Compute-Aware Traffic Steering for Midhaul Networks

<draft-lcmw-cats-midhaul-01>

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Radio functional split
(recapping on the scope of the draft)

Common D-RAN

Full Split C-RAN

EPC/5GC

Virtualized Functions

CATS can be used HERE!
CATS framework applicability for Midhaul

- DU as client of CU instances
- C-PS will take decision on which CU (or Service Instance) deliver all the DU traffic (until any change applies)
  - Maybe an App of O-RAN control architecture
- C-NMA and C-SMA will provide views on metrics relevant for networking and compute respectively
  - O-RAN considers CPU average utilization or the memory and energy usage of every CU-UP instance
- Example in the draft refers to the usage of RFC9543 network slice service for connectivity
Protocol encapsulation view

Connectivity view:

Midhaul (F1 interface)

DU <-> TNE-1 <-> TNE-2 <-> CU-UP
(at Site X)

Protocol view:

F1-U payload

+-----+ +-----+ +-----+ +-----+
| PDCP-U | PDCP-U | PDCP-U | PDCP-U |
+-----+ +-----+ +-----+ +-----+

3GPP encaps

+-----+ +-----+ +-----+ +-----+
| GTP-U | GTP-U | GTP-U | GTP-U |
| UDP | UDP | UDP | UDP |
| IP | IP | IP | IP |
+-----+ +-----+ +-----+ +-----+

CATS concern

MPLS (VPN)  MPLS (VPN)

Traffic steering (e.g., MPLS VPN)
Example using IETF Network Slice Service for steering

```
"connection-groups": {
  "connection-group": [
    {
      "id": "matrix1",
      "connectivity-type": "ietf- vpn-common:hub-spoke",
      "connectivity-construct": [
        {
          "id": "1",
          "p2mp-sender-sdp": "du1",
          "p2mp-receiver-sdp": [
            "cu-up1",
            "cu-up2",
            "cu-up3",
            "cu-up4"
          ],
        },
        "status": {}
      ]
    }
  ]
}

"service-match-criteria": {
  "match-criterion": [
    {
      "index": 1,
      "match-type": "ietf-nss:destination-ip-prefix",
      "value": ["2001:db8::1/64"],
      "target-connection-group-id": "matrix1"
    }
  ]
}
```
Next steps

• Describe CATS as mechanism within O-RAN WG9 specifications
  • A liaison statement would be useful to progress the work?

• Collect (more) feedback from WG (based on additions and clarifications)

• Prepare new version for IETF 121
  • Keep working on the interplay between O-RAN orchestration framework and CATS components
  • Adoption of the document could help on the task of considering CATS for O-RAN. If so, authors would intend to request adoption for IETF 121, as long as the document progresses