

National Knowledge Network (NKN): Concept, Design, and Realization

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WHY NKN?

Convergence of IT and communication (often referred to as ICT), and exponential growth in the communication capacity opens up new vistas for application of these technologies. ICT, when properly deployed in a country, has the potential of solving major challenges faced by human race, such as, Climate Change, Energy Security, Green Design, and so on. Besides, ICT coupled with *processing power* is a potent instrument for any planning process. ICT, when properly harnessed, can render the country flat (devoid of social inequities) and convert it to knowledge society. The **National Knowledge Network** is an initiative in that direction to enable India leapfrog into **Knowledge Society and Knowledge Economy**.

NKN Concept

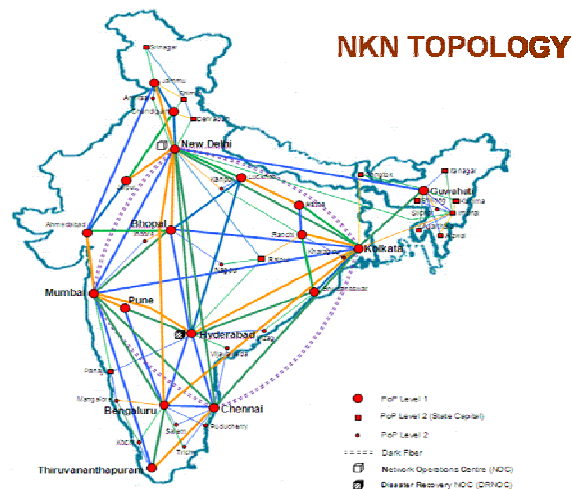
Integration and synergy will enable scientists, researchers and students with different background and diverse geographies will realize the true potential of India. NKN will catalyze knowledge sharing and knowledge transfer between stakeholders seamlessly – that too across the nation and globally. The benefits of NKN are expected to go beyond the urban elitist groups, as the ambiance created by NKN is ubiquitous and globally unique. NKN will encourage the research and educational institutions to create national intellectual assets. NKN is designed to inspire innovation and engage the researchers in the development of technologies that uplift the quality of human life. Besides, NKN will enable use of specialized applications, which allow sharing of high-

performance computing facilities, e-libraries, virtual classrooms, and very large data bases.

NKN Design

The architecture of the National Knowledge Network is scalable and the network has an ultra-high speed CORE (multiples of 10 gigabit per second), complimented with a Distribution layer at appropriate speeds. The participating institutions at the Edge shall connect to the National Knowledge Network seamlessly at speeds exceeding 1 Giga

bits per second (Gbps). NKN is a Dedicated Owned IP-MPLS Network based on multiple λ 's of 10 Gbps in the CORE. The network architecture & governance structure shall allow the user institutions an option to connect to the Distribution layer through a last mile connectivity bandwidth. Architecture allows for direct connections to the CORE, Distribution, or Edge, depending upon the



state of readiness of the user institution / organization. While the main emphasis in the National Knowledge Network is on a strong and robust internal Indian network, that is, intra-Net connectivity, so as to ensure that India is seen and felt as one country from the Himalayas to Kanyakumari, NKN is designed to handle *applications that demand high bandwidth with low latency*. In short, NKN is a reliable, robust, scalable, and secure network.

NKN Benefits

Applications such as Countrywide Classrooms will mitigate the systemic difficulties faced by planners for quality faculty and enhance the reach of all levels of education cutting across all barriers, geographic, religion, caste, economic, etc. The crux of the success of the Knowledge Network is related to the education related applications, databases and delivery of these to the education users on demand. The content

creation and content sharing in all areas of Science & Technology including Bio-Technology and Nano-Technology will be enabled for the purpose of education and research. NKN will thus enable creation of focused workgroups across the country in critical areas as well as create opportunities for global interaction.

The benefits of NKN are perhaps obvious; an opportunity to create country-wide classrooms, common time-tables, create critical mass for collaborative research areas, overcome the language barrier, create universities without walls, laboratories without walls, share the knowledge of the specialists across the whole country, and create the *vasudeiva kutumbakam*, envisioned in our ancient scriptures for universal brotherhood.

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