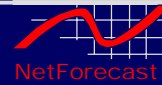


QoS: "Show Me The Money"

IEEE International Conference on Communications
New York - April 30, 2002

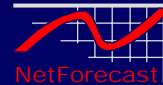


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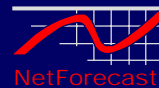
NetForecast Report 5061

Outline



- Problem
- Solutions
- What Works

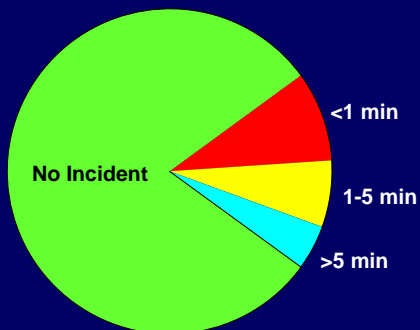
Internet Performance Incidents



North American users have about a 20% chance of experiencing a performance incident

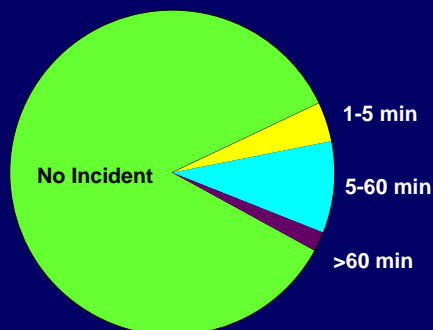
Loss

Over middle and last miles



Delay

Over the middle mile



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Slide 3

Performance Solutions Space

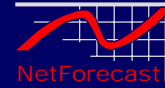


Location	QoS		Acceleration	
	Content	IP Protocol	Content	Application
Desktop/PDA			Content Accl.	
User CPE/CLE	Dual-End Edge	Single-End Dest. Edge Device		
Net Edge			Caching	CDN
Network		Net QoS: MPLS, TOS, Diff Serv, COS		APN
Net Edge			Route Control	Congestion Mngmt
Server CPE/CLE	Dual-End Edge	Single-End Source Edge Device		
Server			Content Acceleration	

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Slide 4

Quality is in the Eye of the Buyer



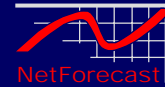
- **The QoS objective**

- Quality must be consistently perceived as better than the lesser alternative
- Many layers of business and technology insulate the service provider from the buyer

- **What QoS does**

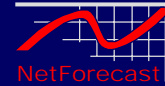
- QoS technologies are all designed to fix, mitigate, or avoid a performance incident
- All performance incidents are a result of congestion for a critical network resource

Why is the Network Congested?



	Not Congested	Congested
Buyer's Choice	Wasting Money?	Under-Provisioned
Seller's Choice	Loosing Money?	Over-Subscribed

Where to Fix the Problem



- **In the center**

- The **smart network**
- QoS as Differentiated Services
- QoS is a technology for networks to sell better services
- This approach must show a consistent clear advantage by enabling an otherwise non-viable application
 - A new service for a new application

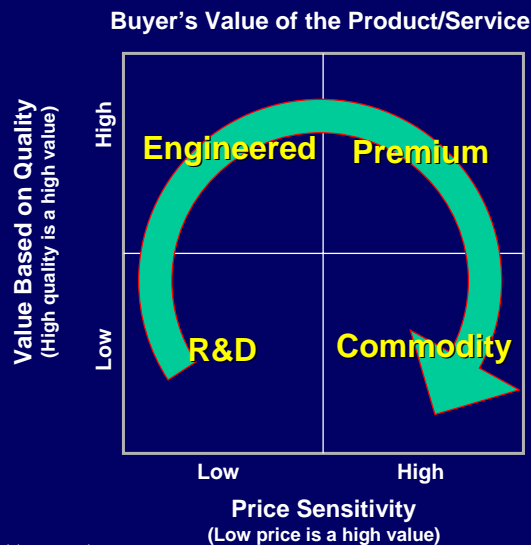
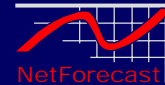
- **At the edge**

- The **smart user**
- QoS as a tool for Differentiating Applications
- QoS is a technology for enterprises to make the best out of existing network services
- This approach must save money while permitting mission critical applications to flourish
 - More for less

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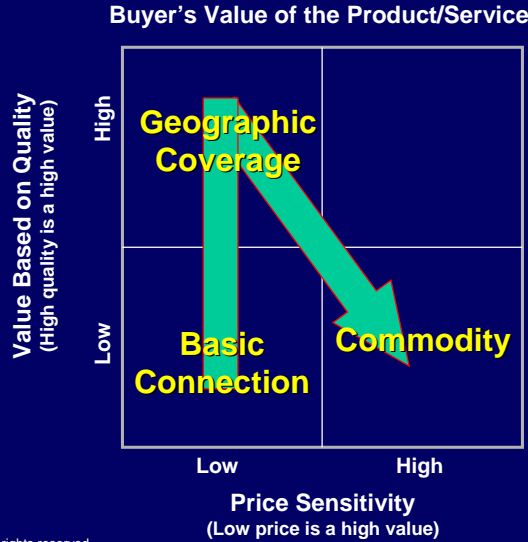
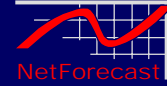
Fundamental Business Path of Any Technology



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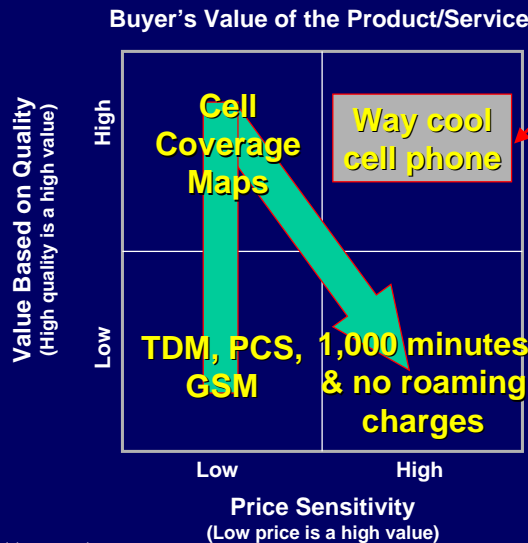
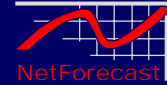
The Network Service Technology Business Path



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Cellular Telephone Example

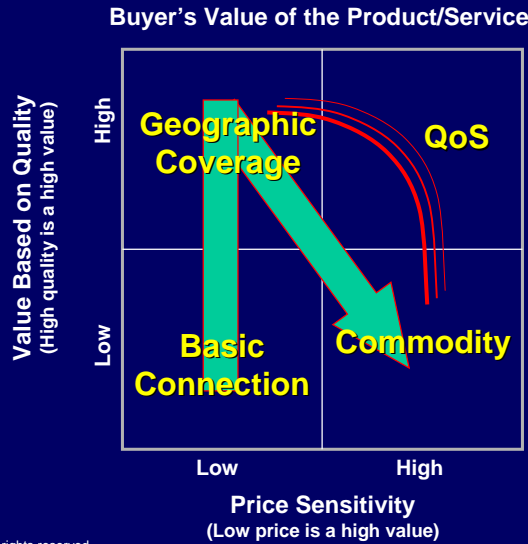
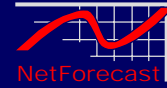


Product that has no relation to the network service

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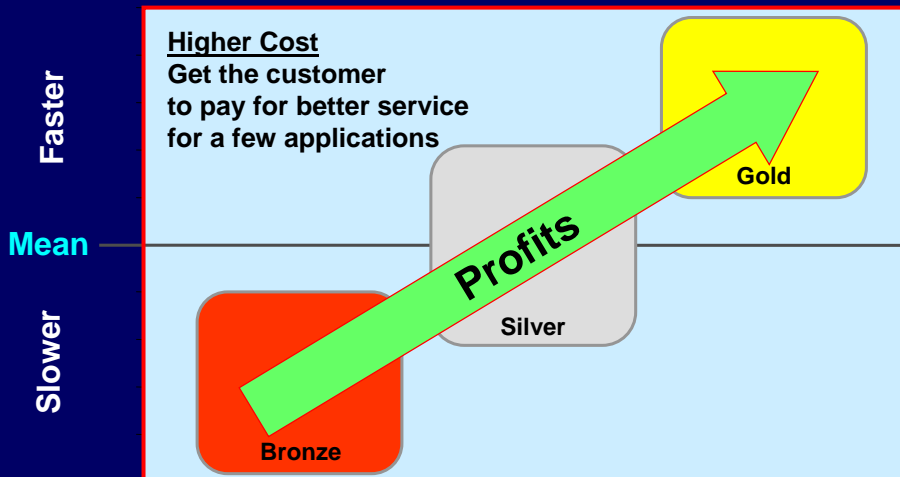
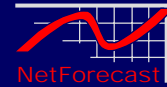
QoS-Based Differentiated Services to the Rescue!



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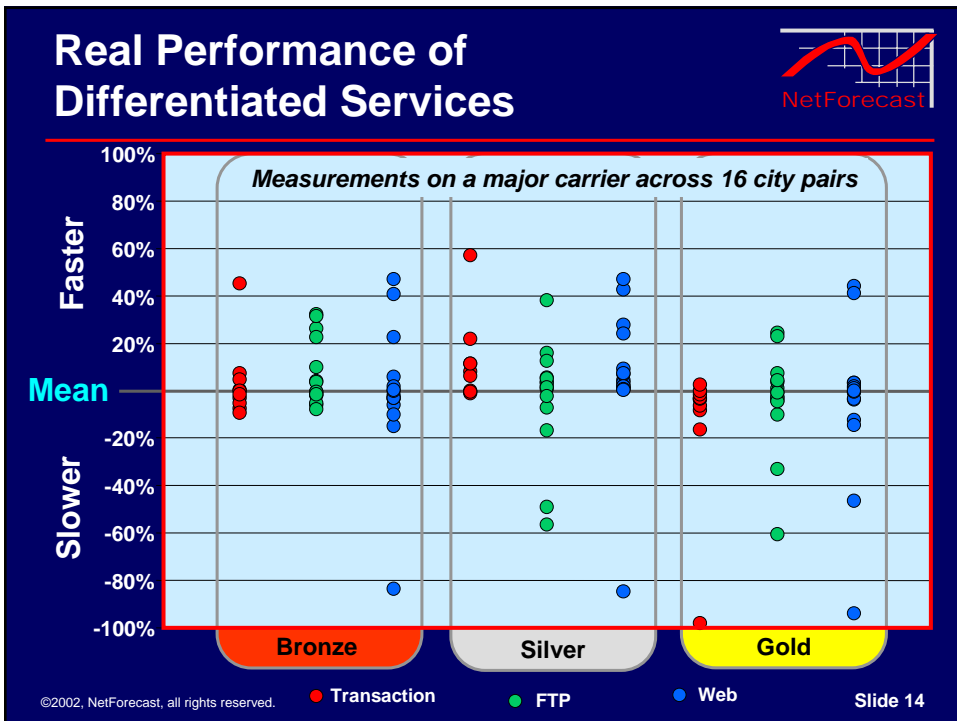
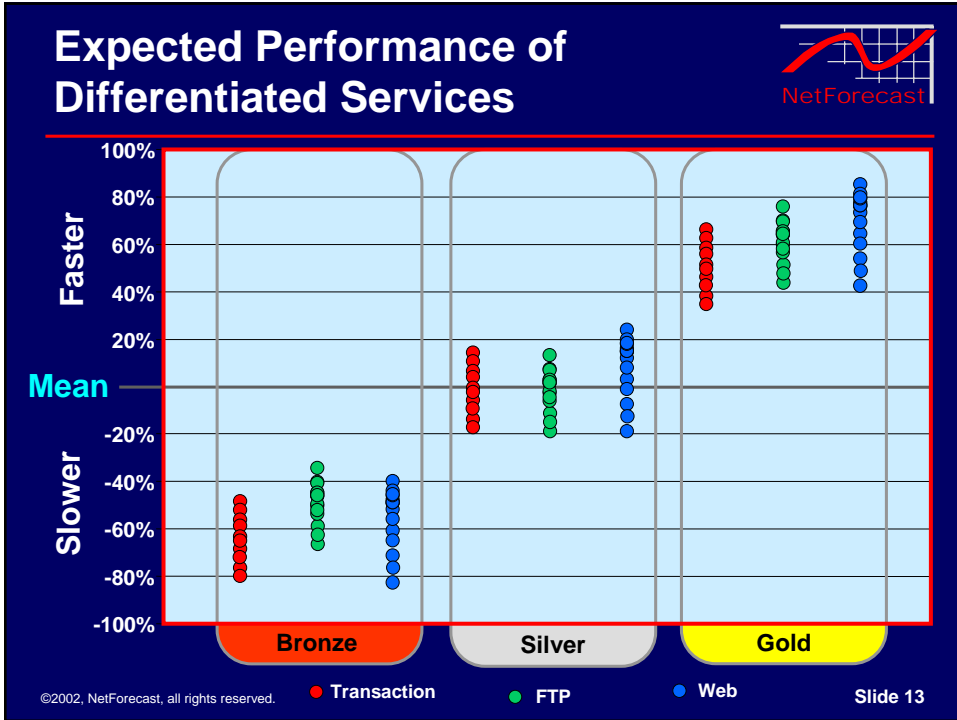
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The Business Model of Differentiated Services

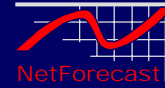


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What Went Wrong

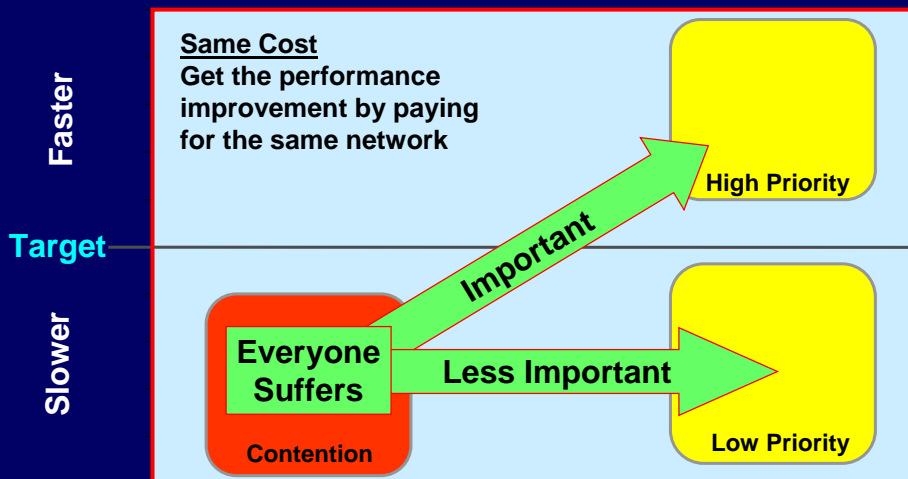
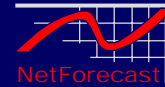


- **The network was not congested, utilization was acceptable**
 - Best effort worked better than the QoS treatments
 - QoS mechanisms got in the way for gold traffic
- **The carrier was left with only two choices**
 - **Operate the network at higher utilization**
 - Reduces costs for the carrier – good
 - Makes the Bronze and Silver services poor compared to Gold – good
 - Current service becomes Gold and therefore the new services of Silver and Bronze must be sold as the new cheaper services – bad
 - If existing customers see poorer performance they will move – bad
 - **Keep the network at current utilization**
 - Sell the new Silver and Gold services as insurance against periodic network congestion – bad (makes the carrier look risky)
 - Sell Silver and Gold services as a way to manage traffic on the customer's access line – OK (but marginal value to both buyers and the carrier)
- **No good business model for the carrier's differentiated services!**

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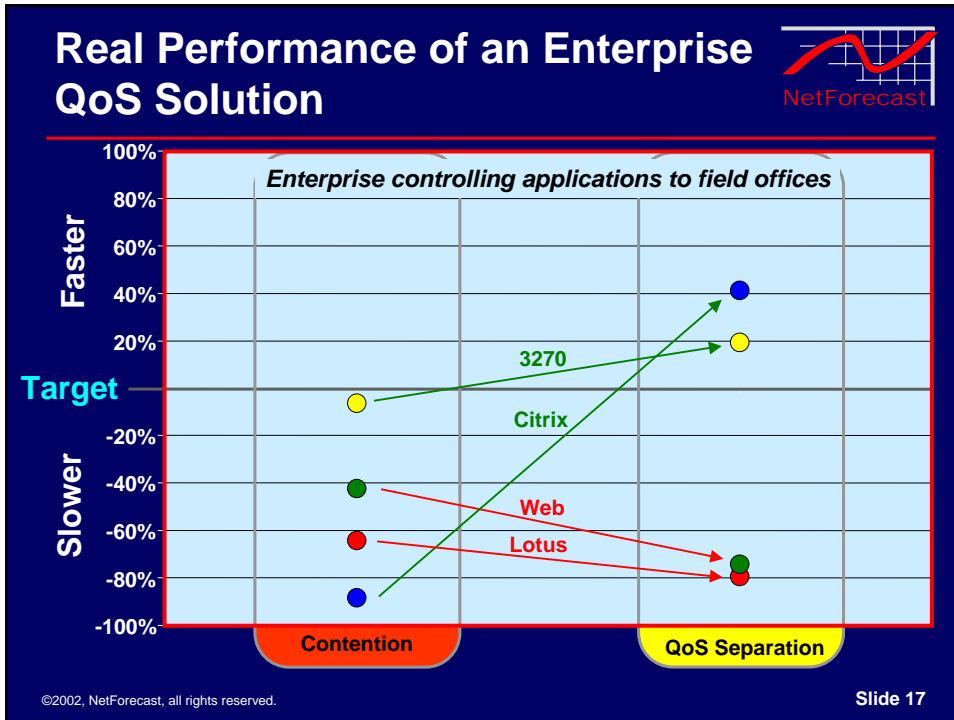
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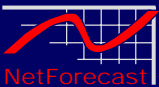
The Business Model of Enterprise QoS Application Management



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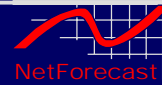
Slide 16



- ## Summary
- 
- **Network services based upon differentiated services that use priority and queuing are flawed**
 - It does not work unless there is serious network congestion
 - "I do not want to pay more to fix your problem"
 - **Successful network services must**
 - Provide a consistent (not sometimes) better service
 - Enable a new application
 - **Customer edge solutions are a key breeding ground for viable innovations**
 - If the customer chooses to put himself into a congested state, then the customer is motivated to fix the problem
 - "Let me fix my own problem my way under my control"
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Thank You

You can contact me at:
Peter@NetForecast.com



Invitation:

Learn more at my full day tutorial at the
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October 14, 2002