

NIL

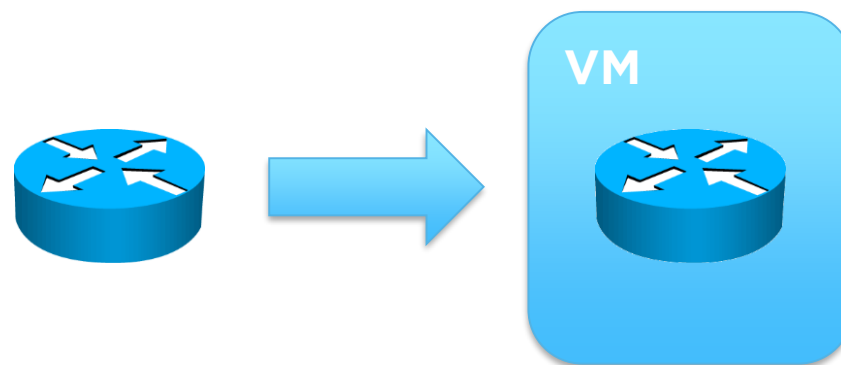




Implementing NFV: From Idea to Practice

- What is NFV?
- Why should I care?
- If I do care, how should I go about making it happen?
- What should I watch out for?
- NFV example – Using Cisco NSO to orchestrate NFV end to end





NFV = Virtual Network Appliances



Because there be business benefits ...

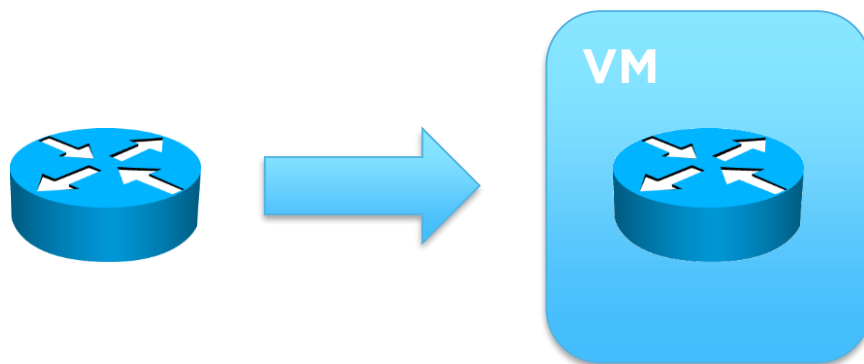


If I Do Care, How Should I Go About Making It Happen?

Create an NFV Solution

Operate an NFV Solution







What is NFV?

Take 2

On Premise

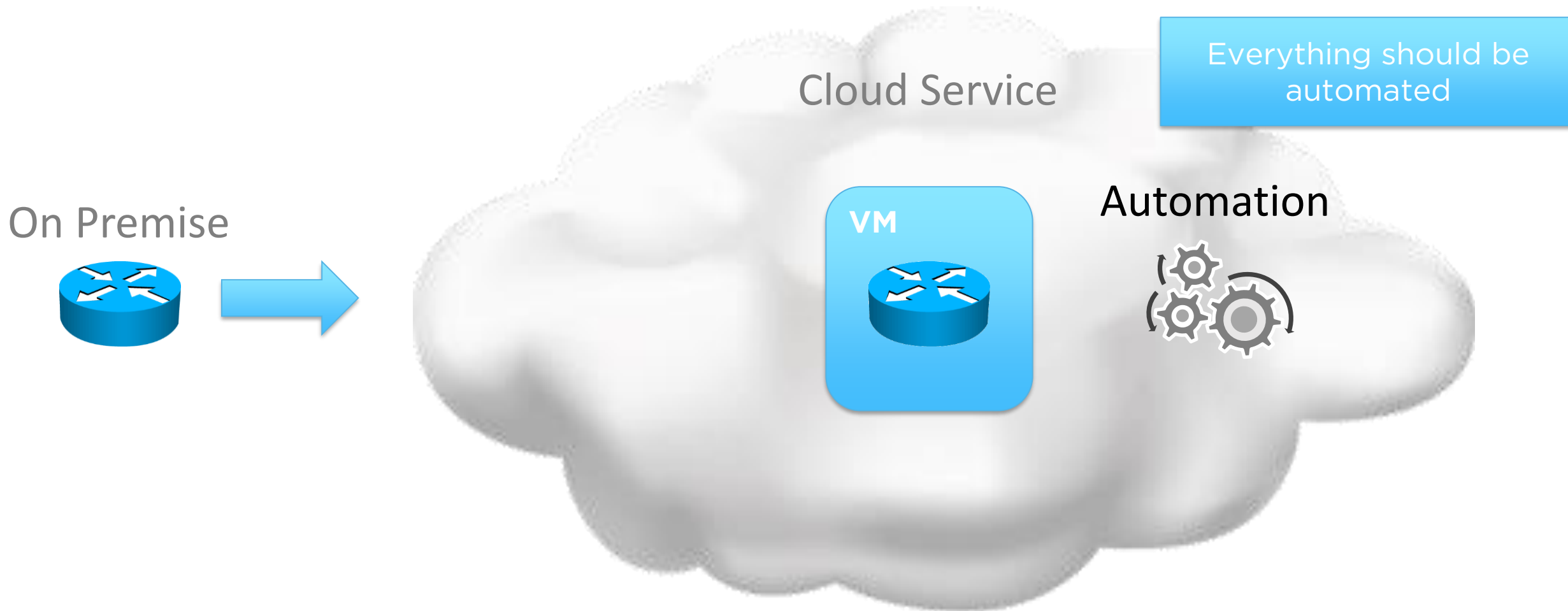


Cloud Service



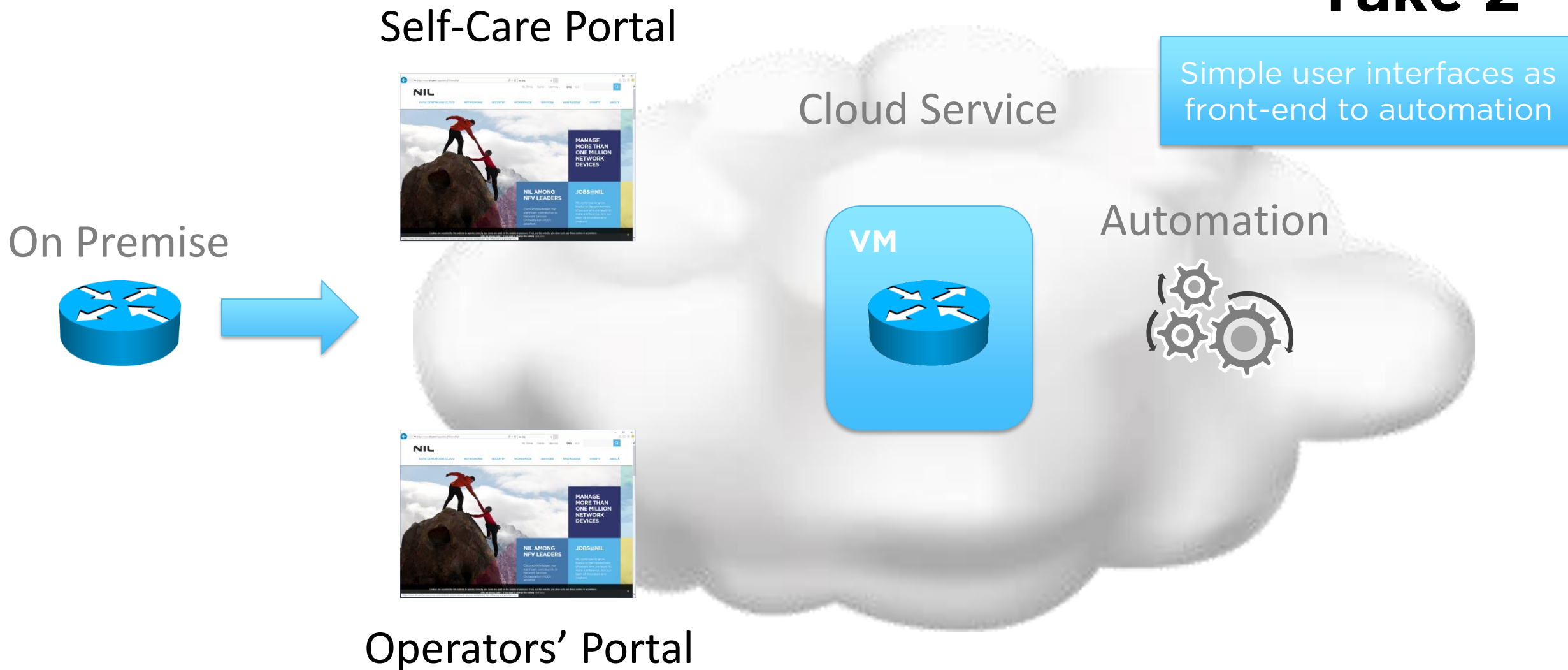
What is NFV?

Take 2



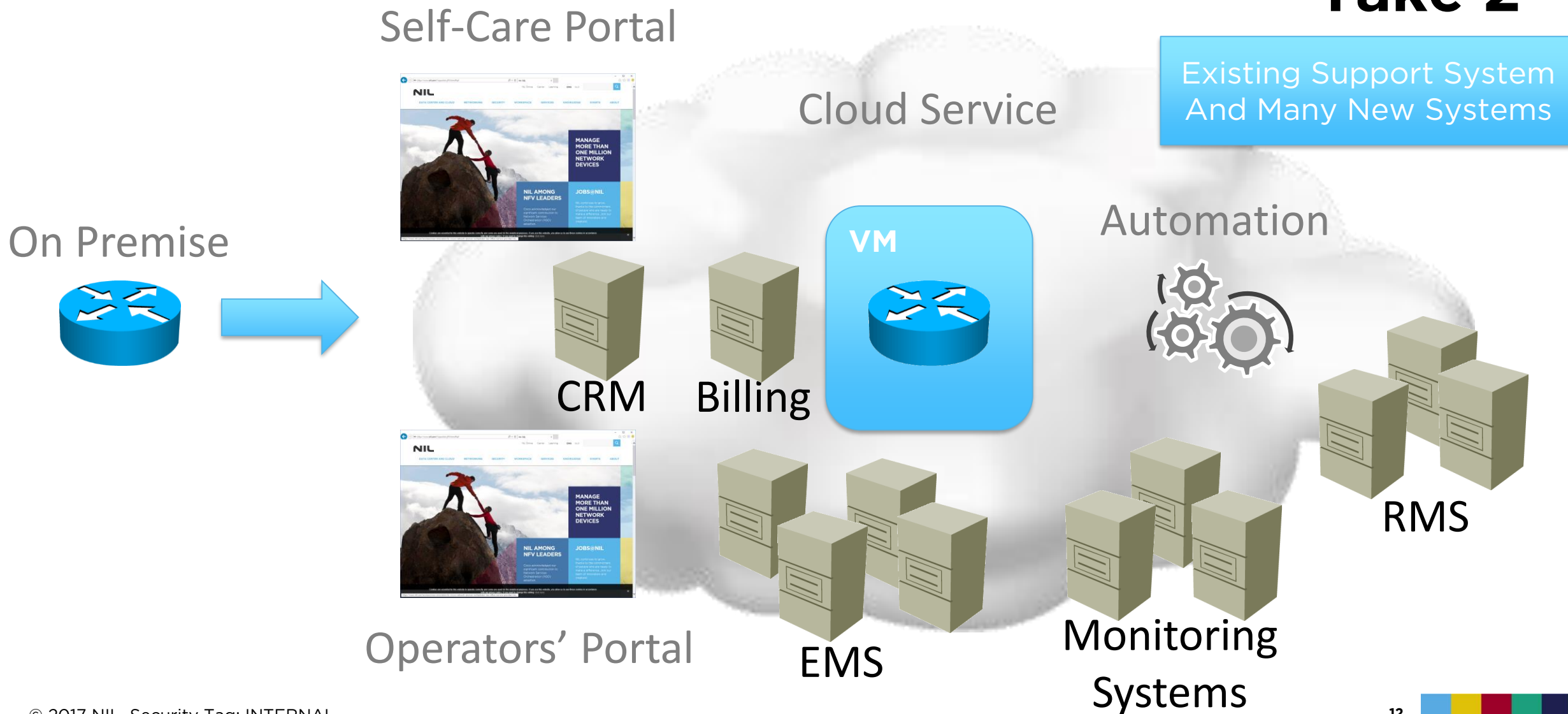
What is NFV?

Take 2



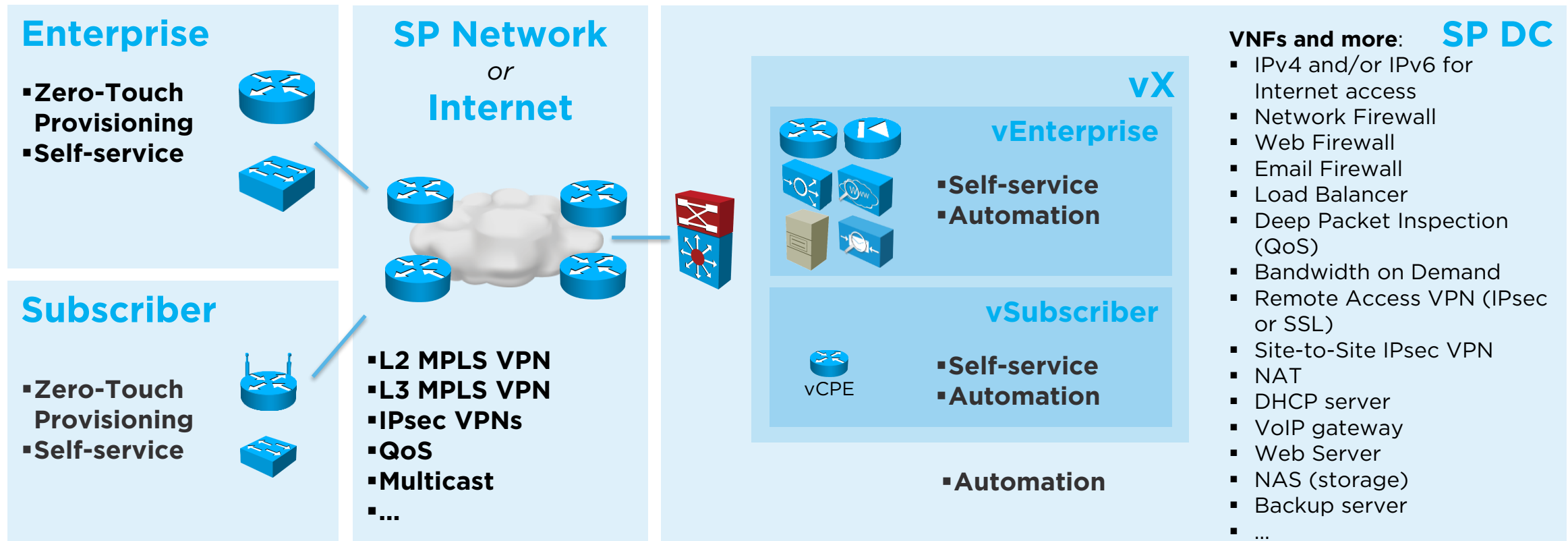
What is NFV?

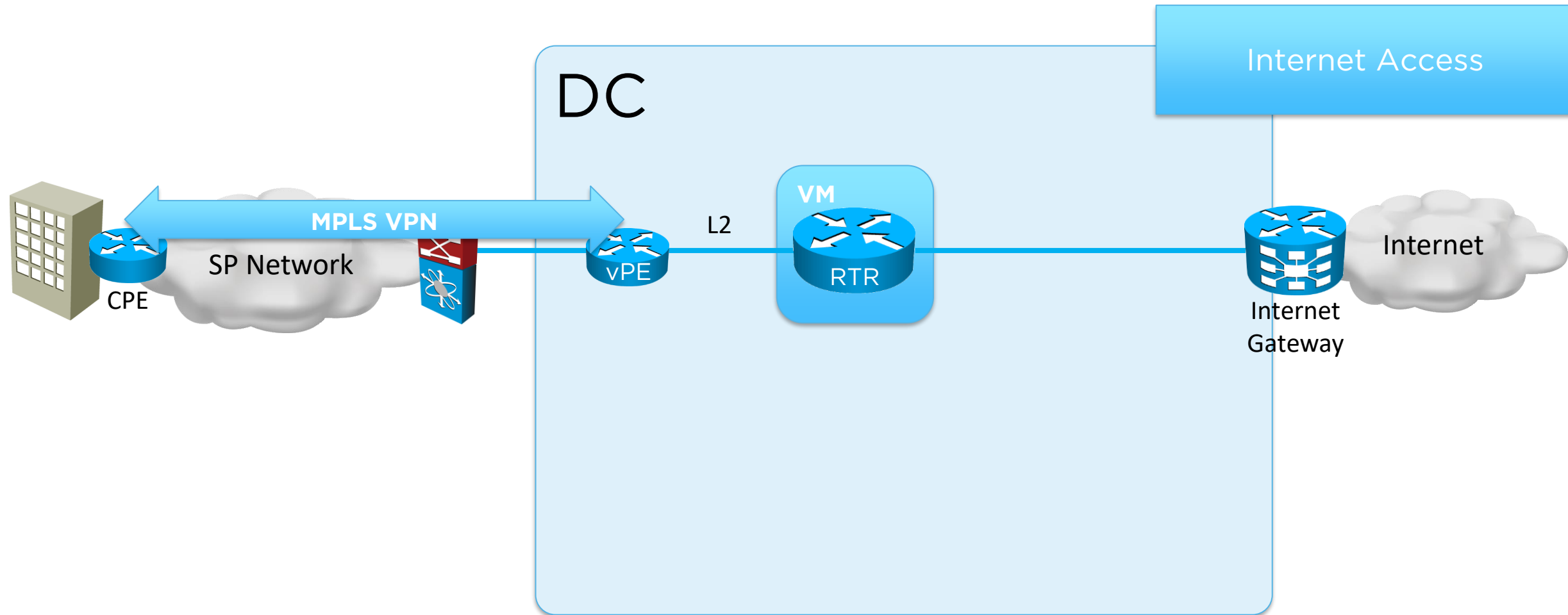
Take 2

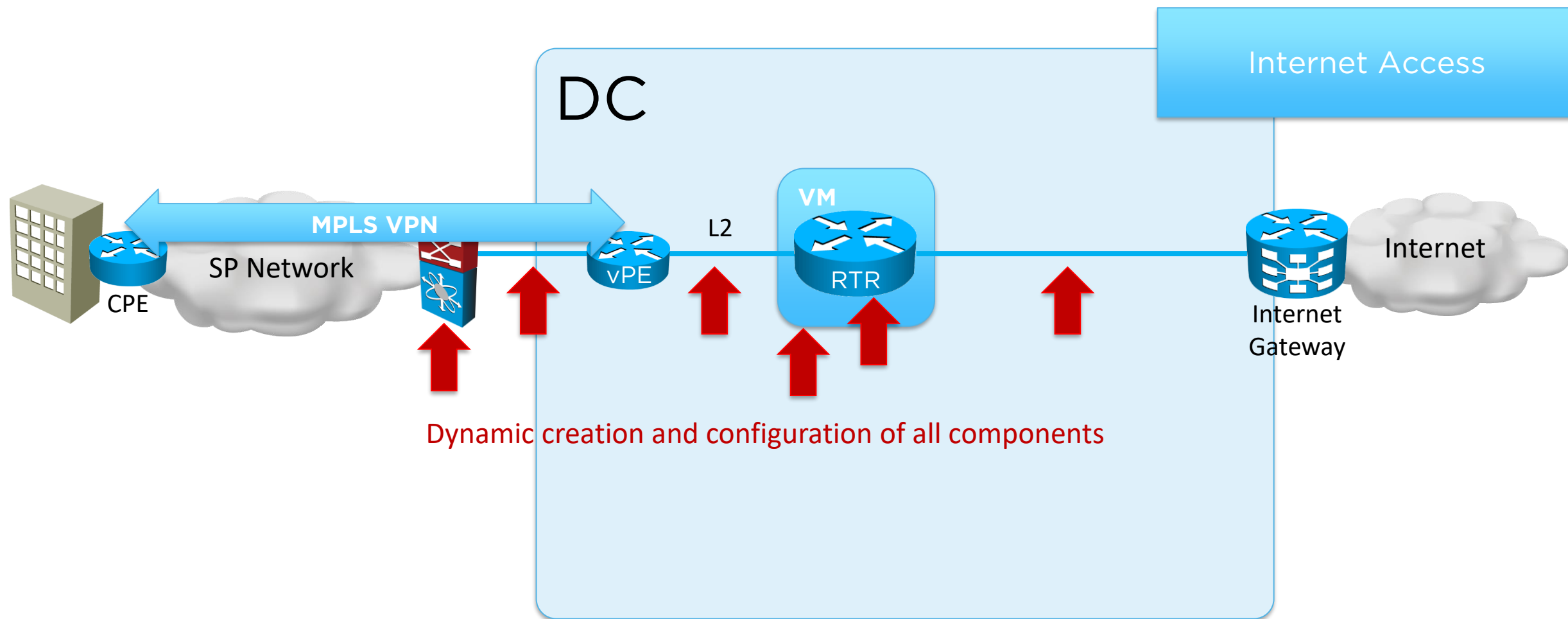


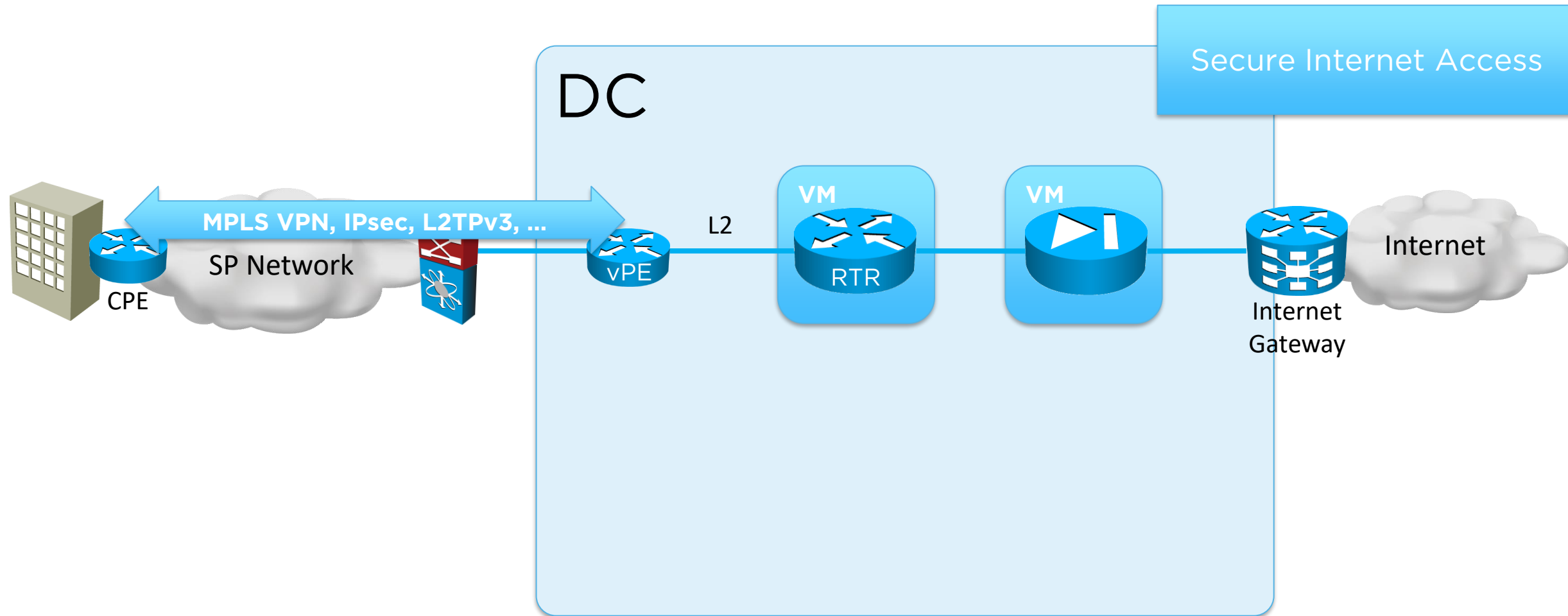
NFV Components Overview

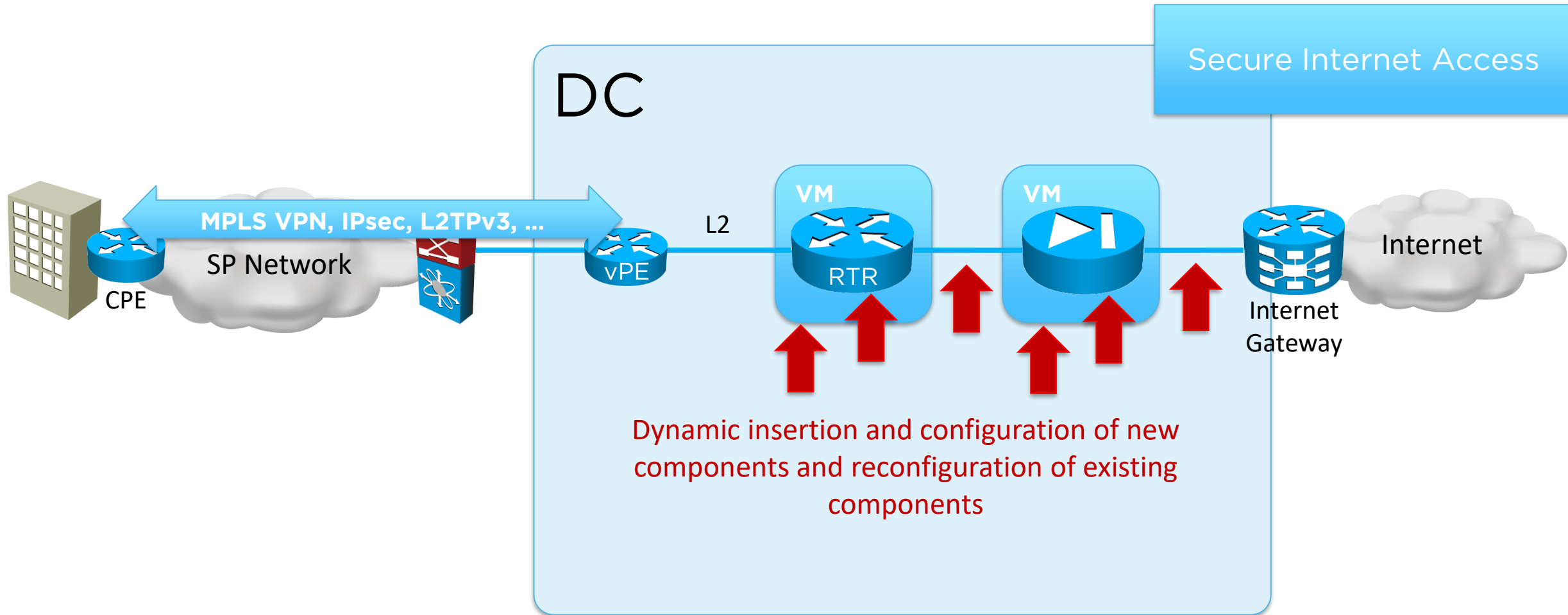
End-to-End Orchestration

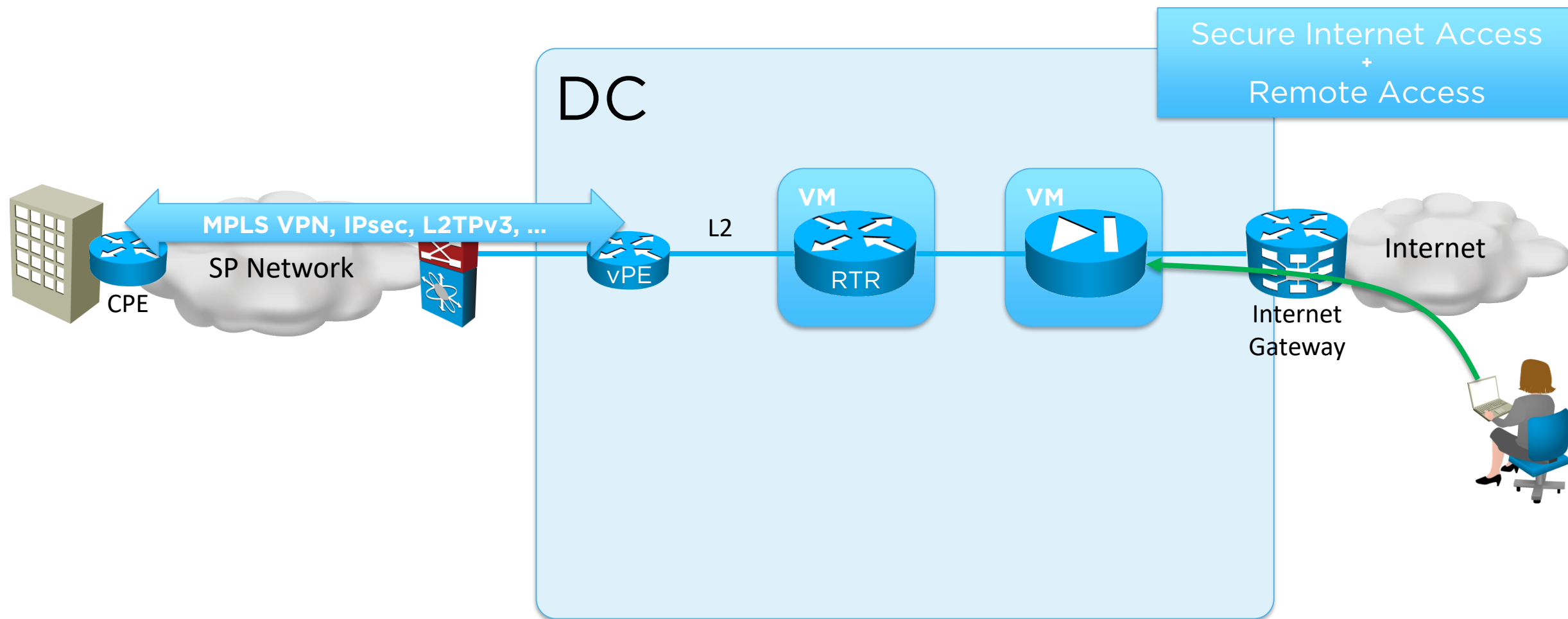


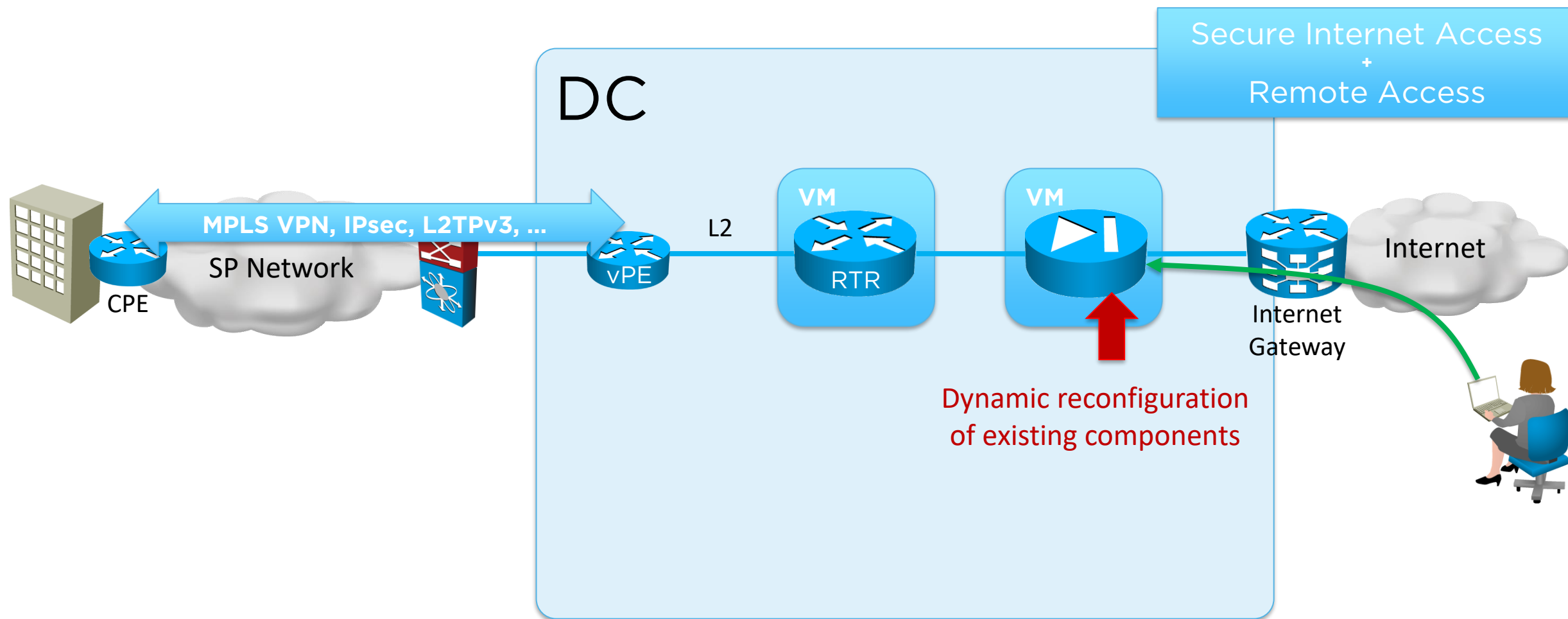












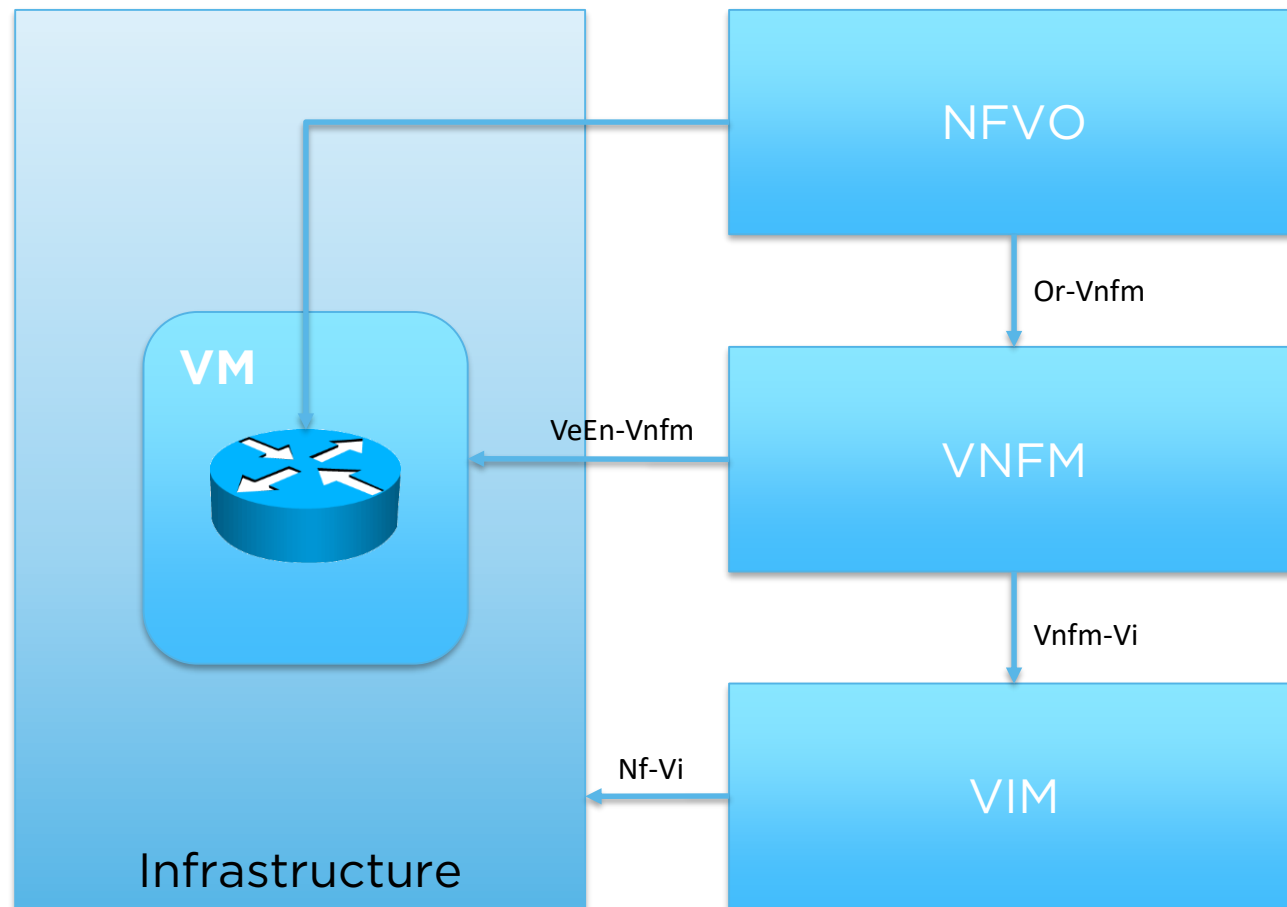
There's an NFV For Dummies Book

- No really, there are a lot of resources out there
- There's also standardization – ETSI NFV MANO



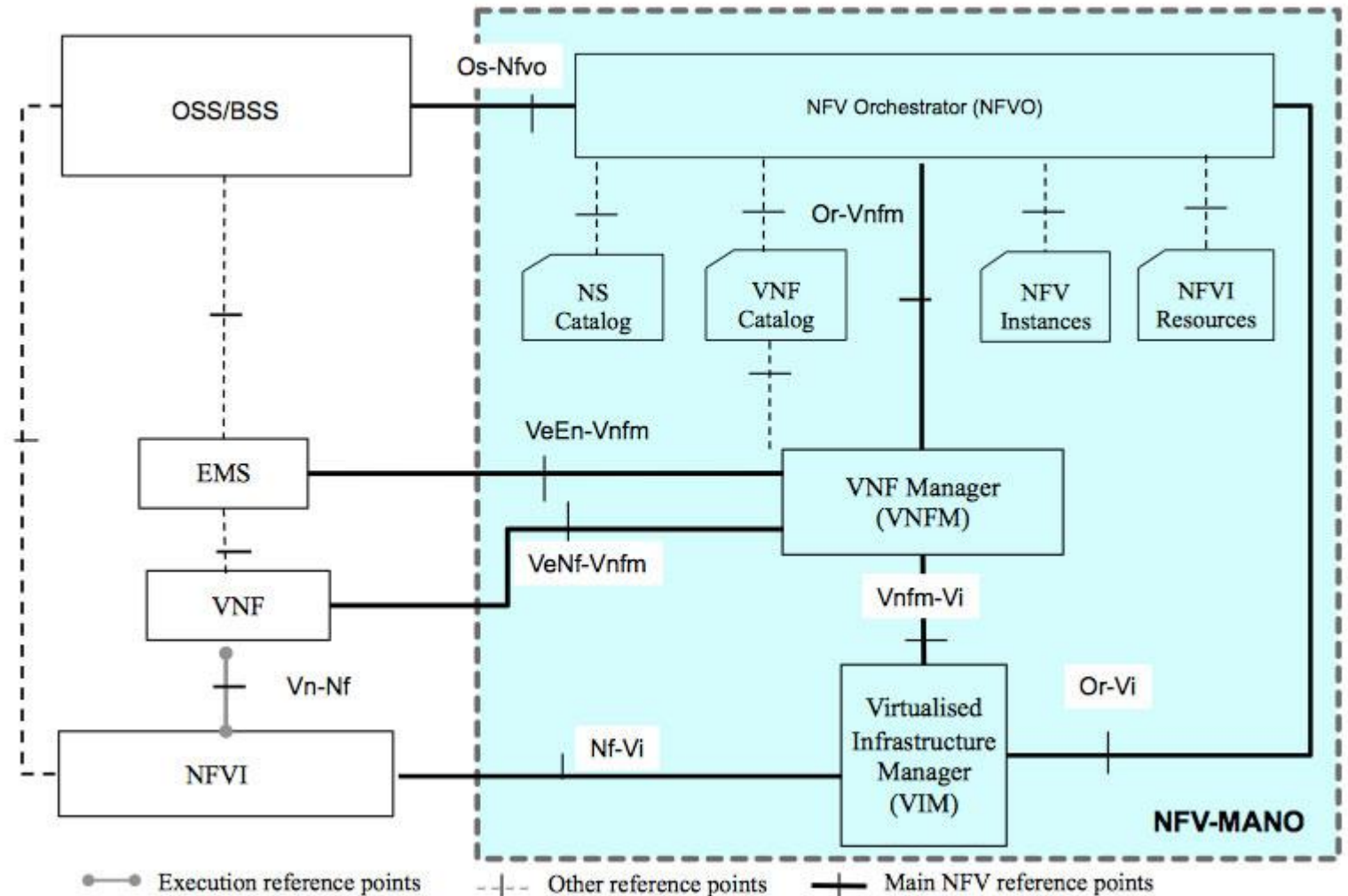
How To Build an NFV Solution

- ETSI NFV MANO aims to standardize the architecture and interfaces for interoperating components



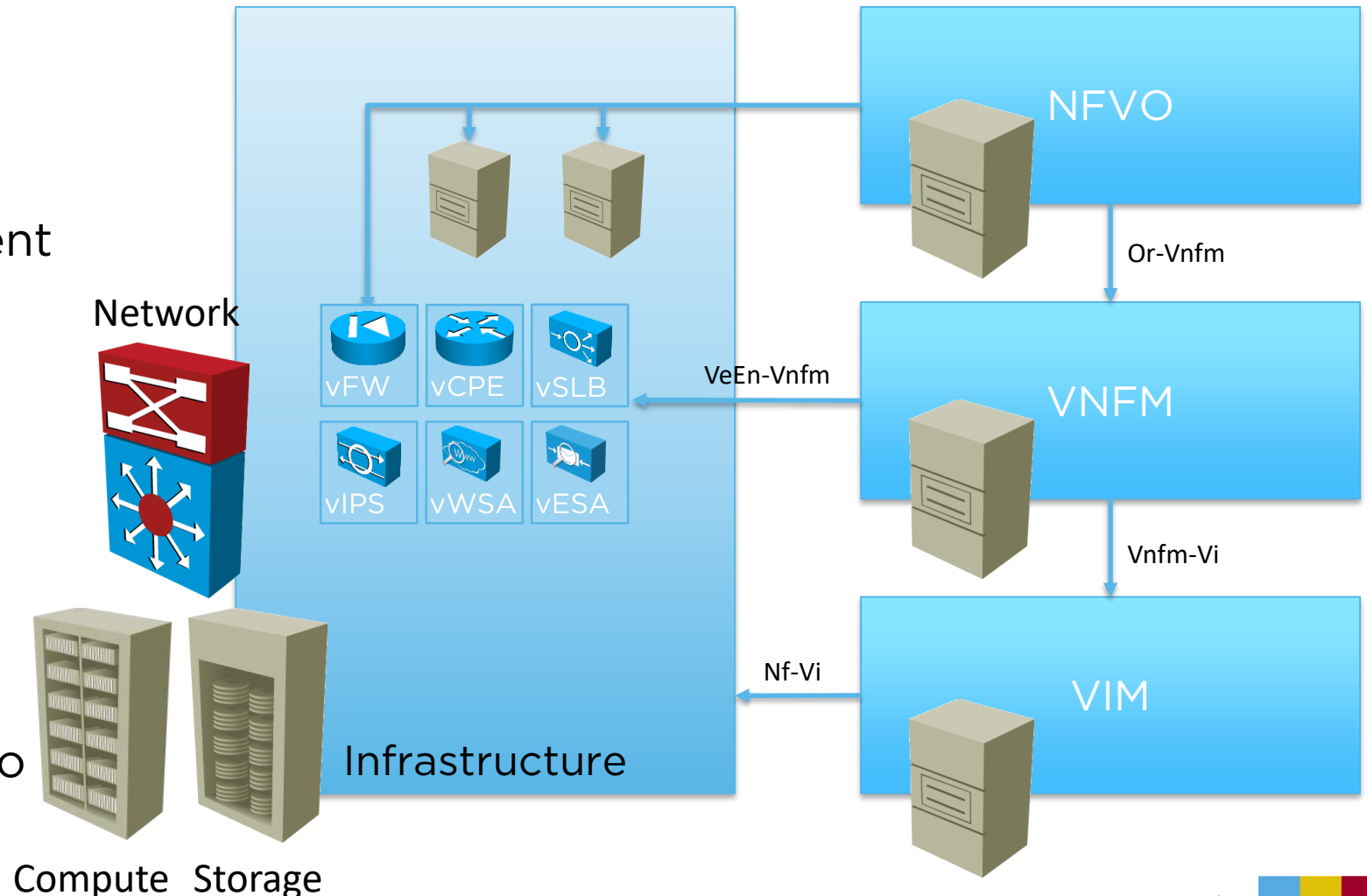
How To Build an NFV Solution

- A slightly more accurate view of the ETSI NFV MANO architecture and interfaces



NIL What Do I Need To Build an NFV Solution?

- Physical infrastructure: servers, storage, DC network
- Hypervisor
- Infrastructure management product
- VNFs
- Some VNFs require additional EMS
- ...
- ...
- ...
- Magic glue to bind all components together into a decent NFV solution



- Everybody claims ETSI NFV MANO compliance
- Every NFV management product is really a rebranded legacy product with some adjustment for NFV MANO
- All integrations are custom, require time and thorough testing
- Not all products support multitenancy
- Not all virtual appliances are virtualization-friendly
- Hypervisors were not originally designed for NFV (basic functionality tweaking, performance tuning)

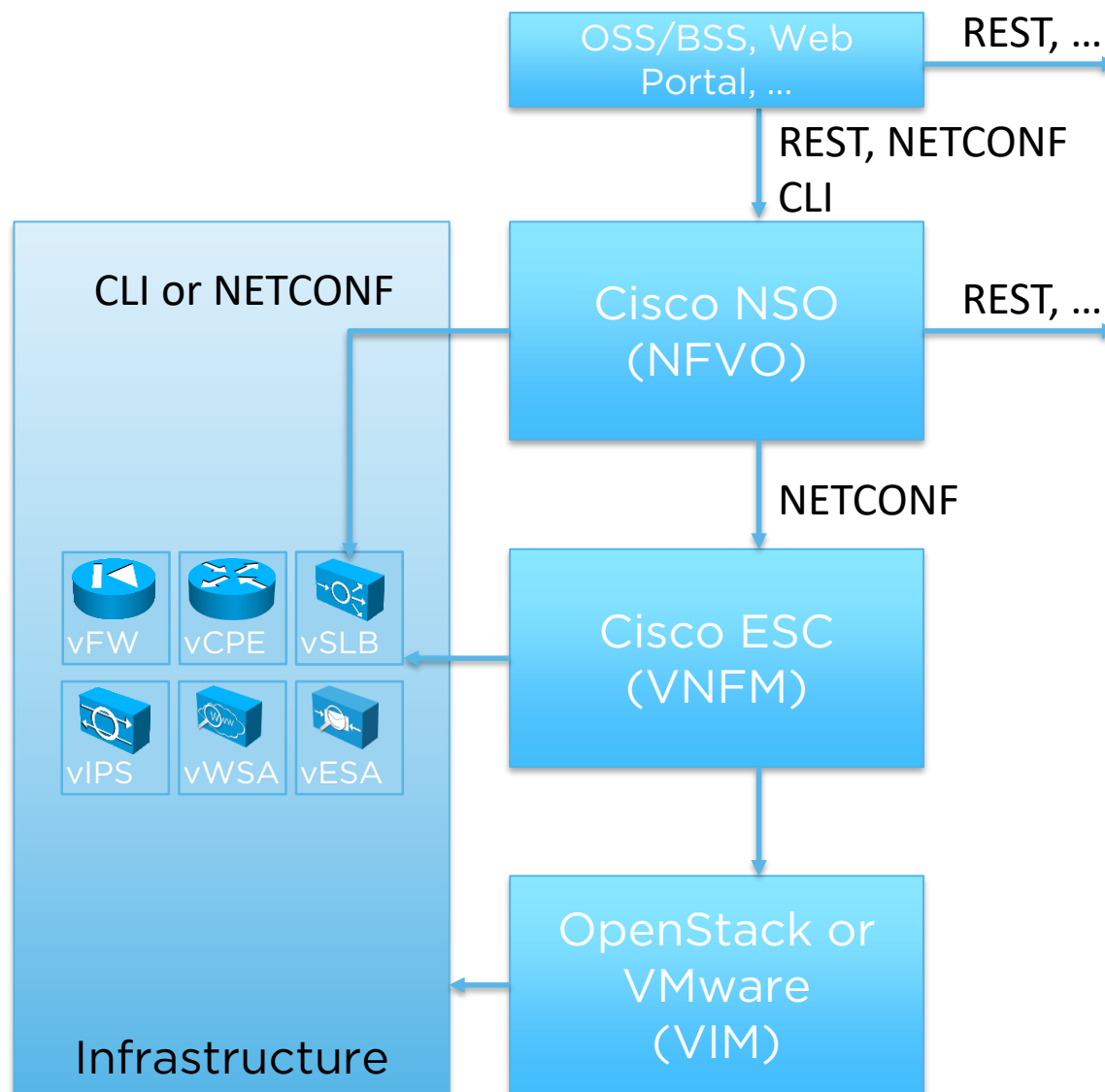


- Adding a new service or modifying an existing services should not be rocket science
- Troubleshooting capabilities and tools should be available
- Re-instantiating a service instance should be available and simple
- Scaling of physical resources should be simple

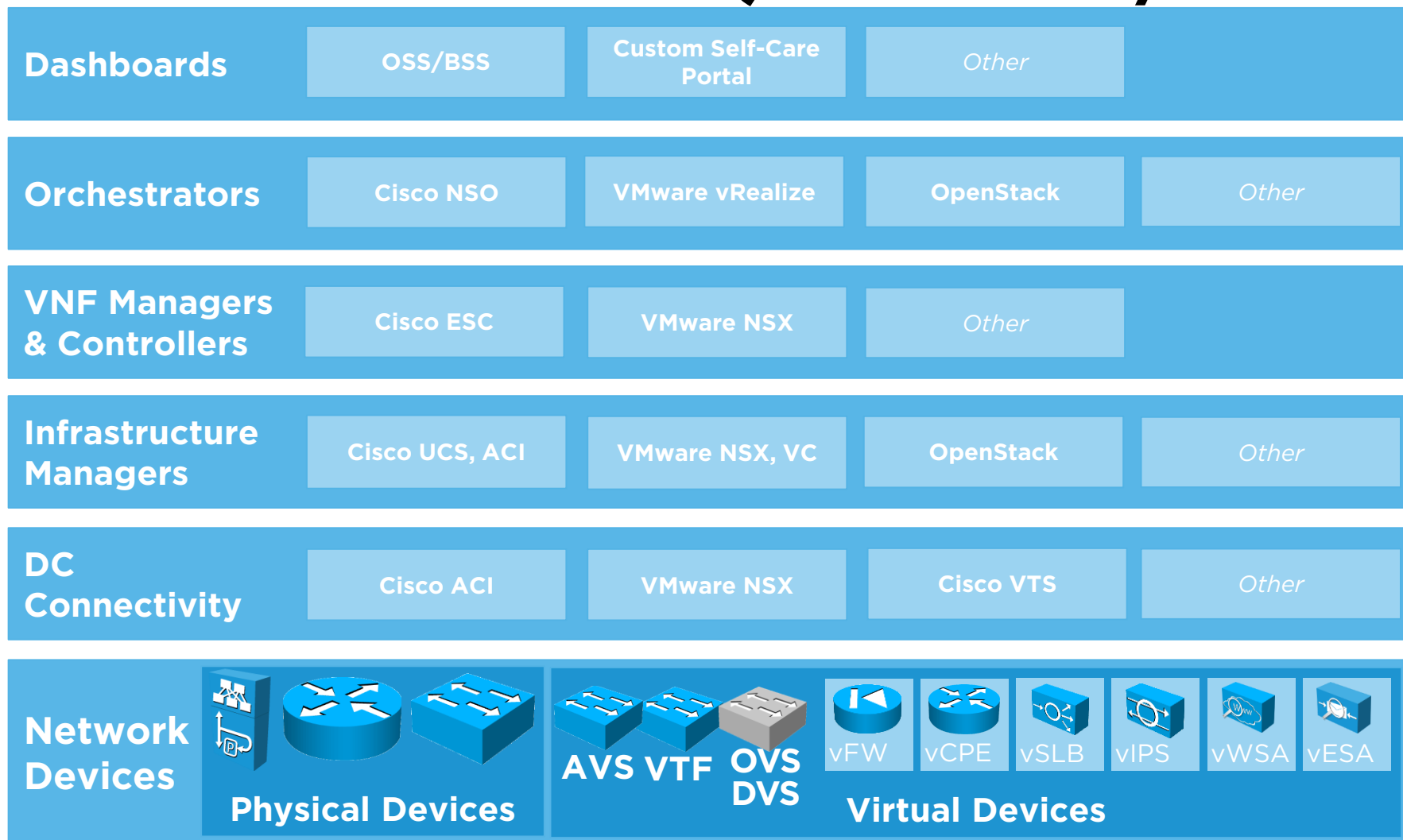


Sample Solution Using Cisco NSO

- Cisco NSO:
 - Service modeling using YANG
 - NETCONF for reliable management of elements
 - NFVO service package for ETSI MANO compliance
 - Network Element Drivers (NEDs) for VNFs of many vendors
 - Automatically exposes service model northbound (via REST, NETCONF, CLI)
- Cisco ESC:
 - Manages VNF lifecycle
 - Provides day-0 configuration to VNFs
 - Uses NETCONF

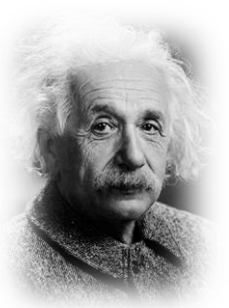


Sample Stack (Cisco and/or VMware)



- Get the design right or else ...
- Do not believe vendors' marketing claims
- Aim not only for management and self-service simplicity, but also for maintenance simplicity as much as possible

Everything should be made as simple as possible, but no simpler



An aerial night photograph of a city, likely Dubai, featuring a complex highway interchange and several illuminated skyscrapers. The entire image is filtered with a yellow tint. A semi-transparent blue horizontal banner is positioned across the middle of the frame.

Q?