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BUILDING THE SMARTEST, WIRELESS DUMB PIPE

VAST NETWORKS, A SOUTH AFRICAN WI-FI PROVIDER

OUR STORY

Background:

South Africans have a voracious appetite for connectivity; according to the International Telecommunications Union, South Africa's Internet penetration grew by 54% in 2017. Growth is expected to significantly increase, with estimates suggesting that Internet traffic will be 267 times greater than it was in 2015.

The rapidly growing rate of consumer demand for reliable and affordable connectivity has posed unique challenges. The number of people connecting to the Internet, predominantly via mobile devices, is rapidly increasing. Infrastructure challenges, especially those pertaining to spectrum availability and onerous administrative processes for wayleaves to deploy fibre, are severely impacting the cost of connectivity and access.

While growth levels are unprecedented, it is a far cry from 100% Internet penetration goal set out in the South African government's National Development Plan, which it hopes to achieve by 2023, at speeds of 100Mbps to each and every citizen.

One of the key inhibitors to access is limited spectrum - a critical challenge for South Africa which is aggregated by two market conditions, namely;
- The number of 2G devices or devices without 3G / LTE radios still in prevalent use
- The lack of progress on digital television migration

Digital dividend spectrum is not available in South Africa; 3.5GHz also remains unallocated, with many other bands currently running technical trials but with no commercial deployment.

The lack of spectrum limits bandwidth, impacting the roll-out of 4G services today and 5G services in future. Mobile network operators have no option but to re-farm spectrum and further densify their

networks at increased costs to cope with the ever-growing urban demand for data. This inhibits the ability of mobile network operators to offer connectivity at affordable rates. Mobile data costs remain considerably high, and South Africa's most economically marginalised communities, who do not have access to fixed-line alternatives, are severely impacted.

The lack of spectrum, and policy / regulation surrounding future spectrum allocations, has also resulted in mobile operators needing to scale back plans for expanded growth into rural areas. Ultimately, this impacts South Africa's global competitive ranking.

Description:
VAST Network's (VAST's) desire to serve the rapidly growing demand for affordable Internet connectivity, on a scalable and multi-tenanted basis, led to its latest innovation. This enhancement to existing standards seamlessly integrates the next generation of wireless communication into South Africa's telecommunications mix; it can get more South Africans connected, more cheaply, using their existing service provider.

VAST has developed Africa's first true carrier-grade 'offload' network, providing a solution to the challenge of spectrum shortages and presenting options for more affordable connectivity.

Learnings:
Currently, the spectrum available to mobile network operators does not adequately address the growing demand for connectivity, creating an urgent need for alternative solutions. This is where open access Wi-Fi has a vital, enabling role to play.

Traditionally, one of the most common obstacles relating to Wi-Fi has been the on-boarding of users. By enabling Passpoint-based mobile data offload functionality, VAST is able to offer both Internet service providers and mobile network operators a secure, seamless and cost-effective way of authenticating their customers using their individual SIM cards via a secure Passpoint SSID that supports multiple EAP types**.**

VAST's network enables scalable aggregation services to operators in a way that masks the Wi-Fi network elements, while maintaining the integrity of the security and management of the users traffic back to their network.

THE SOLUTION

How the "solution" can ensure high-performance connectivity for all

VAST's mobile data offload solution - also known as **hybrid trusted/un-trusted 3GPP shared SSID Mobile Data Offload**, seamlessly moves traffic off the networks of mobile network operators and Internet service providers onto Wi-Fi. Traffic can be rerouted back on to the operator's network equally seamlessly. The technology enables offload across VAST's network of more than 2,500 high-density locations (which vary in size from a small coffee shop to multiple major, international airports).

VAST's technology is pioneering, cost-effective, simple to implement and can be used by any host network, in any terrain, in any country. It is simple to scale, seamless and allows for a robust set of services. Essentially it offers great value to any non-domestic operator that has roaming users, or any domestic operator that wishes to virtually extend its network presence or offer faster, more cost-effective service delivery – enabling the user to cost effectively access all native network services.

This technology positions VAST as the first to have designed and executed an offload model of this magnitude in a region where infrastructure inadequacy is among the leading challenges.

The innovative features that form part of this model include:
- VAST's ability to support multiple EAP authentication types (e.g. EAP-SIM, EAP-AKA, EAP-TLS, EAP-TTLS) on the same SSID
- VAST's ability to encapsulate this traffic (EoGRE) or as a native layer 2 interconnect, to multiple operator end-points on a per-user/pe-UE basis/per-venue basis, programmatically
- The opportunity to accommodate multiple operators on the same network, with differing EAP-types on a shared SSID
  - The value of this for the South African and African market is tremendous as it facilitates the alleviation of congestion on multiple networks. It also eradicates consumer confusion as one is not faced with an overwhelming list of Wi-Fi connections, creating uncertainty about the legitimacy and security of each network

The ultimate value of driving 2G and 3G devices to offload, is freeing up valuable spectrum and cost effectively leaving LTE users on the macro network. This is enabling the refarming of valuable, scarce spectrum for LTE, 4G and 5G. Additionally, the speeds that can be obtained from even very old standards-based Wi-Fi present in 2G/3G handsets exceeds 3G throughout. What this means is

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access to the fastest network speeds on the market, but equally an opportunity to drive inclusivity by making Internet access more affordable.

PARTNERSHIPS

What types of partnerships are critical for your organization to succeed

In a bid to progress the industry, VAST is confident of the immense benefits its model enables for Wi-Fi operators, network providers, mobile operators and consumers across the globe. The provider recognises the potential of its mobile data offload model in accelerating access to connectivity and accessibility in any market. VAST is currently undergoing field trials with two of South Africa's leading mobile operators and is also consulting to international operators in a variety of developed markets who are keen to introduce the technology in their respective countries.

NETWORK PROVIDERS, ENTERPRISE & CITY OFFICALS

How network providers, enterprise and city officials need to adapt their thinking to address the challenges

Affordable Internet connectivity can drive inclusivity and facilitate access to opportunities that improve general standards of living. It is a vital contributor to economic growth, offering millions of South Africans access to resources, information, employment/ entrepreneurial opportunities, learning materials, global media, etc. – all of which can go a long way in driving socio-economic transformation.

In South Africa, specifically, creating sustainable entrepreneurial opportunities is a core focus and pressure exists for 90% of jobs to stem out of the Small, Medium and Micro-sized Enterprises (SMME) sector by 2030. Some estimates suggest that the SMME sector employs up to 60% of the national workforce, contributing more than 34% to GDP.

Playing its part in the socio-economic progression of the country, VAST is committed to supporting the growth of the SMME sector and believes that Wi-Fi should be as accessible and affordable as basic utilities such as water and electricity. The business continues to make affordable Wi-Fi connectivity widely available for the benefit of South Africans - without compromising the quality of service at any of its locations (from suburbs to informal settlements to mega shopping centres). Essentially, the most affluent areas and underprivileged areas are able to enjoy the same, premium quality service.

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In a country where people exceedingly rely on mobile connectivity, on the go, the need for network providers to pioneer new, innovative and cost-effective ways to connect customers has become critical to achieving sustainable business success. Government, policy makers and the ICT industry must work collaboratively to find and develop solutions that bridge the digital divide and facilitate economic inclusion for all.

BUSINESS/SOCIAL IMPACT

How the technical evolution of telecommunications networks will impact the 'solution' or the growth of the usage of our 'solution'

As the number of Internet users continues to increase, so too will the need for faster, seamless and affordable connectivity. VAST's mobile data offload model has the potential to become increasingly valuable as customers enjoy premium quality connectivity at competitive rates and increasingly enjoy access to the most advanced technologies on the market. It also has the potential to be embedded into the fabric of every mobile phone user in the country and the added advantage is that devices that are five years or newer are offload compatible.

Due to the progressive and adaptable nature of VAST's network architecture, the business is able to continuously explore different methods of authenticating and onboarding users to its network with incremental effort. As a pioneering Wi-Fi provider, VAST has launched several enabling solutions since its inception in 2015 and its latest innovation – which is suited for any market - is one that can truly revolutionise the face of global Wi-Fi connectivity.