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Lab: Appei er

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参考了 Rs 程序设计语言学习r s 语言。

Booing Tags

A1:

```
root@eacaa2d969fb:/workspaces/Tacos# cargo run
OpenSBI v1.4-15-g9c8b18e
Platform Name
                          : riscv-virtio,qemu
Platform Features
                         : medeleg
Platform HART Count
                         : 1
Platform IPI Device
                         : aclint-mswi
Platform Timer Device
                        : aclint-mtimer @ 10000000Hz
Platform Console Device
                        : semihosting
Platform HSM Device
Platform PMU Device
Platform Reboot Device
                         : syscon-reboot
Platform Shutdown Device : syscon-poweroff
Platform Suspend Device
Platform CPPC Device
Firmware Base
                         : 0x80000000
Firmware Size
                         : 323 KB
Firmware RW Offset
                         : 0x40000
Firmware RW Size
                         : 67 KB
                        : 0x48000
Firmware Heap Offset
                         : 35 KB (total), 2 KB (reserved), 9 KB (used), 23 KB (free)
Firmware Heap Size
Firmware Scratch Size
                         : 4096 B (total), 328 B (used), 3768 B (free)
Runtime SBI Version
                          : 2.0
Domain@ Name
                          : root
                         : 0
Domain@ Boot HART
Domain@ HARTs
Domain@ Region@@
                          : 0x000000000100000-0x000000000100fff M: (I,R,W) S/U: (R,W)
Domain@ Region@1
                          : 0x0000000002000000-0x00000000000000ffff M: (I,R,W) S/U: ()
                          : 0x0000000080040000-0x000000008005ffff M: (R,W) S/U: ()
Domain0 Region02
                          : 0x0000000080000000-0x000000008003ffff M: (R,X) S/U: ()
Domain@ Region@3
                          : 0x00000000c400000-0x00000000c5fffff M: (I,R,W) S/U: (R,W)
Domain0 Region04
                          : 0x00000000c000000-0x00000000c3fffff M: (I,R,W) S/U: (R,W)
Domain@ Region@5
```

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```
Domain0 Region06
                     Domain0 Next Address : 0x0000000080200000
                       : 0x0000000082200000
 Domain@ Next Arg1
 Domain0 Next Mode
                       : S-mode
 Domain0 SysReset
                       : yes
 Domain@ SysSuspend
                       : yes
 Boot HART ID
                       : 0
 Boot HART Domain
                       : root
 Boot HART Priv Version : v1.10
 Boot HART Base ISA
                      : rv64imafdch
 Boot HART ISA Extensions : zicntr
 Boot HART PMP Count
 Boot HART PMP Granularity: 2 bits
 Boot HART PMP Address Bits: 54
 Boot HART MHPM Info
                    : 0 (0x00000000)
 Boot HART Debug Triggers : 0 triggers
                 : 0x0000000000001666
 Boot HART MIDELEG
 Boot HART MEDELEG
                       : 0x0000000000f0b509
 [20 ms] Hello, World!
 [136 ms] Goodbye, World!
oroot@eacaa2d969fb:/workspaces/Tacos#
```

De bgging

Firs ins r con

B1: hTe firs insr con hageseece isdlato, entry_pgtable nerdhe_entryladd.

B2:0 80200000, sasho nin boot.rs

Fro ZSB LoSBm

B3: 0xFFFFFFC080000000

SB, Ikernel na mody en psasingm

B 4:

- hard_id:0
- dtb: 0x82200000(2183135232)

B5:

- Domain0 Next Address: 0x0000000080200000
- Domain0 Next Arg1: 0x00000000822000000
- Domain0 Next Mode: S-mode
- Boot HART ID: 0

B6:

- Domain0 Next Arg1 = dtb
- Boot HART ID = hard_id

(e kno h ariscv h sa3 o esdM-mode (Mahrine Mode),dS-mode (S per isor Mode) dna Udmode (User Mode))d

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SB In erf ags

B7:

```
• a7 s ores EID of SBI, hi hc eq la CONSOLE_PUTCHAR = 0x01, 1
```

• a6 s ores fid = 0, 0

Kernel Monior

C1:

```
[15 ms] Hello, World!
PKUOS> whoami
[1445 ms] 2200013188
PKUOS> ess
[3846 ms] Invalid command
PKUOS> exit
[5082 ms] Goodbye, World!
```

C2: Rea ster's inp bs ibf n icon console_getchar(). If o n eread() f n icon in io.rs b ord kno ho o sei. So le iche dodi ple en liken hism