Northbound and Southbound Interfaces

Программно-конфигурируемые сети. Университет ИТМО.

Chen Guangyuan, группа К4112С

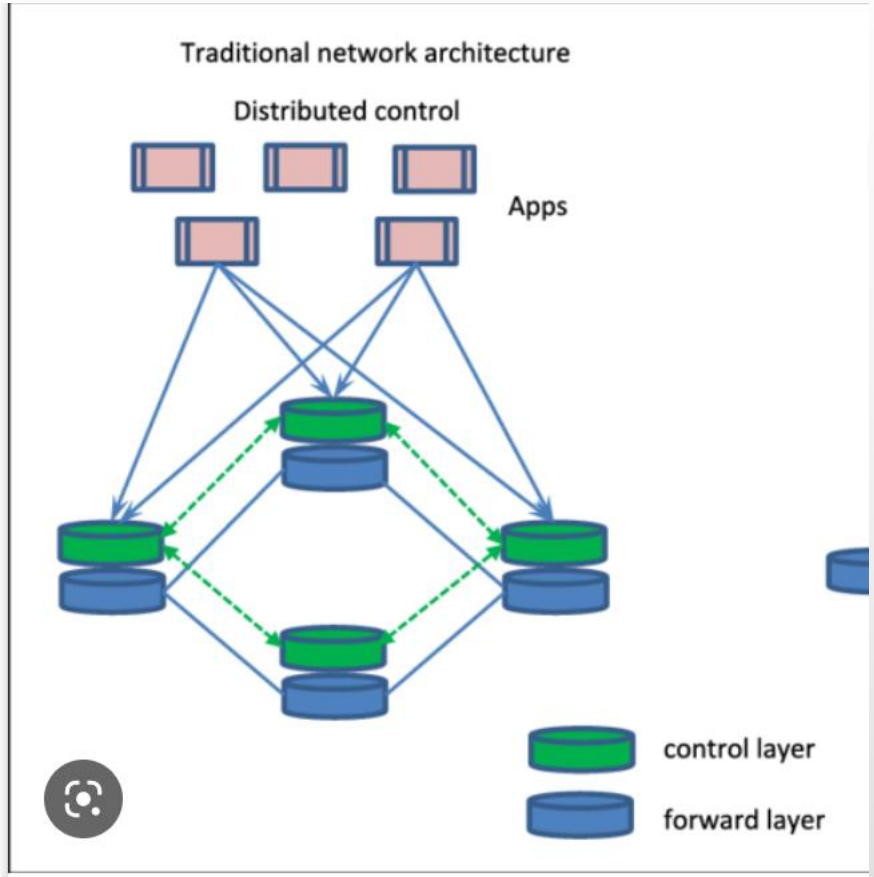
Traditional network architecture

- Traditional networks are divided into management layer, control layerand data layer.

- The management plane mainly includes an equipment management system and a business management system. The equipment management system is responsible for the management of network topology, equipment interface, and equipment characteristics, and can also send configuration scripts to the equipment.The business management system is used to manage the business, such as business performance monitoring, business alarm management, etc.
- The control plane is responsible for network control, and its main functions are protocol processing and calculation.For example, routing protocols are used for the calculation of routing information and the generation of routing tables.
- The data plane refers to the device completing the forwarding and processing of user services according to the instructions generated by the control plane.For example, the router forwards the received data packets from the corresponding outbound interface according to the routing table generated by the routing protocol.

Limitations of traditional networks

- The ability to flexibly adjust the flow path is insufficient.
- The implementation of the network protocol is complex, and the operation and maintenance are more difficult.
- The upgrade speed of new network services is slow.



Limitations of traditional networks

- In addition to standard protocols, equipment manufacturers have some private protocol extensions. Not only are there many equipment operation commands, but the equipment operation interfaces of different manufacturers are very different, and the operation and maintenance are complex.

- In traditional networks, because the control plane of the equipment is closed, and the implementation mechanism of the equipment of different manufacturers may be different, the deployment of a new function may cause a long cycle; and if the equipment software needs to be upgraded, it also needs to be operated on each device, which greatly reduces work efficiency.

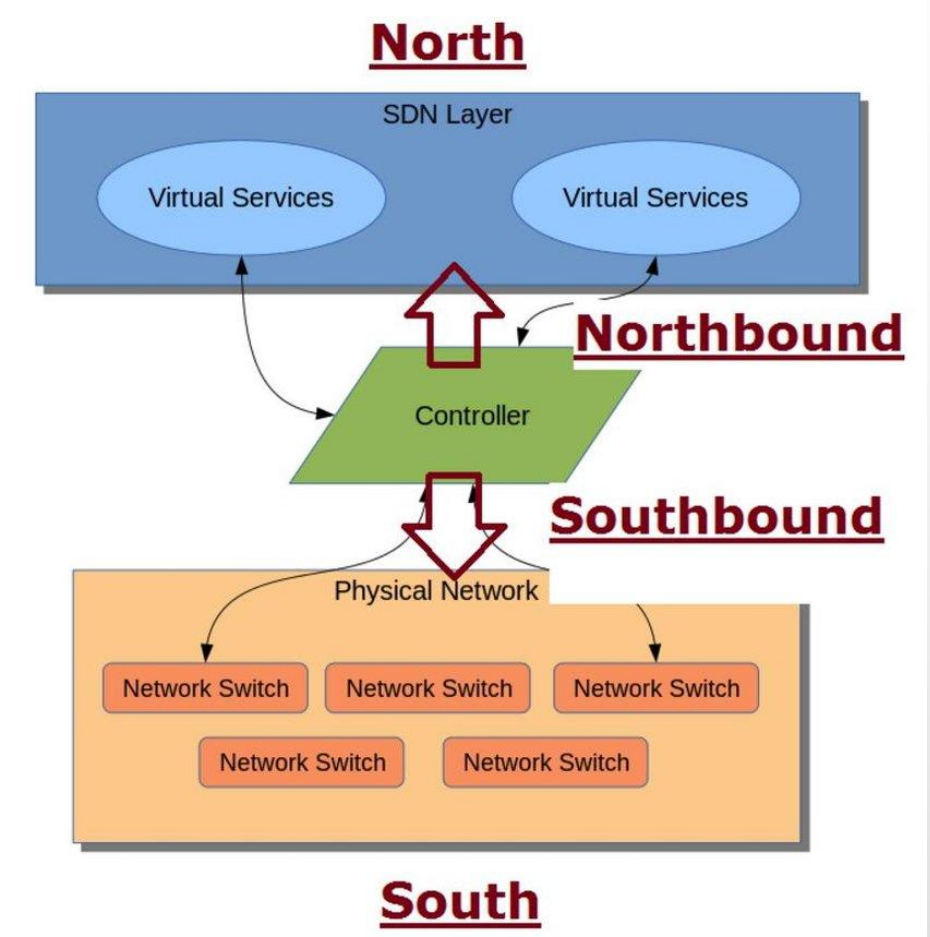
SDN (Software Defined Network)

- In 2006, a team led by Stanford University professor Nike Mckewn proposed the concept of OpenFlow and realized the programmable capabilities of the network based on OpenFlow technology (OpenFlow is just a protocol for implementing SDN). The network is as flexible as software programming, and SDN technology came into being.

Three-layer model of SDN network architecture

- A northbound interface is an interface that conceptualizes lower level details. It interfaces to higher level layers and is normally drawn at the top of an architectural overview.

- A southbound interface decomposes concepts in the technical details, mostly specific to a single component of the architecture. Southbound interfaces are drawn at the bottom of an architectural overview.



Origin of the name

- The northbound interface is named because it is at the top of the architecture diagram, and the southbound interface is named because it is at the bottom of the architecture diagram.

THANK YOU!