

# Central telefonica ip asterisk con conexión desde internet en centos

Por: John A. Pérez B. ~ 20186748

Este tutorial es un extracto del siguiente video:

<https://youtu.be/0CQjdtY6wsQ>

# Configuración previa

Configuramos la red de todos nuestros dispositivos como bridge adapter de tal manera de que podamos comunicar nuestra máquina virtual con el host

File Machine View Input Device



w7-20186748 (2) - Settings

## Network

Adapter 1 Adapter 2 Adapter 3 Adapter 4

Enable Network Adapter

Attached to: Bridged Adapter

Name: Intel(R) Dual Band Wireless-AC 8265

Advanced

OK Cancel





```
C:\WINDOWS\system32\cmd.exe
C:\Users\jp135>ping 192.168.1.12

Pinging 192.168.1.12 with 32 bytes of data:
Reply from 192.168.1.12: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\jp135>
```



Luego actualizamos nuestro gestor de paquetes con el comando **yum update -y**

```
root@localhost:~  
root login as: root  
root@192.168.1.12's password:  
Last login: Tue Nov 12 10:38:04 2019  
[root@localhost ~]# yum update -y  
Loaded plugins: fastestmirror, langpacks
```

11:49 AM  
11/12/2019

Right Ctrl

Con el comando **setenforce 0**, y la expresión regular **sed -i 's/\(^SELINUX=\\).\*/\\SELINUX=permissive/' /etc/selinux/config**, colocamos el selinux en modo permisivo

root@localhost:~

```
[root@localhost ~]# hostnamectl set-hostname VOIP
[root@localhost ~]# setenforce 0
[root@localhost ~]# sed -i 's/^(SELINUX=).*/SELINUX=permissive/' /etc/selinux/config
[root@localhost ~]#
```



En el caso de que no se encuentren en nuestro sistema descargamos los paquetes **wget**, **vim** y **net-tools**. Luego con el comando **yum groupinstall** descargamos las “**Development Tools**”

root@localhost:~#

```
[root@localhost ~]# yum install -y wget vim net-tools
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
 * base: mirror-centos-jpa.hostdime.com.br
 * epel: mirror.atl.genesisadaptive.com
 * extras: mirror-centos-jpa.hostdime.com.br
 * updates: mirror-centos-jpa.hostdime.com.br
Package wget-1.14-18.el7_6.1.x86_64 already installed and latest version
Package 2:vim-enhanced-7.4.629-6.el7.x86_64 already installed and latest version
Package net-tools-2.0-0.25.20131004git.el7.x86_64 already installed and latest version
Nothing to do
[root@localhost ~]#
```

11:51 AM  
11/12/2019

11:51 AM



root@localhost:~#

```
[root@localhost ~]# yum groupinstall -y "Development Tools"
Loaded plugins: fastestmirror, langpacks
There is no installed groups file.
Maybe run: yum groups mark convert (see man yum)
Loading mirror speeds from cached hostfile.
```



Luego descargamos los demás paquetes que usaremos para instalar asterisk

root@localhost:~

```
Verifying : gcc-gfortran-4.8.5-39.el7.x86_64
Verifying : systemtap-client-4.0-10.el7_7.x86_64
Verifying : flex-2.5.37-6.el7.x86_64
Verifying : nettle-2.7.1-8.el7.x86_64
Verifying : libmpc-1.0.1-3.el7.x86_64
Verifying : libquadmath-devel-4.8.5-39.el7.x86_64
Verifying : m4-1.4.16-10.el7.x86_64
Verifying : patchutils-0.3.3-4.el7.x86_64
Verifying : glibc-devel-2.17-292.el7.x86_64
Verifying : systemtap-devel-4.0-10.el7_7.x86_64
Verifying : cscope-15.8-10.el7.x86_64
Verifying : bison-3.0.4-2.el7.x86_64
Verifying : mokutil-15-2.el7.centos.x86_64
Verifying : autoconf-2.69-11.el7.noarch
Verifying : libstdc++-devel-4.8.5-39.el7.x86_64
Verifying : perl-TermReadKey-2.30-20.el7.x86_64
Verifying : mpfr-3.1.1-4.el7.x86_64
Verifying : libquadmath-4.8.5-39.el7.x86_64
Verifying : gmp-0.11-3.el7.x86_64
Verifying : diffstat-1.57-4.el7.x86_64
Verifying : cpp-4.8.5-39.el7.x86_64
Verifying : pakchois-0.4-10.el7.x86_64
Verifying : redhat-rpm-config-9.1.0-88.el7.centos.noarch
Verifying : perl-Test-Harness-3.28-3.el7.noarch
Verifying : glibc-headers-2.17-292.el7.x86_64
Verifying : rpm-sign-4.11.3-40.el7.x86_64
```

Installed:

```
autoconf.noarch 0:2.69-11.el7      automake.noarch 0:1.13.4-3.el7
diffstat.x86_64 0:1.57-4.el7       doxygen.x86_64 1:1.8.5-3.el7
git.x86_64 0:1.8.3.1-20.el7       indent.x86_64 0:2.2.11-13.el7
rcs.x86_64 0:5.9-5.el7           redhat-rpm-config.noarch 0:9.1.0-88.el7.centos
systemtap.x86_64 0:4.0-10.el7_7
```

Dependency Installed:

```
apr.x86_64 0:1.4.8-5.el7          apr-util.x86_64 0:1.5.2-6.el7
efivar-libs.x86_64 0:36-12.el7    gettext-common-devel.noarch 0:0.19.8.1-2.el7
gnutls.x86_64 0:3.3.29-9.el7_6   kernel-debug-devel.x86_64 0:3.10.0-1062.4.1.el7
libquadmath.x86_64 0:4.8.5-39.el7 libquadmath-devel.x86_64 0:4.8.5-39.el7
mpfr.x86_64 0:3.1.1-4.el7        neon.x86_64 0:30.0-4.el7
perl-Error.noarch 1:0.17020-2.el7 perl-Git.noarch 0:1.8.3.1-20.el7
perl-XML-Parser.x86_64 0:2.41-10.el7 perl-SRPMS-Macros.noarch 0:1-8.el7
systemtap-devel.x86_64 0:4.0-10.el7_7 trousers.x86_64 0:0.3.14-2.el7
```

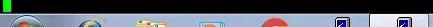
Complete!

```
[root@localhost ~]# yum install -y libedit-devel sqlite-devel psmisc gmime-devel ncurses-devel libtermcap-devel sox newt-devel libxml2-devel libtiff-devel audiofile-devel gtk2-devel uuid-devel libtool libuuid-devel subversion kernel-devel-S(uname -r) git subversion kernel-devel crontabs cronie cronie-anacron wget vim
```

Loaded plugins: fastestmirror, langpacks

Loading mirror speeds from cached hostfile

- \* base: mirror-centos-jpa.hostdime.com.br
- \* epel: d2lzhk17phnq30w.cloudfront.net
- \* extras: mirror-centos-jpa.hostdime.com.br
- \* updates: mirror-centos-jpa.hostdime.com.br



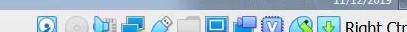
```
50/62
51/62
52/62
53/62
54/62
55/62
56/62
57/62
58/62
59/62
60/62
61/62
62/62
```

```
ctags.x86_64 0:5.8-13.el7
gcc-gfortran.x86_64 0:4.8.5-39.el7
patchutils.x86_64 0:0.3.3-4.el7
swig.x86_64 0:2.0-10.el7
```

```
dwz.x86_64 0:0.11-3.el7
glibc-headers.x86_64 0:2.17-292.el7
libmpc.x86_64 0:1.0.1-3.el7
mokutil.x86_64 0:15-2.el7.centos
perl-Dumper.x86_64 0:2.145-3.el7
perl-Test-Harness.noarch 0:3.28-3.el7
perl-Thread-Queue.noarch 0:3.02-2.el7
systemtap-client.x86_64 0:4.0-10.el7_7
```

...

11:58 AM  
11/12/2019



11:58 AM

Right Ctrl

Ahora procedemos a instalar la librería **jansson** desde github con el comando **git clone https://github.com/akheron/jansson.git**

root@localhost:/usr/src

```
[root@localhost src]# git clone https://github.com/akheron/jansson.git  
Cloning into 'jansson'...
```

12:00 PM  
11/12/2019

12:00 PM Right Ctrl

En el directorio **jansson** ejecutamos el comando **autoreconf -i**

root@localhost:/usr/src/jansson

```
[root@localhost jansson]# autoreconfigure -i
-bash: autoreconfigure: command not found
[root@localhost jansson]# autoreconfigure -i
-bash: autoreconfigure: command not found
[root@localhost jansson]# autoreconf -i
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `'.
libtoolize: copying file './ltmain.sh'
libtoolize: Consider adding 'AC_CONFIG_MACRO_DIR([m4])' to configure.ac and
libtoolize: rerunning libtoolize, to keep the correct libtool macros in-tree.
libtoolize: Consider adding '-I m4' to ACLOCAL_AMFLAGS in Makefile.am.
configure.ac:13: installing './config.guess'
configure.ac:13: installing './config.sub'
configure.ac:5: installing './install-sh'
configure.ac:5: installing './missing'
parallel-tests: installing './test-driver'
src/Makefile.am: installing './depcomp'
[root@localhost jansson]#
```



Luego ejecutamos **./configure --prefix=/usr/**

root@localhost:/usr/src/jansson

```
[root@localhost jansson]# autoreconfigure -i
-bash: autoreconfigure: command not found
[root@localhost jansson]# autoreconfigure -i
-bash: autoreconfigure: command not found
[root@localhost jansson]# autoreconf -i
libtoolize: putting auxiliary files in AC_CONFIG_AUX_DIR, `'.
libtoolize: copying file `./ltmain.sh'
libtoolize: Consider adding 'AC_CONFIG_MACRO_DIR([m4])' to configure.ac and
libtoolize: rerunning libtoolize, to keep the correct libtool macros in-tree.
libtoolize: Consider adding '-I m4' to ACLOCAL_AMFLAGS in Makefile.am.
configure.ac:13: installing './config.guess'
configure.ac:13: installing './config.sub'
configure.ac:35: installing './install-sh'
configure.ac:35: installing './missing'
parallel-tests: installing './test-driver,
src/Makefile.am: installing './depcomp'
[root@localhost jansson]# ./configure --prefix=/usr/
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for a thread-safe mkdir -p... /usr/bin/mkdir -p
checking for gawk... gawk
checking whether make sets $MAKE... yes
checking whether make supports nested variables... yes
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g... yes
checking for gcc option to accept ISO C89... none needed
checking for style of include used by make... GNU
checking dependency style of gcc...
```



una vez ejecutamos los paquetes ejecutamos los comandos **make** y  
**make install** para instalar esta librería en nuestro sistema

root@localhost:~#

```
[root@localhost jansson]# make && make install
make all-recurcive
make[1]: Entering directory '/usr/src/jansson'
Making all in doc
make[2]: Entering directory '/usr/src/jansson/doc'
make[2]: Nothing to be done for 'all'.
make[2]: Leaving directory '/usr/src/jansson/doc'
Making all in src
make[2]: Entering directory '/usr/src/jansson/src'
/bin/sh ../libtool --tag=CC --mode=compile gcc -DHAVE_CONFIG_H -I. -I.. -Wall -Wextra -Wdeclaration-after-statement -Wshadow -Wno-format-truncation -g -O2 -MT dump.lo -MD -MP -MF .deps/dump.lo
libtool: compile: gcc -DHAVE_CONFIG_H -I. -I.. -Wall -Wextra -Wdeclaration-after-statement -Wshadow -Wno-format-truncation -g -O2 -MT dump.lo -MD -MP -MF .deps/dump.lo -o dump.c -fPIC -DPIC -o
libtool: compile: gcc -DHAVE_CONFIG_H -I. -I.. -Wall -Wextra -Wdeclaration-after-statement -Wshadow -Wno-format-truncation -g -O2 -MT dump.lo -MD -MP -MF .deps/dump.lo -o dump.c -o dump.o >/dev/nl
```



Ahora generamos una variable global llamada **VER** con el valor **2.8** y descargamos el paquete **pjproject**, con el comando **wget**

**[http://www.pjsip.org/release/\\${VER}/pjproject-\\${VER}.tar.bz2](http://www.pjsip.org/release/${VER}/pjproject-${VER}.tar.bz2)**

```
root@localhost:~$ cd /usr/src/
[root@localhost src]# ls
debug jansson kernels
[root@localhost src]# export VER="2.8"
[root@localhost src]# wget http://www.pjsip.org/release/${VER}/pjproject-${VER}.tar.bz2
--2019-11-12 11:02:42--  http://www.pjsip.org/release/2.8/pjproject-2.8.tar.bz2
Resolving www.pjsip.org (www.pjsip.org)... 207.38.94.48
Connecting to www.pjsip.org (www.pjsip.org)|207.38.94.48|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://www.pjsip.org/release/2.8/pjproject-2.8.tar.bz2 [following]
--2019-11-12 11:02:42--  https://www.pjsip.org/release/2.8/pjproject-2.8.tar.bz2
Connecting to www.pjsip.org (www.pjsip.org)|207.38.94.48|:443... connected.
```



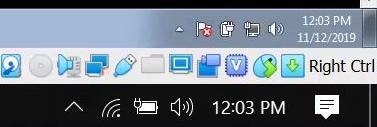
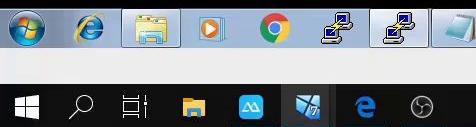
Una vez se descargue en paquete lo desempaquetamos con el comando **tar -jxvf** y el nombre del paquete

```
root@localhost:~$ cd /usr/src/
[root@localhost ~]$ ls
debug jansson kernels
[root@localhost ~]$ export VER="2.8"
[root@localhost ~]$ wget http://www.pjsip.org/release/$VER/pjproject-$VER.tar.bz2
--2019-11-12 11:02:42--  http://www.pjsip.org/release/2.8/pjproject-2.8.tar.bz2
Resolving www.pjsip.org (www.pjsip.org)... 207.38.94.48
Connecting to www.pjsip.org (www.pjsip.org)|207.38.94.48|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://www.pjsip.org/release/2.8/pjproject-2.8.tar.bz2 [following]
--2019-11-12 11:02:42--  https://www.pjsip.org/release/2.8/pjproject-2.8.tar.bz2
Connecting to www.pjsip.org (www.pjsip.org)|207.38.94.48|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/x-bzip2]
Saving to: 'pjproject-2.8.tar.bz2'

[          =>          ] 4,976,501  138KB/s  in 26s

2019-11-12 11:03:08 (189 KB/s) - 'pjproject-2.8.tar.bz2' saved [4976501]

[root@localhost ~]$ tar -jxvf pjproject-2.8.tar.bz2
```



Dentro del directorio **pjsip** ejecutamos el comando **./configure**

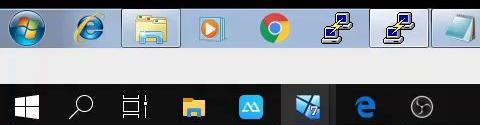
```
CFLAGS="-DNDEBUG -DPJ_HAS_IPV6=1" --prefix=/usr  
--libdir=/usr/lib64 --enable-shared --disable-video --disable-sound  
--disable-opencore-amr
```

w7-20186748 (2) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

root@localhost:/usr/src/pjproject-2.8# cd pjproject-2.8/  
[root@localhost pjproject-2.8]# ls  
aconfigure build c++-build.mak configure configure-iphone doc lib pjlib pjnath pjsip README-RELEMS svn\_add svn\_ps  
aconfigure.ac build.mak.in config.guess configure-android configure-legacy install-sh libpjproject.pc.in pjlib-util pjproject-vs14.sln pjsip-apps README.txt svn\_add.bat tests  
bb10-config.mak build.symbian config.sub configure-bb10 COPYING INSTALL.txt Makefile pjmedia pjproject-vs8.sln pkgconfig.py self-test.mak svn\_pset third\_

[root@localhost pjproject-2.8]# ./configure CFLAGS="-DNDEBUG -DPJ\_HAS\_IPV6=1" --prefix=/usr --libdir=/usr/lib64 --enable-shared --disable-video --disable-sound --disable-opencore-amr  
checking build system type... x86\_64-unknown-linux-gnu  
checking host system type... x86\_64-unknown-linux-gnu  
checking target system type... x86\_64-unknown-linux-gnu  
checking for gcc... gcc  
checking whether the C compiler works... yes  
checking for C compiler default output file name... a.out  
checking for suffix of executables...  
checking whether we are cross compiling... no  
checking for suffix of object files... o  
checking whether we are using the GNU C compiler... yes  
checking whether gcc accepts -g... yes  
checking for gcc option to accept ISO C89... none needed  
checking for g++... g++  
checking whether we are using the GNU C++ compiler... yes  
checking whether g++ accepts -g... yes



12:04 PM  
11/12/2019



12:04 PM Right Ctrl

Una vez termine el proceso de configuración ejecutamos el comando  
**make dep**

root@localhost:/usr/src/pjproject-2.8

```
checking for x86_64-unknown-linux-gnu-pkg-config... no
checking for pkg-config... pkg-config
checking for GnuTLS installations...
checking gnutls/gnutls.h usability... no
checking gnutls/gnutls.h presence... no
checking for gnutls/gnutls.h... no
checking for gnutls_certificate_set_x509_system_trust in -lgnutls... no
  ** No GnuTLS libraries found, disabling SSL support ***
Checking if OpenCORE AMR support is disabled... yes
checking for SILK installations...
checking SKP_Silk_SDK_API.h usability... no
checking SKP_Silk_SDK_API.h presence... no
checking for SKP_Silk_SDK_API.h... no
checking for SKP_Silk_SDK_get_version in -lSKP_SILK_SDK... no
checking for OPUS installations...
checking opus/opus.h usability... no
checking opus/opus.h presence... no
checking for opus/opus.h... no
checking for opus_repacketizer_get_size in -lopus... no
OPUS library not found, OPUS support disabled
checking bcg729 usability... no
Checking if libyuv is disabled... yes
Checking if libwebrtc is disabled... no
checking if select() needs correct nfds... no (default)
  ** Decided that select() doesn't need correct nfds (please check)
checking if pj_thread_create() should enforce stack size... no (default)
  ** Setting non-blocking recv() retrval to EAGAIN (please check)
  ** Setting non-blocking connect() retrval to EINPROGRESS (please check)
acconfigure: creating ./config.status
config.status: creating build.mak
config.status: creating build/os-auto.mak
config.status: creating build/cc-auto.mak
config.status: creating pjlib/build/os-auto.mak
config.status: creating pjlib-util/build/os-auto.mak
config.status: creating pimedia/build/os-auto.mak
config.status: creating pjssip/build/os-auto.mak
config.status: creating third_party/build/os-auto.mak
config.status: creating pjlib/include/pj/compat/cs_auto.h
config.status: creating pjlib/include/pj/compat/m_auto.h
config.status: creating pimedia/include/pjmedia/config_auto.h
config.status: creating pimedia/include/pjmedia-codec/config_auto.h
config.status: creating pjssip/include/pjssip/sip_autoconf.h

Configurations for current target have been written to 'build.mak', and 'os-auto.mak' in various build directories, and pjlib/include/pj/compat/os_auto.h.
```

Further customizations can be put in:  
- 'user.mak'  
- 'pjlib/include/pj/config\_site.h'

The next step now is to run 'make dep' and 'make'.

[root@localhost pjproject-2.8]# make dep



Por último ejecutamos **make** y **make install** para instalar el paquete en  
en sistema

root@voip:/usr/src/pjproject-2.8#

[root@voip pjproject-2.8]# make



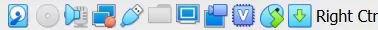
12:06 PM  
11/12/2019



12:06 PM Right Ctrl

root@voip:/usr/src/pjproject-2.8#

```
gcc -o ../bin/samples/x86_64-unknown-linux-gnu/tonegen \
    output/sample-x86_64-unknown-linux-gnu/tonegen.o -L/usr/src/pjproject-2.8/pjlib/lib -L/usr/src/pjproject-2.8/pjlib-util/lib -L/usr/src/pjproject-2.8/pjnath/lib -L/usr/src/pjproject-2.8/pjmedia \
-L/usr/src/pjproject-2.8/third_party/lib \
    -lpjsua -lpjsip-ua -lpjsip-simple -lpjsip -lpjmedia-codec -lpjmedia -lpjmedia-audioodev -lpjmedia -lpjnath -lpjlib-util -lsrtp \
    -lg7221codec -lwebrtc -lpj -luuid -lm -lthread
make --no-print-directory -f /usr/src/pjproject-2.8/build/rules.mak SAMPLE_SRCDIR=../src/samples SAMPLE_OBJS=vid_codec_test.o SAMPLE_CFLAGS="-DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include -I/usr/src/pjproject-2.8/pjnath \
-DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include \
-lgsmcodec -lspeex -llibccodec -lg7221codec -lwebrtc -lpj -luuid -lm -lthread" "SAMPLE_EXE=vid_codec_test APP=SAMPLE app=sample ../bin/samples/x86_64-unknown-linux-gnu/vid_codec_test"
gcc -c -DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjmedia/include -I/usr/src/pjproject-2.8/pjsip/include \
-o output/sample-x86_64-unknown-linux-gnu/vid_codec_test.o \
../src/samples/vid_codec_test.c
if test ! -d ../bin/samples/x86_64-unknown-linux-gnu; then mkdir -p ../bin/samples/x86_64-unknown-linux-gnu; fi
gcc -o ../bin/samples/x86_64-unknown-linux-gnu/vid_codec_test \
    output/sample-x86_64-unknown-linux-gnu/vid_codec_test.o -L/usr/src/pjproject-2.8/pjlib/lib -L/usr/src/pjproject-2.8/pjlib-util/lib -L/usr/src/pjproject-2.8/pjnath/lib -L/usr/src/pjproject-2.8/pjmedia/lib \
-L/usr/src/pjproject-2.8/third_party/lib \
    -lpjsua -lpjsip-ua -lpjsip-simple -lpjsip -lpjmedia-codec -lpjmedia -lpjmedia-audioodev -lpjmedia -lpjnath -lpjlib-util -lsrtp -lresample -lgsmcodec -lspeex -llibccodec -lg7221codec -lwebrtc -lpj -luuid -lm -lthread
make --no-print-directory -f /usr/src/pjproject-2.8/build/rules.mak SAMPLE_SRCDIR=../src/samples SAMPLE_OBJS=vid_streamutil.o SAMPLE_CFLAGS="-DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include \
-SAMPLE_LDFLAGS="-L/usr/src/pjproject-2.8/pjlib/lib -L/usr/src/pjproject-2.8/pjnath/lib -L/usr/src/pjproject-2.8/pjmedia/lib -L/usr/src/pjproject-2.8/pjnath \
-DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include \
-lgsmcodec -lspeex -llibccodec -lg7221codec -lwebrtc -lpj -luuid -lm -lthread" "SAMPLE_EXE=vid_streamutil APP=SAMPLE app=sample ../bin/samples/x86_64-unknown-linux-gnu/vid_streamutil"
gcc -c -DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjmedia/include -I/usr/src/pjproject-2.8/pjsip/include \
-o output/sample-x86_64-unknown-linux-gnu/vid_streamutil.o \
../src/samples/vid_streamutil.c
if test ! -d ../bin/samples/x86_64-unknown-linux-gnu; then mkdir -p ../bin/samples/x86_64-unknown-linux-gnu; fi
gcc -o ../bin/samples/x86_64-unknown-linux-gnu/vid_streamutil \
    output/sample-x86_64-unknown-linux-gnu/vid_streamutil.o -L/usr/src/pjproject-2.8/pjlib/lib -L/usr/src/pjproject-2.8/pjlib-util/lib -L/usr/src/pjproject-2.8/pjnath/lib -L/usr/src/pjproject-2.8/pjmedia/lib \
-L/usr/src/pjproject-2.8/third_party/lib \
    -lpjsua -lpjsip-ua -lpjsip-simple -lpjsip -lpjmedia-codec -lpjmedia -lpjmedia-audioodev -lpjmedia -lpjnath -lpjlib-util -lsrtp -lresample -lgsmcodec -lspeex -llibccodec -lg7221codec -lwebrtc -lpj -luuid -lm -lthread
make --no-print-directory -f /usr/src/pjproject-2.8/build/rules.mak PJSUA2_SAMPLE_SRCDIR=. ./src/samples PJSUA2_SAMPLE_OBJS=pjsua2_demo.o PJSUA2_SAMPLE_CFLAGS="-DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include \
-SAMPLE_CXXFLAGS="-g -O2 -DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include \
-pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/lib \
-L/usr/src/pjproject-2.8/pjnath/lib -L/usr/src/pjproject-2.8/pjmedia/lib -L/usr/src/pjproject-2.8/pjnath \
-DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
-I/usr/src/pjproject-2.8/pjlib/include -I/usr/src/pjproject-2.8/pjlib-util/include -I/usr/src/pjproject-2.8/pjnath/include -I/usr/src/pjproject-2.8/pjmedia/include \
-lgsmcodec -lwebrtc -lpj -luuid -lm -lthread" "PJSUA2_SAMPLE_EXE=pjsua2_demo APP=PJSUA2_SAMPLE app=pjsua2_sample ../bin/samples/x86_64-unknown-linux-gnu/pjsua2_demo"
mkdir -p output/pjsua2_sample/x86_64-unknown-linux-gnu/
g++ -c -g -O2 -DPJ_AUTOCONF=1 -DNDEBUG -DPJ_HAS_IPV6=1 -DPJ_IS_BIG_ENDIAN=0 -DPJ_IS_LITTLE_ENDIAN=1 -fPIC \
ude -I/usr/src/pjproject-2.8/pjmedia/include -I/usr/src/pjproject-2.8/pjsip/include \
-o output/pjsua2_sample-x86_64-unknown-linux-gnu/pjsua2_demo.o \
../src/samples/pjsua2_demo.cpp
if test ! -d ../bin/samples/x86_64-unknown-linux-gnu; then mkdir -p ../bin/samples/x86_64-unknown-linux-gnu; fi
gcc -o ../bin/samples/x86_64-unknown-linux-gnu/pjsua2_demo \
    output/pjsua2_sample-x86_64-unknown-linux-gnu/pjsua2_demo.o -L/usr/src/pjproject-2.8/pjlib/lib -L/usr/src/pjproject-2.8/pjlib-util/lib -L/usr/src/pjproject-2.8/pjnath/lib -L/usr/src/pjproject-2.8/pjmedia/lib \
-L/usr/src/pjproject-2.8/third_party/lib \
    -lpjsua2 -lstdc++ -lpjsua -lpjsip-ua -lpjsip-simple -lpjsip -lpjmedia-codec -lpjmedia -lpjmedia-audioodev -lpjmedia -lpjnath -lpjlib-util -lsrtp -lresample -lgsmcodec -lspeex -llibccodec -lg7221codec -lwebrtc -lpj -luuid -lm -lthread
make[2]: Leaving directory '/usr/src/pjproject-2.8/pjsip-apps/build'
make[1]: Leaving directory '/usr/src/pjproject-2.8/pjsip-apps/build'
[root@voip pjproject-2.8]# make install
```



Para que todo funcione correctamente ejecutamos **ldconfig**, este comando generará los enlaces y el cache necesarios para este paquete

root@voip:/usr/src/pjproject-2.8  
[root@voip pjproject-2.8]# idconfig  
[root@voip pjproject-2.8]#



12:07 PM  
11/12/2019  
Right Ctrl

12:07 PM

Una vez configurados los paquetes anteriores descargamos asterisk  
con el comando wget

**<http://downloads.asterisk.org/pub/telephony/asterisk/asterisk-16-current.tar.gz>** y lo descomprimimos con el comando **tar xvzf asterisk-16-current.tar.gz**

root@voip:/usr/src

```
[root@voip pjproject-2.8]# cd /usr/src
[root@voip src]# ls
debug jansson kernels pjproject-2.8 pjproject-2.8.tar.bz2
[root@voip src]# wget http://downloads.asterisk.org/pub/telephony/asterisk/asterisk-16-current.tar.gz
--2019-11-12 11:08:27--  http://downloads.asterisk.org/pub/telephony/asterisk/asterisk-16-current.tar.gz
Resolving downloads.asterisk.org (downloads.asterisk.org)... 76.164.171.238, 2001:470:e0d4::ee
Connecting to downloads.asterisk.org (downloads.asterisk.org)|76.164.171.238|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 27596631 (26M) [application/x-gzip]
Saving to: 'asterisk-16-current.tar.gz'

100%[=====] 27596631  1.84 MB/s
```

2019-11-12 11:08:42 (1.84 MB/s) - 'asterisk-16-current.tar.gz' saved [27596631/27596631]

```
[root@voip src]# tar xvfz asterisk-16-current.tar.gz
```



En el directorio de asterisk ejecutamos el comando **./configure --libdir=/usr/lib64**. Este debe de generar una salida como la de la segunda imagen

root@voip:/usr/src/asterisk-16.6.1\$

```
[root@voip src]# cd asterisk-16.6.1/
[root@voip asterisk-16.6.1]# ls
addons           autoconf      build_tools    channels       configure     default.exports  include      Makefile.moddir_rules  mkinstalldirs   README-SERIOUSLY.bestpractices.md  sounds
agi              bootstrap.sh  cdr            codecs        configure.ac  doc          install-sh   Makefile.rules      pbx             res
apps             bridges      cel            config.guess  contrib      formats      LICENSE      makeopts.in      phonepxov     static
asterisk-16.6.1-summary.html  BSDmakefile  ChangeLog    config        COPYING      funcs        main         menuselect     README-addons.txt  tests
asterisk-16.6.1-summary.txt  BUGS        CHANGES     config.sub   CREDITS     images      Makefile     missing        README.md      test-api
[root@voip asterisk-16.6.1]# ./configure --libdir=/usr/lib64/
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g...
```

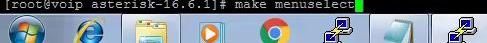


root@voip:/usr/src/asterisk-16.6.1#

```
checking for strcasecmp... yes
checking for strdup... yes
checking for strlen... yes
checking for strsep... yes
checking for unsetenv... yes
checking for vasprintf... yes
checking for newtBell in -lnewt... yes
checking newt.h usability... yes
checking newt.h presence... yes
checking for newt.h... yes
checking for initscr in -lncurses... yes
checking ncurses.h usability... yes
checking ncurses.h presence... yes
checking for ncurses.h... yes
checking for keypad in -ltinfo... yes
checking for ncurses.h... (cached) yes
checking for a sed that does not truncate output... /usr/bin/sed
checking for xml2-config... /bin/xml2-config
checking for pkg-config... /usr/bin/pkg-config
checking pkg-config is at least version 0.9.0... yes
checking for GTK2... yes
configure: creating ./config.status
config.status: creating makeopts
config.status: creating autoconfig.h
configure: Menuselect build configuration successfully completed
```

```
.$$$$$$$$$$$$$$$$$=..
.7$7.. .7$71.
.$$. .,$7.7
..$7. 7$7$ .$$77
..$$. $$$$ .$$77
..7. ?. $$$$ .?.
7$$. .$$7. $$7$7. 7$7$.
.777. .$$$$$77$7$7$7$7$7. $$$,
$$~- .7$7$7$7$7$7$7. $$$.
.$7. .7$7$7$7$7: ?$$.
$$$ 27$7$7$7$7$7$7. $$$7
$$$ .7$7$7$7$7$7$7$7$7$7. :$$.
$$$ $$$$7$7$7$7$7$7$7. $$$.
$$$ $$$ 7$7$7 .$$$ .$$.
$$$$ $$$$7 .$$$.
7$7$7 7$7$7 7$7$7
$$$$$ $$$
$$7$7. $$ (TM)
$$$$$$. .7$7$7$7. $$
$$$$$7$7$7$7$7$7$7$7$7. $$$
$$$$$7$7$7$7$7$7$7$7$7. $$$.
```

```
configure: Package configured for:
configure: OS type : linux-gnu
configure: Host CPU : x86_64
configure: build-cpu:vendor:os: x86_64 : pc : linux-gnu :
configure: host-cpu:vendor:os: x86_64 : pc : linux-gnu :
[root@voip asterisk-16.6.1]# make menuselect
```



Luego para agregar las características de asterisk ejecutamos el comando **make menuselect** y agregamos las características que deseemos con enter. en las siguientes imágenes se muestran las características implementadas en este tutorial

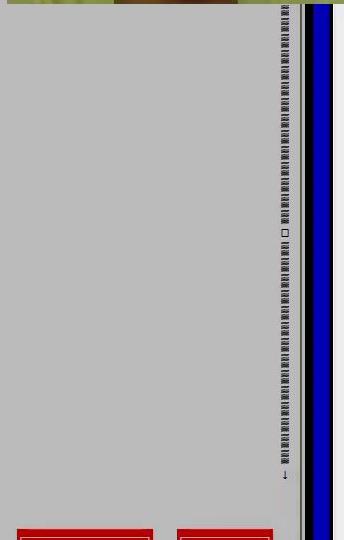
root@voip:/usr/src/asterisk-16.6.1

## Asterisk Module and Build Option Selection

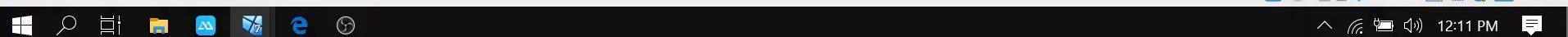
Add-ons (See README-addons.txt) --- Extended ---  
Applications XXX chan\_mobile  
Bridging Modules [\*] chan\_ooh323  
Call Detail Recording [\*] format\_mp3  
Channel Event Logging XXX res\_config\_mysql  
Channel Drivers --- Deprecated ---  
Codec Translators XXX app\_mysql  
Format Interpreters XXX cdr\_mysql  
Dialplan Functions  
PBX Modules  
Resource Modules  
Test Modules  
Compiler Flags  
Voicemail Build Options  
Utilities  
AGI Samples  
Core Sound Packages  
Music On Hold File Packages  
Extras Sound Packages

## MySQL RealTime Configuration Driver

Depends on: mysqlclient(E)  
Can use: N/A  
Conflicts with: N/A  
Support Level: extended



&lt;ENTER&gt; toggles selection | &lt;F12&gt; saves &amp; exits | &lt;ESC&gt; exits without save



root@voip:/usr/src/asterisk-16.6.1

## Asterisk Module and Build Option Selection

Add-ons (See README-addons.txt) [\*] app\_transfer  
Applications [\*] app\_userevent  
Bridging Modules [\*] app\_verbose  
Call Detail Recording [\*] app\_voicemail  
Channel Event Logging [\*] app\_waituntil  
Channel Drivers [\*] app\_while  
Codec Translators --- Extended ---  
Format Interpreters [\*] app\_alarmreceiver  
Dialplan Functions [\*] app\_amd  
PBX Modules [\*] app\_attended\_transfer  
Resource Modules [\*] app\_blind\_transfer  
Test Modules [\*] app\_chaniavail  
Compiler Flags [\*] app\_dictate  
Voicemail Build Options [\*] app\_externalivr  
Utilities [\*] app\_festival  
AGI Samples [\*] app\_ivrdemo  
Core Sound Packages XXX app\_jack  
Music On Hold File Packages XXX app\_meetme  
Extras Sound Packages [\*] app\_minivm  
[\*] app\_morsecode  
[\*] app\_mp3  
XXX app\_osclockup  
[\*] app\_saycounted  
[\*] app\_sms  
[\*] app\_statsad  
[\*] app\_test  
[\*] app\_waitforring  
[\*] app\_waitforsilence  
[\*] app\_zapataeller  
--- Deprecated ---  
[\*] app\_adsiprogs  
XXX app\_dahdiaras  
XXX app\_fax  
[\*] app\_getcpid  
[\*] app\_ices  
[\*] app\_image  
[\*] app\_macro  
[\*] app\_nbcat  
[\*] app\_url

## Extension Macros

Depends on: N/A  
Can use: N/A  
Conflicts with: N/A  
Support Level: deprecated, Replaced by: app\_stack (GoSub)



Save &amp; Exit

Exit

&lt;ENTER&gt; toggles selection | &lt;F12&gt; saves &amp; exits | &lt;ESC&gt; exits without save

12:11 PM  
11/12/2019

12:11 PM Right Ctrl

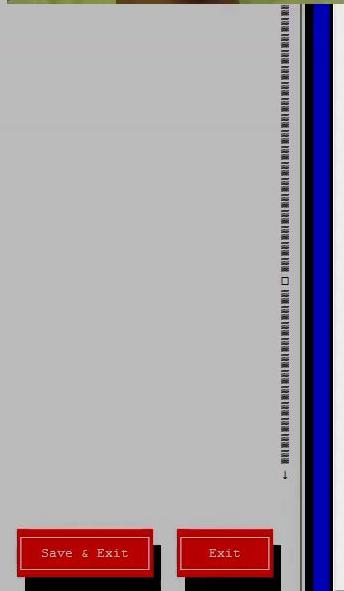
root@voip:/usr/src/asterisk-16.6.1

## Asterisk Module and Build Option Selection

Add-ons (See README-addons.txt)     --- Core ---  
Applications                    [\*] MOH-OP SOUND-WAV  
Bridging Modules              [\*] MOH-OP SOUND-ULAW  
Call Detail Recording        [\*] MOH-OP SOUND-ALAW  
Channel Event Logging       [\*] MOH-OP SOUND-GSM  
Channel Drivers              [\*] MOH-OP SOUND-G729  
Codec Translators            [\*] MOH-OP SOUND-G722  
Format Interpreters          [ ] MOH-OP SOUND-SLN16  
Dialplan Functions            [ ] MOH-OP SOUND-SIREN7  
PBX Modules                    [ ] MOH-OP SOUND-SIREN14  
Resource Modules  
Test Modules  
Compiler Flags  
Voicemail Build Options  
Utilities  
AGI Samples  
Core Sound Packages  
**Music On Hold File Packages**  
Extras Sound Packages

opsound.org Music On Hold Files, G.722 format

Depends on: N/A  
Can use: N/A  
Conflicts with: N/A  
Support Level: core



Save &amp; Exit

Exit



12:11 PM 11/12/2019

12:11 PM

11/12/2019

Right Ctrl

root@voip:/usr/src/asterisk-16.6.1

## Asterisk Module and Build Option Selection

```
Add-ons (See README-addons.txt)      --- Core ---
Applications                         [*] EXTRA-SOUNDS-EN-WAV
Bridging Modules                      [*] EXTRA-SOUNDS-EN-ULAW
Call Detail Recording                 [*] EXTRA-SOUNDS-EN-ALAW
Channel Event Logging                  [*] EXTRA-SOUNDS-EN-GSM
Channel Drivers                       [*] EXTRA-SOUNDS-EN-G729
Codec Translators                     [*] EXTRA-SOUNDS-EN-SLN16
Format Interpreters                   [*] EXTRA-SOUNDS-EN-SIREN7
Dialplan Functions                    [*] EXTRA-SOUNDS-EN-SIREN14
PBX Modules                           [ ] EXTRA-SOUNDS-EN-SIREN14
Resource Modules                      [ ] EXTRA-SOUNDS-EN_GB-WAV
Test Modules                          [ ] EXTRA-SOUNDS-EN_GB-ULAW
Compiler Flags                        [ ] EXTRA-SOUNDS-EN_GB-ALAW
Voicemail Build Options               [ ] EXTRA-SOUNDS-EN_GB-GSM
Utilities                             [ ] EXTRA-SOUNDS-EN_GB-G729
AGI Samples                           [ ] EXTRA-SOUNDS-EN_GB-G722
Core Sound Packages                   [ ] EXTRA-SOUNDS-EN_GB-SLN16
Music On Hold File Packages          [ ] EXTRA-SOUNDS-EN_GB-SIREN7
Extras Sound Packages                 [ ] EXTRA-SOUNDS-EN_GB-SIREN14
[ ] EXTRA-SOUNDS-FR-WAV
[ ] EXTRA-SOUNDS-FR-ULAW
[ ] EXTRA-SOUNDS-FR-ALAW
[ ] EXTRA-SOUNDS-FR-GSM
[ ] EXTRA-SOUNDS-FR-G729
[ ] EXTRA-SOUNDS-FR-G722
[ ] EXTRA-SOUNDS-FR-SLN16
[ ] EXTRA-SOUNDS-FR-SIREN7
[ ] EXTRA-SOUNDS-FR-SIREN14
```

English, G.722.1C (Siren14) format

Depends on: N/A  
Can use: N/A  
Conflicts with: N/A  
Support Level: core



Save & Exit      Exit

&lt;ENTER&gt; toggles selection | &lt;F12&gt; saves &amp; exits | &lt;ESC&gt; exits without save

12:11 PM  
11/12/2019

Right Ctrl

Una vez instaladas las características ejecutamos  
**contrib/scripts/get\_mp3\_source.sh** este nos descargara los audios  
que habíamos seleccionado en nuestro sistema

root@voip:/usr/src/asterisk-16.6.1

```
gcc -g -D_GNU_SOURCE -Wall -DHAVE_NCURSES -c -o strcompat.o strcompat.c
gcc -g -D_GNU_SOURCE -Wall -DHAVE_NCURSES -c -o menuselect_curses.o menuselect_curses.c
gcc -o cmenuselect menuselect.o strcompat.o menuselect_curses.o -lncurses -ltinfo -lxm12 -lz -lm -ldl
make[1]: Leaving directory '/usr/src/asterisk-16.6.1/menuselect'
CC="cc" CXX="g++" LD="" AR="" RANLIB="" CFLAGS="" LDFLAGS="" make -C menuselect CONFIGURE_SILENT="--silent" nmenuselect
make[1]: Entering directory '/usr/src/asterisk-16.6.1/menuselect'
gcc -g -D_GNU_SOURCE -Wall -DHAVE_NCURSES -c -o menuselect_newt.o menuselect_newt.c
gcc -o nmenuselect menuselect.o strcompat.o menuselect_newt.o -lnewt -lxm12 -lz -lm -ldl
make[1]: Leaving directory '/usr/src/asterisk-16.6.1/menuselect'
CC="cc" CXX="g++" LD="" AR="" RANLIB="" CFLAGS="" LDFLAGS="" make -C menuselect CONFIGURE_SILENT="--silent" gmenuselect
make[1]: Entering directory '/usr/src/asterisk-16.6.1/menuselect'
gcc -g -D_GNU_SOURCE -Wall -DHAVE_NCURSES -pthread -I/usr/include/gtk-2.0 -I/usr/lib64/gtk-2.0/include -I/usr/include/atk-1.0 -I/usr/include/cairo -I/usr/include/gdk-pixbuf-2.0 -I/usr/include/pango -I/usr/include/glib-2.0 -I/usr/lib64/glib-2.0/include -I/usr/include/harfbuzz -I/usr/include/freetype2 -I/usr/include/libpng15 -I/usr/include/uuid -I/usr/include/pixman-1 -I/usr/include/libdrm -c -o menuselect
gcc -o gmenuselect menuselect.o strcompat.o menuselect_gtk.o -lgtk-x11-2.0 -lgdk-x11-2.0 -latk-1.0 -lgio-2.0 -lpangofc2-1.0 -lpangocairo-1.0 -lgdk_pixbuf-2.0 -lcairo -lpango-1.0 -lfntconfig -lgobject-2.0 -lglib-2.0 -lfreetype -lxm12 -lz -lm -ldl
make[1]: Leaving directory '/usr/src/asterisk-16.6.1/menuselect'
make[1]: Entering directory '/usr/src/asterisk-16.6.1'
Generating input for menuselect ...
CC="cc" CXX="g++" LD="" AR="" RANLIB="" CFLAGS="" LDFLAGS="" make -C menuselect CONFIGURE_SILENT="--silent" menuselect
make[2]: Entering directory '/usr/src/asterisk-16.6.1/menuselect'
gcc -g -D_GNU_SOURCE -Wall -DHAVE_NCURSES -c -o menuselect_stub.o menuselect_stub.c
gcc -o menuselect menuselect.o strcompat.o menuselect_stub.o -lxm12 -lz -lm -ldl
make[2]: Leaving directory '/usr/src/asterisk-16.6.1/menuselect'
menuselect/menuselect --check-deps menuselect.menuselect.makeopts
menuselect/menuselect --check-deps menuselect.makeopts
menuselect changes saved!
make[1]: Leaving directory '/usr/src/asterisk-16.6.1'
[root@voip asterisk-16.6.1]# con
consolehelper consoletype continue convertquota
[root@voip asterisk-16.6.1]# con
consolehelper consoletype continue convertquota
[root@voip asterisk-16.6.1]# contrib/scripts/get_mp3_source.sh
A addons/mp3
A addons/mp3/MPGLIB_README
A addons/mp3/common.c
A addons/mp3/huffman.h
A addons/mp3/tabinit.c
A addons/mp3/Makefile
A addons/mp3/README
A addons/mp3/decode_i386.c
A addons/mp3/dct64_i386.c
A addons/mp3/MPGLIB_TODO
A addons/mp3/mpg123.h
A addons/mp3/layer3.c
A addons/mp3/mpglib.h
A addons/mp3/decode_ntom.c
A addons/mp3/interface.c
Exported revision 202.
[root@voip asterisk-16.6.1]# make
[CC] astcanary.c -> astcanary.o
[LD] astcanary.o -> astcanary
[CC] astdbzsqlite3.c -> astdbzsqlite3.o
[CC] hash/hash.c -> hash/hash.o
```



Por último ejecutamos **make install** para terminar con el proceso de instalación de asterisk

File Machine View Input Devices Help

root@voip:/usr/src/asterisk-16.6.1

```
[CC] ooh323c/src/ooGkClient.c -> ooh323c/src/ooGkClient.o
[CC] ooh323c/src/context.c -> ooh323c/src/context.o
[CC] ooh323c/src/ooDateTime.c -> ooh323c/src/ooDateTime.o
[CC] ooh323c/src/decode.c -> ooh323c/src/decode.o
[CC] ooh323c/src/dlist.c -> ooh323c/src/dlist.o
[CC] ooh323c/src/encode.c -> ooh323c/src/encode.o
[CC] ooh323c/src/errmgmt.c -> ooh323c/src/errmgmt.o
[CC] ooh323c/src/memheap.c -> ooh323c/src/memheap.o
[CC] ooh323c/src/octrace.c -> ooh323c/src/octrace.o
[CC] ooh323c/src/oochannels.c -> ooh323c/src/oochannels.o
[CC] ooh323c/src/ooh245.c -> ooh323c/src/ooh245.o
[CC] ooh323c/src/ooports.c -> ooh323c/src/ooports.o
[CC] ooh323c/src/ooq931.c -> ooh323c/src/ooq931.o
[CC] ooh323c/src/ooCapability.c -> ooh323c/src/ooCapability.o
[CC] ooh323c/src/ooSocket.c -> ooh323c/src/ooSocket.o
[CC] ooh323c/src/perutil.c -> ooh323c/src/perutil.o
[CC] ooh323c/src/eventHandler.c -> ooh323c/src/eventHandler.o
[CC] ooh323c/src/ooCalls.c -> ooh323c/src/ooCalls.o
[CC] ooh323c/src/ooStackCmds.c -> ooh323c/src/ooStackCmds.o
[CC] ooh323c/src/ooh323.c -> ooh323c/src/ooh323.o
[CC] ooh323c/src/ooh323ep.c -> ooh323c/src/ooh323ep.o
[CC] ooh323c/src/printHandler.c -> ooh323c/src/printHandler.o
[CC] ooh323c/src/rctctype.c -> ooh323c/src/rctctype.o
[CC] ooh323c/src/ooTimer.c -> ooh323c/src/ooTimer.o
[CC] ooh323c/src/h323/H235-SECURITY-MESSAGESDec.c -> ooh323c/src/h323/H235-SECURITY-MESSAGESDec.o
[CC] ooh323c/src/h323/H235-SECURITY-MESSAGESEnc.c -> ooh323c/src/h323/H235-SECURITY-MESSAGESEnc.o
[CC] ooh323c/src/h323/H323-MESSAGES.c -> ooh323c/src/h323/H323-MESSAGES.o
[CC] ooh323c/src/h323/H323-MESSAGESDec.c -> ooh323c/src/h323/H323-MESSAGESDec.o
[CC] ooh323c/src/h323/H323-MESSAGESEnc.c -> ooh323c/src/h323/H323-MESSAGESEnc.o
[CC] ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROL.c -> ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROL.o
[CC] ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROLDec.c -> ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROLDec.o
[CC] ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROLEnc.c -> ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROLEnc.o
[CC] ooh323c/Driver.c -> ooh323cDriver.o
[LD] chan_ooh323.c ooh323c/src/ooCmdChannel.o ooh323c/src/ooLogChan.o ooh323c/src/ooUtils.o ooh323c/src/ooGkClient.o ooh323c/src/context.o ooh323c/src/ooDateTime.o ooh323c/src/decode.o ooh323c/src/dlist.o ooh323c/src/encode.o ooh323c/src/errmgmt.o ooh323c/src/memheap.o ooh323c/src/octrace.o ooh323c/src/oochannels.o ooh323c/src/ooh245.o ooh323c/src/ooports.o ooh323c/src/ooq931.o ooh323c/src/ooCapability.o ooh323c/src/perutil.o ooh323c/src/eventHandler.o ooh323c/src/ooCalls.o ooh323c/src/ooStackCmds.o ooh323c/src/ooh323.o ooh323c/src/ooh323ep.o ooh323c/src/printHandler.o ooh323c/src/rctctype.o ooh323c/src/ooTimer.o ooh323c/src/h323/H235-SECURITY-MESSAGESDec.o ooh323c/src/h323/H323-MESSAGES.o ooh323c/src/h323/H323-MESSAGESDec.o ooh323c/src/h323/H323-MESSAGESEnc.o ooh323c/src/h323/H323-MESSAGESDec.o ooh323c/src/h323/H323-MESSAGESEnc.o ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROL.o ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROLDec.o ooh323c/src/h323/MULTIMEDIA-SYSTEM-CONTROLEnc.o ooh323c/Driver.o -> chan_ooh323.so
[CC] format_mp3.c -> format_mp3.o
[CC] mp3_common.c -> mp3/common.o
[CC] mp3_dct64_i386.c -> mp3/dct64_i386.o
[CC] mp3_decode_ntom.c -> mp3/decode_ntom.o
[CC] mp3_layer3.c -> mp3/layer3.o
[CC] mp3_tabinit.c -> mp3/tabinit.o
[CC] mp3_interface.o -> mp3/interface.o
[LD] format_mp3.o mp3_common.o mp3_dct64_i386.o mp3/decode_ntom.o mp3/layer3.o mp3/tabinit.o mp3/interface.o -> format_mp3.so
```

Building Documentation For: third-party channels pbx apps codecs formats cdr cel bridges funcs tests main res addons

```
+-----+
+ Asterisk has successfully been built, and +
+ can be installed by running:
+   +
+       make install
+-----+
```

[root@voip asterisk-16.6.1]# make install



Para generar los archivos por defecto usamos **make sample**, luego ejecutamos **make config**, y por último **ldconfig**

root@voip:/usr/src/asterisk-16.6.1

```
--2019-11-12 11:26:48-- http://downloads.asterisk.org/pub/telephony/sounds/releases/asterisk-moh-opsound-gsm-2.03.tar.gz
Resolving downloads.asterisk.org (downloads.asterisk.org)... 76.164.171.238, 2001:470:e0d4::ee
Connecting to downloads.asterisk.org (downloads.asterisk.org)|76.164.171.238|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1777967 (1.7M) [application/x-gzip]
Saving to: 'asterisk-moh-opsound-gsm-2.03.tar.gz'

100%[=====] 1,777,967  568KB/s  in 1.9s
```

```
2019-11-12 11:26:51 (500 KB/s) - 'asterisk-moh-opsound-gsm-2.03.tar.gz' saved [1777967/1777967]
```

```
--2019-11-12 11:26:51-- http://downloads.asterisk.org/pub/telephony/sounds/releases/asterisk-moh-opsound-g729-2.03.tar.gz
Resolving downloads.asterisk.org (downloads.asterisk.org)... 76.164.171.238, 2001:470:e0d4::ee
Connecting to downloads.asterisk.org (downloads.asterisk.org)|76.164.171.238|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1103000 (1.1M) [application/x-gzip]
Saving to: 'asterisk-moh-opsound-g729-2.03.tar.gz'

100%[=====] 1,103,000  568KB/s  in 1.9s
```

```
2019-11-12 11:26:53 (568 KB/s) - 'asterisk-moh-opsound-g729-2.03.tar.gz' saved [1103000/1103000]
```

```
make[1]: Leaving directory '/usr/src/asterisk-16.6.1/sounds'
find rest-api -name "*.json" | while read x; do \
    /usr/bin/install -c -m 644 $x "/var/lib/asterisk/rest-api" ; \
done
+---- Asterisk Installation Complete -----+
+
+ YOU MUST READ THE SECURITY DOCUMENT +
+
+ Asterisk has successfully been installed. +
+ If you would like to install the sample +
+ configuration files (overwriting any +
+ existing config files), run:
+
+ For generic reference documentation:
+   make samples
+
+ For a sample basic PBX:
+   make basic-pbx
+
+
+----- OR -----
+
+ You can go ahead and install the asterisk +
+ program documentation now or later run:
+
+   make progdocs
+
+
+ **Note** This requires that you have +
+ doxygen installed on your local system
+
+[root@voip asterisk-16.6.1]# make samples
```



root@voip:/usr/src/asterisk-16.6.1

```
Installing file configs/samples/ooh323.conf.sample
Installing file configs/samples/osp.conf.sample
Installing file configs/samples/oss.conf.sample
Installing file configs/samples/phone.conf.sample
Installing file configs/samples/phoneprov.conf.sample
Installing file configs/samples/pjproject.conf.sample
Installing file configs/samples/pjsip.conf.sample
Installing file configs/samples/pjsip_notify.conf.sample
Installing file configs/samples/pjsip_wizard.conf.sample
Installing file configs/samples/queuerules.conf.sample
Installing file configs/samples/queues.conf.sample
Installing file configs/samples/res_config_mysql.conf.sample
Installing file configs/samples/res_config_sqlite3.conf.sample
Installing file configs/samples/res_config_sqlite.conf.sample
Installing file configs/samples/res_corosync.conf.sample
Installing file configs/samples/res_curl.conf.sample
Installing file configs/samples/res_fax.conf.sample
Installing file configs/samples/res_ldap.conf.sample
Installing file configs/samples/res_odbc.conf.sample
Installing file configs/samples/resolver_unbound.conf.sample
Installing file configs/samples/res_parking.conf.sample
Installing file configs/samples/res_pgsql.conf.sample
Installing file configs/samples/res_pkccops.conf.sample
Installing file configs/samples/res_snmp.conf.sample
Installing file configs/samples/res_stun_monitor.conf.sample
Installing file configs/samples/rtcp.conf.sample
Installing file configs/samples/say.conf.sample
Installing file configs/samples/sip.conf.sample
Installing file configs/samples/sip_notify.conf.sample
Installing file configs/samples/skinny.conf.sample
Installing file configs/samples/sla.conf.sample
Installing file configs/samples/smci.conf.sample
Installing file configs/samples/sorcery.conf.sample
Installing file configs/samples/ss7.timers.sample
Installing file configs/samples/stasis.conf.sample
Installing file configs/samples/statsd.conf.sample
Installing file configs/samples/test_sorcery.conf.sample
Installing file configs/samples/wdptl.conf.sample
Installing file configs/samples/unistim.conf.sample
Installing file configs/samples/users.conf.sample
Installing file configs/samples/voicemail.conf.sample
Installing file configs/samples/vpb.conf.sample
Installing file configs/samples/xmpp.conf.sample
Updating asterisk.conf
/usr/bin/install -c -d "/var/spool/asterisk/voicemail/default/1234/INBOX"
build_tools/make_sample voicemail "/var/lib/asterisk" "/var/spool/asterisk"
Installing file phoneprov/000000000000.cfg
Installing file phoneprov/000000000000-directory.xml
Installing file phoneprov/000000000000-phone.cfg
Installing file phoneprov/polycom_line.xml
Installing file phoneprov/polycom.xml
Installing file phoneprov/snom-mac.xml
[root@voip asterisk-16.6.1]# make config
```



root@voip:/usr/src/asterisk-16.6.1

```
Installing file configs/samples/osp.conf.sample
Installing file configs/samples/oss.conf.sample
Installing file configs/samples/phone.conf.sample
Installing file configs/samples/phonprov.conf.sample
Installing file configs/samples/pjproject.conf.sample
Installing file configs/samples/pjsip.conf.sample
Installing file configs/samples/pjsip_notify.conf.sample
Installing file configs/samples/pjsip_wizard.conf.sample
Installing file configs/samples/queuerules.conf.sample
Installing file configs/samples/queues.conf.sample
Installing file configs/samples/res_config_mysql.conf.sample
Installing file configs/samples/res_config_sqlite3.conf.sample
Installing file configs/samples/res_config_sqlite.conf.sample
Installing file configs/samples/res_corosync.conf.sample
Installing file configs/samples/res_curl.conf.sample
Installing file configs/samples/res_fax.conf.sample
Installing file configs/samples/res_ldap.conf.sample
Installing file configs/samples/res_odbc.conf.sample
Installing file configs/samples/res_resolver_unbound.conf.sample
Installing file configs/samples/res_parking.conf.sample
Installing file configs/samples/res_pgsql.conf.sample
Installing file configs/samples/res_pkccps.conf.sample
Installing file configs/samples/res_snmp.conf.sample
Installing file configs/samples/res_stun_monitor.conf.sample
Installing file configs/samples/rtp.conf.sample
Installing file configs/samples/say.conf.sample
Installing file configs/samples/sip.conf.sample
Installing file configs/samples/sip_notify.conf.sample
Installing file configs/samples/skinny.conf.sample
Installing file configs/samples/sla.conf.sample
Installing file configs/samples/smddi.conf.sample
Installing file configs/samples/sorcery.conf.sample
Installing file configs/samples/ss7.timers.sample
Installing file configs/samples/stasis.conf.sample
Installing file configs/samples/statsd.conf.sample
Installing file configs/samples/test_sorcery.conf.sample
Installing file configs/samples/udptl.conf.sample
Installing file configs/samples/unistim.conf.sample
Installing file configs/samples/users.conf.sample
Installing file configs/samples/voicemail.conf.sample
Installing file configs/samples/vpb.conf.sample
Installing file configs/samples/xmpp.conf.sample
Updating asterisk.conf
/usr/bin/install -c -d "/var/spool/asterisk/voicemail/default/1234/INBOX"
build_tools/make_sample voicemail "//var/lib/asterisk" "//var/spool/asterisk"
Installing file phoneprov/000000000000.cfg
Installing file phoneprov/000000000000-directory.xml
Installing file phoneprov/000000000000-phone.cfg
Installing file phoneprov/polycom_line.xml
Installing file phoneprov/polycom.xml
Installing file phoneprov/snom-mac.xml
[root@voip asterisk-16.6.1]# make config
[root@voip asterisk-16.6.1]# ldconfig
[root@voip asterisk-16.6.1]#
```



Al ejecutar el comando **asterisk -r** deberíamos acceder al panel de administración de asterisk

root@voip:/usr/src/asterisk-16.6.1]

```
[root@voip asterisk-16.6.1]# systemctl start asterisk
[root@voip asterisk-16.6.1]# asterisk -vvvvvv
Asterisk 16.6.1, Copyright (C) 1999 - 2018, Digium, Inc. and others.
Created by Mark Spencer <markster@digium.com>
Asterisk comes with ABSOLUTELY NO WARRANTY; type 'core 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 'core show license' for details.
```

```
Connected to Asterisk 16.6.1 currently running on voip (pid = 30174)
voip*CLI>
```

12:28 PM  
11/12/2019

12:28 PM



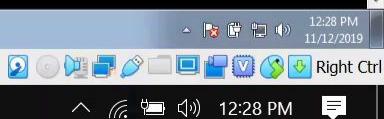
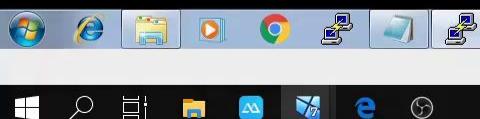
# Configurando asterisk

En el archivo **/etc/asterisk/sip.conf** generamos dos nuevos clientes de prueba, para esto generamos una plantilla con la información general de los clientes, y utilizamos dicha plantilla para crear ambos clientes donde solamente agregamos su contraseña

File Machine View Input Devices Help

root@voip:/usr/src/asterisk-16.6.1#

```
[root@voip asterisk-16.6.1]# vim /etc/asterisk/s
say.conf      sip.conf      sip_notify.conf  skinny.conf    sla.conf       smdi.conf      sorcery.conf   ss7.timers     stasis.conf    statsd.conf
[root@voip asterisk-16.6.1]# vim /etc/asterisk/sip.conf
```



12:28 PM  
11/12/2019

Right Ctrl

root@voip:/usr/src/asterisk-16.6.1

```
; we can via the CIDR notation for source masks
; IPv6 ACLs can be specified if desired. IPv6 ACLs
; apply only to IPv6 addresses, and IPv4 ACLs apply
; only to IPv4 addresses.
; Use names ACLs defined in acl.conf

[client1]
type=friend
secret=1234
qualify=100
host=dynamic
directmedia=no

; qualify peer is no more than 200ms away
; This device registers with us
; Session by default tries to redirected the
; RTP media address (source) to go directly from
; the caller to the callee. Some devices do not
; support this (especially if one of them is
; behind a NAT).
; If address to use until registration
; Maximize to use when calling this device before registration
; Normally you do NOT need to set this parameter
; Channel variable to be set for all calls from us to this Device
; Channel variable to be set for all calls from us to this Device
; cause the given audio file to
; be played upon completion of
; an attempted transfer to the
; target of the transfer.

[pcap4-wxexxx]
type=friend
secret=1234
host=dynamic
rtcp=0;compensate=0;recvonly
; compensate for pre-1.4 H245 transmission from another Asterisk machine.
; You must have this turned on or GOMT reception will work improperly.
; Use the source IP address of RTP as the destination IP address for H245 packets
; if the port option is enabled. If a single RTP packet is received Asterisk will know the
; external IP address of the remote device. If port forwarding is done at the client side
; then H245 will flow to the remote device.

[general]
transport=udp

[template] (!)
type=friend
host=dynamic
context=from-internal
disallow=all
allow=ulaw

[client1](template)
secret=1234
~
```

-- INSERT --



1634,12 12:31 PM  
11/12/2019



12:31 PM Right Ctrl

Luego en el archivo **/etc/asterisk/pjsip.conf** establecemos nuevamente las contraseñas de ambos clientes y los métodos de autenticación

File Machine View Input Devices Help

root@voip:/usr/src/asterisk-16.6.1]

```
[root@voip asterisk-16.6.1]# vim /etc/asterisk/s
say.conf      sip.conf      sip_notify.conf  skinny.conf    sla.conf       smdi.conf      sorcery.conf   ss7.timers     stasis.conf    statsd.conf
[root@voip asterisk-16.6.1]# vim /etc/asterisk/sip.conf
[root@voip asterisk-16.6.1]# vim /etc/asterisk/pjip.conf
```



12:32 PM  
11/12/2019

Right Ctrl

root@voip:/usr/src/asterisk-16.6.1

```
devicestate_publist=          ; Optional name of a publish item that can be used  
                             ; to publish a req.  
  
mailboxstate_publist=         ; Optional name of a publish item that can be used  
                             ; to publish a Req.  
  
device_state=0                ; Whether we should permit incoming device state  
                             ; events.  
  
device_state_filter=          ; Optional regular expression used to filter what  
                             ; devices we accept events for.  
  
mailbox_starevents=          ; Whether we should permit incoming mailbox state  
                             ; events.  
  
mailbox_store_filter=         ; Optional regular expression used to filter what  
                             ; mailboxes we accept events for.  
  
[transport-udp]  
type=transport  
protocol=udp  
bind=0.0.0.0  
  
[endpoint_internal]()  
type=endpoint  
context=from-internal  
disallow=all  
allow=claw  
  
[auth_userpass]()  
type=auth  
auth_type=userpass  
  
[aor_dynamic]()  
type=aor  
max_contacts=1  
  
[client1](endpoint_internal)  
auth=client1  
aor=client1  
[client1](auth_userpass)  
password=1234  
username=client1  
[client1](aor_dynamic)  
  
[client2](endpoint_internal)  
auth=client2  
aor=client2  
[client2](auth_userpass)  
password=1234  
username=client2  
[client2](aor_dynamic)
```



1406,15 Bot

12:34 PM  
11/12/2019

12:34 PM



En el archivo **/etc/asterisk/extensions.conf** colocamos las extensiones que utilizan cada uno de nuestros clientes, con el nivel de prioridad y la acción que se realizará al llamar a esa extensión

```
[root@voip /usr/src/asterisk-16.6.1]# vim /etc/asterisk/s  
say.conf          sip.conf        sip_notify.conf  skinny.conf      sla.conf           smdi.conf       sorcery.conf    ss7.timers      stasis.conf      statsd.conf  
[root@voip asterisk-16.6.1]# vim /etc/asterisk/sip.conf  
[root@voip asterisk-16.6.1]# vim /etc/asterisk/pjsip.conf  
[root@voip asterisk-16.6.1]# vim /etc/asterisk/extensions.conf
```



```
root@voip1:~
```

```
;-----[EXTEN]-----
```

```
; called by "lesson01.conf" <000748111>
```

```
;-----[SETVAR]-----
```

```
;-----[TIMEZONE]-----
```

```
; "timezone" isn't a 'reserved' name in any way, and other places where
```

```
; the timezone is significant (e.g. calls to "SayUnixTime()", eval will
```

```
; require modification as well). Note that voicemail.conf already has
```

```
; a mechanism for timezone.
```

```
;-----[TIME]-----
```

```
[time]
```

```
exten => _X.,30000(time),NoOp(Time: ${EXTEN} ${timezone})
```

```
exten => _X.,n,Wait(0.25)
```

```
exten => _X.,n,Answer()
```

```
; the amount of delay is set for English; you may need to adjust this time
```

```
; for other languages if there's a pause before the synchronising beep.
```

```
exten => _X.,n,Set(FUTURETIME=${T(EPOCH) + 12})
```

```
exten => _X.,n,SayUnixTime(${FUTURETIME}),Zulu,HNS
```

```
exten => _X.,n,SayPhonetic(z)
```

```
; use the timezone associated with the extension (ipb only), or system-wide
```

```
; default if one hasn't been set.
```

```
exten => _X.,n,SayUnixTime(${FUTURETIME}),${timezone},HNS
```

```
exten => _X.,n,Playback(spy-local)
```

```
exten => _X.,n,WaitUntil(${FUTURETIME})
```

```
exten => _X.,n,Playback(beep)
```

```
exten => _X.,n,Return()
```

```
;-----[ANI]-----
```

```
[ani]
```

```
exten => _X.,4000(ani),NoOp(ANI: ${EXTEN})
```

```
exten => _X.,n,Wait(0.25)
```

```
exten => _X.,n,Answer()
```

```
exten => _X.,n,Playback(vm-from)
```

```
exten => _X.,n,SayDigits(${CALLERID(ani)})
```

```
exten => _X.,n,Wait(1.25)
```

```
exten => _X.,n,SayDigits(${CALLERID(ani)}); a playback again in case of missed digit
```

```
exten => _X.,n,Return()
```

```
;-----[COMMANDS]-----
```

```
; For more information on applications, just type "core show applications" at your
```

```
; friendly Debian/Ubuntu prompt.
```

```
;-----[COMMAND]-----
```

```
; "core show application <command>" will show details of how you
```

```
; use that particular application in this file, the dial plan.
```

```
; "core show functions" will list all unique functions
```

```
; "core show function <function>" will show you more information about
```

```
; one function. Remember that function names are UPPERCASE.
```

```
;-----[INTERNAL]-----
```

```
[from-internal]
```

```
exten => 6001,1,Dial(SIP/client1,20)
```

```
exten => 6002,1,Dial(SIP/client2,20)
```



Para aplicar los cambios reiniciamos el servicio asterisk con **systemctl restart asterisk** y en el panel de administración de asterisk ejecutamos **dialplan show [ nuestro contexto ]** para ver si las extensiones se asignaron correctamente

```
root@voip:~  
# login as: root  
# root@192.168.1.12's password:  
Last login: Tue Nov 12 11:05:26 2019 from 192.168.1.24  
[root@voip ~]# vim /etc/asound.conf asterisk/  
[root@voip ~]# vim /etc/asterisk/extensions.conf  
[root@voip ~]# vim /etc/asterisk/extensions.conf  
[root@voip ~]# systemctl restart asterisk  
[root@voip ~]#
```



root@voip:~

```
[ Context 'ael-trunklocal' created by 'pbx_ael' ]
'_9NXXXXXX' => 1. Dial(${OUTBOUND-TRUNK}/${EXTEN:${OUTBOUND-TRUNKMSD}}) [pbx_ael]

[ Context 'ael-trunkld' created by 'pbx_ael' ]
'_91NXXNXXXXX' => 1. Gosub(ael-dundi-e164,~~s~~,1(${EXTEN:1})) [pbx_ael]
                    2. Dial(${OUTBOUND-TRUNK}/${EXTEN:${OUTBOUND-TRUNKMSD}}) [pbx_ael]
Include => 'ael-dundi-e164-lookup' [pbx_ael]

[ Context 'ael-trunkint' created by 'pbx_ael' ]
'_9011.' => 1. Gosub(ael-dundi-e164,~~s~~,1(${EXTEN:4})) [pbx_ael]
                    2. Dial(${OUTBOUND-TRUNK}/${EXTEN:${OUTBOUND-TRUNKMSD}}) [pbx_ael]
Include => 'ael-dundi-e164-lookup' [pbx_ael]

[ Context 'ael-iaxprovider' created by 'pbx_ael' ]

[ Context 'ael-iaxtel1700' created by 'pbx_ael' ]
'_91700XXXXXX' => 1. Dial(IAX2/${IAXINFO-AEL}@iaxtel.com/${EXTEN:1}@iaxtel) [pbx_ael]

[ Context 'ael-dundi-e164' created by 'pbx_ael' ]
'~~s~~' => 1. MSet(LOCAL(exten)=${ARG1}) [pbx_ael]
                    2. Goto($exten,1) [pbx_ael]
                    3. Return() [pbx_ael]
Include => 'ael-builtin-h-bubble' [pbx_ael]

[ Context 'ael-dundi-e164-lookup' created by 'pbx_ael' ]
Include => 'ael-dundi-e164-local' [pbx_ael]
Include => 'ael-dundi-e164-switch' [pbx_ael]

[ Context 'ael-dundi-e164-switch' created by 'pbx_ael' ]
Alt. Switch => 'DUNDI/e164' [pbx_ael]

[ Context 'ael-dundi-e164-local' created by 'pbx_ael' ]
Include => 'ael-dundi-e164-canonical' [pbx_ael]
Include => 'ael-dundi-e164-customers' [pbx_ael]
Include => 'ael-dundi-e164-via-pstn' [pbx_ael]

[ Context 'ael-dundi-e164-via-pstn' created by 'pbx_ael' ]

[ Context 'ael-dundi-e164-customers' created by 'pbx_ael' ]

[ Context 'ael-dundi-e164-canonical' created by 'pbx_ael' ]

-= 105 extensions (233 priorities) in 51 contexts. ==
voip*CLI> dialplan show from-intenal
There is no existence of 'from-intenal' context
Command 'dialplan show from-intenal' failed.
voip*CLI> dialplan show from-internal
[ Context 'from-internal' created by 'pbx_config' ]
'6001' => 1. Dial(SIP/client1,20) [extensions.conf:864]
'6002' => 1. Dial(SIP/client2,20) [extensions.conf:865]

-= 2 extensions (2 priorities) in 1 context. ==
voip*CLI>
```



# Configurando los clientes en la red local

En nuestro cliente procedemos a descargar cualquier softphone, para este ejemplo usaremos zoiper, es posible descargar su versión gratuita desde la página oficial



BRANDING SDK DOWNLOAD PRODUCTS HELP CONTACT

# The all NEW Zoiper 5



BUY

DOWNLOAD



HTTP

Call Center

Get Started

Develop

Buy



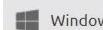
BRANDING SDK DOWNLOAD PRODUCTS HELP CONTACT

## Latest versions

## Zoiper 5

free VoIP softphone for non-commercial use

## Desktop

[Download](#)[Download](#)[Download](#)

## Mobile

[Download](#)[Download](#)

To use Zoiper you will need:

The brand new Zoiper 5 is out NOW!

[Buy](#)12:40 PM  
11/12/2019

12:40 PM



Una vez dentro de la aplicación colocamos nuestro cliente de la siguiente forma **[ cliente ]@[ ip del servidor ]** si queremos también podemos especificar el puerto ( El puerto por defecto es el 5060 ), en el siguiente apartado colocamos la contraseña. Luego si la dirección del servidor es correcta damos a siguiente



Recycle Bin



Putty (1)



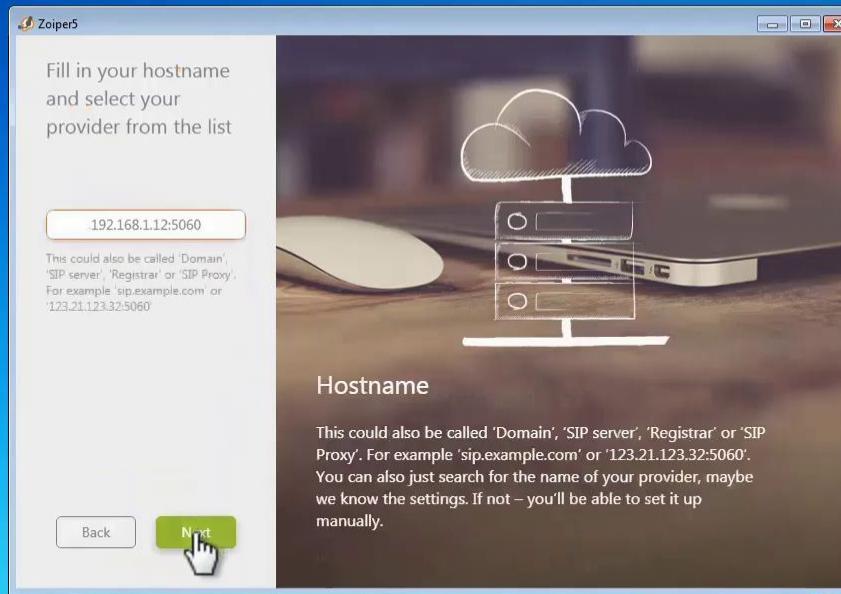
Google

Chrome



all





En este caso no se ha configurado la autenticación adicional por lo tanto omitimos, al final se debe encontrar un SIP de tipo UDP que es el que habíamos configurado antes



Recycle Bin



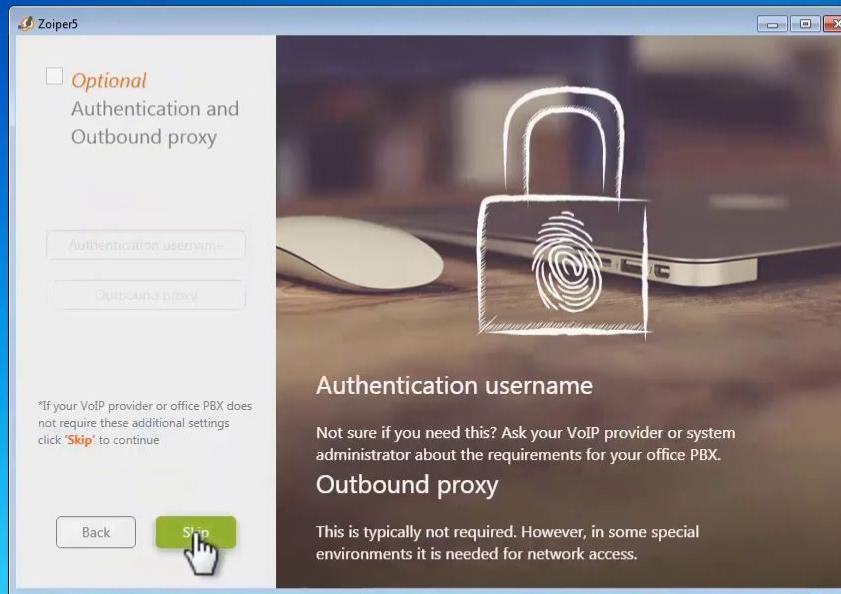
putty (1)



Google Chrome



all





Recycle Bin

Zoiper5

Please wait, we are testing possible configurations

- SIP TLS PRO
- SIP TCP Not found
- SIP UDP Found
- IAX UDP



Success!

We have found some transport type(s) that are available for your configuration.  
The default ones marked with 'Recommended' are priority ordered based on the stability and security of said protocols.  
However, you are free to choose manually one of the options

Back

Next



Recycle Bin

Zoiper5

Please wait, we are testing possible configurations

- SIP TLS PRO
- SIP TCP Not found
- SIP UDP Found
- IAX UDP

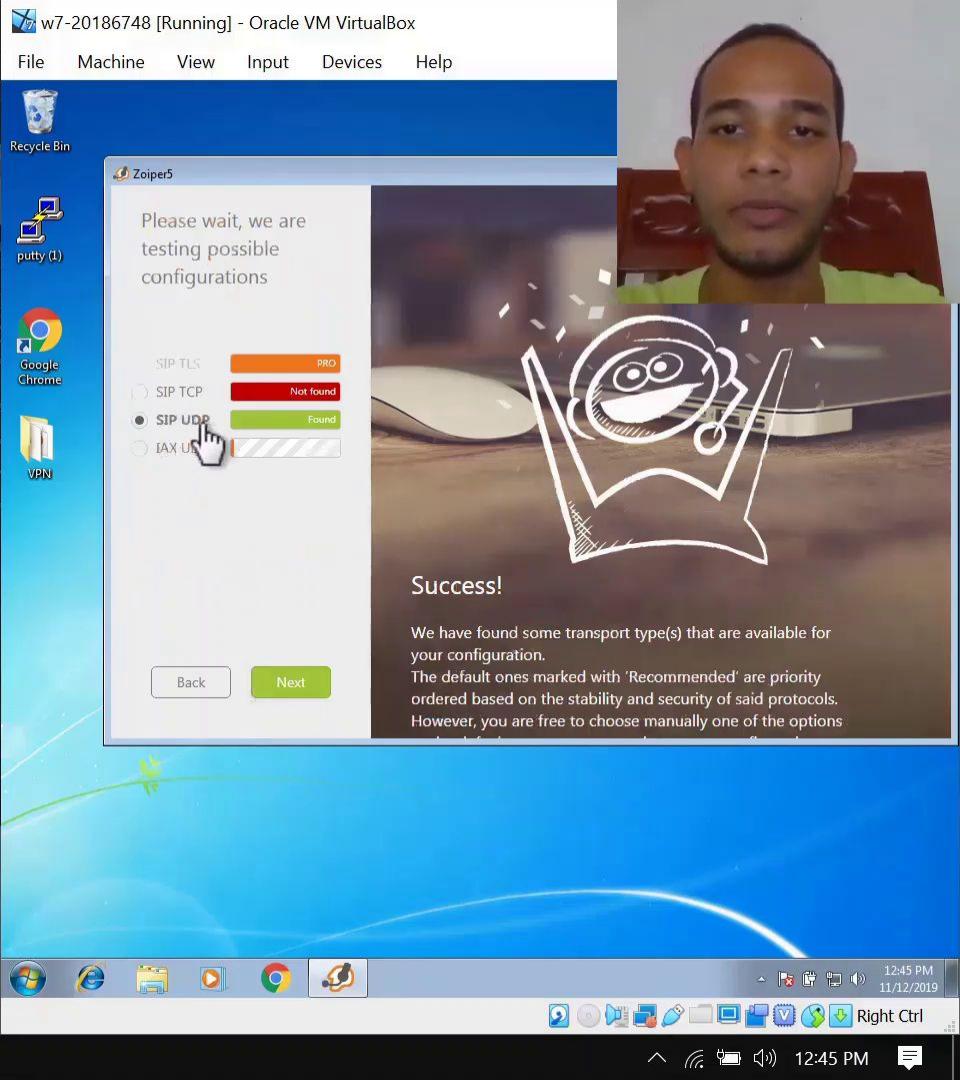


Success!

We have found some transport type(s) that are available for your configuration.  
The default ones marked with 'Recommended' are priority ordered based on the stability and security of said protocols.  
However, you are free to choose manually one of the options

Back

Next



Podemos probar marcando a la otra extensión desde cualquier cliente



Recycle Bin



The image consists of two side-by-side screenshots of a Windows desktop environment, likely running in Oracle VM VirtualBox. Both screenshots show the same software interface, but with different user data.

**Left Screenshot:**

- Title Bar:** w7-20186748 (2) [Running] - Oracle VM VirtualBox
- Menu Bar:** File Machine View Input Devices Help
- Zoiper 5 Interface:**
  - Calls Tab:** Shows a single active call to "client1@192.168.1.12:5060".
    - Call ID: 6002
    - Duration: 00:09
    - Status: Calling
  - Contact List:** Shows "client1" and "client2" under "All".
  - Buttons:** Mute, Speaker, Keypad, Statistics, Record, Video, Hold, Transfer, Add call.
  - Bottom Buttons:** Call, End, Hang Up.
- Taskbar:** Shows standard Windows icons (File Explorer, Internet Explorer, etc.) and the Zoiper 5 icon.
- System Tray:** Shows the date and time (12:46 PM 11/12/2019).

**Right Screenshot:**

- Title Bar:** w7-20186748 [Running] - Oracle VM VirtualBox
- Menu Bar:** File Machine View Input Devices Help
- Zoiper 5 Interface:**
  - Calls Tab:** Shows an incoming call from "client2@192.168.1.12:5060".
    - Call ID: 6002
    - Duration: 00:08
    - Status: Incoming
  - Contact List:** Shows "client1" and "client2" under "All".
  - Buttons:** Mute, Speaker, Keypad, Statistics, Record, Video, Hold, Transfer, Add call.
  - Bottom Buttons:** Call, End, Hang Up.
- Taskbar:** Shows standard Windows icons (File Explorer, Internet Explorer, etc.) and the Zoiper 5 icon.
- System Tray:** Shows the date and time (12:46 PM 11/12/2019).

A large portrait of a man's face is visible in the top right corner of the right screenshot, suggesting a video component or a watermark.

w7-20186748 (2) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Recycle Bin

Zoiper5

client1@192.168.1.12:5060

Find a contact...

Contacts Recent

All Online Favorites +

Click here to add a new contact

6002

Declined (code: 603)

Call to Phone (6002), rejected.  
Busy Here (code: 486)

Call to Phone (6002), answered.

Call to Phone (6002), answered.

Call to Phone (6002), answered.

Call to Phone (6002), rejected.  
Service Unavailable (code: 503)

Call to Phone (6002), rejected.  
Service Unavailable (code: 503)

Call to Phone (6002), answered.

CHAT FEATURE IS UNAVAILABLE  
This functionality and many more useful features are available with Zoiper PRO

Learn more Upgrade now

w7-20186748 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Recycle Bin

putty (1)

Google Chrome

VPN

Zoiper5

client2@192.168.1.12:5060

6001

Call from Phone (client1), answered.

November 12, 2019

12:45 PM

Dial

1 2 3  
ABC DEF  
4 5 6  
GHI JKL MNO  
7 8 9  
PQRS TUV WXYZ  
\* 0 #  
No c  
W

CHAT FEATURE IS UNAVAILABLE  
This functionality and many more useful features are available with Zoiper PRO

Learn more Upgrade now

12:46 PM  
11/12/2019

Right Ctrl

12:46 PM  
11/12/2019

Right Ctrl

The image displays two side-by-side screenshots of a Zoiper5 application window running on a Windows operating system. Both screenshots show an incoming call from a client.

**Left Screenshot:**

- Title Bar:** w7-20186748 (2) [Running] - Oracle VM VirtualBox
- Toolbar:** File, Machine, View, Input, Devices, Help
- Recycle Bin:** icon
- Zoiper5 Window:**
  - Header:** Zoiper5, client1@192.168.1.12:5060, Find a contact...
  - Buttons:** Mute, Speaker, Keypad, Statistics, Record, Video, Hold, Transfer, Add call
  - Section:** Calls
  - Contact List:** client2 (client2@192.168.1.12:5060, DNID: client1)
  - Text:** Click here to add a new contact
  - Bottom Buttons:** Green (Accept), Red (Decline), Orange (Ignore)
- Taskbar:** Shows various pinned icons including File Explorer, Edge, Google Chrome, and others. The system tray shows the date and time as 12:46 PM 11/12/2019.

**Right Screenshot:**

- Title Bar:** w7-20186748 [Running] - Oracle VM VirtualBox
- Toolbar:** File, Machine, View, Input, Devices, Help
- Recycle Bin:** icon
- Zoiper5 Window:**
  - Header:** Zoiper5, client2@192.168.1.12:5060, Find a contact...
  - Buttons:** Mute, Speaker, Keypad, Statistics
  - Section:** Calls
  - Contact List:** 6001 (client2@192.168.1.12:5060, 00:01, Calling)
  - Text:** Click here to add a new contact
  - Bottom Buttons:** Green (Accept), Red (Decline)
- Image:** A large portrait of a man's face is displayed on the right side of the screen.
- Taskbar:** Shows various pinned icons including File Explorer, Edge, Google Chrome, and others. The system tray shows the date and time as 12:46 PM 11/12/2019.

# Cliente móvil

En nuestro dispositivo móvil descargamos zoiper desde la tienda de aplicaciones



Zoiper5

client2@192.168.1.12:5060

Find a contact ...

6001

Call to Phone (6001), answered. 11:02 PM

Call to Phone (6001), rejected. Service Unavailable (code: 503) 11:07 PM

Click here to add a new contact

All Online Favorites +

November 11, 2019

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), rejected. Busy Here (code: 486) 10:27 PM

November 12, 2019

Call to Phone (6001), answered. 12:46 PM

CHAT FEATURE IS UNAVAILABLE

This functionality and many more useful features are available with Zoiper PRO

Learn more Upgrade now



File

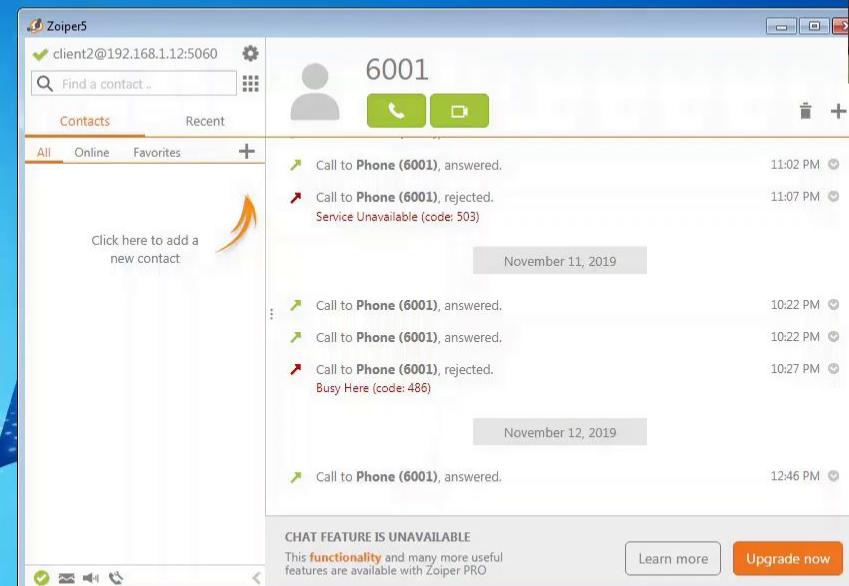
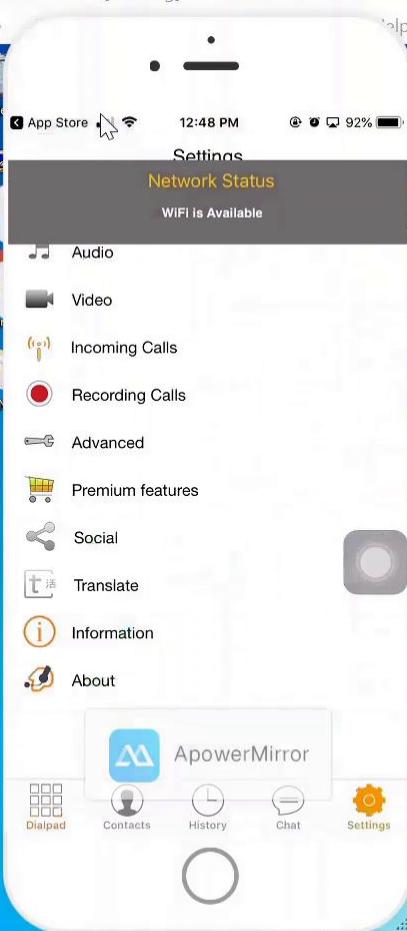
Help

The image shows a Windows desktop environment with several open windows:

- Zoiper5 Application:** A VoIP client window titled "Zoiper5" showing a log of calls to "6001". It includes sections for "Contacts", "Recent", and "All" logs. The logs show various call attempts and rejections.
- ApowerMirror Application:** A floating window titled "ApowerMirror" displaying a preview of a mobile device screen. The device screen shows a Google Play Store listing for an app called "Search" with a rating of 4.5 stars, 19 ratings, and the number 145. The listing includes a "What's New" section and a "Preview" section showing sample messages.
- System Tray:** Located at the bottom right, it displays the date and time (12:48 PM, 11/12/2019), battery level (92%), signal strength, and other system icons.

En la aplicación nos vamos a configuraciones e ingresamos en el apartado de cuentas

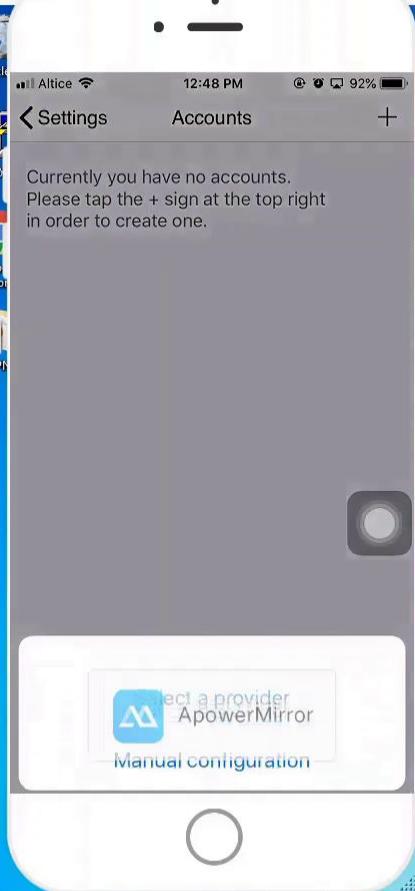
File



En el botón agregar establecemos la configuración de tipo manual

File

Help



**Zoiper5**

client2@192.168.1.12:5060

Find a contact...

Contacts Recent

All Online Favorites

Click here to add a new contact

6001

Call to Phone (6001), answered. 11:02 PM

Call to Phone (6001), rejected. Service Unavailable (code: 503) 11:07 PM

November 11, 2019

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), rejected. Busy Here (code: 486) 10:27 PM

November 12, 2019

Call to Phone (6001), answered. 12:46 PM

**CHAT FEATURE IS UNAVAILABLE**  
This **functionality** and many more useful features are available with Zoiper PRO

[Learn more](#) [Upgrade now](#)



Luego seleccionamos cuenta sip

File

Help



Altice

12:48 PM



92%

&lt; Back

Create account

## CHOOSE AN ACCOUNT TYPE

SIP account

IAX account

ApowerMirror

Zoiper5

client2@192.168.1.12:5060

Find a contact...

Contacts Recent

All Online Favorites +

Click here to add a new contact

6001

Call to Phone (6001), answered. 11:02 PM

Call to Phone (6001), rejected. Service Unavailable (code: 503) 11:07 PM

November 11, 2019

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), rejected. Busy Here (code: 486) 10:27 PM

November 12, 2019

Call to Phone (6001), answered. 12:46 PM

CHAT FEATURE IS UNAVAILABLE

This functionality and many more useful features are available with Zoiper PRO

Learn more Upgrade now



En esta parte colocamos la información de la cuenta, y la dirección ip del servidor asterisk. Si toda la información proporcionada fue correcta nuestro cliente debe de haber establecido conexión con el servidor

File

Help



Altice

12:49 PM



92%



Accounts

SIP Account



Registration Status: OK

Unregister

## SIP OPTIONS

Account name: client1

Domain: 192.168.1.12

User name: client1

Password: \*\*\*\*

Caller ID: 6001



## ADVANCED SETTINGS

Auth Username: [auth username]

Use Outbound Proxy



ApowerMirror

outbound proxy



Zoiper5

client2@192.168.1.12:5060

Find a contact...

Contacts Recent

All Online Favorites

Click here to add a new contact

6001

Call to Phone (6001), answered. 11:02 PM

Call to Phone (6001), rejected. Service Unavailable (code: 503) 11:07 PM

November 11, 2019

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), rejected. Busy Here (code: 486) 10:27 PM

November 12, 2019

Call to Phone (6001), answered. 12:46 PM

CHAT FEATURE IS UNAVAILABLE

This functionality and many more useful features are available with Zoiper PRO

12:49 PM  
11/12/2019

12:49 PM Right Ctrl

File

Help



Altice WiFi

12:49 PM

92%

Settings

Accounts



## SIP ACCOUNTS

client1

## TAX ACCOUNTS

Zoiper5

client2@192.168.1.12:5060

Find a contact...

Contacts Recent

All Online Favorites

Click here to add a new contact

6001

Call to Phone (6001), answered. 11:02 PM

Call to Phone (6001), rejected. Service Unavailable (code: 503) 11:07 PM

November 11, 2019

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), answered. 10:22 PM

Call to Phone (6001), rejected. Busy Here (code: 486) 10:27 PM

November 12, 2019

Call to Phone (6001), answered. 12:46 PM

CHAT FEATURE IS UNAVAILABLE

This functionality and many more useful features are available with Zoiper PRO

[Learn more](#) [Upgrade now](#)

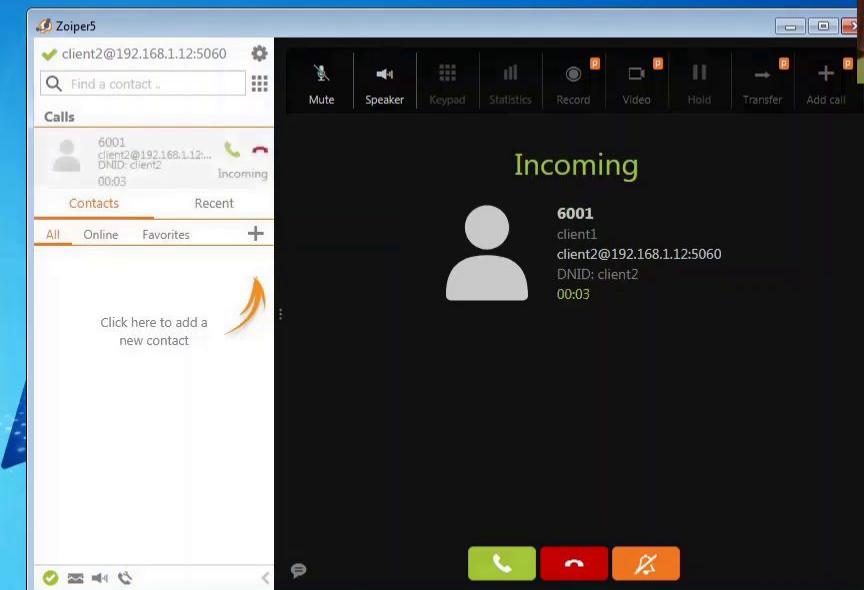
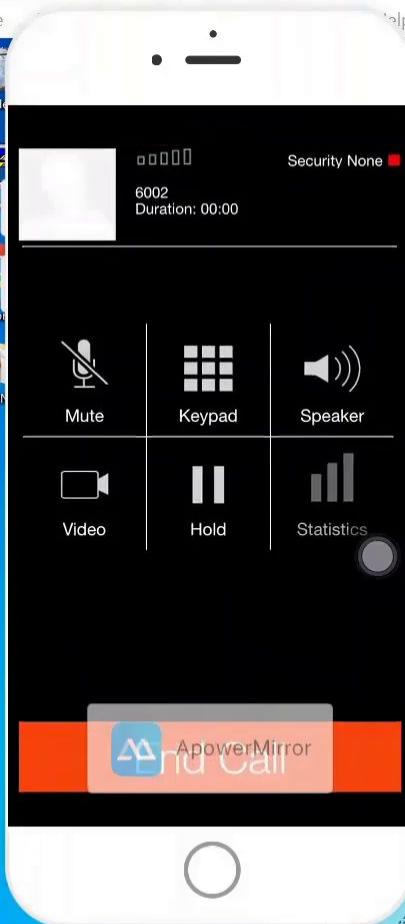


ApowerMirror

12:49 PM  
11/12/2019

Podemos probar realizando llamadas desde el dispositivo móvil

File



# Conexión desde internet

En esta parte nos dirigiremos al menú de configuración de nuestro router, donde daremos clic en configuración avanzada

Sagemcom

Status Basic Advanced Firewall Parental Control Wireless MTA Logout

## Status

### General

This page displays information on the current system software.

**Information**

Standard Specification Compliant	DOCSIS 3.0
Hardware Version	1.0
Software Version	TRICOM_2.12.0
Linux S/W Version	TRICOM_2.12.0-1.2.6.30-1.0.10mp
Cable Modem MAC Address	7c:b7:33:bd:47:90
Cable Modem Serial Number	NQ1530622001852

**Status**

System Up Time	0 days 11h:31m:54s
Network Access	Allowed



En configuraciones avanzada, vamos a forwarding

InPrivate Residential Gateway Co What Is My Public IP Address? + ▾

192.168.1.1/RgOptions.asp

CompTIA Linux+ (Exa)

Sagemcom Advanced Firewall Parental Control Wireless MTA Logout

## Advanced

### Options

This page allows configuration of advanced features of your Residential Gateway.

WAN Blocking	<input checked="" type="checkbox"/> Enable
Ipsec PassThrough	<input checked="" type="checkbox"/> Enable
PPTP PassThrough	<input checked="" type="checkbox"/> Enable
Remote Config Management	<input type="checkbox"/> Enable
UPnP	<input checked="" type="checkbox"/> Enable

Apply

PassThrough Mac Addresses (example: 01:23:45:67:89:AB)

Add MAC Address

Addresses entered: 0/32

Remove MAC Address Clear All

©2010-2011 Sagemcom Corporation. All rights reserved



En esta parte agregamos una nueva regla para enviar todo el tráfico externo que pase por el puerto 5060, hacia el puerto 5060 de nuestro servidor asterisk

InPrivate Residential Gateway Co What Is My Public IP Address +

192.168.1.1/RgForwarding.asp

CompTIA Linux+ (Exa)

## Sagemcom

**Advanced** Firewall Parental Control Wireless MTA Logout

### Advanced

#### Forwarding

This allows for incoming requests on specific port numbers to reach web servers, FTP servers, mail servers, etc. so they can be accessible from the public internet. A table of commonly used port numbers is also provided.

Local IP: 192.168.1.12  
Local Start Port: 5060  
Local End Port: 5060  
External IP: 0.0.0.0  
External Start Port: 5060  
External End Port: 5060  
Protocol: BOTH  
Description: Asterisk  
Enabled: On

Local	External								
IP Address	Start Port	End Port	IP Address	Start Port	End Port	Protocol	Description	Enabled	<input type="button" value="Remove All"/>

http://192.168.1.1/goform/RgForwarding  
©2010-2011 Sagemcom Corporation. All rights reserved.



InPrivate Residential Gateway Co X What Is My Public IP Address: + ▾

192.168.1.1/RgForwarding.asp

CompTIA Linux+ (Exa)

Sagemcom Advanced Firewall Parental Control Wireless MTA Logout

## Advanced

### Forwarding

This allows for incoming requests on specific port numbers to reach web servers, FTP servers, mail servers, etc. so they can be accessible from the public internet. A table of commonly used port numbers is also provided.

Create IPv4

Local		External							
IP Address	Start Port	End Port	IP Address	Start Port	End Port	Protocol	Description	Enabled	
192.168.1.12	5060	5060	0.0.0.0	5060	5060	BOTH	Asterisk	Yes	<input type="button" value="Edit"/> <input type="button" value="Remove"/>

Options IP Filtering MAC Filtering Port Filtering Forwarding Port Triggers DMZ Host



Para probar que se pueden realizar llamadas a través de internet, en nuestro cliente móvil colocamos nuestra ip pública donde se encontraba la ip local del servidor

InPrivate Residential Gateway Config What Is My Public IP Ad +

whatismyip.com/what-is-my-public-ip-address/

Altice 12:53 PM 67% Accounts SIP Account

Registration Status: OK

Unregister Ask A Question

SIP OPTIONS

Account name: client1

Domain: 186.150.

User name: client1

Password: \*\*\*\*

Caller ID: 6001

ADVANCED SETTINGS

Auth Username: [auth username]

Use Outbound Proxy: ApowerMirror [outbound proxy]

Advertisements

berseguridad ante todo. Ver el video (2 min)

What Is My IP? > What Is My Public IP Address

Conozca en 5 minutos las grandes innovaciones de TI

Video serie: Nuevas Fronteras Ver ahora

CISCO

Your Public IPv4 Address Is: 186.150. [2]

Your Public IPv6 is: Not Detected

## What Is My Public IP Address?

Your public IP address is the IP address that is logged by various servers/devices when you connect to them through your internet connection. This is the same IP address that we show on our homepage. So why the secondary page? Well, not everyone speaks the language of IP addresses so we want to make it as simple as possible for everyone to find the information they need. Some even refer to this as their external IP address. Again, it's the same IP we show on our homepage just referred to as something different. Sort of like thingamajig. 😊

IP Address Lookup Is My IP Blacklisted?

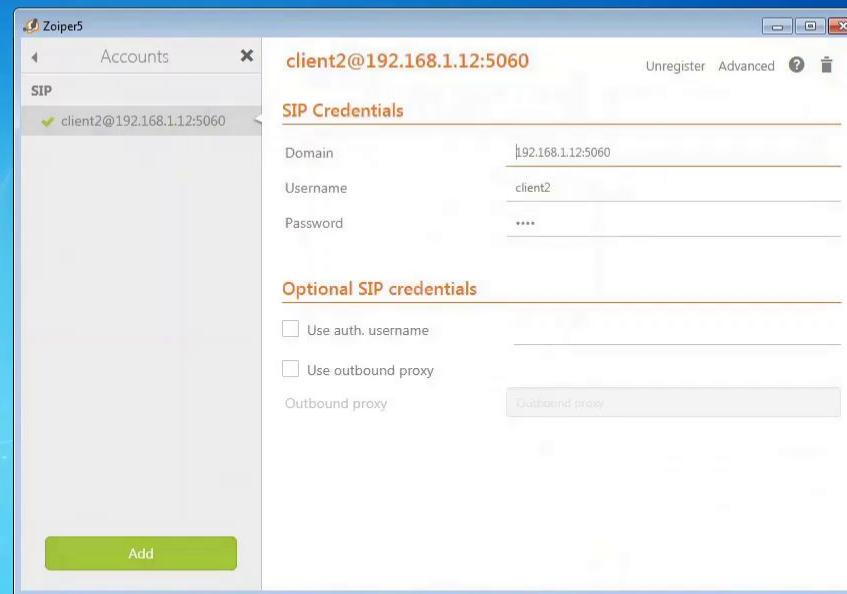


Our partners will collect data and use cookies for ad personalization and measurement. Learn how we and our ad partner Google, collect and use data. [Learn More](#)

[Click here to accept our terms](#)

File

Help



Al realizar una llamada al cliente 2, a pesar de estar conectados desde internet y no la red local directamente, este aún podrá recibir la llamada.

File

