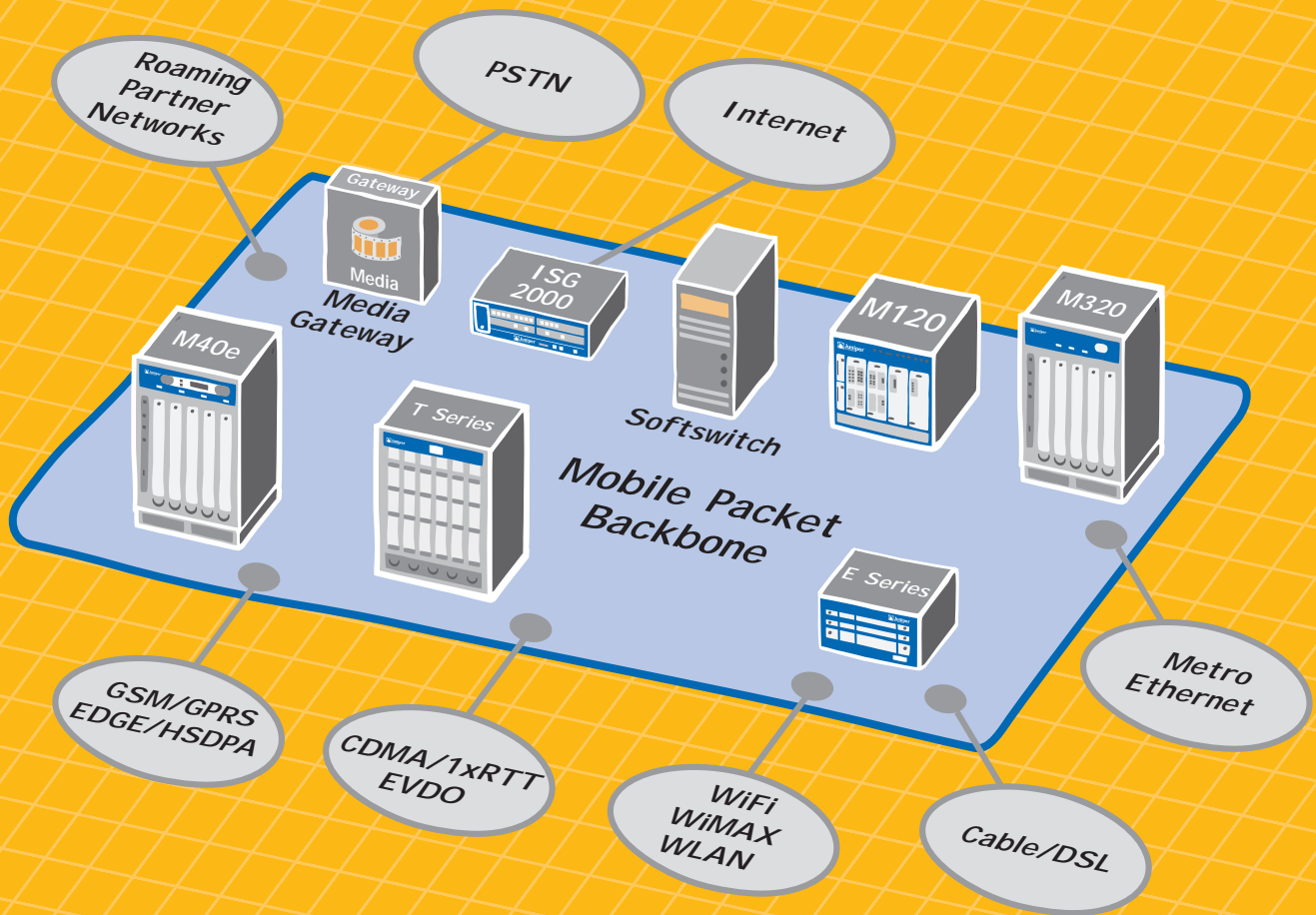


The Mobile Packet Backbone



Mobile Operator Challenges

As a mobile operator, you clearly understand the need to cap TDM, ATM and Frame Relay investments in favor of more cost-efficient mobile softswitch (MSS) and IP-based networks. A mobile IP backbone based on Multiprotocol Label Switching (MPLS) is the key to reliably and cost-effectively offering a mix of new voice, data, and multimedia services. As an added benefit, this IP/MPLS mobile packet backbone will also help smooth the evolutionary path to new IP Multimedia Subsystem (IMS)-based Fixed Mobile Converged (FMC) services. However, the evolution to IP-based networks itself is not necessarily a smooth one. There are many potential pain points to consider.

Mobile Packet Backbone Challenges

You know that mobile packet backbone networks are due to happen, and you understand their benefits, but what you may not know yet is how to manage the transformation, and what to look for when building an IP/MPLS packet backbone. For example, IP networks must meet new traffic delivery requirements in order to support next-generation services such as VoIP, UMA, and Mobile TV. This will require an intelligent infrastructure capable of offering differentiated treatment to a wide range of traffic types. In addition, as mobile services transition to IP, new security concerns must be addressed. Both users and services must be protected against threats previously known only in the public Internet.

Another important thing to consider in evolving from legacy architectures is the importance of finding vendors willing to protect your existing infrastructure investments with graceful, standards-based migration to IP/MPLS.

An Intelligent, Secure and Open Mobile Packet Backbone

Juniper Networks' solutions for mobile carriers use MPLS as a method of controlling traffic flows and integrating the transport of ATM and Frame Relay traffic into a multi-service mobile packet backbone while maintaining the quality associated with ATM and Frame Relay connectivity. For years, Juniper Networks has been helping service providers evolve to a secure, converged IP infrastructure by providing industry-leading routing and security equipment. We work closely with strategic partners to integrate our products into end-to-end solutions designed to address all of the key challenges faced by mobile operators in their migration to IP – from the introduction of mobile softswitching through the deployment of IP transport and the evolution to IMS-FMC networks based on 3GPP and ETSI/TISPAN architectures.

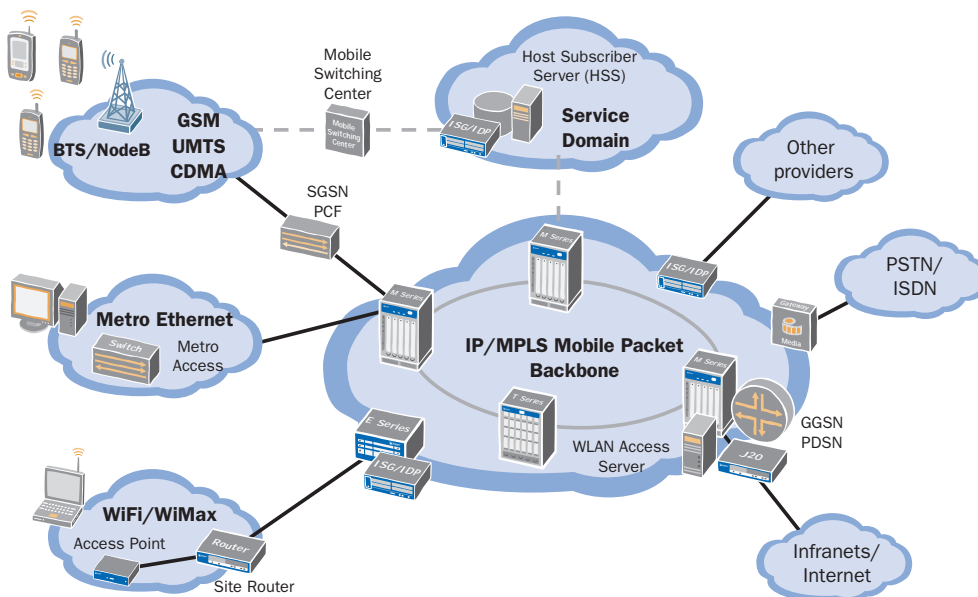


Figure 1: Juniper Networks' products enable mobile operators to build intelligent, secure, and open mobile packet backbone networks

This flexible, service-oriented network infrastructure adapts easily as technologies evolve, enabling carriers to deliver a sustainable set of innovative and secure services. In fact, eleven of the top twelve mobile operators already employ Juniper's mobile solutions, and our products have been deployed in over 100 wireless networks worldwide.

Carrier-Class Transport Infrastructure

Juniper Networks is a leader in the innovation and standardization efforts responsible for developing scalable, highly reliable mobile packet backbone networks. Juniper's products feature intelligent, session- and policy-based IP transport and resource control to give carriers the QoS capabilities for traffic prioritization that ensure application delivery based on service requirements. For example, our routers can support up to eight priority queues and place voice, data, signaling, and application traffic in the proper queue based on service requirements. Our routing products also feature the ability to dynamically control almost any aspect of the forwarding and routing from softswitches and other elements in the control layer.

Performance Features:

- Ensures that voice gets appropriate priority on the data network to deliver superior IP telephony application performance.
- Increases network efficiency by compressing voice packet headers over WAN.
- ASIC-based hardware acceleration provides low-latency, low-jitter, high-availability packet transport for high quality voice communications.

High Availability Features:

- Resilient Virtual Private Network (VPN) connectivity ensures that no calls are dropped, even when a failure occurs.
- Dynamic routing survives failures by automatically finding alternate routes to ensure IP telephony system availability.
- Automatic Protection Switching (APS) and Bidirectional Forwarding Detection (BFD), together with MPLS Fast ReRoute (FRR), provide sub-second link restoration to ensure voice calls are not interrupted if a transmission link or intermediate router fails.
- Redundant forwarding plane elements, including duplicated switch matrix, maintain superior performance even in the event of a failure.
- Modularity of the JUNOS operating system, with each process running in a protected memory space, enables restarting without interruption to the other processes. Graceful Restart (GR) ensures no data is lost during this restart.

Comprehensive, Proven Security for the Entire Mobile Network

Juniper Networks' mobile packet backbone network solutions include pervasive security that protects the infrastructure as well as applications. As an industry leader with a full range of security products, Juniper secures twenty-three of the world's top thirty wireless carrier networks. Our best-in-class network security is designed to handle voice as well as data traffic, to secure converged networks, and to protect both GSM/GPRS and CDMA network interfaces. Our security platforms also include support for new protocols such as GTP, SIGTRAN, and SIP.

In addition to dedicated security appliances such as the Juniper Networks ISG 2000, Juniper routers are also hardened against attacks. Features such as line-rate packet filtering, unicast Reverse Forwarding Path (uRPF), flow monitoring and IPsec VPNs are available on our router product range.

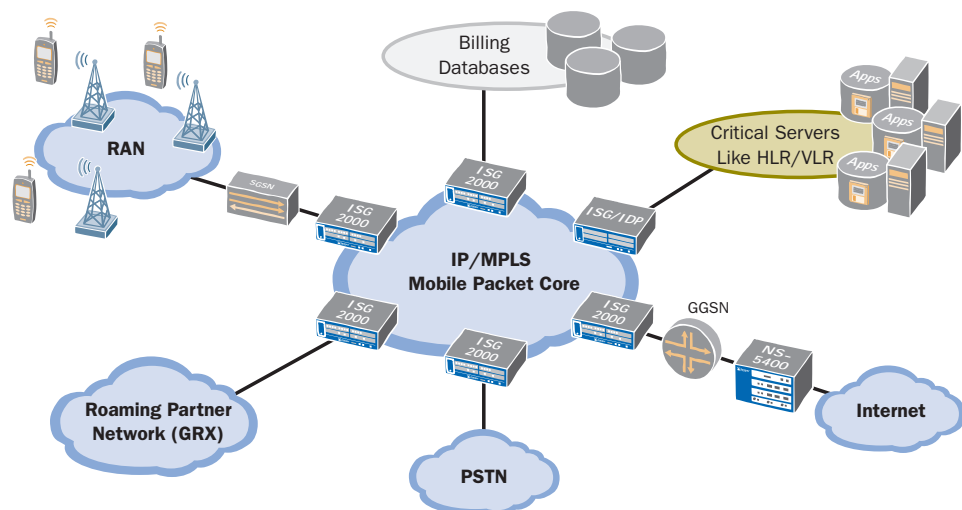


Figure 2: Juniper Networks provides comprehensive security for the entire mobile carrier network.

Open, Scalable Solutions for Graceful Transition to IP

Juniper is committed to non-proprietary and open standards as defined by IETF, ITU-T, 3GPP, ETSI/TISPAN, and other standards groups. We protect your existing ATM and Frame Relay infrastructure investment by providing graceful, standards-based migration to IP/MPLS—for example, through our support for L2 and L3 pseudowires and ATM to MPLS interworking. The Juniper Frame and ATM Service Emulation Toolkit (J-FASE) offers the industry's most accurate ATM/Frame Relay service emulation over MPLS. We also offer industry-leading QoS, Service Level Assurance (SLA), and Call Admission Control (CAC) features to enable various applications on the mobile packet backbone and help retain familiar ATM/Frame Relay experience for a smoother evolutionary path to IP.

Next-Generation Mobile Networks

Looking to the future of network evolution, the introduction of IMS-FMC as a service enabler for the core network will demand an intelligent, secure, and open IP/MPLS core network. The evolution towards mobile broadband using new radio technologies like HSPA (High Speed Packet Access) will further increase the demand for a high-capacity, highly reliable IP core network. Juniper's mobile packet backbone network solutions do more than just build an infrastructure for your current needs, they create a future-proof infrastructure that supports seamless migration to emerging IMS-FMC applications. Our solutions are fully compliant with standards issued by major groups such as 3GPP and 3GPP2, and will enable you to evolve your network as next-generation architectures continue to develop.

Summary of Key Benefits

There is a lot of uncertainty on why, how and when to migrate from legacy TDM, ATM, and Frame Relay infrastructure towards IP. The reward for doing so is the ability to reduce operational expenses, launch new mobile services (such as those enabled by IMS), reduce subscriber churn, and, in essence, operate a more profitable and competitive mobile carrier business.

Juniper Networks is the market leader in building flexible, service-oriented packet networks. Whether you are a GSM/GPRS carrier, a CDMA carrier, or even a UMA or Wi-Fi/WiMAX carrier, an intelligent, secure, and open IP/MPLS infrastructure with products from Juniper Networks will enable you to adapt easily as technologies evolve, allowing you to deliver a sustainable set of innovative and secure services today and in the future. We enable mobile carriers to build more cost-effective, flexible and scalable networks, leveraging a common IP infrastructure that increases profitability by:

- Allowing new higher-margin services to be introduced more economically, rapidly, and flexibly than before.
- Reducing operating expenses associated with managing multiple networks that each depend on a different technology.
- Leveraging existing investments to create bundled services.
- Maintaining a single authentication, authorization, and accounting (AAA) system for all users—regardless of which network resources they use.
- Minimizing the security, reliability, and scalability risks associated with traditional IP networks.

Juniper your Net.™



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