H3C
ITolP Solutions Expert

H3C Network High Availability Solution

I. Preface

Along with the rapid popularization and wide application of networks, value-added services are widely deployed in networks and the network bandwidth exponentially grows. Short-time network interruption may impact plenty of services and cause a huge loss. Therefore, the industry focuses more and more on the high availability (HA) of the basic networks that bear services.

In this background, the entire industry from carriers to large- and medium-scale enterprise customers require high network availability up to 99.999% (the downtime is about five minutes in a year) during the construction of production networks.

In the point of view of device vendors or solution providers, the provisioning of an end-to-end HA network solution is not only a show of their technical strength but also a critical factor that determines whether they can survive the future fierce competition.

II. Define a HA Network

Then how to evaluate the availability of a network? First, faults should not frequently occur in a high-availability network. As long as a fault occurs, even very short interruption will affect the service operation, especially when services highly adaptable and sensitive to packet loss and delay, such as voice and video services, have been deployed in the network. Second, a high-availability network should be able to quickly recovery from faults. If faults seldom occur in a network but it takes several hours or even several days to recover from a fault, the network is not a high-availability network.

In fact, few faults and short fault recovery time are the features of a high-availability network. In practical networks, the quality of software and hardware versions is limited, and network faults and service interruption caused by human and non-technical factors are unavoidable. For this reason, it is rather important to develop a technology that enables networks to quickly recover from faults. In fact, if a network can always recover from faults without causing the interruption of the system services or most of the system services, the network can be considered as fault-free in terms of user's service experience.

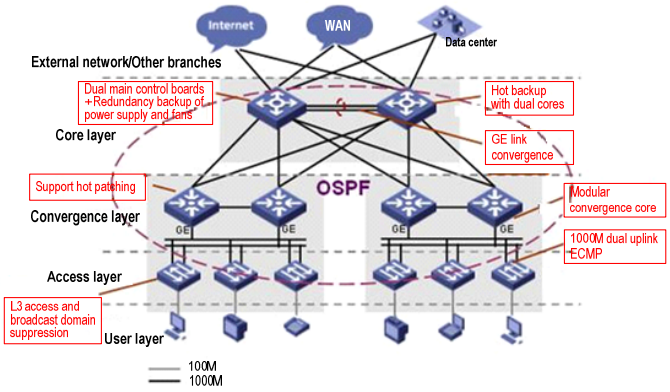
III. Overview

H3C campus network HA solution employs a technology that enables networks to quickly recover from faults. H3C recommends a high-availability networking model and comprehensively considers all aspects including network planning, design, and deployment. The solution can be combined with H3C campus network products S5100/S3600/S5500/S7500E/S9500 to improve the overall availability of campus networks.

H3C recommends typical 3-layer networking models and simplified 2-layer flat network structure, and strictly defines the functional models of various layers. The system employs fault detection technologies to quickly detect and report network faults, adopts redundancy design to provide the redundancy of important nodes and links, implements fast convergence through resource reservation, and comprehensively uses various HA technologies to attain the optimal convergence effect in the event of network faults.

Figure 1-1 shows a recommended 3-layer networking model.

Figure 1-1 A 3-layer HA networking model



The network is hierarchically and modularly designed and planned. It is divided by services, regions, and other planning factors into multiple areas. The convergence core in each area is

connected to the network core.

All layers of the network use L3 equipment and support the OSPF protocol. In the model, H3C S3600EI is used in the access layer, H3C S7506E is used in the convergence layer, and H3C S9505 is used in the core layer. In practical application, other device models may be chosen according to actual needs. On access layer devices, an L3 gateway is configured to provide 100M port access and supports voice and POE. In the access layer, GE links are provided to connect convergence layer devices in dual-homing mode. Redundant links are provided for link backup. The existing ECMP is utilized to implement traffic load sharing. GE links are provided between the convergence cores of the areas, along with 1+1 backup and accelerated route convergence. In the convergence layer, GE links are provided to connect the network core in dual-homing mode. Alternatively, dual GE links may be bound and connected to the uplink core according to actual bandwidth requirements. GE links are bound to connect two core layer devices and provide high-speed data switching and 1+1 hot backup. If the campus network scale is large or the campus network uses quite many access or convergence layer devices, multiple devices may be deployed in the core layer to form an RPR or RRPP ring to replace 1+1 hot backup. The core layer devices support dual main control boards, power and fan redundancy, and inter-board aggregation, which further improve the system reliability.

IV. Features

u Supporting the existing network applications

The typical HA networking model recommended in the solution takes into account the current common network application structure. The current network applications will not be affected by HA network deployment.

u Focusing on technical details

The solution focuses on technical details and suggestions on HA deployment, including the best-practice recommendations when multiple choices are available.

u Integrating multiple products and considering the total network availability

The solution does not implement the reliability of a single product or a single application. It is not simply a stack of reliability technologies but focuses on the availability of the entire network attained by a combination of reliability technologies.

u Abundant networking models

The solution recommends abundant HA networking models, including L2/L3 access and 2-layer/3-layer network structure, which cover most of the present networking applications.