The Computer November 2014 SDN

Review

Software-Defined Networking: Standardization for Cloud Computing's Second Wave

- Common words about SDN

SDN and OpenFlow Evolution: A Standards Perspective

- HP & VMWare
- OF specification process
- Example SDN and use cases
- What's next

SDN and OpenFlow Evolution: A Standards Perspective

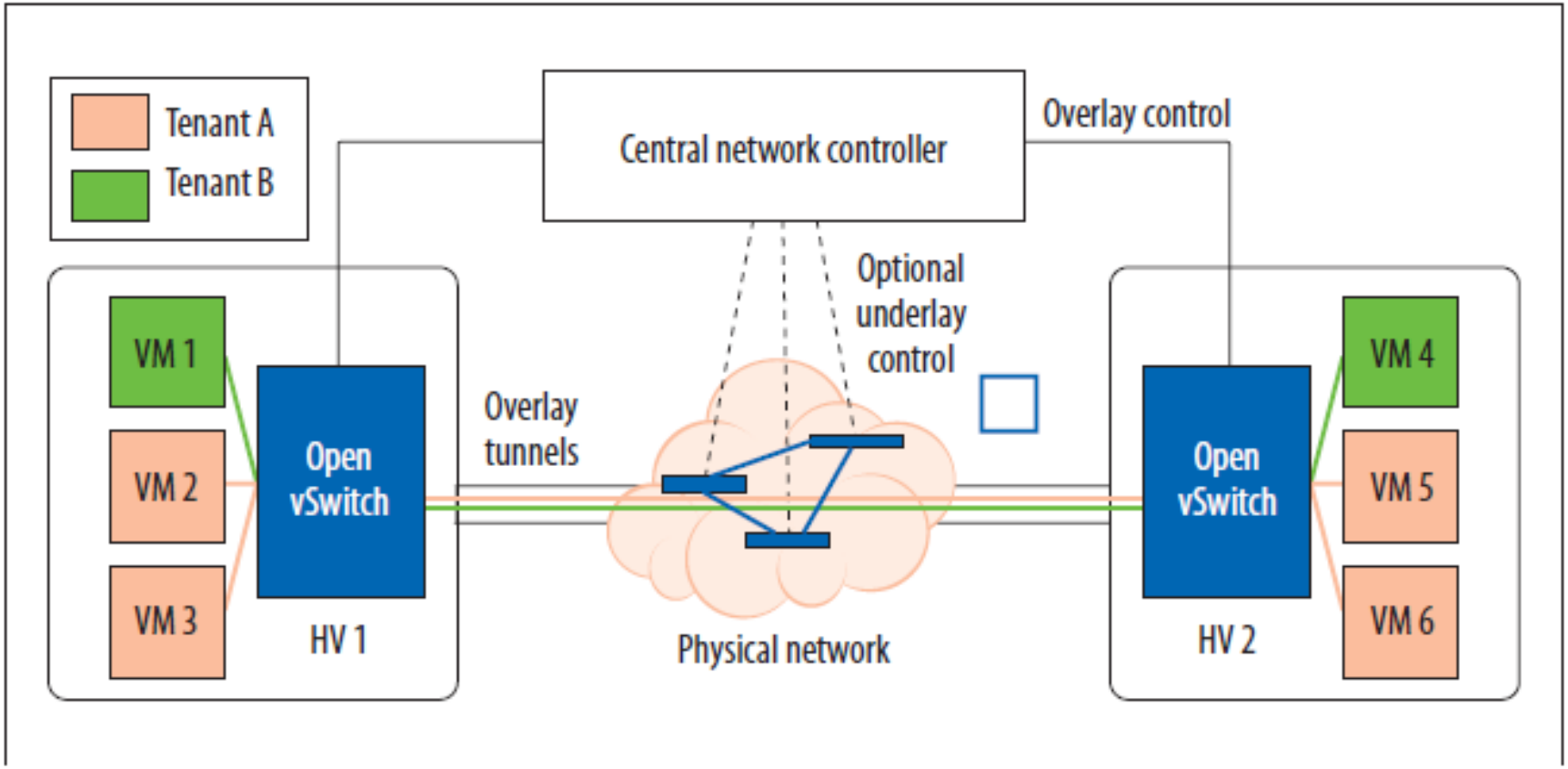


Figure 1. Network virtualization provides logical tenant networks over a shared physical network. The central network controller manages the Open vSwitches that implement this application using a protocol such as OpenFlow. VM: virtual machine; HV: hypervisor.

SDN and OpenFlow Evolution: A Standards Perspective

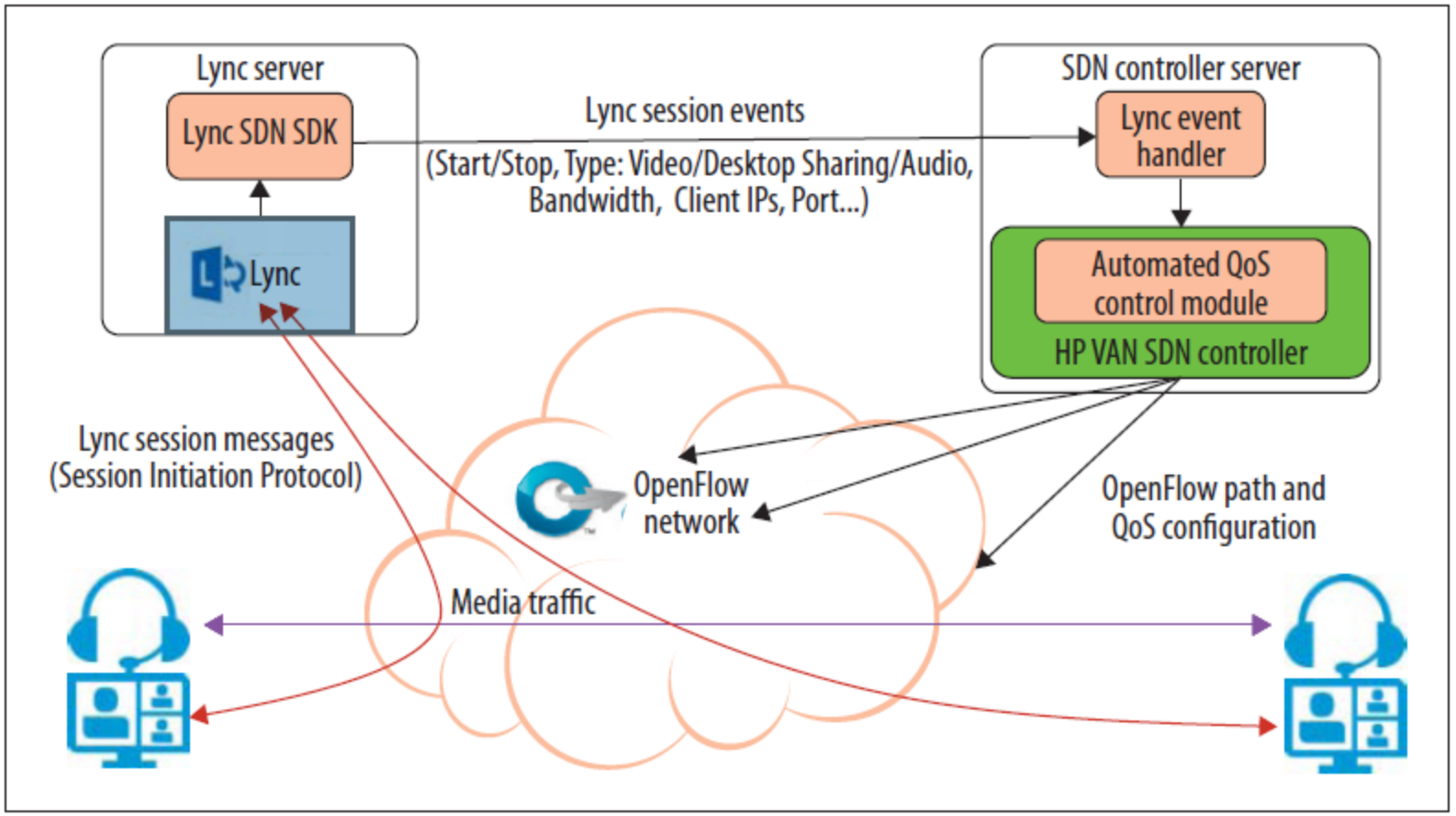
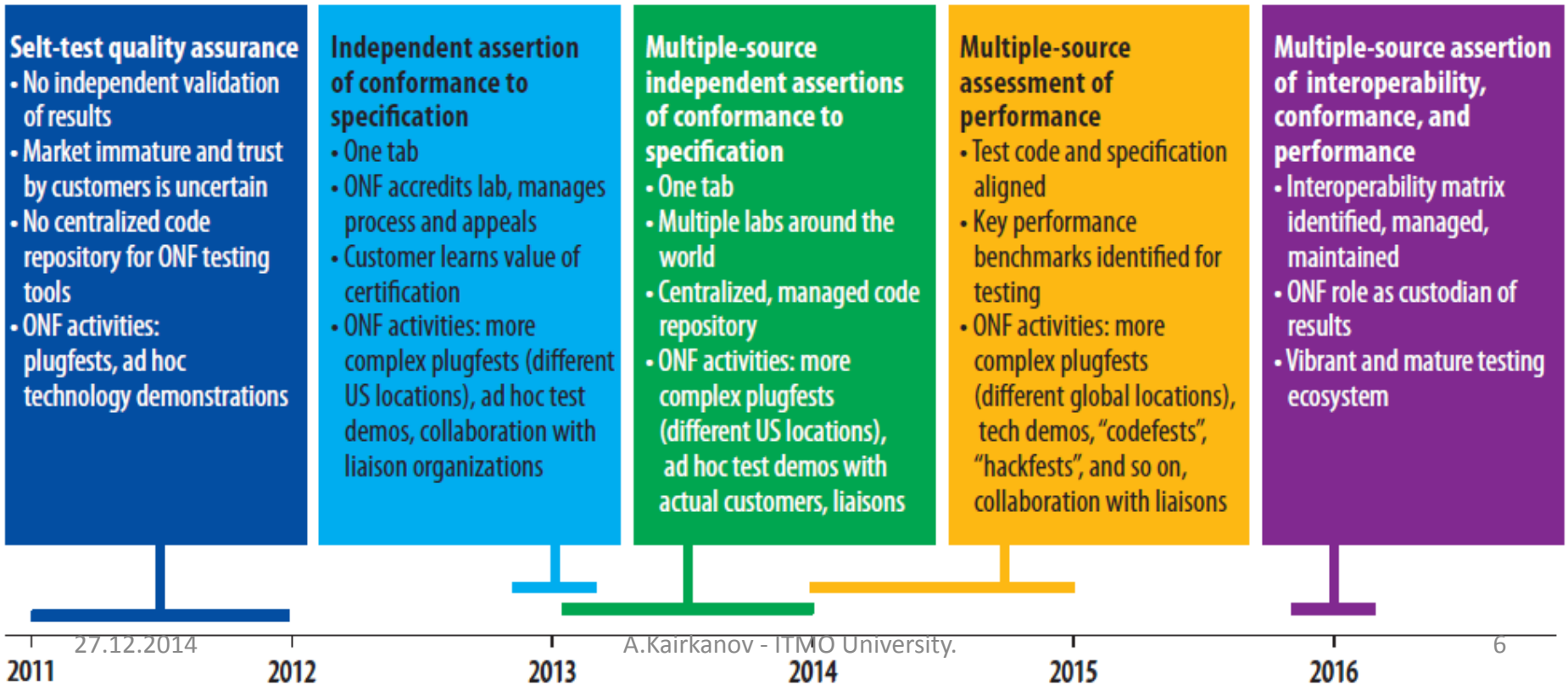


Figure 2. To achieve unified communications sessions, the Microsoft Lync server interacts with the HP Virtual Application Network (VAN) controller, a software-defined networking (SDN) controller that configures network switches using OpenFlow.

Aligning Technology and Market Drivers in an Open Source Standards Testing Program

- About ONF, Collaboration steps
- SDN labs approves



Service Function Chaining: Creating a service plan via network service headers

- Cisco
- Transport level headers
- NSH, SPI

Service Function Chaining: Creating a service plan via network service headers

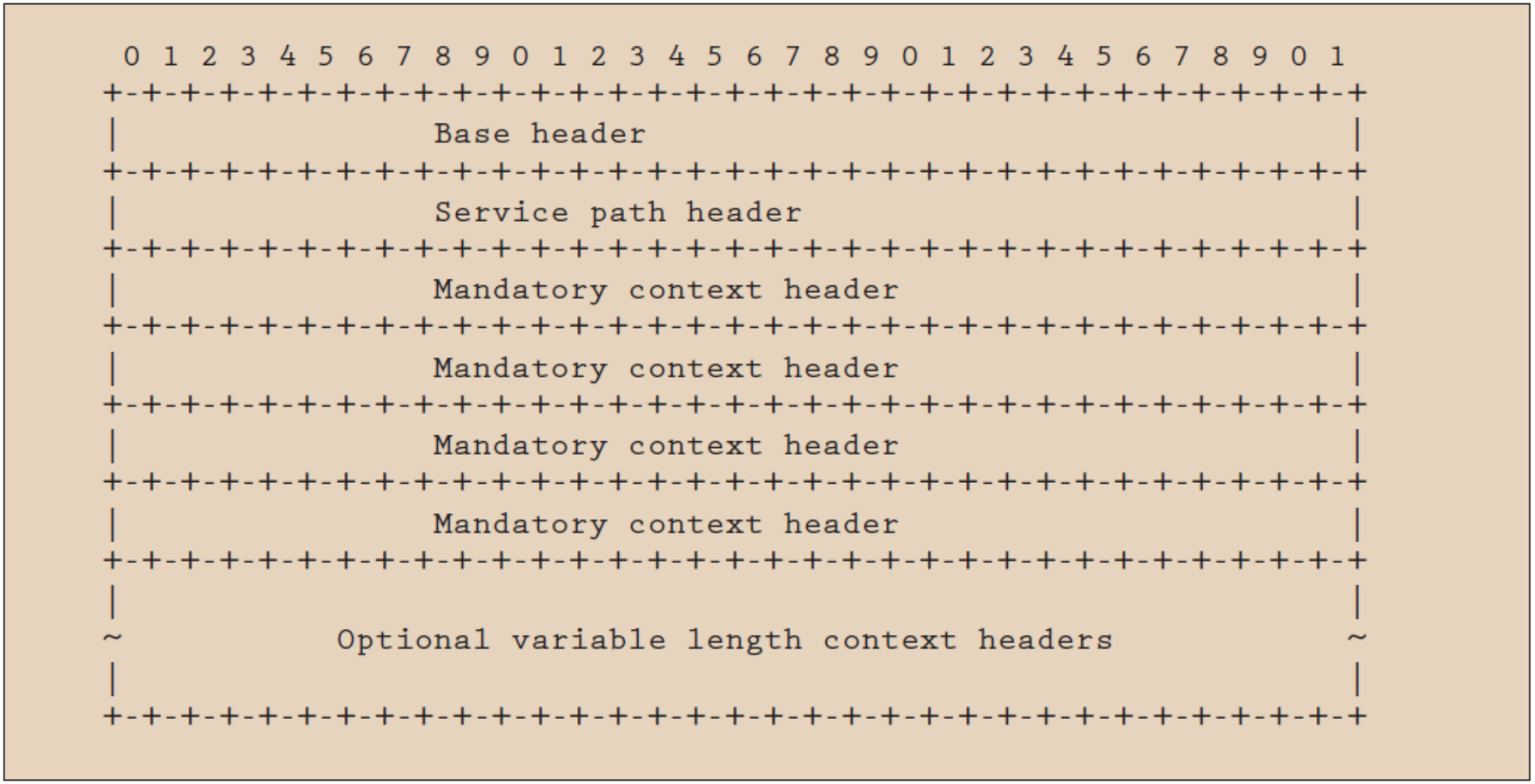


Figure 1. Network service header (NSH) Format.

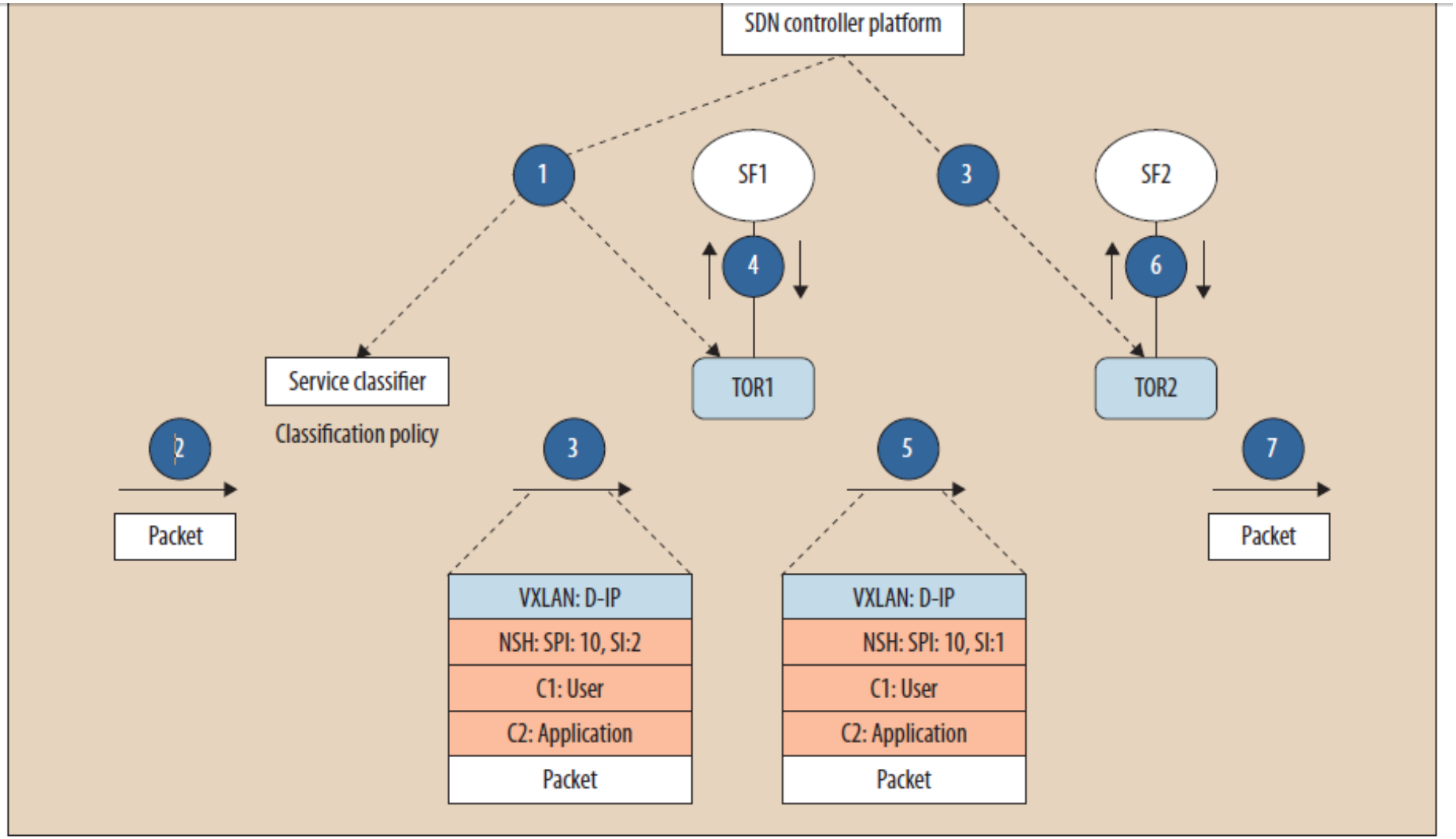


Figure 6. NSH service path forwarding. (1) A software-defined networking (SDN) controller platform configures the classification policies associated with a given service chain; (2) NSH is added to the packets at the ingress service classifier; (3) based on the service path identifier (SPI)/service index (SI) combination, the appropriate transport encapsulation delivers the packet; (4) top of rack switch (TOR1) removes the transport encapsulation, and the packet and NSH are delivered to the initial service function (SF1); (5) the packets and NSH return to TOR1, which determines the next service function to apply; (6) TOR2 uses the SPI/SI to determine that the packet should be delivered to SF2; and (7) when the packet exits the last service function of the chain, it is forwarded to its initial destination.

When Open Source Meets Network Control Planes

- Christian Esteve Rothenberg, University of Campinas
- Case of SDN
- Routeflow. Software-defined IP routing
- Server-Clienr-Proxy
- Table of Open SDN projects
- Controllrer independence

When Open Source Meets Network Control Planes

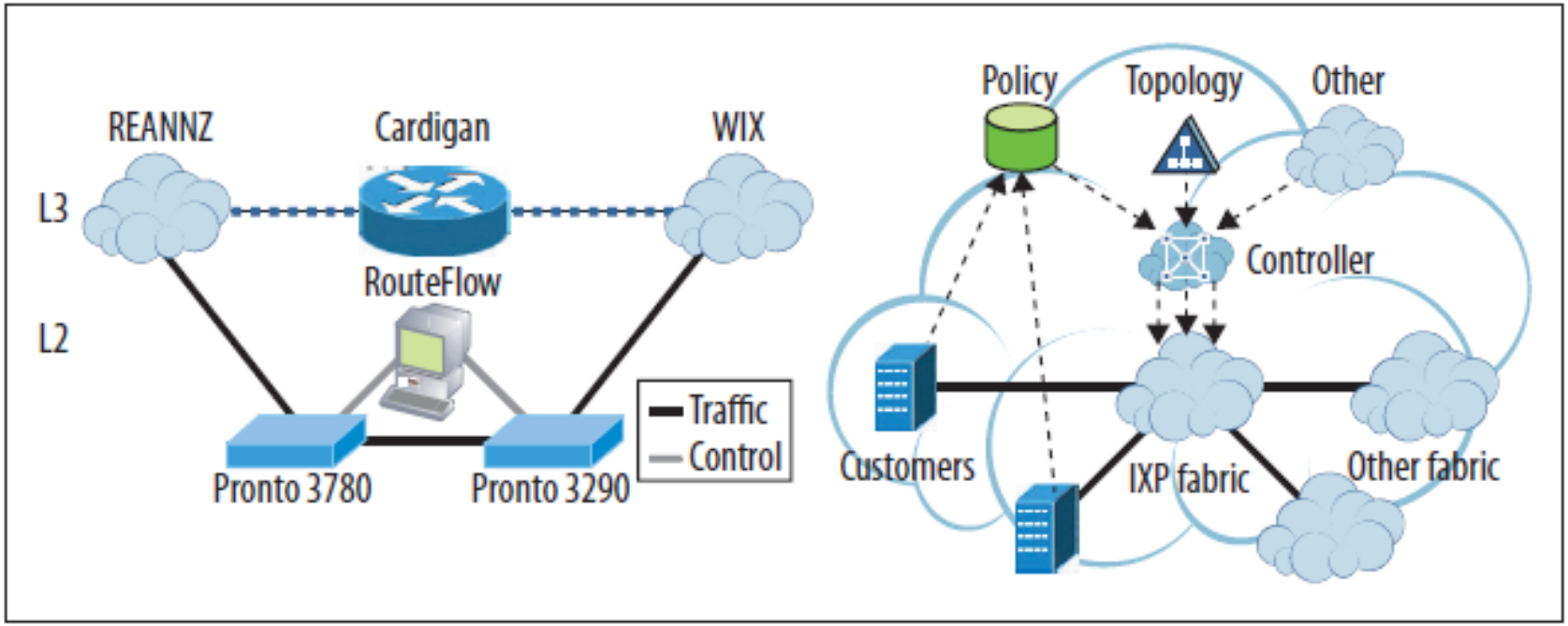


Figure 3. How Cardigan works. Running a tailored RouteFlow version, the Cardigan controller implements the logical router interconnection between the Research and Education Advanced Network New Zealand (REANNZ) and the Wellington Internet Exchange (WIX), which controls two OpenFlow switches (Pronto 3780 and Pronto 3290) that are physically interconnected through dark fiber. IXP: Internet exchange point.

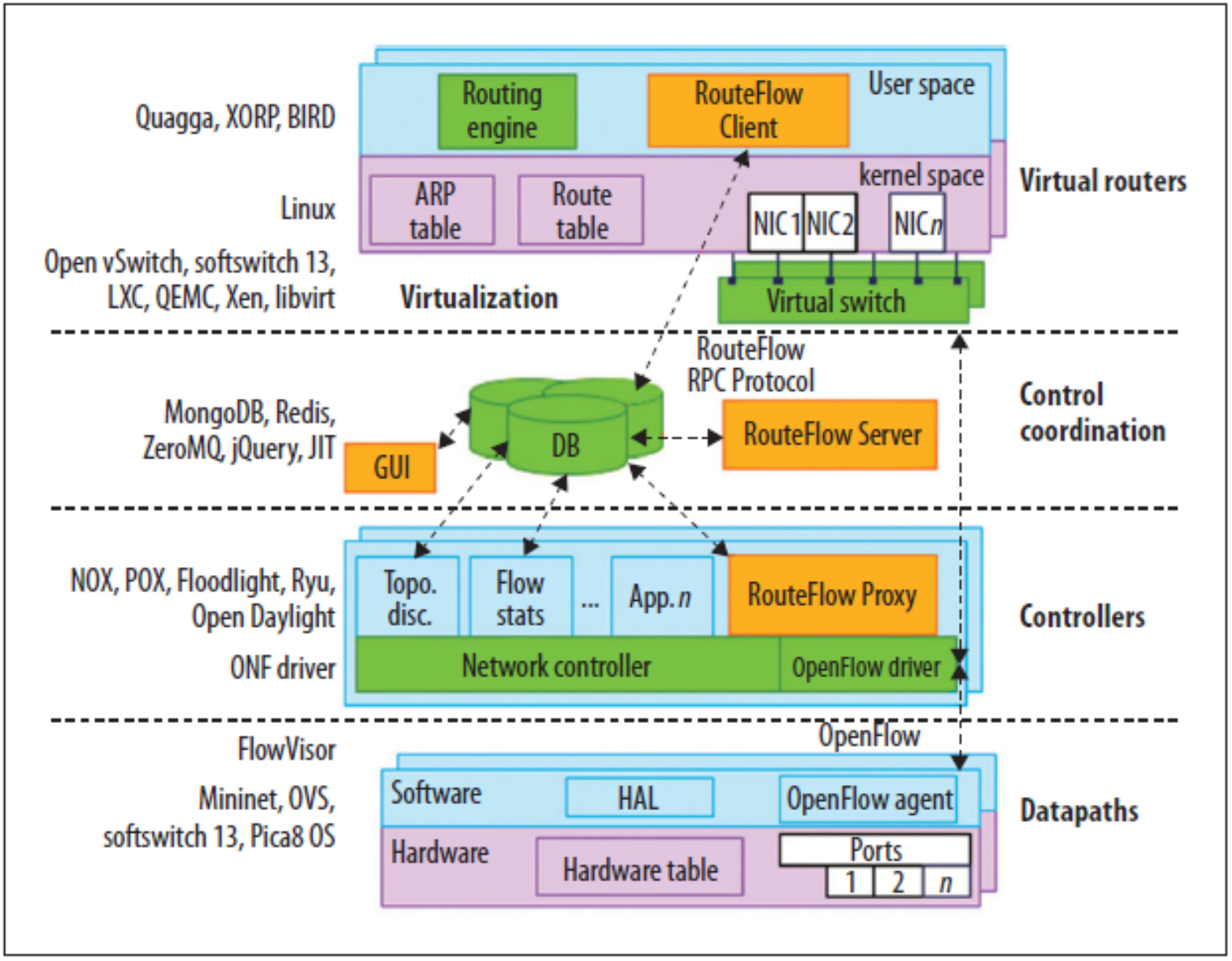


Figure 2. RouteFlow architecture. RouteFlow introduces three software components, RF-Proxy, RF-Server, and RF-Client, into a modular design. The components combine with a routing-oriented SDN stack, which is based on many widely used open source solutions (left). RPC: remote procedure call; ARP: Address Resolution Protocol; NIC: network interface card.

SDN: Incremental Deployment with Panopticon

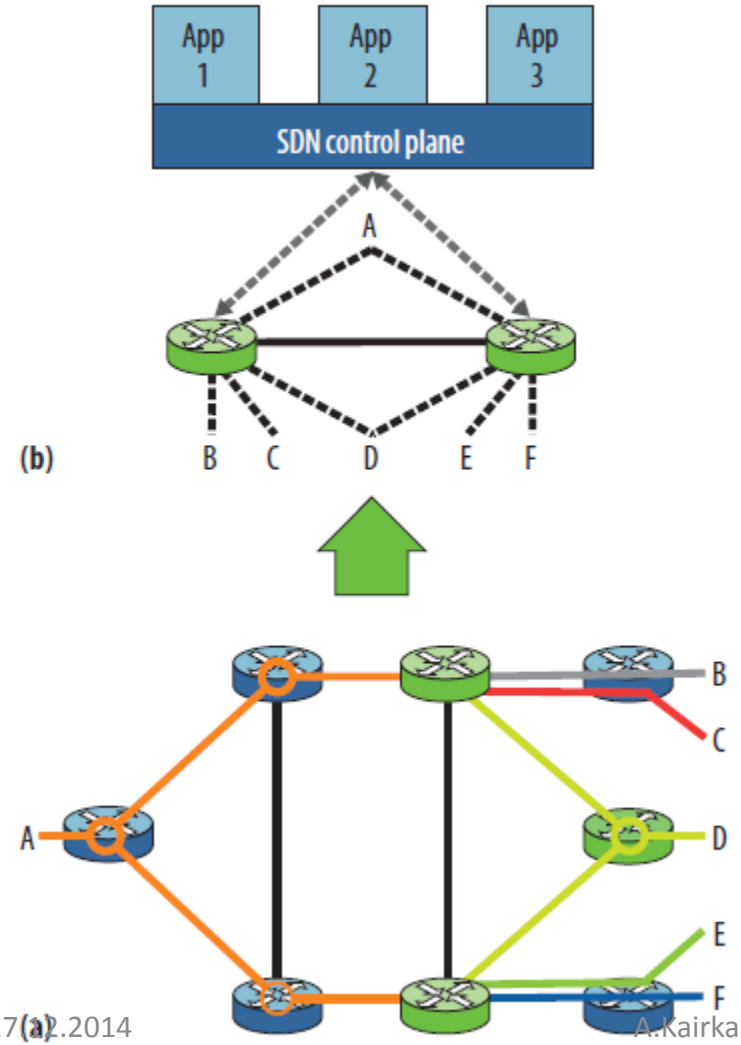


Figure 1. Panopticon overview. (a) In this sample eight-switch hybrid network, the green discs represent software-defined network (SDN) switches, and the blue discs represent traditional switches; overlaid are solitary confinement trees (SCTs) for the SDN-controlled (SDNc) ports A through F. Each SCT is realized by its own virtual LAN (VLAN) ID, represented via different colors. (b) In the corresponding logical SDN, the SDNc ports are virtually connected to SDN switches via “pseudo-wires$ indicated by broken lines.

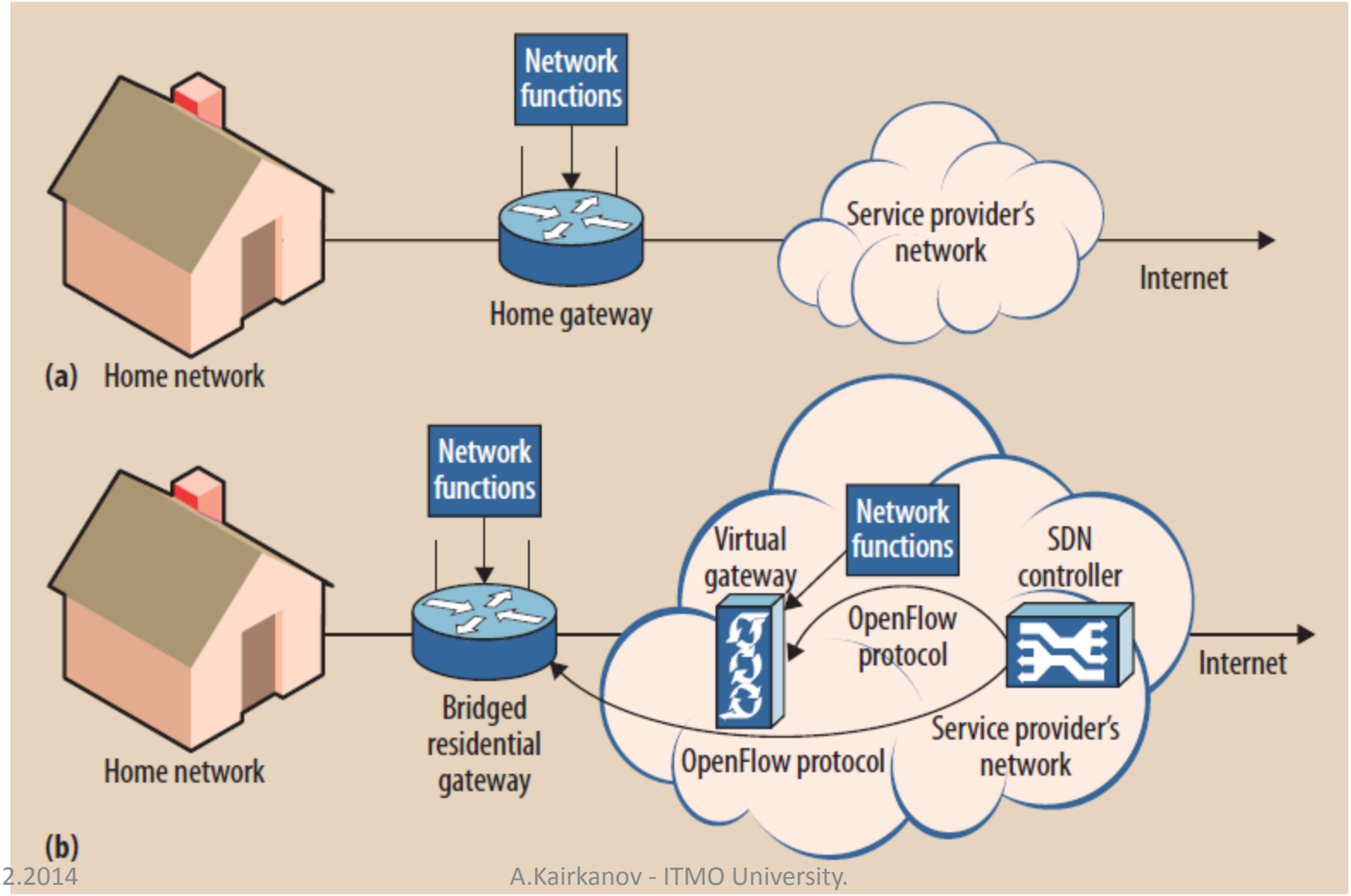
SDN: Incremental Deployment with Panopticon

Figure 2. Using the Panopticon approach, the number of SDNc ports accommodated as a percentage of the number of deployed SDN switches depends on how many VLAN IDs the existing system hardware supports.

Virtualization of Home Network Gateways

- M2M
- Failovers
- QoS
- VLAN
- Why?

Virtualization of Home Network Gateways



Virtualization of Home Network Gateways

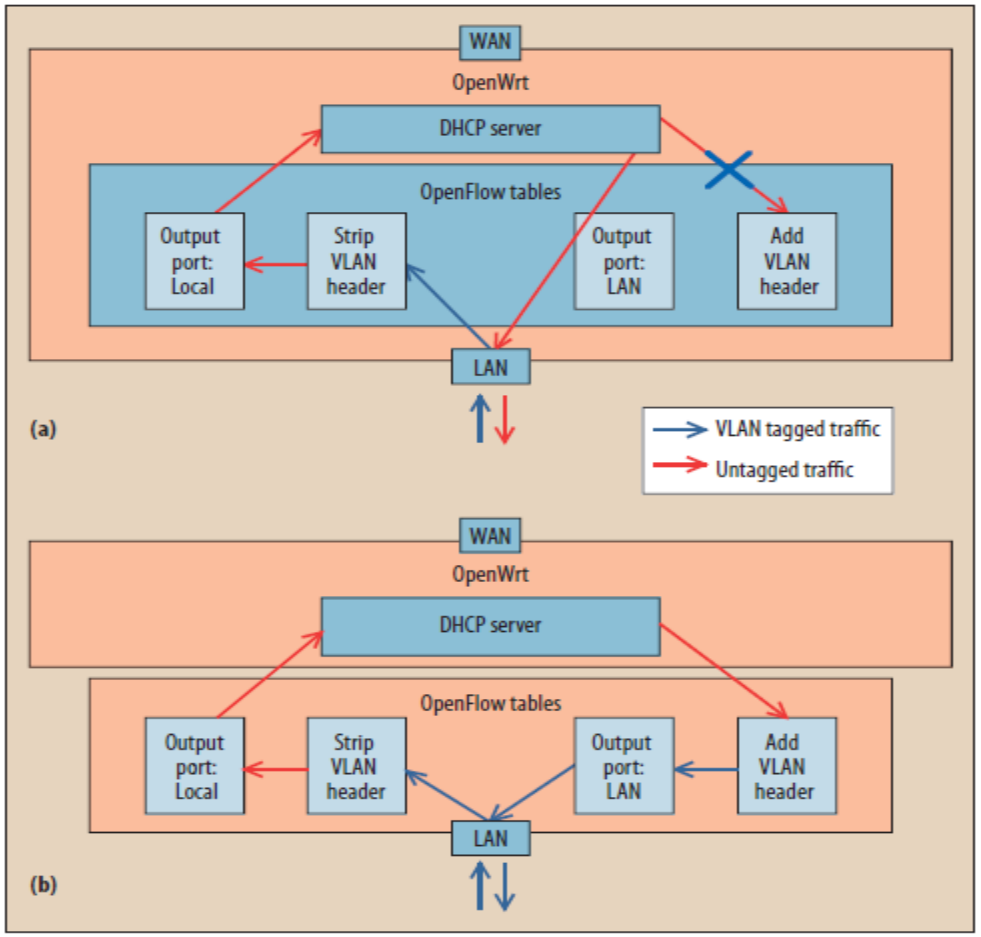


Figure 2. Solving the forwarding software problem. (a) The internal Dynamic Host Configuration Protocol (DHCP) server is unable to send traffic back through the OpenFlow tables to get tagged. (b) Separating the OpenFlow switch from the gateway software solves virtual LAN (VLAN) tunneling issues.

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