
Global Communications Newsletter

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New Trends in Telecommunications and Networking: A Report on ICT 2004

By José Neuman de Souza, Petre Dini, and Pascal Lorenz

The 11th IEEE/IFIP International Conference on Telecommunications (ICT 2004, www.ict2004.com.br) was held 1–6 August, 2004 at Hotel Villa Galé, Fortaleza, Ceará, Brazil, and presented a variety of challenging telecommunication topics ranging from background fields like signals, traffic, coding, and communication basics up to large communication systems and networks, fixed, mobile, and integrated, and so on. Applications, services, system, and network management issues also received significant attention.

Held yearly since 1994, ICT 2004 continues the established tradition of ICTs as a privileged forum for technical exchange among many scientists, students, professionals, and technical staff, representing a large variety of organizations such as universities, research institutes, telecommunication operators, and industry.

An exciting peer-reviewed program of tutorials, plenary sessions, poster sessions, panels, and exhibition opportunities addressed the ever-increasing interest in telecommunications and networking solutions for all types of communications and computing networks, systems, and services.

ICT 2004 was sponsored by the IEEE Communications Society and the International Federation for Information Processing (IFIP) Technical Committee 6. The theme for ICT 2004 was “Telecommunications and Networking.” The theme was chosen to cover a wide range of challenging topics in telecommunications and networking to motivate discussions and evaluate the newest solutions.

ICT 2004 attracted a total of 430 submissions from 36 countries in Asia, the Middle East, Europe, South America, and North America. Of these submissions, only 178 papers were selected. The selective acceptance rate (41.4 percent) is an indication of the very high quality of the technical sessions.

The organization of the Technical Program of ICT 2004 had 44 technical paper sessions, two keynote sessions, two panel sessions, two invited speakers, seven tutorials, and 39 posters. The program included a new workshop named Service Assurance with Partial and Intermittent Resources (SAPIR), which had six technical paper sessions. Full accepted papers were published by Springer-Verlag as *Lecture Notes*

in Computer Science (LNCS-3124 for ICT and LNCS-3126 for SAPIR). A CD-ROM with papers, posters, and tutorials was distributed to the attendees.

The Technical Paper Sessions covered the latest research results in multimedia services, antennas, transmission technologies and wireless networks, communication theory, telecommunications pricing and billing, network performance and telecommunications services, active networks and mobile agents, optical photonic technologies, optical networks, ad hoc networks, signal processing, network performance and MPLS, traffic engineering and Internet, SIP, QoS and switches, network operation and management, network management theory and telecommunications networks, mobility and broadband wireless, cellular system evolution, personal communication, terrestrial radio systems and satellites, mobility management, image processing, ATM and Web services, communication security, switching and routing, and next-generation systems.

The SAPIR Workshop was the first event in a series introducing the concept of pi-resources and bringing it with the emerging and important field of distributed and heavily shared resources.

Two Panels were organized. The first focused on the new trends in telecommunications and networking; it was moderated by Prof. José Neuman de Souza (UFC, Brazil) with the following guests: Nikolai Nefedov (Nokia Research Center, Finland), Rui Aguiar (Aveiro University, Portugal), F. R. P. Cavalcanti (UFC, Brazil), W. Kabaciński (Poznan University of Technology, Poland), and Rossana Andrade (UFC, Brazil). The second had as its main subject the pi-resources in grid networks; it was moderated by Prof. Petre Dini (Cisco Systems, Inc., United States), with the following guests: Ram Khare (Telcordia Technologies, Inc., United States), Claude Jard (IRISA/ENS, France), Antonella Molinaro (Calabria University, Italy), E. den Boef (Philips Research Laboratories, Netherlands) and Pascal Lorenz (Haute Alsace University, France).

Seven Tutorial Sessions were held on the following themes: next-generation optical networks from network layer and physical layer perspectives (speaker: Djafar Mynbaef, City University of New York, United States); IP-oriented QoS in the next-generation networks: application to wireless networks (speaker: Pascal Lorentz, Haute Alsace University, France); UMTS/IMT2000 (speaker: Hamid Aghvami, King's College London, United Kingdom); proactive management through key performance indicators for 3G systems (speaker: Said Soulhi, Ericsson, Canada); standards for wireless data communications: 802.11, 802.15, 802.16 (speaker: T. Cooklev, San Francisco State University, United States); signal-processing

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Paving the Way toward Global Development Distance Training in Saudi Arabia

By Hany D. Alsaialy

Distance learning plays an important role today in the development of both countries and individuals. Although still a novel discipline, significant changes have occurred in the past few years. The applications, development, and underlying infrastructure have all witnessed numerous innovations. These innovations have increased tremendously since the advent of the Internet and the onset of global satellite telecommunications. The Institute of Public Administration (IPA) is working on a number of expansions in this arena, in particular the adoption of distance learning technologies. In this article we present a brief look at some of IPA's achievements in distance learning, with emphasis on information technology (IT).

The Establishment of IPA

IPA was established in Riyadh, the Kingdom of Saudi Arabia (KSA) in 1961. Since its inception as the country's leading government organization responsible for the development of the nation's public sector, a number of changes have occurred. Today, IPA has grown to cover four main duties within the KSA public sector: training, research, consultation, and archiving (of all governmental documents and more). Three branches were established in the cities of Dammam (1973), Jeddah (1974), and Riyadh (the women's branch, 1983).

At the heart of IPA duties is training. Training is delivered to local government employees (via 3–10-day intensive train-

ing programs) and high school graduates (via two-year specialized diplomas). Today, more than 460 distinct intensive training programs and over 30 specialized diplomas are taught in IPA. Disciplines cover a large spectrum, including accounting, public administration, marketing, English language, and computer science. In addition, specially designed intensive training programs and two-year post-graduate diplomas are offered as well. In 2004 more than 18,000 students attended training and graduated from IPA, for a total of 148 delivered training programs distributed over 745 sessions.

The IPA Research Center is mainly responsible for research funding and development, book publishing, and translation. The Consultation Department works on improving the performance of the government sector in several fields such as regulation, organization, and technology. Finally, the Library and Documents Department stores and grants electronic access to archived documents. To date, the IPA has published over 220 books and translations, offered more than 1750 consultations, and digitized over 59,000 government records.

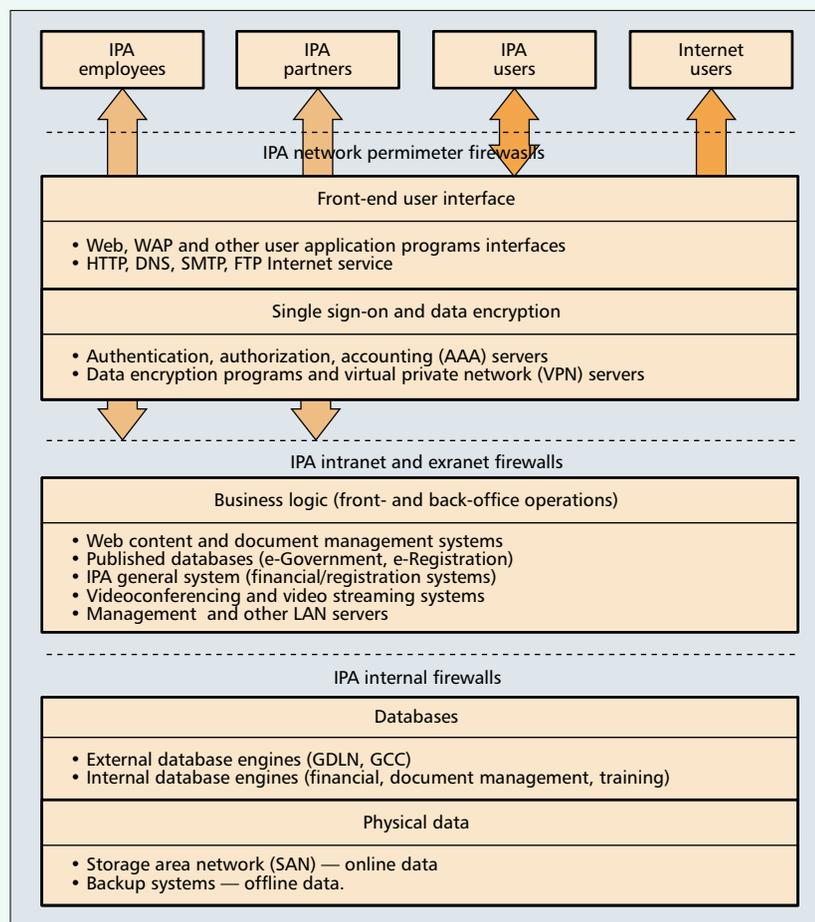
The IPA IT Infrastructure

Within a few years, all the core IPA and administrative business processes have been automated. To support the growing need for IT, the Computer Center was established in 1980. Today, the Computer Center is responsible for planning, developing, supporting, operating, securing, and maintaining IPA's whole computing infrastructure. Among its recent achievements are upgrading the LAN and WAN infrastructures, with special emphasis on both security and performance; the introduction of several state-of-the-art IT services, such as voice over IP (VoIP) and videoconferencing; the encoding of all IPA's video training material into (MPEG) digital format; and the in-house development of more than 70 software applications. In the past few years, over 1250 movies have been encoded, (accounting for more than 420 training hours), and over 1300 units of training material have been digitized. The current IT infrastructure encompasses more than 50 servers, 60 computing laboratories, and 150 IT-enabled classrooms, distributed over IPA headquarters and three branches.

To support the IT infrastructure, significant attention was paid to information systems security. Figure 1 presents part of IPA's high-level security tried data model.

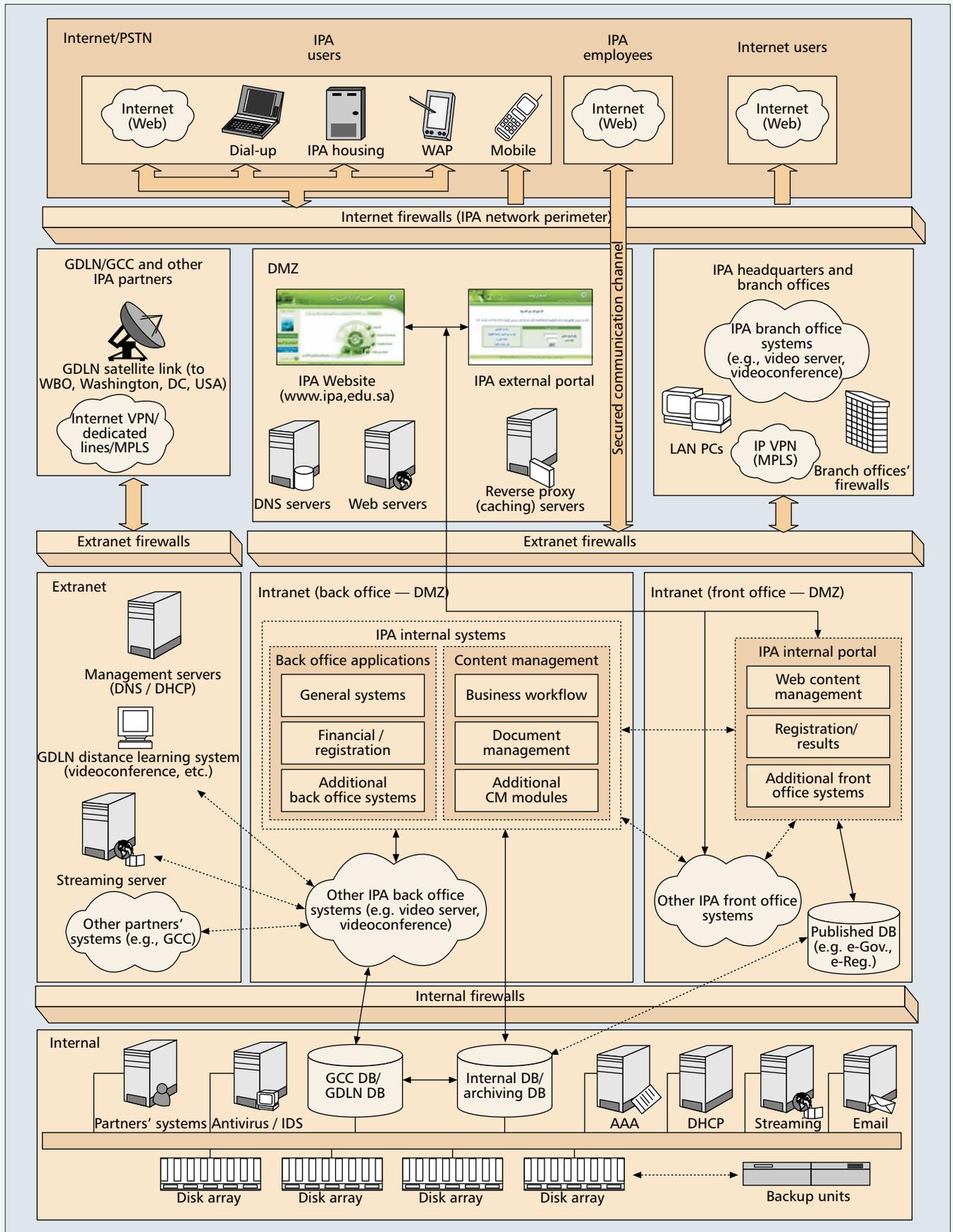
The IPA IT infrastructure is segmented into four main physical parts: the intranet, extranet, Internet, and internal segments (Fig. 2). As noted, the intranet segment is composed of two main parts: the front and back office (with all internal systems and portals). The extranet segment comprises all partner-related systems, and the Internet segment contains all Internet-based systems and services (e.g., Web-based applications, and external e-Government and e-Registration portals). The internal segment is dedicated to mission-critical data and applications, and acts as the data repository. Figures 1 and 2

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■ Figure 1. IPA's high-level security tried data model.

Distance Training in Saudi Arabia (cont'd)



■ Figure 2. Logical diagram of the IPA's IT infrastructure.

DISTANCE TRAINING IN SAUDI ARABIA/(cont'd from page 2)

represent a part of the IT infrastructure supporting today's IPA digital services (including distance learning). From a user perspective, the design provides the required security, greater efficiency, and higher system availability.

The IPA and World Bank Organization Distance Learning Project

IPA and the World Bank Organization (WBO) collaboration goes back to the early 1990s. For more than 10 years the WBO has assisted IPA in the delivery of high-quality strategic training programs. In the past, training was conducted in the traditional (instructor-based) method.

Along with IPA's IT expansion, the Global Development Learning Network (GDLN) was initiated by the WBO in 2000. The GDLN was established with the intent to improve development around the world through the use of distance learning technologies. Today, the GDLN connects countries worldwide using advanced information and communication technologies. This enables GDLN partner countries (affiliates) to communicate, share knowledge, and learn from each others' experiences via consultation, coordination, and training events in a timely and cost-effective manner. Some GDLN affiliates were set up through WBO loans or grants, and most are operated by independent local organizations in their respective countries.

The GDLN core infrastructure (the *hub*) is hosted at the World Bank Institute (WBI) in Washington, DC, United States. From its initial inception, the GDLN has grown to over 70 affiliates (as of June 2005) located in more than 60 countries worldwide. GDLN affiliates include academic institutions, development agencies, government agencies, and non-governmental organizations. Between July 2004 and June 2005, GDLN facilitated more than 900 videoconference-based

activities, connecting an estimated 35,000 people worldwide. More on GDLN can be found at <http://www.gdln.org>.

Soon after its launch, IPA started working with the WBO to link its sites to the GDLN. The project is now completed, and will start operation by the end of this year. As a result, IPA expects to increase the number of both received and delivered training programs. Further development on this project will soon be available at IPA's Website (<http://www.ipa.edu.sa>).

A Glimpse into the Future: E-Training within the Gulf Cooperative Countries

Along with the GDLN, another project aimed at linking several public organizations responsible for training employees in the gulf cooperative countries (GCC) is underway. The IPA represents KSA in the group of six GCC nations. This GCC e-training project has a number of goals. The most significant are:

- Minimizing overall costs while increasing access to training material, seminars, fora, and conferences
 - Sharing expertise among GCC organizations
 - Issuing a common e-training course catalog to facilitate distance training and increase the expected number of participants
- The GDLN and GCC e-training projects are expected to merge and provide a single comprehensive IT integrated solution.

It is important to note, however, that with any new technological innovation comes the need to manage change. Change management is often the most difficult challenge. The success of a project relies on not only proper setup of an IT infrastructure, but also its efficient use. Probably the most difficult change to manage in this respect is cultural.

And while recent years have seen several achievements in the field of distance learning, only time will determine the effective use of these technologies in applied training. With its infrastructure, IPA hopes to pave the way toward global development of distance training in the region.

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based strategies for packet collision resolution (speaker: Charles Cavalcante and Rodrigo Cavalcanti, Federal University of Ceara, Brazil); and telegraphic performance evaluation of wireless cellular networks (speaker: Francisco Barceló, University Polytechnic of Catalunya, Spain).

Prof. Farokh Marvasti (King's College, London, United Kingdom) and Dr. José Leite Pereira Filho (ANATEL, Brazil) were the keynote speakers, talking about telecommunications in developing countries and universal services deregulating in Telecommunications, respectively.

Finally, the organizing committee would like very much to thank the technical program committee members, who had hard work reviewing papers, and all the other participants who contributed to a successful conference.

José Neuman de Souza is an associate professor at the Federal University of Ceará, Brazil. He received a Ph.D. degree from Paris VI (Pierre et Marie Curie) University, France, in 1994. He is the Brazilian representative to IFIP TC6 and a member of the administrative council of the National Research Network. He was General Chair of IEEE/IFIP ICT 2004 and IEEE/IFIP MMNS 2000.

Petre Dini is a senior technical leader with Cisco Systems, Inc., United States, at the NMTG CTO Office. He is Chair of the Policy-Driven Control Work Group of the IEEE Emerging Technologies Group, Vice-Chair of the IEEE CommSoft TC, and Rapporteur for ITU-T/SG4. He received his M.Eng. from Polytechnic Institute of Timisoara, Romania, in computer engineering, and a Ph.D. in computer science from the University of Montreal, Canada. He is currently a Senior IEEE member, and an ACM member. He founded the International Academy, Research and Industry Association (IARIA) to promote young researchers [<http://www.iaria.org>].

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