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## VoIP Research Workshop February, Canberra

HAI VU



### Outline



- ✚ VoIP Workshop
- ✚ VoIP in AARNet (+)
- ✚ Group discussion
- ✚ Summary, what's next?

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## Purpose & Program



- ✦ The workshop was initiated and organized by AARNet
- ✦ Purpose: to achieve successful collaborative research funding bids (e.g. ARC linkage project)
  
- ✦ Program:
  - Introduction (Chris Hancock, AARNet's CEO)
  - Beyond the phone call (Dean Economou, SIT CRC)
  - Working groups
  - ARC linkage discussion (Robin Stanton, ANU)



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## Participants



- ✦ AARNet (3)
- ✦ CSIRO (2)
- ✦ SIT CRC (1)
  
- ✦ Cisco (Adam Mulcahy)
- ✦ Optus (Narelle Clark, R&D manager)
  
- ✦ Universities: UoNSW (2), Swinburne (1), RMIT (1), Wollongong (2), UoSA (1), Macquarie (1).



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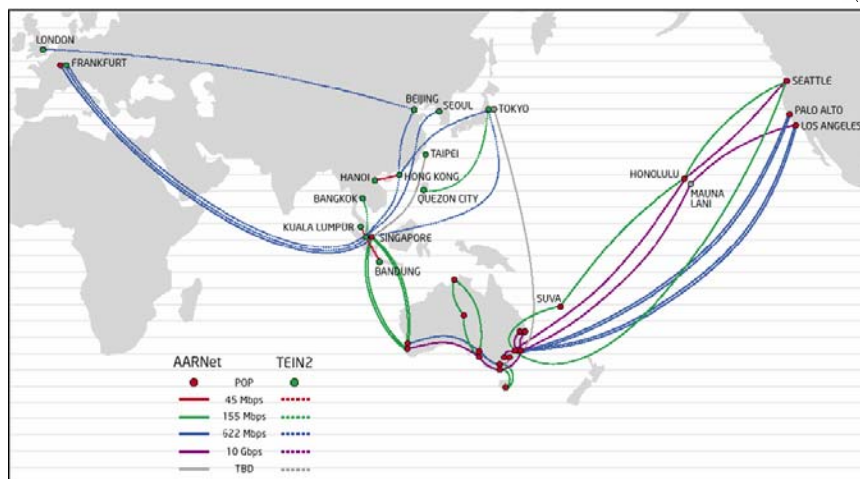
# AARNet



- ✦ Australia's Academic and Research Network (AARNet) is a not-for-profit company limited by shares.
- ✦ The shareholders are 37 Australian universities (including Swinburne univ.) and the CSIRO.
- ✦ Provide services (Internet) for the tertiary education and research sector communities (800e users).
- ✦ Wholesale backbone Internet Service Provider



# AARNet's Footprint



Source: AARNews, issue 1, Sept. 2005

TEIN2: EU sponsored Trans-Eurasian Inf. Net.



## VoIP in AARNet



- Started in 1998, from 2001 offers VoIP service based on H.323 standard.
- Infrastructure: IP network, gatekeepers (registration, authentication, addr. translation), gateways (connect to PSTN).
- Also provides network management, billing, quality monitoring.
- In 2002 connect 2400 VoIP devices in 20 institutions.



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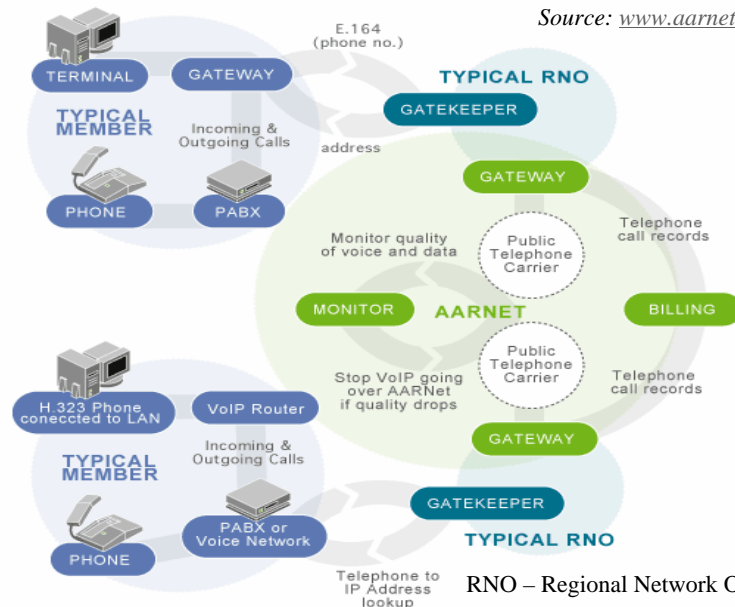
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## AARNet VoIP Network



Source: [www.aarnet.edu.au](http://www.aarnet.edu.au)



RNO – Regional Network Organisation

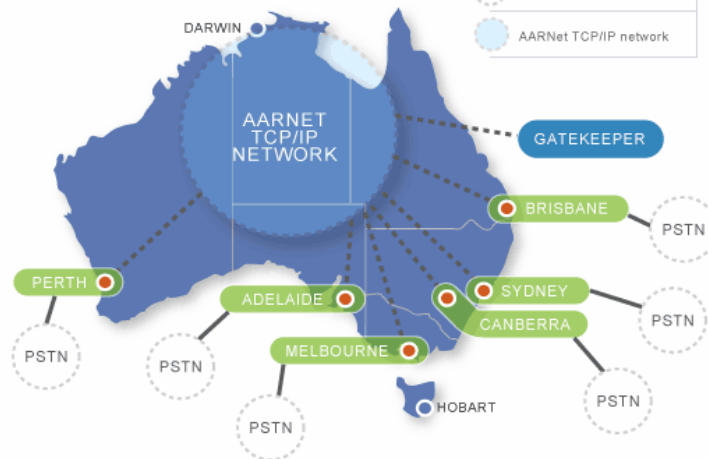
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## AARNet VoIP Network's

Source: [www.aarnet.edu.au](http://www.aarnet.edu.au)

### KEY

- AARNet H.323 Gateway
- ISDN
- Public Telephone Network
- AARNet TCP/IP network



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## Voice of the Future

- ✦ Talk given by Dean Economou (SIT CRC)
- ✦ Main points:
  - Current VoIP focuses on reducing cost, and getting connected to talk.
  - Future: can archive better than "toll" quality? (e.g. fidelity (7kHz); other modalities; spatial sound – echo).
  - Extend personal presence to environmental presence (sound, touch, vision) around the communicating parties.
  - How to measure quality improvements?

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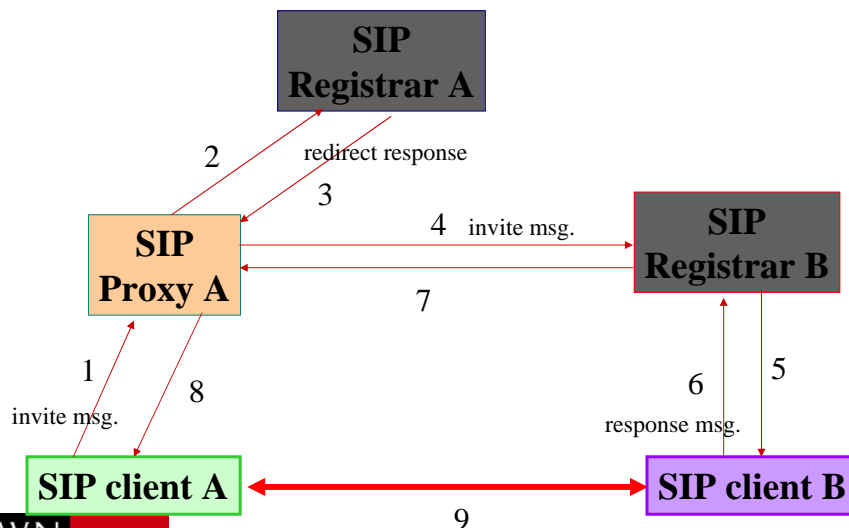
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## Session Initiation Protocol (SIP)

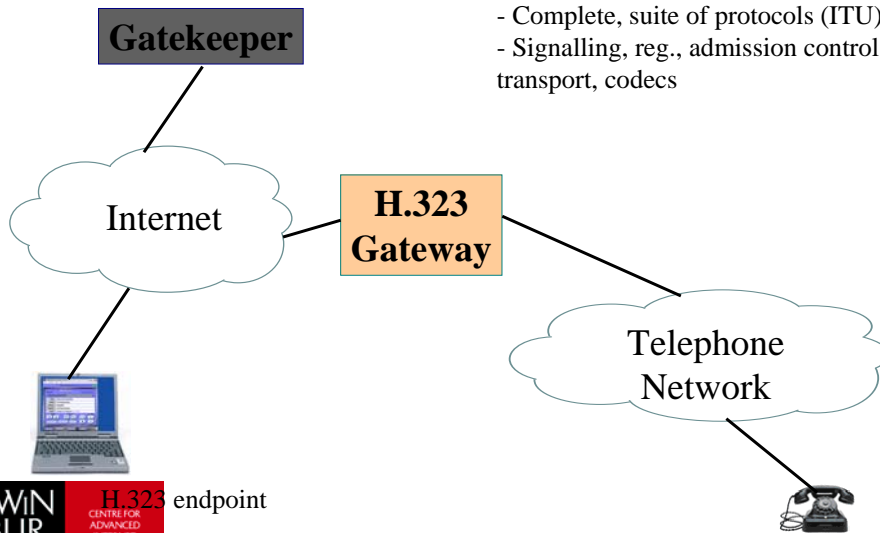


- ✦ Purpose: signaling protocol to establish calls between a caller and callee over an IP network.
- ✦ Provide mechanisms for the caller to determine *current* IP address of the callee.
- ✦ Calls management (add call, transfer, hold ...)
- ✦ single protocol (IETF) for session initiation and management. Does not mandate RTP and codecs.

## SIP Cont.



# H.323

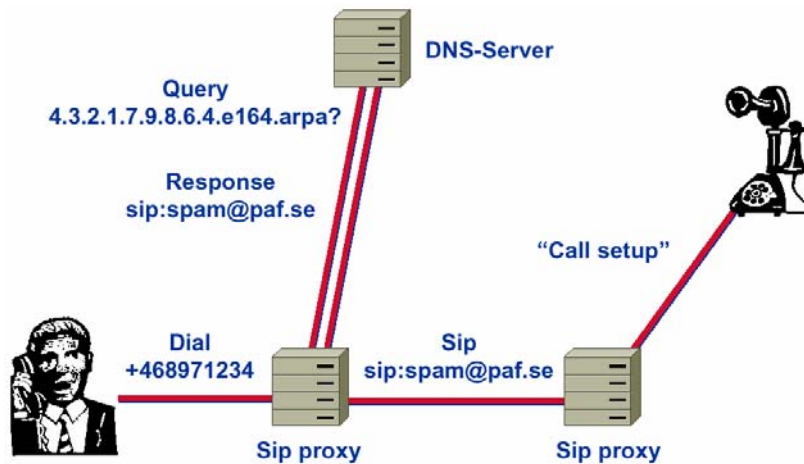


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H.323 endpoint

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# E.164 Number and DNS (ENUM)



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Source: Patrik Fältström, from ITU Tutorial Workshop on ENUM, Feb. 2002, Geneva  
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## ENUM Cont.



- ✦ Purpose: Use DNS to resolve addresses (RFC 2916)
- ✦ No information about QoS, protocol, path, security ...
- ✦ Private, public, mobile applications are uncoordinated (confusion)
- ✦ Update rate, regulatory & policy issues

## Telephone Routing over IP (TRIP)



- ✦ Purpose: exchange information between administrative domains (RFC 3219).
- ✦ Similar to BGP but at application level (more complex)
- ✦ Can be used to exchange attributes necessary to enforce policies or to select routes based on path or gateway characteristics.

## IP Multimedia Subsystem (IMS)



- ✦ Purpose: unified architecture to support a wide range of services (spec. for 3G, adopted by ITU, ETSI ..).
- ✦ Support multiple application servers: both traditional telephony services (voice) and non- telephony services such as instant messaging, push- to- talk, video streaming, multimedia messaging ...
- ✦ And can add authentication, presence, gaming ...

## Possible Objective 2



- ✦ Support multi services (voice, video, IM, presence, etc..)
  - ENUM with routing based on E.164
  - Peering between domains with QoS enable protocol (TRIP)
- ✦ Generic framework IMS 3GPP (middleware keeping balance between privacy and security)
- ✦ Location (Emergency service), IPv6, Security (IPSEC,TLS)
- ✦ SPAM, DDoS, Interception for law enforcements

## What's Next

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- ✦ Forum discussion, working group
- ✦ Develop linkage projects
- ✦ Set up a working SIP based VoIP using AARNet's infrastructure.

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# THANK YOU

