

# VoIP Implemented Using a SONET Ring

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## Project Goals:

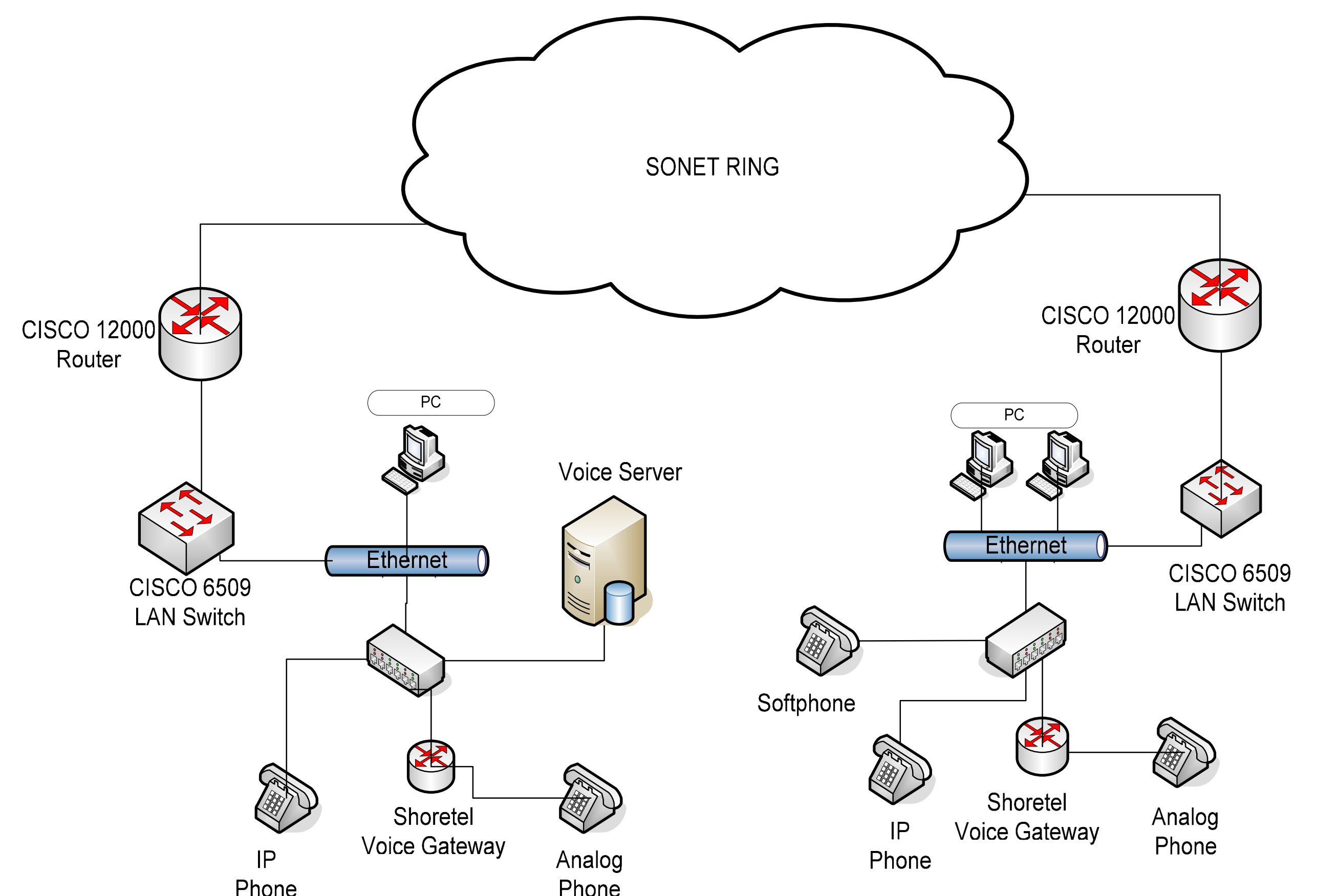
- ◆ **Goal 1**
  - ◆ Design and implement a VoIP application over SONET through a 3-Node Optical Ring.
- ◆ **Goal 2**
  - ◆ Analyze packet transmission through the network utilizing Wireshark.

## Project Results:

- ◆ Successfully designed and configured a VoIP Network using Cisco IOS, routers and switches
- ◆ Repaired Shoretel's VoIP voice server to support new IP addresses
- ◆ Configured Shoretel IP phones with new IP addresses
- ◆ Installed and Configured Shoretel Softphone
- ◆ Successfully ran Wireshark to verify and analyze protocols and packet transmission

## Project Overview:

- ◆ **Design**
  - ◆ Establish voice and data communications throughout the network using different hardware devices such as Cisco 6509, Cisco 12000 and Cisco OC-48. Set up a main server to control voice on one side of the network. Set up a distributed server to control voice server on the other side of the network. Facilitate communication between IP phones and analog phones implementing gateways and routers.
- ◆ **Technical approach**
  - ◆ The network will enable us to transmit data and voice between two LANs. The VoIP network includes the VoIP phones, analog phones, voice gateway and voice server. The network connecting the LANs consist of two Cisco 6509 (Switch), two Cisco 12000 (Router) and three Cisco OC-48 (3-Node Ring). By completing the network, integrated services can be implemented.
- ◆ **Organization**
  - ◆ The team was divided into two groups. One group was responsible for configuring the switches, routers and OC-48. The second group was responsible for configuring the voice servers and IP phones. Both groups worked separately for most of the project and they both ran into different difficulties. In the end we were able to integrate the work done by both groups at the end without any major complications.



## Project Conclusions/Outcomes:

- ◆ Initial Design was to implement two voice servers but we discarded the second server due to installation issues.
- ◆ Added a soft phone in addition to the two IP Phones.
- ◆ Voice calls from analog, IP, and soft phones were successfully established from one side of the network to the other.
- ◆ IP addressing was changed because the previously installed Shoretel voice server's IP address could not be changed.