

# CFP Broadband Working Group: Broadband Usage Cost Recovery

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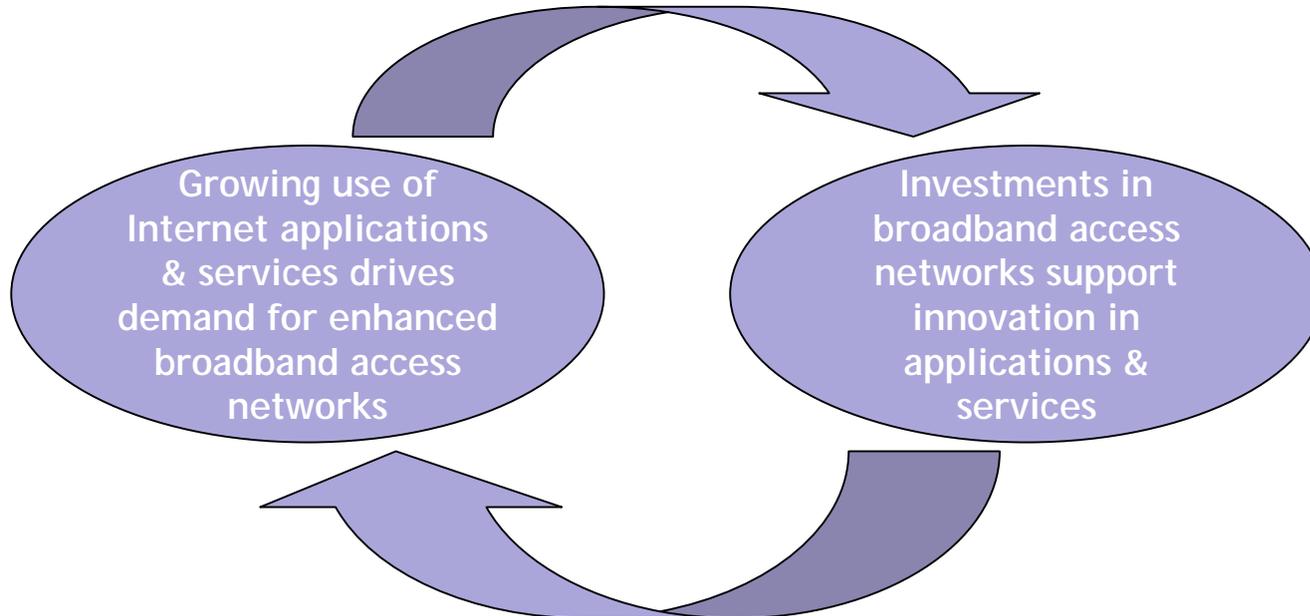
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# Residential Broadband Usage Cost Recovery

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- **A Problem Statement presented as a short White Paper**
- **The Problem Statement:**
  - States assumptions which lead us to believe there is a critical problem
  - Lists commonly proposed solutions, and begins to address their impact on the virtuous cycle



# Assumption: Innovation is Good

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- **Innovation is fostered by improvements in residential broadband access**
  - Peer to Peer filesharing
  - BitTorrent
  - Personal publishing (blogging, photo sharing, video sharing)
- **The problem is that current pricing and business models may suppress innovation**
  - If Access providers don't profit from improvements in broadband access, they have little incentive to upgrade
  - Flat-rate pricing provides operators with an incentive to minimize usage
- **Residential Broadband Cost Recovery is a problem for the entire industry, not just the access providers**

# **Assumption: Services are Interchangeable**

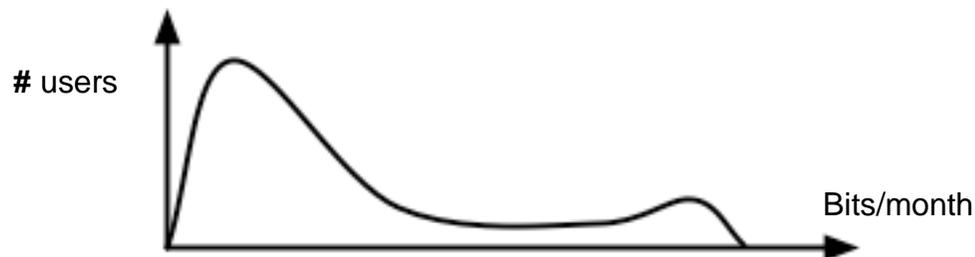
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- **Access providers face competition for most services they provide, including basic transport**
- **Few services offered by providers cannot be interchanged with those available from third parties**
  - **Few services are core, or integrally tied to the broadband access service**
  - **IP number assignment, Routing, and QoS are still core services**
- **Examples of interchangeable services:**
  - **Telephony services provided through VoIP**
  - **Domain Name Service provided through Dynamic DNS**
  - **Content purchase and download**
- **Prices not aligned with services used by a user may drive user to competitor**

# Assumption: The Average User ?

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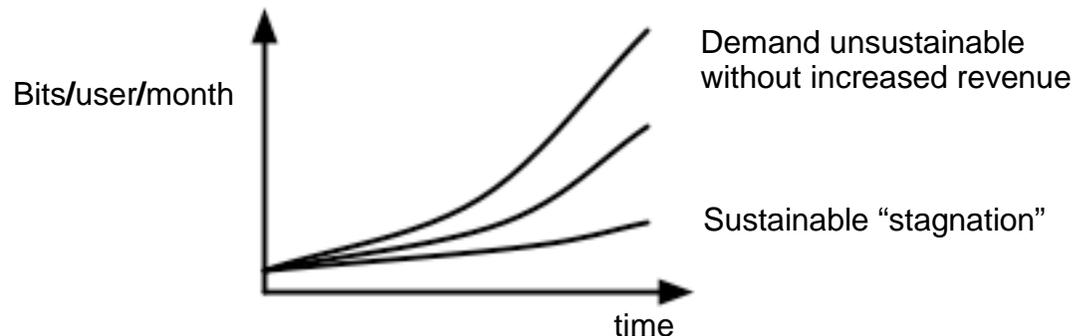
- **As the access bandwidths increase, it is more difficult to identify an “average user”**
  - New applications enabled by increased access bandwidth appear
  - Greater difference between average and high-use users
  - The customer as an aggregator: multiple users and applications sharing a connection
- **Technology-based constraints on usage are vanishing**
  - High-use users limited by peak rate of access
  - The difference between the peak rate and the average rate is increasing rapidly
- **Pricing based on average usage becomes difficult to sustain**



# Assumption: Different Rates of Growth

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- **Equipment and backhaul prices are dropping**
  - Every doubling of volume drops the price per unit of bandwidth to roughly 80% of previous price
- **Demand for bandwidth is increasing**
  - Driven by new, broadband-enabled, applications
- **But, if the rate of price decline is slower than the rate of bandwidth demand growth**
  - Either bandwidth demand is throttled, or traffic-sensitive operating costs increase



# Assumption: Traffic Costs are Significant

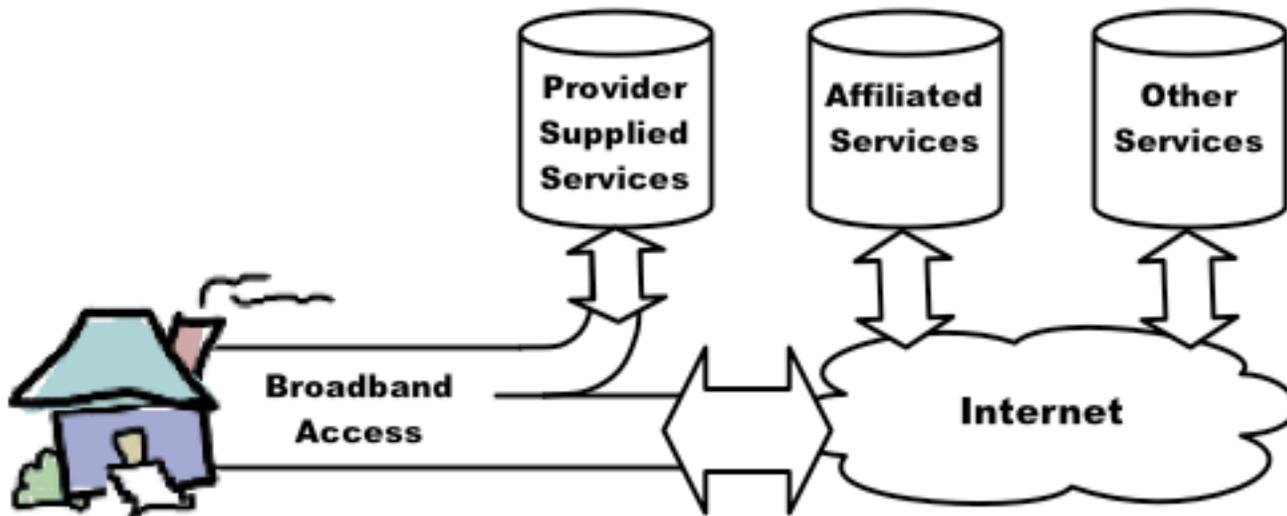
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- **Traffic-sensitive costs are already an important part of a provider's cost structure**
- **Mainly due to traffic transferred to/from the general Internet**
  - **When associated with non-affiliated services, the provider receives no direct revenue**
- **Overprovisioning doesn't help**
- **Questions of Validity**
  - **Both the internal provisioning and the general Internet costs have a granularity which complicates cost estimates**
  - **Nature of the information needed to validate assumption**

# Assumption: Connectivity is the Product

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- **Access to third party services on the general Internet will continue to be a significant portion of traffic**
  - Provider receives no revenue from these services
  - Increasingly difficult to recover costs with flat-rate pricing as volume of this traffic increases



# Solutions

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- **Some commonly proposed solutions and their impact are briefly discussed**
  - In particular, those with adverse impact on innovation
- **Two approaches to solving the problem (sometimes used together):**
  - Solutions that constrain cost
  - Solutions that increase revenue
- **This is not a complete list or taxonomy of solutions**

# Solution: Throttle Traffic

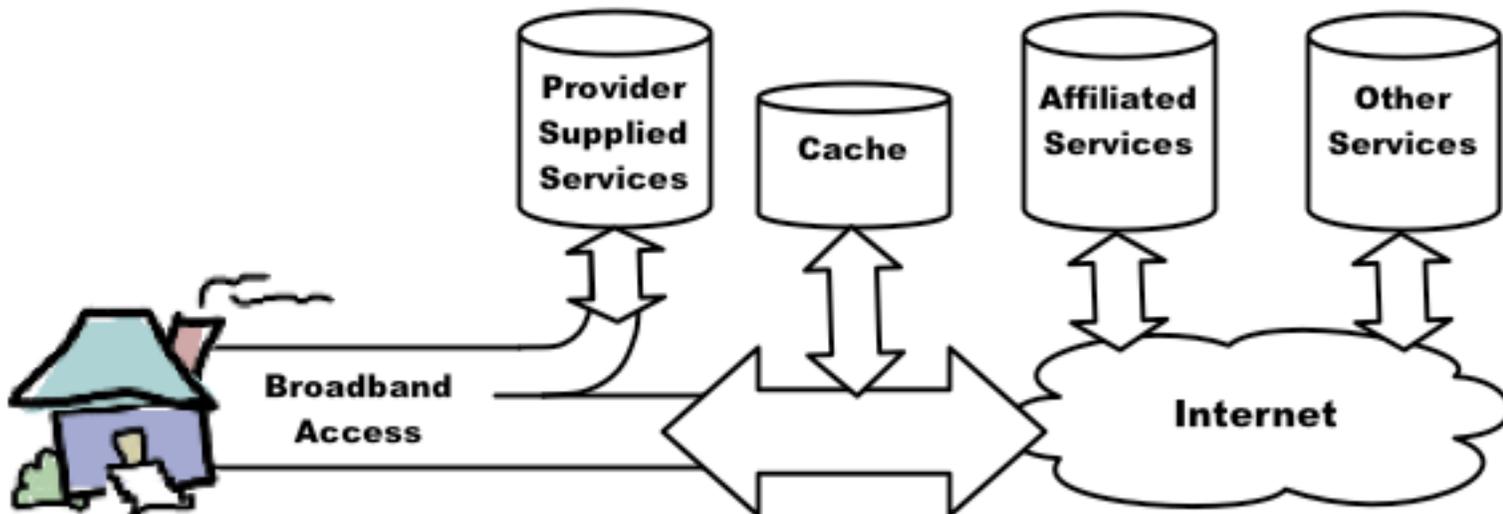
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- **Throttle bandwidth to constrain growth rate**
  - Shaping of aggregate and/or individual user bandwidth
- **Implementation Problems**
  - How to throttle fairly
  - Over what averaging interval ?
  - User irritation
- **Inhibits new applications and supresses new usages**
  - Negative effects on remainder of value chain

# Solution: Reduce Interdomain Traffic

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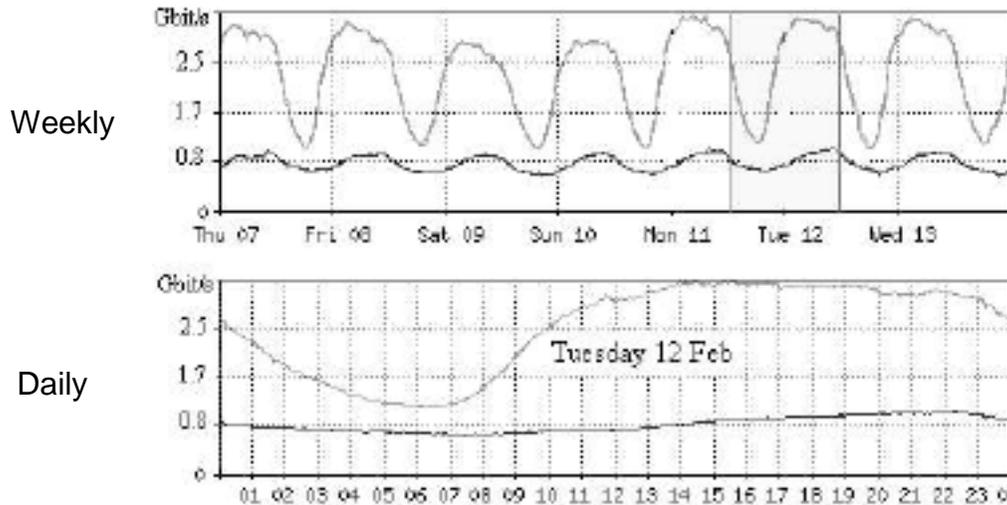
- Re-architect the network to reduce volume of traffic exchanged with other networks
  - Caches or mirrors of popular content within provider network
- Only works for “broadcast” traffic, not communications
  - Popular movie and music downloads, web sites
  - No effect on traffic used for communicating between individuals



# Solution: Smooth the demand

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- **Pricing or Architectural changes which alter the time pattern of traffic**
  - Typical traffic shows significant variation over time
  - User interface issues
- **Backhaul costs determined by traffic volume at peak usage levels**
  - Smooth peak demand into acceptable aggregate levels



Traffic on an  
OC-192 link

# **Solution: Subsidizing the connection cost**

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- **Recover cost of increased traffic by charging for another service offered by the access provider**
  - Web hosting, email, customer service, etc.
  - Local or affiliated content distribution
- **Better alignment between usage costs and prices is critical**
  - Inefficient methods for recovering cost will reduce incentive to improve broadband access available for general Internet traffic
  - Incentive to discriminate against general Internet traffic, either through traffic shaping or lack of investment
- **Other problems**
  - Competition for other services may make this difficult
  - Regulatory constraints

# Solution: Charge for Usage

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- **Recover the cost of increased traffic by charging for it directly**
- **Higher flat rates not a solution**
  - Increasing variance with access capability implies difficulty in establishing one flat rate across all users
  - Providers increasingly face competition for access offering
- **User experience issues**
  - Like mobile carrier “minutes”, but much harder to quantify
- **Other disadvantages**
  - Cost of metering usage
  - Usage charges may actually lower costs (through reduced traffic) more than they increase revenues

# Solution: Charge Third Parties

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- **Recover Usage Costs through charging third parties**
- **Examples currently in use:**
  - Local ad insertion in television
  - Call termination fees in telephony
  - Recommended devices
- **Improved delivery of content from “affiliated” content providers**
- **Competition from Edge**
  - Adware on personal computers

# Validating the Problem Statement

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- **Desire for pooled database, allowing analysis by researchers to validate assumptions and problem statement**
  - But Industry information on user behavior is considered highly confidential
- **For now, validation through comments on white paper draft from providers**
- **Approaches to Solutions**
  - Which solutions foster innovation ?
  - Are there other solutions we should consider ?