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**DC aware TE topology model
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Abstract

This document proposes the extension of the TE topology model for including information related to data center resource capabilities.

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[1.](#) Introduction

More and more service providers are deploying cloud computing facilities in order to host different kinds of services and applications. Such facilities can be generally referred as Datacenter Points of Presence (DC-PoPs). Those DCs will consist on a number of servers and networking elements for connecting all of them with the transport network. Depending on the number of servers in the data center, there will be distinct capabilities in terms of CPUs, memory and storage available for deploying and running the aforementioned services.

In such distributed and interconnected DC-PoPs, both computing and topological information are of interest for determining the optimal DC where to deploy a given service or application.

This document propose a DC-aware extension for the topology model.

[2.](#) Datacenter information

The relevant information for datacenter capabilities can be described in different ways. One potential manner is to describe resource capabilities such as CPU, memory, storage, etc. This can be done in terms of total, used and free capacity for each of the parameters of interest. Another form of populating the information is by describing those resource capabilities as a bundled, usually referred as quota or flavor. In this respect, reference bundles such as the ones proposed by the Common Network Function Virtualisation Infrastructure Telecom Taskforce (CNTT), which is an initiative jointly promoted by GSMA and the Linux Foundation [[CNTT](#)], [[GSMA](#)].

Focusing on the CNTT ongoing work, the flavors there defined are characterized according to:

- o Type of instance (T): the types of instances are characterized as B (Basic), or N (Network Intensive). The latter can come with

extensions for network acceleration for offloading network intensive operations to hardware.

- o Interface Option (I): it refers to the associated bandwidth of the network interface.
- o Compute flavor (F): it refers to a given predefined combination of resources in terms of virtual CPU, RAM, disk, and bandwidth for the management interface.
- o Optional storage extension (S): allows to request additional storage capacity.
- o Optional hardware acceleration characteristics (A): to request specific acceleration capabilities for improving the performance of the infrastructure.

Additional information can refer to the management capabilities of the compute infrastructure, such as hypervisor details or virtualization technologies available.

Finally, all can be complemented with information related to the networking details for reaching the aforementioned compute capabilities (IP addressed, bandwidth, etc).

3. Model structure

```

module: ietf-dcpop-dc
  +--rw dcpop
    +--rw dc* [id]
      | +--rw hypervisor* [id]
      | | +--rw ram
      | | | +--rw total?   uint32
      | | | +--rw used?    uint32
      | | | +--rw free?    uint32
      | | +--rw disk
      | | | +--rw total?   uint32
      | | | +--rw used?    uint32
      | | | +--rw free?    uint32
      | | +--rw vcpu
      | | | +--rw total?   uint16
      | | | +--rw used?    uint16
      | | | +--rw free?    uint16
      | | +--rw instance* -> /dcpop/dc/instance/id
      | | +--rw id         string
      | | +--rw name?      string
      | +--rw instance* [id]
      | | +--rw flavor

```



```

| | | +--rw disk?      uint32
| | | +--rw ram?       uint32
| | | +--rw vcpus?    uint16
| | | +--rw id?       string
| | | +--rw name?     string
| | +--rw image
| | | +--rw checksum   string
| | | +--rw size      uint32
| | | +--rw format
| | | | +--rw container? enumeration
| | | | +--rw disk?    enumeration
| | | +--rw id?       string
| | | +--rw name?     string
| | +--rw hypervisor? -> /dcpop/dc/hypervisor/id
| | +--rw port*       -> /dcpop/dc/network/subnetwork/port/id
| | +--rw project?    string
| | +--rw status?     enumeration
| | +--rw id          string
| | +--rw name?       string
| +--rw image* [id]
| | +--rw checksum   string
| | +--rw size      uint32
| | +--rw format
| | | +--rw container? enumeration
| | | +--rw disk?    enumeration
| | +--rw id        string
| | +--rw name?     string
| +--rw flavor* [id]
| | +--rw disk?     uint32
| | +--rw ram?      uint32
| | +--rw vcpus?   uint16
| | +--rw id       string
| | +--rw name?    string
| +--rw dc-monitoring-param* [name]
| | +--rw name      string
| | +--rw value-string? string
| +--rw network* [id]
| | +--rw subnetwork* [id]
| | | +--rw port* [id]
| | | | +--rw ip-address? inet:ip-address
| | | | +--rw instance?  -> /dcpop/dc/instance/id
| | | | +--rw project?   string
| | | | +--rw status?    enumeration
| | | | +--rw id        string
| | | | +--rw name?     string
| | | +--rw project?    string
| | | +--rw status?     enumeration
| | | +--rw id          string

```



```

| | | +--rw name?      string
| | | +--rw dhcp-agent* [id]
| | | +--rw enabled?   boolean
| | | +--rw pools* [ip-address]
| | | | +--rw ip-address  inet:ip-address
| | | +--rw project?   string
| | | +--rw status?    enumeration
| | | +--rw id         string
| | | +--rw name?      string
| | | +--rw project?   string
| | | +--rw status?    enumeration
| | | +--rw id         string
| | | +--rw name?      string
| | | +--rw dcpop-ref?  -> /dcpop/dcpop-id
| | +--rw ap*          -> /actn-vn:actn/ap
/access-point-list/access-point-id
| | +--rw dcpop-ref?    -> /dcpop/dcpop-id
| | +--rw id            string
| | +--rw name?         string
+--rw dcpop-id?         string

```

4. Security Considerations

The data-model in this document does not have any security implications. The model is designed to be accessed via NETCONF [RFC6241], thus the security considerations for the NETCONF protocol are applicable here.

5. IANA Considerations

This draft does not include any IANA considerations

6. References

- [CNTT] "Cloud infrastructure Telco Taskforce Reference Model, Version 6.0", January 2021, <https://cntt-n.github.io/CNTT/doc/ref_model/>.
- [GSMA] "Cloud Infrastructure Reference Model, Version 1.0", November 2020, <<https://www.gsma.com/newsroom/wp-content/uploads//NG.126-v1.0-2.pdf>>.
- [RFC6241] Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", [RFC 6241](#), DOI 10.17487/RFC6241, June 2011, <<https://www.rfc-editor.org/info/rfc6241>>.

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