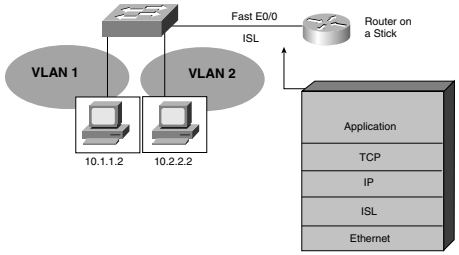
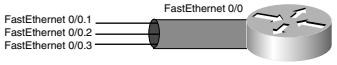
The figure depicts a router attached to a switch. The end stations in the two VLANs communicate by sending packets to the router, which forwards them to the other VLAN. This setup is referred to as a *router on a stick*.



Dividing Physical Interfaces into Subinterfaces



ISL trunking requires the use of subinterfaces. A *subinterface* is a logical, addressable interface on the router's physical Fast Ethernet port. Several subinterfaces can be on a single port (one per VLAN). The **encapsulation isl** *domain* command (in subinterface configuration mode) enables ISL. The *domain* parameter refers to the VLAN domain number.

In the figure, the FastEthernet 0 interface is divided into multiple subinterfaces (FastEthernet 0.1, FastEthernet 0.2, and so on).

Configuring Network Routing Summary

- "Router on a stick" is a router attached only to a switch. The router receives packets from one VLAN and forwards them to another VLAN.
- A subinterface is required to support ISL trunking.
- To configure a router on a stick, enable ISL on the switch port connected to the router, enable ISL encapsulation on the router's FastEthernet subinterface, and assign a network layer address to each subinterface.

Determining IP Routes

Routing Overview

Routing is the process of getting packets and messages from one location to another.

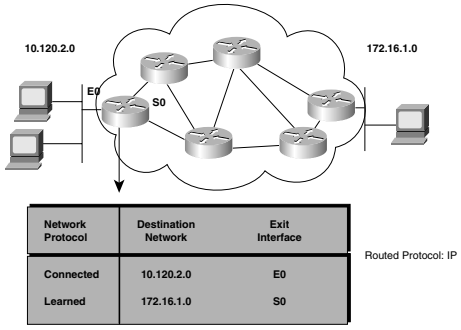
Key Information a Router Needs

The router needs the following key information:

- **Destination address**—The destination (typically an IP address) of the information being sent
- **Sources of information**—Where the information came from (typically an IP address)
- **Possible routes**—Likely routes to get from source to destination
- **Best route**—The best path to the intended destination
- **Status of routes**—Known paths to the most current destinations

A router is constantly learning about routes in the network and storing this information in its routing table. The router uses its table to make forwarding decisions. The router learns about routes in one of two ways:

- Manually (routing information is entered by the network administrator)
- Dynamically (routing processes running in the network)



Identifying Static and Dynamic Routes

A router uses static or dynamic routes when forwarding packets:

- *Static routes* are manually entered by the network administrator. These routes must be manually updated whenever there is a topology change.
- *Dynamic routes* are learned by the router. Unlike static routes, topology changes are learned without administrative intervention and are automatically propagated throughout the network.

Examining Static Routes

Static routes specify the path packets take, allowing precise control over a network's routing behavior. Static routes are sometimes used to define a *gateway of last resort*. This is