



Progress and Challenges in Introducing eduroam and Federated Identity under Asi@Connect/Geant

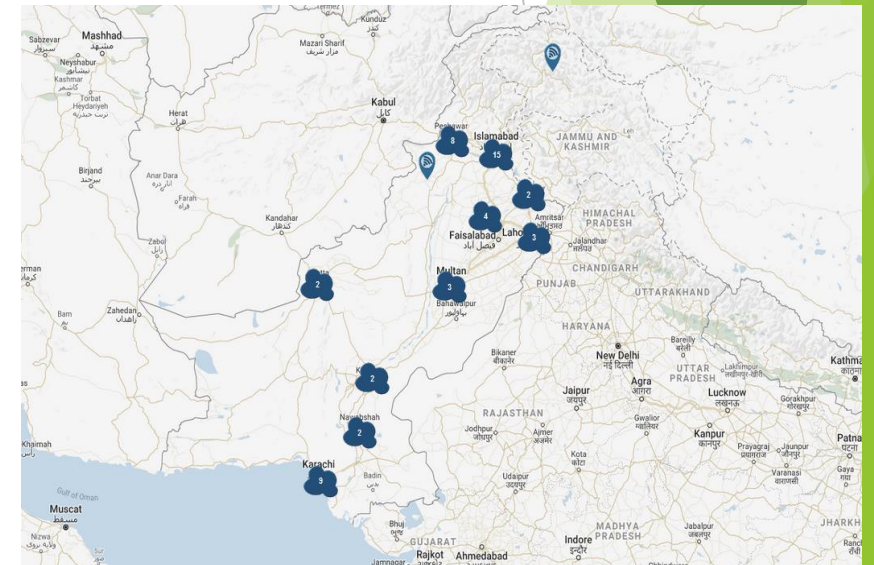
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Pakistan Education & Research Network





Journey Began in 2015

- PERN started eduroam deployment in Pakistan in early 2015 under XeAP (Extending eduroam in Asia Pacific) project led by AARNet.
- The XeAP project provided the guidance and assistance (including provision of hardware and software) to deploy eduroam.
- 5 Servers and 10 Access Points were provided under XEAP Project.
- Deployed 2 NRS Servers and one Monitoring server in Oct 2015.
- Initially 6 institutions joined.

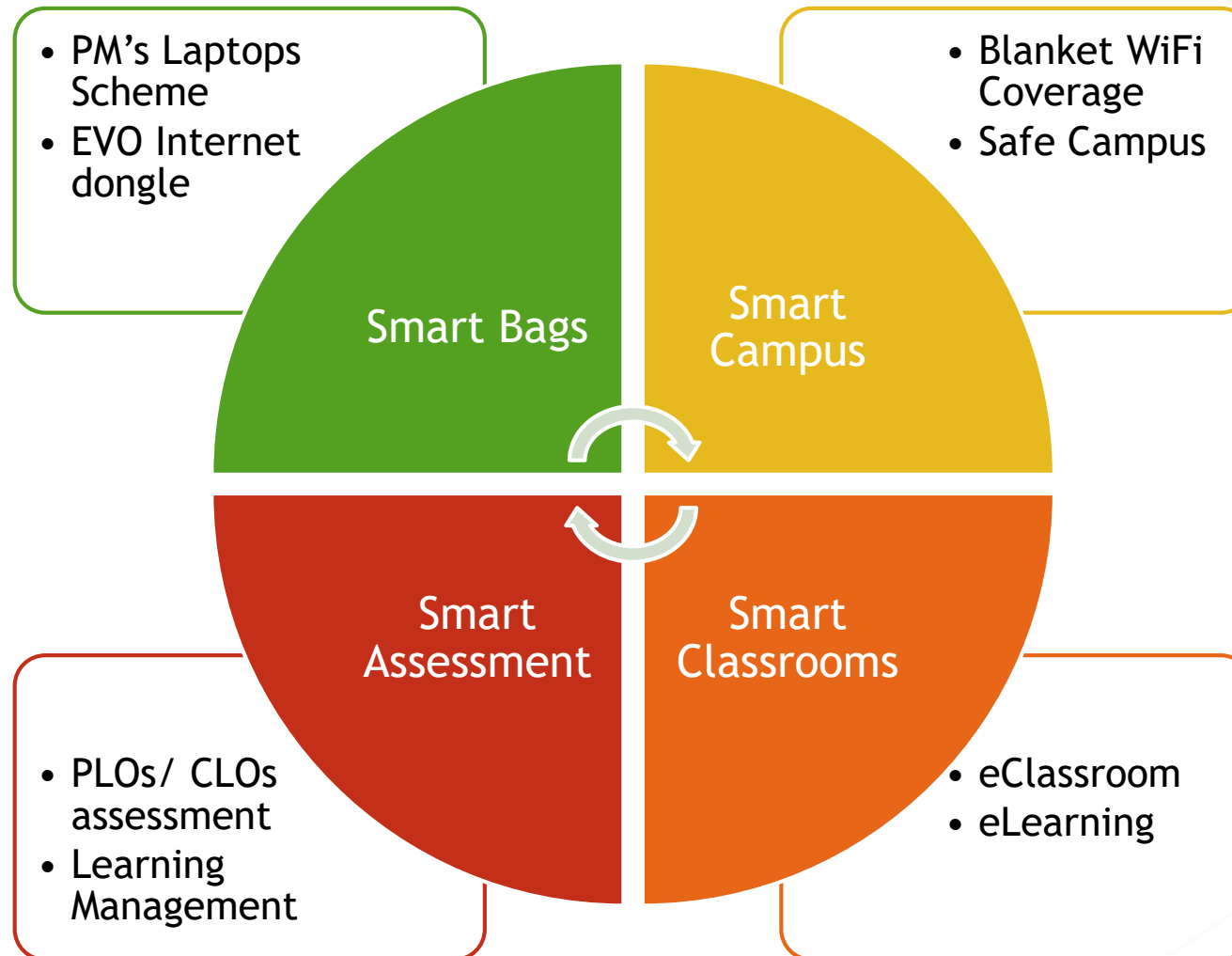


Introduction - Smart Universities Project

- ▶ In 2016, PERN launched Smart University Project in Pakistan to provide blanket Wireless coverage to participating Higher Education Institutions
- ▶ Introducing eduroam facility at the higher education institutes of Pakistan
- ▶ Easy and wide access of internet/ intranet services to the students
- ▶ Promoting the emerging concept of BYOD (bring-your-own-device)
- ▶ Transforming universities from conventional to contemporary
- ▶ Support through enabling environment to all at higher education institutes to enhance their research and learning skills



The Concept: Smart Education through Smart Universities



Smart Campus Project

- The First phase of the project was awarded to Cisco and Commtel Systems to deploy Enterprise class Cisco Unified Wireless Network (CUWN) Solution.
- Under this project Wi-Fi facilities are deployed at Universities to provide free wireless internet access for students, faculty and researchers.
- SU infrastructure is being duly integrated with PERN network to provide Education Roaming, Regional Backups, and Centralized Guest Registration Systems.
- Initially the project is awarded under Built-Operation-Transfer Contract to Commtel which shall deploy the infrastructure of smart university as a Phase I in 3 years and operate it for remaining 5 years as a managed service.
- Commtel has to setup round-the-clock NOC in PERN Headquarters and a team of resident, deployment & field engineers to build, install, support and monitor the operations Smart Universities Infrastructure

Smart University - Core Components

HEC Smart University Project is comprised of following Core Components of Cisco Unified Wireless Networks Solution:

- **Aironet Access Points (APs)**

- Indoor APs – 2700 Series
- Outdoor APs – 1572 Series

- **Wireless Controllers**

- 5508 WLC for HEIs
- 8510 WLC for Regional Core

- **Cisco Identity Services Engine**

- For Guest Portal – Registration

- **Layer 2 POE Access Switches**

- Small Business Series Switches

- **Layer 3 Core Switch**

- ME3600X-24FS-M

- **Cisco Prime Infrastructure**

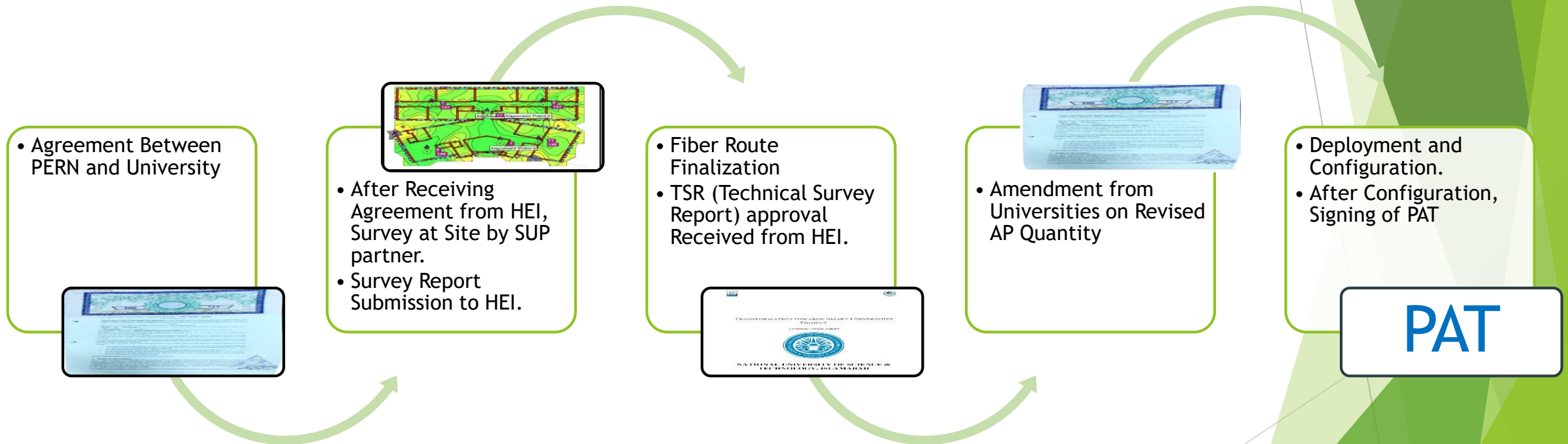
- NMS – SU Infra Monitoring & Reporting

- **Cisco UCS Servers**

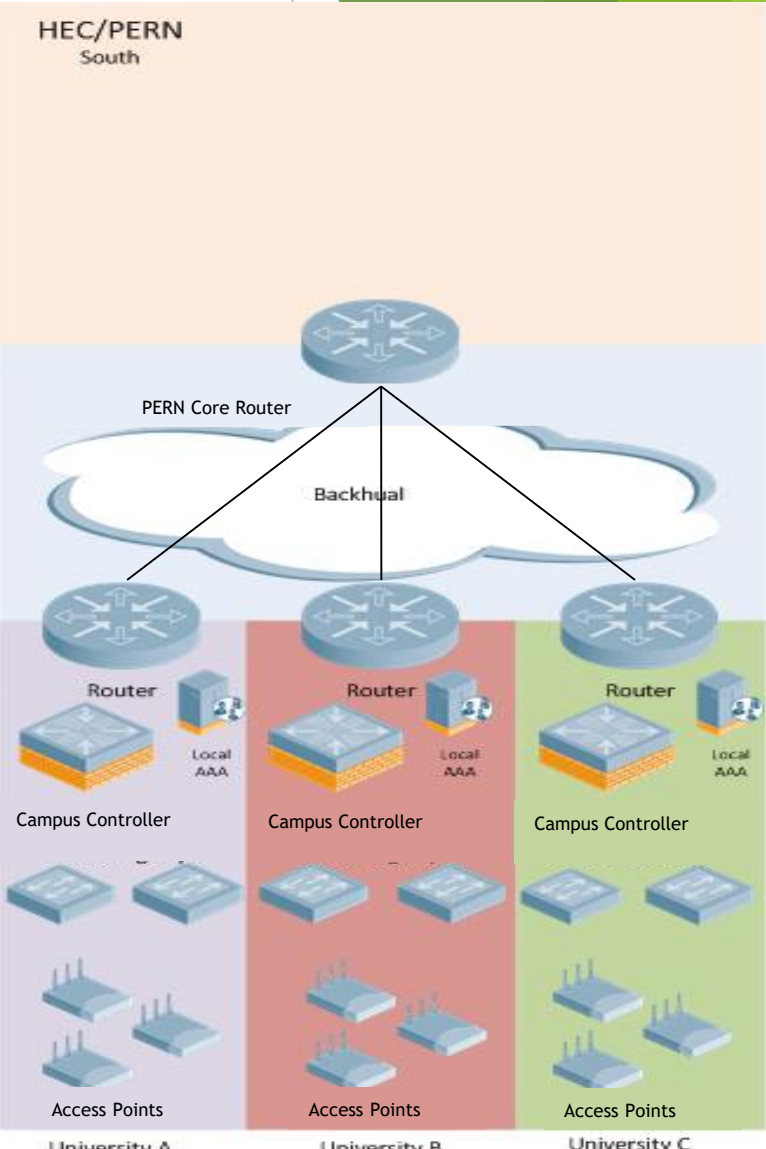
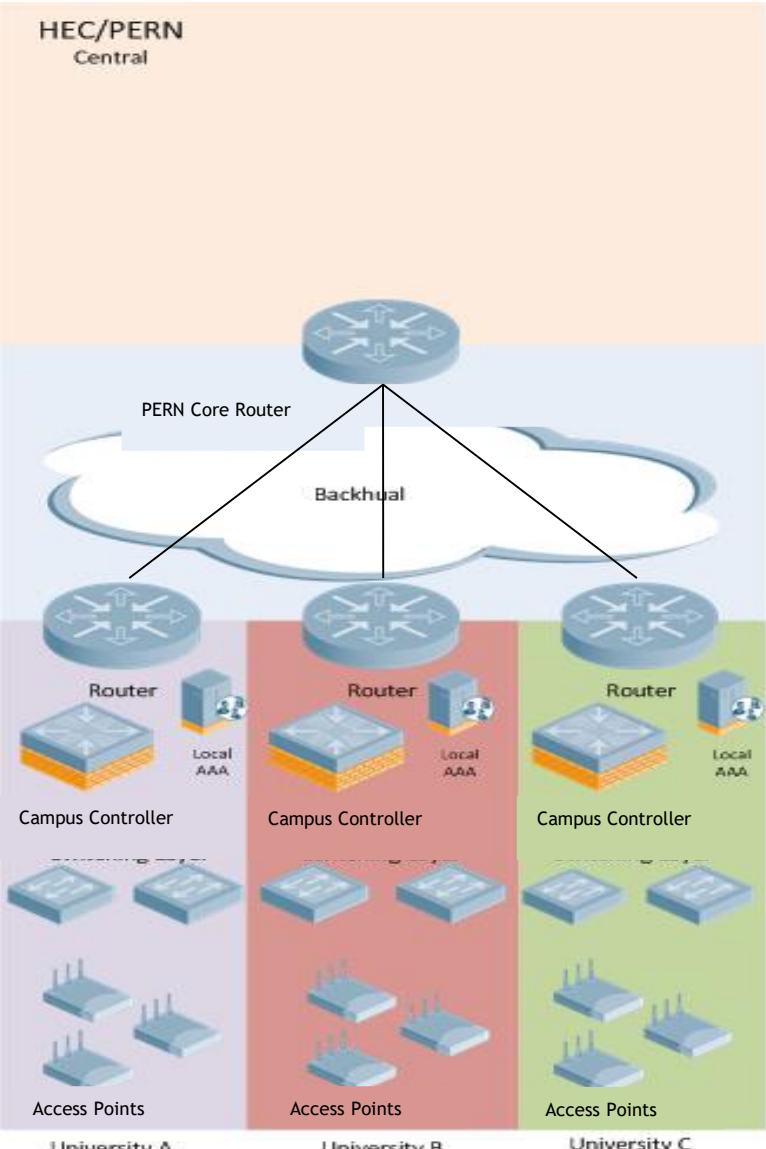
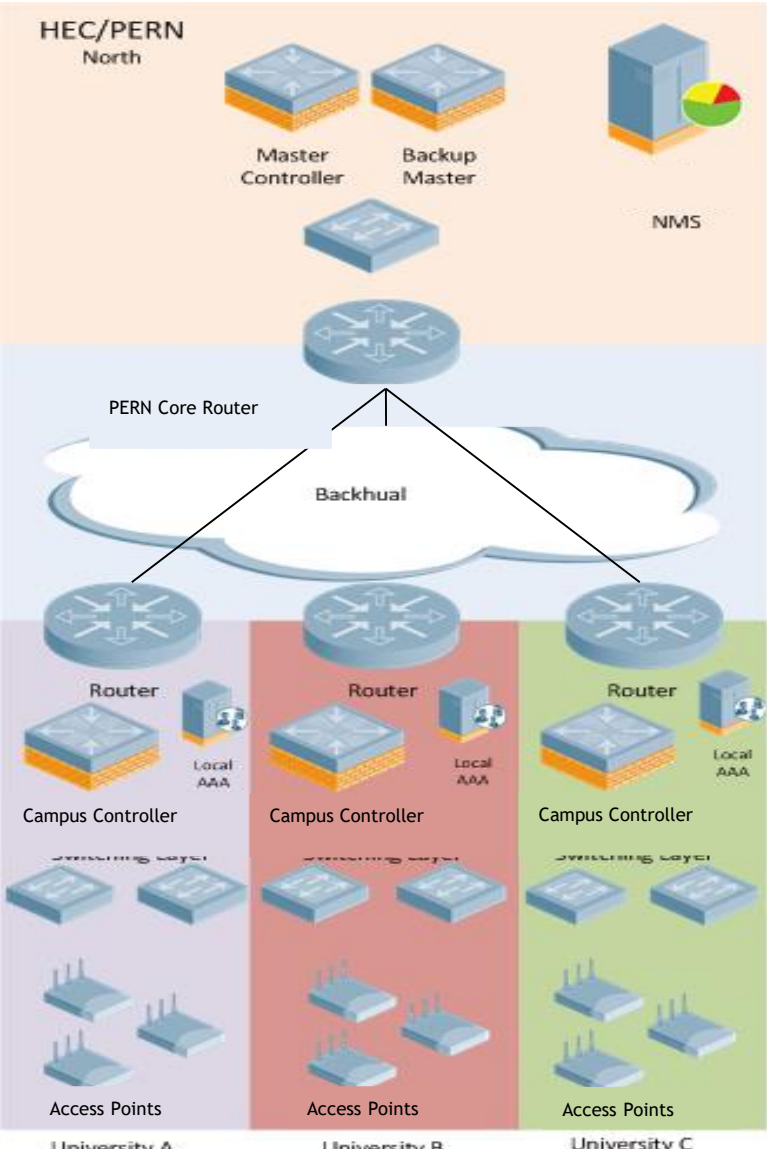
- C220-M4 (For Radius & DHCP Services)



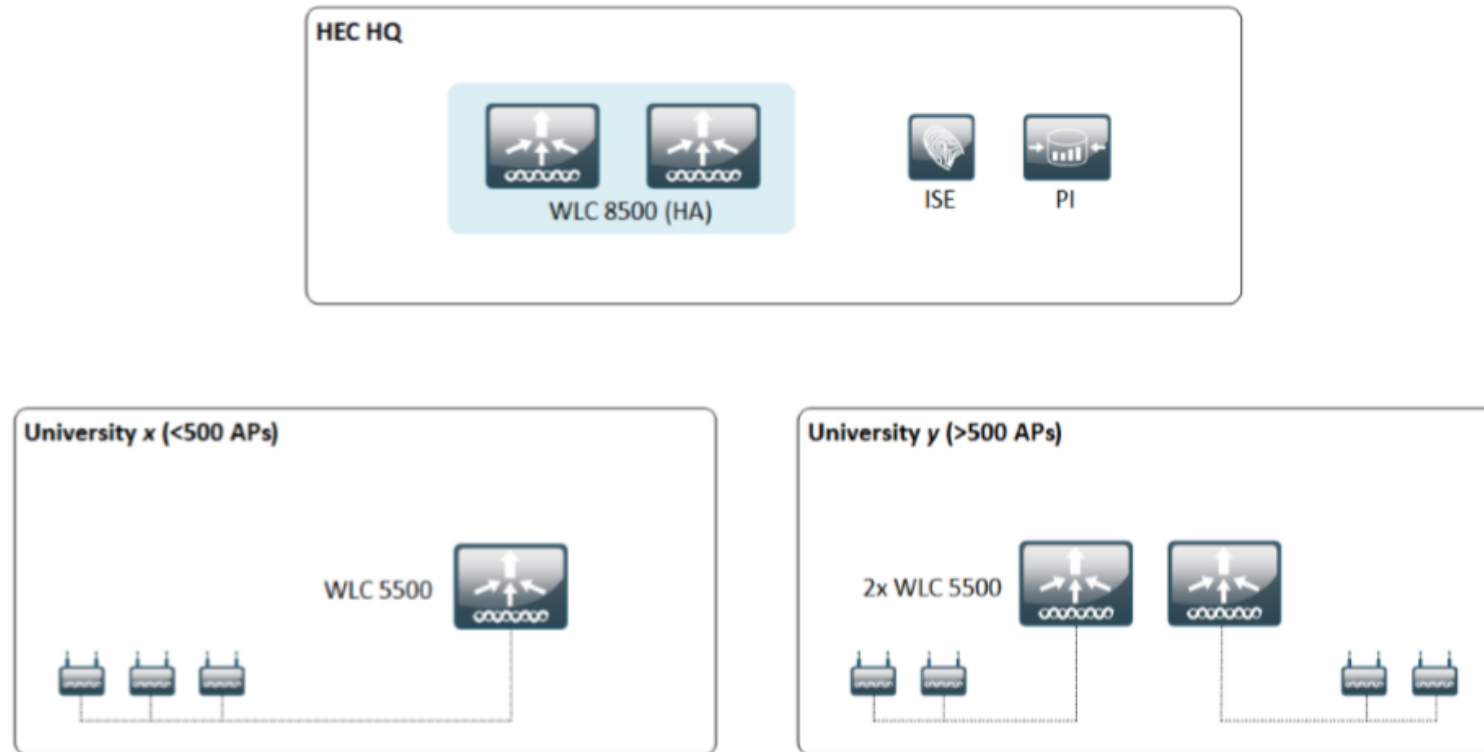
Steps towards Commissioning

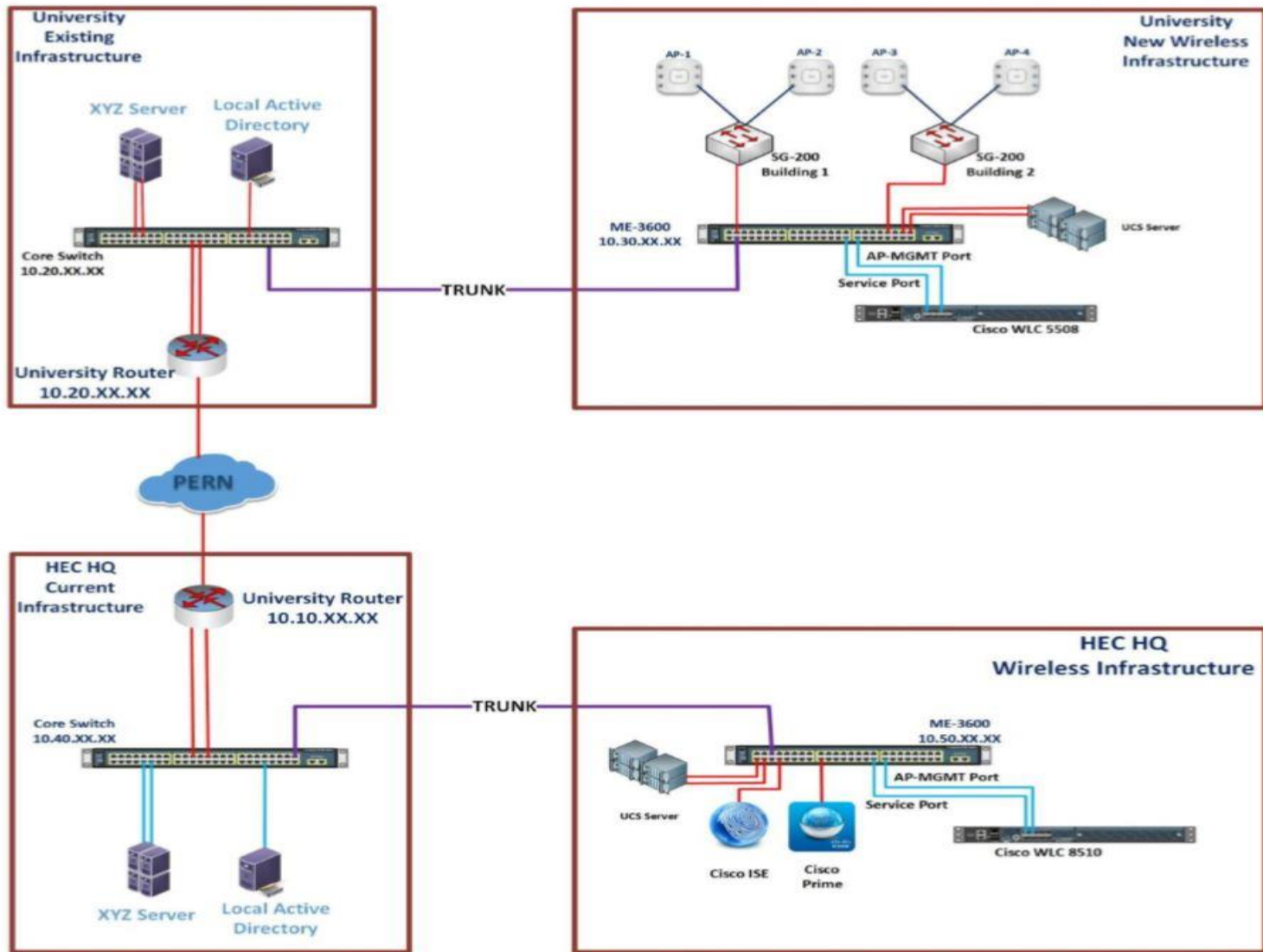


Network Layout



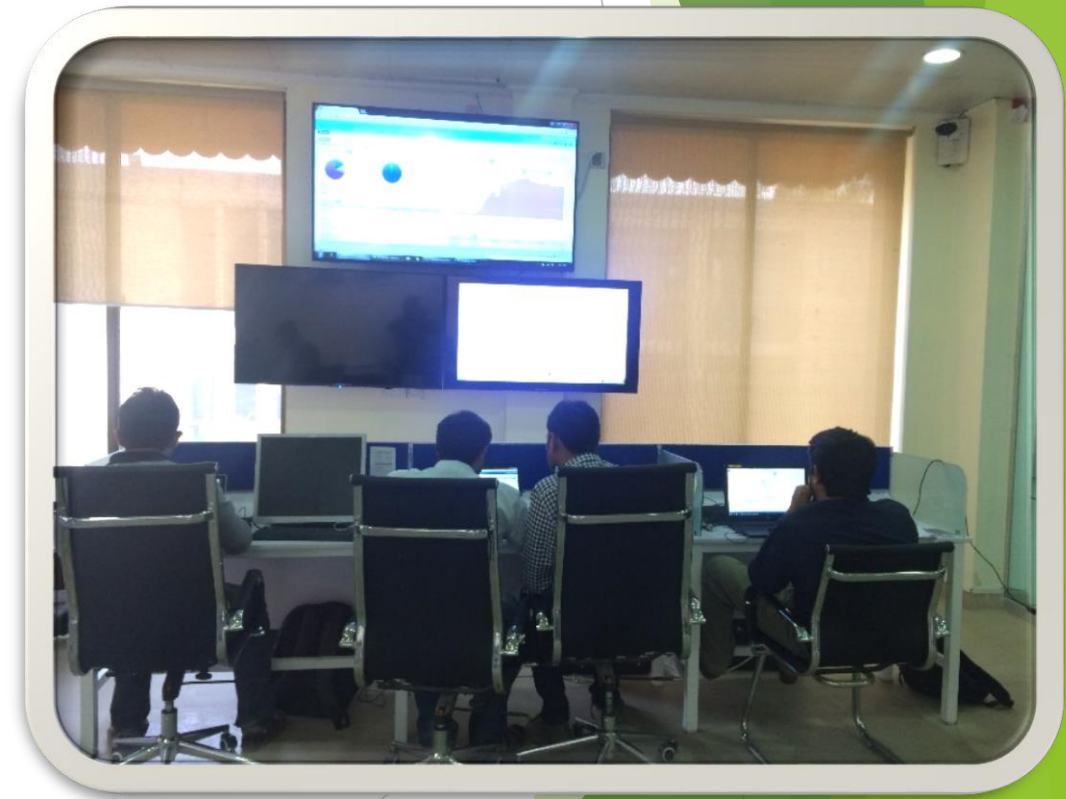
High Level Architecture





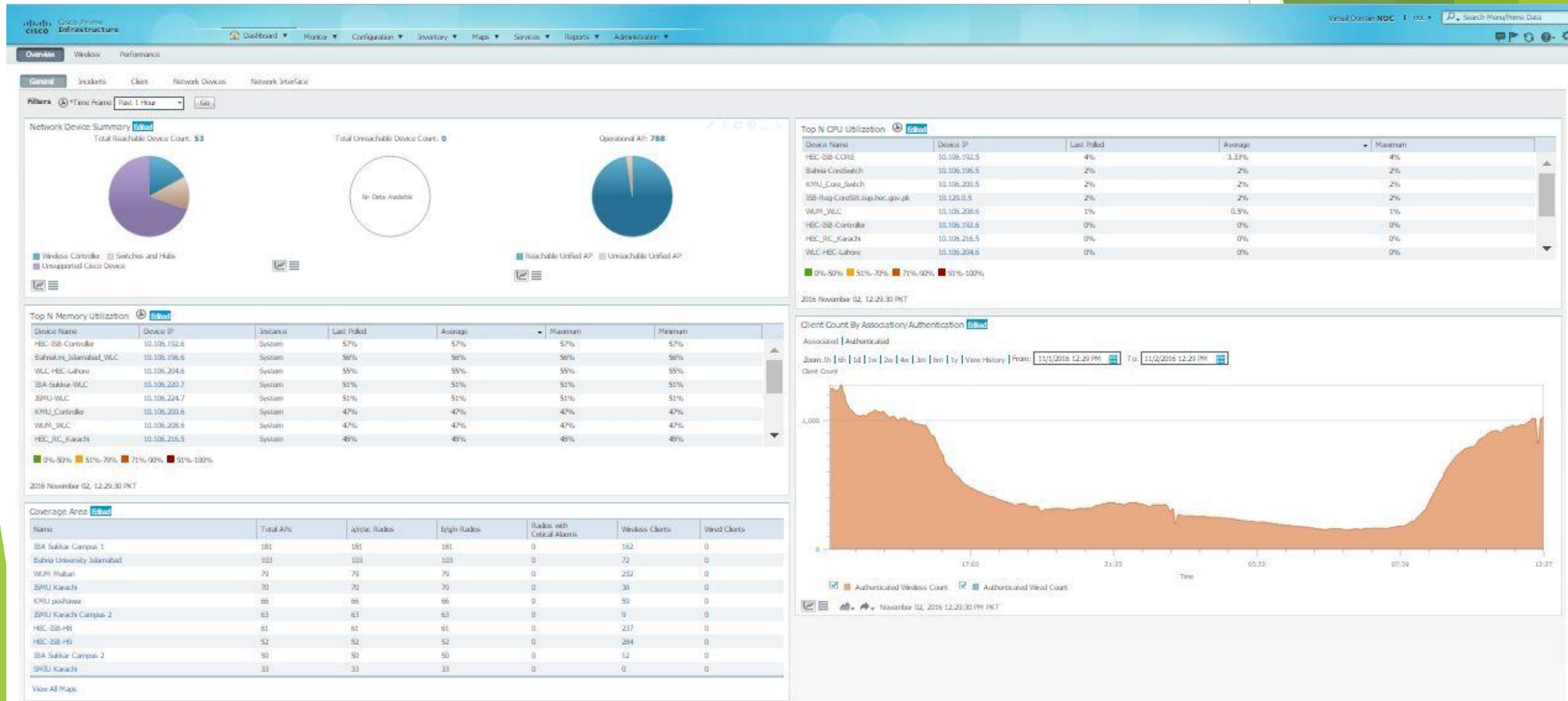
NOC - Operational

- ▶ Centralized SUP NOC has been Established in Islamabad PERN HQ to monitor Wi-Fi services in HEI's by 16x7x365
 - ▶ Five (5) Dedicated NOC Engineer
 - ▶ One (1) Cisco Residential Engineer
- ▶ User traffic usage, user behavior, Network usage, alerts are monitored through Cisco Prime.
- ▶ Due to the dedicated services of NOC, HEI's uptime on avg is above 90%

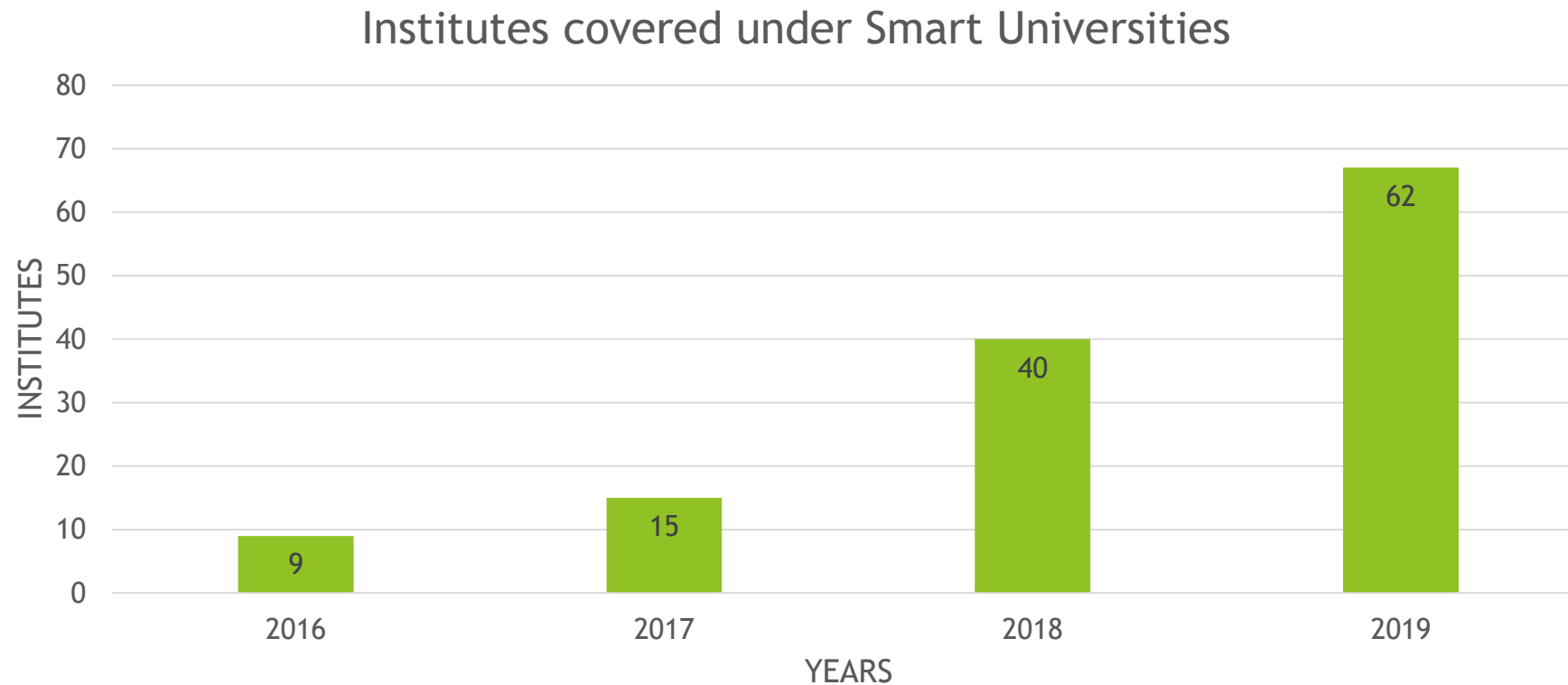


NOC - NMS Access to Universities

- Cisco Prime access is also given to Universities to monitor the Wi-Fi services.

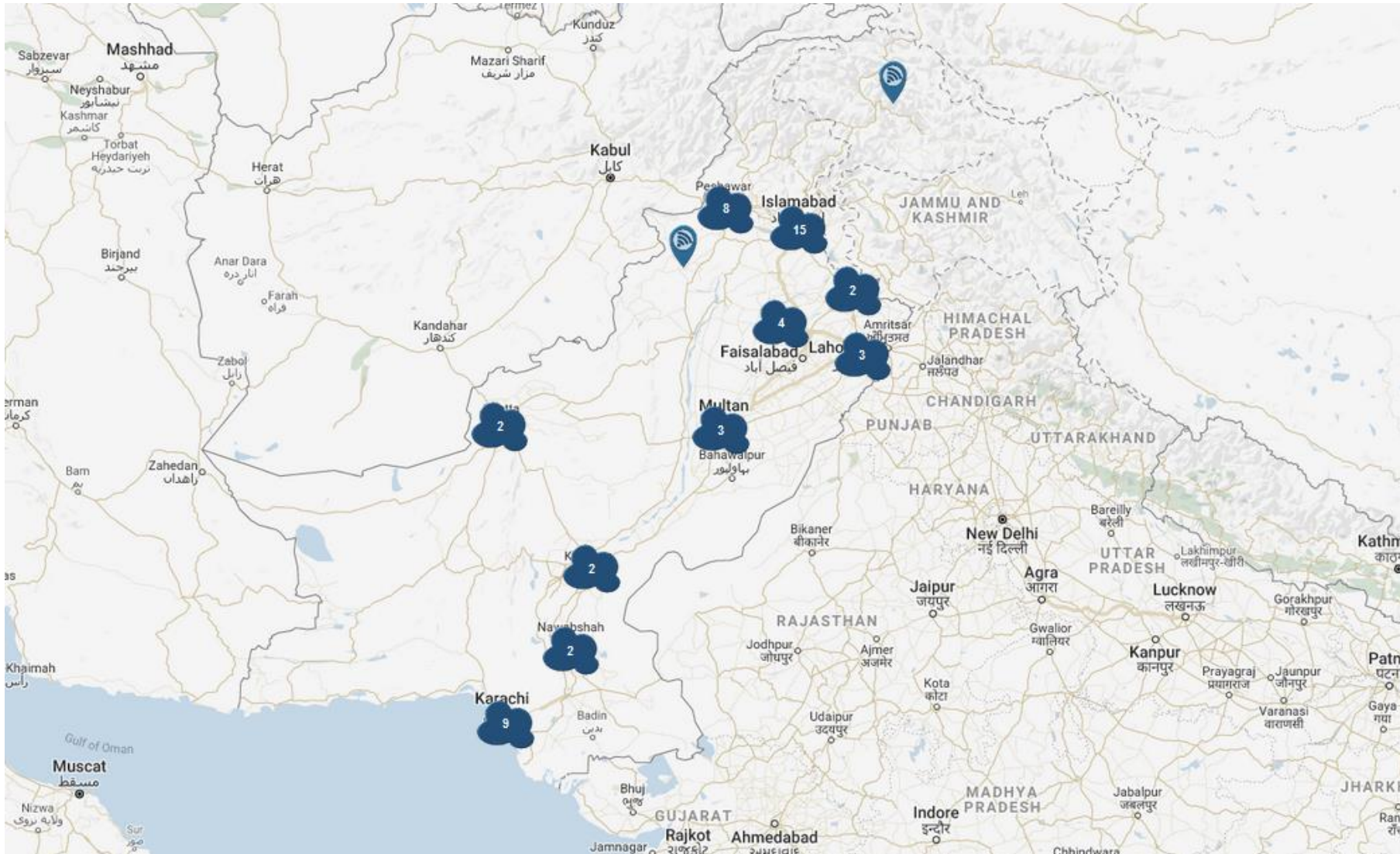


eduroam enabled Institutes



Currently 62 public sector universities are enabled for eduroam

eduroam footprint in Pakistan



Currently 62 public universities are enabled for eduroam

<https://admintool.eduroam.pk>

Softwares we are using:

RadsecProxy for FLR Servers

Windows NPS as University Radius Server

Admintool (DJNRO)

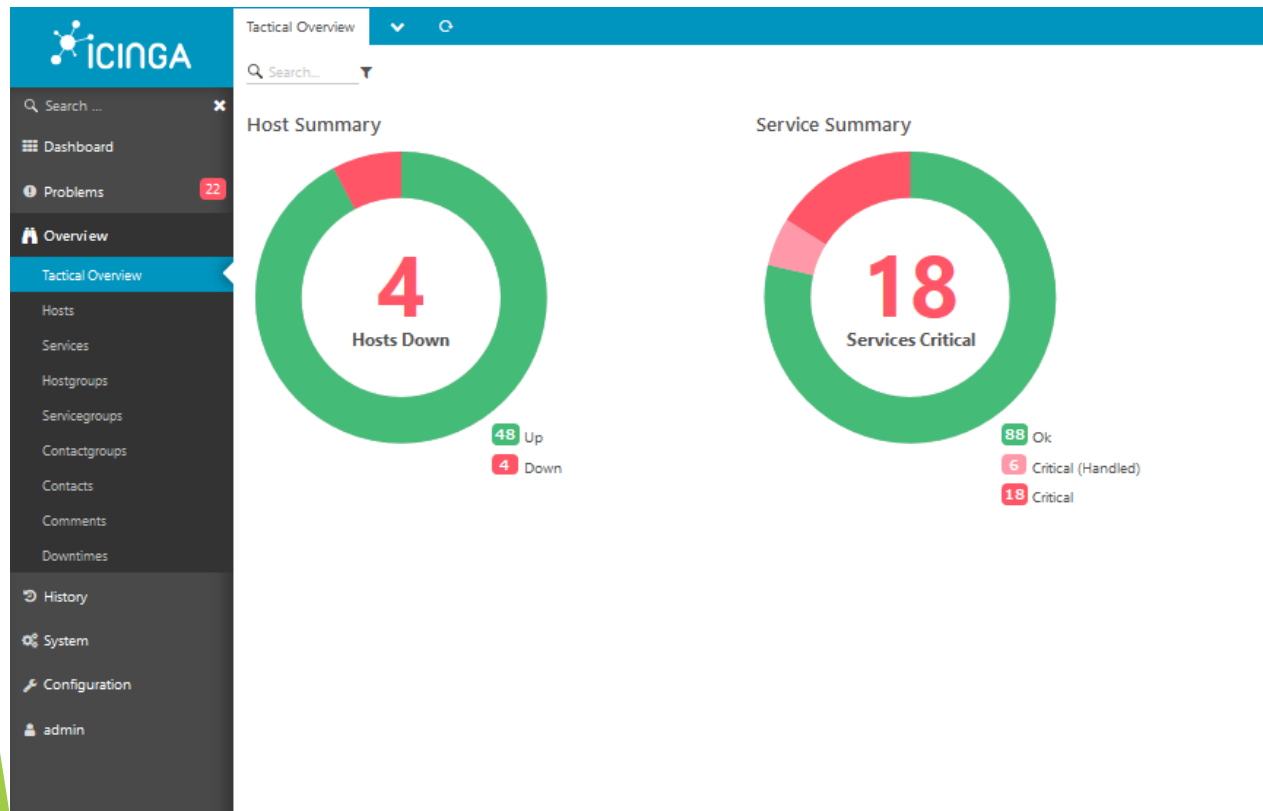
ICINGA NMS for Monitoring

ELK / Kibana for Reports

Kiwi Syslog Server

Cisco Prime NMS

Manageability : Monitoring eduroam network



icINGA Current Incidents Overview Muted

Search...

Dashboard Problems Overview



History System Configuration admin

Service Problems		Recently Recovered Services		Host Problems	
CRITICAL 8m 22s	University of Azad Jammu and Kashmir (UAIK): ping4 PING CRITICAL - Packet Loss = 28%, RTA = 136.72 ms	OK 10m 55s	Islamia College Peshawar (PSH-ICP): ping4 PING OK - Packet Loss = 0%, RTA = 69.78 ms	DOWN 1209	Hazara University Mansehra PING CRITICAL - Packet Loss = 100%
CRITICAL 12:09	PERN.NRS2: eduroam-account-hu.edu.pk-localauthn timeout; 10 sec	OK 29m 9s	PERN.NRS2: eduroam-account-adic.edu.pk-localauthn access-accept; 1.12 sec	DOWN Jan 23	Karakoram International University Gilgit-Baltistan PING CRITICAL - Packet Loss = 100%
CRITICAL 12:08	PERN.NRS1: eduroam-account-hu.edu.pk-localauthn timeout; 10 sec	OK 41m 16s	University of Science Technology (BNU-UST): ping4 PING OK - Packet Loss = 0%, RTA = 35.36 ms	DOWN Jan 23	University of Kotli Azad Jammu and Kashmir PING CRITICAL - Packet Loss = 100%
CRITICAL Feb 8	DOW University of Health Science (KHI-DUHS): eduroam-account-duhs.edu.pk-localauthn timeout; 10 sec	OK 41m 22s	Shaheed Benazir Bhutto Women University (PSH-SBBWU): ping4 PING OK - Packet Loss = 0%, RTA = 30.57 ms	DOWN Jan 23	Sindh Madressatul Islam University CRITICAL - Time to live exceeded (10.106.212.6)
CRITICAL Feb 8	Agha Khan University: eduroam-account-aku.edu.pk-localauthn access-reject; 0.08 sec	OK 48m 43s	Allama Iqbal Open University (ISB-AIOU): ping4 PING OK - Packet Loss = 0%, RTA = 27.09 ms		
CRITICAL Feb 4	PERN.NRS1: eduroam-account-jmu.edu.pk-localauthn timeout; 10 sec	OK 13:28	PERN.NRS2: eduroam-account-campus.aiou.edu.pk-localauthn access-accept; 0.31 sec		
CRITICAL Jan 23	Sulur Institute of Business Administration: eduroam-account-sibadomain.local-localauthn timeout; 10 sec	OK 12:52	Bacha Khan University Charsadda (BKUC): ping4 PING OK - Packet Loss = 0%, RTA = 81.70 ms		
CRITICAL Jan 23	University of Gujrat: eduroam-account-uog.edu.pk-localauthn timeout; 10 sec	OK 12:01	PERN.NRS2: eduroam-account-uos.edu.pk-localauthn access-accept; 0.24 sec		
CRITICAL Jan 23	Jinnah Sindh Medical University: eduroam-account-jmu.edu.pk-localauthn timeout; 10 sec	OK 11:36	COMSATS Institute of Information Technology: ping4 PING OK - Packet Loss = 0%, RTA = 29.28 ms		
CRITICAL Jan 23	Women University Multan: eduroam-account-muw.edu.pk-localauthn access-reject; 0.13 sec	OK 11:13	Sardar Bahadur Khan Woman University Quetta: ping4 PING OK - Packet Loss = 0%, RTA = 23.55 ms		

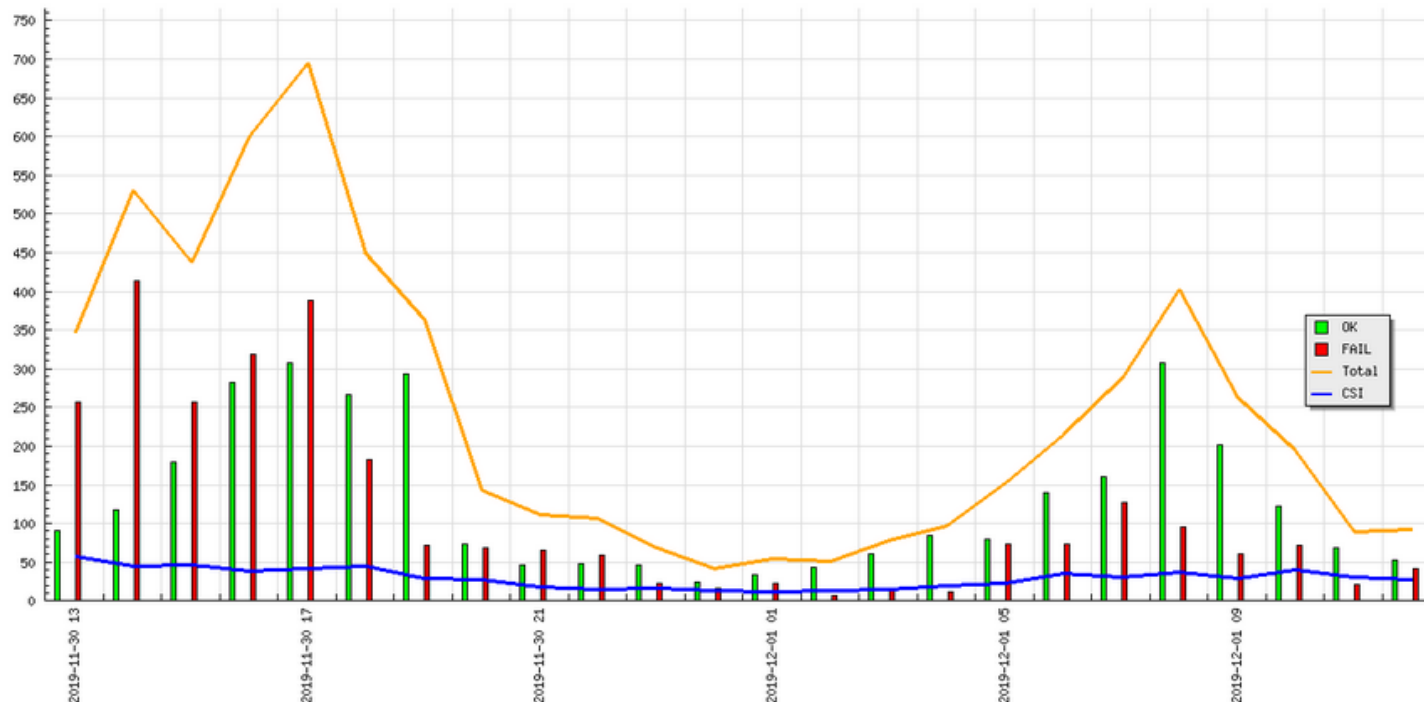
Show More

Monitoring at <https://monitor.eduroam.org>

- PK is also configured at <https://monitor.eduroam.org> and sending FTICKS for statistics.

pk	RADIUS server 1	✓	eduroam.pk	EAP-TTLS	5257	5177	2019-12-03 08:31:47	 Graph
	RADIUS server 2	✓	eduroam.pk	EAP-TTLS	5251	5253	2019-12-03 08:32:03	 Graph

**Accumulated requests statistic for country pk
from 2019-11-30 12:36:00 to 2019-12-01 12:37:00**



Statistic data for country: Pakistan

<https://monitor.eduroam.org>

Time interval 2019-01-01 00:00:00 - 2019-12-31 23:59:59

Number of successful authentication requests

National	International (visitors from other countries)
1272049	372774

Future Plan



We have a plan to introduce eduraom at Airports.



Private Universities and colleges



Pakistan Identity Federation (PKiFED)

Identity federation - Pakistan Update



Identity Federation:

- PERN started working on Federated Identity concept in 2018 under BACKFIRE Project.
- PERN currently use IP based authentication on resource & Journal websites. Users can access e-resources only when they are on the Institute campus.
- To overcome this limitation, PERN has created its own federation with the name of Pakistan Identity Federation (PKIFED).
- The goal of the PKIFED is to allow users to access internal and external resources seamlessly using a single, institutionally controlled identity from institutions from anywhere, anytime.

Current Status:

DEPLOYED IDP SERVERS IN 6 UNIVERSITIES

DEPLOYED FILESENDER AS SERVICE PROVIDER



DEPLOYED EDUVPN AS SERVICE PROVIDER FOR SAML AUTHENTICATION



PAKISTAN/PKIFED BECAME 63RD MEMBER OF EDUGAIN



Pictorial Demo : User “lands” on e-resource

The screenshot displays the Cambridge Journals Online website. At the top, the Cambridge University Press logo is on the left, and navigation links for Academic, Journals, Cambridge English, Education, Bibles, Digital Products, About Us, and Careers are on the right. Below this, a dark blue header contains the 'CAMBRIDGE JOURNALS' logo and a secondary navigation bar with links like Home, CJO Mobile, Mobile Device Twinning, Contact Us, Site Map, Help, FAQ, Accessibility, and Register. A 'Basket' and 'Log in' link are also present. A secondary navigation bar below the header includes links for About Us, News, Browse Journals, Authors, Societies, Librarians, Agents, Users, and Corporate. A search bar is located below this, with a dropdown menu set to 'All Journal Articles and Book Content' and a 'Search' button. On the left side, a 'Welcome to Cambridge Journals Online' message encourages users to log in or register, with a prominent 'Register for an Account' button. Below this are social media icons for Facebook, Twitter, LinkedIn, Email, and a generic share icon, along with 'Like' and '+1' buttons. A large banner on the right side of the page features a megaphone and the text 'For the latest news, updates and special offers visit the Cambridge Journals Blog' with a 'read more' button. Below the banner are four buttons: 'Cambridge Journals Blog', 'New Journals for 2016', 'New CJO Features', and 'Journals Price List 2016'. At the bottom, a 'Browse Journals' section includes a dropdown menu set to 'All Categories'. On the right, a featured journal 'The Journal of Classics Teaching' is highlighted with its cover image and a description: 'Now online and open access the Journal of Classics Teaching (JCT) aims to be the leading journal for teachers of Latin, ancient Greek, Classical Civilisation and...'. A white login modal is overlaid on the right side of the page, containing three buttons: 'User Log-in', 'Institutional Log-in', and 'Register for an Account'.

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Basket Log in

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All Journal Articles and Book Content Search

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To access subscriptions and personalised features please log in or register

Register for an Account

Facebook Twitter LinkedIn Email +

f Like 4 G+1 298

For the latest news, updates and special offers visit the Cambridge Journals Blog
read more

Cambridge Journals Blog New Journals for 2016 New CJO Features Journals Price List 2016

Browse Journals
All Categories

THE JOURNAL OF CLASSICS TEACHING
Now online and open access the *Journal of Classics Teaching (JCT)* aims to be the leading journal for teachers of Latin, ancient Greek, Classical Civilisation and...

User Log-in
Institutional Log-in
Register for an Account

Pictorial Demo : User Chooses Institutional Login

The screenshot displays the Cambridge University Press Journals Online homepage. The top navigation bar includes links for Academic, Journals, Cambridge English, Education, Bibles, Digital Products, About Us, and Careers. Below this, a secondary navigation bar features links for Home, CJO Mobile, Mobile Device Twinning, Contact Us, Site Map, Help, FAQ, Accessibility, and Register. The main header area contains the Cambridge Journals logo and a search bar. A dropdown menu is open, showing options for User Log-in, Institutional Log-in (highlighted with a red box), and Register for an Account. The Institutional Log-in option is the focus of the demo. The page also features a 'Welcome to Cambridge Journals Online' section with a 'Register for an Account' button and social media links. A 'Browse Journals' section is visible at the bottom, showing a dropdown menu for 'All Categories' and a featured journal, 'The Journal of Classics Teaching'.

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Cambridge Journals Blog New Journals for 2016 New CJO Features Journals Price List 2016

Browse Journals
All Categories

THE JOURNAL OF CLASSICS TEACHING
Journal of Classics Teaching
Now online and open access the *Journal of Classics Teaching (JCT)* aims to be the leading journal for teachers of Latin, ancient Greek, Classical Civilisation and

Pictorial Demo : User choses Federation/Institute (Response to WAYF)



Select an identity provider

If you are an OpenAthens user, please proceed to the [OpenAthens Login page](#).

Otherwise, select an identity provider.

The Service you are trying to reach requires that you authenticate with your home organization, enter the name below.

Or choose from a list:

Federation

New Zealand/Tuakiri Federation	^
OpenAthens Federation	
Pakistan/Pakistan Federation	
Portugal/RCTSaai Portuguese Federation	
Spain/Spanish Federation	
Sweden/SWAMID Federation	
Switzerland/SWITCHaai Federation	
UK/UK Federation	
US/InCommon Federation	
All Sites	v

Organization

Bahria University Pakistan	^
College of Physicians and Surgeons Pakistan	
HEC AAF IdP Pakistan	
Higher Education Commission Pakistan	
NED University of Engineering and Technology Pakistan	
Pakistan Education & Research Network	

Select	Remember for session v
--------	------------------------

or

Search by keyword:

<input type="text"/>	Search
----------------------	--------

Pictorial Demo : User redirected on institutional Identity Provider (Login) Page



Higher Education Commission, Pakistan

Username

wakhan@hec.gov.pk

Password

••••••••••

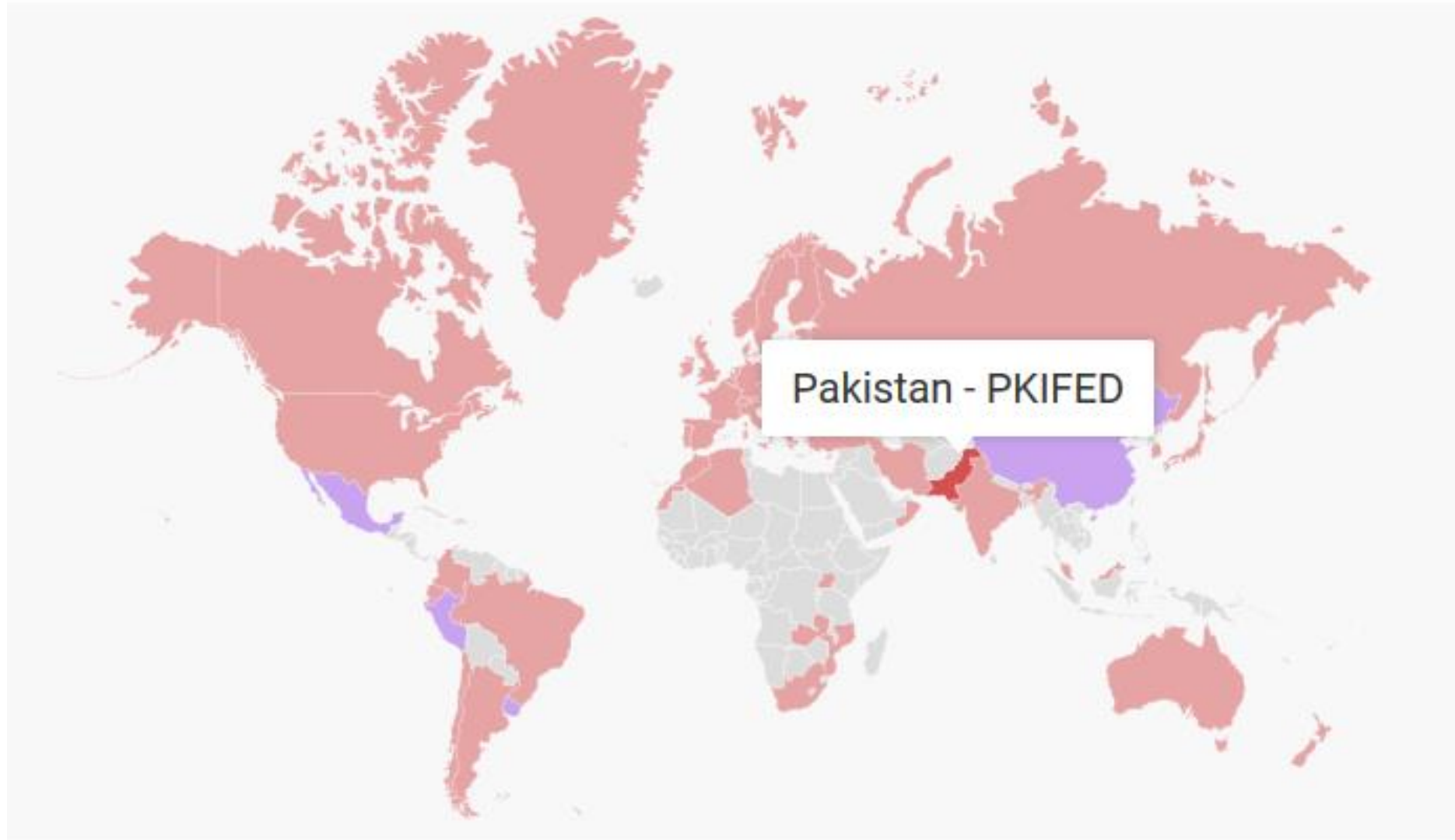
☐ Don't Remember Login

☐ Clear prior granting of permission
for release of your information to
this service.

Login

> [Forgot your password?](#)

> [Need Help?](#)



RED = Member
Purple = Candidate
White = Not Connected

Pakistan/PKIFED became (63rd) member of eduGAIN



Software used in federation:

- ▶ JAGGER (as federation management tool)

Jagger (ResourceRegistry3) is developed by HEAnet to manage the Edugate multiparty SAML federation. Other organisations use Jagger to manage their federations but it can be used to manage the web-of-trust for a single entity.

- ▶ Shibboleth as Institute IdP Server

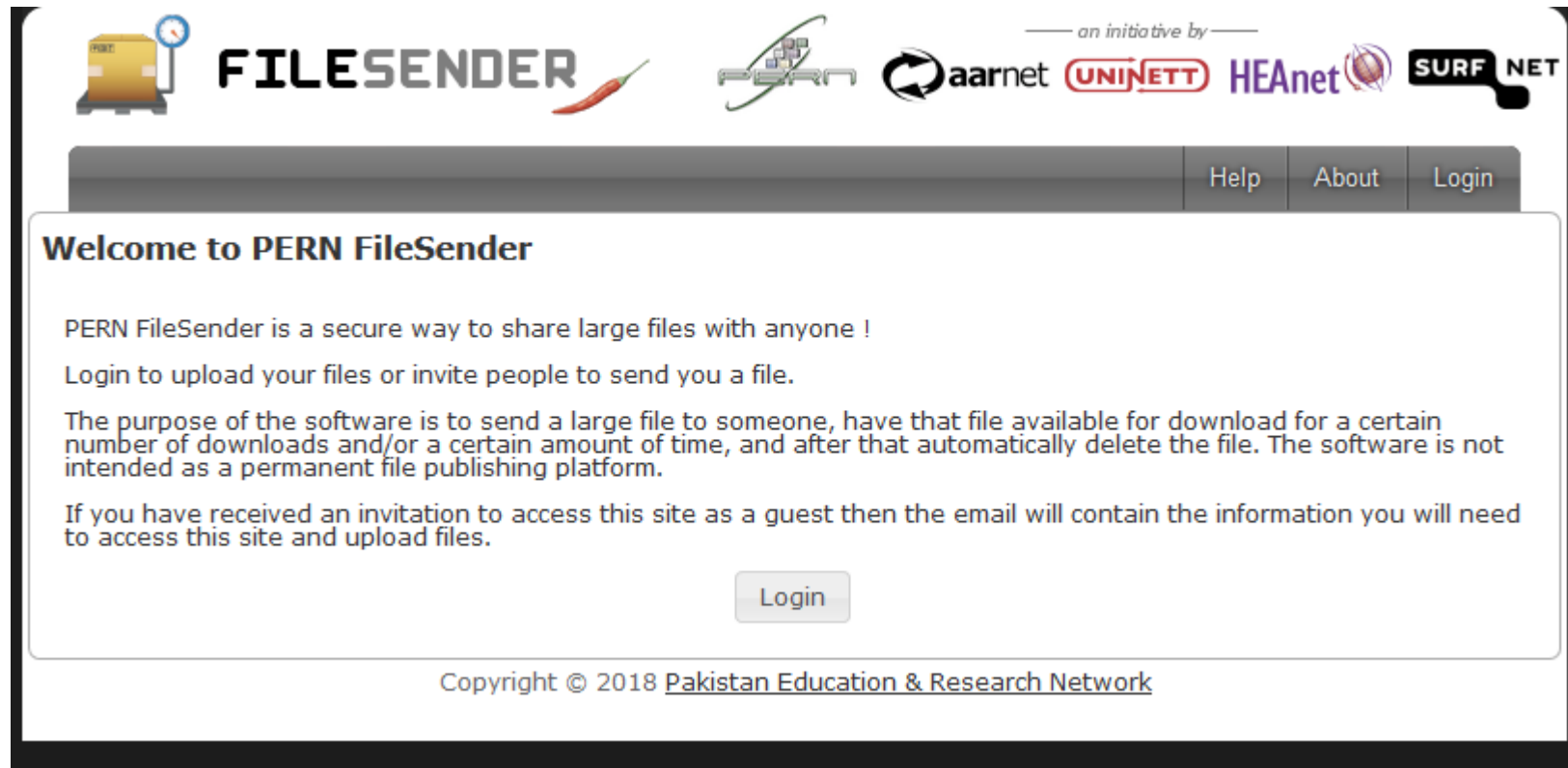
Shibboleth is an open-source PHP authentication application that provides support for SAML 2.0 as a Service Provider (SP) or Identity Provider (IdP).

- ▶ FileSender (<https://filesender.pern.edu.pk>) as Service Provider

- ▶ eduVPN (<https://vpn.pern.edu.pk>) as Service Provider

- ▶ Active Directory / OpenLDAP

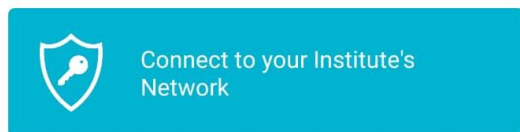
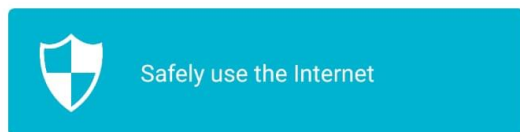
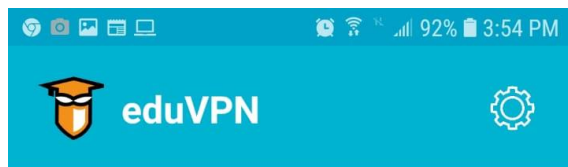
FileSender as Service Provider



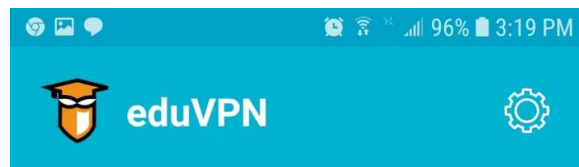
<https://filesender.pern.edu.pk/>



Testing eduVPN as Service Provider



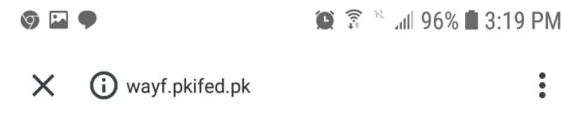
[Add Other Provider](#)



Select your Country

Select your institution's country here. Afterwards you can use other countries.

-  Denmark
-  Germany
-  The Netherlands
-  Norway
-  Uganda
-  Ukraine
-  Pakistan



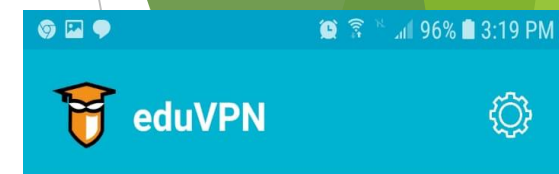
[About Federation](#)

Select your organisation

In order to access the service **PERN eduVPN SP** please select or search the organisation you are affiliated with.

Higher Education Commission


☐ Remember selection for this web browser session.



Secure Internet

-  Internet Access Pakistan
-  Internet Access Denmark
-  Internet Access... (Basic Profile) Germanv

Institute Access



-  Internet Access eduvpn.hec.gov.pk


[Add Provider](#)






Connected ..

 eduVPN 

Status

Provider


Profile
Internet Access



Notifications


Connection Info


Welcome to eduVPN Pakistan by PERN
(Pakistan Education & Research Network).

Disconnect



 eduVPN 

Status

Provider

Profile
Internet Access

Notifications

Connection Info

Duration00:20

Bytes (in)31.00 kB


Bytes (out)23.66 kB

IPv410.46.158.7

IPv62400:fc00:22::1005

View Log

Disconnect



Challenges:

Lack of awareness

No concept of single sign on

Institutes are still happy with IP based authentication.

No technical staff to manage IDPs

Future Plan:

- ▶ Launch similar project like smart WIFI project for IAM.
- ▶ Establish a PERN Working Group on IAM
- ▶ Awareness Sessions and workshops in member Institutes on IAM
- ▶ Install IdPs in more Universities.
- ▶ Integrate PERN services such as Video Conferencing, portals, Cloud E-learning etc. platform with federation
- ▶ Increase more Service Providers

The background features abstract, overlapping geometric shapes in various shades of green, primarily on the left and right sides, framing a central white area.

Thank You