A Network Virtualization Overlay Solution using EVPN

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BioDec

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- Long time ago . . .
- Current solutions
- EVPN
- Conclusions

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Example

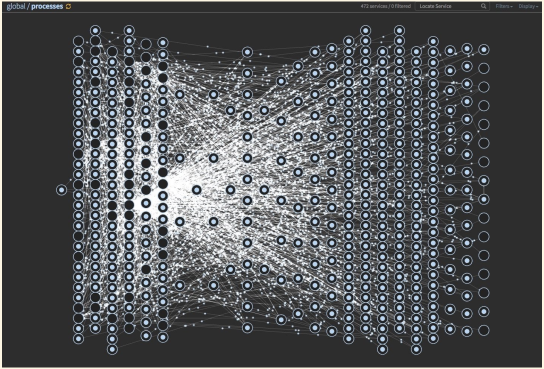

Figure: Allegrotech architecture from “Hitting the wall” - http://allegro.tech/2017/03/hitting-the-wall.html

1 container = 1 IP address

- Each container has an IP address . . .
- . . . and a *virtual Ethernet* interface . . .
- . . . with its own *MAC address*.

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- Layer 2 has no **segmentation** of network traffic.
- Except for *VLAN* (Virtual Local Area Network).

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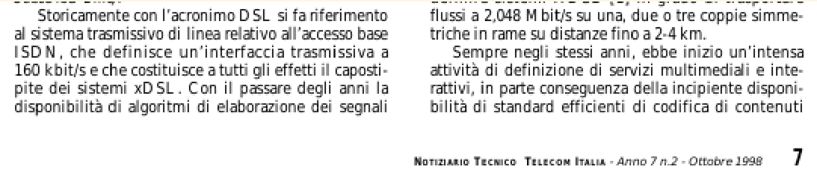
ADSL



Storicamente con l'acronimo DSL si fa riferimento al sistema trasmissivo di linea relativo all'accesso base ISDN, che definisce un'interfaccia trasmissiva a 160 kbit/s e che costituisce a tutti gli effetti il capostipite dei sistemi xDSL. Con il passare degli anni la disponibilità di algoritmi di elaborazione dei segnali

flussi a 2,048 Mbit/s su una, due o tre coppie simmetriche in rame su distanze fino a 2-4 km.

Sempre negli stessi anni, ebbe inizio un'intensa attività di definizione di servizi multimediali e interattivi, in parte conseguenza della incipiente disponibilità di standard efficienti di codifica di contenuti

NOTIZIARIO TECNICO TELECOM ITALIA - *Anno 7 n.2 - Ottobre 1998* 7

Before ADSL !

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- (it had 56Kb)
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An interesting problem

- People wanted to call their provider when they wanted to access the Internet, and hang up after some inactivity timeout.
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Linux setup

- When the modem was connected, the `ppp` daemon would number a `ppp0` interface, and set it as the default gateway.
- Otherwise there was just a single `eth0` linked to the LAN and *no default gateway*.
- How would you know **automatically** that somebody wanted to access the Internet ?
- You should see traffic directed to the Internet gateway.

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Paradox

- To save money, the modem should have been switched off when unused, so by default there was no ppp device, *i.e.* **no default gateway**.
- To access the Internet, traffic must have been routed to the default gateway.
- Since there was no gateway, nothing would ever run the ppp daemon and the Internet would never work.

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Sad picture

Insert your favorite picture of a sad kitten here.

Fake it!

- The solution was to always have a **fake** Internet (default) gateway.
- Since it could not have been a ppp device, it was a `slip` device — *Serial line Internet Protocol*.
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Learning by seeing the traffic

- The first packet travelling through the slip device was given as the *standard input* to a command that discarded it and launched the ppp daemon.
- Upon completion of the ppp setup, the default gateway would be switched to the new (working) interface.
- Putting down the ppp interface would put again the slip device as the default gateway.

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- It is officially documented by the IETF in RFC 7348.
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The main idea

- VXLAN is a Layer 2 overlay scheme on a Layer 3 network.
- Each overlay is termed a **VXLAN segment**. Only VMs within the same VXLAN segment can communicate with each other.
- Each VXLAN segment is identified through a 24-bit segment ID, termed the **VNI** – VXLAN Network Identifier.
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A tunnelling solution

- In other words, a VXLAN segment may be seen as a tunnel between two **VTEP** – VXLAN Tunnel End Point
- The key issue is how the table that associates a MAC address to a given VTEP IP address is updated.
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- The receiving VTEP then updates its own table with the information about the originating MAC address, recording the VTEP where it came from.
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EVPN specifications

- “A Network Virtualization Overlay Solution using EVPN” – which is the Internet Draft `draft-ietf-bess-evpn-overlay`
- “Requirements for Ethernet VPN (EVPN)” – `rfc7209`
- “BGP MPLS-Based Ethernet VPN” – `rfc7432`

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Questions

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Thanks !

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Useless social @gaunilone

4DevOps.ch conference Last-Minute HQ, Corso San Gottardo 30, 6830, Chiasso, Switzerland, 24 of May 2017
http://4devops.ch/

4DevOps.ch workshops Palazzo dei Congressi, Piazza Indipendenza 4, 6900 Lugano, Switzerland, 23 of May 2017 — the day before the conference.