



SISTEMAS
OPERATIVOS ➤

PROYECTO FINAL NETDATA

JULIO ANTHONY ENGELS RUIZ COTO - 1284719

1) ¿QUÉ ES NETDATA Y PARA QUÉ SIRVE, CUÁLES SON SUS PRINCIPALES CARACTERÍSTICAS?

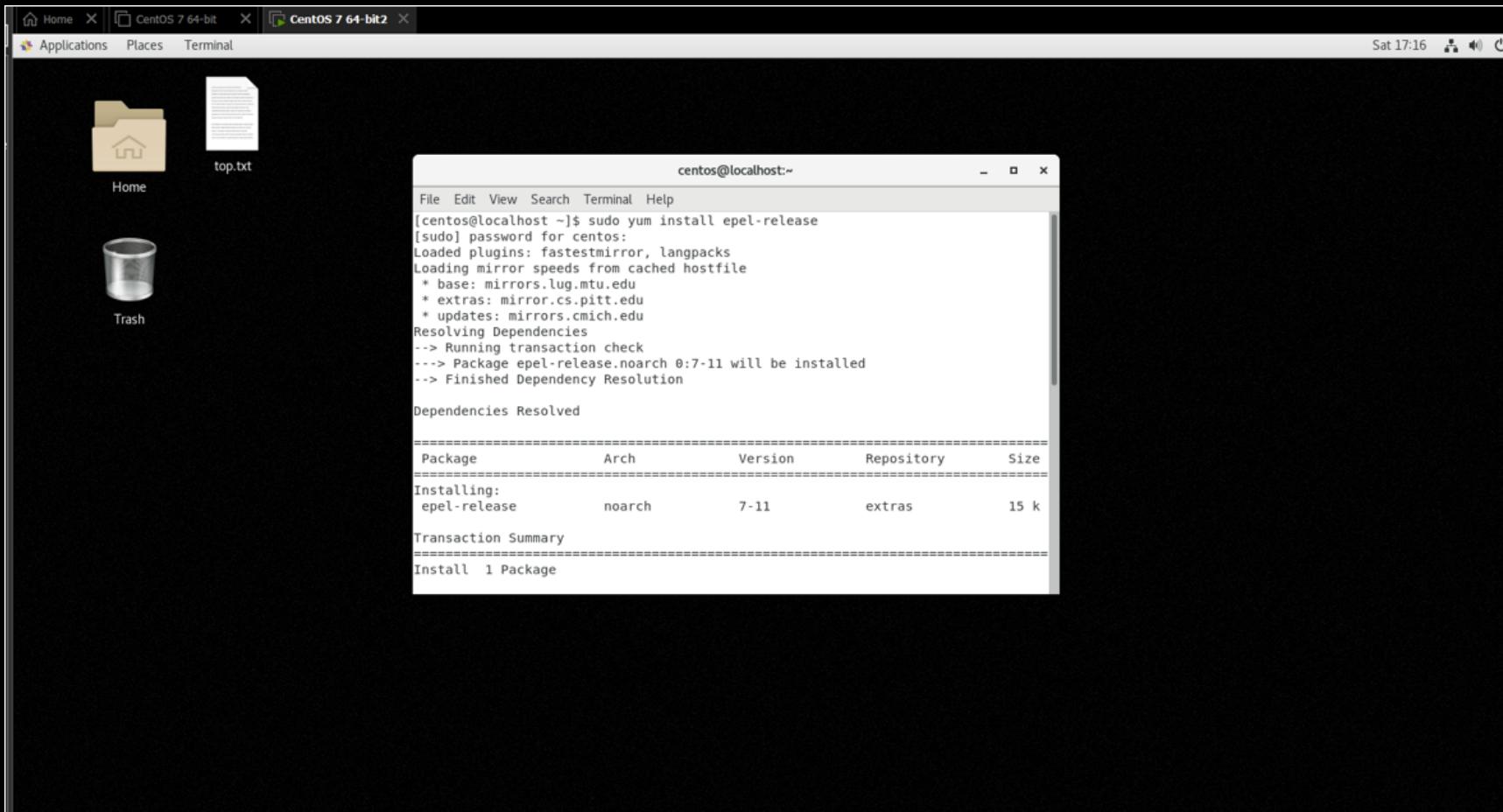
Para comenzar NETDATA es una interfaz de monitoreo en tiempo real, la cual es de código abierto y de alta eficiencia, su diseño presenta la visualización y soluciones a problemas de rendimiento. Sus principales características que posee incluyen, actualizaciones en milisegundos, bajo consumo de recursos, amplia compatibilidad, personalización de paneles y alertas y extensibilidad mediante plugins e integraciones con otros sistemas de monitoreo.

2) ¿QUÉ PODEMOS MONITOREAR CON NETDATA?

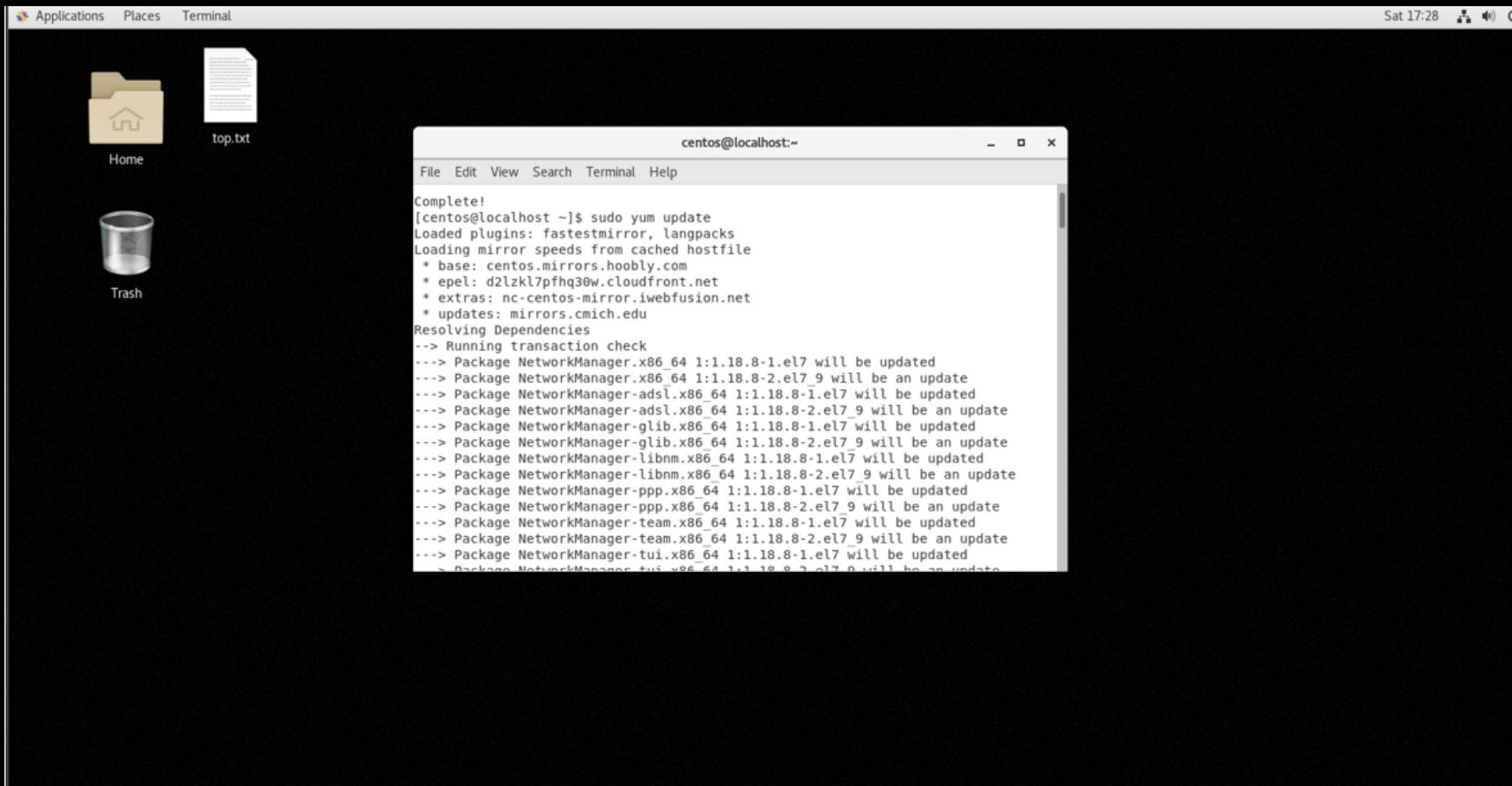
Con esta herramienta podemos monitorear las siguientes métricas: métricas de contenedores y máquinas virtuales, métricas personalizadas mediante plugins e integraciones de terceros, métricas de hardware como las de temperatura, velocidades del ventilador y voltajes, así también se puede monitorear componentes del sistema y aplicaciones como: uso de CPU, disco, memoria, y el ancho de banda de red, Rendimiento y estado de aplicaciones y servicios, como las bases de datos, los servidores web, y los servidores de correo electrónico.

MÉTRICAS NETDATA

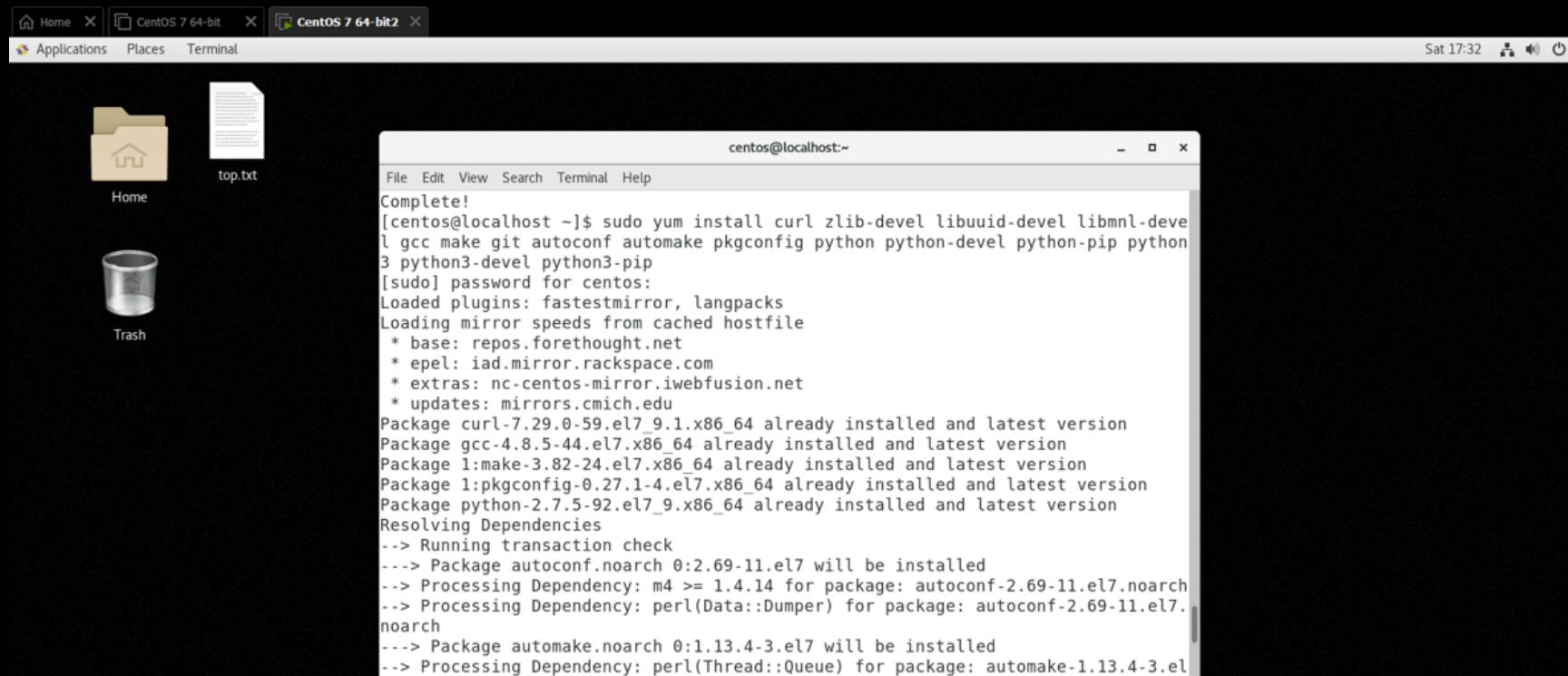
Instalación de dependencias necesarias para instalar NETDATA.



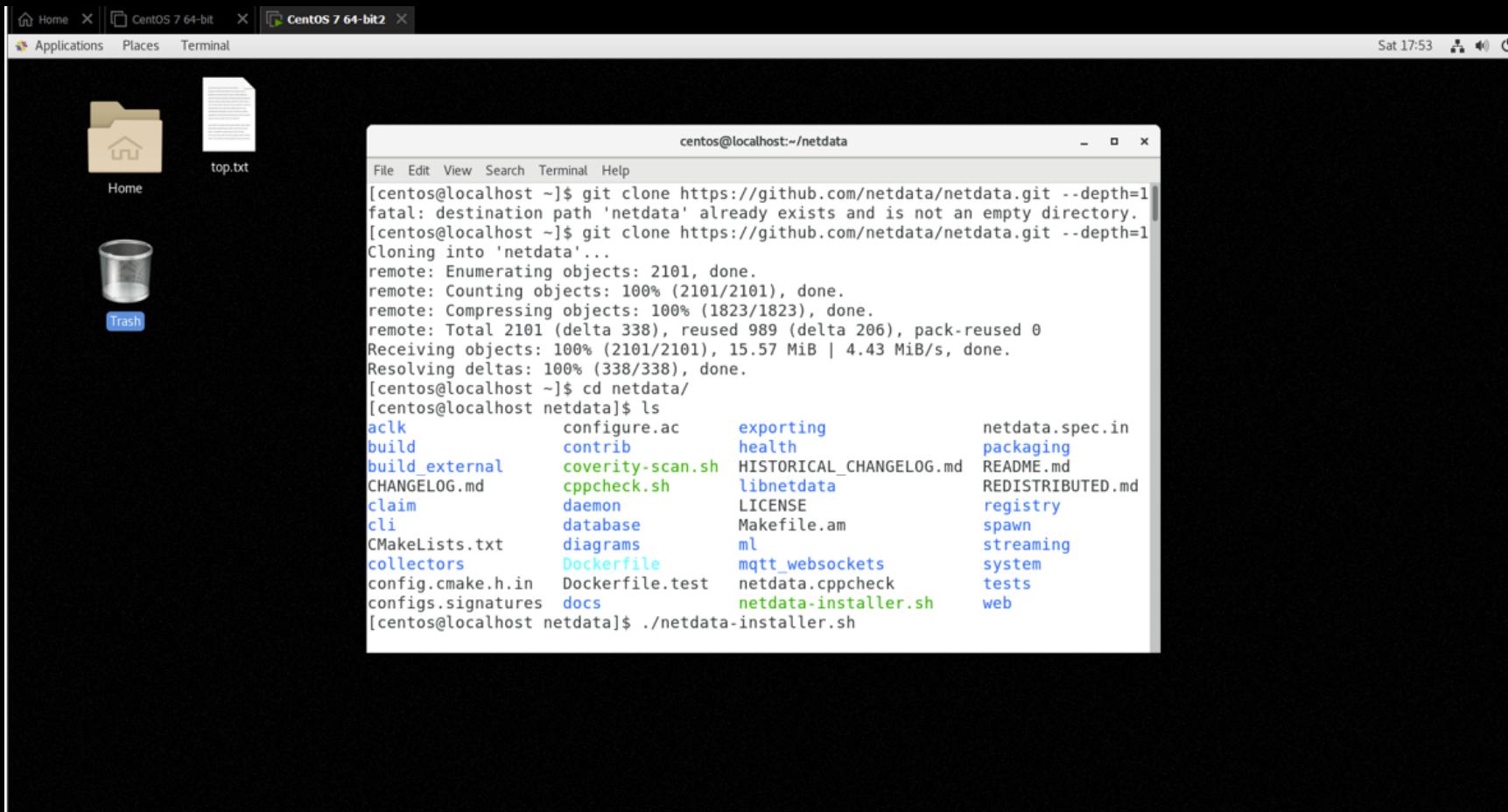
Actualización de dependencias necesarias para instalar NETDATA.



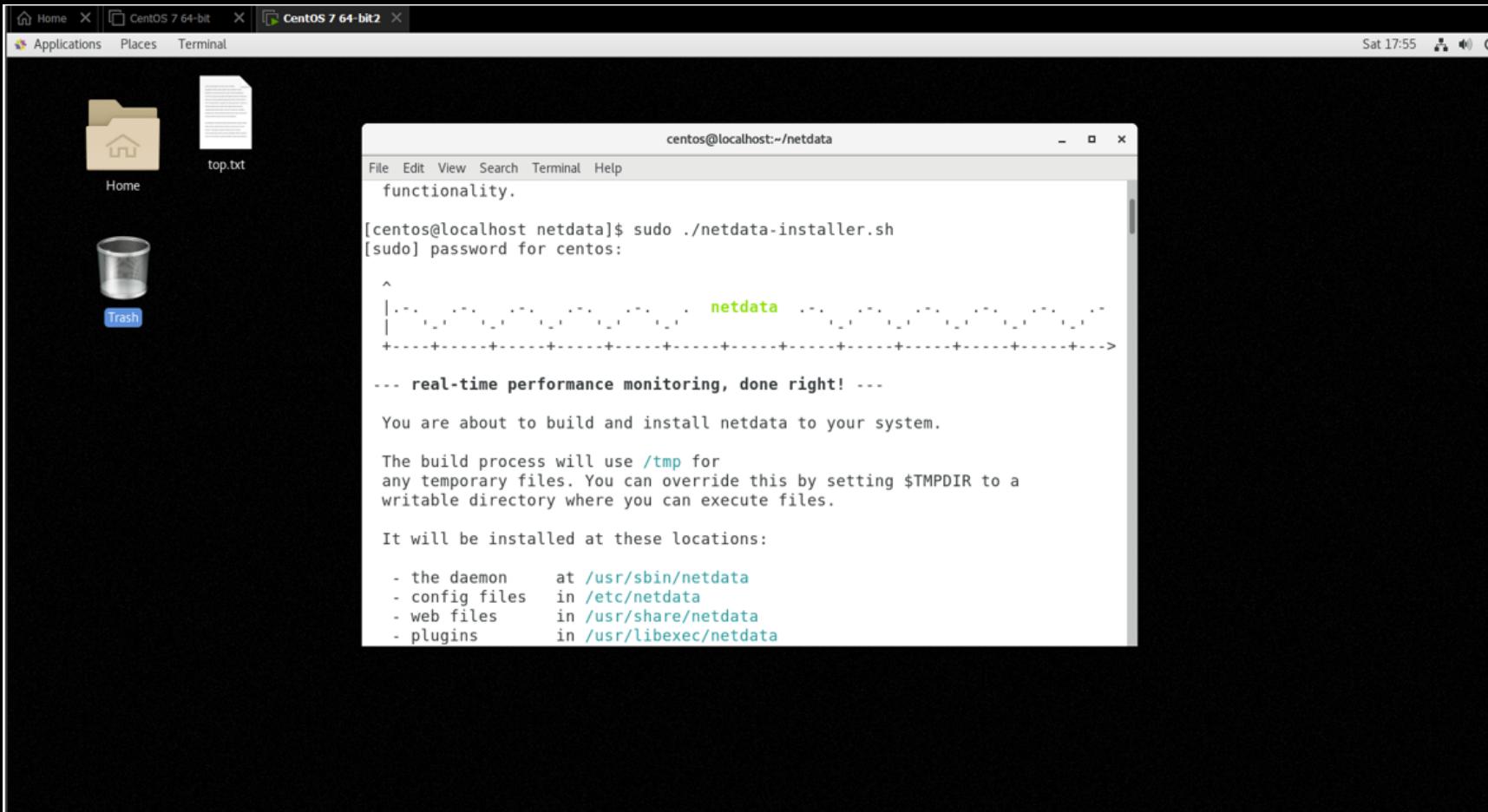
Instalación de dependencias de Python necesarias para instalar NETDATA.



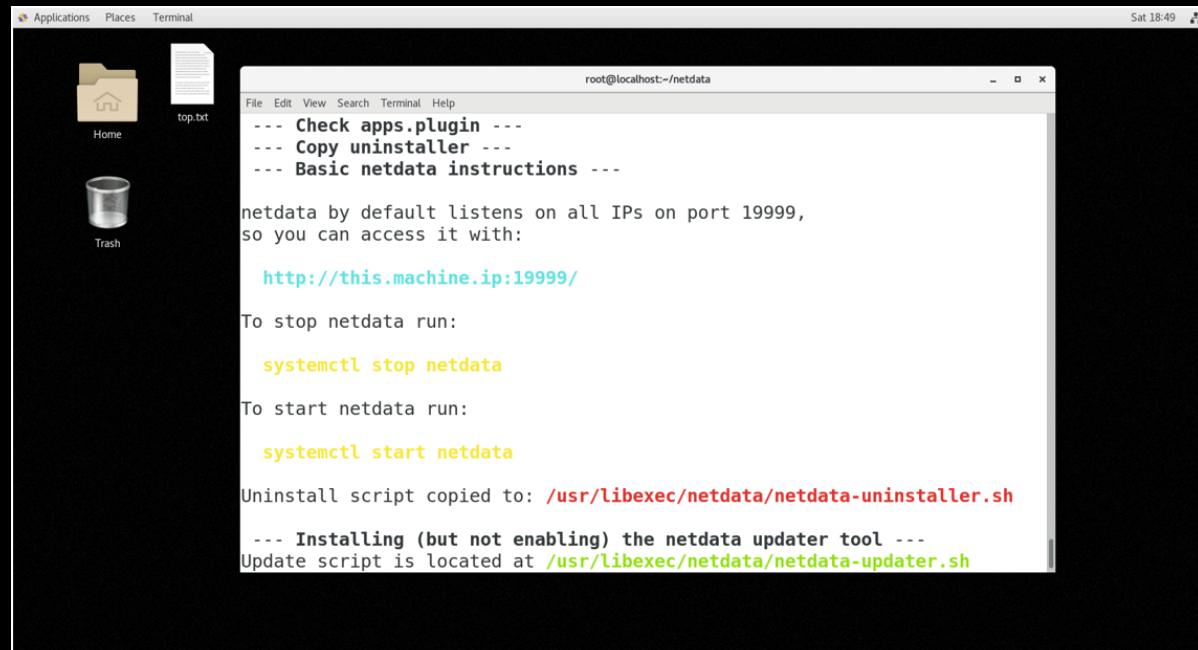
Clonación del repositorio de Github, carpeta de instalación NETDATA.



Ejecutando el instalador de NETDATA.



Herramienta NETDATA instalada con éxito, y dirección del puerto IPs.



root@localhost:~/netdata

```
File Edit View Search Terminal Help
--- Check apps.plugin ---
--- Copy uninstaller ---
--- Basic netdata instructions ---

netdata by default listens on all IPs on port 19999,
so you can access it with:

http://this.machine.ip:19999/

To stop netdata run:

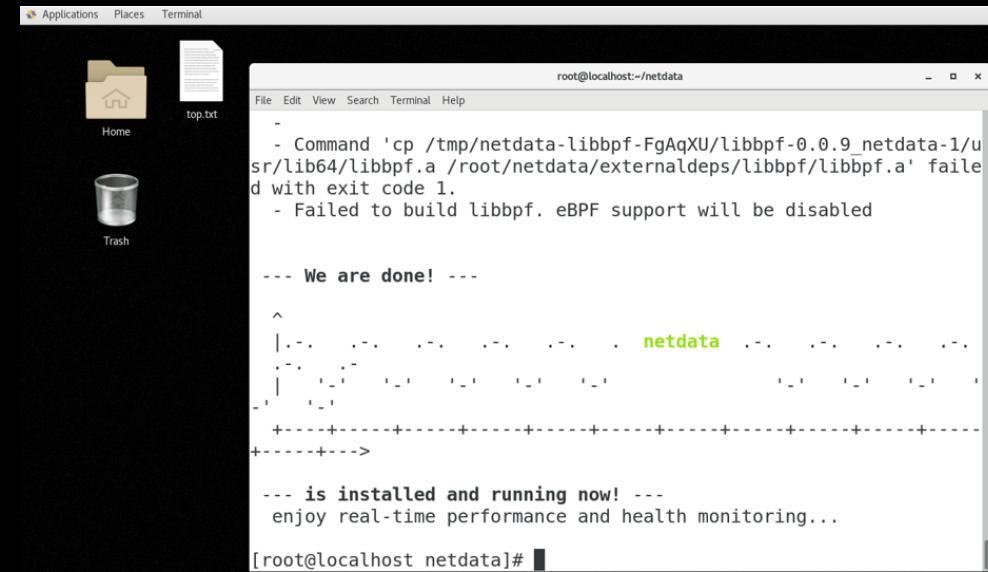
  systemctl stop netdata

To start netdata run:

  systemctl start netdata

Uninstall script copied to: /usr/libexec/netdata/netdata-uninstaller.sh

--- Installing (but not enabling) the netdata updater tool ---
Update script is located at /usr/libexec/netdata/netdata-updater.sh
```



Sat 18:49

root@localhost:~/netdata

```
File Edit View Search Terminal Help
-
- Command 'cp /tmp/netdata-libbpf-FgAqXU/libbpf-0.0.9_netdata-1/usr/lib64/libbpf.a /root/netdata/externaldeps/libbpf/libbpf.a' failed with exit code 1.
- Failed to build libbpf. eBPF support will be disabled

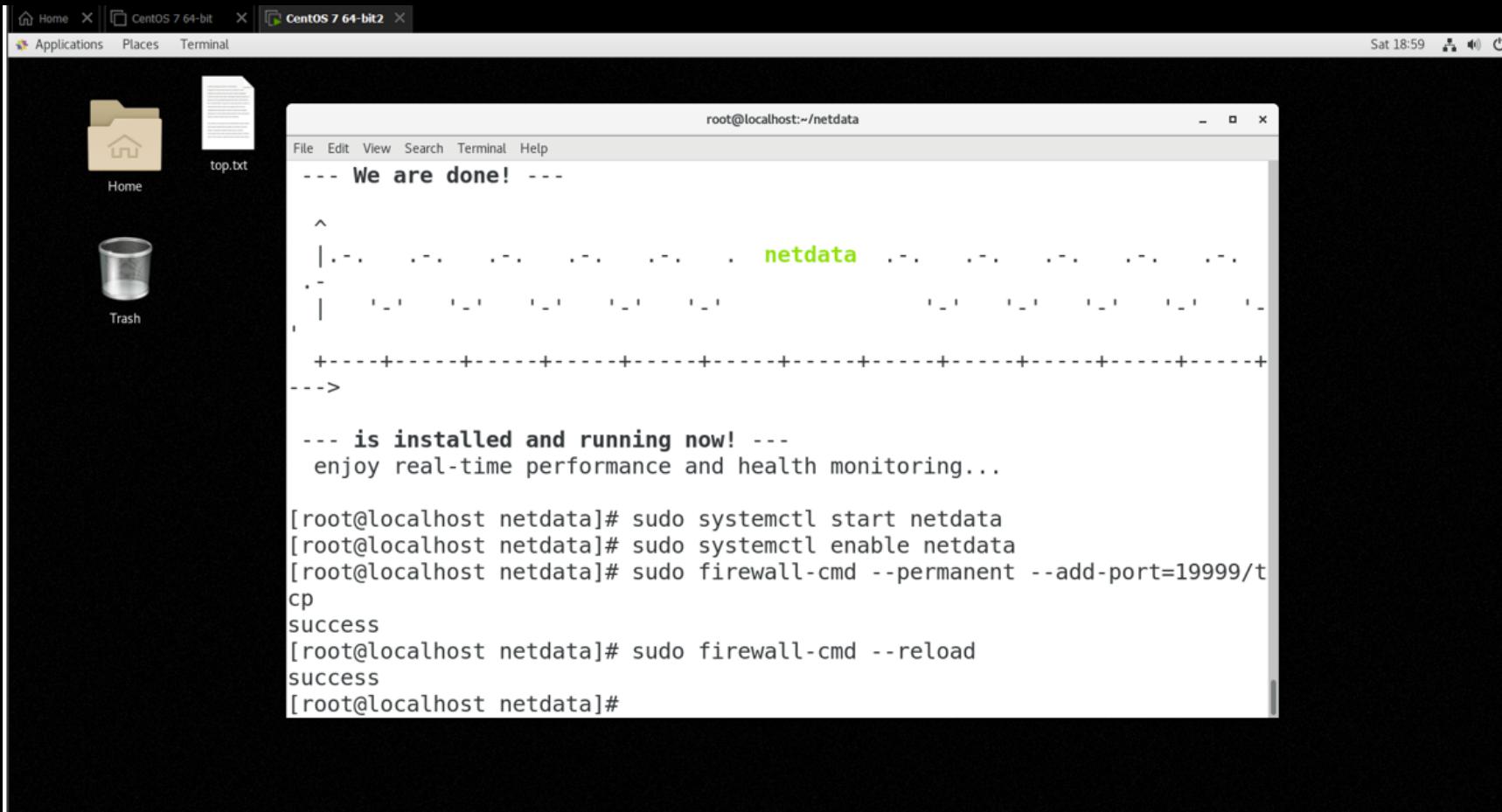
--- We are done! ---

^
| .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-->

--- is installed and running now! ---
enjoy real-time performance and health monitoring...

[root@localhost netdata]#
```

Habilitando NETDATA para inicio automático en el inicio del sistema, y configurando Firewall para acceso del puerto 19999 (puerto de NETDATA).



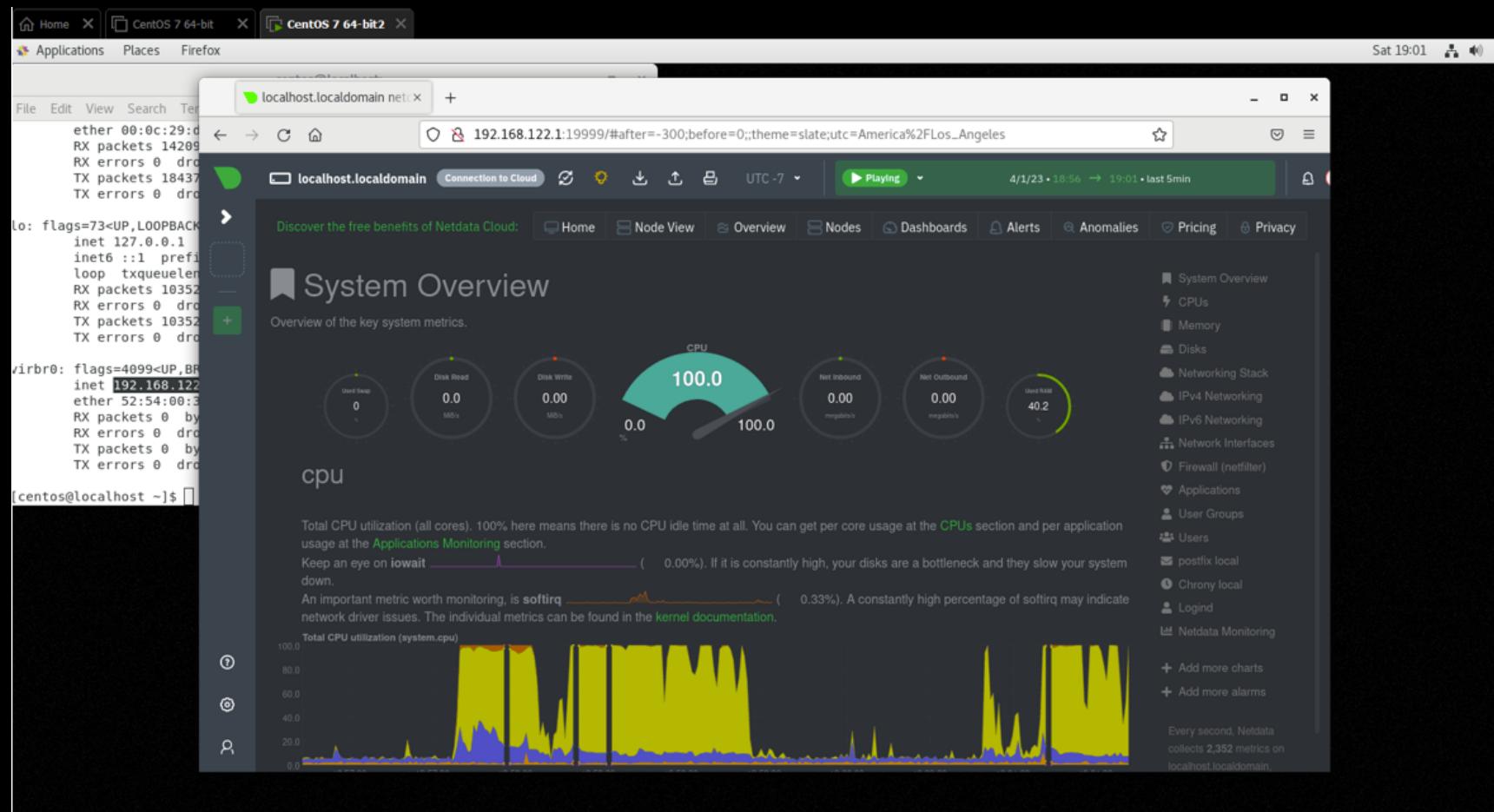
The screenshot shows a desktop environment for CentOS 7 64-bit. The desktop icons include Home, top.txt, and Trash. A terminal window titled "CentOS 7 64-bit2" is open, showing the following text:

```
root@localhost:~/netdata
File Edit View Search Terminal Help
--- We are done! ---
^
|... . . . . . . . . . . . . . . . . . . . . .
|   ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '
+-----+-----+-----+-----+-----+-----+-----+
-->

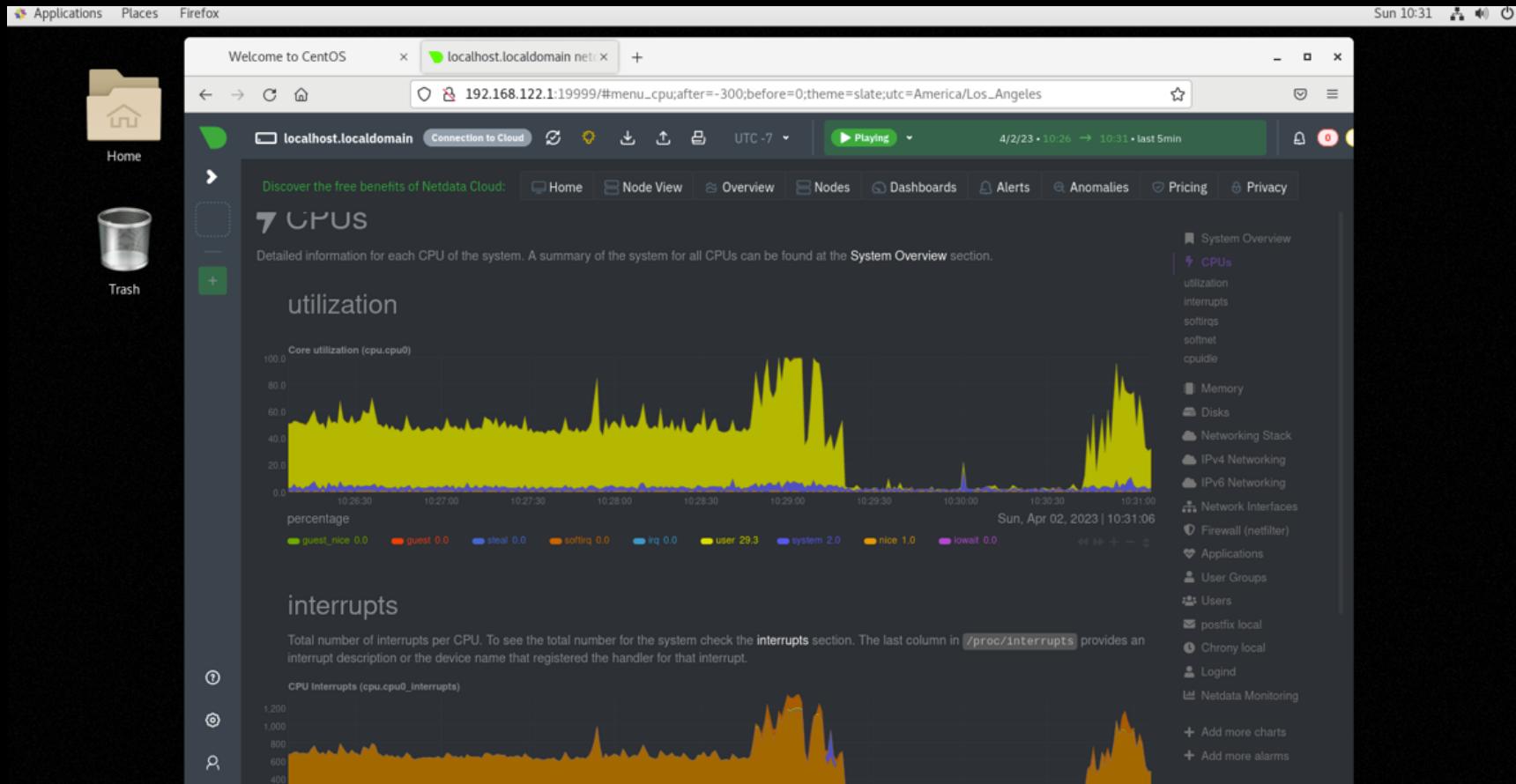
--- is installed and running now! ---
enjoy real-time performance and health monitoring...

[root@localhost netdata]# sudo systemctl start netdata
[root@localhost netdata]# sudo systemctl enable netdata
[root@localhost netdata]# sudo firewall-cmd --permanent --add-port=19999/tcp
success
[root@localhost netdata]# sudo firewall-cmd --reload
success
[root@localhost netdata]#
```

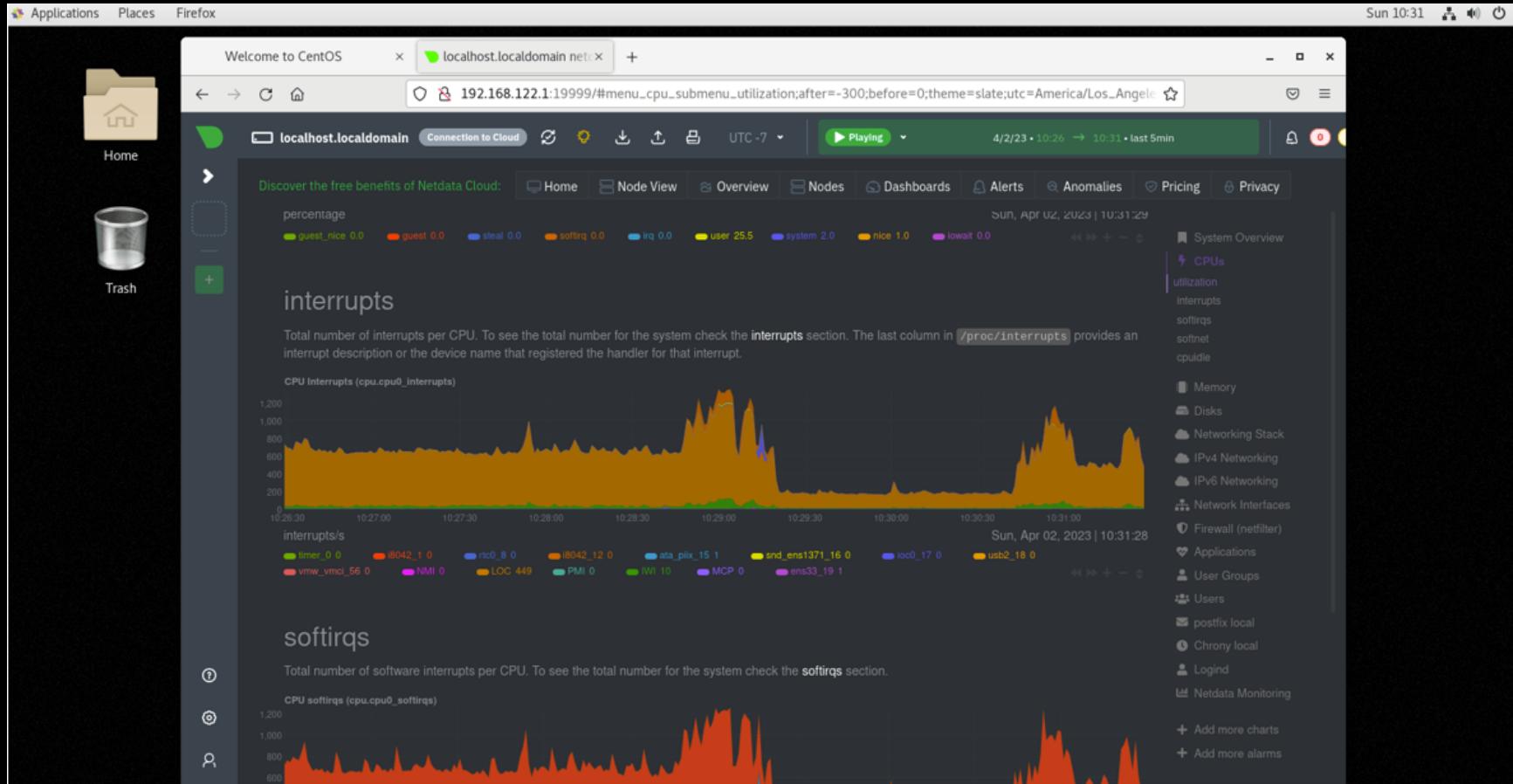
Accediendo a NETDATA desde cualquier navegador utilizando la dirección IP del servidor CentOS 7 y el puerto 19999:



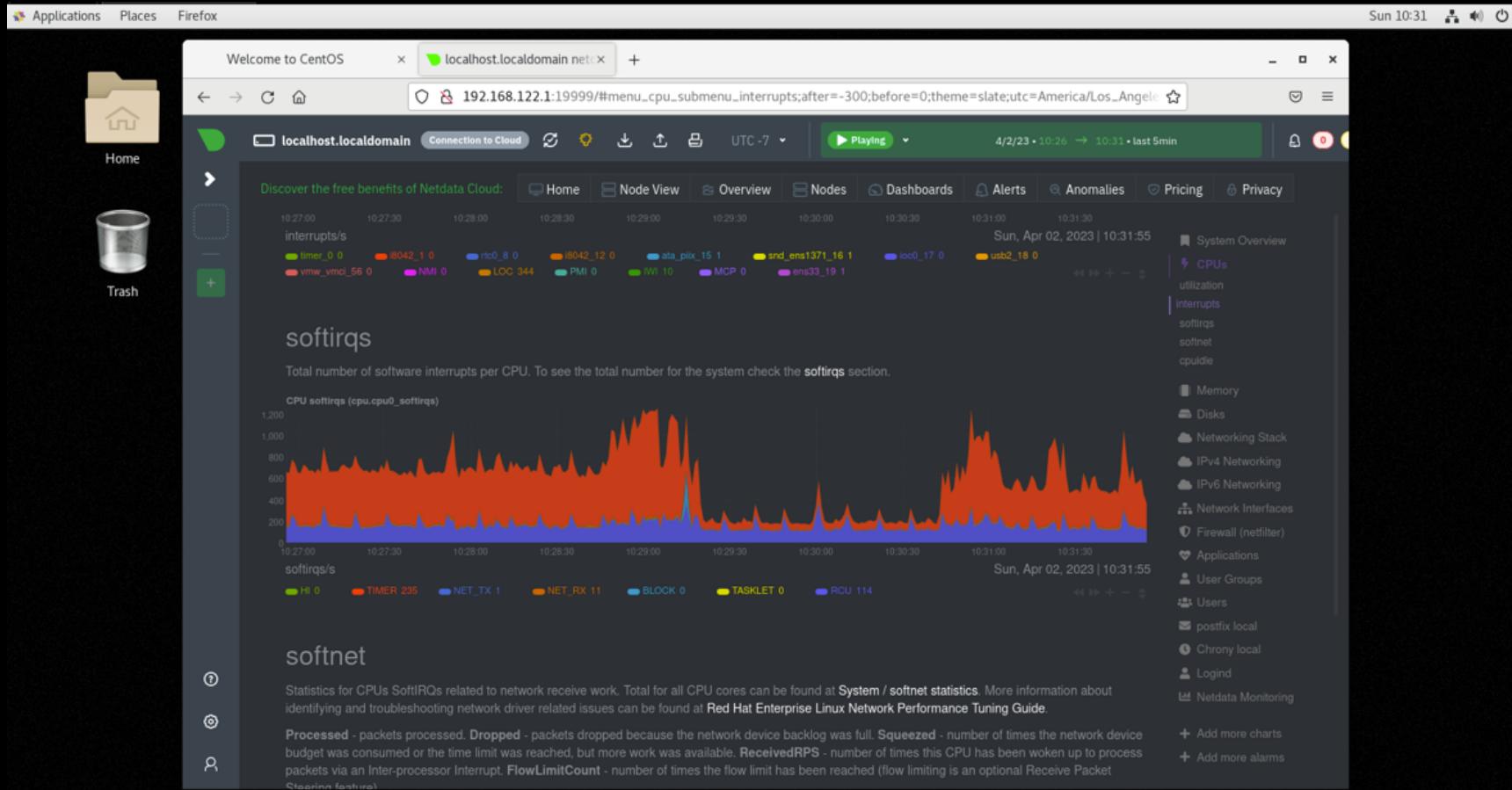
MÉTRICA CPU UTILIZATION



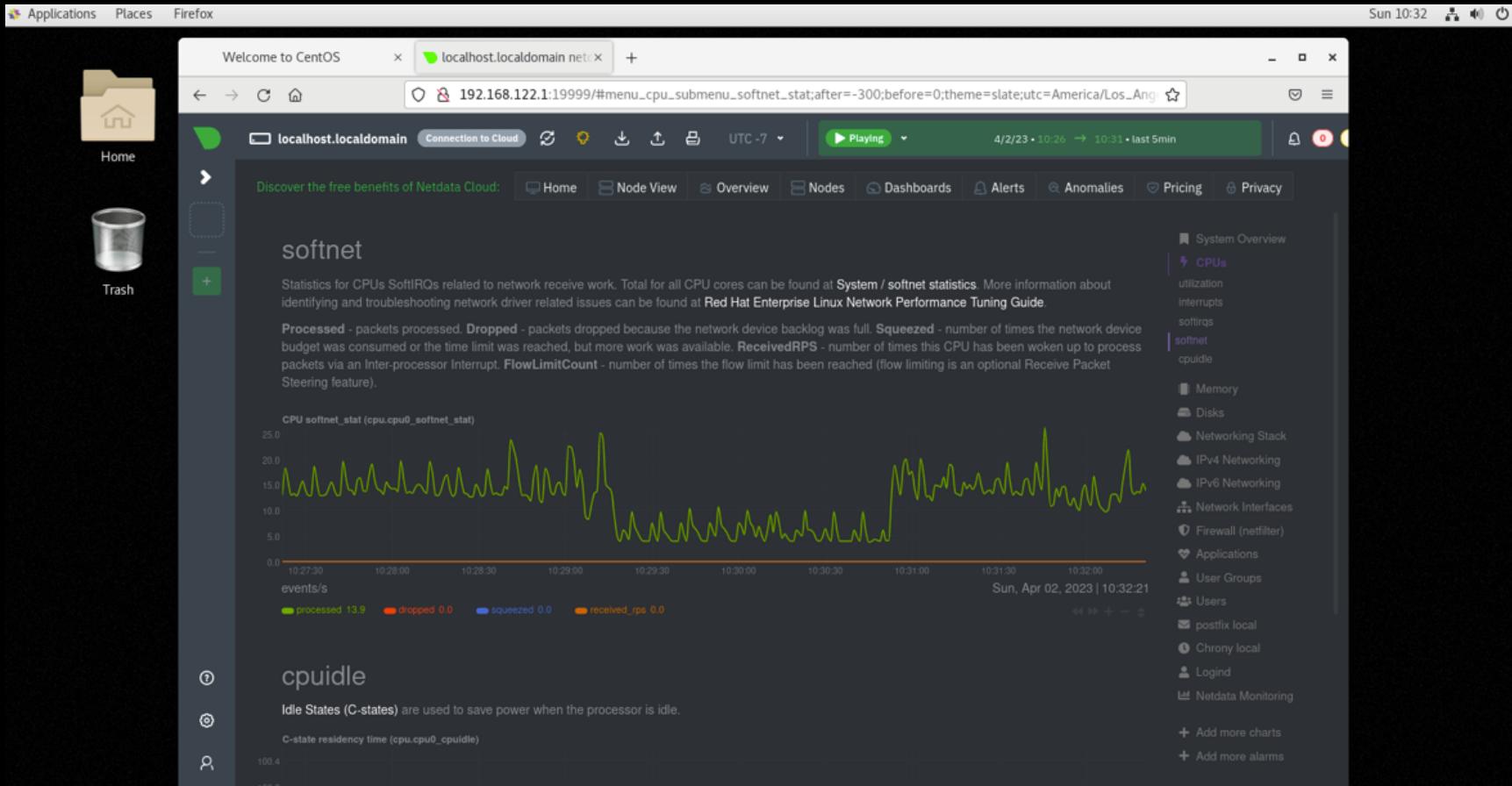
MÉTRICA CPU INTERRUPTS



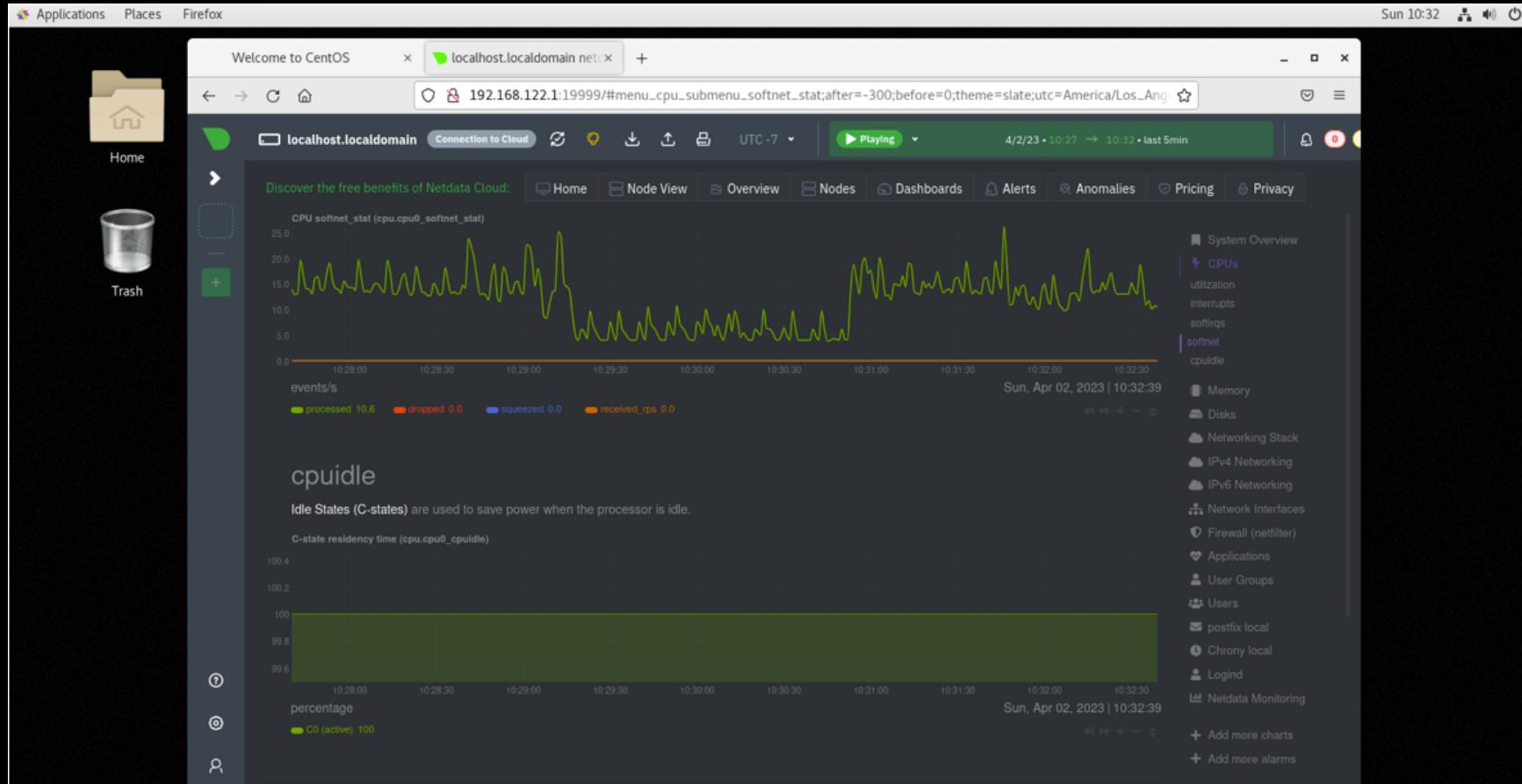
MÉTRICA CPU SOFTIRQS



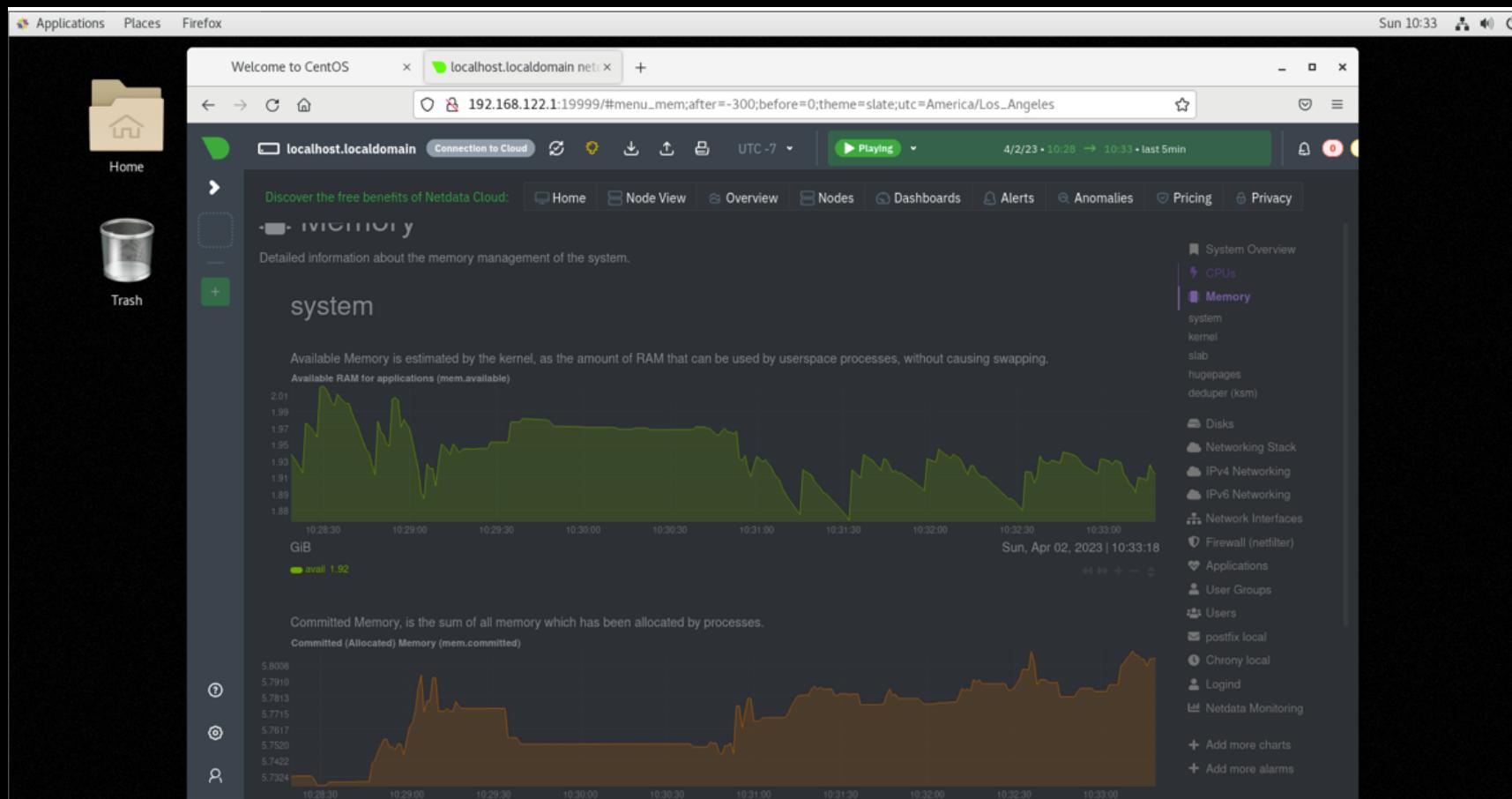
MÉTRICA CPU SOFTNET

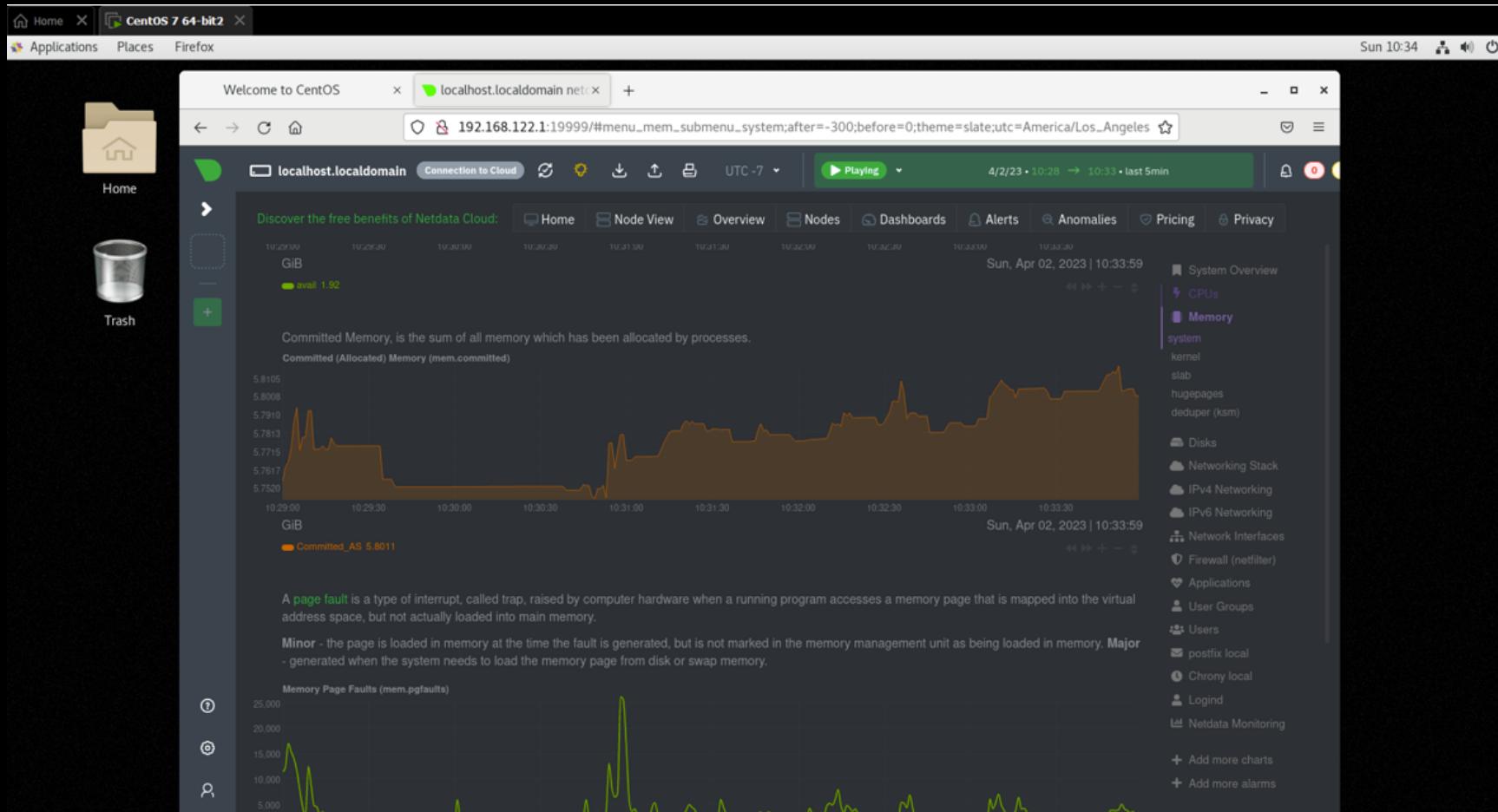


MÉTRICA CPU CPUIDLE



MÉTRICA MEMORIA SYSTEM





Home | CentOS 7 64-bit |

Applications Places Firefox

Sun 10:34

Welcome to CentOS | localhost.localdomain.net | +

localhost.localdomain Connection to Cloud Playing 4/2/23 • 10:28 → 10:33 • last 5min

Discover the free benefits of Netdata Cloud: Home Node View Overview Nodes Dashboards Alerts Anomalies Pricing Privacy

A **page fault** is a type of interrupt, called trap, raised by computer hardware when a running program accesses a memory page that is mapped into the virtual address space, but not actually loaded into main memory.

Minor - the page is loaded in memory at the time the fault is generated, but is not marked in the memory management unit as being loaded in memory. **Major** - generated when the system needs to load the memory page from disk or swap memory.

Memory Page Faults (mem.pgfaults)

faults/s

minor 1.397 major 0

Sun, Apr 02, 2023 | 10:34:22

kernel

Dirty is the amount of memory waiting to be written to disk. Writeback is how much memory is actively being written to disk.

Writeback Memory (mem.writeback)

1.50
1.00

System Overview

- CPU
- Memory

system kernel slab hugepages deduper (ksm)

Disks

Networking Stack

- IPv4 Networking
- IPv6 Networking

Network Interfaces

Firewall (netfilter)

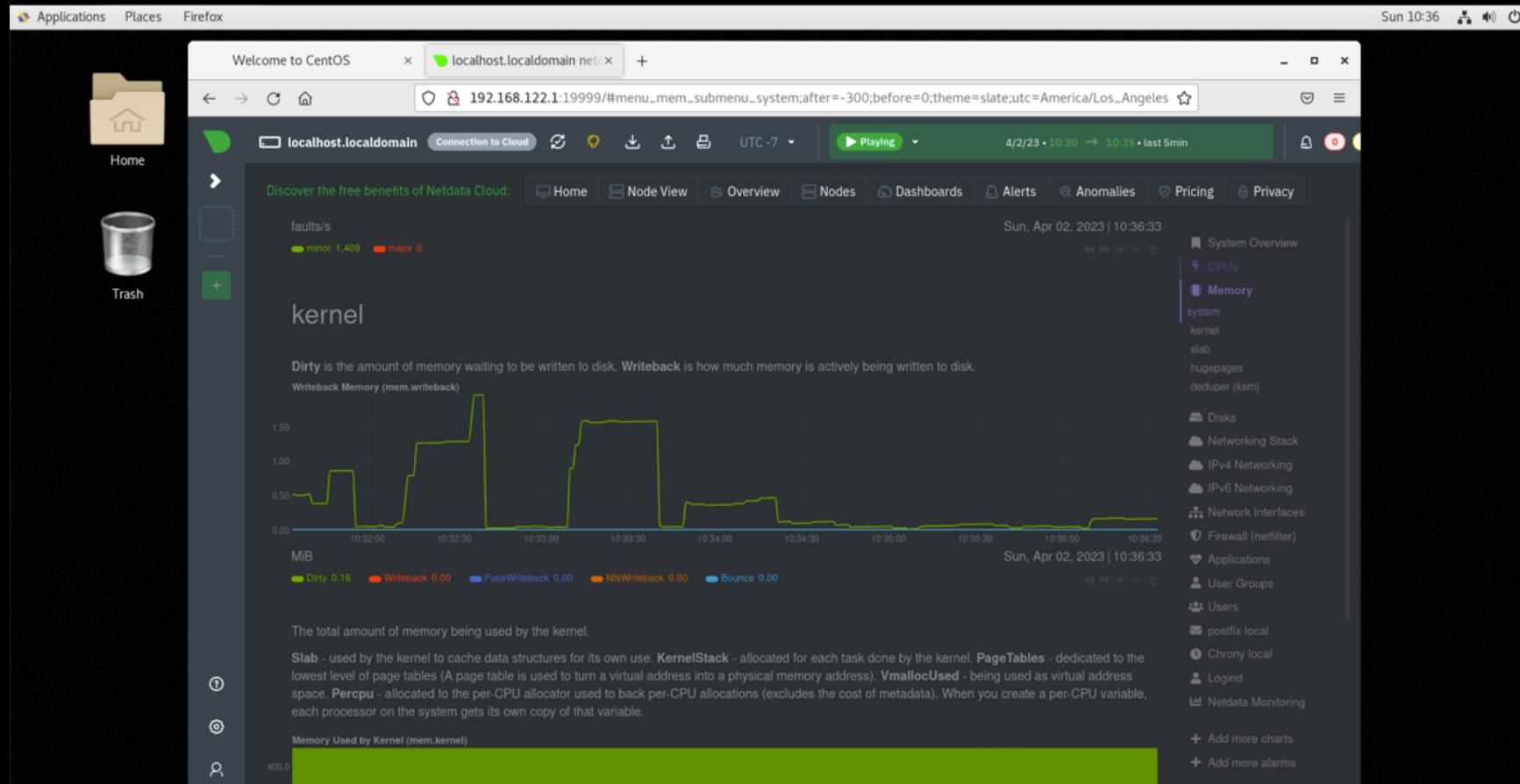
Applications

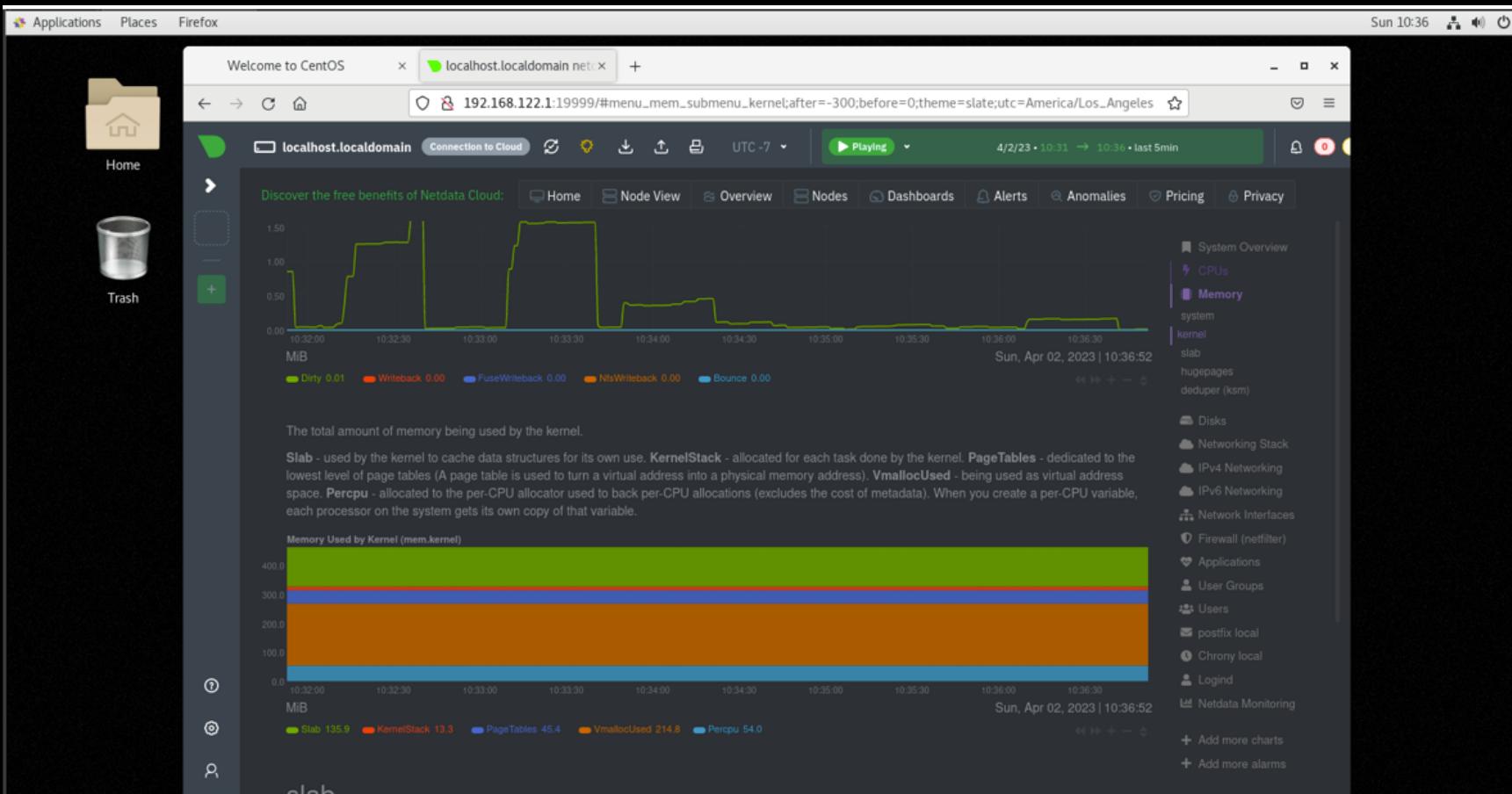
- User Groups
- Users
- postfix local
- Chrony local
- Logind

Netdata Monitoring

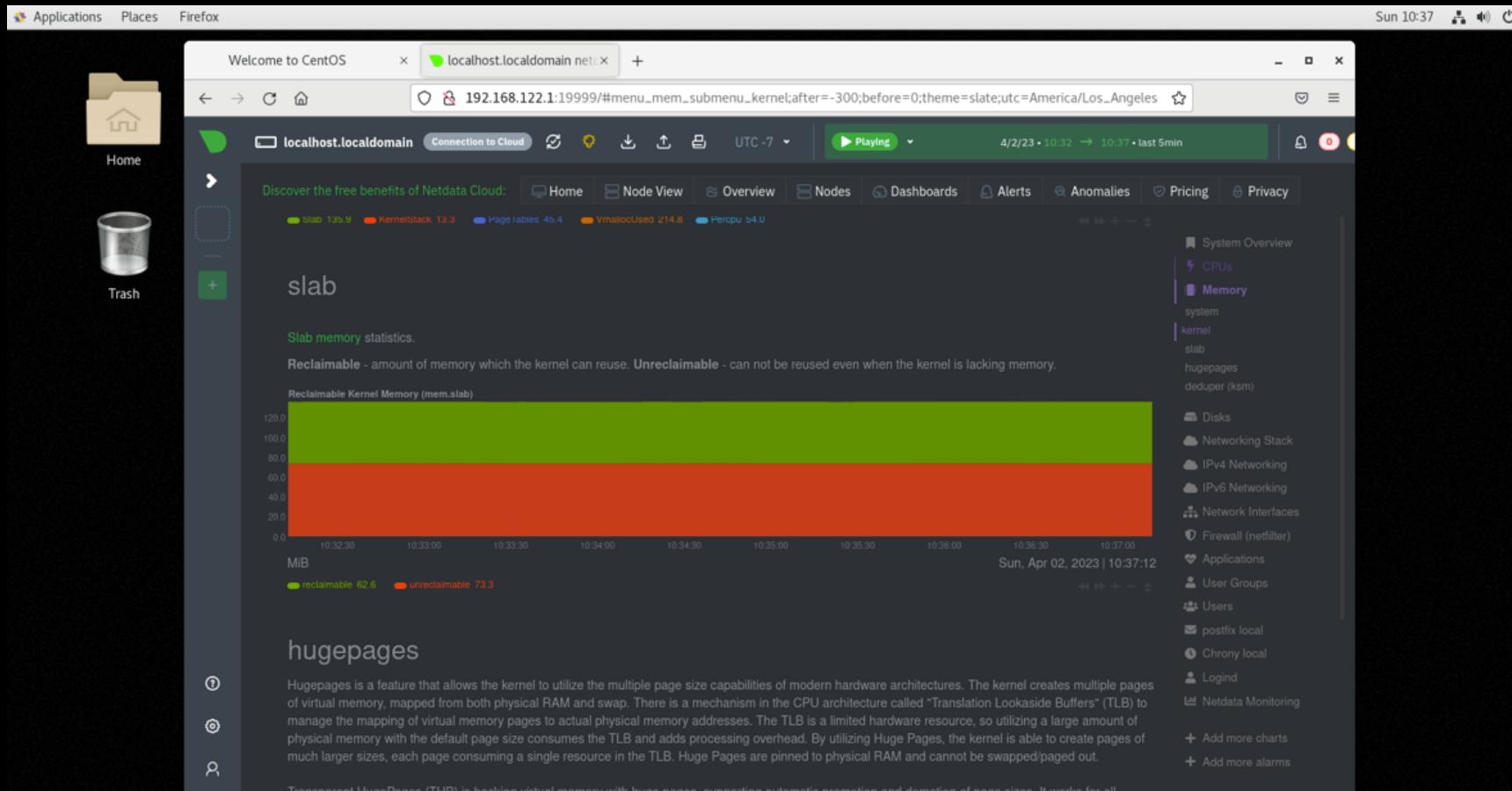
Add more charts Add more alarms

MÉTRICA MEMORIA KERNEL

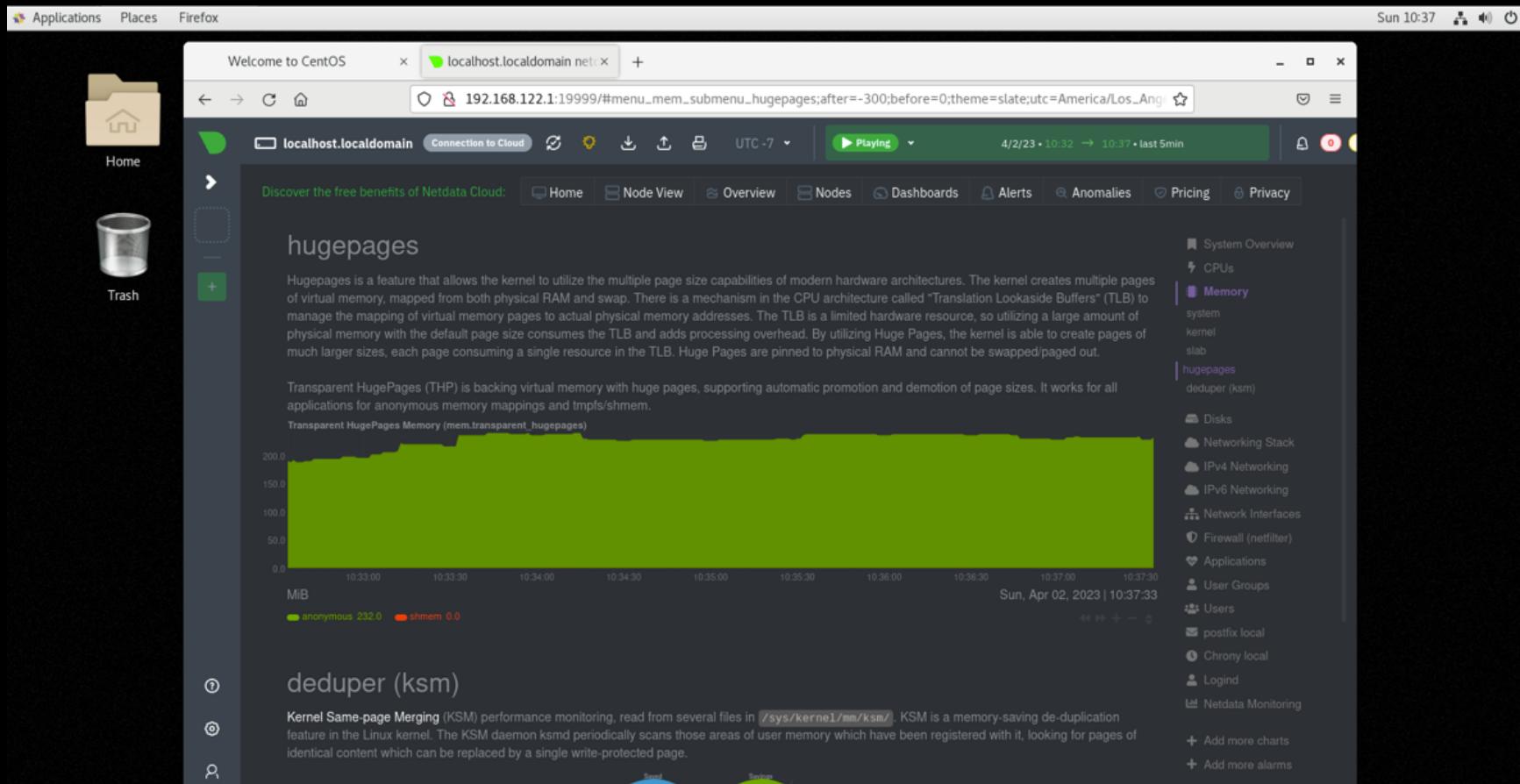




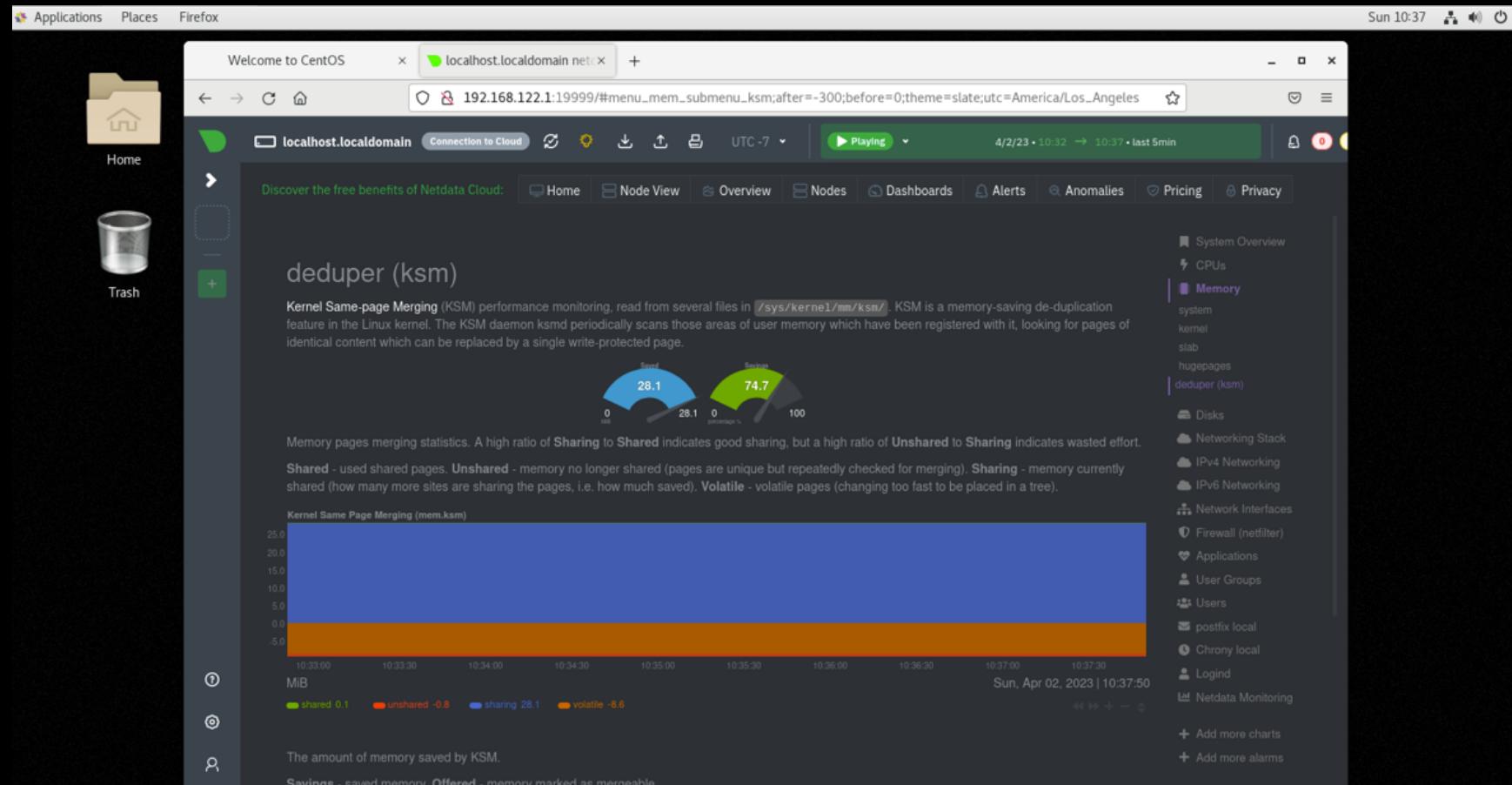
MÉTRICA MEMORIA SLAB



MÉTRICA MEMORIA HUGE PAGES



MÉTRICA MEMORIA DEDUPER(KSM)



Applications Places Firefox Sun 10:38

Welcome to CentOS localhost.localdomain net: +

localhost.localdomain Connection to Cloud Playing 4/2/23 • 10:32 → 10:37 • last 5min

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The amount of memory saved by KSM.

Savings - saved memory. Offered - memory marked as mergeable.

Kernel Same Page Merging Savings (mem.ksm_savings)

30.0
20.0
10.0
0.0
-10.0
-20.0

10:33:30 10:34:00 10:34:30 10:35:00 10:35:30 10:36:00 10:36:30 10:37:00 10:37:30 10:38:00

Sun, Apr 02, 2023 | 10:38:11

MiB

green savings -28.1 red offered 37.6

The effectiveness of KSM. This is the percentage of the mergeable pages that are currently merged.

Kernel Same Page Merging Effectiveness (mem.ksm_ratios)

75
74.8
74.6
74.4
74.2

10:33:30 10:34:00 10:34:30 10:35:00 10:35:30 10:36:00 10:36:30 10:37:00 10:37:30 10:38:00

Sun, Apr 02, 2023 | 10:38:12

percentage

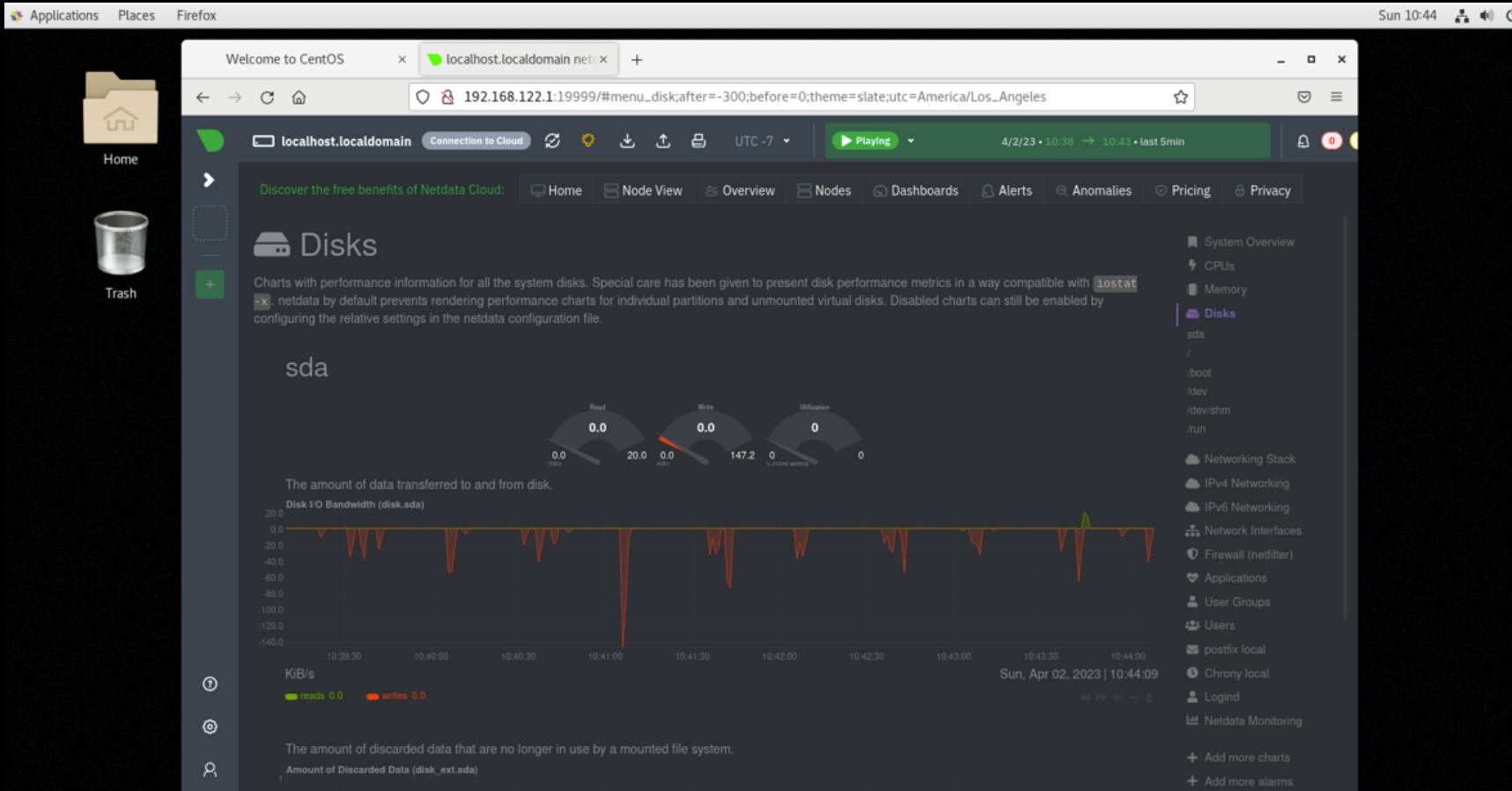
green savings 74.7

System Overview CPUs Memory system kernel slab hugepages deduper (ksm) Disks Networking Stack IPv4 Networking IPv6 Networking Network Interfaces Firewall (netfilter) Applications User Groups Users postfix local Chrony local Logind Netdata Monitoring

+ Add more charts + Add more alarms

Home Node View Overview Nodes Dashboards Alerts Anomalies Pricing Privacy

MÉTRICA DISCO SDA



Sun 10:44

Welcome to CentOS

localhost.localdomain net: +

Discover the free benefits of Netdata Cloud:

Amount of Discarded Data (disk_ext.sda)

KiB/s

discards 0

Completed disk I/O operations. Keep in mind the number of operations requested might be higher, since the system is able to merge adjacent to each other (see merged operations chart).

Disk Completed I/O Operations (disk_ops.sda)

operations/s

reads 0.0 writes 0.0

The number (after merges) of completed discard/lush requests.

System Overview

CPU

Memory

Disks

sda

/

/boot

/dev

/dev/shm

/run

Networking Stack

IPv4 Networking

IPv6 Networking

Network Interfaces

Firewall (netfilter)

Applications

User Groups

Users

postfix local

Chrony local

Logind

Neldata Monitoring

Add more charts

Add more alarms

192.168.122.1:19999/#menu_disk_submenu_sda;after=-300;before=0;theme=slate;utc=America/Los_Angeles

UTC -7

Playing

4/2/23 • 10:38 → 10:43 • last 5min

Sun, Apr 02, 2023 | 10:44:28

Sun, Apr 02, 2023 | 10:44:28

Applications Places Firefox

Welcome to CentOS x localhost.localdomain net x +

localhost.localdomain Connection to Cloud UTC -7 Playing 4/23 • 10:39 → 10:44 • last 5min

Discover the free benefits of Netdata Cloud:

- Home
- Node View
- Overview
- Nodes
- Dashboards
- Alerts
- Anomalies
- Pricing
- Privacy

reads 0.0 writes -0.5

The number (after merges) of completed discard/flush requests.

Discard commands inform disks which blocks of data are no longer considered to be in use and therefore can be erased internally. They are useful for solid-state drivers (SSDs) and thinly-provisioned storage. Discarding/trimming enables the SSD to handle garbage collection more efficiently, which would otherwise slow future write operations to the involved blocks down.

Flush operations transfer all modified in-core data (i.e., modified buffer cache pages) to the disk device so that all changed information can be retrieved even if the system crashes or is rebooted. Flush requests are executed by disks. Flush requests are not tracked for partitions. Before being merged, flush...

[show more information](#)

Disk Completed Extended I/O Operations (disk_ext_ops.sda)

operations/s

discards 0

Sun, Apr 02, 2023 | 10:44:52

I/O operations currently in progress. This metric is a snapshot - it is not an average over the last interval.

Disk Current I/O Operations (disk_qops.sda)

qops 0

System Overview

- CPUs
- Memory
- Disks
- sda
- /
- /boot
- /dev
- /dev/shm
- /run

Networking Stack

- IPv4 Networking
- IPv6 Networking
- Network Interfaces
- Firewall (netfilter)
- Applications
- User Groups
- Users
- postfix local
- Chrony local
- Logind
- Netdata Monitoring

+ Add more charts
+ Add more alarms

Home

Trash

?

?

?

Applications Places Firefox

Sun 10:45

Welcome to CentOS × localhost.localdomain net +

localhost.localdomain Connection to Cloud

Playing 4/23 • 10:40 → 10:45 last 5min

Discover the free benefits of Netdata Cloud:

I/O operations currently in progress. This metric is a snapshot - it is not an average over the last interval.

Disk Current I/O Operations (disk_qops.sda)

operations Sun, Apr 02, 2023 | 10:45:13

Backlog is an indication of the duration of pending disk operations. On every I/O event the system is multiplying the time spent doing I/O since the last update of this field with the number of pending operations. While not accurate, this metric can provide an indication of the expected completion time of the operations in progress.

Disk Backlog (disk_backlog.sda)

milliseconds Sun, Apr 02, 2023 | 10:45:13

System Overview

- CPUs
- Memory
- Disks
 - sda
 - /
 - /boot
 - /dev
 - /dev/shm
 - /run
- Networking Stack
- IPv4 Networking
- IPv6 Networking
- Network Interfaces
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- Users
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+ Add more charts + Add more alarms

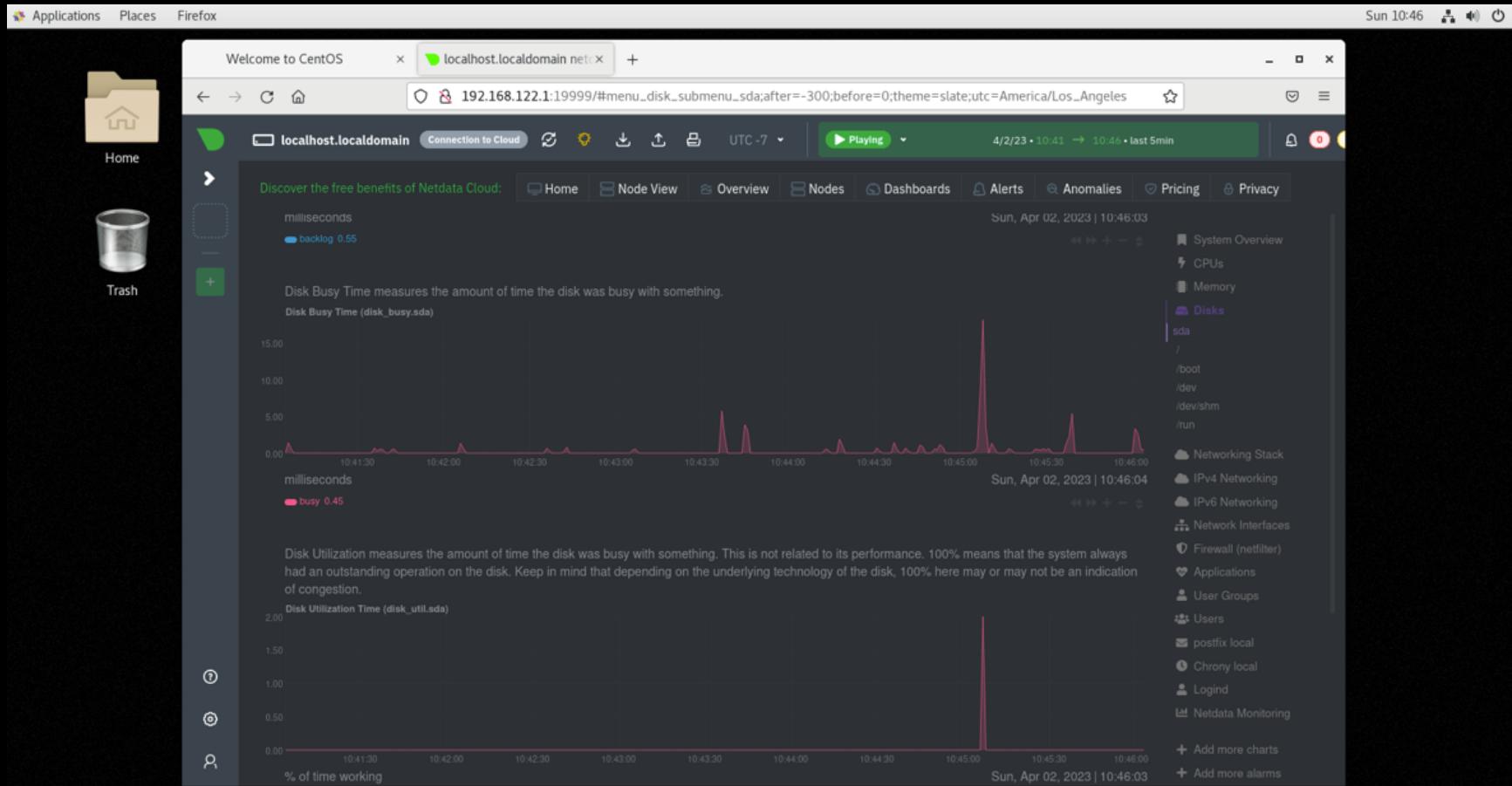
Home

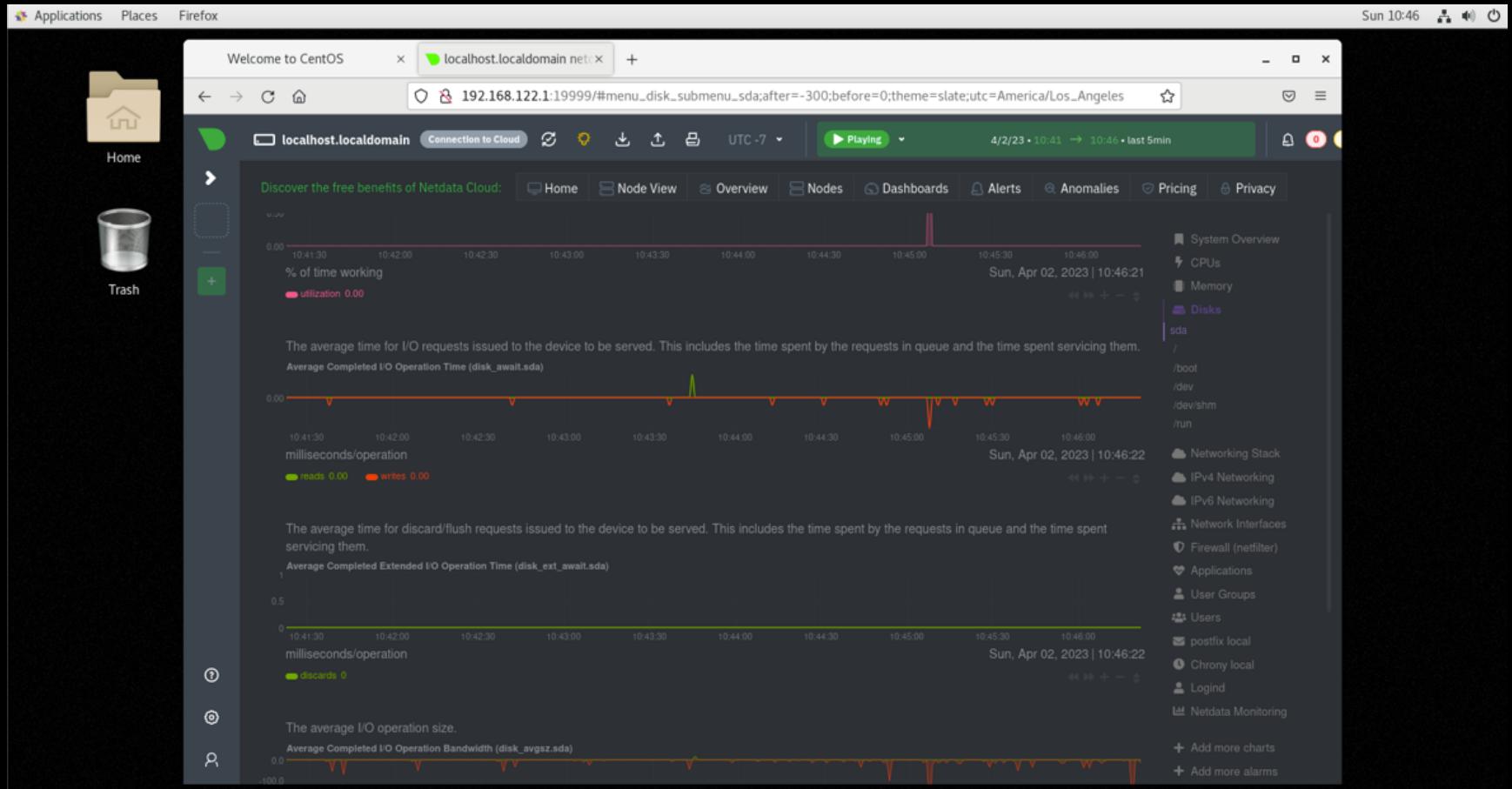
Trash

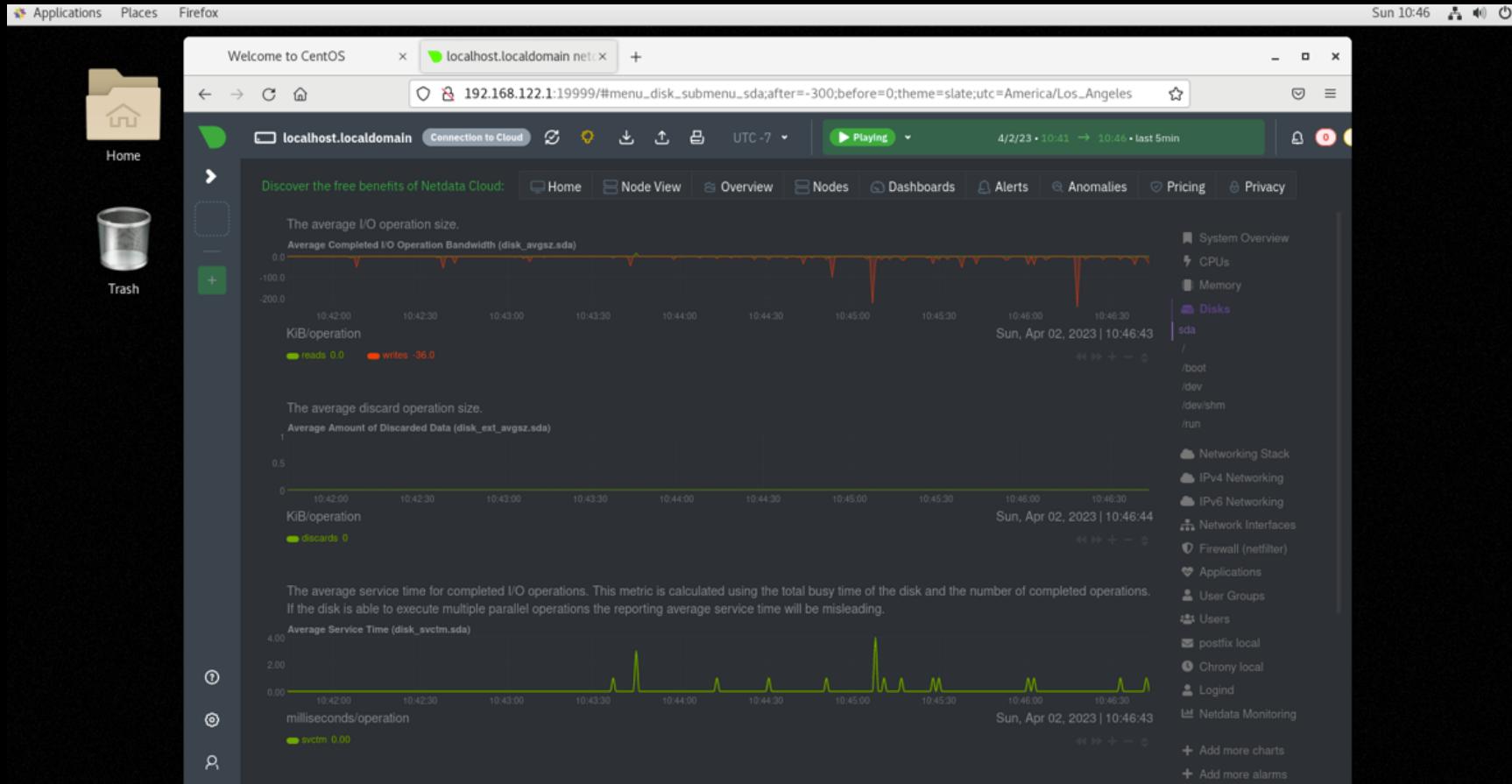
UTC -7

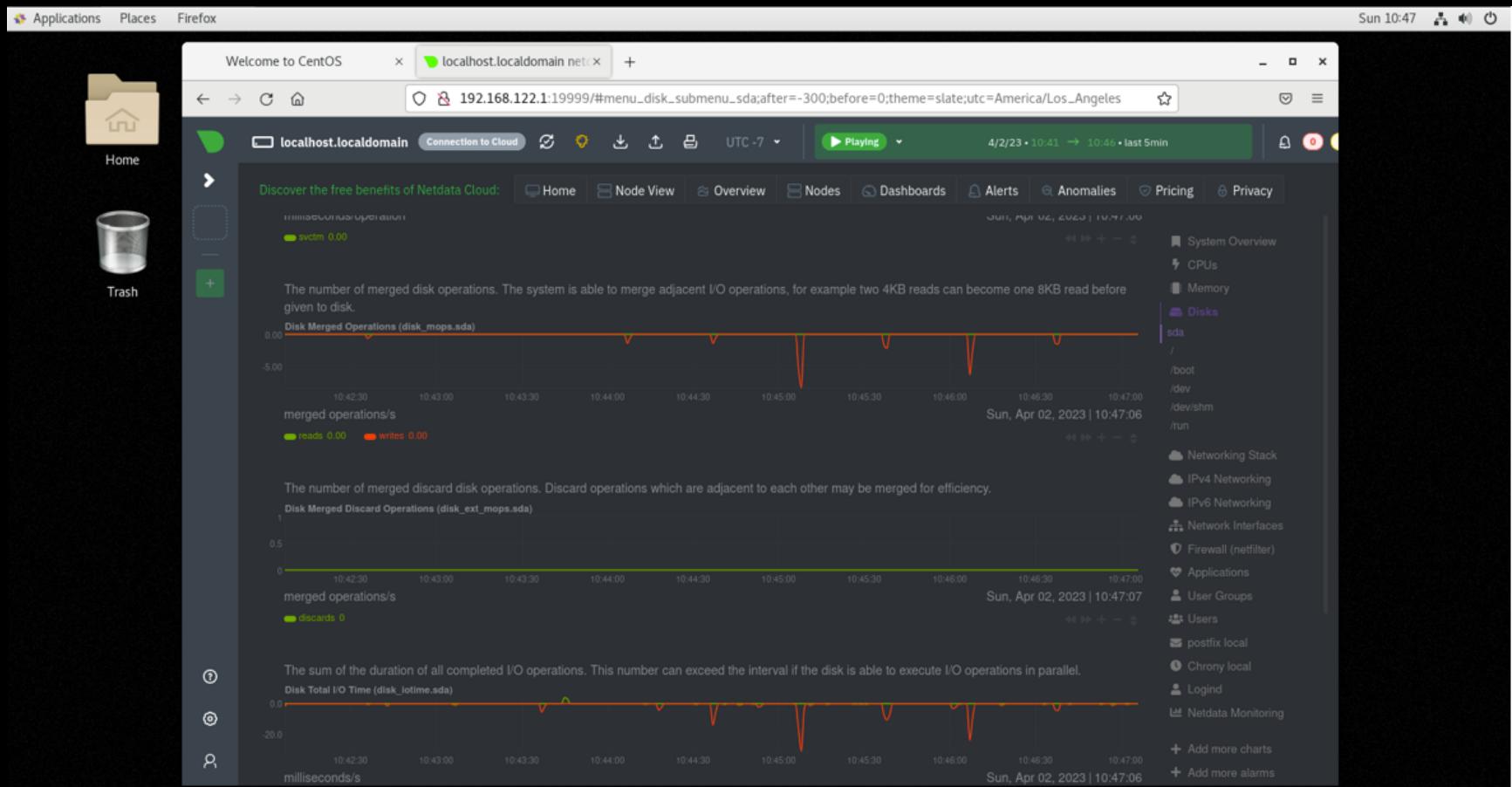
Discover the free benefits of Netdata Cloud:

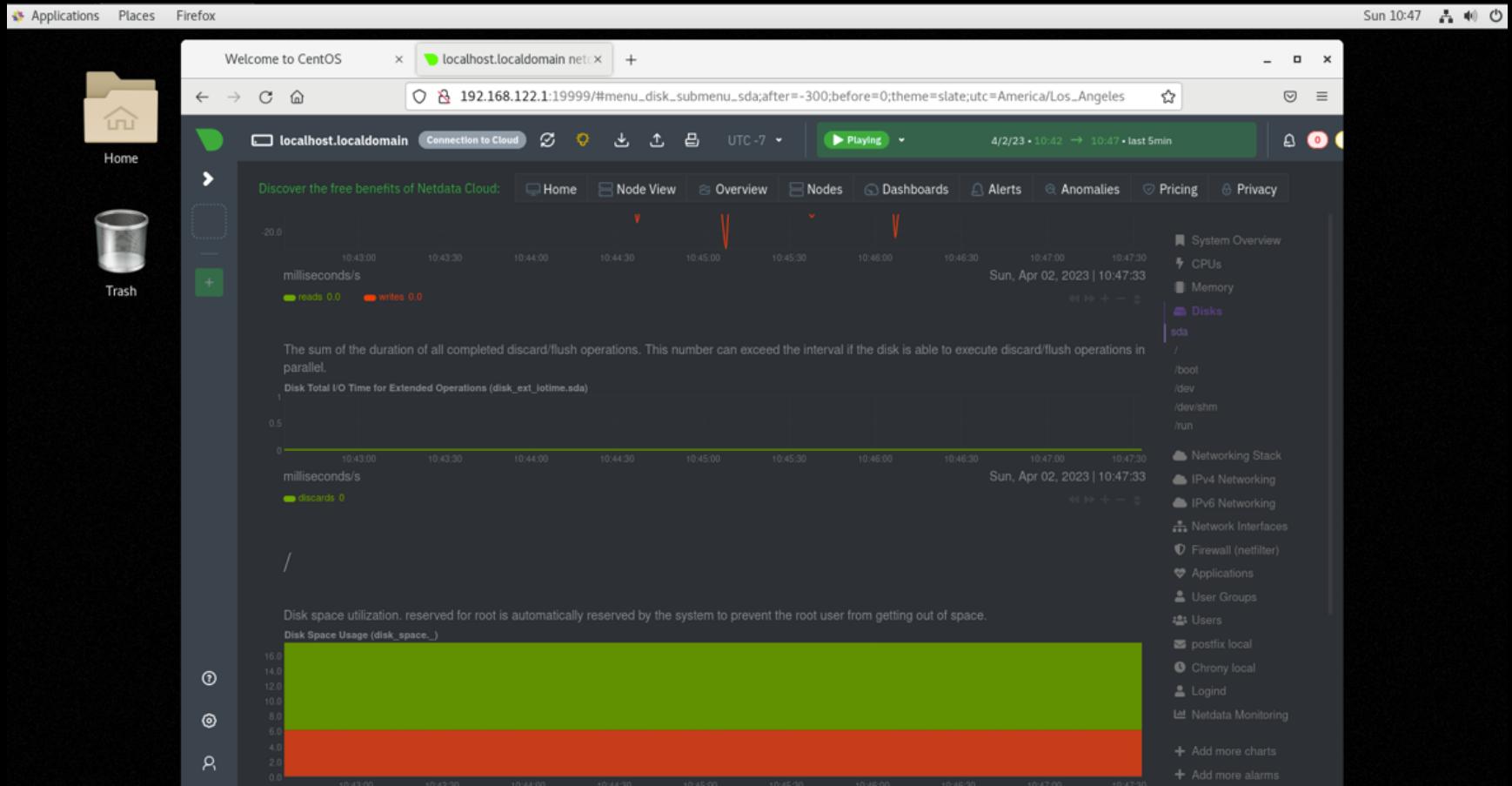
Home Node View Overview Nodes Dashboards Alerts Anomalies Pricing Privacy



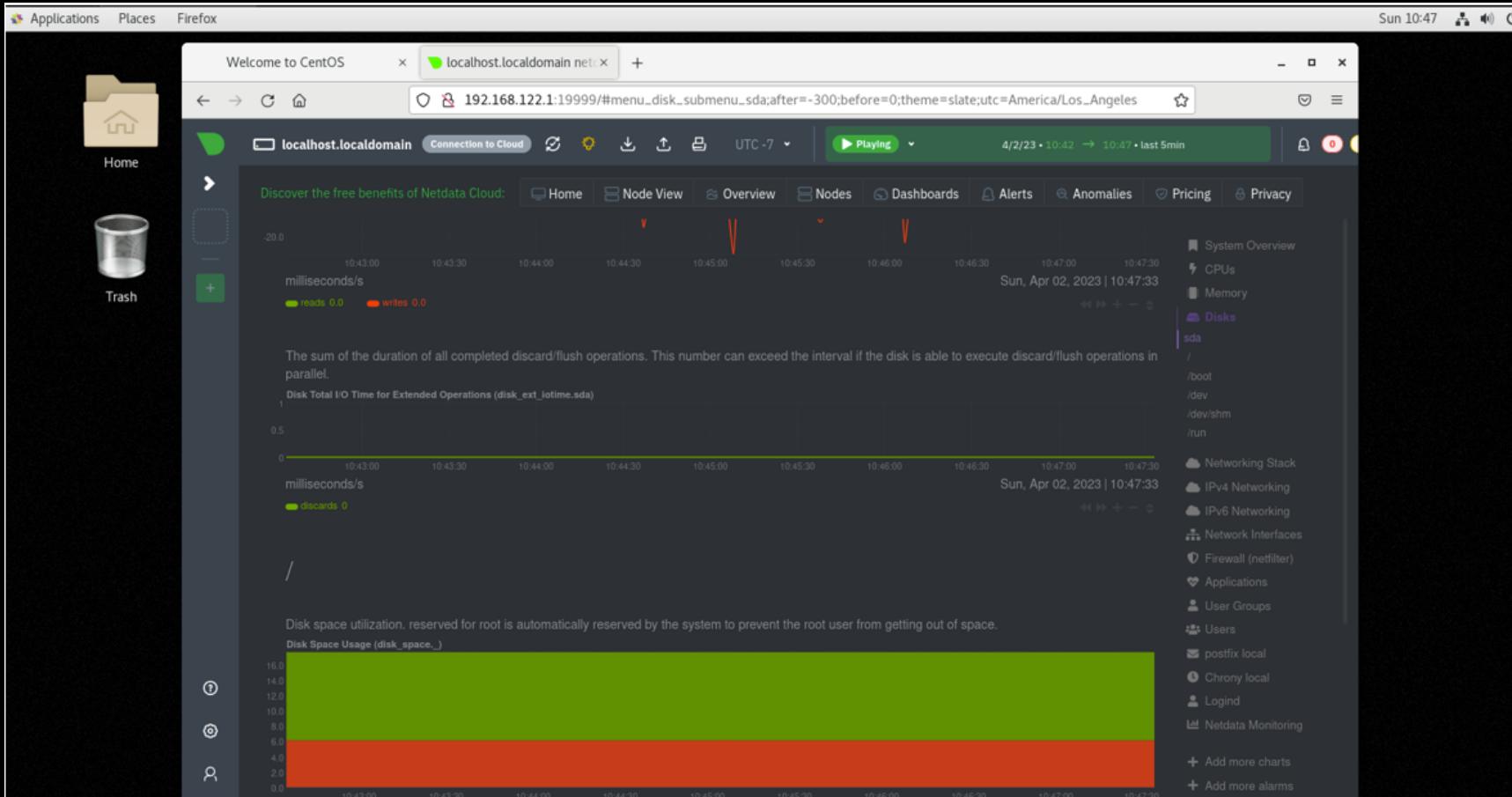








MÉTRICA DISCO /



Applications Places Firefox

Welcome to CentOS x localhost.localdomain netx +

localhost.localdomain Connection to Cloud ⌂ ↻ ⌂ ⌂ ⌂ ⌂ ⌂ ⌂ UTC -7 Playing 4/23 • 10:44 → 10:49 • last 5min

Discover the free benefits of Netdata Cloud: Home Node View Overview Nodes Dashboards Alerts Anomalies Pricing Privacy

Disk Space Usage (disk_space_)

GiB

16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0

10:44:30 10:45:00 10:45:30 10:46:00 10:46:30 10:47:00 10:47:30 10:48:00 10:48:30 10:49:00

Sun, Apr 02, 2023 | 10:49:11

avail 11.5 used 6.2 reserved for root 0.0

Inodes (or index nodes) are filesystem objects (e.g. files and directories). On many types of file system implementations, the maximum number of inodes is fixed at filesystem creation, limiting the maximum number of files the filesystem can hold. It is possible for a device to run out of inodes. When this happens, new files cannot be created on the device, even though there may be free space available.

Disk Files (Inodes) Usage (disk_inodes_)

inodes

8,000,000
6,000,000
4,000,000
2,000,000
0

10:44:30 10:45:00 10:45:30 10:46:00 10:46:30 10:47:00 10:47:30 10:48:00 10:48:30 10:49:00

Sun, Apr 02, 2023 | 10:49:11

avail 9,083,594 used 199,478 reserved for root 0

System Overview CPUs Memory Disks sda / /boot /dev /dev/shm /run Networking Stack IPv4 Networking IPv6 Networking Network Interfaces Firewall (netfilter) Applications User Groups Users postfix local Chrony local Logind Netdata Monitoring

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Home Trash

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Disk Space Usage (disk_space_)

GiB

16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0

10:44:30 10:45:00 10:45:30 10:46:00 10:46:30 10:47:00 10:47:30 10:48:00 10:48:30 10:49:00

Sun, Apr 02, 2023 | 10:49:11

avail 11.5 used 6.2 reserved for root 0.0

Inodes (or index nodes) are filesystem objects (e.g. files and directories). On many types of file system implementations, the maximum number of inodes is fixed at filesystem creation, limiting the maximum number of files the filesystem can hold. It is possible for a device to run out of inodes. When this happens, new files cannot be created on the device, even though there may be free space available.

Disk Files (Inodes) Usage (disk_inodes_)

inodes

8,000,000
6,000,000
4,000,000
2,000,000
0

10:44:30 10:45:00 10:45:30 10:46:00 10:46:30 10:47:00 10:47:30 10:48:00 10:48:30 10:49:00

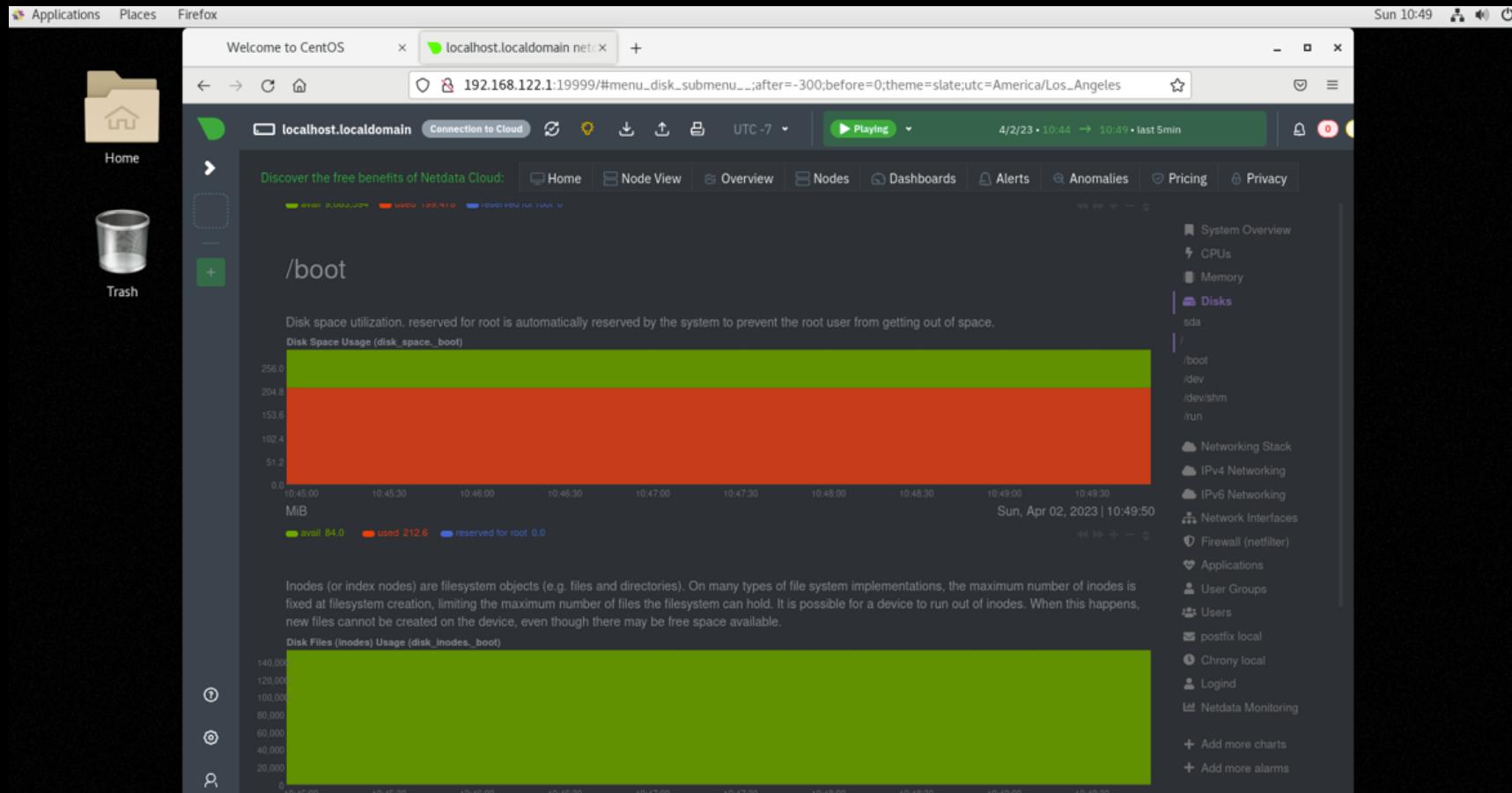
Sun, Apr 02, 2023 | 10:49:11

avail 9,083,594 used 199,478 reserved for root 0

System Overview CPUs Memory Disks sda / /boot /dev /dev/shm /run Networking Stack IPv4 Networking IPv6 Networking Network Interfaces Firewall (netfilter) Applications User Groups Users postfix local Chrony local Logind Netdata Monitoring

+ Add more charts + Add more alarms

MÉTRICA DISCO /BOOT



Applications Places Firefox

Welcome to CentOS x localhost.localdomain net: + Sun 10:50

localhost.localdomain Connection to Cloud Playing 4/2/23 • 10:45 → 10:50 • last 5 min

Discover the free benefits of Netdata Cloud: Home Node View Overview Nodes Dashboards Alerts Anomalies Pricing Privacy

Disk space utilization. reserved for root is automatically reserved by the system to prevent the root user from getting out of space.

Disk Space Usage (disk_space_boot)

256.0
204.8
153.6
102.4
51.2
0.0

10:45:30 10:46:00 10:46:30 10:47:00 10:47:30 10:48:00 10:48:30 10:49:00 10:49:30 10:50:00

Sun, Apr 02, 2023 | 10:50:25

MIB

avail 84.0 used 212.6 reserved for root 0.0

Inodes (or index nodes) are filesystem objects (e.g. files and directories). On many types of file system implementations, the maximum number of inodes is fixed at filesystem creation, limiting the maximum number of files the filesystem can hold. It is possible for a device to run out of inodes. When this happens, new files cannot be created on the device, even though there may be free space available.

Disk Files (inodes) Usage (disk_inodes_boot)

140,000
120,000
100,000
80,000
60,000
40,000
20,000
0

10:45:30 10:46:00 10:46:30 10:47:00 10:47:30 10:48:00 10:48:30 10:49:00 10:49:30 10:50:00

Sun, Apr 02, 2023 | 10:50:25

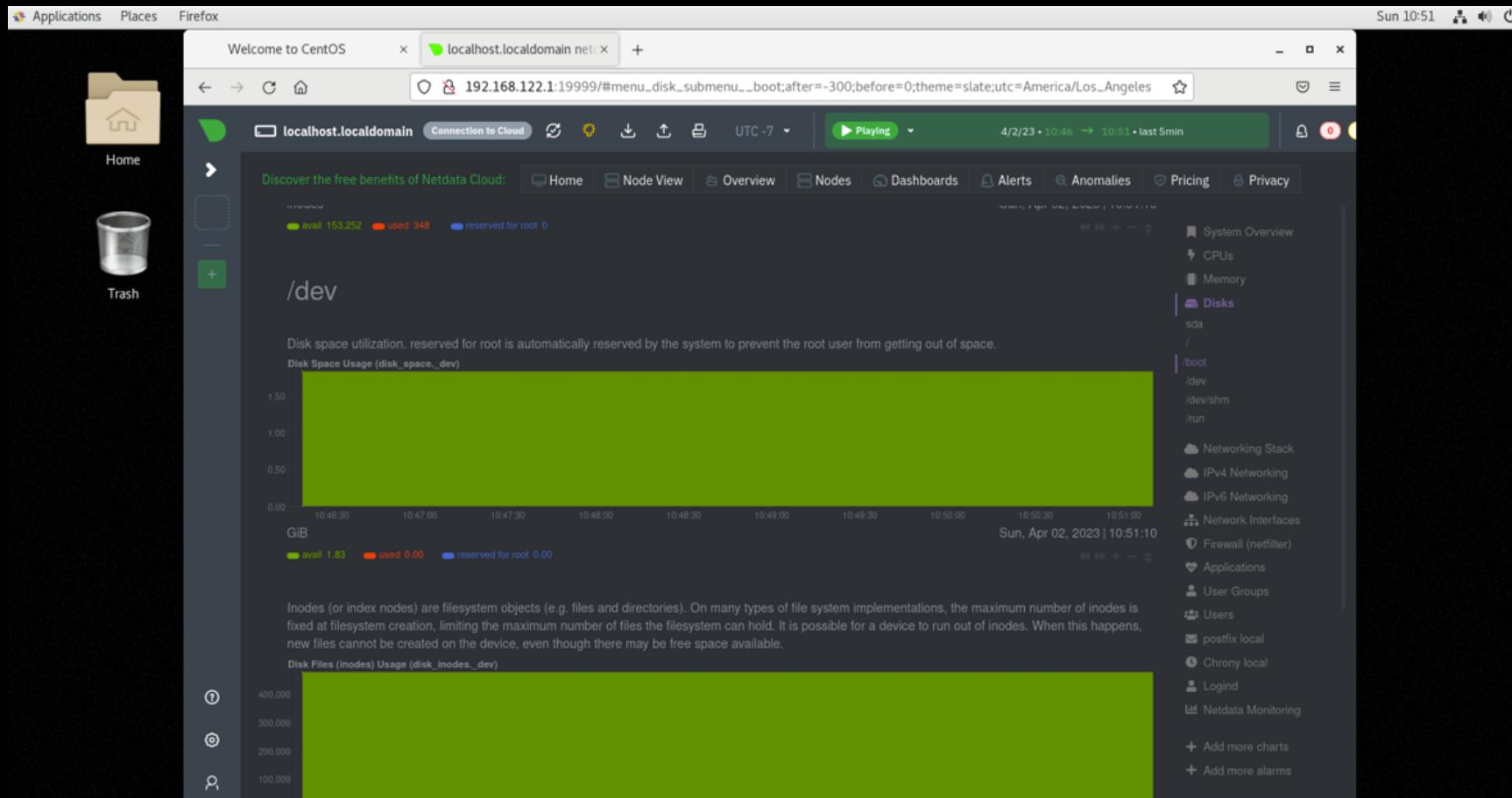
inodes

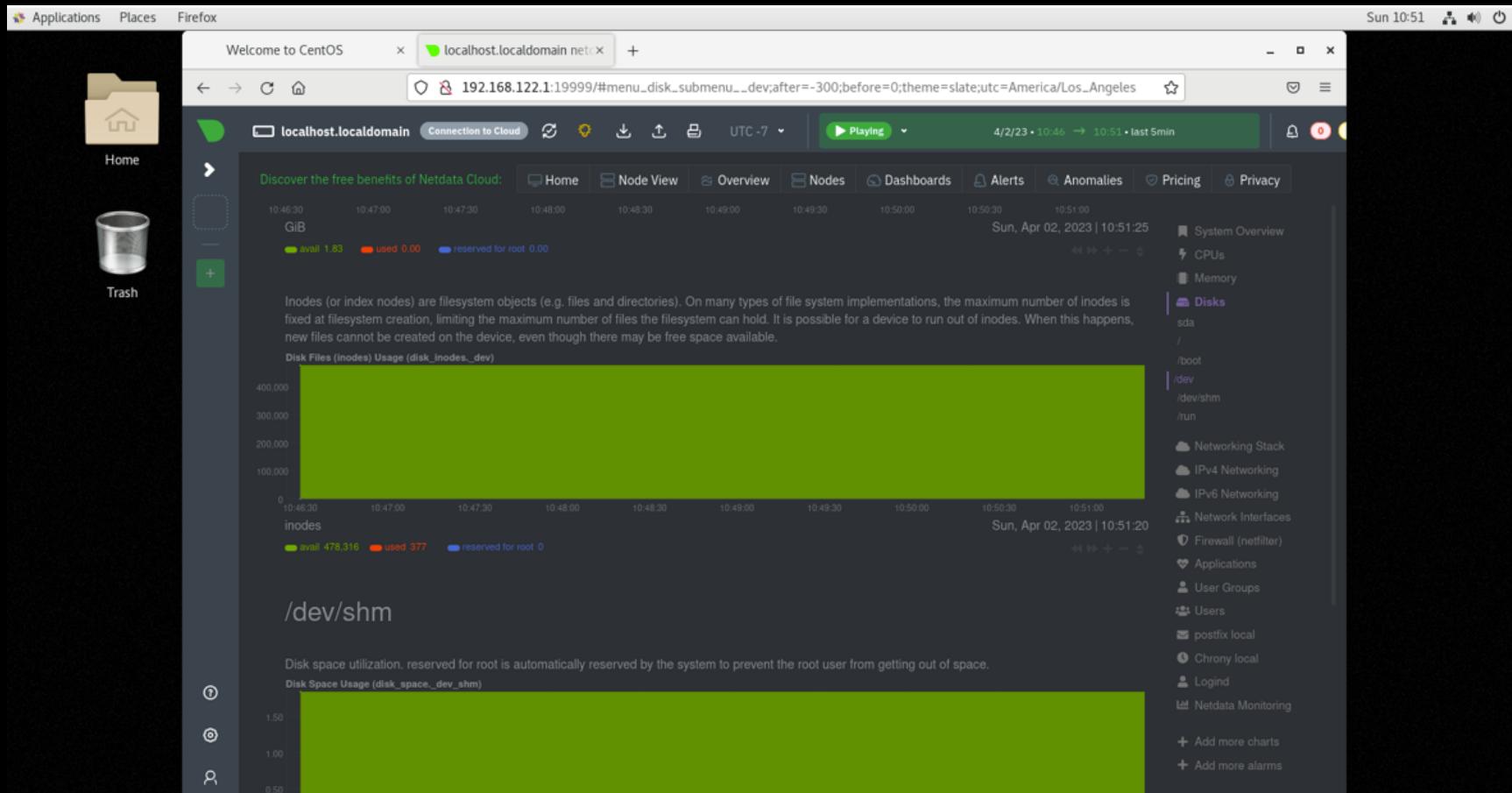
avail 115,252 used 348 reserved for root 0

System Overview CPUs Memory Disks sda / /boot /dev /dev/shm /run Networking Stack IPv4 Networking IPv6 Networking Network Interfaces Firewall (netfilter) Applications User Groups Users postfix local Chrony local Login Netdata Monitoring

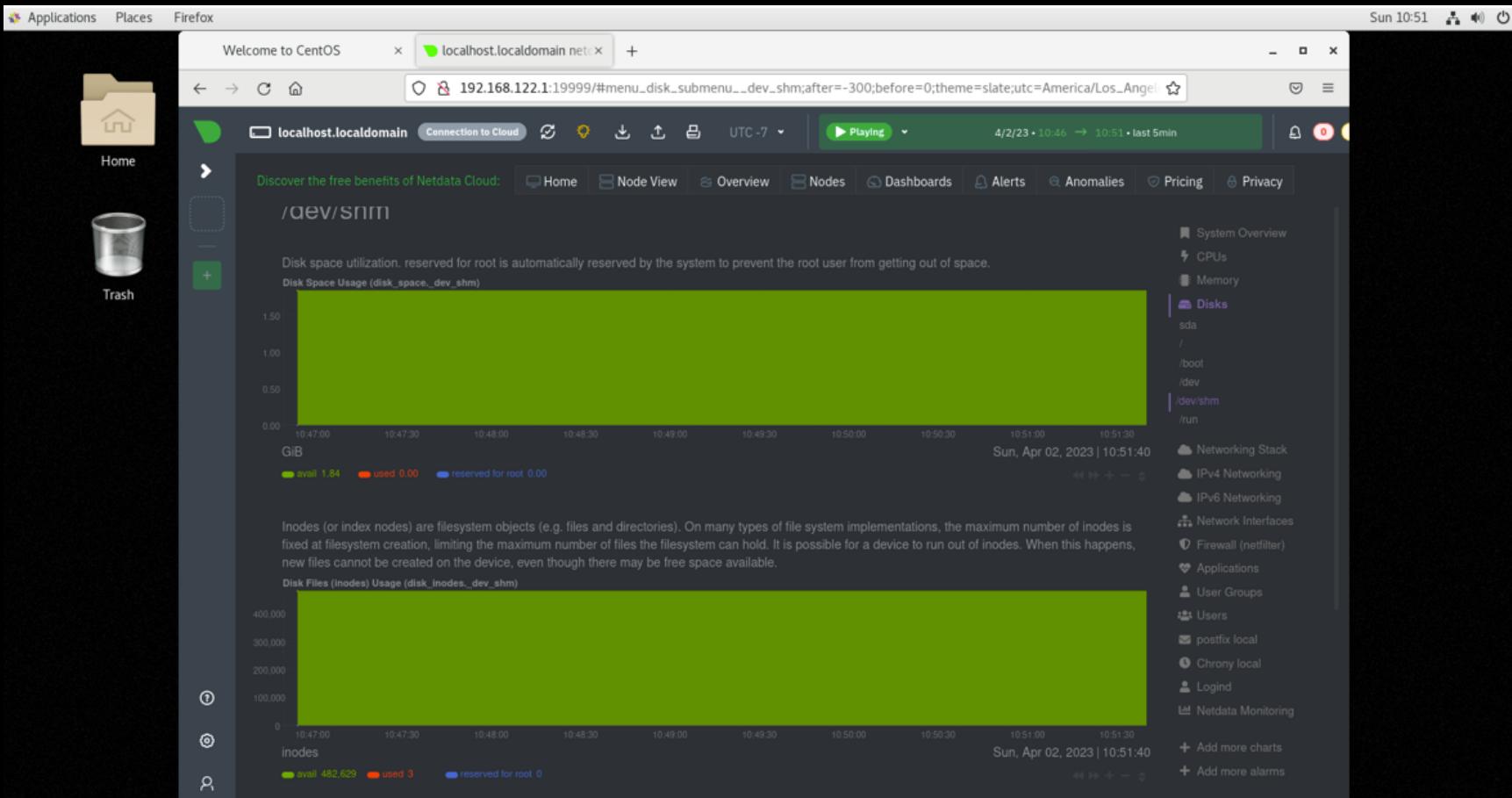
+ Add more charts + Add more alarms

MÉTRICA DISCO /DEV

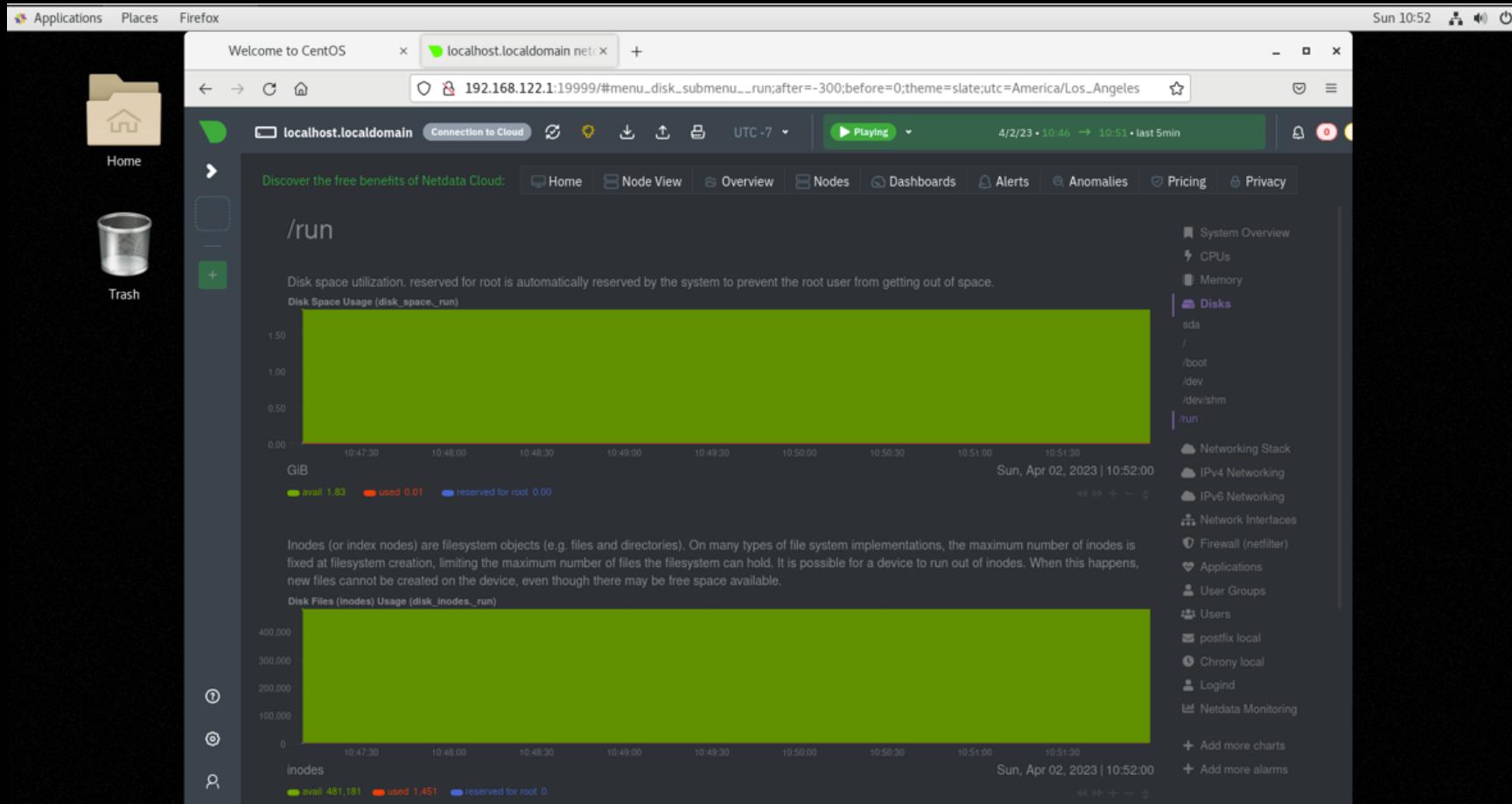




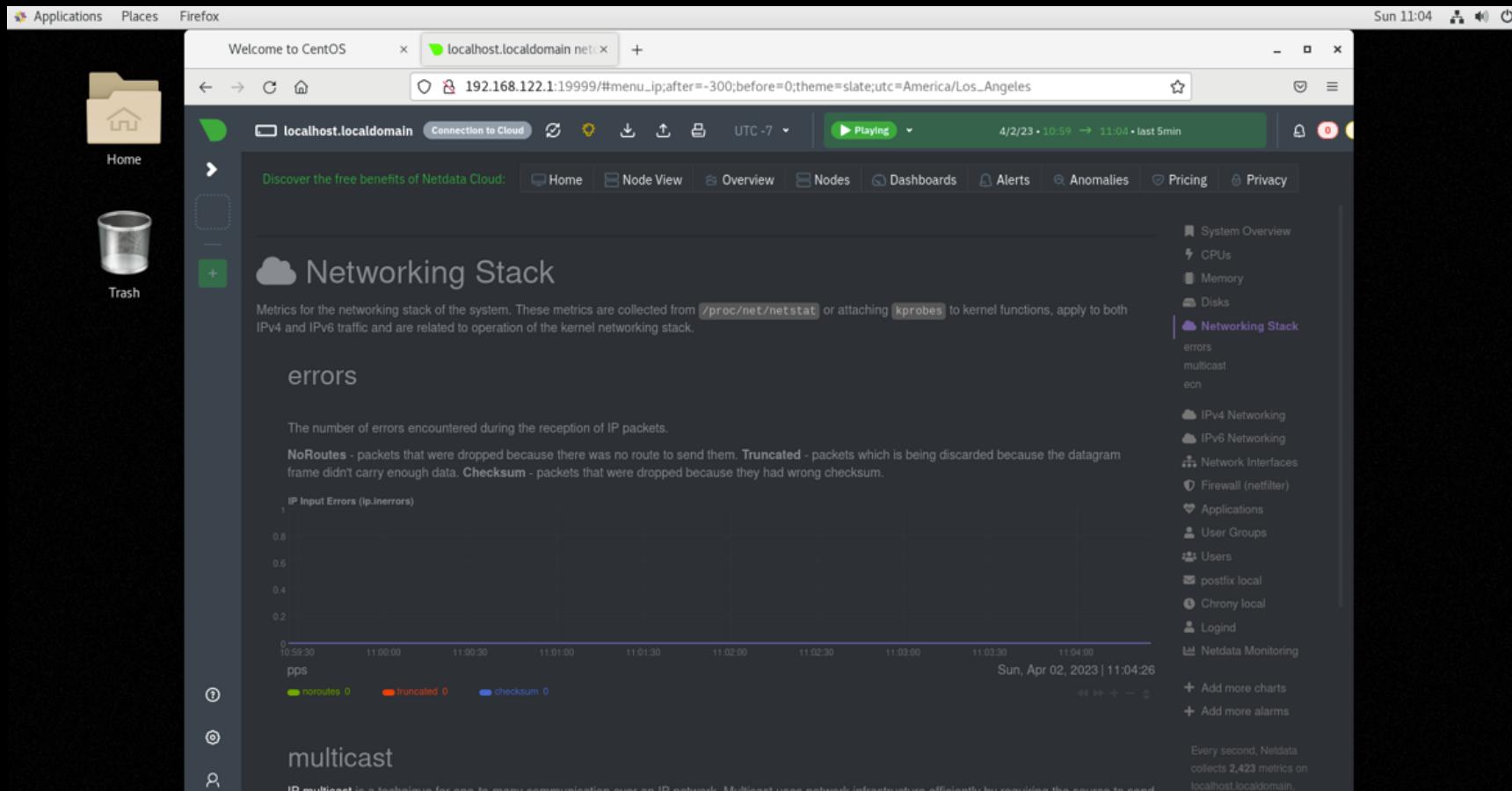
MÉTRICA DISCO /DEV/SHM



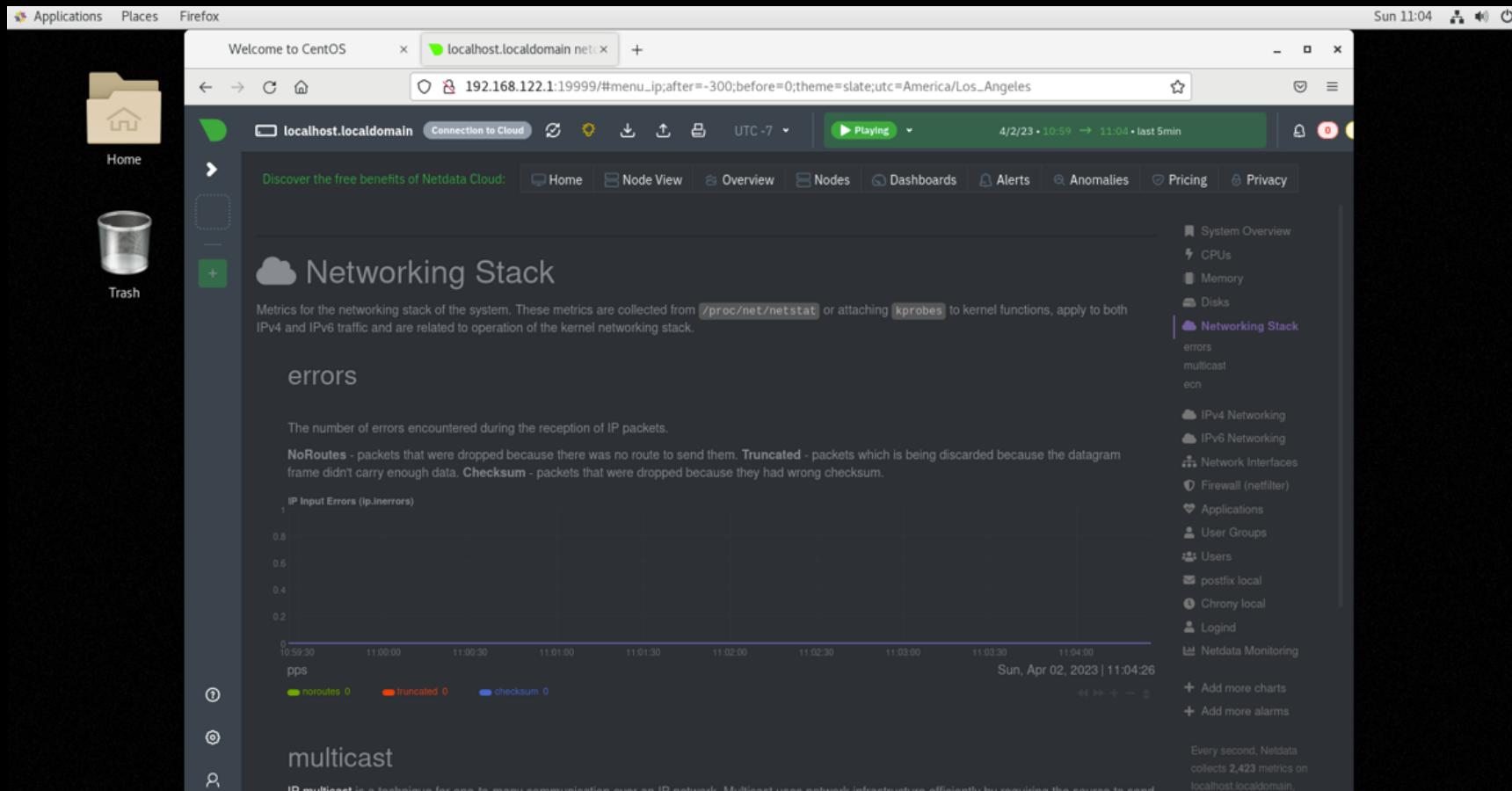
MÉTRICA DISCO /RUN



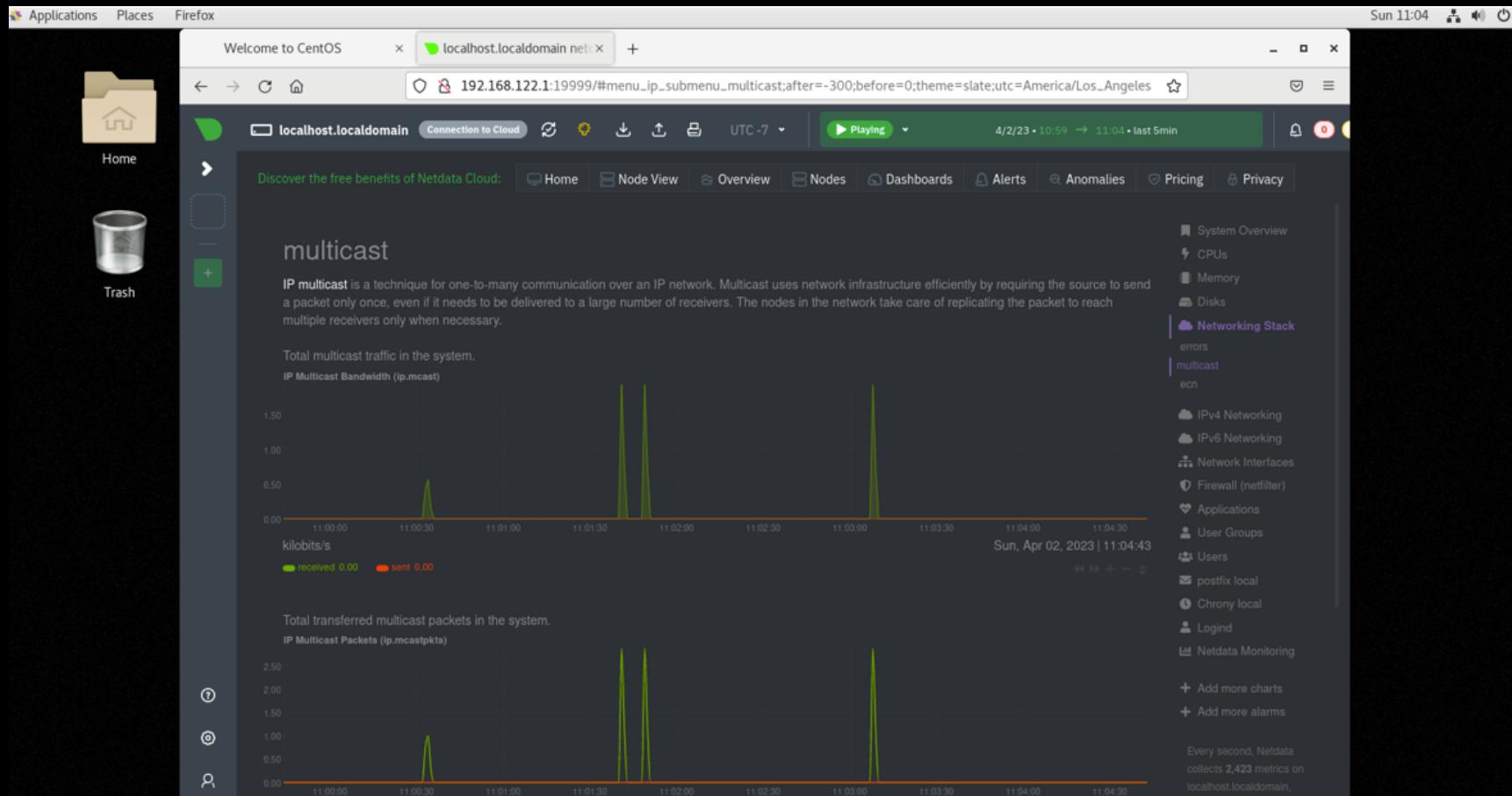
MÉTRICA RED ERRORS



MÉTRICA RED ERRORS



MÉTRICA RED MULTICAST



Applications Places Firefox

Welcome to CentOS localhost.localdomain.net +

192.168.122.1:19999/#menu_ip_submenu_multicast;after=-300;before=0;theme=slate;utc=America/Los_Angeles

localhost.localdomain Connection to Cloud Playing 4/2/23 • 10:59 → 11:04 • last 5min

Sun, Apr 02, 2023 | 11:04:58

Discover the free benefits of Netdata Cloud:

Home Node View Overview Nodes Dashboards Alerts Anomalies Pricing Privacy

0.00 11:00:00 11:00:30 11:01:00 11:01:30 11:02:00 11:02:30 11:03:00 11:03:30 11:04:00 11:04:30

kilobits/s

received 0.00 sent 0.00

Total transferred multicast packets in the system.

IP Multicast Packets (ip.mcastpkts)

2.50 2.00 1.50 1.00 0.50 0.00

11:00:00 11:00:30 11:01:00 11:01:30 11:02:00 11:02:30 11:03:00 11:03:30 11:04:00 11:04:30

pps

received 0.00 sent 0.00

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System Overview CPU Memory Disks Networking Stack errors multicast ecn

IPv4 Networking IPv6 Networking Network Interfaces Firewall (netfilter) Applications User Groups Users postfix local Chrony local Login Netdata Monitoring

+ Add more charts + Add more alarms

Every second, Netdata collects 2,423 metrics on localhost.localdomain,

ecn

Explicit Congestion Notification (ECN) is an extension to the IP and to the TCP that allows end-to-end notification of network congestion without dropping packets. ECN is an optional feature that may be used between two ECN-enabled endpoints when the underlying network infrastructure also supports it.

Total number of received IP packets with ECN bits set in the system.

CEP - congestion encountered. NoECTP - non ECN-capable transport. ECTP0 and ECTP1 - ECN capable transport.

IP ECN Statistics (ip.ecnpkts)

0.0 2.0 4.0 6.0

① ② ③

Sun 11:05

MÉTRICA RED ECN

