INDIAN OCEAN
C O M M I S S I O N

**Regional Conference on
Digital Connectivity in the Indianoceanic Region**

October 23rd-24th, 2013 – Pointe aux Piments, Mauritius

Concept paper

Context

The General Secretariat of the Indian Ocean Commission (IOC), with the European Union support, will organise a regional conference on issues and challenges related to ICTs on 23-24 October, 2013, in Mauritius with a view to the formulation of an Action Plan for sustainable enhanced economic and social benefits through improved digital connectivity in the Indianoceanie. This conference offers the opportunity to bring together key stakeholders of the Indianoceanie to discuss the strategic issues of regional digital connectivity.
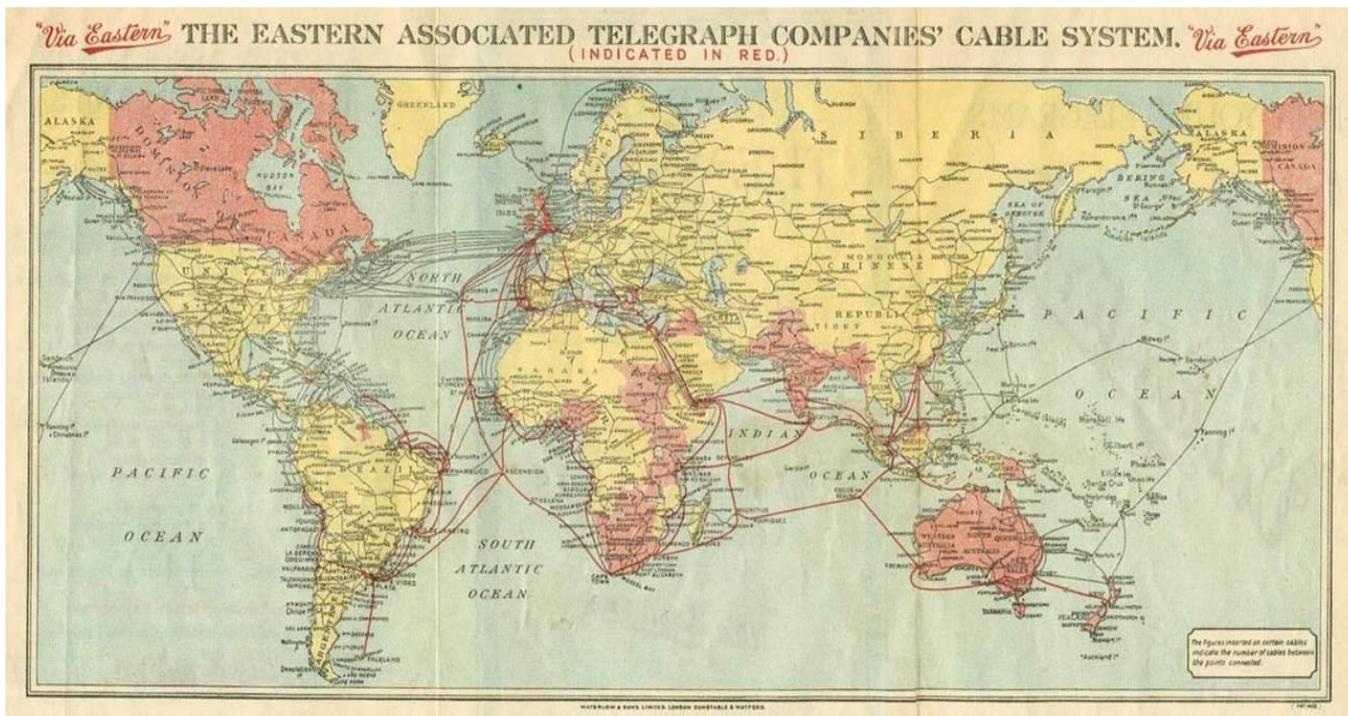
Conscious of the need to promote regional integration of the Island States, the IOC Council has adopted in 2009, an Aid for Trade Strategy which includes ICTs as a major plank of its medium term development strategy. The IOC Strategic Development Plan as approved in January 2013 includes digital connectivity as a priority.

OECD countries have recognised the increasing role played by the telecommunications sector as a means of improving productivity and economic growth while enabling governments to improve provision of public services. The IOC region having heterogeneous economies, with some having the lowest GDP per capita in the world and other small and vulnerable economies, including a high inequality of income distribution, and a relatively high rural population, needs the socio-economic boost provided by greater access to more efficient communication services.

Regional connectivity in the Indianoceanie is the most important stepping stone for the integration of Indianoceanie markets and island traders to broader regional and international markets. A sustainable integration of the Indianoceanie in wider regional space, continental markets and globalised economy, will materialise fully only if it is totally accessible and connected internally, as well as with the outside of region.

Digital connectivity is one of the three dimensions of regional connectivity and is an essential element underpinning the further economic integration of the Indianocéanie. ICTs constitute indeed the main unlocking factor to the progressively service-oriented economies of the Island States. In fact, the services sector brings an increasing contribution to the GDP in the development path of all countries. ICTs have a high value addition to the services sector. Continental Africa is also progressing steadily on its own with massive investment in ICTs led by the big markets and the many players. The IOC region combines both small isolated markets and commercial monopolies whose joint effects tend to marginalize competitiveness and hinder economic growth.

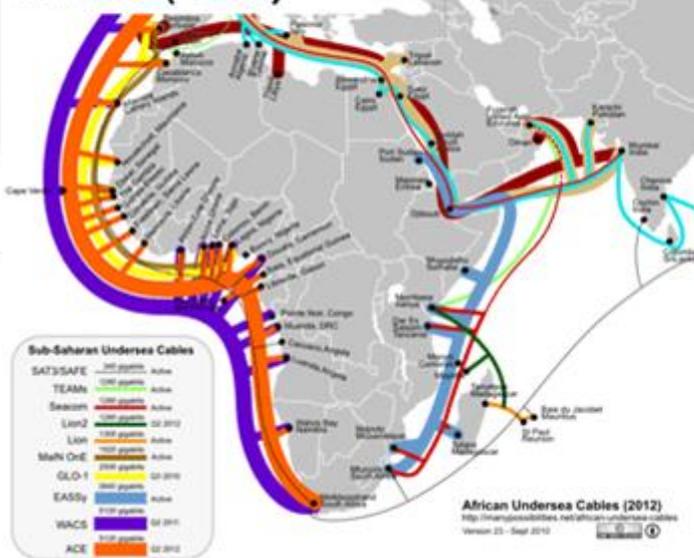# Digital connectivity in the region at a glance

In the early 20th century, the Eastern and Associated Telegraph Companies managed the world's largest telecommunications network consisting of submarine cables (see above). These provide the foundation for the globalization of information and communication that the Internet is now rapidly building upon. The African continent and particularly Indianocéanie Have remained for long on the sidelines of major infrastructure developments related to the continuous improvement of information and communication technology.

Between 2009 and 2012, the network of submarine cables connecting Africa has grown considerably (see below.) In 2012, Indianocéanie, despite the installation of new cables, remains less well connected than other coastal regions of Africa.
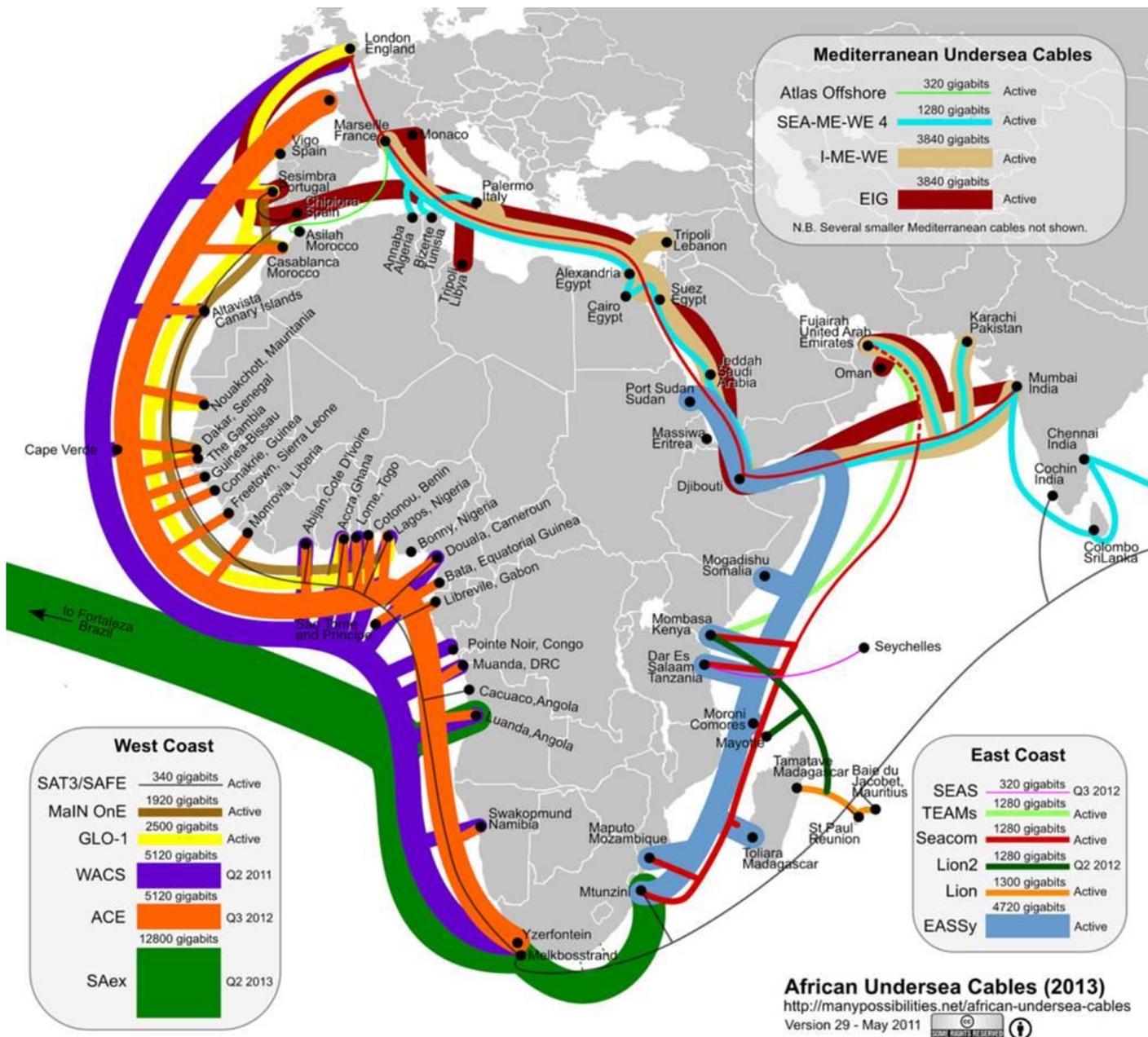
In 2013, it is clear that the islands of the region missed out on this level of connectivity both among themselves and with the world.

The capacity of the Lion and Lion 2 cables (1300 GB and 1200 GB) serving the Indianocéanie is 3.5 times lower than the EASSy cable that connects the East African coast.

Mediterranean Undersea Cables

Atlas Offshore	320 gigabits	Active
SEA-ME-WE 4	1280 gigabits	Active
I-ME-WE	3840 gigabits	Active
EIG	3840 gigabits	Active

N.B. Several smaller Mediterranean cables not shown.

West Coast

SAT3/SAFE	340 gigabits	Active
MaIN OnE	1920 gigabits	Active
GLO-1	2500 gigabits	Active
WACS	5120 gigabits	Q2 2011
ACE	5120 gigabits	Q3 2012
SAex	12800 gigabits	Q2 2013

East Coast

SEAS	320 gigabits	Q3 2012
TEAMs	1280 gigabits	Active
Seacom	1280 gigabits	Active
Lion2	1280 gigabits	Q2 2012
Lion	1300 gigabits	Active
EASSy	4720 gigabits	Active

African Undersea Cables (2013)
http://manypossibilities.net/african-undersea-cables
Version 29 - May 2011

The marginalization of the region is a strong issue!
Improved digital connectivity is the best way to achieve the objectives of regional integration. Furthermore, it opens a wide range of economic opportunities to all countries in the region.

Issues at stake

For the Indianocéanie region to derive optimal returns from the collective investment in ICT infrastructure, services and human resources, a series of core issues need to be addressed and resolved regionally in cases where it is where more efficient to do , in line with the subsidiarity principle. A brief on these issues is provided below:

1. **What are today's elements for a regional strategic framework for ICT4D (ICT for Development) to support sustainable economic growth?**

   In response to nearby continental initiatives and elsewhere it is high time for a coordinated regional approach to facilitate an ICTs-based, knowledge driven economic and business environment for the Island States of the Indianoceanie region. This can only be underpinned by a jointly accepted regional strategic framework on ICTs for Development. An integrated action plan will enable the region's policy makers and business captains to make decisions in respect of appropriate policy-making, regulatory and institutional mechanisms, and best practice. This will incorporate international benchmarks in the ICT sector for sustaining economic growth and alleviating poverty through ICT-enabled sectors.

2. **What do we expect in terms of an enabling and harmonised legislative and regulatory framework for ICT?**

   Best practice frameworks applied world-wide which have helped advance develop ICT industries and address end users interests in those countries.

   There are two interrelated issues here:

   ***1. Is the regulatory framework adequate in order to develop an efficient ICT market?** This relates to the laws, regulatory structures and powers of the regulatory institution. A related issue is how far the overall economic policy in each country places obstacles in the way of transforming and creating a competitive ICT sector. Whilst this needs to be addressed it would not be a main focus of a study.*

   ***2. How well does the regulatory body and/or the Ministry carry out its tasks?** This relates both to the powers of the institution and how these are used in economic regulation of the sector.*

3. **How do we organise for sustainable human resource development in the ICT sector in the region? Can there be a regional model?**

   Developing the necessary skills for the ICT sector in the region is the key for promoting sustainable development through the ICT network. There may be economies of scale through a regional facility which would:

   - *Provide high quality training and research facilities related to the use of ICT for development purposes*
   - *Create a platform for knowledge sharing of best practices among the Island States of the region*
   - *Foster the sharing of knowledge between different stakeholders of the regional ICT industry, including Government officials and small and medium enterprises*
   - *Enhance the development of start-ups in Science and Technology*
   - *Stimulate the development of ICT in countries in the region while enhancing research and development in ICT*

4. How do we support ICT business facilitation with due regard to competitive broadband tariffs compared to best international practice?

In terms of business facilitation the issue of ICT costs and tariffs in general is central in the region's plan to derive optimal returns from the collective investment in ICT infrastructure, services and human resources. Decision-makers in the region need factual and internationally benchmarked data to be able to evaluate the factors underpinning the engines of growth for ICT-supported businesses in the region, including proposals to implement newer and more rational tariffs practice across the region.

5. Which infrastructure to ensure long term resilience, redundancy and competitiveness in the ICT sector and ICT-enabled sectors across the region?

There is a long-standing core issue of securing capacity, cost-effectiveness, and competitiveness for the international digital broadband connectivity among islands and to rest of world with emphasis on submarine cable. The IOC launched the SEGANET initiative a number of years ago with many developments occurring since then, but we have not kept pace by international standards?

A decision of the IOC's 28th Council (2013) reconfirmed the commitment of its Member States to support the IOC to pursue, as a high priority, the development of inter connectivity of the Islands by optical cable allowing for broad bandwidth internet services. It had been agreed by the Seganet Strategic Committee, since 2009, that the objective of the cable is the development of the IOC region and to ensure that the principles of open access at fair and competitive prices are looked upon as a key element to drive the ICT development and reach more general development.

6. Is there a case for a regional IXP (Internet Exchange Point) in the Indianoceanie?

If there is a sufficiently high level of traffic to be exchanged at a local level, then an IXP represents a rational solution. For the Indianoeanie, given the upsurge in internet traffic, the next logical step is to connect local and national IXPs with their counterparts in other countries, to set up what are called Regional Internet Exchange Points (RIXP). In this way one can ensure that regional traffic stays regional.

However, moving from the national to the regional level poses a number of significant challenges such as what model to be used for interconnecting the IXPs, the scale of traffic involved, and the costs of cross-border connectivity compared to existing international transit connectivity. So we must consider the priority to be attached to a regional IXP for the Indianoceanie and whether it is feasible, practical and affordable.

7. How should the region tackle cyber-security and spur confidence-building in its ICT services?

The Indianoceanie region is very vulnerable to threats from Cyber-attacks. These are not only targeting individuals and organisations but also a nation as a whole particularly its critical information infrastructure (electricity grids, airports, banking system etc.), but more so in many sectors of national interest such as air transport and national security which rely heavily on ICTs. Capability of conducting sophisticated countermeasures against cyber-attacks rests on major developing countries.

- *Small Islands Developing States (SIDS) are the least protected from cyber-attacks.*

- *Cyber security issues have cross border as well as legal implications (e.g. phishing attacks which involve fraudulent access to bank accounts and passwords)*
- *The Indianoceanie has developed 'timid' responses to deter, prevent and react against the threat of cyber-attacks. For example only Mauritius among IOC members has a National Cyber Security Strategy and a National CERT [stands for Computer Emergency Response Team and run by the National Computer Board (NCB)].*

Can the Indianoceanie develop an effective regional strategy against Cyber-attacks?

8. What rationale for rolling out a regional Public Key Infrastructure (PKI) system?

The development of online services such as e-Government, e-Commerce, e-Procurement is nowadays part of the basic economic infrastructure across the world and growing day by day. Its challenges however reside in online fraud and attacks to reap personal information. Verification of transactions at both ends (for example buyer-seller in an e-commerce transaction) is a necessity in order to build the required trust for such ICT–enabled services to be used. The technology of Public Key Infrastructure (PKI) (including the issue of digital certificates) has been established to solve issues such as data integrity, confidentiality, user authenticity, and non-repudiation of online users.

In developing the ICT-enabled sectors the Indianoceanic region has an obligation to pay thorough attention to the setting up of a regional PKI so as to offer the level of confidence and trust needed for transactions. A regional PKI would also avoid, within the region, the issue arising from using digital certificates from different PKI domains; there should however be preparedness for interoperability between the regional PKI and external ones.

Is the case for an Indianoceanie regional PKI strong one and a key for driving secure ICT development in the region?

9. How should the small ICT operators leverage the regional ICT infrastructure?

What is the added value of building synergies in the development of the private ICT sector? Is there a need for a Strategy for the implementation of an ICT cluster? How far could this help to expand markets and to develop new export markets by identifying areas of cooperation between companies in the ICT sector. How far could a cluster help to identify sources and opportunities for capitalizing on the synergy of resources in the region?

10.What contents over the regional digital infrastructure to further strengthen regional integration and cooperation?

The Indianoceanie integration stands to benefit substantially from the availability of a competitive, resilient and redundant capacity regional broadband infrastructure. Early gains can already be envisaged in terms of the much wider production and circulation of information with high economies of scale and impact across all users connected whether through mobiles, smartphones, tablets, computers, radio or TV. The infrastructure will boost the outreach down to individual users. ICT can operate from community centres as well as through regional digital TV. These options can provide enhanced access possibilities for all to contribute to the regional digital information network across news, education, entertainment, business opportunities, etc. Such a digital network would also include easier access for indigenous content creators (arts, music, etc.) to be widely disseminated and made regionally and globally visible. Communications among the islands populations would also gain with in-built content translators for the many spoken and written languages in the region.

Regional conference

1. Objective

To exchange on the key ICT pillars towards the formulation of an Action Plan for sustainable enhanced economic and social benefits through improved digital connectivity in the Indianoceanie.

2. Results and output

In addressing the issues covered in Section "Issues at stake", in a participatory Conference among representations of all the relevant stakeholders, the IOC wishes to identify which priorities to pursue further, embracing key areas into a comprehensive Action plan, consistent with the IOC Strategic Development Plan.

This will help the IOC to seek funding from its partners as well as leveraging resources to access other sources of funding such as from private sector and international financing institutions.

3. The approach of the conference

As detailed above in Section 2, ten specific issues have been identified by the General Secretariat of the IOC and which will be the focus for discussion at the Conference. These are the followings:

Theme
1. Elements of a strategic framework for ICT4D (ICT for Development)
2. Enabling and harmonised legislative and regulatory framework for ICT
3. Human resource development in the ICT sector
4. ICT business facilitation including tariff issues
5. Infrastructure: International digital broadband connectivity among islands and to rest of world with emphasis on submarine cable
6. Case for a regional IXP (Internet Exchange Point)
7. Cyber-security
8. Public Key Infrastructure (PKI)
9. Regional leverage for small ICT operators
10. Contents over the regional digital infrastructure

4. Participants

- International and regional experts.
- Senior government officials in charge of ICT policy development.
- Senior government officials in charge of national ICT Development Plans.
- Senior government officials in charge of ICT HR Development and implementation.
- Senior government officials in charge of ICT Infrastructure development.
- Representatives of regulatory authorities of ICT of the member States.
- Public sector senior officials involved in ICT service delivery and use in areas such as telemedicine, education.
- Private sector associations and operators involved in ICT service delivery and/or use such as banks, insurance, tourism and travel.
- Private sector associations involved in ICT Start-ups, Research and Development.
- ICT services users and consumer organisations.
- Competition commissions and national institutions.
- Development partners such as European Union, European Investment Bank, African Development Bank, Agence Française de Développement
- Regional organisations such as COMESA, IGAD, EAC, SADC, IRCC.

Programme

Wednesday 23rd October

Registration and opening		
	8:00-9:00	Registration of participants
	9.00-9.45	Opening Ceremony • Speech by Mr Jean Claude de l'Estrac, Secretary General of the Indian Ocean Commission • Remarks by Mrs Cécile Tassin-Pelzer, Head of Section "Seychelles & Regional Cooperation" at the European Union Delegation, Mauritius • Opening by Honourable Hon. Tassarajen Pillay Chedumbrum, Minister of Information and Communication Technology
Session 1	**Objectives of the Conference and challenges for digital connectivity in Indianocéanie**	
	9.45-10.30	• Objectives and expected output of the Conference by Mr Raj Mohabeer, General Secretariat, Indian Ocean Commission • Challenges for digital connectivity in the Indianocéanie, Dr Anders Comstedt, ICT specialist
Photo Break	*10.30-10.45*	*Photo session with all participants followed by a health break*
Session 2	**Regional strategic framework for ICT4D (ICT for Development) to support sustainable economic growth**	
	10.45-11.30	• Introduction Mr. Ibrahim MZE Mohamed, Head of cooperation & operations, Comores • Presentation by Mr Gil Razafintsalama, consultant • Intervention by Dr Dafalla, Director, COMESA • Exchanges
Session 3	**Enabling and harmonising legislative and regulatory framework for ICT**	
	11.30-13.00	• Introduction by Mr Raj Makoond, Joint Economic Council, Mauritius • Presentation by Dr Dimitri Ypsilanti, consultant • Intervention by Dr Dafalla, Director, COMESA • Exchanges
Lunch	*13.00-14.00*	
Session 4	**Sustainable human resources development for the ICT sector**	
	14.00-15.30	• Introduction by Mr Raoelison Willy Yves, Managing Director, Telecommunication & Infrastructure, Madagascar • Presentation by Dr Sushita Gokool-Ramdoo, consultant • Exchanges
Break	*15.30-15.45*	
Session 5	**ICT business facilitation including tariff issues**	
	15.45-17.30	• Introduction by Mr. Raju Jaddoo, Secretary General, Mauritius Chamber of Commerce and Industry • Presentation by Dr Karin Badenhorst, consultant • Exchanges

End of 1st day Conference followed by cocktail

Thursday 24ᵗʰ October

Session 6	**ICT Infrastructure - International digital broadband connectivity among Indianoceanic islands and to the world with emphasis on submarine cable**	
	9.00-10.30	• Introduction by Mr Ganesh Ramalingum, President, Mauritius Chamber of Commerce and Industry • Presentation by Dr Anders Comstedt, ICT specialist • Exchanges
Break	10.30-10.45	
Session 7	**Regional Internet Exchange Point - feasibility for the region**	
	10.45-11.30	• Introduction by Mr Rakotondramanana Roger Marie, Expert Technique PICOM, Madagascar • Presentation by Dr Vivek Lochun, consultant • Exchanges
Session 8	**Cyber-security - Confidence building in ICT services in Indianocéanie**	
	11.30-13.00	• Introduction by Mr Kaleem Usmani, Computer Emergency Response Team, Mauritius • Presentation by Mr Xavier Debayle, Consultant, Opensphere, Reunion • Video Conference presentation by Mr. Raul Rikk, Cyber security expert, e-Governance Academy, Estonia • Exchanges
Lunch	13.00-14.00	
Session 9	**Regional Public Key Infrastructure System – lessons from experiences elsewhere, including from Estonia**	
	14.00-14.45	• Introduction par Mr. Patrick Moustache, Principal Engineer, Seychelles • Presentation by Dr. Vivek Lochun, consultant • Video Conference with e-Governance Academy panel of experts • Exchanges
Session 10	**Regional leverage for small ICT operators - opportunities and challenges**	
	14.45-15.30	• Introduction by Mr. Raju Jaddoo, Secretary General, Mauritius Chamber of Commerce and Industry • Presentation by Dr. Alain Cucchi, consultant • Exchanges
Break	15.30-15.45	
Session 11	**Contents over the regional digital infrastructure - opportunities and challenges**	
	15.45-17.00	• Introduction by Mr. Guibert Hairson, consultant • Presentation by Dr. Anders Comstedt, ICT specialist • Exchanges
Session 12	**Conclusion and Roadmap**	
	17.00 – 18.00	• Adoption of conclusions and recommendations

Panelists

Regional and international experts on ICT's issues are invited to lead the sessions. Through their expertise and their presentations, conference participants will be able to better assess the state of digital connectivity in the Indianoceanic Region and exchanges their views on the human, legal, and technological resources necessary for the development of the digital economy in the region.

Karin BADENHORST has 25+ years of corporate consulting, business development and research experience working with a large range of industries in both the private and public sectors, including NGOs, large state governed enterprises and corporates. She is passionate about facilitating the development of emerging markets through innovation and the introduction of ICT, government, corporate and emerging enterprise governance, more specifically values based principles. She was a partner with Arthur Andersen and also with Ernst & Young before becoming an independent consultant.

Anders COMSTEDT has for a decade been involved in several European, African and US projects related to new, transformative telecom infrastructure. He is a senior consultant in business implementation of alternative telecommunication networks and studies, and also engaged at KTH-IT, The Royal Institute of Technology in Stockholm, Sweden, as a lecturer on Telecom Policy. In previous positions, he is most recognised for being CEO of Stokab, creating a model for how a sustainable position could look for an independent, passive-infrastructure-only telecoms company serving several service providers. Prior to that, he has had several executive positions, mainly related to the telecoms industry. He holds a master degree in electrical engineering lives and operates out of Stockholm, Sweden.

Alain CUCCHI is Professor of Management Science at the University of La Reunion. He specializes in management information systems. His experience in the private sector and universities has put services and information technology and communication at the heart of his thoughts on the development of economic organizations. His current research fields are partnership organizations promoting development through innovation and relationship management.

Xavier DEBAYLE is a consultant in Information Security at OpenSphere in Reunion. He is a Certified Information Systems Security Professional (CISSP) and ISO27001 Lead Implementer. He has worked in Europe, the United States, China and now in Reunion, where he performed duties of technical security (penetration testing, hacking, training) and organizational (risk analysis, establishment of Disaster Recovery Plan , awareness, etc.).

Dr. Sushita GOKOOL-RAMDOO is the Ag Head of Distance Education and Open Learning at the Tertiary Education Commission, Mauritius. She holds a Professional Doctorate in Education from the University of South Australia. She is a member of the ADEA's task force for ICT integration in education and training in Africa. She also advises Dr. Phumzile Mlambo-Ngcuka, the former Deputy President of South Africa and President of the Umlambo Educational Foundation, South Africa, on the scope of using m-learning (mobile learning). On behalf of the Indian Ocean Commission, she is currently conducting a feasibility study for the establishment of a regional center of excellence for the development of ICT's human resources.

Guibert HAIRSON, now a freelance consultant, was part of the staff of AtosOrigin from 1973 to late 2009. In his early career he was an Organisation and Informatics professor. He still participates as a speaker in numerous conventions, workshops and seminars. He is also author of courses, textbooks and publications on management and IT management of the European procedures. As a freelancer, he works with many international organizations. In the 2000s he has worked with many agencies in the Indianocéanie, particularly in Mauritius and to the IOC

Raju JADDOO is the Secretary General designate of the Mauritius Chamber of Commerce and Industry since 1st February 2013. He was until recently the CEO of Business Alliance, a Corporate Finance and Investment Advisory boutique regrouping a team of highly skilled professionals. Raju Jaddoo was Managing Director of the Board of Investment from 2005 to 2010. The organization became the best practice reference in Africa. Raju Jaddoo is frequently called upon by international and regional institutions for his expertise in investment facilitation and improving business climate.

Vivek LOCHUN has more than 25-year career in the field of ICT. He conceived and managed the development of a platform for electronic commerce for the Mauritian industry based on the PKI (Public Key Infrastructure). As such, he was the first holder of the PKI electronic key in Mauritius and the person responsible for the distribution of PKI keys Mauritian industrialists. He was also consultant for several national and international institutions. He currently leads a feasibility study for the establishment of regional internet exchange point for the Indian Ocean Commission.

Raj MAKOOND is the Executive Director of the Joint Economic Council. As such, Raj Makoond is leading the coordination of the Mauritian private sector. As member of the Board of Investment and the Financial Services Commission, Makoond has made his mark on the Mauritian business climate through years of dedication and commitment in both the public and private sectors.

Ibrahim MZE MOHAMED is a telecommunications engineer of the Union of Comoros trained in Paris and Tunis. He was IT Director of Comores Telecom, Head of Research Department at the same institution, and CEO of the national regulatory authority of ICT.

Yves Willy RAOELISON, engineer, is the Managing Director of Telecommunications and Infrastructures, Ministry of Post, Telecommunication and New Technologies, Madagascar. During his 33-years professional experience he holds different high positions in the ICT sector at national and international levels.

Gil RAZAFINTSALAMA launched with three friends in 1997 the first Malagasy ICT fair and became president of the Association of Malagasy companies ICT sector in 2002 that led him to take responsibility in several institutions. For several years, he has been involved in discussions on the development of ICT in the country and on issues related to trade, especially in the context of the Economic Partnership Agreements. On behalf of the Indian Ocean Commission, Gil Razafintsalama is conducting a study on the development of a strategic framework for the formulation of a regional strategy for the development of the ICT sector in the countries of the IOC.

Raul RIKK is one of the founders of the NATO Cyber Defense Centre of Excellence in Tallinn. He was leading the Centre from 2004 to 2008 (https://www.ccdcoe.org/). Raul is, now, the Cyber Security Program Director at the e-Governance Academy based Estonia and is engaged with strategic cyber security development in many countries and international programs (http://www.ega.ee/cyber-security).

Kaleem USMANI is an experienced security professional and is the Officer-In-Charge of the Mauritian Computer Emergency Response Team (CERT-MU), a division of the National Computer Board, Mauritius. He has more than 11 years' experience in information technology areas and teaching. He has worked in various industry sectors including ISPs, textile, education and communication. He is a Certified Information Security Professional (CISP), a certified ISO 27001 and BS 25999 Lead Auditor, a certified Secure Software Development Professional and a certified ethical hacker

Dimitri YPSILANTI is a telecommunication policy and regulation consultant. Formerly he was responsible at the Organisation for Economic Co-operation and Development for communications policy and regulation, Internet issues, consumer policy issues, information economy and privacy and security. Mr Ypsilanti studied economics at Bristol University (UK), and the Memorial University and Queens University in Canada

Raj MOHABEER is the Officer in Charge of the "Economic, Trade and Infrastructure Development" division at the Indian Ocean Commission. As such, he is responsible for economic affairs and partnering with the private sector (support for entrepreneurship and trade) and leads some of IOC's key projects dealing with maritime, air and digital connectivity. He is also the focal point of African Regional Organisations regrouping under the aegis of the Interregional Coordination Committee in partnership with the European Union.