# China Telecom NFV Lab Trial
Decoupling of VNF/Hypervisor/Hardware/MANO

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NFV overview

NFV target: *"Network Functions Virtualisation aims to transform the way that network operators architect networks by evolving standard IT virtualisation technology to consolidate many network equipment types onto industry standard high volume servers, switches and storage, which could be located in Datacentres, Network Nodes and in the end user premises."*----From ETSI NFV introductory white paper.
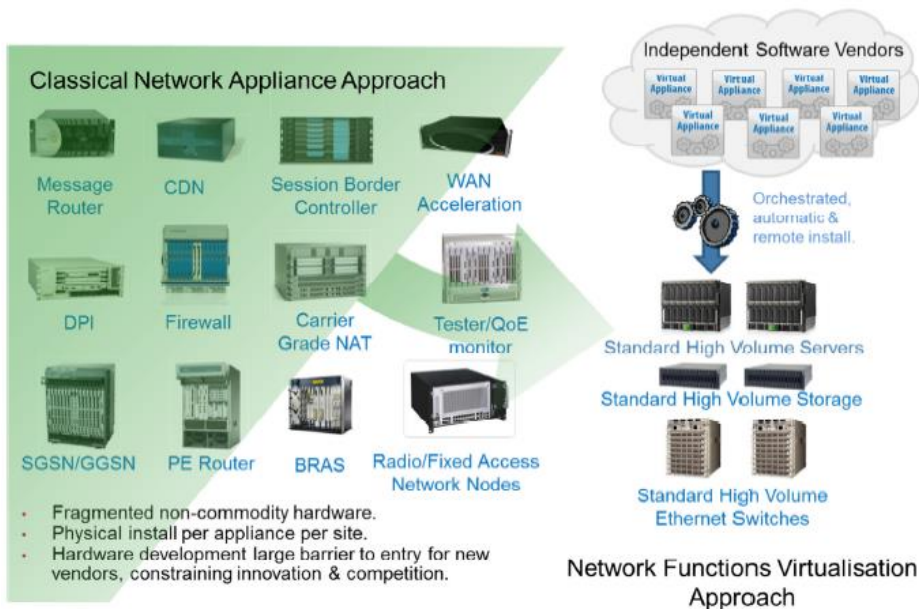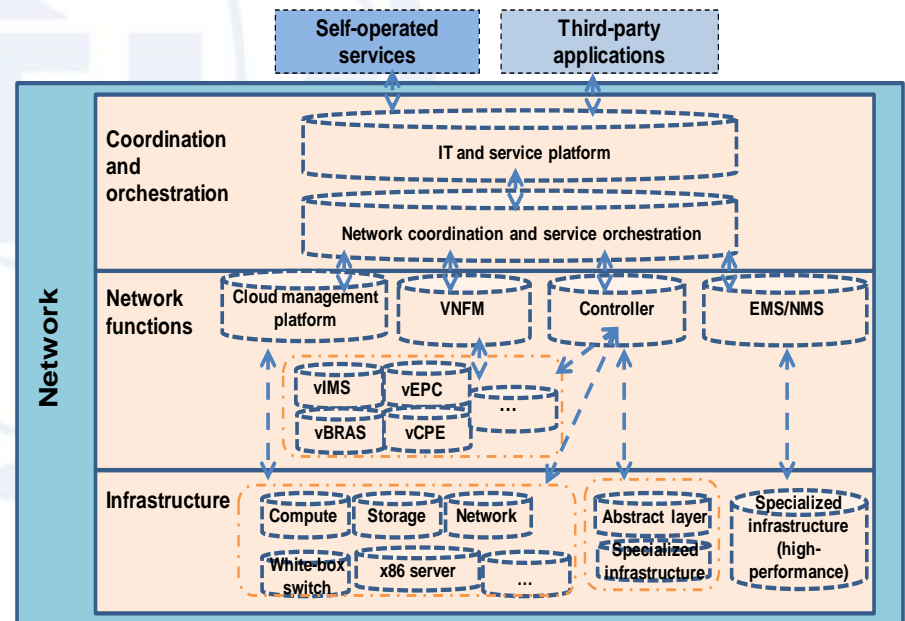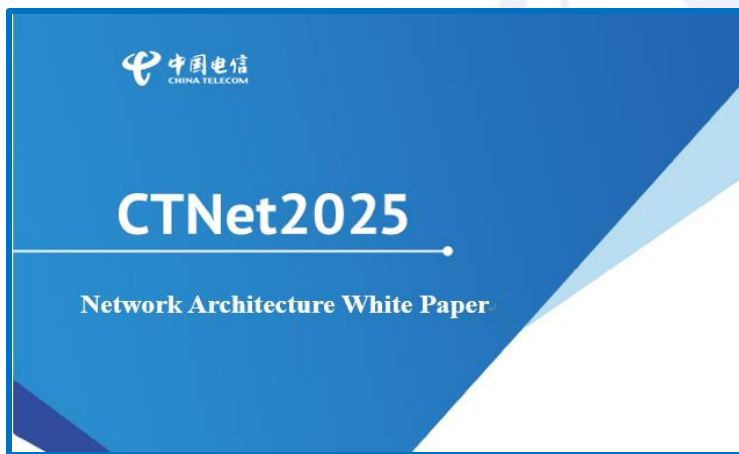

Ideal benefits:

✓ **Lower CAPEX and OPEX**

✓ **Shorter Time to Market**

✓ **Flexible service provisioning**

✓ **Higher operational efficiency**

✓ **Open and wider eco-systems**

NFV in CTNet2025

China Telecom announced Network Reconstruction Plan "**CTNet2025**" in July 2016, introducing cloud computing, SDN, **NFV** technologies to build a concise, agile, open and intensive future network.

CTNet 2025 White Paper

CTNet 2025 target architecture

NFV activities in China Telecom

- **Standard and open source**
  - ETSI, ITU-T, 3GPP, BBF, OPNFV, ONAP…
  - China Telecom specifications
    - NFVI, MANO, VNFs (vIMS, vEPC, vBRAS)
- **Development**
  - NFV Orchestrator
  - Cloud Management System
  - NFV test tool
- **Lab trial and field trial**
  - Horizontal: vendors in each layer, servers, hypervisor
  - Vertical: system from individual vendors,
  - **Cross layer decoupling:
  Decoupling of VNF/Hypervisor/Hardware/MANO**

Project background

- The benefits of NFV are based on the premise that VNFs for different systems from different vendors can be deployed on standard servers from some other vendors.

- The current situation:

  – Traditional telecom vendors are not willing to loose their advance in the market of legacy networks. They do not have the initiative to cooperate with each other or new players to provide the integrated NFV system.

  – Camps:

    - NFVO
    - VNF+MANO
    - Hypervisor
    - Server

Project target

Decoupling of :
**VNF/Hypervisor/Hardware/MANO**
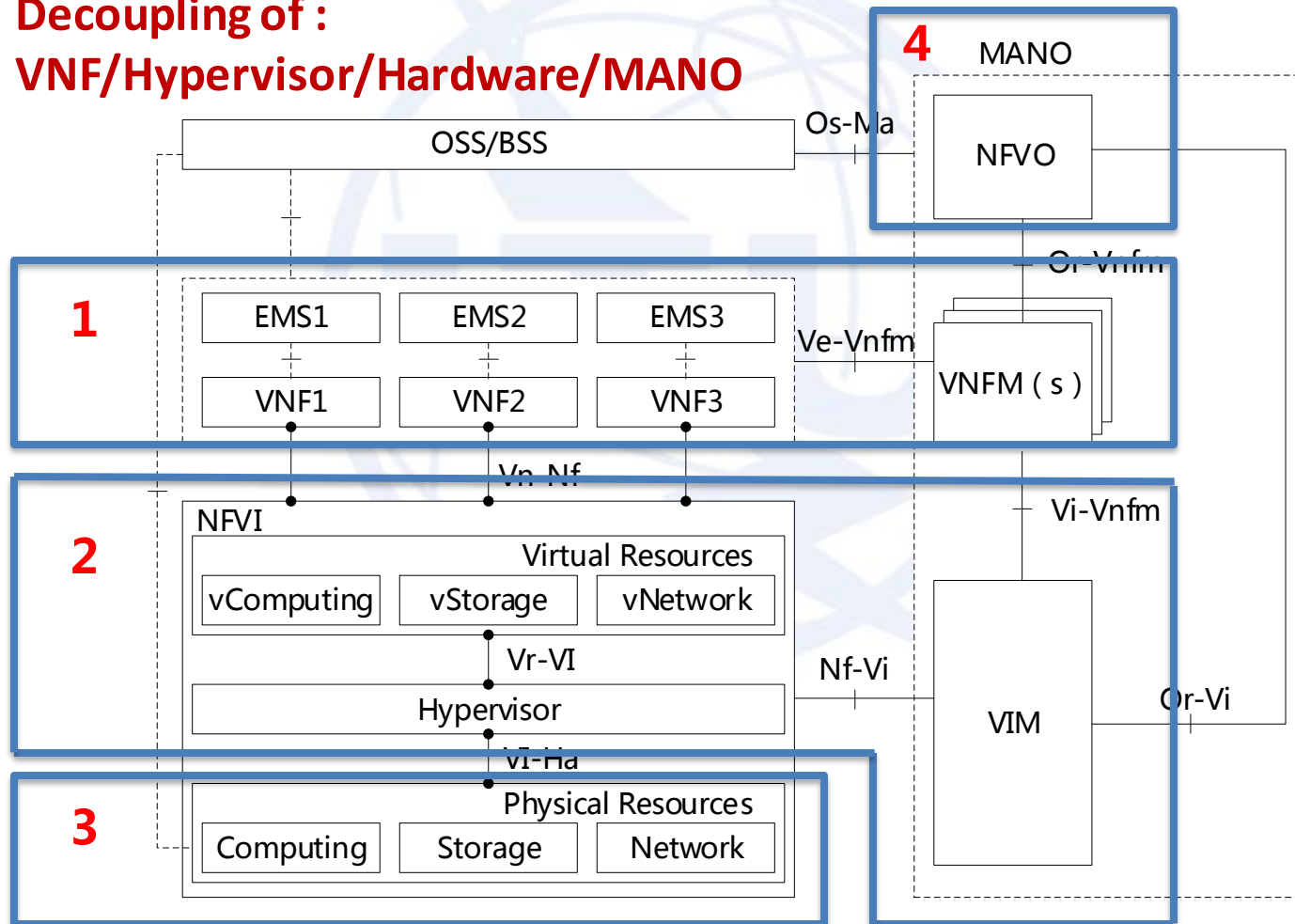
Lab trial preparation

- Involved parties:
  - NFVO: China Telecom
  - VNF(vBRAS)+VNFM: vendor A, B, C, D;
  - Hypervisor+VIM: vendor A, D, E, F;
  - Server: vendor D, F;
- Standards: China Telecom specifications of vBRAS, MANO, NFVI.
- Automatic test tool:
  - Telecom Test Orchestration System (TeleTOS): China Telecom
  - Shorten the test time to less than 1/5 of the traditional test method
- Target:
  - Ensure each combination of {Server, hypervisor, vBRAS} works well and achieve similar performance
  - Ensure each combination of {NFVO, VNFM, VIM} works well for vBRAS lifecycle management.

Test environment and configuration

**TeleLAB @ China Telecom Beijing Research Institute**

| Vendor A HyperVisor | Vendor D HyperVisor | Vendor E HyperVisor | Vendor F HyperVisor |

TeleTOS

Telecom Test Orchestration System
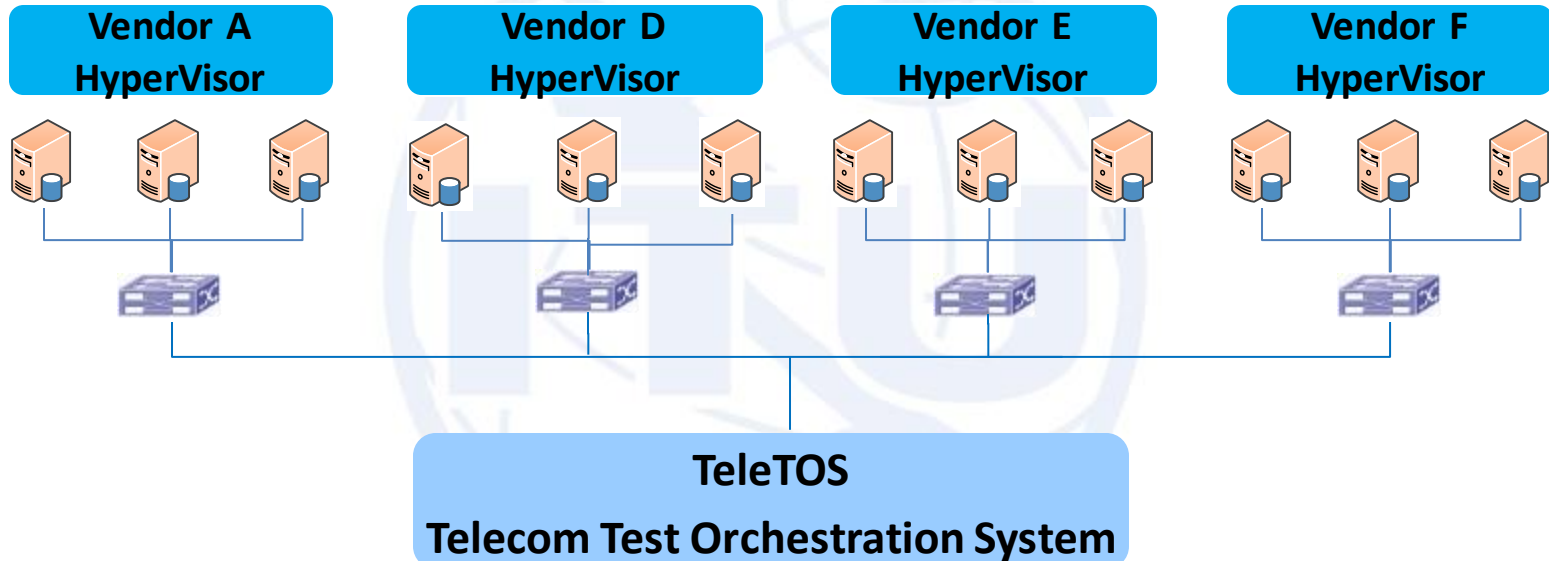
Vendor	Vendor D, F
CPU	E7-4830v3 (12 core) * 4
Memory	16G*16
Hard disk	1TB
network card	82599 10GE*2

VM Configuration:
- CPU：8vCPU
- Memory：16GB
- NIC：82599 10GE X 2

Workflow of TeleNOS and TeleTOS in TeleLAB
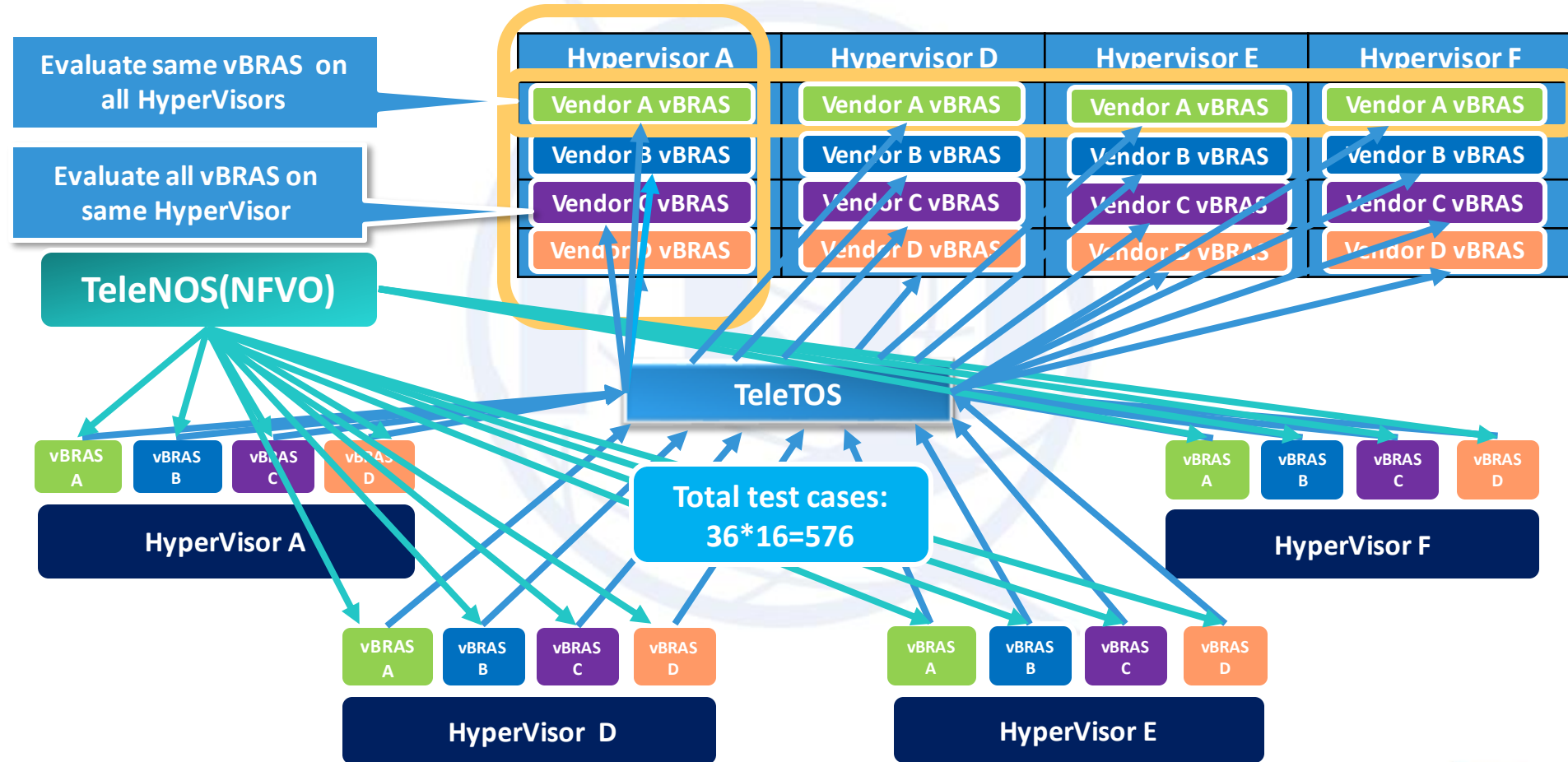
Test results and conclusion

1. Functional test:

vBRAS Vendor	Mandatory test cases (33)	Optional test cases (3)
Vendor A	Pass all	Pass all
Vendor B	Fail 1	Pass all
Vendor C	Fail 1	Fail 1
Vendor D	Pass all	Fail 1

2. Performance test:

➤ **For packets bigger than 512Bytes, all vBRAS vendors have same performance on all hypervisors;**

➤ **For packets smaller than 512Bytes (especially smaller than 256B):**

   ➤ **Vendor A has the most stable performance on all hypervisors**

   ➤ **Vendor B has the best performance except on hypervisor A**

Decoupling of vBRAS/Hypervisor/Hardware/MANO is feasible

Next plan

More vendors

Updated versions

More VNFs

Field trial

Build an open ecosystem for NFV

Thank you

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