

MOBILITY : IPX

A NEW ERA FOR IPX

NEW DEPLOYMENT, NEW APPLICATIONS, NEW SERVICES

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IPX (Internetwork Packet Exchange) has now been part of the mainstream of networking solutions for more than five years. However, although the benefits of IPX are becoming more widely understood, the many ways it can be used are still being discovered.

IPX has traditionally been used to solve data roaming challenges associated with packet-based data transfer. However, its uses can go far beyond this – helping communications service providers deliver innovative solutions to the market, as well as efficient, high-performance networking.

When communications service providers look at their IPX strategies, they should consider an IPX fully converged interconnect platform as a way to deliver a variety of IP-based services. An effective IPX strategy needs to factor in more than just an upgrade path from GRX to Diameter signalling and LTE roaming services.

IPX enables a multi-service environment that means communications service providers can migrate from service-specific networks to a multi-service approach. That's truly liberating, as service providers can now capture new business opportunities while also bringing down the cost and complexity associated with managing specialised, bilateral and isolated interconnects.

A multi-service approach means delivering consolidated access to roaming, transport and other services, including global VPN and IP transit. This route should also be able to integrate legacy GRX and managed transport with a path to IPX for seamless service migration between 3G and 4G, while having the option to run 3G and 4G services in parallel.

IPX is all about efficient inter-connection and inter-working for applications, with optimal network utilisation and a simplified interconnect. It integrates Voice over LTE (VoLTE), HD Voice, Voice over IPX (VoIPX), signalling and roaming services, as well as video, IoT, messaging and rich-media applications – all within a single communications framework.

IPX REDUNDANCY AND A DUAL IPX STRATEGY

IPX offers the ability to deliver and help monitor superior levels of service – above and beyond what the public internet can provide. Enhanced Quality of Service (QoS) and Class of Service (CoS) management enables a higher Quality of Experience (QoE) for users, with high bandwidth rates, strong security and high availability rates.

These benefits make it an ideal solution for delivering high-performance and redundant networks. Optimum QoS and QoE drive customer satisfaction and reduce churn.

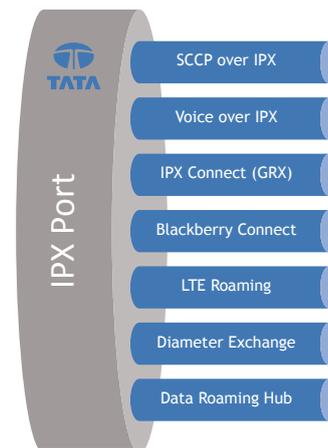


Figure 1 – IPX infrastructure supporting multiple services.

With a dual IPX strategy, communications service providers can guarantee that their customers have the best possible experience and performance with equally capable back-up.

A dual IPX strategy delivers compelling benefits:

- High availability**
 Even with new network equipment designed with the latest technology and with minimal failure rates, no network is 100% reliable or immune from unexpected downtime. As more services rely on IPX, high-performance back-up options become critical. If a service provider relies on IPX, they should look at redundant options for either re-directing network traffic or sharing it with a primary connection. A dual IPX approach minimises the threat of an unexpected failure of any single external network element.
- Expanding reach and coverage**
 In any communications network, accepted best practice is to avoid single network dependencies by instituting geographically diverse network access to multiple network backbones. As services become increasingly global and diverse (voice, roaming, internet access), global reach becomes equally important. The diversity of services across an IP network means that communications service providers should avoid sole dependency on a single IPX provider around the world. Complementary coverage from two IPX providers can expand service options, as well as global reach.
- Secondary peering**
 Peering between IPX providers, whether through established internet exchange points or private peering, plays a critical and economical part in establishing a wide network of connections. It can, however, result in an inherent loss of control over end-to-end QoS at inter-exchange points. Using a second IPX and gaining a

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secondary peering point is an ideal way to ensure better global availability.

- **Increased choice**

A dual IPX approach means that a service provider ceases to be dependent on one IPX vendor and can develop comparative insights into service offerings of each vendor – including support, features and pricing. This helps maintain a highly competitive dynamic between IPX providers to establish optimal services, and promote efficiency and innovation for IP inter-connectivity services.

As communications service providers face an increasingly competitive market, a dual IPX strategy can help to differentiate services, offering maximum uptime and performance for enterprise applications. IPX redundancy also enables service providers to maintain consistent levels of service that include high availability, increased reach and coverage plus improved reliability. This approach helps to combat competitive pressure, and maintain service levels and network redundancy, while broadening options to offer new services not just limited to LTE roaming.

IPX providers themselves can also grow the reach of their IPX global service and avoid the pitfalls of a single source. They can look to other IPX providers to help them add IPX redundancy and guaranteed quality while expanding the scope of their offering.

A dual IPX strategy makes sense for both communications service providers and IPX providers, as it delivers the QoS and QoE that today's market demands.

NFV AND CLOUD OVER IPX

Just as new market requirements can benefit from using IPX, it can also deliver advantages for new and emerging solutions like cloud access and Network Function Virtualisation (NFV). Communications service providers can connect to cloud-based NFV services over MPLS using IPX. This delivers secure access to the cloud ecosystem, along with the responsiveness and performance needed to run applications and services in an NFV environment.

Using IPX in this way enables communications service providers to access the cloud and integrate it with their own network and systems infrastructure, with the predictability, security and guaranteed performance associated with IPX. Communications service providers are wary of NFV's QoS requirements and potential security issues as an emerging technology, in particular 'Denial of Service' attacks and hacking.

The IPX-based approach is a network, function-specific VLAN deployed on IPX, which can be provisioned over

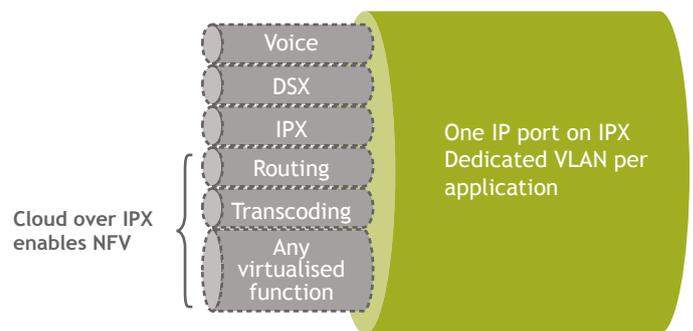


Figure 2 – NFV using IPX cloud access.

existing IPX interconnect. This approach addresses a number of issues, including:

- Security, including hacking and DDoS attacks – as IPX is isolated from the public internet
- QoS on I/O – because bandwidth is managed and segregated by service and function
- Orchestration, with one VLAN per function, which can be turned on and managed separately – and even sourced from different vendors.

IPX can create a secure and consistent environment for the delivery of NFV. It offers the QoS and QoE required for service providers to adopt NFV without fear of networking issues or security threats.

IoT – COMMERCIAL MODELS

Much like NFV, IPX can also have a role to play in the success of IoT. It can provide the scale, supported by the necessary signalling functionality, to make high volume international IoT traffic technically and commercially viable.

IoT is not a single market or segment but multiple markets and multiple segments, including connected cars, smart cities, connected devices, remote security and home automation amongst many others. While individual segments and sub-segments within IoT might vary, the commercial model involves a move from relatively high revenue and low data volume services towards individually lower component revenue services, but with higher data volume.

IPX can deliver the efficiency and scalability to support these growing data volumes while also offering the QoS required for critical applications. IoT services must be reliable in order to be both useful and credible. From sensors on buildings to driverless cars, the network is the foundation for the success of IoT. While some applications may rely on the network in life and death situations – for

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example driverless cars – others will not. This requires a flexible approach to CoS and high availability.

It is also expected that a considerable volume of IoT-connected devices will be in permanent roaming situations. This might include automotive applications, transportation or even connected consumer devices.

When a connected device of whatever type is communicating with a management system in another country, reliable connectivity is vital. The ability to deploy and monitor multiple QoS levels makes IPX an ideal connectivity management tool in these situations.

Security is a recurring concern with IoT. In this case, and unlike the public internet, IPX already provides a separate IP connectivity environment that can offer the security IoT needs.

Like NFV, IoT will need the support of a networking technology that can deliver security, quality and efficiency. That means IPX will be critical to its future success.

WHERE DO WE GO FROM HERE?

IPX has the potential to support a whole new wave of solutions. From building a foundation in quality and availability with a dual IPX strategy, to supporting cloud, NFV and IoT, IPX can help communications service providers grow their businesses. When they examine the possibilities that IPX offers, service providers will be able to offer customers better experiences through new services – as well as compete more effectively in their deployment and management, while reducing churn.

Re-evaluating the role of IPX in a communications service provider’s business can indicate a new way forward and

enable service providers to efficiently deliver the services of the future. Challenged to deliver applications that are increasingly demanding, they will find that IPX can solve pressing issues around QoS, QoE, scalability and security.

IPX is not just invaluable for data roaming. It can have a lasting impact on a communications service provider’s business and transform their approach to high-performance and secure networking.

TATA COMMUNICATIONS’ IPX+

The Tata Communications IPX+ framework provides a converged interconnect platform, enabling end-to-end management across mobile networks for the delivery of multiple IP-based services.

Service providers receive consolidated access to roaming and transport options including Global VPN, IP transit and ‘IPX Connect’. These provide GRX and managed transport with a path to IPX for data roaming, transport, enhanced QoS and security.

The Tata Communications IPX+ framework lets communications service providers efficiently support IP-based services and applications through a consolidated network, with optimal network utilisation, simplified interconnect and managed service options. Voice, signalling and roaming services are integrated within the IPX+ framework, which includes support for LTE Roaming, Voice over LTE (VoLTE), HD voice, VoWiFi, ViLTE and enablement solutions for real-time rich media applications.

Migrating from service-specific networks to IPX+ connectivity means that service providers can create new business opportunities and reduce the complexity and costs associated with managing specialised, bilateral and isolated interconnects.

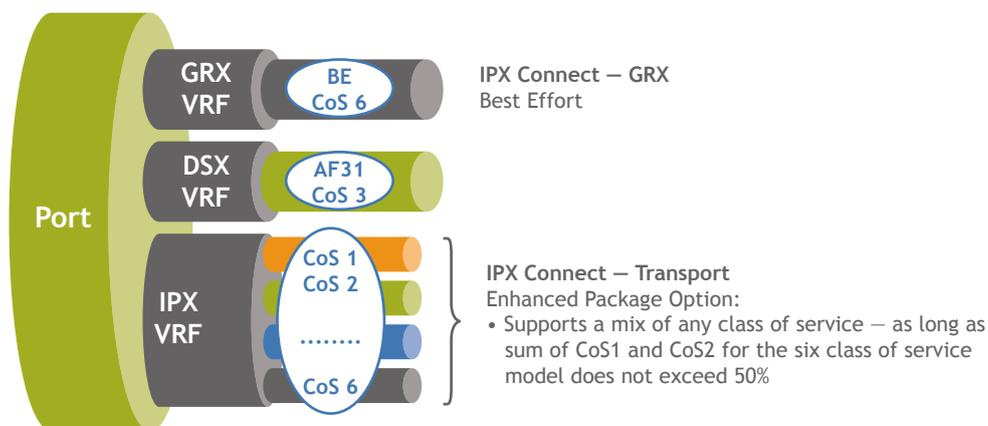


Figure 3 – The Tata Communications IPX: supporting GRX, Diameter Signalling Exchange and multiple CoS types across a single port.

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New services and additional capacity can be added quickly with configuration changes. That means service providers can scale capacity for individual services to respond to changing user demands.

A range of services, including voice, data, mobility and Unified Communications, can co-exist on the same MPLS port on their respective Logical Port/VRF. They can also be implemented on the same customer interface while utilising different OSS/BSS systems

**For more information about the
Tata Communications IPX+ see:
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The Tata Communications global network includes one of the most advanced and largest submarine cable networks and a Tier-1 IP network, as well as nearly 1.5 million square feet of data centre and collocation space worldwide.

Tata Communications' depth and breadth of reach in emerging markets includes leadership in Indian enterprise data services and leadership in global international voice.

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