DANTE MailFLOW Service
Fourth Quarterly Report 1994

Urs Eppenberger
SWITCH Head Office
Limmatquai 138
CH-8001 Zurich
Switzerland
Tel +41 1 268 15 50
Fax +41 1 268 15 68

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1 The Project Team's Activities

1.1 Help Desk Activities

X.400(88) connection tests have been performed between gb1, de1, hu1 and ch3. All these MTAs are running different versions of PP software, and after solving some configuration details the connections seem to work correctly. The v3 route tool again has been modified to generate correct routing tables. It is planned to switch some operational connections to 88 mode very soon.

On November 14th one of the Dutch Relay-MTAs was moved from Delft to Nijmegen. The transition went off smoothly, although it seems that the Greek and the Portuguese managers didn't yet update their configuration tables. (All attempts to contact them have failed until now, which indicates the different levels of service quality the networks are committed to.)

At the end of November the EuropaNET X.25 connection to Italy was broken for nearly one week. This was one of the longest break in the `history' of MailFLOW. Since GARR is not connected over the RFC1006 stack, most of the traffic was routed over SMTP. After a long stable period, the reliability of the connections to the Italian MTAs has decreased noticeably during December. Several times the connection was broken for a few hours. In such cases all the messages to Italy are queued on the Swiss MTA and the Project Team can detect such interruptions within a few minutes.

A lot of routing documents have been sent in to the MailFLOW project team. The Project Team has a checking tool to verify the syntax, but generally it also runs a test with the operational system to check if the configuration parameters in the document are correct. This task has been automated as far as possible, but especially the support in case of errors in the documents and the tests on the system remain manual tasks for an X.400 expert.

It's interesting to see that also the number of mapping table updates sent to the aussie tool has increased clearly during the last few month. This tool works very stable and it doesn't need much human operation, except for one incident December 15th, when an syntactically correct message without any mapping rule caused the Dutch mapping rules to be removed from the mapping tables. With a manual intervention this problem could be solved within a few hours. Some additional sanity checks have been added to the aussie tool to prevent such accidents in future.

1.2 Meeting Participation

Urs Eppenberger attended the 31st **IETF** meeting in San Jose where he participated in working groups related to e-mail. See Annex 2 for more details on the working groups and the results after the IETF meeting.

Marcel Parodi, Felix Kugler and Urs Eppenberger participated at the **RARE WG-MSG** meeting, held October 19-20 at Zürich. Most of the time has been devoted to the PANTOMIME proposal for UPTURN and the future of the group itself. The groups focus has been on filling the gap between the X.400 standard and a real operational e-mail service. While this has been achieved there is no growth in the X.400 usage in the organisations of the participating experts. MIME is taking over since it provides long awaited functionality in an inexpensive way.

1.3 The Second MHS Managers Meeting 1994

25 Participants attended the second MHS Managers Meeting in Zürich. The agenda was full of topics concerning the day to day operation and the near future of the service. Since the current service runs smoothly, most of the managers are reluctant to invest time and resources to migrate to X.400(88) or Directory based mapping and routing. A core group has been formed to progress on the X.400(88) front. The organisation of the mapping registry stays as is, with known problems for multinational organisations and unpaid effort at the national mapping table registries.

2 Planned Activities for 1995

2.1 Project Team

The service basically continues as in 1994. Marcel Parodi and Bernard Stern are the main responsible for the Help Desk, the routing co-ordination and the mapping table co-ordination.

The move to X.400(88) will most probably need more Project Team resources than 1994 since the pressure for the upgrade is much higher now and the managers have gained some experience with the software in the mean time.

2.2 Meeting Activities 1995

The first MHS Managers meeting is scheduled for March 8 at Amsterdam.

The second TERENA WG-MSG meeting will take place at Amsterdam, March 9.

The Project Team will be represented by Urs Eppenberger and Marcel Parodi at the 32nd IETF, April 3-7, Danvers, USA.

The Project Team will be represented by Urs Eppenberger and Felix Kugler at the 33rd IETF, July 17-21, Stockholm.

The second MHS Managers meeting will probably be held at Zurich around October.

The Project Team will be represented by Urs Eppenberger at the 34th IETF, December 4-8, Dallas, USA.

3 Analysis

This chapter contains the opinions and views of Urs Eppenberger, which do not necessarily reflect those of SWITCH nor claim to be correct. This collection is basically meant as an input to discussions on the future of MailFLOW.

The first three quarterly reports for 1994 were focused on the following areas which are part of the MailFLOW service or have at least a close relation:

- Usage of X.400 and SMTP in the R&D and commercial world
- Mapping table co-ordination as a global service
- EEMA participation for contacts with public X.400 service providers
- Implications of MIME and SMTP Service extensions on MailFLOW
- The MailFLOW routing co-ordination
- Migration to X.400(88)

This last analysis looks back at MailFLOW in 1994 and gives an overview of the planned activities for 1995:

3.1 Looking back

During 1994 the MailFLOW service ran smoothly. Most of the updates for mapping and routing were either automatically implemented on the Well Known Entry-Points and gateways or it was mechanical work. The participating managers know basically in depth what is needed and they are willing to assist each other in case of connection problems. The exchanged messages have a friendly undertone which is a very good sign for the co-operation.

New networks have much trouble to join the service. Although everybody is willing to help, we do not offer much education. Networks joining MailFLOW with the goal to learn something about X.400 soon detect that some good know-how is needed before it is possible to integrate a local X.400 service with the global MailFLOW service.

The usage of native X.400 in the R&D communities has dropped significantly. More and more sites move to MIME and SMTP, using the offered multi-media functionality.

The IETF working group CXII on Commercial X.400 Internet Interchange has closed down. This shows again the low importance given to X.400 on the Internet side.

The commercial world uses X.400 because it provides standardised non-delivery reports and receipt notifications and because it is possible to get contracts with service level agreements. Internet is still considered unreliable and insecure. It is felt, however, that Internet is an important information resource and that connectivity is important. For e-mail this means the operation of gateways. EEMA started the ICE working group which digs into this area. It is a big opportunity to have a TERENA secretariat member as the chairman.

3.2 Looking forward

The MailLFOW service will very much run the same way as during 1994. On one hand this is based on the fact that SWITCH has the same contracted activities as 1994 and on the other hand the

participating networks do not plan to change much in their X.400 services, except for the move to X.400(88) and to keep their gatewaying software up-to-date.

A review team works on the SMTP-X.400 gateway specification to include the delivery notifications functionality and fix a number of known bugs. New software can be expected for late 1995. MailFLOW will be the main partner to discuss the introduction of the new gateways into the operational service.

A growing problem for the interoperability between the two worlds are X.400 enclosures. Many user agents allow to include word processor or spread sheet documents. These can only be extracted by the same software. It is basically impossible to gateway such messages in a reasonable way since the gateway does not know which MIME content type to choose for the encapsulation of the X.400 enclosure. The other way around is easier since MIME messages are still ASCII and can be gatewayed into the IA5 body part of X.400. End users start to use a functionality which is not supported by all their intended recipients. Now that the addressing problem has been solved more or less we have to face the different contents of the messages which is significantly more complex and probably unsolvable for many applications especially where the implementor is not willing to publish the specification of the document format.

The growing awareness of the managers for the need of security functionality by the end users will lead to the deployment of PGP (Pretty Good Privacy) and PEM (Privacy Enhanced Mail). The MailFLOW service is not affected since coded body parts are handled transparently by the message relays and gateways. There is no change needed to the message transfer service and its co-ordination by MailFLOW. There is, however, a considerable organisational issue on how encryption keys and security certificates are managed, but this is out of the scope of MailFLOW.

Also for 1996 a central co-ordination will be needed. Its focus will be the same as in 1995, extended with a close co-operation with EEMA. This will guarantee a high service quality during the migration phase from centralised to directory based mapping table co-ordination. The routing will remain mainly a manual task, especially if commercial ADMD service providers are integrated.

3.3 Closing remarks

Running MailFLOW has been sound operational and engineering work but included also some fun. The messaging service is evolving. It started with SMTP. X.400 has been an effort to bring all e-mail systems together. This particular goal failed but it brought at least the commercial world together by offering an agreed messaging standard. Evolution continued but it will not end at MIME and X.400 (92). There are still people around with more ideas and a vision of how messaging can be used in other areas.

Annex 1 Statistics

The layout of this section remains more or less the same for each quarterly report. Highlighting has been used to indicate changing figures in plain text paragraphs.

1.1 Help Desk

Queries to the MailFLOW Project Team are primarily handled by Marcel Parodi and Urs Eppenberger. Two other SWITCH staff members working as postmasters for SWITCHmail act as backup.

Country	Number of Queries			
	Q1	Q2	Q3	Q4
Austria	3	1	0	4
Belgium	10	2	2	3
Canada	0	0	0	0
China	8	6	0	0
Croatia	0	0	0	0
Denmark	11	1	0	0
Finland	1	1	2	1
France	7	5	6	6
Germany	21	3	9	4
Greece	0	0	0	0
Korea	0	0	1	1
Hungary	0	4	0	1
India	4	1	0	1
Ireland	3	2	2	0
Italy	2	4	2	5
Lithuania	0	0	0	1
Luxembourg	0	3	0	1
Norway	6	2	2	0
Poland	0	2	5	2
Portugal	0	0	0	0
Slovenia	0	0	1	0
South Africa	0	0	1	0
Spain	6	3	3	1
Sweden	0	2	0	1
Switzerland	8	3	2	1
The Netherlands	0	0	0	5
Tunisia	1	0	1	0
United Kingdom	15	7	6	9
United States	9	0	1	0
Total	114	52	46	47

During the fourth quarter of 1994 the Project Team handled **47 queries**. They were registered in a

trouble ticket system. The above list indicates the originating country of the query. Please note, that a large number of queries does not mean a lot of trouble in that country. On the contrary, it often means that there are MHS managers who closely monitor the behaviour of the network. They are able to earlier report problems than the responsible managers in the remote network.

13 queries were related to routing document updates. **2 queries** were related to the automatic PP configuration tool. The rest of the queries were related to downtimes of Well known Entry Points (**6**), connection problems (**9**) and various questions about documents, mapping and routing. The introduction of X.400(88) for selected connections needed some support too (**3**).

1.2 File Server

A file server is operated by SWITCH, reachable via FTP, e-mail or TELNET. The procedures for the service and all relevant information for the operation are archived.

The server contains **868 files** with about **30 Mbytes** of data of which about 1 MByte is operational data needed for the configuration of the WEPs and gateways. **29'142 files** have been retrieved from the file server with a total amount of **239 MBytes**. On average each file has been retrieved **34 times**.

42 files have been updated **manually** during the fourth quarter of 1994.

1.3 Routing Co-ordination

The Project Team maintains a collection of **153 routing documents**. The syntax is checked with a tool and the content is checked for correctness by testing the connections with the operational X.400 system of SWITCH. Correct documents only get archived on the server and published via a separate distribution list.

The complexity of the routing can be seen while studying the table on the next page. Each network participating in the DANTE MailFLOW Service is listed together with the number of Well known Entry Points which form the backbone of the X.400 network. There are two important points to note:

- There are networks without their own WEP.
- Some WEPs can't connect to each other since they do not share a common network, for example CRN in China to ESNET in US, or HUNGARNET in Hungary to RESTENA in Luxembourg.

A procedure has been worked out in RARE WG-MSG and IETF X400-OPS which enables mail routing between all participants in the service. The procedure and document formats are described in RFC1465. It enables all participants to exchange mail using third party WEPs with appropriate network connectivity. Where more than one common network exists, managers can define their preferred network.

Almost all systems in the service running PP/ISODE use a tool written by Felix Kugler, SWITCH,

which generates directly usable routing tables according RFC1465. No major problems were detected with the tool during the reported period.

Country	Network	WEP	Network connectivity			
			Inter-net	Public X.25	Europa-net X.25	R&D CLNS
Austria	aconet	1	x	x		
Belgium	belnet	1	x	x		
Canada	cdnnet	1	x	x		
China	crn	2		x		
Croatia	carnet	0				
Denmark	denet	2	x	x	x	
Denmark	dknet	1	x	x	x	
Denmark	minerva	0				
Finland	FUNET	1	x	x		
France	red	2	x	x		
Germany	dfn	1	x	x	x	
Greece	ariadne	1	x	x	x	
Hungary	hungarnet		1	x		
India	ernet	1	x			
Ireland	incip	1	x	x	x	
Italy	garr	2		x	x	
Lithuania	litnet	0				
Luxembourg	restena	1		x		
Norway	uninett	1	x	x	x	
Poland	NASK	1	x			
Portugal	inesc	2	x	x	x	
Slovenia	arnes	2	x	x	x	
Spain	iris	2	x	x	x	
Sweden	sunet	1	x	x		
Switzerland	switch	2	x	x	x	x
The Netherlands	surfnet	1	x	x	x	
Tunisia	irsinet	1		x		
United Kingdom	janet	1	x	x	x	
United States	esnet	2	x			x
United States	xnren	1	x			

Legend:

WEP
: Well known Entry Point

Internet
: connection with TP0/RFC1006/TCP/IP to the Internet

Public X.25

connection withTP0/X.25 to the public X.25 service

Europanet X.25

connection with TP0/X.25 to Europanet

R&D CLNS

connection with TP4/CLNS to the R&D CLNS service mainly available on HEPNET lines

1.4 Mapping Tables

A tool developed during the COSINE-MHS service is used to automatically handle mapping table updates sent in by validated mapping table managers. During the reported period **32 valid updates** and **18 invalid updates** have been received. After reception of a valid update a new international mapping table is created and archived on the file server for retrieval. The tables are also actively distributed once every month according an agreed schedule. All four tables together contain **4'560 mapping rules** (3rd Quarter: 4'001).

Correct mapping tables and correct function of the tools is of major concern for the Project Team. Errors can lead to lots of routing and addressing problems immediately perceived by end users.

The Project Team handles problems if there are conflicting rules. This has not been necessary during the reported period. Since the address of the Project Team is included in the two Internet RFCs defining gateway behaviour and operation, two organisations approached the Project Team to understand the mapping registry procedures and to get the tables.

Annex 2 IETF Working Groups

The IETF **MHS-DS** working group specifies the usage of the X.500 Directory by X.400. Draft documents are ready and two implementations are available, one by CDC and another by the ISODE Consortium. The final goal of this effort is to move from centrally co-ordinated routing and mapping provided by the DANTE MailFLOW service to distributed directory based co-ordination. The technical details are very complex and only few experts understand enough to contribute to the standardisation work. The working group started therefore a LONGBUD pilot where an experimental service based on MHS-DS documents is started to gain experience and to share know-how amongst the engineers and MHS managers.

During the 30th IETF the LONGBUD pilot project has improved their document. While CDC is offering corporate mail solutions using the directory, there is no notable traffic on a global scope using the MHS-DS based specification.

MHS-DS is the only working group with a directory based and therefore distributed and scalable e-mail routing mechanism. The mapping has a competing proposal by Claudio Allocchio which uses

the DNS instead of the X.500 directory. Only the winner will be standardised in IETF. Both proposals have experimental RFC status. It is important to gain operational experience now to be able to decide on the final solution.

The IETF **NOTARY** working group specifies SMTP protocol extensions to support delivery notification. This will eliminate one of the major drawbacks of SMTP for the reliable usage mandated by commercial user communities.

The work of the NOTARY group is very important. It adds the missing functionality for deploying SMTP within and between commercial organisations who need a reliable and controllable mail system. The well accepted RFC1327 for gatewaying between X.400 and RFC822 will need to be changed and all gateway software needs to be replaced.

With the finalised proposal distributed the group will now work on receipt notifications. A delivery report notifies the sender about a successful transmission of the message to the end system or about any problem on the way. A receipt notification informs the sender if the recipient has finally got (or even read) the message. This functionality has some use but touches privacy issues and is therefore highly debatable. The primary intention is to align the functionality with X.400 for easy gatewaying.

To cope with a steady flow of new proposals to improve and extend MIME and SMTP, the group **MAILEXT** has been created to review the documents. This group does not work on new issues but fine tune existing proposals to move them onto the standards track. The continuing changes to MIME and SMTP are a concern for software development companies, especially to those working on gateways to corporate e-mail systems.

IETF started also a working group on **EDI over SMTP**. The discussion list contains hundreds of recipients. Two thirds of the interested people are from US, half of the list members are from companies. The discussions cover broad areas and reflect the various backgrounds of the participants.

One specification is ready on how to use MIME for EDI traffic. A second document explaining in more details practical usage is in preparation.

The work of the group is highly relevant for the e-mail community. X.400 service provider have managed to sell X.400 as the primary highly reliable transport mechanism. It will be a very big push of Internet services in the commercial community, if the EDI work succeeds and the reliability of Internet Mail can be proven.