Towards a new digital divide with multi-layers networks?

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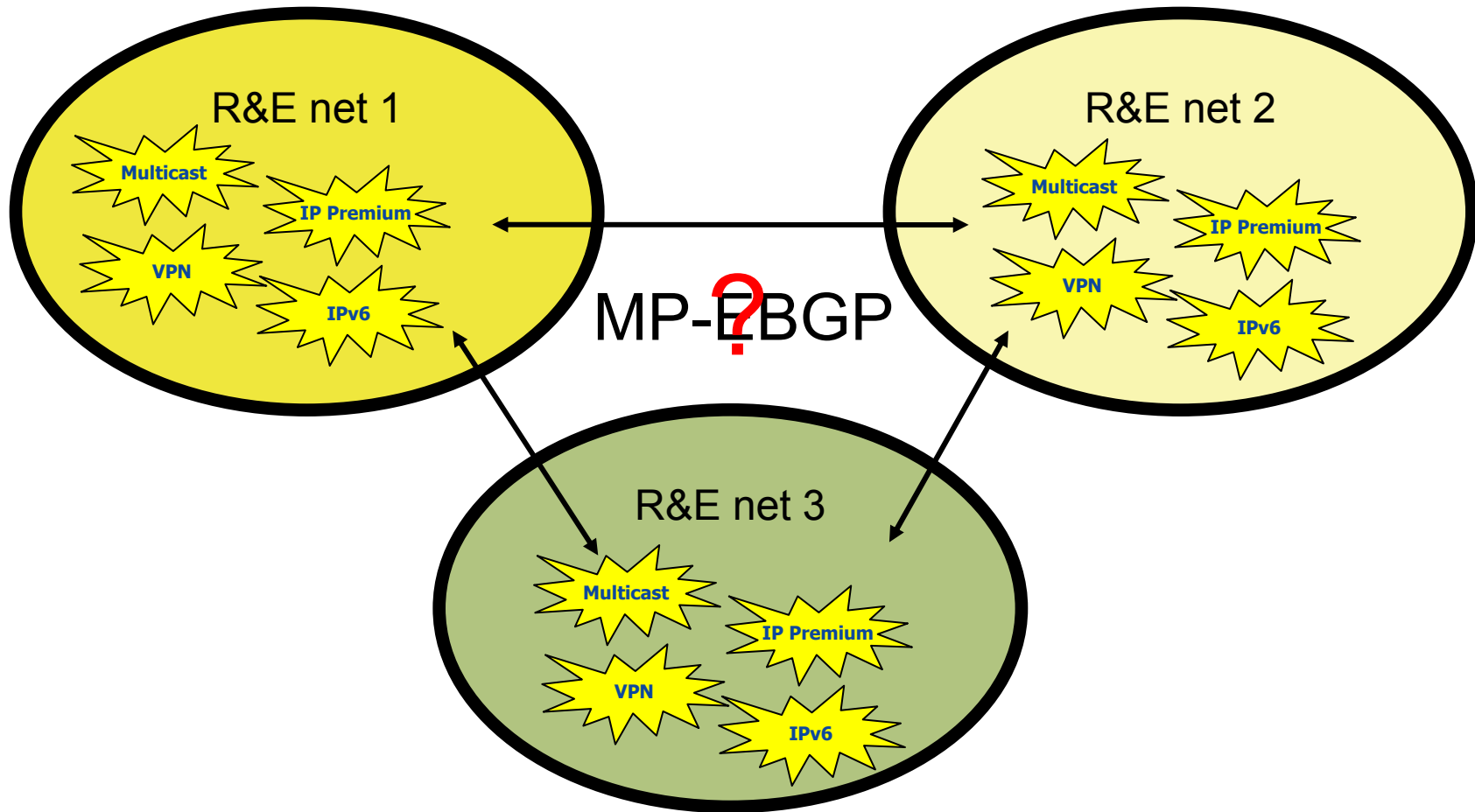GARR Conference, Catania, May 18th, 2006

Objective of this presentation

- R&E community requires more network services than only any-to-any connectivity (Internet commodity)

  - Guaranteed bandwidth on Demand, Multicast, IPv6, VPNs, etc…

- End-users are rarely connected to one single network managed by a unique operator

How can we provide end-to-end services ?

How can we dynamically enable network resource for a given user and application ?

# What are the current inter-domain networking interfaces today ?

R&E net 1

Multicast

IP Premium

VPN

IPv6

R&E net 2

Multicast

IP Premium

VPN

IPv6

R&E net 3

Multicast

IP Premium

VPN

IPv6

MP-EBGP **?**

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Current Limit of Internet Technologies

- Internet proved its any-to-any connectivity capability
  - But it is just a connectivity service…

- Today Public Network requires
  - Dynamic Service Activation of Advanced Inter-Domain Capabilities characterized by 3 dimensions:
    - QoS, Security and Reliability
  - Requires new peering capabilities and techniques
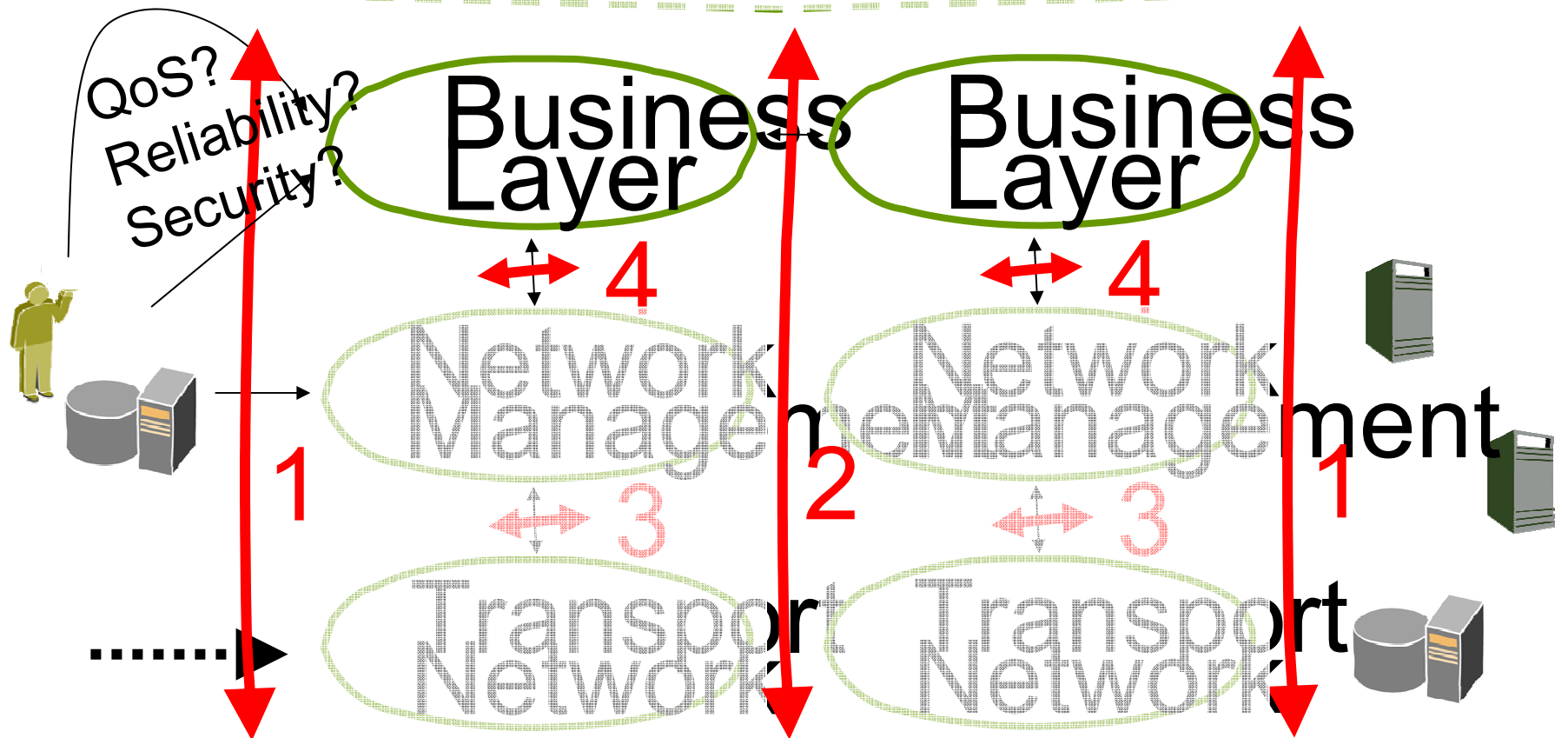   - It is not anymore a question of "just" exchanging route information

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what is missing?
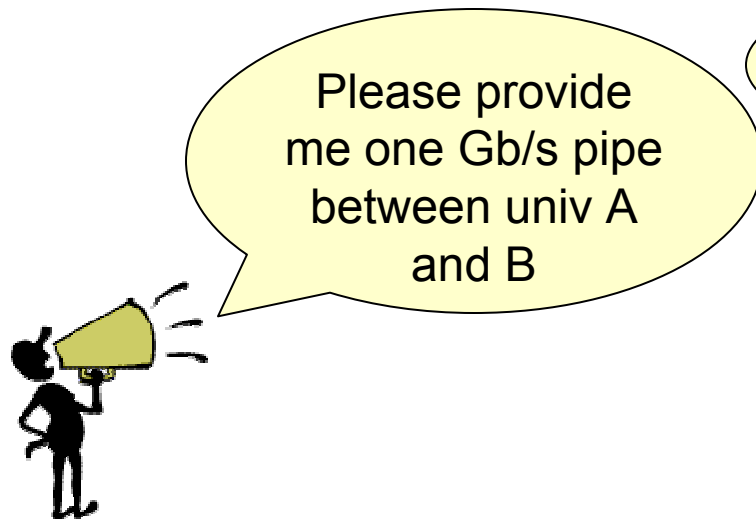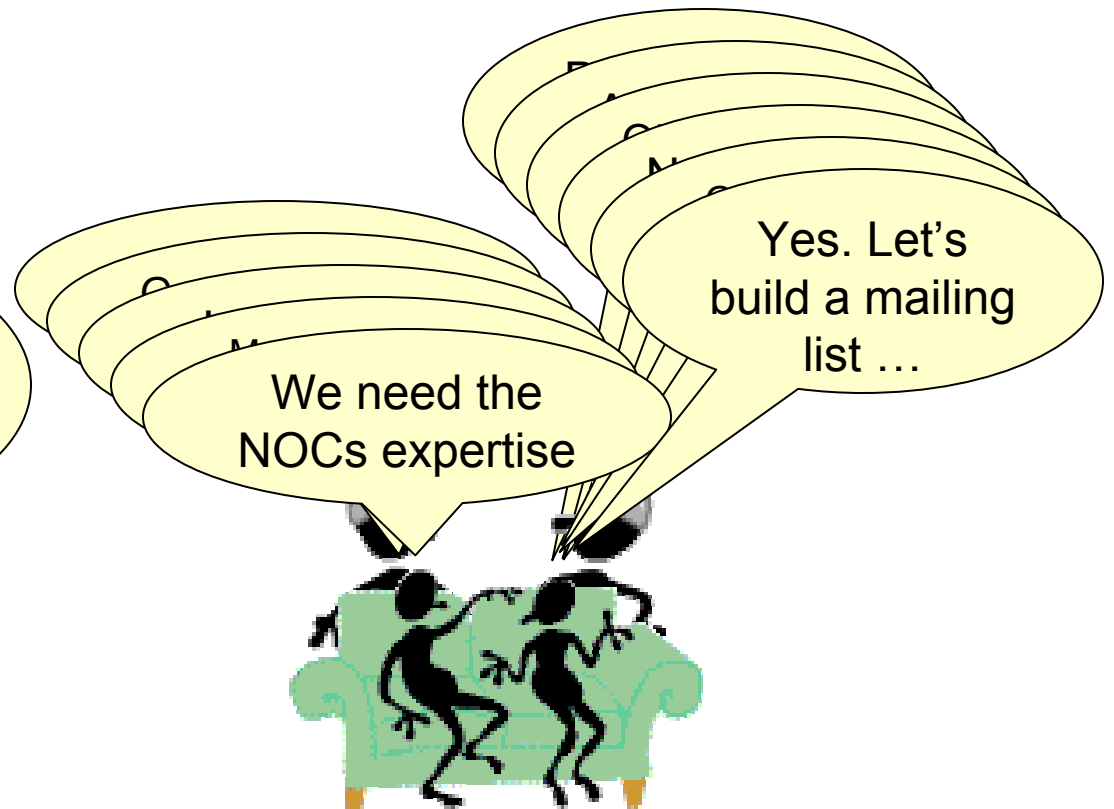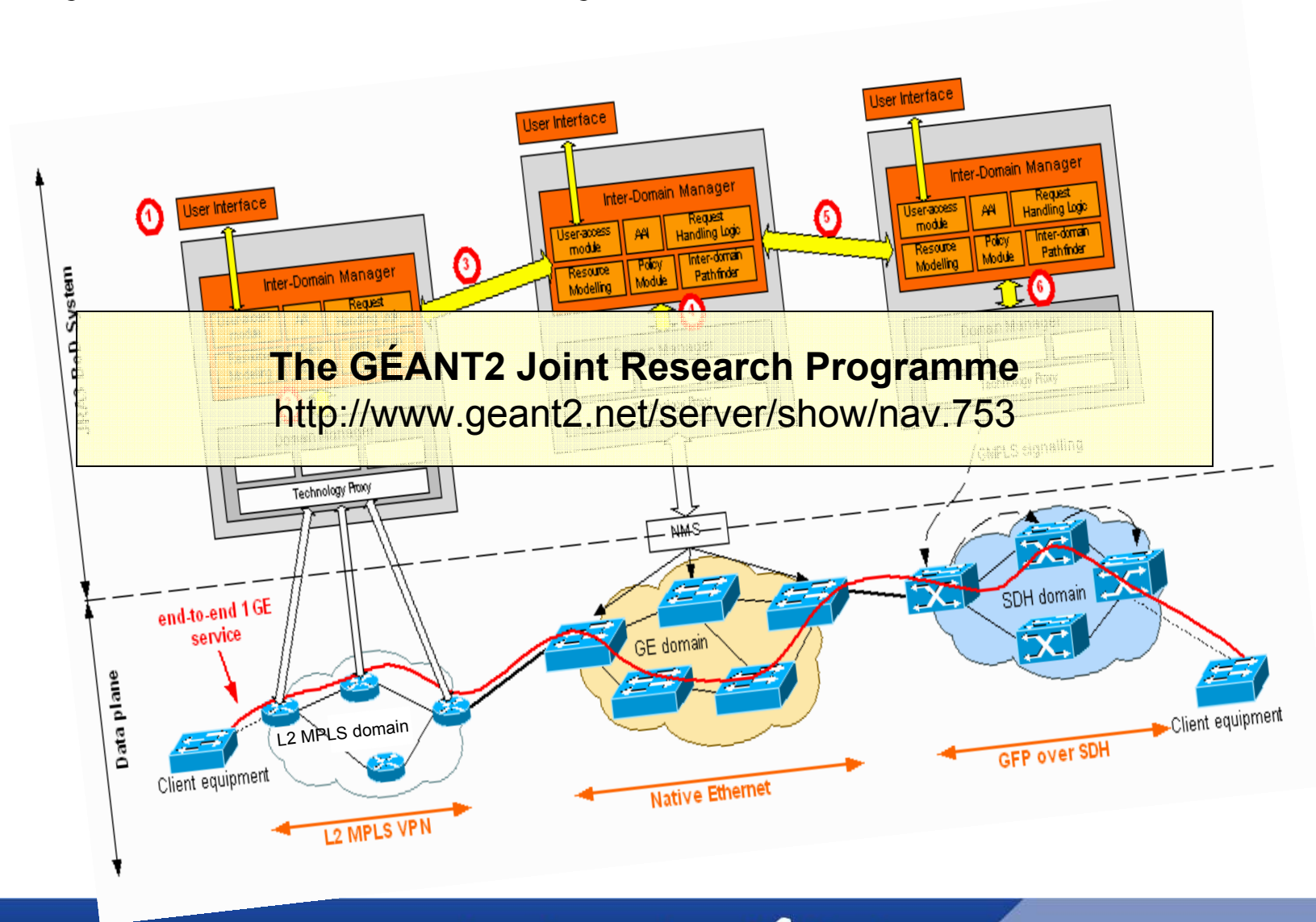
The realistic solution is in a Divide and Conquer approach, again never reinventing the wheel

Potentially a Higher Layer Middleware

QoS?
Reliability?
Security?

Business Layer

Business Layer

4

4

Network Management

Network Management

1

2

1

3

3

Transport Network

Transport Network

1

2

Similar models are developed by R&E community for Specific Services

The GÉANT2 Joint Research Programme
http://www.geant2.net/server/show/nav.753

The need for a "Business Layer"

IPsphere

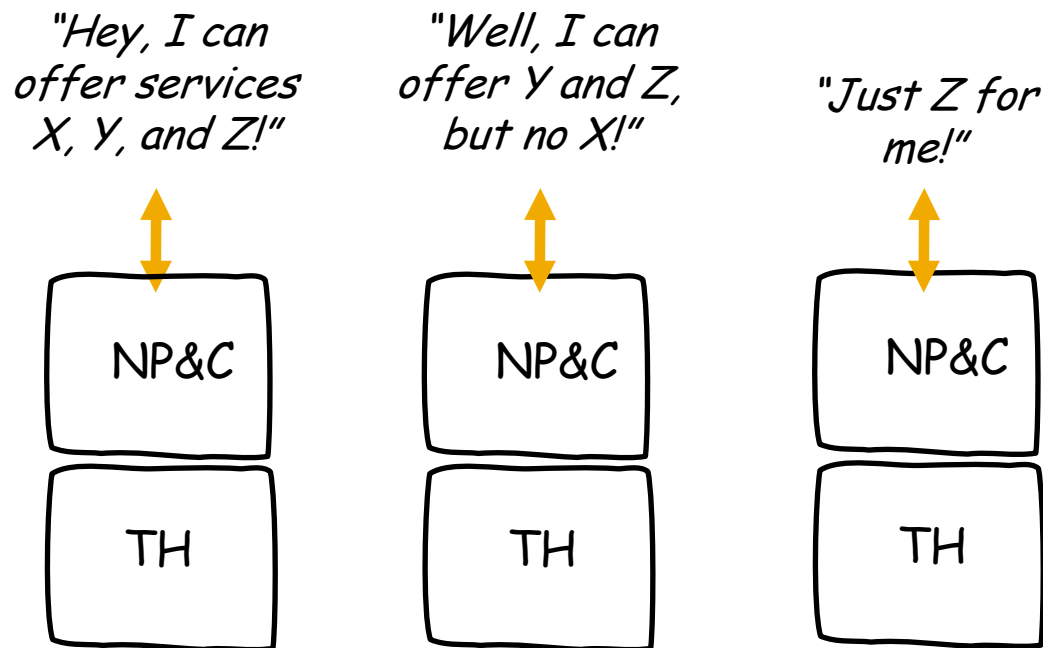## What is an IPsphere ?

A pan-service framework

Defined by the IPsphere Forum

Leveraging Service Oriented Architecture (SOA)

Providing **business structure** for IPservices

Why is this so important?

The SOA framework – using mechanisms like SOAP, XML, UDDI – allows IP networks to "publish" their service capabilities into a structured operational framework

"Hey, I can offer services X, Y, and Z!"

"Well, I can offer Y and Z, but no X!"

"Just Z for me!"

NP&C

TH

NP&C

TH

NP&C

TH

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The creation of a true "business layer"

The Service Structuring Stratum provides this framework – allowing service capabilities to be joined together in unprecedented ways
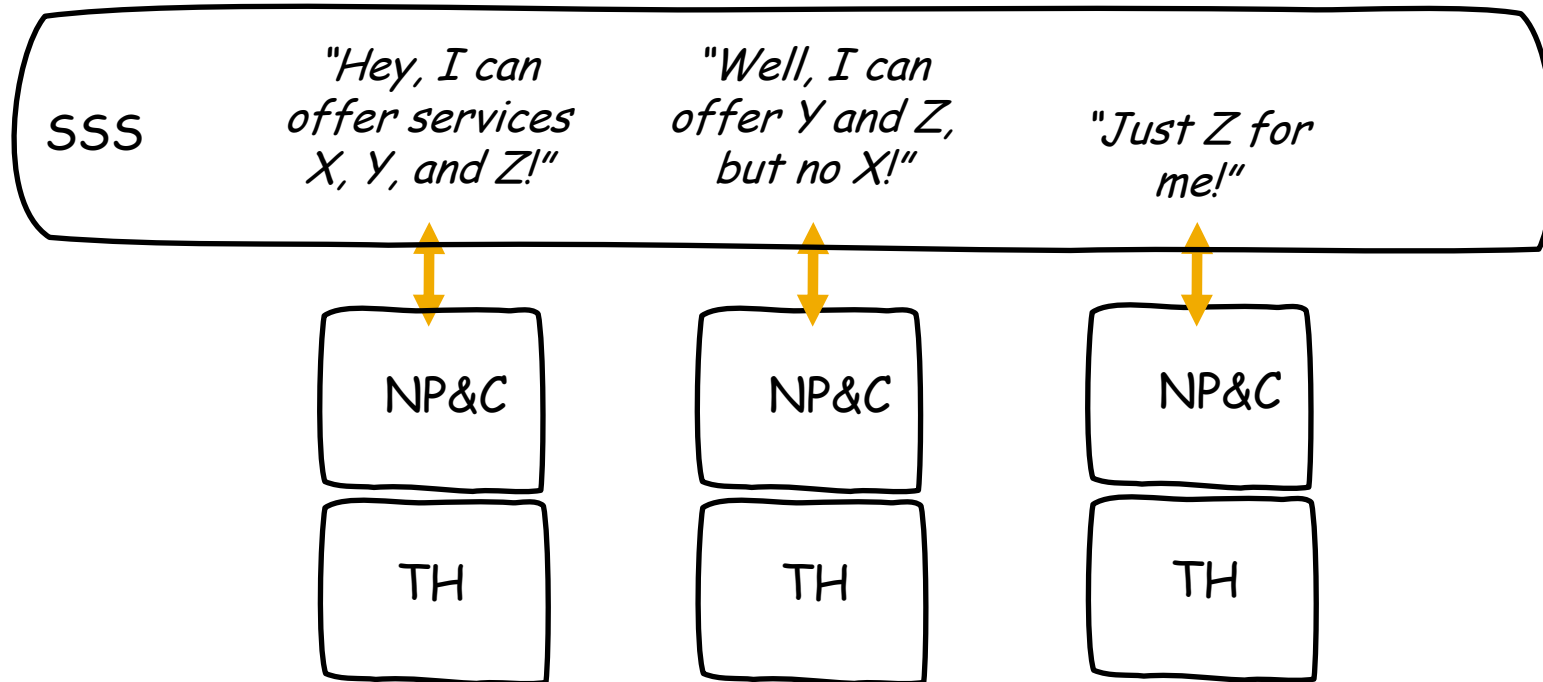
Conclusion

- Deploying a **Inter-domain Services** requires:
  - Both a vertical and horizontal approach
  - A synergy between NREN, end-users (e.g. GRIDs communities), but also with industries

- The problem can be addressed from different angles: but practical development and **standardization work** should be conducted together

- The winning solution will be federative, vendor and domain independent, simple to adapt to any current or future infrastructures and technologies

- The top model will not solve specifically one network service
  - **A common framework for all "on-demand" network services**

- IPSPhere Forum: http://www.ipsphere.org/

  - Overview: http://www.ipsphereforum.org/newsevents/07nollereprint.pdf

Thank You !

"I made it !!"