

Challenges in Traffic Engineered IP networks

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The Future ...

... is not what it used to be, what's more it never was!

Lee Hayes, the Weavers!

However, the future is still there and we have lots of interesting problems to solve!

What is MPLS about anyway...

Misunderstandings

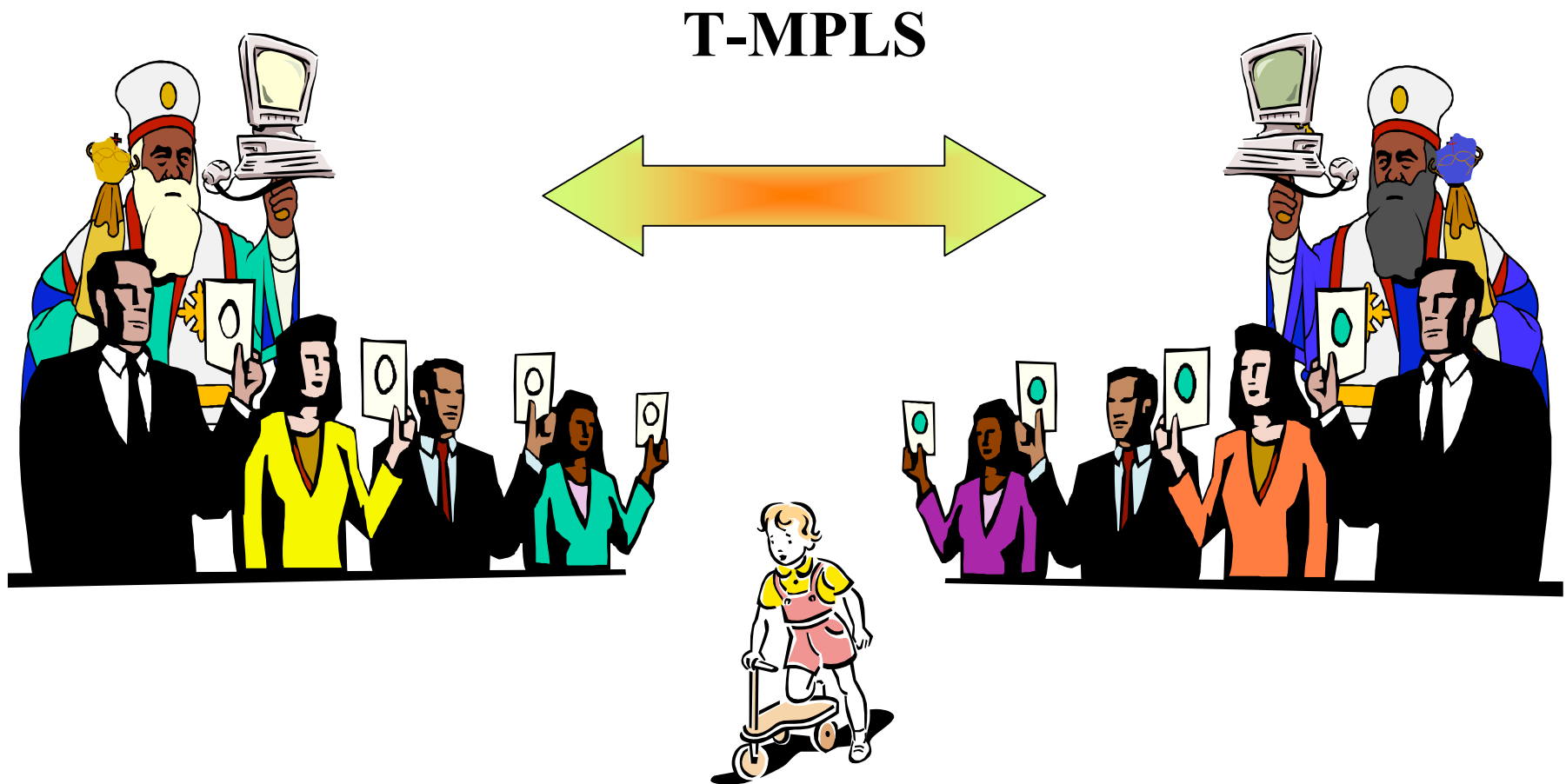
- Higher router capacity
- Security mechanism
- Etc

Actually

- Network performance
- Traffic separation
- Constraint based routing
- Traffic engineering



Friends and Foes





A few additions to the IP control plane

Label Distribution Protocol (LDP

RSVP-TE

OSPF-TE (CSPF and TEDB)

ISIS-TE

The outcome:

- addition to the Forwarding Table**
- Label Information Base (LIB)**



MPLS - one simple paradigm

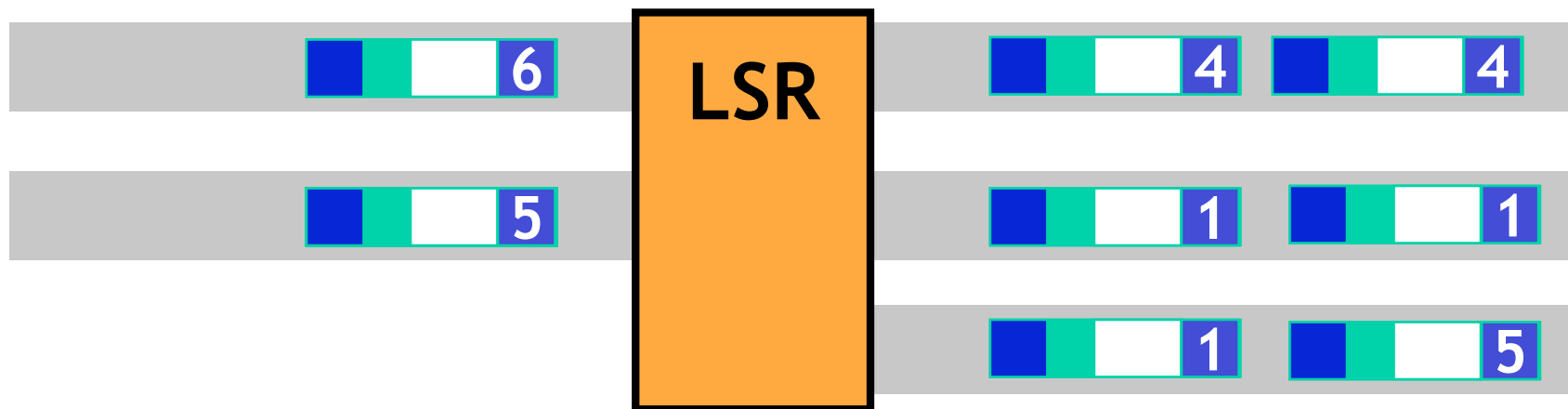
Link local identifier

LABEL

A packet comes in on one interface
and is sent out on a new interface
with a new label attached

LABEL SWAPPING

MPLS data plane



LSR – Label Switching Router



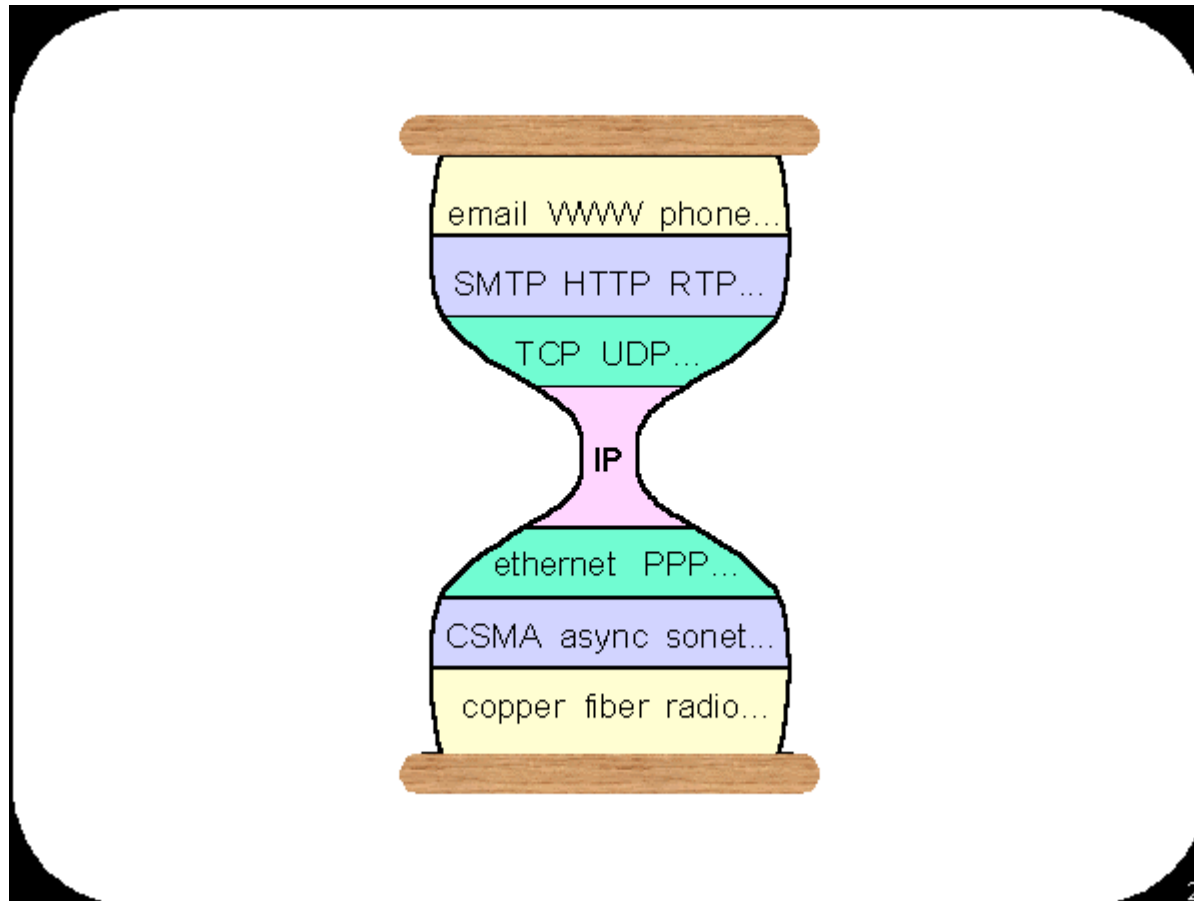
Traffic Engineering and Routing

Two types of Traffic Engineering (TE)

- BGP and Multi-homing**
- MPLS**

Conclusion – TE is nothing both advanced routing

Generalized MPLS



From Steve Deering (London 2001)



What really happened – RFC2547

Most ISPs run MPLS

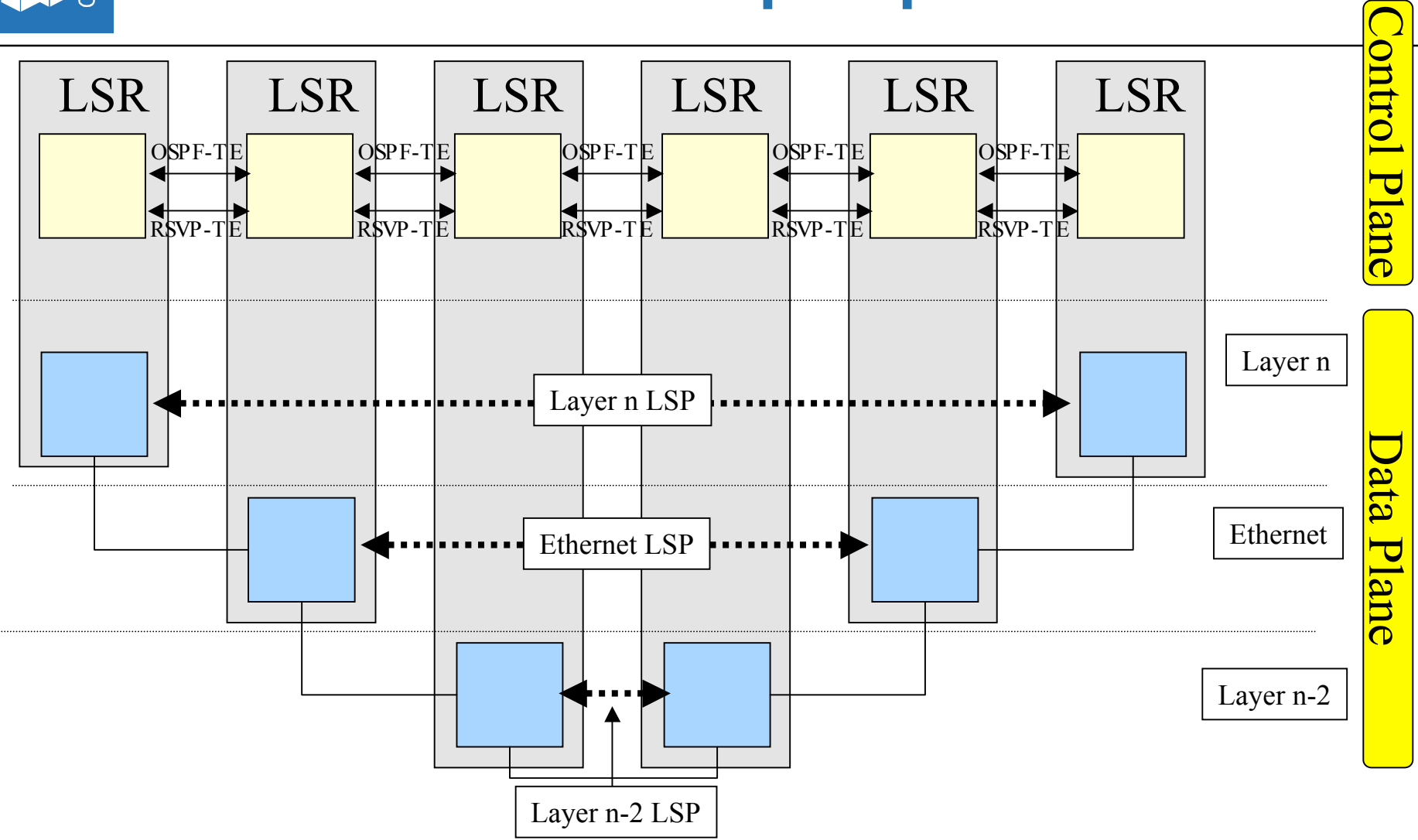
MPLS as an application platform

- Traffic separation
- BGP/MPLS L3 VPN
- No mix of customer and operator routing
- New VPNs – VPWS, VPLS, IPLS and L1VPN, PWs

**No such killer application for GMPLS
- yet**



From the research perspective...





End of presentation!

Questions?