Putting **IPv6** to work

North American IPv6 Summit

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Rocky Mountain IPv6 Task Force

RMv6TF

IPv6 Best Operational Practices of Network Functions Virtualization (NFV) With Vmware NSX

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Overview

- NSX as it pertains to NFV
- How NSX works
- NSX IPv6 Capabilities & Limitations
- How to deploy IPv6 on NSX
- Using IPv6 on NSX
- IPv6 NSX Demo!

BLUF

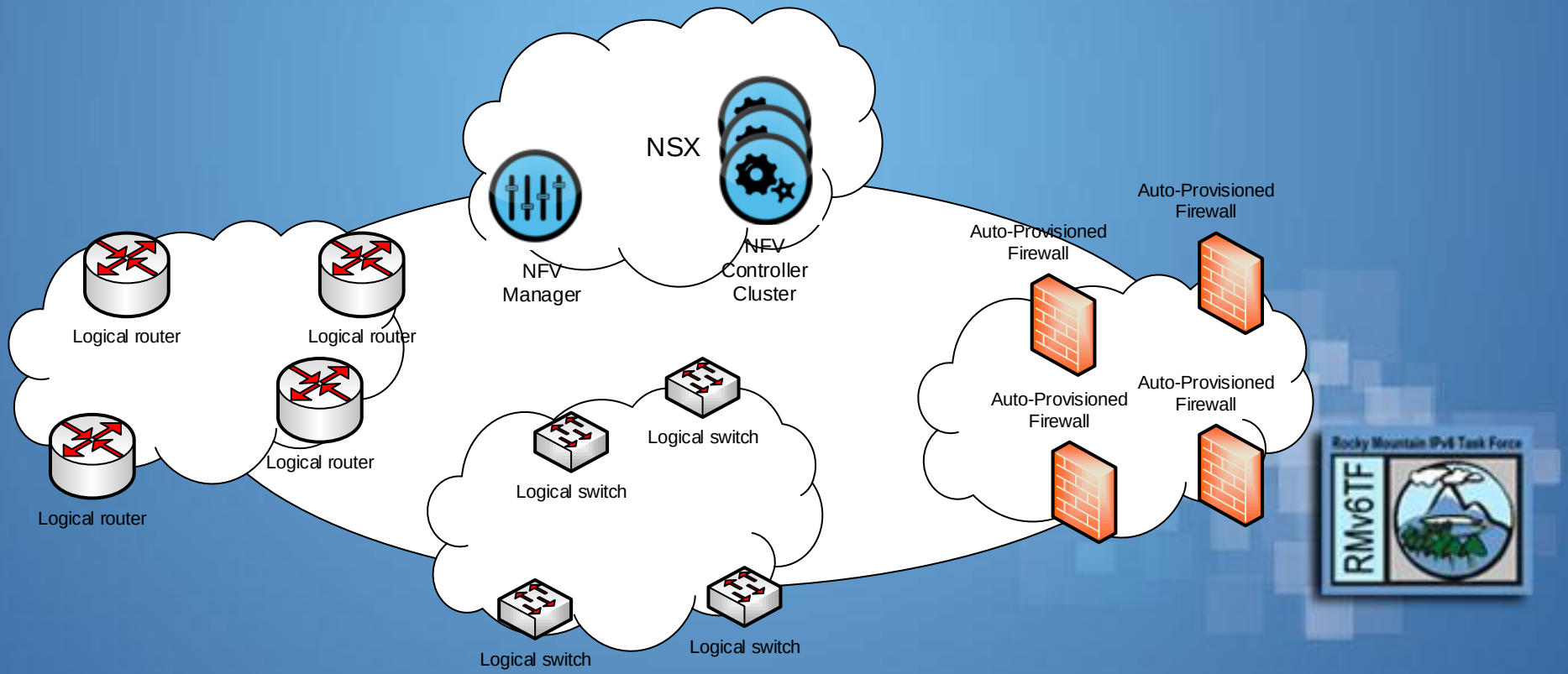
- NSX for IPv6 not ready for production…

NSX is NFV

- NSX is Vmware's answer to Network Functions Virtualization (NFV)
- NSX came from Nicira acquisition
- It provides the same capabilities
  - Distributed switching
  - Logical routing
  - Distributed firewalling
  - Logical load-balancing
  - VXLAN tunneling
  - VPN tunneling services
- Very comparable to OpenStack's Neutron

NSX is NFV, cont.

- It provides this by pushing networking to the hypervisor and managing it with a controller



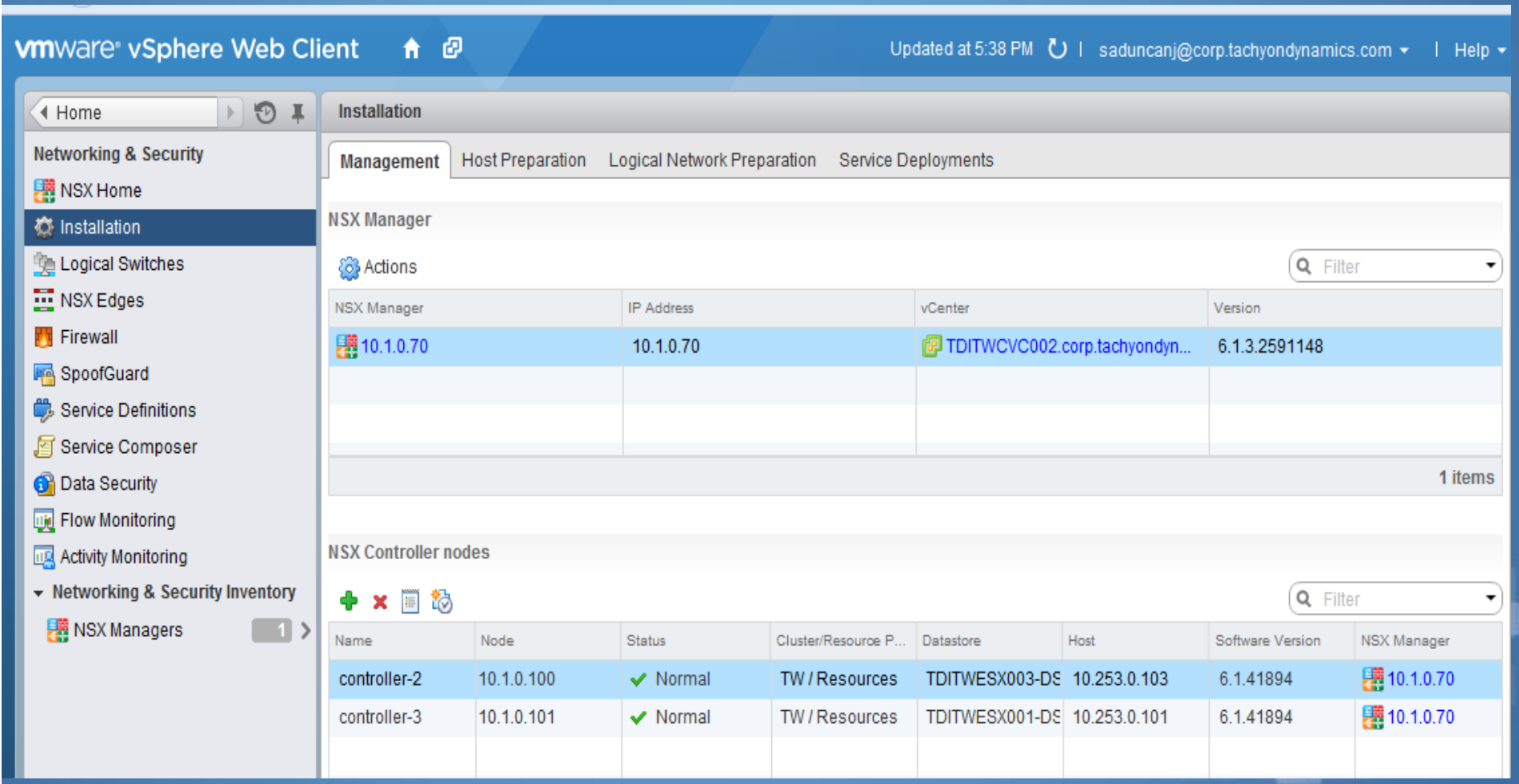
How NSX Works

- Prerequisites
  - Vmware Vcenter server 5.5+
  - Vmware ESXi hypervisor 5.5+
  - Vmware Virtual Distributed Switch (vDS)
  - All ESXi hosts must:
    - Be in a Datacenter Cluster
    - Use vDS version 5.5
  - Uplinks and vDS → MTU 1550+
    - 50 bytes for VXLAN

How NSX Works, cont.

- An NSX Manager installs all of the components
  - NSX Controllers
  - VXLAN transport interfaces
  - Distributed firewall
  - Edge Services Gateway
- The NSX Controllers install all of the virtual networking on the ESXi hosts in a cluster

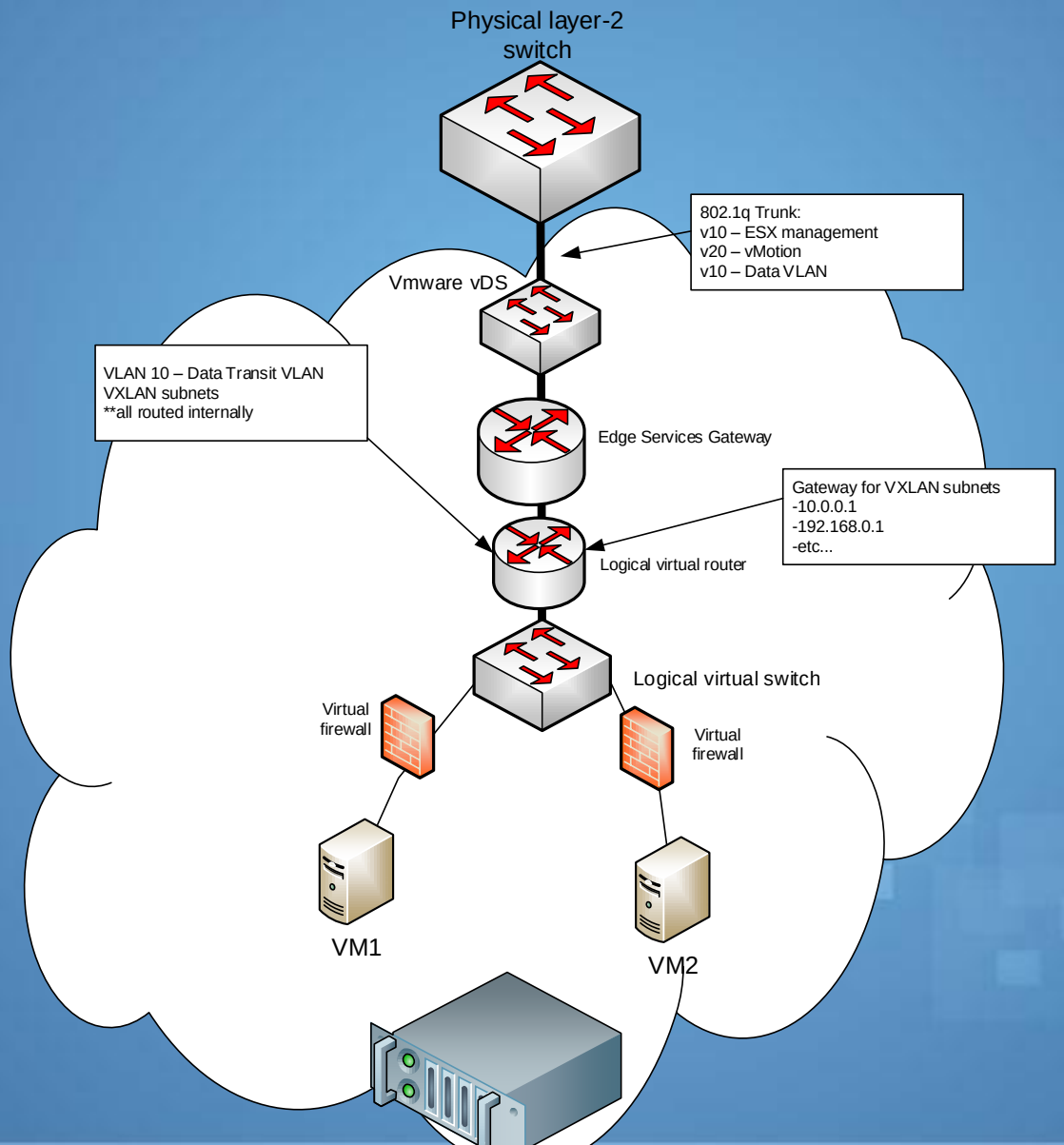
How NSX Works, cont.



How NSX Works, cont.

- VXLAN Transport interfaces created
- NFV tools to deploy:
  - Logical virtual switches
  - Logical virtual firewalls
  - Logical virtual routers
  - Logical virtual-load balancers
  - VPN services

How NSX Works, cont.



IPv6 Capabilities with NSX

- Edge Services Gateway (ESG) can route all IPv6 traffic over VXLAN Tunnel Interfaces
- Full support for IPv6 firewall rule creation
- IPv6 routing on ESG can support full static routing
- Full support for IPv6 load-balancing

IPv6 Limitations with NSX

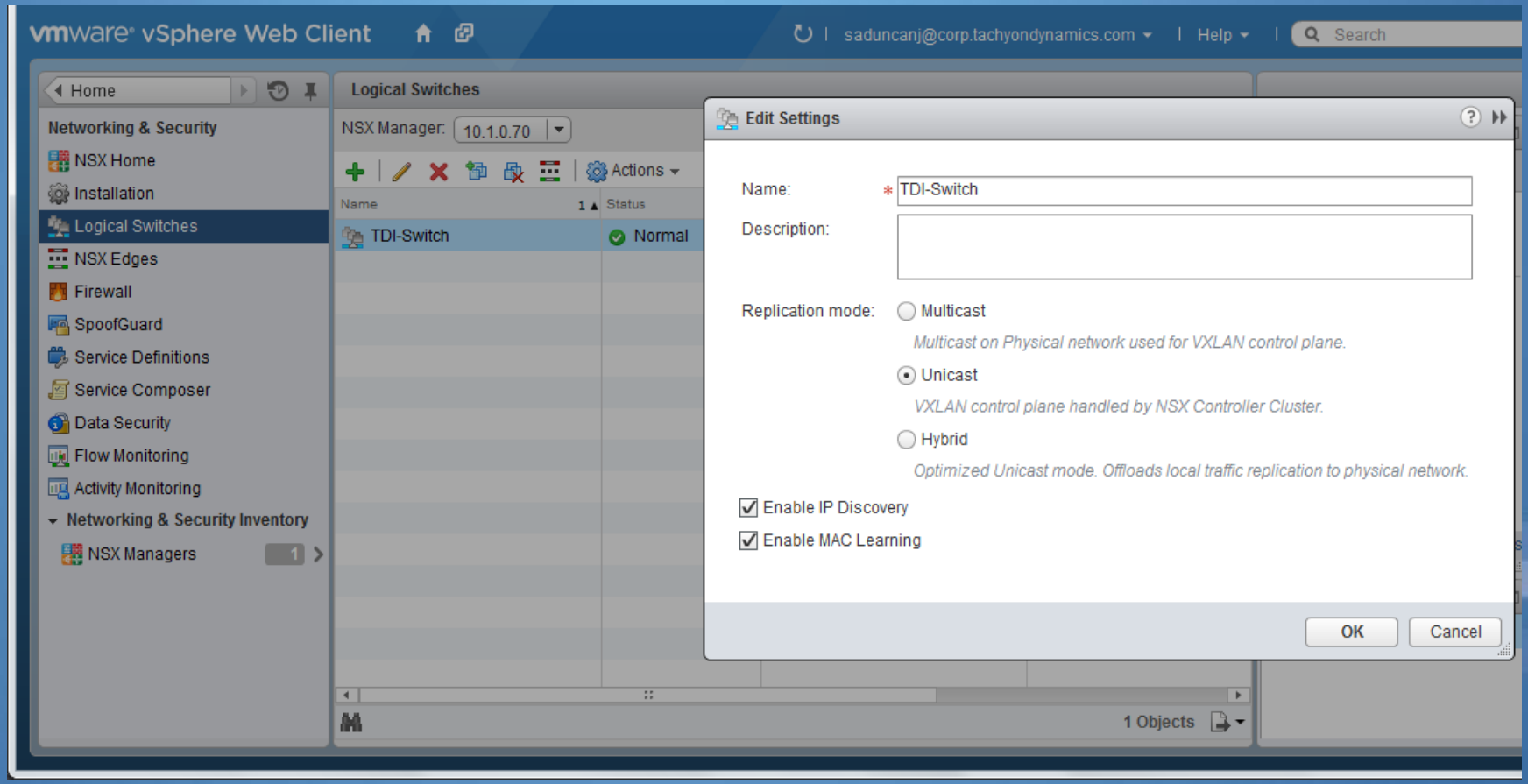
- VXLAN “underlay” network is IPv4 only
- Logical virtual router does not support IPv6 addressing or routing
  - Edge Services Gateway (ESG) must route all IPv6
- ESG does not have support for IPv6 routing protocols (BGP, OSPFv3, etc)
- ESG does not send Router Advertisements or have DHCPv6 relay functionality

How To Deploy IPv6 on NSX

- Create IPv6-enabled VXLAN Tunnel Interfaces (VTI) on the Edge Services Gateway
- On the Logical Virtual Switch ensure this subnet is added as a VTI in Vcenter
- Attach the VTI to the virtual machine (VM)
- Configure IPv6 firewall rules for each VM
- Configure the IPv6 address on the VM

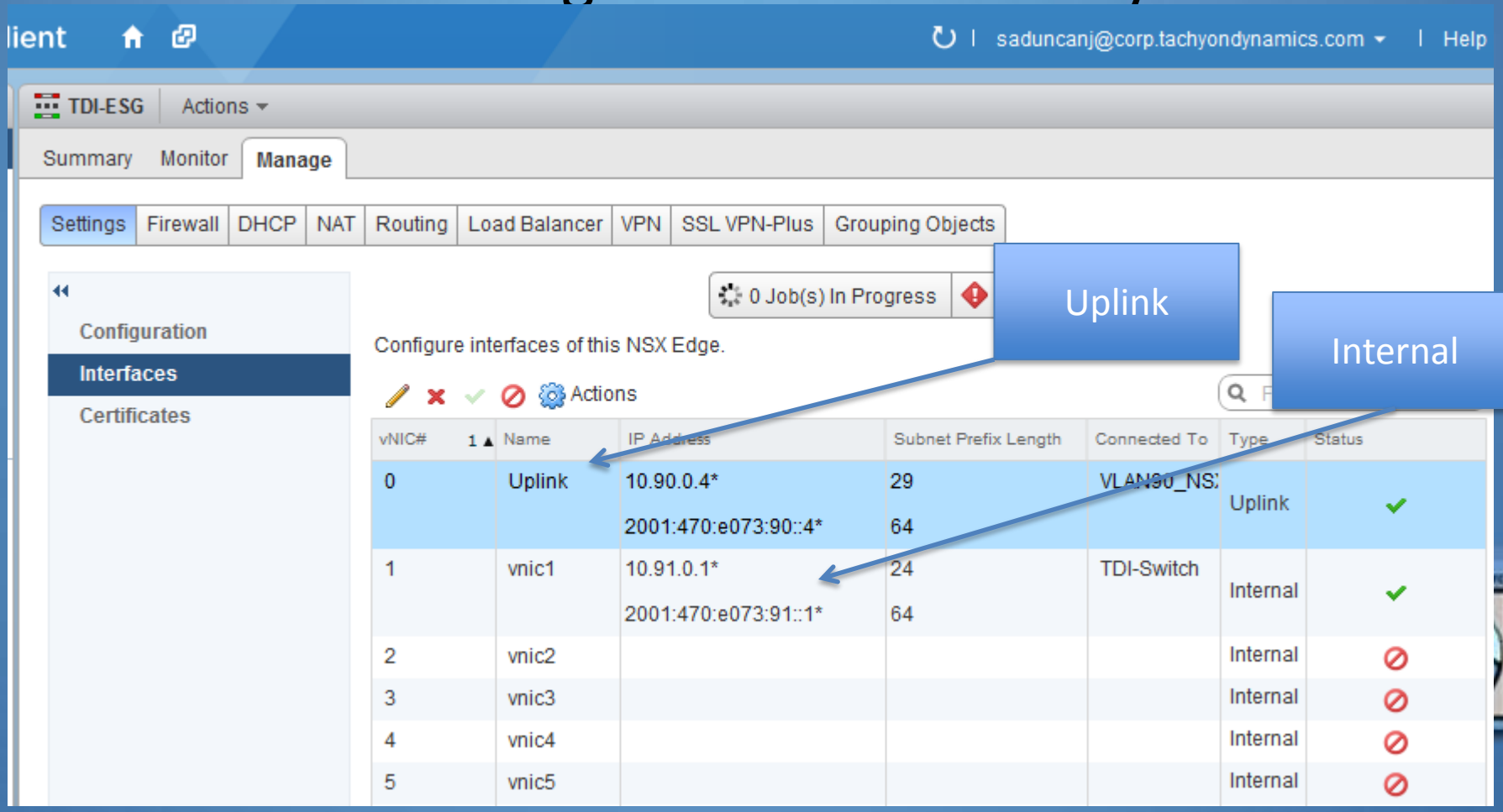
Using IPv6 on NSX

- Provision a Logical Switch



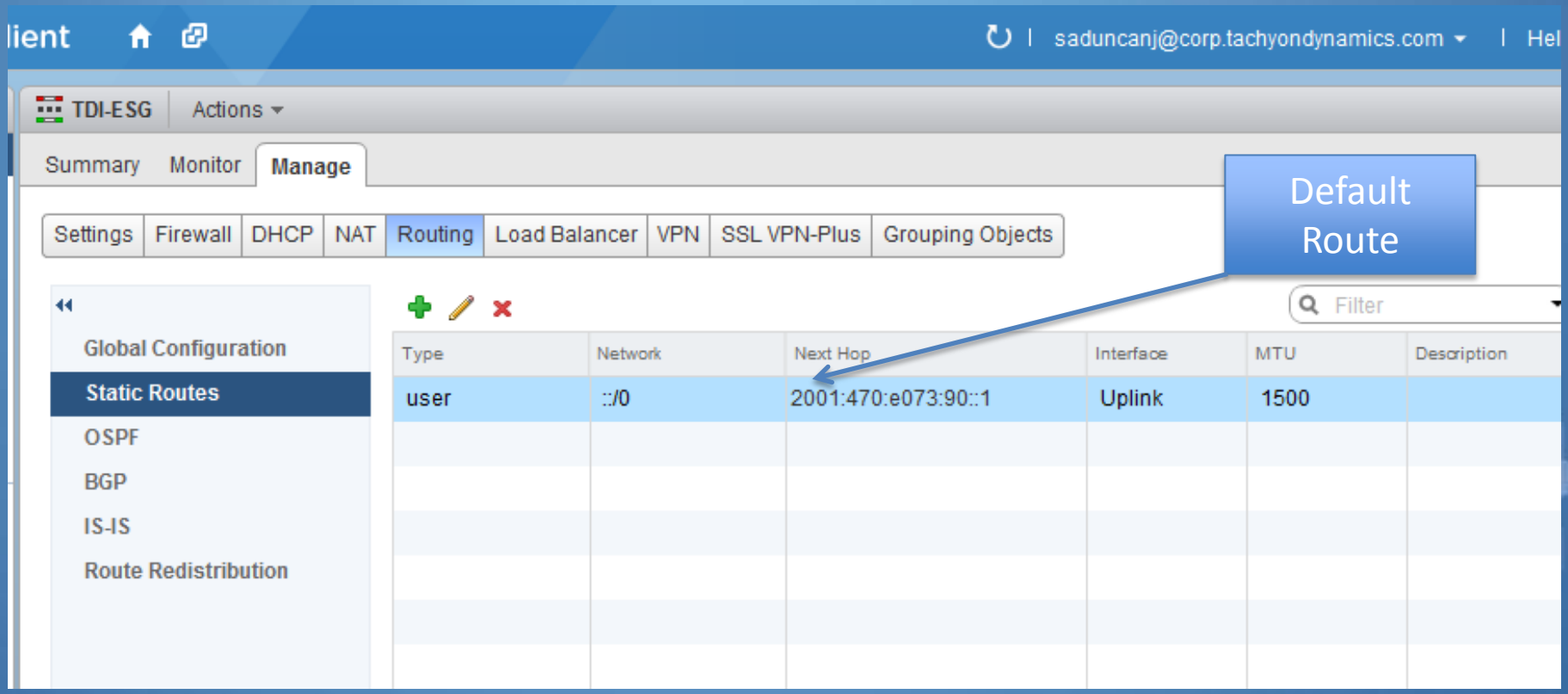
Using IPv6 on NSX

- Provision an Edge Services Gateway



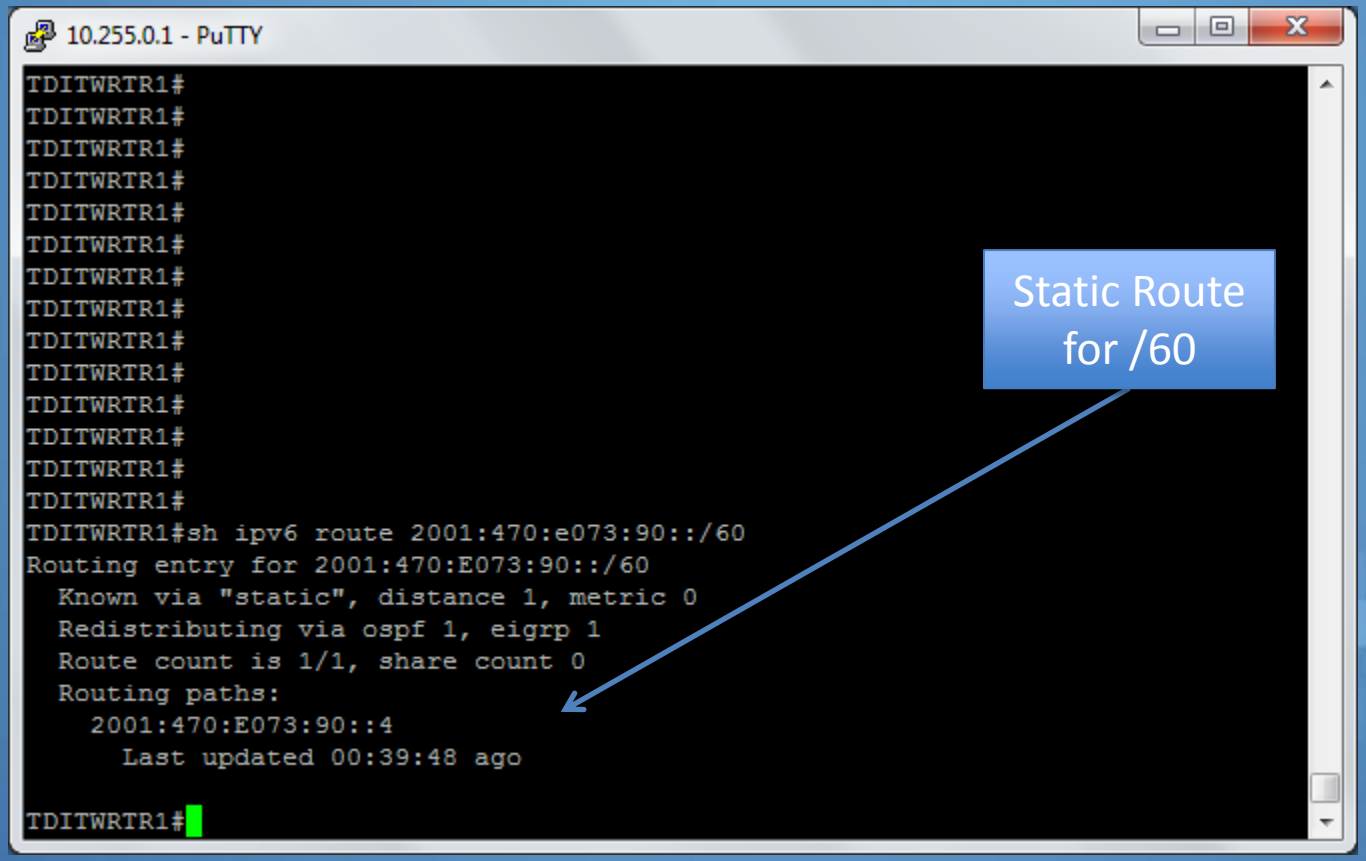
Using IPv6 on NSX

- Configure ESG routing (static)



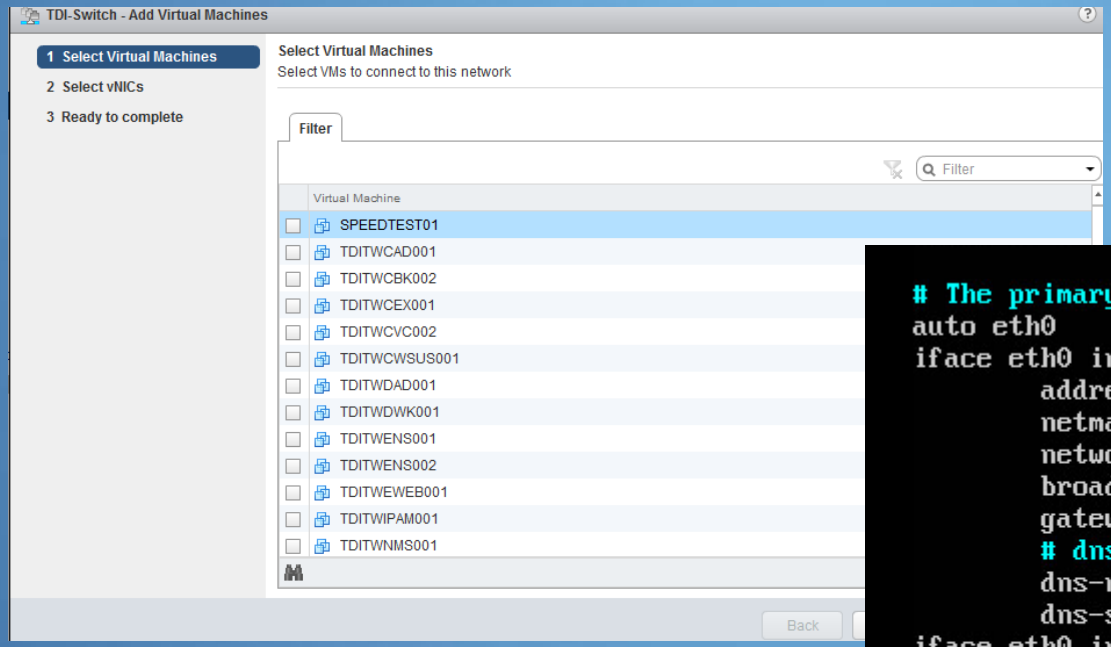
Using IPv6 on NSX

- Configure physical route uplink routing



Using IPv6 on NSX

- Attach a virtual machine to the Logical Switch & address with 2001:470:e073:91::/64 subnet



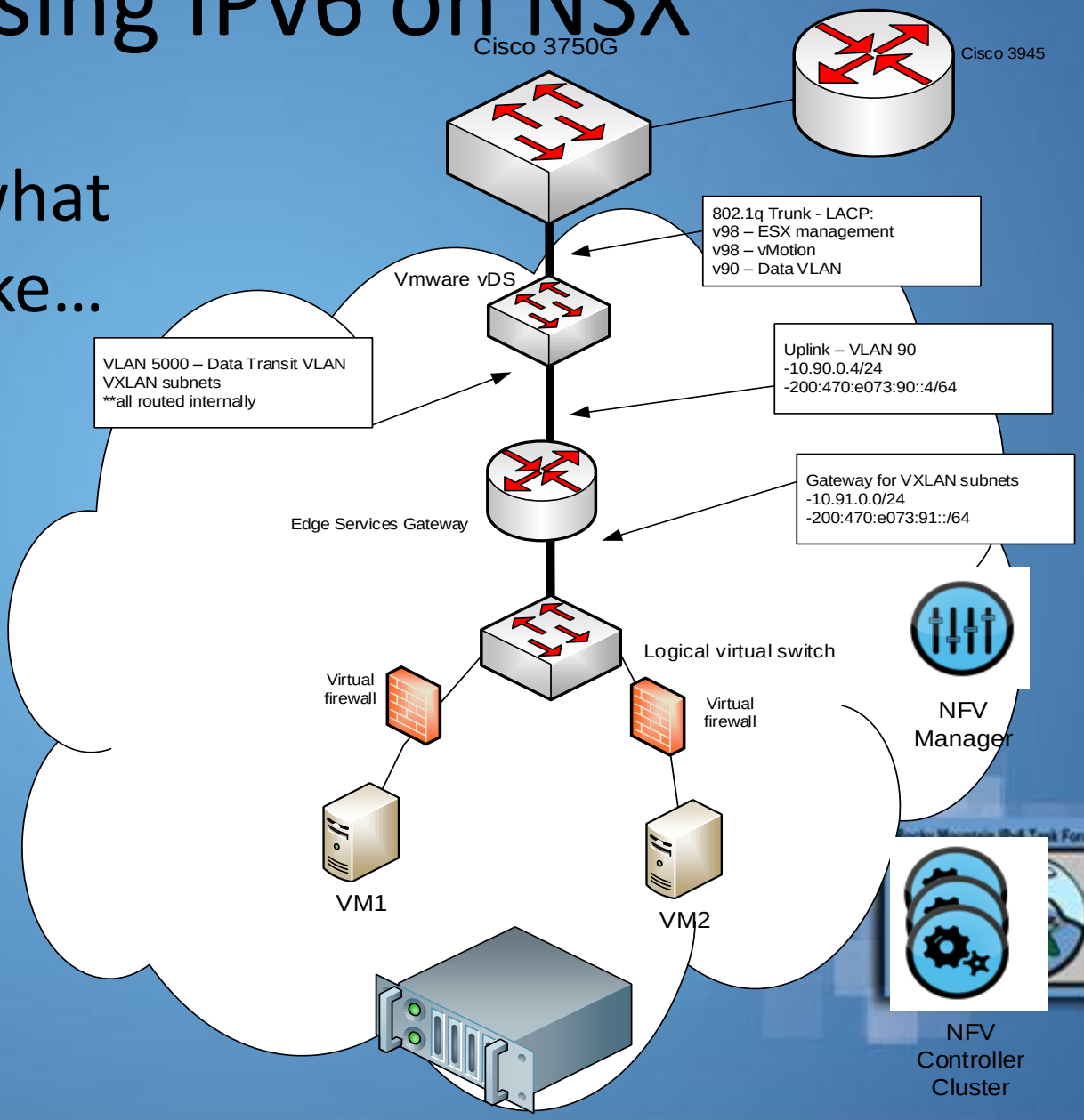

```
# The primary network interface
auto eth0
iface eth0 inet static
        address 10.91.0.10
        netmask 255.255.255.0
        network 10.91.0.0
        broadcast 10.91.0.255
        gateway 10.91.0.1
        # dns-* options are implemented by the resolvconf pacl
        dns-nameservers 8.8.8.8
        dns-search tachyondynamics.com
iface eth0 inet6 static
        address 2001:470:e073:91::10
        netmask 64
        gateway 2001:470:e073:91::1
iface eth0 inet6 auto
```

Using IPv6 on NSX

- All happy to Google

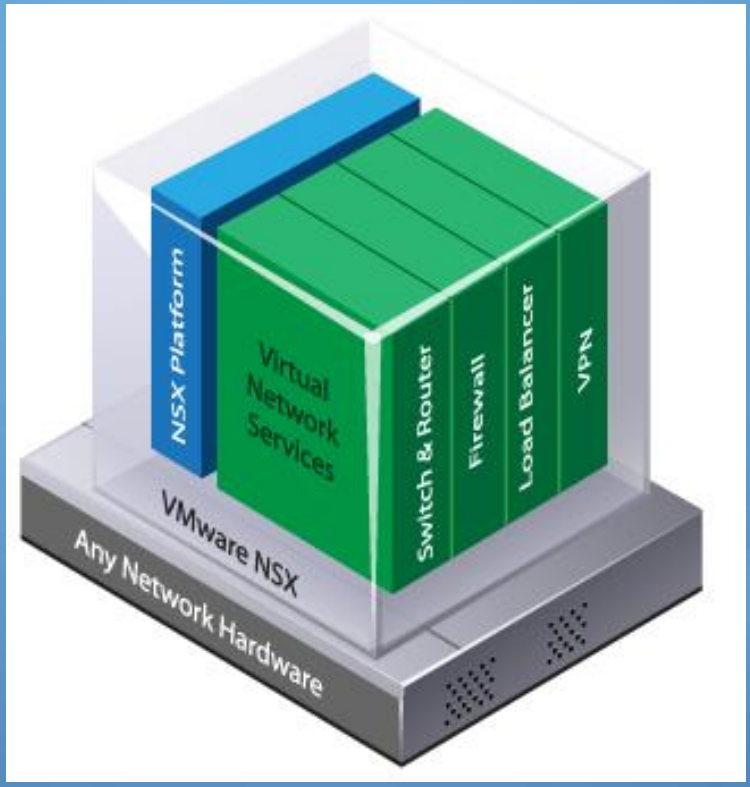
Using IPv6 on NSX

- And this is what it all looks like…



IPv6 with NSX Demo!

- Using the Vcenter Web Console
- Tachyon Dynamics live network!



Questions?

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