Internet Development in Angola
Our contribution

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In 2006 Angola completes ten years of full Internet operation. Although its access is not possible to perform within the parameters of the universality of the four corners of our country, benefits of this technology can be already noticeable in our country.

Today is possible to do our banking transactions using the home banking facility, work using remote access, send and receive messages, perform real time text chatting to and from any place, use Chat and Messenger facilities or even talk from PC to PC or from PC to Telephone using Voice over IP such as Skype, download movies, watch movies, watch television, listen to the radio, read newspapers, get scientific information, etc.

As everything has a beginning, it is important to know how this technology was introduced in Angola, its background and development. It is the result of many different contributions and here we state our contribution to the introduction of new technologies.

As it can be noted through our history, it is clear that love also contributed to the implementation of Internet in this immense and wonderful country.

Background

In 1989, after completing my studies in Ukraine in the *Instituto Superior Politécnico (*Polytechnic Superior Institute*)* of the city of Donesk, as a computer Systems Engineer, I was placed at the *Ministério do Plano* (Planning Ministry); previously, the State had guaranteed work for bursary students, after completing their studies, however, it happened that, after various unsuccessful contacts to the Planning Ministry (which was indicated as my employer), I decided to look in the labour market for a job. I think that, at that stage, we were at the beginning of the open market economy.

After being interviewed by Engineer José Ferreira, then General Director of NCR, I was immediately admitted and introduced to the Technical Director, Engineer António Maurício. After spending some months repairing PCs I was transferred to the Software Department headed by Engineer Mário Ferreira. I still remember that Mini-Tower with its working System Santa Cruz Operation (SCO) ***UNIX***. NCR was and

still is, with no doubt, an important information technology company in the Angolan market. The labour conditions as well as the relationship between the staff made it a pleasant working place where the working hours passed pleasantly.

By the end of 1990, when still working for NCR, I decided to go to Cuba looking for my sweetheart from the student days in the Soviet Union . What was supposed to be a 30 days holiday, which became a stay of nearly two years.

First steps

In the 90s Cuba, like other South American countries, started the first steps in the implementation of e-mail systems. My girlfriend Haymee Pérez Cogle, finalist bursary student of the Universidade Estatal de Donestk / Ukraine, was one of the Pioneers of the nucleus specialists of CENIAI, at the Instituto de Documentação e Informação Científico-Técnica (IDICT*)*, (*Documentation and Scientific-Technical Documentation Institute*) linked to the Academia de Ciências de Cuba (Academy *of Science in Cuba*).

Through Haymée ,I contacted the Cuban pioneers of *Internetworking*, excellent specialists. I have to mention Lic. Oscar Visiedo, Telematics specialist, Engineers Calixto Sánchez and Ulises Guigou, programmers and specialists in data transmission and Jesus Martines, specialists in remote access and data base.

Lic. Oscar Visiedo and Engineers Calixto Sánchez and Ulises Guigou, presently living in the United States of America, are still linked to the IT Sector, the Engineer Jesus Martines is an executive member of ETECSA and directive member of LACNIC.

During the years that I lived in Cuba I had the opportunity of getting involved with companies and projects of data transmission**,** electronic mail and remote access to database. The participation on those projects was decisive to my knowledge and experience in the application of new technologies to solve practical problems.

ALMARED – The first Project

I did not have a definite idea; I was simply motivated to getting information through the powerful tools of information systems. Using the great power of communication beyond borders and researching, we realised that Angola was far from the fascinating world that we conjectured. I, knowledgeable of the Angolan reality and with the support of Haymée and a group of colleagues, among them Oscar Viciedo and Calixto Sanchez, created a project to integrate Angola in the first attempts of Internet, which were appearing all over the world..

The project with the name of ALMARED, conceptualised in Cuba in 1992, targeted the integration of the new information technologies in Angola.

ALMARED aimed at creating a non-profit organization for the Network and Internet sector using/adopting the new technologies of communication via Internet: Electronic Mail, Access to Internet and Training.

ALMARED would service and collaborate with the most various sectors of society, NGO's, University, Investigation Institutes, Libraries, Professional organizations and Companies, promoting the utilization of these technologies.

The technical solution was based on an access network via modem and the operating system Unix / UUCP using the existing telephonic infrastructure.

The technology UUCP or Unix to Unix CoPy; is an old method, used to transmit mail and Usenet items between computers. Although initially it was created for transmission between UNIX computers, it is also possible to use it in other platforms.

So, we started contacting the organizations that promoted Internet projects in Africa; we sent our ideas via E-mail to Universities, in America and to international NGO's. We highlight here the support that we received, since the beginning, from **Network Startup Resource Centre (NSRC)** an NGO based at the University of Oregon, promoter of "*networking*" projects for developing countries. Here we mention our gratitude to Steve G. Huter , Hervey Allen , and the other NSRC colleagues.. We would also like to acknowledge the U.S. National Science Foundation for the technical assistance that we have received in Angola via the Network Startup Resource Center

At that stage we got these contacts through partners / suppliers of CENIAI services in Cuba, where Haymée, Visiedo, Calixto and Ulises worked. CENIAI was the vital point to route traffic to Internet via linkage UUCP through WEB/NIRV Network, Rede APC (APC Network) partner.

Back to Angola

Back to Angola, at the beginning of 1993, as a result of the electronic mail that I was sending from Cuba for support to the implementation of our project ALMARED, we were contacted by Barbara Pesce from PNUD**,** with the intention to create a Sustainable Development Network – **RIDS / SNDP in Angola.** The objective of such network was the utilization of new ways of communication, namely the Electronic Mail, to spread information linked to the environment and the sustainable development.

In 1992 the Country was at war; I remember with terror the three days of war that ravaged the capital city of the Country during the gone by years of 1992. The great desire to implement the **RIDS / SNDP in Angola** project gave me the motivation to contact well known information technologies companies, since computers constitute the basic element for the massive spread of this technology. In the same way I contacted by the only Public Communications Operator (*Operadora Pública de Comunicações*) existing at that time, where I was informed that there was a project pending to implement a database network using the protocol X.25. Through the contacts that we had made it was not possible to find local companies that believed in the possibility of the implementation of a project of this type, especially in

Angola, a country at war, with major energy problems and with poor communications infrastructures.

Angola had been invited to participate in a pilot project. Thus, together with Victor de Carvalho, a Biology specialist (deceased in 1994), we decided to adopt the PNUD project. I was contracted by PNUD as a Project Technical Consultant.

As the war intensified in the Country, there were hesitations on the financing of the project since the PNUD funds, with regards to Angola, now had the priority to help the population affected by the horrible war that was devastating the Country.

In June 1993, I was invited to participate in a regional workshop "Southern African Regional Networking Workshop" held in Johannesburg, South Africa where 11 countries with various Internet initiatives, were represented. The workshop was promoted by NivCentre (Web) of Canada, *Centre D'Information et Documentation Sur L'Afrique Australe (CIDMAA)* supported by the Canadian organization Partnership Africa. During the workshop the Electronic Mail Projects in the region were presented, all financed by NGO's such as APC, UNDP, RINAF (project from UNESCO and Italian Government) IDRC, USAID and CIDA .

During the workshop two kinds of Electronic Mail systems were presented to us, namely the UUCP headed by Mike Lawrie from the University of Zimbabwe and Fidonet, headed by Mike Jensen of IDRC / Worknet consultant, both systems working with MSDOS environment.

Due to the easy installation and functionality, both to the Server and the Client, I adopted the FidoNet. While staying in South Africa, I was informed that Development Workshop-DW, a Canadian NGO in Angola, involved in development and humanitarian help projects, was using electronic mail since 1989. It was a remote point and used international calls to receive messages from the Host in Canada. ANGONET was the name of the project.

The Fido technology worked as a worldwide network of PCs. It also transfers its own electronic mail, generally with the possibility of sending a letter to someone via Internet and vice-versa and its own discussion groups (conferences). It is similar to the Internet, but much more limited in terms of interaction, diffusion, speed and heterogeneity. With the development of Internet the Fido technology became obsolete. There were gateways for the conversion of Internet messages/folders to the Fidonet and vice-versa.

Back to Luanda, I contacted Mr. Allan Cain, Director of the Development Workshop (DW), a man who, through remote access to Electronic Mail, had benefited from the Information Technologies advantages since 1989. He told me that although the project regarding the use of electronic mail had ended, he was very interested in carrying on these services. On the other hand I gave him some information about the sustainable development project (SDNP/ RIDS).

ANGONET was the first initiative of electronic mail in Angola, which started in 1989-90 with the installation of a remote linkage to E-Mail, a project funded by the Angola - Canada program. The program ended in 1993.

ANGONET – First Electronic Mail Network in Angola

From the meeting with Allan Cain, was created the idea of a possibility of installation of **Electronic Mail HOST** in Angola, funded by the people interested in using the service. At that stage the funding of PNUD and RIDSANG Network had not been realized.

DW obtained some funds from IDRC and other NGO's to start Angonet Network, Haymée was contracted as the Project Coordinator and amongst other duties related to the System operations, promotions inside the NGO's and users' training and I, on a part-time basis, gave technical support to the Server installations and maintenance.

We worked very had to start the new project, in December 1993 DW/ANGONET appeared on the Electronic Mail Network partner of GreenNet /APC Directory, among other African countries network such as Algeria Net, University of Botswana, ORSTOM (Cameroon, Congo, Burkina Faso), Egyptian Universities Network, PADIS (Ethiopia), African Centre for Human Rights (ACHRDS-Gambia). Ghastinet and FOE of Ghana, Center Informatica University Eduardo Mondlane / Moçambique, Enda-Dakar, SangoNet and Uninet of ASUL, etc.

Our objective was Internet (Full Internet), however, due to the technical impossibilities, costs involved and other legal constrains we opted for a gradual development, starting with the implementation of one Electronic Mail Network, using the local Server based on DW.

Therefore, we invited Mike Jensen, the CABECA-Capacity Building for Electronic Communication in Africa consultant, to help us with the configuration of the Server Fidonet HOST in Angola, and in February 1994 the **1st Electronic Mail Server** in Angola was born.; ANGONET stopped being a remote point and **started operating as a Network**.

The CABECA project and Mike Jensen, in particular, were directly responsible for the implementation of more than 30 Internet initiatives in 19 countries on the continent. At that stage, it was the only project related to information technology specially designed for the African Continent and co-ordinated in the continent. CABECA had the support of other projects such as RIO-ORSTOM, RINAF, UNDP's Sustainable Development Network and Healthnet/SatelLife.

The Angonet Network, identified as *Fido Node 5:7031/1*, worked as follows: One E-Mail Server with TWO telephone lines, one line to Receive the Users' calls and a 2nd Line which, via a Telephone Line, connected 5 times a day with Gateway Fido from GreenNet / Londres Network / Host of APC Network, received and sent the Message packages that afterwards, would be sent to the Internet Network

addressees. The received messages remained with the Server until the Angonet User connecting via modem downloaded the mail.

The Software used by the Server and the Client was **MARIMBA**. It worked on MS-DOS environment, easy to install, to maintain and to be utilized for users' training. We started with modems with **9.6K**, **14,4K** speed. Basically, to send email from the Internet to the Angonet users the address was :
username@angonet.gn.apc.org

On the **Network Startup Resource Center** site in the USA, there is a file for Hosts List FIDONET Network – Africa, connected to E-Mail (dialup) via APC Network:
In 1992 there were 12 Nodes in Africa, in May 1994 the number of Networks increased to 25 African Host Names.

Such hard times! Since the beginning, with emotion, we saw the interest of the organizations to join the project; we trained many users, an unique effort of DW which supported the project costs, specially regarding communications and power, the power failures were constant. We also from the beginning had non-believers. For example, companies joined suspiciously. It was impossible to satisfy the market technical requirements with the existing scarce resources.

In **December 1994** ANGONET had **30** users, in **1995** the number increased to **80**; 65% were NGO's and 20% were users linked to institutions of the academic sector.

Besides the Electronic Mail, the ANGONET promoted information exchange through Conferences Service (Serviço de Conferências) "Newsletters" such as a ONG ADRA "CRONOLOGIA", a monthly *Bulletin.*

The prices charged for the Email Services were as follows:

Membership and Configuration: US$100.00
Monthly Fee: US$50.00
International Traffic; US$1.00 / Kylobyte
Conferences Service: free
Assistance Support and Training: free

70% of costs were from the funds managed by DW, the remaining 30% of costs were from the users contributions.

The complete version of the 1995 ANGONET Report is available online on PNUD Website.

The following made part of the first list of Electronic Mail users: Dr. Liz Matos, Dr. Augusto Chipesse, Carlos Figueiredo, Dr. Mario Adauta, Dr. Flavio de Sousa, Dr. Kiasekoka Miguel, Drª. Antonica Hembe, Drª Mary Daily, Dr. Alberto Marques, Engº Abdul Kandumba, Nuno Borges da Silva, Luis Felipe (Projecto PREGE), Dr. Carlos Mariano Manuel (Hospital Américo Boavida), Dr. Belchior da Silva, and Dr Miguel Gaspar (CEPIS Project founders, initiative of ICT, promoter of new information technologies in the *Angolan Army Health Department*.- *SSFAA*

Of the NGO's: CEPIS, LWF, CARE, CCF, UNICEF, PAM, etc.; Of the Companies: Sinform, Toyota, JLM Lda and others. From the state institutions we mention the support of the ANGOP (News Agency ANGOP), through Engineer Daniel Jorge (SAMY), promoter of the utilisation of the new information technologies. He still keeps the first MODEM that we used to do the configuration of the Email access of ANGOP in 1994.

The ANGONET list of users is available on the website Angola.ORG

Here we take the opportunity to thank them all for the understanding, support, strength and trust in our work.

The ANGONET Network is still operational as a Service Network with *full access to Internet*, from various provinces in the Country. And also have the objective to increase the capacity of the non profitable organizations, in the civil domain and development, that work in the humanitarian crisis in Angola context through the improvement of communications e information exchange. The national ANGONET Network co-ordinator is the specialist Olivia Augusto.

The arrival of LINUX: RIDSANG Network

In June 1994 I was invited to attend the international Internet – ISOC Annual Conference, of which Haymée and myself are members since 1993.

ISOC is a NGO, created in 1991 , is the only organization solely dedicated to the worldwide Internet development, promotion of efforts and actions related to the formation of specialists, design and Internet infra-structures, protocols, standard techniques compatible to protocol IP. It works as a centre of cooperation and coordination at a global level.

ISOC was initially funded by its members but it changed in 2002 when ISOC won the bid to manage the ".ORG" registry and established the Public Internet Registry, which does now provide some funding to ISOC.

Every year ISOC organizes annual training and conferences aiming to promote the development of Information technologies, the best known are INET and NDSS Workshops. Since my participation on "1994 INET" Workshop, from 13 to 17 June in Prague, I started using and studying LINUX / Slackware. I already had some experience with UNIX and needed to understand the functioning of this new and emerging project for multiple users and multitask at personal computer's level, especially applicable to Internet Servers. The conferences and discussed issues are recorded on INET94 Proceedings Site.

I remember with emotion that day, 14 June 1994 when I was in the conference room in Prague and I received an electronic message from Haymée announcing the birth of our little daughter Deborah. Haymée had received a computer from DW, and as we had a telephone line at home, via Angonet she sent me a message announcing that our daughter was born at dawn of 13 June.

Some months later, with the arrival in Angola of the specialist Raul Zambrano, technical co-ordinator of Rede SDNP we did the configuration of the second E-Mail Server RIDSANG, based on Linux operative System ***"ridsang.sdnp.undp.org"***

In November 1995, the RIDSANG Project enters the second management phase done by UAN-Universidade Agostinho Neto and co-ordinated by Drª. Liz Matos of Centro Recursos Fitogenéticos (Phytogenetics Resources Centre).

Initially the RIDS Project was funded by PNUD, with US$103,900 including a contribution of US$35,000 from Switzerland institutions for acquisition of equipment. However, due to local logistic difficulties, the quality of the telephone line, power failures and other obstacles the Project did not work 100%.

The planned two daily calls to the Server of PNUD in New York sometimes could not be done. Therefore, to complement our work, instead of competing with the Email Network "ANGONET", already operating, similarly to what unfortunately happened to other initiatives in countries in the region, we decided to merge the two Projects, finding common points and creating synergies at the human and financial resources.

The fact that Haymée and myself had been involved in the only two operating Electronic Mail projects, each of us with different responsibilities but fortunately with the same objective, played in our favour. We found the needed synergies between the two projects, to allow us to overcame the adversity and maintain the service active. We had all the support of DW and PNUD.

To promote the access to the Electronic Mail, we increased the resource distribution to the local NGO's, Modems were distributed free of charge, through international NGO's we helped with the acquisition of computers, we also increased the training of in the usage of the new communication tools.

We decided to establish a linkage between the Hosts of both Networks, therefore, the Email RIDSANG Server was connected once a day to the ANGONET Host, facilitating the messages exchange between the users of both Networks. To receive/send Internet messages the RIDSANG Host made a second international call to SDNP NY Server of Rede SDNP (SDNP Network) in New York.

This experience of teamwork is documented on the PNUD Website as a Success Story, among other initiatives in countries such as: Bulgaria, Philippines, Cameroon, China, Colombia, Lebanon, Mozambique, Jamaica and Pakistan.

The activity of ANGONET and RIDSANG Projects during 1995 was very intense, more than **100 organizations** received Training and were connected to E-Mail. The development of the pro-Internet activity in Angola was similar to the situation in the continent, with a common feature: it was promoted and funded by the NGO's sector and/or Academic sector due to the need to contact their partners in the exterior in order to proceed with the Humanitarian Assistance projects and the development of the Country.

Angola Top Level Domain .AO

In June 1995, during the ISOC INET-95 Workshop, organised in Honolulu-USA, we participated together with Professor Pedro Teta, was an unique opportunity to exchange our ideas about the Internet development in the Country. In this annual event, we obtained the relevant contacts and registered the Top Level Domain ".AO".

The Engineering Faculty was the governing entity appointed to administer the domain.

The Engineering Faculty of the Universidade de Agostinho Neto (Agostinho Neto University), represented by Dr. João Sebastião Teta received, by delegation of IANA, the responsibility for the registry of the sub-domains specific to Angola, i.e. those that were directly dependent on the .AO domain. Due to situations relating to technical issues the operation of the Primary Server DNS of the Domain .AO provisionally remained in Portugal at the FCCN (Fundação de Computação Científica Nacional) (National Foundation of Scientific Computation).

The Registry of .AO was a very important step. With the registry of the domain, Angola as a country is identified at the Internet Level. The Faculty of Engineering, which manages the services of distribution of sub-domains, has published on the Universidade Agostinho Neto Website, the Rules of the .AO's Registry.

During the same event INET-95 we, the Africans who were attending, got together and decided to propose the establishment of AFRINIC that only became official in 2005. We must remember that in 1995 there were only 3 Countries in Africa, which were connected to the Internet. Only a few, including Angola, had electronic Mail Servers (Angonet and RIDSANG).

The information regarding the Conferences and Workshops is available on the INET'95 Conference Program site.

Investing in the training and Regional exchange

A weak point, which characterized many Internet initiatives in the region, was the lack of staff specialised in the new information and communication technologies; therefore, the promotion of workshops and conferences done by international organizations was constant during this first development stage.

We emphasize the role of the APC Network, in the assistance and logistic support in the projects and Internet in Africa initiatives, as well as in the technical training and in the promotion of events for the reciprocity between the specialists, particularly the GreenNet-UK and Sangonet-South Africa Networks which, at that date, were co-ordinated by our friends Karen Banks and Anriette Esterhuysen. Nowadays, both of them are still with APC Network, at a global level.

Regional Symposium about Telematics

In April 1995 the UNECA organized a Regional Symposium on Telematics in Ethyopia between 3 and 7 of April 1995, where Angola was represented by Engineer Abdul Kandumba for Angola Telecom and by myself for RIDSANG Network.

In the event were discussed issues related to Building capacity for application of Telematics in the development, Collaboration with the financial entities, such as ITU , UNECA and UNESCO, for the creation of ACTA – African Telematics Association, aspects related to the regulations with the objective to prepare a

framework that would facilitate the discussion about licences of frequencies in the implementation of telematic services, establishment of prices and tariffs, a competitive environment for the promotion of services, strategy and training of specialists and many other current topics. The complete version of the Meeting Conclusions is available in the Internet documents under Telematics Symposium: Recommendations and Statement by African Electronic Service Providers.

Network Workshops for specialists from the PALOPs

In May 1996 the Brazilian Government organized training about networks in Recife, with the participation of Mozambique, Cape Verde Islands and Angola. I was the representative for Angola. The objective was to establish a network between the Palops.

At that time, Electronic Mail Networks were already operating in Angola and Mozambique. During my intervention I stated that Angola only needed a direct Internet service, we already had some knowhow, acquired through various years of operating the ANGONET and RIDSANG Networks.

I remember with nostalgia Dr. Miguel Brucher that I met during the event organized by Itamarati. In Angola, Dr. Miguel Brucher, a respected specialist lead various SERPRO projects. Dr Brucher had a vast knowledge in information technologies and, for us, he was one of the driving forces.

Internet Society Conferences and Workshops

The annual conferences organized by ISOC played a fundamental role in the Internet development and in the formation of human capacities in our continent.

We emphasize the INET 98 Conference in Geneva, where it was organized a Symposium, during 20 and 21 July, to discuss the solutions and problems regarding the connection of Networks in Developing Countries – "Developing Countries Networking Symposium" . Haymée and myself also participated in the "Technical Tutorials" . For the first time the Networks Workshop was organized, simultaneously, in English, French and Spanish.

During the African Networks specialists meeting, Allan Barret and myself were elected members of the AFRINIC Organizer Commission as representatives of the Southern African Countries.

Regional Conference of African Internet Professionals in Benin - AFRINIC Background

Sponsored by UNDP, *Agence de la Francophonie* and the Benin Government, this regional Conference in Cotonou that was held between 15 and 18 December 1998, had as main theme the strengthening of the administration of the IP and Addresses resources by the African Institutions "Administration of Internet Protocol Addresses and Domain Names and the Strengthening of African Emerging Institutions" .

Various themes related to Internet Administration were discussed, especially in the interventions of some Internet development pioneers, such as George Sadowsky and Nii Quaynor, at global and regional levels. Both emphasized the importance for the specialists and organizations in the continent to be actively involved in the management of Internet technology resources.

The group Internet for Africa "Africa Internet Group (AIG)" approved a resolution for the creation of a regional body to operate the Regional Registry of Internet Resources (RIR) in Africa "AFRINIC"

During various years of intensive work, both at regional in the AIG group as well as at international level in the Task Force Membership Implementation Task Force, constituted by 74 voluntaries from 42 nations, with the objective to transform ICANN – Internet Corporation for Assigned Names and Numbers , the global body responsible to set the rules of Internet utilization, an organization much more representative at a global level.

More than 136 Internet professionals from the six African regions participated in the conference, as well as PNUD, ACCT, ISOC, RIPENCC, APNIC, AFNIC, RISQ, ITU, USAID, ADB, and BOAD observers. The Conference Report is available online at African Regional Conference about Internet Administration.

With effect from 22 February 2005, AFRINIC gave a step forward on the way to its transition process. We effectively started the second phase of transition, that is, AFRINIC is now operating exclusively as RIR, with all rights and responsibilities.

The final credential acceptance of AFRINIC by ICANN was in April 2005. We had the unconditional support of NRO (the Numerical Resources Organization), which is a colligation of all RIR already in existence.

Is important to mention the support we receive from Steve G. Huter and Randy Bush, they played an important role by helping the African authors of the first document to officially propose an African RIR in 1997 , also promoting capacity building to manage the RIR, which was critical for helping AfriNIC actually develop. We would like acknowledge as well the support received from IANA and RIPE helping promote the idea of AFRINIC.

EBONet: The first ISP in Angola

In 1996 the phased liberalization of the Telecommunications Sector, starting from the value added Services, was approved by the Angolan Government.
The information regarding this process is stated on the ruling body website INACOM.
Haymée and myself decided to start AlmaService-Lda, an IT and telecommunication services company and, together with INACOM , we prepared all the necessary documentation in order to obtain the licence to supply value added Services. We started looking for partners.

This year, through our friend Engineer Abdul Kandumba, we met Ramos Chaves and Dr. Beto Marques both managers at the IT company Sinform. Chaves and Beto were also interested in the new information technologies, particularly Internet, and they had been looking for partners to enter this new market.

After various meetings we decided to join efforts, internetworking and services on our side and experience in the field of Information, Software and Training from Sinform. In this way we started a new partnership, the company **Pacomm, Lda** . We designed the Internet Services Provider project and finally, after going through various names we opted for **Rede EBONet.** Then, the stage of looking for financial sponsors had started.

After submitting the project to various institutions, the credit of approximately US$200.000 was given by Banco BPC . The interest rates were high but the payments were flexible.

In order to obtain the necessary feedback and recommendations, the technical and economic feasibility of the project was presented to various institutions such as Telecommunications Ministry and INACOM .

With Angola Telecom, the incumbent beneficiary, we discussed and found all the possible variant connections, such as access of users to the Server **EBONet**, using the infrastructures of the Public Network and the international connection of **EBONet** for Internet. We highlight, from the beginning, all the support from Engineers Anibal Cordeiro and Abdul Kandumba from Angola Telecom, and Engineer João G. Matos who was President and CEO of Angola Telecom, as well as from Engineer João Beirão, Director of INACOM .

In the beginning of the second semester of 1996 the conditions for the starting of the Internet Server were completed. They were months of hard work, project conception, establishment of the company and staff training, equipment importation and installation, configuration and tests. The staff training was a decisive aspect and we were lucky to have the experience of Alice Novais who, during years, had the responsibility to administer the training services of Sinform.

To help us with the access Server parameterization and Internet services configuration we invited the South African consultant and Linux specialist, Dr. Evan Summers, recommended by our friend Mike Jensen .

The access Server and the services configuration were done and tested. We did all the possible to register our Internet Provider under the national Top Level Domain **.AO** , but at that stage we met so many difficulties that we decided to register it at an international level; ebonet**.COM** was already being used, we had the alternative **.NET**, therefore the first Angolan ISP was registered as the domain **"ebonet.net"**.

We needed to improvise a website to reflect our presence in the global village. With Evan's help, various colleagues designed a draft of our 1st website ***"www.ebonet.net/index.html"***

On the 29 of October 1996, after overcoming technical difficulties, at last the international output *link* started working through Angola Telecom. At nightfall, we were very tired, but fortunately our efforts had been rewarded: we had accomplished our objective: FULL INTERNET Access!

At that stage we decided to start with the minimum possible. The preoccupation about the project austerity and sustainability was a constant concern of our Sinform partners, with more experience on companies management, particularly Ramos Chaves, our General Director**.** Haymée and myself were more involved in the technical implementation, design and marketing of our services. Beto Marques, although still working full time for Sinform company, took the responsibility to manage the **PAcomm** information technology, the backoffice programs and the intranet.

The EBONet Network started using a Computer P100 as Server, 6 modems Zyxel of 33kps for the Six (dialup) access lines, One Cisco Router series 2500 as Access Server and One Modem RAD ASM-20 to a dedicated connection of 64 Kbps with Angola Telecom. Thus it was possible the first Internet Commercial Server in Angola to start operating: the **EBONet.NET**

We were lucky to have the collaboration and personal involvement of excellent national technicians and specialists, we were learning together, we were a brilliant team, cohesive and very open to experience and knowledge exchanges, both at local and international levels, particularly in the region. As our famous slogan predicted **" Pense Glob@l, Actue Loc@l"** (*Think Glob@,l Act Glob@l*).

With **EBONet** Angola, in 1996, enters into the map of countries linked to the Internet world. We had many colleagues who passed through **EBONet**, and until today we are still together in NEXUS-MSTelcom , public Telecommunication operator, others are involved with other projects**,** but the spirit of the years at **EBONet** is always alive.

We created! Created together,
We created with love,
Love between us and love for our Project.
Here is the fruit of our labour.

Luanda, 2006

Silvio Cabral Almada & Haymée Pérez Cogle

Chronology of Internet in Angola

1990 – 1st E-Mail remote Access from Luanda to an Host in Canada (Angola Program – Development Workshop)

February / 1994 Installation of the 1st ANGONET Email Server

April / 1994 PNUD RIDS-Ang Project (Host UUCP-Linux)

June / 1996 Approval of Legislation for the Value Added Services for Licences of local ISPs

August / 1996 UNINET Network administered by Universidade Agostinho Neto (full Internet)

October / 1996 EBONet : 1st Commercial ISP (full Internet 64Kb)

1997 Installation of Backbone Internet – NAP Angola Telecom

November / 1997 Netangola : 2nd Commercial ISP

1998-2000 Other ISPs SNet, SRC-Angola, Multitel, MSTelcom /Sonangol

1998 Implementation of Internet Wireless Technology (RadioLink 2,4/3,5 Ghz)

1999 Implementation of POPs of Angola Telecom for local access in the provinces

1999 Emergence of Cybercafes

2001 VSAT Technology to access Internet Banda Ku iWAY Africa – Sistec

2002 Legalization of new Fixed Telecommunications Operators : NEXUS , MSTelcom , MundoStartel and Wezacom

June 2003 – Merging of ISPs ENONet and Netangola

2003 ADSL Wireless Access – FWA NEXUS Network and ADSL Angola Telecom

2004 Wireless Broadcasting – NEXUS (Prefix 228)

2005 MOVINET – Internet Access via MOVICEL Network (CDMA 1XRTT)

March 2006 TV CABO – Broadband Internet Access via TV Digital Cable Television Network, **"TV Cabo Angola"**

March 2006 IXPAng – Installation and testing of Internet Exchange Point