SWINOG, May 10, 2012
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SBBS – a product and its plumbing

Sunrise

Sunrise

Agenda

1. Analogy
2. Business Requirements
3. Plumbing

Good product:
in good-looking packaging

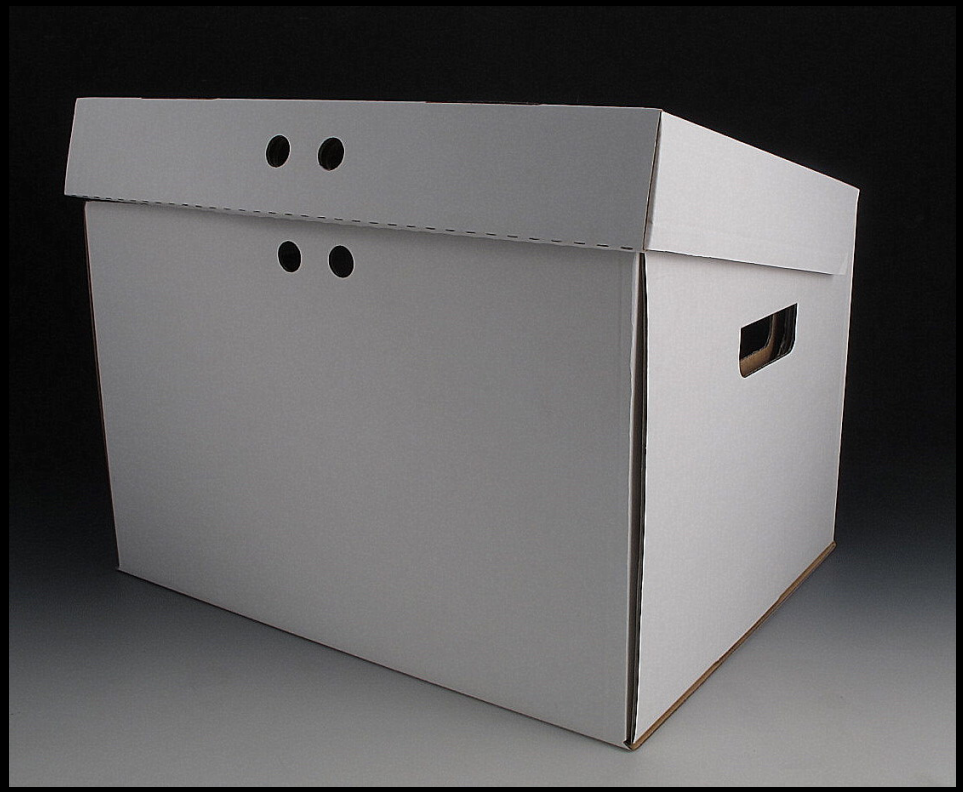
Analogy

The Retail Service Provider's focus

Image source: http://ivannakoryagina.blogspot.com/2010/08/diesel-perfume-packaging-is-amazingly.html

Package, send:

Analogy



Put it in a sturdy box

Add:

- destination address
- Source address
- Packet treatment info

Send to the right transport infrastructure

Somehow it's transported

Analogy

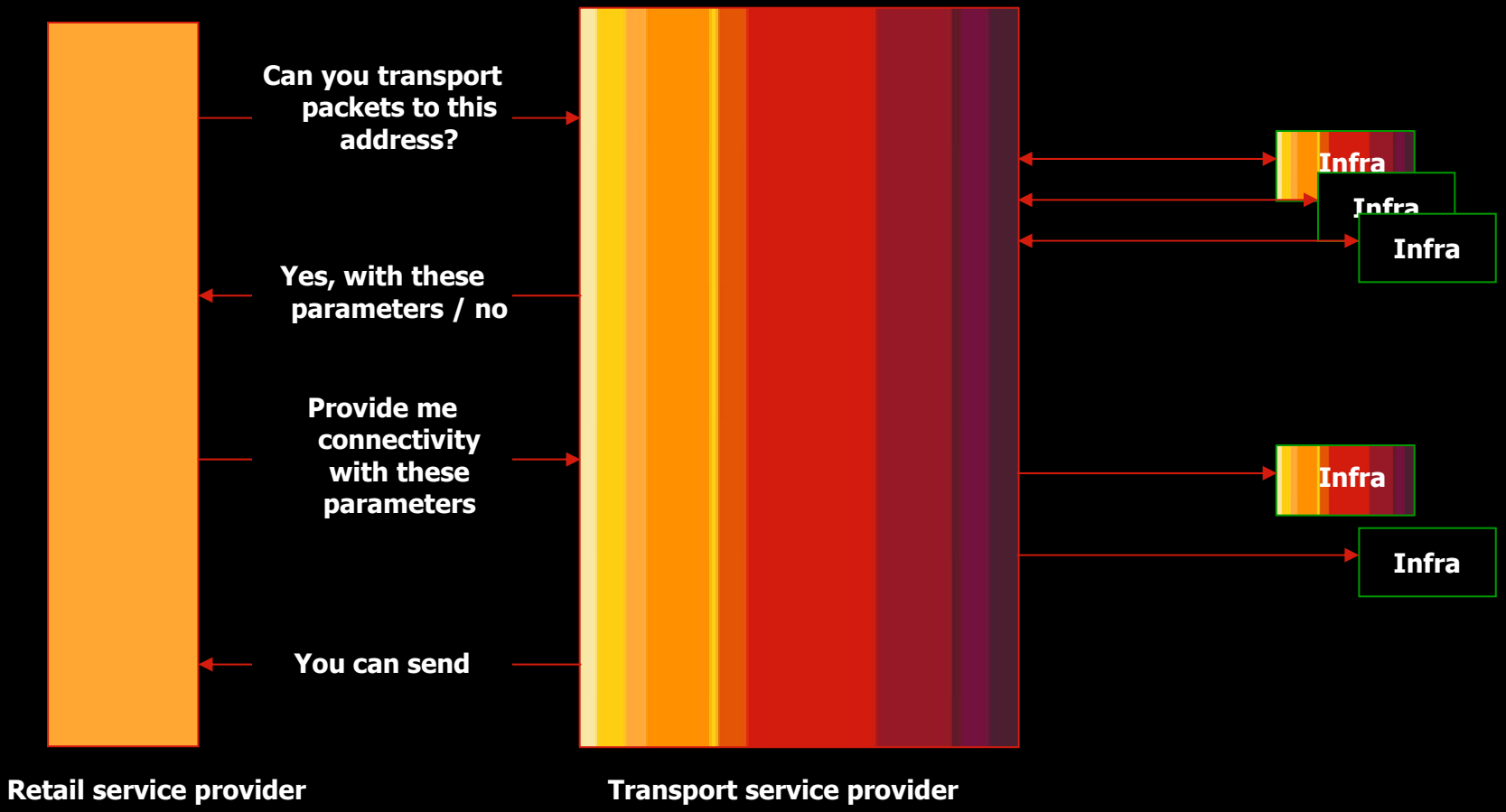
The Transport Service Provider's focus

Deliver:
to the correct address, on time

Analogy

Relationships

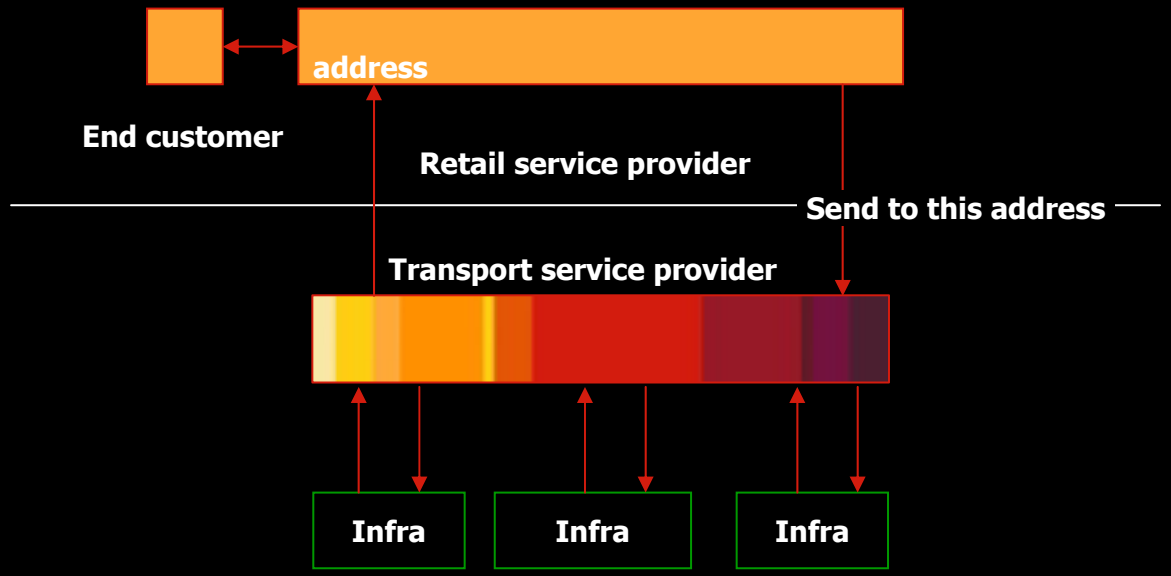
Analogy



Relationships

Analogy

1. The application
2. Transport
3. Infrastructure



Business Requirements

Use generic input	• The fewer restrictions the RSP faces, the more services (and products) an RSP can offer to his customers.

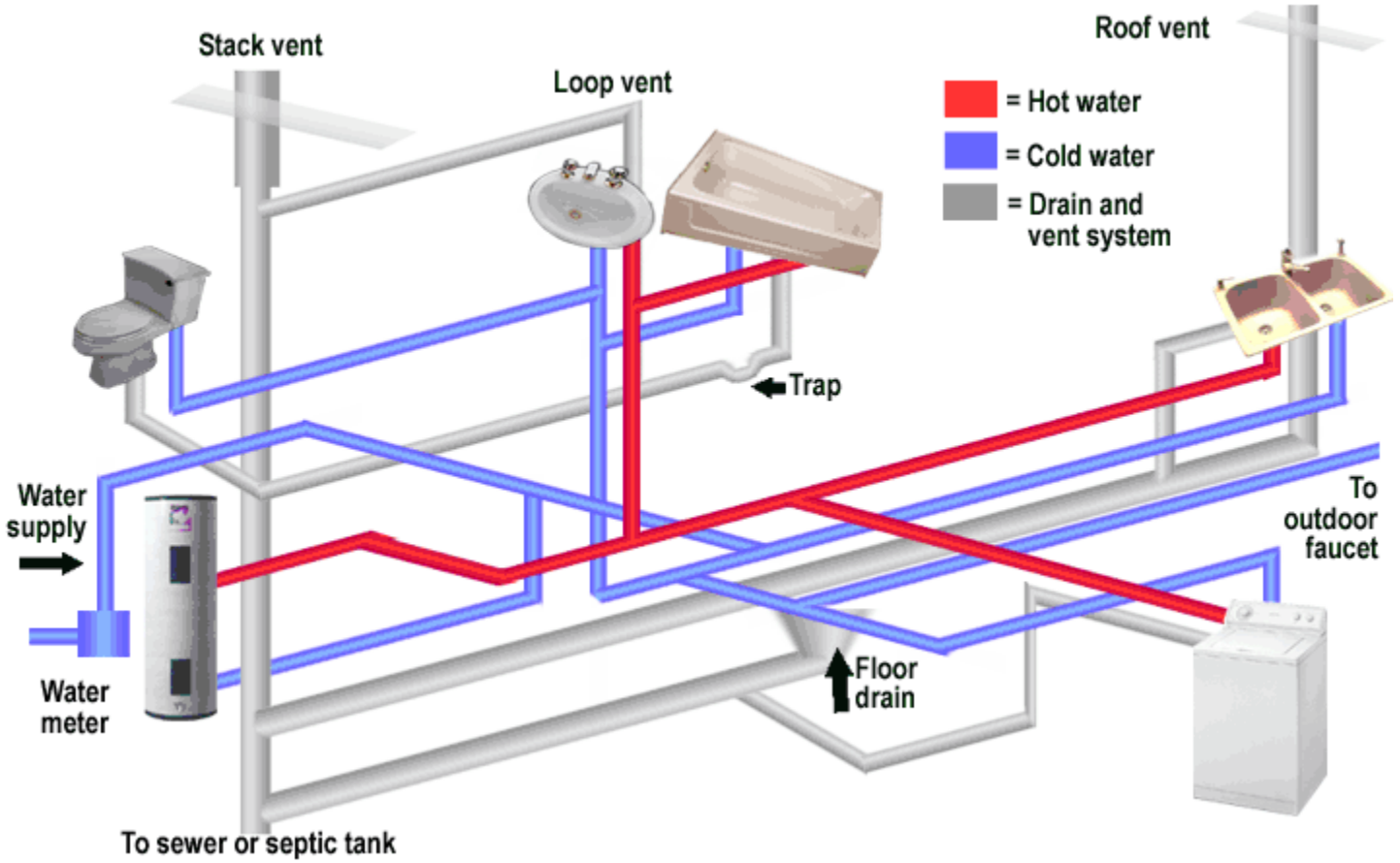
Maximum technical flexibility	• Solution must be as close to a "real" network as possible
	  • Ensure solution offers RSP as much flexibility as possible
	  • Minimize the interactions between RSP and TSP
	• Solution should use simplest protocols for widest applicability

Simpler processes	• Minimize the interactions with the transport provider
	  • Offer on-line interface, and the option to automate
	  • Automate internal processes

TSP should get out of the way of the RSP!

Plumbing

Plumbing



Technical choices

Plumbing

Frame type	• Ethernet:
	  • ubiquitous protocol with PHY component.
	  • Defined for use with xDSL: biggest installed base for non-shared data local loop
		1

Signaling	• None
	  • No routing protocol interaction required between RSP and TSP.
	  • TSP "learns" topology and forwarding request from frame headers
		2

Internal	• Leverage known internal forwarding and signaling protocols (Ethernet, MPLS, BGP) • Leverage BGP capability to signal VPLS membership • No dual-side VPLS configuration required • Use standard provisioning interfaces	**3**

Ethernet

Plumbing

Ethernet is the most wide-spread phy/mac layer protocol in use today for data traffic.

Ethernet uses the **most basic form of networking**:

broadcast at source and filter at sink.

Clearly, the above mechanism assumes that there is *some form of unique network layer access port identifier*, allowing nodes to build up some form of topological overview on which to base their forwarding decisions. This identifier is a end-node MAC address.

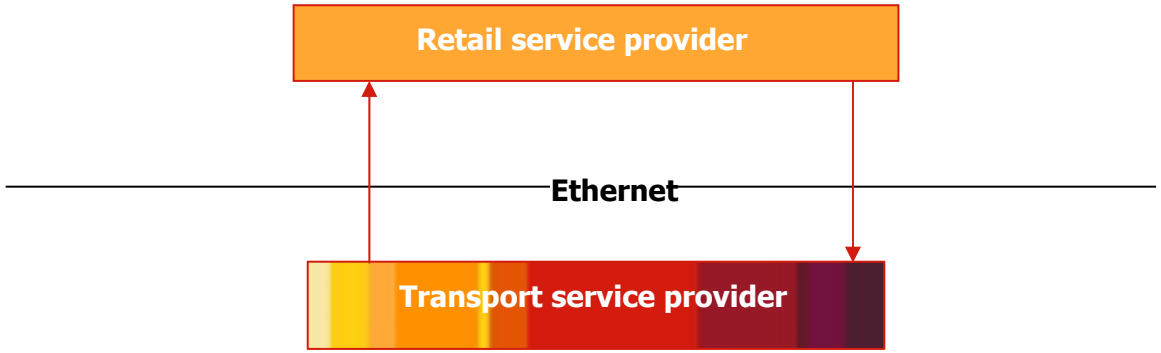
Ethernet supports numerous network layer access points.

It can be

- a multipoint-to-multipoint service
- Restricted to a point-to-multipoint topology (hub & spoke).

End-devices decide on overlay topology membership, by using IEEE802.1q VLAN tagging.

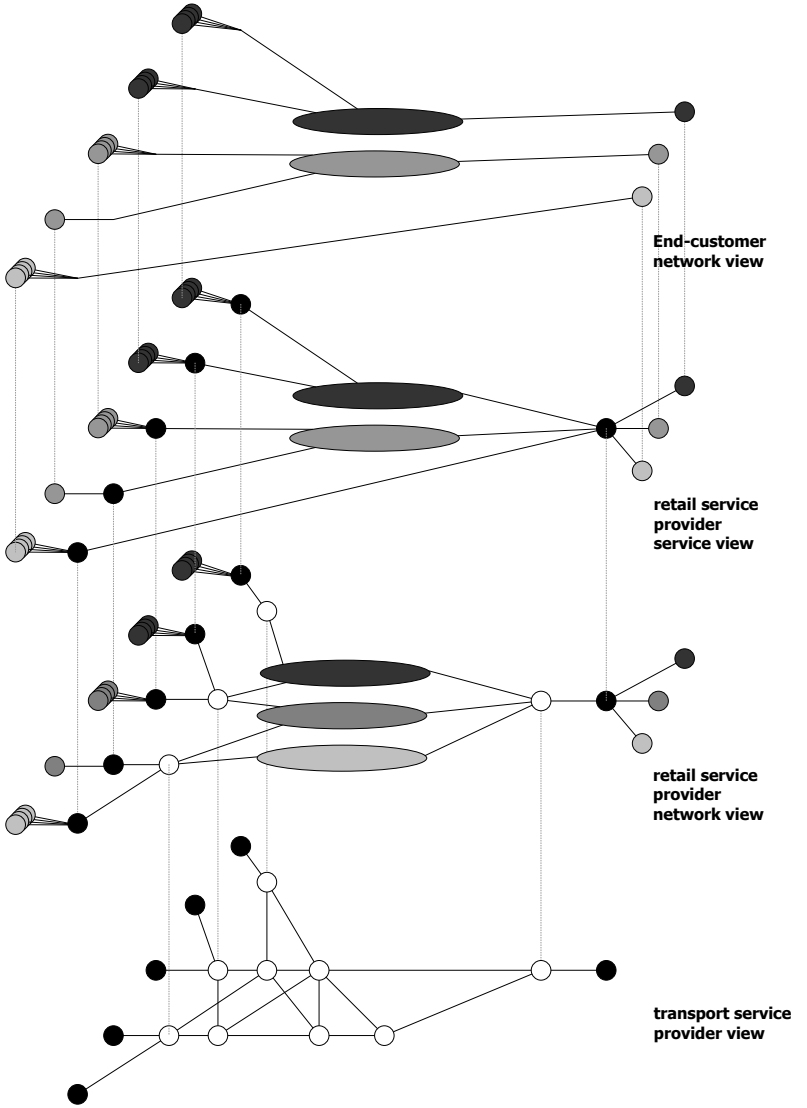
End-device communication can be any payload protocol: IP, PPP, legacy….



Layering

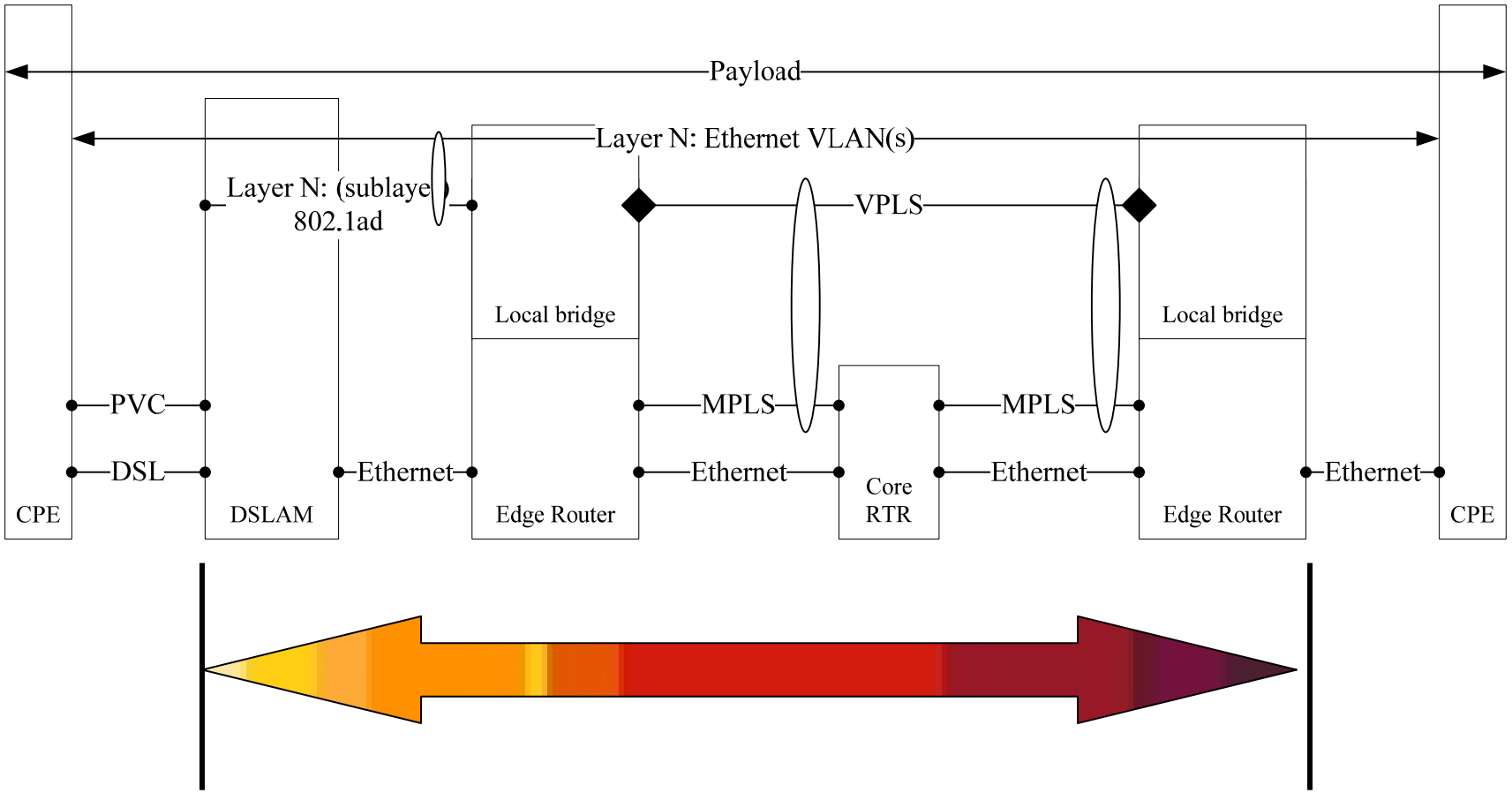
Plumbing

1. Retail (end) customers sees connectivity between his hosts.
2. RSP "service view": specific end-customers may/may not communicate. Defined by CPE config.
3. RSP "network view": allocation of end-points (access circuits) to specific topologies
4. Transport provider view: end-point and topology view.



Inside the box

Plumbing



Technical details

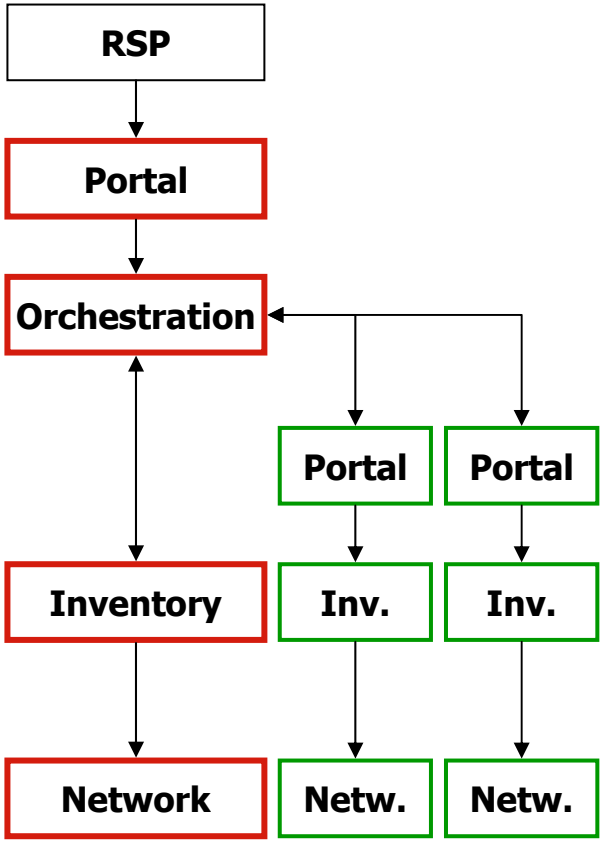
Plumbing

VPN membership and pseudowire setup:

- **RFC 4761:** Virtual Private LAN Service (VPLS) using BGP for Auto-Discovery and Signaling
- **RFC 4448:** Encapsulation of Ethernet over MPLS.
- Address learning is controlled by the VPLS, on a per VPLS basis:
  - Every c-vlan id used may use the same MAC-addresses: correct **IEEE 802.1D** and **802.1Q** bridging behavior.
- Access-circuits (AC) transmit frames into the VPLS instance to which it is associated.

Network Provisioning: Plumbing

1. Portal is triggered by RSP, processes request, passes request to orchestration layer.
2. Orchestration layer interfaces to infrastructure providers (sunrise, others), determines correct order setup. Triggers required orders.
3. Inventory allocates required resources (ports, links, static/volatile resources), orchestrates activation.
4. Proprietory protocols (access network), Netconf are triggered from the inventory system, Netconf **RFC 4741**, **RFC 4742**: provides an XML interface to router commands. Because of its structured nature it is used to provision MPLS edge routers.



Thank you

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