An OpenFlow-based Software-Defined Networking Implementation over Named Data Networking

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The Software-Defined Networking (SDN) architecture splits the control plane from the data plane, which uses a centralized controller for routing decisions and network management, while the switches are only responsible for data forwarding. SDN makes data forwarding more efficient and network management more convenient.The Named Data Networking(NDN) is "content-centric", "destination-driven" and "connectionless-oriented" network architecture, which is designed to replace IP networks to offer fast, stable, secure, low latency, high throughput, mobile network services.Although both NDN and SDN are designed to improve the performance of the Internet, they are not competitive. It is possible to integrate these two architectures and combine their advantages.

This study analyzes the feasibility of integrating SDN and NDN architectures, as well as the characteristics of the existing integration solutions, and designs a new solution for migrating OpenFlow-based SDN to NDN environments. By deploying and evaluating the prototype of this model, it has been proved that this model can successfully integrate NDN and SDN, and it also has excellent scalability, compatibility, and security.