

## Understanding 802.1X and VoIP on EX-series Switches

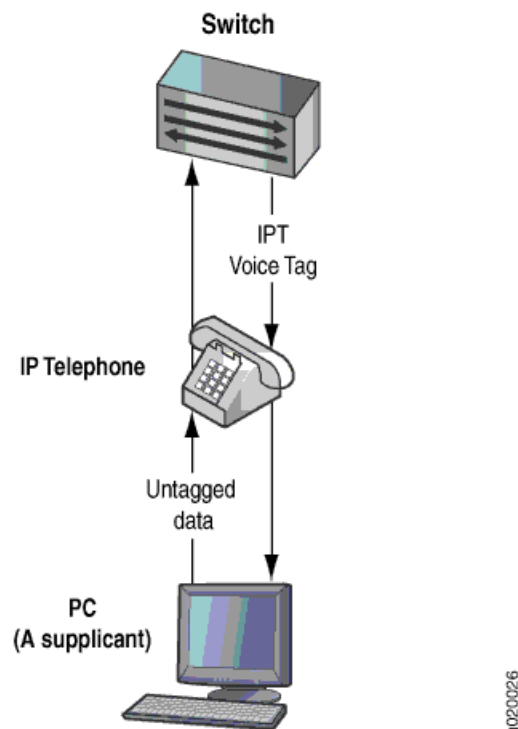
When you use Voice over IP (VoIP), you can connect IP telephones to the switch and configure IEEE 802.1X authentication for 802.1X-compatible IP telephones. The 802.1X authentication provides network edge security, protecting Ethernet LANs from denial-of-service (DoS) attacks and preventing unauthorized user access.

VoIP is a protocol used for the transmission of voice through packet-switched networks. VoIP transmits voice calls using a network connection instead of an analog phone line.

When VoIP is used with 802.1X, the RADIUS server authenticates the phone, and Link Layer Discovery Protocol-Media Endpoint Discovery (LLDP-MED) provides the class-of-service (CoS) parameters to the phone.

You can configure 802.1X authentication to work with VoIP in multiple supplicant or single supplicant mode. In *multiple-supplicant* mode, the 802.1X process allows multiple supplicants to connect to the interface. Each supplicant will be authenticated individually. For an example of a VoIP multiple supplicant topology, see Figure 1.

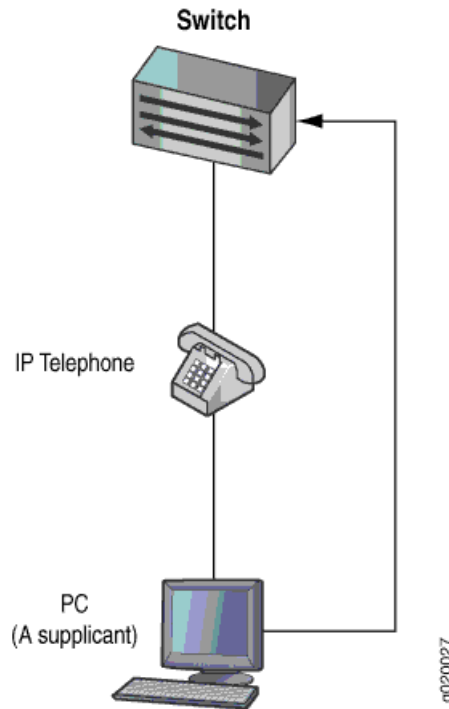
**Figure 1: VoIP Multiple Supplicant Topology**



If an 802.1X-compatible IP telephone does not have an 802.1X host but has another 802.1X-compatible device connected to its data port, you can connect the phone to an interface in single-supplicant mode. In *single-supplicant* mode, the 802.1X process authenticates only the first supplicant. All other supplicants who connect later to the

interface are allowed full access without any further authentication. They effectively “piggyback” on the first supplicant’s authentication. For an example of a VoIP single supplicant topology, see Figure 2 .

**Figure 2: VoIP Single Supplicant Topology**



If an IP telephone does not support 802.1X, you can configure VoIP to bypass 802.1X and LLDP-MED and have the packets forwarded to a VoIP VLAN,.

- Related Topics**
- Understanding 802.1X and LLDP and LLDP-MED on EX-series Switches
  - Example: Setting Up VoIP with 802.1X and LLDP-MED on an EX-series Switch
  - Example: Configuring VoIP on an EX-series Switch Without Including 802.1X Authentication
  - Example: Configuring VoIP on an EX-series Switch Without Including LLDP-MED Support