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**Source:** Editors

**Title:** Output – initial draft baseline text of Recommendation ITU-T Q.vbng-pup-ipt  
 “Interoperability testing suite for cloud-based control plane and pooled user plane  
 of virtualized broadband network gateway” (Geneva, 10-19 May 2023)

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**Abstract:** This document is the initial baseline text of a new work item Q.vbng-pup-ipt  
 “Interoperability testing suite for cloud-based control plane and pooled user plane  
 of virtualized broadband network gateway”. This document includes the results of  
 discussion on the Q14/11 meeting which was held on 10-19 May 2023.

The following table shows discussion results for input documents.

Document Number	Source	Title	Meeting results
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SG11-C144	China Telecom MIIT China Unicom	Output – initial draft baseline text of Recommendation ITU-T Q.vbng-pup-iopt “Interoperability testing suite for cloud-based control plane and pooled user plane of virtualized broadband network gateway” (Geneva, 10-19 May 2023)	Accepted with the following modification. It is agreed to initiate this new work item. <ol style="list-style-type: none"><li>(1) Updates the description of scope.</li><li>(2) Supplement the references.</li><li>(3) Add some description of clause 6.</li><li>(4) Change the title of clause 9 to “Interoperability testing cases between different pooled user planes”</li></ol>
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## **Draft new Recommendation ITU-T Q.vbng-pup-ipt**

### **Interoperability testing suite for cloud-based control plane and pooled user plane of virtualized broadband network gateway**

#### **1 Scope**

This draft Recommendation specifies the interoperability testing suite for cloud-based control plane and pooled user plane of vBNG (virtualized broadband network gateway). The following aspects are addressed in this Recommendation:

- Overview of interoperability testing of cloud-based control plane and pooled user plane of vBNG.
- Interoperability testing cases between cloud-based control plane and pooled user plane.
- Interoperability testing cases between different pooled user planes.

#### **2 References**

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Q.3719] Recommendation ITU-T Q.3719 (2019) “Signalling requirements for the separation of control plane and user plane in a virtualized broadband network gateway (vBNG)”.

[ITU-T Q.4064] Recommendation ITU-T Q.4064 (2020), “Interoperability testing requirements for a virtualized broadband network gateway”.

[ITU-T Q.BNG-PUP] Draft recommendation ITU-T Q.BNG-PUP (2022) “Signalling requirements for cloud-based control plane and pooled user plane of vBNG (Broadband Network Gateway)”.

#### **3 Definitions**

##### **3.1 Terms defined elsewhere**

**TBD**

##### **3.2 Terms defined in this Recommendation**

This Recommendation defines the following terms:

**TBD**

#### **4 Abbreviations and acronyms**

This Recommendation uses the following abbreviations and acronyms:

**TBD**

#### **5 Conventions**

In this Recommendation:

The keywords “is required to” indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this document is to be claimed.

The keywords “is prohibited from” indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this document is to be claimed.

The keywords “is recommended” indicate a requirement which is recommended but which is not absolutely required. Thus this requirement need not be present to claim conformance.

The keywords “is not recommended” indicate a requirement which is not recommended but which is not specifically prohibited. Thus, conformance with this specification can still be claimed even if this requirement is present.

The keywords “can optionally” indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor’s implementation must provide the option and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with the specification.

## 6 Overview of interoperability testing between CCP and PUP of vBNG

According to the framework and overview of cloud computing IOPT in [ITU-T Q.4040], which consists of interaction between cloud service customer-cloud service provider (CSC-CSP), CSP-CSP and CSP-management system corresponding to three different target areas, there are two target areas of CCP-PUP of vBNG.

- Target area 1: dealing with the interaction between vBNG-CP and vBNG-UP.
- Target area 2: dealing with the interaction between vBNG-UPs.

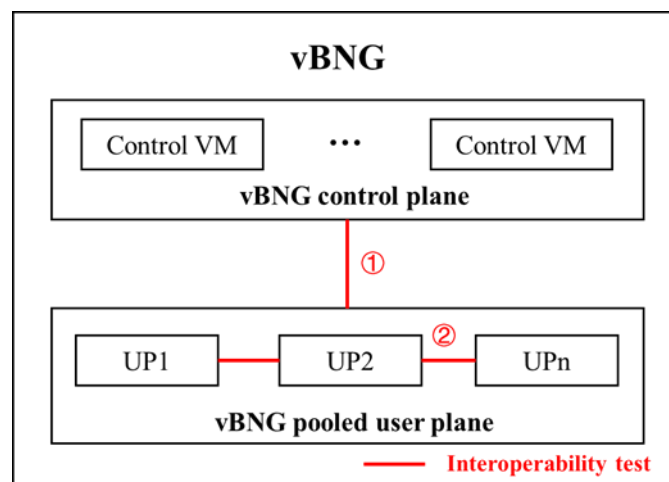


Figure 6-1. Interoperability test between vBNG CCP and PUP

The test entities include vBNG-CP and vBNG-PUP, and the IOPT between the entities includes the IOPT of vBNG-CP and vBNG-PUP, vBNG-UP and vBNG-UP.

IOPT between vBNG-CP and vBNG-PUP should verify the following functions:

- User access and authentication through the information interaction between this two entities.
- User allocation between vBNG-UPs controlled by vBNG-CP for load balancing.
- User control and service policy information delivered from vBNG-CP to vBNG-UP.
- N+1 and N:1 warm standby protection function of vBNG-UP pool cooperated with vBNG-CP.

IOPT between vBNG-PUPs: The principal function for vBNG-PUPs in pool is to confirm the specific port/card/device for user accessing.

vBNG-CP takes the main control function, for example user switching between PUPs. vBNG-CP decides whether the UP is failure based on the connection status between the vBNG-CP and UP, or switches to another one for user switching. At the same time, in order to prevent users from switching back to the UP for the reason of conflicting with the original users after the faulty UP recovered, the vBNG-UP will delete the user’s information when the connection is down. If something wrong happens in vBNG-CP, all users’ information will be lost and encounters disconnection.

This document mainly focuses on following aspects :

1. Test cases of signalling interaction between vBNG-CP and vBNG-UP pool. Noted that the test cases mainly concentrate on the new characteristic or different operation steps introduced by pooling of vBNG-UP, distinguish from self-deployment of vBNG-UP.
2. Operation case of warm and cold standby and failure conversion.

### **7 IOPT Framework for CCP and PUP of vBNG**

[Contributor's note]: This clause specifies the IOPT Framework for CCP and PUP of vBNG.

### **8 Interoperability testing cases between CCP and PUP of vBNG**

[Contributor's note]: This clause aims to provide test method for interoperability testing based on the new characteristic brought by pooling between CCP and PUP. Test objective, test conditions, test configurations, test procedure, evaluation specifications should be included

### **9 Interoperability testing cases for between different pooled user planes**

[Contributor's note]: This clause aims to provide test method for testing suite for fault protection of PUP. Test objective, test conditions, test configurations, test procedure, evaluation specifications should be included.

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