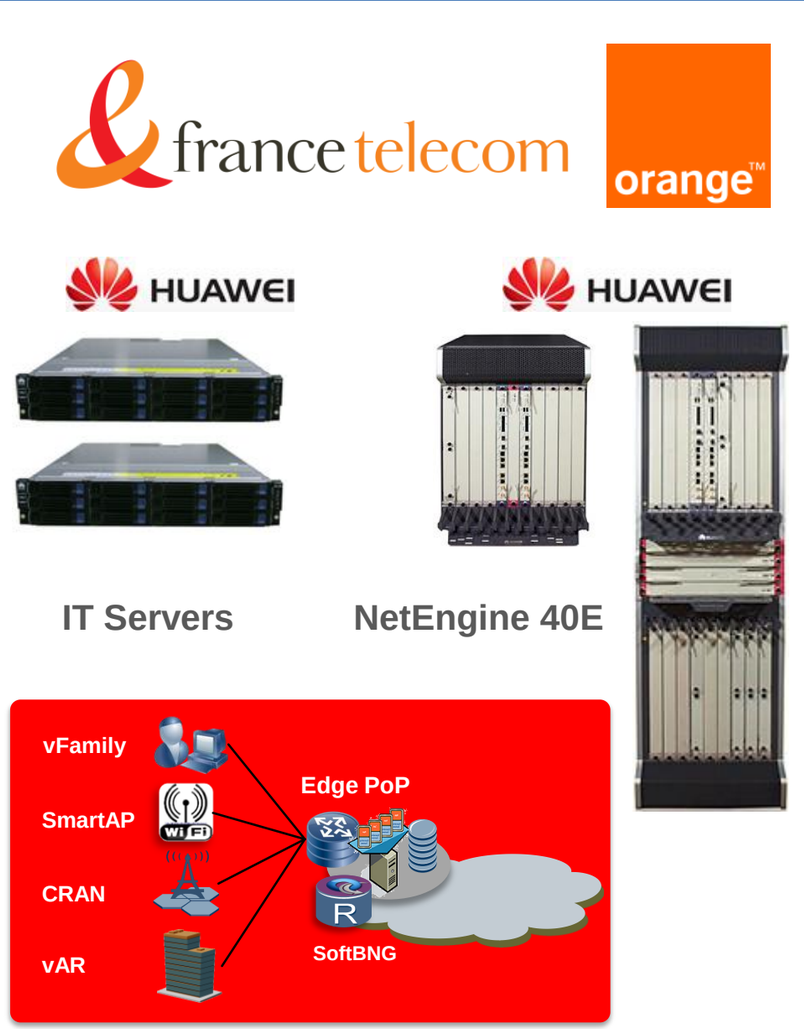
LAB TRIAL: 2012–2014

Research Partnership

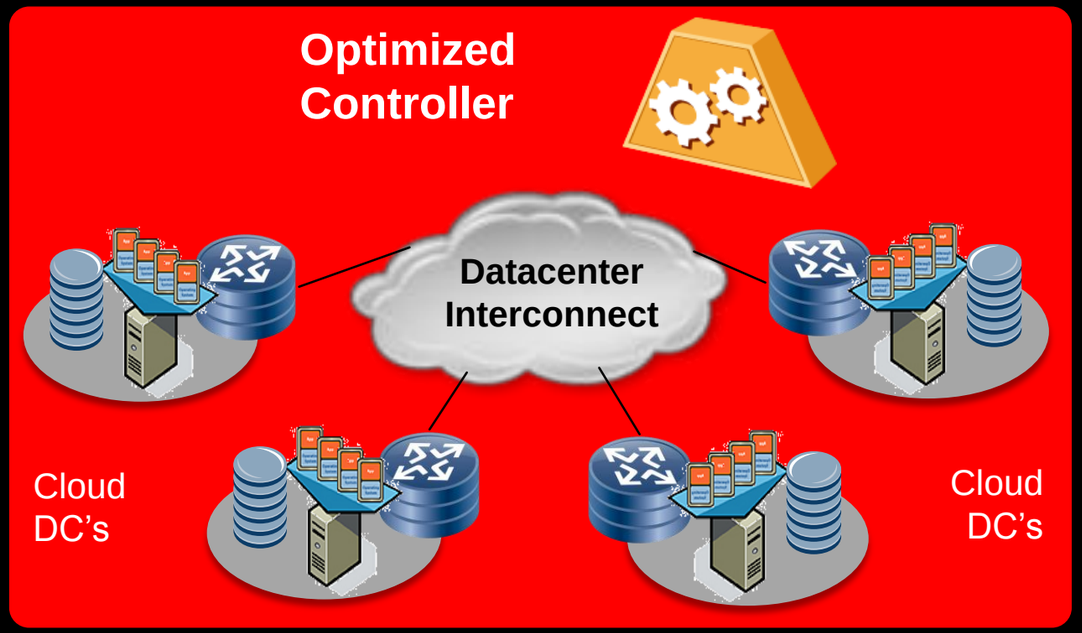
ROI:

CAPEX & OPEX REDUCTION

Significant reduction in Central Offices through the introduction of multi-purpose NG-POP sites



USE-CASE: CLOUD DATACENTER INTERCONNECTION



CUSTOMER COLLABORATION: Multi-Tenant SLA and Network Optimization

China unicom中国联通

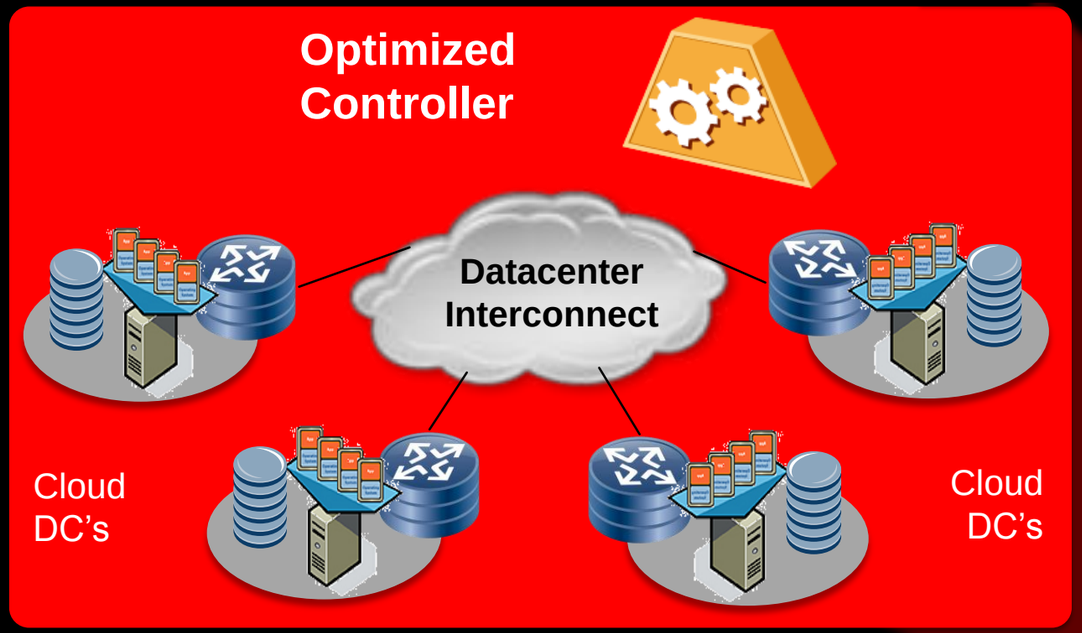
CUSTOMER

- China Unicom
- Mainland China
- $26B USD revenue
- 243M mobile subscribers
- 64M fixed BB subscribers

CHALLENGE

- China Unicom has near 200 datacenters.
- Plan to build premium cloud datacenters offering multi-tenant SLA guarantees.

USE-CASE: CLOUD DATACENTER INTERCONNECTION



Wireless
Residential
Enterprise

Fixed / Mobile
Broadband

IP & Transport

Cloud

LAST MILE	ACCESS	AGGREGATION	METRO & CORE	DATACENTER

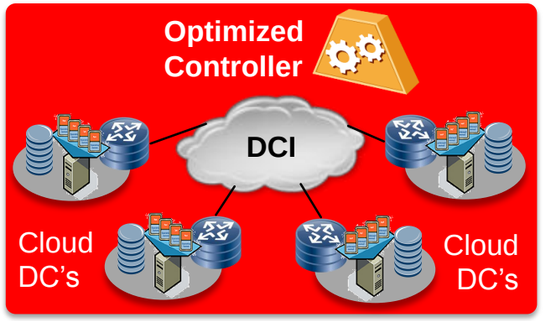
USE-CASE: CLOUD DATACENTER INTERCONNECTION

China unicom中国联通

HUAWEI

IMPLEMENTATION:

Huawei NetEngine 5000E



NetEngine 5000E

STATUS:

LIVE FIELD TRIAL – EOY 2013

ROI:

SERVICE PROVISIONING	Significant improvement expected from self-service portal for on-demand service provisioning
NETWORK UTILIZATION	Bandwidth utilization expected to increase

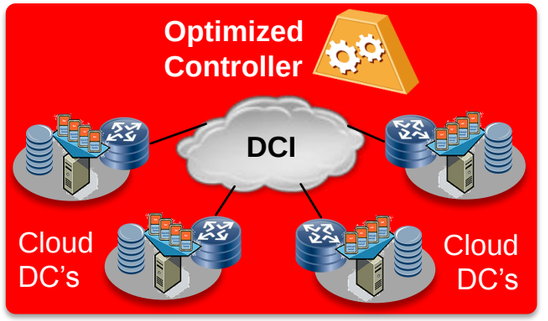
USE-CASE: CLOUD DATACENTER INTERCONNECTION

China unicom中国联通

HUAWEI

IMPLEMENTATION:

Huawei NetEngine 5000E



NetEngine 5000E

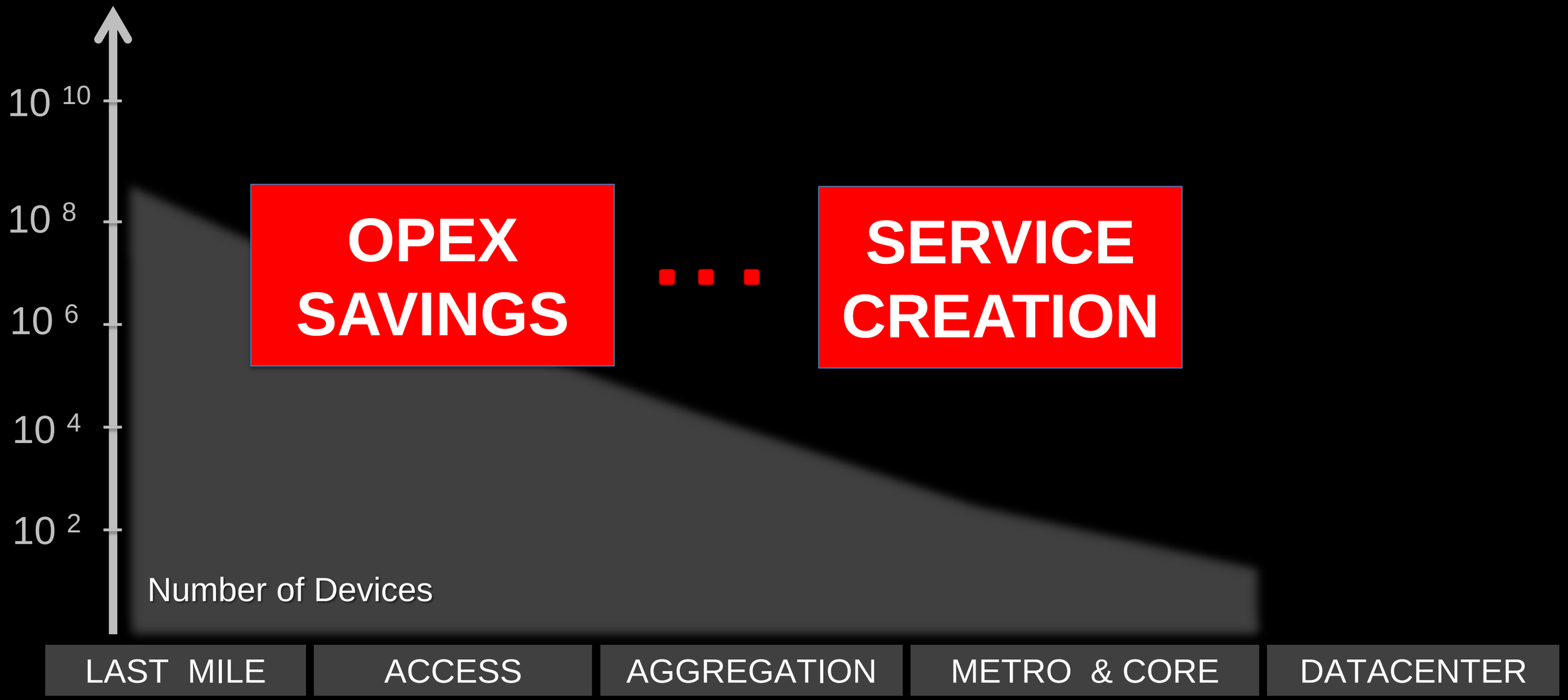
STATUS:

LIVE FIELD TRIAL – EOY 2013

ROI:

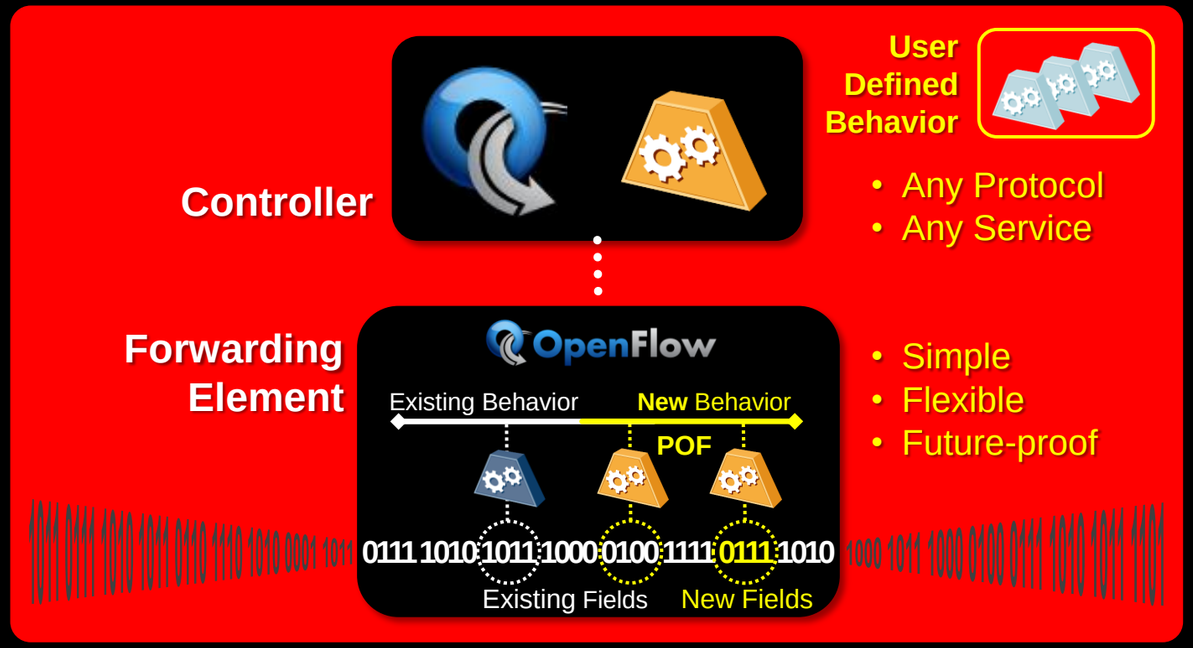
SERVICE PROVISIONING	Significant improvement expected from self-service portal for on-demand service provisioning
NETWORK UTILIZATION	Bandwidth utilization expected to increase

CARRIER NETWORKS – SDN BENEFITS



ONE MORE THING . . .

PROTOCOL-OBLIVIOUS FORWARDING (POF)



Standards-Based Forwarding Elements with Fully-Programmable & Open Interfaces

SIMPLIFIED & FUTURE-PROOF FORWARDING ELEMENTS

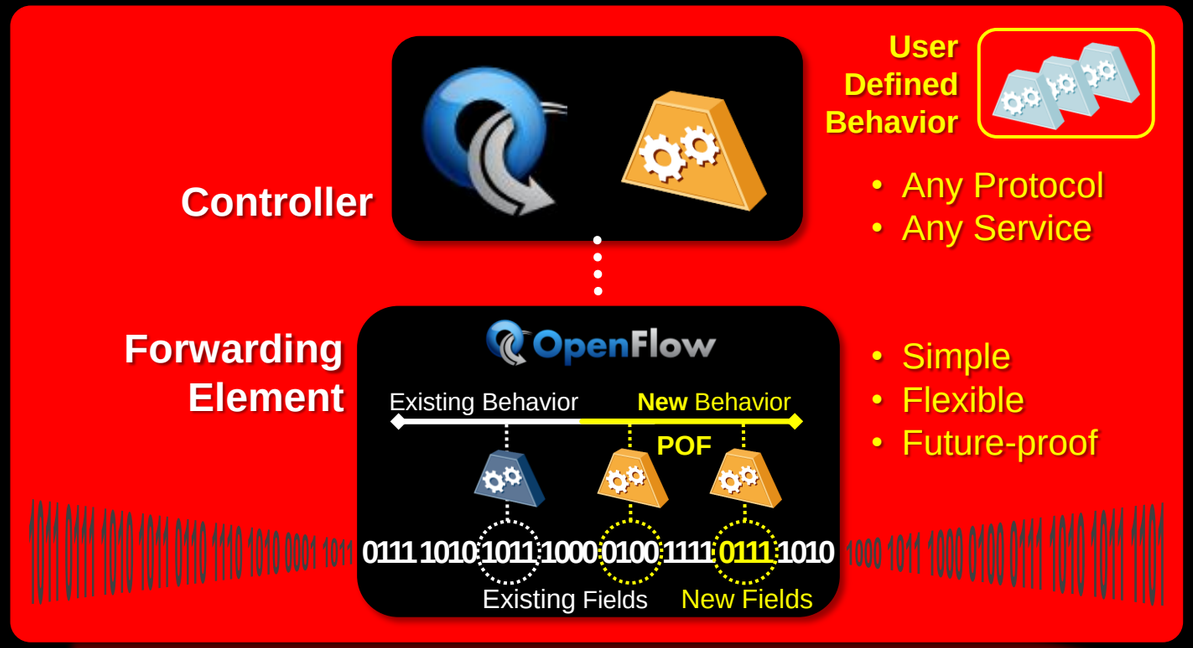
OBJECTIVE

- Support network application innovation
- Evolve SDN toward fully-programmable networks

HIGHLIGHTS

- Data path programming with generic network instructions to support any protocol or stateful service.

PROTOCOL-OBLIVIOUS FORWARDING … EVERYWHERE



PROTOTYPE:
Huawei NE5000E Core Router

Wireless
Residential
Enterprise

Fixed / Mobile Broadband

IP & Transport

Cloud

LAST MILE	ACCESS	AGGREGATION	METRO & CORE	DATACENTER

SDN: FULLY EMBRACED.

OPEN SDN
(STANDARDS-BASED)

OPEN NETWORKING FOUNDATION

BUILDING SOLUTIONS WITH CUSTOMERS

中国电信 CHINA TELECOM

China unicom中国联通

Telefónica

orange™

& france telecom

INVESTING IN SDN INNOVATION & PRODUCTS

vRGW

POF

NetEngine 5000E

SDN-BASED IP RAN

NG-PoP

DCI

NetEngine 40E

MA5600T

CX600-X2

ATN910

OLT | Cell Site Router | Aggregation Router | Service Router | Core Router

AVAILABLE FOR COMMERCIAL TRIAL: 13Q4

SDN-ENABLED ROUTERS

- OpenFlow 1.3 Support
- Service Chaining in SoftBNG
- IP Core Routers
  - Smart Traffic Engineering
  - Instant VPN
  - Route Reflector +

SDN-ENABLED IP RAN 2.0

- OpenFlow 1.3 Support
- Stand-Alone Controller

“It always seems impossible until it’s done”

– Nelson Mandela


HUAWEI