



## FCC Net Neutrality Disclosure for LUS Fiber

The following overview of the LUS Fiber network is in response to an FCC ruling on Net Neutrality. LUS Fiber has always tried to provide an open network and was already adhering to most of the provisions of that ruling.

### Network Overview

LUS Fiber operates a Fiber-To-The-Home (FTTH) network where fiber optics is brought past each home and business in the city of Lafayette. LUS Fiber will build a fiber drop from the street to connect to any home or business who buys service from LUS Fiber, where access is granted. We note that not all residential apartment buildings and multi-tenant office buildings are accessible to LUS Fiber. The FTTH network enables LUS Fiber to bring the exceedingly abundant bandwidth carrying capacity of fiber optics to every customer.

LUS Fiber also provides a more traditional SONET and Ethernet network that is used to provide transport and very large bandwidth to carriers and other large wholesale customers. Wholesale customers of LUS Fiber are defined as those that purchase transport and bandwidth from LUS Fiber and who then enhances the product for their own customers.

### Questions, Answers & Information Regarding Network Practices

#### Congestion Management

- Description of Congestion Management practices.
  - Following are the three potential chokepoints that can occur in the LUS Fiber FTTH network:
    1. Customers in this network share bandwidth on a fiber with up to 32 other customers. The customers share 2.4 Gigabits of data capacity on their fiber. The local 2.4 Gbps of bandwidth is used to deliver multiple services. These services include broadband services (Intranet and high speed Internet access), telephone service, and IPTV (Internet Protocol Television or digital cable TV) service. For public safety reasons (911 calls and Emergency Alert System broadcasts), LUS Fiber allocates bandwidth directly to telephone and IPTV services to ensure these services get to and from customers without delay. It is theoretically possible, but highly unlikely; that customers could all use a lot of bandwidth simultaneously.
      - The broadband services are “best effort” services, meaning that there is no absolute guarantee that a customer will always get the full bandwidth they have subscribed to at all times. However, there is still only a very small possibility of delay of broadband service. The following is the worst-case example.
        - All 32 customers on a local fiber subscribe to a digital tier of IPTV service that include high definition channels and are each watching 4 different HD programs at the same time;

- AND all 32 customers subscribe to telephone service and are talking on the phone at the same time;
  - AND all 32 customers subscribe to Internet service and request to use more than 50 Mbps of bandwidth at the same time.
2. Even if all of the above happens at the same time on a single local fiber, Internet access speeds purchased by customers would only be minimally affected and delayed. It is nearly impossible to imagine a scenario when all 32 local customers are using this much bandwidth simultaneously; therefore, the chance that there will be congestion on the local fiber is extremely low. Customer traffic can also be congested between the local or “neighborhood” fiber (the fiber feeding customers’ homes) and the LUS Fiber Headend facility. The fiber on routes between neighborhoods and the Headend have been sufficiently over-engineered and at the current customer levels there is no congestion on these paths and none expected for a number of years to come.
3. Customer traffic can become congested when it leaves the LUS Fiber network and hits the open Internet. LUS Fiber employs a diversity usage model which does not guarantee that all customers receive 100% of subscribed to speeds 100% of the time. Statistically, all LUS Fiber customers do not use all of their allotted Internet bandwidth at the same time, and the LUS Fiber network was designed to meet the busiest usage times of the day. To date, LUS Fiber customers have not used more bandwidth than is available in aggregate for all customers, so there has been no congestion on the Internet route. However, LUS Fiber sells Internet bandwidth as a “best effort” service and it is possible that there will be times in the future when there will be congestion on the access to the Internet. LUS Fiber will always try to remedy congestion by increasing the amount of Internet bandwidth between the LUS Fiber network and the Internet. Given the inherent and current bandwidth capacity and combined with the fact that there is sufficient bandwidth on each local fiber, no traffic on the LUS Fiber network is currently being delayed or restricted. Thus LUS Fiber is deploying no congestion management, other than monitoring the amount of customer usage on the Internet route.
- Types of traffic subject to these congestion management practices.
    - All traffic traversing the LUS Fiber network is subject to the current LUS Fiber traffic congestion practices. However, there is currently no congestion on the LUS Fiber network; therefore, no congestion management practices are being employed or enforced.
    - The LUS Fiber network carries the following types of broadband traffic:
      1. Traffic to/from a FTTH customer and the Internet.
      2. Traffic to/from a FTTH customer and a point on the LUS Fiber Intranet.
      3. Traffic to/from Wholesale customers and the Internet.
      4. Traffic to/from Wholesale customers on the LUS Fiber SONET/Ethernet network.
    - Again, LUS Fiber has no current congestion other than the theoretical congestion within a local fiber. No congestion management is currently required or being employed or enforced on broadband traffic. All broadband traffic is treated equally on the LUS Fiber network.

- Effects of these congestion management practices on an end user’s experience.
  - Since the LUS Fiber network has been engineered today to allow for the free flow of customer broadband traffic, the result is that customers are able to download and upload traffic at will at the speeds they have purchased, regardless of the types of traffic being downloaded or uploaded.
  
- Congestion indicators that trigger a practice.
  - LUS Fiber monitors aggregate customer usage to the Internet to make certain that there is enough bandwidth to allow free flow of customer traffic to and from the Internet. Congestion on the connection to the Internet backbone would be a trigger to purchase more bandwidth.
  - LUS Fiber has prepared congestion management practices and is ready to be employ or enforce them should traffic on the LUS Fiber network ever become congested.
  
- Usage limits and consequences of exceeding them
  - LUS Fiber places the following caps on the amount of total and accumulated bandwidth that a customer can use in one month.

**Residential Customers:**

|                     |        |           |
|---------------------|--------|-----------|
| 3 Mbps              | 100    | Gigabytes |
| 60 Mbps             | 900    | Gigabytes |
| 100 Mbps            | 2,000  | Gigabytes |
| 1 Gbps (1,000 Mbps) | 10,000 | Gigabytes |
| 2 Gbps (2,000 Mbps) | 15,000 | Gigabytes |

**Business Customers:**

|                     |        |           |
|---------------------|--------|-----------|
| 10 Mbps             | 800    | Gigabytes |
| 20 Mbps             | 1,100  | Gigabytes |
| 50 Mbps             | 1,400  | Gigabytes |
| 100 Mbps            | 2,000  | Gigabytes |
| 500 Mbps            | 6,000  | Gigabytes |
| 1 Gbps (1,000 Mbps) | 10,000 | Gigabytes |

- This monthly usage cap is only applied to Internet usage and any usage on the LUS Fiber Intranet. IPTV and telephone service is not included in measuring the accumulated usage for a month.
- The LUS Fiber Terms of Service allow LUS Fiber to direct a customer to upgrade to a faster tier or be disconnected from the LUS Fiber network if they consistently exceed these caps, but to date no customer has been contacted for exceeding the caps.

- Engineering standards used for practices and criteria
  - No standards are being used since no congestion is being experienced on the LUS Fiber network.

#### Application-Specific Behavior

- Does LUS Fiber block or rate-control specific protocols? If so, why?
  - LUS Fiber does block certain traffic in order to protect LUS Fiber broadband customers from malicious applications such as SPAM, Viruses, BOTs that take over computers, hackers and other malicious activities. LUS Fiber blocks traffic from network sources that are known by the industry to spread this malware and LUS Fiber blocks traffic from applications that are known to propagate these malicious activities.
  - If LUS Fiber did not block and/or control these types of activities, LUS Fiber high speed Internet customers' computers could get infected with all manner of viruses and other malware that could in-turn affect other networks through the Internet.
  - LUS Fiber does not block any other kinds of traffic. LUS Fiber subscribes to the philosophy of complete network neutrality and treats bits to and from all customers the same.
- Does LUS Fiber modify protocol fields in ways not prescribed by protocol standard?
  - LUS Fiber does not modify protocol fields not prescribed by protocol standards.
- Does LUS Fiber inhibitor favor certain applications or classes of applications?
  - LUS Fiber does not favor or inhibit applications or classes of applications of broadband traffic.  
All broadband traffic is treated equally.
  - As stated earlier, for public safety reasons, LUS Fiber does have protocols in place that will favor telephone and IPTV applications over broadband traffic if congestion were to occur on the LUS Fiber access network.

#### Device Attachment Rules

- Does LUS have any restrictions on the types of devices that they allow to connect to the network?
  - LUS Fiber has no restrictions on the types of devices that are allowed to connect to the network. Devices connecting to the Internet and Intranet network are only

required to be able to request and use an IP address.

- If there are restrictions, is there an approval procedure for devices connecting to the network?
  - Since there are no restrictions, there is no approval process.

## Security

- End-user and network security
  - LUS Fiber uses the following practices to ensure end-user and network security:
    - LUS Fiber employs DHCP Option 82. This is a protocol that attaches an identifier to all traffic on the network to identify what part of the network the traffic originated and the portion of the network the traffic is trying to reach. The use of this protocol helps LUS Fiber understand the flow of network traffic in order to best engineer and troubleshoot the network.
    - LUS Fiber uses Anti-Spoof software which is intended to identify and isolate one user's hardware and prevent it from impersonating another user's hardware.
    - LUS Fiber uses the industry practice of blacklisting and blocking access from other ISP networks that are spreading malicious software.
    - The LUS Fiber FTTH network uses encryption methods so that the data from every customer is encrypted which prohibits customers from gaining access to their specific traffic.
  - LUS Fiber uses these protocols and practices to protect and secure customer data as well as to protect the LUS Fiber broadband network for the benefit of all customers. LUS Fiber also uses some of these protocols to adhere to CALEA and other Law Enforcement requirements.
  - LUS Fiber also enforces a Residential Subscriber Agreement and a Business Subscriber Agreement. In said agreements LUS Fiber reserves the right to disconnect customers who repeatedly attempt to abuse the network through spreading malicious viruses, software, etc.
- Security mechanism triggers (excluding information that could reasonably be used to circumvent network security)
  - LUS Fiber believes that the encryption schemes and protocols used on the LUS Fiber FTTH network provide far more security than is available with other technologies.

- Practices on dealing with malware and other types of damaging traffic change all as the malware changes. LUS Fiber keeps current on the tools needed to fight malware.
- LUS Fiber monitors the network many times per second and a trigger would be finding any instance of unwanted intrusion on the network. LUS Fiber would react immediately to such an intrusion and would refer to Law Enforcement Agencies as needed.

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### Performance Characteristics

- General description of the service offered
  - Service technology
    - LUS Fiber uses a state-of-the-art Fiber-To-The-Home (FTTH) access system to deliver broadband services to customers. The FTTH system standard is called GPON (Gigabit Passive Optical Network). Up to 32 customers share one fiber in neighborhoods and this shared fiber is called a PON. The GPON system delivers 2,400 Megabits per second (Mbps) to the subscribers on a single PON and 1,200 Mbps from the subscribers on a single PON.
    - In the LUS Fiber FTTH network there are no electronics between the LUS Fiber substation and the customer. No electronics means that there are fewer failure points in the network and better service quality to customers.
  - Expected and actual speeds
    - Each subscriber to an LUS Fiber FTTH data product (Internet tier) receives two different data products.
      - Every broadband customer is given access to the LUS Fiber Intranet. This provides 100 Mbps access to and from any other customer on the LUS Fiber network. The expected speed for the Intranet service is 100 Mbps and the actual speed is 100 Mbps.
      - LUS Fiber also offers high speed Internet access speeds at 3, 10, 20, 50, 60, 100, 500, and 1000 Mbps in both directions. The expected speeds for these products is as advertised at 3, 10, 20, 50, 60, 100, 500, and 1000 Mbps respectively and the actual speeds being experienced by customers are the same as what is advertised. The LUS Fiber network delivers the speeds to customers that are the same as advertised. It is possible for customers to see much slower speeds on the open Internet, but slower Internet speeds are due to the

nature of the open Internet and not due to any blockage or slowdown on the LUS Fiber network.

- Expected and actual latency
  - The LUS Fiber network is designed to have an operating latency as great as 20 milliseconds. However, in real practice the actual latency is generally around 3 milliseconds or less.
- Suitability of service for real-time applications
  - We believe that the LUS Fiber network is one of the fastest and most accessible networks available in the US. Currently customers can achieve the speeds on our network that they subscribe to, 24/7, without slowdowns or blockages on our networks.

### Impact of Specialized Services

- What specialized services, if any, are offered to end users?
  - LUS Fiber offers two services that could be considered “Specialized” services over the FTTH access system. These services are IP Video (IPTV) and IP based telephone service.
  - Both IP Video and telephone service are delivered to customers over the same fiber bandwidth that is used to deliver broadband data (including high speed Internet traffic).
- Do any of these specialized services affect the last mile capacity available for, and performance of broadband Internet access service?
  - As described in the example provided earlier, there is only a very tiny theoretical chance that delivery of telephone and IPTV service could affect the delivery of broadband data speeds. To date LUS Fiber has never seen interference from these services.

### Wholesale Internet and Data Products

LUS Fiber sells Internet and data products over the wholesale network. These data products provide the customer with the subscribed speeds at all times. Customers can buy any speeds of data up to 1 Gbps. Prices are custom to the service, volume and term of services being purchased by the wholesale customer.

- Usage-based fees
  - LUS Fiber has no usage-based fees for data products.
- Fees for early termination
  - Customers on the FTTH network are not required to sign contracts, so there is no fee for termination. A customer can elect to sign a contract. Should a customer elect to sign a contract, there are fees for early termination. These fees are based on the remaining term of the contract.
  - Customers on the wholesale network sign contracts with LUS Fiber and the termination fees vary by contract. In the most extreme case the termination fee is equal to what the customer would have spent on bandwidth and transport had they not left the LUS Fiber Wholesale network.

#### Privacy Policies

- Do network management practices entail inspection of network traffic?
  - LUS Fiber examines traffic to the extent needed to utilize the network safety features listed earlier such as eliminating spam or intercepting malware. LUS Fiber does not inspect traffic for purposes other than to monitor, at the network level, where traffic flows in order to make certain that the network is adequate for the demands of customers.
- Is stored traffic information provided to third parties or used by LUS Fiber for non-network management purposes?
  - The only time that any stored information is provided to a third party is in response to a court order from a valid and qualified Law Enforcement Agency.

#### Redress Options

- Practices for resolving end-user and edge provider complaints and questions
  - LUS Fiber first logs all complaints of troubles as a trouble ticket in a trouble log system. This allows for a numeric identification of each trouble reported on the network. Trouble tickets can be generated by customers or self-generated by alarms located on the LUS Fiber network.
  - LUS Fiber then assigns a priority to each trouble ticket based upon the perceived severity of the problem. For example, outages involving multiple customers are given a higher priority than a minor network glitch affecting one customer.

- LUS Fiber attempts to identify and fix problems from its network operations center (NOC). If the NOC is unable to correct a reported problem remotely, then a technician is dispatched to resolve the issue.
- If the problem is of such severity that a field technician cannot resolve it, the problem is escalated to an LUS Fiber engineer. If the LUS Fiber engineer is unable to solve the problem, it is generally escalated to an external engineer or consultant or to the vendor that made the equipment in question. LUS Fiber contracts with various vendors for this purpose to ensure that they will respond to problems as needed for the network.
- Once a problem has been fixed, the customer maybe notified depending upon the severity and type of problem.
- Trouble tickets are kept permanently so that LUS Fiber is able to see a history of trouble at a specific customer site, a specific neighborhood or with a specific brand or piece of equipment.