

**Draft Response to TRAI Consultation Paper on Review of Tariff for Domestic
Leased Circuits (DLCs)**

Q1. What is expected to be the likely impact on competition and tariffs in the DLC sector, if the ISPs are permitted to provide DLCs in the future? Please provide your response with justification.

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Q2. What is the likely impact of tariffs for DLC on the bandwidth charges (including the transmission costs) or any other costs incurred by ISP operators, especially for ISP B & C operators who do not have their own transmission infrastructure? Further, what are the specific elements of DLC tariff which can be addressed in the regulation to make it more relevant for ISP B & C business? Please provide your response with justification.

Response: It is essential to recognize that the Indian DLC market is already overcrowded and hyper-competitive. **The impact on competition and tariffs should be viewed through the lens of this existing saturation:**

1. An already Overcrowded Market

- **High Number of Players:** The market is currently served by an extensive array of players, 71 National Long Distance (NLD) licenses and numerous Access Service Providers (ASPs). When including both national and local players, the field is effectively "**overcrowded.**"

2. Market-Led Tariff Discovery

- **Existing Deep Discounts:** Current market dynamics have already driven tariffs to record lows. Service providers are already offering discounts ranging from 20% to 98% below the existing TRAI ceiling tariffs.

3. Justification for Forbearance

Given that the market is already crowded and prices are significantly below regulatory ceilings, **there is no evidence of market failure.** The expansion of the provider base to include ISPs further reinforces the case for complete tariff forbearance. Competitive forces, rather than regulatory intervention, are the most effective mechanism for ensuring fair pricing.

Q3: Should the MPLS-VPN DLCs be brought under the tariff regulation framework? Please provide your response with justification.

Response: MPLS-VPN DLCs should not be brought under the tariff regulation framework and should continue to remain under forbearance, based on the following justifications:

1. Defined Market Dynamics and Hyper-Competition: The primary objective of tariff regulation is to protect consumers in markets with limited competition or high entry barriers. However, the Indian VPN market is already hyper-competitive. Imposing a regulatory ceiling in such a mature market would be redundant and may stifle the flexibility required for customized enterprise solutions.

2. MPLS-VPN: A Technology in Decline: The push to regulate MPLS-VPN comes at a time when technology itself is being challenged and gradually replaced by more modern, efficient, and cost-effective alternatives:

- **Defining MPLS Technology:** Multiprotocol Label Switching (MPLS) is a routing technique that directs data from one node to the next based on short path labels rather than long network addresses, allowing for the creation of Virtual Private Networks (VPNs) over shared infrastructure.
- **The Shift to SD-WAN and Cloud:** While MPLS offered scalability in the past, it is increasingly viewed as a "legacy" or "declining" technology. Enterprises are rapidly migrating to SD-WAN (Software-Defined Wide Area Network) and Cloud-based DLCs, which offer superior dynamic routing and better integration with cloud services.
- **Regulatory Risk:** Bringing a technology that is already being phased out by market trends under a rigid tariff framework would be counterproductive. It would force regulators to manage a "technology of the past" rather than focusing on the infrastructure of the future.

3. Nature of the Service: Unlike standard point-to-point (P2P) circuits, MPLS-VPNs are typically delivered as Managed Services rather than simple network pipes.

- **Value-Added Components:** These services are bundled with complex Service Level Agreements (SLAs), uptime guarantees, security layers, and 24/7 managed support.
- **Complexity of Costing:** Because these tariffs are inclusive of managed services and security, they do not follow a simple distance-based cost model. Imposing a standard tariff ceiling would ignore these critical value-added components and could lead to a decline in service quality.

Q4: What are the key differences in cost structure and service delivery between traditional P2P-DLCs and MPLS-VPNs that should be reflected in tariff regulation? Please provide your response with justification.

Response:

Key Differences in Cost Structure and Service Delivery

P2P-DLCs (The Transport Layer):

- **Service Model:** These are physical or dedicated logical links providing raw, transparent transport between two specific endpoints (Point-to-Point).
- **Cost Structure:** Pricing is primarily distance and bandwidth dependent. Costs are driven by heavy capital investment in physical infrastructure (fiber, Right of Way (RoW) and high-capacity transmission equipment like DWDM).
- **Network Role:** P2P-DLCs function as the underlying transport network. They provide the high-reliability "pipes" upon which all other services are built.

MPLS-VPNs (The Overlay Service):

- **Service Model:** MPLS-VPN is a subset overlay service that runs on top of the physical transport layer. It provides "**any-to-any**" connectivity by creating logical circuits over a shared network infrastructure.
- **Cost Structure:** Unlike P2P-DLCs, VPN costs are bandwidth and port-based rather than strictly distance-based. Since multiple customers share the same backbone, providers achieve significant resource optimization (bandwidth, power, and port utilization).
- **Service Delivery:** VPNs offer intelligent traffic management (Quality of Service - QoS) and managed features (CPE management, security, and cloud integration) making them a value-added managed service rather than a raw commodity.
- **While P2P-DLC and MPLS-VPN differ in architecture and billing—P2P being distance-based and circuit-oriented, and MPLS-VPN being port- and site-based within a managed IP framework—these are commercial and technological variations. They do not justify separate tariff prescriptions.**

Given the competitive and commercially negotiated nature of the enterprise connectivity market, we submit that regulatory forbearance should continue for both P2P-DLC and MPLS-VPN.

Q5. What has been the impact of deployment of DWDM, SD-WAN and Ethernet over Fiber on provisioning of DLCs, in terms of operations, costs and tariffs? Should the regulation incorporate these technological changes in the ceiling tariff framework? Please provide your response with justification.

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Q6. Are there any other technological changes apart from the ones mentioned in above paragraphs in provisioning of DLCs in India? If yes, what has been the impact of deployment of such technologies on provisioning of DLCs, in terms of operations, costs and tariffs? Should the regulation incorporate these technological changes in the ceiling tariff framework? Please provide your response with justification. Telecom Regulatory Authority of India

Response:

- SD-WAN provides centralized control and automation, enabling dynamic traffic routing across multiple links (DLCs, broadband, LTE). It integrates seamlessly with modern network architecture and cloud-based services.
- SD-WAN reduces operational costs through automated management and more efficient use of multiple connectivity links.
- Ethernet over Fiber offers high-bandwidth services with dynamic and fast provisioning, allowing providers to meet high-capacity demands quickly.
- DWDM significantly increases transmission capacity by optimizing fiber utilization and increasing equipment capacity.

In terms of costs and tariffs, these technologies have driven down both capital and operating costs per unit of bandwidth, particularly in fiber-rich, competitive corridors.

There is no basis for incorporating these technological developments into a tariff framework. Any attempt to regulate tariffs risks mispricing complex, differentiated services and discouraging ongoing investment and innovation. Accordingly, tariff forbearance remains the most appropriate regulatory approach.

Q7. As an alternative to Q5 & Q6, should the Authority consider technology-neutral tariff models, focusing on bandwidth and service commitments rather than provisioning technologies? If yes, what should the criteria for the same? Please provide your response with justification.

Response: At the outset, we submit that the Authority should continue to maintain regulatory forbearance in respect of tariffs for DLCs across all capacities and technologies.

- In the current market environment, neither technology-specific tariff regulation nor a technology-neutral tariff prescription based on bandwidth and service commitments is warranted.
- The existing tariff framework for DLCs, first introduced under the Telecommunication Tariff Order (TTO), 1999 and last revised in 2014, was formulated in a market context where DLCs represented the primary and often the only reliable enterprise connectivity solution.
- Regulatory oversight at that time was justified to ensure fair access, prevent abuse of dominance, and facilitate enterprise adoption.
- The Authority should **not** introduce technology-neutral tariff models for DLCs or enterprise connectivity services. Instead, **regulatory forbearance across all capacities** should be maintained under a stable and predictable policy framework.
- The enterprise connectivity market is already competitive, technologically diverse, and fully driven by commercial negotiations. Service commitments vary widely across customers, making standardized tariffs both impractical and distortive. **Continuing forbearance will prevent contracting distortions and ensure the financial viability needed for sustained fibre rollout and digital infrastructure expansion.**

Q9. Should the proposed regulation include staggered tariffs in line with service commitments, possibly further staggered for different regions, for both VPN & P2P based DLC? If yes, what are the service commitments, mentioned as reply to Q8, which should be considered for tariff regulation?

Response: There is no need to include staggered tariffs in the proposed regulation, as such a move is neither technically feasible nor commercially viable

- 1) Modern DLC and VPN services are highly customized "**managed services**" rather than standardized network pipes. Service commitments, including uptime guarantees, latency, packet loss, and response times are driven entirely by specific customer needs and the unique technical requirements of their applications.

- 2) Introducing staggered layers for both service commitments and regional variations would create a highly fragmented and ambiguous tariff structure. Instead of providing clarity, it would lead to disputes over service classifications and make it difficult for enterprise customers to compare **"like-for-like"** offerings from multiple providers.
- 3) The market is already hyper-competitive, with discounts on base tariffs reaching as high as for P2P-DLCs and similar levels for VPNs. This intense competition already ensures that pricing **is naturally "staggered" through** commercial negotiations and transparent tender processes. Any additional regulatory layering would only serve to distort these natural market incentives.

As noted in the consultation paper, the growing prevalence of IP-based networks has already led to more standardized, uniform bandwidth-based pricing that is largely independent of technology and distance. Moving back to complex, staggered regional or commitment-based models would be a regressive step that ignores current technological trends.

Therefore, Staggered tariffs based on service commitments or geographic regions for VPN- or P2P-based DLCs are neither necessary nor appropriate. The Authority should continue with **regulatory forbearance** for all DLC services.

Q10. What reporting mechanisms should be mandated to ensure transparency in discounts and service bundling for DLCs? Please provide your response with justification.

Response: No additional reporting mechanisms should be mandated for Domestic Leased Circuits (DLCs). The current market for enterprise connectivity is characterized by hyper-competition and extreme price sensitivity, rendering further regulatory reporting unnecessary and counterproductive.

- a) In the current DLC landscape, transparency is naturally ensured by the presence of competitive players. Enterprise customers are highly sophisticated and typically utilize competitive tender processes to select providers based on the best combination of price and Service Level Agreements (SLAs).
- b) VPN-based DLCs and services below 2 Mbps have been under tariff forbearance since 2014. During this period, the market has seen massive discounts without the need for rigid reporting frameworks.
- c) Rigid reporting often precedes rigid tariff fixing. As enterprises shift toward next-generation technologies like SD-WAN and Cloud-based networks, any attempt to fix or report on legacy DLC products risks creating artificial barriers to the adoption of future-ready network solutions.

Therefore, there should be **no mandated reporting mechanisms** solely for ensuring transparency in DLC discounts or service bundling. Transparency is already ensured through competitive commercial practices, contractual disclosures, and informed enterprise procurement. Imposing additional reporting requirements would only create unnecessary

compliance burdens without delivering any meaningful benefit to competition, consumer choice, or market efficiency.

Q.11 Should the Authority mandate standardized tariff disclosure formats for all DLC service providers? Please provide your response with justification.

There is *no justification* for mandating standardized tariff disclosure formats for DLC service providers. Such a requirement would be unnecessary, commercially intrusive, and inconsistent with a regulatory environment based on forbearance. Specifically, it would:

- Undermine commercial confidentiality and limit the flexibility required for bilateral tariff negotiations. Expose competitively sensitive information in a market that is already intensely priced.
- Introduce avoidable regulatory complexity without evidence of any market failure that warrants intervention.
- Distort healthy competitive dynamics that currently ensure efficient price discovery; and
- Deviate from the well-established and successful principles underpinning a forbearance-based regulatory framework.

Q12. Should TRAI use the same cost methodology i.e. BU-FAC for computing cost based ceiling tariffs for P2P DLCs as was used in 2014? Please provide your response with justification.

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Q13. In case response to the above question is affirmative, what values of the following items should be used for estimation of ceiling tariffs for DLCs:

- (i) Return of Capital Employed (ROCE)
- (ii) Useful lives of transmission equipment and Optical Fibre Cable separately
- (iii) Average no. of fibre pairs lit in OFC in trunk segment and local lead segment separately
- (iv) Utilization factor of OFC system in trunk segment and local lead segment separately
- (v) % of use for the transmission equipments used at local lead junction points and in trunk segment for DLCs
- (vi) If the repeaters are still being used in the trunk segment, what is the average distance between two repeater sites?
- (vii) What is the factor of use (no. of circuits in underlying OFC system) to be taken into consideration at local lead and trunk segment for computation of ceiling tariffs?

Response: The Authority should not move toward another round of cost-based ceiling fixation using the BU-FAC or any other methodology.

- The primary purpose of the BU-FAC model in 2014 was to prevent monopolistic pricing. Today, with numerous active players and the entry of ISPs into the DLC segment, the market has reached a level of hyper-competition. Current market-discovered prices are already below the existing 2014 ceilings, rendering cost-based regulation redundant.
- BU-FAC is a backward-looking, static model that struggles to keep pace with rapid technological shifts like SD-WAN, DWDM and 5G backhaul. These technologies have

fundamentally altered the cost structure by significantly lowering the unit cost of bandwidth, which competitive forces are already passing on to consumers far more efficiently than a regulatory ceiling could.

- With the rise of IP-based backbones, the distinction between a "trunk" and "local lead" segment is becoming technically blurred, making segment-specific utilization factors and "lit fiber" counts an inaccurate basis for modern tariff regulation.
- The cost of **Right of Way (RoW)**, a critical component of the cost structure, is extremely volatile and varies significantly between municipal bodies, making it impossible to fix a single "national" value that is fair to all providers.

Q14. As an alternative to the BU-FAC methodology, or in addition to it, should LRIC or any other methodology be considered for computing ceiling tariffs for P2P DLCs? Please support your view with detailed justification along with data and assumptions

Response: Please refer to Q12

Q15. What should the bandwidth capacities be, including the minimum and maximum bandwidth capacity, of P2P DLC for which ceiling tariffs need to be prescribed? In case of bandwidth capacities not regulated in the 2014 TTO, what should be the concomitant value of the relevant factors mentioned at Q13? Please provide your response with justification

Response:

- **Success of Forbearance for Higher Capacities:** In the 2014 TTO (57th Amendment), bandwidths beyond 622 Mbps (STM-4) were left under forbearance. This approach has been highly successful, fostering a competitive market where prices for high-capacity links have dropped significantly due to technological advances and competitive pressure. There is no reason to reverse this successful trend by introducing new regulations for higher capacities.
- **Irrelevance of Bandwidth "Slabs" in IP Networks:** With the shift to **Ethernet over Fiber and IP-based backbones**, bandwidth is no longer a rigid physical constraint but a software-defined allocation. Customers often require "burstable" or flexible bandwidth models that do not fit into traditional, regulated capacity buckets.
- **Already Affordable Low-End Circuits:** Even for lower bandwidths (like E1), the market is already offering rates that are **below the 2014 ceilings**. This demonstrates that even without a "minimum" regulated capacity, market forces are effectively protecting smaller consumers and SMEs.

Therefore, The Authority should maintain **full tariff forbearance** for P2P-DLCs across all bandwidth capacities. Current market conditions do not warrant technology-specific tariff controls or bandwidth-based ceiling prescriptions.

Q16. Should the Authority consider the cost methodologies used in other countries for determining tariffs for P2P-DLCs? If so, which methodologies would

be appropriate for the present exercise? Please provide your response with justification along with data and assumptions.

Response:

Given the competitive intensity, technological diversity, and predominantly commercial negotiation-driven nature of the Indian enterprise connectivity market, adopting foreign cost-based methodologies for determining P2P-DLC tariffs would neither be appropriate nor beneficial. The Indian market's dynamics are fundamentally different and are best served by the continued reliance on market-led price discovery under a forbearance-based framework.

Q17. Is there a need for prescribing separate ceiling tariffs for local lead and trunk segments? Should the Authority adopt different cost methodology for local lead and trunk segment for provisioning of DLCs? If yes, please provide your response with justification

Response: No, there is no need to prescribe separate ceiling tariffs for local lead and trunk segments. The Authority should continue with a regime of regulatory forbearance for DLC services across all segments.

- Today enterprise customers do not purchase local leads and trunk segments as separate commodities. They demand **end-to-end managed connectivity** solutions with a single price point and a unified Service Level Agreement (SLA). Regulating these components separately would disrupt the current "one-window" commercial practice and create unnecessary billing complexity for both the provider and the customer.
- **IP-based backbones and Software Defined Networks (SDN)**, the technical distinction between "local lead" and "trunk" has become increasingly blurred. Modern equipment allows for dynamic routing and bandwidth allocation across the entire network path, making segment-specific cost-allocation models (like separate BU-FAC or LRIC) technically outdated and operationally difficult to implement.
- Introducing separate ceilings for different segments would create a "grey area" regarding the handover points and jurisdictional boundaries between local and long-distance segments. This ambiguity could lead to disputes between service providers and regulatory overhead that would ultimately increase the cost of doing business.

Q.18 Should the Authority adopt BU-FAC, LRIC or any other methodology for computing ceiling tariffs for VPN DLCs? Please support your view with a detailed justification along with data and assumptions.

Response: VPN-DLC tariff regulation should continue to be governed by forbearance, as maintained in the TTO (57th Amendment), 2014.

- Since the 2014 amendment, VPN services have operated successfully under a forbearance regime. This has fostered a stable investment environment and allowed service providers to offer innovative, customer-centric solutions without rigid regulatory constraints.

- **Effective Competition:** The VPN segment is characterized by intense competition with a large number of players, including NLDOs, ASPs, and soon, ISPs. This high level of competition acts as a natural check on pricing, with current market rates already significantly lower than the ceilings prescribed for traditional P2P-DLCs.

2. Technical and Operational Complexity

- **Shared Infrastructure Model:** VPNs (such as MPLS-VPNs) utilize **shared network infrastructure**. Unlike P2P-DLCs, which involve dedicated point-to-point links. Apportioning costs for shared elements using methodologies like BU-FAC or LRIC is technically complex, highly subjective, and prone to inaccuracies that could lead to market distortions.
- **Service Differentiation:** VPNs are often bundled as part of a "Managed Service" package including security, cloud integration, and specialized Service Level Agreements (SLAs). Prescribing a cost-based ceiling for such heterogeneous services is impractical and would stifle innovation in service delivery.

3. Economic and Market Realities

- **Incentive for Innovation:** VPN technology is rapidly evolving with advancements like **SD-WAN** and **Network Function Virtualization (NFV)**. A rigid, cost-based regulatory model (typically backward-looking) would fail to account for these dynamic shifts and could discourage providers from deploying next-generation technologies.

Therefore, the Authority should maintain **forbearance** for VPN-DLC tariffs and refrain from adopting BU-FAC, LRIC, or any other cost-based methodology for ceiling tariff determination.

Q19. What should the bandwidth capacities, including the minimum and maximum bandwidth capacity, of VPN DLC for which ceiling tariffs need to be prescribed? Please provide your response with justification.

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Q20. Should the Authority consider the cost methodologies used in other countries for determining tariffs for VPN-DLCs? If so, which methodologies would be appropriate for the present exercise? Please provide your response with justification along with data and assumptions.

Response: Refer to response to Question 18. VPN-DLC services should remain under regulatory forbearance, consistent with the TTO (57th Amendment), 2014.

Q21. Should the spectrum charges recommended for a point-to-point link of 28MHz paired bandwidth in the 6GHz(lower) band, be taken as reference for DLC ceiling tariff? If yes, what could be the approximate order of multiple between the backhaul link charges and DLC ceiling tariff? Should the reference be considered for local lead or trunk segment or on overall basis? Please provide your response with justification.

Response: The spectrum charges for a point-to-point link of 28 MHz paired bandwidth in the 6 GHz (lower) band **should not be taken as a reference** for determining DLC ceiling tariffs. Furthermore, we strongly advocate that the Authority continue to maintain a **regulatory forbearance regime** for DLC services across all technologies and capacity segments. Our justification is as follows:

- **Inherent Difference in Cost Drivers:** DLC services are predominantly provided over **optical fiber networks**, where the primary cost drivers are Right of Way (RoW), fiber deployment, and high-capacity switching/routing equipment.
- Wireless backhaul, using the 6 GHz band is a niche alternative used primarily for specific terrain challenges or temporary links. Anchoring fiber-based DLC tariffs to wireless spectrum pricing would be fundamentally flawed and economically non-representative.
- **Managed Service vs. Raw Spectrum:** A DLC is a **managed end-to-end service** carrying strict Service Level Agreements (SLAs) regarding uptime, latency, and packet loss. Spectrum charges represent only a minuscule fraction of the cost of providing such a managed service. Using a raw spectrum fee as a baseline would ignore the significant OPEX involved in network monitoring, maintenance, and multi-layered service delivery.
- **Technological Neutrality:** Regulatory principles should remain technology neutral. Linking DLC tariffs to a specific wireless frequency band (6 GHz) would create an uneven playing field and could inadvertently penalize or subsidize one technology over another (e.g., Fiber vs. Microwave vs. Satellite).
- **Forbearance as the Optimal Path:** Given that current market rates are significantly lower than any historically prescribed ceilings, there is no evidence of market failure. Therefore, recommends that the Authority **avoid anchoring DLC tariffs to spectrum metrics** and instead continue with the successful policy of forbearance, allowing competition to determine pricing.

Q22. Is the distance-based pricing, based on distance slabs contained in the 2014 TTO (57th Amendment), still relevant for prescribing ceiling tariffs for P2P DLCs? Should the Authority consider new distance slabs, separately for both the local lead and trunk segments, for prescribing ceiling tariffs for P2P DLC? Please provide your response with justification.

- **Uniformity and Market-Led Discovery:** Introducing location-specific ceiling tariffs would fragment the regulatory framework and create unnecessary complexity. In a mature and highly competitive market, price discovery is most effectively achieved through market forces rather than geographically differentiated regulations. Allowing uniform tariffs ensures that competition, not administrative segmentation, drives efficient and transparent pricing.
- **Technological Neutrality:** Modern networks increasingly leverage satellite communication, IP-based backbones, and software-defined overlays such as SD-WAN. These technologies significantly reduce the correlation between service cost and physical terrain. Maintaining a

uniformity across regions encourages providers to deploy the most efficient and innovative technologies without being constrained by legacy distance-based or terrain-based tariff structures.

Q23. Is there a need for prescribing separate ceiling tariffs for remote and hilly areas? What criteria should be used to define such regions? Please provide your response with justification.

Response: No need to prescribe separate ceiling tariffs for remote and hilly areas.

Q24. How can the Authority ensure affordability in low-competition areas, such as remote and hilly areas, without distorting market incentives? Please provide your response with justification.

Response: DLC services are already affordable across the country, including in remote and hilly areas. The current market dynamics are sufficient to ensure affordability without the need for additional intervention that might distort market incentives.

- The adoption of IP-based backbones, Satellite communication and SD-WAN have decoupled service delivery from the physical constraints of terrain. These technologies allow for more efficient use of infrastructure, significantly reducing the cost of carrying data to remote locations. Market forces are already passing these cost efficiencies to customers through flexible, bandwidth-based pricing.
- Affordability in difficult terrains is best addressed by reducing the cost of provisioning rather than capping tariffs.

Therefore, The Authority should allow market forces to continue driving affordability, service innovation, and infrastructure expansion, including in remote and hilly regions. A uniform **regime of regulatory forbearance** best upholds the principles of non-discriminatory access, equitable service provision, and regulatory certainty.
