Software Defined Networking

# (SDN)

LIMITS OF THE TRADITIONAL DATA NETWORK

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.Tasks such as configuration, provisioning, management of changes and deprovisioning are particularly long and sources of error (human)

. Multiplication of technologies and their management vs limit resources to
provision of operators

. Infrastructure and proprietary software
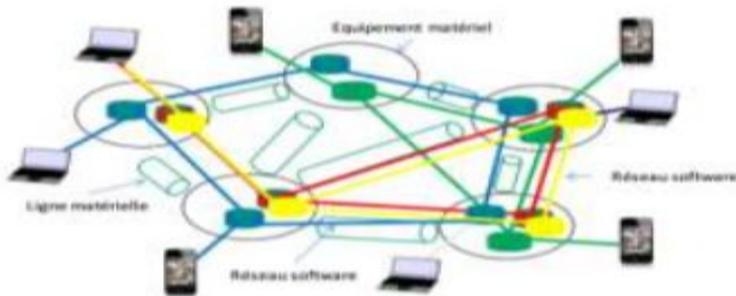that no longer optimize the costs
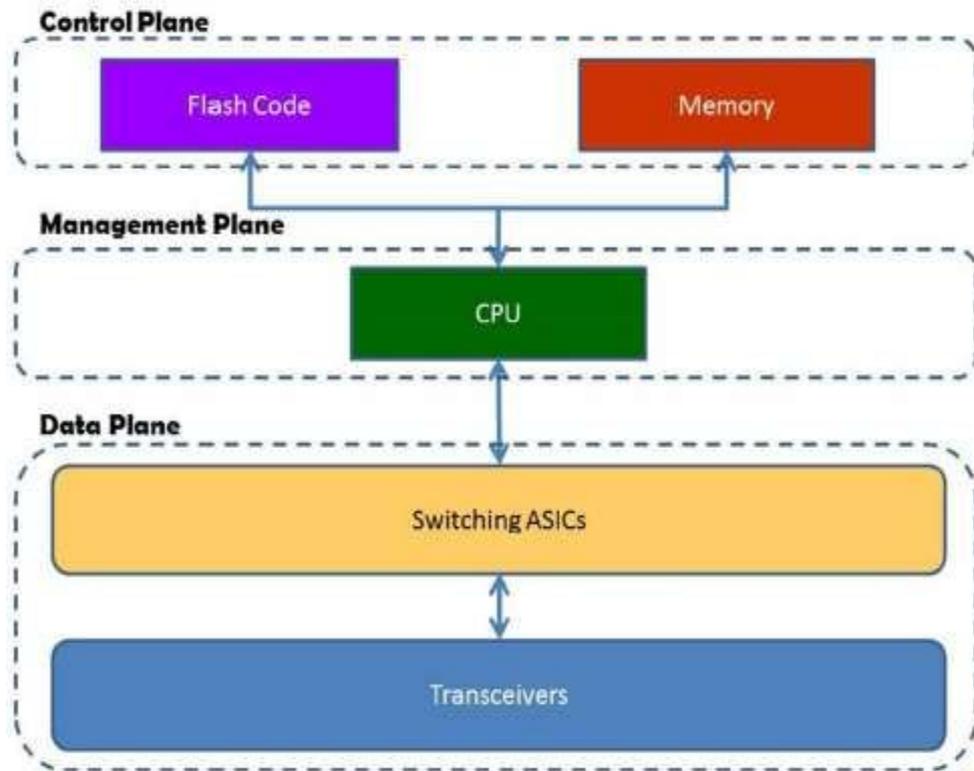
WHAT IS SDN?
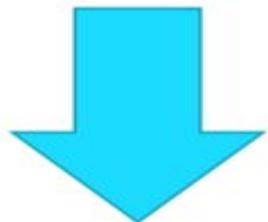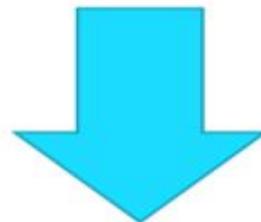
WHAT IS SDN?

- 3 principes

logiciel

logiciel

logiciel

DECOUPLAGE

PASSAGE AU LOGICEL
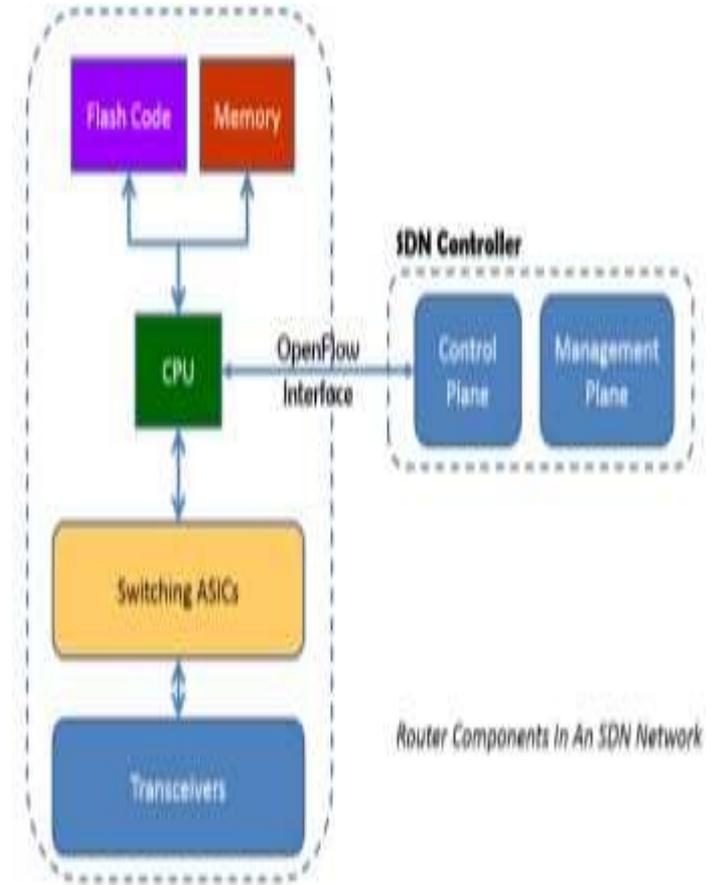
AUTOMATISATION

matériel

matériel

matériel

➜ Software Defined Networking is an approach that centralizes network management by decoupling hardware and software components

➜ It allows orchestra engineers and automates a computer network without having to physically access hardware components (routers, swit chs, etc.).

Router Components In An SDN Network

SDN ARCHITECTURE

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According to the ONF, the SDN architecture is:

Directly programmable: network control is directly programmable because it is dissociated from redirection features.

Agile: The separation of control and redirection features allows administrators to dynamically adjust traffic across the network in order to respond to changing needs.

Centrally managed: The intelligence (logic) of the network is centralized within SDN software controllers that provide an overview of the network and are perceived by applications and strategy engines as a switch unique logic.
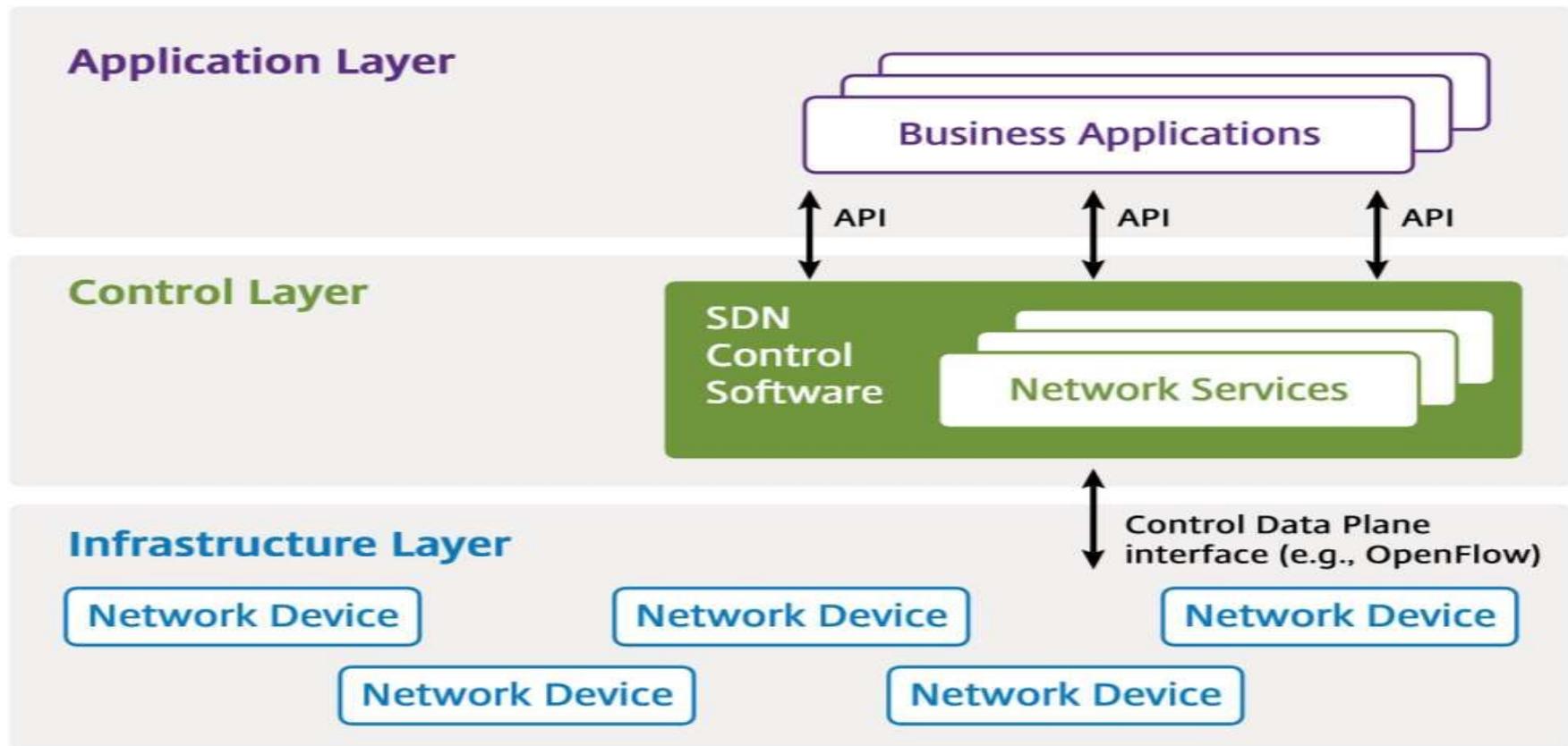
Figure 1 : L'architecture SDN
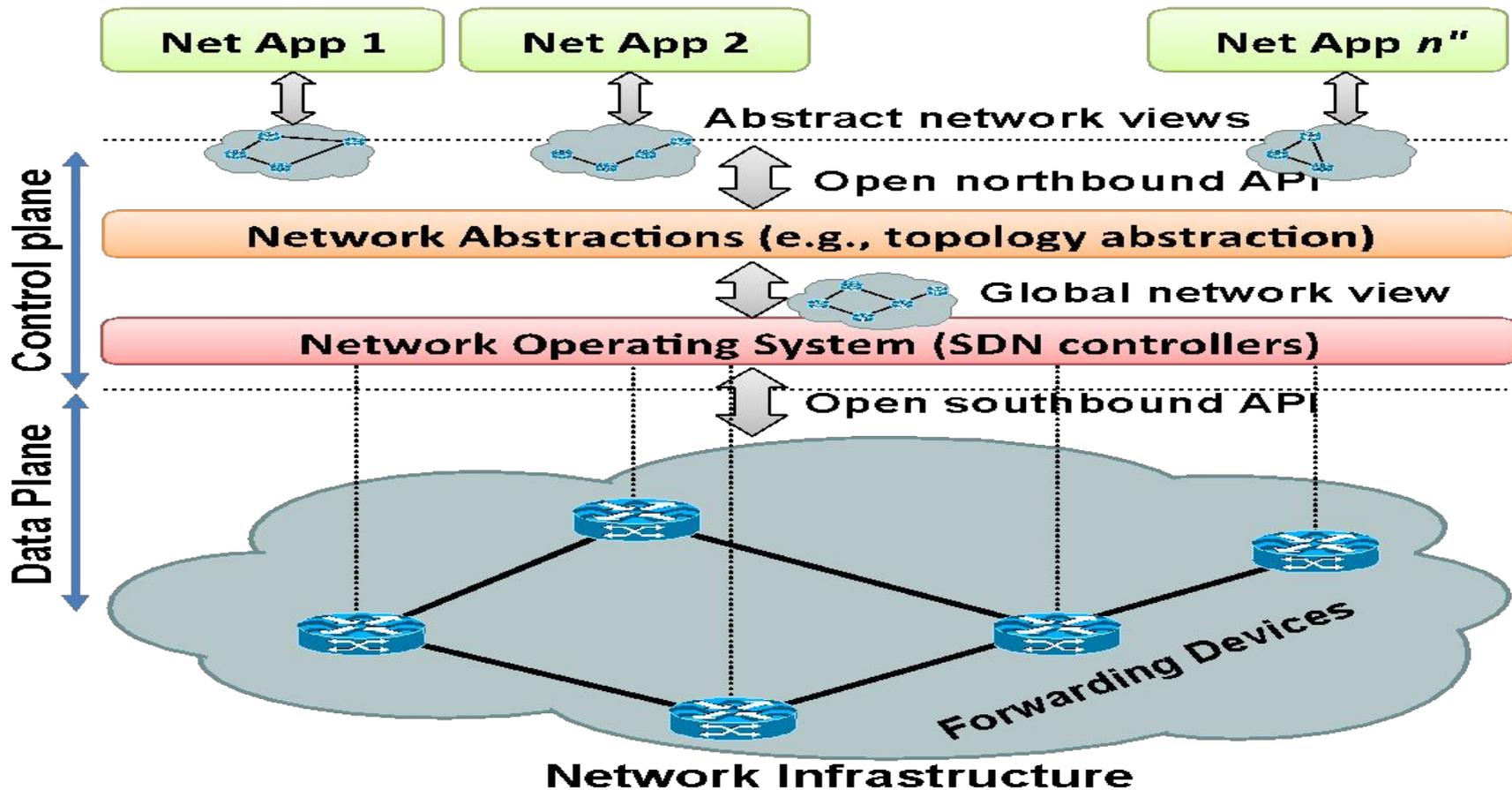**Source :** ONF

Fig. 4.   SDN architecture and its fundamental abstractions.

THE SOUTH INTERFACE

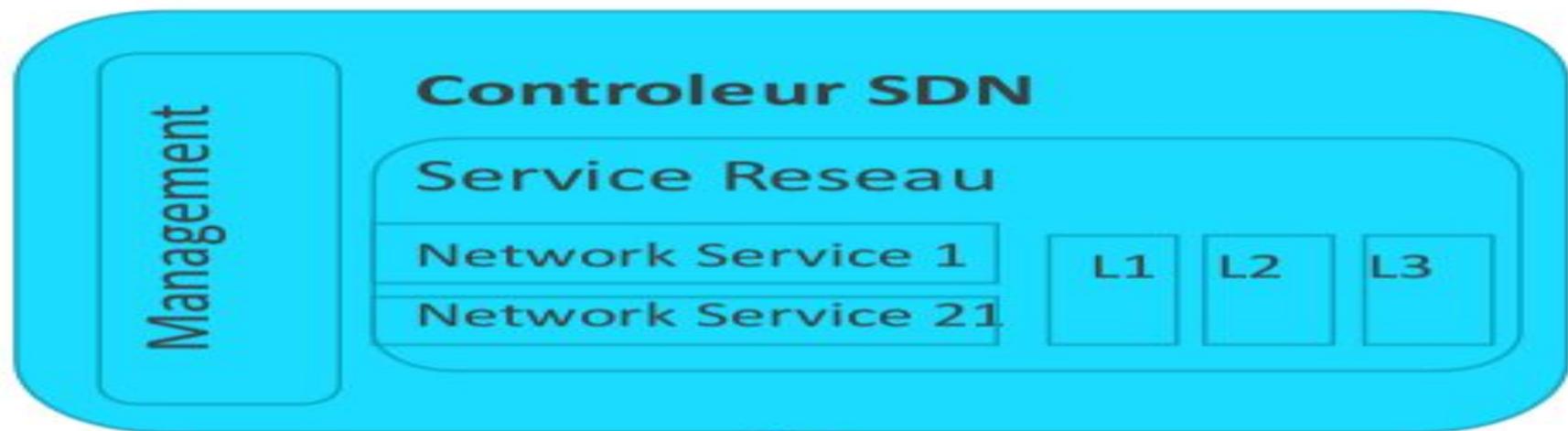A signaling protocol passes the configuration commands in one direction and

the feedback of statistical information in the other. Numerous proposals

Open Source are in progress:
- Open Flow de l'ONF
- NetConf
- SNMP
- BPG

Controleur SDN

Management

Service Reseau

Network Service 1

Network Service 21

L1 | L2 | L3

Commutateur OpenFlow

Management

Plan de données

Corresp. | Action | Stat

CONTROLLER

- The controller aims to control the data plan and receive the plan the elements necessary to determine the control to be exercised
- One of the most important functions in the controller for the smooth running of the network is the load balancer: this term indicates algorithms determining the best way to follow in the data plan

THE NORTH INTERFACE

THE NORTH INTERFACE

- The north interface between the application plan and the controller aims to make pass information from application needs so that the controller can open the best software network with the right quality of services, the right security, and the management needed for operations to run smoothly
- The basic protocol for performing these transmissions is based on the REST API
- (Representative State Transfer):
- ▪ Each resource is individually identified
- ▪ Resources can be manipulated through representations
- ▪ The messages are self descriptive

THE BENEFITS OF THE SDN

SDN optimizes the match between resources (networks and IT) on the one hand and business needs on the other. The SDN allows:
- Deleting network provisioning delays
- Adapting the network setting to the needs of applications
- The elasticity of resources (networks and IT)
- The drastic reduction of network management complexity
- Changing bandwidths

ANALOGY WITH MAPPING

- Shortest path route
- Static

- Multi-route
- Traffic-aware
- Real-time, self-tuned