



**Fermi National Accelerator Laboratory**

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**HEPnet  
NHM TECHNICAL NOTES  
Proposal To Upgrade KEK Link to 192 Kbps**

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# **HEPnet**

## **NHM TECHNICAL NOTES**

**Proposal to Upgrade KEK Link to 192 Kbps**

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## **Proposal to Upgrade KEK Link to 192 Kbps**

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The present KEK transmission link is a 56 Kbps circuit from Tsukuba, Japan to Berkeley, California. It first goes from Tsukuba to Tokyo. From there, it is transmitted via satellite to San Francisco. It then goes from San Francisco to Berkeley. At Berkeley, it is connected to the ESnet T1 backbone. At the moment, this link carries DECnet traffic only.

Due to increased traffic, the need for the link to carry IP as well as DECnet traffic, and reduced prices for trans-oceanic fiber links, National HEPnet Management proposes reconfiguration of the KEK link. The recommended configuration is a 192 Kbps dedicated line from Tsukuba to Tokyo. From Tokyo, traffic would be transmitted on a 192 Kbps fiber circuit (probably in the TPC-3 cable) to Honolulu, Hawaii. A 192 Kbps link would go from Honolulu to PACCOM to NASA-Ames Research Center in Sunnyvale, California. It would join the ESnet T1 backbone at that point. The new link would be a dual protocol link (i.e. -- carry both DECnet and TCP/IP).

Pricing from commercial carriers for a 128 Kbps link from Tsukuba, Japan to PACCOM (in Honolulu, Hawaii) is given in Table 1. Quotes were supplied by AT&T, WorldCom, and MCI; Tony Hain (ESnet staff) also supplied a pre-negotiated price for a 192 Kbps circuit between PACCOM and Japan. The price quoted was approximately \$6,000 per month for a 192 Kbps half circuit from Hawaii to Japan. Using Tony Hain's special pricing on the circuit to Japan is the least cost approach, and results in the highest circuit bit rate. This is based on the assumption that there is no additional cost for using the fat pipe from PACCOM in Honolulu, Hawaii to NASA-Ames in Sunnyvale, California.

There has been some concerns voiced about using the multi-agency "fat pipe" for the connection from Hawaii to California. These concerns are listed below:

- 1) there is difficulty in diagnosing link problems through the Proteon bridge/routers that are at both ends of the multi-agency "fat pipe".

- 2) HEP traffic between KEK and U.S. HEP will now use a multi-agency link that provides no redundancy, and over which HEP has limited influence in terms of upgrading or improving performance characteristics.
- 3) the link through PACCOM will be both a DECnet and a TCP/IP link; routing of IP traffic at the U.S. end of the circuit will be administered by PACCOM personnel.

While it may not be possible to provide complete answers for each of these concerns, NHM and ESnet will try to address as many of these issues as possible as we re-engineer this important international circuit.

The lease for the new circuit would be for a two year period (from January 1, 1992 to December 31, 1993). Near the end of the lease period, link performance and capacity issues will be addressed and a decision reached about what will be done with this circuit. The recurring monthly cost to HEPnet of the 192 Kbps half circuit between Tsukaba, Japan and PACCOM (Honolulu, Hawaii) is approximately \$6,000. It will not be necessary to pay a recurring monthly charge for the T1 local loop from the operating company point-of-presence to PACCOM; that cost is factored into the \$6,000 monthly charge. The cost of installation of the half circuit and T1 local loop will be on the order of \$5,000. HEPnet should pay the installation charges for the new circuit.

Yukio Karita would be responsible for coordinating the installation of the 192 Kbps half circuit in Japan. Issues to be worked there are the installation of the circuit, and the installation of the local loop. It is my understanding that the local loop will be furnished by the same carrier that supplies the local loop for the present 56 Kbps satellite circuit. If the T1 local loop that was used for the CHEP '91 video conference is available, that would save the cost of installing a T1 loop for the new circuit.

There are precedents for handling the financial aspects of the above arrangement. What has been done in the past is for the requestor (in this case National HEPnet Management) to transfer the annual cost of the half circuit into an account at LLNL (which will be administered by ESnet) to pay the recurring charges.

Table 1

## Cost of 128 Kbps circuit from Tsukuba to Honolulu, HI

| <u>Name of Carrier</u> | <u>Circuit Capacity</u> | <u>Monthly Charges</u>  | <u>Installation Charges</u> |
|------------------------|-------------------------|-------------------------|-----------------------------|
| WorldCom               | 128 Kbps                | \$ 5,890 (D)            | \$ 1,500 (D)                |
|                        | 128 Kbps                | \$ 11,480 (I)           | \$ 80 (I)                   |
| MCI                    | -can't provide service- | -can't provide service- | -can't provide service-     |
| ESnet(*)               | 192 Kbps                | \$ 6,000 (D)            | \$ 5,000 (D)                |
|                        | 192 Kbps                | \$ ??? (I)              | \$ ??? (I)                  |
| AT&T                   | 128 Kbps                | \$ 9,536 (D)            | \$ 4,278 (D)                |
|                        | 128 Kbps                | \$ 13,021 (I)           | \$ 1,072 (I)                |

Note:

- (\*) note circuit speed difference (ESnet link is 192 Kbps -- all others are 128 Kbps)
- (D) indicates the domestic half circuit cost (i.e. -- the connection from the United States to Japan)
- (I) indicates the international half circuit cost (i.e. -- the connection from Japan to the United States)

Discussion:

From Table 1, the FY92 DoE cost of HEPnet connectivity to Japan will be the cost of the present service (from 01-Oct-1991 to 01-Jan-1992), and the cost of the upgrades service or the remainder of the fiscal year. These costs are for the domestic half circuit only. The cost summary for FY93 is based on constant pricing for the domestic half circuit from PACCOM.

FY92 Cost Summary:

|  |                 |
|--|-----------------|
| 56 Kbps service (01-Oct-1991 through 01-Jan-1992)  | \$ 17,500       |
| 192 Kbps service (01-Jan-1992 through 30-Sep-1992) | \$ 48,000       |
| installation charges                               | <u>\$ 5,000</u> |
| total cost   | \$ 70,000       |

FY93 Cost Summary:

|  |                  |
|--|------------------|
| 192 Kbps service (01-Oct-1992 through 30-Sep-1993) | <u>\$ 72,000</u> |
| total cost   | \$ 72,000        |