EARN Document

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INTRODUCTION

The letter E in the artificial word E-box was supposed to mean expensive. I leave it to the friendly reader to decide whether this has any relation to reality. What is the E-box? There are two possible interpretations. The "small" Ebox consists only of the two little programs that run as OTSS application and provide the SNA/NJE - NJEOSI mapping. The other school would could all the other IBM software and hardware, too. If the latter view is taken then the work "expensive" is definitely true.

But in a normal large computing centers (and we are only talking about such things) the hard- and software that is used for NJEOSI is also used for many other things like:

If one uses IBM's X.400 system on VM and MVS, or DFN's UCLA/Mail400 a working OTSS environment already exists. If this is the case then it has been demonstrated several times that the NJEOSI software can be installed in less than one hour (mostly limited by the ability of using a keyboard and a telephone). The major task is to define some parameters in VTAM OSNS OTSS RSCS/JES2.

If there is no experience in SNA/NJE, if there is no experience in NPSI etc. then it depends on the skill of people that learn all these things. My personal experience with a fresh environment at CNUSC, Montpellier was that the whole environment could be created in less than one week limited by the frequence of possible network controller load times (one per day in this case).

RECORDS OF PROBLEMS ENCOUNTERED

The quality of the NJEOSI software: I have found a few problems with the e-box software in some strange network situations.

- The software does not handle session setup contention in a correct way. This misbehavior can be easily avoided if an agreement is made that only one partner created a session.

  The hanging situation can be observed if one makes a VTAM display of the OSNS APPL, and find two sessions that have two sends and one receive for an outgoing call and two receives and one send for the incoming call. This corresponds to two transport connections that are established and two session connect request sent.

  There are several ways to recover from this.

- When JES2 receives an incoming request from the NJEOSI, it is necessary that the logmode specified with JES2 has values defined as in the VM environment RSCSNJE0. This logmode cannot be used for SNA/RMT and applications like JES328X but JES2 has a second VTAM APPL for this ($LOGON2). It is a recommended to split NJE and RJE anyway. The effect that occurs in this environment is that the NJEOSI application program terminates but does not reject the incoming session request, so the other end hangs.

  I assume that a similar situation occurs if the RSCS/JES2 NJE application is not active. Therefore one should ensure that RSCS JES2 are running and having SNA/NJE sessions before the NJEOSI layer 5 and the applications are started.

- I have observed that in cases where the network is unstable it may happen that the NJEOSI application programs receives some unexpected session data units and terminates.

  NJEOSI does some WTO in all these cases.

  OTSS sometimes abends with strange messages in such cases, too. There are both weaknesses in NJEOSI and also bugs in OTSS/OSNS.

  I would recommend that University Heidelberg is approached to change the software to be a little bit more self cleaning.

PRODUCTION REPORTS

GMD Bonn - CNUCE Pisa:(by Marco Sommani)

A software alignment phase between GMD and CNUCE about GCS, OSNS and OTSS was performed and completed on the 1st of June 1990, then I was busy with other activities (including vacations) and I came back to the project on the 30th of June. The OTSS/OSNS configuration files that had been used during the OSIRIDE Intertest project had to be changed not just for adding the new definitions for NJEOSI, but also because the NPSI attachment had been moved from a Dynatech MSW-12 to an Eripax PS-50.

On July 2nd a signon ICNUCEVM-DBNGMD21 over PSDN was completed, but it was found that the session hung after sending one packet or two. In the next day I realized that the reason of hangs was due to the fact that the OSNS definitions were still using the default window size that had been used on the MSW-12. On the 3rd of July at 3:00 pm, after changing the definition of the default window size on OSNS, the connection started without problems. In the same day at 17:30 p.m., we activated the connection over IXI.

The call over IXI succeeded only if the call was sent from Bonn, so it was agreed that the link would have been started always from Bonn. The reason why calls leaving from CNUCE were failing was found only in September.

On July 4th all traffic from Italy to Germany was routed over IXI. Routing over IXI was deactivated on the 6th. On Monday 9th it was found that the connection could not work any more because some parameters had been changed on the German IXI connection. At that point, we decided to stop the NJEOSI testing, because I was going to Amsterdam and then in vacation and Peter was leaving for Montpellier.

I came back to work on NJEOSI only after the EARN-IXI meeting of Paris. Soon we found that CNUCE was unable to call IXI addresses because of a calling address translation that was done in the X.25 switch of CINECA. As soon as CINECA deactivated the address translations, we were able to call IXI addresses from all DTEs attached to the Dynatech CPX-20 (the X.25 switch that is attached to the 64Kbps line CNUCE-CINECA). During the summer NPSI had been moved from the Eripax PS-50 back to the Dynatech MSW-12 and we found that it was impossible to call IXI from DTEs attached to the MSW-12 (the MSW-12 is attached to the CPX-20 via a null-modem connection at 64Kbps). This was found to be due to routing problems in the MSW-12. On September 19th the routing problems were solved and it was finally possible to start the ICNUCEVM-DBNGMD21 link from CNUCE.

The solution to the problems in the German IXI connection

had been found during the summer, however NJEOSI over IXI is not working as well as it did in July: the link usually hangs after just a few hundreds of NJE records have been transmitted.

CNUCE Pisa - CNUSC Montpellier:(by Marco Sommani)

On September 25th at 6:00 pm the ICNUCEVM-FRMOP22 connection was activated without birth troubles, but it showed soon the same hanging problems observed on ICNUCEVM-DBNGMD21. The link was therefore brought back immediately to SDLC.

The data hanging problem is still an open issue. I plan to work on the problem as soon as I'll have some spare time. Probably the bug is in the GARR-IXI connection, because FRMOP22-DBNGMD21 works without problems.

GMD Bonn - CNUSC Montpellier:

I installed the software in July and it is used since then in the way that we have TWO SNA/NJE session active between DBNGMD21 and FRMOP22. With this session I could gain some good experience with the quality of IXI. In the beginning the well known "contest program storage cancer problem" also hit this connection.

Since this was resolved IXI is very stable, I have not seen failures in IXI at all. There is an unidentified problem with the packet size/window size negotiation since the German access point was switched to X.25 version 80. The connection only works with TPDU sizes of 128. The connection of the German WIN is expected for September and therefore this problem will not be investigated. (It is not an NJEOSI problem, X.400 with Joint Networking Center in Belgium has the same problem.).

GMD Bonn environment:

In order to recover from any abnormal situation the OSNS address space is restarted automatically at 6.am each day. The environment is running together with an X.400 UCLA/Mail400 environment (a reliable transfer service implementation from Retix written for unix and ported to MVS by Softlab Munich) that current has about 30 X.400 partner systems and processes somewhat around 300 messages per day for X.400.

In order to debug problems with X.25 etc we are using the famous so called WANGE-TRACE. This is a program written by an IBM person. The output is much nicer than ACFTAP.

In order to further reduce the output I have written a small post processor in SPITBOL. There is still a small bug in this beast but here is an example output. This example contains the first ebox - gbox interoperabitliy test. The session refuse for the connection is missing due to an error in my snobol program. It is left to the reader as a simple exercise to find out why the gbox did not talk to the ebox.

SOME OTHER PRODUCTION REPORTS

GMD Bonn - University of Duesseldorf

Since March 1990 the NJEOSI is used in production between DBNGMD21 and the Siemens implementation at University of Duesseldorf. I have not seen any of the problems mentioned above on this connection but a few others. ALL of them can be either qualified as X.25 problems in either WIN or local switches (in March we had three occurrences where the x.25 window sizes were not defined properly). Another error that happened during the Killarney conference was that the spool in Duesseldorf was simply full. This was diagnosed from Killarney using the X.29 capabilities there. The third kind of error were caused by an incomplete NJE implementation in Duesseldorf (on the NJE layer, multiple data sets for example).

GMD Bonn - TH Darmstadt:

This system used the same environment as on DBNGMD21, there is also a JES2 system with UCLA/Mail400. Here we detected the LOGMODE RMT/NJE incompatibility.

GMD Bonn - University Erlangen:

The DERRZE1 system lost it BCS EARN connection at the end of April. A few days before the two NJEOSI program had been sent to that site via EARN. At this system an OSNS OTSS environment exists with IBM's X.400 MTF. For a still unidentified reason it is not possible to start the connection from GMD to Erlangen. The NJEOSI software cannot establish a session to RSCS. (This seems similar to the problem with a wrong log mode for JES2). The error wasn't yet looked after because there was simply no time, and the link is always started from the other end.

GMD Bonn - University Passau:

This university never had an EARN connection before. They were new and had neither a BSC or SNA connection to other EARN sites. NJEOSI was shipped via TCPIP binary FTP and installed in one one. The situation is identical as with

Erlangen. Since there is some cooperation between these bavarian sites it is likely that we have the same error there.

GMD Bonn - University Karlsruhe:

This environment is also identical to GMD and Th-Darmstadt. It is JES2 and UCLA/Mail. The installation of NJEOSI was done in about one hour.

DLR Oberpfaffenhofen:

The DFN reference machine recently installed the NJEOSI software in order to simplify the distribution of UCLA/Mail400 software via NJE. It was agreed that NJEOSI can be distributed together with UCLA/Mail400, so that it can be easily installed there. NJEOSI was tested between the DFN reference MVS system and GMD without ant consulting from GMD or University of Heidelberg. We identified that the RSCS log mode was missing in the sample E box definition data set that I created in FRMOP22.

The Joint Network Center of the European Community in Geel, Belgium was the first customer that received NJEOSI by DLR together with UCLA/Mail400.

I assume that this report finishes phase 3 (at least) for several e-box sites. (Phase 4 will end when real OSI appls replace NJE.)

APPENDIX: Example OSNSTRAC output.

```
XC3LU0   15.58.59.409080: Incoming Call  VCID=
|        BB450502113044505033317800030101 00


XC3LU0   15.58.59.414864: Call Confirmation Out VCID=F01B Windowsize=07
Packetsi
ze=0080
|


ID0C052  15.59.02.604088: Inbound Data
|         Transport Connection Request In
|          0000001E00C0010BC10830343036313435 30C2083034303631343530


ID0C052  15.59.02.612817: Outbound Data
|         Transport Connection Accept Out
|          001E00FA00C2083034303631343530C10830343036313435 30C0010B
```

```
ID0C052  15.59.04.414197: Clear Indication In VCID= CAUSE=
|        0000


XC3LU0   15.59.23.116292: Outgoing Call  CID=0002 Windowsize=07
Packetsize=0080
|        BE204308300700344505021130400000022


XC3LU0   15.59.24.414975: Call Confirmation In CID=0002 VCID=F033


ID0C022  15.59.27.210855: Outbound Data
|         Transport Connection Request Out
|          000000FB00C1034E4A45C2034E4A45C00107


ID0C022  15.59.28.304127: Inbound Data
|         Transport Connection Clear In
|          00FB000000


ID0C022  15.59.28.398266: Clear Request Out CID=0002 CAUSE=
|        0000


ID0C022  15.59.28.602895: Clear Confirmation In
|          17


XC3LU0   15.59.37.801637: Incoming Call  VCID=0002
|        BB450502113044505033317800030101 00


XC3LU0   15.59.37.804836: Call Confirmation Out VCID=F01B Windowsize=07
Packetsi
ze=0080
|


XC3LU0   15.59.38.811378: Incoming Call  VCID=0002
|        BB450502113044505031600400030101 00


XC3LU0   15.59.38.814494: Call Confirmation Out VCID=F01C Windowsize=07
Packetsi
ze=0080
|
```

```
ID0C052  15.59.41.222680: Inbound Data
|         Transport Connection Request In
|          0000001E00C0010BC1083034303631343530C2083034303631343530


ID0C052  15.59.41.231349: Outbound Data
|         Transport Connection Accept Out
|          001E00FC00C2083034303631343530C1083034303631343530C0010B


ID0C050  15.59.41.403547: Inbound Data
|         Transport Connection Request In
|          0000EA0A00C00107C2083034303631343530


ID0C050  15.59.41.412731: Outbound Data
|         Transport Connection Accept Out
|          EA0A00FD00C2083034303631343530C00107


ID0C050  15.59.42.402988: Inbound Data
|         T70 Transport Data In Last TSDU
|          Session Connect 0D In
|
0D6A01240A0D140B44464E2D474D442D45414E0B131711393030393138313630
|
3531392B303130300509130100160101 1A0100C1373135A003800100A12E8001
|          0081010182010184010 1A320


ID0C052  15.59.43.112398: Clear Indication In VCID=0002 CAUSE=
|        0000


ID0C050  15.59.43.112642: Clear Indication In VCID=0002 CAUSE=
|        0000


XC3LU0   16.00.05.672441: Outgoing Call  CID=0002 Windowsize=07
Packetsize=0080
|        BE2043083007003445050211304000 0022


XC3LU0   16.00.07.003695: Call Confirmation In CID=0002 VCID=F033


ID0C022  16.00.10.203323: Outbound Data
|         Transport Connection Request Out
|          000000FE00C1034E4A45C2034E4A45C00107
```

```
ID0C022  16.00.10.700195: Inbound Data
|         Transport Connection Accept In
|          00FE830000C00107


ID0C022  16.00.10.705432: Outbound Data
|         T70 Transport Data Out Last TSDU
|          Session Connect 0D Out
|
0D27050F13010015040000000001601011A0100140200023306465247424F5834
|          0844424E474D443232


XC3LU0   16.00.36.018162: Incoming Call  VCID=0002
|        CB450502114042043345050000000015D0300


XC3LU0   16.00.36.024468: Call Confirmation Out VCID=F01C Windowsize=07
Packetsi
ze=0080
|


XC3LU0   16.00.41.220319: Incoming Call  VCID=0002
|        BB450502113044505031600400030101 00


XC3LU0   16.00.41.223804: Call Confirmation Out VCID=F01D Windowsize=07
Packetsi
ze=0080
|


ID0C04E  16.00.44.309788: Inbound Data
|         Transport Connection Request In
|          0000EA0A00C00107C2083034303631343530


ID0C04E  16.00.44.320873: Outbound Data
|         Transport Connection Accept Out
|          EA0A00FF00C2083034303631343530C00107


ID0C04E  16.00.45.115206: Inbound Data
|         T70 Transport Data In Last TSDU
|          Session Connect 0D In
|
0D6A01240A0D140B44464E2D474D442D45414E0B131711393030393138313630
|
3632322B303130300509130100160101 1A0100C1373135A003800100A12E8001
|          00810101820101840101A320
```

```
ID0C04E  16.00.45.805040: Clear Indication In VCID=0002 CAUSE=
|        0000


ID0C050  16.00.48.903565: Inbound Data
|          8D


XC3LU0   16.00.49.612275: Outgoing Call  CID=0003 Windowsize=07
Packetsize=0080
|        BE204308300700254505021130400003010100


XC3LU0   16.00.51.802244: Clear Indication In VCID=0003 CAUSE= 00B1
|


ID0C050  16.00.54.990068: Inbound Data
|         Transport Request 6A In
|          E86AE88D
```