Spam Detection in IP-Telephony

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Brief Explanation of Title

What is Spam?
- Any unsolicited bulk message.
- Leads to waste of Resources.
- Time, Bandwidth, Memory and Productivity.

What is IP Telephony?
- Services transported via the Internet, rather than the public switched telephone network (PSTN).
- Also called VoIP (Skype, Vonage, Lingo ...)

So, Spam over Internet Telephony (SPIT) is any unwanted multimedia session over the internet.
SPIT Challenges

**Real Time**
- Decisions *must* be made very quickly (typically 1-2 sec).

**Data Content Limitation**
- Processing Call Data (Voice or Video) is impractical.

**High Cost of False Positive**
- Filtering out legitimate calls is potentially fatal.

**Legal Issues**
- *Violation of freedom of speech*?
Our Methodology of Detection

1. **Call Network Analysis**
   - Network Graph is constructed from Call Logs (Nodes as people, Edges as calls).
   - Properties of nodes are studied (In/Out-Degree, Call Duration Patterns, Node Links).

2. **Feedback Analysis**
   - Feedback collected from Callee. (Spam OR Not Spam)
   - Reveals the concrete ground truth.

3. **Handshake/Turing Test**
   - A voice challenge is given to the Caller.
   - Differentiates between Automated Caller and Real Person.

For implementation, we chose a typical Server-Client system.
Mobile Application

- Built for Android Platform 1.6 (Nexus One, HTC ..)
- Handles all Incoming Calls and displays Spam Rating.
- Blocks or Diverts Call according to User settings.
- Collects the feedback and transmits to server.

SPIT Server

- Standard Linux, Apache, MySQL, PHP (LAMP) Server.
- Responds to application request, provides Spam Rating.
- All communication is through HTTP Post, encrypted using User password, IMEI number.
- MySQL backend to store user details and feedback data.
System Overview

Figure: A brief schematic diagram of the System
Figure: Main Activity and User Settings
Figure: Spam Rating Screen and Feedback Screen
Conclusion & Future Work

Conclusions

- The system works very well, and we hope to release it for beta-testing soon.
- It is very simple, intuitive to use and less annoying.
- Works better than traditional Whitelist/Blacklist approach.

Future Works

- Improve Application to be more robust to network failures.
- Make the Server and transmission of Data more secure.
- Integration with other analyzer modules.
Thank You for your attention
Any Questions?

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Towards a Spam-Free world... Amen...