

Network upgrade gives academia more speed

South African universities, colleges, scientific councils, researchers, and innovation centres will be able to access faster connectivity quicker, thanks to the latest upgrade to the South African National Research and Education Network (SA NREN).



Anthony Laing, GM of networking at NEC XON

The CSIR, SANReN, TENET, and NEC XON have upgraded the SA NREN network to 96-channel 100Gbps fibre with multi-gigabits-per-second regional links. This makes it one of the finest NRENs in sub-Saharan Africa.

“Providing ubiquitous access to South African academia, researchers, student healthcare, scientific and innovation institutions is a challenge we continuously strive to resolve,” says Ajay Makan, head of operations at SANReN. “This is particularly in light of how learning and research has evolved in the past couple of years. It is also in the context of the socio-economic challenges that students experience. This network helps us toward achieving that goal.”

More speed

The network provides significantly more bandwidth. An additional key benefit is it is now much quicker to provision bandwidth to all users. These include universities and their satellite campuses, teaching hospitals, the Square Kilometre Array (SKA) project, South African Large Telescope (SALT), South African Radio Astronomy Observatory (SARAO) HartRAO Facility and other astronomy users, Technical and Vocational Education and Training (TVET) colleges, academic entities, technology innovation hubs, and science councils.

SANReN (network) is provisioned by the South African National Research Network (SANReN) group of the National Integrated Cyberinfrastructure System (NICIS) at the Council for Scientific and Industrial Research (CSIR) and operated by the Tertiary Education and Research Network of South Africa (TENET).

SANReN is a core national dark fibre backbone with several managed bandwidth backbone links, regional backbone extensions, back-hauling from the submarine cable landing stations at Yzerfontein and Mtunzini, capacity on five undersea cables, and several metropolitan area networks. It was established in 2007 dedicated to science, research, education, and innovation traffic.

The upgrade now delivers as much as 600Gbps on the backbone in tests, up from 100Gbps. It also achieves up to 300Gbps for the regional links, up from 10Gbps.

The backbone uses ADVA Optical Networking DWDM equipment, which works by combining and transmitting multiple signals simultaneously at different wavelengths on the same fibre. The technology creates multiple virtual fibres, effectively multiplying the capacity of the physical medium.

The service-centric MX10003 Universal Routing Platform helps users address long-term traffic, subscriber, and services growth. EX Series switches are cloud-ready, high-performance access and distribution and core-layer devices for enterprise branch, campus, and data centre networks.

Scalability

“The combination of ADVA and Juniper equipment in the SA NREN architecture makes this a carrier-grade network with the capacity to scale to meet dynamic user requirements. This is particularly important now as the world increasingly evolves through hybrid work and study scenarios,” says Anthony Laing, head of networking at NEC XON. “It positions SANReN to meet the changing needs of their users without necessarily having to know upfront what those future needs may be.”

“Having the capacity enables new future services,” says Makan. “We may not know what they are but we have the capacity to enable them. For example, nobody could have foreseen the sudden and widespread adoption of video conferencing during the Covid-19 pandemic. That was a behaviour change that TENET had to ramp up and support via the network.”

“We previously used managed circuits, which were the best technology at the time,” says Shukri Wiener, executive officer: technical and operations at TENET. “But they caused longer provisioning times. With the upgraded network, that is now changed.”

“Our researchers and academics need bandwidth of varying scales for different periods,” says John Hay, networking expert and IP authority at SANReN. “The DWDM equipment on dark fibre enables us to light it up quickly at the speeds we need and is installed across the network at all the major nodes which are in Johannesburg, Cape Town, Potchefstroom, East London, Port Elizabeth, Durban, and Pretoria.”