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**IETF Network Slice use cases**  
**draft-cheng-teas-network-slice-usecase-01**

Abstract

This draft supplements the usecase described in [\[I-D.ietf-teas-ietf-network-slice-definition\]](#) from the perspective of the operator. In specific, it mainly includes two types of the network slice customers from the perspective of operators:

- o End-to-end slicing cloud-network collaboration
- o The branch departments that use slices within the operator.

Status of This Memo

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## [1.](#) Introduction

[I-D.ietf-teas-ietf-network-slice-definition] defines the concept of IETF network slices that provide connectivity coupled with a set of specific commitments of network resources between a number of endpoints over a shared network infrastructure and describes a number of use-cases benefiting from network slicing including:

- o 5G network slicing
- o Network wholesale services
- o Network sharing among operators
- o NFV connectivity and Data Center Interconnect

In the document also clearly stated services that might benefit from the network slices include but not limited to the above use-cases.



This document supplements two use-cases from the perspective of operators. In specific, it mainly includes two types of the network slice customers from the perspective of operators:

- o End-to-end slicing cloud-network collaboration
- o The branch departments that use slices within the operator.

## **2. Requirements notation**

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

## **3. Network Slice use cases**

### **3.1. cloud-network service for enterprise**



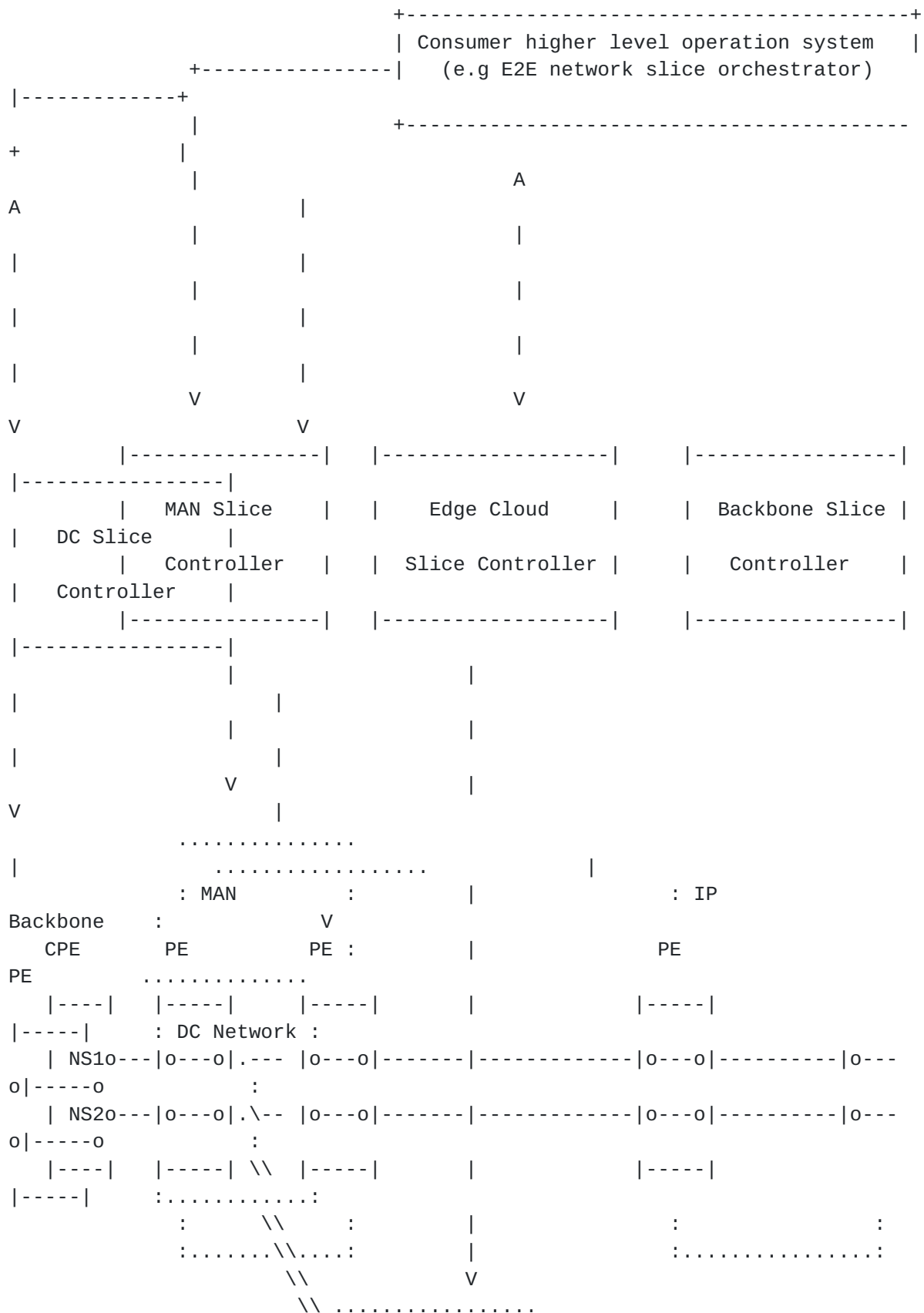




Figure 1

A cloud-network service for enterprise will involve several domains, each with its own controller. MAN, Edge Cloud, IP Backbone and DC domains need to be coordinated in order to deliver a cloud-network service for enterprise.

In Figure 1, the network operator has created two E2E network slices, there are two types of traffic from the client, and each traffic is mapped to different slice, which is NS1 and NS2. Each NS with its own MAN, Edge Cloud, IP Backbone and DC network slices. The mechanism used to establish network slices in different domains and map the traffic to a network slice is outside the scope of this document.

### 3.2. The branch departments that use slices within the operator.

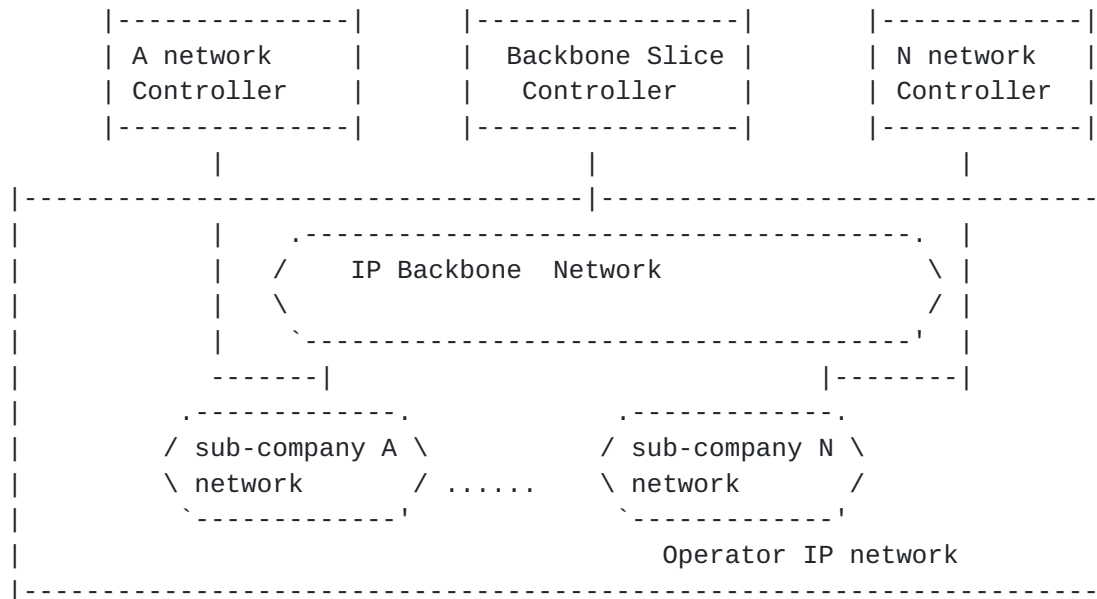


Figure 2

There are multiple sub-company network and IP Backbone network in an operator IP network, each with its own slice controller. Sub-company network can be the branches of the operator using slices.

IP Backbone network slice is orchestrated by the IP Backbone network orchestrator, and the path is calculated through the IP Backbone network slice controller.

For network slicing inside the local branch (sub-company network in the figure) is orchestrated through the orchestrator of the sub-company network. The sub-company network slice controller performs unified control and path calculation for the sub-company network. The path calculation and control of slices related to the IP Backbone are sent to the IP Backbone network slice controller through the eastbound and westbound interfaces, and the IP Backbone network slice controller controls and calculates the path.

#### 3.2.1. Network Slice resource management





|                           |  |
|---------------------------|--|
| -----                     |  |
| Resource Type             | Orchestrator resource                                      |
| management                |  |
| -----                     |  |
| Slice ID                  | Unified resource orchestration and planning, plan Slice ID |
| by sub-company.           |  |
|                           | The orchestrator ensures that the IDs do not conflict with |
| each other.               |  |
| -----                     |  |
| Node SID                  | Unified resource orchestration and planning. A unified     |
| coding mode is            |  |
|                           |  |
| recommended.              |  |
| -----                     |  |
| SR Policy Color           | Unified resource orchestration and planning, and resource  |
| pool allocation.          |  |
| -----                     |  |
| VPN name                  | Unified resource orchestration and planning. Perform       |
| unified resource conflict |  |
|                           | detection. VPN name within the same network element shall  |
| not be repeated.          |  |
| -----                     |  |
| VLAN sub-intf             | Unified resource orchestration and planning: Resources are |
| divided for VLAN          |  |
|                           | sub-interfaces under the same physical                     |
| interface.                |  |
| -----                     |  |

### [3.2.2.](#) Domain governance of network slice

|              |               |
|--------------|---------------|
| -----        |               |
|              |               |
| V            |               |
|              |               |
| -----        | -----         |
| -----        |               |
| V            | / Operation\  |
| / Operation\ | / Role \----- |

```

-----
\ Set / \ management/ . Security
System . -----'-----
'-----' '-----' . administrator
administrator . / Role Set \ ..... / Role Set \
      A      A      |      /
\-----> \ A      /      \ N      /
      |      |      |-----|      \ Maintainer Operator
monitor /      '-----' '-----'
      |      |
V      .      .      /\      / |
      |      .-----'-----'
-----'-----' / \      / |
      |-----/ Operation\ / User
\      .-----'-----' V V      / V
      \ Set / \ management/---> . All user User
Group . -----'-----' V -----'
      '-----' '-----' /      \--
> / User \ / User \..... / User \
      \
Current      / \ A / \ B / \ N /
User . -----'-----'-----' . Login User Locked
'-----'-----' | / \ |
V V \ V
V .-----'-----'
sub-company A \ ..... / sub-company N \
network / \ network /
'-----'-----'

```

Role-based user rights management uses the role template to quickly allocate user rights, and provides network resources and sub-network slice resources for different users.

#### **4. Security Considerations**

TBD

#### **5. IANA Considerations**

This document does not have any requests for IANA allocation. This section may be removed before the publication of the draft.

#### **6. Normative References**

[I-D.ietf-teas-ietf-network-slice-definition]

Rokui, R., Homma, S., Makhijani, K., Contreras, L., and J. Tantsura, "Definition of IETF Network Slices", [draft-ietf-teas-ietf-network-slice-definition-00](#) (work in progress), January 2021.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.

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