

Pricing the Internet

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Issues Covered

- Cost Identification
- Pricing Policies

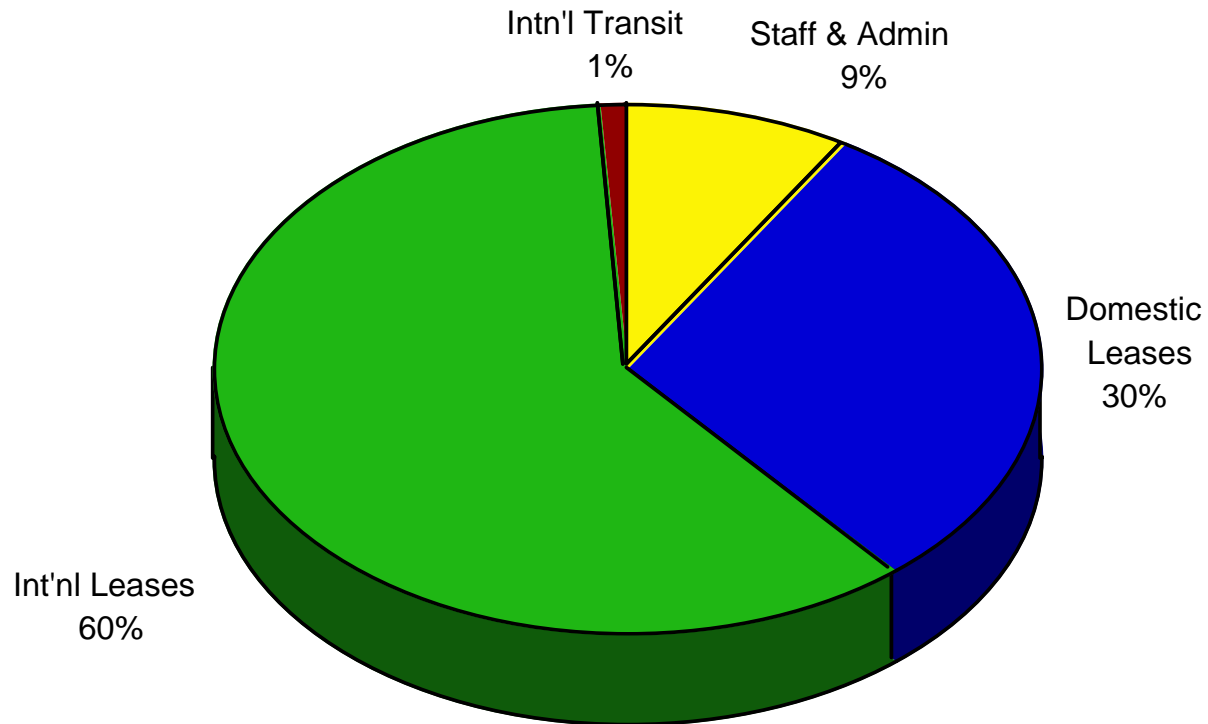
Cost Identification

- Cost elements for an Internet Service
 - technical staff
 - operational and support staff
 - administrative overheads
 - capital equipment
 - data transmission costs
 - domestic line leases
 - international line leases
 - ISP transit costs

Cost Profile

- Typical recurrent costs - non US profile - national backbone carrier
 - staff & admin 10%
 - domestic leases 30%
 - international leases 60%
 - international transit <1%

Cost Profile



Cost Profile

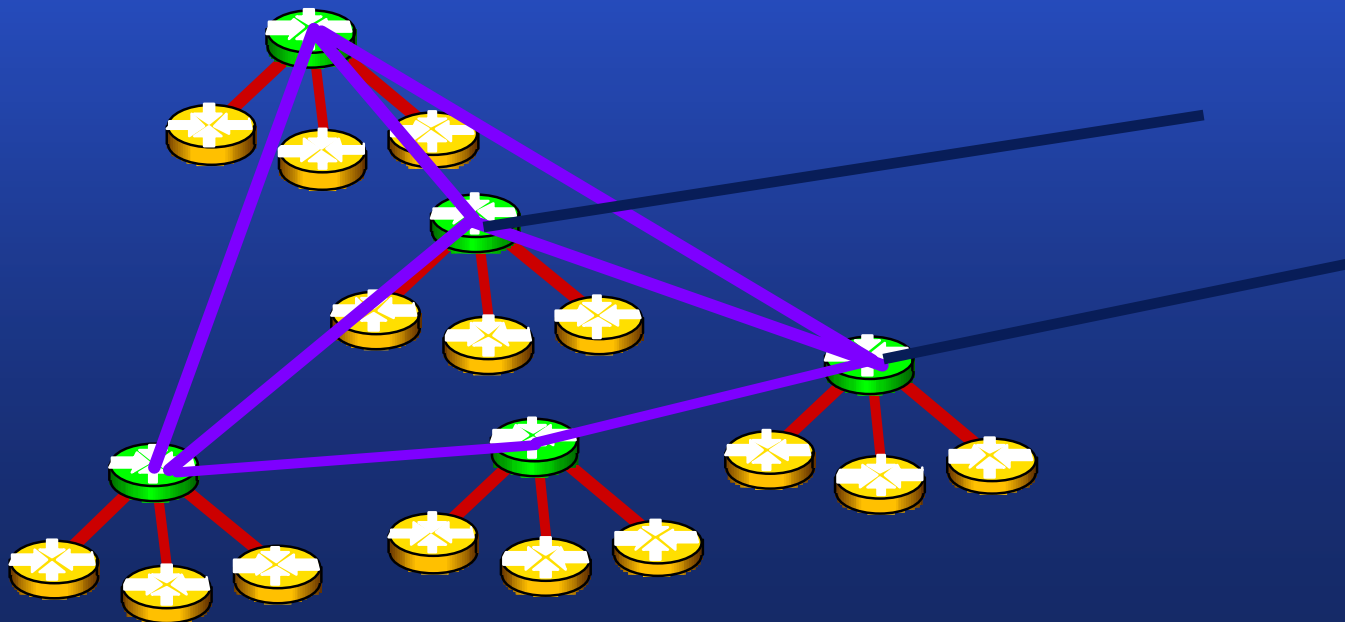
- US profile has proportionally
 - lower international lease cost
 - lower domestic lease cost
 - higher support staff cost
- Non-US profile used in this presentation

Cost Profile

- typical recurrent costs - non-national backbone carrier, non-US profile
 - staff & admin - 20%
 - domestic leases and backbone services - 80%

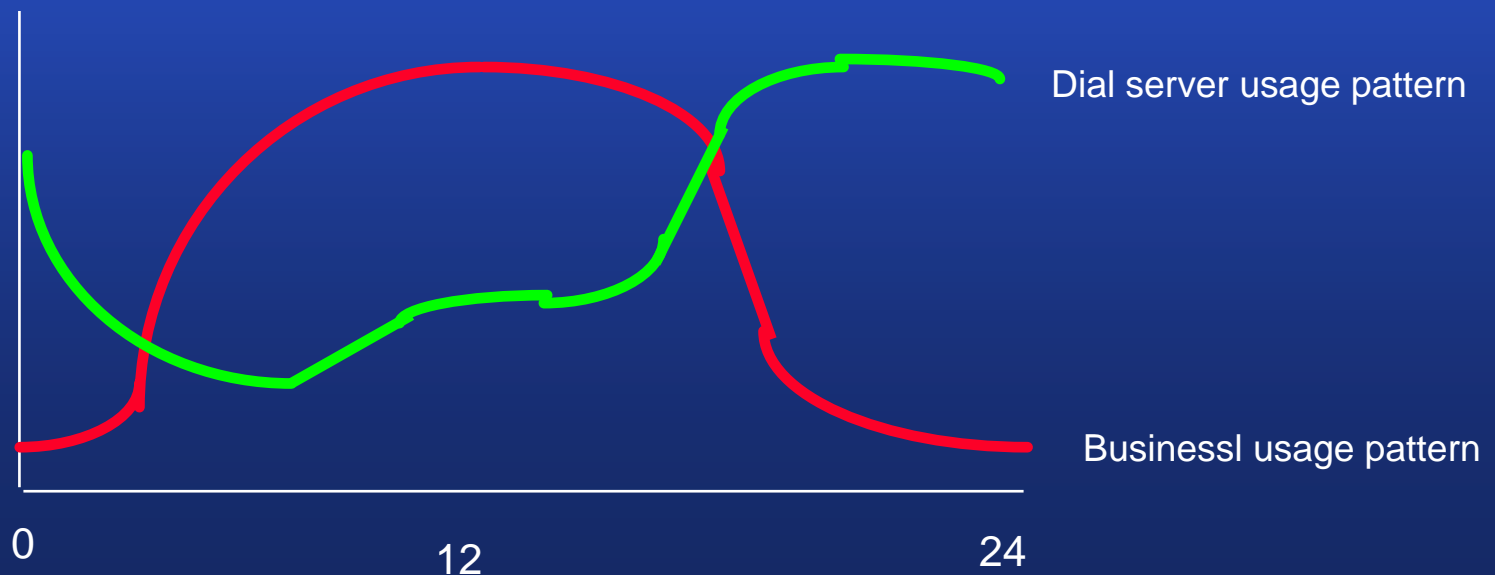
Cost Profile

- Determining the unit cost of passing traffic over the network
 - sum of unit costs for passing traffic over each circuit
 - normalised by average end to end traffic flow profile



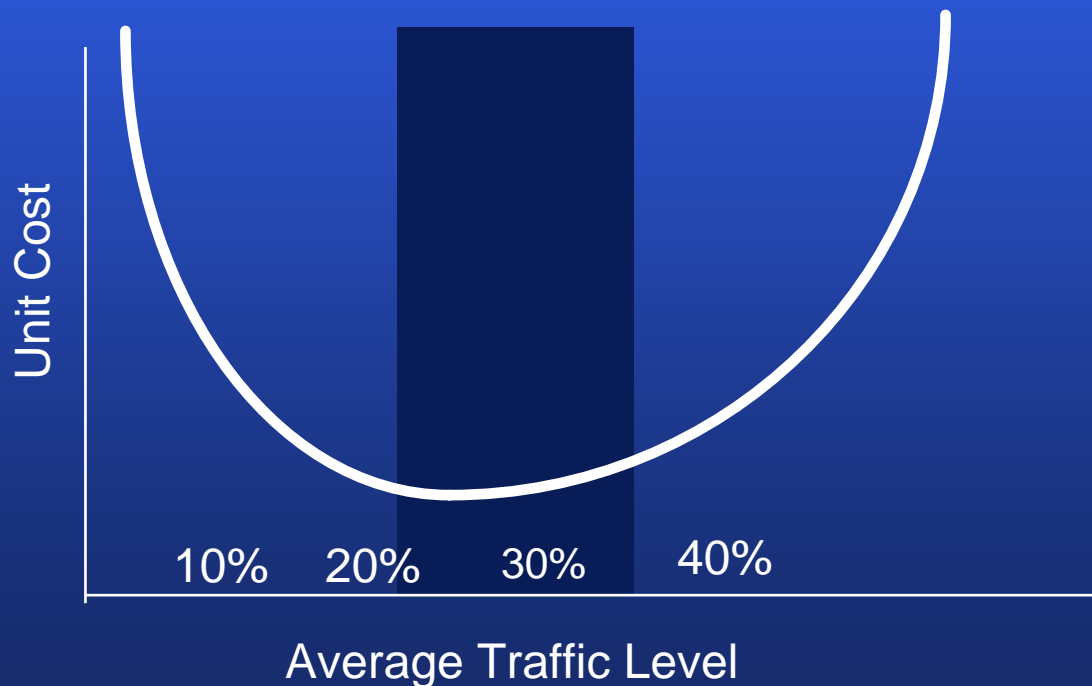
Cost Profile

- determining the unit cost of passing traffic over a circuit
 - bidirectional or unidirectional?
 - line occupancy pattern (peak to average)
 - average sustainable line occupancy



Cost Strategy

- avoid congestion on the circuit as a priority
 - (actual unit cost of delivered data)



Cost Strategy

- leased circuit cost
 - circuit lease cost must be fully defrayed at average circuit occupancy of 35% for a stable operating network.
 - higher average occupancy is possible at the cost of peak load inefficiency
 - lower average occupancy is under subscription of the circuit resource.

Cost Profile Example

Type	Proportion	unit cost	% total trans cost recoverable
Intl	30	1.00	87%
Dom	3	0.12	12%
Local	37	0.00	0%

Cost Strategy

- minimise International Lease costs
 - tariff structure of decreasing unit cost with
 - longer lease commitment
 - higher volume circuit
 - Note that the Minimum Investment Unit (MIU) of international cable systems is an E1 bearer
 - major cost break leading to E1 size
 - reduced cost break thereafter

Cost Strategy

- quantity over quality
 - Frame Relay for lower speeds
- quantity over diversity

Cost Strategy

- terminate at the cheapest useful full circuit location
 - high volume termination locations are cheaper
 - distance is not a significant factor
- maximise useful circuit capacity
 - secondary goal
 - avoid the long delay pipe protocol behaviour
 - use cable if marginal premium over satellite is small
 - tend to cable for higher bandwidths

Cost Strategy

- Minimising International Lease cost is the most significant cost factor
- Domestic lease cost can be significant
 - similar factors apply here as with International leases

International Access Costs

- Connection Options
 - Connect to “upstream” ISP
 - Import default route
 - Contract ISP to advertise your routes to Internet
 - Cost highly variable
 - Quality of default can be variable
 - Purchase carefully!

International Access Costs

- Connect to an exchange point
 - Can advertise your routes to all exchange peers
 - Can import all announced routes to your network
- This is not the same as importation of default
 - You need to purchase transit at the exchange point in order to reach other exchange points
 - same conditions apply

Costs and Revenue

- This is a growth industry
- Cost containment is subsidiary to revenue growth
- Effective marketing leads to
 - higher revenue
 - greater purchasing power
 - lower unit costs

Client Pricing

- Objectives
 - service provision
 - cover costs?
 - generate revenue?
 - constrain / encourage use?
 - competitive positioning

Revenue Generation

- constrained by policy objective of the network
- initial revenue levels need to be offset against future growth potential within competitive environment
- maintain revenue levels in line with investor expectation

Constrain / Encourage Use

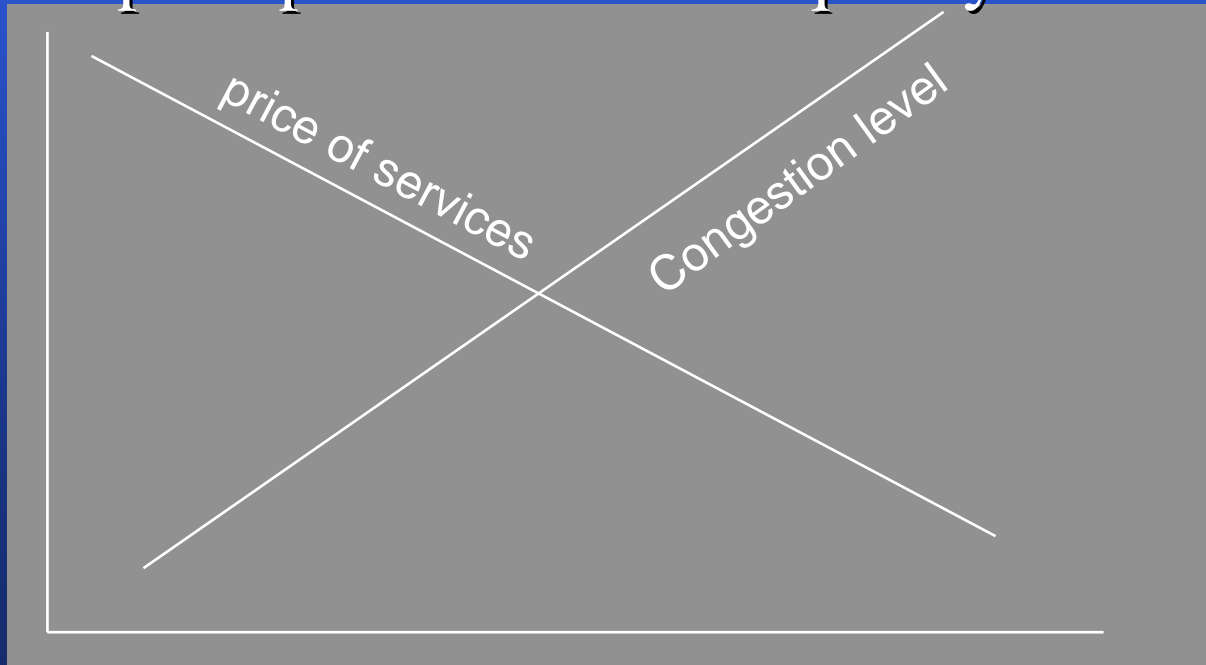
- Must constrain use within a fixed funded or subsidised environment
 - unrestricted growth of subsidised environment implies fundamental business failure within a cross-subsidised environment
- Must constrain use if increased use does not generate increased funding and / or revenue
- Should encourage use within parameters of constant or improving
 - income
 - delivered quality of service

Competitive Pricing

- Must set pricing at a level which is
 - comparable to competitive networks
 - modulo:
 - delivered service profile
 - quality of delivered service
 - Opportunity pricing is inherently unsafe as a longer term strategy

Internet Service Pricing

- Unit pricing is variable against target congestion level
- The discriminant is quality
- Variable perception of value of quality



Pricing Elements

- Access
- Time
- Volume
- Distance
- Price = $f(\text{Access}) + g(\text{Time}) + h(\text{Volume}) + j(\text{Distance})$

Access Price

- Normally varied by bandwidth
- If used as sole price parameter then the provider relies on averaging across the client base
- Sophistication of client base implies increased usage at constant price
- Must be offset by constant growth
 - ie acces pricing must be offset by increased marketing costs and / or access to lower unit costs of bandwidth

Access Pricing

- flat fee based on bandwidth
 - widely used
 - predictable billing
 - low administrative overhead
 - increased marketing costs
 - no traffic shaping
 - no incentive for shared caching to offset intn'l lease costs

Time Pricing

- only applicable to dial-up operation
- scales with growth in dial-up market
- widely used

Volume Pricing

- cannot measure “calls”
- Sent or Received traffic?
- Sent Volume
 - reduces incentive to populate network with services (information provider pays to pass information to receiver)
- Received Volume
 - matches ftp & html usage
 - poor match for email & telnet
 - low incentive for cooperative infrastructure
 - provider undertakes all dns, named, caches, etc

Volume Pricing

- Decision on Volume unit
 - tens of gigabytes (virtual access bandwidth)
 - megabytes (high sensitivity)
- Traffic shaping by time of day
 - peak / off peak pricing
 - reflects congestion price premium

Volume Pricing

- Unit price on received tens of gigabytes per quarter
- Off Peak volume discount
- increasing adoption within the Internet
- scalability
- allows increasing revenue with increasing use to ensure constant delivered quality
 - i.e. allows constant service integrity

Distance Pricing

- Typically applied to volumes
 - unit cost for local switching
 - unit cost for intercity switching
 - unit cost for international switching
- requires traffic sniffing
- poorly understood within the client environment

Pricing Conclusions

- No pricing (funding by external agencies or by multilateral client agreement) is typical starting position, but
 - requires long lead times to set up!
- Access Pricing is effective starting position, but
 - is difficult to produce a stable outcome under growth pressure
- Volume Pricing is stable, but
 - requires careful positioning within current / future competitive market

Discussion

- Marketing Internet Services
 - Cost containment vs revenue growth
 - marketing as a measure to support pricing strategy
 - plan ahead on demand levels, revenue and expenditure
- Issues of marketing content vs marketing data switching services