

# Routing Metrics Basics

By,

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This paper I will discuss at a high level some of the most used routing protocols and how they might fit your network. I will not cover too much of the particulars of any routing protocol here but you can freely Google any of the terms and get more information on them. The terms and protocols are mostly vendor neutral so if you are working with Cisco, Juniper, Motorola, Riverstone, Foundry, Alcatel, Force-10, Bay, or any other Router vendor most of the information below will apply since it's all based on standards.

Route Source	Default Distance
Internal BGP	200
Internal Enhanced IGRP	90
OSPF	110
RIP	120
Static route	1
Unknown	255

When dealing with routes on a router you need to understand the routing protocol and how the router responds to traffic. With Static routes the router will always assign a value of 1 (this is default). Static routes are the best path according to the cost metric (static route = 1). Other routing protocols have default values assigned to them too and the chart above shows the values of many routing protocols. It is possible to set custom costs to any path (this function may not be supported in all type of routers). Which metric do you need for your network will depend on its complexity and the technical/hardware you have available. With small simple topologies you can normally just use static routes or maybe RIP (Routing Information Protocol). RIP has two versions and neither are very scalable for future growth. When designing any network you should always allow for 100% growth. The best routing protocol for small to medium networks is OSPF (Open Shortest Path First). OSPF is a scalable routing protocol that uses different metrics for route selection and works well in small to medium network (some cases larger networks use OSPF with different areas). Now for larger networks or medium network with complex topologies you would use OSPF and maybe BGP. BGP is a protocol that is good for load balancing or connecting to different ISP's. Many larger networks with multiple gateways to other networks use OSPF with BGP on the core. The OSPF helps to maintain the routing in smaller or less complex Autonomous Systems (AS) or areas of the network. OSPF routes can be ported over the BGP links so you can propagate your routes to other networks. When OSPF is divided into smaller areas they are called Autonomous system (AS). More information on routing metrics and protocols can be found on major networking equipment vendors sites and Google is always good to use to find information.