

# InteropLabs: VoIP Security & Integration Initiative

May 2006

**INTEROP<sup>®</sup>**  
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**SMART**

# What are the InteropLabs?

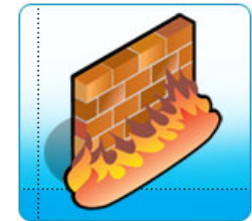
- Vendor Neutral
- Technology Focused
- Unbiased and Practical



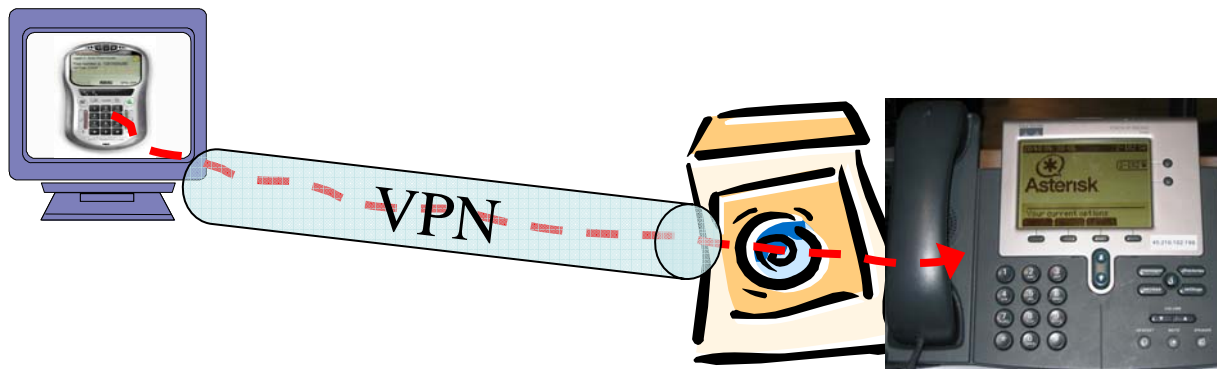
This year:

- Network Access Control Initiative
- Open Source Software Initiative
- VoIP: Security and Integration Initiative

# What is the VoIP Security & Integration Initiative?

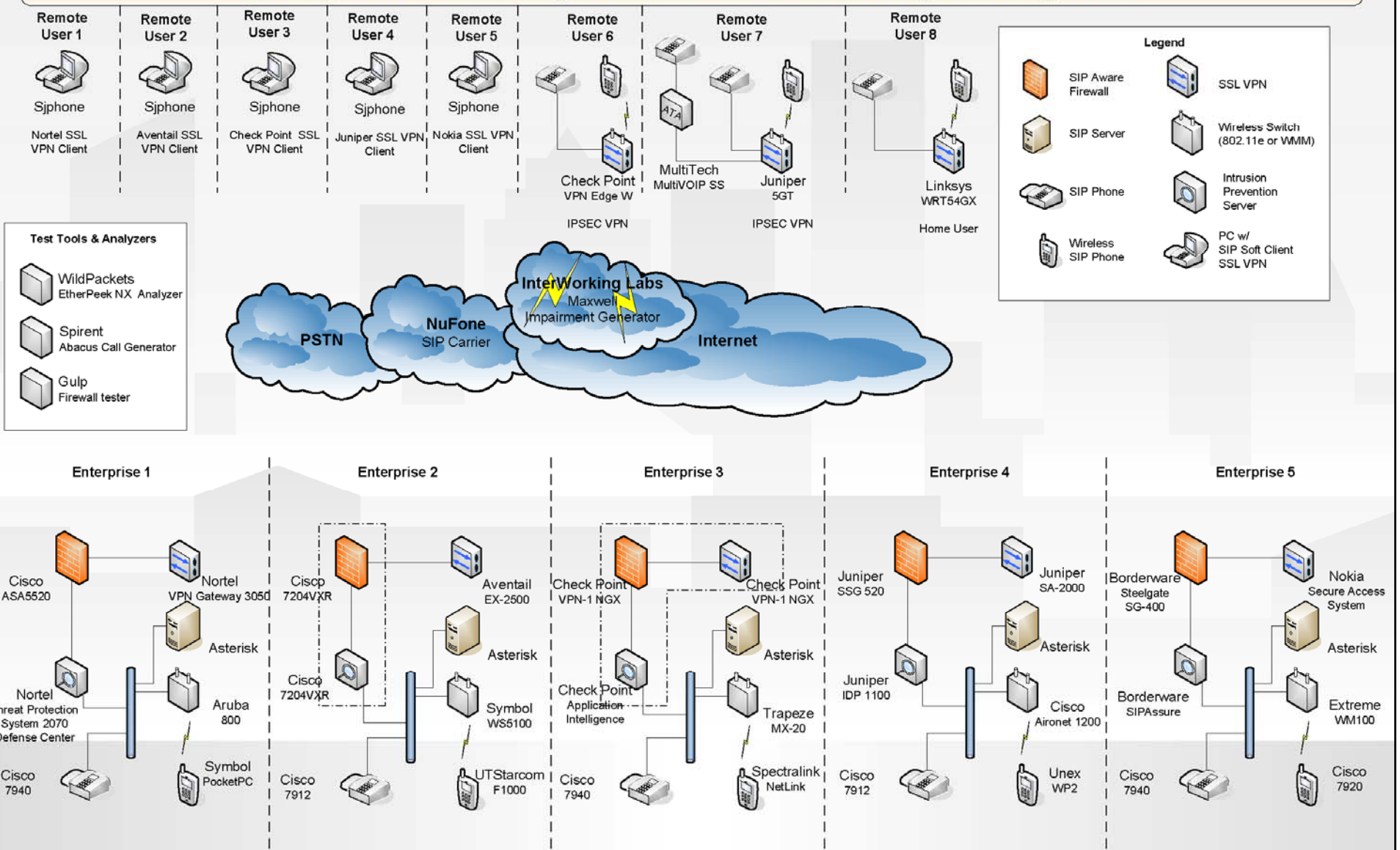


- Border Security and IDS/IPS
- VoIP over Wireless within the Enterprise
- VoIP through VPNs

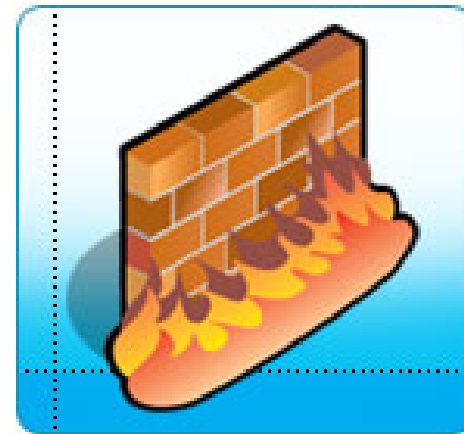


# What's In the InteropLabs VoIP Initiative?

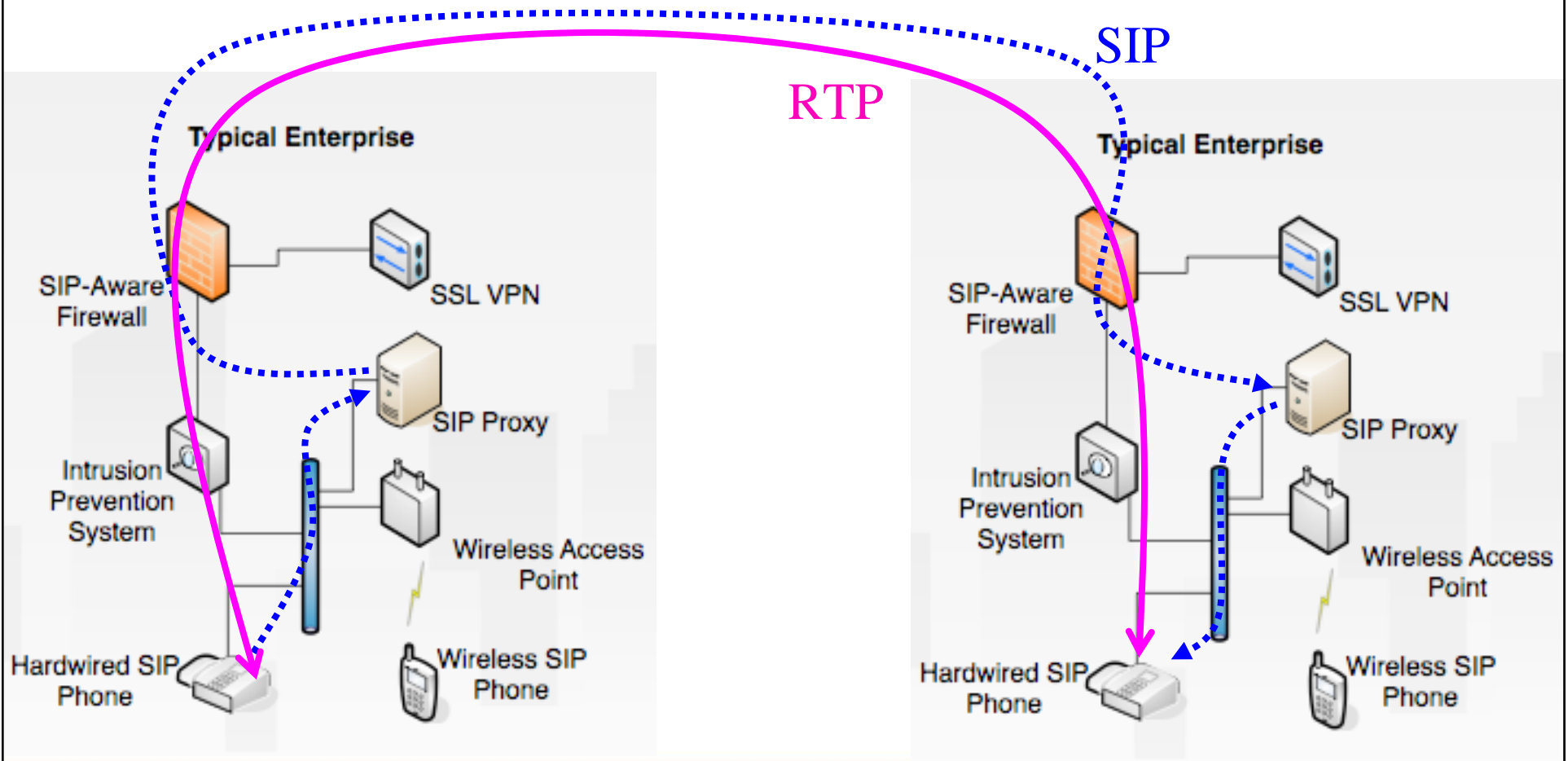
## InteropLabs - Las Vegas 2006 - VoIP: Security & Integration



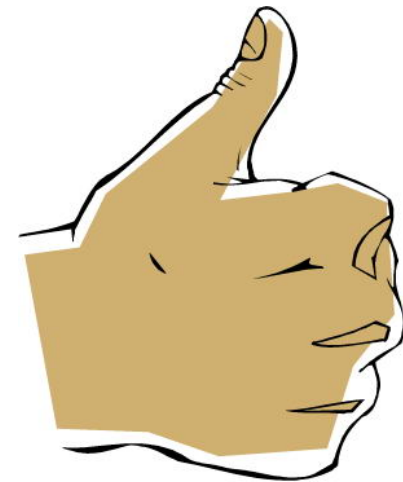
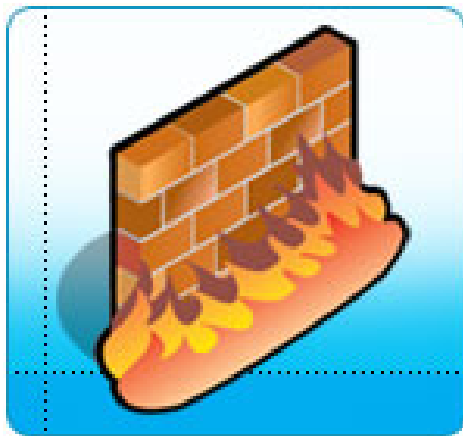
# Border Security, Access Control, and Intrusion Detection/Prevention



# We started with Enterprise Firewalls and SIP Awareness

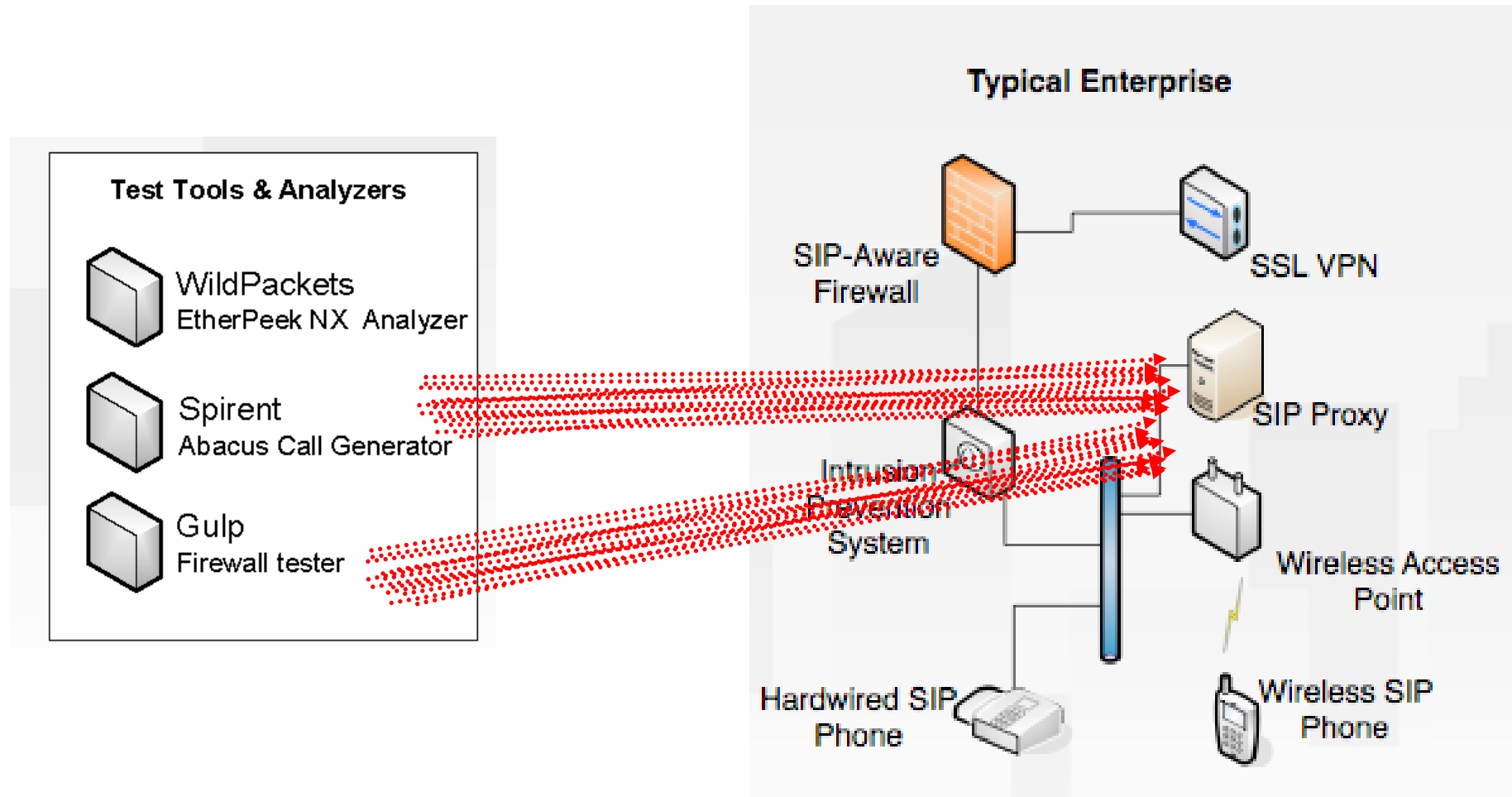


# Conclusion: SIP Awareness in Firewalls is (not surprisingly) **GOOD**

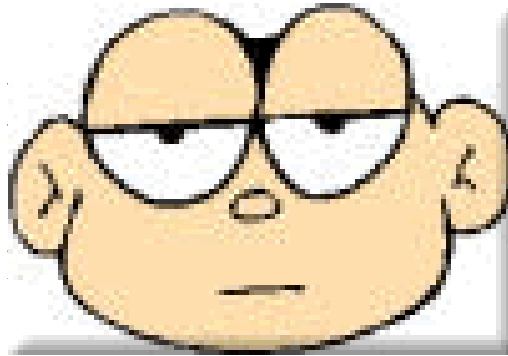


- All of the firewalls we tested were able to "do the right thing"

# Then we attacked the Proxies to test the IDS/IPS

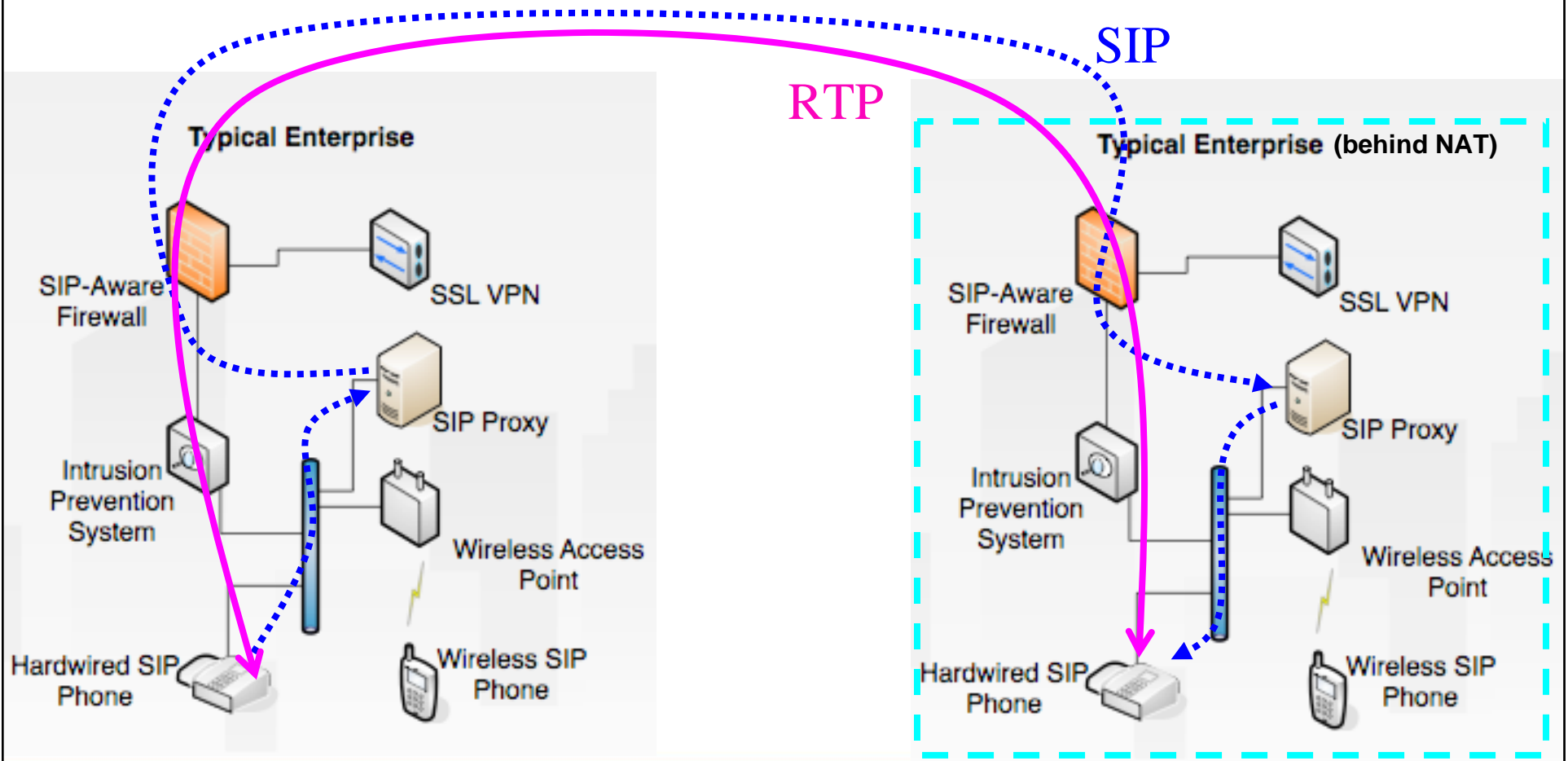


# Conclusion: IPS still needs work (with regards to SIP)



- Sometimes they were able to block the attack traffic appropriately
- Most of the time, they didn't
- We found that Asterisk is surprisingly robust!
- The SIP specification still needs refinement

# Finally, we threw in some NAT to really break things!

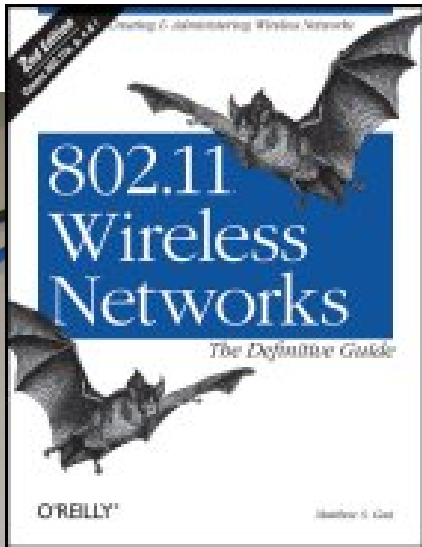


# Conclusion: NAT is EVIL

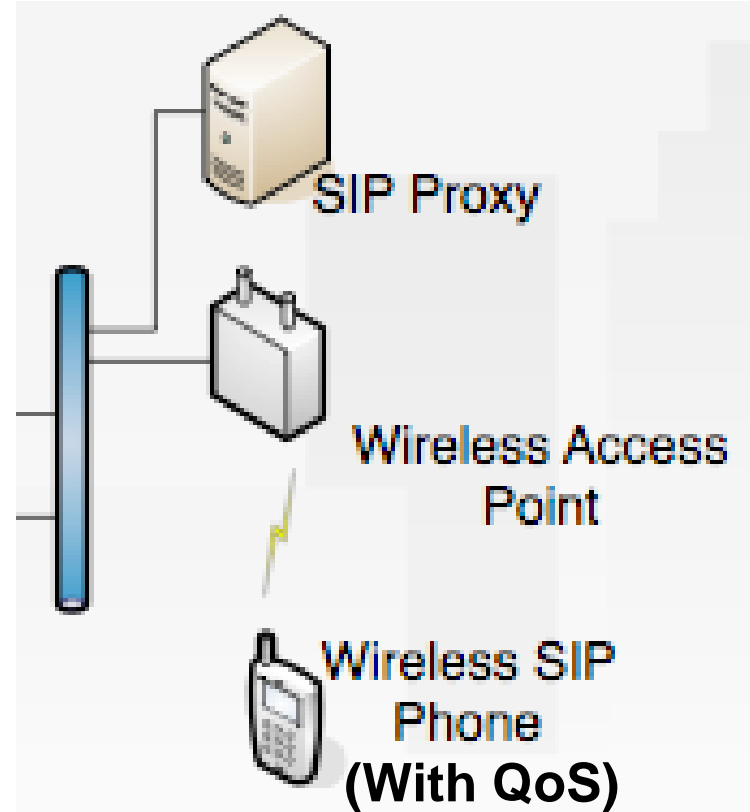
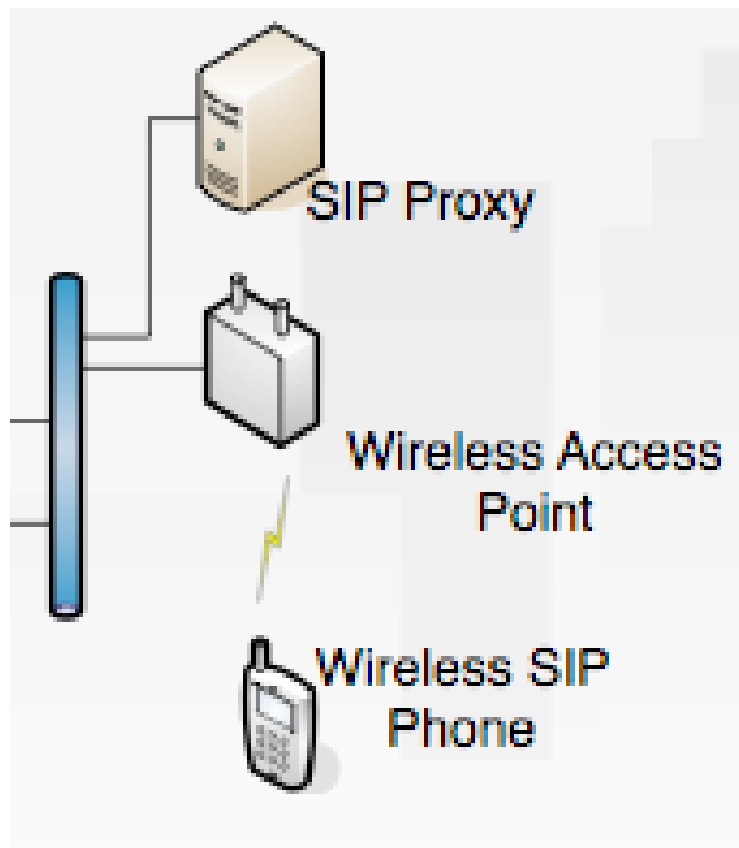
- We had many problems trying to get calls to work through NAT
- There are many tricks to try
- None of them are 100% reliable



# VoIP over Wireless (802.11)

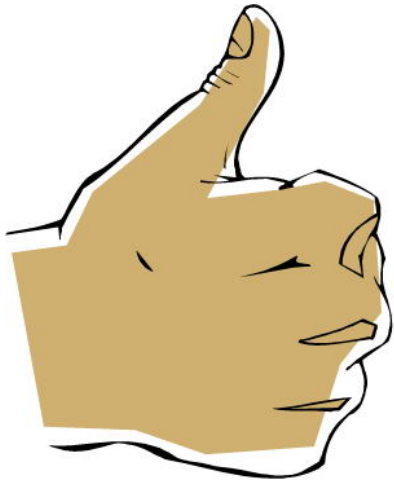


# We tried VoIP over WiFi with and without QoS

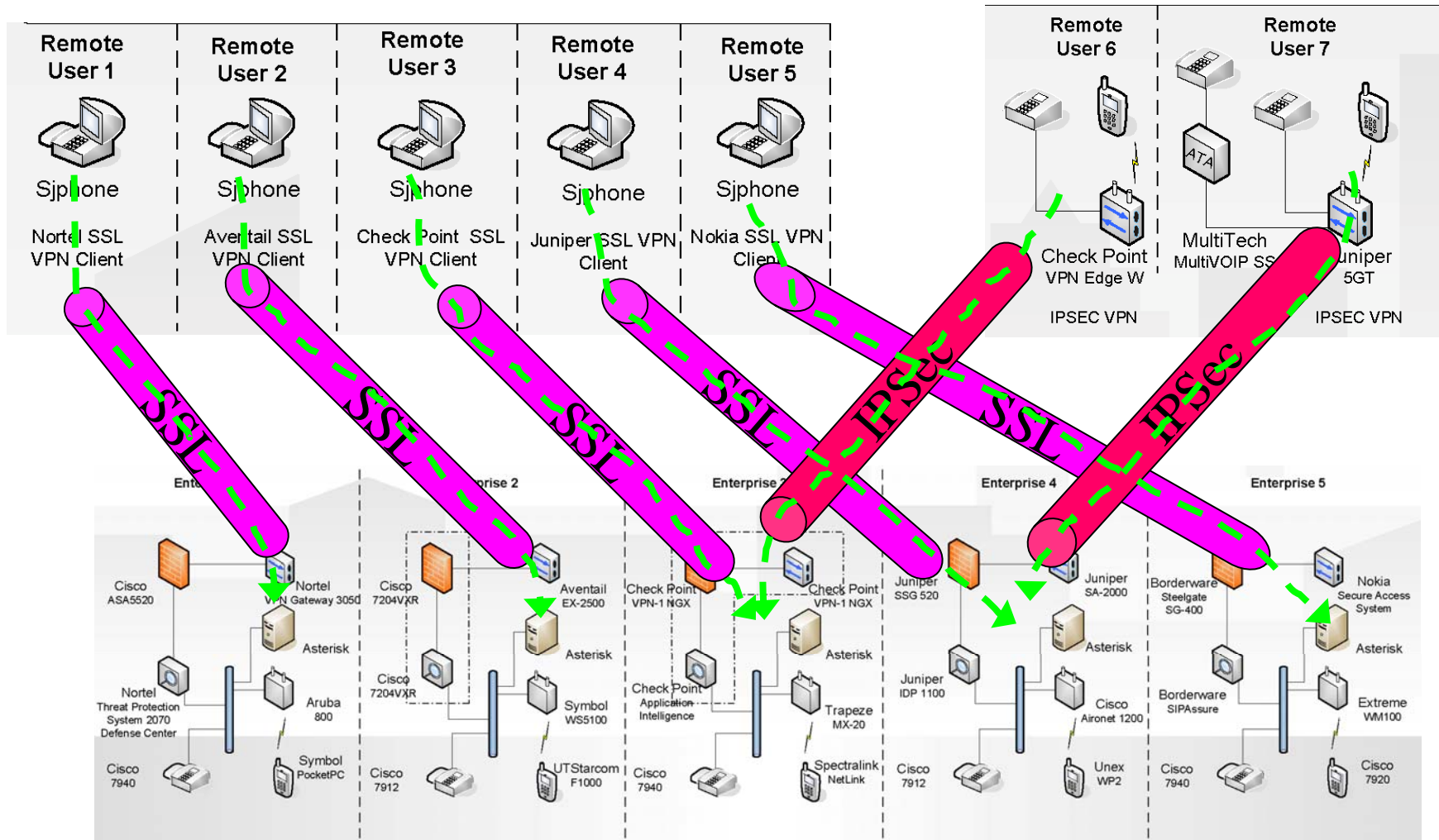


# Conclusion: QoS can make a BIG difference

- We found that calls were as good or better(!!!) than wired calls

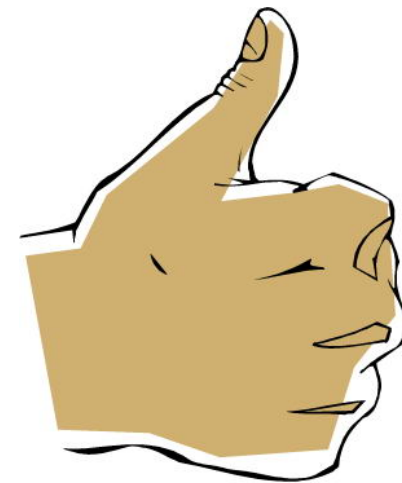


# We tested phone calls over VPNs



# Conclusion: Calls worked with little to no noticeable degradation!

- If you can get the packets into the tunnel, it will likely work just fine
- With SSL, you are restricted to a softphone, and \*might need to install a client



\*Might: this depends on your personal definition of a client

# Things we wanted to try, but didn't (or couldn't)

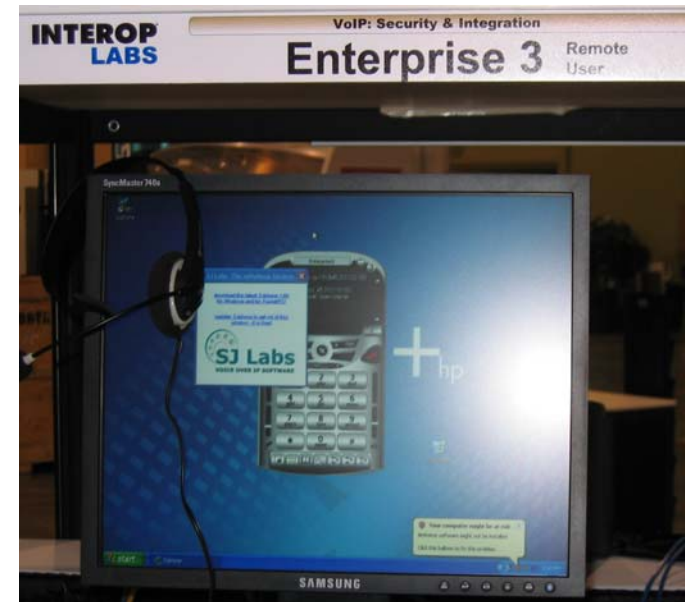
- SIP/TLS
- SRTP
- Endpoint Authentication
- More WiFi phones



End-to-end Encryption



# Come to the InteropLabs ... See What's on the...



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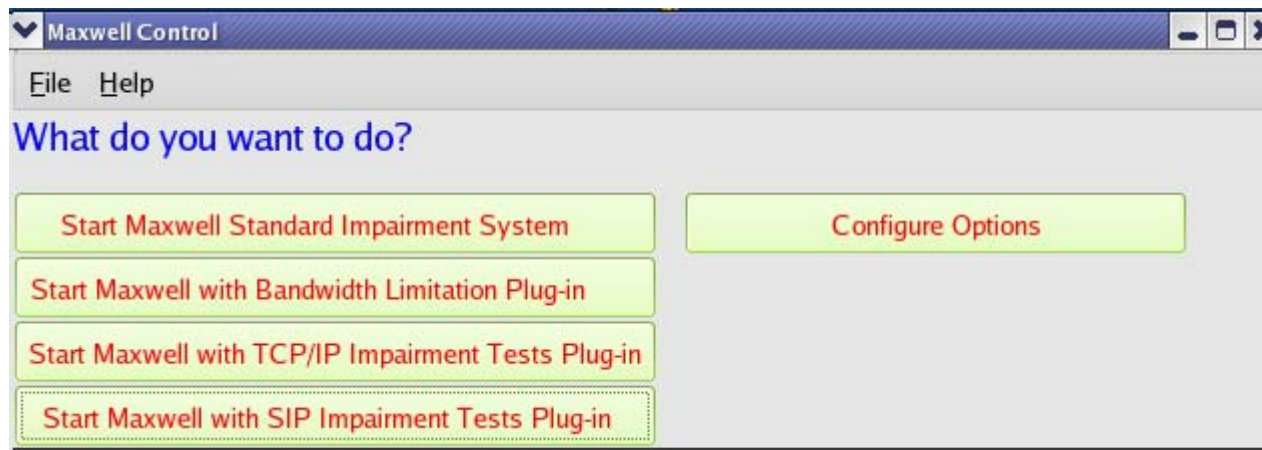
# What's In the InteropLabs

- 5 Different Firewalls
- 8 Wireless Access Points
- 7 WiFi Phones
- 5 SSL VPNs
- 2 IPSec VPNs
- 4 IPS Devices
- 2 Different Soft Phones
- 5 Test Tools and Analyzers



# What You Can Do in the InteropLabs?

- Call from phone to phone through several different firewalls
- Make calls through several different VPNs (SSL and IPSec)
- Use the impairment tool to simulate real-world conditions and network problems



# What else can you do in the InteropLabs?

- Use WiFi phones and compare performance with and without QoS
- Use a protocol analyzer to watch and listen to SIP traffic
- Call to the PSTN - talk to someone at your office or home
- Make Elvis Dance!



# How to Learn More

- **Come see** the InteropLabs VoIP: VSI demo and ask questions - inside first hall entrance
- **Pick up** these white papers in the InteropLabs or electronically:
  - What is SIP?
  - Getting Started with SIP
  - Migrating to SIP
  - SIP Resources
  - What is ENUM?
  - SIP and Firewalls
  - VoIP and VPNs
  - VoIP and 802.11
  - Connecting with SIP to the Public Phone System
- [www.opus1.com/voip](http://www.opus1.com/voip)
  - InteropLabs white papers, this presentation and layout diagram (up forever)

# With grateful thanks to

- Jiri Kuthan, iptel.org
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- David Oran, Cisco Systems

For their excellent SIP tutorials

- Jan Trumbo and Joel Snyder, Opus One

For the foundation material for this class

# Thanks from the Voice Over IP Security and Integration Team!

- |                   |                |                            |
|-------------------|----------------|----------------------------|
| • Jim Martin      | SIP Team Lead  | Netzwert AG                |
| • Jed Daniels     | SIP Instructor | IronPort Systems           |
| • Bill Burge      | SIP Engineer   | Tactical Networking        |
| • Helen Garey     | SIP Engineer   | Tactical Networking        |
| • Matthew Gast    | SIP Engineer   | Trapeze Networks           |
| • Jeremy McNamara | SIP Engineer   | The NuFone Network         |
| • Doug Moeller    | SIP Engineer   | National Technical Systems |
| • David Newman    | SIP Engineer   | Network Test, Inc.         |

With support from

- |                 |                   |
|-----------------|-------------------|
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# Thank You From the 2006 InteropLabs VoIP Team!

