

IP routers are now increasingly expected to do more than just traditional packet forwarding – they must be extensible as well as scalable. It is a challenge to design a router architecture to support both high (and increasing) packet forwarding rates as well as a wide array of packet processing services. The most easily extensible design would be entirely software-based, but this is in tension with the requirement for high performance. One possible answer is to couple a software-based router with a high performance platform. Cluster-based supercomputers are very successful due to their scalability and high availability, and they also exhibit outstanding performance/cost ratio. In this paper, we describe the implementation and evaluation of an extensible and scalable software-based IP router, which is built using a cluster of processors connected by a high-speed / low latency InfiniBand interconnection network. Our measurements show that the performance of this router can be scaled nearly linearly with increasing hardware.