

ASREN

Arab States Research and Education Network



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جامعة خليفة
Khalifa University

Summary Report e-AGE19

The 9th International Platform on Integrating
Arab e-Infrastructure in a Global Environment

**"GROUNDBREAKING RESEARCH AND
EDUCATION NETWORKS"**

Khalifa University, Abu Dhabi, UAE
11-12 December 2019



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1. Overview

ASREN, the Arab States Research and Education Network, is a nonprofit international organization, registered in Dusseldorf, Germany, on 3rd of June, 2011, under the umbrella of the League of Arab States. ASREN is the association of the Arab region National Research and Education Networks (NRENs), as well as their strategic partners, that aims 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.

Vision

“To boost scientific research, innovation and education levels in the Arab countries to the highest world standards by uplifting efficiency and productivity of research and education communities, and by setting up pan-Arab collaborative research and education projects and activities through high-speed networks.”

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.”

Objectives

- Build, maintain and consolidate regional e-Infrastructures dedicated to e-science and education across the Arab countries, by developing, managing and operating a regional network that interconnects the NRENs of the Arab countries.
- Create and sustain National Research and Education Networks (NRENs), by supporting them to implement leading-edge technological solutions while pursuing cost-effectiveness and favoring the exchange of expertise and best practices amongst NREN members.
- Facilitate collaboration and cooperation among scientists and educators in the Arab region by increasing the availability and accessibility of knowledge resources, promoting the development of content, facilitating knowledge exchange and transfer processes across the region and with relevant partners in Europe and worldwide.
- Promote the adoption and usage of e-Infrastructures and services among the scientific community, also through training and tutoring activities and strengthening regional partnerships and encouraging joint scientific research at all levels.

2. What is e-AGE all about?

Integrating Arab e-infrastructure in a Global Environment, e-AGE, is an annual international conference organized by the Arab States Research and Education Network, ASREN. Since the launch of ASREN in December 2010 at the League of Arab States, it was decided to organize e-AGE every year in one of the Arab countries. e-AGE is in line with ASREN’s major objectives that are related to dissemination and awareness, promotion of research collaboration and joint activities, and establishment of research networks in the Arab region and worldwide.

3. e-AGE19



e-AGE is a launching pad for Research and Education connectivity and cooperation. It brings together ASREN, EUMEDCONNECT, AfricaConnect, 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 research and education 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.

e-AGE19 was hosted by the United Arab Emirates' Advanced National Research and Education Network (Ankabut) at Khalifa University in Abu Dhabi, with a focus on demonstrated successes in using research and education e-Infrastructures and a need for interoperable high speed networks at national, regional and international levels. e-AGE19 main theme was "GROUNDBREAKING RESEARCH AND EDUCATION NETWORKS".

e-AGE19 included the following events and meetings:

- Main Conference e-AGE19, 11-12 Dec 2019
- The 9th annual meeting of ASREN
- EUMEDCONNECT3, Africaconenct2/3 and Internet2 Middle East SIG Meetings, 10 Dec 2019

4. Participants



As a Platform on Integrating Arab e-Infrastructure in a Global Environment, e-AGE19 was attended by more than 80 academics, network professionals, researchers, scientists, and high-level decision makers from governments, enterprises, NGOs, embassies, academia, and civil society. The e-AGE Platform is 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 Brazil, Cyprus, Egypt, Ghana, Iraq, Italy, Japan, Jordan, Lebanon, Morocco, Netherlands, Oman, Palestine, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the UAE, the UK, and the USA.

5. Highlights from the Opening Ceremony



5.1 Session (1): “Inauguration and High Level Opening”

Dr. Arif Al Hammadi, Executive Vice President of Khalifa University, UAE,

Dr. Al Hammadi commenced his speech by welcoming the distinguished guests and speakers, he expressed his pleasure to host the e-AGE20 conference, and his gratitude to the Arab States Research and Education Network for organizing this important event.

He continued: “As a higher education institution, Khalifa University acknowledges the continuous efforts of the Arab States Research and Education Network to integrate the Arab e-infrastructure in a global environment, linking universities and research and education institutions in the Arab world.”

Dr. Al Hammadi concluded his speech by wishing a successful event and fruitful conferences, which will result to an Arab vision to promote and develop cooperation in the field of education and scientific research.

Mr. Yousef Torman, "ASREN", Executive Director, ASREN, Jordan

Mr. Torman commenced his presentation by giving a brief on the NRENs and the RRENs: "Research and Education networks are non-commercial dedicated networks connecting the Universities, Schools, Research Centers, Hospitals, Museums and any other institution that may have research and education activities.

National Research and Education Networks (NRENs) are established to provide connectivity and communications services for the research and education communities at the national level, while Regional Research and Education Networks (RRENs) are connecting the NRENs to provide connectivity and services to researchers and educators across the borders."

He added: "NRENs now provide services beyond connectivity. This includes applications, collaboration tools, access and other infrastructure services to the R&E communities."

He also gave a brief on the Arab States Research and education Network (ASREN), its vision, mission and objectives, asserting that ASREN's original mission to establish a pan-Arab e-Infrastructures for research and education remains unchanged as we go further.

Mr. Torman concluded his presentation by highlighting the evolution of the NRENs in Arab World through out the years 2011-2019, acknowledging the European Commission's role in supporting the development of these NRENs through the EUMEDCONNECT and Africaconnect projects.

Dr. Fahem Al Nuaimi, "Ankabut", CEO, Ankabut, UAE

Dr. Fahem commenced his presentation by giving a brief introduction on Ankabut: "the United Arab Emirates' Advanced National Research and Education Network (NREN); is an initiative of Khalifa University and funded by ICT Fund with a vision to create an opportunity for the UAE to be a global leader in research and education. In addition to connecting universities, Ankabut can connect schools and public institutions together across the UAE with an effective cost model."

He also highlighted a number of technology services provided by Ankabut to its member institutions, one of which is Ankabut cloud "Mozoon", which is a cloud solution hosted in Ankabut to empower the role of Ankabut in supporting the education and the R&D in UAE along with enhancing the education experience by hosting vendors solutions. He added: "At Ankabut, we rely on a service co-creation/co-design model with our members and partners. Our specialized team includes best-of-class experts in networking, infrastructure, operations, applications, security, integration, IT services, and educational technology. We are the leading education technology and innovation enabler in the United Arab Emirates, and are leading the way for next-generation teaching and learning process in the region as a whole."

Dr. Fahem concluded his presentation by stressing on Ankabut's believes that offering network, processing and storage support is the best way to develop a collaborative approach to research and education in the United Arab Emirates and the region as a whole.

Dr. Saeed K.Aldhaheri , “The Digital Nation”, Chairman, Smart World, UAE

Dr. Saeed introduced his book “The Digital Nation” which is the first book-of-its-kind that explores the digital transformation of the United Arab Emirates and provides a comprehensive analysis of it’s digital transformation journey. The book uncovers the mindset and approach of the UAE’s rulers and its senior leaders from public and private sectors as they pursue a digital vision and bring it to life. Along with commentary on the country’s digital strategies and initiatives, and its numerous successes, the book also identifies and addresses the challenges faced, and gives unique perspectives on how these can be addressed. Informed by interviews with numerous senior public and private sector leaders and executives, the book offers lessons for leaders, executives, and innovators around the world as they look to thrive in the era of digital transformation. It also provides useful insights to multinational firms, startup entrepreneurs and talented executives who are keen to leverage the opportunities offered by the UAE’s digital economy and ecosystem.

HE Dr. Talal Abu Ghazaleh, Chairman of ASREN, Jordan

HE Dr. Abu-Ghazaleh commenced his speech by expressing his gratitude to the fascinating support of Khalifeh University and Ankabut for the development of the pan-Arab research and education activities and e-infrastructure networking, and for their generous host.

He conveyed his appreciation to HE Dr. Ahmad Aboul Gheit for his support as Honorary President of ASREN, and to the delegation of the League of Arab States – our partner in developing the Arab network for research and education.

HE also expressed his gratitude to the European Commission for its continued support and generous funding for the development of research and education networks in the Arab region, also his tribute to all Arab NRENs, partners and sponsors for their contribution and their role in the success of the e-AGE20 conference and activities.

He pointed a number of achievement including; the new phase of AfricaConnect Project, the joining of Palestine, Iraq, and Somalia as new official shareholders of ASREN, and the signing of cooperation agreement between ASREN and the Egyptian Universities Network for interconnecting to ASREN’s exchange point in London. And recognized the achievements of our partners in Algeria, Saudi Arabia, Somalia, Mauritania and the United Arab Emirates.

He added: “with 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. With GEANT, Ubuntunet Alliance, and WACREN, we will cooperate in AfricaConnect 3 to develop the pan-African Research and Education infrastructure and provide seamless access to high-speed networks across Africa.”

He commenced his speech by wishing for a furtfull meetings with outcomes that will consolidate our efforts together towards developing a better network infrastructure for a prosperous future of our young people.

5.2 Appreciation and Recognition



In recognition and honor for their efforts and their role in the success of the e-AGE20 conference and activities, and for their continuing support to ASREN, HE Dr. Talal Abu-Ghazaleh along with Dr. Arif Al Hammadi and Yousef Torman, have given the appreciation shields to the following:

1. Internet Society represented by Mr. Kevin Meynell for the support provided to ASREN and sponsoring the conference.
2. RIPE NCC represented by Gergana Petrova; for their support to ASREN and for sponsoring the conference.
3. MAEEN, the NREN of Kingdom of Saudi Arabia represented by Dr. Ibrahim Al Shadokhi; for their participation and support.
4. SomaliREN, the NREN of Somalia represented by Dr. Abdullahi Bihi Hussein; for joining ASREN and for their recent achievements of connecting SomaliREN to GEANT.
5. The Egyptian Universities Network (EUN) represented by Dr. Ibrahim Mouawad; for signing a connectivity Agreement with ASREN to connect with GEANT under AfricaConnect3 project.
6. The European Academic and Research Network (GEANT) represented by Helga Spitaler, a Project Manager for AfricaConnect and UMEDCONNECT projects; for their continuous support.
7. The National Research and Education Network of Italy represented by its Director, Prof. Federico Ruggieri.
8. The National Research and Education Network of Cyprus represented by its director Dr. George Connis.
9. The National Research and education Network of Spain represented by its deputy director Dr. Antonio Saravia González,
10. Dr. Saeed Al Dhaheri, the Chairman of Smart World, UAE.
11. Mr. Shuji Shimizu, Director of the Telemedicine Development Centre of Asia, Japan.
12. Khalifa University represented by Dr. Arif Al Hammadi; for their support.
13. Ankabut represented by Mr. Fahem Al Nuaimi for hosting and organizing this conference.

6. Highlights from the Sessions and Discussions



6.1 Session (2):

Chair: Boubakar Barry, CEO, West and Central Africa Research and Education Network, WACREN, Senegal

Salem Al-Agtash, “e-Infrastructure landscape: ASREN perspective”, ASREN, Jordan

E-Infrastructures became critical platforms that integrate computational resources, facilities and repositories globally. The coordination and harmonization of advanced e-Infrastructure is motivated by the availability of interoperable platforms that are based on identity federation and science gateway technologies.

In his presentation, Dr. Al-Agtash presented such technologies to support key services in the development of Arabia networking and services platform for research and education in the context of AC3. The platform provides scientists, teachers, and students with seamless access to a variety of advanced resources, services, and applications available at regional e-Infrastructures in Europe and elsewhere. Users simply enter the credentials provided by their home institutions to get authenticated and do not need digital certificate-based mechanisms. Seamlessly integrated e-Infrastructures for regional e-Science activities are important resources that support scientists, students, and faculty with computational services and linkage to global research communities.

Walid Zidan, “A Source of Light in the Middle East”, Director of Administration, SESAME, Jordan

SESAME is a unique project and research center in the Middle East. In his presentation, Mr. Zidan reviewed briefly the history of SESAME from idea to reality. He also shed light on the impact of SESAME on education, scientific research as well as technology development. Today, SESAME is producing science through two operational beamlines. Three more beamlines are currently under construction. Since SESAME beamlines started to generate huge amount of data, the connectivity of SESAME to high performance computing facilities became necessary. This presentation also touched on the efforts done so far and being made to connect SESAME to dedicated educational and research networks to enable and involve cross border research groups and communities to transfer their data out and do the research remotely.

Esther Wilkinson, “National Research and Education Networks – Evolution or Revolution?”, Head of International, Jisc, United Kingdom

NRENs and RENs across the world come in many shapes and sizes, and are at various stages of their development. What should the key role of an NREN be? What products and services should we offer? What stages of evolution do we go through, and can we fast track through any stages to be able to keep at the forefront of technology for research and education? What lessons can we learn from each other, and how can we collaborate effectively in order to build our global NREN community?

In her talk, Dr. Wilkinson addressed the stages of ‘evolution’ of the UK NREN, Jisc, which serves the UK’s research and education sector, providing a digital infrastructure that enables teaching, learning and research, nationally and internationally. Jisc is unique in bringing together both the technology (as the operator of the UK’s network, Janet) and digital content to provide technology services, library and data services, and shared services and tools to support the student experience and the management of universities and colleges. Our vision is to support research and education (R&E) globally through best-of-breed technology, services and the provision of trusted advice.

Jisc is at the forefront of edtech, with learner analytics and the learner records warehouse our flagship beta service in the data arena. Thought leadership is provided in key areas such as cyber security, analytics, online learning, digital capabilities and open science, helping to inform policy and drive innovation in the sector and keep our systems and data secure. Our new areas of focus include ‘the intelligent campus’, working on ways to improve the student experience by capturing and analysing the many kinds of data that can be collected across university and college campuses

Khaled Abd Elfattah, “Digital Libraries: An Overview of Arab Countries Initiatives”, Dubai Digital Library and Knowledge Solutions Director, Mohamed Bin Rashid Knowledge Foundation, UAE

Prof. Abd Elfattah presented the Arab countries initiatives for building digital libraries by exploring the executed and ongoing national projects. He addressed the seven roles of digital libraries and to what extent they are implemented in the current initiatives. Moreover, he focused on the emerging technologies and their role on the future of information dissemination in the fourth and fifth generation. Finally, he discussed the current challenges and future of digital libraries.

6.2 Keynote:

Shuji Shimizu, “Telemedicine in Asia and beyond: Experiences over 15 years”, Director of the Telemedicine Development Centre of Asia, Japan

Telemedicine is one of the key applications in the field of research and education network (REN). We started remote medical education project when Japan and Korea, co-host of FIFA World Cup, were connected with superfast REN in 2002. We successfully used free software called digital video transport system (DVTS) which could convert digital video signal to Internet protocol without loss of image quality with the bandwidth of 30Mbps. It was epoch making not only in terms of satisfactory quality for medical education but also of low cost and low latency compared with satellite. Our activities expanded fast across Asia where there were many developing countries. When FIFA was organized in South Africa in 2010, we demonstrated the first live surgery all the

way from Japan to Cape Town through REN, and similarly we expanded our project to Latin American countries after FIFA2014 in Brazil, and to Russia after 2018. We have performed over 1000 telemedicine programs with 738 institution in 70 countries with continuous development of REN and videoconferencing equipment. We hope to expand our telemedicine activities to Arabian regions with the support of ASREN.

6.3 Session (3):

Chair: Abdulmonem Ali Al Kharusi, Director, Oman Research and Education Network, Oman

Edward J Moynihan , “Practical Strategies for Identifying and Interacting with End Users”, Principal Network Engagement Analyst, Indiana University, USA

Despite access to a robust, global community of research and education networks, many researchers around the world continue to struggle to transfer and access data effectively and efficiently. Researchers often do not understand the value REN services can bring to their research, or worse, are simply unaware that these services are available to them. In order for our community to address this, a proactive effort across many stakeholders (global, regional, national, local, campus, etc.) is needed. First, we need to know who is and who isn't using our networks; second, we need to know how these users are currently interacting with our resources; and third we need to know how to effectively interact with end users to help improve their experience. In his talk, Mr. Moynihan argued that proactive engagement with end users to identify and solve networking issues is critical to the sustained success of a REN organization. He provided an overview of the Engagement and Performance Operations Center (EPOC), highlighting practical strategies that International Networks at Indiana University has developed for identifying researchers, and looked at successful methods used for engaging and interacting with researchers and research communities.

Muataz Al Barwani, “Center for Research Computing @ NYUAD”, Senior Director, Center for Research Computing, New York University Abu Dhabi, UAE

Research computing historically has been the purview of a few fields within engineering and applied sciences with the focus on access to and the using of High Performance Computing (HPC) systems. However more recently, other disciplines such as social sciences and humanities have ventured into data intensive research, this requires additional resources and support.

To cater for this expansion and growth, universities should not only grow their computing and data storage resources but also introduce new services such as consulting & professional services, application development and data science services including; analytics, visualization, big data, data management and the use of artificial intelligence (AI) techniques such as machine learning, natural language processing and computer vision.

Dr. Al Barwani provided insight into the Center for Research Computing at New York University Abu Dhabi (NYUAD); the infrastructure, applications, tools, governance, staff and the skills needed to manage and support all computational and data intensive research activities carried out at NYUAD.

Ibrahim Moawad, “Arabic Semantic Search Engines for Big Governmental Organizations”, Director, Electronic & Knowledge Services Center, Supreme Council of Universities, Egypt

Big governmental organizations contain huge structured and unstructured data. This data need to be analyzed and retrieved as a part of their daily business. Data extractor that depends on entity recognition to extract data from documents and converts it into structured database can solve the problem of searching in unstructured data. In addition, semantic search engines that use query expansion to extract results that are more informative can solve the problems of polysemy and synonymy. Prof. Moawad presented a complete solution to solve these problems: An Arabic semantic search engine system for big governmental organizations. The system consists of four components: data extractor, taxonomy builder, database indexer, and search engine. The system was applied on a real case study of a large governmental organization’s database in Egypt. The results show superior performance compared to other solutions. It gives good measures for the F-score and gives a mean average precision of 0.8.

6.4 Session (4):

CHAIR: Helga Spitaler, Senior International Relations Project Manager, GÉANT, UK

Federico Ruggieri, “Network and Cloud Services in GARR”, Director, GARR, Italy

GARR is the Italian R&E Network and is conceptually a Community Network for R&E collaboration that has a Communication Network with top performances providing: High-bandwidth, transparent and symmetric connectivity; Advanced services; E-Infrastructure support. GARR is the network built by the Italian Research and Education community to satisfy the needs of the users. Currently the GARR Network connects more than 1.000 sites of: Universities (100); Research Institutes and Laboratories (350); Biomedical Research Institutes (60); Libraries, Museums and Cultural Institutions (65) and more than 500 schools (170 directly connected). The network infrastructure is based on more than 16.000 km of GARR owned optical fibres with more than 1,8 Tbps of aggregated access capacity and more than 3,5 Tbps of total backbone capacity. Current user access capacity is up to multiples of 100 Gbps. The Network and Operation Centre is in house and monitors and controls the entire infrastructure from the offices in Roma.

GARR is a founding member of the European GEANT network with currently 2000 Gbps access to the European backbone.

A set of services were developed during the last years and made available to the R&E community. In 2014 a distributed computing and storage infrastructure has been deployed in 5 sites in the South of Italy for a total of 8448 virtual CPU and 10 PB of storage that constitute the hardware infrastructure of the GARR Cloud based on Open Stack and Kubernetes offering services to the community such as: Infrastructure as a Service (IaaS) with Virtual Data Centre and Deployment as a Service (DaaS) a type of PaaS (Platform as a Service). The GARR Cloud is used also to support GARR services such as IdP in the Cloud, a full-fledged Identity Provider pre-configured to be connected to IDEM (Italian Identity Federation) and eduGAIN.

The GARR Cloud activity is coherent with a Community Cloud approach that has the following motivations: Preserve knowledge (investing on your own staff and having the knowledge to compare the contents of commercial offers); Tune Cloud to your community needs (commercial offers do provide only a price list and customisation is a separate and high cost support service); Your services are on your network (you don't need to peer with Commercial Providers at high speed to avoid bottlenecks); Data Sharing and Collaboration Tools can be easily used (different providers for different research groups can endanger collaboration and data sharing); Provide expertise for the members of your community (collaborate in the evolution of the cloud environment with distributed and federated approach of resources); Cost effective, if your resources are used 24x7; Sovereignty: Data and Applications are on storage and computing infrastructure in your country.

Antonio Saravia González, “RedIRIS: overview of 2020 strategic plan and new services”, Deputy Director of RedIRIS, Spain

RedIRIS, Spanish NREN, is facing a new stage in which to upgrade the network to 100Gbps and develop and deploy new services to meet the needs of the R&E community.

All this is part of a Strategic Plan structured in Objectives, Strategies and Actions to be developed in 3 years. Mr. Gonzalez provided an overview of this plan and its structure, with a short review of new projects and services being developed or implemented in areas such as:

- Connectivity (100G upgrade, BELLA)
- Identity and Mobility (IdP in Cloud, EVA)
- Data Transfer (for high volumes at maximum speed)
- Security (global schema, DDoS)
- Cloud adoption
- Blockchain initiatives (European EBSI, Spanish BLUE)

David Heyns, “Commercial cloud services and their role in research and education”, Cloud Services Manager, GÉANT, Netherlands

As the demand for agility in the delivery of solutions in support of activities in both research and teaching/learning accelerates, so does the adoption of consumable infrastructure, platform and software services.

Mr. David explored the consumption of these services as opposed to building new on-premise resources from the perspective of:

- Flexibility and agility
- Interoperability
- Security
- Data sovereignty and the protection of personal information
- Cost
- Sustainability

Nabil Ksibi, “Implementation of ORCID & the ORCID API”, Engagement Lead, ORCID, South Africa

ORCID’s vision is a world where all who participate in research, scholarship, and innovation are uniquely identified and connected to their contributions across disciplines, borders, and time. ORCID is part of the wider digital infrastructure needed for researchers to share information on a global scale. We enable transparent and trustworthy connections between researchers, their contributions, and affiliations by providing an identifier for individuals to use with their name as they engage in research, scholarship, and innovation activities.

6.5 Session (5):

Chair: Habib Youssef, Directeur Général, Centre de Calcul El-Khawarizmi, Tunisi

Mario Reale, “The GÉANT Trust and Identity services”, Senior Research Engagement and Support Officer, GÉANT, Netherlands

In his presentation, Dr. Reale described the main services related to the Trust and Identity domain offered by GEANT to the Community of Users. He focussed on highlighting the architecture, management , provisioning model, current uptake and the adoption scenarios for eduroam and eduGAIN; and described the eduTEAMS and InAcademia services.

There is growing interest and demand for AAI services capable of supporting scientists and researchers worldwide, to provide them with network connectivity even while not at their home institutions, to enable cross e-Infrastructure Authentication and Authorization, to seamless access services from Research Communities and worldwide electronic infrastructures. These services ensure effective collaboration among scientists worldwide, to perform cutting-edge research and manage always growing data sets, ensuring access to distributed computing resources, data catalogues, data sets, metadata, enabling Open Access to Resources and Open Science , to implement the FAIR policy approach to Research Data.

Georgios Konnis, “Establishing an Academic”, Managing Director, Cyprus Research and Academic Network, Cyprus

CYNET is Cyprus’ National Research and Education Network. It provides a network infrastructure for the Cypriot Research and Education Community. CYNET connects educational and research institutions. The national backbone of CYNET is connected to the European backbone GEANT that is a part of the worldwide community of research and education networks. Through this connection the CYNET backbone is connected to the Global Internet as well. CYNET’s main objective is to provide e-infrastructure and e-services exclusively to the educational and research community through its participation in programmes funded by the European Union. Particularly, in 2010 CYNET was assigned the creation and setting up of the Cyprus Academic CSIRT (CYNET-CSIRT), as part of the National Digital Strategy. The project did not progress then due to lack of funding that made completion of the project impossible.

However, in 2017 the submission of a successful proposal resulted in the granting of funds through CEF (Connecting Europe Facility), in which CYNET in collaboration with DSA - Digital Security Agency of Cyprus and 2nd partner in the proposal - were selected for funding, with the action ‘2017-CY-IA-0121: Establishment of Cypriot Academic CSIRT’, under the ‘Connecting Europe Facility Call for proposals: CEF Telecom Call 2017 CEF-TC-2017-2’. The objective of the proposed

action is to establish the Cypriot Academic CSIRT, hosted by the Cyprus Research and Academic Network (CYNET). This will be achieved by acquiring the necessary infrastructure; developing tools for analysis, identification, and detection of threats; running awareness campaigns ancillary to capabilities development; training current and new staff, participating in collaboration meetings and Europe-wide cybersecurity exercises; and performing data protection compliance audits. Moreover, the Action will facilitate the connection with the National CSIRT-CY and other CSIRTs in Europe. CYNET-CSIRT aims to provide incident response and security services to all Academic Institutions, Research Institutes and educational networks that are members of CYNET. It also aims to provide early warnings, alerts, announcements and dissemination of information to its constituency and relevant parties regarding risks and incidents. This will be accomplished by acting as an intermediary between affected parties and offering, when required, technical advice leading to the resolution of the incident. The affected parties may be internal or external entities to CYNET. Furthermore, CYNET-CSIRT aims to educate its members about the effects of cyber-threats and cyber-crime, and train them to provide early warnings, alerts, announcements and efficient use of the respective tools.

The Cyprus Academic CSIRT also aspires to become a member of the Forum of Incident Response and Security Teams (FIRST) and Trusted Introducer (TI) affiliation, so as to increase both the maturity and capabilities of the Academic CSIRT. The main services that CYNET-CSIRT is expected to provide are divided into the following categories:

- Reactive Services
- Proactive Services
- Security Quality Management Services
- Alerts and Warnings
- Announcements
- Security Awareness
- Incident Handling
- Tools Development
- Education and Training
- Intrusion Detection
- Threat Intelligence Sharing

While the CYNET-CSIRT's stakeholders are expected to be the existing CYNET members, Academic Private Institutes and relevant organisations, Research Institutes and relevant organisations, public and private schools, National CSIRT-CY and other global sectorial and private CSIRTs. The project is ongoing and is expected to be completed by August 2020.

Elisabetta Zuanelli, “Cybersecurity ontology for proactive incidents detection”, Professor Emeritus, University of Rome “Tor Vergata”, Italy

The global concern on proactive early detection of prospective cybersecurity incidents needs the ontological contextualization of cybersecurity events and incidents as an ontological representation of specific knowledge.

The application of AI solutions to knowledge representation is favoured by technologies to be implemented by domain specific content.

In her presentation, Prof. Zuanelli dealt with research and technological work done on the project of an enabling cybersecurity ontology platform. Pragmemma's POC is a prototype platform on Liferay technology that releases a suite of cybersecurity services including a contextualized semantic vocabulary, risk assessment and evaluation tools, statistical data and the 'incidents' recording database. She presented a perspective predictive service that can be released by processing ontological variables strata approach. The Ukraine's case study can illustrate the need for clustering different variables in incidents reporting. She presented their approach, the reverse knowledge incident modelling (RKIM), through samples of clustered variables, at different structured levels, by means of a graph representation.

Kevin Meynell, "Observing your MANRS", Manager, Technical & Operational Engagement, ISOC, Netherlands

There are over 65,000 networks comprising the Internet that exchange reachability information using the Border Gateway Protocol (BGP), but the problem is that BGP is almost entirely based on trust with no built-in validation of the legitimacy of routing updates. This causes many problems such as IP prefix hijacking, route leaks, and IP address spoofing, and there have been a growing number of major incidents in the past few years. There are solutions to address these issues, but securing one's own network does not necessarily make it more secure as it remains reliant on other operators also implementing these solutions too.

The Mutually Assured Norms for Routing Security (MANRS) initiative (<https://www.manrs.org>) therefore tries to address these problems by encouraging network operators, content providers and IXPs to subscribe to four actions including filtering, anti-spoofing, coordination and address prefix validation, and has developed resources to help them implement these. The MANRS Observatory has recently been developed to help network operators to view routing incidents that affect their networks, to check the general routing health of networks, countries and regions, and to provide a longer-term overview on whether routing incidents are getting better or worse.

6.6 Session (6):

CHAIR: Mohammad Mabrouk, Ankabut, UAE

Fahd Batayneh, "Universal Acceptance of Top-Level Domains", Stakeholder Engagement Senior Manager, Middle East, ICANN, Jordan

Ever since 100s of new Internet extensions were rolled out a couple of years ago, there has been an aggressive push by Internet industry players to have these new extensions universally acceptable across all software platforms; current and future ones. To achieve Universal Acceptance, Internet applications and systems must treat all TLDs in a consistent manner, including new gTLDs and internationalized TLDs. Specifically, they must accept, validate, store, process and display all domain names.

Academia can have a crucial role in pushing this initiative at the local level.

Gergana Petrova , “RIPE NCC and Academia”, External Relations, RIPE NCC, Netherlands

The RIPE NCC is one of the five global Regional Internet Registries distributing Internet resources such as IP addresses and AS numbers to Europe, the Middle East and parts of Central Asia. On 25 November 2019, the RIPE NCC ran out of IPv4 /22 blocks (1,024 IPv4 addresses). From that point onward, following RIPE community policy, a waiting list was implemented for Local Internet Registries (LIRs) who've never received an allocation from RIPE NCC before, who can request a single /24 (256 addresses). This means that operators who've already received addresses from us and who need IPv4 urgently have to either purchase it from the IPv4 transfer market, implement Network Address Translation (NAT) or switch to IPv6.

Next to distributing number resources, the RIPE NCC provides a lot of services for the benefit of the Internet community at large. Both network operators and academics use RIPE Atlas, a global measurement platform useful for monitoring networks, troubleshooting, checking responsiveness as well as research. In addition, numerous maps, tools and of course RIPE Stat produce a wealth of data regularly used for research purposes.

The RIPE NCC provides numerous opportunities for online learning, such as the RIPE Academy, our online webinars and the upcoming RIPE NCC Certified Professionals program. And, not least, the RIPE Academic Cooperation Initiative (RACI) has funded close to 100 academics to attend our meetings to present their research. If you are working on something interesting yourself, you should consider applying for the next round!

Khaled Mohammed Fouad, “Big data management and analytics”, Director of MIS, Supreme Council of Universities, Egypt

In the information era, information technology spreads and evolves fast. Most of the data were born-digital as well as exchanged on the Internet today. Big data points to datasets that are not only big but also high in variety and velocity, which make it challenging to be managed and analyzed using traditional tools and techniques. Due to the rapid growth of such data, solutions need to be studied and provided to manage and extract value and knowledge from these datasets.

Hasan Othman Farahneh, “Visible light s as a promising spectrum for 6G technology”, University of Jordan, Jordan

The need for bandwidth has increased each year since 3G technology deployed. That is due to 3G technology offers data services that drive emerging a lot of exciting applications and content for users. As applications and content increased, data traffic also goes up each year. Then cellular operators upgrade the technology to 4G technology with data rate up to 100 Mbps. However, data traffic is increasing exponentially so that inevitably operators must deploy new network or upgrade their technology so that a service quality is still maintained. 5G Technology is one of the solutions to keep service quality remain good. 5G provides downlink data rate up to 1 Gbps and requires wide bandwidth, i.e., frequency range from the low band (less than 1 GHz), the middle band (1-6 GHz), and high band or millimeter-wave band (above 6 GHz).

However, the weakness of this technology is the high cost of infrastructure development. For example, 5G small cell technology will require high costs in the backhaul and licensing processes. In addition, the increasing traffic and applications that require extra high data rate are feared

that they cannot be handled by 5G technology. On continuing the consecutive development of mobile wireless technology, 6G technology is predicted to emerge in 2025. The new technology will be driven to give solution for any 5G technological limitations. 6G is expected to be able to provide a more perfect used case than what 5G may offer, in particular for dealing with exaggerate traffic growth and efficiency of indoor network performance. Meanwhile, in the effort to construct new technological platform for 6G, researchers have begun to study the potential use of radio communications over Terahertz spectrum, in which VLC is the primary technology working on it.

Abdullahi Bihi Hussein , “The Research and Education Networking Marketplace” ,Somali Research and Education Network , Somalia

The research and education networking community, including the regional and national research and education networks, the member institutions of the NRENs, the relevant governmental bodies and donors, invest vast amounts of money in the development, operation, and maintenance of infrastructure. A significant percentage of this infrastructure and related resources are unutilized, and some of the infrastructures are unnecessary duplication, as in some cases, they might be in the same geographic location. Besides the inefficient utilization of infrastructure and resources, the duplication of such resources defeats the purpose of the research and education networking efforts.

The concept of the research and education networking marketplace calls for reemphasizing the primary goal of the network of systems, devices, and people that results from the establishment of national and regional research and education networks – to share. As crucial principles adopted by most research and education networks, cost-recovery and leveraging economies of scale and the purchasing power of the community have the most significant impact in a research and education networking marketplace. The marketplace is a medium through which the members of the research and education community can address their needs for sourcing ICT, research, and education products and services; and also sell the surplus capacities for services and products to their counterparts in the community. It not only helps buyers in the market to get highly competitive deals for their requirements but also helps the sellers save costs by recovering capital expenditures and sharing operational costs with others.

The research and education networking marketplace concept borrows from the community-based, peer-to-peer market principles such as that of the open-source software industry. Keeping the community's business within the community promotes innovation, collaboration, interdependence within the community, and stronger bargaining through demand aggregation. The concept addresses interactions in the community as well as with the other markets in the form of group purchasing and cost-sharing of infrastructure, services, human resources, and consulting in which the savings trickle down to the individual institutions and even researchers.

The potential for such a market is tremendous and includes strengthening the community and developing strategies for engaging commercial vendors. The topic is to be explored further, starting with mapping the infrastructure, services, and capabilities of the NRENs and regional RENs, which they are willing to share with the rest of the community. With today's cutting edge technology such as blockchain and cryptocurrencies, the idea of having a research and education networking currency could serve as a potential medium of exchange whose value is based on the cost of infrastructure investments by the market participants.

7. Closing Remarks

The organizers have acknowledged the role of each institution and member who has contributed to the success of the conferences, workshops and meetings. It was a hope that they successfully served as effective medium in attaining a convincing environment towards achieving their goals in developing stronger technology, research, and education communities in the Arab region and beyond.



8. e-AGE20

It was decided to have the Tenth International Platform on Integrating Arab e-Infrastructure in a Global Environment, e-AGE20 on December 2020 in Tunis, Tunisia.

9. Clouds and Open Access Workshop



A short workshop on “Clouds and Open Access” was arranged and successfully delivered on the afternoon of 12 December 2019, with participation from various NRENs from the Arab region and Europe (Egypt, Morocco, Tunisia, Oman, UAE, Jordan, Lebanon, Palestine, Somalia, Sudan, Italy, Cyprus in addition to GEANT, SESAME and ASREN). It was a discussion format workshop moderated by Mohammad Mabrouk, Infrastructure Development and Delivery Manager at Ankabut.

The workshop started with a short presentation by Federico Ruggieri, Director of GARR Consortium, followed by quick overview of Clouds experience at each country. ASREN presented its plans for Clouds and Open Access with focus on the support provided by the africaConnect3 project as the plan includes a survey to be conducted in the region to identify the status of clouds deployments in the region as well as the needs of the region in terms of clouds and cloud services. Based on the survey, and in cooperation with GEANT and the Arab NRENs, ASREN will build its own clouds services.

10. ANNEX

Organizers and Partners

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

- EUMEDCONNECT3 and AfricaConenct2/3 Projects
- The pan-European GÉANT network
- US Internet2
- Talal Abu-Ghazaleh Global (TAG.Global)

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- Abdumonem Al Kharusi, OMREN
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- Dale Smith, NSRC
- David West, GEANT
- Fahem Al Nuaimi, Ankabut
- Federica Tanlongo, GARR Consortium
- Federico Ruggieri, GARR Consortium
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- Matthews Mtumbuka, UbuntuNet Alliance
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11. Sponsors

RIPE NCC



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

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.

For more information please visit: <https://www.ripe.net/>.

Internet Society



Founded by Internet pioneers, the Internet Society (ISOC) is a non-profit organization dedicated to ensuring the open development, evolution, and use of the Internet. Working through a global community of chapters and members, the Internet Society collaborates with a broad range of groups to promote the technologies that keep the Internet safe and secure, and advocate for policies that enable universal access. The Internet Society is also the organizational home of the Internet Engineering Task Force (IETF).

For more information please visit: <https://www.internetsociety.org/author/isoc/>.

e-AGE19

Abu Dhabi, UAE

11-12 December 2019

“GROUNDBREAKING RESEARCH AND EDUCATION NETWORKS”

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