

# Konwergencja

**Połączenie tradycyjnej telefonii z siecią IP  
I co dalej?**

Dominik Hamera <[dh@wizjonerzy.com](mailto:dh@wizjonerzy.com)>

Jakub Klausa <[jk@wizjonerzy.com](mailto:jk@wizjonerzy.com)>

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- **Jak to dawniej bywało**
- **Po co ten VoIP?**
- **OpenSource a VoIP**
- **I co z tego?**
- **A gdyby tak... (przykład)**
- **Pytania**



- **Alexander Graham Bell (1876)**
- **Pierwsza centrala ręczna (1876)**
- **Pierwsza centrala automatyczna (Almon Strowger 1891)**
- **Centrale elektroniczne (~1970)**
- **Cyfryzacja sieci (ITU/CCITT 1984)**
- **Telefonia komórkowa (~1980)**
- **Voice over IP (~1995)**



Po co?

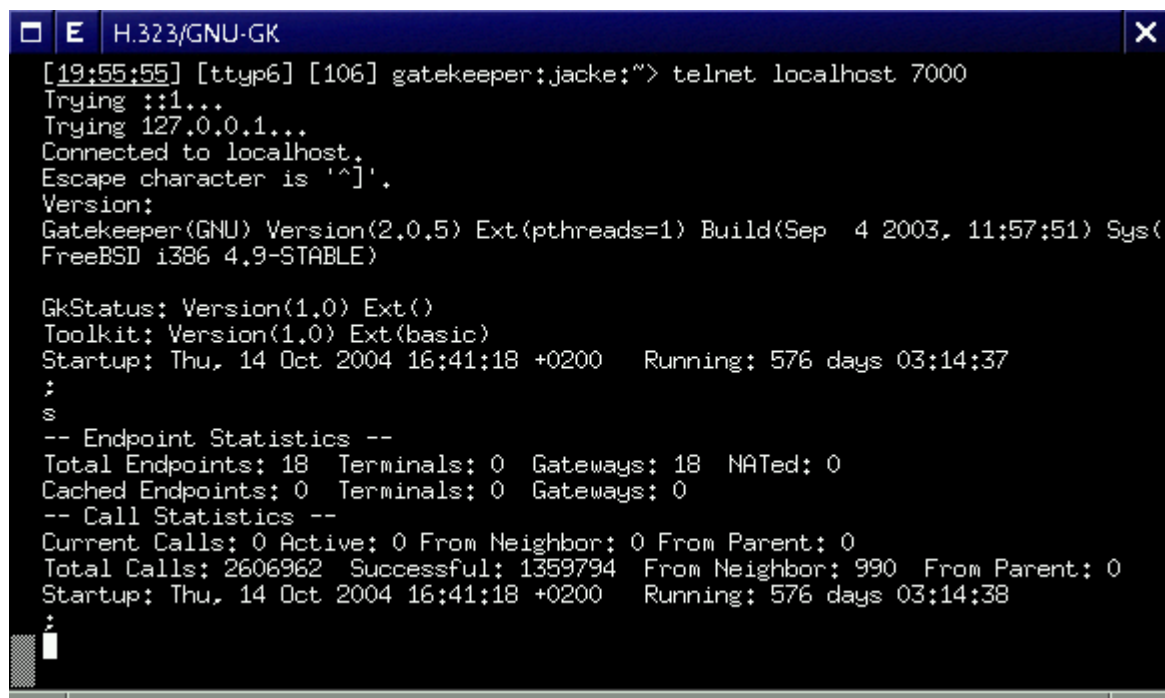


- **Przesłanki ekonomiczne**
  - **Tańsze urządzenia**
  - **Tańsze opcje**
  - **Jedna sieć**
  - **Mniejsze użycie pasma**
  - **Omijanie PSTN**
- **Przesłanki techniczne**
  - **Homogeniczna struktura sieci**
  - **Spójne systemy monitoringu/nadzoru/testów**
  - **Większe możliwości konfiguracyjne**
  - **Łatwiejsze przetwarzanie**
- **Przesłanki użytkowe**
  - **Wszystko w komputerze**
  - **Usługi dodane**
  - **Dostęp do wielu nowych opcji**

# Narzędzie OpenSource

- **Gnu Gatekeeper (H.323)**
- **OpenSER (SIP)**
- **Asterisk (PBX)**
  
- **VoMIT (VoIP Man In The middle attack)**
- **VoIPONG**

- **Gnu Gatekeeper (H.323)**

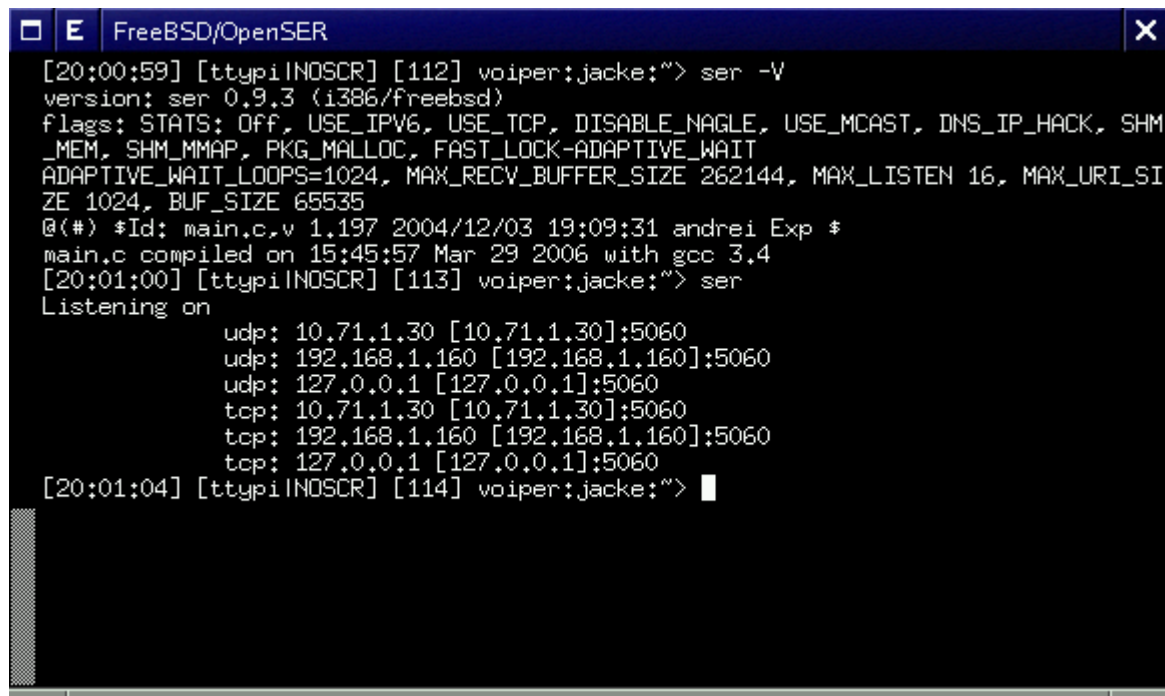
A terminal window titled "H.323/GNU-GK" with a dark blue header bar. The window shows a telnet session to localhost 7000. The output displays the Gatekeeper version (2.0.5), build date (Sep 4 2003), and various statistics including endpoint counts (18 total, 0 cached), call statistics (0 active, 2606962 total), and uptime (576 days 03:14:37).

```
[19:55:55] [ttyp6] [106] gatekeeper:jacke:~> telnet localhost 7000
Trying ::1...
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Version:
Gatekeeper(GNU) Version(2.0.5) Ext(pthread=1) Build(Sep  4 2003, 11:57:51) Sys(
FreeBSD i386 4.9-STABLE)

GkStatus: Version(1.0) Ext()
Toolkit: Version(1.0) Ext(basic)
Startup: Thu, 14 Oct 2004 16:41:18 +0200   Running: 576 days 03:14:37
;
s
-- Endpoint Statistics --
Total Endpoints: 18  Terminals: 0  Gateways: 18  NATed: 0
Cached Endpoints: 0  Terminals: 0  Gateways: 0
-- Call Statistics --
Current Calls: 0 Active: 0 From Neighbor: 0 From Parent: 0
Total Calls: 2606962 Successful: 1359794 From Neighbor: 990 From Parent: 0
Startup: Thu, 14 Oct 2004 16:41:18 +0200   Running: 576 days 03:14:38
;
;
```

WWW: <http://www.gnugk.org>


- **OpenSER (SIP)**

A terminal window titled "FreeBSD/OpenSER" showing the output of the "ser -V" command. The output displays the version (0.9.3), various flags, and the listening addresses for UDP and TCP on ports 5060.

```
[20:00:59] [ttypti@INOSCR] [112] voiper:jacke:"> ser -V
version: ser 0.9.3 (i386/freebsd)
flags: STATS: Off, USE_IPV6, USE_TCP, DISABLE_NAGLE, USE_MCAST, DNS_IP_HACK, SHM
_MEM, SHM_MMAP, PKG_MALLOC, FAST_LOCK-ADAPTIVE_WAIT
ADAPTIVE_WAIT_LOOPS=1024, MAX_RECV_BUFFER_SIZE 262144, MAX_LISTEN 16, MAX_URI_SI
ZE 1024, BUF_SIZE 65535
@(#) #Id: main.c.v 1.197 2004/12/03 19:09:31 andrei Exp #
main.c compiled on 15:45:57 Mar 29 2006 with gcc 3.4
[20:01:00] [ttypti@INOSCR] [113] voiper:jacke:"> ser
Listening on
      udp: 10.71.1.30 [10.71.1.30]:5060
      udp: 192.168.1.160 [192.168.1.160]:5060
      udp: 127.0.0.1 [127.0.0.1]:5060
      tcp: 10.71.1.30 [10.71.1.30]:5060
      tcp: 192.168.1.160 [192.168.1.160]:5060
      tcp: 127.0.0.1 [127.0.0.1]:5060
[20:01:04] [ttypti@INOSCR] [114] voiper:jacke:"> █
```

WWW: <http://www.openser.org>

- **Asterisk (PBX)**

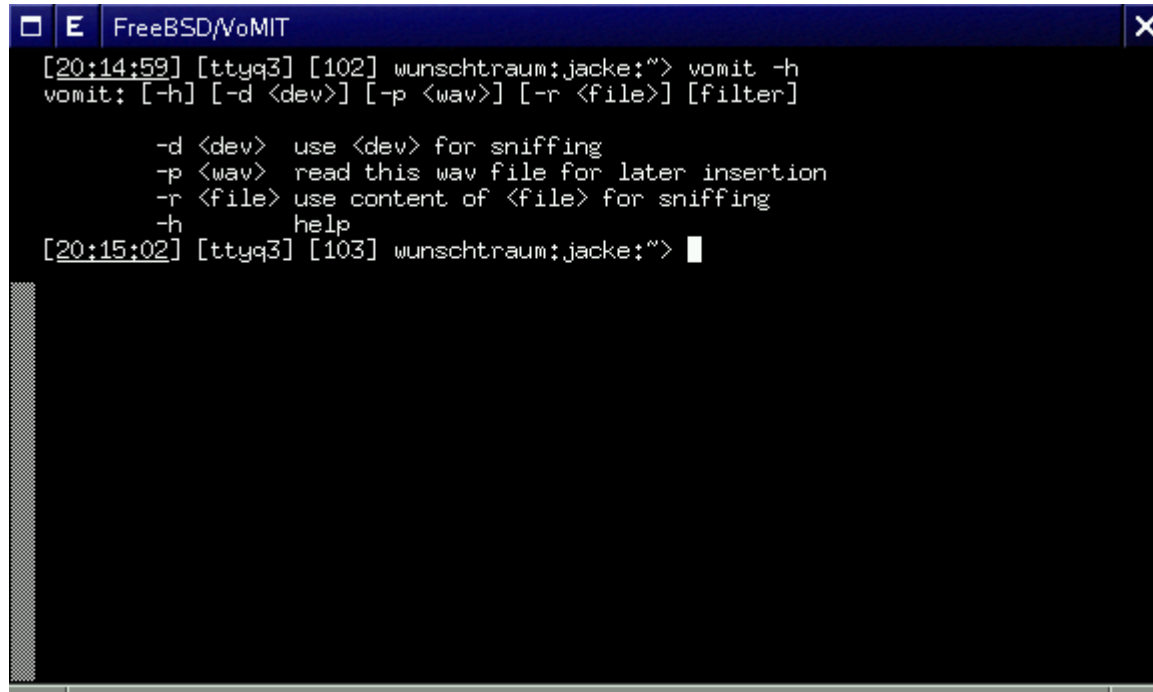
A terminal window titled "FreeBSD/ASTERISK-PBX" showing the output of the "asterisk -r" command. The output includes version information, copyright notices, and connection details for Asterisk 1.2.7.1 running on ipbx (pid = 49475). The terminal prompt is "ipbx\*CLI>".

```
FreeBSD/ASTERISK-PBX
[21:56:58] [ttyp615] [105] ipbx:jacke:/home/jacke# asterisk -r
Asterisk 1.2.7.1, Copyright (C) 1999 - 2006 Digium, Inc. and others.
Created by Mark Spencer <markster@digium.com>
Asterisk comes with ABSOLUTELY NO WARRANTY; type 'show warranty' for details.
This is free software, with components licensed under the GNU General Public
License version 2 and other licenses; you are welcome to redistribute it under
certain conditions. Type 'show license' for details.
=====
Connected to Asterisk 1.2.7.1 currently running on ipbx (pid = 49475)
Verbosity is at least 300
-- Remote UNIX connection
ipbx*CLI>
```

WWW: <http://www.asterisk.org>



- **VoMIT (VoIP Man In The middle attack)**

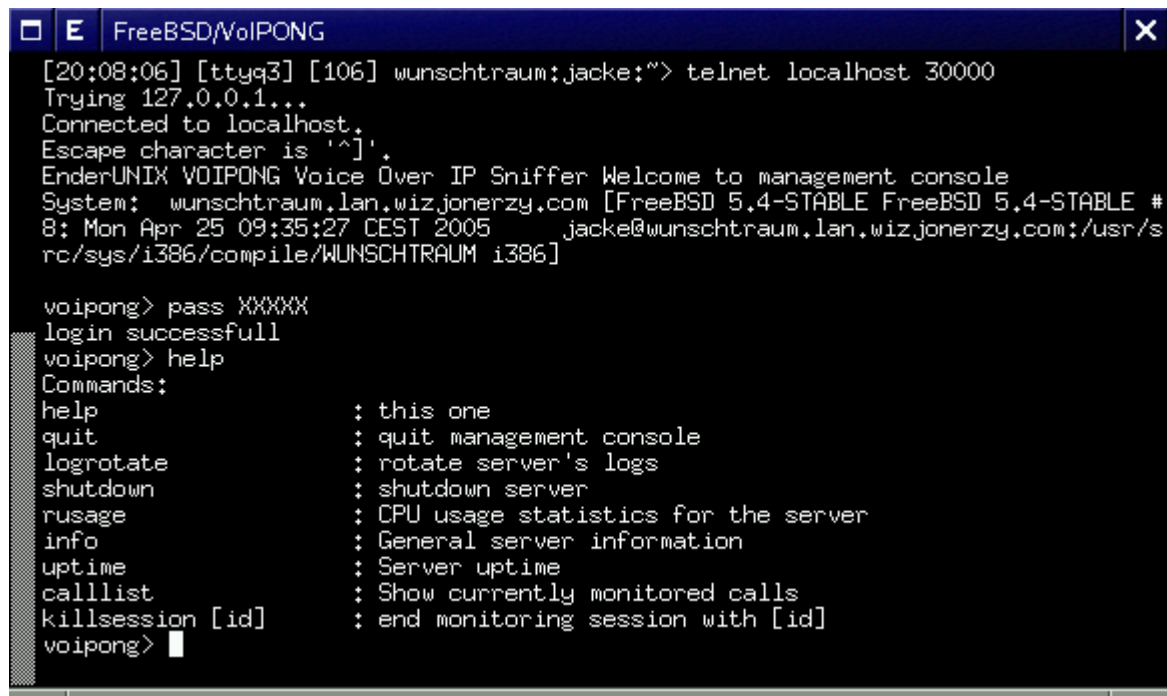


```
FreeBSD/VoMIT
[20:14:59] [ttyq3] [102] wunschtraum;jacke:"> vomit -h
vomit: [-h] [-d <dev>] [-p <wav>] [-r <file>] [filter]

        -d <dev>  use <dev> for sniffing
        -p <wav>  read this wav file for later insertion
        -r <file> use content of <file> for sniffing
        -h       help
[20:15:02] [ttyq3] [103] wunschtraum;jacke:"> █
```

WWW: <http://vomit.xtdnet.nl>

## o VoIPONG

A terminal window titled "FreeBSD/VoIPONG" showing a telnet session. The user connects to localhost 30000 and enters the password "XXXXXX". The terminal displays system information and a list of available commands.

```
FreeBSD/VoIPONG
[20:08:06] [ttyq3] [106] wunschtraum;jacke:"> telnet localhost 30000
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^'.
EnderUNIX VOIPONG Voice Over IP Sniffer Welcome to management console
System: wunschtraum.lan.wizjonerzy.com [FreeBSD 5.4-STABLE FreeBSD 5.4-STABLE #
8: Mon Apr 25 09:35:27 CEST 2005 jacke@wunschtraum.lan.wizjonerzy.com:/usr/s
rc/sys/i386/compile/WUNSCHTRAUM i386]

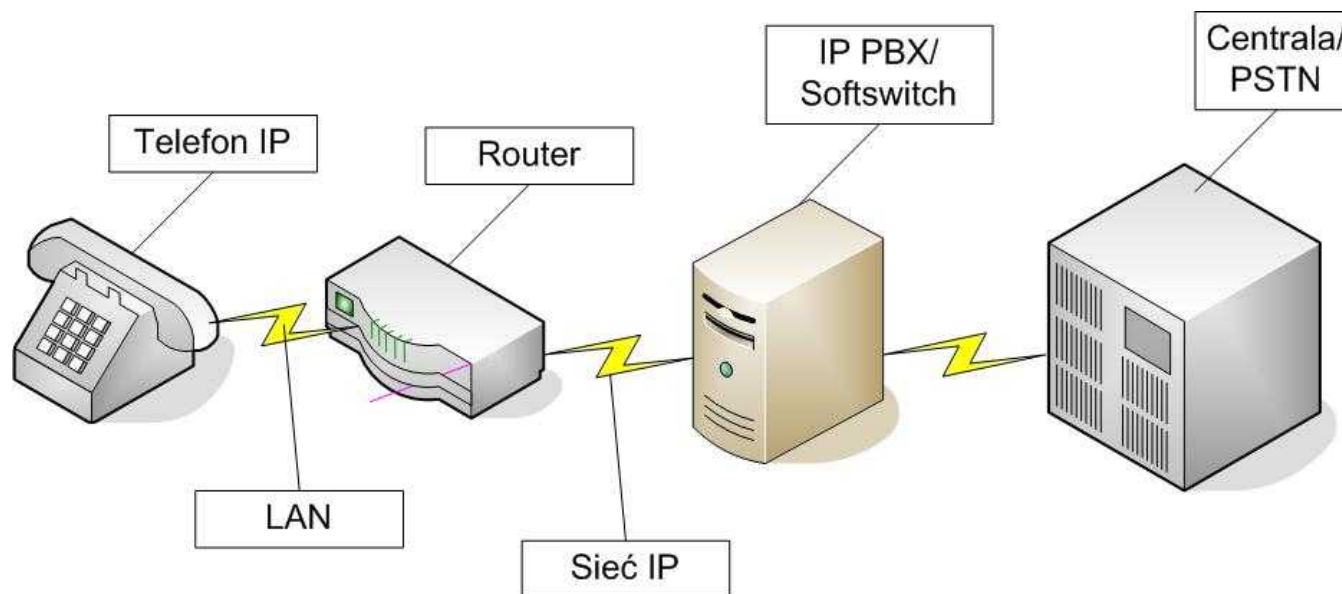
voipong> pass XXXXX
login successfull
voipong> help
Commands:
help           : this one
quit          : quit management console
logrotate     : rotate server's logs
shutdown     : shutdown server
rusage       : CPU usage statistics for the server
info         : General server information
uptime       : Server uptime
callist      : Show currently monitored calls
killsession [id] : end monitoring session with [id]
voipong>
```

WWW: <http://www.enderunix.org/voipong/>

## Schemat klasycznej sieci telefonicznej



## Schemat sieci telefonicznej wykorzystującej VoIP

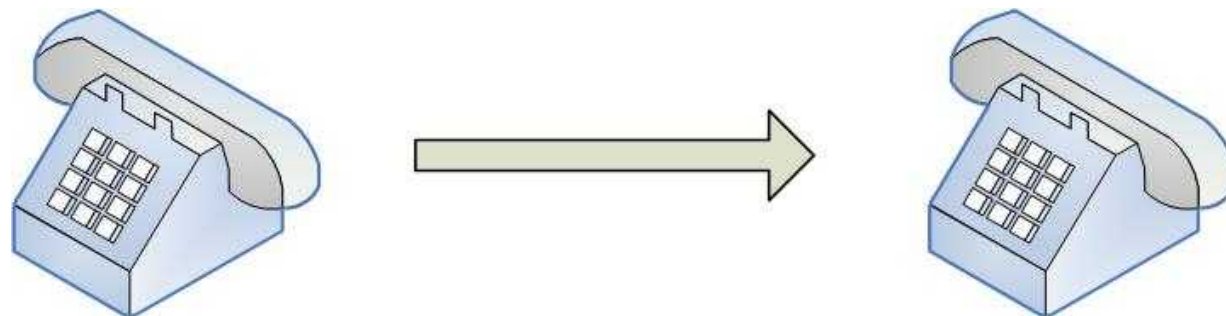


## Różnice?

- **Protokoły**
- **Sprzęt (redundancja)**
- **Skomplikowanie systemu (błędy)**
- **Awaryjność (czas nieprzerwanej pracy)**
- **Architektura**
- **Standaryzacja**
- ...
- **Cena**

A gdyby tak... [case]

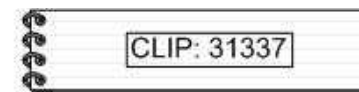
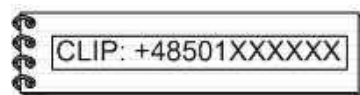
Co to jest CLIP?



WWW: <http://www.enderunix.org/voipong/>

A gdyby tak... [case]

Co to jest CLIP?



WWW: <http://www.enderunix.org/voipong/>

A gdyby tak... [case]



## I gdzie tu problem?

- **Automatyczne systemy uwierzytelniające**
- **Bilingi NDS**
- **Anonimowość**
- **Służby ratownictwa**
- **Systemy Callback**
- **Uciecha dla windykatorów ;)**

WWW: <http://www.enderunix.org/voipong/>



**Zakończenie**



**Pytania?**

**Zakończenie**



**Dziękujemy  
za uwagę!**

**<http://www.wizjonerzy.com/public/pdf/confidence-2006.pdf>**