



End-to-End Functional Test Coverage

London

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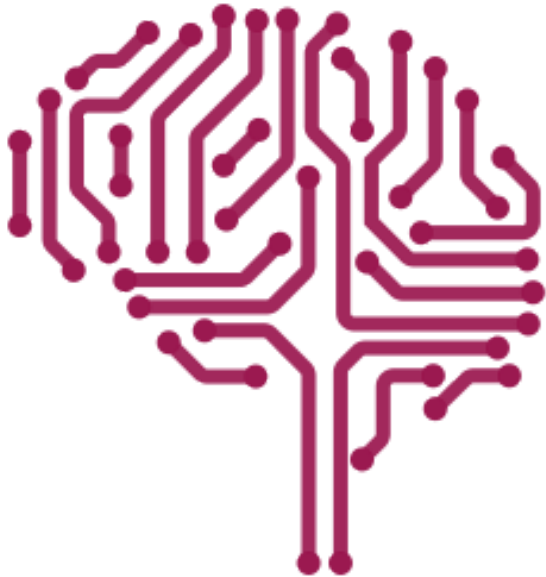
1. Introducción

Breve descripción y especificaciones

- Customer Management Leaves → 70.000 pruebas.
- Una campaña de regresión completa \approx 60 horas.

Objetivos

- Dividir la suite en subsets.
- Identificar los subset asociados a las funciones.
- Identificar escenarios duplicados.
- Minimizar costes → Tiempo + Recursos.



2. Entorno inicial

Versión en Producción → Branch →
Release → Feature → **Escenarios**

```
lonh48lon.amadeus.net - Putty
drwxr-xr-x 4 ngdcsbld ngdcsbld 4096 Jun 10 01:53 55-0-52_PRIA
drwxr-xr-x 7 ngdcsbld ngdcsbld 4096 Jun 14 18:58 55-0-61_PRIA
drwxr-xr-x 4 ngdcsbld ngdcsbld 4096 Jun 20 17:44 55-0-79_PRIA
drwxr-xr-x 6 ngdcsbld ngdcsbld 4096 Jun 26 19:23 54-1-53_PRIA
drwxr-xr-x 3 ngdcsbld ngdcsbld 4096 Jun 30 16:41 54-2-8_PRIA
drwxr-xr-x 14 ngdcsbld ngdcsbld 4096 Jul 3 21:46 PRD_2017Q2
drwxr-xr-x 11 ngdcsbld ngdcsbld 4096 Jul 3 22:43 55-0-80_PRIA
drwxr-xr-x 6 ngdcsbld ngdcsbld 4096 Jul 4 12:07 PRD_2017Q3
drwxr-xr-x 5 ngdcsbld ngdcsbld 4096 Jul 4 16:56 55-0-90_PRIA
-rw-r--r-- 1 ngdcs ngdcs 161 Jul 4 17:32 grafana_branches
-rw-r--r-- 1 ngdcs ngdcs 433 Jul 4 17:32 app_information
./ (/vtmp/ngdcsbld) -----
^--> ls -lrt PRD_*
PRD_2017Q1:
total 12
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 May 9 15:25 53-3-10
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 May 17 09:11 53-3-18
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 May 22 19:50 53-3-21

PRD_2017Q2:
total 48
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 1 09:38 54-1-53
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 8 20:00 54-1-54
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 19 20:40 54-2-1
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 20 09:57 54-2-2
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 20 22:51 54-2-3
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 21 10:12 54-2-4
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 21 20:22 54-2-5
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 22 09:53 54-2-6
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 22 16:49 54-2-7
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 26 17:19 54-2-8
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 27 21:08 54-2-9
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jul 3 20:19 54-3-1

PRD_2017Q3:
total 16
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 28 09:28 55-0-92
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jun 29 19:21 55-0-95
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jul 3 21:36 55-0-97
drwxrwxr-x 3 ngdcsbld ngdcsbld 4096 Jul 4 10:33 55-0-98
./ (/vtmp/ngdcsbld) -----
```

```
lonh48lon.amadeus.net - Putty
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_SpecialAttribute_ByLicensePlate.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_LastSeenInformation.Case_005.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_ActivationStatus.Case_002.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_FlightStatus.Case_002.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_EmergencyLock.Err_004.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_SpecialAttribute_ByCarrierAndTag.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_PoolIndicator.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_Missing_Linked_TagNumber.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_SpecialAttribute_ByUBI.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_Screening.Case_003.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_InternalAirlineText.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_Screening.Case_005.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_Screening.Case_006.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_LoadDetails.Case_002.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_LoadDetails.Case_008.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_UCI.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_LastSeenInformation.Case_002.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_PBT.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_MOPName_historicalDays.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_Screening.Case_002.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_LastSeenInformation.Case_001.scn
cmbmt/ngbmtmgr/idb/BIDBRQ_112/IdentifyBaggage_UBI.Case_006.scn^C
./ (/vtmp/ngdcsbld/PRD_2017Q3/55-0-98/internal) -----
^--> find cm*/ng*mgr/*/* -name "*.scn" | wc -l
68985
```

2. Entorno inicial

	58-0-123	58-0-124	58-0-125	58-0-127	58-0-128	58-0-129	58-0-130	58-0-131
	In lon 02/28 21:42 03/01 13:56 => 16:14:00	In syd 03/01 12:08 03/02 09:52 => 21:44:00	In lon 03/01 22:18 03/02 08:05 => 09:47:00	In lon 03/04 04:44 03/04 13:42 => 08:58:00	In lon 03/06 04:12 03/08 16:47 => 60:35:00	In syd 03/06 17:37 03/07 14:33 => 20:56:00	In lon 03/07 01:08 03/07 12:57 => 11:49:00	In syd 03/07 12:48 On Going => 19:29:00
PRD_2018Q2 %	▼ 91.7% 56947 ok 4947 failed 62130 total (236 unreported)	▲ 92.9% 57733 ok 3750 failed 62132 total (649 unreported)	▼ 92.8% 57667 ok 4237 failed 62140 total (236 unreported)	▼ 92.1% 57260 ok 4354 failed 62144 total (530 unreported)	▼ 88.2% 54791 ok 4051 failed 62146 total (3304 unreported)	▲ 92.6% 57577 ok 4503 failed 62147 total (67 unreported)	▼ 89.8% 55829 ok 6249 failed 62149 total (71 unreported)	▲ 93.4% 58035 ok 4056 failed 62149 total (58 unreported)



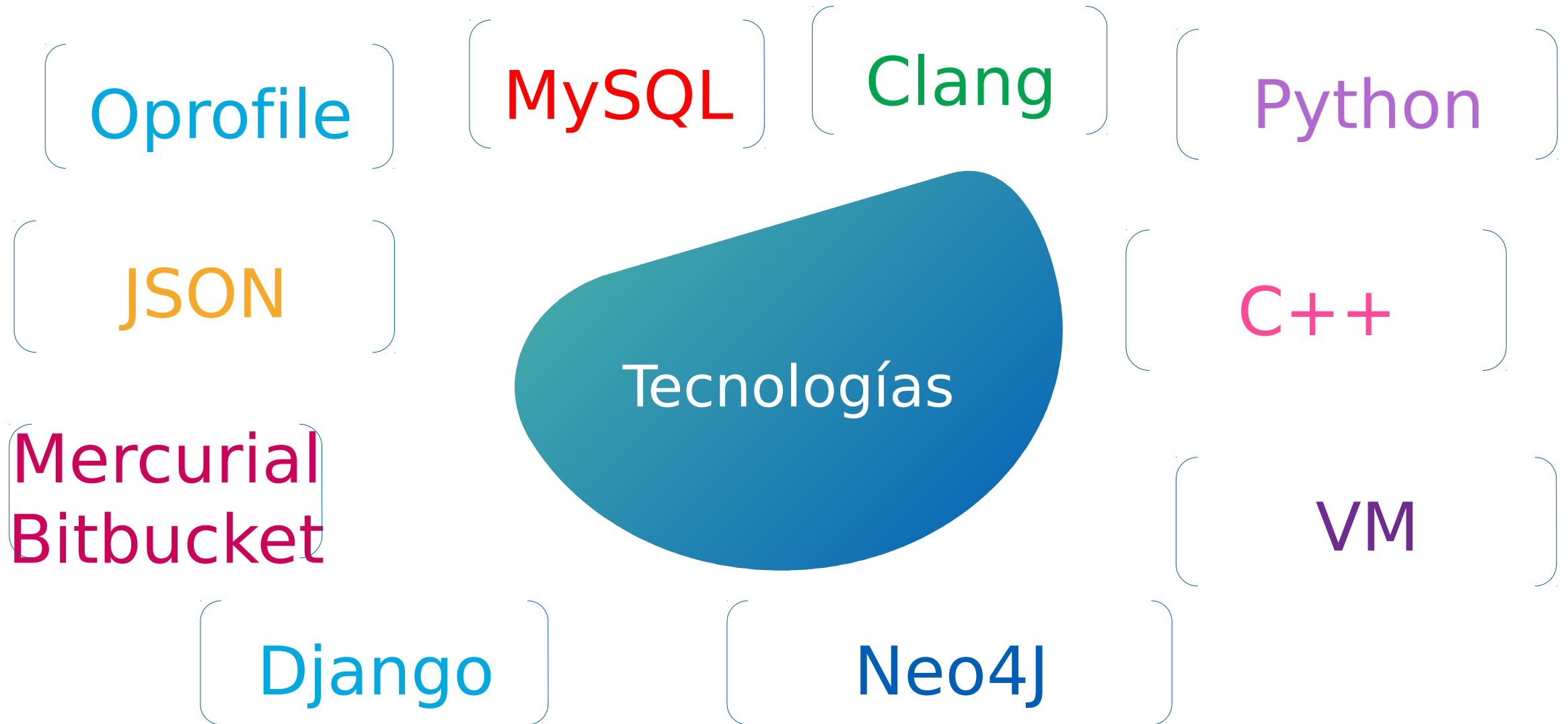
NGDCS User Regression Report for user rchossar 24-03-2010

>>run >>branch >>release >>package >>type >>function

		Duration	OK	Total	%
> RUN	Regression	17m 9s	0	162	0 %
>> BRANCH	DEV	17m 9s	0	162	0 %
>>> RELEASE	27-0-202	17m 9s	0	162	0 %
>>>> PACKAGE	smt	17m 9s	0	162	0 %
>>>>> TYPE	cry	6m 36s	0	19	0 %
>>>>>> FUNCTION	STO	6m 36s	0	19	0 %

Scenario	Status	Logs	Duration	Time	User
RetrieveSeatsOccupied.Case_001.scn	Failed	[log][diff]	20.2 s	14:53:50	rchossar
RetrieveSeatsOccupied.Case_002.scn	Failed	[log][diff]	20.1 s	14:54:11	rchossar
RetrieveSeatsOccupied.Case_003.scn	Failed	[log][diff]	20.2 s	14:54:31	rchossar
RetrieveSeatsOccupied.Case_004.scn	Failed	[log][diff]	20.3 s	14:54:51	rchossar
RetrieveSeatsOccupied.Case_005.scn	Failed	[log][diff]	20.2 s	14:54:52	rchossar
RetrieveSeatsOccupied.Case_006.scn	Failed	[log][diff]	24.7 s	14:55:16	rchossar
RetrieveSeatsOccupied.Case_007.scn	Failed	[log][diff]	24.4 s	14:55:41	rchossar
RetrieveSeatsOccupied.Case_008.scn	Failed	[log][diff]	23.5 s	14:56:24	rchossar
RetrieveSeatsOccupied.Case_009.scn	Failed	[log][diff]	20.3 s	14:56:45	rchossar
RetrieveSeatsOccupied.Case_010.scn	Failed	[log][diff]	20.4 s	14:56:45	rchossar

3. Tecnología usada



4. Herramientas desarrolladas

4.1. Aplicación Web para la gestión de usuarios

- Python
- Django
- HTML/CSS
- Javascript
- JSON
- MySQL
- Mercurial
- BitBucket

The screenshot shows a web browser window with the address bar displaying 'lonlnx48:40000/new_comer/create_user/'. The page title is 'New Comers Dashboard | Create'. In the top right corner, there are links for 'Log in - Help' and a home icon. The main content area is titled 'Create regressions users' and contains a form with two input fields: 'Unix ID:' with the value 'unix ID' and 'Machine:' with the value 'lonlnx48'. Below these fields is a section labeled 'Advanced options+' with a 'Send' button. At the bottom of the page, there are four buttons: 'List users', 'Import form users repository', 'Synchronize changes', and 'Export to CSV'. The footer text reads 'New comers dashboard © 2017'.

4.1. Aplicación Web para la gestión de usuarios

← → ↻ ⓘ lonInx48:40000/new_comer/list_user/ 🔍 ☆ ⋮

Regression users dashboard | Comers's List Log in - Help - 🏠

🔊 🔄 Latest regression users

ID	Unix ID	DB Username Peak 1	DB Username Peak 2	Database	Port	Update	Delete
4014	mraimold	mraimold	mraimold_p2	LONDB04	100	✏️	✖️
4021	skopcsa	skopcsa	skopcsa_p2	LONDB04	18	✏️	✖️
4020	mvaitkus	mvaitkus	mvaitkus_p2	LONDB04	17	✏️	✖️
4019	mgocieva	mgocieva	mgocieva_p2	LONDB04	15	✏️	✖️
4018	qbernard	qbernard	qbernard_p2	LONDB04	111	✏️	✖️
4017	jkong	jkong	jkong_p2	LONDB04	136	✏️	✖️
4016	zhamilton	zhamilton	zhamilton_p2	LONDB04	60	✏️	✖️
4015	rmillward	rmillward	rmillward_p2	NCMUSR04LS	66	✏️	✖️
4022	lhopkins	lukehopkins	lukehopkins_p2	LONDB04	22	✏️	✖️
4013	vsantiago	vsantiago	vsantiago_p2	LONDB04	174	✏️	✖️
3933	rdagenais	rdagenais	rdagenais_p2	LONDB04	203	✏️	✖️
3932	rblusr2	rblusr2	rblusr2_p2	LONDB04	177	✏️	✖️
3931	rblusr1	rblusr1	rblusr1_p2	LONDB04	177	✏️	✖️
3930	cdevautour	cdevautour	cdevautour_p2	LONDB04	176	✏️	✖️
3929	jacopo.biscella	jacopobiscella	jacopobiscella_p2	NCMUSR04LS	153	✏️	✖️
3928	daniel.hurtado	danielhurtado	danielhurtado_p2	LONDB04	240	✏️	✖️
3927	pannamalai	pannamalai	pannamalai_p2	NCMUSR02LS	227	✏️	✖️
3926	anand.palani	anandpalani	anandpalani_p2	LONDB04	213	✏️	✖️
3925	psathineni	psathineni	psathineni_p2	LONDB04	212	✏️	✖️

New regression user

Import form users repository

Synchronize changes

Export to CSV

Options:

☐ Select / Deselect All

▪ Migrate to: LONDB04

Send

▪ General filter:

Regression users dashboard | Update

Update user

ID: 4013

Unix ID:

DB Username Peak 1:

DB Username Peak 2:

Database:

LONDB04

 LONDB04 (current selection)

Port:

Update

Create comers

List comers

Delete

Regression users dashboard | Comers's List

Latest regression users

ID	Unix ID	DB Username Peak 1	DB Username Peak 2	Database	Port	Update	Delete
	<div>vs</div>						
4013	vsantiago	vsantiago	vsantiago_p2	LONDB04	174		
3997	vsoomaneyvijaykumar	vsoomaneyvijaykumar	vsoomaneyvijaykumar_p2	LONDB04	68		

Options:

☒ Select / Deselect All

▪ Migrate to:

LONDB04

Send

▪ General filter

LONDB04
LOCALDB
NCMUSR02LS
NCMUSR03LS
NCMUSR04LS
NCMUSR05LS

Regression users dashboard | Delete

Log in - Help -

Delete user

ID: 4013

Unix ID: vsantiago

DB Username Peak 1: vsantiago

DB Username Peak 2: vsantiago_p2

Database: LONDB04

Port: 174

Delete

Create comers

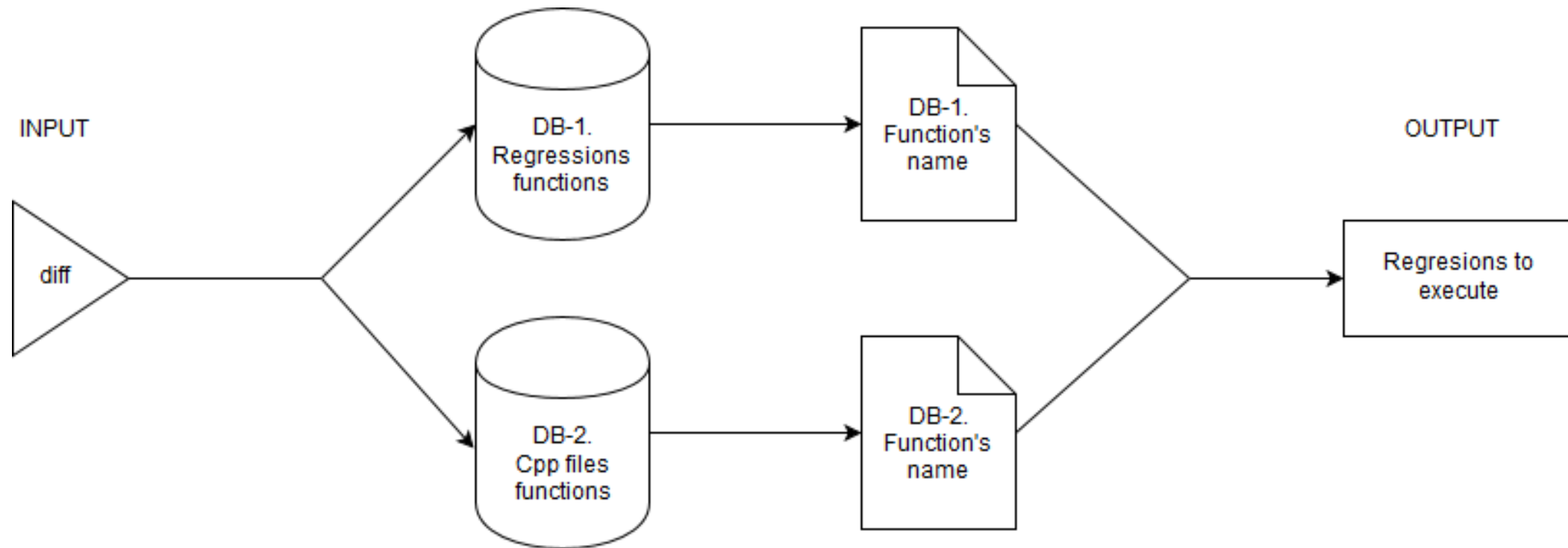
List comers

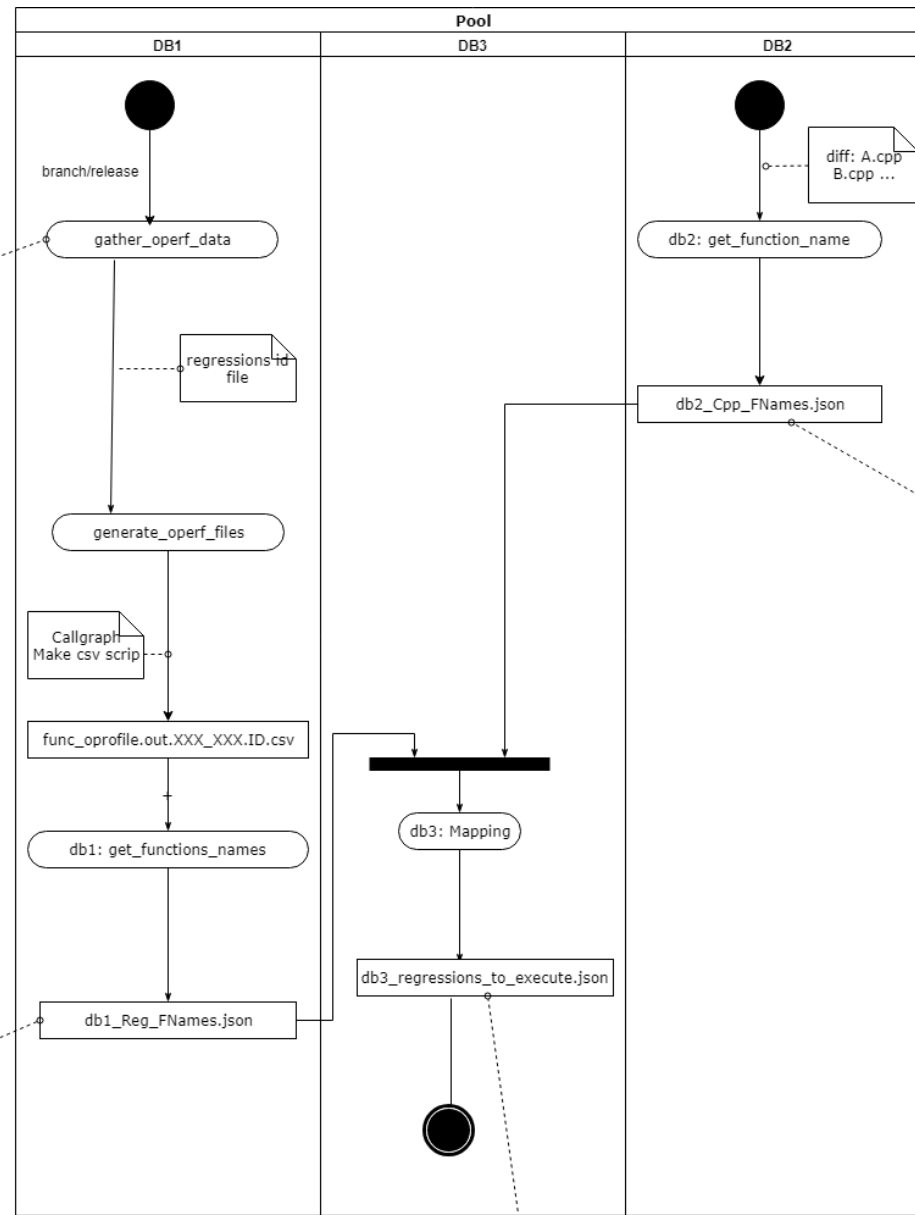
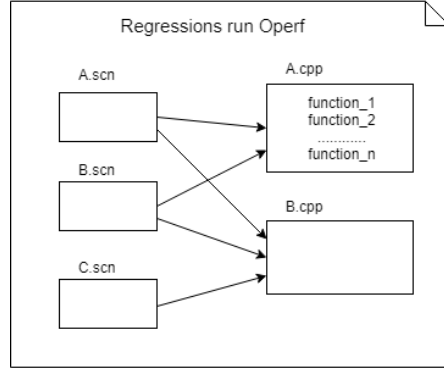
4.2. End-to-End Functional Test Coverage Tool

- Modulo 1. Subsets de regresiones.
 - Oprofile, Python, JSON, Neo4J.
- Modulo 2. Obtención de funciones de los ficheros cpp.
 - Clang, VM/Docker, JSON, Python, C++.
- Modulo 3. Identificación de los subsets implicados.
 - Python, JSON.

4.2. End-to-End Functional Test Coverage Tool

- Recepción del proyecto.
- Ejecución de los módulos.
- Obtención del resultado.





```

{"path_to_subset_id":
["function()",
.....]}
    
```

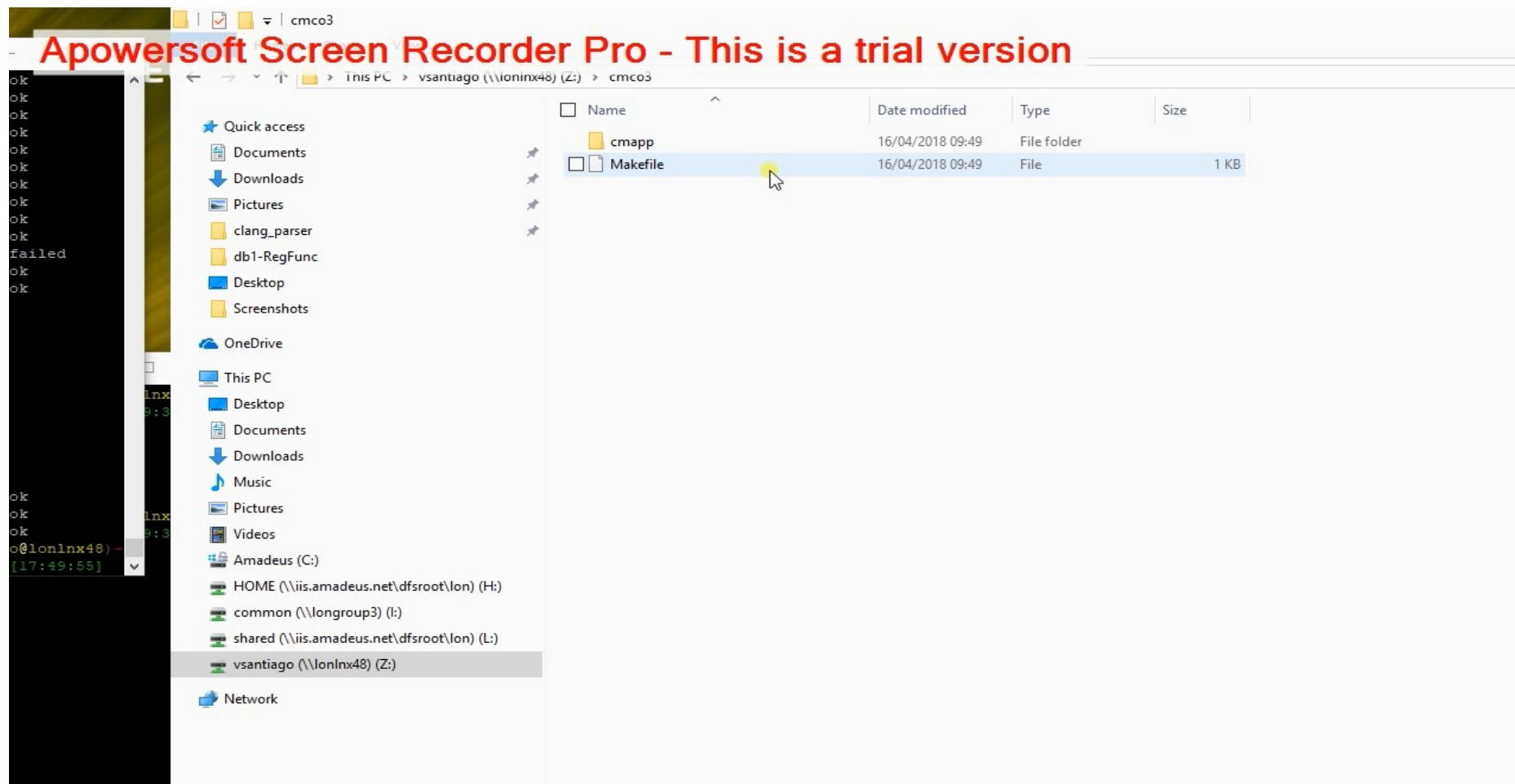
```

{"namespace": ["function()",
.....]}
    
```

```

{"regressions": [/PRD_201XQX/XX-XX-XX/release/
cmapp/ngidcgr/edi/func_oprofile.out.RGR.LVP.145263,
xxxxxx/yyy/func_oprofile.out.XXX.ID]}
    
```

4.3. Demo



5. Resultados:

Tiempo

*Reducción de el tiempo
de ejecución*



Recursos

*Reducción del número de
recursos utilizados*

Código

*Proporciona una comprensión más profunda de
nuestra cobertura de código*

6. Trabajo Futuro

- Dockerización de las regresiones.
- Creación de una interfaz amigable.
- Despliegue de la herramienta en otros hosts.
- Incorporar mejoras UX a la dashboard de registro de usuarios.



Regresiones en Docker

```
Bootstrapping dockerised CMI: x
Cisco Jabber
Terminal — docker run -it --name myreg --entrypoint bash lonvdcereg03.lon.amadeus.net:5000/cmi:58-0-129 — 160x54

Time spent refreshing the database: 0.3 sec
DecodePassport.Case_001.scn OK (0.0 sec)
DecodePassport.Case_002.scn OK (0.0 sec)
DecodePassport.Case_003.scn OK (0.0 sec)
DecodePassport.Case_004.scn OK (0.0 sec)
DecodePassport.Case_005.scn OK (0.0 sec)
DecodePassport.Case_006.scn OK (0.0 sec)
DecodePassport.Case_007.scn OK (0.0 sec)
DecodePassport.Case_008.scn OK (0.1 sec)
DecodePassport.Err_001.scn OK (0.0 sec)
DecodePassport.Err_002.scn OK (0.0 sec)
DecodePassport.Err_003.scn OK (0.0 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodePassport_Generic.Case_001.scn OK (0.0 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodePassport_IDN.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodePassport_InvalidDob.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodeQFdualloyaltyCard.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodeQatarFqtv.Case_001.scn OK (0.0 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodeReaderTypeTRN.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodeTapFqtv.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
DecodeVisa.Case_001.scn OK (0.0 sec)
DecodeVisa.Case_002.scn OK (0.0 sec)
DecodeVisa.Case_003.scn OK (0.0 sec)
DecodeVisa.Err_001.scn OK (0.0 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
Decode_1D_FQTV.Case_001.scn OK (0.1 sec)
Decode_1D_FQTV.Case_002.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
Decode_A3_MilesAndBonus_FQTV.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
Decode_AB_FQTV.Case_001.scn OK (0.1 sec)
Refreshing database
Time spent refreshing the database: 0.3 sec
Decode_AC_FQTV.Case_001.scn OK (0.3 sec)
Refreshing database
```



7. Conclusiones



- Se han creado dos herramientas las cuales cumplen con todos los requisitos fijados, satisfaciendo por lo tanto las necesidades de sus usuarios.
- Se ha conseguido construir un sistema mantenible, modularizado, accesible, extensible y sostenible.

Algunas referencias:

- [Amadeus SI](https://amadeus.com/en). <https://amadeus.com/en>

- [LLVM Tutorial. A First Function.](http://releases.llvm.org/2.6/docs/tutorial/JITTutorial1.html)

<http://releases.llvm.org/2.6/docs/tutorial/JITTutorial1.html>

- [LLVM](https://github.com/llvm-mirror/llvm). <https://github.com/llvm-mirror/llvm>

- [Clang](https://github.com/llvm-mirror/clang). <https://github.com/llvm-mirror/clang>

- [Proxy Squid](https://rndwww.nce.amadeus.net/confluence/pages/viewpage.action?spaceKey=~wherka&title=How+to+setup+your+own+http+proxy).

[https://rndwww.nce.amadeus.net/confluence/pages/viewpage.action?](https://rndwww.nce.amadeus.net/confluence/pages/viewpage.action?spaceKey=~wherka&title=How+to+setup+your+own+http+proxy)

[spaceKey=~wherka&title=How+to+setup+your+own+http+proxy](https://rndwww.nce.amadeus.net/confluence/pages/viewpage.action?spaceKey=~wherka&title=How+to+setup+your+own+http+proxy)

- [Oprofile](http://oprofile.sourceforge.net/docs/). <http://oprofile.sourceforge.net/docs/>

- [Django](https://www.djangoproject.com/). <https://www.djangoproject.com/>

- [Imagen trabajo futuro](https://duckduckgo.com/?q=mejoras&t=canonical&atb=v123-3&iar=images&iar=images&ia=images&iai=http%3A%2F%2Fwww.actiongroup.com.ar%2Fwp-content%2Fuploads%2F2012%2F03%2Fevento-kaizen-action-group-mejoras-rapidas.png). <https://duckduckgo.com/?q=mejoras&t=canonical&atb=v123-3&iar=images&iar=images&ia=images&iai=http%3A%2F%2Fwww.actiongroup.com.ar%2Fwp-content%2Fuploads%2F2012%2F03%2Fevento-kaizen-action-group-mejoras-rapidas.png>

- [Imagen conclusiones](http://elescapulario.wordpress.com). elescapulario.wordpress.com

Gracias.

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