ZTE

Hopping or Step by Step?

— Towards SA & Full Capable 5G Network

Jason Tu
Principal Scientist of NFV/SDN Products
ZTE Corporation

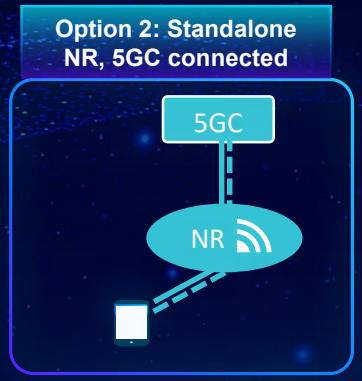
Leading 5G Innovations

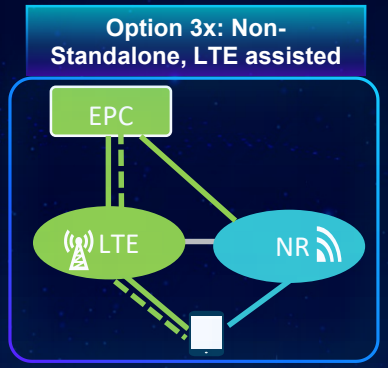
Island Hopping Saved Time and Lives in World War II

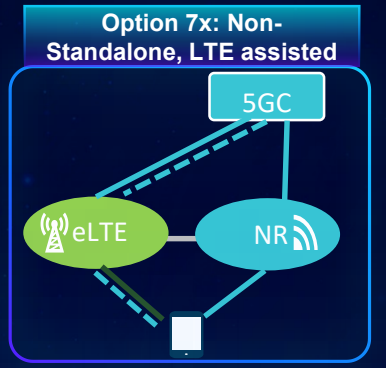
- End the Pacific War at least a year earlier.
- Millions of lives have been saved, including U.S. and Japanese soldiers.

The Differences Between SA and NSA

ZTE







Key Features	SBA	E2E Slice	Flow Based QoS	CUPS	FMC
NSA	Not Support	Not Support	Not Flexible	Limited Support	Not Support
SA	Support 3GPP defined SBA	Support Multi slice selection Multi slice access	Flexible Enhanced QoS mechanism 。	Support Guaranteed service continuity	Support Access by N3IWF, unified authentication

SA is aggressive choice for 5G continuous coverage in the initial stage.

Two Paths to Target Full Capable 5G Network from 4G

ZTE

	Route 1	Route 2 √
Network upgrading	Long (upgrade twice)	Short (upgrade one time only)
Evolution cost	Low (reusing is possible)	Low (partly reusing)
User experience	Bad(frequent upgrading)	Good(convergent core, no impact on existing network)

Considering upgrading cycle, evolution cost and user experience, route 2 is suggested.

NSA is Conservative for Rolling Development

ZTE

Standards

Earlier than SA (NSA standards froze in Dec 2017).

Service

- eMBB for initial 5G scenario, e.g. 4K/8K Video, AR/VR.
- Dual-connection for traffic diverting for Hotspot.

Terminal

NSA terminal already commercial launched.

Network

- less investment and faster 5G NR hot spot deployment
- Just upgrading eNB , EPC and bearer network

NSA is more mature, it can be commercial launched as a temporary solution for eMBB scenario.

NSA Faces Many Challenges

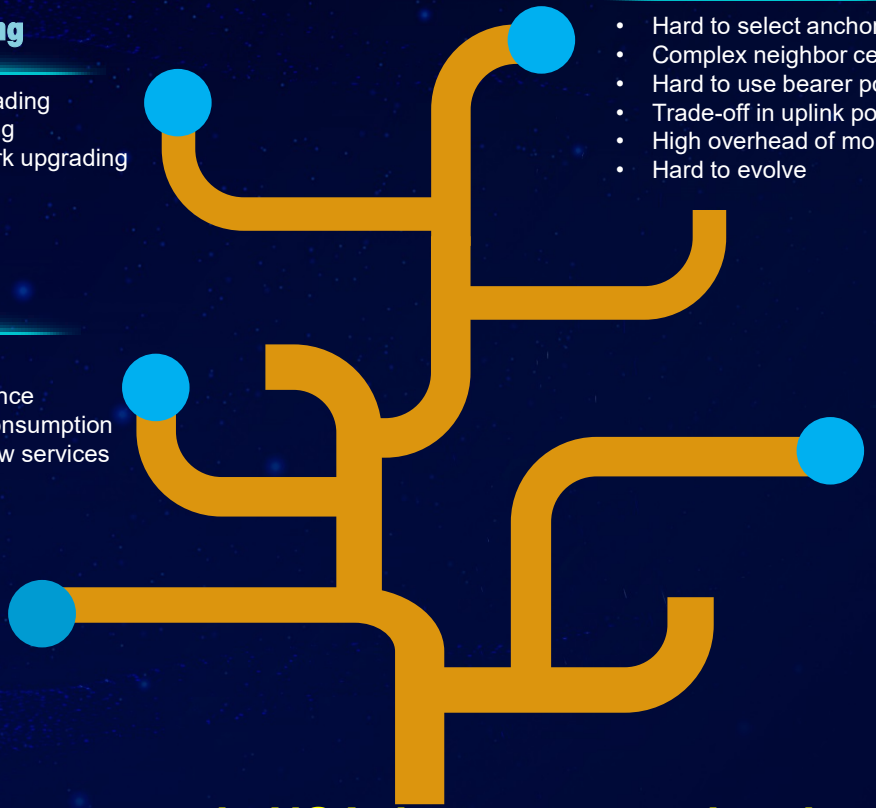
ZTE

Networking

- Hard to select anchors
- Complex neighbor cell configuration
- Hard to use bearer policy
- Trade-off in uplink power control
- High overhead of mobility management
- Hard to evolve

Upgrading

- 4G eNB upgrading
- EPC upgrading
- Bearer network upgrading



Terminal

- High cost
- Low performance
- High power consumption
- Limited 5G new services

Interworking

- Hard to guarantee performance in multi-vendor environment
- Hard to conduct interworking between different vendors

Optimization

- One time to optimize 2 networks
- 4/5G is tight-coupled, hard to improve KPI

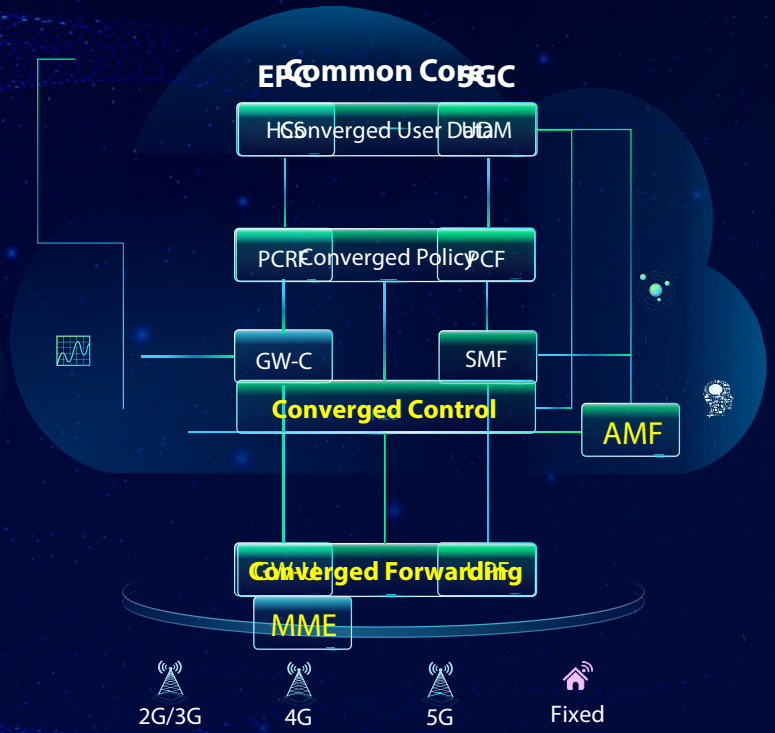
To target network ,NSA is more complex than expected.

ZTE

One Core for All - Common Core

Challenges

- Multiple Cores
- EPC + 5GC Overlapping Investment
- Complicated O&M



One Core

KPI 20% ↑

2G/3G/4G/5G/Fixed full convergence

Reduce signaling & latency

Target Architecture

Investment 40% ↓

Support both SA and NSA, no repeated upgrade Reusable resource

Simplified O&M

Efficiency 2X ↑

DevOps-based rapid service onboarding

AI-based self-optimization & autonomy

1st 中国移动 China Mobile
5GC SA lab test

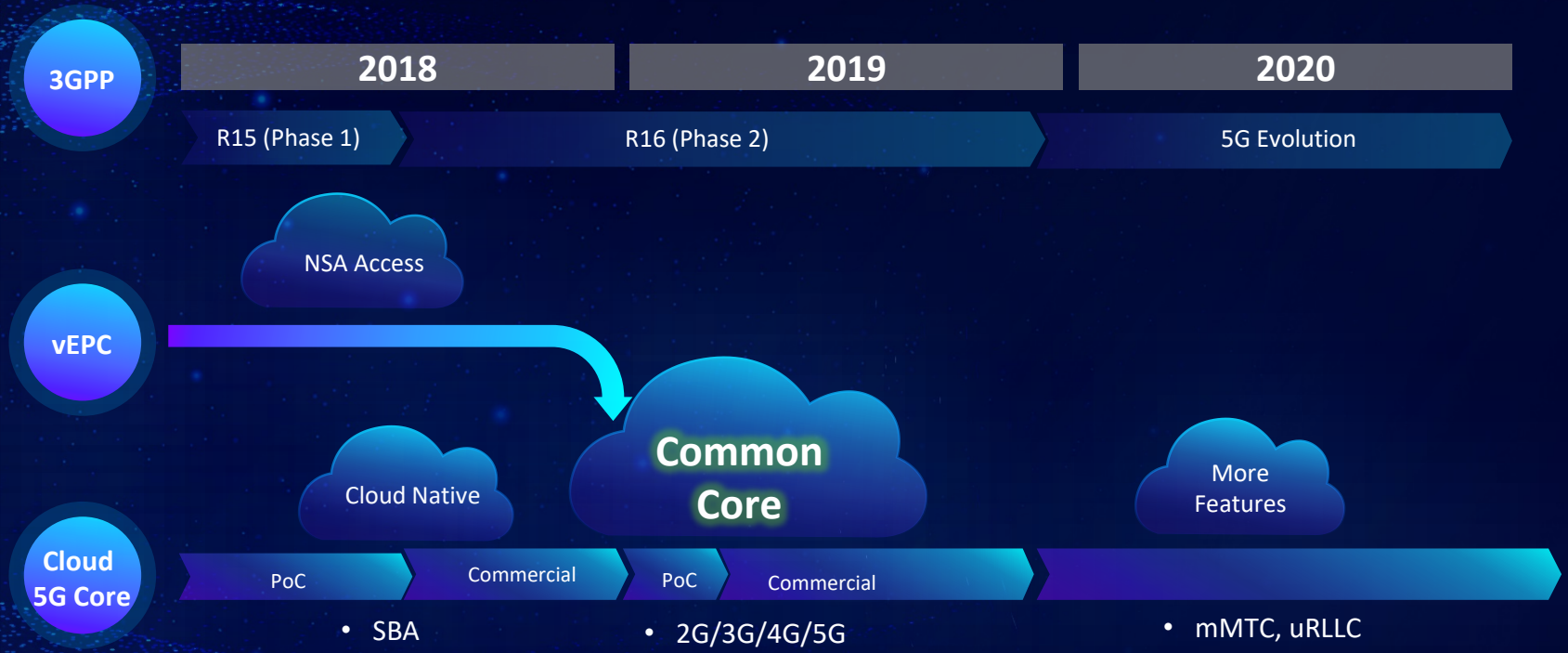
1st QUALCOMM
5G E2E live demo with commercial devices

1st orange
5G MOU

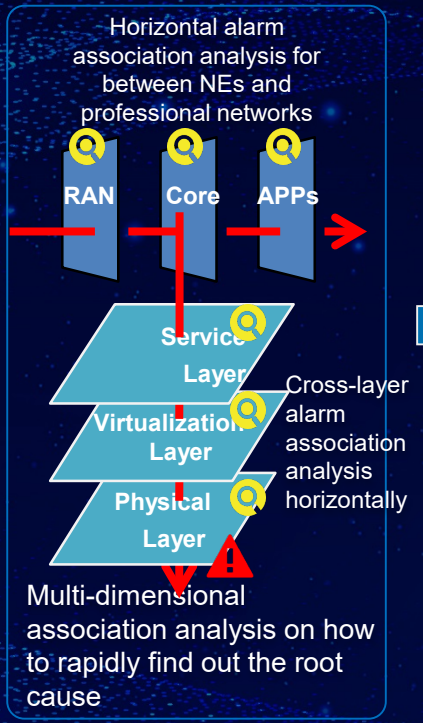
amazon
vEPC on AWS Public Cloud

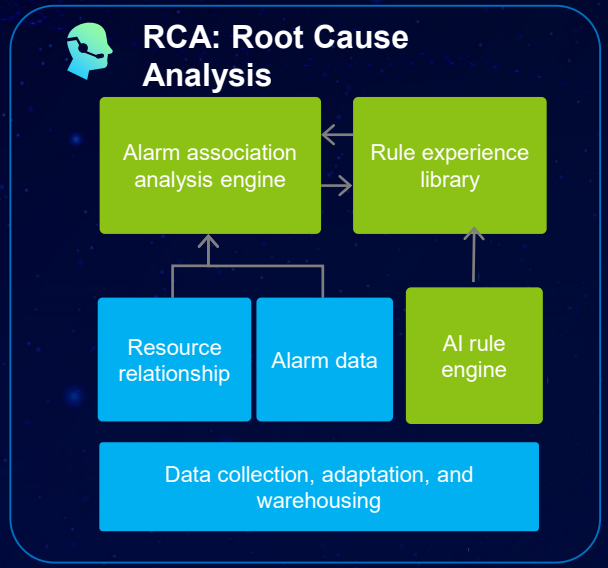
5G Common Core Roadmap

ZTE



AI Based RCA to Promote O&M Efficiency





Capability

1. **AI mining alarm association rules**
   - a) Alarm data multi-dimensional slice
   - b) Association algorithm improvement, automatic selection
2. **Cross-layer alarm tag association**
   - a) Mark the fault tag to the L3 alarm
   - b) Make unified collection of alarm and resource data
   - c) Automatically the cross-layer alarm association relationship through the analysis engine

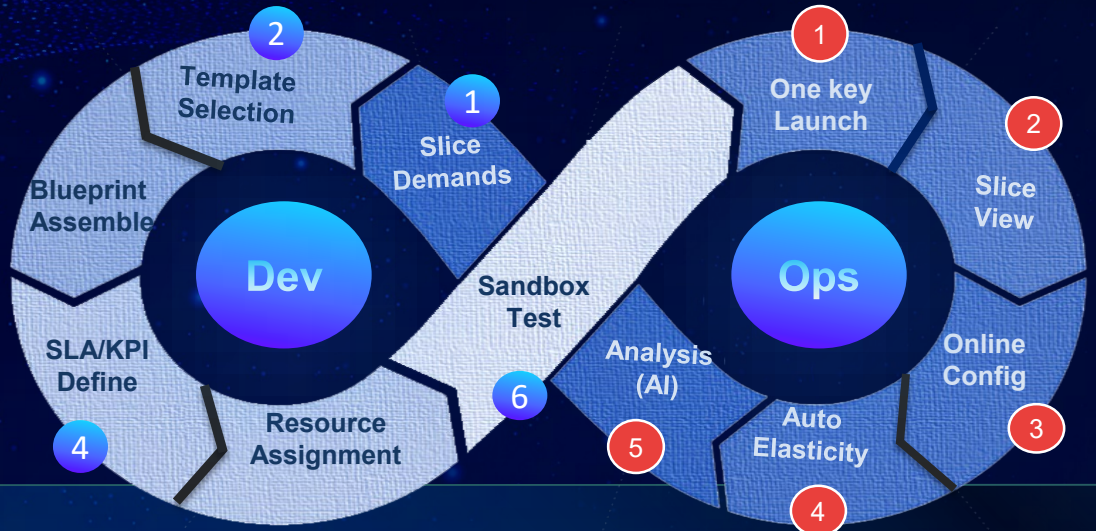
Benefits

1. Reduce the alarm pressure by 90% by using the flash rule and alarm association
2. Promote the alarm analysis efficiency by 40% because the skill requirement is reduced significantly
3. Build in the alarm association rule library. The number of rules is more than 1,000.

AI technologies are realized for the horizontal/vertical alarm association

Carrier DevOps for Digital Transformation

ZTE



Slice Wholesale Solution for B2B2C

ZTE

Industry application

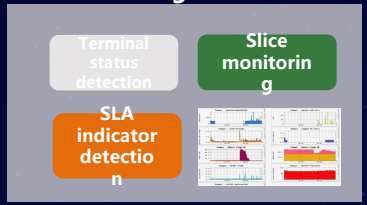

Sensor


Robotic arm

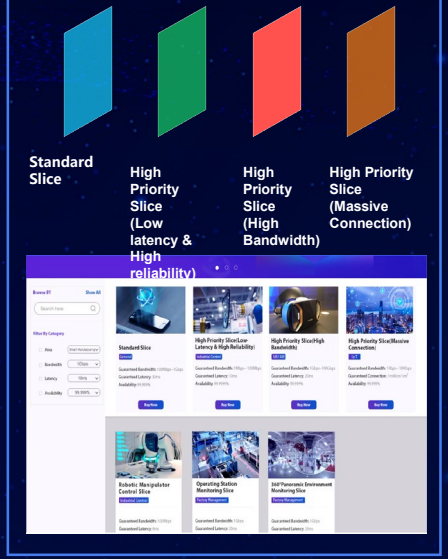

Camera


AGV

Industry control management



5G Slice Store



Carrier operating system

Open Capability (API Gateway)

Slice Orchestration System

Portal

Design | Orchestration | SLA Assurance

NSMF (network slice management function)

OSS/BSS

CSMF

RAN sub-slice management

DU | MEC | CU

RAN

TN sub-slice management

WAN,LAN

TN

CN sub-slice management

NEF | AMF | SMF | UPF | NFVI

CN

Customized on demand | **Automatic workflow** | **End-to-end** | **Intelligent optimization** | **SLA assurance** | **Safety isolation**

***25+* global mainstream operators cooperate to promote 5G commercial scale**

WIND open fiber | orange | JT | Telefónica | VEON | mobile | velcom | SoftBank | 中国移动 China Mobile | 中国电信 China Telecom | China Unicom 中国联通

ONAP OPEN NETWORK AUTOMATION PLATFORM
-3rd in global contribution
-Experts invest 30+

OPNFV
- 4th in global contribution
- Experts invest 10+

openstack
- 13th in global contribution
- Experts invest 30+

The Leader of vCN Commercialization

ZTE

Cloud Native

NFV & SDN Coordination

Telcom Enhancement

5G Oriented

Takeaway

- 2G/3G/4G/5G/Fixed Convergence
- SW & HW Acceleration
- SBA & SBA+
- Hybrid NSA & SA

- Multi-level AI-driven
- Intelligent E2E Network slicing
- Inter-domain Association
- RCA (Root Cause Analysis)

Common Core for SA & NSA & Combination

Leading 5G Innovations