Network Configuration Web API for Bandwidth Reservation

draft-tsuzaki-netconfig-webapi-00

SDN RG

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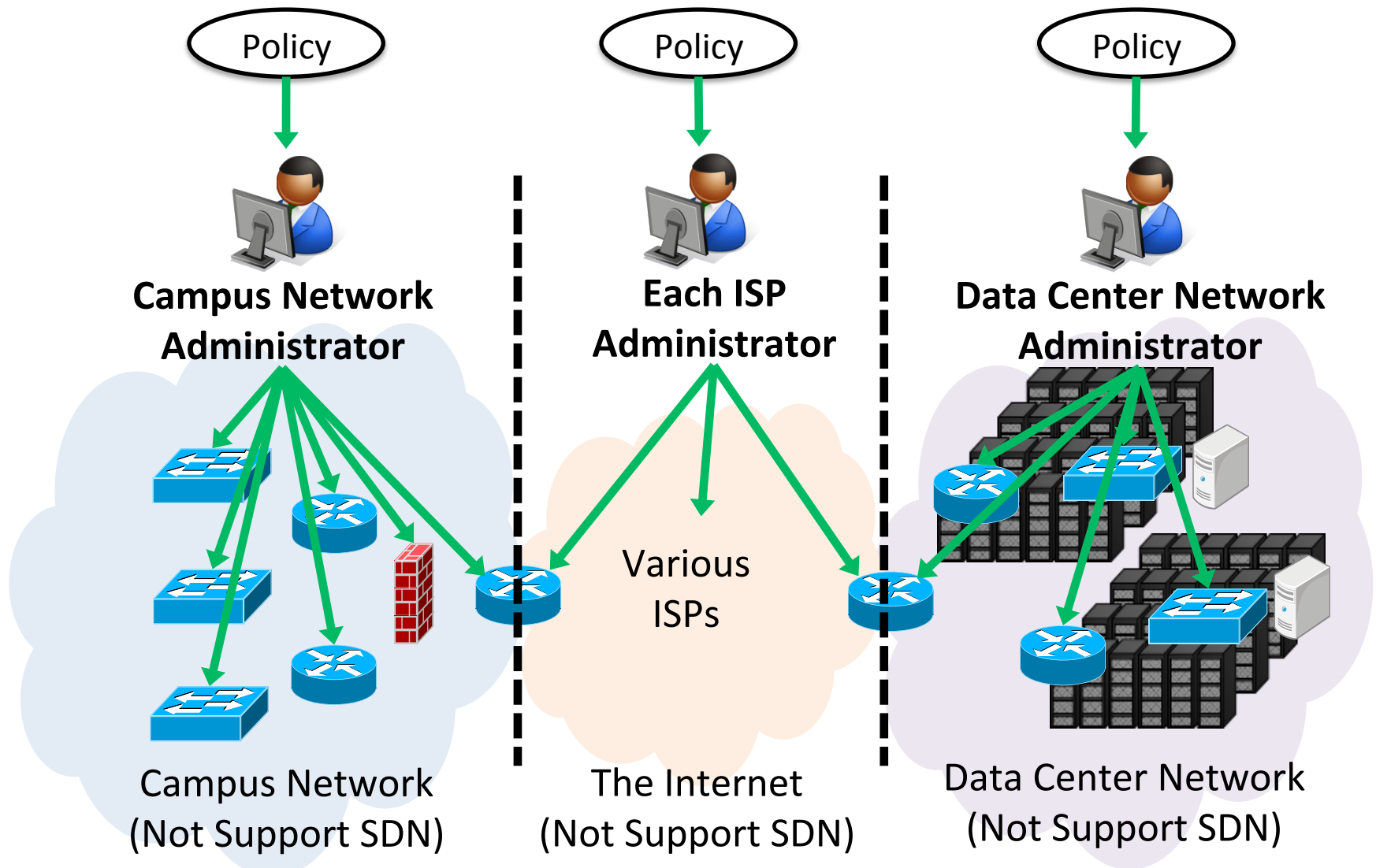R. Atarashi <ray@iijlab.jp>
S. Suzuki <shigeya@wide.ad.jp>
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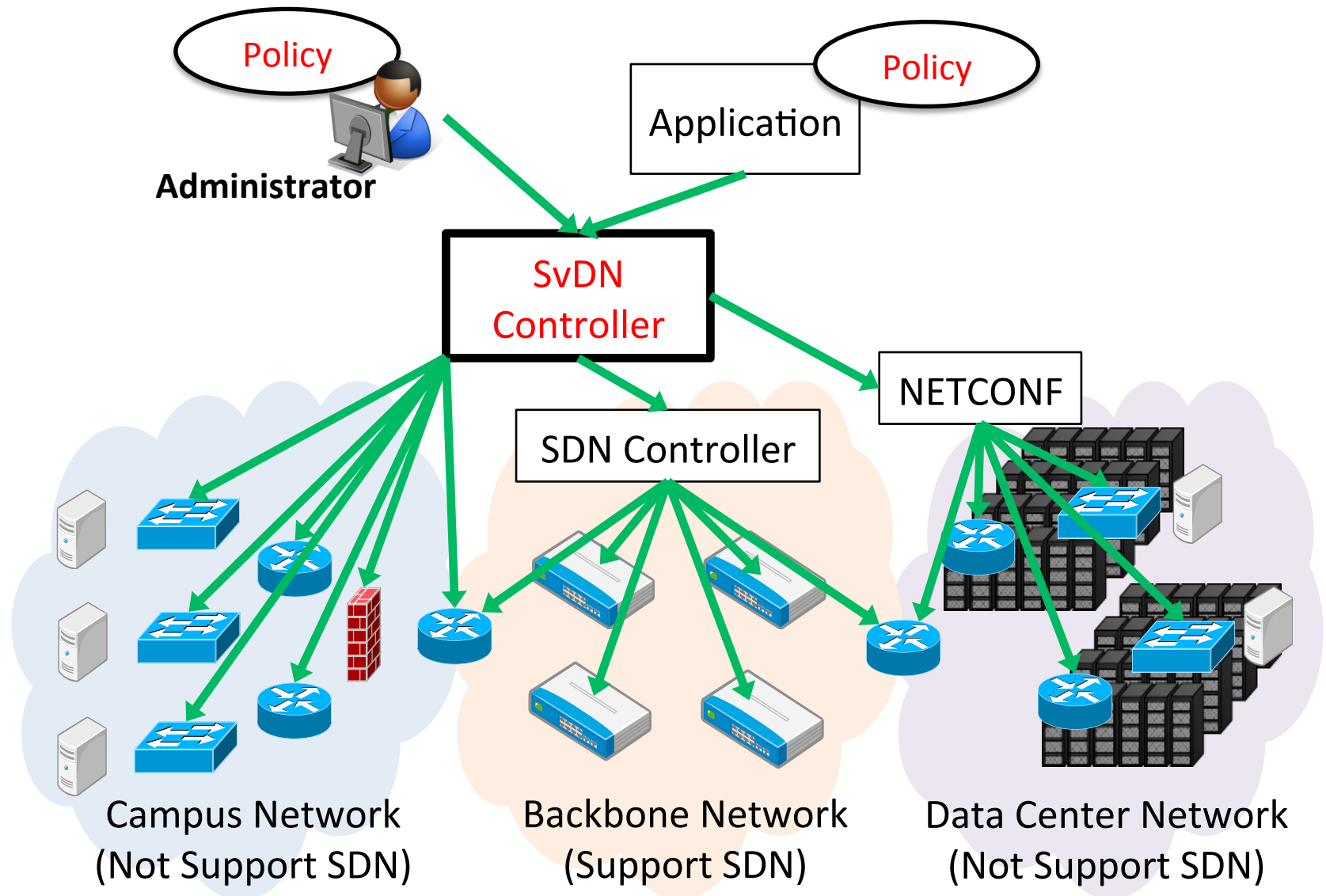K. Okada <okd@lepidum.co.jp>

Motivation

- Network became more programmable thanks to the raise of SDN and NFV

- Letting applications or end-users take more advantage of this

- Aims to manage complicated networks in a centralized manner with a simple policy

Conventional Network Management

Our Goal is Service Defined Networking (SvDN)

Policy explicitly described as **Service Description**

Campus Network
(Not Support SDN)

Backbone Network
(Support SDN)

Data Center Network
(Not Support SDN)

SvDN : Service Defined Network※

- Define that the whole network provides various functions as "services"

- Describe explicitly service "specifications", constraints and requirements for functions provided by the network

- In SvDN, app demands "I want to receive 4K streaming from YouTube" then the service description is extracted to various convectional network configurations on network devices across the world

※ Teramoto, Y., "Managing Networks Independently of the Physical Topology by Service Defined Network", COMPSACW 2013 IEEE 37th

Example Virtual Topology
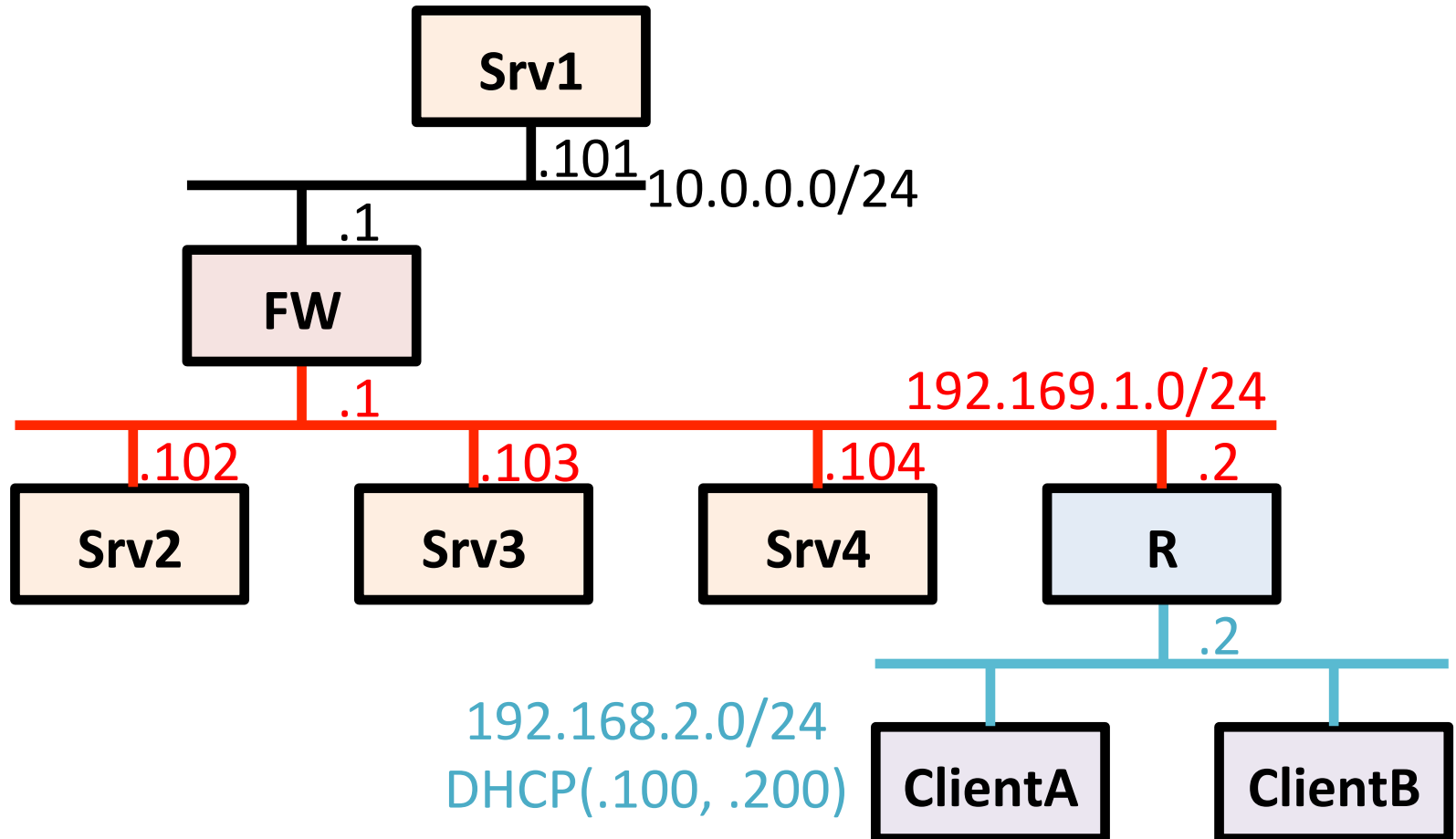
Network Description Language

```
node {
        srv1.laccoons.org;
        srv2.laccoons.org;
        srv3.laccoons.org;
        srv4.laccoons.org;
        fw.laccoons.org;
        r.laccoons.org;
}
location {
        Building-A {
                srv1.laccoons.org;
                srv2.laccoons.org;
                srv3.laccoons.org;
                fw.laccoons.org;
                r.laccoons.org;
        }
        Building-B {
                srv4.laccoons.org;
        }
}

group {
        red {
                srv2.laccoons.org;
                srv3.laccoons.org;
                srv4.laccoons.org;
                r.laccoons.org;
                fw.laccoons.org;
        }
        black {
                srv1.laccoons.org;
                fw.laccoons.org;
        }
        blue {
                r.laccoons.org;
        }
}
service {
        dos-protection {
        enable;
}
```

Service Description Language

```
domain laccoons.org;                          vlan = 1200;
networks {                                    r[address = "192.168.2.2"];
    network black {                           clientA;
        address = "10.0.0.0/24";              clientB;
        vlan = 1000;                        }
        srv1[address = "10.0.0.101"];     }
        fw[address = "10.0.0.1"];         event {
    }                                      always {
    network red {                              reserve-bandwidth(10.0.0.101,
        address = "192.168.1.0/24";                              192.168.1.104);
        vlan = 1100;                        }
        fw[address = "192.168.1.1"];      }
        svr2[address = "192.168.1.102"];  action {
        svr3[address = "192.168.1.103"];   reserve-bandwidth(10.0.0.101,
        svr4[address = "192.168.1.104"];                       192.168.1.104)
        r[address = "192.168.1.2"];            allocated_bandwidth = 10Mbps;
    }                                       }
                                          }
        network blue {
        address = "192.168.2.0/24";
```
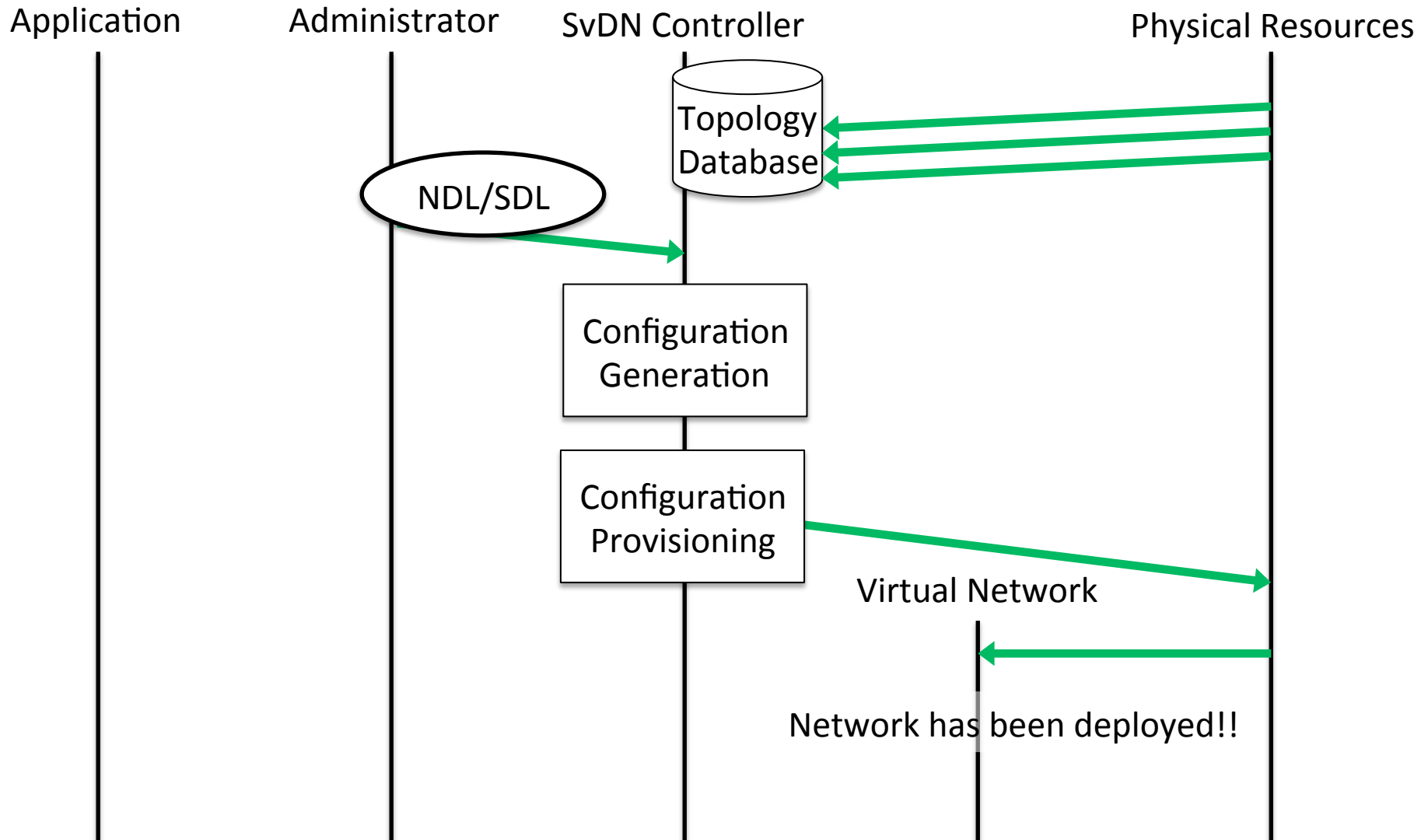
Scenario 1/2

Scenario 2/2
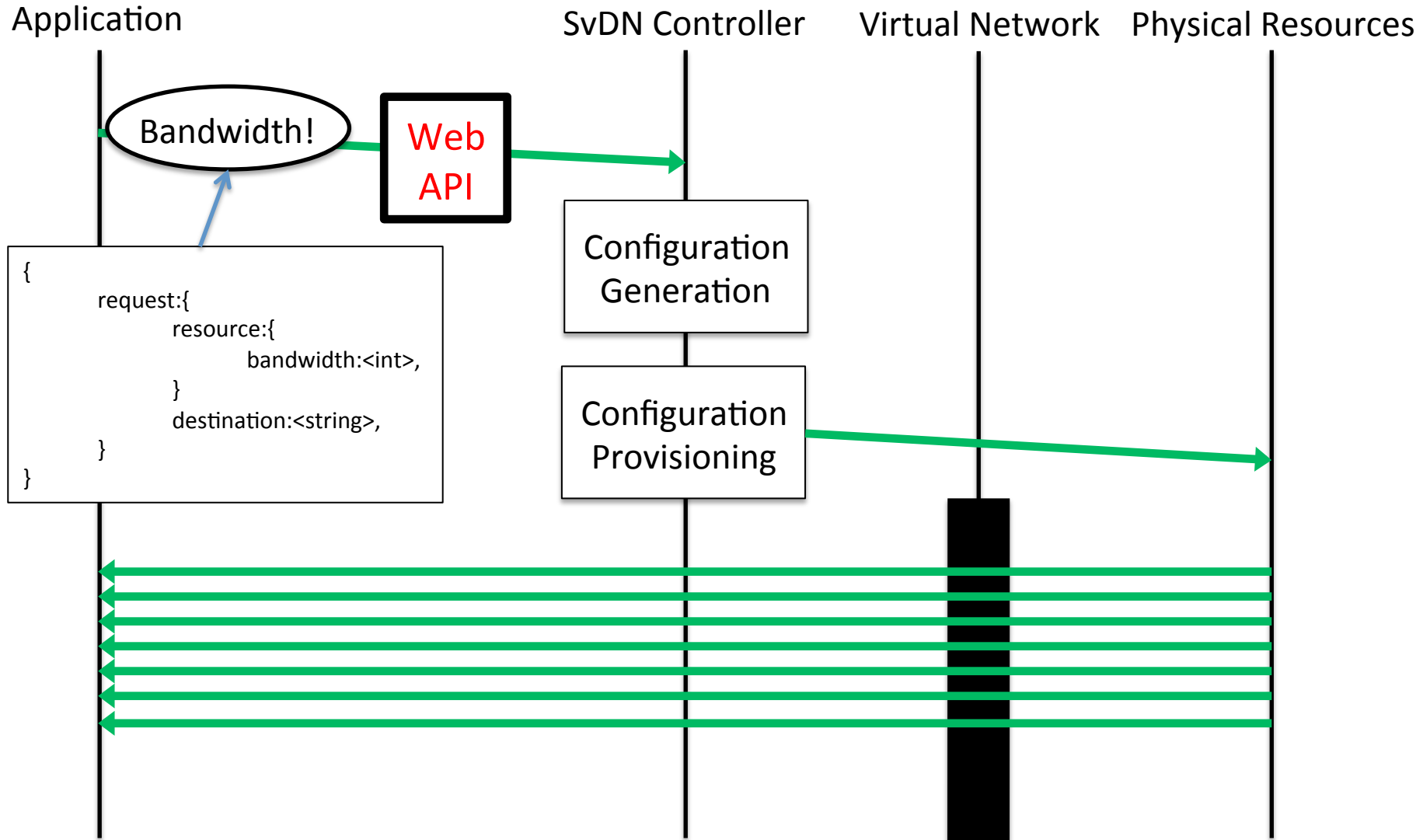
Summary

- Proposed SvDN, a new type of network management, to let applications or end-users take advantage of programmable networks
- Current work: developing Proof of Concept on Japanese nationwide academic network and a commercial datacenter

- Where to standardize Service Description?