Cloud networking

Composante
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

En bref

> **Volume horaire texte (reprise v3):** 9 seances

> **Code:** N9EN10A

Présentation

Objectifs

- **To present new paradigm of networking : virtualisation control and programmability**
- **To detail new technologies for control (QoS ,Routing, Reliability) DCBx, Trill, segment routing, EPR**
- **To explain cloud networking architectures**

Description

Chap1 Context-

Data Center history: data and storage networks-from centralised to cloud networking Virtualisation principle of containers versus virtual machine-levels of virtual communications-specificities of L 2 virtual communications MAC addressing and extended VLAN segmentation L3 virtual communications addressing, IP floating .

Chap2 Data Center Architecture

DC Network. Network element architecture- Isolated processes: routing and switching- Integrated processes: flow switching- Separated processes : hardware design with multistage Fabric and software design with SDN concept

Performance of communication aArchitecture-Limitations- Congestion management principles- Traffic management principles

Chap3 Data center Communication

Topology types: big switch, clos network fat tree- Routing and topology-Problems and new solutions for DC-Hierarchical L2Routing with Pod and pseudo addresses- L3 routing on pseudo IP addresses

Infrastructure Standardisation TIA942 standard elements-Redundancy and reliability levels-Rated (tiers) DC --Data Center Bridging standards- Enhanced Ethernet flow control and congestion management. PFC,ETS,CN,DCBX

Chap4 Load sharing

Principles of load sharing: Load sharing objective, levels and processes: discovery, distribution, type of distribution: traffic independent, traffic dependant, load dependant

Path load sharing: Bridging sharing, STP, Trill SPB Packet; Routing sharing- ECMP, Flow routing sharing : MPLS-TE and Segment routing

Chap5 Reliability

Principles : Failure characteristics, fault handling strategies, protection and restoration

Failure recovery for routed network: recovery methods in MPLS-TE, recovery cycles, local versus global strategies, bandwidth sharing versus protection ; Fast reroute Mechanism – overview , types of protection; detour and bypass illustration, signalling

Failure recovery for bridged networks: EPRS

Pré-requis obligatoires

- **LAN networking : Ethernet, switching**
- **Internet networking IP, TCP,BGP, MPLS**

Infos pratiques