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SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Packet-based Networks

Architecture of an independent scalable control plane in future packet based networks

Recommendation ITU-T Y.2622

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Recommendation ITU-T Y.2622

Architecture of an independent scalable control plane in future packet based networks

Summary

Recommendation ITU-T Y.2622 describes the functional architecture of an independent scalable control plane (iSCP) that is achieved by separating the control plane from the data plane in future packet based networks (FPBNs). Basic functional components and reference points of an iSCP are illustrated.

History

Edition	Recommendation	Approval	Study Group
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Forwarding, FPBN, iSCP, network entity, routing, scalability, separation, virtual network element.

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Recommendation ITU-T Y.2622

Architecture of an independent scalable control plane in future packet based networks

1 Scope

This Recommendation describes the architecture, basic functional components, and reference points of an independent scalable control plane (iSCP) that is achieved by separating the control plane from the data plane in future packet based networks (FPBN), as described in [ITU-T Y.2621].

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.2011] Recommendation ITU-T Y.2011 (2004), *General principles and general reference model for Next Generation Networks*.

[ITU-T Y.2621] Recommendation ITU-T Y.2621 (2011), *Requirements for an independent, scalable control plane in future, packet-based networks*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 control plane [ITU-T Y.2011]: The set of functions that controls the operation of entities in the stratum or layer under consideration, plus the functions required to support this control.

3.1.2 data plane [ITU-T Y.2011]: The set of functions used to transfer data in the stratum or layer under consideration.

3.1.3 future packet based network (FPBN) [ITU-T Y.2621]: A network architecture providing the topmost layer(s) of the transport stratum as defined in [ITU-T Y.2011].

3.1.4 independent scalable control plane (iSCP) [ITU-T Y.2621]: An architectural approach of future packet based networks (FPBNs) which consists of separating the control plane from the data plane.

3.1.5 management plane [ITU-T Y.2011]: The set of functions used to manage entities in the stratum or layer under consideration, plus the functions required to support this management.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

BGP Border Gateway Protocol

CE	Control Element
FE	Forwarding Element
FIB	Forwarding Information Base
FPBN	Future Packet Based Networks
iSCP	independent Scalable Control Plane
ME	Management Element
MIB	Management Information Base
OSPF	Open Shortest Path First
QoS	Quality of Service
RIB	Routing Information Base
SCE	Service Control Element
SPE	Service Processing Element
VNE	Virtual Network Element

5 Conventions

In this Recommendation, the following conventions are used:

The keyword "entity" indicates a CE, SCE, FE, SPE, ME or VNE.

6 iSCP architecture

The high level requirements stated in [ITU-T Y.2621] necessitate defining the following reconstructible components for the iSCP architecture: the control plane, data plane, management plane, control elements (CEs), service control elements (SCEs), forwarding elements (FEs), service processing elements (SPEs), and management elements (MEs).

Figure 6-1 shows the relationship between the control plane, data plane, and management plane, and the relationship of the reconstructible components. Multiple MEs, CEs, SCEs, FEs, and SPEs can form a virtual network element (VNE).

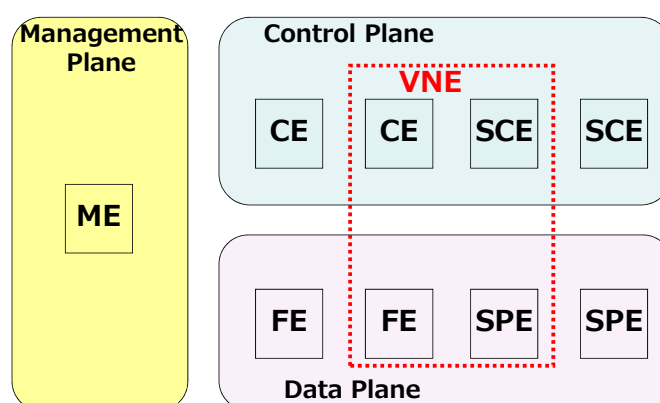


Figure 6-1 – Three planes and reconstructible components

The control plane of an iSCP contains mechanisms for operating the packets and deciding the pathways for user traffic. These mechanisms are implemented in the CEs and SCEs. The data plane of an iSCP contains mechanisms for forwarding and processing user traffic and/or control traffic. These mechanisms are implemented in the FEs and SPEs. The management plane of an iSCP