

Nepal Research and Education Network

R&E Network Members'

Memorandum of Understanding (MoU)

(October, 2010)

Member Name: Kathmandu University, Dhulikhel

Date of MoU Signed: 10 January, 2011

Date of Connectivity Established: 15 May, 2009

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Memorandum of Understanding

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I. Purpose

This Memorandum of Understanding (MoU) states the objectives of NREN, the prerequisites for joining research and education network members, the services that NREN provides to its members and the commitments of members to NREN. It shall be signed by all new members upon joining, and forms a formal agreement between the member and NREN.

This MoU is placed in the public domain to help organizations that wish to join research and education network members of NREN and the requirements for those who wish to join as R&E member.

II. Definitions

"NREN" refers to Nepal Research and Education Network, a nongovernmental not for profit organization registered on District Administrative Office, Social Welfare Council and District Development Committee, Kathmandu, Nepal.

"Members" refers to an organization who has successfully met and continues to meet process of connectivity (listed on Annex V) as Research and Education (R&E) network members and has signed a copy of this MoU.

"Membership" refers research and education network member.

"Fees" are the charges levied for services which are documented in Subscription Fees - see Annex IV.

"Member Equipment" is any equipment owned by, leased to, or otherwise controlled by a member.

"NREN Equipment" is that equipments which are afford by NREN to a member for research and education network purpose.

"Memorandum of Understanding" means this agreement between the member and NREN, together with its annexes.

"Services Benefits" refers to the benefits of Research and Education Network provide to a member as defined in the Annex I.

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III. Objectives of NREN

NREN providing high speed network connectivity services to the colleges and institutions through APAN(Asia Pacific Advanced Network), Internet2 (US Advanced R&E networks), TEIN3 (Trans-Eurasia Information Network)/ Europe's DANTE (Delivery of Advanced Network Technology to Europe) GÉANT2, AI3 (Asian Internet Interconnection Initiatives)/WIDE project Japan, for building an ICT developed nation for Research and Education. NREN has established an agreement with Asia Pacific Advanced Network (APAN) towards to the establishment of high speed dedicated network to support development of national computational grid for research and education.

NREN has six primary objectives.

- Run a high speed network and connecting all Universities, Colleges, Academies and research institutes.
- Promote advanced research in networking technologies and the development of high-performance broadband applications.
- To coordinate the development of an advanced networking environment for research and education communities in the Asia-Pacific region and to encourage and promote global cooperation to help achieve the above.
- Act as a catalyst for the development of national research networking. Exchange resources and knowledge by means of Networking with different universities, colleges and research institutions.
- Provide the resource and infrastructure of the information communication technology (ICT) for the development of research and learning purpose.
- Provide content and services related to ICT.

IV. Legal Structure of NREN

NREN is an independent, non-profit and non-governmental social organization registered on District Administrative Office, Social Welfare Council and District Development Committee, Kathmandu.

Articles

1. Prerequisites to apply to become member:

- 1.1. Candidates for membership will be a recognized and registered legal entity
- 1.2. Candidates for membership should be an education and research institution
- 1.3. Candidates for Membership should have committed for Information and Communication Technology (ICT) on Education Sector.

These prerequisites, together with the Technical Details referenced in Clause 5 of this document, form the basis of ongoing requirements for members.

2. Responsibilities and Services to be provided by NREN

- 2.1 NREN provides advanced research and education applications and promotes collaboration relating the

development of next generation networking applications in research and higher education.

2.2 NREN provides research & education network among R&E network member.

2.4 NREN and member jointly monitor and employ technology and other tools to ensure that advance networking traffic between institutions is consistent with their mission and obligations.

2.5 NREN provide R&E Services and application listed on Annex III

3. Member Responsibilities

3.1 Members are expected to contribute towards the running of NREN by paying subscription fee.

3.2 Members shall ensure that all contact information which is held by NREN in connection with their membership is correct and kept up-to-date.

3.3 Not to apply for or register a patent, trademark, design, copyright or other intellectual property to the other Party without prior written approval from NREN;

4. Membership Status

4.1 The new Member complies with the Technical Requirements of NREN within three months of being granted temporary membership status. In the event that the new Member does not comply with this requirement, temporary membership status may be withdrawn and it shall be necessary for the new member to re-apply for NREN Membership. In this event any Fees paid to date shall be deemed to be non-refundable and any subsequent membership application shall incur additional fees as per Clause 8 of this document.

4.2 A connection to NREN may only proceed after:

4.2.1 NREN has received a copy of this MoU signed by an authorized representative of the new member

4.2.2 NREN has received a membership form from the new member, duly completed and giving all required information

4.2.3 All technical requirements have been met by the member

4.3 A member shall only be deemed to have full membership status once they met all the requirements listed in 4.1 and 4.2.

5. Technical Details

5.1 NREN provides very high-speed connectivity between research and education users wishing to collaborate with others in their national and international communities through Single mode fiber optic connections for Physical access.

5.2 All connections to NREN should be made with single mode 9/125 micron fiber optic cable. Connections can be made to members at the 1 Mbps. The connecting organizations equipment will provided by NREN as the property of NREN.

5.3 NREN will peer, where appropriate, with local and regional networks to extend its reach and to minimize duplication of infrastructure.

5.4 NREN is continually evolving, with emphasis on flexibility of functionality, supply, scalability and reach, subject only to the needs of its connected users. NREN supports following standards to maintain connection between members:

- 802.1Q VLAN tagging
- IPv4 (minimum 24 bit subnet mask) or IPv6 (minimum 64 bit subnet mask)
- Path MTU Discovery (RFC 1191 Compliant)
- OSPF

6. Non-compliance

6.1 Failure of a member to comply with the Technical Details (Clause 5.4) or any other requirements of this MoU may result in sanction being taken against a member. Such sanction shall be at the sole discretion of the board and may, depending on the severity of the incident, take the form of any or all of:

6.1.1 Immediate disconnection from the services pending resolution of the non-compliance by the member

6.1.2 Termination of membership which, for the avoidance of doubt shall mean: permanent removal and disconnection from the services and no right to a refund for any fees paid to NREN.

7. Communication

The primary means of communication with NREN Staff and other members shall be via email.

8. Fees

Higher Bandwidth will attract higher fees. (For subscription fees refer to Annex IV). Fees are payable three-month in advance. All fees for a member shall be due within 30 days of the due date. However, all fees shall be due immediately if any of the following happens:

8.1 Members canceling either their subscription to NREN or any Services supplied by NREN are obliged to give at least 30 days notice of such cancellation via email to support@nren.net.np If cancellation occurs other than during the months of September or March, the member shall be entitled to a pro-rata refund of Services and Membership fees for complete calendar months between the cancellation date and the end of the billing period.

Services shall be deemed ongoing on an annual basis unless formal cancellation has been received by NREN from any connected Member.

9. Insurance and Liability

In the event of any claims made by an R&E network member against NREN, the maximum amount payable

for whatever reason shall be decided by the NREN with effective investigation.

Members shall hold liable for NREN equipments and have to arrange suitable insurance to cover their equipment. Any damage by negligence, fault or improper security will be the subject of liable.

10. Human Resource Development

Following activities will be conducted for Human Resource Development of the members.

10.1 NREN will provide opportunities for R&E network members to participate on International Workshop/Conference/Trainings along with NREN official representations.

10.2 Two meetings of network members will arrange per year and will manage following activities on regular schedule.

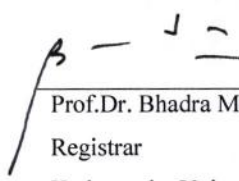
- a) Workshop/ Conference
- b) Working Group Meetings
- c) Committee Meeting

11. Duration, Termination and Revision

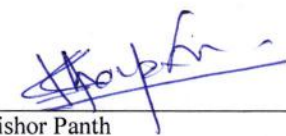
This MoU will be effective from the date of signing by Members and NREN and may be subject to extension, termination and revision by mutual consent in writing.

IN WITNESS WHEREOF, this MOU has been dully sealed and executed as of the date first above written.

Agreed to By:




Prof. Dr. Bhadra Man Tuladhar
Registrar
Kathmandu University
Date: 11 January, 2011




Mr. Kishor Panth
Executive Director
Nepal Research and Education Network
Date: 10 January 2011

Witnessed by



Mr. Shekhar Prasad Dhungana
Head, Information System Management Section
Kathmandu University
Date: 11 January 2011





Mr. Rajan Parajuli
Program coordinator
Nepal Research and Education Network
Date: 10 January 2011



ANNEX I: Services Benefits

- National and global collaboration with other researchers and educators via highly reliable, non-congested Internet services through an optical backbone infrastructure resulting in the lowest latency network services to other major research and education institutions.
- Encourage collaboration, sharing of intellectual capital, and material resources among participating research and educational institutions on computational, application and networking issues.
- Highly reliable R&E network aggregation point delivering high-speed research Internet connectivity of Asian, European and American Network.
- Expand knowledge and expertise on human resource management of colleges make available on the network
- Sharing of reference materials and resources cost on an entire network.
- Application developed by one institution in the network can be shared and used by others in the network will help in reducing development cost.
- Promote and participate in collaborative research projects.
- Introducing sustainable knowledge centers and deploy basic infrastructure for video conferencing to aid in tele-teaching, e-learning, e-science, e-culture, e-agriculture, e-environment and e-medicine applications.
- Enhance work together in working groups and other mutual activities and initiatives.
- Members have access on members-only online resources and participate in member email discussion lists.
- Members leverage NREN communications activities, such as press releases, newsletters, web sites, member profiles and more.
- Hosting of an experimental SIP network between member institutions.
- Core network of at least 1Gbps capacity, with spur networks at least 10Mbps and the minimum connectivity speed will be 1Mbps.
- Improves teaching learning activities by the use of modern audio visual aid.

ANNEX II: R&E Network on NREN

- Asia-Pacific Advanced Network (APAN), Asia Pacific backbone, is a national network of Asia where 39 organizational members of different countries give their representation. APAN is designed to be a high-performance network for research and development on advanced next generation applications and services. It provides an advanced networking environment for the research and education community in the Asia-Pacific region, and promotes global collaboration. It has the objectives: Its objectives are: to coordinate and promote network technology developments and advances in network-based applications and services; to coordinate the development of an advanced networking environment for research and education communities in the Asia-Pacific region; and to encourage and promote global cooperation to help achieve the above.

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- TEIN2/3 (Trans-Eurasia Information Network) is the first large-scale research and education network for the Asia-Pacific. TEIN2 connects ten countries in the region, and provides direct connectivity to Europe's GÉANT2 network. TEIN3 network brought into service in early 2009 to seamlessly replace the TEIN2 network. TEIN3 (Trans-Eurasia Information Network) provides a dedicated high-capacity Internet network for research and education communities across Asia-Pacific. TEIN3 extends research and education IP connectivity between Europe and the Asia-Pacific region and within the Asia-Pacific region for the benefit of developing countries in Asia. It currently connects 11 countries in the region, and provides direct connectivity to Europe's GÉANT2 network. TEIN3 offers Asia-Pacific a gateway for global collaboration, enabling over 30 million users across the region to participate in joint projects, with their peers in Europe and other parts of the world. TEIN3 comprises three network hubs in Beijing, Hong Kong and Singapore, connected to GÉANT2 in Europe via high-speed links.
 - Internet2 is a not-for-profit advanced networking consortium comprising more than 200 U.S. universities in cooperation with 70 leading corporations, 45 government agencies, laboratories and other institutions of higher learning as well as over 50 international partner organizations. It is the foremost U.S. advanced networking consortium. Led by the research and education community since 1996 that promotes the missions of its members by providing both leading-edge network capabilities and unique partnership opportunities that together facilitate the development, deployment and use of revolutionary Internet technologies.
 - Network Startup Resource Center (NSRC)-University of Oregon: Collaboration with NSRC, NREN is providing campus network design training, workshop and all the other internal networking needs of the universities, colleges for human resource development in Nepal. NSRC also supporting to coordinating donations and shipments of networking books and equipment start up network for internal and external enhancement. In addition to this, Helping develop and deploy infrastructure in R&E networks, providing direct network engineering and design assistance, helping organize regional training workshops and centers.
 - AI3 (Asian Internet Interconnection Initiatives) is a research group established by WIDE (Widely Integrated Distributed Environment) project in October 1995 which motives to provide the open Internet test-bed for: countries and regions in Asia, research / academic activities, sharing expertise / knowledge, encourage and support cooperative works, testing new technologies, acceleration of local Internet developments and prototyping the future Asian infrastructure. AI³ has been developing a research consortium of 29 partner institutions in 13 countries utilizing an Internet infrastructure over a satellite links. The project aims to develop partnerships and human networks to foster researchers within the regions to carry out research on the satellite Internet and to develop their regions. It has successfully conducted productive research and also developed a distance-learning environment as a result of more than a decade of experiments. WIDE, a research consortium of distributed computing, computer communication and the Internet promoted since November 1981.

ANNEX III: R&E Services and Application

Deliver qualitative and quantitative improvements in the conduct of:

- Test-bed
- Tele-teaching, e-learning and collaboration tools
 - Telemedicine
 - Emerging infections
 - Digital heritage
 - Disaster warning, oceanographic research and climate modelling
 - Performance measurement and monitoring
- Course content Sharing
- Video Conferencing
- Digital Library
- Virtual Laboratories with interactive research and instruction

ANNEX IV: Subscription Fee

Consumption of higher bandwidth attracts higher fees. The following fees are issued for research and education network member organizations -

Joining Fee (one time, non-refundable) :

Monthly Subscription Fees (includes unlimited local bandwidth and 1Mb International Bandwidth):
6,000.00

All Members will get Free Subscription for the first three months. Three months will be counted after the establishment of physical connectivity.

ANNEX V: Process of Connectivity

The following should be the joining requirements as well as the formal process to get the Research and Education network membership from NREN.

- Letter of Interest (LoI) indicating the interest for connecting NREN R&E Network from the interested organization
- Fiber Connectivity and Premise Equipment
- Test Connectivity
- Extra Technical requirements if directed by NREN
- Sign on MoU