MYREN

MALAYSIAN RESEARCH AND EDUCATION NETWORK

BRIDGING THE PAST, EMPOWERING THE FUTURE

Agenda

Introduction

01

MYREN was officially established in 2005 under the Ministry of Higher Education, Malaysia. It was created to enhance connectivity and provide dedicated high-bandwidth access for academic and research purposes.

02

Facilitate collaborative research locally and internationally and act as a gateway to global research and education networks (RENs).

03

MYREN played a vital role in integrating Malaysian researchers into global research networks. Through MYREN, Malaysia became an active member of APAN, connecting the country to international collaborators in science, technology, and education.

04

MYREN remains a critical infrastructure for Malaysia's higher education and research ecosystem. By connecting researchers and educators to high-speed internet and global networks, it continues to drive advancements in education, research, and technology, supporting Malaysia's aspirations to become a knowledge-driven economy.

Empowering Connectivy and Collaboration

High Speed Internet Access

Dedicated high-speed bandwidth for research and education institutions to connect to the internet and other global research networks.

Network Connectivity Services

Links to global research and education networks via Asia@Connect project (10 Gbps) and ARENAPAC (100 Gbps).

A private network for secure communication between MYREN member institutions.

Consultation and Technical Support

Advisory services for network planning, management, and optimization for member institutions.

Technical support for integration with MYREN services.

EduVPN and Eduroam

Secure, world-wide Wi-Fi access for researchers, staff, and students across participating institutions in Malaysia and globally.

Network Monitoring and Management

Tools for monitoring and managing the performance of the MYREN network, ensuring reliable connectivity and minimal downtime.

Proactive alerts and incident handling to maintain uptime.

The Beginning of the Journey

UPSTREAM

2 IP TRANSIT
LOCAL & INTERNATIONAL
40Gpbs

3 PRIVATE PEERING
GOVERNMENT 100Mbps
TEIN 10Gbps
GOOGLE 20Gbps

1 PUBLIC PEERING
MALAYSIA INTERNET EXCHANGE 10Gbps

POP

7 POINT OF PRESENCE

KEMENTERIAN PENDIDIKAN INSTITUT AMINUDDIN BAKI
UNIVERSITY OF MALAYA
UNIVERSITI SAINS MALAYSIA
UMPSA UNIVERSITI MALAYSIA PAHANG AL-SULTAN ABDULLAH
UTM UNIVERSITI TEKNOLOGI MALAYSIA
UMS UNIVERSITI MALAYSIA SABAH
UNIMAS UNIVERSITI MALAYSIA SARAWAK

LOCATION

171 CUSTOMER BASED

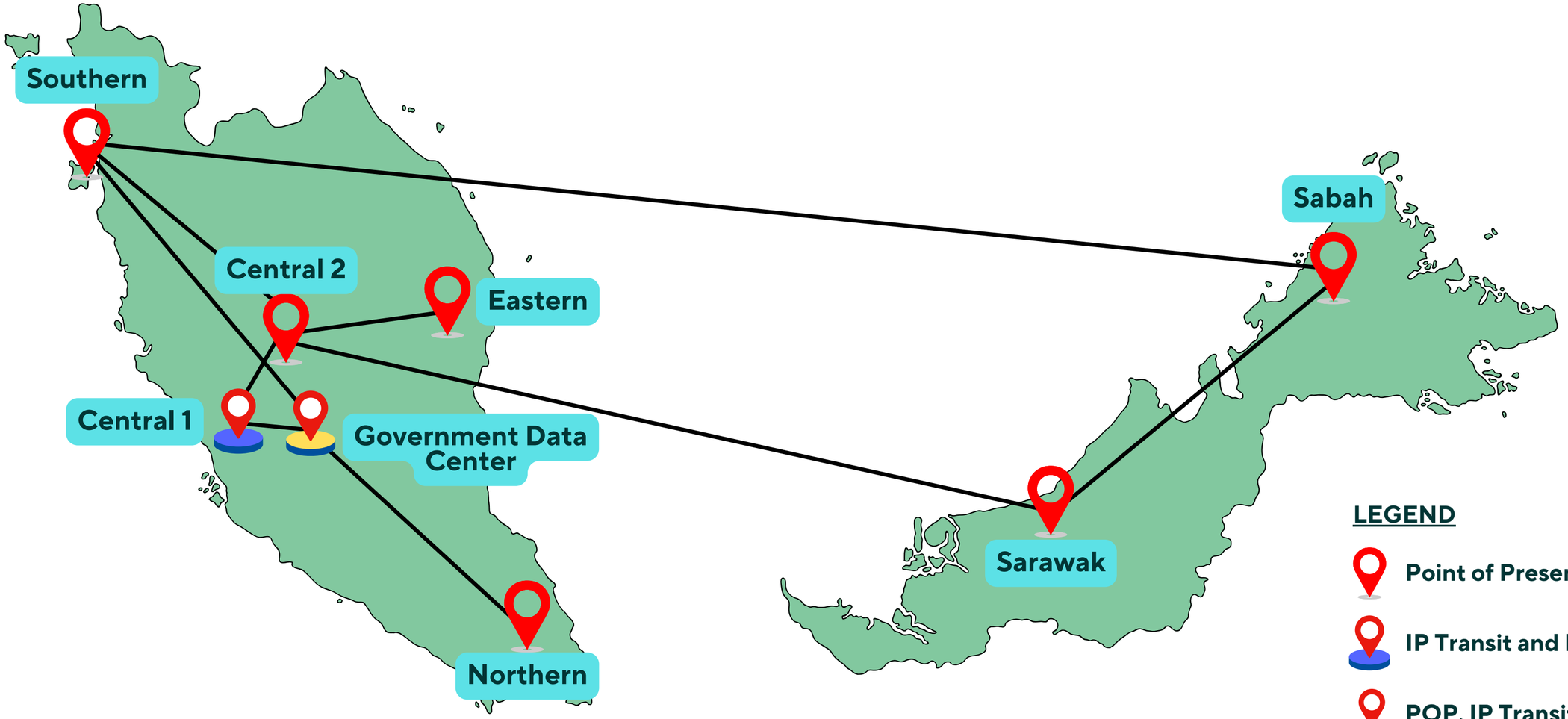
23 Public and Private Universities

4 Hospital Universities

4 Government Agencies

140 Polytechnics & College Community

MYREN - POP Connectivity



The Evolution of MYREN

8 Significant Enhancement

POINT OF PRESENCE
+2
9 Location
*Added 1 new PoP Location

CUSTOMER BASED
+ 73 Location
244 Location
*MYREN as primary Internet Gateway

UPSTREAM
+120Gbps
200 Gbps
*Internet Upstream increase from 80Gbps to 100Gbps

HARDWARE
*Most Network Equipment are being refreshed on 2024

CORE NETWORK
+30Gbps
40 Gbps
*Core Network Increase from 10Gbps to 40Gbps

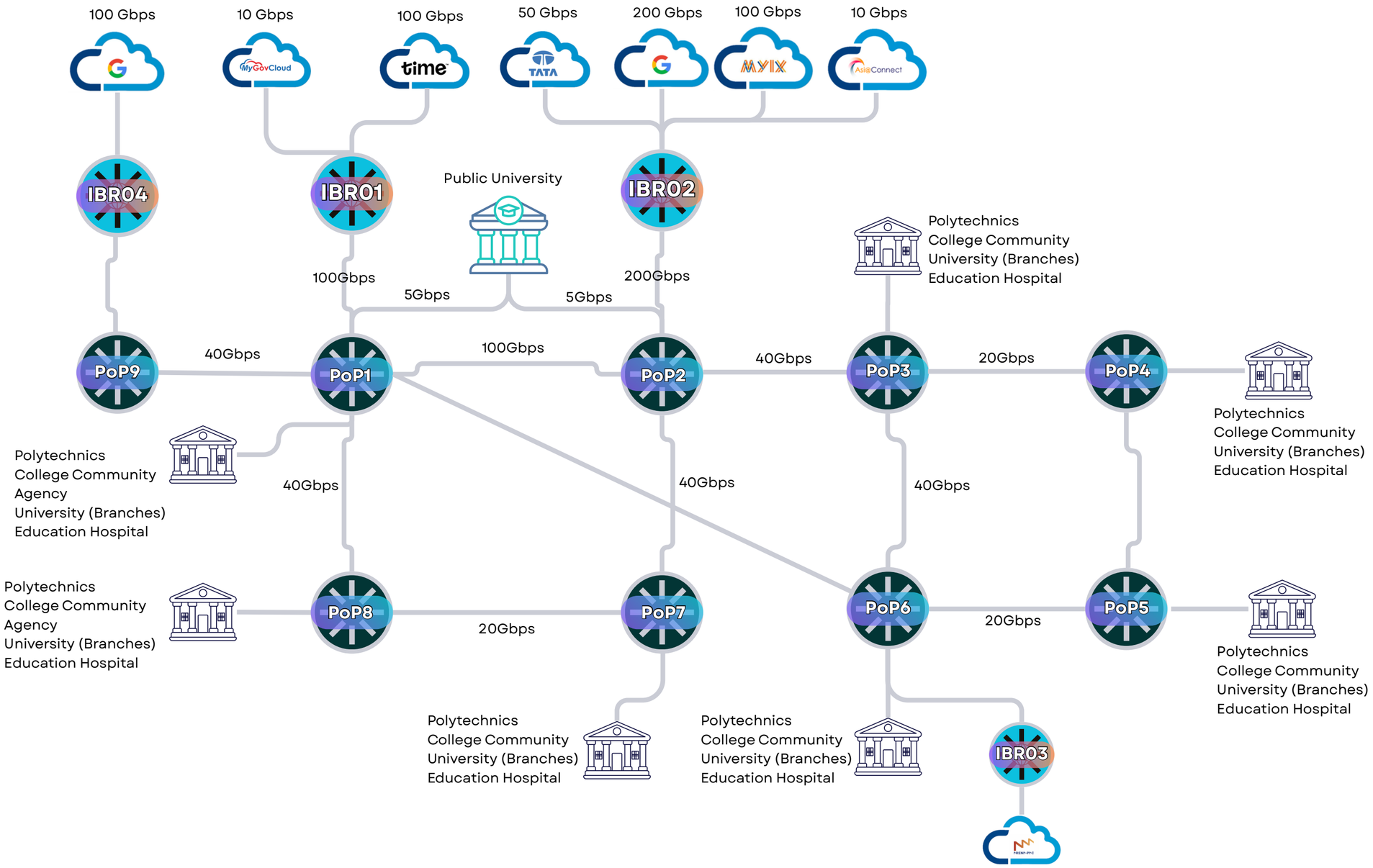
SDWAN
*Implement SDWAN Technology in 104 Locations

VISIBILITY
*Implement advance flow all over the Router

ACCESS
*All Universities will have direct link (DWDM) to the IBR (IP Transit)

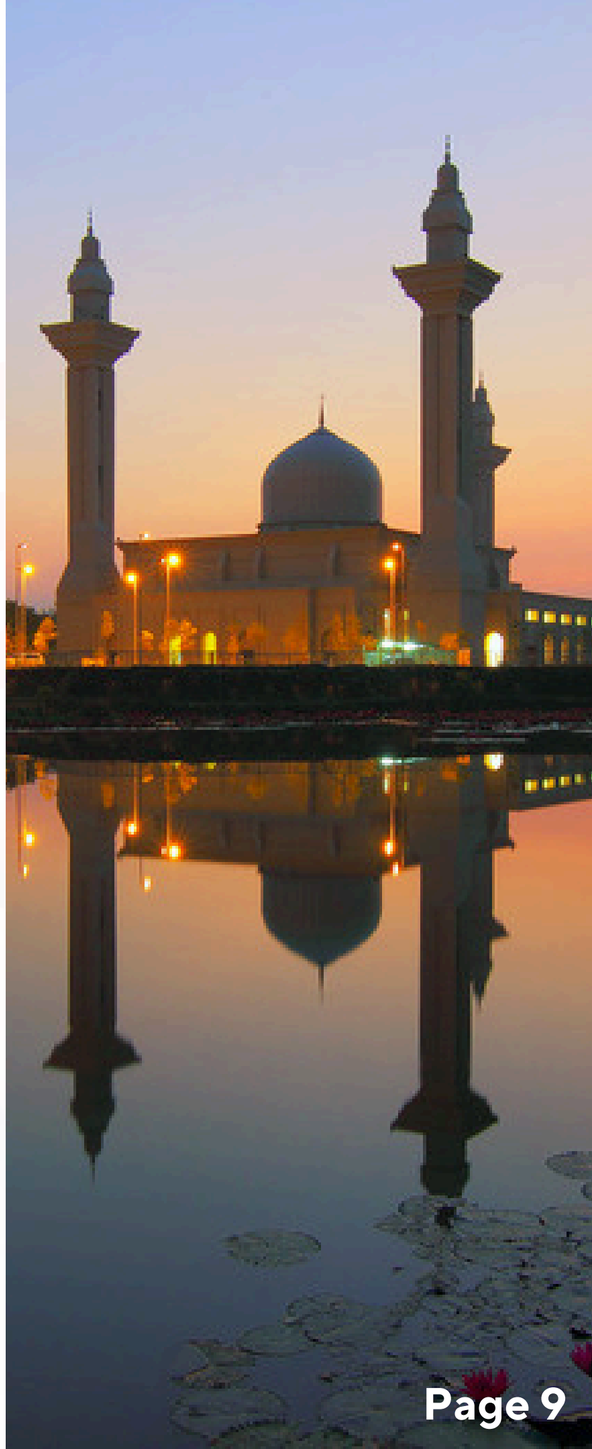
PEERING
+270Gbps
300 Gbps
Direct peering capacity increase from 30Gbps to 300Gbps

MYREN Now


100 Gbps
10 Gbps
100 Gbps
50 Gbps
200 Gbps
100 Gbps
10 Gbps
IBR04
IBR01
Public University
IBR02
100Gbps
5Gbps
5Gbps
200Gbps
Polytechnics
College Community
University (Branches)
Education Hospital
PoP9
40Gbps
PoP1
100Gbps
PoP2
40Gbps
PoP3
20Gbps
PoP4
Polytechnics
College Community
University (Branches)
Education Hospital
Polytechnics
College Community
Agency
University (Branches)
Education Hospital
40Gbps
40Gbps
40Gbps
Polytechnics
College Community
Agency
University (Branches)
Education Hospital
PoP8
20Gbps
PoP7
PoP6
20Gbps
PoP5
Polytechnics
College Community
University (Branches)
Education Hospital
Polytechnics
College Community
University (Branches)
Education Hospital
IBR03

Present-Day Achievement

- Upgrading the MYREN Core Network from 10 Gbps to 40 Gbps
- Implementing SDWAN technology
- Upgrading IP Transit to 100Gbps
- Migrating all Public University to the MYREN Network as Primary Upstream. Estimated around 900,000 customer from Researcher, Staff and Students are using MYREN
- Implementation of flow on MYREN Network for visibility



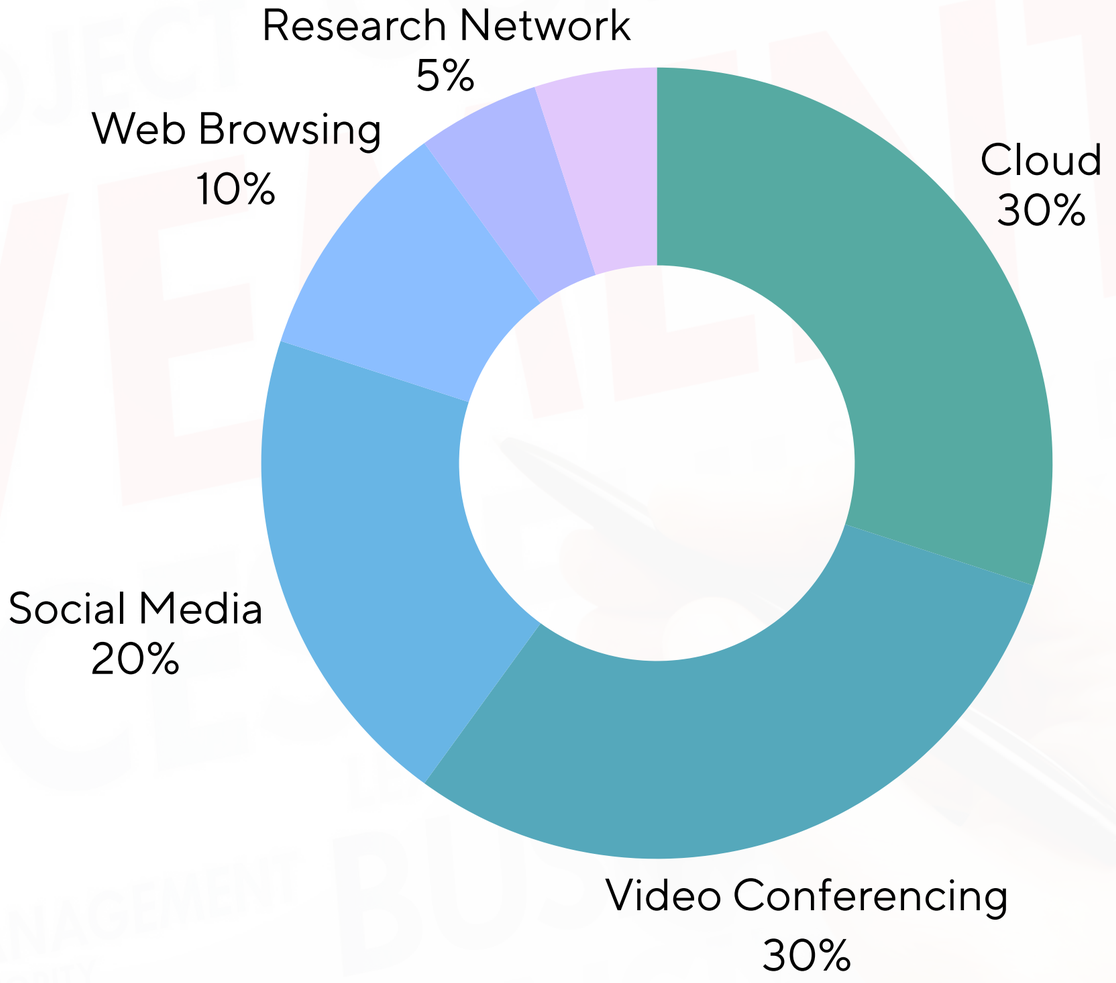
Network Performance & Utilization

Current peak throughput

120 - 180 Gbps

MYREN currently sustains a robust throughput reflecting the high-performance demands of Malaysia’s academic and research ecosystem.

The utilization profile reveals that Cloud Computingand Video Conferencing represent the core traffic drivers, accounting for 60% of the total bandwidth. This aligns with the national shift towards hybrid learning environments and centralized data services.



MYREN Challenge Landscape

Bandwidth Management and Capacity Planning

As new customers join and existing institutions use more bandwidth-intensive applications (e.g., online learning, research data transfer, and video conferencing), managing bandwidth efficiently becomes critical.

Cybersecurity Risks

A bigger network and more customers mean a higher risk of cyber threats like DDoS attacks, ransomware, or unauthorized access.

Routing Validation Issues

Oversights in IP transit policy management led to inconsistent routing paths. Lack of a central dashboard to periodically validate status updates across the transit network.

Traffic Flow Anomalies

Persistent asymmetric routing caused inefficient data paths. Traditional tools failed to detect abnormal traffic flows effectively.

Network Visibility and Monitoring Challenges

With an expanded network and more customers, ensuring end-to-end visibility into traffic, devices, and performance metrics becomes increasingly complex.

Current NOC Limitations

Too many monitoring tools

- Engineers jump between 5–10 dashboards.
- No single source of truth.
- Correlation is manual.

Use unified telemetry platform

- Telegraf, OpenSearch, Elastiflow.
- Unifying multiple data sourcees into a single platform.
- Engineers can correlate within seconds

Monitoring is reactive

- Only tells something when they are already broken
- No prediction or early warning

Predictive & proactive alerting

- Implement OpenSearch Anomaly Detection for early warning signals.
- Capacity forecasting to predict bandwidth exhaustion before it happens.
- Dynamic filtering for faster root-cause analysis during anomalies.

Lacks traffic intelligence

- Does not know which ASN causes congestion
- Which customer drives traffic growth

Multi tenant visibility

- Institutes only see their own traffic and flows.
- Still sharing the same infrastructures.

Current NOC Limitations

Manual reporting

- Check interface graph
- Export screenshots
- Builds reports manually

Automated & scheduled reporting

- Automated PDF/CSV report generation directly from dashboards.
- Scheduled email/channel delivery for management and institutes.
- Eliminates manual screenshotting and compilation.

Data silos

- Multiple data from SNMP, Netflow, Syslog, BGP, IPSLA
- Cannot be correlated automatically

Unified Telemetry & Cross-Correlation

- Centralized data lake in OpenSearch for SNMP, Netflow, Syslog, and IPSLA.
- Automated correlation via common indexing (e.g., node and interface tagging).
- Single timeline view to trace root cause from log to traffic flow.

The Overcoming Strategies

Custom Application Development

We developed a proprietary application providing 360-degree visibility. Key metrics include end-to-end latency (A to B) and bidirectional flow monitoring (Traffic Direction) to eliminate routing blind spots.

Integrated Helpdesk, Flow, and NCM into a single "Source of Truth" dashboard.

Quantifying Operational Success

- **Interface Health Detection: Automated monitoring of device interfaces to detect failures before they impact the user community.**
- **Intelligent Ticketing: Integration of automated detection with instant notifications and auto-generation of support tickets.**
- **Proactive Communication: Immediate alerts sent to relevant stakeholders, reducing the Mean Time to Repair (MTTR).**

Results:

By removing human intervention from the initial detection and reporting phase, MYREN now operates with unprecedented agility, ensuring high availability for critical research data.

100%
DEVICE HEALTH VISIBILITY

24/7
AUTOMATED DETECTION

0
MANUAL TICKET DELAYS

Vision for Tomorrow

Seamless Regional and Global Connectivity

Establish high-speed, low-latency links to ArenaPac to expand MYREN's global reach, providing Malaysian researchers, educators, and students access to a broader ecosystem of regional and international collaborations.

Resilient and Secure Connectivity

Implement a comprehensive security framework to protect MYREN's infrastructure from threats, ensuring seamless and secure connectivity for all users.
Provide regular cybersecurity training for IT staff, researchers, and educators to improve awareness and readiness for emerging threats.

Promoting Collaborative Research Platforms

Establish MYREN as a hub for research collaboration, connecting Malaysian institutions to innovation networks powered by Asi@Connect and ArenaPac.

Shared Services for Research and Education

Establish a national-level, secure, and scalable platform for storing and sharing research data across institutions.
Build a shared HPC infrastructure to provide cutting-edge computational resources for large-scale simulations, data analysis, and machine learning.

QUESTION & ANSWER

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