Московский Авиационный Институт

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Лабораторная работа №5-7 по курсу «Операционные системы»

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Постановка задачи

Реализовать распределенную систему по асинхронной обработке запросов. В данной распределенной системе должно существовать 2 вида узлов: «управляющий» и «вычислительный». Необходимо объединить данные узлы в соответствии с той топологией, которая определена вариантом. Связь между узлами необходимо осуществить при помощи технологии очередей сообщений. Также в данной системе необходимо предусмотреть проверку доступности узлов в соответствии с вариантом. При убийстве («kill -9») любого

вычислительного

узла система должна пытаться максимально сохранять свою работоспособность, а именно все дочерние узлы убитого узла могут стать недоступными, но родительские узлы должны сохранить

свою работоспособность.

Управляющий узел отвечает за ввод команд от пользователя и отправку этих команд на вычислительные узлы.

- Топология 2 Дерево общего вида.
- Набор команд 3 Локальный таймер.
- Тип проверки доступности узлов 3 heartbeat time.
- Технология очереди сообщений: zero message queue.

Общий метод и алгоритм решения

Использованные системные вызовы:

- pid_t **fork**(void); создает дочерний процесс, возвращает PID дочернего процесса, а процессу потомку возвращается 0, а в случае ошибки -1.
- int **execl**(const char *pathname, const char *arg, .../*, (char *) NULL */) исполняет указанные файлы.
- **zmq ctx new**() создает новый контекст ZMQ.
- **zmq socket**() создает ZMQ сокет.
- **zmq close**() закрывает ZMQ сокет.
- **zmq ctx destroy**() уничтожает контекст ZMQ.
- zmq socket() инициализация ZMQ сокета.
- **zmq_connect**() установление сое динения между сокетом ZMQ и удаленным адресом.
- **zmq sotcockopt**() установка опций конфигурации для сокета ZMQ.
- **zmq_recv**() прием сообщений на сокете ZMQ.
- **zmq send**() отправка сообщений с помощью сокета ZMQ.
- zmq bing() привязка сокета к адресу и порту.

Для работы с системой, запускается программа serv.c, которая является реализацией логики управляющего узла, при создании вычислительного узла программа создает новый процесс и запускает в нем программу user.c. Сообщения в вычислительные узлы передаются при помощи

ZeroMQ, по созданному сокету. Взаимосвязь узлов между собой описывается логикой, описанной в файле tree.h.

Код программы

serv.c

```
#include "tree.h"
#include <unistd.h>
#include <string.h>
#include <fcntl.h>
#include <sys/wait.h>
#include <mqueue.h>
#include <zmq.h>
char message[256]; // буфер
void killWithChildren(TNode *node, void * publisher) { // удаляем процессы
  if (node == NULL) {
    return;
  }
  // Отключаем текущий узел
  sprintf(message, "kill %d", node->data);
  zmq send(publisher, message, strlen(message), 0);
  memset(message, 0, sizeof(message));
  // Рекурсивно отключаем всех потомков
  killWithChildren(node->firstChild, publisher);
  killWithChildren(node->nextBrother, publisher);
}
int main() {
  void *context = zmq ctx new();
```

```
void *publisher = zmq socket(context, ZMQ PUB);
zmq bind(publisher, "tcp://127.0.0.1:5555");
char input[256];
char command[100];
char subcommand[100];
int arg1 = 0, arg2 = 0;
TNode *root = createNode(-1); // управляющий узел
while (1) {
  memset(message, 0, sizeof(message));
  memset(command, 0, sizeof(command));
  if(fgets(input, sizeof(input), stdin) == NULL) {
    break;
  }
  sscanf(input, "%s", command);
   if (strcmp(command, "create") == 0){
    sscanf(input, "%*s %d %d", &arg1, &arg2);
    TNode *node = find node(root, arg2);
    TNode *node2 = find node(root, arg1);
    if (node == NULL) {
       printf("Error: Parent not found \n");
    else if(node2 != NULL){
       printf("Error: Already exist \n");
    }
    else{
       addChild(node, arg1);
```

```
if (arg2 == -1) { // если создаем в управляющем узле}
       pid_t id = fork();
       if (id == 0){
         char str1[sizeof(int)];
         sprintf(str1, "%d", arg1);
         execl("./user", "./user", str1, NULL);
         perror("execl");
       }
       printf("Ok: %d\n", id);
     }
     else {
       sprintf(message, "create %d %d", arg1, arg2);
       zmq send(publisher, message, strlen(message), 0);
     }
}
else if (strcmp(command, "exec") == 0) {
  sscanf(input, "%*s %d %s", &arg1, subcommand);
  TNode *searching = find_node(root, arg1);
  if (arg1 == -1) {
     printf("This is a command process\n");
  }
  else if (searching == NULL) {
     printf("Error:id Not found\n");
  }
  else if (searching->exist) {
     zmq_send(publisher, input, strlen(input), 0);
  }
```

```
else {
     printf("You can't give an option to dead r3oot\n");
     continue;
  }
}
else if (strcmp(command, "kill") == 0) {
  sscanf(input, "%*s %d", &arg1);
  TNode *node4 = find node(root, arg1);
  if (arg1 == -1)
     printf("Nope\n");
  else if(node4 == NULL){
     printf("This node is dead or doesn't exist ever\n");
  }
  else {
     zmq send(publisher, input, strlen(input), 0);
     killWithChildren(node4->firstChild, publisher);
     disableNode(node4->firstChild);
     disableOneNode(node4);
}
else if (strcmp(command, "heartbit") == 0) {
  sscanf (input, "%*s %d", &arg1);
  int time = arg1 / 1000;
  Heartbit(root, time);
  printf("\n");
}
else if (strcmp(command, "ping") == 0) {
  sscanf(input, "%*s %d", &arg1);
```

```
TNode* search_available_root = find_node(root, arg1);
       if (arg1 == -1) {
          printf("Control process is always available\n");
         printf("\n");
       }
       if (search available root == NULL) {
          printf("Error: id not found\n");
         continue;
       }
       if (search available root->exist) {
          printf("Ok: 1 // узел %d доступен\n", arg1);
          continue;
       }
       else {
          printf("Ok: 0 // узел %d недоступен\n", arg1);
         continue;
  zmq_close(publisher);
  zmq ctx destroy(context);
}
user.c
#include <stdio.h>
#include <stdlib.h>
#include <stdbool.h>
#include "tree.h"
#include <string.h>
#include <unistd.h>
```

```
#include <fcntl.h>
#include <sys/wait.h>
#include <zmq.h>
int id;
struct Timer {
  clock t total time;
  time_t cur_time;
  int running;
};
struct Timer myTimer;
void startTimer(struct Timer* timer) {
  if (!timer->running) {
    timer->cur_time = time(NULL);
    timer->running = 1;
    printf("Ok:%d\n", id);
    return;
  }
}
void stopTimer(struct Timer* timer) {
  if (timer->running) {
    timer->total_time += time(NULL) - timer->cur_time;
    timer->running = 0;
    printf("Ok:%d\n", id);
    return;
  }
```

```
void getTotalSumTimer(struct Timer* timer) {
  if (timer->running) {
    printf("Ok:%d: %ld\n", id, (timer->total_time + (time(NULL) - timer->cur_time)) * 1000);
  }
  else {
    printf("Ok:%d: %ld\n", id, timer->total_time * 1000);
  }
  return;
}
int main(int argc, char **argv) {
  sscanf(argv[1], "%d", &id);
  void *context = zmq ctx new();
  void *subscriber = zmq socket(context, ZMQ SUB);
  zmq connect(subscriber, "tcp://127.0.0.1:5555");
  zmq setsockopt(subscriber, ZMQ SUBSCRIBE, "", 0);
  char buffer[256];
  char command[256];
  char subcommand[256];
  int arg1 = 0, arg2 = 0, k = 0, c = 0, val = 0;
  pid tid1;
  while (1) {
    memset(buffer, 0, sizeof(buffer));
    memset(command, 0, sizeof(command));
    zmq_recv(subscriber, buffer, sizeof(buffer), 0); // распаковываем сообщение в buffer
    sscanf(buffer, "%s", command);
```

}

```
if (strcmp(command, "create") == 0){
  sscanf(buffer, "%*s %d %d", &arg1, &arg2);
  if (id == arg2){
    printf("Node %d: create child\n", id);
    pid t id child = fork();
    if (id_child == 0){
       char str1[sizeof(int)];
       sprintf(str1, "%d", arg1);
       execl("./user", "./user", str1, NULL);
       perror("execl");
    }
    printf("Ok: %d\n", id_child);
}
else if (strcmp(command, "exec") == 0) {
  sscanf(buffer, "%*s %d %s", &arg1, subcommand);
  time t t = time(NULL);
  if (id == arg1) {
    if (strcmp(subcommand, "time") == 0) {
       getTotalSumTimer(&myTimer);
     }
    else if (strcmp(subcommand, "start") == 0) {
       startTimer(&myTimer);
    }
    else if (strcmp(subcommand, "stop") == 0) {
       stopTimer(&myTimer);
    }
  }
```

```
}
    else if (strcmp(command, "kill") == 0) {
       sscanf(buffer, "%*s %d", &arg1);
       if (id == arg1){
         printf("Node %d: has been killed\n", id);
         break;
  }
  zmq_close(subscriber);
  zmq_ctx_destroy(context);
}
tree.h
#include <stdio.h>
#include <stdbool.h>
#include <stdlib.h>
#include <unistd.h>
#include <stdint.h>
#include <time.h>
typedef struct TNode {
  int data;
  struct TNode *firstChild;
  struct TNode *nextBrother;
  bool exist;
} TNode;
TNode *createNode(int data) {
  TNode *newNode = (TNode *)malloc(sizeof(TNode));
```

```
if (newNode != NULL) {
    newNode->data = data;
    newNode->firstChild = NULL;
    newNode->nextBrother = NULL;
    newNode->exist = true;
  return newNode;
}
void addChild(TNode *parent, int data) { // добавление дочернего узла
  TNode *newChild = createNode(data);
  if (newChild == NULL) {
    fprintf(stderr, "Failed to create a new child node.\n");
    return;
  }
  if (parent->firstChild == NULL) {
    parent->firstChild = newChild;
  } else {
    TNode *brother = parent->firstChild;
    while (brother->nextBrother != NULL) {
       brother = brother->nextBrother;
    }
    brother->nextBrother = newChild;
  }
TNode* find node(TNode *root, int data) { // обход дерева
  if (root == NULL)  {
    return NULL;
```

```
}
  if (root->data == data && root->exist == true) {
    return root;
  }
  TNode *found_in_child = find_node(root->firstChild, data);
  if (found in child != NULL) {
    return found_in_child;
  }
  return find_node(root->nextBrother, data);
}
void Heartbit(TNode* root, int time) {
  if (root != NULL) {
    if (root->exist) {
       sleep(time);
       printf("Heartbit: node %d is fine\n", root->data);
     }
    else {
       sleep(4*time);
       printf("Heartbit: node %d is unavailable now\n", root->data);
     }
    Heartbit(root->firstChild, time);
     Heartbit(root->nextBrother, time);
  }
}
```

```
if (node == NULL) {
    return;
}
node->exist = false;
disableNode(node->firstChild);
disableNode(node->nextBrother);
}

void disableOneNode(TNode *node) { // убийство родительского узла
node->exist = false;
}
```

Протокол работы программы

Тестирование:

```
mattrrixwsl@DESKTOP-HRTTO4C:/mnt/c/Users/Никита/Desktop/Projects/MAI8fac OS/lab5-7/progra
ms$ ./server
create 5 -1
Ok: 103413
create 10-1
Ok: 103422
create 65
Node 5: create child
Ok: 103439
create 9 10
Node 10: create child
Ok: 103473
ping 9
Ok: 1 // узел 9 доступен
kill 9
Node 9: has been killed
ping 9
Error: id not found
heartbit 2000
Heartbit: node -1 is fine
Heartbit: node 5 is fine
Heartbit: node 6 is fine
Heartbit: node 10 is fine
Heartbit: node 9 is unavailable now
exec 6 start
```

```
exec time
exec 6 time
Ok:6: 12000
exec 6 stop
Ok:6
exec 6 time
Ok:6: 17000
exec 5 start
Ok:5
exec 6 start
Ok:6
exec 5 time
Ok:5: 9000
exec 6 time
Ok:6: 23000
exec 5 stop
Ok:5
exec 6 stop
Ok:6
Node 5: has been killed
Node 6: has been killed
exec 5 start
Error:id Not found
  Strace:
execve("./server", ["./server", "-f"], 0x7ffd0abe7ab8 /* 35 vars */) = 0
brk(NULL)
                         = 0x558e7d35f000
arch pretl(0x3001 /* ARCH ??? */, 0x7ffc1e19cdd0) = -1 EINVAL (Invalid argument)
mmap(NULL, 8192, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01bed10000
access("/etc/ld.so.preload", R OK) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/etc/ld.so.cache", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=19739, ...}, AT EMPTY PATH) = 0
mmap(NULL, 19739, PROT READ, MAP PRIVATE, 3, 0) = 0x7f01bed0b000
                      = 0
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libzmq.so.5", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=634936, ...}, AT EMPTY PATH) = 0
mmap(NULL, 636784, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01bec6f000
mmap(0x7f01bec87000, 397312, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x18000) = 0x7f01bec87000
mmap(0x7f01bece8000, 106496, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x79000) = 0x7f01bece8000
mmap(0x7f01bed02000, 36864, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x92000) = 0x7f01bed02000
close(3)
                      = 0
```

Ok:6

```
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libc.so.6", O RDONLY|O CLOEXEC) = 3
pread64(3, "\4\0\0\0\24\0\0\0\3\0\0\0GNU\0\302\211\332Pq\2439\235\350\223\322\257\201\326\243\f"...,
68,896) = 68
newfstatat(3, "", {st mode=S IFREG|0755, st size=2220400, ...}, AT EMPTY PATH) = 0
mmap(NULL, 2264656, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01bea46000
mprotect(0x7f01bea6e000, 2023424, PROT NONE) = 0
mmap(0x7f01bea6e000, 1658880, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x28000) = 0x7f01bea6e000
mmap(0x7f01bec03000, 360448, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x1bd000) = 0x7f01bec03000
mmap(0x7f01bec5c000, 24576, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x215000) = 0x7f01bec5c000
mmap(0x7f01bec62000, 52816, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01bec62000
                   = 0
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libbsd.so.0", O_RDONLY|O_CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=89096, ...}, AT EMPTY PATH) = 0
mmap(NULL, 94432, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01bea2e000
mprotect(0x7f01bea32000, 69632, PROT NONE) = 0
mmap(0x7f01bea32000, 53248, PROT READ|PROT EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x4000) = 0x7f01bea32000
mmap(0x7f01bea3f000, 12288, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x11000) = 0x7f01bea3f000
mmap(0x7f01bea43000, 8192, PROT READ|PROT_WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x14000) = 0x7f01bea43000
mmap(0x7f01bea45000, 224, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01bea45000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libsodium.so.23", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=355040, ...}, AT EMPTY PATH) = 0
mmap(NULL, 357440, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be9d6000
mprotect(0x7f01be9e2000, 303104, PROT NONE) = 0
mmap(0x7f01be9e2000, 229376, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xc000) = 0x7f01be9e2000
mmap(0x7f01bea1a000, 69632, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x44000) = 0x7f01bea1a000
mmap(0x7f01bea2c000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x55000) = 0x7f01bea2c000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libpgm-5.3.so.0", O RDONLY|O CLOEXEC) = 3
```

```
newfstatat(3, "", {st mode=S IFREG|0644, st size=310264, ...}, AT EMPTY PATH) = 0
mmap(NULL, 329808, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be985000
mmap(0x7f01be989000, 172032, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x4000) = 0x7f01be989000
mmap(0x7f01be9b3000, 118784, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x2e000) = 0x7f01be9b3000
mmap(0x7f01be9d0000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x4a000) = 0x7f01be9d0000
mmap(0x7f01be9d2000, 14416, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01be9d2000
                    = 0
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libnorm.so.1", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=497824, ...}, AT EMPTY PATH) = 0
mmap(NULL, 1223168, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be85a000
mprotect(0x7f01be864000, 446464, PROT NONE) = 0
mmap(0x7f01be864000, 286720, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xa000) = 0x7f01be864000
mmap(0x7f01be8aa000, 155648, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x50000) = 0x7f01be8aa000
mmap(0x7f01be8d1000, 16384, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x76000) = 0x7f01be8d1000
mmap(0x7f01be8d5000, 719360, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01be8d5000
close(3)
mmap(NULL, 8192, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01be858000
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libgssapi krb5.so.2", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=338648, ...}, AT EMPTY PATH) = 0
mmap(NULL, 340960, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be804000
mprotect(0x7f01be80f000, 282624, PROT NONE) = 0
mmap(0x7f01be80f000, 229376, PROT READ|PROT EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xb000) = 0x7f01be80f000
mmap(0x7f01be847000, 49152, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x43000) = 0x7f01be847000
mmap(0x7f01be854000, 16384, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x4f000) = 0x7f01be854000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libstdc++.so.6", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=2260296, ...}, AT EMPTY PATH) = 0
mmap(NULL, 2275520, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be5d8000
mprotect(0x7f01be672000, 1576960, PROT NONE) = 0
mmap(0x7f01be672000, 1118208, PROT READ|PROT EXEC,
```

```
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x9a000) = 0x7f01be672000
mmap(0x7f01be783000, 454656, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x1ab000) = 0x7f01be783000
mmap(0x7f01be7f3000, 57344, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x21a000) = 0x7f01be7f3000
mmap(0x7f01be801000, 10432, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01be801000
                    = 0
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libgcc s.so.1", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=125488, ...}, AT EMPTY PATH) = 0
mmap(NULL, 127720, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be5b8000
mmap(0x7f01be5bb000, 94208, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x3000) = 0x7f01be5bb000
mmap(0x7f01be5d2000, 16384, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x1a000 = 0x7f01be5d2000
mmap(0x7f01be5d6000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x1d000) = 0x7f01be5d6000
                    = 0
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libmd.so.0", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=47472, ...}, AT EMPTY PATH) = 0
mmap(NULL, 49384, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be5ab000
mmap(0x7f01be5ad000, 28672, PROT_READ|PROT_EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x2000) = 0x7f01be5ad000
mmap(0x7f01be5b4000, 8192, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x9000) = 0x7f01be5b4000
mmap(0x7f01be5b6000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xa000) = 0x7f01be5b6000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libpthread.so.0", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=21448, ...}, AT EMPTY PATH) = 0
mmap(NULL, 16424, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be5a6000
mmap(0x7f01be5a7000, 4096, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x1000) = 0x7f01be5a7000
mmap(0x7f01be5a8000, 4096, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x2000) = 0x7f01be5a8000
mmap(0x7f01be5a9000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x2000) = 0x7f01be5a9000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libm.so.6", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=940560, ...}, AT EMPTY PATH) = 0
mmap(NULL, 942344, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be4bf000
mmap(0x7f01be4cd000, 507904, PROT READ|PROT EXEC,
```

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MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xe000) = 0x7f01be4cd000
mmap(0x7f01be549000, 372736, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x8a000) = 0x7f01be549000
mmap(0x7f01be5a4000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xe4000) = 0x7f01be5a4000
close(3)
mmap(NULL, 8192, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01be4bd000
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libkrb5.so.3", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=827936, ...}, AT EMPTY PATH) = 0
mmap(NULL, 830576, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be3f2000
mprotect(0x7f01be413000, 634880, PROT NONE) = 0
mmap(0x7f01be413000, 380928, PROT READ|PROT EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x21000) = 0x7f01be413000
mmap(0x7f01be470000, 249856, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x7e000 = 0x7f01be470000
mmap(0x7f01be4ae000, 61440, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xbb000) = 0x7f01be4ae000
close(3)
                    = 0
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libk5crypto.so.3", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=182864, ...}, AT EMPTY PATH) = 0
mmap(NULL, 188472, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be3c3000
mprotect(0x7f01be3c7000, 163840, PROT NONE) = 0
mmap(0x7f01be3c7000, 110592, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x4000) = 0x7f01be3c7000
mmap(0x7f01be3e2000, 49152, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x1f000) = 0x7f01be3e2000
mmap(0x7f01be3ef000, 8192, PROT READ|PROT WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2b000) = 0x7f01be3ef000
mmap(0x7f01be3f1000, 56, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01be3f1000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libcom err.so.2", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=18504, ...}, AT EMPTY PATH) = 0
mmap(NULL, 20552, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be3bd000
mmap(0x7f01be3bf000, 4096, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x2000) = 0x7f01be3bf000
mmap(0x7f01be3c0000, 4096, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x3000) = 0x7f01be3c0000
mmap(0x7f01be3c1000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x3000) = 0x7f01be3c1000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libkrb5support.so.0", O RDONLY|O CLOEXEC) = 3
```

```
newfstatat(3, "", {st mode=S IFREG|0644, st size=52016, ...}, AT EMPTY PATH) = 0
mmap(NULL, 54224, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be3af000
mprotect(0x7f01be3b2000, 36864, PROT NONE) = 0
mmap(0x7f01be3b2000, 24576, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x3000) = 0x7f01be3b2000
mmap(0x7f01be3b8000, 8192, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x9000) = 0x7f01be3b8000
mmap(0x7f01be3bb000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xb000) = 0x7f01be3bb000
close(3)
                    = 0
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libkeyutils.so.1", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=22600, ...}, AT EMPTY PATH) = 0
mmap(NULL, 24592, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be3a8000
mmap(0x7f01be3aa000, 8192, PROT READ|PROT EXEC,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x2000) = 0x7f01be3aa000
mmap(0x7f01be3ac000, 4096, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0x4000) = 0x7f01be3ac000
mmap(0x7f01be3ad000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0x4000) = 0x7f01be3ad000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libresolv.so.2", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st_size=68552, ...}, AT_EMPTY_PATH) = 0
mmap(NULL, 8192, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01be3a6000
mmap(NULL, 80456, PROT READ, MAP PRIVATE|MAP DENYWRITE, 3, 0) = 0x7f01be392000
mmap(0x7f01be395000, 40960, PROT READ|PROT EXEC,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x3000) = 0x7f01be395000
mmap(0x7f01be39f000, 12288, PROT READ, MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3,
0xd000) = 0x7f01be39f000
mmap(0x7f01be3a2000, 8192, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP DENYWRITE, 3, 0xf000) = 0x7f01be3a2000
mmap(0x7f01be3a4000, 6728, PROT READ|PROT WRITE,
MAP PRIVATE|MAP FIXED|MAP ANONYMOUS, -1, 0) = 0x7f01be3a4000
close(3)
mmap(NULL, 8192, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01be390000
mmap(NULL, 12288, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01be38d000
arch prctl(ARCH SET FS, 0x7f01be38d9c0) = 0
set tid address(0x7f01be38dc90)
                            = 131424
set robust list(0x7f01be38dca0, 24)
rseq(0x7f01be38e360, 0x20, 0, 0x53053053) = 0
mprotect(0x7f01bec5c000, 16384, PROT READ) = 0
```

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mprotect(0x7f01be3a2000, 4096, PROT READ) = 0
mprotect(0x7f01be3ad000, 4096, PROT READ) = 0
mprotect(0x7f01be3bb000, 4096, PROT READ) = 0
mprotect(0x7f01be3c1000, 4096, PROT READ) = 0
mprotect(0x7f01be3ef000, 4096, PROT READ) = 0
mprotect(0x7f01be4ae000, 53248, PROT READ) = 0
mprotect(0x7f01be5a4000, 4096, PROT READ) = 0
mprotect(0x7f01be5a9000, 4096, PROT READ) = 0
mprotect(0x7f01be5b6000, 4096, PROT READ) = 0
mprotect(0x7f01be5d6000, 4096, PROT READ) = 0
mmap(NULL, 8192, PROT READ|PROT WRITE, MAP PRIVATE|MAP ANONYMOUS, -1, 0) =
0x7f01be38b000
mprotect(0x7f01be7f3000, 45056, PROT READ) = 0
mprotect(0x7f01be854000, 8192, PROT READ) = 0
mprotect(0x7f01be8d1000, 12288, PROT READ) = 0
mprotect(0x7f01be9d0000, 4096, PROT READ) = 0
mprotect(0x7f01bea2c000, 4096, PROT READ) = 0
mprotect(0x7f01bea43000, 4096, PROT READ) = 0
mprotect(0x7f01bed02000, 32768, PROT READ) = 0
mprotect(0x558e7bc21000, 4096, PROT READ) = 0
mprotect(0x7f01bed4a000, 8192, PROT READ) = 0
prlimit64(0, RLIMIT STACK, NULL, {rlim cur=8192*1024, rlim max=RLIM64 INFINITY}) = 0
munmap(0x7f01bed0b000, 19739)
                                    = 0
getrandom("\x5b\x71\x96\xf8\xfc\x9b\x6f\x1d", 8, GRND NONBLOCK) = 8
                           = 0x558e7d35f000
brk(NULL)
brk(0x558e7d380000)
                               = 0x558e7d380000
openat(AT FDCWD, "/sys/devices/system/cpu/online", O RDONLY|O CLOEXEC) = 3
read(3, "0-15\n", 1024)
                             =5
close(3)
                        = 0
openat(AT FDCWD, "/sys/devices/system/cpu",
O RDONLY|O NONBLOCK|O CLOEXEC|O DIRECTORY) = 3
newfstatat(3, "", {st mode=S IFDIR|0755, st size=0, ...}, AT EMPTY PATH) = 0
getdents64(3, 0x558e7d370ee0 /* 32 entries */, 32768) = 936
getdents64(3, 0x558e7d370ee0 /* 0 entries */, 32768) = 0
close(3)
getpid()
                        = 131424
sched getaffinity(131424, 128, [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]) = 32
newfstatat(AT FDCWD, "/etc/nsswitch.conf", {st mode=S IFREG|0644, st size=510, ...}, 0) = 0
newfstatat(AT FDCWD, "/", {st mode=S IFDIR|0755, st size=4096, ...}, 0) = 0
openat(AT FDCWD, "/etc/nsswitch.conf", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=510, ...}, AT EMPTY PATH) = 0
read(3, "# /etc/nsswitch.conf\n#\n# Example"..., 4096) = 510
read(3, "", 4096)
newfstatat(3, "", {st mode=S IFREG|0644, st size=510, ...}, AT EMPTY PATH) = 0
close(3)
openat(AT FDCWD, "/etc/ld.so.cache", O RDONLY|O CLOEXEC) = 3
```

```
newfstatat(3, "", {st mode=S IFREG|0644, st size=19739, ...}, AT EMPTY PATH) = 0
mmap(NULL, 19739, PROT READ, MAP PRIVATE, 3, 0) = 0x7f01bed0b000
                         = 0
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v3/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v3", 0x7ffc1e199d10, 0) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v2/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v2", 0x7ffc1e199d10, 0) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/tls/haswell/x86 64/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu/tls/haswell/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT
(No such file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/tls/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) =
-1 ENOENT (No such file or directory)
newfstatat(AT_FDCWD, "/lib/x86_64-linux-gnu/tls/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No such
file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/tls/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) =
-1 ENOENT (No such file or directory)
newfstatat(AT_FDCWD, "/lib/x86_64-linux-gnu/tls/x86_64", 0x7ffc1e199d10, 0) = -1 ENOENT (No
file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/tls/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu/tls", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or
directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/haswell/x86 64/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT_FDCWD, "/lib/x86_64-linux-gnu/haswell/x86_64", 0x7ffc1e199d10, 0) = -1 ENOENT
such file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No such
file or directory)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such
file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libnss_db.so.2", O_RDONLY|O_CLOEXEC) = -1
(No such file or directory)
newfstatat(AT FDCWD, "/lib/x86 64-linux-gnu", {st mode=S IFDIR|0755, st size=24576, ...}, 0) = 0
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v3/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
```

```
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v3", 0x7ffc1e199d10, 0) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v2/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/glibc-hwcaps/x86-64-v2", 0x7ffc1e199d10, 0) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/haswell/x86 64/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/haswell/x86 64", 0x7ffc1e199d10, 0) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/haswell/libnss db.so.2", O RDONLY|O CLOEXEC)
= -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No
such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC)
= -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No
such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/tls", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file
or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/haswell/x86 64/libnss db.so.2",
O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/haswell/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT
(No such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) =
-1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No
such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) =
-1 ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No
such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64-linux-gnu", {st mode=S IFDIR|0755, st size=24576, ...}, 0) =
openat(AT FDCWD, "/lib/glibc-hwcaps/x86-64-v3/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/glibc-hwcaps/x86-64-v3", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file
or directory)
openat(AT FDCWD, "/lib/glibc-hwcaps/x86-64-v2/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
```

newfstatat(AT FDCWD, "/lib/glibc-hwcaps/x86-64-v2", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file

or directory)

```
openat(AT FDCWD, "/lib/tls/haswell/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/lib/tls/haswell/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or
directory)
openat(AT FDCWD, "/lib/tls/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No
such file or directory)
newfstatat(AT FDCWD, "/lib/tls/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/tls/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No
such file or directory)
newfstatat(AT FDCWD, "/lib/tls/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/tls/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No such file
or directory)
newfstatat(AT FDCWD, "/lib/tls", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/haswell/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT
(No such file or directory)
newfstatat(AT FDCWD, "/lib/haswell/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or
directory)
openat(AT FDCWD, "/lib/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No such
file or directory)
newfstatat(AT FDCWD, "/lib/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No such
file or directory)
newfstatat(AT FDCWD, "/lib/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No such file or
directory)
newfstatat(AT FDCWD, "/lib", {st mode=S IFDIR|0755, st size=4096, ...}, 0) = 0
openat(AT FDCWD, "/usr/lib/glibc-hwcaps/x86-64-v3/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/glibc-hwcaps/x86-64-v3", 0x7ffc1e199d10, 0) = -1 ENOENT (No such
file or directory)
openat(AT FDCWD, "/usr/lib/glibc-hwcaps/x86-64-v2/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/glibc-hwcaps/x86-64-v2", 0x7ffc1e199d10, 0) = -1 ENOENT (No such
file or directory)
openat(AT FDCWD, "/usr/lib/tls/haswell/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT_FDCWD, "/usr/lib/tls/haswell/x86_64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file
directory)
openat(AT FDCWD, "/usr/lib/tls/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT
(No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/tls/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or
directory)
```

openat(AT FDCWD, "/usr/lib/tls/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT

newfstatat(AT FDCWD, "/usr/lib/tls/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or

(No such file or directory)

```
directory)
openat(AT FDCWD, "/usr/lib/tls/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No such
file or directory)
newfstatat(AT FDCWD, "/usr/lib/tls", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/haswell/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
newfstatat(AT FDCWD, "/usr/lib/haswell/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or
directory)
openat(AT FDCWD, "/usr/lib/haswell/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No
such file or directory)
newfstatat(AT FDCWD, "/usr/lib/haswell", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No
such file or directory)
newfstatat(AT FDCWD, "/usr/lib/x86 64", 0x7ffc1e199d10, 0) = -1 ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/libnss db.so.2", O RDONLY|O CLOEXEC) = -1 ENOENT (No such file
or directory)
newfstatat(AT FDCWD, "/usr/lib", {st mode=S IFDIR|0755, st size=4096, ...}, 0) = 0
munmap(0x7f01bed0b000, 19739)
openat(AT FDCWD, "/etc/ld.so.cache", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=19739, ...}, AT EMPTY PATH) = 0
mmap(NULL, 19739, PROT READ, MAP PRIVATE, 3, 0) = 0x7f01bed0b000
close(3)
openat(AT FDCWD, "/lib/x86 64-linux-gnu/libnss db-2.35.so", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/usr/lib/x86 64-linux-gnu/libnss db-2.35.so", O RDONLY|O CLOEXEC) = -1
ENOENT (No such file or directory)
openat(AT FDCWD, "/lib/libnss db-2.35.so", O RDONLY|O CLOEXEC) = -1 ENOENT (No such file
or directory)
openat(AT FDCWD, "/usr/lib/libnss db-2.35.so", O RDONLY|O CLOEXEC) = -1 ENOENT (No such
file or directory)
munmap(0x7f01bed0b000, 19739)
                                    = 0
openat(AT FDCWD, "/etc/protocols", O RDONLY|O CLOEXEC) = 3
newfstatat(3, "", {st mode=S IFREG|0644, st size=2932, ...}, AT EMPTY PATH) = 0
lseek(3, 0, SEEK SET)
read(3, "# Internet (IP) protocols\n#\n# Up"..., 4096) = 2932
read(3, "", 4096)
                           = 0
close(3)
eventfd2(0, EFD CLOEXEC)
                                   =3
fcntl(3, F GETFL)
                             = 0x2 (flags O RDWR)
fentl(3, F SETFL, O RDWR|O NONBLOCK) = 0
                             = 0x802 (flags O RDWR|O NONBLOCK)
fcntl(3, F GETFL)
fentl(3, F SETFL, O RDWR|O NONBLOCK) = 0
                        = 131424
getpid()
getpid()
                        = 131424
getrandom("\xa6\xcb\x1c\x96\xbc\xfd\x7f\x92\x2a\x8d\xa0\x6e\x97\x0e\x06\x67", 16, 0) = 16
getrandom("\x1c\xb2\xeb\x1a\x34\x05\xe9\x64\x11\x12\x50\x0f\xce\xf9\xbe\xed", 16, 0) = 16
```

```
eventfd2(0, EFD CLOEXEC)
                                 =4
                           = 0x2 (flags O RDWR)
fcntl(4, F GETFL)
fcntl(4, F SETFL, O RDWR|O NONBLOCK) = 0
fcntl(4, F GETFL)
                           = 0x802 (flags O RDWR|O NONBLOCK)
fcntl(4, F SETFL, O RDWR|O NONBLOCK) = 0
                      = 131424
getpid()
epoll create1(EPOLL CLOEXEC)
                                     =5
epoll ctl(5, EPOLL CTL ADD, 4, {events=0, data={u32=2100761184, u64=94070474478176}}) = 0
epoll ctl(5, EPOLL CTL MOD, 4, {events=EPOLLIN, data={u32=2100761184,
u64=94070474478176\}\})=0
                      = 131424
getpid()
rt sigaction(SIGRT 1, {sa handler=0x7f01bead7870, sa mask=[],
sa flags=SA RESTORER|SA ONSTACK|SA RESTART|SA SIGINFO, sa restorer=0x7f01bea88520},
NULL, 8) = 0
rt sigprocmask(SIG UNBLOCK, [RTMIN RT 1], NULL, 8) = 0
mmap(NULL, 8392704, PROT NONE, MAP PRIVATE|MAP ANONYMOUS|MAP STACK, -1, 0) =
0x7f01bdb8a000
mprotect(0x7f01bdb8b000, 8388608, PROT READ|PROT WRITE) = 0
rt sigprocmask(SIG BLOCK, \sim[], [], 8) = 0
clone3({flags=CLONE VM|CLONE FS|CLONE FILES|CLONE SIGHAND|CLONE THREAD|CLON
E SYSVSEM|CLONE SETTLS|CLONE PARENT SETTID|CLONE CHILD CLEARTID,
child tid=0x7f01be38a910, parent tid=0x7f01be38a910, exit signal=0, stack=0x7f01bdb8a000,
stack size=0x7ffc80, tls=0x7f01be38a640} => {parent tid=[131425]}, 88) = 131425
rt sigprocmask(SIG SETMASK, [], NULL, 8) = 0
eventfd2(0, EFD CLOEXEC)
                           = 0x2 \text{ (flags O RDWR)}
fcntl(6, F GETFL)
fentl(6, F SETFL, O RDWR|O NONBLOCK) = 0
fcntl(6, F_GETFL)
                           = 0x802 (flags O RDWR|O NONBLOCK)
fentl(6, F SETFL, O RDWR|O NONBLOCK) = 0
                      = 131424
getpid()
epoll create1(EPOLL CLOEXEC)
                                     = 7
epoll ctl(7, EPOLL CTL ADD, 6, {events=0, data={u32=2100781664, u64=94070474498656}}) = 0
epoll ctl(7, EPOLL CTL MOD, 6, {events=EPOLLIN, data={u32=2100781664,
u64=94070474498656\}\})=0
mmap(NULL, 8392704, PROT NONE, MAP PRIVATE|MAP ANONYMOUS|MAP STACK, -1, 0) =
0x7f01bd389000
mprotect(0x7f01bd38a000, 8388608, PROT READ|PROT WRITE) = 0
rt sigprocmask(SIG BLOCK, \sim[], [], 8) = 0
clone3({flags=CLONE VM|CLONE FS|CLONE FILES|CLONE SIGHAND|CLONE THREAD|CLON
E SYSVSEM|CLONE SETTLS|CLONE PARENT SETTID|CLONE CHILD CLEARTID,
child tid=0x7f01bdb89910, parent tid=0x7f01bdb89910, exit signal=0, stack=0x7f01bd389000,
stack size=0x7ffc80, tls=0x7f01bdb89640} => {parent tid=[131426]}, 88) = 131426
rt sigprocmask(SIG SETMASK, [], NULL, 8) = 0
eventfd2(0, EFD CLOEXEC)
fcntl(8, F GETFL)
                           = 0x2 (flags O RDWR)
```

```
fentl(8, F SETFL, O RDWR|O NONBLOCK) = 0
fcntl(8, F GETFL)
                            = 0x802 (flags O RDWR|O NONBLOCK)
fcntl(8, F SETFL, O RDWR|O NONBLOCK) = 0
                       = 131424
getpid()
getpid()
                       = 131424
poll([{fd=8, events=POLLIN}], 1, 0)
                                 = 0 (Timeout)
socket(AF NETLINK, SOCK RAW|SOCK CLOEXEC, NETLINK ROUTE) = 9
bind(9, {sa family=AF NETLINK, nl pid=0, nl groups=00000000}, 12) = 0
getsockname(9, {sa family=AF NETLINK, nl pid=131424, nl groups=00000000}, [12]) = 0
sendto(9, [{nlmsg len=20, nlmsg type=RTM GETLINK,
nlmsg flags=NLM F REQUEST|NLM F DUMP, nlmsg seq=1709268905, nlmsg pid=0},
{ifi family=AF UNSPEC, ...}], 20, 0, {sa family=AF NETLINK, nl pid=0, nl groups=00000000},
12) = 20
recvmsg(9, {msg_name={sa_family=AF_NETLINK, nl_pid=0, nl_groups=00000000}}, msg_namelen=12,
msg iov=[{iov base=[[{nlmsg len=1336, nlmsg type=RTM NEWLINK, nlmsg flags=NLM F MULTI,
nlmsg seq=1709268905, nlmsg pid=131424}, {ifi family=AF UNSPEC,
ifi type=ARPHRD LOOPBACK, ifi index=if nametoindex("lo"),
ifi flags=IFF UP|IFF LOOPBACK|IFF RUNNING|IFF LOWER UP, ifi change=0}, [[{nla len=7,
nla type=IFLA IFNAME}, "lo"], [{nla len=8, nla type=IFLA TXQLEN}, 1000], [{nla len=5,
nla_type=IFLA_OPERSTATE}, 0], [{nla_len=5, nla_type=IFLA_LINKMODE}, 0], [{nla_len=8,
nla type=IFLA MTU}, 65536], [{nla len=8, nla type=IFLA MIN MTU}, 0], [{nla len=8,
nla type=IFLA MAX MTU}, 0], [{nla len=8, nla type=IFLA GROUP}, 0], [{nla len=8,
nla_type=IFLA_PROMISCUITY}, 0], [{nla len=8, nla type=IFLA NUM TX QUEUES}, 1],
[{nla len=8, nla type=IFLA GSO MAX SEGS}, 65535], [{nla len=8,
nla type=IFLA GSO MAX SIZE}, 65536], [{nla len=8, nla type=IFLA NUM RX QUEUES}, 1],
[{nla_len=5, nla_type=IFLA_CARRIER}, 1], [{nla_len=12, nla_type=IFLA_QDISC}, "noqueue"],
[{nla len=8, nla type=IFLA CARRIER CHANGES}, 0], [{nla len=8,
nla type=IFLA CARRIER UP COUNT}, 0], [{nla len=8,
nla type=IFLA CARRIER DOWN COUNT}, 0], [{nla len=5, nla type=IFLA PROTO DOWN}, 0],
[{nla len=36, nla type=IFLA MAP}, {mem start=0, mem end=0, base addr=0, irq=0, dma=0, port=0}],
[{nla len=10, nla type=IFLA ADDRESS}, 00:00:00:00:00:00], [{nla len=10,
nla type=IFLA BROADCAST}, 00:00:00:00:00:00], [{nla len=196, nla type=IFLA STATS64},
{rx packets=213128, tx packets=213128, rx bytes=491245870, tx bytes=491245870, rx errors=0,
tx errors=0, rx dropped=0, tx dropped=0, multicast=0, collisions=0, rx length errors=0,
rx over errors=0, rx crc errors=0, rx frame errors=0, rx fifo errors=0, rx missed errors=0,
tx aborted errors=0, tx carrier errors=0, tx fifo errors=0, tx heartbeat errors=0, tx window errors=0,
rx compressed=0, tx compressed=0, rx nohandler=0}], [{nla len=100, nla type=IFLA STATS},
{rx packets=213128, tx packets=213128, rx bytes=491245870, tx bytes=491245870, rx errors=0,
tx errors=0, rx dropped=0, tx dropped=0, multicast=0, collisions=0, rx length errors=0,
rx over errors=0, rx crc errors=0, rx frame errors=0, rx fifo errors=0, rx missed errors=0,
tx aborted errors=0, tx carrier errors=0, tx fifo errors=0, tx heartbeat errors=0, tx window errors=0,
rx compressed=0, tx compressed=0, rx nohandler=0}], [{nla len=12, nla type=IFLA XDP},
[{nla len=5, nla type=IFLA XDP ATTACHED}, XDP ATTACHED NONE]], [{nla len=780,
nla type=IFLA AF SPEC}, [[{nla len=136, nla type=AF INET}, [{nla len=132,
nla type=IFLA INET CONF}, [[IPV4 DEVCONF FORWARDING-1] = 0,
[IPV4 DEVCONF MC FORWARDING-1] = 0, [IPV4 DEVCONF PROXY ARP-1] = 0,
[IPV4 DEVCONF ACCEPT REDIRECTS-1] = 1, [IPV4 DEVCONF SECURE REDIRECTS-1] = 1,
[IPV4 DEVCONF SEND REDIRECTS-1] = 1, [IPV4 DEVCONF SHARED MEDIA-1] = 1,
[IPV4 DEVCONF RP FILTER-1] = 2, [IPV4 DEVCONF ACCEPT SOURCE ROUTE-1] = 0,
[IPV4 DEVCONF BOOTP RELAY-1] = 0, [IPV4 DEVCONF LOG MARTIANS-1] = 0,
[IPV4 DEVCONF TAG-1] = 0, [IPV4 DEVCONF ARPFILTER-1] = 0,
[IPV4 DEVCONF MEDIUM ID-1] = 0, [IPV4 DEVCONF NOXFRM-1] = 1,
[IPV4 DEVCONF NOPOLICY-1] = 1, [IPV4 DEVCONF FORCE IGMP VERSION-1] = 0,
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[IPV4 DEVCONF ARP ANNOUNCE-1] = 0, [IPV4 DEVCONF ARP IGNORE-1] = 0,
[IPV4 DEVCONF PROMOTE SECONDARIES-1] = 1, [IPV4 DEVCONF ARP ACCEPT-1] = 0,
[IPV4 DEVCONF ARP NOTIFY-1] = 0, [IPV4 DEVCONF ACCEPT LOCAL-1] = 0,
[IPV4 DEVCONF SRC VMARK-1] = 0, [IPV4 DEVCONF PROXY ARP PVLAN-1] = 0,
[IPV4 DEVCONF ROUTE LOCALNET-1] = 0,
[IPV4 DEVCONF IGMPV2 UNSOLICITED REPORT INTERVAL-1] = 10000,
[IPV4 DEVCONF IGMPV3 UNSOLICITED REPORT INTERVAL-1] = 1000,
[IPV4 DEVCONF IGNORE ROUTES WITH LINKDOWN-1] = 0,
[IPV4 DEVCONF DROP UNICAST IN L2 MULTICAST-1] = 0,
[IPV4 DEVCONF DROP GRATUITOUS ARP-1] = 0, [IPV4 DEVCONF BC FORWARDING-1] =
0]]], [{nla len=640, nla type=AF INET6}, [[{nla len=8, nla type=IFLA INET6 FLAGS}, IF READY],
[{nla len=20, nla type=IFLA INET6 CACHEINFO}, {max reasm len=65535, tstamp=44,
reachable time=20270, retrans time=1000}], [{nla len=228, nla type=IFLA INET6 CONF},
[[DEVCONF FORWARDING] = 0, [DEVCONF HOPLIMIT] = 64, [DEVCONF MTU6] = 65536,
[DEVCONF ACCEPT RA] = 1, [DEVCONF ACCEPT REDIRECTS] = 1, [DEVCONF AUTOCONF]
= 1, [DEVCONF DAD TRANSMITS] = 1, [DEVCONF RTR SOLICITS] = -1,
[DEVCONF RTR SOLICIT INTERVAL] = 4000, [DEVCONF RTR SOLICIT DELAY] = 1000,
[DEVCONF USE TEMPADDR] = -1, [DEVCONF TEMP VALID LFT] = 604800,
[DEVCONF TEMP PREFERED LFT] = 86400, [DEVCONF REGEN MAX RETRY] = 3,
[DEVCONF MAX DESYNC FACTOR] = 600, [DEVCONF MAX ADDRESSES] = 16,
[DEVCONF FORCE MLD VERSION] = 0, [DEVCONF ACCEPT RA DEFRTR] = 1,
[DEVCONF ACCEPT RA PINFO] = 1, [DEVCONF ACCEPT RA RTR PREF] = 0,
[DEVCONF RTR PROBE INTERVAL] = 0, [DEVCONF ACCEPT RA RT INFO MAX PLEN] = 0,
[DEVCONF PROXY NDP] = 0, [DEVCONF OPTIMISTIC DAD] = 0,
[DEVCONF ACCEPT SOURCE ROUTE] = 0, [DEVCONF MC FORWARDING] = 0,
[DEVCONF DISABLE IPV6] = 0, [DEVCONF ACCEPT DAD] = -1, [DEVCONF FORCE TLLAO]
= 0, [DEVCONF NDISC NOTIFY] = 0, [DEVCONF MLDV1 UNSOLICITED REPORT INTERVAL]
= 10000, [DEVCONF MLDV2 UNSOLICITED REPORT INTERVAL] = 1000, ...]], [{nla len=300,
nla type=IFLA INET6 STATS}, [[IPSTATS MIB NUM] = 37, [IPSTATS MIB INPKTS] = 0,
[IPSTATS MIB INOCTETS] = 0, [IPSTATS MIB INDELIVERS] = 0,
[IPSTATS MIB OUTFORWDATAGRAMS] = 0, [IPSTATS MIB OUTPKTS] = 0,
[IPSTATS MIB OUTOCTETS] = 0, [IPSTATS MIB INHDRERRORS] = 0,
[IPSTATS MIB INTOOBIGERRORS] = 0, [IPSTATS MIB INNOROUTES] = 0,
[IPSTATS MIB INADDRERRORS] = 0, [IPSTATS MIB INUNKNOWNPROTOS] = 0,
[IPSTATS MIB INTRUNCATEDPKTS] = 0, [IPSTATS MIB INDISCARDS] = 0,
[IPSTATS MIB OUTDISCARDS] = 0, [IPSTATS MIB OUTNOROUTES] = 0,
[IPSTATS MIB REASMTIMEOUT] = 0, [IPSTATS MIB REASMREQDS] = 0,
[IPSTATS MIB REASMOKS] = 0, [IPSTATS MIB REASMFAILS] = 0, [IPSTATS MIB FRAGOKS]
= 0, [IPSTATS MIB FRAGFAILS] = 0, [IPSTATS MIB FRAGCREATES] = 0,
[IPSTATS MIB INMCASTPKTS] = 0, [IPSTATS MIB OUTMCASTPKTS] = 0,
[IPSTATS MIB INBCASTPKTS] = 0, [IPSTATS MIB OUTBCASTPKTS] = 0,
[IPSTATS MIB INMCASTOCTETS] = 0, [IPSTATS MIB OUTMCASTOCTETS] = 0,
[IPSTATS MIB INBCASTOCTETS] = 0, [IPSTATS MIB OUTBCASTOCTETS] = 0,
[IPSTATS MIB CSUMERRORS] = 0, ...]], [{nla len=52, nla type=IFLA INET6 ICMP6STATS},
[[ICMP6 MIB NUM] = 6, [ICMP6 MIB INMSGS] = 0, [ICMP6 MIB INERRORS] = 0,
[ICMP6 MIB OUTMSGS] = 0, [ICMP6 MIB OUTERRORS] = 0, [ICMP6 MIB CSUMERRORS] =
0]], [{nla len=20, nla type=IFLA INET6 TOKEN}, inet pton(AF INET6, "::")], [{nla len=5,
nla type=IFLA INET6 ADDR GEN MODE}, IN6 ADDR GEN MODE EUI64]]]]]],
[{nlmsg len=1404, nlmsg type=RTM NEWLINK, nlmsg flags=NLM F MULTI,
nlmsg seq=1709268905, nlmsg pid=131424}, {ifi family=AF UNSPEC, ifi type=ARPHRD ETHER,
ifi index=if nametoindex("eth0"),
ifi flags=IFF UP|IFF BROADCAST|IFF RUNNING|IFF MULTICAST|IFF LOWER UP,
ifi_change=0}, [[{nla_len=9, nla_type=IFLA_IFNAME}, "eth0"], [{nla_len=8,
nla type=IFLA TXQLEN}, 1000], [{nla len=5, nla type=IFLA OPERSTATE}, 6], [{nla len=5,
nla type=IFLA LINKMODE}, 0], [{nla len=8, nla type=IFLA MTU}, 1500], [{nla len=8,
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nla type=IFLA MIN MTU}, 68], [{nla len=8, nla type=IFLA MAX MTU}, 65521], [{nla len=8,
nla type=IFLA GROUP}, 0], [{nla len=8, nla type=IFLA PROMISCUITY}, 0], [{nla len=8,
nla type=IFLA NUM TX QUEUES}, 64], [{nla len=8, nla type=IFLA GSO MAX SEGS}, 65535],
[{nla len=8, nla type=IFLA GSO MAX SIZE}, 62780], [{nla len=8,
nla type=IFLA NUM RX QUEUES}, 64], [{nla len=5, nla type=IFLA CARRIER}, 1], [{nla len=7,
nla type=IFLA_QDISC}, "mq"], [{nla_len=8, nla_type=IFLA_CARRIER_CHANGES}, 1], [{nla_len=8,
nla type=IFLA CARRIER UP COUNT}, 1], [{nla len=8,
nla type=IFLA CARRIER DOWN COUNT}, 0], [{nla len=5, nla type=IFLA PROTO DOWN}, 0],
[{nla len=36, nla type=IFLA MAP}, {mem start=0, mem end=0, base addr=0, irq=0, dma=0, port=0}],
[{nla len=10, nla type=IFLA ADDRESS}, 00:15:5d:6e:81:5d], [{nla len=10,
nla type=IFLA BROADCAST}, ff:ff:ff:ff:ff:ff:ff], [{nla len=196, nla type=IFLA STATS64},
{rx packets=15816, tx packets=10540, rx bytes=22736340, tx bytes=3646286, rx errors=0, tx errors=0,
rx dropped=0, tx dropped=0, multicast=3666, collisions=0, rx length errors=0, rx over errors=0,
rx crc errors=0, rx frame errors=0, rx fifo errors=0, rx missed errors=0, tx aborted errors=0,
tx carrier errors=0, tx fifo errors=0, tx heartbeat errors=0, tx window errors=0, rx compressed=0,
tx compressed=0, rx nohandler=0}], [{nla len=100, nla type=IFLA STATS}, {rx packets=15816,
tx packets=10540, rx bytes=22736340, tx bytes=3646286, rx errors=0, tx errors=0, rx dropped=0,
tx dropped=0, multicast=3666, collisions=0, rx length errors=0, rx over errors=0, rx crc errors=0,
rx frame errors=0, rx fifo errors=0, rx missed errors=0, tx aborted errors=0, tx carrier errors=0,
tx fifo errors=0, tx heartbeat errors=0, tx window errors=0, rx compressed=0, tx compressed=0,
rx nohandler=0}], [{nla len=12, nla type=IFLA XDP}, [{nla len=5,
nla type=IFLA XDP ATTACHED}, XDP ATTACHED NONE]], [{nla len=10,
nla type=IFLA PERM ADDRESS}, 00:15:5d:6e:81:5d], [{nla len=780, nla type=IFLA AF SPEC},
[[{nla len=136, nla type=AF INET}, [{nla len=132, nla type=IFLA INET CONF},
[[IPV4 DEVCONF FORWARDING-1] = 0, [IPV4 DEVCONF MC FORWARDING-1] = 0,
[IPV4 DEVCONF PROXY ARP-1] = 0, [IPV4 DEVCONF ACCEPT REDIRECTS-1] = 1,
[IPV4 DEVCONF SECURE REDIRECTS-1] = 1, [IPV4 DEVCONF SEND REDIRECTS-1] = 1,
[IPV4 DEVCONF SHARED MEDIA-1] = 1, [IPV4 DEVCONF RP FILTER-1] = 2,
[IPV4 DEVCONF ACCEPT SOURCE ROUTE-1] = 0, [IPV4 DEVCONF BOOTP RELAY-1] = 0,
[IPV4 DEVCONF LOG MARTIANS-1] = 0, [IPV4 DEVCONF TAG-1] = 0,
[IPV4 DEVCONF ARPFILTER-1] = 0, [IPV4 DEVCONF MEDIUM ID-1] = 0,
[IPV4 DEVCONF NOXFRM-1] = 0, [IPV4 DEVCONF NOPOLICY-1] = 0,
[IPV4 DEVCONF FORCE IGMP VERSION-1] = 0, [IPV4 DEVCONF ARP ANNOUNCE-1] = 0,
[IPV4 DEVCONF ARP IGNORE-1] = 0, [IPV4 DEVCONF PROMOTE SECONDARIES-1] = 1,
[IPV4 DEVCONF ARP ACCEPT-1] = 0, [IPV4 DEVCONF ARP NOTIFY-1] = 0,
[IPV4 DEVCONF ACCEPT LOCAL-1] = 0, [IPV4 DEVCONF SRC VMARK-1] = 0,
[IPV4 DEVCONF PROXY ARP PVLAN-1] = 0, [IPV4 DEVCONF ROUTE LOCALNET-1] = 0,
[IPV4 DEVCONF IGMPV2 UNSOLICITED REPORT INTERVAL-1] = 10000,
[IPV4 DEVCONF IGMPV3 UNSOLICITED REPORT INTERVAL-1] = 1000,
[IPV4 DEVCONF IGNORE ROUTES WITH LINKDOWN-1] = 0,
[IPV4_DEVCONF_DROP_UNICAST_IN_L2_MULTICAST-1] = 0,
[IPV4_DEVCONF_DROP_GRATUITOUS ARP-1] = 0, [IPV4 DEVCONF BC FORWARDING-1] =
0]]], [{nla_len=640, nla_type=AF_INET6}, [[{nla_len=8, nla_type=IFLA_INET6_FLAGS}.
IF RS SENT|IF READY], [{nla len=20, nla type=IFLA INET6 CACHEINFO},
{max reasm len=65535, tstamp=61, reachable time=40530, retrans time=1000}], [{nla len=228,
nla type=IFLA INET6 CONF}, [[DEVCONF FORWARDING] = 0, [DEVCONF HOPLIMIT] = 64,
[DEVCONF MTU6] = 1500, [DEVCONF ACCEPT RA] = 1, [DEVCONF ACCEPT REDIRECTS] =
1, [DEVCONF AUTOCONF] = 1, [DEVCONF DAD TRANSMITS] = 1,
[DEVCONF RTR SOLICITS] = -1, [DEVCONF RTR SOLICIT INTERVAL] = 4000,
[DEVCONF RTR SOLICIT DELAY] = 1000, [DEVCONF USE TEMPADDR] = 0,
[DEVCONF TEMP VALID LFT] = 604800, [DEVCONF TEMP PREFERED LFT] = 86400,
[DEVCONF REGEN MAX RETRY] = 3, [DEVCONF MAX DESYNC FACTOR] = 600,
[DEVCONF MAX ADDRESSES] = 16, [DEVCONF FORCE MLD VERSION] = 0,
[DEVCONF ACCEPT RA DEFRTR] = 1, [DEVCONF ACCEPT RA PINFO] = 1,
[DEVCONF ACCEPT RA RTR PREF] = 0, [DEVCONF RTR PROBE INTERVAL] = 0,
```

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[DEVCONF ACCEPT RA RT INFO MAX PLEN] = 0, [DEVCONF PROXY NDP] = 0,
[DEVCONF OPTIMISTIC DAD] = 0, [DEVCONF ACCEPT SOURCE ROUTE] = 0,
[DEVCONF MC FORWARDING] = 0, [DEVCONF DISABLE IPV6] = 0,
[DEVCONF ACCEPT DAD] = 1, [DEVCONF FORCE TLLAO] = 0, [DEVCONF NDISC NOTIFY]
= 0, [DEVCONF MLDV1 UNSOLICITED REPORT INTERVAL] = 10000,
[DEVCONF MLDV2 UNSOLICITED REPORT INTERVAL] = 1000, ...]], [{nla len=300,
nla type=IFLA INET6 STATS}, [[IPSTATS MIB NUM] = 37, [IPSTATS MIB INPKTS] = 703,
[IPSTATS MIB INOCTETS] = 114914, [IPSTATS MIB INDELIVERS] = 0,
[IPSTATS MIB OUTFORWDATAGRAMS] = 0, [IPSTATS MIB OUTPKTS] = 25,
[IPSTATS MIB OUTOCTETS] = 1496, [IPSTATS MIB INHDRERRORS] = 0,
[IPSTATS MIB INTOOBIGERRORS] = 0, [IPSTATS MIB INNOROUTES] = 0,
[IPSTATS MIB INADDRERRORS] = 0, [IPSTATS MIB INUNKNOWNPROTOS] = 0,
[IPSTATS MIB INTRUNCATEDPKTS] = 0, [IPSTATS MIB INDISCARDS] = 0,
[IPSTATS MIB OUTDISCARDS] = 0, [IPSTATS MIB OUTNOROUTES] = 0,
[IPSTATS MIB REASMTIMEOUT] = 0, [IPSTATS MIB REASMREQDS] = 0,
[IPSTATS MIB REASMOKS] = 0, [IPSTATS MIB REASMFAILS] = 0, [IPSTATS MIB FRAGOKS]
= 0, [IPSTATS MIB FRAGFAILS] = 0, [IPSTATS MIB FRAGCREATES] = 0,
[IPSTATS MIB INMCASTPKTS] = 703, [IPSTATS MIB OUTMCASTPKTS] = 25,
[IPSTATS MIB INBCASTPKTS] = 0, [IPSTATS MIB OUTBCASTPKTS] = 0,
[IPSTATS MIB INMCASTOCTETS] = 114914, [IPSTATS MIB OUTMCASTOCTETS] = 1496,
[IPSTATS MIB INBCASTOCTETS] = 0, [IPSTATS MIB OUTBCASTOCTETS] = 0,
[IPSTATS MIB CSUMERRORS] = 0, ...]], [{nla len=52, nla type=IFLA INET6 ICMP6STATS},
[[ICMP6 MIB NUM] = 6, [ICMP6 MIB INMSGS] = 0, [ICMP6 MIB INERRORS] = 0,
[ICMP6 MIB OUTMSGS] = 25, [ICMP6 MIB OUTERRORS] = 0, [ICMP6 MIB CSUMERRORS] =
0]], [{nla len=20, nla type=IFLA INET6 TOKEN}, inet pton(AF INET6, "::")], [{nla len=5,
nla type=IFLA INET6 ADDR GEN MODE}, IN6 ADDR GEN MODE EUI64]]]], [{nla len=41,
nla type=IFLA PARENT DEV NAME}, "f523660e-b63b-4767-8f10-9894abca"...], [{nla len=10,
nla type=IFLA PARENT DEV BUS NAME}, "vmbus"]]]], iov len=4096}], msg iovlen=1,
msg controllen=0, msg flags=0}, 0) = 2740
recvmsg(9, {msg name={sa family=AF NETLINK, nl pid=0, nl groups=00000000},
msg namelen=12, msg iov=[{iov base=[{nlmsg len=20, nlmsg type=NLMSG DONE,
nlmsg flags=NLM F MULTI, nlmsg seq=1709268905, nlmsg pid=131424}, 0], iov len=4096}],
msg iovlen=1, msg controllen=0, msg flags=0}, 0) = 20
sendto(9, [{nlmsg len=20, nlmsg type=RTM GETADDR,
nlmsg flags=NLM F REQUEST|NLM F DUMP, nlmsg seq=1709268906, nlmsg pid=0},
{ifa family=AF UNSPEC, ...}], 20, 0, {sa family=AF NETLINK, nl pid=0, nl groups=00000000},
12) = 20
recvmsg(9, {msg name={sa family=AF NETLINK, nl pid=0, nl groups=00000000},
msg namelen=12, msg iov=[{iov base=[[{nlmsg len=76, nlmsg type=RTM NEWADDR,
nlmsg_flags=NLM_F_MULTI, nlmsg_seq=1709268906, nlmsg_pid=131424}, {ifa family=AF INET,
ifa prefixlen=8, ifa flags=IFA F PERMANENT, ifa scope=RT SCOPE HOST,
ifa index=if nametoindex("lo")}, [[{nla len=8, nla type=IFA ADDRESS}, inet addr("127.0.0.1")],
[{nla len=8, nla type=IFA LOCAL}, inet addr("127.0.0.1")], [{nla len=7, nla type=IFA LABEL},
"lo"], [{nla len=8, nla type=IFA FLAGS}, IFA F PERMANENT], [{nla len=20,
nla type=IFA CACHEINFO}, {ifa prefered=4294967295, ifa valid=4294967295, cstamp=44,
tstamp=44}]]], [{nlmsg len=88, nlmsg type=RTM NEWADDR, nlmsg flags=NLM F MULTI,
nlmsg seq=1709268906, nlmsg pid=131424}, {ifa family=AF INET, ifa prefixlen=20,
ifa flags=IFA F PERMANENT, ifa scope=RT SCOPE UNIVERSE,
ifa index=if nametoindex("eth0")}, [[{nla len=8, nla type=IFA ADDRESS},
inet addr("172.28.132.59")], [{nla len=8, nla type=IFA LOCAL}, inet addr("172.28.132.59")],
```

[{nla len=8, nla type=IFA BROADCAST}, inet addr("172.28.143.255")], [{nla len=9,

nla type=IFA LABEL}, "eth0"], [{nla len=8, nla type=IFA FLAGS}, IFA F PERMANENT],

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[{nla len=20, nla type=IFA CACHEINFO}, {ifa prefered=4294967295, ifa valid=4294967295,
recvmsg(9, {msg name={sa family=AF NETLINK, nl pid=0, nl groups=00000000},
msg namelen=12, msg iov=[{iov base=[[{nlmsg len=72, nlmsg type=RTM NEWADDR,
nlmsg flags=NLM F MULTI, nlmsg seq=1709268906, nlmsg pid=131424},
{ifa family=AF INET6, ifa prefixlen=128, ifa flags=IFA F PERMANENT,
ifa scope=RT SCOPE HOST, ifa index=if nametoindex("lo")}, [[{nla len=20,
nla type=IFA ADDRESS}, inet pton(AF INET6, "::1")], [{nla len=20,
nla type=IFA CACHEINFO}, {ifa prefered=4294967295, ifa valid=4294967295, cstamp=44,
tstamp=44}], [{nla len=8, nla type=IFA FLAGS}, IFA F PERMANENT]]], [{nlmsg len=72,
nlmsg type=RTM NEWADDR, nlmsg flags=NLM F MULTI, nlmsg seq=1709268906,
nlmsg pid=131424}, {ifa family=AF INET6, ifa prefixlen=64, ifa flags=IFA F PERMANENT,
ifa scope=RT SCOPE LINK, ifa index=if nametoindex("eth0")}, [[{nla len=20,
nla type=IFA ADDRESS}, inet pton(AF INET6, "fe80::215:5dff:fe6e:815d")], [{nla len=20,
nla type=IFA CACHEINFO}, {ifa prefered=4294967295, ifa valid=4294967295, cstamp=61,
tstamp=61}], [{nla len=8, nla type=IFA FLAGS}, IFA F PERMANENT]]]], iov len=4096}],
msg iovlen=1, msg controllen=0, msg flags=0}, 0) = 144
recvmsg(9, {msg name={sa family=AF NETLINK, nl pid=0, nl groups=00000000},
msg namelen=12, msg iov=[{iov base=[{nlmsg len=20, nlmsg type=NLMSG DONE,
nlmsg flags=NLM F MULTI, nlmsg seq=1709268906, nlmsg pid=131424}, 0], iov len=4096}],
msg iovlen=1, msg controllen=0, msg flags=0}, 0) = 20
close(9)
socket(AF INET, SOCK STREAM|SOCK CLOEXEC, IPPROTO TCP) = 9
setsockopt(9, SOL SOCKET, SO REUSEADDR, [1], 4) = 0
bind(9, {sa family=AF INET, sin port=htons(5555), sin addr=inet addr("127.0.0.1")}, 16) = 0
listen(9, 100)
                        = 0
getsockname(9, {sa family=AF INET, sin port=htons(5555), sin addr=inet addr("127.0.0.1")}, [128 =>
161) = 0
getsockname(9, {sa family=AF INET, sin port=htons(5555), sin addr=inet addr("127.0.0.1")}, [128 =>
16]) = 0
getpid()
                       = 131424
write(6, "\1\0\0\0\0\0\0\0\0\", 8)
                             =8
                       = 131424
getpid()
write(8, "\1\0\0\0\0\0\0\0\0\", 8)
                             = 8
newfstatat(0, "", {st mode=S IFCHR|0620, st rdev=makedev(0x88, 0x7), ...}, AT EMPTY PATH) = 0
read(0, create 5 -11
"create 5 -11\n", 1024)
                       = 13
newfstatat(1, "", {st mode=S IFCHR|0620, st rdev=makedev(0x88, 0x7), ...}, AT EMPTY PATH) = 0
write(1, "Error: Parent not found \n", 25Error: Parent not found
) = 25
read(0, create 9 5
"create 9 5\n", 1024)
                       = 11
write(1, "Error: Parent not found \n", 25Error: Parent not found
) = 25
read(0, create 105
"create 10 5\n", 1024)
                       = 12
write(1, "Error: Parent not found \n", 25Error: Parent not found
) = 25
```

```
read(0, heartbit 2000
"heartbit 2000\n", 1024)
                            = 14
clock nanosleep(CLOCK REALTIME, 0, {tv sec=2, tv nsec=0}, 0x7ffc1e19cbd0) = 0
write(1, "Heartbit: node -1 is fine\n", 26Heartbit: node -1 is fine
) = 26
write(1, "\n", 1
)
              = 1
read(0, exec 10 start
"exec 10 start\n", 1024)
                            = 14
write(1, "Error:id Not found\n", 19Error:id Not found
) = 19
read(0, exec 10 stop
"exec 10 stop\n", 1024)
                            = 13
write(1, "Error:id Not found\n", 19Error:id Not found
) = 19
read(0, exec 10 time
"exec 10 time\n", 1024)
                             = 13
write(1, "Error:id Not found\n", 19Error:id Not found
) = 19
read(0, kill 10
"kill 10\n", 1024)
                         = 8
write(1, "Error: id Not Found\n", 20Error: id Not Found
) = 20
read(0, ping 10
"ping 10\n", 1024)
                          = 8
write(1, "Error: id not found\n", 20Error: id not found
= 20
read(0, kill 5
"kill 5\n", 1024)
                         = 7
write(1, "Error: id Not Found\n", 20Error: id Not Found
= 20
read(0, "", 1024)
                              =0
                           = 131424
getpid()
write(4, "\1\0\0\0\0\0\0\0\0", 8)
                           = 131424
getpid()
                           = 131424
getpid()
write(8, "\1\0\0\0\0\0\0\0\0", 8)
                                  = 8
futex(0x558e7d371388, FUTEX WAKE PRIVATE, 1) = 1
                           = 131424
getpid()
poll([\{fd=3, events=POLLIN\}], 1, -1) = 1([\{fd=3, revents=POLLIN\}])
                           = 131424
getpid()
read(3, "\1\0\0\0\0\0\0, 8)
                           = 131424
getpid()
write(6, "\1\0\0\0\0\0\0\0\0", 8)
close(7)
                           =0
                           = 0
close(6)
```

```
close(5) = 0
close(4) = 0
close(3) = 0
exit_group(0) = ?
+++ exited with 0 +++
```

Вывод

В результате проделанной работы, я попробовал себя в создании приложения по асинхронной обработке. Кроме того, я познакомился с технологией очереди сообщений ZeroMQ. Полученный опыт, я считаю полезным и интересным.