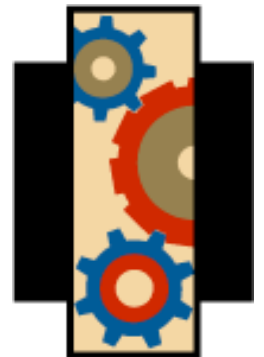


# Experience with a Distributed VoIP PBX

APRICOT 2004, Kuala Lumpur



# Internet Systems Consortium

- Previously known as Internet Software Consortium, changed name in Jan 2004
- Main office is 950 Charter Street, Redwood City, California, USA
- Remote employees in Canada, Australia, Netherlands and USA

# Before

- Old and crusty Nortel PBX installed at 950 Charter office, fed by a small handful of analogue lines
- Remote staff used extra analogue lines in their homes from local telcos

# Issues

- Expensive for staff to talk to each other on the phone (international calls)
- Conference bridges and other “advanced” features are difficult to set up, or expensive, or unreliable
- Nortel Space Heater can't be upgraded, and if it breaks we can't get parts for it

# New PBX

- Linux box with T1 PRI card
- Asterisk
- cisco 7960 phones and ATA-186 adaptors with SIP software loads
- Various other SIP handsets and soft phones
- g.711 (uncompressed, open codec)

# cisco Phone Bits

- TFTP server containing cisco phone configs
  - central configuration management for ISC-owned phones
- Remote employees modify their own DHCP server settings to allow the phones to boot appropriately
  - fortunately we are all geeks

# INOC-DBA bits

- The Asterisk box at 950 registers as 3557@inoc-dba.pch.net
- People can call INOC-DBA extensions from their regular desk phones
- People can receive inbound INOC-DBA calls on their regular desk phones, too

# Telephony Bits

- We are mainly IP networking and software people at ISC, so we are really just guessing at some of this telephony stuff
- fortunately it does not appear to be all that hard



# Telephony Bits

- Simple dial-plan:
- \*NNNN, \*NNNN\*EEE  
makes a call to an  
INOC-DBA destination
- Calling other numbers  
tends to do the right  
thing. For example, all  
the following are  
equivalent:

\*3557\*1300

00 | 650 423 1300  
01 | 650 423 1310  
1 | 650 423 1310  
650 423 1310  
1310

# Telephony Bits

- Some numbers ring on multiple phones
  - +1 650 423 1310 (NOC)
  - 3557 (INOC-DBA)
- Some peoples' extensions simultaneously ring cellphones and desk phones

# “Advanced” Features

- Voicemail
  - e-mail notification, voicemail messages as attachments by e-mail
- Conference bridges
  - everybody has their own
- Divert on no answer, divert on busy
- All work for both INOC-DBA and PSTN-originated calls

# Successes

- We eliminated the Nortel Space Heater
- Long, free staff phone calls
- VoIP calls are frequently clearer and more reliable than PSTN calls

# Successes

- We can host conference bridges which people can reach by both INOC-DBA and PSTN
- With soft phones, our desk phones can travel with us
- We are saving money
  - upgrades, repairs, power, telephony charges

# Ongoing Issues

- Asterisk, PRI card stability
  - part of this might relate to our general inexperience with Linux compared to other OSes
- When the network is really broken, the phones don't work
  - cellphone

# Possible Future

- Maybe stop using ISDN on the Asterisk box, and start using commercial SIP telephony services
- Move the Asterisk box to more secure colo
- Add backup Asterisk servers in other places

# The End

Joe Abley <jabley@isc.org>

