                NETWORK USAGE AND SERVER COMPENSATION
              _____

The EARN Board of Directors approved at their meeting in June 89
the
"Principles for future distribution of EARN costs" and the "EARN
statis-
tics directive" - see documents BOD28 89 and BOD33 89 in the
appendix.
One of the principles is

     Volume dependent costs are based on usage
     _____

     Work should be initiated to extract reliable figures independent
of
     seasonal fluctuations from the accounting statistical data,
e.g.
     using data from the first six months in a year for the budget
pre-
     sented in the fall for the next year. Traffic from file
servers
     should be handled correctly, so that the country operating a
server
     does not pay for traffic initiated by other countries.

According to this principle available data and alternatives are
listed
and discussed.

                    Accounting statistical data
                  _____

The accounting statistical data as described in BOD33 89 show 3 types of
international traffic figures per country on a monthly basis:

o Data sent to other countries
o Data received from other countries
o Data sent to and received from other countries

Out of the 3 types only the data sent to other countries should be used
to describe the "usage" of EARN by a country because they are caused by
people in the sending country. The data received from other countries
can not be used for calculating the usage of EARN by a country because
the country can not influence it.

                        Server compensation
                    _____

Many countries provide additional service to EARN by running NETSERV,
LISTSERV and other fileservers like TRICKLE, MACSERV or ASTRA. This pro-
vision of service causes additional resources in the operating country
which should not get the penalty paying for traffic initiated by other
countries.

Today 2 programms to calculate country statistics derived from standard
RSCS accounting records are available and used for the international
traffic figures:

o RSCSACCT written by Udo Meyer
o CTRYSTAT written by Jose Maria Blasco and maintained by Manfred Bogen
     at DEARN

The programm CTRYSTAT shows extra statistics for LISTSERV, NETSERV and
MAILER and can be enhanced to calculate statistics for other file-
servers. These server statistics are based on all accounting

records
with the name of the server either in the sending address or in
the
receiving address.

Within EARN we can differentiate between 2 major types of servers

o Mail servers and
o File servers

and between 3 types of traffic related to servers

o Requests send to servers,
o Traffic between servers and
o Results send back to the requestor,

where traffic between servers should be treated as an
infrastructure
service of EARN and be taken into account when calculating   the
coun-
tries usage.

Mail servers
_____

Mail servers are the mailers and the mail distribution function
of
LISTSERV. A typical LISTSERV list communication consists of the
follow-
ing steps:

| 1. Send a mail to the LISTSERV managed list, implemented as a
"dummy"
| user on the VM system.
  2. LISTSERV takes the reader files of the list and processes them.
  3. For peered lists LISTSERV sends the mail to other LISTSERVs for
fur-
      ther processing.
  4. For non-peered lists LISTSERV also may use LISTSERV internal
commu-
      nication if another LISTSERV is closer to the destination node.
  5. LISTSERV then sends the mail for distribution to the subscribed
list
      members to the mailer doing the transportation.

  Thus the accounting data do not indicate LISTSERV, the
destination
  address for sending is the list and the source address for

distribution
  is the mailer. The mailer itself today does not provide
additional
  accounting data to identify the "real" source.

  Therefore it is proposed to take only the inter-LISTSERV traffic
into
| account for server compensation. For LISTSERV lists it is
possible to
| get a LISTSERV statistic per list and to take this into account -
but
| because statistics can be disabled this is not further
considered in
| this paper.

  File servers
  _____

  Examples of file servers are NETSERV, MACSERV, ASTRA, TRICKLE and
the
  file distribution part of LISTSERV. A typical communication with a
file
  server consists of the 2 steps

  1. Send a mail or interactive message to the file server
  2. which then in turn sends the requested files back.

  Thus the accounting data indicate for file servers the
requestors
  address in the destination field and can be taken into account for
serv-
  er compensation. i.e. traffic sent due to file requests should
reduce a
  country's value and increase the requesting countries value.

                        Reliable figures
                        _____

  According to BOD28 89 reliable figures should be extracted
independent
  of seasonal fluctuations from the accounting statistical data.

  A higher independency is of course caused by a longer time
period of
  data collection. Taking into account that the EARN BOD meeting in
the
  fall of a year decides on the budget for the next year, the latest

month
| in the year can be June for data collection and preparation of the
bud-
  get figures.

| For the first year of using usage data in the budget at least 6
month
| (from January to June) are required. For all following years 12
month of
| data starting in July up to June of the then current year should be
used
  for the calculation.

                              SUMMARY
                              ‾‾‾‾‾‾‾

  Out of the listing of available data and the discussion above on
alter-
  natives it is proposed for calculating a country's usage of EARN

  1. To use the data send to other countries as a global base.

  2. To correct this global value by server compensation values for
for
      servers like LISTSERV, NETSERV, MACSERV, ASTRA, TRICKLE etc.

      2.1. To reduce the global value by inter-server communication
traf-
            fic.

      2.2. To reduce this value by all data sent to other
countries
            because of file server requests.

      2.3. To increase this value by all data received due to file
server
            requests to other countries.

| 3. To use the month June as a deadline for data collection for the
next
| years budget calculation.

| 4. To use at least 6 month (January to June) data collection in
the
| first and 12 month (July to June) in all following years.

                                          BOD28 89
                                  revision of BOD27 89

EARN BOARD OF DIRECTORS

Principles for future distribution of EARN costs

                                          issued by
                                          F Greisen
                                          June 6, 1989
----

1 Volume dependent costs are based on usage

  Work should be initiated to extract reliable figures independent of
  seasonal fluctuations from the accounting statistical data, e.g.
using
  data from the first six months in a year for the budget presented in
the
  fall for the next year. Traffic from file servers should be handled
  correctly, so that the country operating a server does not pay for
  traffic initiated by other countries.

  Until agreed reliable statistics can be produced, GNP ratios are
used.
  Preliminary studies show a reasonable correlation.

  The budget items in the volume dependent category are 3 "Staff", 5
  "Inter-continental lines", 6 "Development", and 7 "Contingency
fund".

  2 Volume independent costs are based on RARE keys

  For non-RARE countries the key for a RARE-country is the same GNP
class
  is used. These items are 1 "President's office", 2 "EARN office",
and 4
  "Other expenses".

  3 International links are funded by countries

  Each country still pays its connection to the network.

4 Countries on the EARN X.25 with EARN funded lines contribute to
EARN
   central funds

   Countries connected to the network through EARN paid lines
contribute
   the equivalent of the cost of a line which would otherwise be chosen
to
   central funds.

   5 Co-operating countries contribute to the items they use and
influence

   The contribution to 5 "Inter-continental lines" is according to
usage
   (or GNP) and the contribution to 1 "President's office" and 2 "EARN
   office" is according to (extended) RARE keys.

                       APPENDIX B: BOD33 89
                       _____

                                             BOD33 89
                                    Revised BOD26 89
                                    and   EXEC71 89
   EARN BOARD OF DIRECTORS

   EARN statistics "directive"
   Approved at the Board of Directors Meeting June 1/2, 1989
   and revised under delegated powers by the Executive.

                                             issued by
                                             A Auroux
                                             June 1, 1989

   I have revised the statistics directive to align with the directives
   paper which I intend to re-issue as an EXEC paper. I have also added
   explanatory material. I think it is now correct, water tight, and
   explains what we want to achieve. May I ask for agreement to the
revised
   text? EXEC34 89 refered to has not yet been prepared.

1 Requirement

EARN now collects traffic figures on international links. These are
required to:

- show the loading on lines with a view to indicating:

    - desirable topology changes
    - desirable line upgrading
    - desirable relocation of servers.

- distribute part of the EARN costs from financial year 1991
onwards.

To achieve these requirements traffic figures must be collected by
each
international node. To this end this EARN "directive" is being
issued.

The definition of an EARN directive can be found in EXEC34 89. It is
mandatory for relevant nodes to implement directives.

2 Directive

Each international node is required to collect traffic data on EARN
international links for traffic to and from every other country.
Data is
collected on a calendar monthly basis and sent to the "traffic data"
co-
ordinator before the 10th of the following month.

The format of the data and the destination address for the data are
determined by the Network Operations Group.

Suitable code for collecting and submitting data exists or is being
developed.

This directive must be implemented by September 1, 1989 in order to
have
complete traffic data starting in September 1989.

3 Dispensation

International nodes not using IBM VM or MVS will only be required to
submit figures when suitable software has been developed.

4 Technical annex (not part of the directive)

The file which contains the traffic data must currently be sent to
Dominique Dumas (BRUCH@FRMOP11) with the name "ccyymm DATA"
(cc=Country
Code, yy=year, mm=month).

The file may be produced by:

- the Udo Mayer program
- the Jose-Maria program
- any other program producing the same output.

Dominique Dumas should be contacted for details of the format
required
for submitted data.

4 Results (not part of the directive)

The results of the analysis of the data are stored on LISTSERV@DEARN
with names "STATyymm DATA". Other types of analysis will be
developed as
required.