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Source: Editors**Title:** Initial draft Recommendation ITU-T Y.ecloud-reqts, : “Cloud computing - Functional requirements of edge cloud”**Purpose:** Proposal

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Keywords: Cloud computing, edge cloud**Abstract:** This document provides initial new draft Recommendation ITU-T Y.ecloud-reqts, “Cloud computing -Functional requirements of edge cloud”.

The following table shows discussion results for contributions.

Contribution No.	Source	Contribution title	Result and action
C1052	Electronics and Telecommunications Research Institute (ETRI)	New: Y.egc-reqts, “Cloud computing - Functional requirements of edge cloud” (merged with C161)	Accepted with modification

Major issues of initial draft Recommendation are summarized as follows:

- adding explain the relationship between distributed cloud and edge cloud.
- involving model 2, and model 3 of distributed cloud in clause 7.

Future contributions are invited for the following topics with high priority:

- Contributions are invited to overview of edge cloud(clause 6);
- And operation of edge cloud in distributed cloud (clause 7) to build the consensus for edge cloud.

Initial draft Recommendation ITU-T Y.ecloud-reqts

Cloud computing - Functional requirements of edge cloud

Summary

Edge cloud is defined in ITU-T Recommendation Y.3508 as a cloud computing deployed to the edge of the network accessed by cloud service customers (CSCs) with small capacity resources enabling cloud service. In edge cloud, the cloud service is provided in forms of lightweight cloud service by CSP. Lightweight cloud service refers to a portion of cloud service to reconfigure the functionality of cloud service to fit on edge cloud such as base station and gateway with small capacity resource.

This Recommendation provides the functional requirements of the edge cloud to support lightweight cloud service to CSC.

Keywords

edge cloud, distributed cloud, cloud computing

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Initial draft Recommendation ITU-T Y.ecloud-reqts

Cloud computing - Functional requirements of edge cloud

1 Scope

This Recommendation provides functional requirements of edge cloud. Edge cloud is a cloud computing deployed to the edge of the network. It has small capacity resources enabling cloud service. It addresses the following subjects:

- Overview of edge cloud;
- Operation of edge cloud in distributed cloud;
- Functional requirements of edge cloud;
- Use cases of edge cloud in distributed cloud.

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 Y.3500] Recommendation ITU-T Y.3500 (2014), *Information technology – Cloud computing – Overview and vocabulary*.

[ITU-T Y.3502] Recommendation ITU-T Y.3502 (2014), *Information technology – Cloud computing – Reference architecture*.

[ITU-T Y.3508] Recommendation ITU-T Y.3508 (2018), *Cloud Computing – Overview and high-level requirements of distributed cloud*.

[TBD]

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 cloud computing [IUT-T Y.3500]: Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand.

NOTE – Examples of resources include servers, operating systems, networks, software, applications and storage equipment.

3.1.2 core cloud [IUT-T Y.3508]: A cloud computing, which manages resource pools including resources in the edge of the network and enables cloud service.

NOTE – Enabled cloud service on the core cloud is provided by a cloud service provider (CSP).

3.1.3 distributed cloud [IUT-T Y.3508]: Distribution of cloud capabilities types to the edge of the network for enabling cloud services with low latency and real time processing on limited bandwidth by interworking among pools of physical or virtual resources.

3.1.4 edge cloud [IUT-T Y.3508]: A cloud computing deployed to the edge of the network accessed by cloud service customers (CSCs) with small capacity resources enabling cloud service.

NOTE 1 – Enabled cloud service on the edge cloud is lightweight cloud service provided by a cloud service provider (CSP) depending on cloud service category.

NOTE 2 – Lightweight cloud service refers to a portion of cloud service to reconfigure the functionality of cloud service to fit on edge cloud such as base station and gateway with small capacity resource.

3.1.5 regional cloud [IUT-T Y.3508]: A cloud computing hosted from core cloud to particular geographical regions.

NOTE – Enabled cloud service on the regional cloud is entire or partial cloud service of core cloud provided by a cloud service provider (CSP).

3.2 Terms defined in this Recommendation

None

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CC	Core Cloud
CSC	Cloud Service Customer
CSP	Cloud Service Provider
EC	Edge Cloud

[TBD]

5 Conventions

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 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 “**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.

[TBD]

6 Overview of edge cloud

6.1 Introduction to distributed cloud

[Editor's note on 2020-07-29] Contributions are invited to enhance the texts in clause 6.1 to introduce edge cloud as well as distributed cloud. In the scope of distributed cloud, edge cloud should be explained according to the description of Y.3508.

Figure 6-1 shows a concept of distributed cloud. The distributed cloud includes core, regional and edge clouds, which meet the cloud capabilities types described in [ITU-T Y.3500]. Cloud services are deployed to the core, regional and edge clouds, interwork with one another, and provide a single system view to the CSCs for location transparency. Thus, the distributed cloud provides low latency and fast response to access cloud services by CSCs to satisfy their need for real-time services in various areas. [ITU-T Y.3508]

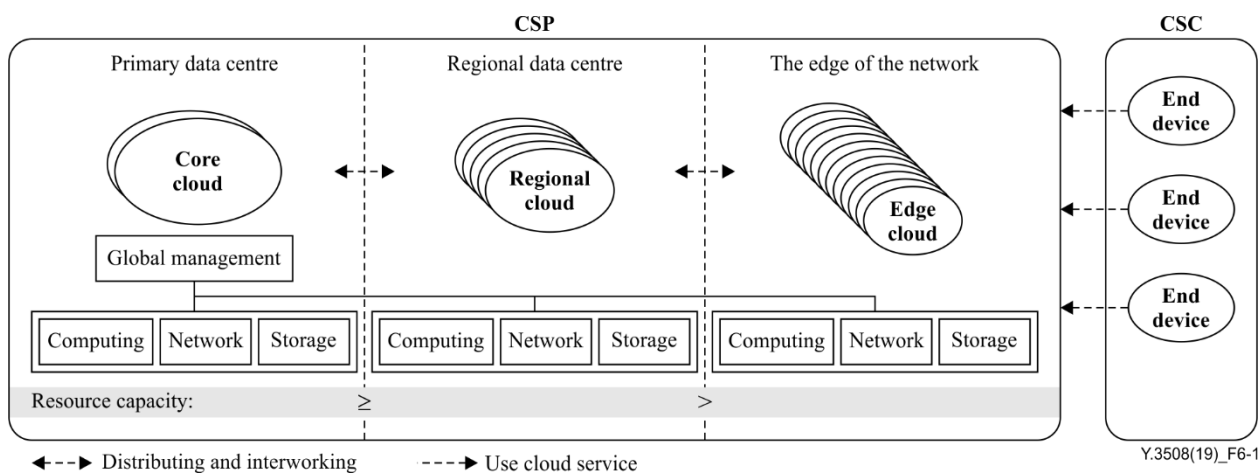


Figure 6-1 – Concept of distributed cloud

[Editor's note on 2020-07-28] The requirements of Y.ccecm can be considered in the figure. Contributions are invited to enhance the figure 6-1.

[TBD]

7 Operation of edge cloud in distributed cloud

[Editor's note on 2020-07-29] Contributions are invited to enhance the texts on the operation of edge cloud in distributed cloud. In the scope of distributed cloud, edge cloud should be explained according to the description of Y.3508.

CSC is served cloud computing service from distributed cloud which composing two or more clouds among core, regional and edge cloud. As shown figure 6-2, CSC is serviced from edge cloud directly in model 2 and model 3. This Recommendation focuses on distributed cloud-model 2 and distributed cloud – mode 3.

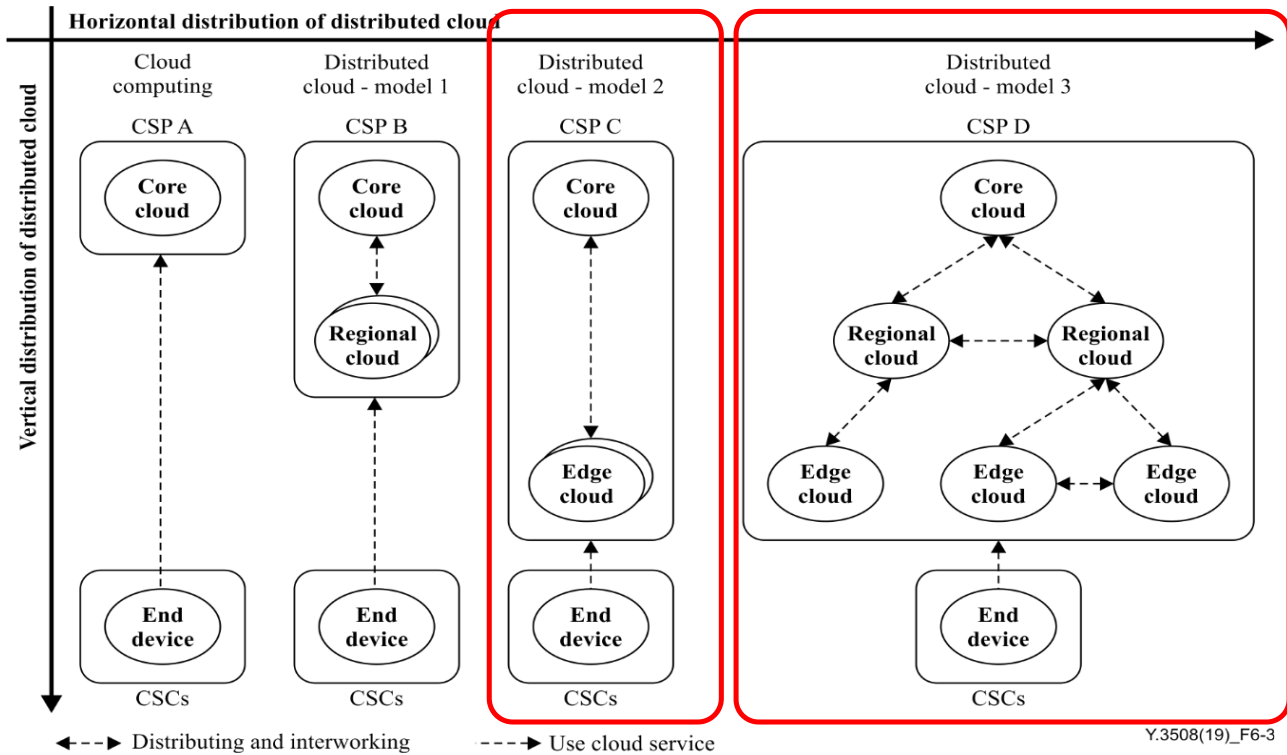


Figure 7-1 – Related model of edge cloud in distributed cloud

[Editor's note on 2020-07-28] The following model will not be developed in this Recommendation. It should be mapping with Y.3508

Model 2 is a shape of a distributed cloud in which the edge cloud and the core cloud are configured together. A cloud service is functionally reconfigured and is executed on both edge and core clouds by interworking. The edge cloud is configured for real-time service delivery. The edge cloud assists end devices by offloading cloud services or caching the data of cloud services. [ITU-T Y.3508]

Model 3 is a shape of a distributed cloud in which edge, regional and core clouds are configured together. A cloud service is reconfigured and deployed to edge, regional and core clouds and is executed by interworking. This model is a combination of model 1 and model 2. This model provides cloud services efficiently by mitigating the traffic of the cloud service, caching data of the cloud service and by offloading cloud services for the CSC's end devices. [ITU-T Y.3508]

[TBD]

8 Functional requirements

[Editor's note on 2020-07-28] This clause will include functional requirements in infrastructure, service, interworking, security and management and network aspect of the edge cloud. Contributions are invited to decide the structure of clause 8 as well as functional requirement to align with Y.3508.

[Editor's note on 2020-07-28] The management functional requirements should be align with Y.ccccm.

9 Security considerations

[TBD]

Appendix I
Use case of edge cloud

(This appendix does not form an integral part of this Recommendation.)

I.1 Use case of edge cloud

Title	
Description	
Role/Sub-role	
Figure (optional)	
Pre-conditions (optional)	
Post-conditions (optional)	
Derived requirements	

[b-xxx]

xxx
