

Concept, Functionality and Scalability

Oct. 2017

Concept and overview

Goal of MSF project

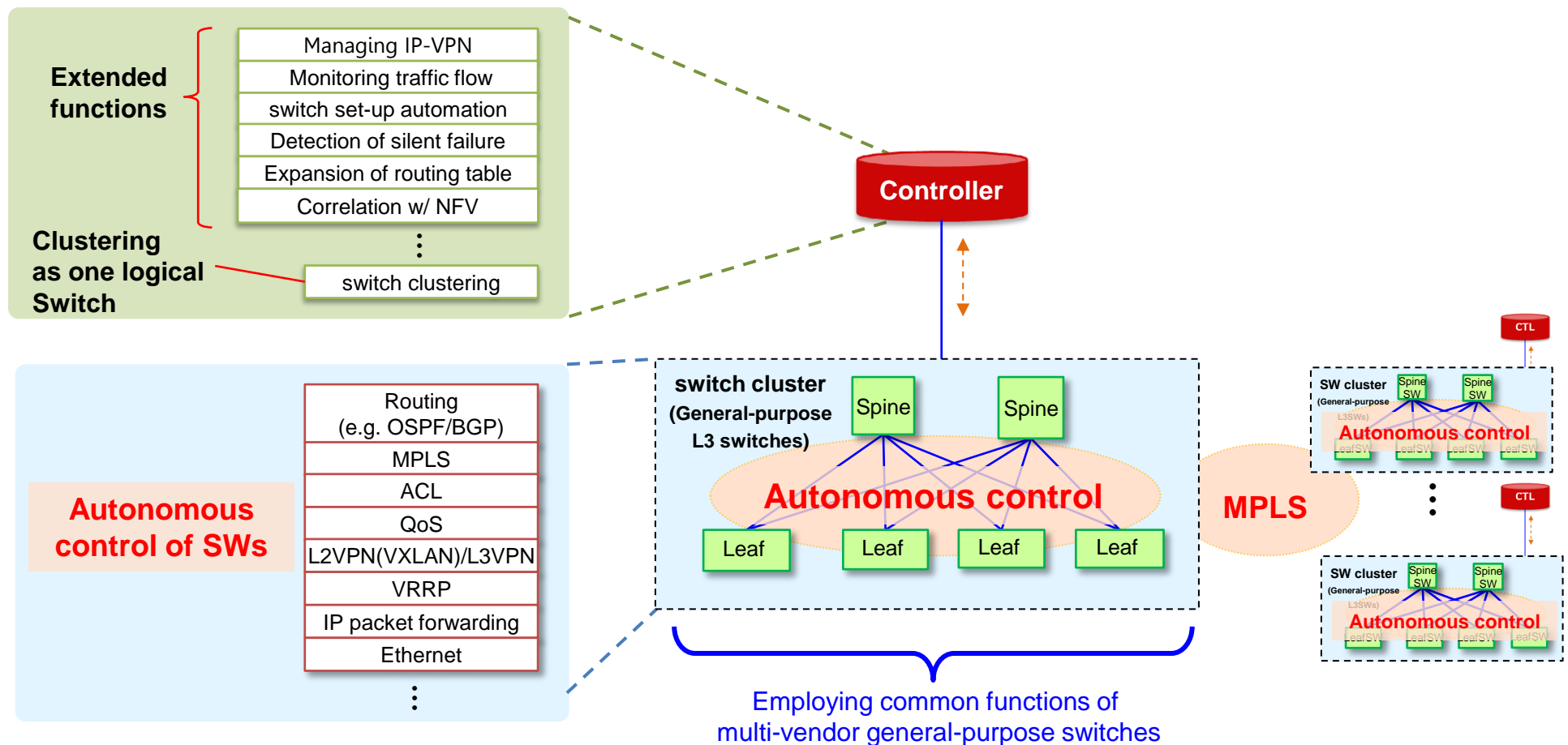
- ❑ **The architectural design of carrier-grade SDN that provides wide logical network slices with general purpose switches**
- ❑ Value proposition
 - **Immutable low-cost architecture (cost reduction)**
Capable to employ any product that is most economical and suitable at each moment, for providing functions required for service provider network
 - **Unlimited and adaptive scalability**
Capable to provide any level of scale needed for any use case (e.g. small in rural area or in the startup phase, large when the business succeeded to enhance)
 - **Applicability of “Any-vendor” product**
Simplified functions and unified specification in order to enable to select any-vendor’s products as you like
 - **Easy maintenance**
Capable to make use of small, simple and transparent equipment in order to let it easy to detect and fix the cause in case of failure

Design Policy

- Applicable to both data center and service provider network with the same architecture
- Use commodity hardware and open source software, open interface as much as possible
- Support carrier-grade scalability and stability by making use the autonomous and distributed IP function of the switches
- Provide service common functions on the switches and service dependent functions on servers in cloud
- In order for quick commercial deployment, it must be interoperable with existing networks using legacy protocols
- Solving limitation of commodity switches is assisted by the controller that organizes the switch cluster as a fabric

Vision

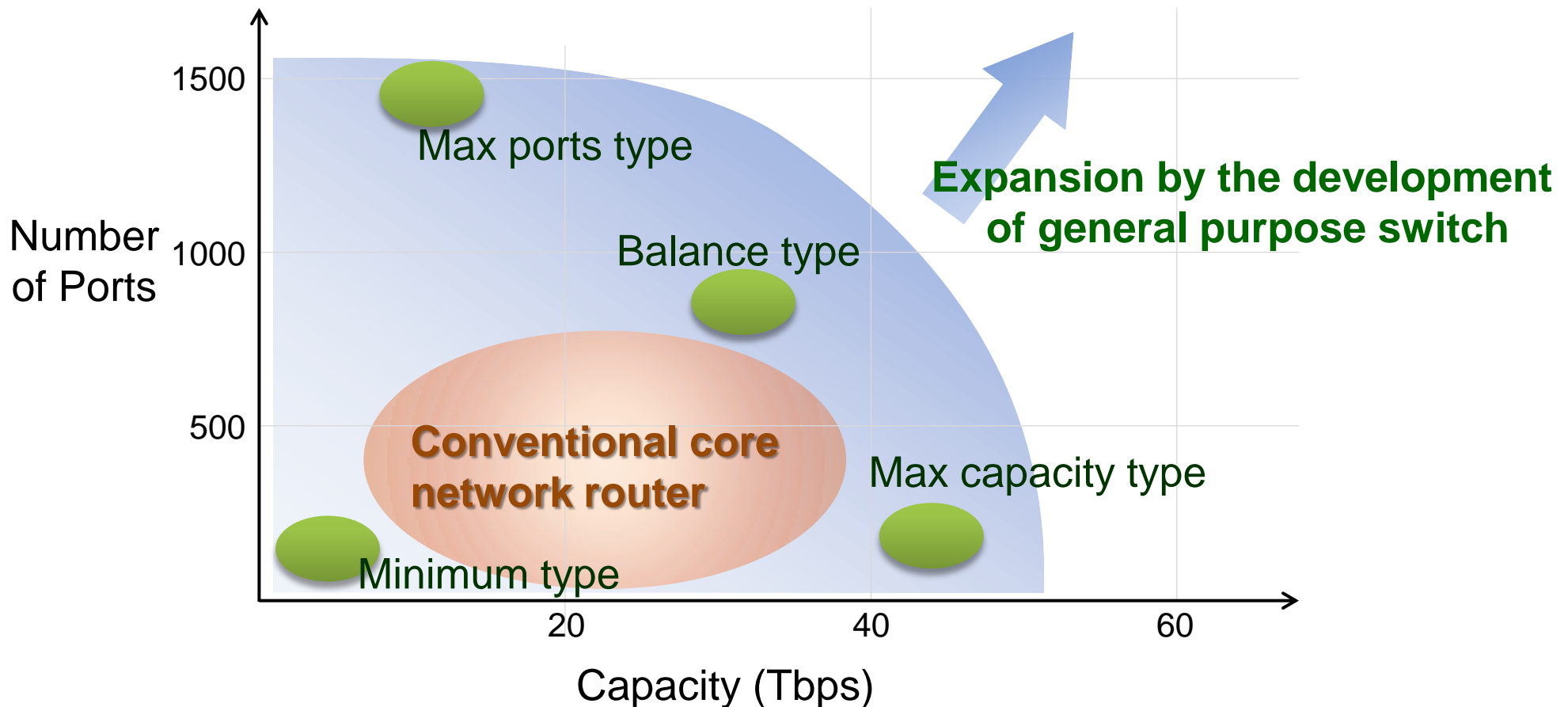
- ◆ Centralized: management and abstraction is performed by the controller
- ◆ Distributed/Autonomous: routing is done among the switches.





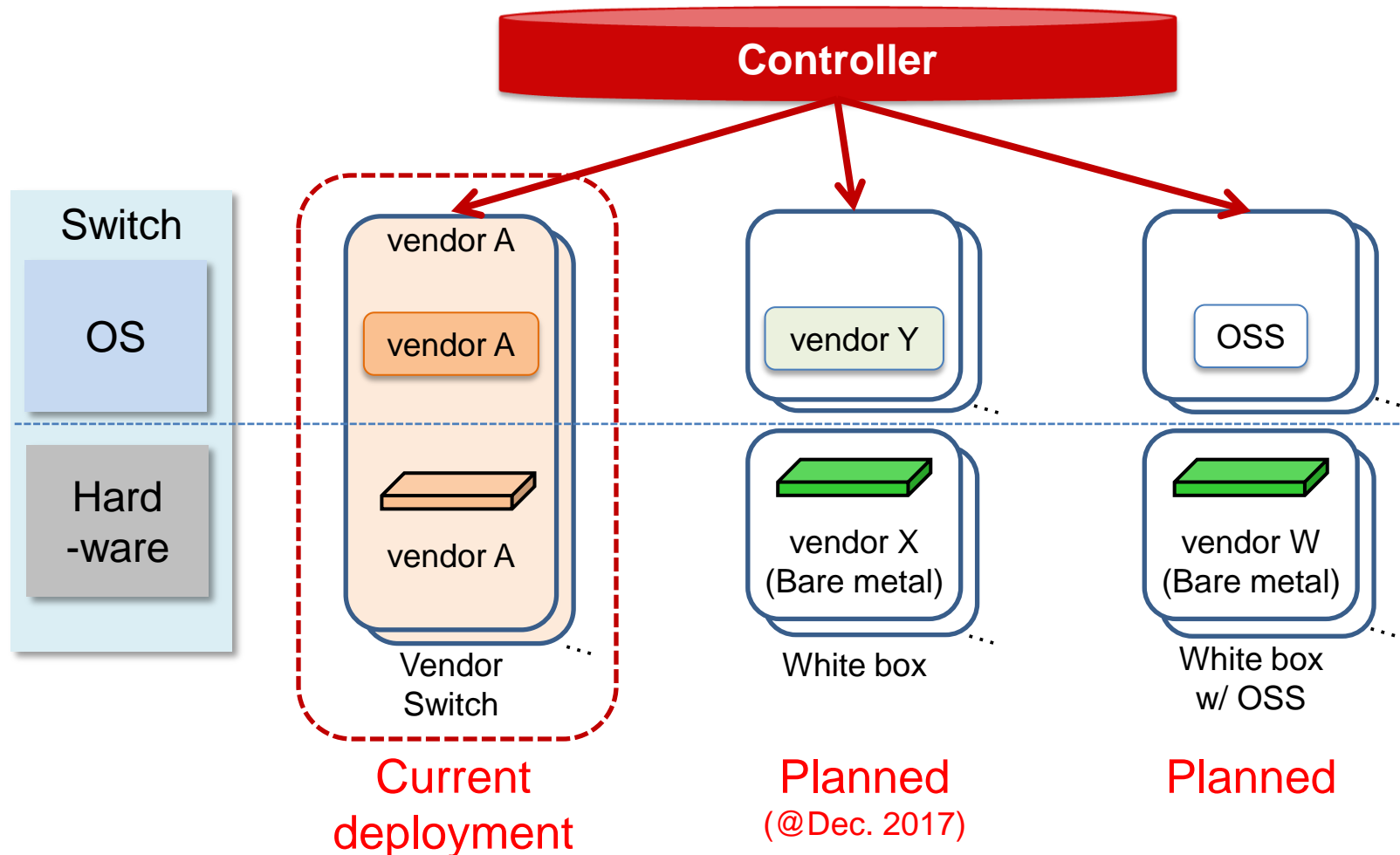
Adaptive scalability

- ◆ By assembling the switch cluster according to the requirement, our concept is capable of providing any level of scale needed for any use cases.



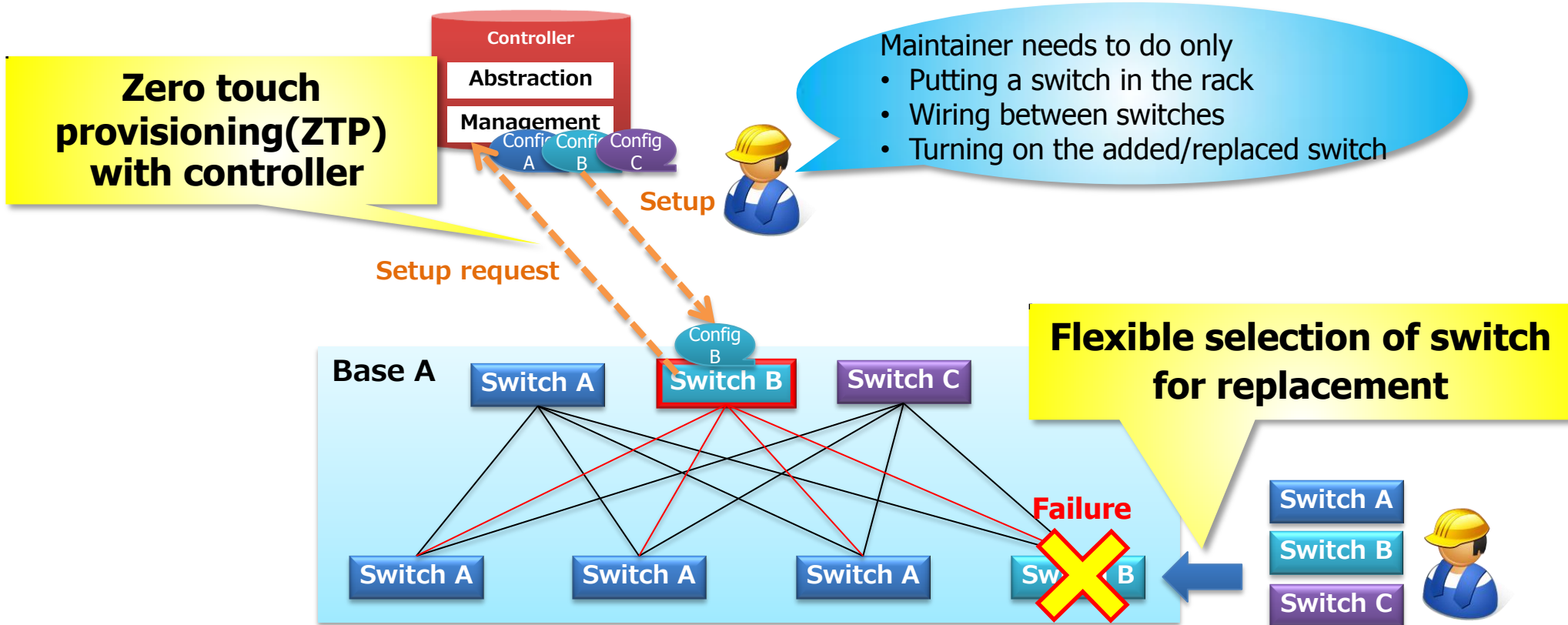
"Any-vendor" modular assemble/replacement

- ◆ Components are able to be replaced freely with any vendor's product to choose the best and cheapest product at each moment.



Easy maintenance

- ◆ Connection between switches consists of standard Ethernet link and standard routing protocols.
- ◆ Maintainers do not need to know knowledge depending on vender products.
- ◆ Controller has functions for assistance of switch replacement and addition.



Use case

- ◆ Used in various networks to make easy operation by zero-touch provisioning and network abstraction, and CAPEX reduction

1. Replace core/edge routers to general purpose switches

- switch fabric

2. Provide various services with the common infrastructure

- Virtual network slicing

3. Enterprise Services

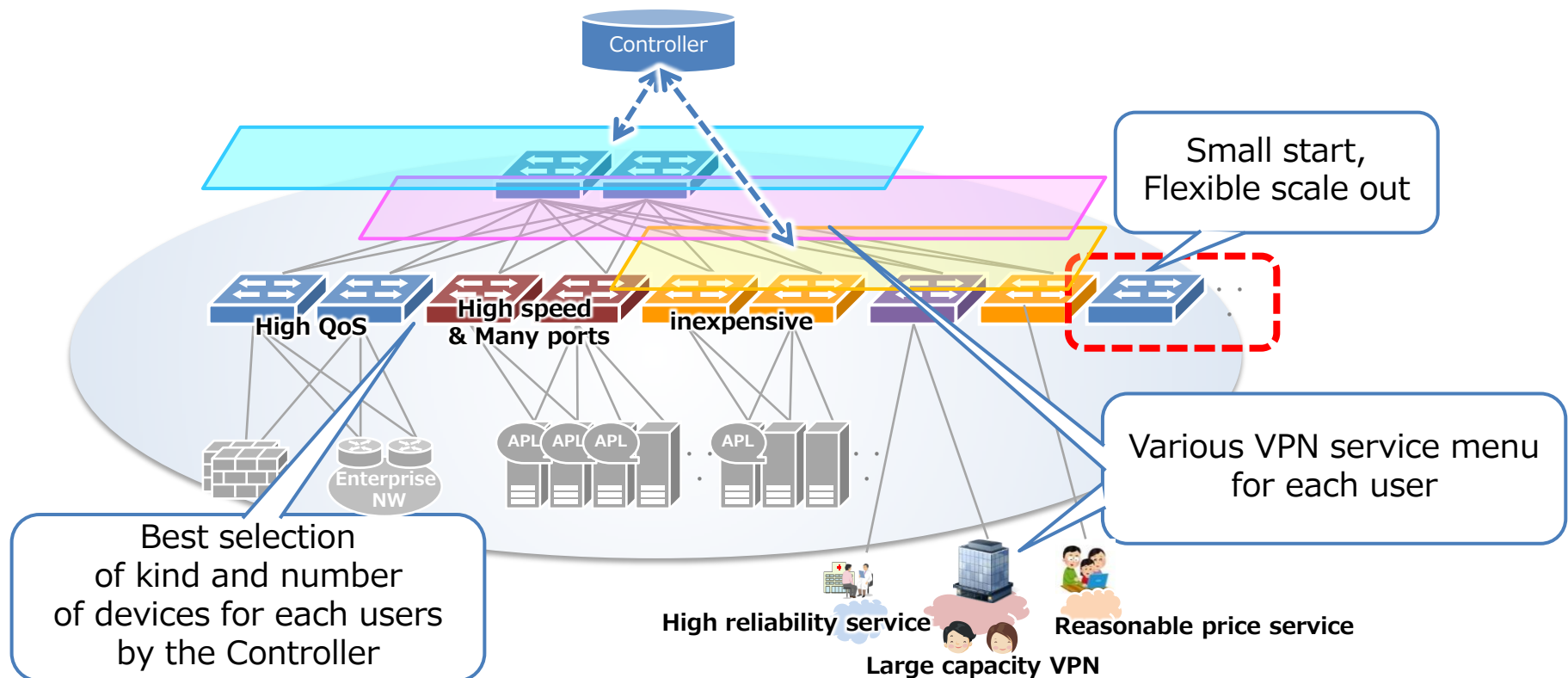
- L2/L3 (MPLS) VPN

4. Datacenter

- switch fabric

Expectations for DC

- ◆ Providing global DC/cloud service for various requirements by **unified network technologies**.
- ◆ Availability of application of **various types and vendors' devices** to various flexible services.
- ◆ Small start and large scale out, **introducing technologies flexibly**.
- ◆ **Reliable mechanism** by independence of switch's forwarding from controller conditions.
- ◆ **Avoiding silo** by independence of controller vendor from switch vendors.



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