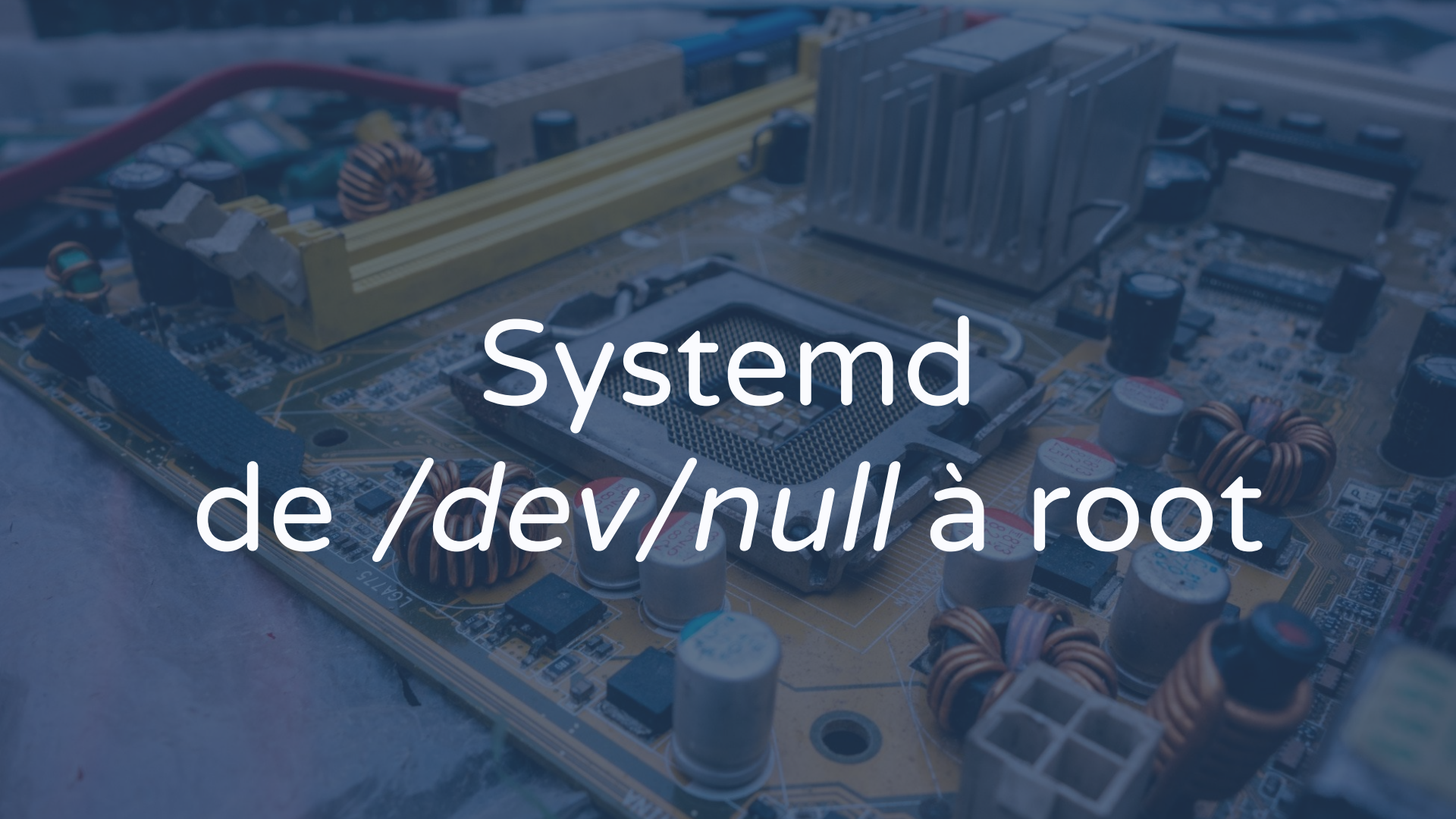

Systemd
de /dev/null à root


I'M SORRY
FOR ALL THE MEMES


Most impressive.


DEVOPS
LIGHTYEAR
DEVOPS EVERYWHERE


YOU BUILD IT
YOU RUN IT


YAML
LIGHTYEAR
YAML EVRYWHERE

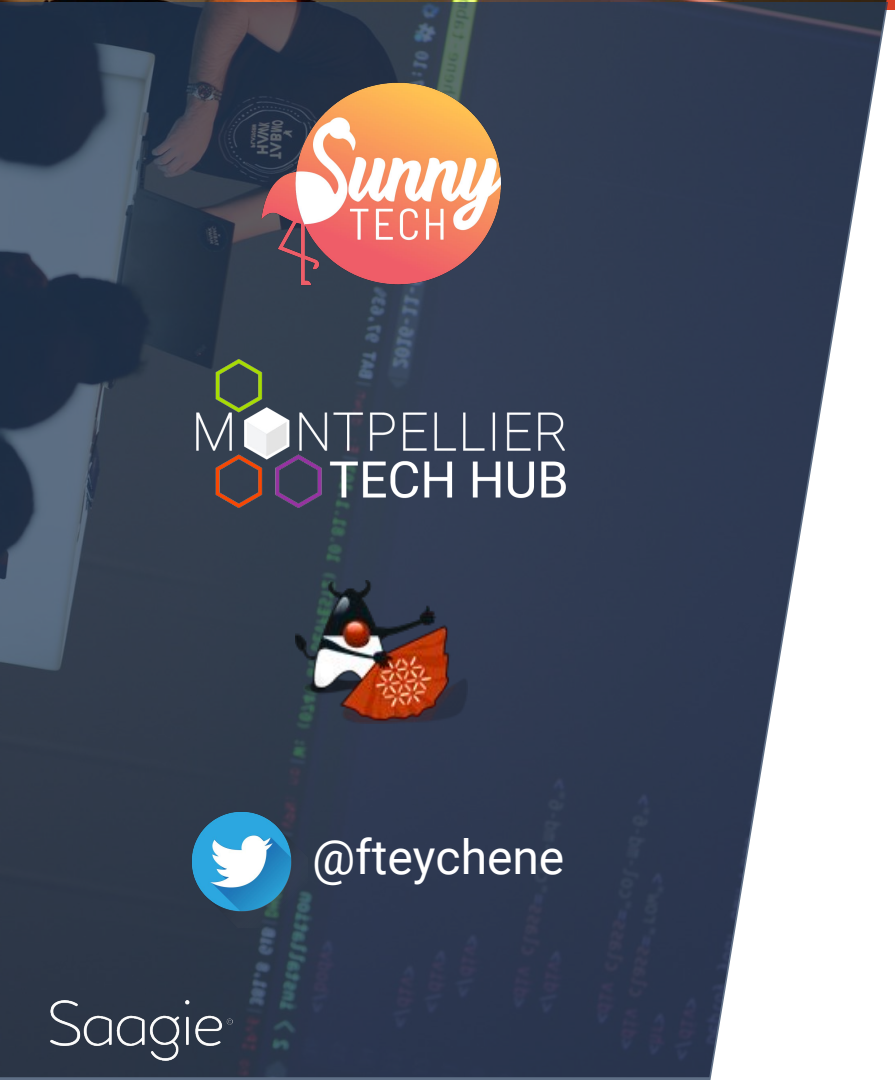

docke


HELP!


SYSTEM
ADMINS


THEMOVIEBIT.COM


PLEASE HELP ME



Sunny TECH

MONTPELLIER TECH HUB

@fteychene

Saagie

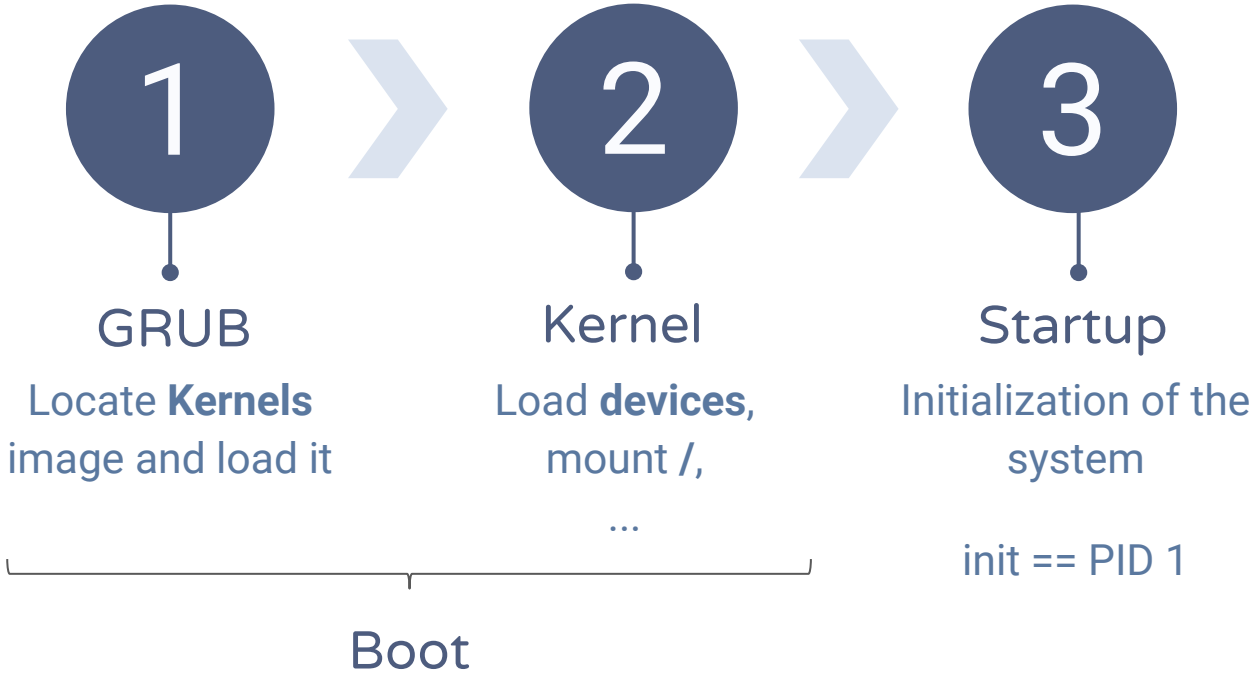
François Teychené

Cloud developer Saagie

N’a pas peur d’utiliser le terme Monad

Delegate execution to the system

PID 1 & System boot



Startup

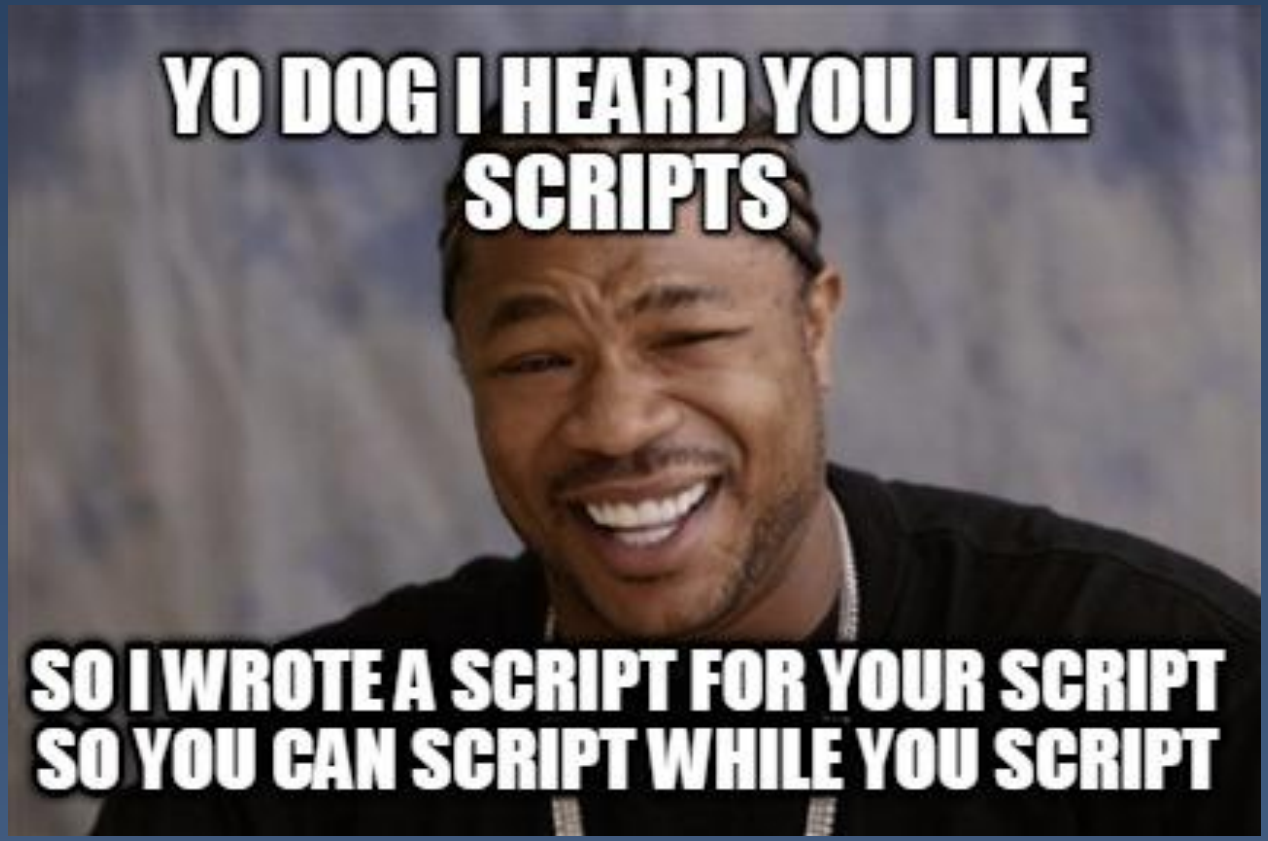
systemd

Choose your hero

Startup

VS

Scripts & “convention”




and??

Everything is manual !

... IN SHELL !!

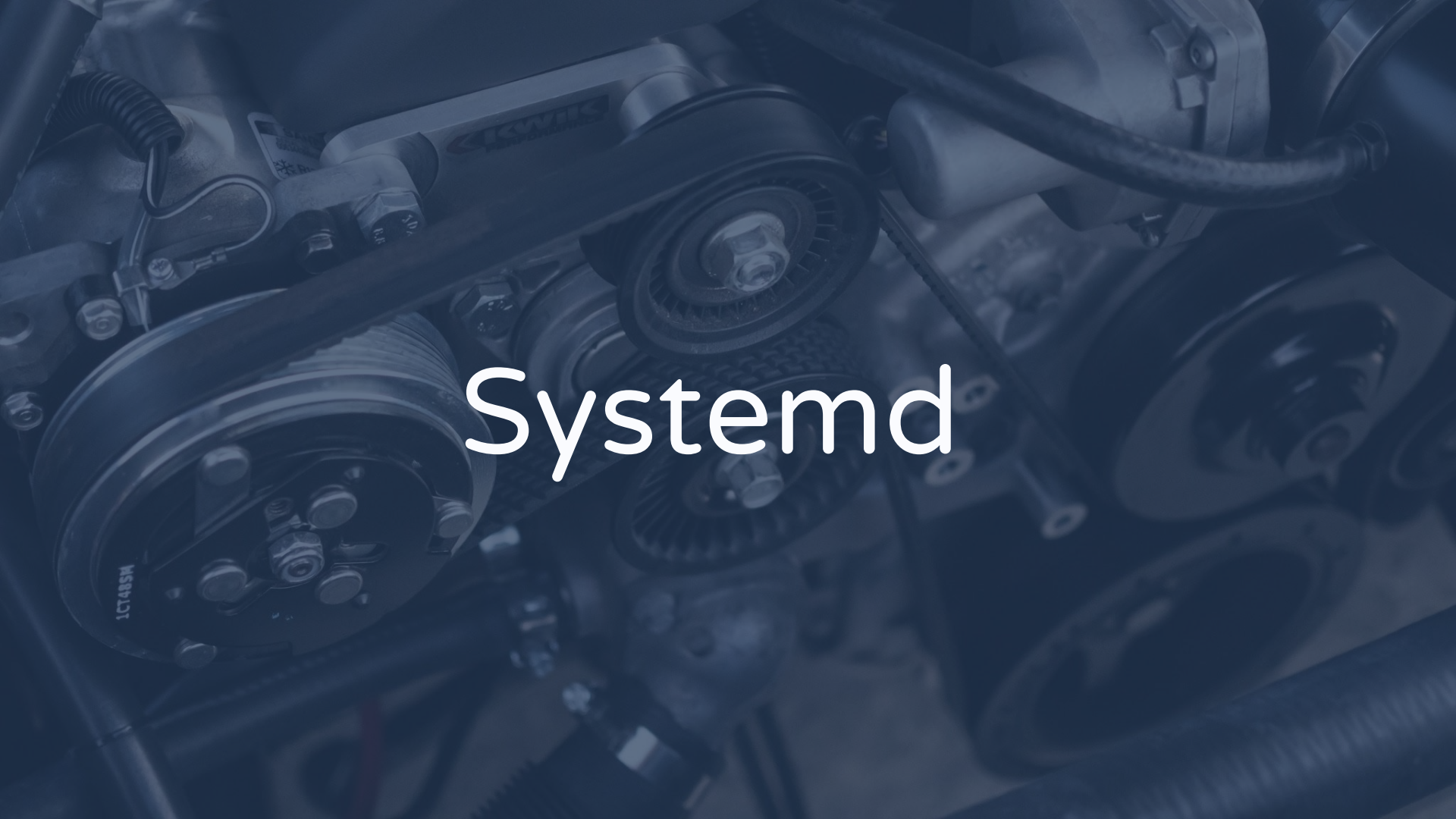
.. AS ROOT !!!

... EVEN PARSING START !!!!


GIFSec.com

Exemple : Gitlab startup*

*Gitlab init.d script - https://gitlab.com/gitlab-org/gitlab-ce/blob/master/lib/support/init.d/gitlab



Systemd

Infos

Releases

30 march 2010

Current Version : 239

Compiled binary

Integrations

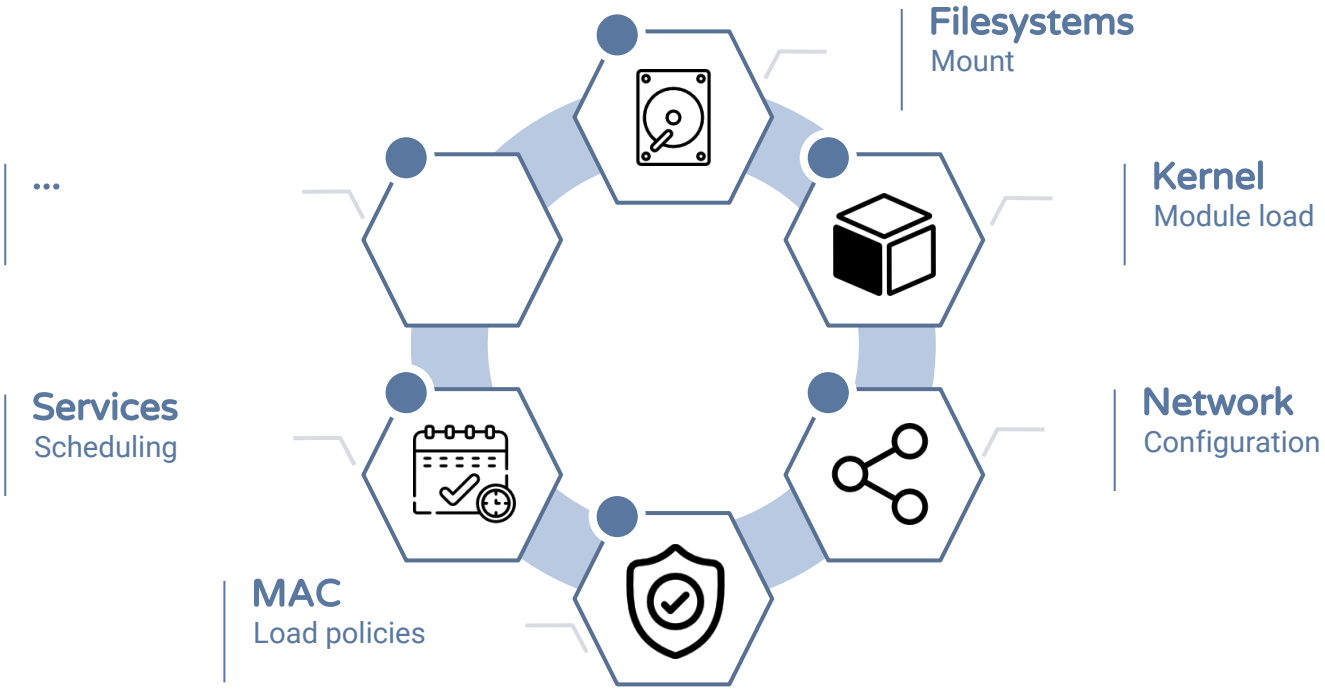
Ubuntu 15.04

CentOs 7

Debian 8


GOOD
NOW YOU HAVE NOWHERE TO HIDE
memegenerator.net

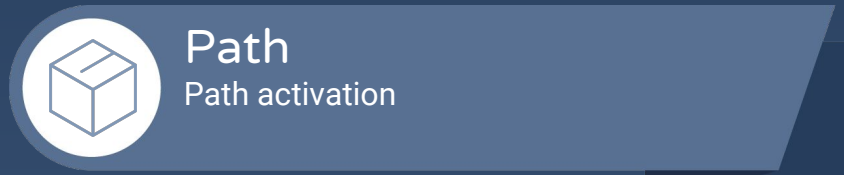
What does it do

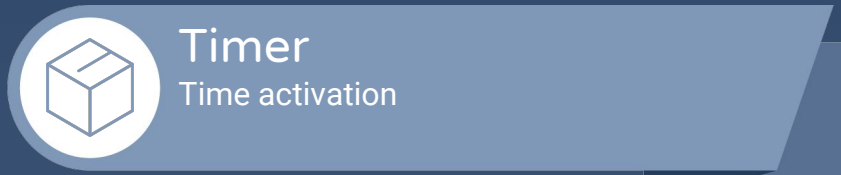


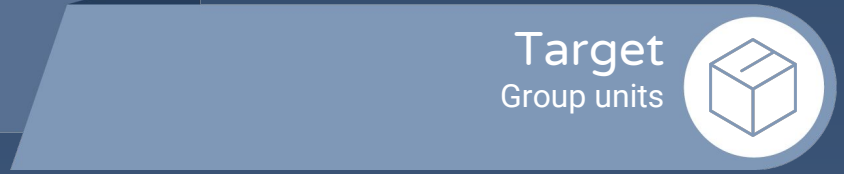
Configuration over scripting

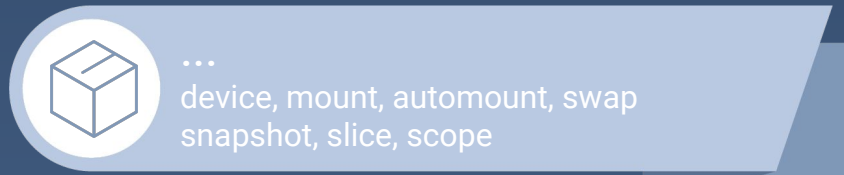
Units

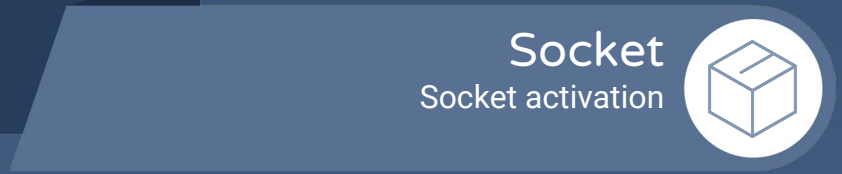

Service
Execution unit


Path
Path activation


Timer
Time activation


Target
Group units


...
device, mount, automount, swap
snapshot, slice, scope


Socket
Socket activation

Service

Service

```
[Unit]
Description="Graphql proxy"
Requires=redis.service
Wants=notify-failed.service
After=redis.service x-install.target
OnFailure=notify-failed@%N

[Service]
Environment=JAVA_HOME=/usr/lib/java8
Environment=ENVIRONMENT=prod

WorkingDirectory=/var/graphql-proxy
Restart=on-failure
RestartSec=4

User=graphql
Group=applications

ExecStart=/var/graphql-proxy/bin/graphql-proxy \
          -Dconfig.file=/var/graphql-proxy/resources/application.prod.conf \
          -Dlogger.file=/var/graphql-proxy/resources/logback.prod.xml \
          -J-javaagent:/usr/local/bin/jolokia.jar=port=7777,host=0.0.0.0
```

Dependencies

```
[Unit]
Description="Graphql proxy"
Requires=redis.service
Wants=notify-failed.service
After=redis.service x-install.target
OnFailure=notify-failed@%N

[Service]
Environment=JAVA_HOME=/usr/lib/java8
Environment=ENVIRONMENT=prod

WorkingDirectory=/var/graphql-proxy
Restart=on-failure
RestartSec=4

User=graphql
Group=applications

ExecStart=/var/graphql-proxy/bin/graphql-proxy \
          -Dconfig.file=/var/graphql-proxy/resources/application.prod.conf \
          -Dlogger.file=/var/graphql-proxy/resources/logback.prod.xml \
          -J-javaagent:/usr/local/bin/jolokia.jar=port=7777,host=0.0.0.0
```

Configuration

```
[Unit]
Description="Graphql proxy"
Requires=redis.service
Wants=notify-failed.service
After=redis.service x-install.target
OnFailure=notify-failed@%N

[Service]
Environment=JAVA_HOME=/usr/lib/java8
Environment=ENVIRONMENT=prod

WorkingDirectory=/var/graphql-proxy
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RestartSec=4

User=graphql
Group=applications

ExecStart=/var/graphql-proxy/bin/graphql-proxy \
          -Dconfig.file=/var/graphql-proxy/resources/application.prod.conf \
          -Dlogger.file=/var/graphql-proxy/resources/logback.prod.xml \
          -J-javaagent:/usr/local/bin/jolokia.jar=port=7777,host=0.0.0.0
```

Failure management

```
[Unit]
Description="Graphql proxy"
Requires=redis.service
Wants=notify-failed.service
After=redis.service x-install.target
OnFailure=notify-failed@%N

[Service]
Environment=JAVA_HOME=/usr/lib/java8
Environment=ENVIRONMENT=prod

WorkingDirectory=/var/graphql-proxy
Restart=on-failure
RestartSec=4

User=graphql
Group=applications

ExecStart=/var/graphql-proxy/bin/graphql-proxy \
          -Dconfig.file=/var/graphql-proxy/resources/application.prod.conf \
          -Dlogger.file=/var/graphql-proxy/resources/logback.prod.xml \
          -J-javaagent:/usr/local/bin/jolokia.jar=port=7777,host=0.0.0.0
```

```
RestartSec=...
TimeoutStartSec=...
TimeoutStopSec=...
RestartPreventExitStatus=...
RestartForceExitStatus=...
```

Execution

```
[Unit]
Description="Graphql proxy"
Requires=redis.service
Wants=notify-failed.service
After=redis.service x-install.target
OnFailure=notify-failed@%N

[Service]
Environment=JAVA_HOME=/usr/lib/java8
Environment=ENVIRONMENT=prod

WorkingDirectory=/var/graphql-proxy
Restart=on-failure
RestartSec=4

User=graphql
Group=applications

ExecStart=/var/graphql-proxy/bin/graphql-proxy \
          -Dconfig.file=/var/graphql-proxy/resources/application.prod.conf \
          -Dlogger.file=/var/graphql-proxy/resources/logback.prod.xml \
          -J-javaagent:/usr/local/bin/jolokia.jar=port=7777,host=0.0.0.0
```

```
ExecStartPre=...
ExecStartPost=...
ExecReload=...
ExecStop=...
ExecStopPost=...
PIDFile=...
```

Moar dependencies

unit.wants folder

Symbolic link to other unit = Wants configuration

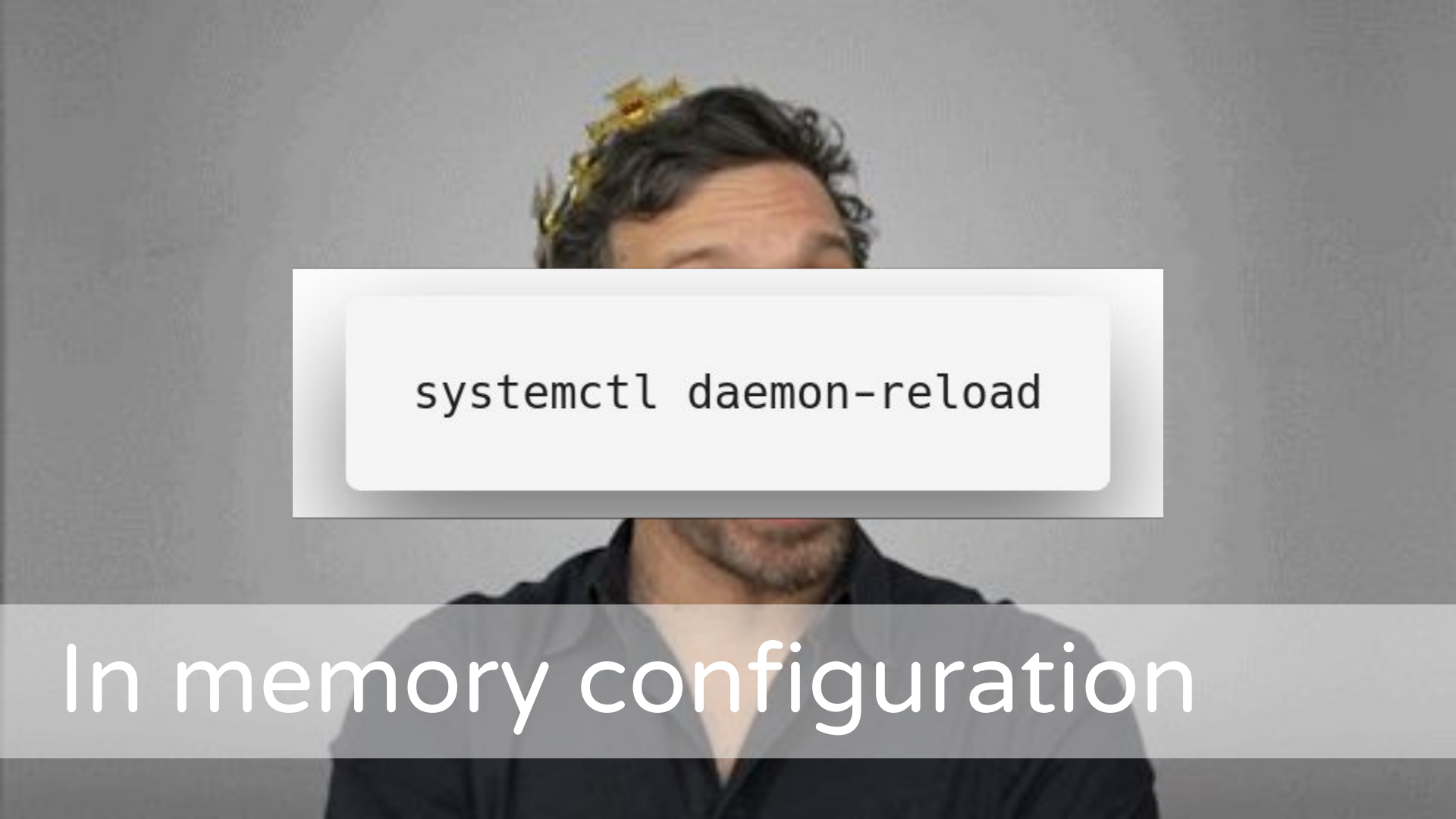
Also exist for Requires

Base commands

```
systemctl --all

systemctl --all -t service

systemctl start ...

systemctl status ...

systemctl stop ...
```

Enable/Disable

```
systemctl enable # Activate on boot

systemctl disable # Disable on boot

systemctl mask # Desactivate unit in systemd

systemctl unmask # Activate unit on systemd
```



In memory configuration

Only daemons ?

No, of course

simple (default)

forking

oneshot

dbus

notify

idle

Install service

/lib/systemd/system

Server service installation

Packages default installation

/etc/systemd/system

Override by system administrator

Override lib installation

Partial override

/lib/systemd/system/nginx.service

```
[Unit]
Description=A high performance web server and a reverse proxy server
Documentation=man:nginx(8)
After=network.target

[Service]
Type=forking
PIDFile=/run/nginx.pid
ExecStartPre=/usr/sbin/nginx -t -q -g 'daemon on; master_process on;'
ExecStart=/usr/sbin/nginx -g 'daemon on; master_process on;'
ExecReload=/usr/sbin/nginx -g 'daemon on; master_process on;' -s reload
ExecStop=-/sbin/start-stop-daemon --quiet --stop --retry QUIT/5 --pidfile /run/nginx.pid
TimeoutStopSec=5
KillMode=mixed

[Install]
WantedBy=multi-user.target
```

/etc/systemd/system/nginx.service

```
[Service]
ExecStart=/usr/sbin/nginx -c /var/test.conf -g 'daemon on; master_process on;'
```


FUUUUSION... HA!

Why use systemd

Standard

Based on **standard** and not only on good behavior

Declarative

Configuration by **configuration files** that can be validated

Portable

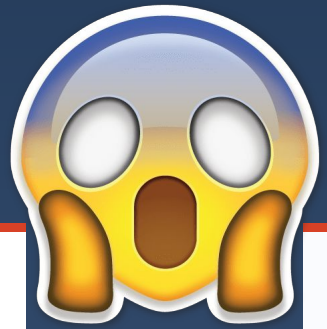
Systemd configuration files can be deployed on all **distro**

Extensible

Override by configuration and positioning


MORE!

Systemd for user



System

Setup system

Global

User

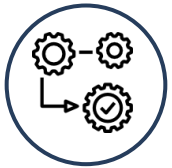
Instance for user

Scoping for user
~/.local/share/systemd/user
~/.config/systemd/user

systemctl --user ...

Templates !

Templating



/run/systemd/system

Runtime generated units

xxx@.service

Instance configuration

%i / %I specifiers

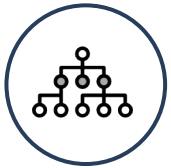
start vpn@saagie.service

Logging

```
journalctl # All logs

journalctl -u nginx.service # Specific unit logs

journalctl --since yesterday # Logs since yesterday

journalctl -f -u nginx.service # Live logs

journalctl /usr/bin/dbus-daemon # Logs from a speficic binary
```

Other units

Target



Group units

Manage a group of unit as one

Easy dependency management

/etc/systemd/system/enterprise.target

```
[Unit]
Description=My enterprise boot target
Requires=multi-user.target
Wants=custom-configuration.service
Conflicts=rescue.service rescue.target
After=multi-user.target rescue.service rescue.target
```

```
/etc/systemd/system/enterprise.target.wants/:
total 8.0K
drwxr-xr-x  2 root root 4.0K Nov  4 21:20 .
drwxr-xr-x 15 root root 4.0K Nov  4 21:18 ..
lrwxrwxrwx  1 root root   33 Nov  4 21:20 nginx.service -> /etc/systemd/system/nginx.service
```

Path

Activate on path

Activate on filesystem notify

React on configuration, ...

/etc/systemd/system/nginx-reload.path

```
[Unit]
Description=Nginx configuration reload
[Path]
PathModified=/etc/nginx/sites-enabled
```

/etc/systemd/system/nginx-reload.service

```
[Unit]
Description=Nginx configuration reload
[Service]
ExecStart=/usr/sbin/nginx -s reload
```

Socket

Activate on socket

Activate on socket call

/etc/systemd/system/metrics.socket

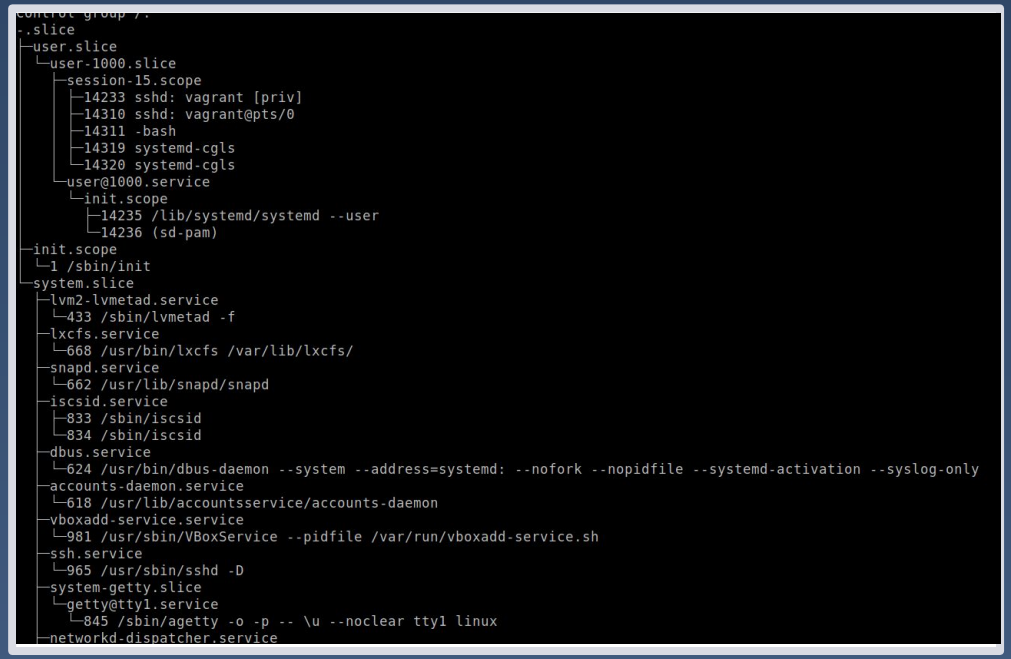
```
[Unit]
Description=Streaming service activation on socket

[Socket]
ListenStream=/run/metrics.sk

[Install]
WantedBy=sockets.target
```


WELCOME TO OUR GROUP
LEAVING IS NOT AN OPTION
imgflip.com

Slices
CGroups

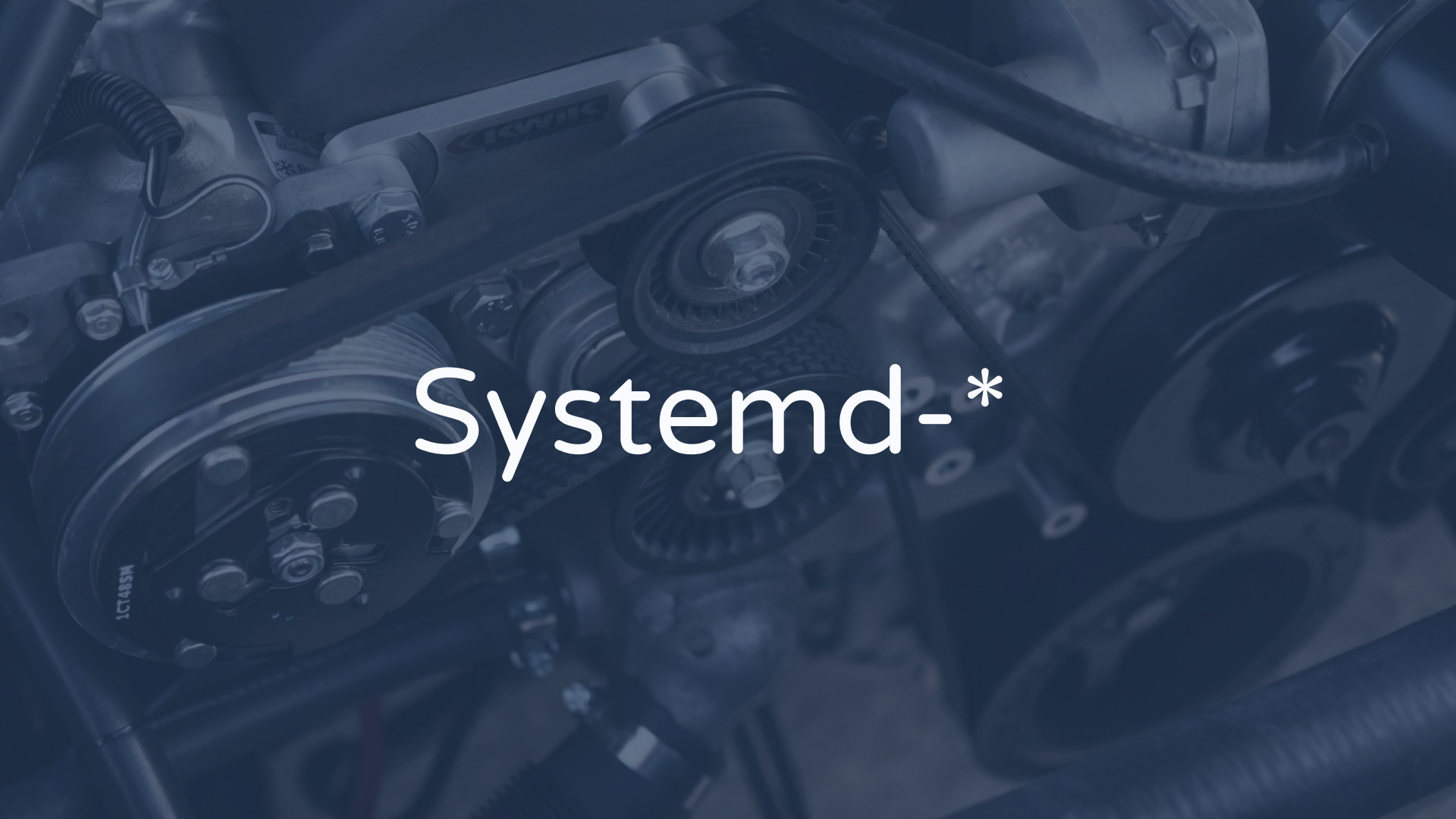
Tag unit in Cgroups

Resource limitation (Maybe)



Saagie

device, mount, automount, swap, snapshot, scope


Systemd-*

systemd-analyze

Analyse & debug system manager

systemd-analyse

```
systemd-analyze time # kernel & user space boot time

systemd-analyze blame # prints all running units ordered by init time

systemd-analyze dot # generate unit dependency graph

systemd-analyze verify # load & check a unit
```

systemd-cgls

Show control group content

systemd-cgtop

Top control group for their resource usage

systemd-cat

Send output to journald

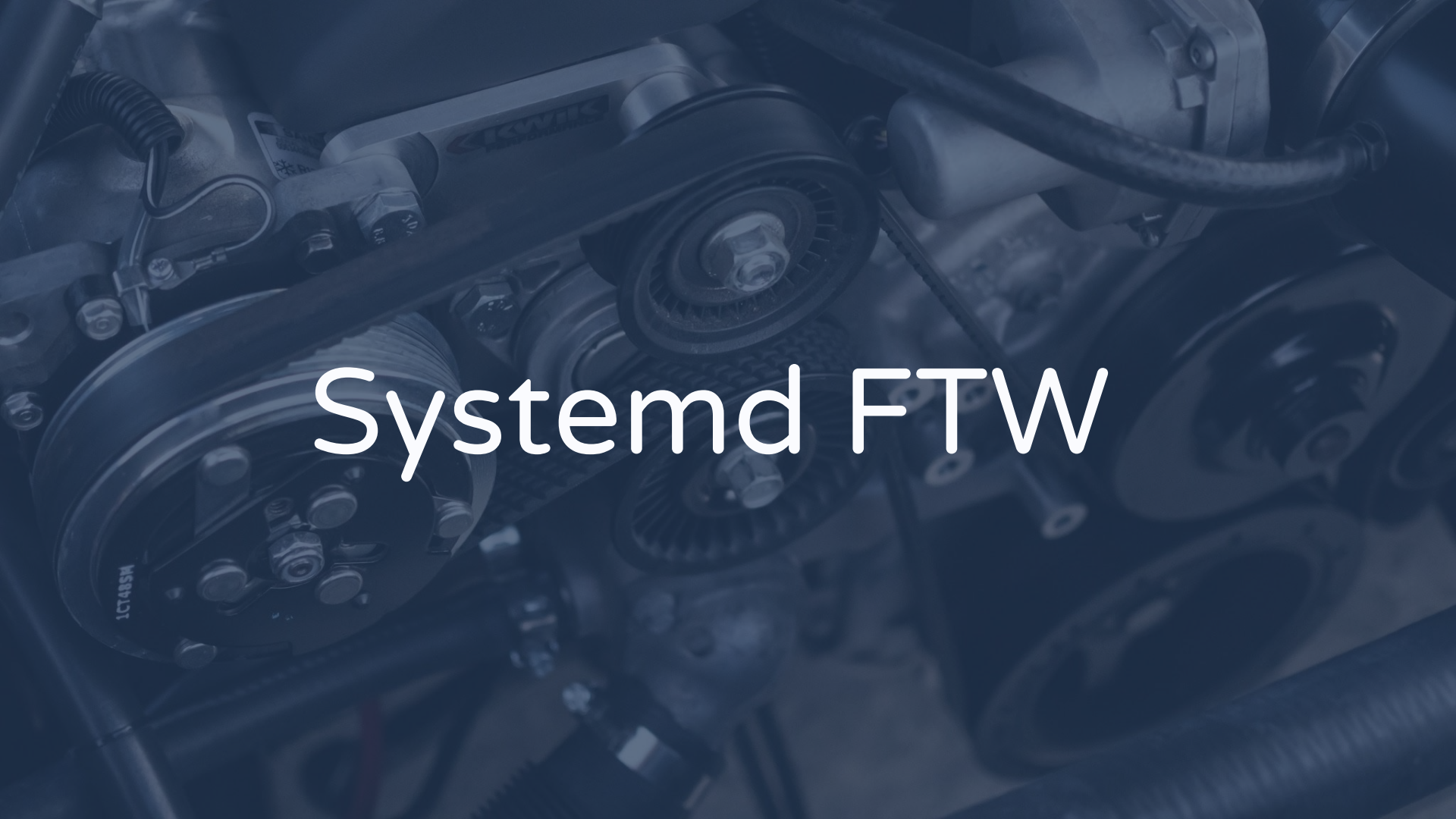
systemd-run

Run programs in transient scope units

systemd-ask-password, systemd-delta, systemd-detect-virt, systemd-escape, systemd-hwdb, systemd-inhibit, systemd-machine-id-setup, systemd-notify, systemd-path, systemd-resolve, systemd-stdio-bridge, systemd-tmpfiles, ...

systemd-nspawn

Run containers


Systemd FTW

More to discover

Devoxx university

man

Saagie©

@fteychene