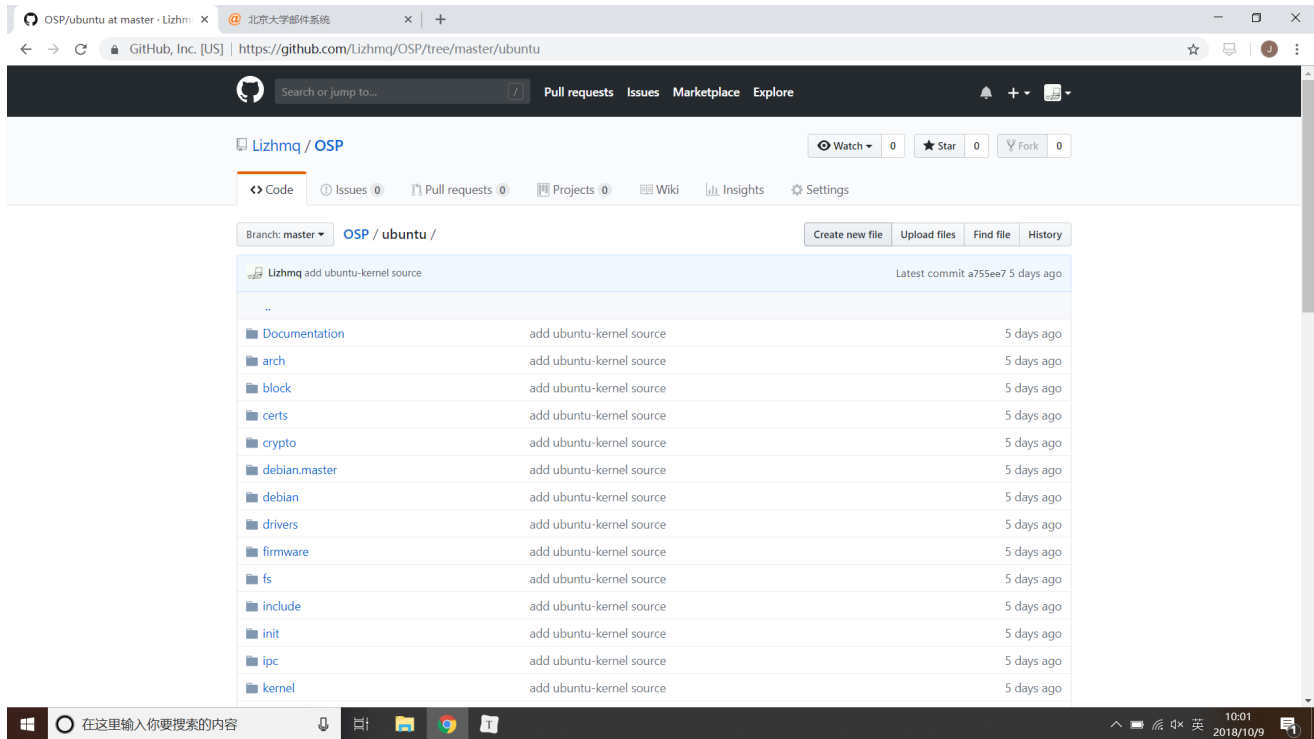


LKLAB02 -- Lzzz

1-2 GitHub Update



3 Init_debug & trace

- sudo vim /etc/default/grub 修改GRUB_CMDLINE_LINUX

```
10 # If you change this file, run 'update-grub' afterwards to update
9 # /boot/grub/grub.cfg.
8 # For full documentation of the options in this file, see:
7 #   info -f grub -n 'Simple configuration'
6
5 GRUB_DEFAULT=0
4 GRUB_TIMEOUT_STYLE=hidden
3 GRUB_TIMEOUT=10
2 GRUB_DISTRIBUTOR=`lsb_release -i -s 2> /dev/null || echo Debian`
1 GRUB_CMDLINE_LINUX_DEFAULT="maybe-ubiquity"
1 GRUB_CMDLINE_LINUX="initcall debug printk.time=1 init=/lib/systemd/systemd-b
ootchart"
1
2 # Uncomment to enable BadRAM filtering, modify to suit your needs
3 # This works with Linux (no patch required) and with any kernel that obtains
4 # the memory map information from GRUB (GNU Mach, kernel of FreeBSD ...)
5 #GRUB_BADRAM="0x01234567,0xfefefefe,0x89abcdef,0xefefefef"
6
7 # Uncomment to disable graphical terminal (grub-pc only)
8 #GRUB_TERMINAL=console
9
10 # The resolution used on graphical terminal
NORMAL /etc/default/grub con... 33% 11: 85
```

- reboot
- dmesg > res.txt

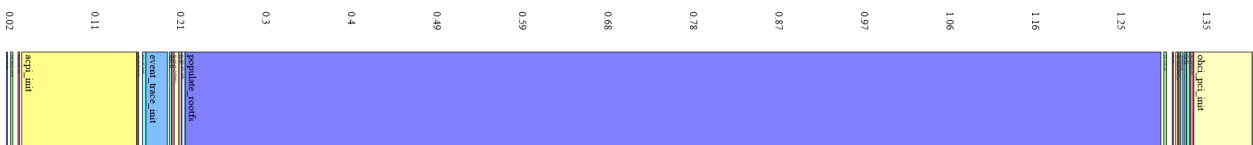
```

1 [ 0.000000] Linux version 4.15.0-36-generic (build@lgw01-amd64-031) (gcc version 7.3.0 (Ubuntu 7.3.0-16ubuntu3)) #39-Ubuntu SMP Mon Sep 24 16:19:09 UTC 2018 (Ubuntu 4.15.0-36.39-generic
2 [ 0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-4.15.0-36-generic root=UUID=cd7b57e6-c587-11e8-9f1c-0800279a8ffa ro initcall_debug printk.time=1 init=/lib/systemd/systemd-bootchart
3 [ 0.000000] KERNEL supported cpus:
4 [ 0.000000] Intel GenuineIntel
5 [ 0.000000] AMD AuthenticAMD
6 [ 0.000000] Centaur CentaurHauls
7 [ 0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
8 [ 0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
9 [ 0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
10 [ 0.000000] x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: 256
11 [ 0.000000] x86/fpu: Enabled xstate features 0x7, context size is 832 bytes, using 'standard' format.
12 [ 0.000000] e820: BIOS-provided physical RAM map:
13 [ 0.000000] BIOS-e820: [mem 0x0000000000000000-0x0000000000000bfff] usable
14 [ 0.000000] BIOS-e820: [mem 0x00000000000009fc00-0x0000000000000fffff] reserved
15 [ 0.000000] BIOS-e820: [mem 0x000000000000f0000-0x0000000000000fffff] reserved
16 [ 0.000000] BIOS-e820: [mem 0x0000000000100000-0x0000000000007fffff] usable
17 [ 0.000000] BIOS-e820: [mem 0x0000000007fff0000-0x0000000007ffffff] ACPI data
18 [ 0.000000] BIOS-e820: [mem 0x000000000fc00000-0x000000000fc00000] reserved
19 [ 0.000000] BIOS-e820: [mem 0x000000000fa00000-0x000000000fa00000] reserved
20 [ 0.000000] BIOS-e820: [mem 0x000000000fffc0000-0x000000000fffc0000] reserved
21 [ 0.000000] NX (Execute Disable) protection: active
22 [ 0.000000] SMBIOS 2.5 present.
23 [ 0.000000] DMI: innotek GmbH VirtualBox/VirtualBox, BIOS VirtualBox 12/01/2006
24 [ 0.000000] Hypervisor detected: KVM
25 [ 0.000000] e820: update [mem 0x00000000-0x00000000] usable ==> reserved
26 [ 0.000000] e820: remove [mem 0x00000000-0x00000000] usable
27 [ 0.000000] e820: last_pfn = 0x7ffff0 max_arch_pfn = 0x400000000
28 [ 0.000000] MTRR default type: uncachable
29 [ 0.000000] MTRR variable ranges disabled:
30 [ 0.000000] MTRR: Disabled
31 [ 0.000000] x86/PAT: MTRRs disabled, skipping PAT initialization too.
32 [ 0.000000] CPU MTRRs all blank - virtualized system.
33 [ 0.000000] x86/PAT: Configuration [0-7]: WB WT UC- UC WB WT UC- UC
34 [ 0.000000] Found SMP MP-table at [mem 0x0009fff0-0x0009ffff] mapped at [ (ptrval)]
35 [ 0.000000] Scanning 1 areas for low memory corruption
36 [ 0.000000] Base memory trampoline at [ (ptrval)] 99000 size 24576
37 [ 0.000000] BRK [0x5f3f0000, 0x5f3fffff] PGTABLE
38 [ 0.000000] BRK [0x5f340000, 0x5f34ffff] PGTABLE
39 [ 0.000000] BRK [0x5f341000, 0x5f341ffff] PGTABLE

```

4 Generate SVG with bootgraph.pl

- cat res.txt | perl xxxx/xxx.pl > res.svg



5 Initcall file / level / function

```
dmesg -s 128000 | grep "initcall" | sed "s/(.*)after/(.*)/2 \1/g" | sort -rn
```

```

1970169 usecs [ 10.530005] initcall intel8x0_driver_init+0x0/0x1000
[snd_intel8x0] returned 0
1056051 usecs [ 1.303827] initcall populate_rootfs+0x0/0x10f returned 0
561259 usecs [ 4.901766] initcall init_module+0x0/0x1000 [raid6_pq] returned 0
535734 usecs [ 2.276042] initcall ahci_pci_driver_init+0x0/0x1000 [ahci]
returned 0
520251 usecs [ 2.251529] initcall e1000_init_module+0x0/0x1000 [e1000] returned
0
502997 usecs [ 2.239085] initcall piix4_driver_init+0x0/0x1000 [i2c_piix4]
returned 0
488326 usecs [ 2.221422] initcall pacpi_pci_driver_init+0x0/0x1000 [pata_acpi]
returned 0
144540 usecs [ 8.086482] initcall vbox_init+0x0/0x1000 [vboxvideo] returned 0
131590 usecs [ 1.926119] initcall aesni_init+0x0/0x20e [aesni_intel] returned 0
124279 usecs [ 0.168663] initcall acpi_init+0x0/0x35e returned 0

```

- Intel8x0
 path: sound/pci/intel8x0.c
 level: 6: device_initcall
 function: ALSA driver for Intel ICH (i8x0) chipsets
 Called by module_pci_driver(), which is the helper macro for registering a PCI driver
- Populate_rootfs
 path: init/initramfs.c
 level: rootfs
 function: load the built in initramfs
 load default modules from initramfs
- Init_module -- raid6_pq
 path: lib/raid6/
 level:
 function: init the raid6
- Ahci_pci_driver_init
 path: drivers/ata/ahci.c
 level: 6: device_initcall
 function: init ahci pci device
- E1000_init_module
 path: drivers/net/ehernet/intel/e1000e/netdev.c
 level: 6: device_initcall
 function: Driver Registration Routine
 the first routine called when the driver is loaded
 register with the PCI subsystem
- Piix4_driver_init
 path: drivers/i2c/busses/i2c-piix4.c
 level: 6: device_initcall
 function: init Intel PIIX4 device
 piix4 is multi-function PCI device implementing a PCI-to-ISA bridge, a PCI IDE function
 , a USB host/hub function and an EPM function
- Pacpi_pci_driver
 path: drivers/ata/pata_acpi.c
 level: 6: device_initcall
 function: init ACPI PATA driver
 ACPI provides a set of BIOS methods that allow an SFF compliant controller to be
 configured and managed by the OS without specific OS support for the controller

- Vbox_init
path: drivers/staging/vboxvideo/vbox_drv.c
level: 6: device_initcall
function: init vbox_pci_driver
- Aesni_init
path: arch/x86/crypto/aesni-intel_glue.c
level: 7: late_initcall
function: support for Intel AES-NI instructions
- Acpi_init
path: drivers/acpi/bus.c
level: 4: subsys_initcall
function: init ACPI Bus Driver

6 Bootchart & Generate SVG

- sudo vim /etc/default/grub 修改GRUB_CMDLINE_LINUX
- reboot
- ls /run/log

Bootchart for ubuntu - Tue, 09 Oct 2018 02:31:47 +0000
System: Linux 4.15.0-36-generic #39-Ubuntu SMP Mon Sep 24 16:19:09 UTC 2018 x86_64
CPU: AMD Ryzen 7 PRO 2700U w/ Radeon Vega Mobile Gfx
Boot options: BOOT_IMAGE=/boot/vmlinuz-4.15.0-36-generic root=UUID=cd7b57e6-c587-11e8-9f1c-0800279a8ffa ro initcall_debug printk.time=1 init=/lib/systemd/systemd-bootchart maybe-ubiquity
Build: Ubuntu 18.04.1 LTS
Log start time: 5.246s
Idle time: 16.153s
Graph data: 25,000 samples/sec, recorded 500 total, dropped 1 samples, 856 processes, 149 filtered

Top CPU consumers:
1198.8ms - systemd-bootchart [358]
1113.6ms - cloud-init [972]
1001.9ms - cloud-init [405]
941.4ms - systemd-udevd [438]
893.8ms - cloud-init [183]
887.2ms - cloud-init [859]
470.2ms - systemd-udevd [420]
302.5ms - systemd-journal [400]
234.1ms - kworker/0-1 [321]
186.3ms - networkd-dispatcher [762]

