Stabilizing and extending the IT-Infrastructure

Report from a mission to the National Statistical Institute of Mozambique, Maputo Mozambique

25 January – 5 February, 2010

within the frame work of the

AGREEMENT ON CONSULTING ON INSTITUTIONAL CAPACITY BUILDING, ECONOMIC STATISTICS AND RELATED AREAS

between

INE and Scanstat

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List of abbreviations

DBA	Database Administrator
CO	Scanstat Coordination Office in Statistics Denmark
DKK	Danish Kroner
DSt	Statistics Denmark
EUR	European Euro
INE	Instituto Nacional de Estatística, Mozambique
INE-P	Instituto Nacional de Estatística, Portugal
IIS	Internet Information Server (A Microsoft product)
LTA	Long Term Advisors
STA	Short Term Advisors
MZM	Mozambique Meticais
PX	Family of Software produced by Statistics Sweden
Scanstat	Consortium between Statistics Denmark, Statistics Norway and Statistics Sweden
SCB	Statistics Sweden
SDMX	Statistical Data and Meta data exchange
SSB	Statistics Norway
SQL	Structured Query Language
XML	Extendable Mark up Language

1   RESUMO

Scope of the mission

O foco principal da missão foi a implementação de soluções para evitar INE sejam penalizadas por causa de SPAM. O relatório contém um anexo com uma série de recomendações que vão proporcionar INE pessoal com um ambiente de trabalho do rede mais estável e confiável. As recomendações seguem o exemplo que têm sido dado anteriormente por Jespersen, Guldager e eu.

Recomendações relativas a infra-estrutura no prédio INE novo para ser concluído final de 2010 também estão incluídas no presente relatório.

Uma série de atividades foram realizadas e uma série de alterações na rede foram implementadas tanto no site do INE e do Censo.

Como acesso à Internet é cada vez mais importante, a segurança e regras de utilização da internet foi discutido, e ferramentas para monitorar o uso da Internet foram executados durante a missão. Soluções para impedir alguns usuários no INE para usar toda a banda disponível para acesso à Internet foram executadas durante a missão também.

1   EXECUTIVE SUMMARY

Scope of the mission

The main focus of the mission was on implementing solutions to prevent INE from being blacklisted because of SPAM. The report contains an annex woth a series of recommendations that will provide INE staff with a more stable and reliable net work environment. The recommendations follow the lines of those that have been given earlier by Jespersen, Guldager and my self.

Recommendations regarding the infrastructure at the new INE building to be finished late 2010 are also included in this report.

A number of activities were carried out and a number of changes to the network were implemented both at INE and Census site.

As internet access is more and more important, security and rules of internet use was discussed, and tools to monitoring the internet usage were implemented during the mission. Solutions to prevent a few users at INE to use all the available bandwidth to accessing the Internet were implemented during the mission as well.

2   Introduction

The mission was carried out 25 January 2010 – 5 February 2010.

The purpose of the mission was to stabilize the working of the INE IT infra structure and to help solve some very specific problems related to mail (Exchange) and fire wall configurations.

In this report I have compiled a series of recommendations that will help the IT function at INE provide statisticians and subject matter departments with a more reliable network.

Thanks to all at INE   Finally I would like to express my thanks to all officials and individuals meet during the mission. They all provided me with the necessary information in a kind and open atmosphere which greatly facilitated my work in Mozambique. But specially, I would like to thank Mr. Lars Carlsson for being an excellent host and for a very constructive sharing of his thoughts on the project.

My best personal professional opinion   It should be noted that this report contains my best personal professional opinions as consultant, and that they do not necessarily correspond to the views of Statistics Denmark or INE.

3   Work undertaken

SPAM sent from INE has been a big problem lately. Because of SPAM being sent / relayed through servers as INE, INE has been blacklisted in different places, and by that having problems sending e-mails to companies/users using these blacklists.

It is not the employees at INE who send all the SPAM. Instead it was a misconfiguration in the Exchange server that caused the problem. The configuration is now in place, and the work to have INE delisted from the blacklists is started.

The existing Squid proxy was replaced by enabling web proxy in the existing Microsoft ISA Server 2004 during the mission. The ISA proxy has a well-known interface for administration and it should be easier to manage the Internet usage.

The Internet connection has been slow, and a job to find the reason was started. Of course sending all the SPAM has used some of the bandwidth, but the investigation came up with a few users using about 60 % of the bandwidth browsing some URLs containing streaming video.

These URL's are now blocked by the proxy server, and a recommendation of making a frequently analyse of the Internet usage was discussed and hands on training in using an Internet monitoring tool was carried out.

To block download specific file types, i.e. exe, mp3 and mpeg, will also help getting more bandwidth for work related Internet activity, and this has also been implemented in the proxy server during the mission.

The server hardware at INE is still getting older and in conjunction to the wish of using virtual servers and splitting up services to run on more servers, it should be considered to replace some of the server hardware with new and more powerful hardware.

Running the free version of VMware Server on two modern servers configured with a certain quantity of processors and RAM can host most of the servers needed.

INE's province offices need to have access to the INE Intranet. It is important to ensure that the network traffic between INE and the province offices is encrypted with a VPN technology. To do this the province offices needs to have an infrastructure supporting that technology. The province offices can then use the Internet as secure connection to INE.

At the Census site the ISA Server crashed a while ago and a new one has been installed and implemented during the mission. It is critical to have a firewall to protect the company when connected to the Internet.

INE has implemented MS Forefront to replace Trend Micro as antivirus software. MS Forefront is cheaper and still has a central management interface that helps the IT staff keeping control with the computers at INE.

To be even more safe from getting virus a second layer of virus scanning can be considered. The second layer can run on a mail gateway or a stand-alone proxy. At the Ministry of Education we were presented the Cyberoam. It is a hardware appliance which can run firewall, mail gateway and proxy. On this appliance a virus scanner other than MS Forefront can run.

When employees are hired for jobs at the IT staff, INE should require that they read and talk English. Manuals, help on the Internet and communication with external consultants are mostly in English. If INE is to be totally self supporting in the IT area it is important to recognize that software, related documentation and training is mainly available in English and not in Portuguese.

The IT staff should advance their participation in courses and training in the products used at INE i.e. Windows operating systems, ISA server and network hardware. Taking tests and being certified in products used at INE helps a lot in the daily work and management.

Recommendations from earlier missions were discussed, and only recommendations from these earlier missions that are still not implemented are present in the Recommendations and How To annex to this report.

4   RECOMMENDATIONS

Follow up and recommendations from this and previous missions can be found in a separate RECOMMENDATIONS and HOW TO annex, as they contain information sensitive for the IT-infrastructure.

- **APPENDIX 1. List of persons met**

INE:
Mr. Tomás Bernardo
Mr. Salomão Muianga
Mr Valeriano Levene
Mrs Amélia Muendane
Mr Paulo
Mr Neto

Census site:
Mr Mauro

Scanstat Consortium, LTA:
Mr. Lars Carlsson, Team Leader
Mr. Søren Netterstrøm, Statistics Denmark

Ministry of Education, IT Department:
Mr. Kauxique Mangalal

- **APPENDIX 2. List of Literature**

All mission reports from the Scandinavian programme are available
On-line at: *www.dst.dk/mozambique*

For this mission I would especially like to refer to the reports:

MZ-2004-04: Report from a short-term Mission on Consolidation of Network
Administration by Bo Guldager Clausen and Niels Jespersen

MZ:2005:20; Win03 and Migration by Bo Guldager Clausen (English version)

MZ:2007:11; Windows 2003 Migration follow up and maintenance By Bo
Guldager and Niels Poulin

- **APPENDIX 3. Terms of Reference**

TERMS OF REFERENCE

For a Short-term Mission on the Network situation

25 Janeiro – 5 February, 2010

within the

AGREEMENT ON CONSULTING IN INSTITUTIONAL CAPACITY BUILDING, ECONOMIC STATISTICS AND RELATED AREAS BETWEEN INE AND SCANSTAT.

Consultant*:*   Niels Poulin
Counterparts*:*   Tomás Bernardo, Salomão Muianga and other staff at
DICRE/DISI

1. Background
The INE internal network has been used for several years without a thorough revision that makes it up to date with current necessities. Apart from in-house and local technical assistance, TA from Scanstat has been here on several occasions. See for example: MZ:2007:11; Windows 2003 Migration follow up and maintenance By Bo Guldager and Niels Poulin, MZ:2006:10: IT Management and Strategic IT use by Lars Thygesen, MZ:2006:09: Final report from a long term consultancy on IT and Statistical Production by Karsten Bormann, MZ:2005:20: Win2003 and Migration by Bo Guldager Clausen, MZ:2005:03 Final observations and recommendations from a Long-Term Advisor on IT by Mogens Grosen Nielsen, MZ-2004-04: Consolidation of Network Administration by Bo Guldager Clausen and Niels Jespersen, MZ-2003-10: Strategic IT Development issues by Lars Thygesen

2. Main Reasons for the Mission
This short-term mission is just a small initial part of the broader long term task of restructuring the network and the network administration into a well-functioning infrastructure at INE. As the dependency of the internet is growing a set of urgent has to been identified.

If the consultant see an advantage in an advance purchace any equipment, software or other necessary tools to facilitate the mission this could be discussed.

3. Beneficiaries of the Mission
The mission will primarily benefit the staff at the IT-Department by providing knowledge of the software and hardware to be used. The beneficiaries in the long run will be the users of the INE network through improved functioning of network dependent processes.

4. Objectives of the Mission
Secure, adjust and modify the network in co-operation with the DICRE/DISI staff.

5. Expected Results
A network that gives a secure and stable environment for INE activities.

6. Work to be carried out by the Consultants
- Speeding up the responce on the now to slow internal network (connecting applications to databases hosted on servers)
- Reduction of the downtime of e-mail services and Internet access
- Management of Internet traffic (access control and management of downloads)
- and Control of SPAM's
- Contribute with ideias on ToR for a long term solution of the network situation

7. Agenda for the Mission
Working sessions with the staff

8. Tasks to be done by INE to facilitate the Mission
- Elaborate the Terms of Reference for the mission
- Prepare and supply the consultant with necessary documents and information
- Supply good working conditions for the consultant

9. Timing of the mission
Se above.

10. Source of Funding
Project: MPD-2008-0011 – Coordenação e Integração Estatística
        PAAO10 – 3.1.1 Construção de Bases de Dados Integrados

11. Report
The consultant will prepare a draft Technical Report to be discussed with INE before leaving Maputo. A final draft will be submitted to INE for final comments within one week of the end of the mission.

Approved by Amélia Muendane INE/DICRE

Day   /   /   ....

Approved by Tomás Bernardo INE/DICRE/DISI

Day   /   /   ....

Confirmed by Luis Mungamba, Contract Manager for the INE – Scanstat Contract

Day   /   /   ....

• APPENDIX 4. Activities during the mission

The following activities were carried out during the mission:

Monday 25 January   Start up meeting with Mr Salomão Muianga, Mr. Tomás Bernado and Mr. Lars Carlsson.

Start looking at Blackberry synchronization problem and get a short overview of the network infrastructure.

Creating a To Do list for the work at the mission.

Configure the Exchange Server to block open SMTP relaying.

Tuesday 26 January   Visiting the Ministry of Education and talking with Mr Kauxique who kindly shared his knowledge and shortly showed the IT setup at Ministry of Education.

Testing ISA Server 2004 as proxy, i.e. blocking .exe download and hands on training using ISA Server 2004 as proxy.

Meeting with Mrs Amélia Muendane to give her a short brief of the to do list at the mission.

Meeting with Mr Valeriano Levene for a talk about the new INE building regarding the network infrastructure.

Exchange clean-up from earlier mail-relaying in corporation with Mr Salomão.

Wednesday 27 January   Looking at the rules at the present Squid proxy server to make a migration plan for using the ISA Server 2004 as proxy server.

Installing, testing and hands on training in using Internet Access Monitor for MS ISA Server and Squid server and Mail Access Monitor for MS Exchange Server from Red Line Software to determine who is using the bandwidth and sending all the mails.

Set up Exchange to deny mails to non AD-users and setup tarpitting in a try to avoid NDR attacks.

In Squid and ISA proxy blocking for selected URL's as browsing these URL's use more than 60% of the Internet bandwidth.

Thursday 28 January   Increase the maximum database limit on Windows Exchange Server from 18 to 35 GB.

Creating documentation on how to block for file download and bandwidth expensive URLs is made for both Squid and ISA.

Firewall review and preparing for firewall setup at Census site.

Friday 29 January	Troubleshooting after power breakdown late Thursday. INE could not browse the Internet after that.
	Discussed two reports from Business Connexion about storage and IT draft with Mr Tomás.
	Because of missing power, we couldn't get further with the new firewall to the Census site, than building the hardware.
Weekend 30-31 January	Modifying the firewall rule set to be more restrictive.
	Defining, testing and implementing ISA proxy rule set.
Monday 1 February	Hands on training using Microsoft ISA 2004 Server.
	GPO changed to push out proxy settings to users to use ISA Server as proxy server. Furthermore a setting is applied to make it impossible for users to change proxy settings at the client computers.
	Installing and configuring the Microsoft ISA 2004 Server to replace broken firewall at the Census site.
Tuesday 2 February	Implementing Microsoft ISA 2004 server at Census site.
	Configure GPO at Census site to force the users to use the ISA Server as proxy.
	Changing the login-script to start up INE Intranet at logon and change all user accounts at INE to use the new login-script.
Wednesday 3 February	National holiday.
Thursday 4 February	Preparing the ISA firewall to handle different exceptions to the default rule set at INE and Census.
	Walking through the performed activities during this mission and recommendations from earlier missions with Mr Tomás Bernardo, Mr Salomão Muianga and Mr Lars Carlsson.
	Create documentation for how to create mailbox quota for the users.
	Preparing the ISA firewall to allow outgoing FTP and create documentation for how to handle it.
	Creating and installing certificate using SelfSSL on the Exchange server at Census site.
Friday 5 February	Installing SQL Server to Mr Søren Netterstrøm to make it possible for him to do his job at his short term mission regarding NADABAS.