

El control en las Comunicaciones

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- *En el mundo de la informática desde 1984*
- *Apoyando el software libre desde 1996*
- *Disfrutando de la VoIP y Asterisk desde 2004*
- *Cocreador de la comunidad Asterisk-ES*
- *Creador de sinologic.net*



- *Desde 2004 hablando de VoIP y Asterisk*
- *Más de 3500 visitas diarias*
- *Más de 2500 usuarios únicos*
- *Más de 2000 artículos*

...y todo gracias a tí...

Control de las comunicaciones

“Rama de la tecnología dedicada al diseño, desarrollo y mantenimiento de las aplicaciones encargadas de gestionar y monitorizar las comunicaciones.”

Configuración

Gestión

Monitorización

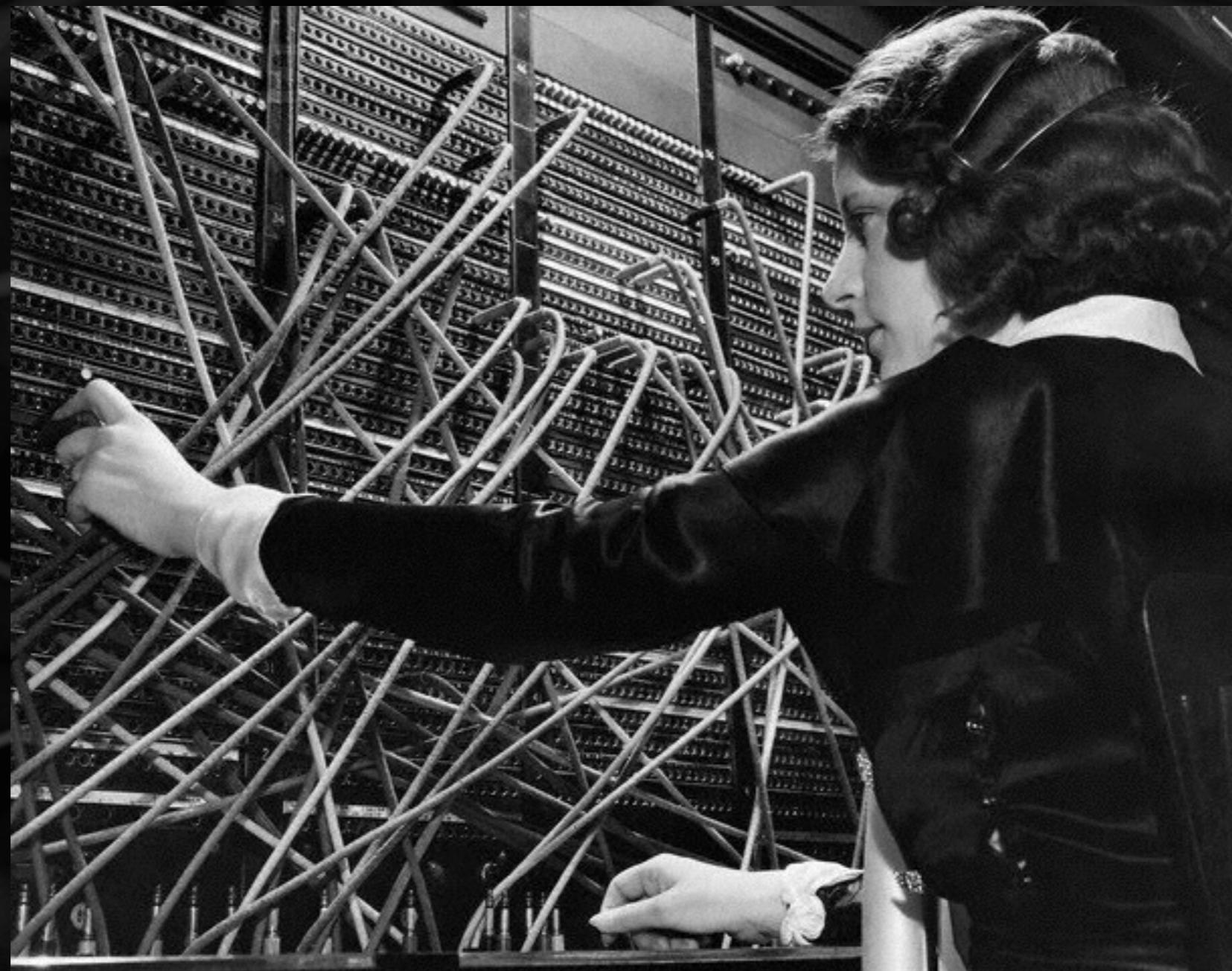
Seguridad

Configuración

¿Qué es el control de las comunicaciones?

*Vamos a ver cómo han evolucionado
los interfaces de configuración...*

Interfaces de gestión de comunicaciones



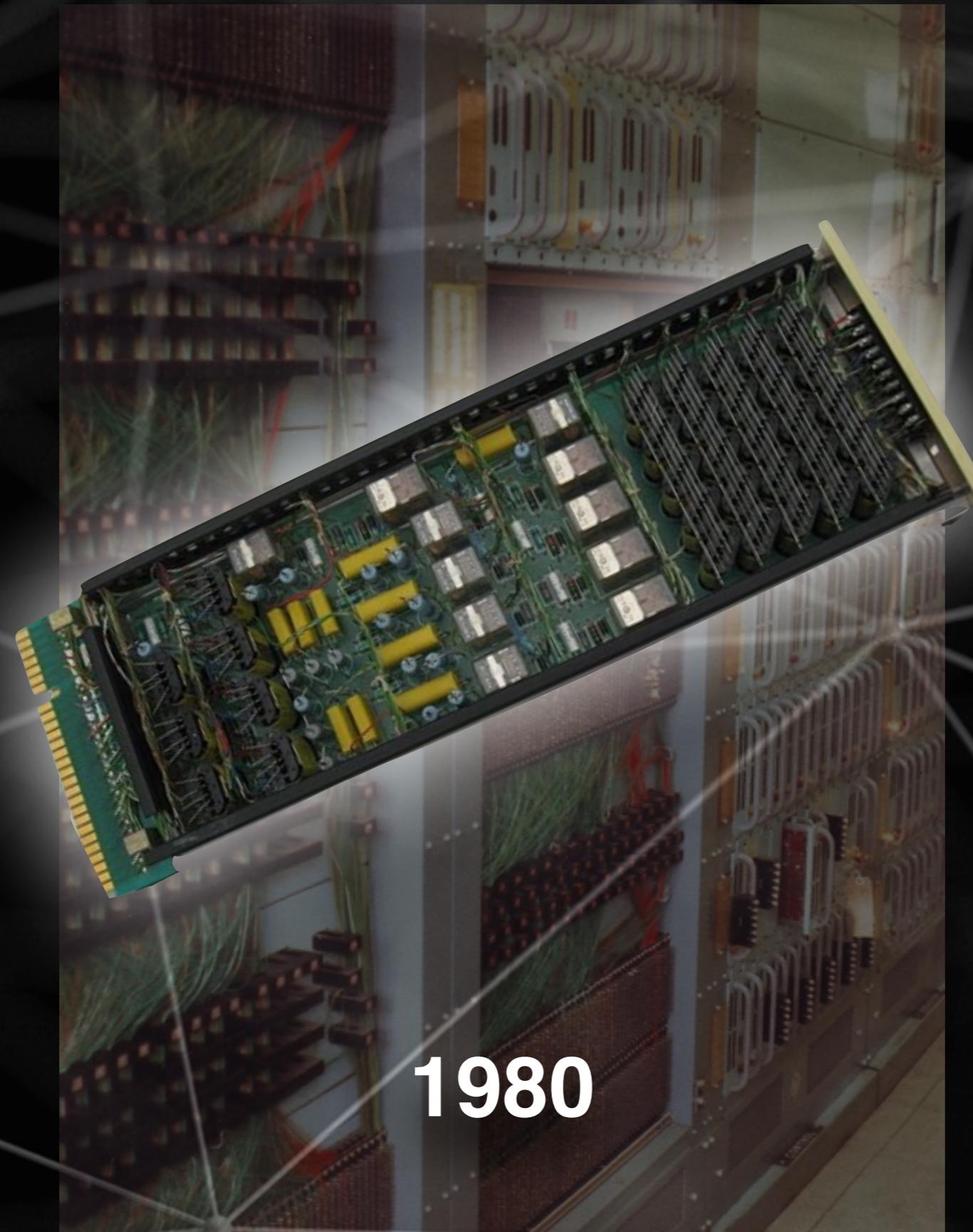
1900

Interfaces de gestión de comunicaciones



1970

Interfaces de gestión de comunicaciones



Interfaces de gestión de comunicaciones

Group Number: 1

Group N

Direct

Dial Acc

Queue Len

Service T

Extension: 2022
Type: 8434D
Port: 01A0423
Name: Ken CIS 2022

Group Type: isdn

STATION

Lock Messages? n
Security Code:
Coverage Path 1:
Coverage Path 2:
Hunt-to Station:

CDR Reports: n

*01

PRI/BRI

BCC: 0
TN: 1
COR: 1
COS: 1

TestCall

STATION OPTIONS

TRUNK PAR

Data Module? n
Speakerphone: 2-way
Display Language: english

Personalized Ringing Pattern: 1
Message Lamp Ext: 2022
Mute Button Enabled? y
Expansion Module? n

Supplie

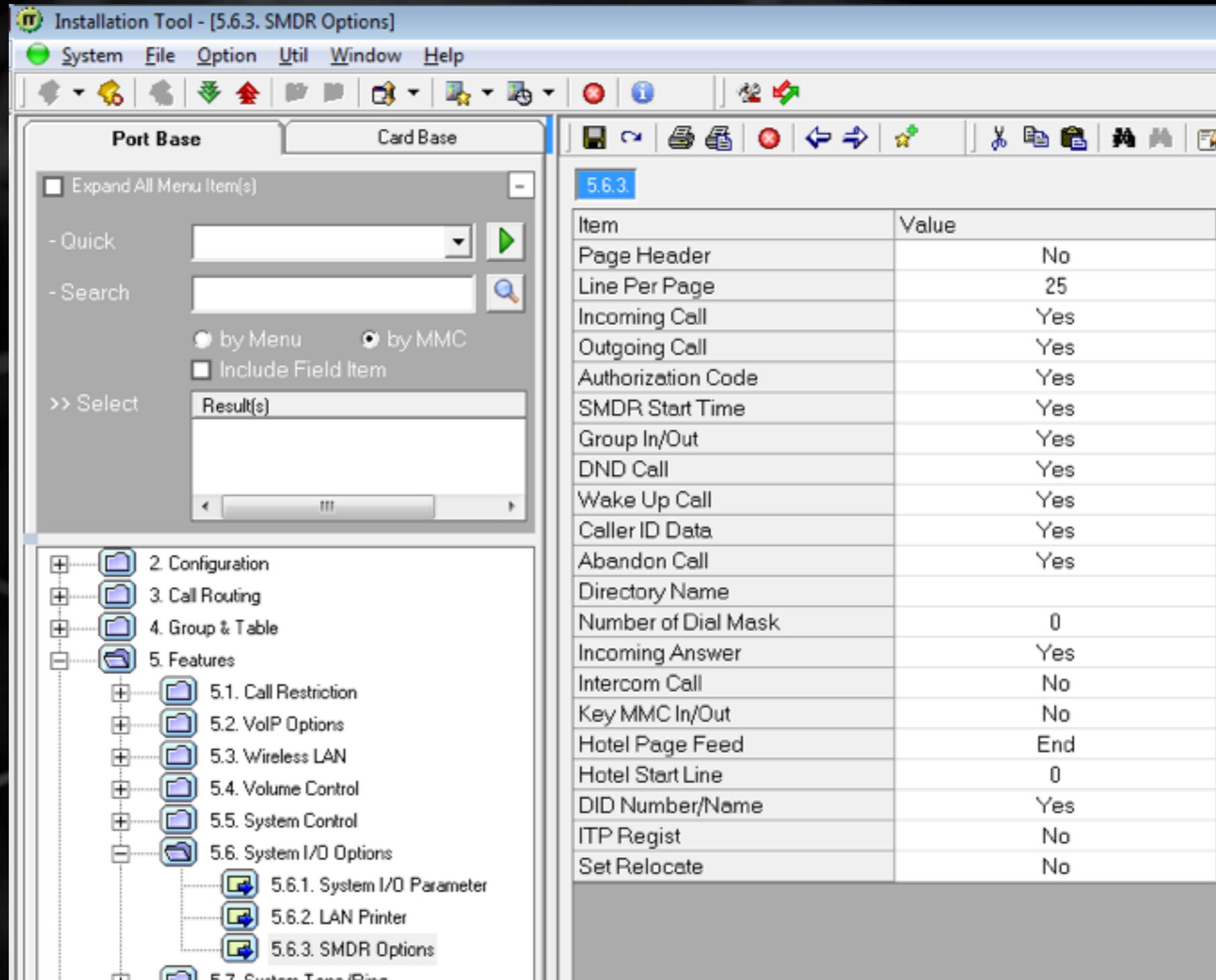
Calling N

Disconnect Supervision - In? y Out? y

Answer Supervision Timeout: 0

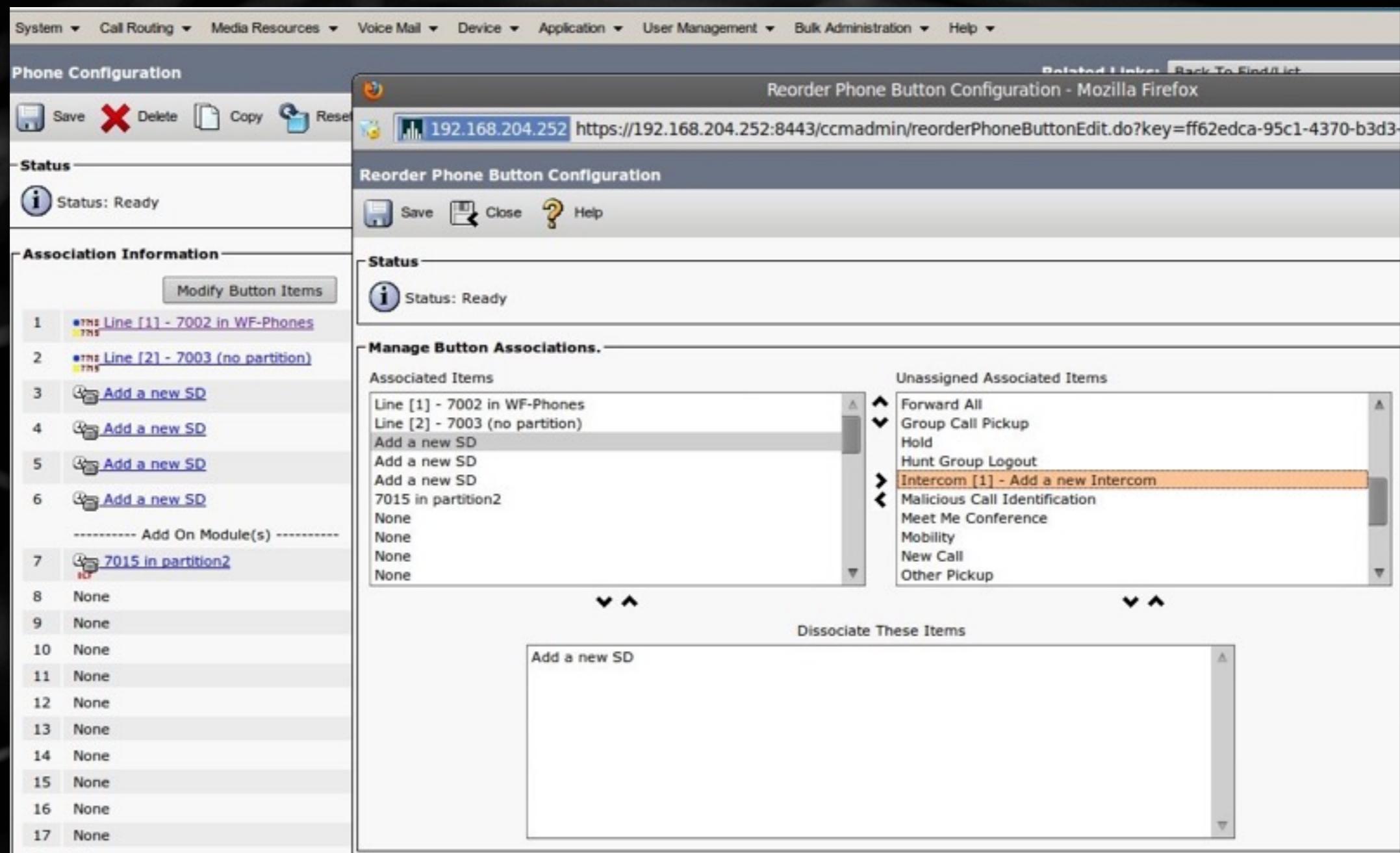
1990

Interfaces de gestión de comunicaciones



2000

Interfaces de gestión de comunicaciones



2005

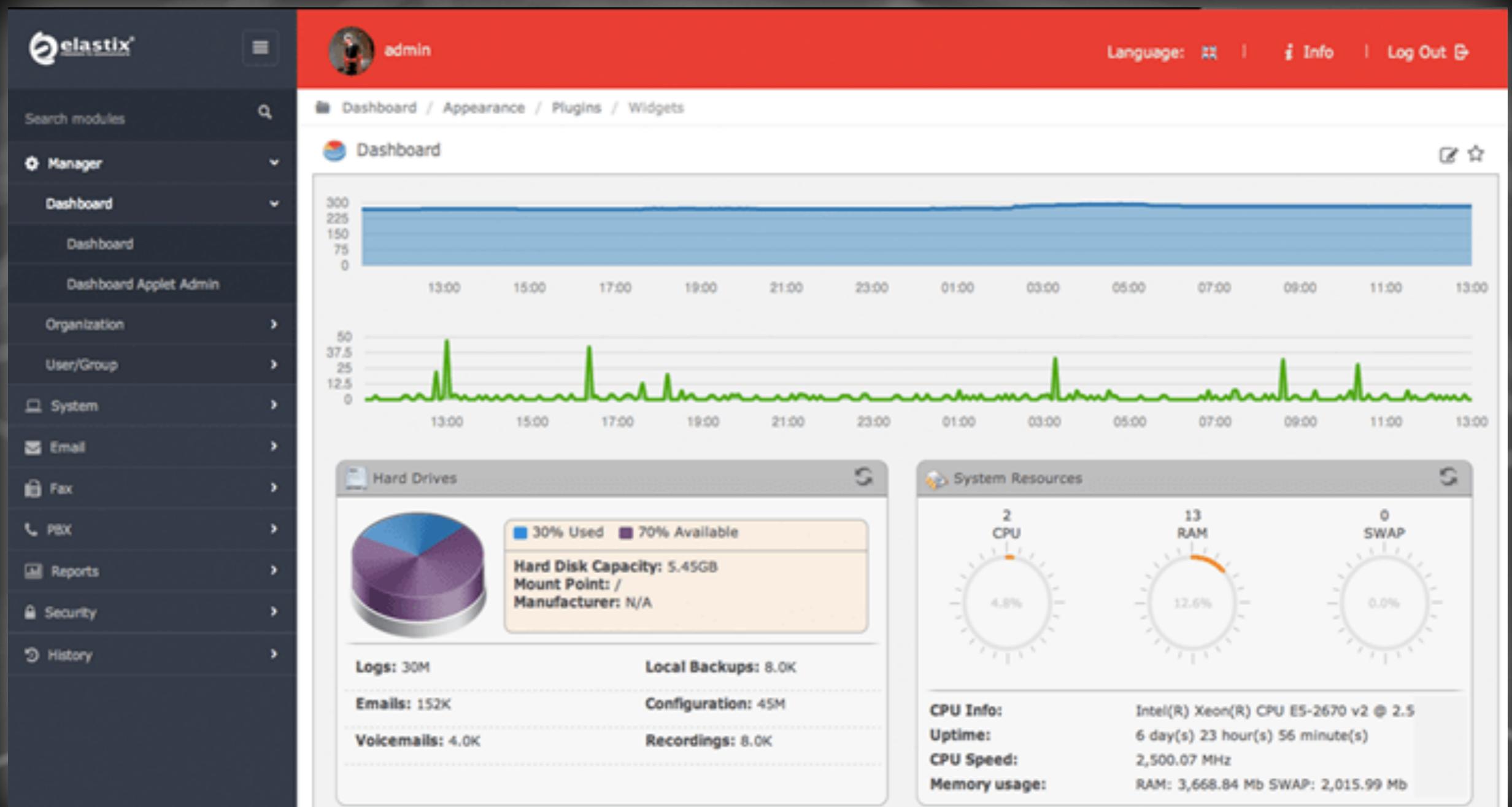
Interfaces de gestión de comunicaciones

The screenshot shows the digiumAsterisk web interface. On the left is a sidebar with various configuration links. The main area is titled "User Extensions on PBX" and contains a table listing user extensions. The table columns are: Extension, Full Name, Port, SIP, IAX, DialPlan, OutBound CID, Edit, and Delete.

Extension	Full Name	Port	SIP	IAX	DialPlan	OutBound CID	Edit	Delete
001	Group Member 1	--	Yes	Yes	Local	001	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
002	Group member 2	--	Yes	Yes	Local	002	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
003	Group Member 3	--	Yes	Yes	Local	003	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
021	Clark Kent	--	Yes	Yes	Local	021	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
022	Barak Obama	--	Yes	Yes	Local	022	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
023	Jim Douglas	--	Yes	Yes	Local	023	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
024	Henry Henderson	--	Yes	Yes	Local	024	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
044	Tim Allen	--	Yes	Yes	Local	044	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
045	Jim Turk	--	Yes	Yes	Local	045	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
047	Ralph Nilson	--	Yes	Yes	Local	047	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

2010

Interfaces de gestión de comunicaciones

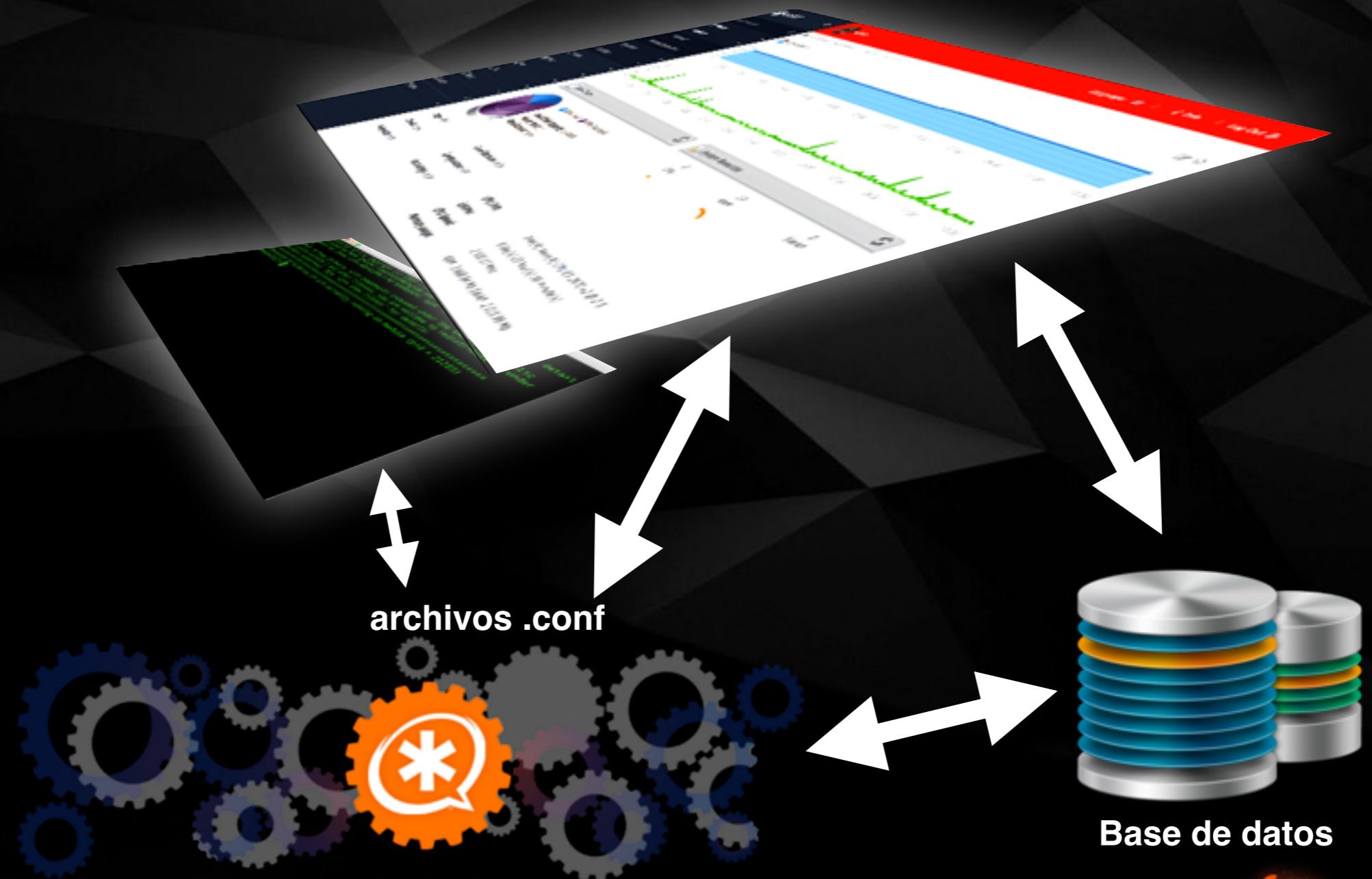


The screenshot shows the Elastix 5.0.10 Administration interface. The top navigation bar includes the Elastix logo, user 'admin', language selection, and 'Info' and 'Log Out' links. The left sidebar has a 'Manager' section with 'Dashboard' selected, along with links for 'Organization', 'User/Group', 'System', 'Email', 'Fax', 'PBX', 'Reports', 'Security', and 'History'. The main content area is titled 'Dashboard' and displays several widgets:

- A large blue bar chart from 0 to 300.
- A green line chart showing activity over time from 13:00 to 13:00.
- A 'Hard Drives' widget with a pie chart (30% Used, 70% Available), capacity (5.45GB), mount point (/), and manufacturer (N/A). It also lists Logs (30M), Emails (152K), Voicemails (4.0K), Local Backups (8.0K), Configuration (45M), and Recordings (8.0K).
- A 'System Resources' widget with three circular gauges: CPU (2 cores, 4.8%), RAM (13, 12.6%), and SWAP (0, 0.0%). It provides detailed CPU info, uptime, speed, and memory usage.

2015

Un ejemplo: *Elastix*



El código fuente ofrece un 100% de posibilidades de adaptación

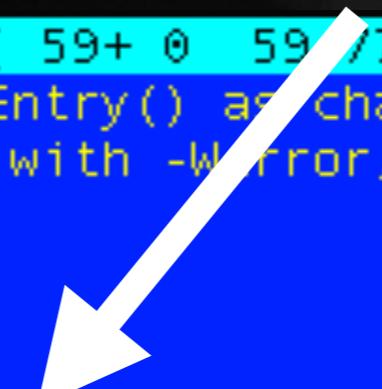
```
/usr/src~stman.c [---] 0 L:[ 59+ 0 59/78] *(1284/19915b) 0032 0x020
 * for the 5th argument to newtEntry() as char ** or const char ** . To
 * let the code compile cleanly with -Werror, we cast it to void * through
 * _NEWT_CAST.
 */
#define _NEWT_CAST (void *)

#define DEFAULT_MANAGER_PORT 5038

struct message {
    unsigned int hdrcount;
    char headers[MAX_HEADERS][MAX_LEN];
};

static struct ast_mansession {
    struct sockaddr_in sin;
    int fd;
    char inbuf[MAX_LEN];
    int inlen;
} session;

struct ast_chan {
    char name[80];
```

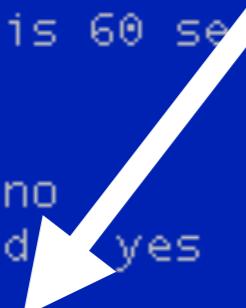


No siempre poseemos los conocimientos técnicos para modificar el código de forma segura...

La modificación de los archivos de configuración permiten ajustar el 80% de las posibilidades...

```
/etc/ast~ger.conf  [----]  1 L:[ 16+ 6  22/156] *(914 /6580b) 0110 0x06E
; http.conf and if both "enabled" and "webenabled" are set to yes in
; this file. Both default to no. httptimeout provides the maximum
; timeout in seconds before a web based session is discarded. The
; default is 60 seconds.
;
[general]
enabled = no
;webenabled = yes
port = 5038
bindaddr = 0.0.0.0

; Parameters that control AMI over TLS. ("enabled" must be set too).
; You can open a connection to this socket with e.g.
;
;----->openssl s_client -connect my_host:5039
;
;tlsenable=no<-><----->; set to YES to enable it
;tlsbindaddr=0.0.0.0:5039<-----><----->; address and port to bind to, default t
;tlscertfile=/tmp/asterisk.pem<>; path to the certificate.
;tlsprivatekey=/tmp/private.pem ; path to the private key, if no private given,
;                                ; if no tlsprivatekey is given, default is to se
```



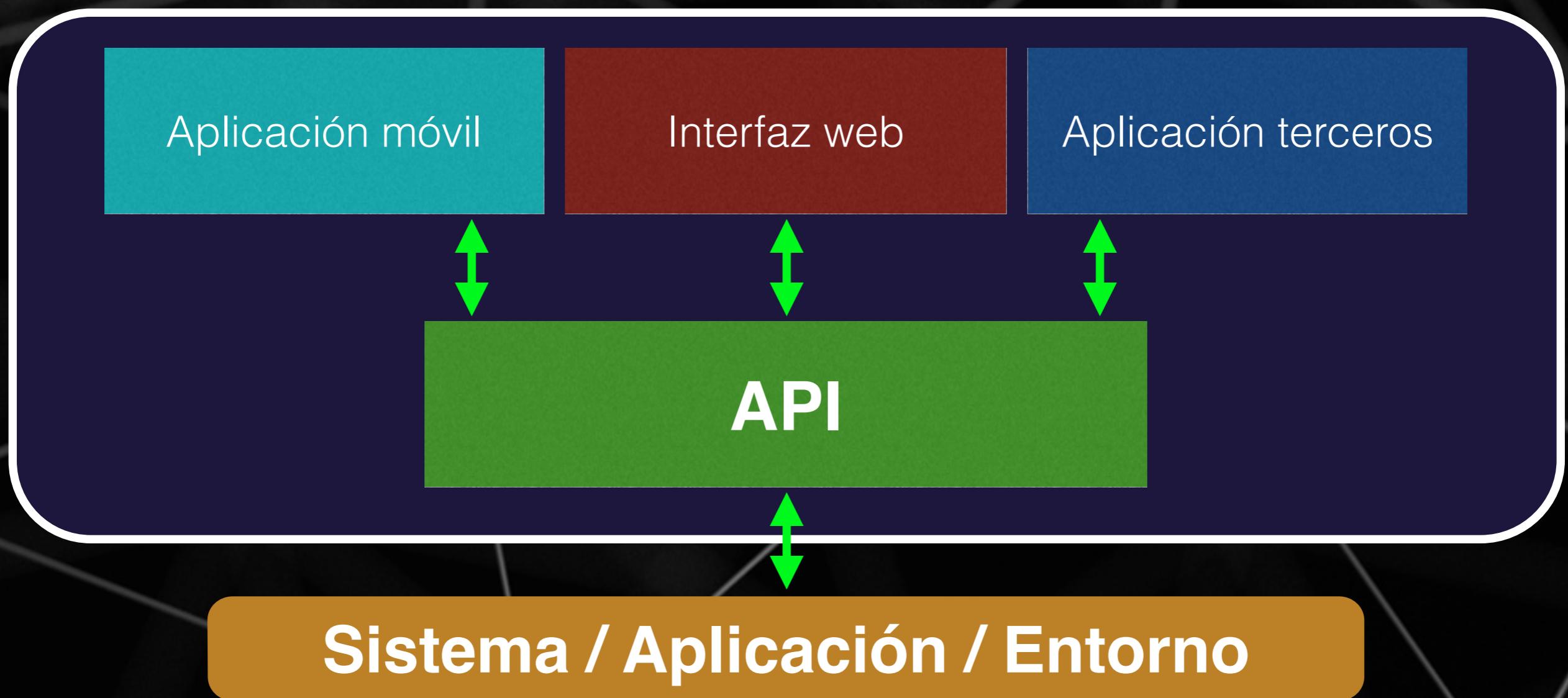
*En un interfaz web, se suelen
eliminar el 80% de las opciones de
los archivos de configuración*

*... y eso que está orientado a un
usuario técnico...*

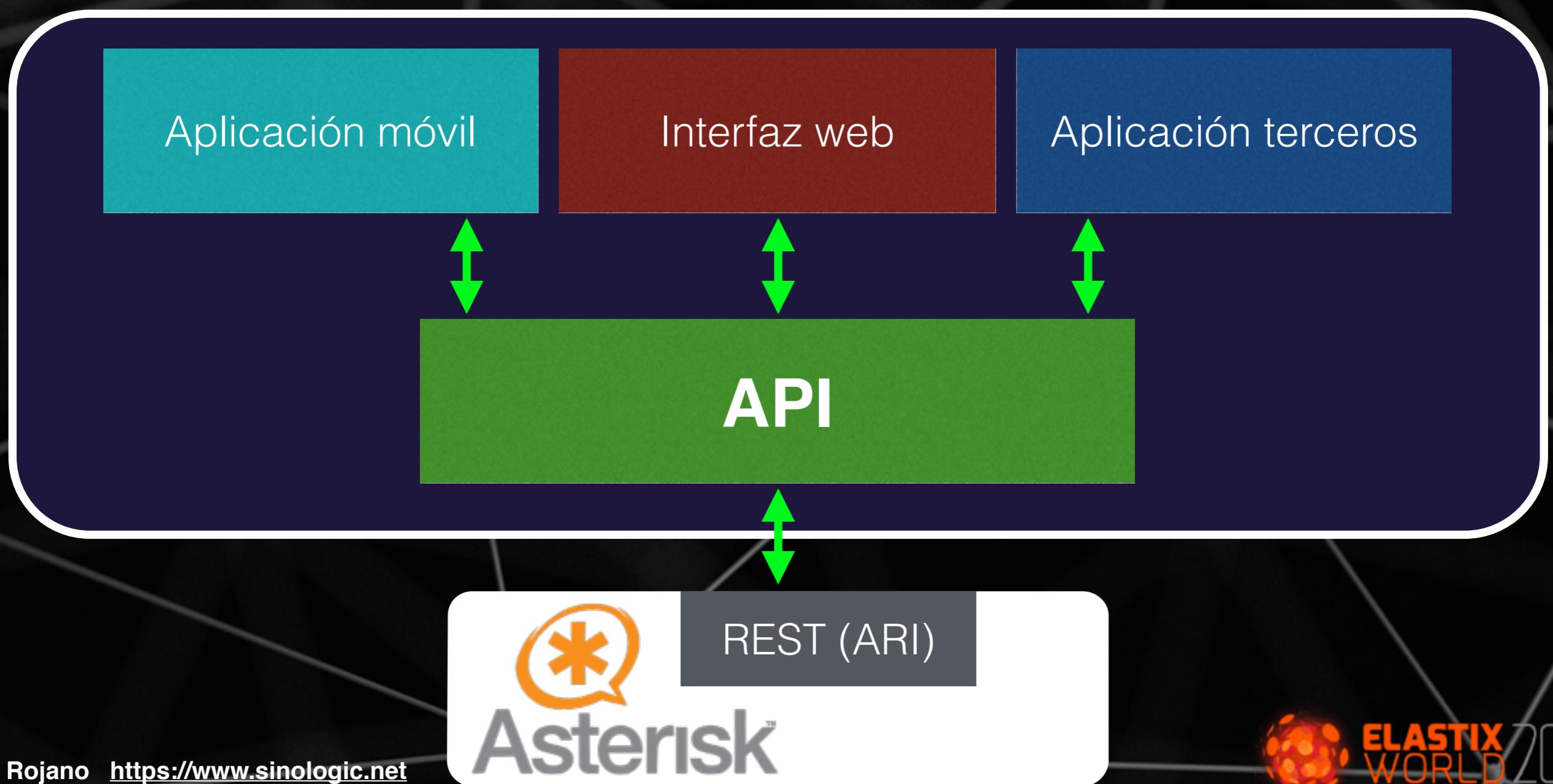
Problema: Todos los interfaces de configuración están orientados a la “pequeña empresa”

¿cuánto tiempo tardaríamos en dar de alta 3000 extensiones?

Las nuevas metodologías de programación simplifican su creación.



Las nuevas metodologías de programación simplifican su creación.



Gestión

*Las aplicaciones de gestión permiten
a **los usuarios** realizar tareas
sencillas que no requieren
conocimientos técnicos.*

Los interfaces de gestión solo sirven para que el usuario final sepa qué está haciendo su sistema de comunicaciones.

No debe servir para configurarlo.

Una panadería, una carnicería, una fábrica de calzado, ... no tiene porque saber qué es un codec, el puerto del protocolo SIP y qué contraseña es la más adecuada.

*Generalmente suele venir integrada
dentro de la aplicación de
configuración, pero nadie lo explica.*

*La parte de gestión sí que debe integrarse con la siguiente parte:
Monitorización*

Monitorización

Muestran al usuario el estado del sistema y toda la información relevante EN TIEMPO REAL

La Red
El servidor
Las llamadas actuales
Las llamadas realizadas
Estado de las colas
Incidencias
Seguridad
etc...

Monitorización de la Red

Zenoss Core

The screenshot displays the Zenoss Core web interface with several panels:

- Main Views:** Shows an "Object Watch List" with categories like /Devices/Discovered (14), /Locations/USA (17), /Events/Status/Ping (31), and /Systems/Email (green). It also includes a "Root Organizers" section for device types.
- Messages:** A panel showing system messages such as "Discovery Complete" (15 hours ago), "Devices Added" (2 days ago), and "Discovery Complete" (2 months ago).
- Event Count:** A graph showing event counts over time (7th 00:00 - 7th 08:00) with a legend for event types: OK (green), INFO (blue), WARNING (yellow), ERROR (red), and CRITICAL (dark red).
- Collected Events:** A graph showing collected events over time (7th 00:00 - 7th 08:00) with a legend for event types: zevent.eventlog (green), zevent.errorlog (blue), and zevent.rap (cyan).
- Event Queues:** A graph showing event queue levels over time (7th 00:00 - 7th 08:00) with a legend for various queue names.
- Production Status:** A table showing production status for three hosts: 10.87.209.187, 10.87.209.5, and 10.87.209.51, all in Maintenance mode.
- US Datacenters:** A map of the United States showing datacenter locations with red dots and connections between them.
- Current Weather:** A weather map showing current surface conditions.
- Logs:** Two panels showing log entries for various hosts and services, including error logs for test-cent04-04-Lan and test-cent04-04-Lan.

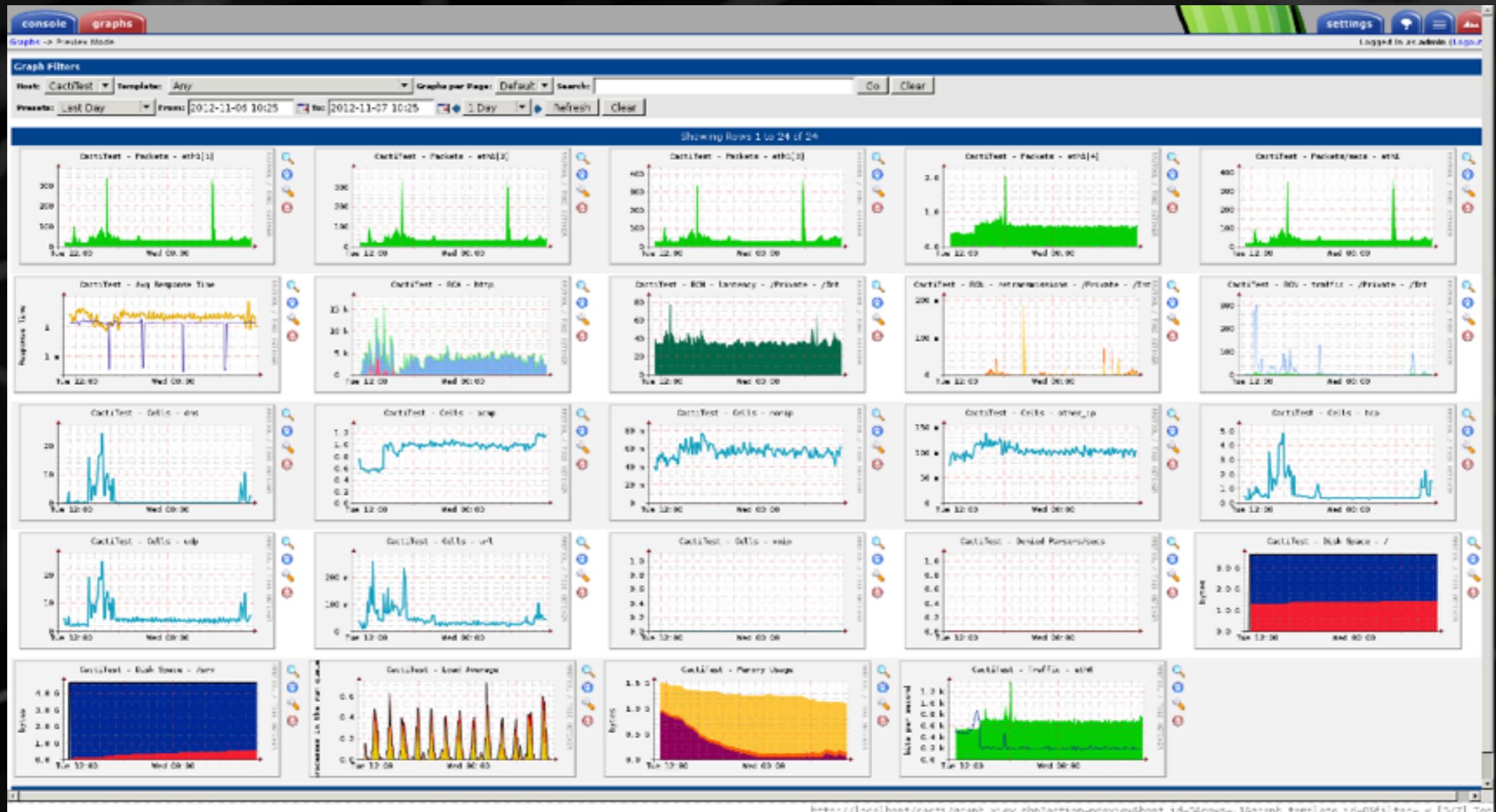
Zenoss (<http://www.zenoss.org/>)

Monitorización de la Red

The image displays two side-by-side screenshots of the PandoraFMS monitoring software interface. The left screenshot shows a detailed view of a 'MOSCOW ROUTER' with a diagram of the device and two line graphs showing outgoing throughput over time. The right screenshot shows a dashboard with multiple widgets: a graph of User CPU and System CPU comparison, a graph of Free Memory vs Used Memory, a map of the USA with sales data, a network map, and a global health status bar.

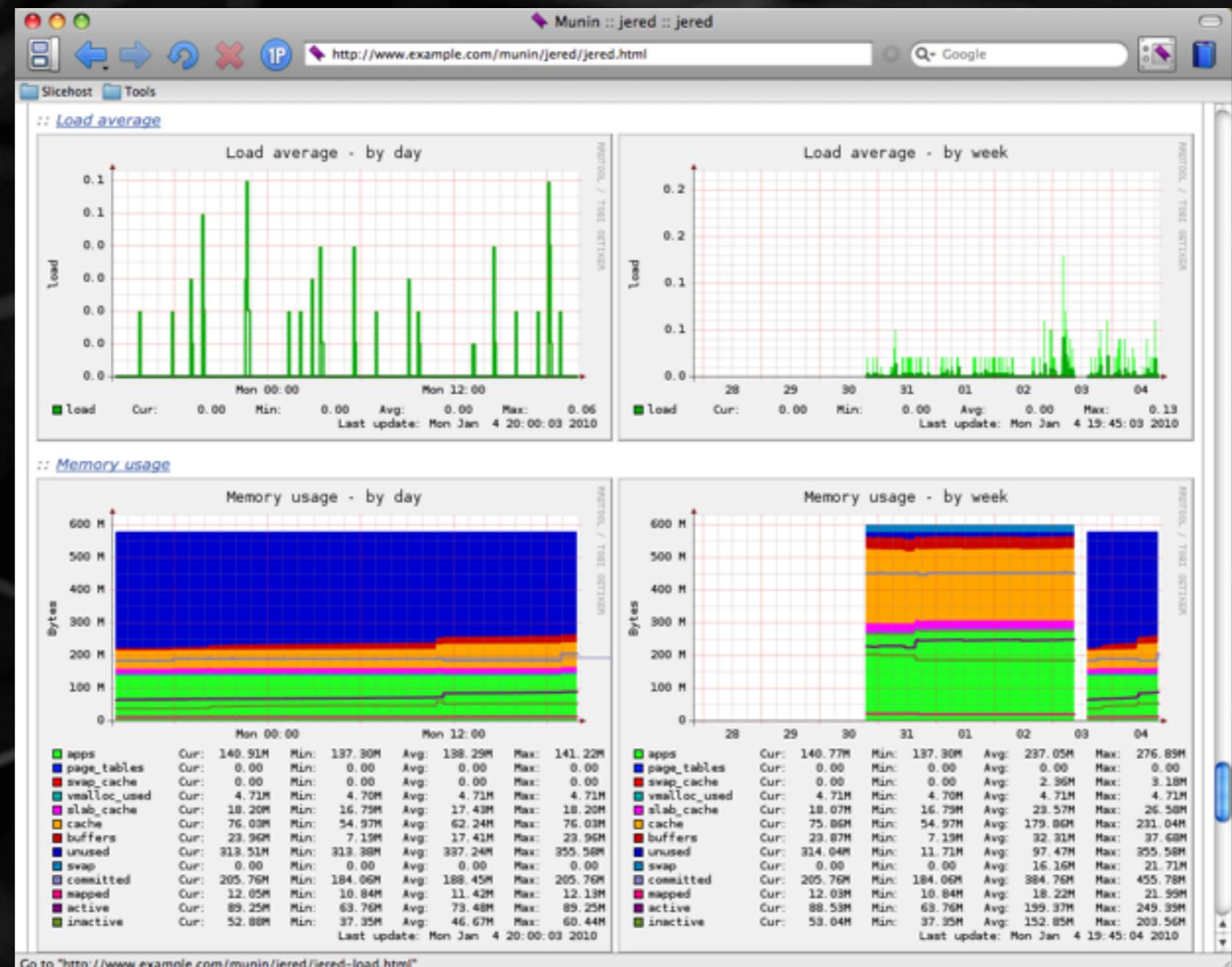
Pandora (<http://pandorafms.com/>)

Monitorización del Servidor



Cacti (<http://www.cacti.net/>)

Monitorización del Servidor



Munin (<http://munin-monitoring.org/>)

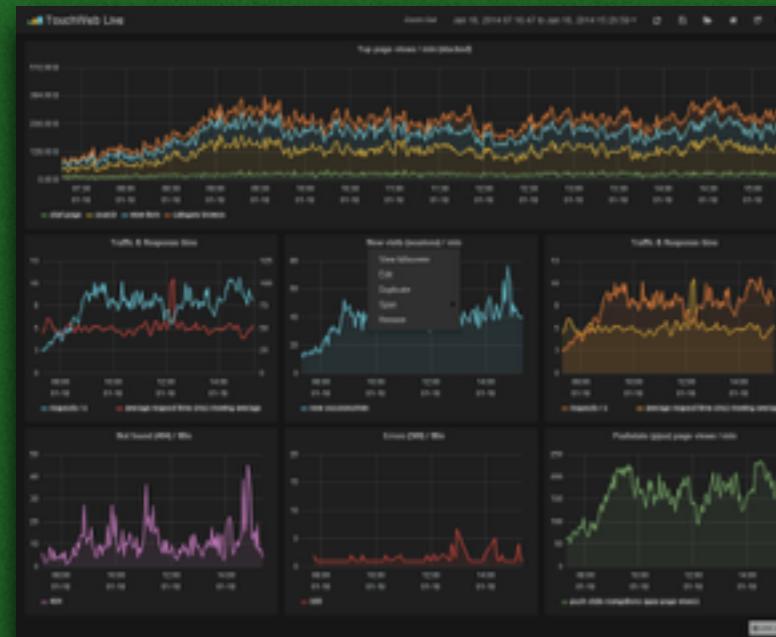
Herramientas de visualización de CDR hay muchas, pero a partir de cierto número de llamadas, el sistema se vuelve lento.

La mayoría de sistemas no están preparados para un número grande de llamadas y/o usuarios.

Para ello, el sistema a monitorizar debe permitir “exportar” la información a un sistema que pueda procesarla.

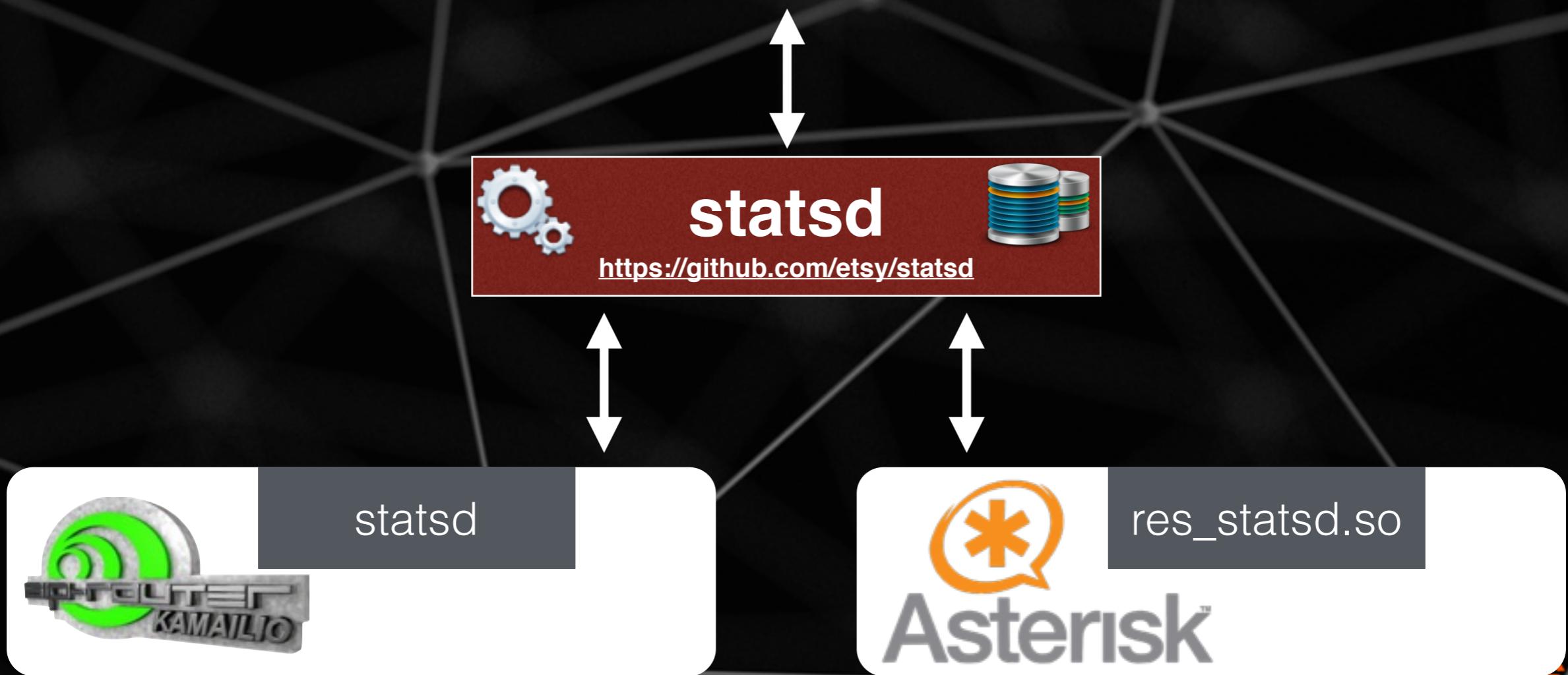
Bases de datos, CDR, REST, AMI, AGI, etc... muchos métodos para obtener información...

*Asterisk 12, Asterisk 13 y Kamailio
han incorporado nuevas
herramientas para monitorización
en tiempo real*



Graphite

<http://graphite.wikidot.com/>



Hay planificadas nuevas aplicaciones de Dialplan para utilizar ‘statsd’ en Asterisk más dinámicamente.

```
[Initialization]
StatsD(gauge, channels.inuse, 0)

[Statistics]
exten => _XXXX,1,NoOp(Do some awesome statistics.)
same => n,StatsD(gauge, channels.inuse, +1)
same => n,Dial(${EXTEN})
same => n,Hangup()
same => n,StatsD(gauge, channels.inuse, -1)
```

<https://wiki.asterisk.org/wiki/display/~tcambron>

Seguridad

“Hay dos tipos de empresas, las que admiten que han sido víctimas de un ataque, y las que aún no lo saben”

John Chambers

¿A quién no le ha ocurrido esto?

```
[Sep 26 17:17:26] NOTICE[16166]: chan_sip.c:27851 handle_request_register: Registration from '"712" <sip:712@78.60.201.227>' failed for '212.129.8.246:7245' - Wrong password
[Sep 26 17:17:26] NOTICE[16166]: chan_sip.c:27851 handle_request_register: Registration from '"712" <sip:712@78.60.201.227>' failed for '212.129.8.246:7245' - Wrong password
[Sep 26 17:17:27] NOTICE[16166]: chan_sip.c:27851 handle_request_register: Registration from '"712" <sip:712@78.60.201.227>' failed for '212.129.8.246:7245' - Wrong password
[Sep 26 17:17:27] NOTICE[16166]: chan_sip.c:27851 handle_request_register: Registration from '"712" <sip:712@78.60.201.227>' failed for '212.129.8.246:7245' - Wrong password
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...
6 minutos después...
...
[Sep 26 17:24:13] NOTICE[27646]: chan_sip.c:27851 handle_request_register: Registration from '"711" <sip:711@78.60.201.227>' failed for '212.129.8.246:6302' - Wrong password
[Sep 26 17:24:13] NOTICE[27646]: chan_sip.c:27851 handle_request_register: Registration from '"711" <sip:711@78.60.201.227>' failed for '212.129.8.246:6302' - Wrong password
[Sep 26 17:24:13] NOTICE[27646]: chan_sip.c:27851 handle_request_register: Registration from '"711" <sip:711@78.60.201.227>' failed for '212.129.8.246:6302' - Wrong password
[Sep 26 17:24:13] NOTICE[27646]: chan_sip.c:27851 handle_request_register: Registration from '"711" <sip:711@78.60.201.227>' failed for '212.129.8.246:6302' - Wrong password
[Sep 26 17:24:13] NOTICE[27646]: chan_sip.c:27851 handle_request_register: Registration from '"711" <sip:711@78.60.201.227>' failed for '212.129.8.246:6302' - Wrong password
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```

¿Cómo detectarlo a tiempo?

```
/etc/asterisk/logger.conf
```

```
; running a production system. Debug mode turns on a LOT of extra messages,  
; most of which you are unlikely to understand without an understanding of  
; the underlying code. Do NOT report debug messages as code issues, unless  
; you have a specific issue that you are attempting to debug. They are  
; messages for just that -- debugging -- and do not rise to the level of  
; something that merit your attention as an Asterisk administrator. Debug  
; messages are also very verbose and can and do fill up logfiles quickly;  
; this is another reason not to have debug mode on a production system unless  
; you are in the process of debugging a specific issue.  
  
;debug => debug  
security => security  
console => notice,warning,error  
;console => notice,warning,error,debug  
messages => notice,warning,error,security  
;full => notice,warning,error,debug,verbose,dtmf,fax  
  
;syslog keyword : This special keyword logs to syslog facility  
;  
;syslog.local0 => notice,warning,error  
;
```

Vamos a ver el LOG de seguridad...

```
/var/log/asterisk/security                                         2533695/2474K 100%
[Sep 26 17:29:00] SECURITY[27675] res_security_log.c:
SecurityEvent="InvalidPassword",EventTV="2015-09-26T17:29:00.130+020
0",Severity="Error",Service="SIP",EventVersion="2",AccountID="711",SessionID="0x7fbfd4312518"
,LocalAddress="IPV4/UDP/78.60.201.227/5060",RemoteAddress="IPV4/UDP/
212.129.8.246/7393",Challenge="29883af8",ReceivedChallenge="29883af8",ReceivedHash
="ab11a45aa/b4ac45e9940fe23dc2bc7f"

[Sep 26 17:29:00] SECURITY[27675] res_security_log.c:
SecurityEvent="InvalidPassword",EventTV="2015-09-26T17:29:00.230+020
0",Severity="Error",Service="SIP",EventVersion="2",AccountID="711",SessionID="0x7fbfd42f0b68"
,LocalAddress="IPV4/UDP/78.6
0.201.227/5060",RemoteAddress="IPV4/UDP/
212.129.8.246/7393",Challenge="5e6536ce",ReceivedChallenge="5e6536ce",ReceivedHash
="83e7fe40c874f7b107f22155beade95f"

[Sep 26 17:29:00] SECURITY[27675] res_security_log.c:
SecurityEvent="ChallengeSent",EventTV="2015-09-26T17:29:00.340+0200"
,Severity="Informational",Service="SIP",EventVersion="1",AccountID="711",SessionID="0x7fbfd42
fad68",LocalAddress="IPV4/UDP
/78.60.201.227/5060",RemoteAddress="IPV4/UDP/212.129.8.246/7393",Challenge="106cfcc0a"

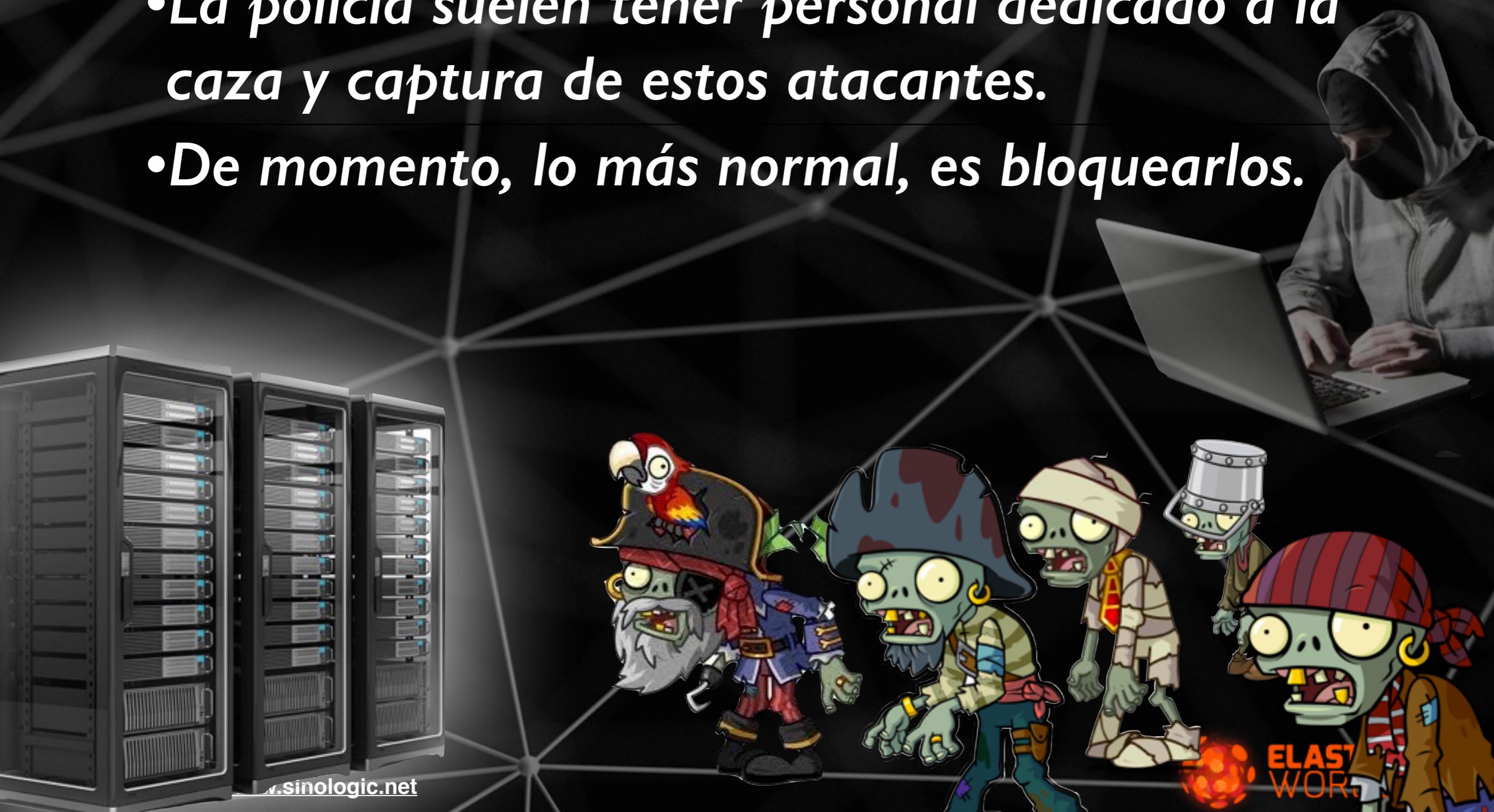
[Sep 26 17:29:00] SECURITY[27675] res_security_log.c:
SecurityEvent="ChallengeSent",EventTV="2015-09-26T17:29:00.371+0200"
,Severity="Informational",Service="SIP",EventVersion="1",AccountID="711",SessionID="0x7fbfd42
fc268",LocalAddress="IPV4/UDP
/78.60.201.227/5060",RemoteAddress="IPV4/UDP/212.129.8.246/7393",Challenge="0373c790"
```

Ya lo tenemos: 212.129.8.246
¿y ahora qué?



¿y ahora qué?

- Los ataques se hacen con ordenadores zombies... así que sirve de poco contraatacar.
- La policía suelen tener personal dedicado a la caza y captura de estos atacantes.
- De momento, lo más normal, es bloquearlos.



¿y ahora qué?

Utilizar un bloqueador automático:

- * ***Fail2ban (<http://www.fail2ban.org>)***
- * ***SIPCheck2 (<https://github.com/sinologicnet/sipcheck>)***

Revisar las contraseñas:

- * ***Generar siempre contraseñas fuertes:
<https://www.sinologic.net/proyectos/genpass/>***

Nota: Las contraseñas SIP no hay que recordarlas, se utilizan entre el servidor y el teléfono/softphone, así que no tiene que ser fácil de recordar.

Vigilar y automatizar los avisos

- * ***No utilices el correo como medio de información, no es seguro.***

¿y ahora qué?

Revisa posibles exploits que pueden surgir en las distintas páginas:

packet storm
all things security

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Search files: elastix Showing 1 - 14 of 14

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Elastix 2.5.0 SQL Injection
Authored by Ahmed Abou-Ela Posted Mar 6, 2015

Elastix versions 2.5.0 and below suffer from a remote blind SQL injection vulnerability.

tags | exploit, remote, sql injection
MD5 | 81385990327b1a31af0f8097c842b7a7

[Download](#) | [Favorite](#) | [Comments \(0\)](#)

Elastix 2.4.0 Stable XSS / CSRF / Command Execution
Authored by Simo Ben Youssef | Site monxploit.com Posted Oct 17, 2014

Elastix version 2.4.0 stable suffers from cross site request forgery, remote command execution, and cross site scripting vulnerabilities.

tags | exploit, remote, vulnerability, xss, csrf
MD5 | 436cc831ab6baf8d50bf136fcfb7a699

[Download](#) | [Favorite](#) | [Comments \(0\)](#)

Elastix 2.4.0 Cross Site Scripting
Authored by Bassem Posted Nov 17, 2013

Elastix version 2.4.0 suffers from multiple cross site scripting vulnerabilities.

tags | exploit, vulnerability, xss
MD5 | a72c5fea817dc1fa585544079356e2ad

[Download](#) | [Favorite](#) | [Comments \(0\)](#)

Elastix 2.4.0 Cross Site Scripting
Authored by cheki Posted Jun 1, 2013

Elastix version 2.4.0 suffers from a cross site scripting vulnerability.

tags | exploit, xss
MD5 | 8638653ba6e45ee768afa5d4338eb203

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Elastix 2.3 PHP Code Injection
Authored by i-Hmx Posted Jan 4, 2013

Elastix versions prior to 2.4 php code injection exploit.

packet storm
all things security

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Search files: freepbx Showing 1 - 25 of 30

Files | News | Users | Authors

Search for Search

FreePBX 12.0.43 Cross Site Scripting
Authored by High-Tech Bridge SA | Site htbridge.com Posted Apr 22, 2015

FreePBX version 12.0.43 suffers from multiple cross site scripting vulnerabilities.

tags | exploit, vulnerability, xss
advisories | CVE-2015-2690
MD5 | 79cee98f92edb2ccaa42d7468d97b0b8

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FreePBX Authentication Bypass / Account Creation
Authored by Rob Thomas Posted Oct 1, 2014

A remote attacker can bypass authentication and create a false FreePBX Administrator account, which will then let them perform any action on a FreePBX system as the FreePBX user (which is often 'asterisk' or 'apache'). As of 2014/10/01 all versions of FreePBX are affected.

tags | advisory, remote, bypass
MD5 | be8e253ba1f0dd155fc81a0cab78d6ec

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FreePBX config.php Remote Code Execution
Authored by i-Hmx, 0x00string | Site metasploit.com Posted Mar 25, 2014

This Metasploit module exploits a vulnerability found in FreePBX version 2.9, 2.10, and 2.11. It's possible to inject arbitrary PHP functions and commands in the "/admin/config.php" parameters "function" and "args".

tags | exploit, arbitrary, php
advisories | CVE-2014-1903
MD5 | eb66aafbde2a7c0352575e1ef94440a5

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FreePBX 2.x Remote Command Execution
Authored by i-Hmx Posted Feb 24, 2014

FreePBX versions before 2.3 suffer from a remote command execution vulnerability.

tags | exploit, remote
MD5 | 38281d77aa25169073da8dd123ef9d20

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¿Preguntas?

Agradecimientos...

- *Rosa Atienza*
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- *La gente de PaloSanto y Elastix*
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