

# Multi-Protocol Label Switching

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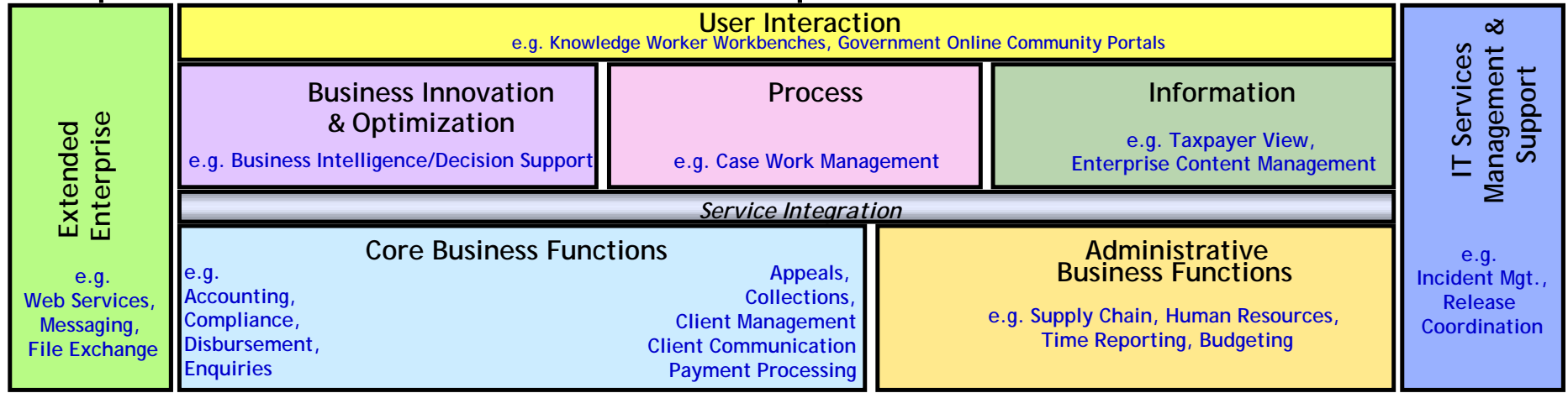
The logo for GTEC 2009, featuring a stylized white arrow pointing upwards and two white arrows pointing outwards, forming a star-like shape.

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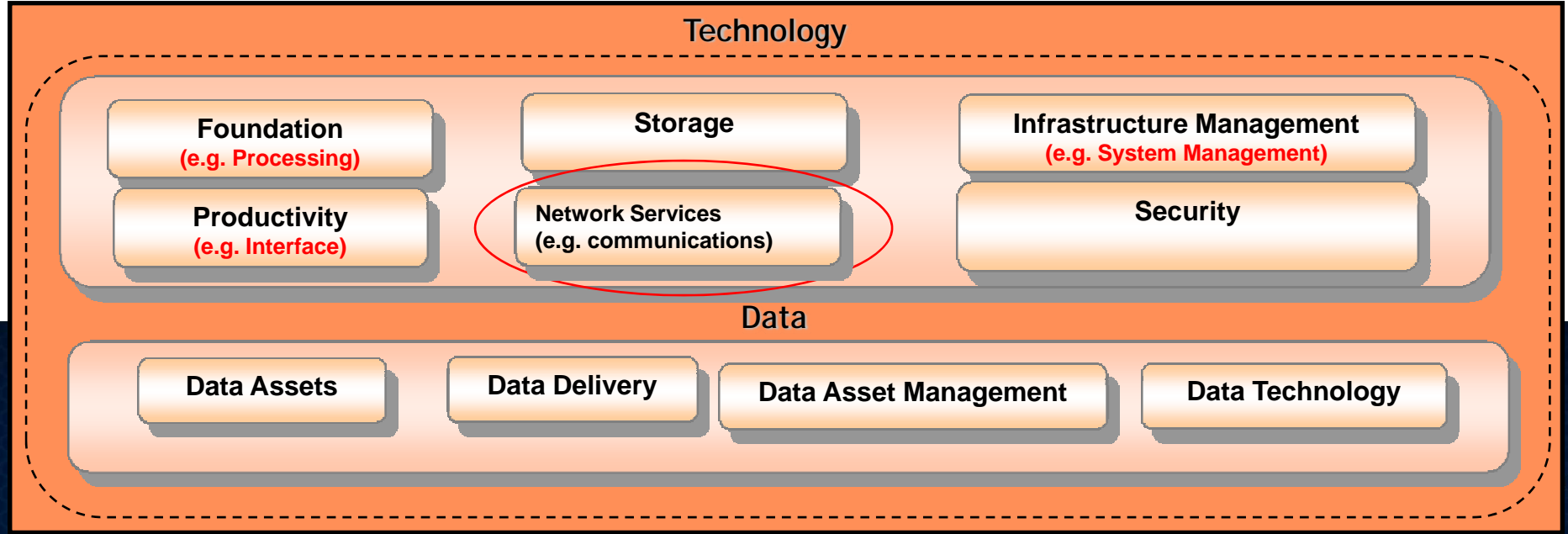
# Business & Architecture Alignment

Private Sector  
OGD  
(other Government  
Departments)

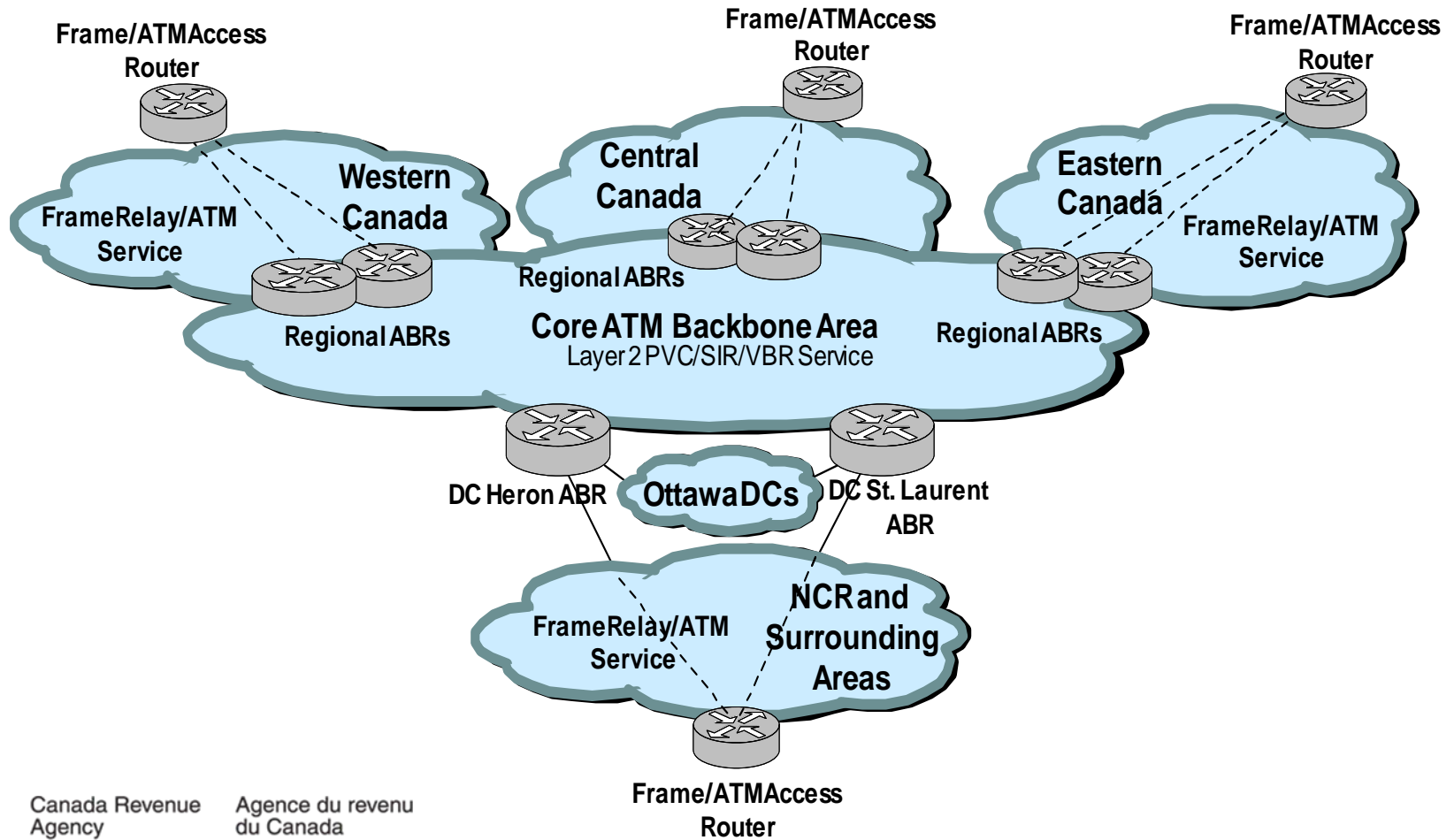
CRA Internal User  
Taxpayers:  
Individuals, Businesses,  
3rd Parties



## Infrastructure



# CRA's Network Topology - Before MPLS



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# Why CRA Migrated to MPLS?

Align network with road maps from various platforms, position network as an enabler to business needs;

Carriers started to sunset Frame Relay and ATM networks and converging to MPLS;

Simplify WAN infrastructure and design, move core backbone closer to sites;

Greater scalability and cost efficiencies

Provides the ability to subscribe to different QoS levels of service

MPLS is the most efficient WAN technology for Voice, Video, and Data integration



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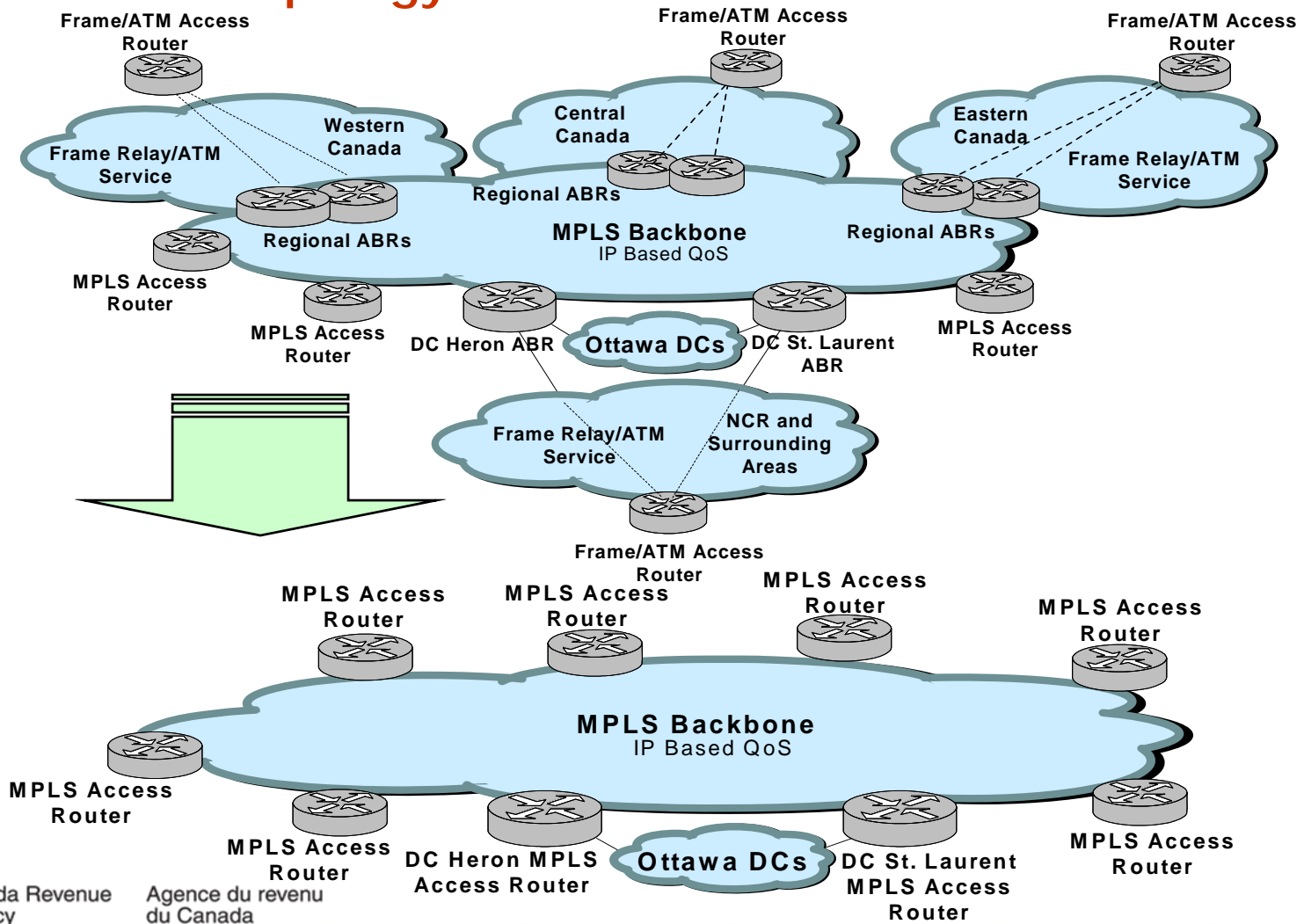
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# CRA's Network Topology- Post MPLS



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# Key guiding principles in implementing MPLS

MPLS cannot defy the “Laws of Physics” and overcome the physical latency inherent in the physical layer.

MPLS does not eliminate the requirement to properly impact applications and baseline user expectations.

MPLS is not limitless and is still dependant on available carrier facilities.

Available MPLS bandwidth capacity does not replace proper network design and usage



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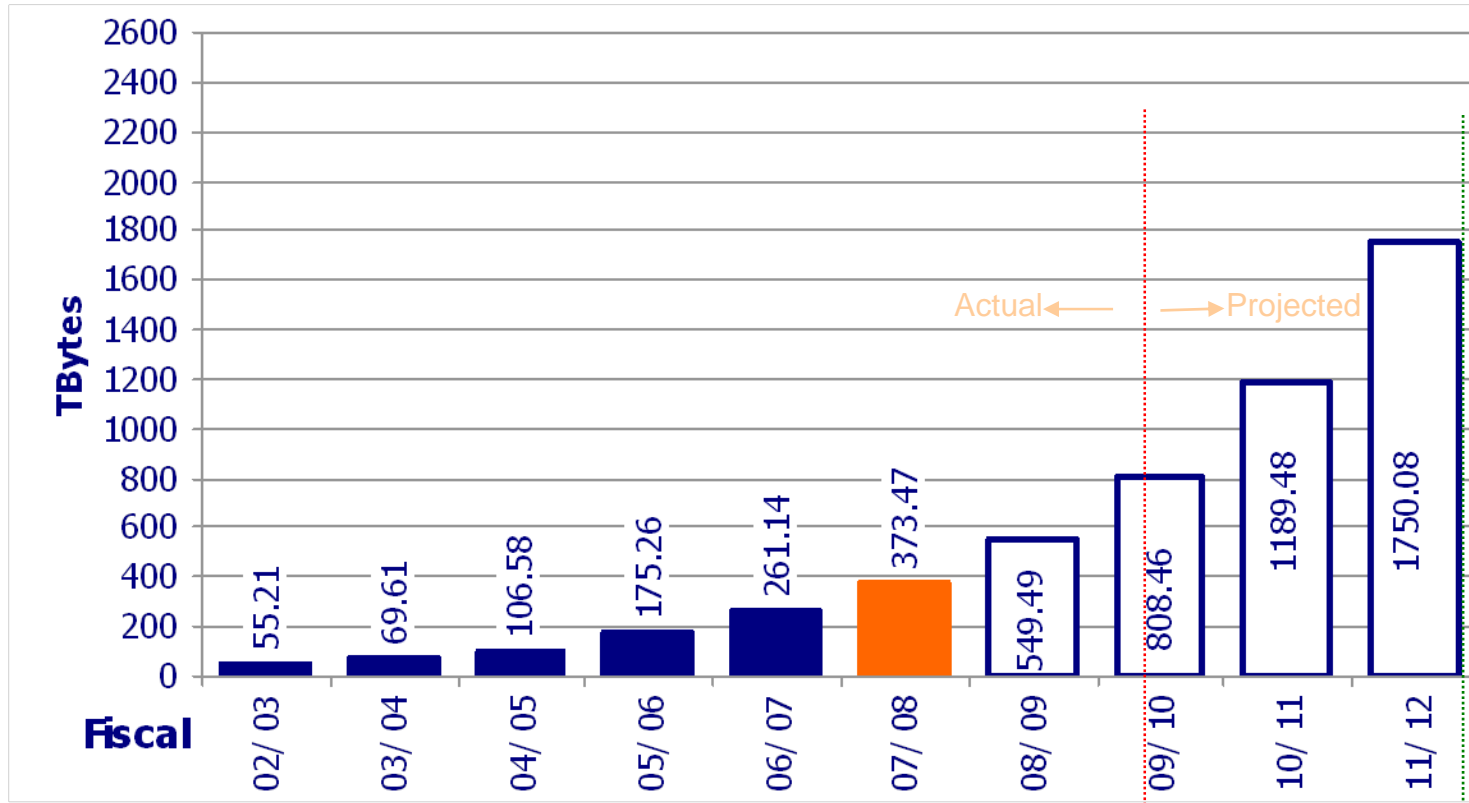
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# Network Growth



Growth: Up to 08/09 is actual  
>08/09 projected

FR/ATM

With  
MPLS



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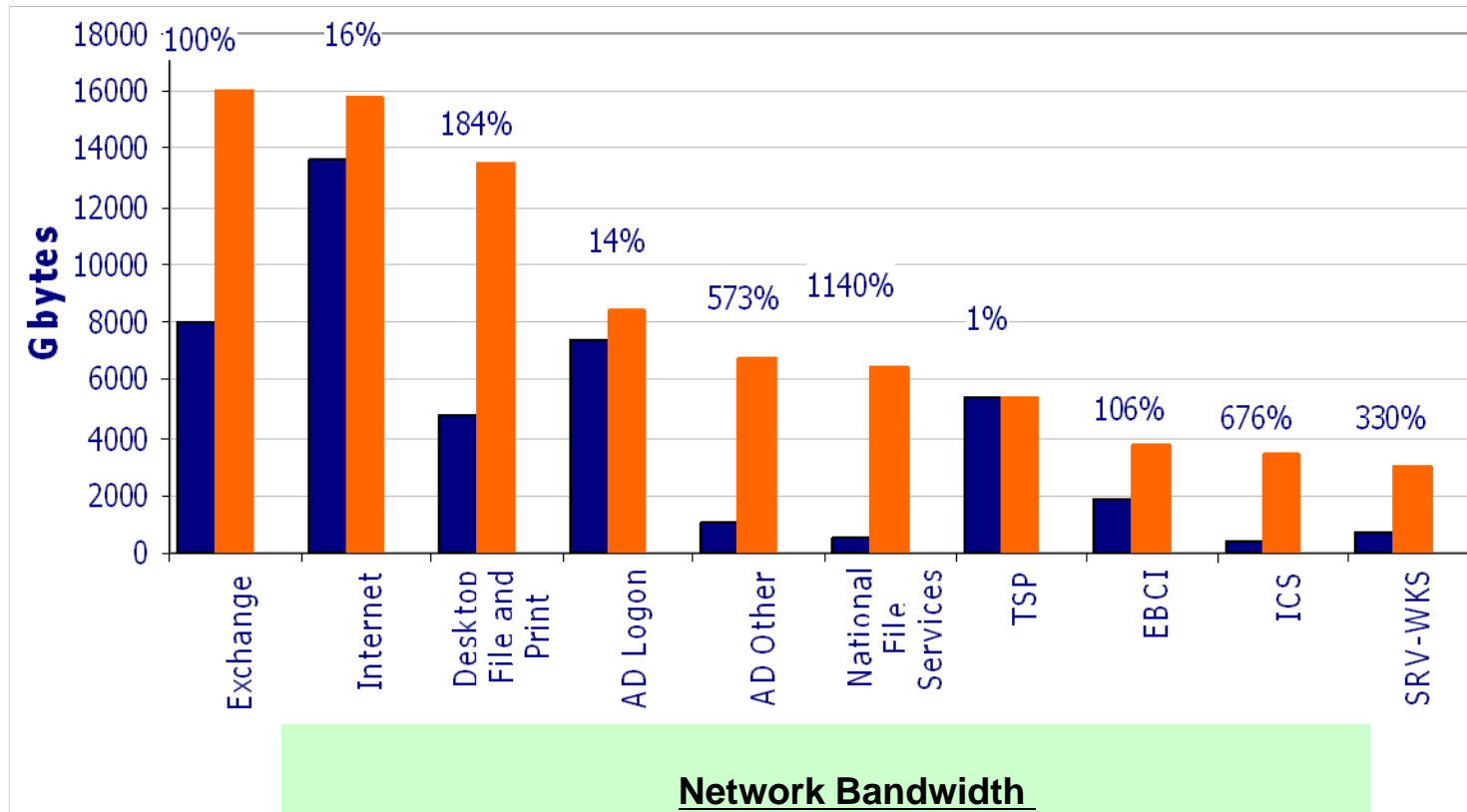
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# High growth applications



**Network Bandwidth**  
**Frame Relay / ATM total client site bandwidth: 770 Mbps**  
**MPLS total client site bandwidth: 2,645 Mbps**



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# Success factors

- **Understand your MPLS traffic requirements**  
Engineer QoS levels and preserve response time for critical applications while only purchasing the required amount of bandwidth for each application type.
- **Test your QoS assumptions**  
QoS metrics must be defined, the typical network constraints (e.g. distance, multiple handoffs points, router latencies, etc.) must be accounted for when certifying apps.
- **Validate investment to realize BW requirements**  
Determining how much real time traffic & the overall pipe size is critical in order to decide how much MPLS bandwidth to purchase.
- **Minimize recurring cost**  
MPLS services can carry any mix of protocols, but at a price. For example, in narrow band links (less than 256Kbps), must dedicate a minimum of 25% to VoIP.
- **Monitor and report SLA's**  
Are the applications obtaining the response times and priority provisioned? Are the service thresholds reported by the SP accurate? Can bandwidth consumption be trended by the various applications so that upgrades can be planned and justified using real data? Is the current traffic policy working?

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# Success factors (cont'd)

- **Manage Latency**

Latency is one of the most sensitive service metrics for network design. ALL CRA applications were designed with architectures that assumed direct network connections with less than 80 milliseconds delay.

- **Manage response times and user expectations**

In migrating from Server Based Computing environment to thin client (TSP & Server Consolidation), business expectations on response times were clearly defined.

## Summary:

1. Network plays an instrumental role in ensuring adequate response times for services/applications and superior user experience;
2. Minimize latency impact on real time applications and overall health of communications infrastructure;
3. Expedite the transfer of data and information between data centres, national sites, and the public.



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