



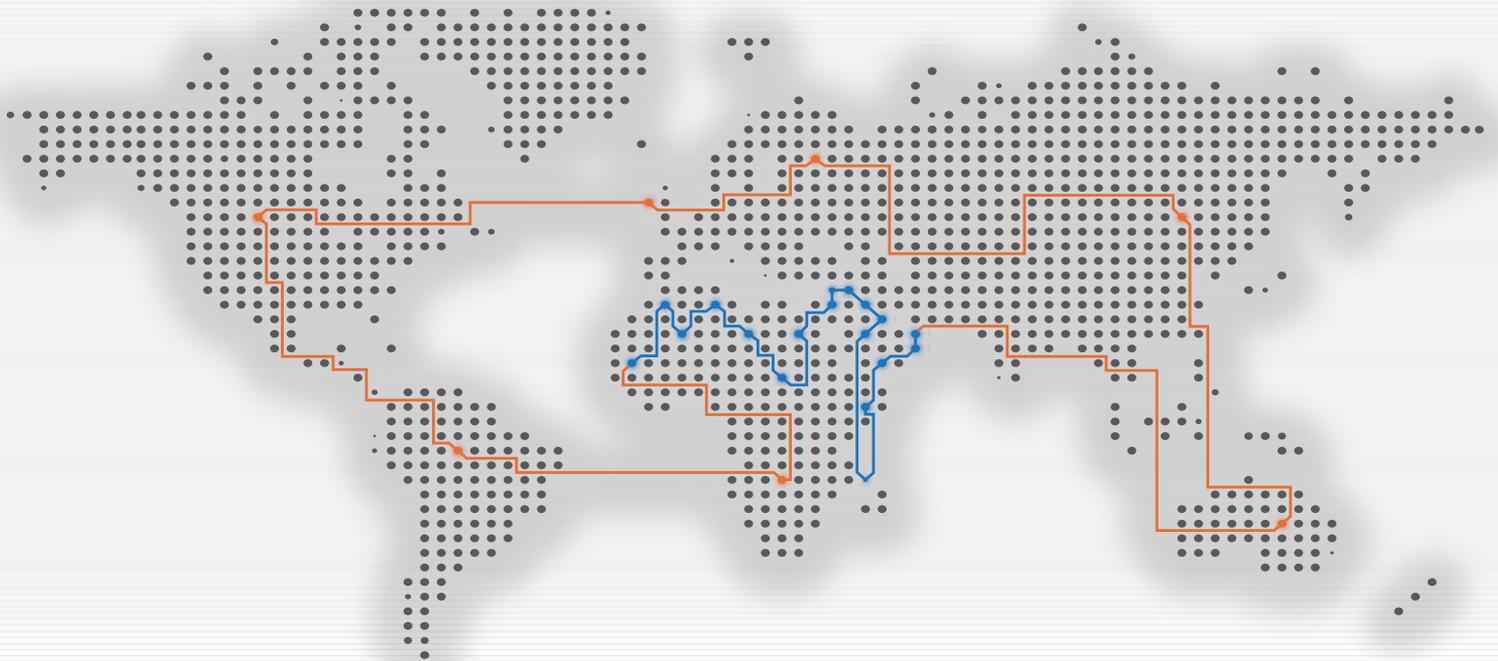
مجلس البحث العلمي  
The Research Council  
في صميم الابتكار  
at the heart of innovation

## Summary Report

Under the Patronage of  
**His Highness Sayyid Taimur Bin As'ad Al Said**

**The 4<sup>th</sup> International Platform on Integrating  
Arab e-Infrastructure in a Global Environment**

**e-AGE 2014**



Grand Hyatt hotel, Muscat, Oman

10-11 December, 2014

[asrenorg.net](http://asrenorg.net)

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## 1. ASREN Overview

The Arab States Research and Education Network (ASREN) was launched in 2010 under the auspices of the League of Arab States and the UN Global Alliance for ICT and Development (GAID). ASREN is a legal not for profit regional Arab organization that aim to implement, manage and extend sustainable Pan-Arab e-Infrastructures dedicated for the Research and Education communities and to boost scientific research and cooperation in the Arab countries through the provision of world-class e-Infrastructures and e-services.

### **Vision**

“Pan-Arab collaborative research and education projects and activities, contribute to boost the scientific research, innovation and education levels in the Arab countries by uplifting efficiency and productivity of research and education communities.”

### **Mission**

“To implement, manage and extend sustainable Pan-Arab e-Infrastructures dedicated for the Research and Education communities and to boost scientific research and cooperation in member countries through the provision of world-class e-Infrastructures and E-services”.

## 2. What is e-AGE all about?

Integrating Arab e-Infrastructure in a Global Environment, e-AGE, is an annual international event organized by the Arab States Research and Education Network, ASREN. Since its launch in December 2010 at the League of Arab States, it was decided to have this annual activity move from one Arab country to another. e-AGE is in line with ASREN’s major objectives related to creating awareness, promoting R&E collaboration and joint activities and establishing human networks in order to facilitate collaboration and cooperation among researchers and academicians in the Arab region and the rest of the world.

e-AGE is meant to be the launching pad for R&E connectivity and cooperation. It brings together ASREN, EUMEDCONNECT, GÉANT, AfREN and INTERNET2 stakeholders and the region’s foremost innovators, leaders, scientists, and businesses to discuss and debate new models of innovation, integration of R&E networks, policies for sustainable development in education, means of knowledge sharing and dissemination, capacity building programs, and region-wide e- infrastructure deployment to tackle today’s crises in climate change, global economy, food, water scarcity, alternative energy, and environmental issues. The forum can lay the foundation for a dream of many of today’s leaders towards a global e-infrastructure for R&E, based on real life inclusiveness beyond any political protocols.

### 3. e-AGE 2014

The e-AGE platform is becoming one of the most important venues for networking among experts and scientists from all over the world. In e-AGE 2014, the main theme was “Intercontinental Connectivity of the Pan Arab Network”. ASREN started concrete steps towards interconnecting researchers and academics across the Arab states by launching its first PoP in London Telicity and working with its partners on new PoPs in the UAE, Egypt and the Maghreb region. ASREN is also supporting the development of National research and education networks (NRENs) in some Arab countries. ASREN gave special attention and more focus on users and how the e-Infrastructure can support their needs in terms of services and applications.

More sessions were dedicated to the users to present their research and education activities and then to identify how these users can be better served by NRENs. Moreover, special sessions were dedicated to specific domains, mainly focusing on experiences in connectivity and e-Infrastructure, applications and services in variety of scientific domains, and case studies with impact indicators and measures. The sessions also show how research infrastructure created benefits to communities and collaboration. It is still critical to show how research connectivity can promote collaboration and innovation. Different discussions were stimulated during the conference to drive outcomes and concrete results on practical steps towards developing a regional e-Infrastructure.

Following the success of e-AGE in the past three years, e-AGE 2014 included events, workshops and meetings centered on the following themes:

- The 7th Event on Euro-Mediterranean e-Infrastructure
- The 4th Annual Conference of ASREN
- ASREN Shareholders Meeting
- EUMEDCONNECT3 Project Meeting
- AROQA’s 6th Annual Conference
- AROQA’s Workshop on Ensuring Congruence between Internal and External Quality Assurance

It is worth mentioning that e-AGE 2014 has proudly witnessed the first huge gathering of the Arab National Research and Education Networks

### 4. Participants

As a Platform on Integrating Arab e-Infrastructure in a Global Environment, the e-AGE 2014 was attended by more than 200 academics, network professionals, researchers, scientists, and high-level decisionmakers from governments, enterprises, NGOs, embassies, academia, and civil society. The e-AGE Platform became a very important venue for networking among experts and scientists from all over the world.

Representatives from many countries participated in e-AGE meetings including Algeria, Australia, Austria, Bahrain, Belgium, Canada, Egypt, Greece, Iraq, Italy, Jordan, Kyrgyzstan, Lebanon, Libya, Malaysia, Morocco, Netherlands, Oman, Palestine, Poland, Qatar, Russia, Saudi Arabia, Singapore, Somalia, Spain, Sudan, Switzerland, Syria, Tunisia, Turkey, the UAE, the UK, the USA and Yemen.

## 5. Highlights from the Opening Ceremony

It is joint opening with AROQA's sixth annual conference started with the following opening keynotes:



### **HE Dr. Hilal Al Hinai, Secretary General, TRC, Oman**

HE Dr. Hilal Al Hinai commenced his speech by welcoming HH Sayyid Taimur Bin As'ad Al Said, the conference sponsor, as well as other prominent figures and esteemed guests. Dr. Al Hinai also expressed his pleasure to attend this important international platform which includes research, education and technical experts from more than thirty countries worldwide. The platform was organized by The Research Council (TRC) in cooperation with the Arab States Research and Education Network (ASREN), with a view to finding mechanisms for technological cooperation between international networks and electronically connecting them to facilitate the requirements of researchers and students from various countries.

His Excellency emphasized that the communication networks became one of the most important factors for success in this era, known as knowledge era. This is highly evident upon comparing the countries' development and advancement in the knowledge economy with the quality and dissemination of other information networks at the regional and international levels.

He also indicated the desire of the Omani Research Council to work with the international and regional research and education networks in order to establish a broad and secure infrastructure connected to research and education sources worldwide. Such infrastructure shall fulfill the present and future needs, comply with the international standards, characterize with proper readiness, promote societal and research cooperation and provide the necessary support for educational and research institutions in Oman and the Arab world. Unfortunately, the Arab region suffers poor quality and high costs of communication networks, which deprived research and education institutions from taking advantage of available knowledge treasures through connecting with this generation of networks and we, as institutions and individuals, became outside the context of scientific and technological cooperation system.

His Excellency added that the Research Council sought, through approving the Oman Research and Education Network (OMREN), to establish a solid infrastructure for developing scientific research and education in the Sultanate, and building local research capacities in various scientific fields. The OMREN shall connect the research and academic institutions in the Sultanate through high-speed and high efficiency electronic network, which includes electronic applications and packages to promote the level and efficiency of education, research and electronic communication. It shall also serve as the Sultanate's gateway to similar international networks.

As part of the Council's endeavors to enable the Omani Network project, a network data center was provided within the National Data Center at the Information Technology Authority. In addition, the design of the project's logo has been completed and announced during the platform. A steering committee and a technical committee were also formed for the project to work in full efficiency. Moreover, the tender of the network basic structure was announced to connect 14 educational institutions in the first phase during the first quarter of 2015 until completing all the phases of project implementation plan in 2019 to connect 57 educational institutions.

HE Dr. Al Hinai emphasized the significance of digital infrastructures in allowing researchers, professors and students to connect, contact and cooperate with each other, and providing them with the knowledge and ability to extract, analyze and use research and educational information and broadband cloud computing. He also hoped that the universities as well as education and research institutions in the Sultanate become an integral part of the Arab and international research and education networks, through embracing research and technological competences and supporting research, education, sustainable technological infrastructure as well as taking advantage of the digital world capabilities.

Finally, His Excellency expressed gratitude for the participation of attendees in this platform, wishing they enjoy their accommodation in their second country, Oman, and wishing them success in their tireless efforts and endeavors.



### **HE Dr. Talal Abu-Ghazaleh, Chairman of ASREN, Jordan**

HE Talal Abu- Ghazaleh extended a special tribute and deep appreciation to HH Sayyid Taimur Bin As'ad Al Said, Assistant Secretary General for Communication at The Research Council of Oman for the patronage of the conference on integrating Arab e-Infrastructure in a global environment. This patronage is considered as a support to host research and education activities and e-infrastructure networking for all the Arab region and Sultanate of Oman. He also thanked His Excellency Adam Kulach, Head of Delegation of the EU to Oman, Bahrain, Kuwait, Qatar, and Saudi Arabia for taking the time to join the conference. This is seen as a signal of great continuous support and generous funding to the efforts in developing research networking for the whole Arab region. He also expressed

his appreciation to the Ministers of Higher Education and Scientific Research, ICT and Planning in Palestine, Somalia, Yemen and Oman as well as Mrs. Magda Zaki, Director of Education and Scientific Research at the League of Arab States, our partners in developing the Arab network for research and education.

HE Dr. Abu-Ghazaleh expressed his appreciation to the Oman Research Council, the event's host, with the great support of His Excellency Dr. Hilal Al Hinai, Secretary General of TRC and Eng. Juma Baloushi, the director of the Oman Research and Education Network – OMREN project. Tribute and appreciation to the sponsors and he also welcomed the delegation of the European Commission and European partners from EUMEDCONNECT3, CHAIN-REDS, with great appreciation for their technical and financial support since 2004 and beyond, as well as the delegations of the Arab countries – Saudi Arabia, United Arab Emirates, Qatar, Bahrain, Yemen, Lebanon, Egypt, Tunisia, Algeria, Somalia, Algeria, Morocco, Libya, Palestine, Jordan, Syria, Iraq, and Sudan, as our partners in developing the Arab research and education network, and finally welcoming the delegation of the US Internet2, and representatives of regional research and education network from Asia Pacific, Europe, Latin America, and Canada, with them, ASREN will continue to work to develop coordination and interoperations towards a global network for research and education.

His Excellency asserted the growing interests of Arab NRENs for joining ASREN as shareholders in addition to the NRENs in Jordan, Morocco, Sudan, Egypt and Tunisia, he announced the United

Arab Emirates, Somalia, and Iraq research and education networks as new shareholders, now in the legalization process in Germany. He continued, ASREN will continue to serve the Arab region in developing best practice NREN model and provide pan-Arab e-Infrastructure connectivity at the regional level. He also announced the launch of ASREN's operational point of exchange in London with the support of ISOC, Cisco, and DANTE. This point of exchange is now connected to the European GEANT network and to the rest of the world's research and education network. He invited the Arab NRENs to link to this PoP for direct peering for research and education. Also, he announced the development of AGE-OX in Fujairah as a regional point of exchange with the support of Ankabut. In addition to that, he declared the kickoff of the 155 Megabits per second STM1 link funded by Talal Abu-Ghazaleh Organization (TAG-Org) for the connection between ASREN and the European Research and Education Network "GEANT" through ASREN PoP in London. Dr. Abu Ghazaleh asserted the support of developing quality of education through the Arab Organization for Quality Assurance in Education – AROQA. This year's AROQA's 6th Annual Conference, held in parallel with e-AGE platform, focused on quality standards and accreditation on digital education. In this regards, he announced the establishment of the "Association of Arab e-Universities" (AAEU), with the e-Universities of the UAE, Jordan, Palestine, Sudan, Bahrain, Yemen, and Tunisia as funding partners, as well as the announcement of the quality standards and accreditation of schools, now being implemented in Jordan's Omarieh Schools and the first Arab Journal of Quality in Education, a peer reviewed and indexed Journal.

In closing, Dr. Abu- Ghazaleh concluded his speech by saying "This event is an opportunity to consolidate our efforts together towards developing a better network infrastructure and a better quality education for a prosperous future of our young people."

## Launch of OMREN Logo



### **Mohammed Al Farai, Managing Director, Zeenah Group, Oman**

Mr. Mohammed Farai welcomed the distinguished guests and was so proud to represent his colleagues in The Research Council (TRC) and Zeenah Group to give a brief about the logo of Oman Research and Education Network (OMREN). It was a real pleasure to work side by side with the management team of OMREN to come out with the logo which shows the vision and the goals of this project.

The goal of the project is to establish a high-speed and efficient network that links the research and the academic institutions in the Sultanate of Oman and offers plenty of scientific applications and services to enhance and develop the quality and the efficiency of education, research and communications. This network will be the Oman's gateway to the global similar networks.

Inspired by the project's goals, they came out with the logo as shown, which reflects the project vision. The green dots represent the national and the international research and education networks and institutions linked together and overlapped in the middle of the character "O" which is the first letter of Oman. The acronym is retained in English for easier



identification. Looking into the whole logo, you will see how it reflects the role played by OMREN and TRC.



**HE Adam Kulach, Ambassador-Head of Delegation of the European Union to Saudi Arabia, Bahrain, Kuwait, Oman and Qatar**

First of all, I would like to thank all of those who have helped in the development and organization of this conference; because without their efforts this would not be possible. As you know the European Commission and the European Union have been from the beginning supporting not only emergence of inter-Arab connectivity between universities and educational establishment, but also supporting financially for twelve years now organizations and networks, like ASREN, and other regional organizations of the same type in other regions, because we truly believe that through development of the interconnectivity between us, we really lay foundations for the future cooperation.

Nowadays you cannot really imagine high quality higher education and research without this electronic infrastructure that enables universities not only to contact, but also to exchange the knowledge, and to be part of the International community of science.

The European Commission first priorities are the creation of jobs and growth, and this would not be possible without education and investing in the human potential. One of our biggest initiatives aimed at achieving that goal is the Horizon 2020 which is the program for innovational research open to all our partners globally. It will provide over seven years funding in the range of 80 billion euros, which is really a big potential to use.

The European Union has been from the beginning very active in supporting every single initiative which brings us closer and also in the higher education, for example, the EUMEDCONNECT project connection with the European network of universities and research establishment (GEANT), all this is really important because if we developed separately without this inter connection not only in higher education, we will not achieve the goal of the better future to our children.

Another initiative which is very important and the EU has been developing and continue to develop is Maria Sklodowska, a Poland scientist. Under this name the EU has been developing programs and activities to encourage exchanges between researchers, to encourage the development of the careers for professors, PhD holders and those who are working on their PhDs, mobility between research staff and professors, and we believe that this is really something that should be used more by our partners.

In the previous financial perspective, we count our budget in financial perspective of seven-year period, practically, no body from the GCC was participating in those activities, and we regret it, because it was open at that time, we hope that in the new financial perspective there will be more interest because it will be jointly beneficial to us. Now we have the first institution that showed interest in this program, King Abdulla University of Science and Technology, which has become part of the consortium working in geophysics, and this is a good example to all higher education institutions in the Middle East and the Sultanate of Oman that the cooperation with the European

Union is possible but requires an initiative to look for potential partners to identify priorities and to identify those institutions on the European side who are leading and willing to cooperate with their Arab partners. Willingness and readiness on the European side of course exists but it also requires initiatives from the other side.

We hope also that apart from the cooperation between the European Union and the Arab world as a whole and the networks, we will also attract more interests in other part of the Arab world especially in the GCC region in jointly developing this initiative for the sake of a better future for us all.

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**Keynote (1): Thomas Delaney, "Community-Based Research through Open R&E Exchanges: A New York University Perspective", Vice President for Information Technology & Chief Global Technology Officer, New York University, USA**

New York University (NYU) began a transformation process seven years ago to become a globally-based research university. Half a decade later, NYU operates on six continents, with three degree-granting portals and 13 additional study away locations across the globe.

NYU's researchers indicated that it wished to collaborate not just with NYU partners across the globe, but also with other research universities. Thus evolved a global community of practice, developed largely through the cooperation of globally-minded universities and the national research networks throughout the world.

Delaney described the formation and operation of Research & Education (R&E) co-location facilities that are strategically placed around the world to facilitate research collaboration, and the impact of that this evolving infrastructure has had on our global R&E community of practice whose collaboration is no longer constrained by campus or national borders.

Delaney spotlight the achievements of the global R&E community in far-ranging areas such as medicine, energy, climate, and security

## 6. Appreciation



In recognition and honor for their efforts and their role in the success of the e-AGE 2104 conference and activities, and for their continuing support to ASREN, HH Sayyid Taimur Bin As'ad Al Said, Assistant Secretary General for Communication at TRC, along with HE Dr. Talal Abu-Ghazaleh, ASREN Chairman, have given the appreciation shields to the following:

- HE Ms. Khawla Shakhshir, Minister of Education & Higher Education, Palestine
- Dr. Abdurahman Hussein, representing Minister of Culture and Higher Education, Somalia
- HE Adam Kulach, Ambassador, Head of Delegation of the EU to Saudi Arabia, Bahrain, Kuwait, Oman and Qatar
- HE Dr. Ali Ismail, Secretary General, Ministry of Higher Education and Scientific Research, Yemen
- Mrs. Magda Zaki, Director of Education and Scientific Research, League of Arab States, Egypt
- Mr. Thomas A. Delaney, Vice President for Information Technology & Chief Global Technology Officer, New York University, USA
- Prof. Eesa Al-Bastaki, President, University of Dubai, UAE
- Mr. Aniyan Varghese, Programme Manager, DG Connect, European Commission, Belgium

At the end, HE Dr. Talal Abu-Ghazaleh gave the appreciation shield to HH Sayyid Taimur Bin As'ad Al Said in recognition of the patronage and hospitality of The Research Council, the event's host.

## 7. Highlights from the Panels and Discussions

### 7.1 Session (1): “Evolution of ASREN’s Region”



#### **Oman: Nasser Al Mandhari, OMREN Sponsor and Deputy Director of IT, TRC**

Mr. Al Mandhari has presented the National Research and Education Network of Oman (OMREN) in terms of objectives and implementation phases. The research Council of Oman (TRC) took over the responsibility of establishing this network to help enhancing the research and education in Oman via a high-speed effective network that links all the educational and academic institutions together in Oman then linking them to the global research networks. This project aims at finding research communities and enriching the knowledge society.

The actual work began in 2013 by conducting periodical meetings at TRC to put the plan for executing this project. The first phase began by collecting the requirements of the universities and colleges of Oman then analyzing these requirements to identify their needs and the difficulties they facing. In addition to that, the laws and legislation of telecommunications in Oman had been viewed as well as the experiences of countries that have preceded Oman in this area. Based on that, the network design was developed and a tender was launched. Mr. Al Mandhari displayed some of the events and achievements that have been made since the beginning of the project. Also, another tender has been launched to provide the connectivity and to link OMREN with the global research networks, such as Internet2. Currently, they are working on the trend that connects 14 national educational institutions in Oman; this will be executed in the first quarter of 2015. In the second phase, another 25 institutions will be connected in addition to the 14 institutions in the first phase. In another phase, the programs and services will be added to the network.



#### **Algeria: Aouaouche El-Maouhab, Director, ARN**

Mme. El-Maouhab briefed an overview about the Algerian Research Network (ARN). Since 1994 ARN has followed a successful evolution, until now last architect is national backbone which is built with 10 PoP distributed over Algeria, the network is connecting more than 110 scientific and academic institutions, they have about 54 universities and more than 20 national high schools and more than 15 research centers, the network is IP/MPLS with IPv6 fully used in the backbone, ARN is in the progress to deploy IPV6 on the hardware. Regarding connectivity, the PoPs are based on Giga Internet links, connectivity of institutions 100 MB for universities and 10 MB for research center and high schools.

On the International level there are two types of links, one is related to Internet community with commercial Internet provider, and the second is the most important is the link with GEANT, which now about 622 Mb, it has been deployed through and with the help of the European Commission projects, EUMEDCONNECT which is now in its third phase, since the first connection which has been done since 2004 they have followed all steps of the EUMEDCONNECT project and they will go shortly in the next months to upgrade the connection 2.5 Gbps in the link with GEANT.

Regarding services, the most important, the grid facility, they worked on it on a national level with the help of EC project, EUMEDGrid, EUMEDGrid Support, EPIK and the last one is CHAIN-REDS, these projects has helped improved our activity regarding the grid facility, and now they have developed services which are offered to our users, the main one, is to identify and discover users and to help building scientific community which will be involved in the grid activity to improve their computational work and to improve from our side the infrastructure and the technical issues related to this type of infra, for example they are deploying Science Gateway with to facilitate access to the grid facilities with the help of CHAIN-REDS project and the team from INFN and they have also deployed the identity provide and other services that helps users.

### **Bahrain:**

Some activities had been initiated by ASREN and several meetings with the prime minister took place. Things are progressing but no one presented at e-AGE 2014.

### **Comoros and Djibouti:**

No reports are available for the developments of research and education network at the national level. ASREN is investigating the opportunities for cooperation in Comoros and Djibouti.



### **Egypt: Ahmad Hassan, General Manager, EUN**

Dr. Hassan introduced the Egyptian Universities Network (EUN). EUN was established in 1987, the EUN and ESTINET, which is the research network in Egypt, they are both serving the education and research community in Egypt in a collaborative way. They have on the international level two lines, 1 for 2 Gbps for commodity Internet and they have for Internet2 a connection which is 1 Gbps going to GLORIAD. A link is provided between ENSTINET and EUN which serves the universities with 155 Mbps. The entire network serves 23 public universities and 14 research centers in addition to Al-Azhar University which was built around 1000 years ago, and they have Bibliotheca Alexandrina as a member in this network, they also have about 120 small links to campuses that are outside the main universities buildings. Each university has a link between 34 Mbps and 155 Mbps according to its capacity, they are using a lot of video conference services special with the recent political situations, and the EUN has been extended to form the Electronical Knowledge Service Center, it has now become a part of this center which contains four other units beside the EUN, these include the National Research Center which provides e-learning courses about 570 e-learning courses that serves 300,000 students and most of these courses are used by 425 universities, they have also the digital library unit which contains the theses and dissertations for the Egyptian universities about 400,000 dissertations and theses, they have the central unit of IT training serving out 60K students and professors every year to train them for the IT, and they have the MISDSS unit gives decision support and facilitates enrolment of the students in the university hostels, it serves about 100,000 students. EUN is involved in other projects regarding the EU, for example, Tempus project for the regulatory and legalization of e-learning projects and e-learning curriculum, and SHEMERA which is related to the female participation in the research and education compared to other countries in the Mediterranean

## **Iraq:**

ASREN signed MOU last year and already started to have the ministry of higher education as official shareholder. No one presented in e-AGE 2014.



## **Jordan: Nabil Shawaqfeh, Chairman, JUNet**

Dr. Shawaqfeh has presented the Jordanian Universities Network (JUNET) which is a nonprofit company with limited liability owned by the Jordanian public universities.

It was established in July 2003 as a first stage of the national broadband network which was established in the light of His Majesty King Abdullah's initiative to connect Jordanians. The National Broadband Network (NBN), is a comprehensive learning and public access network that connects public universities, public schools, community colleges and public access sites. The Ministry of Information and Communication Technology took the responsibility of publishing this network, which was built using dark fiber leased from the National Electricity Power Company; the reason for dark fiber is a freedom of selecting the transmission technology as well as the communication speed.

In particular, JUNET was established to provide and advance TCP-IP network for Jordanian universities and scientific research centers. The Network's main achievements are: 1) provide a quality network services to the universities including VPNs, Video Conferencing services and reliable infrastructures to the libraries to provide sectors wide management services and the scientific GRNOS and periodical publications that are commonly used, 2) Internet consolidation including all related management services for all universities, 3) provide a quality and specialized training to the technical staff at universities, 4) completed an Internet caching and filtering project for member universities to boost the information and network security measures. Strategic goals and future plans: 1) build an e-learning platform and environment to integrate efforts made by member universities, for this year, the domain name [www.e-learning.edu.jo](http://www.e-learning.edu.jo) was reserved, 2) to be the host of Ministry of Higher Education national exams such as but not limited to national English test, a national universities profession exam, 3) utilize the cloud computing services public and private to consolidate and integrate EMIS systems in member universities, a strategic partnership with Microsoft is being worked out, 4) establish a national research gateway to connect researcher at the national, regional and global levels, 5) be a host of electronic learning digital content and scientific research to serve member universities as well as higher education sector in Jordan and the region.

## **Kuwait:**

ASREN has expressed some efforts with Kuwait, they have established grid computing infrastructure which was connected to the EUMEDGrid Support. No one presented at e-AGE 2014.



## **Lebanon: Walid Karam, Advisor to the Minister, Ministry of Telecommunications**

Lebanese NREN has been in effort for 5 years now by the National Center for Scientific Research (NCSR) in cooperation with the Ministry of Higher Education and the Ministry of Telecommunication. Unfortunately, this project has not seen the light yet due to many factors, one of the major factors is the lack of infrastructure, the national

fiber project, which has been installed, is not yet operational, due to politics and other reasons. The good news is that since the new Telecom Minister Botrus Harb took his office in February 2014, the project has been revived in cooperation with the NCSR, MOHE, Lebanese University and other 50 universities; there has been a memorandum of understanding signing among them to define the services that should be on the network, and a waiting for the infrastructure to be ready to host this very important network for the country. Lebanon hopes in the next e-AGE they will announce the official Lebanese NREN.



### **Libya: Abubkr Abdelsadiq, Elmergib University**

The LibREN has not been started yet, but the plans are to have it very soon, they are working with ASREN to organize a workshop to spread the awareness of the necessity of establishing the NREN in Libya and how the country can benefit from it. The efforts spent in Libya shows that the country is rich of fibers but not yet used to enhance the research and education in the area. There are some initiatives from the Higher Education Ministry to digitalize some sectors in the higher education; one of them is the Libyan Digital Library project and now working on establishing a center of excellence in collaboration with UNESCO. A pilot study has been started to connect two universities. Libya hopes that by the end of 2015 they will have the LibREN ready and established.

### **Mauritania:**

No reports are available for the developments of research and education network at the national level. ASREN is investigating the opportunities for cooperation in Mauritania.



### **Morocco: Redouane Merrouch, Director, MARWAN**

In Morocco, there are 15 public and four private universities scaled about the white territory of half square kilometers, these universities have huge number of students and researchers, therefore it is not easy to build a cost effective network covering the whole institutions. MARWAN is one of the first NRENs in the region; it started 16 years ago in 1998, today it is in its third version connecting all public universities and some of the private ones. They are working on upgrading to the fourth version. Now, MARWAN connects universities at 100 Mbps link, this bandwidth will be multi Gbps in MARWAN 4. MARWAN was the first southern network connected to GEANT but unfortunately this connection was stopped due to financial reasons, but they will establish again this connection in MARWAN 4 through ASREN. Despite the financial limitations they succeeded in developing very interesting e-infrastructure and e-services, the most important are the Grid Computing Magrid and its certification authority, also the Science Gateway, eduroam and recently the Federation of Identity. Establishing a national research and education network and being able to maintain it, is not an easy task in the region where the economic situation is tight, as well as the very high prices from the telecom operators.



### **Palestine: Irene Hazou Makhoul, Vice President for Academic Affairs, Bethlehem University**

The Palestinian education sector has always recognized the need for network facilities in Palestine with the region and the rest of the world. Yet, the sector continues to face many obstacles ranging from restrictions imposed by the Israeli occupation, finding sufficient funding, shortage in skills and resources, in addition to finding the right infrastructure. Several initiatives were made as far back as 1995 with projects such as PADI1 and PADI2, and the PalTel which was the first network linking Palestinian universities and hosted at Al-Quds University. In 2010, the Palestinian government has acquired through PalTel the Palestinian telecommunications, the first Palestinian National Research and Education Network, PalNREN, with EUMEDCONNECT at 45 Mbps, it is owned and funded by the Ministry of Education and Higher Education, where all Palestinian universities are connected free of charge. Unfortunately, due to the financial difficulties, this connection has to be disconnected as of last year, the future is not yet clear, but the Ministry of Education and Higher Education continues to support higher education institutions through its membership with EXCO and this service is available to all 15 universities. Beside financial and technical support, the collaboration among the institutions is required. The occupation has succeeded in turn all institutions into isolated entities that serve their own immediate facilities. Research is very much an individual endeavor, and some of the research that is being conducted is actually very successful and has international renounce, but for the research to be better realized, the Ministry has launched a project to establish centers or research and excellence at the Palestinians universities, this year a call for applications for a competitive fund to establish these centers was announced. To build strong networking among universities, each such center is expected to incubate research initiatives and create a collaborative environment with fellow Palestinian universities. In Palestine they do look forward to be part of the regional International networks because it is a lifeline to overcome the isolation and to allow our academic and education institutions to enhance their academic programs and as well as their scientific research capabilities.



### **Qatar: Hassan Al-Derham , Vice President for Research, Qatar University**

The Qatar National Research and Education Network (QNREN) project was initiated following the large amount of data produced by the many research projects and innovative scientific studies being undertaken in the country as it became very necessary for the data to be shared between researchers in Qatar and outside. Building on that, the project was initiated by Qatar University with the approval of the Ministry of Information and Communication Technology and the regulatory body of telecommunication of the state of Qatar. The broad goal of QNREN is to build an independent high speed and latency network as a national resource that will allow educational and research institutions in Qatar to exchange data and services and facilitate communications between universities and research institutions worldwide via dedicated international connectivity. In this direction, QNREN will act as an educational network service provider to provide high speed national inter-connectivity and other services are required by the participating institutions for their research and educational programs. It has been conceived as the catalyst in promoting development and deployment of new technologies among research and educational institutions in Qatar.

QNREN network will have a dedicated dark fiber backbone of capacity of 100 Mbps with possibility of upgrade that will allow institutions to connect at minimum of 10 Gbps with the least distribution of their existing configurations. Qatar University will build the first node and host the QNREN operation, the addition of a secondary redundant node will follow in other sites such as the MEZA datacenter and others, with the understanding that the international connection should have 10 Gbps capability and to be done through a major Internet exchange that will allow access to many NRENs worldwide. The nether light exchange in Amsterdam was selected due to the multitude connections in efforts to other RENS' networks. The first entities that will be able to connect to QNREN are Qatar University, College of Atlantic Qatar and Qatar Science and Technology Park (QSTP). Available QNREN connectivity services are basic IP connectivity service, the Ethernet service for higher connectivity performance, other operational services are networks monitoring, application monitoring, altering systems, SMS, helpdesk, ticketing applications and web server with QNREN public website, which is ready but not yet published. QNREN's plants services includes the creation of the regional operator for federation of eduroam authentication services and Qatar, this will allow the visiting professors from other universities to use their credentials to access service in Qatar universities.

QNREN's governance structure follows the existing model adopted by majority of NRENs worldwide within its users being exclusively non-commercial. The following services will be available: operational services, information services, security services, and users support services. The Ministry of Information and Communication Technology as the government body that supervise its activities represented in QNREN's Organization structure, this insures that QNREN has the needed legal backbone. With anticipated further expansion and SERVICES delivery, there will be a management board and a technical advisory board as required, QNREN as a backbone operator and legal entity will have a CEO technical team and administrative teams, it will be part of ICT Qatar and operates as a non-profit body. Its funding will be mixed with government providing operating funds and the members contributing through the payment of fees.

### **Saudi Arabia:**

The Saudi Arabian King Abdulaziz City for Science and Technology (KACST) has been mandated to undertake the planning and implementation phases of the Saudi Academic Research and Innovation Network (SARInet) ([www.sarinet.org.sa](http://www.sarinet.org.sa)). KACST has been leading the gradual introduction, adoption and penetration of a Next Generation National Research and Educational Network within Saudi Arabia, servicing the entire Academic and Research communities in the Kingdom of Saudi Arabia. No one presented at e-AGE.



### **Somalia: Dahir Hassan, CEO, SomaliREN**

SomaliREN was established in 2010 by six universities. It became a member of UbuntuNET Alliance as Somalia is an Arab African country. Now they have 14 members and it is expected to reach 40 universities by 2015 as they are receiving so many applications from both public and private universities. SomaliREN has managed to provide capacity building training to its members in order to capitalize the e-infrastructure mechanism and also has tested to interconnect some of universities in the

northern part of the country. The fiber optic was too late but finally it has landed on January 24th 2014, and now with the help of the Ministry of Higher Education as well as the World Bank and the European Union they started to make an assessment to do the required infrastructure in order to interconnecting among Somalian universities and research institutions. They are also trying to benefit from another project called AfricaConnect project which is also financed by the EC. SomaliREN also started negotiations with DelCom which is the company that owns the fiber optic as well as the telecom operators in order to use the towers to reach the universities based in the remote part of the country.



**Sudan: Sami Salih, CEO, SudREN**

Between 2003 and 2004, the Ministry of Higher Education conducted a project to connect 34 public universities in Sudan, accordingly the Sudanese Research and Education Network was established in 2004 with 34 members and 128 Kbps as a backbone, during that time they lost the frame lay to connect the institutions. In 2009, the scope is even extended to cover all research and educational institutions in the country and the new name “SudREN” was founded under the umbrella of Association of Sudanese Universities. So far, they accommodate 63 members and another 20 will join the campaign before the end of 2015. Our core network can provide 450 Mbps and they use fiber technology via our local telecom operators to connect our member institute in our MPLS VPN network.

Moreover, SudREN provides e-services such as web hosting, email, VoIP, video conferencing, HPC, library database, capacity building and technical support, furthermore, they support the ICT sector in Sudan by supporting young initiatives such as IPV6 and SDNOG, the Sudanese Network Operator Group. SudREN are very proud to be the first ISP in Sudan who provides the native IPV6 connectivity to our members. Regionally, SudREN is an active member of Ubuntunet Alliance which accommodates 14 NRENs from south and east Africa, they are also very proud to be the first NREN to join ASREN. Finally, Mr. Salih expressed his appreciation to ASREN for all the efforts spent to enhance the education and research in the Arab region and they look forward to connecting to the London PoP very soon.

**Syria:**

Started the work early in 2000. No updates since the last three years. No one presented at e-AGE.



**Tunisia: Habib Youssef, General Director, CCK**

CCK was established in 1976, but since the 1990 it has been the official national Internet service provider for the research and education community in Tunisia. It has been making major upgrade to the network and the last upgrade started in 2012 and should be ending in 2015, this major upgrade is changing the network and infrastructure and putting the fiber everywhere. CCK now is connecting basically about 500sites, access network through fiber to the core network, in the core they have a bandwidth of 2 times 10Gbps, and in the combined bandwidth for the access network there

are roughly 6 Gbps. With the end of this major upgrade, the next phase is basically to make major upgrade to the services, CCK really need to adopt technologies and provide more services to the NREN, in 2015 they will also start the deployment of IPv6.



**UAE: Mohammad Mabrouk, Manager, Network Operations, Ankabut**

Ankabut started in 2002 as an idea which became reality in 2006 when the five public institutions in UAE (Khalifa University, Zayed University, UAE University, Institute of Applied Technology and Higher College of Technology) signed an MoU to establish Ankabut. They assigned the role to Khalifa University to develop the network, which was built in 2009. Now, Ankabut has 6 PoPs and 25 links and started in 2009 with a 10 GB backbone network and 1 GB access for each campus. The network is MPLS enabled and dual stack IPv4 and IPv6 since the first day.

Locally, there is a growth in the network where now Ankabut has 100 sites connected to Ankabut as well as K12 schools and 28 public and private institutions are connected to Ankabut. Also, Ankabut has a target to connect all the schools of the Ministry of Higher Education by the end of 2015, and our mandate is to connect 400 schools in the northern Emirates in the UAE. For the international connectivity, they are working on the AGE-OX, this is explained in depth in roundtable 1.

In 2009, Ankabut started four basic services, the network basic services and other services such as HPC, Learning Management System and Library Management System. Right now, our portfolio services is growing very fast, they have the Virtual Desktop Infrastructure (VDI) as a service, MOZON which is the Ankabut Cloud, they are offering our institutions the software as a service, Platform as a service, colocation service, they developed the state of the art datacenter and also offer the colocation and the disaster recovery services for the universities. Ankabut is hosting EFADA consortium, which is the universities libraries consortium. In 2015, Ankabut will focus on connecting the K12 schools.



**Yemen: Khaled Basulaim, Managing Director, YCIT-HE**

With the new government, YCIT-HE hopes 2015 will be the year of education, training and learning, they hope that some progress will happen in Yemen. This is a real challenge for us, I remind you that everything started relatively early in Yemen on the side of NREN. Studies and plans started at the beginning of the third millennium and even before. YCIT-HE did some work with the European and Chinese partners through some projects; they started with the networks of two universities for \$5 million and another university for \$1.85 million and another one for \$2.5 million, but unfortunately, since the Arab Spring everything stopped but they continued to offer the technical support for the universities in the side of MIS and also training for the teams of the universities computer centers. Next year, they are promised with \$50 million in order to start the construction of YNREN, the Yemeni National Research and Education Network, and also to start the work with other projects on e-Learning and e-Library. Yemen hopes by next e-AGE the YNREN will be a real active network.

## 7.2 Roundtable (1): “ AGE-OX and AGE-OP, Towards Intercontinental Connectivity ”



**Yousef Torman, Co-Managing Director, ASREN, Jordan (Moderator)**

**Mohammad Mabrouk, Manager, Network Operations, Ankabut**

Ankabut has led the technical work on AGE-OX, they have leased the racks and smart hub of Etisalat in Fujairah, and linked the smart hub to the Ankabut core network that will be connected to the PoP of Fujairah which connects Fujairah with the institutions around it with a 10G link. Ankabut has also contracted Etisalat, a UAE network operator, to link the smart hub with the Ankabut core of 10G link and then they will buy the equipment for the smart hub which is the router of AGE-OX and to finalize the technical evaluation. There is also a progress from Internet2 and New York University to bring the link from Singapore to AGE-OX hub.

**David West, EUMEDCONNECT3 Project Manager, GÉANT Association, UK**

Mr. West has been working with the Arab region for over 10 years through the EUMEDCONNECT project which has been managed through DANTE and had the funding support from the European Commission. Mr. West mentioned that last year, ASREN has presented its network strategy on how to create the infrastructure to provide the Pan-Arab research and education network, and what we see this year is that the strategy now in the way. The PoP in London is the first physical manifestation, and the PoP in Fujairah with Ankabut is the second manifestation. DNATE has been working and helping ASREN in granting settlement of free peering between ASREN and GEANT

network which means that any network wants to connect via ASREN will have the access to GEANT network and how we use the European user base under the terms and agreement with helped ASREN secure extremely good PoP accommodation at a colocation site at Telicity in London and very close to where the GEANT network is located, they are also providing the operational support to that PoP to make sure it delivers service to the high standards operations that are available. They are also supporting the Fujairah PoP, DANTE is already talking to Ankabut and several of the European NRENs which have campuses in the region who are keen that DANTE provides a connection to Fujairah from the GEANT network as soon as it can be done and hopefully this will happen in the first half of 2015.

### **Sureswaran Ramadass, Chairman, APAN, Malaysia**

The talk was all about APAN, it is the equivalent of ASREN but for the Asia Pacific region, ASREN and APAN membership has been extended beyond the Asia Pacific region to the south Asian countries as well including Bangladesh, Pakistan, Sri Lanka and so on. APAN's roles lie in connectivity, community, continuity, coordination and collaboration for the research community. APAN is working closely with the areas of e-Research Infrastructure including IT enhancing, enabling research, computing, data, collaboration, networking and security, as well as agriculture, disaster management, remote sensing, collaboration, education, Internet, telemedicine, health, and also working with Asian Development Bank. Mr. Ramadass invited all to attend Fukuoka meeting in Japan, next February.

Mr. Ramadass concluded by saying "The open exchange is an excellent idea where you can do the required networking with others, while the open source is to code."

### **George Loftus, Associate Vice President for Network Services, Internet2, USA**

Internet2 has contracts ready to execute, they only wait for the equipment of Ankabut to be installed. Mr. Loftus pointed to a great collaboration that has been done in Internet2 that is to support universities members jointly with the research networks around the globe. Mr. Loftus recommended Ankabut and ASREN to really embrace the open exchange concept as it is real opportunities to bring these national research and education networks together and share information and not having a lot of rules and policies for the construction of this exchange, having such exchange in the Arab region would be very helpful.

### **Constantin Vaduva, CTO, QNREN, Qatar**

Mr. Vaduva started his talk expressing QNREN was incubated in Qatar University (QU), when they started to building up the QNREN, they started with the design and looked for what they need to do, they realized they had the target of the backbone of 100GB and the need for a PoP to be able to talk to the world and do the peering with others networks, the reason of this need is that QU has a very ambitious research plan and they have a lot of collaboration with many universities in Europe, US and the eastern part of the world. When QU started the project, they decided to go to Amsterdam, one of the biggest open exchanges areas. Mr. Vaduva continued, "From the perspective of Qatar which has collaborations with many of the research institutions in the world, this open exchange can be extended, ASREN is a good link to have collaboration with,

and the open exchange in Fujairah is very interesting for Qatar which has very good geographical position. From the mutual projects which develop the e-services in the region, Qatar finds ASREN connectivity via London PoP access will be a big benefit”.

### **Salem Alagdash, German Jordanian University, ASREN, Jordan**

Prof. Alagdash highlighted the AGE-OP as the first PoP in London that ASREN has established in partnership with DNATE which is providing the technical support, also the donation from ISOC and CISCO to establish this operational peering for research and education traffic. This PoP will create the opportunities for most of the Arab NREN to interconnect with the regional networks worldwide and looking forward to the operation and interconnection with GEANT, Internet2, RedCLARA, WACREN, Ubutunet and APAN.

He continued that ASREN is the regional REN for the Arab region. ASREN is very much interested to support internally the Arab countries to build their internal REN especially in the countries where those NRENs do not exist, for instance ASREN is supporting Lebanon, Bahrain, Iraq and Yemen. On the international level, ASREN will be the connecting point to the rest of the world in terms of research and education network, what ASREN is doing now is to establish this inter-link with the rest of the world and this cannot be done without open exchange points, and the first exchange point was in London to create the inter-link with the international RENs, and now working with Ankabut to establish the AGE-OX which is the open exchange in the Gulf countries. ASREN also started to create another PoP in Alexandria in Egypt; a proposal for the Ministry of ICT was submitted. There were also some discussions with Saudi Arabia to create the PoP in Jeddah; the reason of selecting those cities is that most of the cables landing come to these cities. On the other side, ASREN is also working on the interoperability projects funded by EC in terms of providing services to the users such as science gateway, eduroam, eduGAIN, digital libraries and digital repositories, one of those projects is CHAIN-REDS, but without having a dedicated network, connectivity and infrastructure, there is no way to access any of those services.

## **7.3 Keynote (2)**



### **Eesa Bastaki, President, University of Dubai, UAE**

Prof. Bastaki talked about his strategic vision for the UAE is “To achieve a long-term sustainable, prosperous and productive lifestyle after oil for UAE’s next generations.” Prof. Eesa explained in details the three main requirements for achieving Smarter Cities; the first one is leadership and innovation, the second one is smarter society eco-system, which includes education, research and business development (R&BD); and ICT Infrastructure, the third one is future trends. Prof. Bastaki mentioned Ankabut as an example of ICT infrastructure; it has 32 institutional members and applicants with connections to over 100 campuses throughout the UAE.

## 7.4 Roundtable (2): “ International Co-operation in Research and Innovation - How to Make it Work for the Arab Region ”



**Salem Alagdash, German Jordanian University, ASREN, Jordan (Moderator)**

**Aniyan Varghese, Programme Manager, DG CONNECT, European Commission, Belgium**

Mr. Varghese presented HORIZON 2020 in terms of EU enabling global research for connectivity, data, computation, cooperation and innovation. He expressed the significance of the collaboration in this area with the EU. The approach they follow lies within transversal of cutting across disciplines and sectors, support tomorrow's science and enabling innovation, he continued by previewing the drivers for change by providing more computing power, big data, limitless global connections, global participation, and collaborations between science and society. He showed how the computing power and big data have been evolved in the last 40 years.

From the e-infrastructure side of view, the infrastructure and connectivity aspects which literally support every other area should be taken into account and each society should decide in which global virtual research community they can make the best out of it. Mr. Varghese showed a building block on how the e-infrastructure can help in the different areas and the EU has developed significant number of projects and activities in which many Arab partners are involved in. He explained the importance of HPC and how it supports many areas; climate, earth sciences, life sciences, fundamental sciences, industrial and engineering. He also expressed the importance of exploring the HPC's strategy and the agreement of the politician to have the policy and then how to implement it. He continued, research data become the infrastructure for modern science.

Mr. Varghese has also highlighted the GEANT network as a success story in Europe. He asserted that the GCC and Arab countries can be quite visible in the EU programs activities but the initiative need to come from their side. The EU has launched many projects calls; a recent one, but now closed, is the e-Infrastructure policy development and international cooperation.

**Carlos Oliveira, Responsible for International Co-operation, DG CONNECT, European Commission, Belgium**

Mr. Oliveira defined the Horizon 2020 as the largest research innovation program in the world with more than 80 billion Euros. The project targets not only EU member states, but also it is looking for enlarging this corporation to countries around the world, and in this context the Arab countries play a very important role. H2020 is not only about research, of course research is an element of it, but there are a number of very important activities dealing with innovation, entrepreneurship, and business world involving startups, new companies and ventures, and in this context international cooperation is an essential feature we need to target not only specific problem of one country but activities that address global problems, and have the possibility of reaching a wider population.

There are three major pillars of H2020; the excellent science, the industrial header ship and the societal challenges. These activities link between each other very tightly, and within these areas ICT has a large presence everywhere.

Today, the center of innovation and research is not only focused on the developed countries; we have seen that there is an increasing number of patent coming from developing countries. We have also seen these in terms of publications, the typical indicators for research and development. Also many of the challenges they are facing are not only at a level of a single country, they engage a whole region and a whole globe, such as climate and security.

EU remains an important actor in these areas despite this desertification, the benefits of cooperation with EU in science and technology lies is being connected to the most advanced economics in the world and having the access to the knowledge in terms of development, jobs, peace and stability.

**Fahad Al-Hosni, Director of Research Administration, TRC, Oman**

TRC was founded in 2005; it is a young organization with a royal degree, with clear duties on to be the focal point to facilitate the generation and development of research strategies in the country and to oversee the implementation of that strategy and working the plan. Today, TRC has the mission to create an innovation ecology that is responsive to local needs and international trends, fosters social harmony, and leads to creativity and excellence.

The vision is to have Oman as an innovation hub of the GCC and to lead production of new ideas, products and services, and has the deepest research capacity in selected areas and reaches the

research excellence in specific fields, TRC is also respective in local, social and economic needs, and has the e-infrastructure that is required for cooperation.

TRC has four main goals, the first main objective is to build research capacity in the country, research in Oman started 13 years ago only, so Oman is still new in this area, so a lot of work has been done to identify what are the challenges, and how to address these challenges to come over them. TRC is keen to assist the academia to develop graduate programs in science and humanities and to assist them to create specialized post graduate programs in selected areas, and to build world class researchers and encourage research collaboration. The second main goal is to reach an excellence in the research areas, to build for strength in the diverse areas of national interest, and to build strength in policy research for informed decision-making. Another goal that is important to Oman is to facilitate knowledge transfer, and TRC is doing a lot of work to diffuse knowledge between academia, local industries, government, and other publics from different stakeholders and to align research with local socioeconomic issues.

The fourth main objective is to create and enabling environment for researches, and to make Oman as attractive place for leading international scholars, scientists and corporations to conduct research.

TRC used the 3 Wave Strategy model; the basic elements of this model are Enable, Align and Build.

### **Abdallah Al Zoubi, General Director, Scientific Research Support Fund, Jordan**

Scientific Research Support Fund (SRSF) in Jordan is a young independent institution established in 2007, the goal of SRSF is to support the researchers and talented students, because we truly believe that the PhD and the master students are the core of the research.

SRSF has a special program to support the graduated students, helps them to carry an excellent research inside the universities. When we talk about reaching the cooperation in an international level between Arab universities, and with the world community, we should first be ready to restructure our universities, to perform all of their functions in the best way, including teaching, research, and community services.

Prof. Al Zoubi continued, "the most important thing is that every university should be ready to cooperate with other universities in the same country first then with the international institutions, and when we start to believe that science doesn't recognize the political borders, then we will reach success."

## 7.5 Session (2): “ Research Communities ”



### **Federico Ruggieri, “e-Infrastructures Technical and Organizational Challenges”, Head of Computing and Storage Department, GARR, Italy (CHAIR)**

Research and education need efficient communication and innovative services that can jointly be named e-Infrastructure. Mr. Ruggieri stated, “several e-Infrastructures have been deployed in different regions of the world providing services ranging from the Network connectivity to Grid, Cloud and HPC Computing. Research and education, however, is now globalised and Virtual Research Communities can address new scientific challenges thanks to the collaboration of groups distributed worldwide. European and non-EU e-Infrastructures have thus to interoperate to address the requirements of cross-continental research communities. Moreover, new and emerging regional e-Infrastructures are customising existing technical and Organizational best-practices to their specific region and National Research and Education Networks (NRENs) are providing new services on top of the high bandwidth trying to find a balance between scalability and pervasiveness. These evolutionary paths are challenging both the technical and Organizational aspects of e-Infrastructures. Coordination and harmonisation of e-Infrastructures among different regions of the world is the aim of the CHAIN-REDS project.” The presentation showed the current achievements of the CHAIN-REDS project and the technical and Organizational challenges that NRENs and regional e-Infrastructures have to face today and in the near future.



### **Anna Rajab, “Development of Genetic Services in the Sultanate of Oman”, Consultant Clinical Geneticist, Director of National Genetic Center, Ministry of Health, Oman**

The Sultanate of Oman is a rapidly developing Muslim country with well organised Government funded healthcare services, including primary, secondary and tertiary levels of care and rapidly expanding medical genetic facilities. At the present time the Omani population is characterised by a rapid rate of growth, large family size, consanguineous marriages, and the presence of genetic isolates. The preservation of a tribal structure in the community coupled with traditional isolation has produced unique and favorable circumstances for building genealogical records and the study of genetic disease. Genetic services developed in the Sultanate of Oman in the past decade have become an important component of healthcare. The support in education, technology transfer, and research in collaboration with the C. Walch Laboratory at Harvard Institute of Neurology (USA), Weill Cornell College (USA), Institute of Human Genetics at Humboldt University (Berlin, Germany), Genetic Department of St-George’s Hospital Medical School (UK) and Leiden University (Netherlands) paved the way to success. The recently built National Genetic Centre in Muscat is expected to meet the needs of the Omani population in provision of genetic services and research, in a manner deferential to the cultural and religious traditions of the country.



**Guido Zebisch, “ARABTERM, ALECSO’s Technical Terminology Database. A Future Hyper-Platform”, Project Director, ARABTERM Project - Deutsche GIZ GmbH, Morocco**

The ground-breaking Arab Human Development Report 2003 pointed out that knowledge transfer cannot take place when academic and vocational students do not dispose of a command of terminology in a precise way in their habitual language.

The multidisciplinary project ARABTERM aims at creating opportunities of knowledge transfer for key technologies that have been identified as vital with regard to more sustainable absorption within the Arab world. The Technical Dictionary [www.arabterm.org](http://www.arabterm.org) is an online internet dictionary project jointly commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Arab League Educational, Cultural and Scientific Organization (ALECSO), and carried out by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in collaboration with ALECSO’s division in Rabat, the Arabization Coordination Bureau (BCA).

The [www.arabterm.org](http://www.arabterm.org) platform: ARABTERM offers a free platform for professional translation of technical terminology, and noteworthy, Arabic definitions, from and to Arabic, German, English and French. The dictionary is composed of different volumes covering Automotive Engineering, Water Technology, Renewable Energies, Electrical Engineering, Textiles, Transport and Infrastructure (up to 2014).

The ARABTERM aims at creating synergies within the networks of the respective scientific communities by presenting these plans of upcoming content (for 2014-2016). Terminology shall be presented, further needs identified, and a call for participation in an experts’ network shall be held, in order to enhance the quality of the terminological content (through revisions, updates) for mutual benefit between producers and beneficiaries, in the long run.



**Brahim Lagoun and Oufa Bentaleb, “ABINIT, a First Step on GRID Infrastructures under CHAIN-REDS Project”, Professor & Researcher, Laghout University, Algeria**

The development that humanity lives with a very high speed, and the requirement of society to preserve the environment, opens new challenge to scientists (physicists and chemists) to develop new, more efficient materials with properties well defined. In this context intervene the simulation discipline in materials science. Specifically the ab initio calculations. View the performance of DFT (Density Functional Theory) [1,2] to predict the properties of a set of atoms (molecules, clusters, bulk, surfaces and interfaces), in addition, relatively rapid computations compared to other methods since the latter depends only on the electronic density [3,4], the number of papers published last two decades has evaluated exponentially [5,6], so it has become the main actor in the simulation domain. To facilitate to the scientific community to perform calculations in the framework of the DFT. The ABINIT code was chosen view these advantages as a first experience of code implemented in grids enjoying the collaboration between several organizations and countries.

ABINIT code has been deployed first on DZ e-Science GRID, the Algerian GRID infrastructure. To facilitate access to GRID infrastructures, Abinit has been integrated recently, through CHAIN-REDS and Algerian Science Gateways after a specific development based on JSR 286 portlet. This work has been achieved with the contribution of INFN team at Catania under CHAIN-REDS project and DZ e-Science GRID team with researcher from Laghouat University in Algeria. So, researchers using ABINIT can run both sequential and MPI-based versions of Abinit successfully deployed on Arab (1), European (7) and Latin American (1) sites.

### 7.6 Session (3): “ Education and Learning, to Where? ”



**Hisham Ibrahim, “Bridging Gaps: ICT and Innovation in the Arab World”, Regional Program Manager, RIPE NCC, UAE (CHAIR)**

This presentation attempted to identify and analyze some of the current gaps that exist in the Arab world that are preventing us from being truly interconnected and innovative in the ICT domain. Mr. Ibrahim described the separation and disconnections from what people do in academia and what the market actually requests and needs in the Arab region. He continued, we have really smart students but we don't know how to introduce them to the community, or the community doesn't use us the way it should be.

Mr. Ibrahim mentioned the RIP NCC program called RACI, which is The RIP NCC Academic Collaborative Initiative, where it sends academic students that are researching the Internet to present in front of the people that actually build the Internet, the operators, and the people that put the protocols, the point is that there are a lot of ways to bring these academic institute into this world. They also have a platform called The RIPE Atlas Platform, that has probes deployed all over the world to where academics can actually use this in their researches, and see how the traffic goes in and out of the country, there is a lot of these things out there in the world, and he invited all institutes and students to be part of this world.



**Karim Abdelghani, “ITU’s Regional Initiative on Smart Learning”, Program Coordinator, ITU Regional Office for the Arab States, Egypt**

The ITU World Telecommunication Development Conference that was held in Dubai in March/April 2014 adopted regional initiatives that focus on priority areas that will guide the work of the Union regionally in the coming four years. One of which for the Arab region is a regional initiative on Smart Learning. This presentation displayed the findings of an overview assessment of Smart Learning policies and strategies in the countries of the Arab region. In addition, a four year plan to implement this regional initiative was presented with the aim of receiving valuable feedback from the e-Age community, increasing awareness on upcoming ITU activities and promoting cooperation in that regard.



**Ali Yazici, “Lifelong Learning (LLL): A Roadmap for the Developing Countries”, Head of Software Engineering Department, Atilim University, Turkey**

Lifelong Learning (LLL) is defined as all learning activities undertaken throughout life with the aim of improving knowledge, skills and competences, within a personal, civic and social and/or employment-related perspective. This article aims at discussing the main issues in LLL, using the approach in the European Union countries. Challenges in Turkey’s recently completed European Union (EU) project “Promoting LLL in Turkey”, and the current situation in the Arab world in the same context are summarized. Based on these cases, a roadmap and a set of recommendations for LLL in developing countries are given

## 7.7 Session (4): “ e-Infrastructures and Services ”

**Sharifa Hajjat, E-learning Manager, Higher Colleges of Technology, UAE (CHAIR)**



**Brook Schofield, “Increasing eduGAIN Participation through the Evolution of Federation Development”, Project Development Officer, GÉANT Association, The Netherlands**

The NRENs portfolio was originally a suite of connectivity, bandwidth and network services. As the student and researcher population become more mobile and the plethora of services available via the cloud meet the collaboration needs of our community, the link to these tools is no longer IP but your identity and through eduGAIN your identity can access services world wide.

What’s the best path to bring these services from the institution, the NREN, neighbouring NRENs and the world to allow a pool of resources to be available at your fingertips for research with seamless access. These are the challenges that have been tackled by identity federations as they grow and mature and embark on interfederation to increase the sharing of services and identities. How can the ASREN community best participate in this federated future?



**Elisabetta Zuanelli, “Aquenergy: A Transboundary Platform for Water and Energy Information Availability”, Full chair Professor, University of Rome “Tor Vergata,” Italy**

Mrs. Zuanelli expressed that the demand for water and energy in multiple uses is growing in every country even though the resources are limited in quantity and quality. Moreover, dryness and floods make water an increasing factor of risk and energy supplies represent a present vital issue. The local, national and supranational energy suppliance is one of the most important current issues. In the international context, procurement, cost and financial logic are of interest for individuals, businesses, public institutions, research and education. At the transboundary level, water and energy become a relevant policy, a cooperation and peace issue. Laws, policies, research, planning and management, both from a public and a private perspective, require the identification, sharing and monitoring of good quality information. Knowledge of the water and energy resources, initiatives, research activities require participation of different actors and users, information and communication for experts and general public, research and education. An added value is represented by the provision of information security

mechanisms. All these are essential elements in the global perspective of the World Wide Web, although still goals to be achieved.

Although the Internet offers big opportunities to the identification, sharing and monitoring of good quality information the current situation in the water and energy sector is still that of a high fragmentation, a scattering of sources and a lack of common criteria for sharing and monitoring information in a cost-effective way. In order to achieve this target we have developed an advanced digital communication tool [www.aquasearchportal.it](http://www.aquasearchportal.it) for a cost/effective information sharing and, basically, for improving water governance at the different levels. The Aquasearchportal is in fact proposed as an innovative and practical solution to the growing need of pertinent, useful, reliable and comparable data, indicators and information, both qualitative and quantitative. It is based and developed on former implementations, experiences and outcomes in several domains, such as training, administration, research and education.

The presentation dealt with aims, content, characteristics and technological roadmap for the Project through steps and organization of the Aquenergy platform. The proposal aims at the implementation of the water platform/search engine extended to energy contents by means of collaboration of a specific network of stakeholders: institutions, companies, academics and students.



**Antonio Sanfilippo, “Shaping the Future Computing Infrastructure for a Research & Education Network in Qatar”, Research Director, Qatar Foundation, Qatar**

Mr. Sanfilippo reported the results of a recent workshop on requirements for a research and education network in Qatar, with specific reference to the Qatar Foundation. The workshop focused on three themes: global connectivity, user expectations, and the research and education network as a locus of innovation. He briefly described the discussion held on these three topics during the workshops’ breakout sessions and provide a summary of the conclusions reached.



**Sergey Suchkov, “PPPM as a New Model of and thus a Unique Tool in a Global Reshuffling of National and International Healthcare Services”, Chair and Director, Dept for Preventive, Personalized and Translational Medicine, A.I.Evdokimov Moscow State Medical & Dental University, Russia**

Mr. Suchkov started by defining the medicine as an undergoing a paradigm shift to strive from the diagnosis and treatment for prediction and prevention. A new systems approach to disease to pay its crucial attention on the trend would result in a new branch in the healthcare services, namely, predictive, preventive and personalized medicine (PPPM).

To achieve the practical implementation of PPPM concept, it is necessary to create a fundamentally new strategy based upon the subclinical recognition of biomarkers of hidden abnormalities long before the disease clinically manifests itself. This strategy would give a real opportunity to secure

preventive measures whose personalization could have a significant influence on demographics!.

PPPM is a medical model being tailored to the individual and dictates a construction of PPPM algorithms to diagnose, to predict, and to prevent in time!

So, coordinated measures to optimize the progress should be well-focused on solving the accumulating problems in healthcare and the concomitant economic burden that societies across the globe are facing more and more.

The reason is predicting the future and it is not a new calling neither even a new challenge to ask merely for the God's help! So, no needs for soaring in the heaven! Well, indeed, PPPM offers great and real promise for the future, and next generations will speak about the XXI century as a time, when healthcare services became predictive and preventive, and its outcomes – secured.



**Roberto Barbera, “The INFN Open Access Repository”, Associate Researcher, University of Catania and INFN, Italy**

The steep decrease of costs of large/huge-bandwidth Wide Area Networks has fostered in recent years, the spread and the uptake of the Grid Computing paradigm and the distributed computing ecosystem has become even more complex with the recent emergence of Cloud Computing.

All these developments have triggered the new concept of e-Infrastructure (also called cyber-infrastructure, especially in the US) defined as “[...] an environment where research resources (hardware, software and content) can be readily shared and accessed where necessary to promote better and more effective research; such environment integrate hard-, soft- and middleware components, networks, data repositories, and all sorts of support enabling virtual research collaborations to flourish globally”. Indeed, e-Infrastructures are being built since several years both in Europe and the rest of the world to support diverse multi/inter-disciplinary Virtual Research Communities (VRCs) and their Virtual Research Environments (VREs) and a shared vision for 2020 is that e-Infrastructures will allow scientists across the world to do better (and faster) research, independently of where they are deployed and of the paradigm(s) adopted to build them.

E-Infrastructure components can be key platforms to support the Scientific Method, the “knowledge path” followed every day by scientists since Galileo Galilei. Distributed Computing and Storage Infrastructures (local High Performance/Throughput Computing resources, Grids, Clouds, long term data preservation services) are ideal both for the creation of new datasets and the analysis of existing ones while Data Infrastructures (including Open Access Document Repositories – OADR – and Data Repositories – DRs) are essential also to evaluate existing data and annotate them with results of the analysis of new data produced by experiments and/or simulations. Last but not least, Semantic Web based enrichment of data is key to correlate document and data, allowing scientists to discover new knowledge in an easy way.

In this contribution we presented the Open Access Repository (OAR), a pilot data preservation

repository of INFN and other Italian Research Organizations' products (publications, software, data, etc.) meant to serve both researchers and citizen scientists and to be interoperable with other related initiatives both in Italy and abroad. OAR is powered by the INVENIO software and is both an Open Access Initiative conforming and an official OpenDOAR data provider, able to automatically harvest resources from different sources, including the Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP3), using RESTful API's. It is also one of the official OpenAIRE archives, compliant with version 3.0 of its guidelines.

OAR allows SAML-based federated authentication and it is one of the Service Providers of the eduGAIN inter-federation; it is also connected to DataCite for the issuance and registration of Digital Object Identifiers (DOIs).

But what makes OAR really different from other repositories is its capability to connect to Science Gateways and exploit Distributed Computing and Storage Infrastructures worldwide, including EGI and EUDAT ones, to easily reproduce and extend scientific analyses. In this respect, the Open Access Repository is fully compliant with the Data Accessibility, Reproducibility and Trustworthiness (DART) model conceived by the CHAIN-REDS project and a concrete example related to the data of the CERN ALEPH Experiment were shown. The possibility and advantages of creating clones of the Open Access Repository in the Arab Region were also discussed.

## 7.8 Keynote (3)



### **Barend Mons, "Data Stewardship, Boring or Soaring?", Chair of DTL-data and Head of ELIXIR node NL, Netherlands**

In the eScience era, meaningful pattern recognition in high dimensional and complex data has a major contribution to knowledge discovery in science, specifically chemistry and biology, whether it be in drug discovery or materials development. In order to optimally (re-)use data for this purpose, the data need to be machine-readable. However, many key data sets and databases are not in enabling formats and most research projects do not even have a "data management plan" that deals with the generated data for the duration of the project. Many key data sets therefore go unnoticed or worse, get lost. Data stewardship emphasizes the long-term availability of data for continued use in human and machine meta-analyses. This talk covered aspects of data publishing in FAIR format (Findable, Accessible, Interoperable and Reusable). It also showed how well stewarded data can serve "in silico knowledge discovery" and may change the metrics of scientific attribution. Specifically interaction between traditionally separated chemical and biological data was also addressed.

## 7.9 Session (5): “ Internet Governance in the Arab Region ”



### **Fahd Batayneh, Coordinator, Stakeholder Engagement, Middle East, ICANN, Jordan**

Mr. Batayneh talked about the Internet governance as it is the development and application by all stakeholders (business and the private sector, governments, civil society and academic and technical community) in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the Internet.

There are several general topics discussed within the Internet Governance Ecosystem; these topics are: access, diversity, openness, security, Critical Internet Resources (CIR), and privacy and human rights. There are couple of organizations within Internet Governance Ecosystem that actually work on Internet related topics, with technical or policy development, they are called the I\*Organizations, such as ICANN, ISOC, IETF, IAB, RIRs, RTLDs, and IGF. Mr. Batayneh gave a brief about The Internet Governance Forum (IGF) which is an annual event since 2006 that attracts all stakeholders to discuss and share experiences and best-practices. One way to feed the Global Internet Governance Forum is to have regional and local internet governance forums. Mr. Batayneh listed many examples and gave more details about the Arab IGF.

There are summer schools on Internet Governance, where students are brought in for 3-5 days of extensive training and workshops on Internet Governance, and teach participants on the A-Z of Internet Governance. Some versions of such schools include the European and South Summer School on IG. The inaugural Arab version of such a school took place in Kuwait during May 25-29, 2014 under the name “Middle East and Adjoining Countries School on IG”.

Mr. Batayneh answered guests question about how ICANN convince the governance, feedback examples from people who adopted ICANN model and how they process the feedback, and how NREN can be part of the I\* Organization.

## 7.10 Session (6): “ Trends in Global Networking ”

### **Johnathon Chapman, US Internet2 Special Interest Group Middle East (Internet2 SIG), Qatar (CHAIR)**



### **Greg Cole, “GLORIAD: The Next Generation of Innovations, Services, Communities and Leaders”, Principal Investigator and Director, GLORIAD, USA**

Beginning work in 1997 deploying the first R&E network connecting the US and Russia (MIRnet), the Global Ring Network for Advanced Applications Development (GLORIAD) has expanded and evolved through nearly 20 years of service into a loosely-organized community of individuals and organizations around the globe sharing core values about science collaboration via open networking and committed to building

and cooperatively managing leading-edge information and communications infrastructure connecting scientists, educators and students through a grass-roots, bottom-up approach. The “ring of rings” GLORIAD network facilitates shared work on challenges common to all cultures in virtually all domains of science, education, health care and infrastructure. It is community-born, community-driven and community-led – ever evolving, synergistic, center-less, diverse, tolerant, informal and intensely purposeful – standing on the shoulders of and building on the good work of those who gave the world a common Internet infrastructure. While contributing partners include the US, Egypt, Russia, China, Korea, Canada, Netherlands, the Nordic Countries, India, Singapore and Malaysia, GLORIAD is open to all who wish to join and contribute; it is strongly affiliated with and committed to the openness, transparent governance and shared resources model of the GLIF ([www.glif.is](http://www.glif.is)).

The presentation briefly introduced the GLORIAD family, network and application communities – and then described plans for a next generation of services, innovations, communities and leadership. Emphasis was placed on describing science-responsive infrastructure given recent work on open exchanges, software defined networking, dynamic provisioning of network services and much higher link capacities (100 Gbps and beyond). GLORIAD’s recent work on the InSight performance verification system was introduced as well as its new ventures to “crowd source” operations, cybersecurity and science application support - leveraging broad community cooperation via information sharing and social media technologies. The presentation concluded with a description of efforts to engage new communities around the world with a special focus on attracting young people into the areas of network research, operations, performance measurement and security.



**Alexander van den Hil, “SURFnet: Network Services and International Collaboration”, Product Manager, SURFNet, Netherlands**

SURFnet’s mission is to boost the quality of higher education and research through the support, innovation, development and operation of an advanced and interconnected ICT infrastructure, enabling the potential of ICT to its full extent.

In this way SURFnet is working to create a connected world in which simple and reliable tools are available to ensure universal connectivity and access.

SURFnet7 is the latest SURFnet network generation, and offers new connectivity features such as the Multi Service Port (MSP). MSPs allow users to connect to the SURFnet7 network in new ways. They can be simultaneously connected to multiple network services such as lightpaths. New lightpaths can also be added to an MSP very easily. SURFnet has developed software to allow users to setup lightpaths independently

SURFnet7 is available in locations in the Netherlands and its neighboring countries via an 11,000-km fiber optic network. Connections between the core locations around the country are illuminated using SURFnet’s optical equipment. This equipment allows the fibers to be illuminated at different wavelengths.

NetherLight is SURFnet’s open lightpath exchange: Any party can join and link up with an

unlimited number of connected other parties. NetherLight brings cloud services over lightpaths, which in turn enable collaboration with parties outside the campus network without losing control. Research universities and universities of applied sciences that have a Multi Service Port on SURFnet7 can use the available bandwidth to easily set up a light path to parties on NetherLight and to each other.

NetherLight also has excellent access to networks outside the Netherlands. SURFnet GEANT and other National Research and Education Networks have international network connections to NetherLight that can be used for applications in their respective fields. Cities around the world, including Chicago, New York, London, Geneva, Prague, Hamburg, Copenhagen, Moscow, Thuwal, Taipei, Doha and Seoul, are connected to NetherLight. NetherLight is therefore part of the Global Lambda Integrated Facility (GLIF). Numerous international destinations can be reached through this global collaboration, which comprises network connections and open exchanges.

To keep NRENs well-connected SURFnet collaborates closely with other NREN at individual, GEANT or global scale. One of the example projects is titled the "Advanced North Atlantic 100G" or ANA-100G. The goal is to stimulate the market for 100 Gbps intercontinental networking and to advance global networks and applications to benefit research and education.



**Marco Brandstaetter, "UAE-IX the Internet Exchange for the Middle East", Business Development, UAE-IX, Austria**

Mr. Brandstaetter presented the UAE-IX as an neutral Internet traffic exchange platform that interconnects global networks and, above all, network operators and content providers in the GCC region. UAE-IX is built on a fully redundant switching platform located in two high-class secure data centers in Dubai. Initiated by the UAE's Telecommunication Regulatory Authority (TRA) and fully managed by DE-CIX, who operates the world's largest Internet Exchange based in Frankfurt, Germany, UAE-IX delivers a highly available local alternative for regional traffic exchange, localizing Internet content. UAE-IX will reduce latency times by up to 80 per cent and costs by up to 70 per cent for GCC providers. Moreover, UAE-IX will improve IP network resilience and robustness and will also help provide reliable connectivity within the GCC.

He expressed that the Gulf economy is booming and so is the region's data traffic. HDTV, online gaming, multimedia, and cloud computing are driving data traffic here as well. Until now, Internet service providers in the GCC region have had to exchange their traffic via Europe, Asia or North America, leading to high latency rates. Initiated by the UAE's Telecommunication Regulatory Authority (TRA) and supported by DE-CIX, UAE-IX delivers a highly available local alternative for regional traffic exchange, localizing Internet content. It will dramatically improve routing efficiency and the quality of the Internet experience for end-users.



**Nasir Memon, “Cyber Stability and Security in the Gulf: Challenges and Opportunities”, Professor, New York University, USA**

Mr. Memon talked about the computing as it is becoming centered on the vast amounts of information captured and made accessible as all humans and devices get connected into to an “Internet of Humans and Things” (IoHT). By 2020 it is expected that 20 billion devices will be connected to the Internet and this is further projected to reach a trillion, soon after. IoHT will span the energy grid, water supply, law and order, first responder networks, health care systems and transportation systems. It will encompass medical implants, alarm clocks, wearable systems, automobiles, washing machines and traffic lights. This talk discussed challenges that will have to be overcome from a security and privacy point of view as we move towards the vision of IoHT and the tremendous benefits it can bring.



**Sami Salih, “Deployment of IPv6: Case of SudREN”, CEO, SudREN, Sudan**

Mr. Salih expressed the importance of IPv6 for the long-term sustainability of the Internet. The current IP addressing protocol (IPv4) contains only around 3.7 billion Public IP Addresses, which can not hold ground against today’s ever-growing demand for Internet access specially with the introduction of smartphones, tablets, PC, gaming systems, and just about everything else connecting to the Internet. Major Internet Service Providers (ISPs), vendors, and networking equipment manufacturers, and web companies around the world are permanently enabling IPv6 for their products and services.

Locally in Sudan, IPv6 has a big support from operators and regulators. In 2010, the National Telecommunication Committee put forth an IPv6 migration plan and formed the Sudanese IPv6 Task Force (SDv6TF) followed by a set of workshops and seminars to spread the awareness of IPv6 within the community.

Mr. Salih confirmed that on June 10th 2014 SudREN completed its IPv6 preparation and started announcing its prefixes to the world following its peers and other service providers taking the next step in IP Addressing. Currently most of SudREN services are running both IPv4 and IPv6.

## 7.11 Session (7): “ CERN and Regional Cooperation ”



**Patrick Fasnacht, “CERN: from Fundamental Science to Daily Applications”, Adviser to DG for MENA, CERN, Switzerland (CHAIR)**

Mr. Fasnacht gave an overview about the European Organization for Nuclear Research, physicists and engineers (CERN) which was founded in 1954. In the meantime it has 21 member states, with 2300 staff scientific users, more than 10 thousand users, 10 applications, and more than 40 international agreement have been signed (ICAs). He also explored the mission and vision of CERN in accelerating science and innovation.

Mr. Fassnacht showed maps charts of the Middle East countries which has collaboration with CERN, also charts on the age distribution of scientists in CERN where more than two thousands scientists are involved. He also demonstrated CERN interfaces between fundamental science and key technological developments; this is essentially in the area of accelerating, detectors and computing. He briefed CERN education activities and programs such as the Academic Training Programme, Summer Physics Students Program and teachers programs worldwide.

In general, CERN is not only big science, it is also innovation and technology, it is training of students and teachers, and it brings people together.



**Albert De Roeck, "Experiments at the Large Hadron Collider at CERN: Challenges and Opportunities", Senior Research Scientist, CERN, Switzerland**

The Large Hadron Collider (LHC) has produced proton-proton collisions at a centre of mass energy of 8 Tera-Electron Volt (TeV). These are the most energetic collisions ever produced in the laboratory. The Large Hadron Collider is a circular atom smashers of 27 kilometers of length located 100 m underground at the CERN laboratory near Geneva, Switzerland. The LHC is probably the most complex scientific instrument build by mankind so far. It's science goal is to help us understand what the smallest building blocks of matter are, how they interact, and what the conditions were at the very beginning of the creation of our Universe.

Large experiments have been constructed at the four interaction points of the LHC, to detect and study the particles created in these high energy collisions. The results of the 2010-2012 data taking run have led to the much acclaimed discovery of the Higgs boson, a very new kind of fundamental particle that helps to explain why the Universe is as we observe it.

This overview discussed the Large Hadron Collider complex and its main experiments. Cutting edge technologies have been used and are further planned for the upgrades of the present detectors. The plans for the next 20 years at the LHC were discussed. Opportunities for Arab states in joining the CERN science program were presented.



**Tony Cass, "The Worldwide LHC Computing Grid and its Network Connections", Head of Communication Systems, CERN, Switzerland**

The Worldwide LHC Computing Grid (WLCG) links over 150 computer centres into a powerful computing facility able to meet the unprecedented demands of the LHC experiments in their search for ground-breaking physics results. This brief presentation gave an overview of WLCG as a whole, highlighting the network infrastructure that links CERN to the Tier1 centres which share custodial responsibility for the LHC data and to the Tier2 centres at universities around the globe.



**Salman Matalgah, “SESAME as an International Research Lab”, Computing Group Leader, SESAME, Jordan**

SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East) is a third-generation synchrotron light source under construction in Allan (Jordan). It will be the Middle East’s first major international research center. The main aim is to foster scientific and technological excellence in the Middle

East and neighboring countries (and prevent or reverse the brain drain) by enabling world-class scientific research in subjects ranging from biology, archaeology and medical sciences through basic properties of materials science, physics, chemistry, and life sciences; and build scientific and cultural bridges between diverse societies, and contribute to a culture of peace through international cooperation in science.

In each experimental lab at SESAME (Namely Beamline) collaboration between scientists including graduate students, from universities and research institutes from world-wide among centers/countries will return home to analyze the data they have obtained from SESAME experiments, the amount of data vary depends on each experiment type and image detectors, in many cases the produced row data could reach few Tera Bytes, this led users’ to be more demanding for both the computing processing power and networking to operate in-site/off-site the pre and post processing on SESAME’s Beamline’s data.

One of the main responsibilities on The Computing Group at SESAME is to maintain all users’ demands from basic infrastructure services, data transfer to the advance High Performance Computing (HPC) infrastructure. For that purpose SESAME is engaged with IMAN1 (The Jordan’s National Supercomputing Center) The main project objective is to enable scientific computational research in the region by engaging and supporting research communities with providing extensive HPC user support, training, develop and implement a well-structured HPC resource allocation mechanism and operations.

### 7.12 Roundtable (3): “Technology Prospects”

**Mohammad Mabrouk, Manager, Network Operations, Ankabut, UAE (Moderator)**



**Yves Poppe, “ASREN and High Performance Computing (HPC)”, Transcontinental Supercomputing Networking, A\*STAR Computational Resource Centre, Singapore**

A\*STAR is the agency for science research and networking in Singapore, and now they are working on a technology to maximise the throughput between two sites, they started with Physionopoles and Biopolis sites in Singapore. The work is based on the InfiniBand which is the protocol that enables the cores of the supercomputer to talk to each other. These two sites are now connected at 80gbps.

There is another idea behind that which is NSCC (National Supercomputer Centre), and that approved by the minister of education in Singapore. The goal of NSCC is to get the budget for two PetaFLOP machine, and part of that budget is international connectivity to the US, Japan,

Europe, and the hope it could be for the AGE-OX in the Middle East. Mr. Poppe continued, TCP has a curse; it falls apart when you go to higher speed, so InfiniBand is the magic portion with RDMA (Remote Direct Memory Access), which is a kind of buss analogue, and that's the magic portion of supercomputing. RDMA has undeniable virtues. Mr. Poppe also explained the InfiniBand Jailbreak technology. A\*STAR now working on Infinicortex that is to develop new algorithms to have a supercomputer of supercomputers.

Mr. Poppe showed some charts on the data transfer speed. The next step is to try the IP over InfiniBand. He also encouraged the NRENs of ASREN region to start implementing the InfiniBand networks to their communities to satisfy the needs of HPCs.



**Michael Moore, “Are We Really Impacting Teaching and Learning?”, Senior Advisory Consultant, D2L Corporation, Canada**

Mr. Moore introduced Desire to Learn (D2L) which is a Canadian company that integrates learning systems platforms for education. He talked about the uses of data to improve educational outcomes for graduates and to transform the educational experience. In this context, Mr. Moore explained in details D2L LeaP platform which serve both the students at providing them with focused learning options at any given time, and instructors where the D2L LeaP is a powerful assistive learning tool that quickly and easily enables instructors to optimize learning outcomes by delivering the capability to craft a more personalized learner experience.

Mr. Moore also demonstrated the importance of the D2L LeaP in personalizing the learning experience, engaging, empowering, optimizing the learning outcomes, harnessing your learning content, and monitoring the learner progression and achievement.



**Mohammed Husamaddin, “Disruptive Technologies Change the Face of Higher Education”, Director, Knowledge Assets Management, Naseej, Saudi Arabia**

Higher Education institutions are at a cross section on their strive to achieve goals. The balance between organizational effectiveness vs organizational efficiency is more and more driving up institutions and driving

Higher Education institutions are at a cross section on their strive to achieve goals. The balance between organizational effectiveness vs organizational efficiency is more and more driving up institutions and driving many out. Rapid technological innovations, while presented many challenges, can also be the vehicle for unique differentiation. Mr. Husamaddin suggested a strategy framework to face these challenges.

The higher education space is really facing many challenges in terms of technology, that is coming up very quickly and fast, which we are unable to coop with, and this lefts the CTO of the academic institutions at the challenge of how they meet the expectations of users, community, and faculties as well. Mr. Husamddine described the “Scenario Based Planning” framework as a solution which is very helpful for universities and Naseej can help for implementing this framework. He talked about its benefits, places where this framework is already implemented and how this framework acheives the objectives of the institution.

## 7.13 Session (8): “ Scientific Contributions ”



### **Rafael Mayo García, “CHAIN-REDS Application Use Cases on Data Management”, Senior Researcher, CIEMAT, Spain (CHAIR)**

CHAIN-REDS started on December 2012 and focuses on promoting and supporting technological and scientific collaboration across different e-Infrastructures established and operated in various continents. After two years of work, specific results on data handling (use, management, exploitation and interoperability) are presented with a special focus on Arab use cases.



### **Bremananth Ramachandran, “An Efficient Approach of e-Iris Enrolling and Authentication for FS e-Apps”, Associate Professor, Sur University College, Oman**

E-Enrolling and authentication is an essential task for any kind of e-apps (e-applications). In this paper, a framework has been proposed on how to provide the e-enrolling and authentication for Financial Sector (FS) e-apps. E-iris and e-imaging security in the exiting official communication is an essential and challenging task in the present scenario. We suggest a method of e-imaging and feature extraction and provide e-authentication. A proposed framework consists of e-enrolling related issues, e-authentication, cryptography for authenticating e-users, and e-iris sign in FS. Unlike other biometrics such as the fingerprint, palm, gait, retina, face, eras, and lips, the iris biometric is the best choice for deploying with the exiting e-apps. Because, an Iris has many distinctive textures which are aptly computed and discriminated diverse e-users. In the e-enrolling, e-user has to enroll Iris features through a Java run time (JRE) interface. A sequence of algorithm has been performed to localize e-user's Iris and extract features. On successful enrolment, e-user can access FS e-apps based on the diverse level of options. Unlike traditional e-apps, e-Iris system can provide more secure communication and avoiding multiple verifications. As result computational complexity of existing e-apps has been reduced by developing e-Iris framework. In addition, Iris patterns of both eyes are chaotically distributed and well-matched to grant authentication to the genuine e-users throughout their lifetime with a single enlistment. In this framework, we suggest e-imaging phase, e-authentication, cryptography tunneling, recover procedures, and deployment of e-Iris system with existing FS e-apps. The proposed framework has been implemented in JRE and tested with diverse kind of e-users in different real-life scenarios. This paper also includes some of implementation issues of e-Iris system in the e-apps.



### **Ognjen Prnjat, “Surveying Clouds in the Global Environment”, European and Regional e-Infrastructure Manager, GRNET, Greece**

This paper reports on the results of the survey regarding the Research and Education (R&E) clouds in a number of world regions covered by the CHAIN-REDS project, including the Arab region. The survey includes the technical aspects of R&E clouds, as well as issues related to interoperation, interoperability, compatibility, orchestration and federation. Results obtained show a high interest in standards, thus pointing to the fact that the cloud federation solutions offered by CHAIN-REDS, which include a global cloud federation test-bed and the use of OCCI and CDMI standards, provide a building block for global cloud federated environment.



**Ognjen Prnjat, “Shared Computing Infrastructures: A Regional Operational Approach”, European and Regional e-Infrastructure Manager, GRNET, Greece**

Modern research relies on the ability to share storage and computational resources, as well as algorithms and data, between research groups on national, regional and global levels. This paper presents a case study for regional organization of computational resource sharing and joint operations, enabling international research over a spectrum of scientific fields. The case study is based on 10 years of multiple high-end technology projects in South-East European region, including both Grid Computing and High-Performance Computing. The case study is considered as a useful model for organising computing resource sharing in other world regions, including the Arab region, as currently promoted by the project CHAIN-REDS.



**Karim Zerhouni, “Comprehensive Distance - Flexible Learning through the Latest in Collaboration and Virtualization”, Chief Information Officer, American University of Central Asia, Kyrgyzstan**

Colleges and universities need new tools to enrich coursework, enhance flexibility, and attract the best students and faculty. A virtual classroom distance learning solution supported by a BYOD policy enforced campus wide, lets institutions of higher education reach students anywhere, anytime, realizing a better return on technology investments by blending fully interactive and recordable audio, video, and Web conferencing capabilities on any capable device owned by the recipient. With this design, and using these tools, colleges and universities can extend the walls of their classrooms in both space and time, and bring the rest of the world to their campuses.



**Mimoun Hajj, “Aromatic Hydrodecyclization of Using Catalysts Based on Molybdenum and Tungsten Supported on the Remblend of Kaolin”, Professor, University of Boumerdes, Algeria**

The study consists of the valorization of petroleum fractions rich on polyaromatics diesel fuel using clay catalysts. In this way, Remblend Kaolin was used to prepare two kinds of catalysts.

The first is monometallic, consisting of molybdenum and the second is bimetallic, consisting of molybdenum and tungsten. The product used is the average aromatics. The study is based on the change in the content of aromatics in terms of temperature, under constant hydrogen pressure.



**Abubkr Abdelsadiq, “Towards Libyan Research and Education Network (LibREN)”, Elmergib University, Libya**

The LibREN (Libyan Research and Education Network) aims to enhance higher education and research activities in Libya. Through which universities and research institutions would exchange information, collaborate economically, and approach a world leading research. This paper discussed general issues of LibREN; it introduced the connectivity model and the funding model of the prospective network. We also discussed how the proposed framework would establish collaborative educational virtual environment.

## 8. Closing



At the joint closing with AROQA for the two successful days of activities, Dr. Salih Hashem, the former Secretary General of the Association of Arab Universities, on behalf of HE Dr. Talal Abu-Ghazaleh, expressed appreciation to HH Taimur Bin As'ad Al Said, HE Dr. Hilal Al Hinai and all who joined, participated, supported or helped in making it a success. Salem Alagdash presented the event summary and conclusions under the name "Muscat Declarations" which can be found later in this document. Yousef Torman concluded by thanking all Omani people who have helped by all means to make this a success as well as all committees' members. At the end, he invited HE Prof. Khawla Shaksheir, Palestinian Minister of Education and Dr. Abdulmunem Al-Kharusi from University of Nizwa for handing the appreciation shields to the following:



The Research Council for hosting the event



EUMEDCONNECT3 Project



Dr. Barend Mons, Chair of DTL-data and Head of ELIXIR node NL, Netherlands, as a keynote speaker



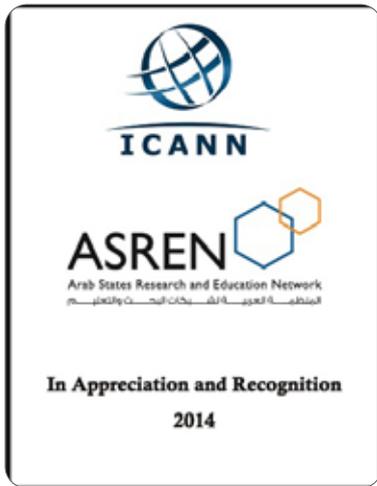
Dr. Terence Clifford, International Consultant, United Kingdom



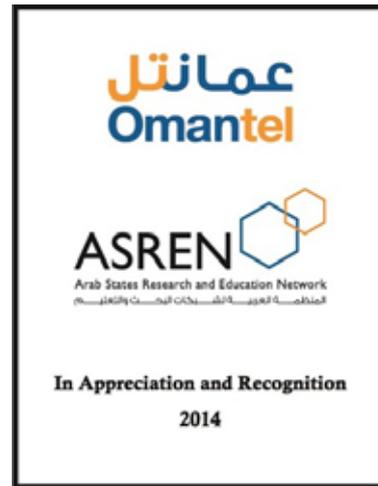
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## 9. Muscat Declarations

MUSCAT --- December 11, 2014 ---- Under the patronage of His Highness Sayyid Taimur Bin As'ad Al Said and Chaired by His Excellency Dr. Talal Abu-Ghazaleh (Chairman of ASREN), the 4th "International Platform on Integrating Arab e-infrastructure in a Global Environment, e-AGE 2014" concluded with a wide high level participation and delegates from over 40 countries.

It has been recognized that the Arab region has attained a certain level of development towards developing advanced e-Infrastructure and it is important for the Arab States Research and Education Network to make use of its current potential in strengthening research connectivity and make it available for use on a regional scale as well as developing regional points of exchange, one of them currently operational in London and another to be established in Fujaira.

It is our duty at ASREN to provide regional e-infrastructure networking and services, for the benefit of the research and educational institutions that are members of ASREN together with the wider regional research and education community.

The e-AGE platform organized by ASREN on December 10-11, 2014 has set among its priorities, the development of pan-Arab e-Infrastructure and services, coordination with regional e-infrastructures, and enhancement of research and education cooperation in a wide range of activities, among the Arab countries and with communities in Europe, the US, Canada, Latin America, Africa, and the world at large.

In addition, it is our objective that a suitable medium for dialogue is created to facilitate investments needed for regional links and capacity for research and education through preparation and execution of national and regional e-Infrastructure projects. It is important that this dialogue and debate are based on objective grounds motivated by the long-term strategies and interests of our countries in the Arab region.

We deem it inspiring that e-AGE was attended by esteemed speakers, policy makers, experts, and scientists representing all the Arab countries, Europe, the US, Africa, Latin America, Canada, Asia, and international organizations and companies in a larger audience scale, representing over 40 countries. We see this as a manifestation of the sound basis and the respectable sustainability of the dialogue environment towards developing Arab research and education networks.

It is of the utmost importance that we build on the success of e-AGE and take necessary steps towards developing Arab e-Infrastructure and linking to the world research and education communities on a global scale.

It is also of great importance that we make use of the support of the League of Arab States, the European commission, and the international donors to initiate cooperation and develop sustainable projects towards connectivity and ensurance of a sense of self dependence.

It is of significant value that the Arab NRENs, the European GEANT, the US Internet2, and the

Asia Pacific APAN have come together and declared to continue cooperation in order to develop sustainable and interoperable e-Infrastructures, providing support to scientists and researchers across the world.

After presenting topics, holding meetings and deliberating between delegations and participants, e-AGE concluded:

- To address deep thanks and appreciation to His Highness Sayyid Taimur Bin As'ad Al Said in the name of the participants for his highness's support
- To address a thanks and appreciation to the Research Council for their host and support
- To follow His Highness mandate in establishing links to China and far east
- To adopt ASREN programs and strategy for the upcoming stage, with focus on a pan-Arab e-infrastructure and inter-continental connectivity
- To strengthen collaboration with the League of Arab States and the Arab countries themselves towards developing an e-integration of educational networks in the Arab countries
- To continue to focus on the ASREN main exchange points, now operational in London, currently being deployed at Fujairah with UAE Ankabut and planned in Alexandri in cooperation with Egypt Universities Network
- To plan for the fifth e-AGE in December in 2015

Also concluded on a concrete basis:

- To accelerate the integration of Arab e-infrastructure and connecting them with the European, the US, the Latin American, and the African research and education Networks through ASREN main exchange points in London and Fujaira
- To continue to support the relatively well established NRENs such as in Jordan, Algeria, Egypt, Morocco, Tunisia and Palestine, especially where facing temporary sustainability issues
- To continue to support the development of research and education infrastructure in Lebanon, Bahrain, Yemen, Libya, and Iraq
- To continue to support peering of emerging networks in Oman and Qatar
- To emphasize the importance to extend effective participation of ASREN, integrate Arab unified e-infrastructure and promote the role of research and education communities in the Arab world.
- To encourage the participation of Arab NRENs in ASREN regional network and peering at ASREN hubs in London and Fujairah
- To deploy network services of direct benefit to Arab NRENs and researchers including EduRoam, EduGain and Science Gateway as well as seamless access to services and repositories
- To benefit from and build upon the success of the EUMEDCONNECT, CHAIN-REDs and other EC funded projects in the field of developing cooperation and coordination between Arab and European researchers, and should tackle joint scientific research projects that use scientific infrastructure between countries
- To encourage and attract donors, research foundations and supporting organizations in

the Arab region, Europe and the world to support ASREN development as well as research infrastructures in the Arab world.

- To promote private sector's participation and cooperation in developing research and education

This year e-AGE has witnessed the launch of ASREN's exchange point in London and international linkage between Jordan and UK for research and education at a capacity of 155 Mbps and supported by Talal Abu Ghazaleh Organization. It has also witnessed the announcement of the continuing support of EC to Arab e-Infrastructure in the context of EUMEDCONNECT

A strong and high level participation from the European Commission DG Connect has been witnessed in an effort to support and create research cooperation with Oman and the Gulf research communities.

It is also encouraged to provide a full report on the fruits of the EC funding in support Arab e-Infrastructure and services as well as to develop a proposal for long term cooperation in the context of Horizon 2020.

On behalf of the Research Council, the League of Arab States, the shareholders of ASREN, EUMEDCONNECT, CHAIN-REDS, and the participating organizations, we thank all those who have contributed to e-AGE and we hope that it has successfully served as an effective medium in attaining a convincing environment towards achieving our goals in developing stronger research and education communities in the Arab region and beyond.

With all respect and appreciation,

**Dr. Talal Abu-Ghazaleh**

Chairman of ASREN

## 10. AROQA Workshop

### “Ensuring Congruence between Internal and External Quality Assurance (IQA) (EQA)”

The workshop consisted of two main sessions. Its aim was to define the essential practices in designing and operating Quality Systems that promote unity and synthesis in IQA and EQA and the high standards required towards realizing the vision of AROQA. With reference to the European Foundation for Quality Management (EFQM) Excellence Model, the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and progress in developing a Pan-Arab Quality Framework.

The workshop commenced with a brief outline of the need for this synthesis and practice, addressing:

- whole institutional quality culture;
- validation and accreditation;
- student self-assessment;
- institutional self-assessment;
- responsibilities of academic administrative and support faculties, departments, units;
- internal periodic reviews (processes and report writing) and EQA modeling;
- gathering and handling evidence;
- stakeholders;
- profiling quality;
- knowledge of EQA and developing confidence in transparency and submission to scrutiny;
- Ensuring that IQA is not an overly intrusive, burdensome, obtrusive and dislikeable practice.

The practical activity was (in designated working groups) to produce the outline of a document advising an Institutional Governing Body (or similar authoritative Board in home HE institutions) on future strategies and practice to realize high standards in IQA and EQA and their closer working relationship.

## 11. AROQA 6<sup>th</sup> Conference

The importance of AROQA annual conferences arise from our sense of responsibility towards the future of education in the Arab world. Such a future requires us to raise the level of awareness among Arab educational institutions on the importance of accreditation and quality assurance, and work together towards building and enhancing the Pan-Arab educational systems and structures.

AROQA's 6th Annual Conference entitled “Patterns of Education and Related Quality Standards” served as a platform for the promotion of quality in education. It is brought together academics, policy leaders, representatives of quality assurance and accreditation agencies and quality experts. The objective was to discuss the new patterns of education, the mechanisms of applying related quality standards, development of an educational models and successful adoption of systems to ensure the quality of education.

The Conference held five sessions in addition to the opening and closing sessions, the workshop, founding meeting of the Association of Arab e-Universities, and annual general assembly meeting. The themes of the sessions were:

1. Challenges in the implementation of quality assurances and accreditation systems
2. Unification of academic qualifications and accreditation models
3. Quality management models
4. Quality and accreditation Standards- Open and digital education
5. Best-Practices Benchmarking for excellence in Higher education in MENA

During AROQA 2014, it has been recognized that the Arab region has attained a certain level of development towards developing quality education and it is important for the Arab Organization for Quality Assurance in Education (AROQA) to make use of its current potential in strengthening quality systems and developing accreditation in cooperation with international accreditation agencies.

#### **AROQA 2014 has launched:**

- The Association of Arab e-Universities under the umbrella of the League of Arab States, to be hosted at Hamdan Bin Hamad Smart University
- The quality systems, processes, and accreditation standards for K-12 school education
- The Arab Journal for Quality Assurance in Education as a peer-reviewed and indexed Journal

AROQA has set among its priorities, the development of pan-Arab quality systems and accreditation for higher education, the pan-Arab quality standards and accreditation of digital universities and to closely coordinate with national quality assurance and accreditation commissions in the Arab countries, and enhancement of cooperation with international organizations in a wide range of activities.

#### **The following represent the main conclusions:**

- To develop quality assurance standards and accreditation for training and digital education
- To continue a dialogue and cooperation between education institutions and accrediting bodies and quality organizations to consolidate the concepts of quality and accreditation at the Arab regional level
- There is an urgent need to promote a culture of quality and certification systems and improve the quality of education in the Arab educational institutions
- There is a need for continuous dialogue and continuous deployment of best practices related to quality in education
- Support initiatives aimed at enhancing the quality of education and work on further studies and research related to quality and accreditation
- Promote sustainable cooperation among educational institutions and bodies of quality and accreditation and launch programs to promote joint research that addresses quality and accreditation
- Strengthen the role of the Secretariat of the League of Arab States and the Arab Organization for Education, Science and Culture and the Arab Organization for Quality Assurance in Education and coordination among these institutions to work to support the establishment of a comprehensive system of a pan – Arab quality initiative
- Identify common priorities of quality and accreditation in Arab educational institutions
- Develop action plans to establish a pan-Arab educational space to promote educational exchanges and academic recognition

- Create the environment and conditions for AROQA to become an independent Arab accreditation body recognized in the Arab region and without any dependency on any legal or legislative or executive of any government or union

## 12. e-AGE 2015

It was decided to have the 5th International Platform on Integrating Arab e-Infrastructure in a Global Environment e-AGE 2014 in Morocco in December 2015.

## 13. ANNEX

### Organizers and Partners

The Platform is organized by Arab States Research and Education Network GmbH, in cooperation with:

- The Research Council of Oman (TRC)
- Talal Abu-Ghazaleh Organization (TAG-Org)
- Delivery of Advanced Network Technology to Europe Ltd (DANTE)
- Euro-Mediterranean Connect project (EUMEDCONNECT3)
- US Internet2 Special Interest Group Middle East (Internet2)
- Co-ordination & Harmonization of Advanced e-Infrastructures for Research & Education Data Sharing (CHAIN - REDS)

### Program Committee



Ahmed Dabbagh, Emirates Identity Authority, UAE



Boubakar Barry, West and Central African Research and Education Network (WACREN), Senegal



David West, Delivery of Advanced Network Technology to Europe (DANTE), UK



Federica Tanlongo, Consortium GARR, Italy



Federico Ruggieri, The Italian National Institute of Nuclear Physics (INFN), Italy



Habib Youssef, The Computing Center Al Khwarizmi (CCK), Tunisia



Helga Spitaler, Delivery of Advanced Network Technology to Europe (DANTE), UK



Johnathon Chapman, US Internet2 Special Interest Group Middle East (Internet2 SIG), Qatar



Mwaffaq Ootom, Yarmouk University (YU), Jordan



Ola Samara, Arab States Research and Education Network (ASREN), Jordan



Salem Al-Agtash, German Jordanian University (GJU), Jordan



Sara Al-Eisawi, Arab Organisation for Quality Assurance in Education (AROQA), Jordan



Yousef Torman, Arab States Research and Education Network (ASREN), Germany

### Organizing Committee



Juma Al Balushi, The Research Council (TRC), Oman



Maisoon Kawwar, Talal Abu-Ghazaleh Organisation (TAG-Org), Oman



Majdi Al-Abiad, Talal Abu-Ghazaleh Organisation (TAG-Org), Oman



Ola Samara, Arab States Research and Education Network (ASREN), Jordan



Warda Al Habsi, The Research Council (TRC), Oman



Yousef Torman, Arab States Research and Education Network (ASREN), Jordan

### Scientific Committee



Ahmed Dabbagh, Emirates Identity Authority, UAE



Federico Ruggieri, The Italian National Institute of Nuclear Physics (INFN), Italy



Boubakar Barry, West and Central African Research and Education Network (WACREN), Senegal



Salem Al-Agtash, German Jordanian University (GJU), Jordan

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At the forefront of CERN research is the largest scientific tool in the world, the Large Hadron Collider. A particle accelerator 27km in circumference, the LHC is buried 100 metres underground. Four huge detectors study the particle collisions generated by the LHC. Two of these – ATLAS and CMS - recently found the Higgs boson, one of the greatest discoveries in physics.

To conduct science at the frontiers of knowledge, CERN develops state-of-the-art technology, which has found applications in fields as diverse as vacuums and medicine. As well as knowledge transfer, CERN educates the scientists of tomorrow through its education and outreach programmes.

Founded in 1954 and based astride the Franco-Swiss border near Geneva, CERN has become a prime example of international collaboration. It has 21 Member States and involves today more than 10,000 scientists of almost 100 nationalities.



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RIPE NCC is an independent, not-for-profit membership organisation that supports the infrastructure of the Internet through technical coordination in Europe, Middle East and parts of Central Asia. The most prominent activity of the RIPE NCC is to act as the Regional Internet Registry (RIR) providing global Internet resources and related services (IPv4, IPv6 and AS Number resources) to members in the RIPE NCC service region. The RIPE NCC also provides services for the benefit of the Internet community at large.

RIPE NCC members are mainly Internet Service Providers (ISPs), telecommunication organisations, large corporations and governments located in Europe, the Middle East and parts of Central Asia. The RIPE NCC operates from its main office in Amsterdam, the Netherlands and from its new regional office in Dubai.

By expanding its presence in the Middle East, the RIPE NCC hopes to meet increased demand for region-specific support in an area experiencing continuous growth in the Internet and related fields. The Dubai office has a growing team that will help the organisation engage effectively with its members, as well as industry representatives and government bodies in the region. The RIPE NCC has also appointed two local industry experts who will also be able to provide support in Arabic regarding both policy-related and technical issues.



**On 31 March 2014, the RIPE NCC opened its first regional office in Dubai to better connect with our members in the Middle East.**

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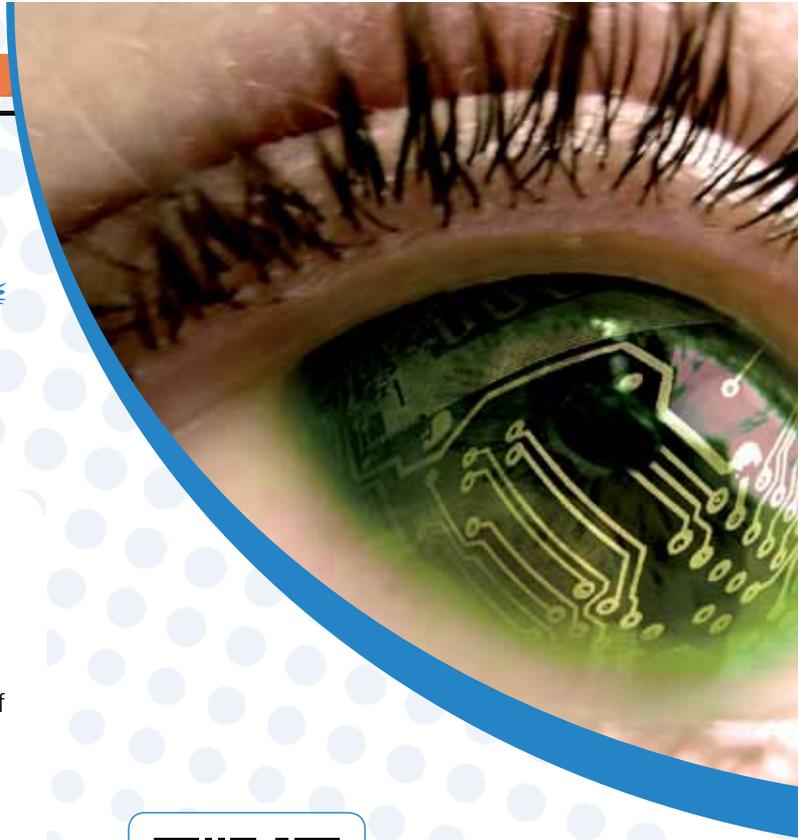
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- tales and talks, as well as **amazing multimedia** contents, for a broad perspective of the latest in digital art;
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digitalmeetsculture.net is the communication platform run by company Promoter, designed as an on-line magazine about the digital culture, that collects and shares information and events, globally. Currently, it counts over 16000 visits per month, 6000 readers and a large and constantly increasing number of registered users, from all over the world.

digitalmeetsculture.net is addressed to professionals belonging to different sectors as cultural heritage institutions (museums, libraries and archive managers), technical and scientific area (universities, IT experts, e-infrastructure providers, researchers and SMEs), training and education (teachers, students, vocational trainers).

digitalmeetsculture.net is aimed also to people interested in the digital art (artists, photographers, performers), and more generally to readers who want to be informed and up-to-date on what is happening in the domain of the encounter of digital technologies with culture and art.

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## Contact

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