

组会报告

徐益

2018 年 11 月 10 日

1 工作内容

1. 完成服务器环境配置;
2. 学习线程绑定 CPU;

2 服务器环境配置信息

```
1  ubuntu: 16.04
2  gcc:    5.4.0
3  icc:    18.0.2
4  boost:  1.58.0
5  DPDK:   18.05.1
```

3 线程绑定 CPU

3.1 CPU 亲和度 (affinity)

3.1.1 基本概念

概念: 是一种调度属性 (scheduler property), 它可以将一个进程“绑定”到一个或一组 CPU 上。在 SMP(Symmetric Multi-Processing 对称多处理) 架构下, Linux 调度器 (scheduler) 会根据 CPU affinity 的设置让指定的进程运行在“绑定”的 CPU 上, 而不会在别的 CPU 上运行。

3.1.2 表示方法

CPU affinity 使用位掩码 (bitmask) 表示, 每一位都表示一个 CPU, 置 1 表示“绑定”。最低位表示第一个逻辑 CPU, 最高位表示最后一个逻辑 CPU。

3.2 核心函数

```
1 NAME
2     pthread_setaffinity_np, pthread_getaffinity_np
3     - set/get CPU affinity of a thread
4
5 SYNOPSIS
6     #define _GNU_SOURCE
7     #include <pthread.h>
8     int pthread_setaffinity_np(pthread_t thread, size_t cpusetsize,
9                                const cpu_set_t *cpuset);
```

```
10     int pthread_getaffinity_np(pthread_t thread, size_t cpusetsize,  
11                               cpu_set_t *cpuset);  
12  
13     Compile and link with -pthread.
```

3.3 测试结果

```
mimo5g1@mimo5g1-sever:~/XuYi/Test_bindCPU$ ./main  
this system has 40 processor(s)  
this thread 364750592 is running in processor 0  
this thread 364750592 is running in processor 1  
this thread 364750592 is running in processor 2  
this thread 364750592 is running in processor 3  
this thread 364750592 is running in processor 4  
this thread 364750592 is running in processor 5  
this thread 364750592 is running in processor 6  
this thread 364750592 is running in processor 7  
this thread 364750592 is running in processor 8  
this thread 364750592 is running in processor 9  
this thread 364750592 is running in processor 10  
this thread 364750592 is running in processor 11  
this thread 364750592 is running in processor 12  
this thread 364750592 is running in processor 13  
this thread 364750592 is running in processor 14  
this thread 364750592 is running in processor 15  
this thread 364750592 is running in processor 16  
this thread 364750592 is running in processor 17  
this thread 364750592 is running in processor 18  
this thread 364750592 is running in processor 19  
this thread 364750592 is not running in processor 20  
this thread 364750592 is not running in processor 21  
this thread 364750592 is not running in processor 22  
this thread 364750592 is not running in processor 23  
this thread 364750592 is not running in processor 24  
this thread 364750592 is not running in processor 25  
this thread 364750592 is not running in processor 26  
this thread 364750592 is not running in processor 27  
this thread 364750592 is not running in processor 28  
this thread 364750592 is not running in processor 29  
this thread 364750592 is not running in processor 30  
this thread 364750592 is not running in processor 31  
this thread 364750592 is not running in processor 32  
this thread 364750592 is not running in processor 33  
this thread 364750592 is not running in processor 34  
this thread 364750592 is not running in processor 35  
this thread 364750592 is not running in processor 36  
this thread 364750592 is not running in processor 37  
this thread 364750592 is not running in processor 38  
this thread 364750592 is not running in processor 39
```

图 1: 测试结果