

An Intelligent Backbone Network to Bridge the Digital Divide

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In a significant leap forward for digital connectivity, Broadband Infraco has upgraded its high-capacity national optical fibre network by introducing 800 Gbps per channel transmission within its Optical Transport Network (OTN). This upgrade enables Broadband Infraco to transmit data at 800 Gbps per channel, significantly increasing network capacity to meet the growing demands of a digitally connected economy. This strategic investment directly supports the goals of SA Connect, enables the rollout of Smart City initiatives, and provides the digital backbone necessary for South Africa's participation in the Fourth Industrial Revolution (4IR).



PETER MAFAGANA

Acting CTO of BBI

The Power of Flexi-Grid Technology

At the heart of this advancement lies Flexi-Grid technology, an innovative approach to Dense Wavelength Division Multiplexing (DWDM) systems. Unlike traditional fixed-channel systems, Flexi-Grid dynamically allocates spectrum bandwidth to optical channels, optimizing efficiency and scalability. This technology is critical for supporting high-speed internet, cloud services, and data-intensive applications, particularly in long-haul communications.

Key benefits of this deployment include:

- **Higher Data Rates:** Capable of handling 400 Gbps, 800 Gbps, and beyond, the network enhances connectivity across the country and SADC region, beginning with the extension to the Botswana, Mozambique and Zimbabwe Border Posts.
- **Improved Spectral Efficiency:** The flexible allocation of bandwidth ensures optimal use of existing infrastructure.
- **Future Proof Design:** The system is engineered to support emerging technologies such as 5G, AI, IoT, and cloud services.

Bridging the Digital Divide

Peter Mafagana, Acting CTO of Broadband Infraco, highlighted the following "Broadband Infraco's latest network expansion represents a critical step toward advancing digital inclusion. By significantly increasing capacity across our national fibre backbone, we are enabling high-speed, affordable connectivity that directly addresses long-standing barriers such as infrastructure gaps and high access costs, particularly in underserved rural areas and townships. This investment supports our commitment to universal access, economic participation, and the national objectives outlined in SA Connect policy."

This infrastructure empowers national efforts to bridge the digital divide and provide the following benefits for communities:

1. **Faster Public Wi-Fi:** Increased speeds enable smoother streaming, quicker downloads, and seamless browsing at public hotspots.
2. **Greater Capacity:** More devices can connect simultaneously without performance degradation, ideal for high-traffic areas.
3. **Reliable Connectivity:** Reduced downtime and stable connections benefit both urban and rural users.

Affordable, high-capacity backhaul solutions also empower local Internet Service Providers, including those serving lower-income areas, to connect efficiently to Internet exchange points. The resulting cost savings can be passed on to end-users, making reliable internet access more attainable. "

Alignment with SADC's Digital Goals

The newly constructed fiber route, stretching from the Kopfontein border to Isando (Johannesburg) via Tshwane, Rustenburg, and Northam, not only bolsters national connectivity but also strengthens cross-border links within the Southern African Development Community (SADC) region. The SADC's Digital Transformation Strategy prioritizes Infrastructure and Connectivity, aiming to harmonize and expand digital access across the region. Broadband Infraco's network expansion from Johannesburg to Kopfontein aligns perfectly with these goals, increasing bandwidth for landlocked SADC nations and linking them to vital Internet exchange points.

Industries Set to Benefit

All sectors stand to gain from this enhanced connectivity, with education and healthcare seeing particularly transformative impacts. Rural areas will benefit from advancements in telemedicine and internet-based learning, while high-capacity networks ensure seamless service delivery and superior user experiences.

Reliability and Scalability at the Core

Broadband Infraco's network is designed for high availability and scalability, featuring self-healing technologies like Automatically Switched Optical Networks (ASON) and redundant components to prevent service interruptions. The infrastructure is housed in temperature-controlled data centers with uninterrupted power supplies, ensuring optimal performance.

A 24/7 Network Operations Center (NOC) leverages automated systems to monitor compliance with Service Level Agreements (SLAs), while skilled field staff across the country ensure swift resolution of issues, meeting Mean Time to Restore (MTTR) targets.

Conclusion

This initiative is more than a technical milestone—it's a catalyst for economic growth, improved public services, and a better quality of life.

Through public-private partnerships and alignment with national digital transformation agendas such as SA Connect, Broadband Infraco is reinforcing South Africa's digital infrastructure, ensuring that no community, especially those in rural and underserved areas, is left behind. As implementation accelerates, the goal of transformative, affordable connectivity for all moves steadily toward reality.



Enquiries: Marketing@infraco.co.za

