Fixed Broadband Quality of Service (QoS) Surveys

Network End Surveys

### Quarter-01 2025

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1. Executive Summary

Pakistan Telecommunication Authority (PTA) has carried out Quality of Service (QoS) Survey of 46 x unique operators in 17 x major cities of Pakistan during 1st Quarter 2025. During the survey, the performance of fixedline broadband operators have been assessed in accordance with the Fixedline Broadband Regulation, 2022. Operator wise & Citi wise summary of operators are mentioned below:

51 Locations Tested	46 Unique Operators	17 Major Cities	At 15 locations, Operators are fully complied
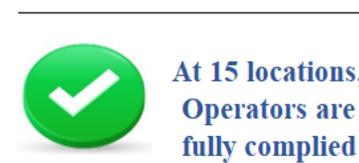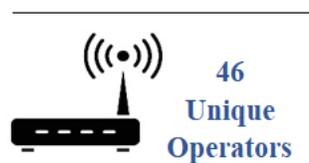
Operator Wise – Compliance Status

Sr No.	Company Name	City	Overall Score	Percentage Compliance (%)	Compliance Status
1	PTCL	Quetta	6	100.00	⬆
2	PTCL	Abbottabad	6	100.00	⬆
3	PTCL	Hub	5	83.33	➡
4	NTC	Peshwar	3	50.00	⬇
5	NTC	Hub	2	33.33	⬇
6	Galaxy	Khairpur	5	83.33	➡
7	Galaxy	Karachi	5	83.33	➡
8	PaceTel	Abbottabad	6	100.00	⬆
9	PaceTel	Haripur	6	100.00	⬆
10	Burak Tech	Sukkur	5	83.33	➡
11	D3 Advertising	Sukkur	6	100.00	⬆
12	Fiberish	Sukkur	6	100.00	⬆
13	TesMedia	Shikarpur	5	83.33	➡
14	Brilliant Enterprise	Quetta	5	83.33	➡
15	SpeedNet	Quetta	2	33.33	⬇
16	SCO	Gilgit	0	0.00	⬇

17	Sky Tel	Mirpur	3	50.00	⬇
18	WiCloud	Mirpur	4	66.67	⬇
19	Gul Techno.	Mirpur	5	83.33	➡
20	Gorsi Tele	Kotli	5	83.33	➡
21	Netpoint	Kotli	3	50.00	⬇
22	Telenex	Lahore	6	100.00	⬆
23	Well NW	Lahore	5	83.33	➡
24	Lahore Online	Lahore	6	100.00	⬆
25	Z Com Networks	Lahore	4	66.67	⬇
26	Net Comm	Lahore	4	66.67	⬇
27	Logon	Karachi	5	83.33	➡
28	Gemnet	Karachi	5	83.33	➡
29	Dreams NW	Karachi	6	100.00	⬆
30	Netsol	Karachi	4	66.67	⬇
31	Optix	Peshwar	5	83.33	➡
32	Solace Tel	Islamabad	6	100.00	⬆
33	MediaHut	Islamabad	4	66.67	⬇
34	Aero Comm.	Rawalpindi	6	100.00	⬆
35	ClickPick Comm.	Rawalpindi	6	100.00	⬆
36	Waylink	Rawalpindi	5	83.33	➡
37	Airmax	Abbottabad	5	83.33	➡
38	GlobalXpert	Abbottabad	6	100.00	⬆
39	CyberNet	Abbottabad	5	83.33	➡
40	WifiInternet	Abbottabad	6	100.00	⬆
41	NewMillinium	Haripur	5	83.33	➡
42	PrimeNW	Multan	4	66.67	⬇
43	Instacom	Multan	4	66.67	⬇
44	MISPL	Multan	4	66.67	⬇
45	DuosLinks	Multan	4	66.67	⬇
46	Getlinks	Multan	4	66.67	⬇
47	AANet	Faisalabad	5	83.33	➡
48	Orbit	Faisalabad	4	66.67	⬇
49	McSol	Faisalabad	3	50.00	⬇
50	XtremeNet	Faisalabad	4	66.67	⬇
51	CitydotNet	Faisalabad	4	66.67	⬇

City Wise – QoS KPIs Compliance Status

City	Company Name	Network Availability Core Nodes >=99.9%		Network Availability - Access Nodes >=99%		RTT - Local Network Latency <= 40msec		RTT - International Segment – Terrestrial <= 110msec		Bandwidth Utilization<=80%		Jitter<=15msec	
		Obtained %	Compliance (Y/N)	Obtained %	Compliance (Y/N)	Obtained %	Compliance (Y/N)	Obtained %	Compliance (Y/N)	Obtained %	Compliance (Y/N)	Obtained %	Compliance (Y/N)
Sukkur	Burak Tech	100.00	Y	100.00	Y	1.20	Y	18.50	Y	88.00	N	0.62	Y
Sukkur	D3 Advertising	100.00	Y	100.00	Y	1.00	Y	20.95	Y	65.30	Y	1.75	Y
Sukkur	Fiberish	100.00	Y	100.00	Y	1.05	Y	22.70	Y	80.00	Y	0.86	Y
Shikarpur	TesMedia	100.00	Y	100.00	Y	1.00	Y	20.60	Y	87.70	N	1.35	Y
Khairpur	Galaxy	100.00	Y	100.00	Y	1.05	Y	21.65	Y	84.00	N	2.72	Y
Quetta	PTCL	100.00	Y	100.00	Y	2.25	Y	33.75	Y	54.00	Y	1.06	Y
Quetta	Brilliant Enterprise	100.00	Y	100.00	Y	2.30	Y	29.75	Y	83.00	N	0.33	Y
Quetta	Speed Cable Net	90.81	N	90.81	N	2.55	Y	40.10	Y	85.00	N	16.10	N
Gilgit	SCO	-	N	-	N	-	N	316.00	N	-	N	27.00	N
Mirpur	Sky Tel	99.00	N	99.00	Y	1.65	Y	266.10	N	93.00	N	0.40	Y
Mirpur	WiCloud	99.70	N	100.00	Y	6.70	Y	54.00	Y	86.00	N	1.00	Y
Mirpur	Gul Techno.	99.99	Y	99.97	Y	13.10	Y	74.40	Y	80.00	Y	47.00	N
Kotli	Gorsi Tele	100.00	Y	100.00	Y	1.85	Y	40.00	Y	40.00	Y	33.00	N
Kotli	Netpoint	93.00	N	96.00	N	5.50	Y	37.95	Y	98.70	N	1.50	Y
Lahore	Telenex	100.00	Y	99.83	Y	2.45	Y	43.15	Y	9.00	Y	2.25	Y
Lahore	Well NW	100.00	Y	100.00	Y	1.25	Y	159.15	N	54.00	Y	0.90	Y
Lahore	Lahore Online	100.00	Y	100.00	Y	0.00	Y	38.55	Y	32.00	Y	0.70	Y
Lahore	Z Com Networks	92.00	N	92.00	N	2.25	Y	31.65	Y	4.40	Y	2.01	Y
Lahore	Net Comm	96.74	N	96.74	N	0.00	Y	31.40	Y	5.58	Y	0.63	Y
Karachi	Logon	100.00	Y	93.34	N	2.40	Y	14.20	Y	61.00	Y	0.59	Y
Karachi	Gemnet	100.00	Y	100.00	Y	1.00	Y	20.95	Y	92.00	N	1.48	Y

City	ISP												
Karachi	Dreams NW	99.97	Y	99.98	Y	1.15	Y	18.15	Y	63.00	Y	8.74	Y
Karachi	Netsol	100.00	Y	**95.12**	**N**	7.25	Y	74.50	Y	**97.00**	**N**	0.50	Y
Karachi	Galaxy	100.00	Y	100.00	Y	1.00	Y	22.70	Y	**97.00**	**N**	0.66	Y
Peshawar	NTC	100.00	Y	100.00	Y	**40.40**	**N**	77.10	Y	**90.90**	**N**	**21.26**	**N**
Peshawar	Optix	100.00	Y	99.00	Y	6.90	Y	39.60	Y	**84.00**	**N**	0.57	Y
Islamabad	Solace Tel	100.00	Y	100.00	Y	0.45	Y	42.10	Y	56.43	Y	4.53	Y
Islamabad	MediaHut	100.00	Y	**-**	**N**	1.25	Y	31.70	Y	**91.09**	**N**	3.12	Y
Rawalpindi	Aero Comm.	100.00	Y	100.00	Y	2.05	Y	48.50	Y	50.47	Y	2.96	Y
Rawalpindi	ClickPick Comm.	100.00	Y	100.00	Y	8.60	Y	40.45	Y	68.49	Y	2.58	Y
Rawalpindi	Waylink	100.00	Y	100.00	Y	2.40	Y	45.50	Y	**87.04**	**N**	3.09	Y
Abbottabad	Airmax	100.00	Y	100.00	Y	2.20	Y	93.70	Y	**95.00**	**N**	1.16	Y
Abbottabad	GlobalXpert	100.00	Y	100.00	Y	12.30	Y	46.40	Y	70.00	Y	11.75	Y
Abbottabad	PTCL	100.00	Y	99.90	Y	7.35	Y	50.80	Y	68.00	Y	3.43	Y
Abbottabad	CyberNet	100.00	Y	100.00	Y	23.05	Y	45.85	Y	75.09	Y	**19.52**	**N**
Abbottabad	WifiInternet	100.00	Y	100.00	Y	5.50	Y	60.35	Y	70.00	Y	6.72	Y
Abbottabad	PaceTel	100.00	Y	100.00	Y	8.45	Y	53.55	Y	68.83	Y	13.75	Y
Haripur	PaceTel	100.00	Y	100.00	Y	9.10	Y	40.15	Y	64.33	Y	8.25	Y
Haripur	NewMillinium	100.00	Y	100.00	Y	4.35	Y	46.85	Y	**88.89**	**N**	4.87	Y
Multan	PrimeNW	100.00	Y	100.00	Y	2.45	Y	**281.00**	**N**	**99.75**	**N**	0.64	Y
Multan	Instacom	100.00	Y	99.08	Y	0.00	Y	**286.05**	**N**	**99.75**	**N**	0.94	Y
Multan	MISPL	100.00	Y	99.79	Y	1.05	Y	**263.10**	**N**	**90.00**	**N**	1.49	Y
Multan	DuosLinks	99.94	Y	99.90	Y	3.95	Y	**303.15**	**N**	**83.40**	**N**	1.16	Y
Multan	Getlinks	99.99	Y	99.99	Y	1.50	Y	**277.70**	**N**	**100.00**	**N**	0.66	Y
Faisalabad	AANet	100.00	Y	100.00	Y	4.65	Y	95.55	Y	**81.00**	**N**	1.86	Y
Faisalabad	Orbit	100.00	Y	100.00	Y	15.75	Y	41.00	Y	**94.00**	**N**	**54.06**	**N**
Faisalabad	McSol	100.00	Y	100.00	Y	14.60	Y	**112.25**	**N**	**85.00**	**N**	**106.91**	**N**
Faisalabad	XtremeNet	100.00	Y	100.00	Y	**45.60**	**N**	72.45	Y	76.00	Y	**124.97**	**N**
Faisalabad	CitydotNet	100.00	Y	100.00	Y	36.80	Y	56.00	Y	**97.00**	**N**	**129.19**	**N**
Hub	PTCL	100.00	Y	99.89	Y	37.70	Y	48.95	Y	68.00	Y	**71.00**	**N**
Hub	NTC	100.00	Y	100.00	Y	**87.50**	**N**	**130.95**	**N**	**86.90**	**N**	**107.00**	**N**

Note: **Red Highlighted KPIs are non-complied.**

2. Background

The **Fixedline Quality of Service (QoS)** surveys for fixedline operators are conducted to assess the performance, reliability, and user satisfaction of fixed-line broadband services across Pakistan. This survey aims to understand how well service providers meet the regulatory benchmarks and consumer expectations for internet speed, connectivity stability, and customer support. As fixed-line broadband plays a crucial role in both personal and business communication, ensuring high-quality service is critical for the continued growth of digital infrastructure.

These Surveys across Pakistan are governed by the "Fixed Broadband Quality of Service Regulations, 2022." The regulations were enacted to set **Key Performance Indicators (KPIs)** that BSPs must meet to ensure reliable and high-quality fixed broadband services across Pakistan. These KPIs serve as measurable benchmarks to assess the service quality delivered to customers, including aspects such as network uptime, data throughput, latency, jitter, packet loss, and customer service responsiveness.

3. Scope

QoS surveys are crucial tools for measuring the performance of broadband networks in Pakistan, ensuring service providers adhere to high standards, and continually improving the availability and quality of internet services for consumers. These surveys cover all fixed broadband technologies in use, such as xDSL, DSL, copper and fiber optics technologies. The regulations apply to all BSPs operating in Pakistan, requiring them to maintain **minimum service standards** at various levels of their networks—from access nodes to core nodes.

These surveys also provide critical data on network performance, helping identify gaps and inefficiencies in service delivery. This helps regulatory authorities enforce service standards and ensure BSPs meet the requirements for customer satisfaction.

By regularly testing and publishing the results of broadband services, the PTA promotes **transparency.** BSPs are held accountable for their network performance, fostering competition and driving improvements in broadband services.

By gauging factors such as **download/upload speeds,** network latency, and customer service efficiency, the surveys enable BSPs to improve their networks, which directly impacts the **user experience**.

4. Methodology

The **Quarter 01 2025 surveys** started from January 1, 2025 till March 31, 2025. In the surveys, **46 x major BSPs** were inspected, operating in **17 x cities** across Pakistan. These cities were selected based on their high subscriber density, ensuring that the surveys focused on areas where the quality of service would have the most significant impact. The surveyed cities include:

    i.   Lahore

    ii.   Karachi

    iii.   Islamabad

    iv.   Rawalpindi

    v.   Peshawar

    vi.   Abbottabad

    vii.   Faisalabad

    viii.   Multan

    ix.   Quetta

    x.   Sukkur

    xi.   Gilgit

    xii.   Mirpur

    xiii.   Shikarpur

    xiv.   Khairpur

    xv.   Kotli

    xvi.   Haripur

    xvii.   Hub

The surveys are conducted by the **Enforcement Division team** of the PTA at the **Network Operation Centers (NOCs)** of each BSP. This method allowed for real-time assessments of network performance across various parameters, offering a detailed insight into the performance of fixed broadband networks at a deeper, technical level.

5. Parameters Monitored and Survey Results

Following key network performance parameters are checked during the surveys:

    i.   Bandwidth Utilization

    ii.   Network Availability

           a) Core Nodes

           b) Access Nodes

    iii.   Network Latency / Round Trip Time (RTT)

           a) Local Network Latency

           b) International Segment – Terrestrial

    iv.   Jitter

Below mentioned are details of Network level parameters measurement details along with survey results:

i. Bandwidth Utilization

This measures how effectively the network's capacity is being used. It is the ratio of peak utilization of bandwidth to the total bandwidth available.

Benchmark:

The bandwidth utilization should be < **80%**

Measurement

BSPs are required to run "Daily" MRTG (Multi Router Traffic Grapher) Graphs at 5 minute average during peak hours. The highest bandwidth utilization is the peak utilization level for each month. BASPs are required to run "Monthly" MRTG Graphs to obtain average bandwidth utilization for each month for their network. BSPs should closely monitor their links and the loading level shall not exceed.

Bandwidth Utilization = (Peak Utilization level of the network / Total bandwidth available) x 100%

Bandwidth Utilization<=80%
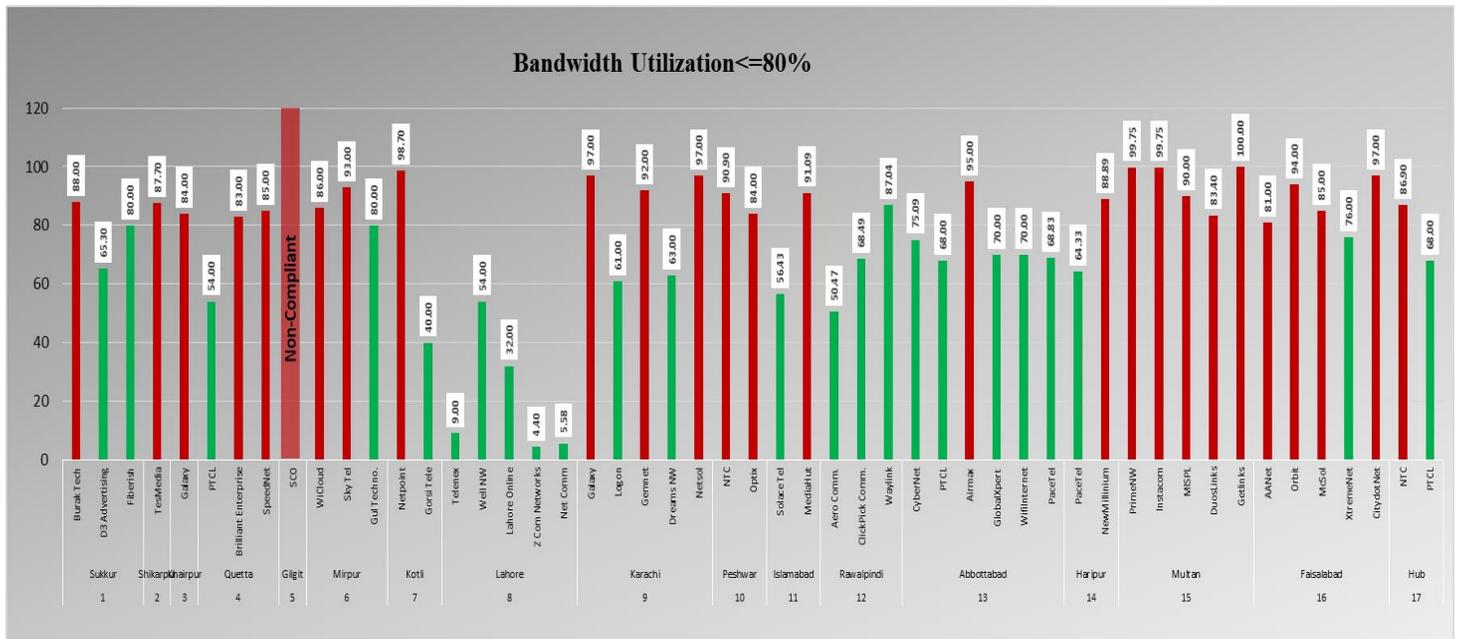
Results

Bandwidth utilization is not complied for majority of the operators and is exceeding above 80%.

ii. Network Availability

Network Availability is the measure of the degree to which the network (Access and Core) is operable and not in a state of failure or outage at any point of time.

It measures the total downtime of the network, including the ATM/IP switches, multiplexers, routers, e-mail facilities (if provided) and connection to Internet backbone over a month. All scheduled downtime for the purposes of maintenance and upgrading of the network system will be excluded from the calculation.

Benchmark

Network Availability for:

a) Access Nodes should be > 99% and for;
b) Core Nodes should be > 99.9%

Measurement

Network Availability = (Total operational minutes - Total minutes of service downtime) / (Total operational minutes) x 100%

a) Network Availability – Core Nodes

Core Nodes include BRAS, Metro Ethernet Switches, routers etc. along with their Operational Minutes and Down Time Minutes.

Network Availability Core Nodes >=99.9%
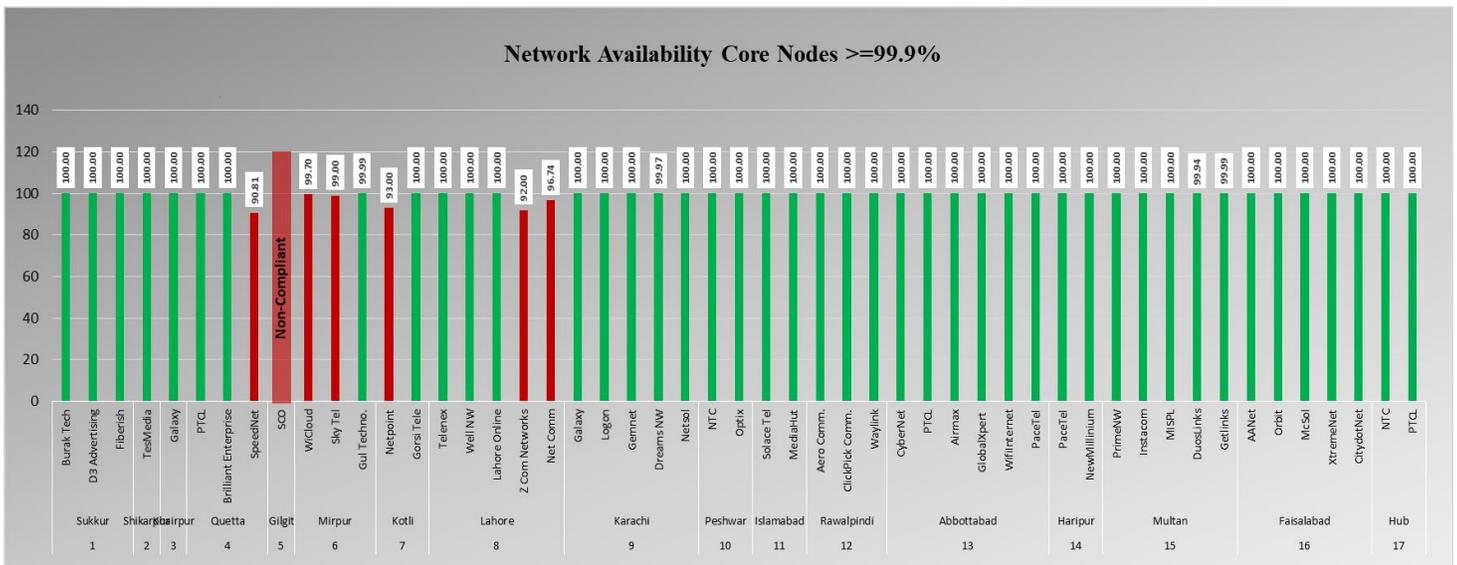
Results

Majority of operators comply with KPI i.e. Network Availability of Core Node. However, Dreams Network (Karachi), Net Communication & Z Communication (Lahore), Netpoint (Kotli), World Call & Sky Telecom (Mirpur), and SCO in Gilgit city are not complied with KPI's threshold.

b) Network Availability – Access Nodes

Access Nodes include MSAGs/MSANs, DSLAMs, ONUs, etc. along with their Operational Minutes and Down Time Minutes.

Network Availability - Access Nodes >=99%
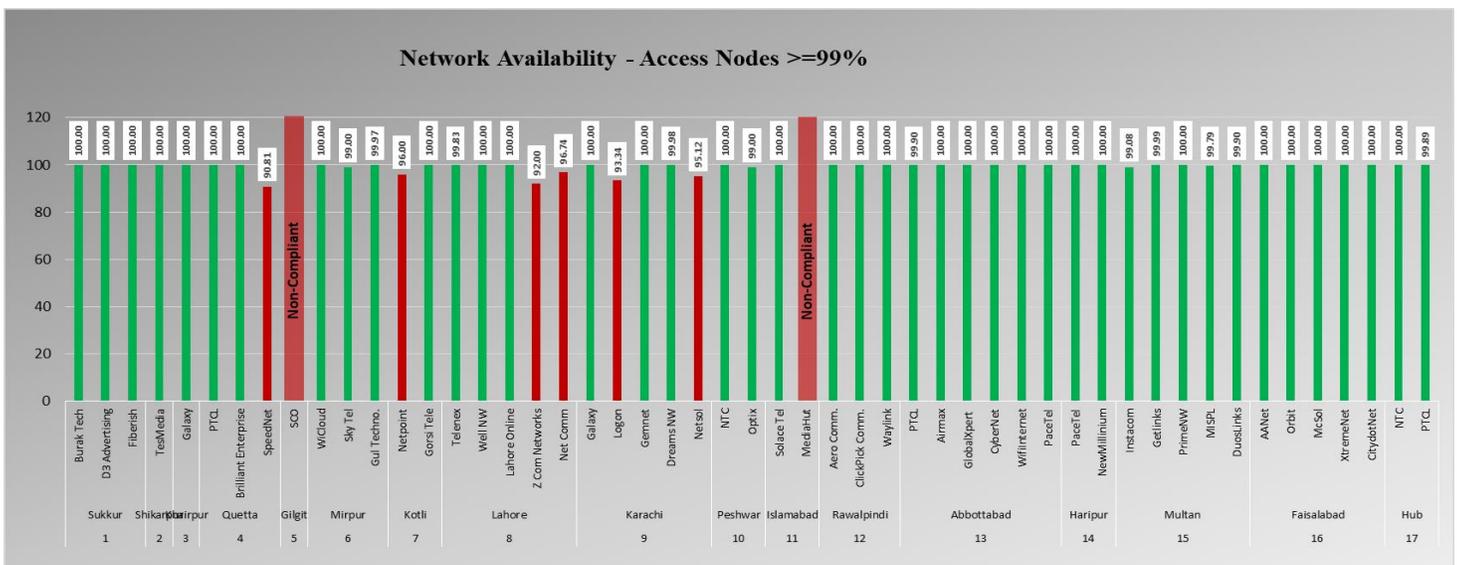
Results

Majority of operators comply with KPI i.e. Network Availability of Access Node. However, Media Hut (Islamabad), Netsol & Logon Broadband (Karachi), Net Communication & Z Communication (Lahore), Netpoint (Kotli), SCO (Gilgit) and Speed Net (Quetta) do not comply with the KPI threshold.

iii. Network Latency / Round Trip Time (RTT)

Latency or Round Trip Time (RTT) is the measure of duration of round trip for a data packet between specific source and destination. It is used to measure the delay on a network at a given time. The greater the latency within a network, the longer it takes packets to reach their destination.

Benchmark

Network Latency in Segment	Threshold
Local Network Latency	=40 msec
International Segment – Terrestrial	=110 msec

Measurement

The RTT test shall be conducted using **"ping"** based on a minimum standard packet size of 32 bytes, and should be measured up to the edge node of the network, connected to the Internet cloud or any other server decided by the Authority.

a) Round Trip Time (RTT) – Local Network

For calculating the Local Network Latency, obtain IP address of BSP's BRAS and run command "ping xxxx.xxxx.xxxx.xxxx –n 100" in DOS Prompt / mode. (xxxx here refers the IP address of the BRAS).

**RTT - Local Network Latency <= 40msec**
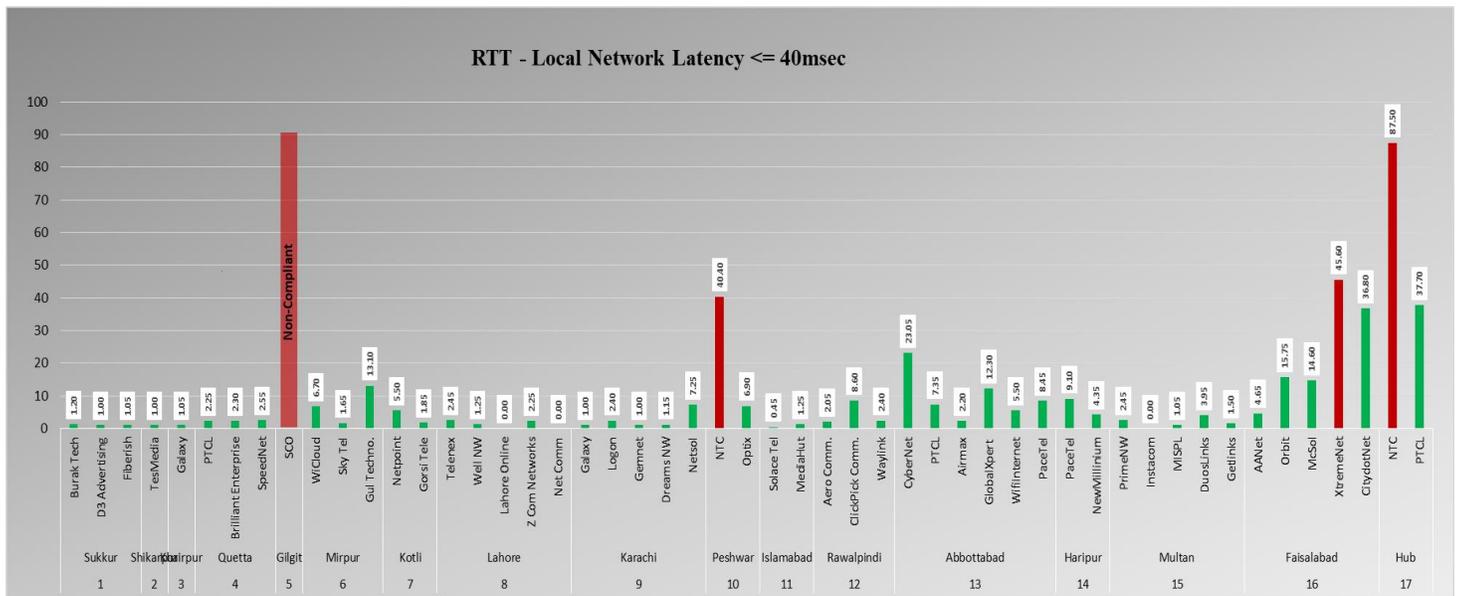
Results

Majority of operators comply with KPI i.e. Round Trip Time for Local Network. SCO (Gilgit), NTC (Peshawar & Hub) and Xtreme Net (Faisalabad) do not comply with KPI threshold value.

b) Round Trip Time (RTT) – International segment (Terrestrial)

For Calculating the International Segment – Terrestrial Segment: Run the following command " ping www.google.com –n 100" or any international known server as decided by the PTA team.

RTT - International Segment (Terrestrial) <= 110msec
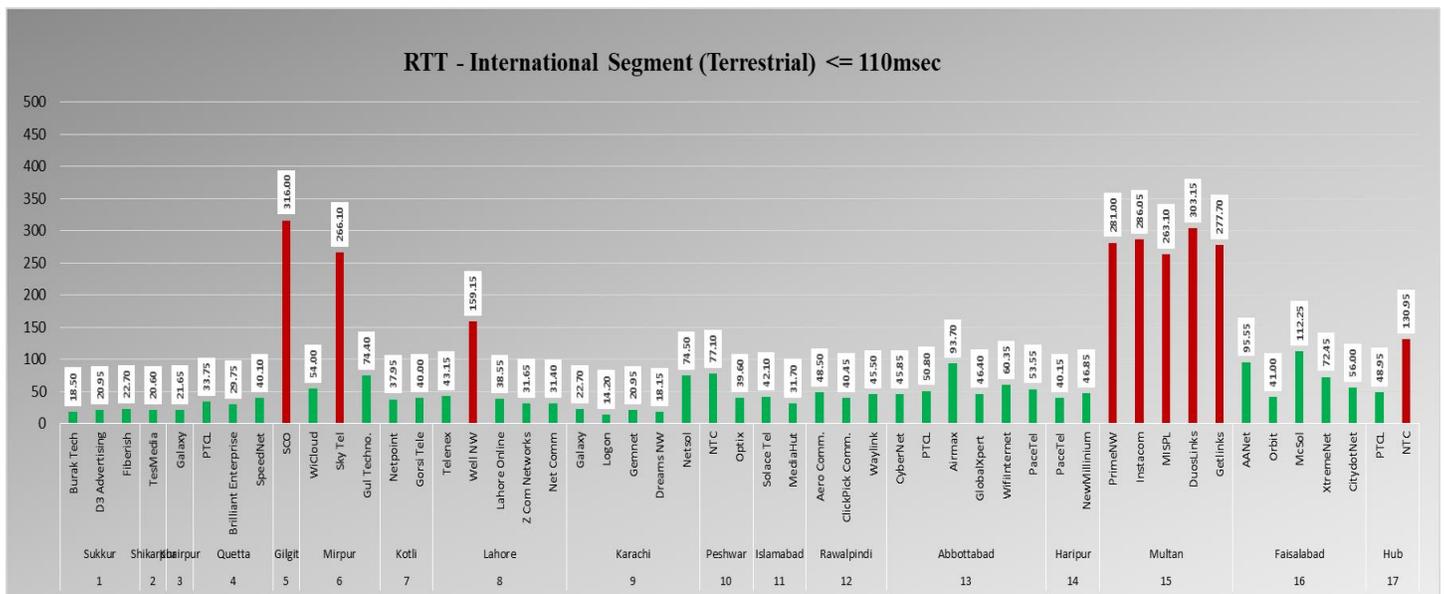
Results

Majority of operators comply with KPI i.e. Round Trip Time for International Segment (Terrestrial Network). However, SCO (Gilgit), Well Networks (Lahore), Prime Networks, Instacom, MISPL, Duos Link & Get Links (Multan) and NTC (Hub), do not comply and are exceeding their KPI threshold value.

iv.   Jitter (mses)

A jitter is a variation in latency. High amounts of jitter cause packets to be delivered out of sequence. In a specific time window, jitter refers to the variation between the maximum delay and minimum delay.
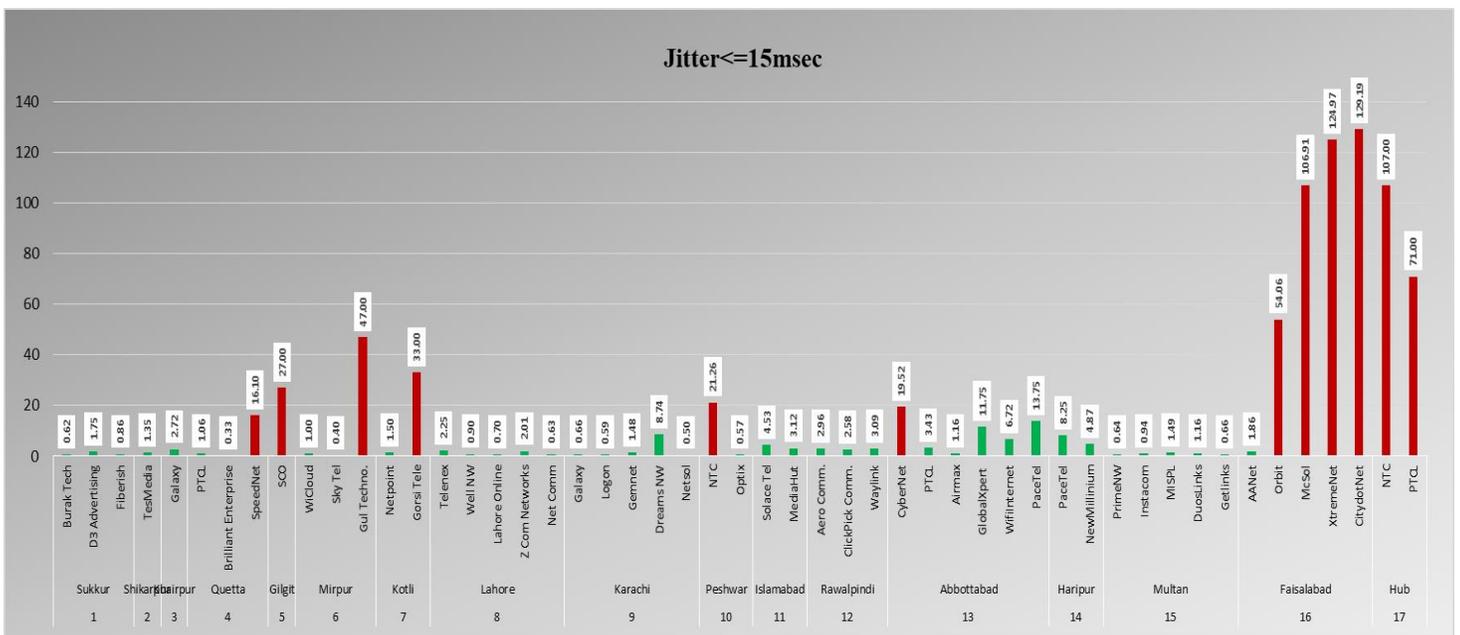
Benchmark

The Jitter should be **< 15 msec**

Measurement

The Jitter shall be calculated using **'ping'**. The minimum samples shall be 100. If RTT avg is the average RTT, derived out of 100 samples, and RTT 1, RTT 2....RTT 100 are the RTT for individual packets then jitter shall be calculated as follows:

Jitter (msec) = X (RTTavg-RTTk)/100 (magnitude shall be used without '*+/-' signs)

Results

Majority of operators comply with KPI i.e. Jitter. Speed Cable Net (Quetta), SCO (Gilgit), Gul Technologies (Mirpur), Gorsi Telecom (Kotli), NTC (Peshawar), Orbit ISP, McSol, Xtreme Net & City Dot Net (Faisalabad) and PTCL & NTC (Hub) do not comply and are exceeding their KPI threshold value.

6. KPIs Analysis

- **Bandwidth Utilization**

  Network of majority of BSPs is found choked with high bandwidth utilization which causes low internet speeds to subscribers during peak hours.

- **Latency**
  - For local network is high for SCO, NTC and Xtreme Net.
  - For international segment, latency is very high for SCO, Well Networks, Prime Networks, Instacom, MISPL, Duos Link & Get Links and NTC.

- **Jitter**

  High for Speed Cable Net, SCO, Gul Technologies, Gorsi Telecom, NTC, Orbit ISP, McSol, Xtreme Net, City Dot Net and PTCL and NTC.

- **Network Availability**
  - For access Nodes, network availability is below the threshold for Media Hut, Netsol, Logon Broadband, Net Communication and Z Communication, Netpoint, SCO and Speed Cable Net.
  - For core nodes, network availability is below the threshold for Dreams Network, Net Communication, Z Communication, Netpoint, World Call, Sky Telecom and SCO.

7. Conclusion

Most Broadband Service Providers (BSPs) failed to meet a critical Key Performance Indicator (KPI)—**Bandwidth Utilization**. High bandwidth utilization, particularly during peak traffic hours, frequently leads to reduced download and upload speeds, significantly degrading user experience and overall service quality. This issue highlights a pressing need for BSPs to optimize their network resources to ensure consistent and reliable performance for customers.

Further observations indicated that operators in Multan face notably **high latency** in international segments, while those in Faisalabad struggle with excessive **jitter**. These challenges compound the quality-of-service issues, affecting real-time applications such as video calls, online gaming, and VoIP services. The combination of high bandwidth utilization, latency, and jitter underscores systemic inefficiencies that require immediate attention.

To address these concerns, non-compliant BSPs were formally notified and provided with detailed performance metrics, outlining their shortcomings in these KPIs. These metrics serve as a baseline for BSPs to identify gaps and implement targeted improvements. By optimizing bandwidth allocation, upgrading infrastructure, and refining traffic management strategies, providers can enhance compliance with performance standards, ultimately delivering a better user experience and upholding higher service quality benchmarks.