



# Kata Containers 101





## \$ whoami



**Gloria Palma Gonzalez**  
Cloud DevOps Engineer



@zatoryprivate



**Alvaro Soto Escobar**  
OpenStack Engineer III



@alsotoes

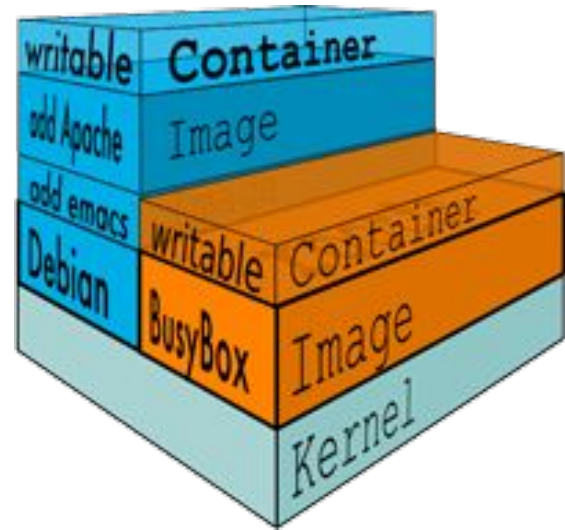


---

# Containers: ¿Qué son?

Un contenedor en Linux es un grupo de uno o más procesos, aislados del sistema operativo.

Comparte los recursos con su host sin embargo no la totalidad de un filesystem.



---

# Containers: ¿En qué ayudan?

La finalidad de todo contenedor es:

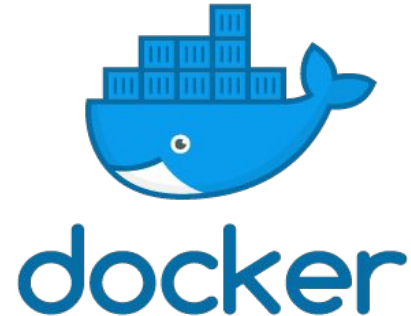
1. Aislar
2. Abstraer
3. Empaquetar

Todo esto en un sistema operativo (host).





## Containers: Algunos casos de uso populares





## Historia del contenedor marítimo

29 Abril, 2016 / 1 Comment / in Comercio exterior, Logística /

## McLean y la caja que cambió el transporte de mercancías

*“Qué fácil sería tomar el camión en sí, su caja,  
y ponerla sobre cubierta”.*



## Containers: ¿Para qué se usan?

Haciendo esta analogía, lo que quería McLean es lo mismo que buscan los containers y toda su amplia oferta de herramientas actualmente.

*Tomar cualquier aplicación y subirla a cubierta (SO).*



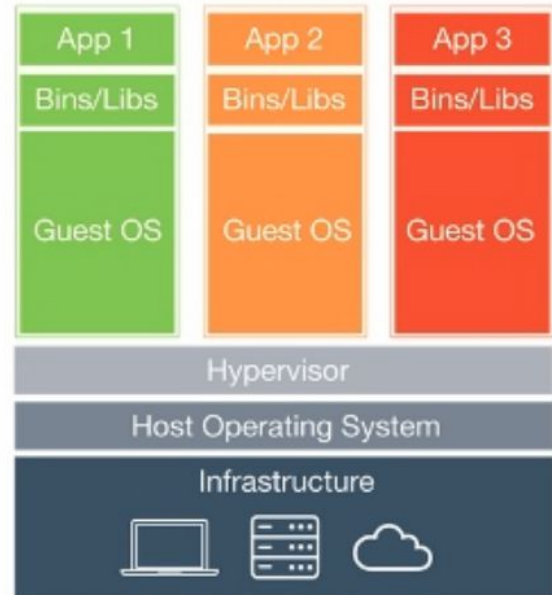
# ¿Kata son containers?

Que nos lo diga Álvaro xD



## Instancias virtuales: qué son?

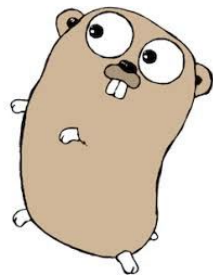
Una máquina virtual es un software que crea una capa independiente donde se emula el funcionamiento de una computadora real con todos los componentes de hardware que necesita para funcionar



# Instancias virtuales: para qué sirven?

Existen diversos **usos para las máquinas virtuales**, pero ya que permiten **emular casi cualquier sistema operativo estándar** (Windows, GNU/Linux, MacOS, Android, etc.), y dado que se ejecutan en una capa de software diferente y totalmente aislada, uno de los usos más frecuentes es el de **probar diferentes sistemas operativos, programas o configuraciones con total seguridad** para tu sistema operativo real ya que, si algo falla en la máquina virtual, este fallo no afectará en absoluto al sistema que la ejecuta.





# Projects & Communities at OSF



OpenStack is an open source software project for creating private and public clouds, powering 60 public cloud data centers and thousands of private clouds at a scale of more than 10 million physical cores worldwide.

[Technical Committee](#)[User Committee](#)

The speed of containers, the security of VMs

Kata Containers is an open source project delivering increased container security and workload isolation through an implementation of lightweight virtual machines.

[Architectural Committee](#)[Working Committee](#)

Stop merging broken code

Zuul is an open source CI/CD platform specializing in gating changes across multiple systems and applications before landing on a single patch.

[About](#)

The Edge Computing Group is a working group comprised of architects and engineers across large enterprises, telecoms and technology vendors working to define and advance edge cloud computing. The focus is open infrastructure technologies, not exclusive to OpenStack.

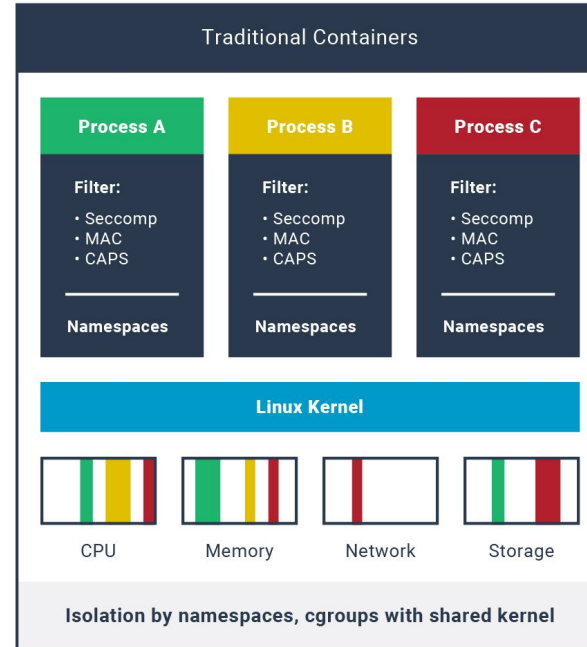
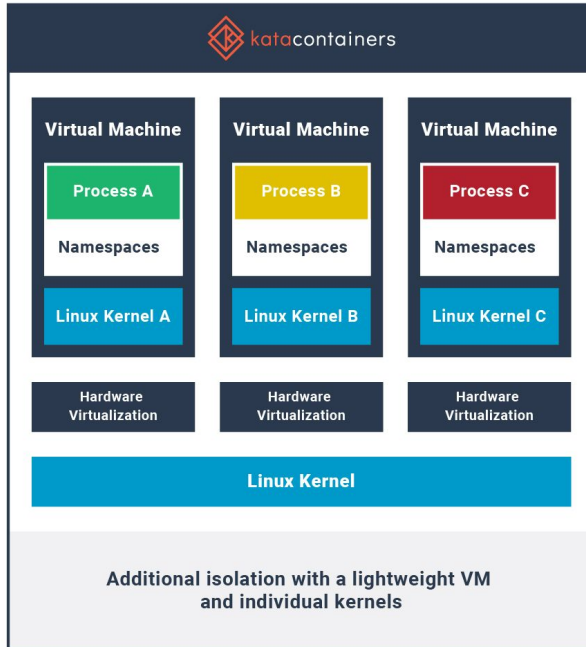
[Edge Whitepaper](#)[Weekly Meetings](#)[Join the Mailing List](#)

Elevate your Infrastructure

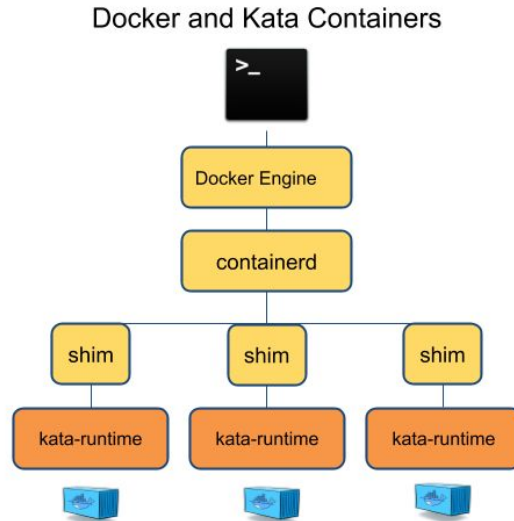
Airship is a collection of interoperable and loosely coupled open source tools that provide for automated cloud provisioning and life cycle management in a completely declarative and predictable way. The focus of this project is the implementation of a declarative platform to introduce OpenStack on Kubernetes, and the lifecycle management of the resulting cloud.

[About](#)

# Kata Containers v/s Containers tradicionales

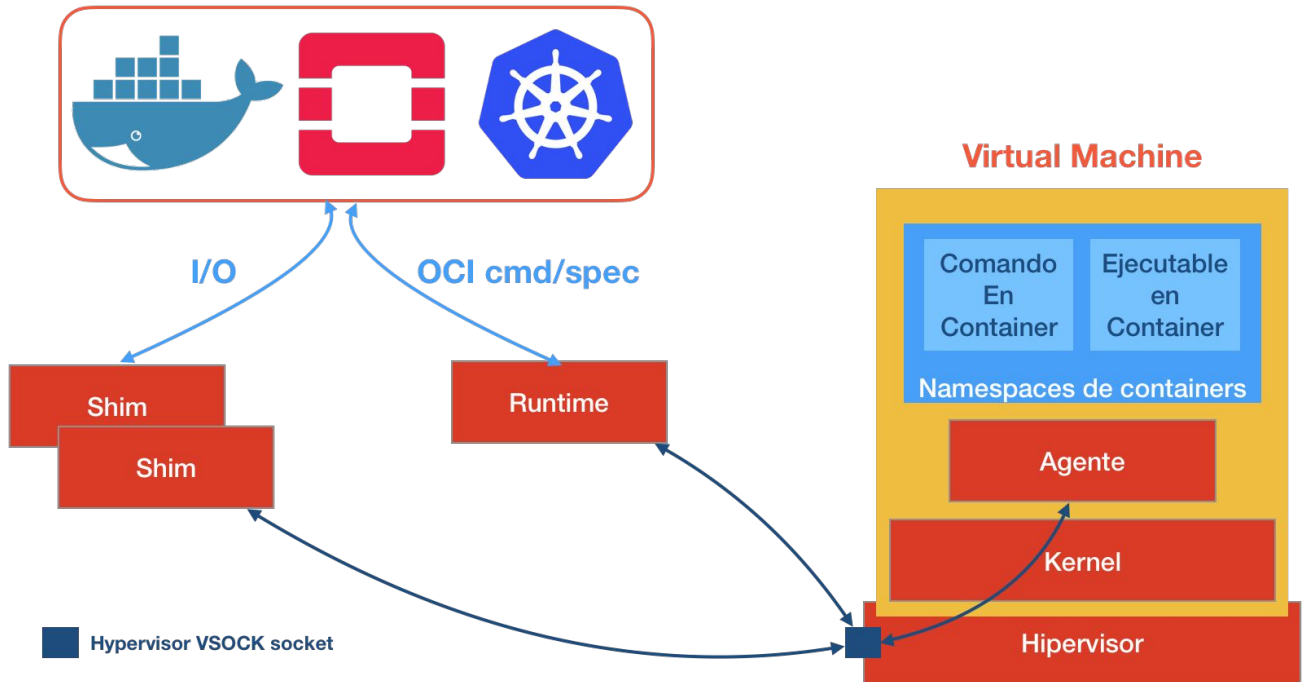


# Kata Containers: resumen de arquitectura



# Kata Containers: componentes

- QEMU Package
- Runtime
- Kernel
- Rootfs Image
- Agent
- Shim
- Proxy





# Kata containers: soporte de plataformas

- [Intel](#) VT-x technology.
- [ARM](#) Hyp mode (virtualization extension).
- [IBM](#) Power Systems.
- [IBM](#) Z mainframes.

```
$ kata-runtime kata-check
```

```
...
```

```
INFO[0000] System is capable of running Kata Containers arch=amd64 name=kata-runtime pid=16225 source=runtime
```





# Kata Containers: kata-env

```
$ kata-runtime kata-env
```

```
Path = "/usr/bin/qemu-vanilla-system-x86_64"
```

```
Path = "/usr/share/kata-containers/kata-containers-image_clearlinux_1.9.0-alpha0_agent_ffd19914b0.img"
```

```
Path = "/usr/share/kata-containers/vmlinuz-4.19.52.45-50.1.container"
```

```
Kernel = "5.2.7-100.fc29.x86_64"
```



# Kata Containers: kernel info

```
[root@lykan ~]# docker run busybox uname -a
```

```
Linux be217ed20c93 4.19.52-50.1.container #1 SMP Thu Jan 1 00:00:00 UTC 1970 x86_64 GNU/Linux
```

```
[root@lykan ~]# docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
b643658d8049	busybox	"top"	21 minutes ago	Up 21 minutes		great_chatterjee
e68a4737645b	busybox	"top"	32 minutes ago	Up 32 minutes		infallible_poincare

# QEMU v/s Docker CVE

## Qemu : Vulnerability Statistics

[Products \(1\)](#)
[Vulnerabilities \(272\)](#)
[Search for prod](#)  
[Vulnerability Feeds & Widgets](#)

### Vulnerability Trends Over Time

Year	# of Vulnerabilities	DoS	Code Execution
<a href="#">2007</a>	1		
<a href="#">2008</a>	6	<a href="#">1</a>	
<a href="#">2009</a>	1		<a href="#">1</a>
<a href="#">2010</a>	1	<a href="#">1</a>	<a href="#">1</a>
<a href="#">2012</a>	7	<a href="#">3</a>	<a href="#">1</a>
<a href="#">2013</a>	4	<a href="#">2</a>	<a href="#">1</a>
<a href="#">2014</a>	36	<a href="#">17</a>	<a href="#">27</a>
<a href="#">2015</a>	11	<a href="#">8</a>	<a href="#">6</a>
<a href="#">2016</a>	91	<a href="#">65</a>	<a href="#">10</a>
<a href="#">2017</a>	65	<a href="#">55</a>	<a href="#">6</a>
<a href="#">2018</a>	36	<a href="#">12</a>	<a href="#">6</a>
<a href="#">2019</a>	13	<a href="#">3</a>	<a href="#">3</a>
<b>Total</b>	272	<a href="#">167</a>	<a href="#">62</a>
<b>% Of All</b>		61.4	22.8

Warning : Vulnerabilities with publish dates before 1999

## Docker » Docker : Vulnerability Statistics

[Vulnerabilities \(22\)](#)
[CVSS Scores Report](#)
[Browse all versions](#)
[Possible matches for this product](#)
[Related Metasploit Modules](#)

[Related OVAL Definitions :](#)
[Vulnerabilities \(0\)](#)
[Patches \(2\)](#)
[Inventory Definitions \(0\)](#)
[Compliance Definitions \(0\)](#)

[Vulnerability Feeds & Widgets](#)

### Vulnerability Trends Over Time

Year	# of Vulnerabilities	DoS	Code Execution	Overflow	Memory Corruption	Sql Injection	XSS	Directory Traversal	Http Response Splitting	Bypass something	Gain Information	Gain Privileges	CSRF	File Inclusion	# of exploits
<a href="#">2014</a>	6		<a href="#">2</a>							<a href="#">1</a>		<a href="#">1</a>			
<a href="#">2015</a>	3										<a href="#">1</a>	<a href="#">1</a>			
<a href="#">2016</a>	2									<a href="#">1</a>		<a href="#">1</a>			
<a href="#">2017</a>	5	<a href="#">2</a>													
<a href="#">2018</a>	2														
<a href="#">2019</a>	4		<a href="#">1</a>					<a href="#">1</a>							
<b>Total</b>	22	<a href="#">2</a>	<a href="#">3</a>					<a href="#">1</a>		<a href="#">2</a>	<a href="#">1</a>	<a href="#">3</a>			
<b>% Of All</b>		9.1	13.6	0.0	0.0	0.0	0.0	4.5	0.0	9.1	4.5	13.6	0.0	0.0	

Warning : Vulnerabilities with publish dates before 1999 are not included in this table and chart. (Because there are not many of them and they make the page look bad; and they may not be actually published in those years)





# How to Get Involved

<https://osf.dev/>

<https://katacontainers.io/>

## Stay in the loop

Join the mailing list:

<http://lists.katacontainers.io> Slack:  
[bit.ly/KataSlack](https://bit.ly/KataSlack) IRC: [#kata-dev](https://irc.katacontainers.io)

## Weekly Architecture Meetings

Updates from the community on a weekly basis.

[View the Etherpad](#)

## Share your story.

Are you running Kata Containers?

Contact us at [info@katacontainers.io](mailto:info@katacontainers.io)



# Kata Containers: Links

Source code:

Kata GitHub: <https://github.com/kata-containers/>

Apache 2 License

Kata documentation: <https://github.com/kata-containers/documentation>

Community:

Slack: <https://katacontainers.slack.com>

IRC: #kata-dev@freenode

E-Mail: [kata-dev@lists.katacontainers.io](mailto:kata-dev@lists.katacontainers.io)