

I.3: Development in Networking and Communication at RRCAT

A) Commissioning of a 100 Mbps Leased Circuit

A 100 Mbps leased circuit has been commissioned between RRCAT, Indore and TIFR, Mumbai. It has a gateway to Internet and high speed connectivity to CERN, Geneva. The 100 Mbps leased circuit has been added to the already existing pool of Internet circuits - 34 Mbps (1:2) and 34 Mbps (1:4) - to augment the Internet access bandwidth of our center. The additional Internet link provides one more level of fault tolerance to our network, for highly available Internet connectivity. Figures I.3.1, I.3.2, I.3.3 show the usage pattern of the 100Mbps TIFR link, 34 Mbps (1:2) ERNET link and the 34 Mbps (1:4) BSNL link respectively.

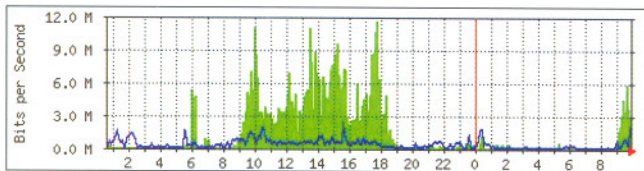


Figure I.3.1: 100 Mbps TIFR link usage graph

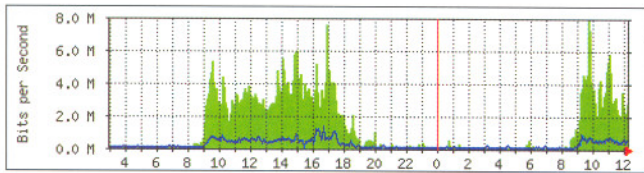


Figure I.3.2: 34 Mbps(1:2)ERNET link usage graph

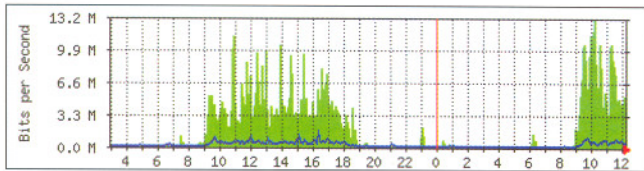


Fig. I.3.3: 34 Mbps(1:4)BSNL link usage graph

B) Deployment of CallerID and One Time Password (OTP) based authentication setup for multifactor authentication

For securing web applications deployed on Internet's DeMilitarized Zone (DMZ), a callerID (calling phone number identifier in a telecommunication setup) and OTP based authentication setup has been designed, developed and commissioned. This helps in authorizing the right person to access the deployed web application, for eg. accessing secured email server over Internet. The usage of callerID as a factor ensures that only the person with the registered phone number is accessing the web service and helps in foiling phishing and brute force password cracking attack attempts. The usage of OTP, protects the web application from replay attacks, which is a very common form of attack on Internet deployed web applications.

C) Commissioning of Internet proxy servers

Two number of high throughput Internet proxy servers, configured in load sharing and failover mode have been added to RRCATNet. Each of these servers is having two Quad Core 3.0 GHz Intel Xeon processors, 16 GB RAM and four 72 Gb SAS hard disk drives, with RedHat Enterprise Linux (version 5) as the operating system. Open source proxy server package, namely squid version 3.1.3 has been used for proxy services. Three squid processes running on different TCP ports (3128,4128 and 5128) have been configured on each of these servers. Each squid process is allocated 25 GB of cache memory to store cached files. In all, six squid proxy processes are running on these two servers in failover and load balanced mode. The failover and load balancing configurations have been done using the server load balancing feature of the network core switch. The new servers have replaced the old Internet proxy servers. With latest squid software (version 3.1.3) configurations, the new setup provides improved performance over the old Internet proxy server setup based on squid software (version 2.5.3).

D) Enhancements to Anunet/ DAEGrid network

Email transactions among RRCAT, BARC and IGCAR have been re-routed through the secured channel of Anunet. Now emails are flowing over the Anunet link in encrypted form, as compared to the unencrypted form earlier, thus further securing the mail transactions between major DAE units. A DAE wide Domain Name Server (DNS) has been commissioned at Computer Centre, RRCAT, to automate the process of intra DAE routing of emails, using Anunet and Internet as the two channels. The DNS server is commissioned for usage by all DAE units for machine name to IP address and Mail Exchanger (MX) record resolutions. All DAEGrid leased lines (2Mbps) namely the BARC-1, BARC-2, IGCAR-1, VECC-1 and KOTA-1 have all been converted from individual copper circuits to a single E3 multiplexed leased circuit. This has helped in reducing the number of equipments required to be maintained for operating these lines.

E) Expansion of communication Network

Mobile facilities were enabled on 17 extensions, 20 telephone connections were shifted, 18 new telephone connections were installed and 12 numbers of digital reflex phones were installed with voice mail facility in RRCAT campus.

F) RRCATNet Planning, Expansion and Upgradation

Installation of 94 number of network nodes, distributed across various existing building networks including LFL, ADL, Colony Exchange, Admin, PLAVT, LMD and MIA was completed. In CME building, internal LAN cabling work was completed and a new network rack was installed for a network of 12 ports. Connectivity to RRCATnet was also provided using the 8 Mbps broadband access network. One number of OFC segment between IT building and the new library building was also made operational. Planning for laying of OFC segments in Phase-VI of the network expansion plan, covering 24 new building was also carried out. Procurement process for the active and passive components of Phase-V of the network expansion was also initiated.

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