



**3rd NKN ANNUAL WORKSHOP
IIT GUWAHATI
15 – 17 December 2014**

WORKSHOP BROCHURE



National Knowledge Network – Third Annual Workshop *NKN: The E4 (Encourage, Empower, Enable, Enrich) NGN*

National Knowledge Network (NKN) was setup with the goal to bring together all the stakeholders from science, technology, higher education, healthcare, agriculture and governance to a common platform for enabling them to share information / data / knowledge without any bottlenecks.

Globally, frontier research and innovation is shifting towards a multidisciplinary and collaborative paradigm requiring substantial communication bandwidth and high end computational power. In India, NKN with its multi-gigabit capability aims to connect all universities, research institutions, libraries, laboratories, healthcare and agricultural institutions across the country to address such a paradigm shift. By facilitating unhindered flow of information and knowledge, the network addresses the critical issue of access and creates a new paradigm of collaboration to enrich the research efforts in the country. The network design is highly scalable and takes into account the future requirements that would need to be addressed as the network grows. NKN is a game changer, as it is bringing a knowledge revolution that will be instrumental in transforming the society and promoting inclusive growth.

KEY HIGHLIGHTS

The architecture of NKN has been designed with scalability in mind and consists of a core layer that is inherently capable of moving to multiples of 10/40/100 Gbps. The architecture is complimented with distribution and edge layers at appropriate speeds.

The idea of setting up the NKN was deliberated & finalized at the office of Principal Scientific Advisor (PSA) to the Government of India (GoI) and the National Knowledge Commission (NKC). NKN is an outcome of a collaborative engagement with key stakeholders including experts, potential users, telecom service providers, educational and research institutions.

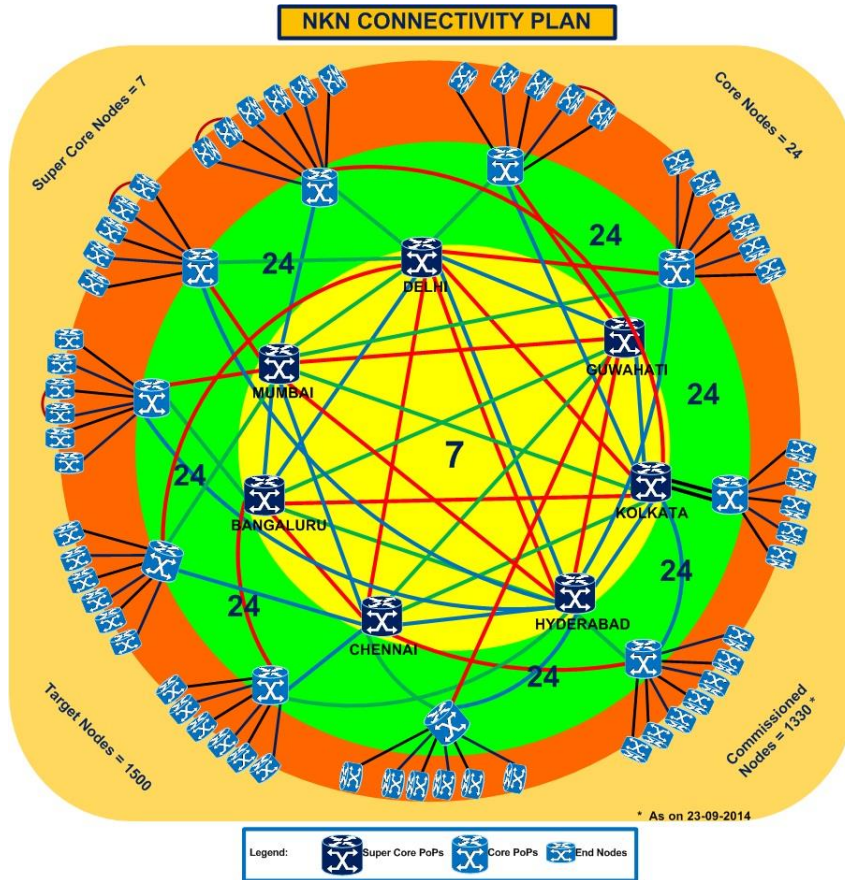
NKN Connectivity Plan

NKN backbone is fully meshed with 7 Super Core locations which initially had a 2.5 Gbps bandwidth, and has now migrated to 10 Gbps. The network is deployed through 24 Core distributed locations with multiple of 2.5/10 Gbps links. The distribution layer connects the entire country to the core of the network using multiple links at speeds of 2.5/10 Gbps. The end users are being connected to links of 100 Mbps or up to a speed of 1 Gbps.

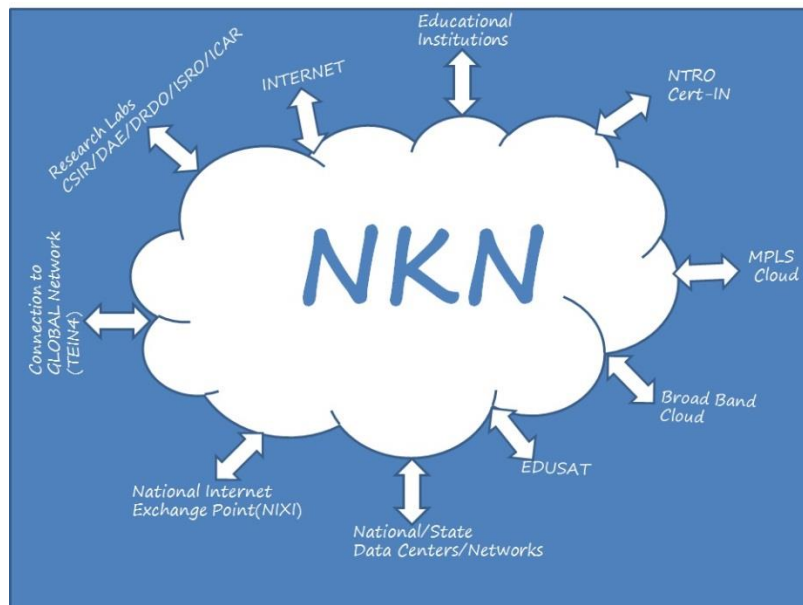
The network architecture and governance structure allows users with the option to connect to the edge or distribution layer. NKN enables creation of Virtual Private Networks (VPN) for



special interest groups. NKN provides international connectivity to its users for global collaborative research.



Today India has International connectivity with a 2.5 Gbps link between NKN & GEANT through the TEIN4 project. NKN is connected to Europe POP of GEANT as well as a 2.5 Gigabit link to the Singapore POP. Work is currently underway to establish NKN PoPs at 5 international locations that would serve as a platform for research and international collaborations.





Currently, NKN is functional with 7 super nodes (in a mesh topology) and 24 core nodes connecting over 1330 institutes. In addition, 66 virtual classrooms have also been established across NKN nodes. The NKN Grid infrastructure consists of Garuda Grid, DAE Grid and regional LHC computing Grid. Many applications such as CollabCAD, Open Drug Discovery project of CSIR and ESRF synchrotron remote operation & control are running on NKN.

Growth

NKN has had a stupendous growth since its inception in 2010. It is proposed to bring 1500 knowledge institutions under the ambit of NKN. As of now more than 1330 institutions under more than 40 categories viz Engg., Medical, CSIR, DRDO, CDAC, Management etc. are connected under NKN with a bandwidth speed of 1Gbps/100 Mbps. The network is spread across 24 core and 7 Super core locations covering the entire length and breadth of the country. In addition there are a total of 89 core links and 421 districts links connecting the entire country. The last couple of years have seen increased awareness about NKN and the services it offers. The curiosity among institutions has led to a significant increase in the number of institutions desirous of having NKN connectivity.

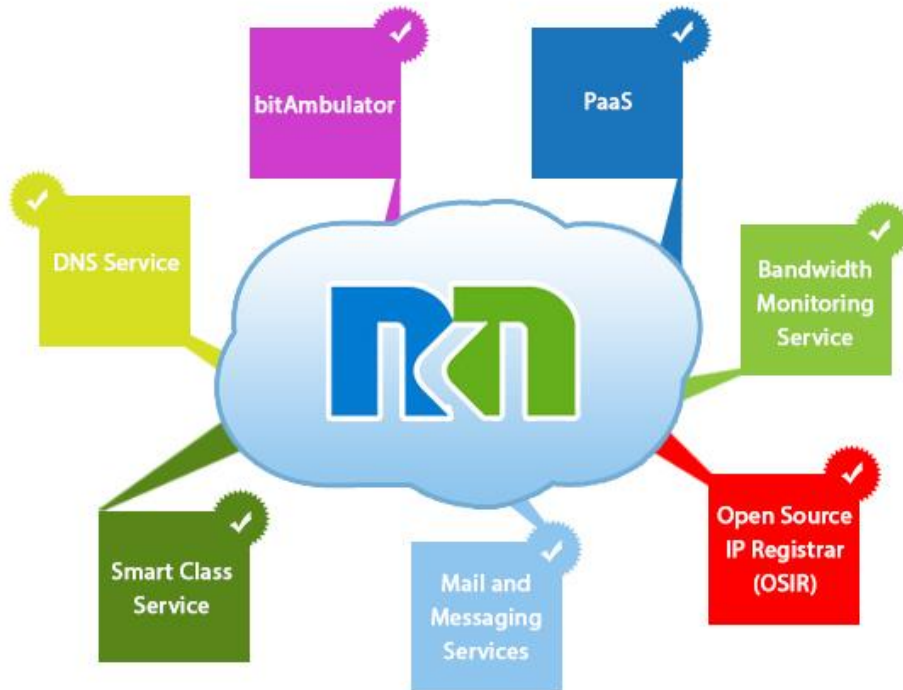
NKN is also focusing on dissemination of knowledge far and wide including to people living in remote and distant locations. With this in view NKN has been propagating the concept of virtual classrooms wherein instructions are imparted by teachers of elite institutions to audience based in distant locations.

Another key contribution of NKN has been funding of model projects. These projects involve research in areas as diverse as medicine, biology and structural engineering etc. which aim to bring about public good and impact the community at large. NKN has been in the forefront in encouraging such projects which involve a lot of innovation and collaboration among different stakeholders.

NKN Products and Services

NKN is steadily evolving as the National Education Research Network (NREN) of India. The project has already made significant progress by connecting over 1330 institutes in the network. NKN is now being looked as the harbinger of change in our knowledge society but this also brings together the responsibility to continuously look forward to provide the much required impetus to R&D initiatives related to networking technology.

NKN understands the requirement of R&D initiatives without a profit motive and therefore took a step forward in facilitation of this cause. The team at NKN comprising of engineers and networking experts have been working hard to provide services and products that would serve the NKN fraternity. The diagram below mentions few of the soon-to-be launched services and products.



Objective of the 3rd NKN Annual Workshop

The objective of this year's workshop is to focus on how NKN as the Next-Generation Network (NGN) manages multiple types of traffic (such as voice, data and multimedia). NKN has brought in convergence of service provider networks that includes the telephone network, data network and wireless networks as well. This would also help different user communities such as doctors, scientists, professionals, scholars, teachers and students in their endeavours by providing them cost effective access to the desired data/information/knowledge.

It is planned to organize the 3rd Annual Workshop of NKN at Guwahati from 15th to 17th December 2014 jointly by the National Informatics Centre (NIC) and the Indian Institute of Technology (IIT) Guwahati. It is expected that representatives from all major academic institutions across the country and abroad would participate actively in this workshop demonstrating applications which they are working on using NKN at the core.

The first two days of this workshop would be dedicated to various applications on NKN while the third day would focus on NKN Tutorials.



The team with a vision:

Dr R Chidambaram, Principal Scientific Advisor to the Government of India – Chief Patron

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