EUX2010SEC - Security infrastructure for the open source Enterprise Unified Exchange (EUX2010) VoIP system – Project number 180054/S10

Securing Open Source Communication Systems

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– *"Hello? Who is this?"*

An analysis of VoIP security threats and challenges. And proposals on how to fix them.

Project goal:

"The overall goal of this research project, is to improve both the security level and the security awareness when developing, installing and using open source VoIP/PBX/multimedia solutions."

When calling.

- Can we know who it is?
- Can we be sure that no one is listening in?
- Can we be sure no one knows when I was placing the call?
- Can we be sure to get through?
- Can we be sure to get a good-quality telephonic conversation?
- Can we be sure we are billed correctly?

VoIP challenges:

1. Scalability
2. Reliability/QoS
3. **Security**

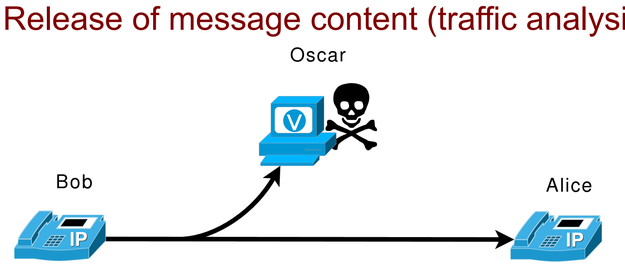
Public Switched Telephone Network:

- 99.999% uptime (<5 min a year)
- call anyone, anytime, anywhere and
- experience good-quality telephonic conversation

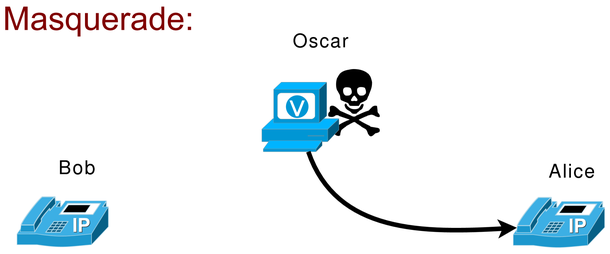
"Can VoIP provide this today?"

VoIP attacks:

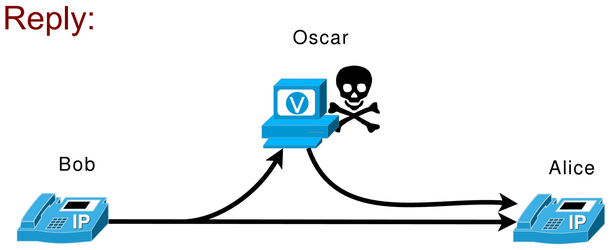
Release of message content (traffic analysis):



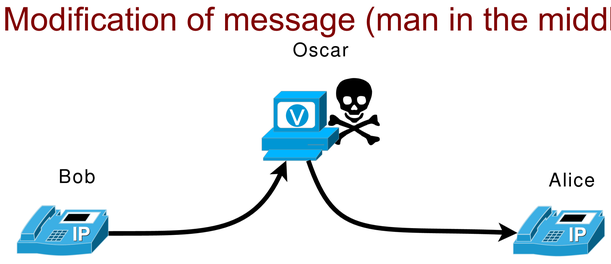
Masquerade:



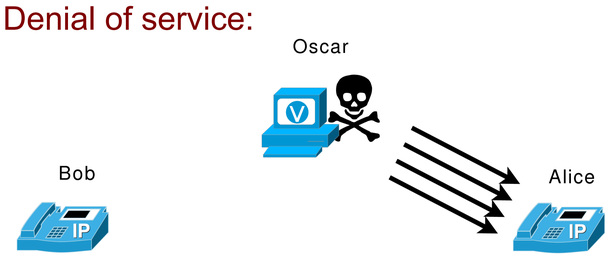
Reply:

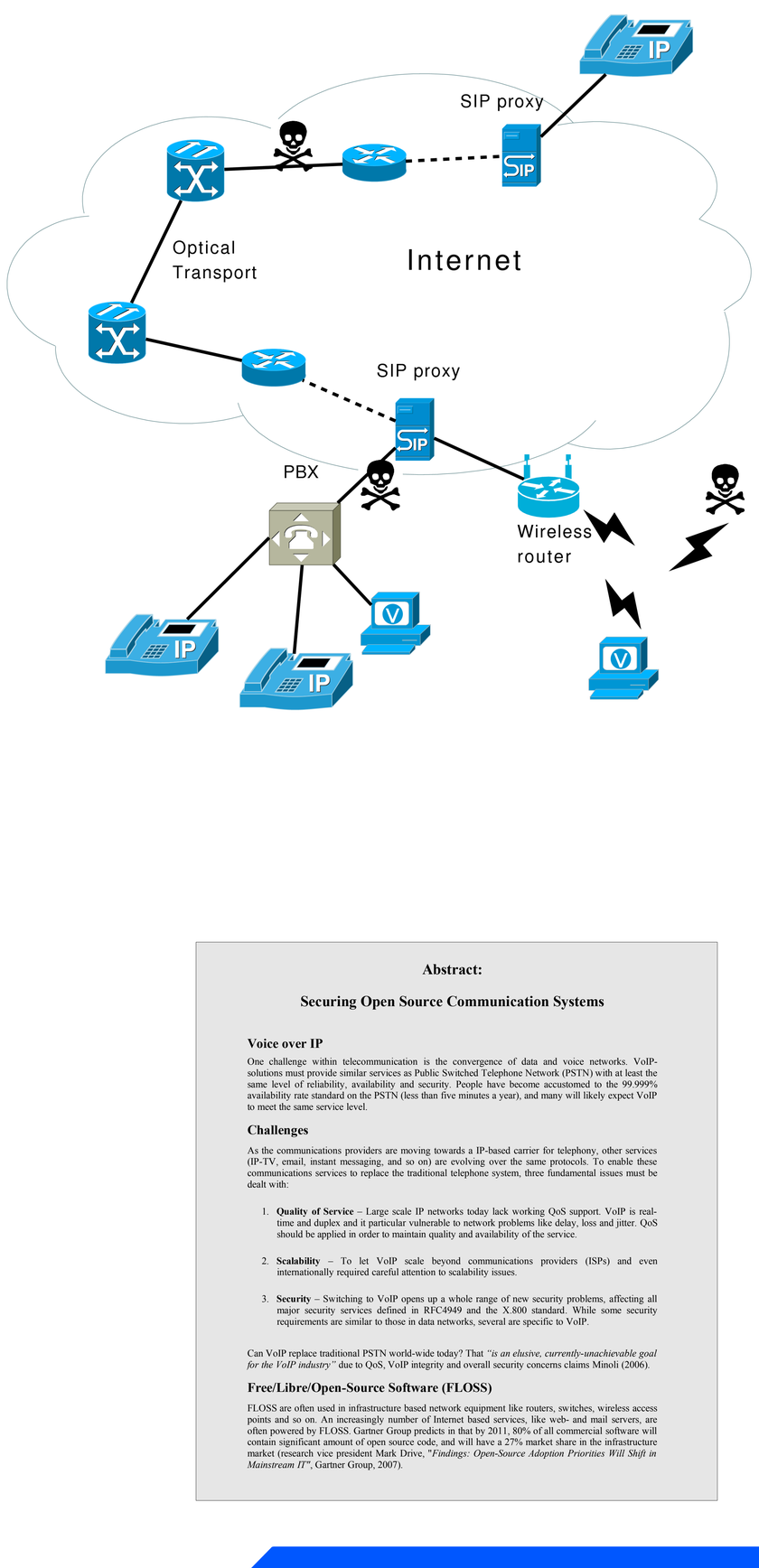


Modification of message (man in the middle):



Denial of service:





VoIP requirements:

- Low latency
- Real-time duplex communication
- High availability
- Secure communication

"Can Internet provide this today?"

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References:

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EUX2010SEC partners:

*) Today: Agder Energi Telefoni

Abstract:

Securing Open Source Communication Systems

Voice over IP

One challenge within telecommunication is the convergence of data and voice networks. VoIP-solutions must provide similar services as Public Switched Telephone Network (PSTN) with at least the same level of reliability, availability and security. People have become accustomed to the 99.999% availability rate standard on the PSTN (less than five minutes a year), and many will likely expect VoIP to meet the same service level.

Challenges

As the communications providers are moving towards a IP-based carrier for telephony, other services (IP-TV, email, instant messaging, and so on) are evolving over the same protocols. To enable these communications services to replace the traditional telephone system, three fundamental issues must be dealt with:

1. **Quality of Service** – Large scale IP networks today lack working QoS support. VoIP is real-time and duplex and it particular vulnerable to network problems like delay, loss and jitter. QoS should be applied in order to maintain quality and availability of the service.
2. **Scalability** – To let VoIP scale beyond communications providers (ISPs) and even internationally required careful attention to scalability issues.
3. **Security** – Switching to VoIP opens up a whole range of new security problems, affecting all major security services defined in RFC4949 and the X.800 standard. While some security requirements are similar to those in data networks, several are specific to VoIP.

Can VoIP replace traditional PSTN world-wide today? That *"is an elusive, currently-unachievable goal for the VoIP industry"* due to QoS, VoIP integrity and overall security concerns claims Minoli (2006).

Free/Libre/Open-Source Software (FLOSS)

FLOSS are often used in infrastructure based network equipment like routers, switches, wireless access points and so on. An increasingly number of Internet based services, like web- and mail servers, are often powered by FLOSS. Gartner Group predicts in that by 2011, 80% of all commercial software will contain significant amount of open source code, and will have a 27% market share in the infrastructure market (research vice president Mark Drive, "*Findings: Open-Source Adoption Priorities Will Shift in Mainstream IT*", Gartner Group, 2007).

Read more: http://eux2010sec.nr.no/

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