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XON Networking is a systems integrator specialising in solutions for Service Providers, Mobile Operators, ISPs and large enterprises. We have over 20 years of experience delivering complex turnkey solutions and pride ourselves in a highly-skilled team of local skills that can design, build and operate networking solutions of any scale or complexity. We combine extensive experience in the market space with industry leading technologies to build solutions that meet the ever evolving requirements of the modern network.

Our solution partners include Juniper Networks, ADVA Optical, Procera Networks, PeerApp, NEC and other market leading vendors.

On the 1st of July 2015, XON merged with NEC Africa to combine their local expertise in an integrated market approach that will provide greater sales coverage in the sub-Saharan African market and accelerate regional growth for both companies in the telecoms, enterprise, government and energy sectors. The partnership aims to expand the scope available to XON and NEC customers relating to networking and security, infrastructure and datacentre, information management, cloud, retail, alternative energy, consulting services, public safety, and carrier networks.

“We build best-of-breed solutions based on partnerships with vendors that differentiate themselves through innovative and disruptive technology.”

- Anthony Laing, Chief Strategy Officer

**NETWORKING SOLUTIONS**
- Mobile backhaul and timing solutions
- IP/MPLS networking and optimisation
- Optical Metro, Long haul and Data Centre connectivity solutions
- Centralised, distributed and virtualised security
- Data centre routing and switching
- Subscriber & bandwidth management
- Caching and content delivery
- Managed services
- Network management

**SERVICE OFFERING**
- Complex project delivery across sub-Saharan Africa
- Project and Programme Management
- Design and planning
- Integration and implementation
- Acceptance testing and handover
- Network and security optimization and audits
- Standard and customized training
- Premium support throughout Africa from our 24/7 NOC and regional support depots
AFRICAN FOOTPRINT

XON currently offers design, implementation and support services in a number of African countries. We achieve this through the use of locally established partners that can offer spares holding and remote hands. Higher-level skills are based in South Africa, Kenya and Namibia and roam throughout Africa to deliver on complex projects and requirements. Support and Maintenance is coordinated by our 24/7 Network Operations Centre in Midrand, South Africa.

The following countries are where XON has already delivered projects and/or offers support and maintenance services:

- Ivory Coast
- Egypt
- Uganda
- Kenya
- DRC
- Namibia
- Botswana
- Mozambique
- Mauritius
- Tanzania
- Zimbabwe
- Zambia
- Lesotho
- Nigeria

* See Testimonials
PROJECT DELIVERY CAPABILITY

XON’s project delivery capability will accelerate your network’s time to value, bringing revenue generating capabilities online faster for bigger productivity gains, faster rollouts of new business models and ventures, greater market reach, and higher levels of customer satisfaction.

XON helps you build operational excellence to maintain required levels of performance, reliability, and availability; to scale and adapt to new business requirements; to reduce operational costs; and to eliminate exposure to risks.

We have experience with complex installations because we’ve done them before. Many times. We provide network design, network certification testing, traffic migration, and operations/business support systems (OSS / BSS) transformation. Our end-to-end approach for lifecycle services is called PDIOO: plan, design, implement, operate, and optimize.

These five stages provide collaborative services and support for all phases of a network’s lifecycle, from initial planning to feature rollouts. XON Professional Services enhances your team with our experts, so new projects have minimal impact on your operations.

With three major offices in Johannesburg, Cape Town and Durban and regional offices in Nigeria, Kenya and Namibia, we bring experience working on projects across Africa with both large and small service providers. This background lowers the risks for projects because, with our help, projects can be completed faster, at a higher quality and with reduced risk.

MAINTENANCE, SUPPORT & NETWORK OPERATIONS

XON operates an extensive support and maintenance capability across sub-Saharan Africa. All support is provided directly by XON and is typically backed by 3rd level support from the relevant vendors. Across our territories XON has their own field services and senior engineering teams as well as regional warehousing that is coordinated through our centralised Network Operations Centre in Midrand, South Africa. With this capability we are able to offer customised support services based on customer requirements.

We typically base our service offerings on the following three base options:

**Extended Warranty**
- 24/7 support through helpdesk and NOC
- Access to technical expertise and software updates
- Customer returns faulty unit to XON for replacement or repair

**Next/ Same-Day Support**
- 24/7 support through helpdesk and NOC
- Access to technical expertise and software updates
- Next business day or same day replacement of faulty hardware
- Spares held in-country (next-day) or nearest city (same-day) by XON

**NOC / Managed Services**
- As per Next/ Same-Day Support, including:
  - pro-active monitoring and maintenance of network
  - Reporting and Service Management
  - Network planning and optimisation
  - Design review and consultancy credits

XON 24/7/365 Helpdesk and NOC based in Midrand, South Africa
**NETWORKING SOLUTIONS**

1. **TELCO SDN/NFV SOLUTIONS FOR ENTERPRISE**
   Service Providers have seen an erosion of their high-margin voice services over the past 10 years when their subscribers started migrating to data services to drive their productivity applications. Data now dominates Service Providers networks but the largest proportion of the service revenue has moved to the OTT content providers, resulting in a decoupling of traffic and revenue. The OTT providers have secured a position of very high revenues for their services but with very low risk since the bulk of the cost in providing their services lies in connectivity from the subscriber to their platforms, which is borne by the Service Provider.

2. **INTEGRATED IP/OPTICAL CORE NETWORKS POWERED BY SDN**
   The introduction of integrated IP/Optical networks has enabled Service Providers to meet their objectives of reduced time to market for new services whilst reducing Operational Expenditure (OPEX) associated with their networks. Software Defined Network takes these integrations a step further by enabling applications and services to dynamically request network infrastructure on demand. Through this integration Service Providers will become much more aligned with their customers and business requirements making their environments much more agile and competitive, at a lower cost. Business agility affects the top-line with a potential increase in revenue and integration at the operational level affects the bottom line with OPEX savings – thus a win-win situation.

3. **SERVICE CREATION AND OPTIMISATION**
   Users are demanding an enhanced Quality of Experience (QoE) from their service providers. These user demands are incrementally increasing the pressure on Service Providers to continuously upgrade their core network’s bandwidth. The Optimisation solution from XON allows Service Providers to deliver an enhanced QoE to their users without necessarily increasing investment in core bandwidth through Deep Packet Inspection and caching techniques. These are tightly integrated with the billing capability included in the solution and for the first time it is possible to monetise what was previously seen as techniques to reduce Operational Expenditure only. This solution leads to increased revenue and reduced Capital and Operational Expenditure for Service Providers whilst maintaining and growing a loyal, happy subscriber base.

4. **METRO ETHERNET AND MOBILE BACKHAUL**
   Offering the lowest cost per megabyte of any transport technology the applications of Carrier Ethernet are endless including Mobile Backhaul, Enterprise LAN interconnection, Enterprise Data Centre interconnection, Leased Line replacement, Ethernet Access and Ethernet Transit services. The main advantage of Carrier Ethernet is that the services, interfaces and management layers have been fully standardised by the Metro Ethernet Forum but the method of connecting these services is flexible and is delegated to lower level protocols and technologies, like MPLS. XON’s Carrier Ethernet solution integrates technologies from Juniper Networks - providing the Carrier Ethernet services layer, ADVA Networks – providing the optical transport and NEC – providing packet microwave transport.

5. **SECURITY AND DDOS PROTECTION**
   Service Providers, Enterprises and Small to Medium Businesses are increasingly seeing their business being threatened by cyber security attacks. Africa is no longer immune to cyber threats and the number and severity of targeted attacks is increasing exponentially year on year. XON have brought together two of the most innovative vendors in the cyber security space to create a solution that not only ensures Service Providers customers business continuity but also protects Enterprise and Small to Medium businesses from both internal and external threats. XON’s integrated solution aims to protect Service Providers from the revenue impacting threat of their customers operations being attacked as well as the potentially devastating impact on businesses when their operations are crippled by malicious attackers.

6. **CARRIER WIRELESS ACCESS**
   Mobile networks have seen an explosion in the amount of data consumed by subscribers due to the proliferation of smart devices and media rich applications. In a study by the US FCC the amount of mobile data consumed in the USA alone in 2013 was 563 Petabytes (PB) per month and it is predicted that this will grow to six times this amount by 2019. In order to deliver on these demands mobile networks must make optimal use of any spectrum and wireless technologies available to them in the pursuit of heterogeneous networks (HetNets). XON’s integrated 3G, LTE small cell solution from NEC allow Mobile Operators to increase their footprint and capacity at the lowest cost with the very small environmental impact and footprint.

7. **SOFTWARE DEFINED DATA CENTRE**
   Software Defined Data Centre (SDDC) is an architecture that allows IT organisations, whether in Service Providers or Enterprises, to build a unified hybrid cloud, which brings together the Enterprises private, public and hybrid cloud environments. In most Enterprises cloud services will be planned and deployed in a mix of private cloud for proprietary corporate information, public cloud for less sensitive or publicly accessible information which the management of may be self-managed or outsourced. SDDC extends the virtualisation concepts that have been the basis for the traditional cloud services to present all resources, including computing power, virtualisation, storage and management as utilities to any device at any time on what customers perceive as one unified cloud.

8. **NETWORK MANAGEMENT, OPERATIONAL AND BUSINESS SUPPORT SYSTEMS**
   TMForum Frameworx is a suite of best practices and standards that provides the blueprint for effective, efficient business operations. It enables Service Providers to assess and optimise performance using a proven, service-oriented approach to operations and integration. The practical tools available in Frameworx help improve end-to-end management of services across complex, multi-partner, multi-vendor environments.Netcracker, an independent company owned by NEC, is the leading provider of TMForum compliant and certified NMS, OSS and BSS solutions that enable effective business process and operations management for large Service Provider customers.
Problem Statement

Service Providers have been endlessly adding massive amounts of capacity to their core and access networks just to respond to the threat of subscribers and business customers churning to lower cost and lower margin operators. In addition the OTT content providers have taken advantage of this unprecedented bandwidth explosion by launching high-value and high-revenue applications for subscribers over these networks which has effectively minimised any chance for the connectivity Service Providers to move up the value chain with their subscribers and business customers to increase revenue and ARPU.

The most sensitive business metric in delivering internet services is time-to-market and OTT providers have reduced this to weeks instead of years, and at a substantially lower cost. Service Providers networks are static and complex and they lack the agility to launch new services quickly and efficiently. New services require dedicated, expensive platforms which need to be integrated into the Service Providers business processes to allow fulfilment (provisioning), assurance (service management) and billing. This typically takes from 12 – 36 months depending on the complexity of the integrations. However Service Providers have no guarantee that the service will be successful, especially if a more agile operator launches an equivalent service before they are ready to go to market. The result is that the more innovative services, which should generate the most revenue are shelved before launching and the OTT providers continue to retain the lion’s share of the service revenue.

XON’s SDN and NFV solution for Service Providers allows the Service Providers to be agile, be first to market with new high-value services and offer subscribers a high quality service that simply cannot be matched by OTT providers.

Solution Overview

XON’s solution was designed with the following goals:

- All services should run on low cost industry standard platforms,
- Platforms should be virtualised and configured to provide multiple services from a single platform,
- Platforms should be “spun-up” to deliver new services rapidly,
- Virtual platforms should be dynamic and elastic to respond to subscriber demands,
- Deploying services on these low cost virtual platforms should be low risk for the Service Provider,
- Time to market should be reduced to weeks rather than months,
- Service Provider should open their subscriber market to the software vendors, making the business case for software vendors to prefer Service Providers to OTT providers.

Solution Description

The XON solution brings together best-of-breed products and solutions from the most innovative networking, virtualisation and storage vendors in the market and provides an in-house developed services orchestration platform to bring the components together, based on either Openstack or Contrail from Juniper Networks.

The networking layer is provided by industry standard switching and routing hardware under the control of Juniper Networks open service orchestration platform, Contrail. Contrail differs significantly from Openflow and brings carrier class SDN and NFV to the Service Provider market, which simply cannot be achieved with Openflow. Service Providers networks, when SDN enabled, will deliver services with the same level of quality and control that is delivered with traditional Juniper Networks products but with the dynamic control and agility of an OTT operators services – Service Providers will have the best of both worlds.

Service chaining is the technique that Contrail defined to support NFV services. Currently Juniper support the following NFV applications:

- Deep Packet Inspection (see also XON’s Service Creation and optimisation solution),
- Caching and optimisation (see also XON’s Service Creation and optimisation solution),
- Network Address Translation,
- Multi-level user based network firewalling (see also XON’s Security solution),
- However the number of applications are endless with 3rd parties already shipping applications supporting CPE, VPNs, Security, Unified Communications, Cloud, Analytics, etc.

Service chaining allows Service Providers to integrate NFV applications into their service catalog and offer services in-line to customers quickly and without the large capital investments and risk of the service failing due to low subscriber uptake. Contrail is an SDN controller which has an equivalent open-source version (Opencontrail) which is available currently from Juniper or by download from opencontrail.org. XON’s solution adds business, service and billing logic to Contrail and the ability to automatically orchestrate service fulfilment, assurance and billing, with dedicated SLAs. At a business level the XON’s solution is integrated tightly into either Openstack or Netcracker’s suite of carrier class OSS / BSS solutions to make orchestration of the entire data centre, service chain and network automatic.
Where would we use this solution?
- Service providers looking for new revenue opportunities and / or to share more fairly in the content providers revenue.
- Service Providers looking for business agility and dynamic networks that can respond to customers demands in the internet world.
- Service Providers looking to increase their wallet share of SMB’s ICT budget from the current 14% of spend.
- Service Providers looking to move up the value chain of their Enterprise customers who are planning to outsource large portions of their ICT functions.
- Service Providers looking to launch new high-value services including Managed data center, Security, VPN, DPI, Unified Communications, Big Data analytics and IoT.

Solution Benefits / Competitive advantages
- Light-weight orchestration platform that is ready for production immediately,
- Complete stand-alone solution, with APIs for integration if required,
- Additional revenues from existing customer-base,
- Revenue-sharing model that shares risk and reward,
- Fully integrated and tested in XON’s SDN/NFV Experience Centre.

ROI/Commercial proposition
NFV bring the following proven benefits to Service Providers:
- 86% reduction of time required to scale and implement services,
- 69% reduction in cost when using software for services instead of bespoke hardware,
- 62% reduction in cost when using commercial off the shelf servers instead of proprietary hardware.

SDN brings the following proven benefits to Service Providers:
- 68% reduction in service provisioning time through automated provisioning and service orchestration,
- 68% reduction in time to market for new services,
- 61% reduction in network provisioning time through automated provision of network resources.
INTEGRATED IP/OPTICAL NETWORKS WITH SDN

Problem Statement
Business is becoming increasingly bandwidth hungry with the introduction of services like enterprise mobility, high levels of video traffic and more sophisticated applications. With this increase in application sophistication and the increased demands of users who are used to consuming high bandwidth content in their personal lives the Total Cost of Ownership (TCO) of providing these services is increasing exponentially.

The increased mobility of the workforce of enterprises and customers of service providers make accurately predicting shifting traffic patterns almost impossible and ICT departments and service providers are over provisioning their networks to accommodate peak demand periods. To remain profitable, businesses need to transition to a more agile, intelligent and responsive infrastructure that leads to improved utilisation or revenue streams by enabling and delivering new, customisable and dynamic services.

Solution Overview
The Converged Supercore™ is an integrated solution developed by Juniper Networks which describes an integrated IP/MPLS core network with application awareness under the control of the Northstar software-defined networking (SDN) controller. The programmability of SDN introduces a new level of network elasticity and flexibility that enables enterprises and service providers to maximise usage of their scarce network resources whilst shortening network planning cycles. The introduction of SDN into the networking environment helps to centralise traditionally distributed traffic engineering operations, enabling enterprises and service providers to realise greater asset utilisation, create predictable network survivability scenarios, and quickly respond to new business and customer demands.

XON, being the largest Juniper partner in Africa, and a significant partner of ADVA Networks have taken the Juniper concept and expanded it further into a fully integrated and tested solution covering the IP/MPLS and SDN portfolio from Juniper Networks and the Optical portfolio from ADVA Networks. This XON solution takes the market leaders technologies in their respective segments and integrates them into a fully tested, supported and managed integrated IP/MPLS and Optical with SDN solution removing any integration and support risk from XON’s customers, whether they be enterprises or service providers.

Solution Description
XON’s IP/MPLS and Optical with SDN solution merges the packet layer with the optical transport layer in a new class of equipment from Juniper—the PTX Series Packet Transport Router, which is optimised for high speed Layer 2 MPLS switching, optimised for core networks. PTX Series devices are packet transport routers that combine the efficiency of packet technology with the simplicity of switching and the high capacity of optical transport at cost points that are similar to circuit switching. With transport-level performance, the PTX Series can switch LSPs in the same manner as traditional circuits like SDH or OTN. Looking at it differently, we can think of the PTX Series as the circuit switch of the future. After all, in a world that becomes increasingly IP and packet-based, LSPs are the circuits of the future.

The ADVA FSP is a scalable optical transport solution designed to respond to today’s exploding bandwidth demands. Whether you’re a service provider or an enterprise, the modular design of the platform ensures that Service Provider and Enterprise networks are built on a flexible WDM foundation. The FSP platform represents Optical+Ethernet provisioning for seamless end-to-end connectivity from the access to the metro and on to long haul. When used in conjunction with the Juniper PTX and Northstar controller the world of optical networking has never been so dynamic and responsive to customer demands.

Juniper Networks Northstar Controller is a powerful and flexible traffic-engineering solution that enables granular visibility and control of IP/MPLS flows in large service provider and enterprise networks. It enables enterprises and service providers to optimise their network infrastructure through proactive monitoring, planning, and explicit routing of large traffic loads dynamically based on the constraints specified. This allows operators to run their networks “hotter” while ensuring predictability, resiliency, and service-level guarantees.
Solution Components
• IP Routing / MPLS Switching – Juniper Networks.
• Optical Transport – ADVA Networks FSP.
• SDN – Juniper/ADVA.

Where would we use this solution?
• Enterprise Data Centre interconnection.
• Service Providers Data Centre interconnection.
• Service Providers Core Networks.

Solution Benefits / Competitive advantages
• “Run the network hotter” – i.e. utilise the available network links at 80-90% capacity vs the norm today of 40-60%. This is due to planning for peak demand without any application awareness.
• Make the network dynamic and application aware – i.e. allow increased business agility where applications, via the SDN controller, can dynamically request network resources.
• Real-time visibility and reporting, across the IP/MPLS and Optical domain.

ROI/Commercial proposition
• Reduction in the Total Cost of Ownership through:
  • Requiring less equipment enables a reduction of Capital Expenditure,
  • Less equipment to manage enables a reduction in Operational Expenditure.
• Typical payback period of 2 years in service provider core and enterprise data centre interconnect networks.
• Operational agility – deliver new services in weeks instead of months, for both enterprises and service providers.
• Very highly utilised optical capacity, instead of the typical scenario where 60% of the network is reserved for peaks occurring 20% of the time.

Support/Maintenance/Operations
Integration of the management, control and planning of the IP/MPLS and optical domains will result in a much lower TCO of the system. Typically in the past the engineering resources in the transmission (optical) domain and the routing and switching (IP/MPLS) domain were decentralised and not integrated. This XON solution allows service providers options to integrate their network engineering resources which didn’t exist in the past, however it is still possible to keep these engineering functions separate if required.

Management systems may also be optimised since the SDN controller is seen as the domain manager for the entire core network and the NMS, OSS and BSS systems require an interface into the SDN controller rather than all of the equipment in the network. This will significantly reduce the Operational Expenditure of the core network.
Problem Statement
Optimisation of network traffic and enhanced subscriber intelligence allows Service Providers to maintain a manageable network planning and upgrade cycle. The ubiquitous model for Service Providers world-wide is to continually add bandwidth to the core network to respond to subscriber demands and churn. Service Providers have been absorbing the cost of the continuous core bandwidth upgrades simply to deliver more and more revenue to OTT content providers.

With the increased mobility of Service Providers subscriber base, Service Providers networks – especially in Africa - are frequently being compared to experiences that are enjoyed internationally in terms of service pricing and performance. International markets are driven by different dynamics and often provide premium services either for free or for a very low cost cross-subsidising the cost of these services with other products in their portfolios. In Africa where Service Providers are unable to cross-subsidise services the result is that subscribers are increasingly likely to churn to lower cost providers.

Solution Overview
Broadband subscribers are changing their usage patterns as new devices and content become available online. XON’s Optimisation Solution marries Procera’s ability to allow Service Providers to understand the trends that are driving usage with Peerapps’s ability to optimise bandwidth usage resulting in an enhanced QoE for subscribers and increased revenue opportunities for Service Providers. The Openet billing platform is integrated through the solution to turn the increased network usage into revenue.

Solution Description
The PacketLogic software is the foundation of Procera’s Internet Intelligence solutions. PacketLogic’s unique capability to both provide Insights as well as to take Action sets it apart from other solutions designed to enhance a subscriber’s Quality of Experience. Peerapp’s Integrated, transparent caching alleviates the problem of network congestion due to bandwidth constraints. It allows video, music, games and other OTT content to be delivered quickly, with optimal quality, by bringing it closer to the subscriber and managing their network experience.

The XON optimisation solution is and integrated, modular solution which is designed to enable Service Providers to address specific concerns of on their networks. The solution offers the following:

- Enhanced customer care,
- Network Quality Assurance,
- Control over OTT services,
- Peering Management,
- Real-time problem resolution,
- Revenue assurance,
- Subscriber usage management,
- Threat detection and mitigation,
- Enhanced QoE for users,
- Up to 12 times faster delivery of content to subscriber, most often video content,
- Revenue protection and growth,
- Reduced Operational Expenditure.

Openet billing and revenue management is integrated through the PCRF interface in mobile networks to provide monetisation of data usage in real-time.
Support/Maintenance/Operations

The inclusion of active subscriber intelligence and network optimisation reduces the number of support cases being logged with the Network Operations Centre by up to 75%. A satisfied subscriber base also reduces the damaging impact of negative publicity caused by inconsistent subscriber experience.

Customer Quote –

"XON and Procera’s leading subscriber management capabilities enable us to develop and deploy new packages for all of our customers in ways that were previously not achievable, our customers will benefit from an enhanced experience made possible by more granular network quality and utilisation data."

- Raymond Macharia, CTO of Access Kenya

Solution Components

- Subscriber Experience Intelligence – Procera Networks.
- Caching and Optimisation - Peerapp.
- Billing and revenue management – Openet.

Solution Benefits / Competitive advantages

- Optimise subscribers QoE.
- Optimise delivery of content to subscribers.
- Introduce many service options and increase revenue opportunities, through: Zero-rating plans, multi-device and family plans, innovate with tiered service levels and data plans, and deliver kid-friendly broadband services.
- Introduce real-time billing capabilities to data services.

ROI/Commercial proposition

- Potential Increase in subscriber base through offering a higher quality service than your competitors.
- Significantly reduce subscriber churn and simultaneously increase ARPU.
- Reduction in the Total Cost of Ownership through:
  - Less investment in expensive network bandwidth results in a reduction of both Capital an Operational Expenditure,
  - Less equipment to manage enables a reduction in Operational Expenditure.
- Typical payback period of 2 years in service provider networks.
- Operational agility – deliver new services and revenue opportunities for Service Providers.

Customer Quote –

"Procera’s leading application identification and enforcement system Data consumption per subscriber type (pre-paid, pay-as-you-go, etc) including application data (streaming, browsing, etc) over time"

"XON and Procera’s leading subscriber management capabilities enable us to develop and deploy new packages for all of our customers in ways that were previously not achievable, our customers will benefit from an enhanced experience made possible by more granular network quality and utilisation data."

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ROI/Commercial proposition

- Potential Increase in subscriber base through offering a higher quality service than your competitors.
- Significantly reduce subscriber churn and simultaneously increase ARPU.
- Reduction in the Total Cost of Ownership through:
  - Less investment in expensive network bandwidth results in a reduction of both Capital an Operational Expenditure,
  - Less equipment to manage enables a reduction in Operational Expenditure.
- Typical payback period of 2 years in service provider networks.
- Operational agility – deliver new services and revenue opportunities for Service Providers.
Problem Statement
Ethernet as a network access technology has become ubiquitous over the past 20 years with almost every new standard and technology adopting Ethernet due to its high bandwidth and low cost per Megabyte. Service Providers were traditionally unable to offer services that transported Ethernet natively across their core networks and complex methods of interworking services, technologies and Quality of Service (QoS) schemes between their customers Ethernet networks and their core technologies like SDH, DWDM, ATM was difficult to achieve. The Metro Ethernet Forum solved this by developing a set of standards for Carrier Ethernet with integration of legacy, current and future technologies as its core value proposition.

Solution Overview
XON’s Carrier Ethernet solution integrates products from Juniper Networks, ADVA Networks and NEC. The entire solution is tested by XON to Metro Ethernet Forum Carrier Ethernet 2.0 standards, guaranteeing interoperable Carrier Ethernet services from end-to-end across disparate transport types, being Optical, Microwave Wireless and copper based. The solution also provides carrier class synchronisation to Ethernet networks, allowing the solution to support timing sensitive applications like mobile backhaul and replacement of SDH networks.

Solution Description
ADVA’s award winning FSP Carrier Ethernet transport for Optical Network solution enables Service Providers and Enterprises to deliver MEF-certified Carrier Ethernet services with carrier-class performance, scalability and resiliency, anywhere, at any time and with maximum reliability. Whether deployed in mobile backhaul, business services or open access, the FSP family is the market’s first ubiquitous access platform designed to enable profitable and differentiated Ethernet services. The FSP family is designed for demarcation, aggregation or extension, and is optimised for cost-efficiency, reliability and manageability. The ADVA FSP family provides legacy interfaces and makes transitioning from legacy technologies like SDH, ATM and other TDM based technologies seamless.

NEC’s award winning iPasolink family of packet microwave radio platforms provide Carrier Ethernet transport for both core and access wireless networks. In Service Providers and Enterprises today microwave systems are not only deployed in areas where the last mile to the customer or mobile RAN is difficult to service with cabled technologies but also in core networks; either as primary links of up to 1Gb/s or as links deployed for redundancy and capacity scaling. Resiliency and availability of the NEC microwave solution meets the carrier class requirements of “5 nines” (99.999%) availability. NEC’s solution, like ADVA’s allows for a smooth, seamless migration legacy technologies to Carrier Ethernet.

Juniper Networks provide switching, traffic engineering and services interfaces to the Carrier Ethernet solution, providing heterogeneous Carrier Ethernet networks that support payloads for mobile, video and cloud services, giving Service Providers and Enterprises a way to converge Metro Ethernet, Mobile Backhaul and business services onto infrastructures that are both manageable and cost effective. Juniper develops carrier-grade solutions that enable automation and service creation at scale, lowering costs for our service provider customers with next-generation tools that automate provisioning, service creation and management that opens new avenues of revenue and Operational cost savings.

Virtualization technologies available on Junipers access and aggregation routers integrate with proven cloud orchestration solutions to enhance service offerings such as billing, analytics and real-time diagnostics. Further, advanced timing and synchronisation protocols, together with integrated GPS, drive costs down while increasing timing and location services in mobile applications.
Where would we use this solution?
• Service Providers delivering Carrier Ethernet services to customers over various transport technologies, including optical, microwave wireless and copper cables.
• Enterprises requiring Data Centre interconnection or LAN interconnection.

Solution Benefits / Competitive advantages
• Highly integrated solution delivering managed Carrier Ethernet services across any technology.
• Lowest cost per Megabyte.
• Flexible bandwidth profiles that scale in increments of 1Mb/s up to 10Gb/s.

ROI/Commercial proposition
• Typical payback period of 2 years in service provider networks.
• Operational agility – deliver new services and revenue opportunities for Service Providers.

Solution Components
• Carrier Ethernet over Optical networks – ADVA.
• Carrier Ethernet over Packet Microwave - NEC.
• Carrier Ethernet services, switching and traffic engineering – Juniper Networks.
Problem Statement
Studies show that most businesses now use the internet as the primary mechanism to conduct their business operations and generate revenue. The extent of the business functions and transactions carried out over the internet range from, advertising, selling, communications with staff, customers and suppliers; ordering and financial transactions. It is clear that disruptions to any of these operational processes may have a devastating effect on the company’s ability to generate and maintain revenue and business operations.

Firstly businesses need to ensure continued availability and integrity of their systems and services allowing customers with the unhindered ability to continue doing business with them. Secondly businesses need to protect their core systems and operations from the threat of disruption and unauthorised access from both internal and external sources, and this is achieved with best-of-breed network firewalls.

Targeted Distributed Denial of Service (DDoS) attacks are the largest threat to business availability and system integrity. Reports from analysts world-wide show that as many as 60% of businesses had been the target of a DDoS attack in 2013 and the number of businesses targeted is doubling every year.

XON’s integrated security solution addresses both of the above-mentioned concerns through best-of-breed, focussed products that give Service Providers, Enterprises and Small to Medium businesses peace of mind that their business integrity and continuity needs are being looked after.

Solution Overview
Service Providers are primarily concerned with protecting their revenue and reducing their Operational Expenditure. Enterprise customers are prepared to pay Service Providers premium rates for assured business availability and are likely to churn from Service Providers who are not taking active steps to protect their services from malicious attacks.

Enterprises and Small and Medium businesses should demand that their Service Providers ensure their safety by implementing every available threat mitigation strategy possible. However businesses cannot simply rely on Service Providers to protect their business operations and should also actively participate in the risk mitigation process. Architecturally security strategies are most effective when they are implemented in hierarchies, with Service Providers providing the first line of defence and the businesses providing their own second level of defence. If these hierarchical defence mechanisms are synchronised and are able to communicate with each other to work together to mitigate the attacks then the security policy is at its strongest.

Traditionally network firewalls were configured to act on information gathered from specific fields in the network traffic headers. This approach not only restricted the flexibility of firewalls to act on a very narrow set of parameters but also does not provide business with the tools to develop comprehensive, user, group and role based, security policies which are globally deployable.

The products in this solution provide the following:
- Comprehensive DDoS attack mitigation through a dedicated best-of-breed appliance.
- Granular firewall which provides an end-to-end protection mechanism under the umbrella of Unified Threat Management (UTM).

Solution Description
Arbor Networks is recognised as the undisputed leader in the business availability market providing dedicated appliances to protect against DDoS attacks. Not only do Arbor Networks supply appliances to ensure business availability, network security intelligence and security analytics but they also operate the world’s premier Arbor Security Engineering and Response Team (ASERT) which is a world-renowned group of security engineers and researchers dedicated to monitor and respond to Internet threats at all times.

With ASERT, service providers and enterprises gain the expertise needed to reinforce their overworked security response groups and optimise the defense of their entire network infrastructure. ASERT allows XON’s customers through Arbor’s solutions to detect and mitigate DDoS attacks, worms and other security threats long before they impact business service availability and integrity.
Solution Description (cont’d)

Juniper Networks family of advanced network firewalls are built on the award winning JUNOS network operating system, which is ubiquitous across all Juniper products. The Juniper firewalls are fully fledged carrier class IP / MPLS routers with network layer firewalling capabilities and all of the advanced features that Juniper customers are familiar with. Additionally the firewalls provide an optional set of value-added firewall features collectively known as Unified Threat Management (UTM). UTM is a collection of five optional licenses which provide the following features:

- Antivirus,
- Antispam,
- Web filtering,
- Intrusion Detection and Prevention (IDP),
- AppSecure.

AppSecure elevates Juniper’s firewall to provide full application layer capabilities. A substantial list of applications are provided by default, identified by application signatures. The firewall is then configurable to provide Quality of Service (QoS), application tracking, application based firewall and basic DDOS protection per known application.

The control and granularity of the Juniper firewall is unparalleled and all firewalling features are available on a per-user or per user group basis. Users are authenticated against the businesses enterprise directory, whether it be Microsoft’s Active Directory, a RADIUS server or any LDAP based user directory and authorised to access business systems and information through infinitely configurable business wide authorisation policies. These policies may be statistically.

Scripts may be configured to act on specific triggers caused by exceptions that are caught by the firewall system which may be a single discrete event or sequence of events which make the Juniper firewall the most advanced threat mitigation system available on the market.

ROI/Commercial proposition

- The loss of business availability through DDOS attacks is unquantifiable and at best results in substantial loss of reputation and at worst could irreparably damage the business to point of closure.
- For Service Providers, DDoS protection may:
  - Significantly reduce Enterprise customer churn.
  - Require less investment in expensive network bandwidth from blocking of DDoS attacks.
  - Typical payback period of 2 years or less in service provider networks.
- Unauthorised access to business intellectual property is potentially devastating for business customers, and the damage also potentially unquantifiable. Granular control of firewalling policies down to a user or group of users and auditable logs is absolutely necessary for control of business property.

Solution Components

- DDoS protection - Arbor Networks.
- Advanced Threat Mitigation - Arbor Networks.
- Extensive Network Visibility - Arbor Networks.
- Advanced Network Firewall - Juniper Networks.

Solution Benefits / Competitive advantages

- Advanced mitigation of the most prevalent and complex business risks facing any organisation in the online world.
- Advanced, granular control over access to the information, resources and intellectual property of the business on a per user or per user group basis.
Problem Statement
In the past mobile Radio Area Networks (RAN’s) have been deployed using a limited number of macro-cells that are planned and optimised to give subscribers access to a limited amount of shared bandwidth. As subscriber usage increased and areas of no coverage and limited bandwidth became apparent, providers of mobile network equipment responded by developing equipment that services smaller cells that are more densely deployed closer to the subscribers.

Solution Overview
The XON solution introduces NEC’s Small Cell family of products that are custom designed and developed to cost effectively enable Mobile Operators to respond to these challenges. XON’s solution covers the entire spectrum of Small Cell technologies optimised for indoor and outdoor installations.

Solution Description
The outdoor solution consists of NEC’s award winning, self-optimising LTE eNodeB (eNB). The eNB is specifically designed to be light and inconspicuous enough to be installed on any type of physical infrastructure, from wall mounted to pole mounted. XON’s solution for the eNB packages an all-in-one solution for operators which includes power, switching, Radio Access and backhaul in a very compact and low power solution. Installation of the eNB is a one-man operation and the entire eNB weighs just 8kgs.

For in-building coverage NEC developed a family of Enterprise Radio Access Network nodes which are collectively known as the E-RAN solution. The E-RAN solution contains two system elements: the services node and the radio node. Multiple radio nodes are deployed inside a building and are connected to the services node using standard Ethernet infrastructure. The Services Node manages up to 100 radio nodes that support licensed, and optionally unlicensed, spectrum.

The Services Node is designed to accept two access modules that support UMTS and LTE radio access technologies and optionally a services module that can host third-party applications running on virtual machines. The services module can also host a Wi-Fi controller to provide integrated Wi-Fi capacity and coverage within the E-RAN.

Using a single Services Node, the operator can aggregate traffic for all radio access technologies, manage interference and mobility, and utilise a single backhaul and network management solution for all access technologies.

The Services Node is the central control point of the small cell network and provides the following functionality:
- User traffic aggregation and access control.
- Radio Frequency management for system self-optimisation.
- Single point of management and provisioning.
- Interference coordination.
- Mobility management.
- Enterprise networking.
- Single l3 interface to the 3G UMTS mobile core network.
- Single S1 interface to the 4G LTE packet core.
- Powerful platform to host services at the edge.

Femtocells are fully featured, short range mobile phone base-stations used to complement mobile phone service from larger macro-cell towers. These range from very compact residential Femtocells, the size of a paperback book and connected using standard domestic internet broadband through to larger equipment used inside commercial offices or outdoor public spaces. They offer excellent mobile phone coverage and data speeds at home, in the office and public areas for both voice and data. Small cells have been developed for both UMTS and the LTE radio technologies.

NEC’s core ”Software-based EPC " (vEPC) implement all of the required LTE capabilities (MME, P-GW, S-GW, HSS, PCRF) and capacity handling in software deployable as a virtualised network function (NFV function). Operators can use any virtualised server platform and when combined in a network deploying XON’s NFV solution the vEPC simply becomes another network application, with all of the scalability and management flexibility that XON’s NFV solution offers at a small incremental cost.
Support/Maintenance/Operations
The manageability of the NEC solution is unparalleled and each component is designed with manageability in mind. Also all components are carrier class and therefore have a very low TCO over their lifespans.

Customers
- E-RAN - Vodafone
- Femto – SFR, Network Norway

Customer Quote
"The rise of the smartphone, mobile apps and BYOD (Bring Your Own Device) in the workplace means high-quality, high-speed indoor coverage is no longer just a nice-to-have for business," said Fergal Kelly, CTO at Vodafone UK. "With Sure Signal Premium, large businesses can satisfy rising indoor capacity and coverage demands in a highly integrated, well managed way. This new service is just one benefit from the £900m we spent last year on our fixed and mobile network in the UK. This is one of the reasons 72% of FTSE 100 companies choose Vodafone to meet their communications needs."

Solution Components
- Outdoor – LTE eNB.
- Indoor – E-RAN and Femtocell.
- Core – vEPC.

Where would we use this solution?
- Mobile operators needing to cost effectively deliver coverage and high-capacity very rapidly without requiring significant investment in infrastructure like power and towers.
- Public safety organisations who require rapidly deployable telecommunications capabilities in support of their operations.
- Large Enterprises who require high quality integrated communications and who are strategically moving towards heterogeneous networks (HetNet’s).

Solution Benefits / Competitive advantages
- The cost of the solution is a fraction of the cost associated with macro-cell deployments.
- Network availability is increased exponentially with hotspots and capacity shortages being a thing of the past.
- Speed and ease of install, one man can install the solutions on almost zero infrastructure.
- Optimisation of the spectrum available increases the performance of the operators services, reducing customer churn and increasing revenue.
- The E-RAN solution includes local switching capabilities which not only increases performance but decreases the amount of backhaul required.
- One of the key advantages is the reduction of space and power consumption that all of the solutions offer driving down the Operational Expenditure of the Mobile Operator.
- The in building E-RAN solution offers Mobile Operators Multi-Tennant capabilities which have the potential to increase revenue and decrease deployment costs.

ROI/Commercial proposition
- Potential Increase in subscriber base through offering a higher quality service than your competitors.
- Significantly reduce subscriber churn and simultaneously increase ARPU.
- Reduction in the Total Cost of Ownership through:
  - Less investment in expensive network infrastructure (power and towers) results in a reduction of both Capital and Operational Expenditure,
  - Less equipment to manage enables a reduction in Operational Expenditure.
- Operational agility – deliver new services and revenue opportunities for Service Providers.
- The E-RAN solution typically achieves the following, when compared to traditional techniques:
  - ROI between 2½ to 8 times faster.
  - Between 1/3 and 1/2 the immediate installed cost.
  - Between 1/4 and 1/8 of the macro-cell TCO after 5 years.
  - Winning enterprise market share 3-4 times faster.
Problem Statement
Service Providers can no longer control service delivery from the core network to the end user. A new business model is emerging where content providers, content aggregators, and content distributors are creating a unique and powerful Services Ecosystem that allows them to share information and entertainment in creative new ways. Ways that threaten to marginalise Service Providers as OTT providers continue to grow their share of the service revenues.

To survive and prosper in this new environment, Service Providers must undertake a fundamental business transformation that maximises the capabilities of the network, manages network and IT from a single platform, accelerates the creation and delivery of new services, and monetises the Ecosystem. At the same time, Service Providers must continue to cut costs and build operational excellence.

To avoid being marginalised by OTT providers, Service Providers need to adopt a business model that:
• Meets the increasing demand for fixed and mobile broadband access and high-capacity networks,
• Transforms network and operations cost structures to maximize the return on next-generation infrastructure investments,
• Accelerates service creation, delivery, and management across diverse infrastructures,
• Creates the business, process, and technology framework that enables them to benefit from the Services Ecosystem.

Solution Overview
XON’s Netcracker and NEC Network, IT, and service platforms combined with NetCracker’s OSS solutions, overcome these challenges and accelerate business transformation through:
• Network and IT optimisation,
• Service acceleration,
• Content monetisation.

The XON Netcracker and NEC solution enables Service Providers to accelerate ROI as they deploy next-generation networks. They also provide new platforms and software that drive service creation and delivery innovation. Using these solution Service Providers can easily migrate rapidly to next-generation networks by optimising Network and IT resources. This enables the profitable adoption and management of new infrastructure and technologies.

Solution Description
Netcracker’s solutions automate the order-to-activate cycle for rich media and other next-generation services across any Network, IT, or device, from core to door to home network. This innovative approach enables rapid time-to-market and accelerated order-to-payment cycles.

The innovative XON NetCracker and NEC approach enables Service Providers to profit from content creation, aggregation, and distribution, and thereby monetise the Services Ecosystem. The solutions fulfil the following functions:
• Abstract services from the network,
• Expose service elements to partners,
• Enable partners to create new content,
• Syndicate services with content creators,
• Empower end users and enable devices to customise services,
• Enable new business models such as Software as a Service (SaaS) and Virtual Network Operator.

Solution Components
• Network, IT and Service Platforms - NEC and XON,
• NMS, OSS and BSS platforms – Netcracker.
• Billing and revenue management – Netcracker.
Support/Maintenance/Operations
Netcrackers solutions are installed at the majority of tier-1 Service Providers worldwide and have revolutionised the NOC capabilities of the providers.

Where would we use this solution?
• Large Service Providers wishing to build a TMForum compliant integrated NMS, OSS and BSS capability to integrate all of their network and subscriber management needs.

Solution Benefits / Competitive advantages
• Fully TMForum certified, compliant with the Business Process Framework, Information Framework and Integration Framework.
• Fully multi-vendor capable, managing any vendors networking products.
• Fully automation and optimisation of the Service Providers management capability.

ROI/Commercial proposition
• Up to 96% improvement in time-to-market for services,
• Ability to monetise services that have been generating revenue for OTT providers at the Service Providers expense.

Netcracker’s TM Forum compliant OSS/BSS Stack
Problem Statement
Service Providers and Enterprises have been deploying applications into cloud environments to meet business demands. Often these services were deployed in response to an urgent business need and were not carefully planned and integrated into a cohesive business strategy within the Enterprises IT governance framework. The result is that most enterprises have a multitude of cloud providers and cloud services delivering business application in a disjointed manner without consistent control and security.

Data Centres were traditionally very static in nature and could not respond to the dynamic demands of the businesses they were serving. Virtualisation addressed this shortcoming at the compute level but storage and networking were left behind the curve. It became possible through technologies like VMWare to “spin-up” new compute power dynamically as demand changed but the storage and networking were still provisioned manually. Recent introduction of new technologies like VMWare’s NSX and Openstack with networking plug-ins like Contrail have revolutionised Data Centre orchestration and automation.

Solution Overview
XON’s SDDC solution integrates technologies from VMWare, Openstack and/or Juniper’s Contrail. This solution fully automates the orchestration and provisioning of Data Centre services on demand from end-to-end, including compute, storage and networking.

Solution Description
The XON solution brings together best-of-breed products and solutions from the most innovative networking, virtualisation and storage vendors in the market and provides an option of VMWare’s NSX or the Openstack based Wingu services orchestration platforms to bring the components together and network orchestration and automation using Contrail from Juniper Networks.

XON have custom developed an API to allow SDDC’s to interconnect with public cloud platforms, like Wingu, with full automation and orchestration of services. XON have also integrated into the solution Application Container technology which allows Hyper-V based environments to migrate to VMWare ESX based public clouds at the application layer without any modification to the original application.
Solution Components

- Carrier Class SDN and NFV controller (Contrail) – Juniper Networks.
- Virtualisation – VMWare or Openstack.

Where would we use this solution?

- Service providers looking for new revenue opportunities in the public cloud market.
- Service Providers looking for business agility and dynamic networks that can respond to customers demands in the on-demand cloud world.
- Service Providers looking to move up the value chain of their Enterprise customers who are planning to outsource large portions of their ICT functions.
- Enterprises looking to unify their cloud environments into a single, unified cloud, delivering services to any device from anywhere at any time.
TO: The Chairman  
Zamtel Tender Board  
Lusaka

RE: Reference on XON-Systems at Telecom Namibia

Dear Members of the Tender Board,

Telecom Namibia has appointed Messrs. XON Systems for the design, build, commission and operate / manage during warranty period of Telecom’s new Universal Backhauling Network, a countrywide Juniper based IP MPLS network.

Telecom’s Universal Backhauling Network consists of:

- Multiple High Bandwidth Core Backbone sites — Points of Presence
- Multiple High Bandwidth Core Access
- Multiple High Bandwidth Mobile Core sites
- Multiple High Bandwidth Aggregation sites

Telecom’s Universal Backhauling Network will cater for and backhaul following technologies; among others:

- GSM (2G, 3G and LTE) Networks
- Broadband (xDSL and WiMax) Services
- VPN services
- Peering and Upstream services
- Ethernet services

Telecom Namibia has also appointed XON Systems for the design, build and commission the new Government Metro Ethernet network, a countrywide Juniper based network. Project rollout is currently underway.

XON Systems has also invested in Local Offices in Windhoek from where all operations are being handled.

Directions: Dr CM Beukas-Amiss (Chairperson), FJP Ndoroma (Managing Director), Ms F Veldskoen, RM Gertze, I Awene
Company Secretary: Ms P Kauqueni-Kanaelo
Reg. No: 62/282
Juniper kit for the Telecom Namibia training initiative, called the Juniper Network Academy.

Telecom and Government employees will benefit from this with instructor led Juniper training. The qualified Juniper instructor covers both theory and practical training. The Academy is hosted in Telecom’s training Center.

XON Systems has a compliment of skilled and professional staff. The Universal Backhauling Phase 1 rollout was completed successfully in 2013 with Phase 2 currently underway.

Should you require any further information, please contact me at telephone no. +264 61 201-2223.

Heinrich P. Bader
CHIEF OPERATIONS OFFICER
RE: LETTER OF RECOMMENDATION
TO WHOM IT MAY CONCERN

It is my pleasure to recommend the services of XON Systems to you. During the past four years we have worked with the Network division of XON Systems on numerous projects and have been pleased with their work and satisfied with their level of support. The company offers excellent quality services.

Some of the major projects that illustrate their attention to detail and high level of competency are the IP Core Upgrade Project and the IP MPLS Project. IP Core project consisted of the deployment of a high availability and redundant network spread over two geographical locations to serve our IP based services. The project consisted of the implementation of chassis routers and firewalls (Juniper MX960s and SRX3600s) with VPLS running for interconnecting the sites and unification of all BNG/BRAS on a single platform (MX960) for Data Services. OSPF was used as IGP on the Core Network and eBGP for IP-Transit peering.

The IP MPLS project consisted of building a Next-Generation Converged Backbone for Mobile Backhauling and Fixed Services. A unified IP Network using MPLS for traffic engineering and a 10Gbps Fiber Optic ring network at core with high availability protection mechanisms was built. The IP MPLS Network was constructed on Juniper MX480s, MX80s and EX4200s.

I am happy to recommend them and look forward to working with them again.

Sincerely,

Paul Valette

CTO
6TH March 2014

To Whom It May Concern

Re: Xon Systems Ltd – Performance to date in respect of the EC Development Corporation funded Africa Connect Project

Xon were contracted for the provision, delivery, installation, support and maintenance of network equipment to provide IP and associated services, specifically:

- IP Routing equipment and associated services
- Out of Band equipment and associated services
- A traffic flow analysis solution
- Ancillary equipment

The project was successfully implemented across 9 sites in Eastern & Southern Africa as well as Western Europe.

Given the size and distributed nature of the project, a number of occasions inevitably arose that caused some implementation issues.

Xon managed these issues professionally and maintained effective communications with DANTE at all times.

A member of their senior management team has been committed to the successful delivery of the project throughout its implementation - to the point of personally getting on a plane to ensure the successful and safe import of Juniper Equipment within Africa.

DANTE will be placing further business with Xon for the additional sites that we are seeking to bring onto the new Africa Connect network and are grateful for their continued support.

Phil Matthews BSc MCIPS
Procurement and Commercial Lead for AfricaConnect
DANTE