- *Hierarchical Subdivision Into Areas*. To handle large intranets and limit routing overhead, OSPF allows a site to partition its networks and routers into subsets called *areas*. Each area is self-contained; knowledge of an area's topology remains hidden from other areas. Thus, multiple groups within a given site can cooperate in the use of OSPF for routing even though each group retains the ability to change its internal network topology independently.

- *Support For Authentication*. OSPF allows all exchanges between routers to be *authenticated*. OSPF supports a variety of authentication schemes, and allows one area to choose a different scheme than another area.

- *Arbitrary Granularity*. OSPF includes support for host-specific, subnet-specific, network-specific, and default routes.

- *Support For Multi-Access Networks*. To accommodate networks such as Ethernet, OSPF extends the SPF algorithm. Normally, SPF requires each pair of routers to broadcast messages about the link between them. If K routers attach to an Ethernet, they will broadcast K^2 status messages. Instead of a graph that uses point-to-point connections, OSPF reduces broadcasts by allowing a more complex graph topology in which each node represents either a router or a network. A *designated gateway* (i.e., a *designated router*) sends link-status messages on behalf of all routers attached to the network.

- *Multicast Delivery*. To reduce the load on nonparticipating systems, OSPF uses hardware multicast capabilities, where they exist, to deliver link-status messages. OSPF sends messages via IP multicast, and allows the IP multicast mechanism to map the multicast into the underlying network; two IPv4 multicast addresses are preassigned to OSPF 224.0.0.5 for all OSPF routers and 224.0.0.6 for all OSPF Designated Routers (DRs).

- *Virtual Topology*. A manager can create a virtual network topology. For example, a manager can configure a virtual link between two routers in the routing graph even if the physical connection between the two routers requires communication across multiple transit networks.

- *Route Importation*. OSPF can import and disseminate routing information learned from external sites (i.e., from routers that do not use OSPF). OSPF messages distinguish between information acquired from external sources and information acquired from routers interior to the site.

- *Direct Use Of IP*. Unlike RIP and RIPng, OSPF messages are encapsulated directly in IP datagrams. The value *89* is used in the *PROTO* field (IPv4) or the *NEXT HOP* field (IPv6) in the header to identify the datagram is carrying OSPF.