Traffic Engineering Architecture and Signaling WG (TEAS)

5G Transport Slice Connectivity Interface (TSCi)

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End-to-end network slicing

- **RAN slices**
  - Infotainment
  - HD maps
  - Automated driving

- **Transport slices**
  - RAN slice controller
  - Transport slice controller

- **Core slices**
  - Core slice controller

- **Tenants**
  - Public safety
  - Video surveillance

- **E2E network slices**
  - NS1
  - NS2
  - NS3
  - NS4
  - NS5

- **Clouds**
  - Public and private clouds}

- **Network components**
  - E2E network slice orchestrator
  - BMW infotainment
  - BMW HD maps
  - Multi-source artificial intelligence
  - PS video surveillance
Automation of end-to-end network slices – putting it all together

Customer (tenant) requests MNO for creation of a new 5G network slice:

- MNO: “X operator”
- Customer: “Gaming company Y”
- Service: URLLC
- SLA: latency < 5 ms

Note: Steps shown are logical and they can be combined. For example, step 3 can be combined with steps 4 or 5.
Transport Slice is aligned with 3GPP definitions

http://www.3gpp.org/NEWS-EVENTS/3GPP-NEWS/1951-SA5_5G

Ref: 3GPP TS 28.530
5G Network Slice management-3GPP view

Each controller/orchestrator performs:
1. Automation (aka creation)
2. Monitoring and analytics
3. Optimization

E2E NSMF (i.e. E2E Network Slice Orchestrator)
- E2E NSI (Network Slice Instance)
- AN Abstraction
- TN Abstraction
- CN Abstraction

AN NSSMF (i.e. RAN Slice Controller)
- AN NSSI
- AN Automation
- AN Monitoring
- AN Optimization

Transport NSSMF (i.e. Transport Slice Controller)
- Transport NSSI
- Transport Automation
- Transport Monitoring
- Transport Optimization

CN NSSMF (i.e. Core Slice Controller)
- CN NSSI
- CN Automation
- CN Monitoring
- CN Optimization

3GPP

5G Transport Slice Connectivity interface

3GPP

NSMF: Network slice management function
NSSMF: Network sub-slice management function
NSI: Network Slice Instance
NSSI: Network Sub-Slice Instance
• 3GPP defines the RESTful interface from e2e network slice controller to 5G RAN and Core slice controllers
• This work defines the same interface to “Transport Slice controller”
• This new interface called **Transport Slice Connectivity interface (TSCi)**
• Addresses automation (creation), monitoring and optimization of transport slices
“Transport Slice Connectivity Interface” in action

1- Create_transport_connectivity (gNB1.tp1, gNB2.tp1, UPF1.tp1, UPF2.tp1 for S-NSSAI=20, SLA: 5ms and 10 M, Tenant: HONDA, Infotainment, ...)
Also enable transport slice monitoring & Optimization

2- find the resources (e.g. routers CSG1.tp1 and BR1.tp1

3- Implement (aka realize) the connection using Service (e.g. L3VPN, L2, etc) using and tunnels (e.g. Ethernet, MPLS, SR etc)

Transport Connectivity API provides:
- Abstraction
- Assist the Transport Controller to map Connection request to Service/Tunnel implementation
- Transport slice monitoring, assurance and Optimization

5G E2e network slice for S-NSSAI=20 for customer HONDA & service type Infotainment
SLA: latency < 5ms and B/W > 10Mbps
Next

- More reviews needed
- Addresses more details on three main functions:
  - Automation (aka creation) of transport slices
  - Monitoring and analytics on transport slices
  - Optimization on transport slices
- Define the requirements for TSCi informational model
- Target for IETF 106 with new version to continue addressing the above-mentioned functions
Thank you