

CRIU Introduction

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Introduce CRIU



What's CRIU

Checkpoint/Restore In Userspace, or CRIU (pronounced kree-oo, IPA: /kriʊ/, Russian: криу), is a software tool for Linux operating system. Using this tool, you can freeze a running application (or part of it) and checkpoint it to a hard drive as a collection of files. You can then use the files to restore and run the application from the point it was frozen at. The distinctive feature of the CRIU project is that it is mainly implemented in user space.

https://criu.org/Main_Page

Introduce CRIU

CRIU usage scenarios

- Live migration
- Load balance
- High availability
- ...

Introduce CRIU

What cannot be checkpointed

- Dumped with special option
 - External resources
 - File locks
 - Invisible files
- Cannot be dumped (yet)
 - Devices
 - Tasks with debugger attached
 - Task from a different user (for non-root)
 - Task running in compat mode (x86-64)
 - Sockets other than TCP, UDP, UNIX, packet and netlink
 - Packetized pipes
 - Cork-ed UDP sockets
 - Files sent over unix sockets
 - Half-opened UNIX connections
 - SysVIPC memory segment w/o IPC namespace

Introduce CRIU

CRIU support in major distro

- Fedora/Debian/Ubuntu/Gentoo/OpenSUSE/Arch/...
- RHEL 7.2 Tech Preview

CRIU Architecture support

- x86_64, Intel/AMD
- PPC64LE, IBM Power 8
- ARM, AARCH64

https://criu.org/Comparison_to_other_CR_projects

CRIU x Container

- Application use various network, filesystem, cgroups, etc.
- Baremetal OS env is too complicated
- Containerized application are isolated with the rest of OS/Applications
- Containerized applications need similar KVM live migration technology

CRIU Demo

- Checkpoint/Restore application on Baremetal OS
- Checkpoint/Restore application with cgroup
- Checkpoint/Restore LXC container
- Checkpoint/Restore Docker/runc container

Containerized App support status

- Top 10 Applications

- dnsmasq
- httpd
- vsftpd
- sendmail
- tomcat
- mongo
- mysql
- mariadb
- postgres
- oracle

Container support status

- LXC
- Docker
- runc

Enterprise Linux support

- RHEL
- SUSE
- Ubuntu

Q & A