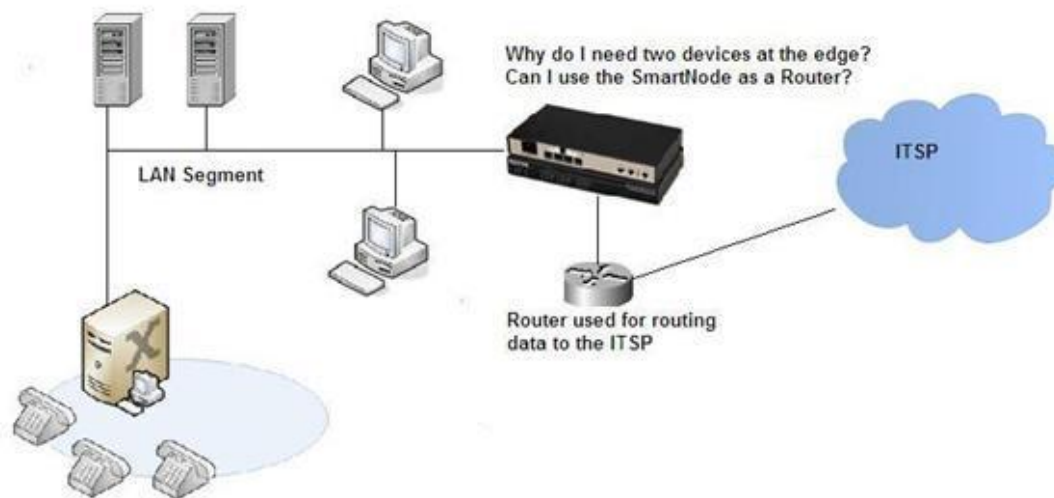


## Can my SmartNode do Enterprise Class IP Routing?

In the landscape of VoIP gateways, the SmartNode is a venerable leader with a proven track record of deployments across the world. So you already bought a SmartNode. With your IP telephony needs planned, you ask yourself, do I really need another router at the Enterprise Edge? Would my SmartNode not work as an Enterprise IP Router instead? Of course it can. Even though Cisco and other high end routers are ideal Carrier Backbone devices the costs don't justify deploying these in small to medium sized deployments. SmartNode is your one stop Integrated Access Device.

But don't take my word for it. Let's take a look at a scenario, where an Enterprise needs features like IP routing (static or dynamic), VRRP (optionally to connect to multiple ISP's) and of course advanced features like Policy Based Routing, Access lists, Nat etc. As you can see the basic setup below, adding a router doesn't lend you any additional benefits. The SmartNode can function as your Router and fulfill all your Enterprise Routing requirements. Let's take a look:



### IP Routing – RIP v1 and v2

The cornerstone of Enterprise Routing features is the IP routing protocol itself. SmartNode enables IP routing with not just static routing but also allowing a full implementation of RIP (both V1 and V2). Routing can further be extended using Policy Based Routing (PBR).

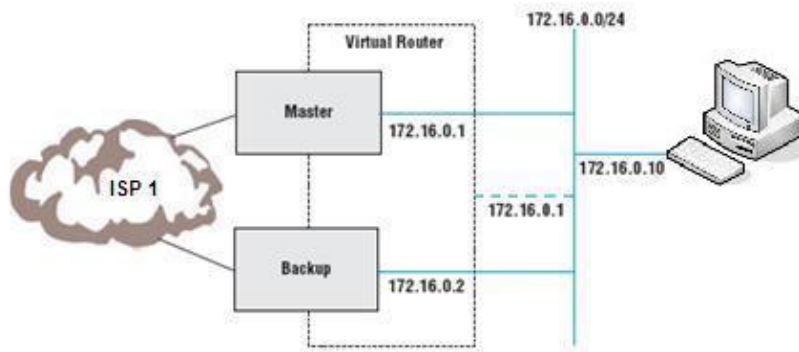
For small, homogeneous networks, RIP proves to be highly robust and a compact routing protocol. SmartNodes allows you to configure interfaces to send and receive either v1 or v2 or both updates.

### VRRP

The Virtual Router Redundancy Protocol (VRRP) aims to provide a router fallback in environments, where routing redundancy is a must. Two or more physical units build together one virtual router. This virtual router provides the routing functionality as long as at least one of the physical units is up and running.

Let us look at two scenarios where your enterprise could leverage VRRP

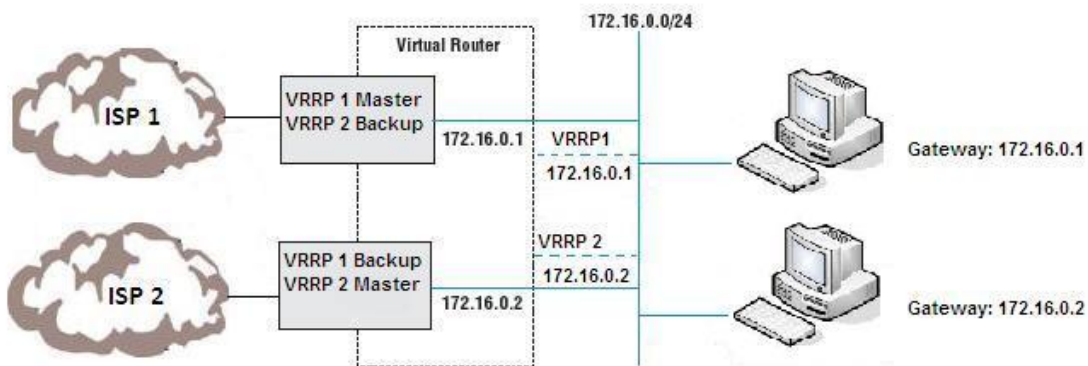
#### Basic Setup:



The basic virtual router setup consists of one node as the master and a second node as the backup. The master is always the node that has the same physical IP address as the virtual router IP address. The master node sends VRRP advertisement messages to the VRRP multicast IP address, where all backup nodes listen. If a backup node does not receive an advertisement message for 4 advertisement intervals, it becomes the master node.

### Advanced VRRP – Redundancy and Load Sharing

With the basic router setup you can get redundancy. However the back up node is always idle. This could be remedied if you used a load sharing scheme. To enable load sharing however you will have to create two VRRP profiles. This can be shown as below



In this scenario two ISP's are used (one primary, one secondary) for redundancy. Your mission critical connections could be connected to the primary ISP, while the less important ones could be connected to ISP2. This allows load balancing and failover to be implemented using VRRP.

### Access Lists

Access list are a critical part of today's routed environment. There are many reasons to configure access lists. But the most important reason to configure access lists is to provide security for your network. If you do not configure access lists on your router, all packets passing through the router could be allowed onto all parts of your network.

Access lists filter network traffic by controlling whether routed packets are forwarded dropped or blocked at the SmartNode interfaces. Your SmartNode examines each packet to determine whether to forward or drop the packet, based on the criteria you specified, like the destination address or an upper layer protocol or other information within the access lists.

## NAT

NAT – Network Address Translation is a technique that hides an entire address space, usually consisting of Private Network addresses, behind a single IP address in another, often public address space. This mechanism is implemented using translation tables to map the "hidden" addresses into a single address and then rewrite the outgoing IP packets on exit so that they appear to originate from the router. In the reverse communications path, responses are mapped back to the originating IP address using the rules stored in the translation tables.

Although not a serious security solution in itself, the lack of full bidirectional connectivity prevents malicious activity initiated by outside hosts from reaching those local hosts.

When combined with Access Lists SmartWare provides a strong security solution for your Enterprise needs.

## PBR and QoS

Policy based Routing is based on setting up rules similar to an Access list. Packets are routed based on the criteria they meet set in these lists. PBR can ensure packets are optimally routed over the network. In addition, profiles can be given to various classes of user generated traffic and bandwidth shared between these can be finely configured to ensure highest Quality of Service.

## Advanced Features:

There are certain Enterprise features that go hand in hand with IP routing. These are critical for many Enterprise Deployments. Below we see a list of some of the important features SmartNode supports:

- IGMPv2
- SNMP and SSH for secure management
- Radius
- DHCP Client/ Server and DNS Relay
- IPSec VPN's
- PPPoE, IPoA
- Access Technologies like ADSL, G.SHDSL, V.35, X.21, T1/E1 etc

## Conclusion:

SmartNode is your one stop Integrated Access Device which resolves both Telephony and Data Routing requirements and thus provides greater savings compared to the Ciscos and Junipers of the world in both CAPEX and OPEX for your Enterprise.

