

AARNet Voice Network Overview of the Technology

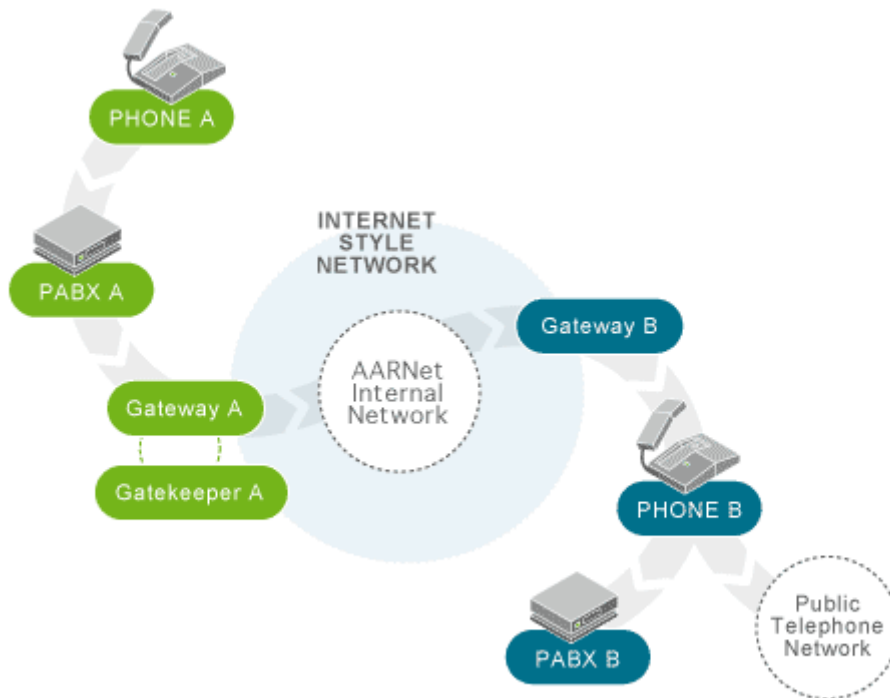
This page provides the reader with an overview of how the technology can carry a telephone call across AARNet without either of the users knowing. Contents of this page:

1. How the building blocks are connected together
2. What does each building block do
3. How do all the parts work together

1. How the building blocks are connected together?

The technology used in the Internet is based on the H.323 standard. The technology used on the telephone side is the same technology that is used to connect PABXs to the Telephone Networks. The figure below illustrates the components that make the technology work. Each one is described below.

Building blocks of the technology



2. What does each building block do?

The Public Switched Telephone Network (PSTN)

This is the telephone network that most telephones are connected to. Every telephone connected to the PSTN has a unique telephone number. A telephone number in Australia is made up 9 digits. The first digit indicates the Area (or zone), often written with a leading "0", and the remaining 8 digits is the subscriber's telephone number within the zone.

The PABX

PABX is short for Private Access Branch Exchange and is used by most organisations to support internal telephone extensions, such as within an office building or a campus. The PABX receives telephone calls from the PSTN and connects them to the telephone extensions. It also sends telephone calls made by the extensions to destinations the PABX thinks can deliver the telephone call to the required destination, usually the PSTN but in this case the PABX might also send the calls to a Gateway that is connected to AARNet.

The Internet

The Internet is like the PSTN except that instead of telephones it has computers, and instead of telephone numbers every computer has a unique IP Address. One important difference between the AARNet Internet Network and the Public Internet Network is that AARNet can tell the difference between data traffic that is carrying telephone traffic and other sorts of traffic, like WWW and email. Voice is very sensitive to slow or congested networks, so AARNet has been configured to give the telephone traffic preference over other traffic but still leaving more than enough for them to continue operating.

The Gateway

The Gateway converts telephone calls from the traditional telephone technology into Internet technology and back again. The AARNet Gateways support ISDN and Q.Sig on the PABX side, and H.323 Voice over IP on the Internet side. So the Gateway knows about the Telephone Network using telephone numbers, and it knows about the Internet and IP Addresses. The Gateway looks like a computer on the Internet, and it looks like a PABX on the Telephone Network.

The Gatekeepers

The Gatekeepers do a variety of functions, the most important is to convert telephone numbers into IP Addresses, but Gatekeepers can and do a lot more than this. As the technology develops we will see Gatekeepers provide the advanced features that will make existing advanced PABX networking look very inadequate.

3. How do all the parts work together?

The following describes how a telephone call is connected from one telephone to another over AARNet. Follow what happens using the diagram above.

1. Telephone "A" dials the telephone number for telephone "B".
2. PABX "A" looks at the telephone number and decides to send the call via AARNet, so it sends the call to Gateway "B". Remember from the above description, the Gateway looks just like another PABX or even a Telephone Network to PABX "A".
3. The Gateway looks at the telephone number and asks the Gatekeeper to tell it what IP Address to use (because AARNet used IP Addresses not Telephone numbers) to contact the remote Gateway.
4. The Gatekeeper looks at the telephone number and tells the Gateway what IP Address to use. In this case it would be the IP Address of Gateway "B".
5. Gateway "A" then uses the IP Address to contact Gateway "B" and tells it the telephone number that telephone "A" dialed.
6. All the data packets that flow between Gateway "A" and Gateway "B" are looked after by AARNet to make sure they are not delayed. AARNet knows to look after them because the Gateways have marked the voice traffic.
7. Gateway "B" looks at the telephone number and decides that PABX "B" can deliver the telephone call, so it sends the call to PABX "B".
8. PABX "B" receives the telephone call and connects it to Telephone "B".