

# Can Overlay Hosting Services Make IP Ossification Irrelevant?

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## Motivation

- Growing concern with IP ossification
  - » inability to deploy new network capabilities stifles innovation & inhibits development of new applications
- Idea of using network virtualization to fix IP ossification is now at least three years old
- Planned infrastructure for network virtualization (GENI) is still 2-4 years from being deployed
- True Internet virtualization is even longer term prospect
- Is there a more direct path?

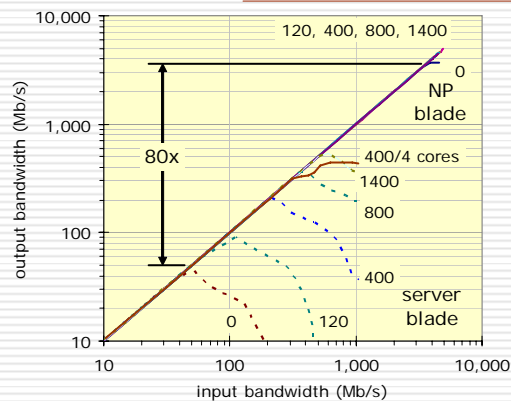
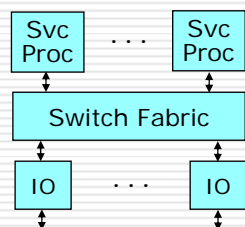
# Overlay Networks Revisited

- Can overlays enable new network architectures and services?
  - » in theory, sure
  - » in practice, not so sure
- Successful new network architectures must handle Internet-scale traffic volumes
  - » overlay network platforms not engineered for this
  - » lack of provisioned bandwidth makes it hard for overlays to deliver consistent performance
- But both problems can be fixed
  - » high performance overlay platforms
  - » provisioned virtual link services (MPLS, SONET, ...)

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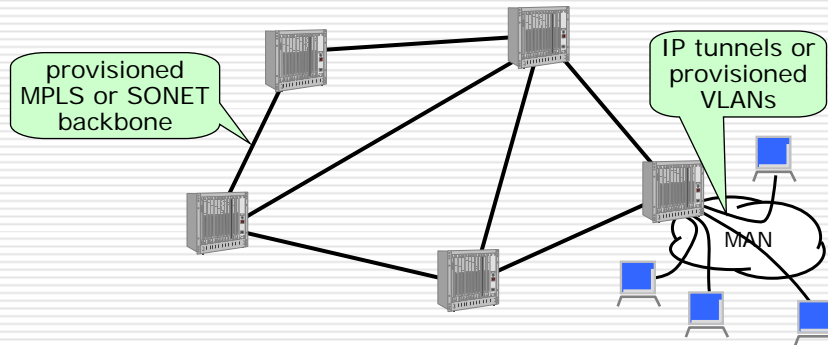
# Internet Scale Overlay Platforms

- Higher performance components
  - » network processors for fast path processing
- Scalable architectures
  - » many IO interfaces
  - » many service processors
  - » many overlays



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## Overlays with Provisioned Virtual Links



- MPLS or Sonet backbone enables consistent performance between points-of-presence
- Access can use IP tunnels
  - » in longer term, transition to Metro-Ethernet VLANs

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## IP Ossification Irrelevant?

- Given globally deployed overlay hosting service,
  - » can create new overlays that implement new network services anytime and anyplace
  - » IPv4 needed for "last few miles" only
- Single organization can implement an overlay hosting service
  - » no standards organization must approve it
  - » all it takes is set of distributed data centers connected by provisioned virtual links
  - » many organizations already have the appropriate infrastructure
- What can we do to make it happen faster?

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