

Maximizing Service Provider Profitability Using IP Infusion Virtual Routing and the OSE Real-time Kernel

by Robert May, Architect, Advanced IP Software for IP Infusion

This article provides a brief introduction to the advantages of employing IP Infusion's Virtual Routing (VR) with the OSE Real-Time Kernel (RTK) to aggregate multiple customers onto a single Provider Edge (PE) device. Service offerings like VPN require strict security enforcement, which can typically only be achieved using separate hardware and software. Virtual Routing provides a much more cost-effective alternative without restricting functionality. The OSE RTK further extends the scalability of VR to deliver maximum performance and minimal cost to a PE box builder.

Service Provider Dilemma

Service Providers (SPs) are continually searching for new revenue-generating services to offer, for which they can charge a premium. One popular example is providing a Virtual Private Network (VPN) service. While this article focuses on VPN, the same ideas can be applied to any other application that is historically provisioned by the end user, but which—for reasons of economies of scale—can be offered by the SP at a much cheaper rate.

Traditionally: A VPN is installed, maintained, and monitored by each end user or enterprise.

VPN Service: Today, SPs offer a VPN service, relieving the user of this burden. Customers are no longer responsible for purchasing expensive hardware or hiring staff to maintain it. SPs can operate much more efficiently and significantly reduce the up front and ongoing costs to the user.

Problem: Services such as VPN require strict security between SP customers. This typically requires the installation and maintenance of separate hardware and software per customer, which seriously impacts the profit margin for the SP.

Solution: VR can be used to provision services for multiple customers on a single hardware device (usually a PE router), while maintaining the security requirements for the applications.

Furthermore, the more powerful the OS, the more scalable is the VR solution; hence minimizing expenditure for the SP.

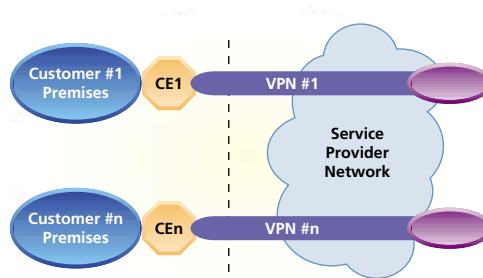


Figure 1 illustrates VPN service with Virtual Routing employed.

Defining Virtual Routing

Virtual Routing is interpreted to be an emulation of a physical router at the software layer. The operating system, TCP/IP stack, routing protocols, etc. are logically divided into multiple instances/contexts, and each instance runs independently for a specific customer.

Requirements for a VR system:

- Each VR must be fully independent from any other VR and must not compromise security.
- Each VR contains a separate instance of all routing and forwarding information, plus separate instances/contexts of the routing protocols, TCP/IP stack, management interface, etc.
- Each VR must be able to reuse existing mechanisms for configuration, deployment, operation, troubleshooting, monitoring, and accounting.

Maximizing Scalability with OSE

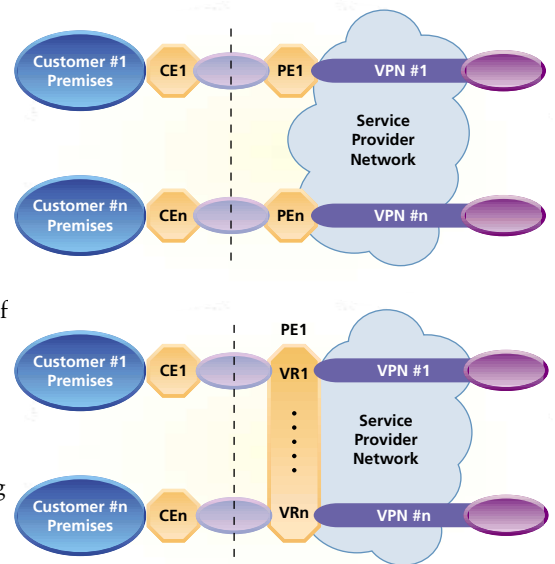
The OSE RTK is complementary for Virtual Routing due to its high performance and real-time characteristics. These advantages produce a more scalable version of VR than

non-RTOS systems. Service providers can provision many more customers per-PE device, greatly extending the cost-saving benefits. Another potential advantage of the OSE RTK is its inherent IPC abilities to easily support multi-blade architectures. Revolutionary designs can take advantage of parallel processing to achieve even greater levels of scalability under these architectures.

See Also

Additional information about Virtual Routing and its applications—including a comprehensive white paper—is available at the IP Infusion website www.ipinfusion.com. The IP Infusion ZebOS™ Advanced Routing Suite is the only commercially offered Virtual Routing implementation available for the OSE platform.

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US Headquarters OSE Systems, Inc., 1731 Technology Drive, San Jose, CA 95110 USA, Toll-free: 1.866.844.RTOS, Fax: 408.392.9301, email: info@enea.com

European Headquarters OSE Systems AB, Nytorpsvägen 5B, SE-183 23 Täby, Sweden, Phone: +46 (0)8 507 157 00, Fax: +46 (0)8 507 140 40, email: info@enea.se

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