

Network Connection Policy defines the conditions under which organizations may be given connectivity to PERN.

Network Connection Policy

Pakistan Education & Research
Network (PERN)

Version 2.0
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1 GENERAL

Pakistan Education and Research Network (PERN) is a part of the overall vision and objectives of IT Action Plan of Government of Pakistan which was launched by the then Minister of Science & Technology. At the time of its inception, the project was jointly financed by the Ministry of Science & Technology, Government of Pakistan and PTCL (Pakistan Telecommunication Company Limited) Research & Development Funds. The network was designed by PTCL and handed over to NTC (National Telecommunication Corporation) for operations and maintenance, however it was managed by Higher Education Commission of Pakistan.

PERN focuses on collaborative research, knowledge sharing, resource sharing and distance learning by connecting people through the use of intranet and internet resources. It offers true packet switched network which is required for research and collaboration in areas like VoIP, grid computing, high energy physics, telemedicine, research related video and image exchange, enterprise level video conferencing.

PERN is a highly resilient network and the availability is ensured through a dedicated NOC which provides network operations and services on 24x7x365 basis. PERN provides special services like dedicated R&E link, 1Gbps intranet connectivity to each university/ institute, MPLS Layer3 VPN, MPLS Layer2 VPN (VLL-PWE3), VPLS, IPv4 Multicast, IPv6 Multicast, Transit AS and also ordinary services like Internet, IPv4, IPv6, Reverse DNS, Network Monitoring Services etc.

2 BACKGROUND

The project is aimed towards establishing an integral part of the overall education system of the country and is designed to interlink all public/ private sector higher education institutes (HEIs) registered with Higher Education Commission, Pakistan and other organizations/ institutes having relevance to education and research. The interconnectivity of all these organizations/ institutes will empower its users in establishing integrated data banks, collaboration for research and development, and uplifting the overall standard of teaching, learning, and research across the country as per the international norms.

Initially, the network was comprised of a backbone network connecting main hub locations in Islamabad, Lahore and Karachi. From these main hub, radial spur circuits were extended to numerous higher education institutes throughout the country. However in 2006, second phase of the project was launched by Higher Education Commission as "PERN 2" with an aim to transform the network as per international practices; whereby the network is designed, developed, operated, maintained, and managed by the partner institutions. For this, the PERN2 was designed to establish PoPs (Point of Presence) within the selected higher education institutions across the country and other institutions in vicinity are served through these PoPs in radial spurs. Moreover, in metro cities and per the needs, the network comprise of more than one PoP connected through fiber ring.

PERN2 at present comprised of three (03) Core Regional Access [cRA-PoPs] and five (05) Sub Regional Access [sRA-PoPs] interconnected through more than 6,200 Km of dark-fiber currently providing a core capacity of 10Gbps through DWDM transmission network. In metro cities, there are seven (07) Local Access [LA-PoPs] which are interconnected through more than 500 Km of metro fiber rings providing a capacity of 10Gbps through metro Ethernet technology. However, eight (08) Aggregation [A-PoPs] are established through more than 400 Km of dark-fiber providing a capacity of 1Gbps primarily through SDH transmission network.

3 DEFINITIONS

- 3.1 **PERN** is the acronym of the **Pakistan Education & Research Network**. The revolutionary Pakistan Education & Research Network (PERN) is a nationwide educational communicational network connecting premier education and research institutes; and providing high-speed R&E, intranet as well as internet bandwidth across the country and to international networks.
- 3.2 **PERN Principal** is referred as the Higher Education Commission of Pakistan being the custodian of PERN.
- 3.3 **PERN services** are all those network and application services available to partner organizations on PERN infrastructure.
- 3.4 **PERN resources** are all those tangible and intangible assets, hardware equipment and software tools, as well as human workforce, involved in operating the PERN infrastructure and PERN services.
- 3.5 **NRENs** are National Research & Education Networks of countries around the world, e.g. MyREN (Malaysia), KOREN (Korea), UKERNA (UK), AARNET (Australia), Internet2 (USA), etc.
- 3.6 **Consortium of NRENs** is a network of NRENs interconnected to form a large community for collaboration for education and research, e.g. TEIN (TransEurasia Information Network), GEANT (Pan-European Advanced Network), etc.
- 3.7 **Partner Organization** refers to all organizations getting R&E services from PERN and contributing towards sustainability of this network.
- 3.8 **HEIs** refer to higher education institutions both public and private sector universities, centers of excellence, affiliated colleges, degree/ postgraduate colleges, etc.
- 3.9 **Last Mile Connection** is a connectivity between organization and nearest circuit termination point to take the traffic further to PERN aggregation points or host organization.
- 3.10 **International traffic** is the traffic between the PERN and any other international Public network (Internet).
- 3.11 **R&E traffic** of the NRENs is the traffic between the PERN and any other NRENs or network

of NRENs of the world.

3.12 **Packaged Digital Resources** are a set of services provided by PERN to its users for example digital library, Video conferencing etc.

3.13 **PERN Subscription Plan** are a set of services provided by PERN to the users.

4 PURPOSE OF DOCUMENT

The document is prepared to provide necessary information to Organization interested in seeking PERN connection for their academic and research needs, on applicable terms of engagement under this Network Connection Policy. The document also elaborate various connection types and grouping of organizations in order to define eligibility criteria set policies accordingly. The document also covers the terms of PERN service charges, service level agreement as offered by PERN and their applicability. Termination terms relating to PERN connection or service agreement are also defined in this document.

5 TYPES OF CONNECTION

Two types of Connection are offered and defined as follows;

5.1 **Primary Connection** is one provided by PERN directly to the organization and delivers the full range of services specified in the PERN Subscription Plan(s) as reflected in Packaged Digital Resources.

5.2 **Sponsored Connection** is provided by an organization with consent of PERN that holds a PRIMARY connection and is not subject to the PERN SLA.

6 CATEGORIES OF ORGANIZATIONS

The categorizations of the organizations for this Network Connection Policy are given below;

6.1 Category I

Public or private sector chartered higher education institutes recognized by Higher Education Commission of Pakistan.

6.2 Category II

Public sector degree/ post-graduate colleges (both constituent and affiliated) duly recognized by the respective government body and/ or affiliating institute.

6.3 Category III

Organizations involved primarily with the delivery or support of education and research but whose purpose is not wholly the teaching or learning;

6.3.1 Public libraries, either directly or via local or unitary authorities.

6.3.2 Not for profit museums, galleries and archives both publicly and privately funded.

6.3.3 Organizations broadly involved in promoting learning activities and with express sponsorship from a collaborating HEIs or Research Council.

6.3.4 Academic blocks, wings or research units of organizations primarily linked with research and education.

6.4 **Category IV**

Organizations working with or linked with education or research or with other public sector services, and organizations wishing to receive or deliver educational or research services from or to the PERN community;

6.4.1 Local or unitary authorities and other public or private sector bodies, for the purpose of delivering lifelong learning along with other services that cannot be disaggregated from lifelong learning services.

6.4.2 Not for profit professional bodies (e.g. Institute of Electrical Engineers, Pakistan Computer Society, The Institute of Physics, etc.).

6.4.3 Commercial organizations including those on science and business parks, innovation centers, research units and incubator units, and spin-out companies wishing to collaborate with the PERN community on research, learning or teaching, or wishing to receive learning, research or development from members of PERN community.

6.4.4 Commercial organizations such as electronic publishers, content and applications services providers, etc. wishing to deliver non-chargeable or chargeable services to the PERN community.

6.5 **Category V**

Organizations wishing to use PERN for purposes other than academics or collaborative research;

6.5.1 Partner organizations allied to education and/ or research and collaborating on teaching, learning, research or development with the sponsoring organization, where the organization wishes to use PERN to support their normal activities.

6.5.2 Local and unitary authorities, and other public sector bodies for community services and activities not directly concerned with learning, but where the use of PERN is to the benefit of the local community or to the public in general.

7 ELIGIBILITY CRITERIA

7.1 **Category I** organizations are provided with the **PRIMARY Connection** subject to receipt of a formal request followed by signing of PERN Service Agreement.

7.2 **Category II** organizations are provided with a **PRIMARY Connection** on receipt of formal request followed by signing of PERN Service Agreement and Advance payment to PERN towards capital cost (if any) by the organization or respective government body and/ or

affiliating institute.

- 7.3 Any **Category I** and **Category II** organization having more than one campus within 50 km radius will be treated as single organization and connection would be provided at primary location. Campuses will be provided with a **SPONSORED Connection** at the discretion of its sponsoring organization, provided the organization receiving connection is eligible to do so under the provision of this policy. However, if there is any connectivity problem observed by the PERN engineers, a separate **PRIMARY Connection** may be provided to that campus.
- 7.4 **Category III, IV** organizations may be provided with a **PRIMARY Connection** on receipt of formal request followed by PERN Service Agreement and the approval from the PERN Principal. The approval is normally granted on a case-by-case basis in response to the request received from the organization to PERN Principal.
- 7.5 Any other **Category V** organizations may be given connectivity through a **SPONSORED Connection** at the discretion and on receipt of a formal request and signed PERN Service Agreement from the sponsoring organization, provided that the organization receiving the connection is eligible to do so under the provisions of this policy.
- 7.6 Organization having **PRIMARY Connection** can offer **SPONSORED Connection** with the permission of PERN Principal, and may request more bandwidth for the purpose.

8 SERVICE COMMISSIONING

PERN connectivity to Organization is determined through service commissioning which includes communication medium to provide physical connectivity and Internet Protocol (IP) addresses enabling the devices to communicate over the network.

8.1 Connectivity Medium

- 8.1.1 PERN as per the overall design of network which is based on optical fiber links to ensure high speed connectivity to Organizations, shall prefer optical fiber connectivity in most cases.
- 8.1.2 Optical fiber based connectivity shall be provided to Organizations which are in the vicinity of any of the PERN PoP, subject to the feasibility.
- 8.1.3 Alternate medium for connectivity may also be considered for Organizations to whom optical fiber connectivity seems not feasible.
- 8.1.4 Requesting organization may be provided connectivity through alternate medium initially on interim basis through some other operators till the fiber connectivity is provisioned, if committed for PERN connectivity to the organization.

8.2 IP Provisioning

- 8.2.1 PERN shall provide IP addresses (both IPv4 and IPv6) on right-of-use basis.
- 8.2.2 Organizations shall be provided with /28 or /29 prefix of IPv4 as per provision

available in PERN Subscription Plan and/or /44 prefix of IPv6 in order to meet their IP based communication needs.

- 8.2.3 Organizations who have already been provided more than /28 prefix IPv4 addresses may continue to use these IPs, till PERN reaches to a situation where additional IP addresses are to be revoked in order to accommodate other Organizations. However, PERN shall give ninety (90) day notice period to Organization prior to revocation of additional IP addresses being in use.
- 8.2.4 Organizations are encouraged to implement private IP scheme within their network and/ or across PERN for which PERN provides /19 prefix of IPv4.

9 OTHER TERMS & CONDITIONS

- 9.1 PERN shall offer standard Service Level Agreement (SLA) to all Partner Organizations which will be reviewed for any possible revision time to time by PERN Operations team.
- 9.2 Use of PERN by any organization having receive either type of connection is subject to the PERN Acceptable Use Policy (AUP).
- 9.3 All organizations shall ensure the availability of necessary hardware (Customer Premises Equipment) and inform PERN for termination of link.
- 9.4 PERN may however provide appropriate hardware on loan basis as temporary arrangement for a maximum period of one year subject to the approval of PERN Principal.
- 9.5 PERN may advise the requesting Organization to have the last mile connection from own resources or from its own arrangement.
- 9.6 Organization will be bound to provide any information relating to PERN and its usage on request of PERN or PERN Principal as it deems necessary and required on occasional basis.
- 9.7 PERN connectivity to rental premises of Partner Organization shall be subject to prior approval of PERN Principal. In case, Organization desires to shift/ relocate from the rental premises during the course of PERN Service Agreement, the PERN Service Charges shall still be payable till the expiry of Agreement. For PERN correspondence, each organization shall create and maintain an email address as PERN@universitydomain.edu.pk. For example, PERN correspondence email address for NUST would be PERN@nust.edu.pk.

10 PERN CHARGES

PERN reflects a very cost-effective investment in next-generation networking for research and education. It follows the PERN principles of stewardship of member resources, equitable sharing of costs, and sustaining a long-term, financially viable and technologically advanced network.

- 10.1 PERN service charges shall be governed by PERN Principal through PERN Subscription Plan(s) as reflected in Packaged Digital Resources with the approval of Principal Accounting Officer.

- 10.2 PERN Subscription Plan(s) may be reviewed for any possible revision in rates and/ or offered services every six (06) months or as deem necessary time to time, however, same shall be subject to approval of Principal Accounting Officer.
- 10.3 PERN Subscription Plan(s) once approved shall be notified and/ or posted on PERN website explicitly mentioning its date of effectiveness and any specific terms, if applicable.
- 10.4 PERN service charges shall be in accordance with prevailing PERN Subscription Plan(s) applicable at the time of applying connectivity.
- 10.5 Billing will be sent to organizations on quarterly (i.e. three (03) months) basis and in advance, however charges will start from commissioning date.
- 10.6 Organization may change/ opt any valid PERN Subscription Plan at any time, however change(s) in PERN services charges shall be reflected/ adjusted in subsequent bill.
- 10.7 Any change(s) caused due to revision of PERN Subscription Plan(s) and/ or due to change/ shift from one plan to another shall be subject to an Amendment between the parties. However, in later case this shall have sub-number of prevailing Amendment number
- 10.8 During course of rendering the implementation services for PERN connectivity, PERN Principal shall, inter alia, lay, deliver, install, integrate and commission the Last Mile Connection and/ or the Equipment (Optional) at the designated site as per given timelines.
- 10.9 Any delays caused due to any agreed obligation(s) on Organization's part shall not deem to have delay in commissioning PERN services and so PERN charges shall be applicable from the date of agreed upon obligation(s) on PERN part, e.g. ATP of fiber or similar.
- 10.10 Any adjustment(s) required in billing shall be made in subsequent bills.

11 PERN SERVICE AGREEMENT & TERMINATION

Subject to the provisions hereof, PERN Connectivity will be valid for a period of year (10) year extendable from the date of service activation (the "Term"). If it can be physically accommodated, at the end of the Term, the services will be automatically renewed for a period of Two (2) year, unless written notice to the contrary is received by HEC from Organization at least 90 days prior to expiry of the Term. Any subsequent renewal of the Term for the services shall not be for a period of less than two (2) year, unless the Parties expressly agree otherwise and will charges of mutually agreed rates.

If the level of O&M Services to be maintained by HEC/PERN pursuant to the Service Agreement falls below the minimum uptime detailed in SLA or HEC/PERN completely ceases to provide the O&M Services, Organizations shall give a thirty working days' written notice of such failure to HEC. Upon expiry of the notice period of 90 working days Organization shall become entitled to terminate the Agreement, provided HEC has failed to remedy such breach after 90 days of expiry of said notice period

If Organization is in material breach (e.g. site access rights, payment delays, violation of PERN AUP, etc.) of this NCP, the Organization may be served with a One (01) month written notice to remedy the same. If the Organization fails to remedy such breach within the said notice period, PERN shall have the right to downgrade the PERN services to the Organization without any financial adjustment against the downgraded service. If the situation continues beyond three (months), PERN Principal may terminate Organization's PERN Connectivity/ Service Agreement after lapse of an additional fifteen (15) days from the date of expiry of Service Termination notice;

11.1 In case of service renewal of PERN services after termination, one time re-activation charges shall be payable by the Organization in advance prior to service restoration, if service restoration is requested within one month

11.2 Service restoration after one month of termination shall be subject to payment in advance for the average fiber leasing cost or 25% of the previously monthly billing (whichever is higher) for the complete duration of service termination.

12 COMPLIANCE AND NON-CONFORMITY CLAUSES

Once the connectivity is established and commissioned under this policy, Organization will be required to comply all terms and conditions elaborated in here; and any subsequent terms and conditions; amendments or addendums as time to time notified to the Organizations.

12.1 Any information submitted by the university if found incorrect/ fake, HEC will reserve the right to disconnect the PERN Connectivity or take necessary action.

12.2 PERN may ask Security Deposit as deem appropriate from the Organization on receipt of request for PERN connection.

13 REVISION IN POLICY

This policy shall be regularly reviewed for possible revision, if deem necessary, in any eventuality in PERN infrastructure, resources and services. Amended texts shall be approved by the PERN Principal and shall be made publically available.

Subscription Plans – Packaged Digital Resources

		P-1	P-2	P-3	P-4	
		16 - 45 Mbps	46 - 155 Mbps	156 - 310 Mbps	311 & Above	
Applicable Traffic	International Bandwidth	Public Sector	\$45/Mbps/mth	\$40/Mbps/mth	\$35/Mbps/mth	\$30/Mbps/mth
		Private Sector (Eligible for Public Funds)	\$47/Mbps/mth	\$42/Mbps/mth	\$37/Mbps/mth	\$32/Mbps/mth
		Private Sector	\$50/Mbps/mth	\$45/Mbps/mth	\$40/Mbps/mth	\$35/Mbps/mth
	Intranet Bandwidth (Min. 20 Mbps/ site)		\$20/Mbps/mth	\$17.5/Mbps/mth	\$15/Mbps/mth	\$12.5/Mbps/mth
	IPv4 Addresses		\$0.5	\$0.5	\$0.5	\$0.5
	IPv6 Addresses		<i>Promotionally Free for Limited Time</i>			
	Digital Library (Base Resources)		Inclusive			
	Network Consultancy & Technical Support		Inclusive			
	Turnitin Software/Services		\$200	\$150	\$75	Inclusive
	Video Conferencing (SLA) ¹		\$180	\$90	Inclusive	
	Collaborative Research Project over PERN (upto \$20,000/year) ²		(\$5,000)	(\$10,000)	(\$15,000)	(\$20,000)
	PERN Workshops/Seminars/Conferences Support (upto \$10,000/year when applied) ²		(\$2,500)	(\$5,000)	(\$7,500)	(\$10,000)
	International relevant certifications (upto \$4,000/year) ³		(\$1,000)	(\$2,000)	(\$3,000)	(\$4,000)
	Unified Communication for Faculty & Staff		Min 250 @ 1	Min 500 @ 0.75	Min 1000 @ 0.5	Min 2500 @ 0.25
			\$250	\$375	\$500	\$625
	Redundant Link (for single site)		As per Actual		25% PERN Contribution	Matching Contribution
Trainings	Local (3 Trainings/Year)	25% PERN Contribution	50% PERN Contribution	Inclusive		
	Foreign (1 Training/Year)	N/A	50% PERN Contribution	75% PERN Contribution	Inclusive	

Note: The above referred Subscription Plan(s) for Packaged Digital Resources are effective from October 01, 2013 and shall be subject to following condition(s):

- i. Subscription Plan(s) can only be available as packaged solution of all components without any exception(s).
- ii. The new rates shall only be effective subject to clearance of all outstanding dues and/ or arrears as reflected in Oct. – Dec. 2013 invoice.
- iii. Universities/ Institutes requesting to drop any of the listed components from the Packaged Digital Resources shall be charged as per Old Subscription Plan(s) effective till September 2012 (see next page). Adjustments of past invoices shall be accommodated in PERN invoice for Oct. – Dec. 2013 period.
- iv. Charges against the PERN service(s) which are not enabled yet for universities/ institutes by PERN will be adjusted as soon as services are enabled/ offered.
- v. All new requests for PERN connectivity shall be dealt as per this Subscription Plan(s) of Packaged Digital Resources and their variance as announced by PERN/ HEC time to time.

¹ Applicable for public sector universities/ institutes having facilitated with video conferencing setup by HEC.

² Selection of proposed project will be subject to the recommendation/ approval of committee so constituted.

³ Nominated persons may apply for any relevant International Certification with the permission of their respective institute and after soliciting approval from PERN/ HEC.

SERVICE PLAN
PERN2 Service PLAN
Jul 10 – Sep 12



		Service Plan 1	Service Plan 2	Service Plan 3	Service Plan 4	
		8 – 12 Mbps	13 – 45 Mbps	46 – 155 Mbps	155 & Above	
Applicable Traffic	International Bandwidth*	Public	70 \$/Mbps/Month	65 \$/Mbps/Month	60 \$/Mbps/Month	50 \$/Mbps/Month
		Private (W)	85 \$/Mbps/Month	80 \$/Mbps/Month	75 \$/Mbps/Month	65 \$/Mbps/Month
		Private	98 \$/Mbps/Month	90 \$/Mbps/Month	85 \$/Mbps/Month	85 \$/Mbps/Month
	Intranet Bandwidth (Layer 3)		20 MB @25\$ /MB/month/site	20 MB @20\$ /MB/month/site	20 MB @15\$ /MB/month/site	
	IPV4 IP		First 16 IPs with the package. Additional @ \$ 0.5/IP			
	Buffer Bandwidth (Double Bandwidth)		Free two events per years			

Value Added Services	Extended LAN (Layer 2 VPN)		10 MB @100\$ /MB/month		
	Additional Intranet Bandwidth (Layer 3)	40 Mbps	40\$ /MB/month	35\$ /MB/month	25\$ /MB/month
		60 Mbps	35\$ /MB/month	30\$ /MB/month	20\$ /MB/month
		100 Mbps	25\$ /MB/month	20\$ /MB/month	18\$ /MB/month
	Nationwide Multicast Services		@ 15\$ / 2IP /month	@ 15\$ / 2IP /month	@ 15\$ /2 IP /month
	International Multicast Services		As per requirement		
	National Multilink		As per requirement /Survey		
	International Multilink		200% of international Bandwidth rates / day		
Additional Buffer Bandwidth		As per requirement @ 15\$ /MB/Day			