Hacking

Hack the planet

- Distributed network & P2P
- Self-sovereign identity
- Object Capabilities, ACLs & Sandboxing
- PinePhone issues
- Offline first P2P identity and communication
- The Hexagonal Order of Free Knowledge

Distributed network & P2P Protocols

- https://dat-ecosystem.org/
- https://twtxt.net/

Self-sovereign identity

Identity

- DID
- The Laws of Identity

> Understand the dynamics causing digital identity systems to succeed or fail in various contexts, expressed as the Laws of Identity. Together these laws define a unifying identity metasystem that can offer the Internet the identity layer it needs. (14 printed pages)

SSI

- https://sovrin.org/principles-of-ssi/
- FLOSS Weekly 628

MathMesh

- https://www.mathmesh.com/open-infrastructures

Object Capabilities, ACLs & Sandboxing

Capabilities

- Public keys are capability to send you a message that you can grand by giving the key
- Capabilities can be forwarded - external system like trust needs to be used
- Capabilities needs to be revocable - single key per capability granted

Confused deputy problem

UNIX security

- https://wiki.alopex.li/LetsBeRealAboutDependencies

> what we actually want for robust, reliable infrastructure is an environment and API that deals with all the above stuff one way or another, and provides explicit, deny-by-default control of everything programs are allowed to do, a la a capability system. Linux is not this, but people keep trying to turn Linux into that with tools like Docker. I think that if an API like WASI or such ever gets popular, that has these properties designed in from the start, life will become much better. Making such a system that is actually nice for humans to use interactively is still a problem, but a different problem.)

- https://github.com/netblue30/firejail/wiki/Frequently-Asked-Questions

Implementations

- https://forgefed.org/blog/stabilizing-ocaps/

PinePhone issues

Connecting to UART

Set headphone micorswitch to OFF.

```
tio /dev/ttyUSB0
```

Apparently baud of 1500000 should be used but only default works.

```
Booting from SD
arch=arm
baudrate=115200
board=sunxi
board_name=sunxi
...
bootargs=init=/init.sh rw console=tty0 console=ttyS0,115200 earlycon=uart,mmio32,0x01c28000
panic=10 consoleblank=0 loglevel=1 PMOS_NO_OUTPUT_REDIRECT PMOS_FORCE_PARTITION_RESIZE
pmos_boot=/dev/mmcblk0p1 pmos_root=/dev/mmcblk0p2 lima.sched_timeout_ms=2000
```

So it could be some bootloader setting.

PinePhone audio playback kernel panic

After around 5-6 minutes of mpv mp3 stream playback I get:

Linux futaba 6.1.9 #2-postmarketos-allwinner SMP PREEMPT Sun Feb 26 21:53:50 UTC 20 aarch64 GNU/Linux

```
[  827.257300] Internal error: Oops: 0000000096000004 [#1] PREEMPT SMP
[  827.263581] Modules linked in: nft_reject_inet nft_reject nft_ct nf_tables ov5640
snd_soc_hdmi_codec gc2145 hci_uart btbcm 8723cs(C) btrtl bluetooth st_magn_i2c st_magn
snd_soc_simple_card snd_soc_simple_card_utils sun9i_hdmi_audio inv_mpu6050_i2c
```

```
sun50i_codec_analog ecdh_generic ecc dw_hdmi_i2s_audio inv_mpu6050 st_sensors sun8i_a33_mbus
sun8i_adda_pr_regmap industrialio_triggered_buffer kfifo_buf sun8i_codec stk3310
st_sensors_i2c snd_soc_bt_sco sun4i_lradc_keys sun4i_i2s snd_soc_ec25 snd_soc_simple_amplifier
snd_soc_core snd_pcm_dmaengine snd_pcm snd_timer snd ppkb_manager i2c_gpio soundcore dm_crypt
pinephone_keyboard gpio_vibra anx7688
[  827.320482] CPU: 0 PID: 0 Comm: swapper/0 Tainted: G         C         6.1.9 #2-
postmarketos-allwinner
[  827.329788] Hardware name: Pine64 PinePhone (1.2) (DT)
[  827.334927] pstate: 400000c5 (nZcv daIF -PAN -UAO -TCO -DIT -SSBS BTYPE=--)
[  827.341892] pc : sun6i_dma_interrupt+0x164/0x240
[  827.346528] lr : sun6i_dma_interrupt+0x160/0x240
[  827.351152] sp : ffff800008003ea0
[  827.354468] x29: ffff800008003ea0 x28: ffff8000090e8b80 x27: 0000000000000000
[  827.361616] x26: 0000000000000010 x25: ffff000001af1880 x24: ffff0000026083f0
[  827.368764] x23: 0000000000000001 x22: 0000000000000000 x21: 0000000000000000
[  827.375911] x20: ffff0000025bba80 x19: 0000000000000003 x18: 0000000000000000
[  827.383057] x17: ffff8000b69fe000 x16: ffff800008004000 x15: 0000000000004000
[  827.390204] x14: 00000000000003d1 x13: 00000000000003d1 x12: ffff8000090dae60
[  827.397350] x11: 0000000000000001 x10: 0000000000000930 x9 : ffff8000090d3ce0
[  827.404497] x8 : ffff0000bf95bbb8 x7 : 379da3c4df1854b1 x6 : a0c41cc6790e1dbe
[  827.411644] x5 : c3cb7390598308f4 x4 : 0000000000000001 x3 : ffff0000026083f0
[  827.418791] x2 : 0000000000000000 x1 : 0000000000000000 x0 : 0000000000000001
[  827.425938] Call trace:
[  827.428387]  sun6i_dma_interrupt+0x164/0x240
[  827.432665]  __handle_irq_event_percpu+0x48/0x160
[  827.437385]  handle_irq_event+0x4c/0xc0
[  827.441233]  handle_fasteoi_irq+0xa4/0x1a0
[  827.445340]  generic_handle_domain_irq+0x2c/0x4c
[  827.449968]  gic_handle_irq+0x44/0xc0
[  827.453644]  call_on_irq_stack+0x2c/0x5c
[  827.457577]  do_interrupt_handler+0x80/0x84
[  827.461770]  el1_interrupt+0x34/0x6c
[  827.465359]  el1h_64_irq_handler+0x18/0x2c
[  827.469467]  el1h_64_irq+0x64/0x68
[  827.472874]  cpuidle_enter_state+0x130/0x2fc
[  827.477157]  cpuidle_enter+0x38/0x50
[  827.480741]  do_idle+0x22c/0x2c0
[  827.483981]  cpu_startup_entry+0x28/0x30
[  827.487913]  kernel_init+0x0/0x130
```

```
[  827.491329]  arch_post_acpi_subsys_init+0x0/0x18
[  827.495962]  start_kernel+0x650/0x690
[  827.499636]  __primary_switched+0xb4/0xbc
[  827.503666] Code: 91028018 aa1803e0 941a3c75 f9400e81 (b9400023)
[  827.509763] ---[ end trace 0000000000000000 ]---
[  827.514382] Kernel panic - not syncing: Oops: Fatal exception in interrupt
[  827.521253] SMP: stopping secondary CPUs
[  828.741041] SMP: failed to stop secondary CPUs 0-1
[  828.745836] Kernel Offset: disabled
[  828.749324] CPU features: 0x00000,00c00080,0000420b
[  828.754203] Memory Limit: none
[  828.757267] Rebooting in 120 seconds..
```

Linux futaba 6.1.9 #4-postmarketos-allwinner SMP PREEMPT Mon Apr 10 21:39:33 UTC 20 aarch64 GNU/Linux

After an update and reboot it run fine for 25 minutes, including more after stream rewind.

After full shutdown and start it did crash after 4 minutes.

```
[  329.803102] Internal error: Oops: 0000000096000004 [#1] PREEMPT SMP
[  329.809444] Modules linked in: nft_reject_inet nft_reject nft_ct nf_tables gc2145 ov5640
snd_soc_hdmi_codec hci_uart btbcm btrtl bluetooth 8723cs(C) snd_soc_simple_card
inv_mpu6050_i2c snd_soc_simple_card_utils snd_soc_simple_amplifier inv_mpu6050 sun8i_codec
dw_hdmi_i2s_audio sun9i_hdmi_audio st_magn_i2c st_magn sun50i_codec_analog st_sensors
sun8i_adda_pr_regmap industrialio_triggered_buffer ecdh_generic kfifo_buf st_sensors_i2c
snd_soc_ec25 stk3310 sun8i_a33_mbus ecc sun4i_i2s snd_soc_bt_sco snd_soc_core sun4i_lradc_keys
snd_pcm_dmaengine snd_pcm snd_timer snd ppkb_manager i2c_gpio soundcore dm_crypt
pinephone_keyboard gpio_vibra anx7688
[  329.866351] CPU: 0 PID: 0 Comm: swapper/0 Tainted: G         C         6.1.9 #4-
postmarketos-allwinner
[  329.875657] Hardware name: Pine64 PinePhone (1.2) (DT)
[  329.880796] pstate: 000000c5 (nzcv daIF -PAN -UAO -TCO -DIT -SSBS BTYPE=--)
[  329.887759] pc : sun6i_dma_interrupt+0xc0/0x240
[  329.892312] lr : __handle_irq_event_percpu+0x48/0x160
[  329.897376] sp : ffff800008003ea0
[  329.900691] x29: ffff800008003ea0 x28: ffff800009088bc0 x27: 0000000000000000
[  329.907841] x26: 0000000000000010 x25: ffff00000212c080 x24: 0000004cc9b9f426
```

```
[  329.914987] x23: 0000000000000001 x22: 0000000000000000 x21: 0000000000000000
[  329.922133] x20: ffff00000269b280 x19: 0000000000000003 x18: 0000000000000000
[  329.929280] x17: ffff8000b6a4b000 x16: ffff800008004000 x15: 0000000000004000
[  329.936427] x14: ffff800009088bc0 x13: ffff8000b6a4b000 x12: 0000000034d4d91d
[  329.943574] x11: 0000000000000000 x10: 0000000000001000 x9 : ffff800008010800
[  329.950721] x8 : 00000072b5503510 x7 : 00000000000000c0 x6 : 0000000006ff8584
[  329.957867] x5 : ffff80000847ba04 x4 : ffff8000b6a4b000 x3 : ffff800008003f70
[  329.965015] x2 : 0000000000000002 x1 : 0000000000000000 x0 : ffff000002078350
[  329.972162] Call trace:
[  329.974614]  sun6i_dma_interrupt+0xc0/0x240
[  329.978807]  __handle_irq_event_percpu+0x48/0x160
[  329.983523]  handle_irq_event+0x4c/0xc0
[  329.987369]  handle_fasteoi_irq+0xa4/0x1a0
[  329.991474]  generic_handle_domain_irq+0x2c/0x4c
[  329.996101]  gic_handle_irq+0x44/0xc0
[  329.999771]  call_on_irq_stack+0x2c/0x5c
[  330.003702]  do_interrupt_handler+0x80/0x84
[  330.007894]  el1_interrupt+0x34/0x6c
[  330.011477]  el1h_64_irq_handler+0x18/0x2c
[  330.015581]  el1h_64_irq+0x64/0x68
[  330.018988]  cpuidle_enter_state+0x130/0x2fc
[  330.023271]  cpuidle_enter+0x38/0x50
[  330.026870]  do_idle+0x22c/0x2c0
[  330.030129]  cpu_startup_entry+0x28/0x30
[  330.034059]  kernel_init+0x0/0x130
[  330.037470]  arch_post_acpi_subsys_init+0x0/0x18
[  330.042096]  start_kernel+0x650/0x690
[  330.045766]  __primary_switched+0xb4/0xbc
[  330.049792] Code: 54000140 39458801 340004e1 f9400e81 (f9400820)
[  330.055890] ---[ end trace 0000000000000000 ]---
[  330.060512] Kernel panic - not syncing: Oops: Fatal exception in interrupt
[  330.067382] SMP: stopping secondary CPUs
[  330.071778] Kernel Offset: disabled
[  330.075267] CPU features: 0x00000,00c00080,0000420b
[  330.080147] Memory Limit: none
[  330.083210] Rebooting in 120 seconds..
```

Offline first P2P identity and communication

Like SSB but without need for relocation of all data, light on resources. Needs to work on solar power, eg. on a boat.

https://merveilles.town/@neauoire/110418852580865817

The Hexagonal Order of Free Knowledge

> AI generated.

Core Beliefs:

1. Openness: The Hexagonal Order believes in the free and open access to knowledge and information for all individuals. It rejects the use of technology that is locked away from users or designed to work against their interests.
2. Balance: The Order acknowledges the presence of entropy and the gradual decay of order in the universe. It emphasizes the need to strike a balance between preserving and disseminating knowledge to prevent stagnation and ensure progress.
3. Empowerment: The Order believes that knowledge is power. It encourages individuals to seek knowledge, understand it, and use it responsibly to benefit themselves and society as a whole.

Symbolism and Rituals:

1. The Hexagon: The hexagon is a sacred symbol representing the interconnectedness of information. It symbolizes the multidimensional nature of knowledge and the diversity of perspectives that contribute to its understanding.
2. The Dust: Dust symbolizes entropy and the impermanence of all things. During rituals, dust can be used to represent the gradual decay of knowledge and the importance of actively preserving and sharing it.
3. Contemplation: Believers engage in meditative practices, contemplation, and discussions to reflect on the significance of information, its role in society, and the impact of locked technology on access to knowledge.

Community and Values:

1. Openness and Collaboration: The Order fosters a sense of community where individuals collaborate and share knowledge freely, promoting intellectual growth and collective learning.
2. Intellectual Curiosity: Believers are encouraged to pursue intellectual curiosity, constantly seeking new knowledge, challenging assumptions, and exploring different perspectives.
3. Advocacy: The Order actively engages in advocacy efforts to promote open-source technologies, transparency in technology development, and the protection of individual rights to access and modify technology.

Ethics and Principles:

1. Responsible Technology Use: The Order encourages believers to critically evaluate the ethical implications of technology and its alignment with values of openness and transparency before engaging with it.
2. Empathy and Equity: Believers are guided by principles of empathy and equity, ensuring that access to knowledge is not restricted by barriers such as socioeconomic status, disability, or geographical location.

Engagement with Technology:

1. Unlocking Knowledge: The Order supports initiatives aimed at unlocking knowledge by breaking through barriers that limit access to information. This can include advocating for open-source software, supporting initiatives for digitizing and preserving cultural heritage, and promoting data liberation.
2. Technology as a Tool: While the Order is critical of locked technology, it recognizes that technology can also be a powerful tool for information dissemination and knowledge sharing. Believers strive to use technology responsibly and mindfully, aligning its use with the principles of openness and empowering others.

Interfaith Dialogue: The Hexagonal Order of Free Knowledge welcomes interfaith dialogue and collaboration. It actively engages with other religious and philosophical traditions to foster a deeper understanding of the intersection between technology, spirituality, and the dissemination of knowledge.

Note: This concept can be further developed by defining specific rituals, ceremonies, scriptures, and organizational structures that align with the core beliefs and values of the Hexagonal Order.