

Title : AGE-OX – Serving the Global Network Architecture from the Gulf

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ABSTRACT

In April 2013 Internet2 and ANKABUT (the NREN for the United Arab Emirates) made a commitment to provisioning an open exchange point of presence in the Arabian Gulf region. This point of presence would provide local Internet2 connectivity for campuses of U.S. universities, as well as other regional NRENs and International universities in the Gulf region, to a global network of exchange points.

This session will inform attendees of the AGE-OX facility and its capabilities, identify the role of the AGE-OX in the global network architecture and identify ways other NRENs and universities can engage with the exchange to broaden the global reach in the Gulf. We have been collaborating with the Arab States Research and Educational Network (ASREN) on the long term role of the AGE-OX in cooperation with other open exchange points ASREN is building to support the region.

This presentation will identify and describe benefits of establishing a Global Open Exchange Point (GXP) in the Arabian Gulf region with high-speed connectivity to Internet2's global exchange point in Asia, initially, and Europe. An Open Exchange like AGE-OX will enhance opportunities for universities and institutions in the region to collaborate with research and education partners across the world. Given globalization trends in higher education, ANKABUT (the UAE NREN) made a commitment to ensure the Gulf region had the capacity and capability to support researchers in the region. This session will depict the efforts to open the AGE-OX in early 2015, and describe the opportunity for future connectivity growth.

Extended Abstract

In April 2013 at Internet2's Annual Member Meeting, Internet2 and ANKABUT signed a Memorandum of Understanding that included a commitment to explore the feasibility of provisioning an Internet2 point of presence in the Arabian Gulf region. This point of presence would provide local Internet2 connectivity for branch campuses of U.S. universities as well as other regional NRENs, universities and research institutes.

Discussions continued between these two organizations accelerating in early 2014 with the active involvement of New York University Abu Dhabi (NYUAD). NYUAD had an internal project to improve connectivity to their campuses in New York and Shanghai as well as the rest of their global sites and looked to Internet2 and Ankabut for a possible synergy of efforts. These discussions culminated in the signing of the Arabian Global Education Open Exchange (AGE-OX) agreement between Internet2, ANKABUT and NYU in April 2014 in Denver.

The prime objective of establishing a Global Open Exchange point (GXP) for interested parties (e.g., NRENs, individual research universities and institutes, medical research organizations) is to provide additional aggregation points and "on-ramps" to the global research network infrastructure. The intent is to provide connection points for regional and national research and education networks and to improve reliability and availability of network services to regional universities and NRENs through geographic diversity.

Today all Middle Eastern regional institutions are primarily and individually connected to global NREN networks, and to a lesser extent the commodity Internet, through submarine fiber systems that connect the Arabian Gulf to Europe/North America. The common route passes through the Red Sea, and then transits through Egypt, towards Europe then via the Mediterranean to Europe either as a termination point or fiber system transmission interconnect point towards North America. The AGE-OX, however, utilizes the international fiber landing point in Fujairah, UAE creating an alternative path for the Global Network Architecture.

The Arabian Global Education Open Exchange (AGE-OX) was established as a regional GXP in Fujairah, UAE, in a free-zone environment equivalent to the concept of a 'carrier-neutral hotel' in the commercial world. Initially this exchange point will be connected to a similar Internet2 GXP located in Singapore via a proposed high-speed data link. Parties will share the costs of connectivity and operating the AGE-OX. All will benefit from economies of scale when acquiring international bandwidth, resulting in lower unit costs for capacity. The AGE-OX will be open to all NRENs and research and

education entities both within the region, and globally, with the expectation that more participants will further reduce costs and increase collaboration. The AGE-OX is being designed to also accommodate international links to the west for connections to Europe/North America when more parties decide to participate in the open exchange and can share in the costs. This is a key part of the Global Network Architecture (GNA).

We have made good progress in establishing the AGE-OX, with the commitment of the founding partners Ankabut, NYUAD and Internet2. But this should be seen as only the opening chapter of what could become a great story for how this region addresses the needs of its research and education community, and how they will play a part in the emerging Global Network Architecture. NRENs engaged in the Global Network Architecture discussions are invited and welcome to join the AGE-OX to further expand connectivity in the area.

To ensure the greatest success for the AGE-OX the engagement of leaders of NRENs, universities and government ministries in countries in the region is needed. Leaders need to encourage their organizations to join the AGE-OX for the benefit of their NRENs, and the Global Community as a whole. This will help us break down the telecom cost barriers faced by many in the region. Current pricing policies by incumbent telecommunications providers in many countries in the region do not provide adequate educational pricing that would enable NRENs, and the universities they support, to afford the capacity needed to fulfill their research missions and collaborate with their global colleagues.

In implementing the AGE-OX we face three key challenges that need to be addressed:

- Collaboration with regional partners is needed to help reduce the intra-region connectivity costs, which remain quite high compared to Europe and North America. These relatively high costs currently may make the ability to connect to this exchange point economically challenging.
- A need to develop governance for initial operation that could then be modified as necessary during the proposed two-year 'proof of concept' operating period.
- Lacking any governmental funding for this effort, the initial parties in the AGE-OX needed to develop a funding model that would "kickstart" the exchange and allow for future investment by other parties as involvement grew.

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Mr. George Loftus serves as the Associate Vice President, Network Services for Internet2 where he is responsible for all business development and implementation services for customers of the Network Services division. Prior to be named to this position in September 2012 he served in an interim appointment to assist in the direction and coordination for the overall program and activities for Internet2 Member Relations & Marketing/Communications.

Prior to joining Internet2, Loftus served as the President and CEO of OSHEAN, Rhode Island's non-profit research and education network from its founding in 2000 until 2012. He was the Director of Network Services at Brown University from 1991 -2000. Very involved in the higher education community and Internet2 for over two decades, Loftus has served on the Internet2 Board of Trustees as chair of the Architecture and Operations Advisory Council (AOAC).

Since joining Internet2, Loftus worked with Internet2 member CIO's, regional network leadership and others to develop a new fee model to encourage adoption of 100G-connectivity to the network. He also led a team that developed and deployed the Arabian Gulf Educational Open Exchange point in Fujairah, UAE.

He earned his Bachelor of Science Degree in Business Management from Salve Regina University. Loftus is based in Newport, Rhode Island.

PLEASE NOTE-- Bios for other speakers will be provided upon acceptance of the presentation by the committee.