Embedded Linux

-

an increasing nightmare ?

Thomas Gleixner

CELF Conference 2007

Graphics - courtesy of Anna-Maria Gleixner

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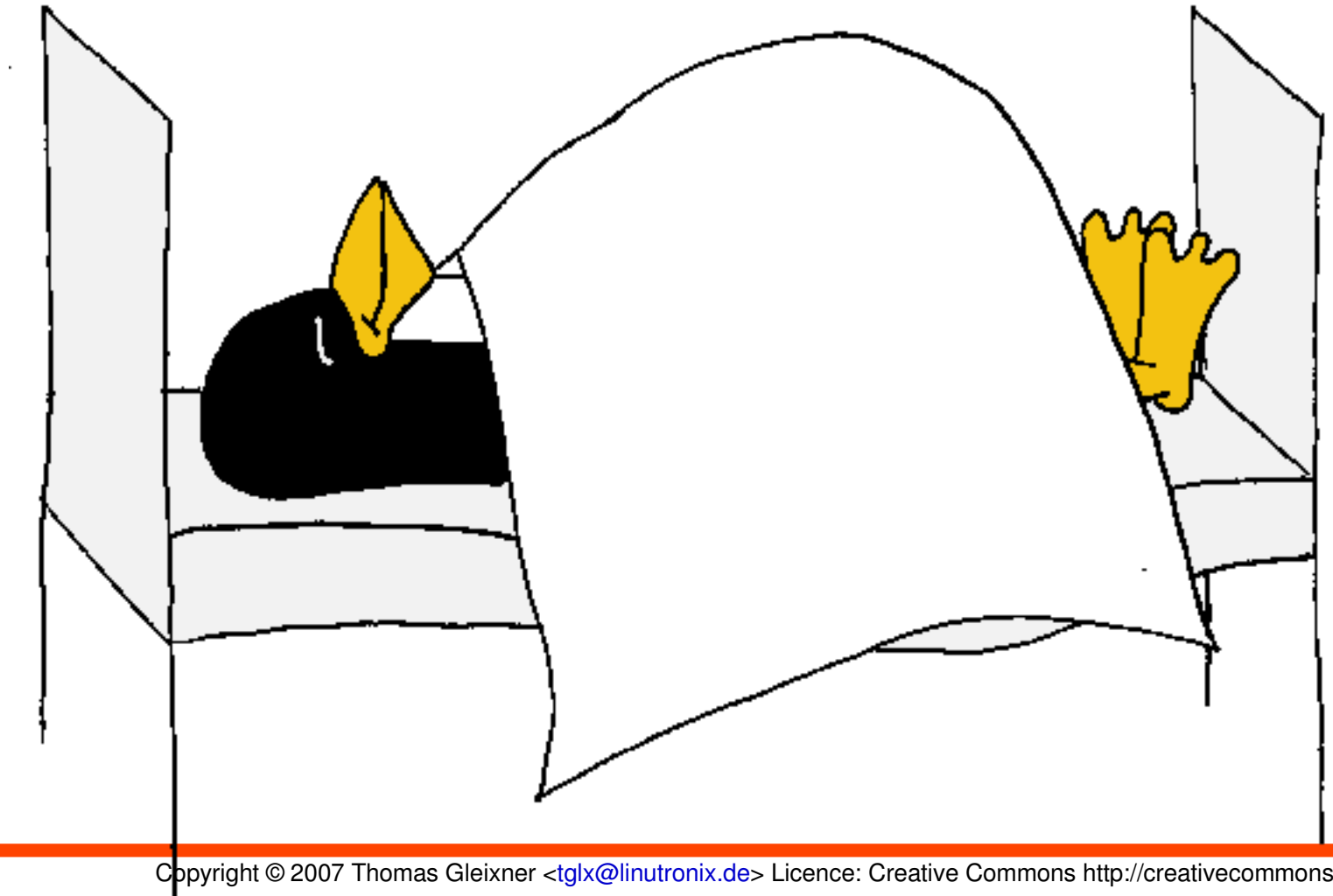

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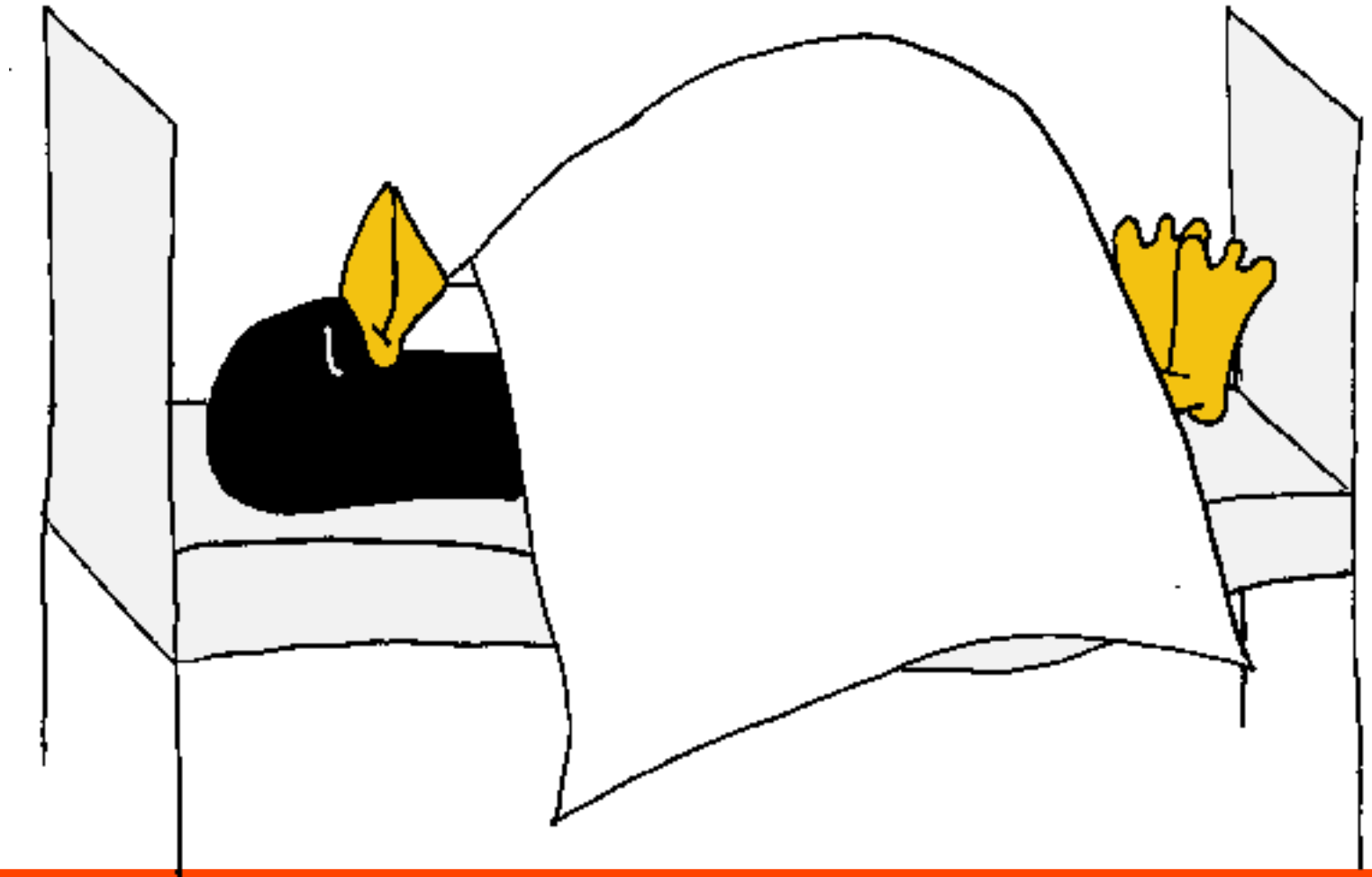
The Linux community is a mutual benefit society !



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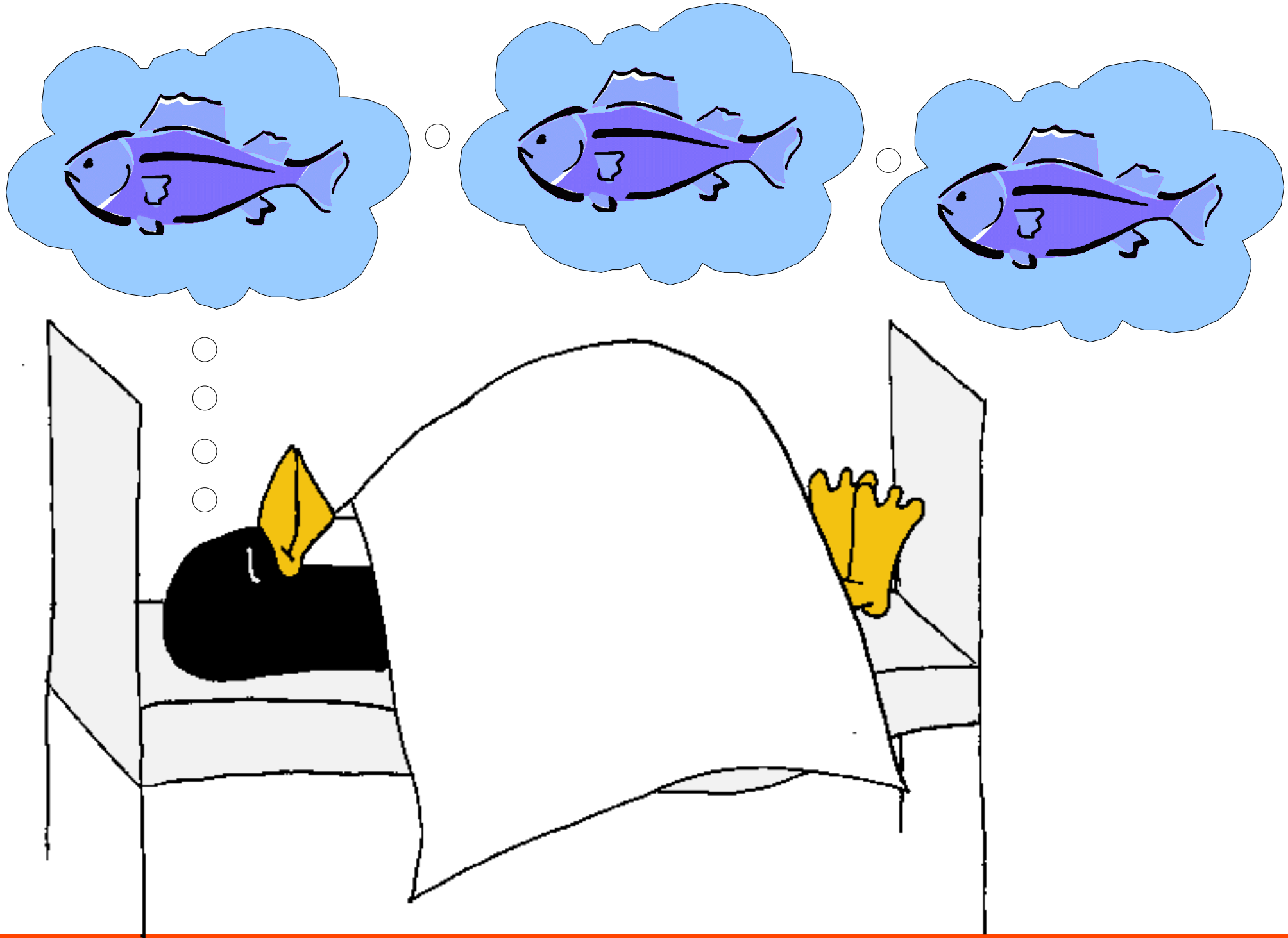

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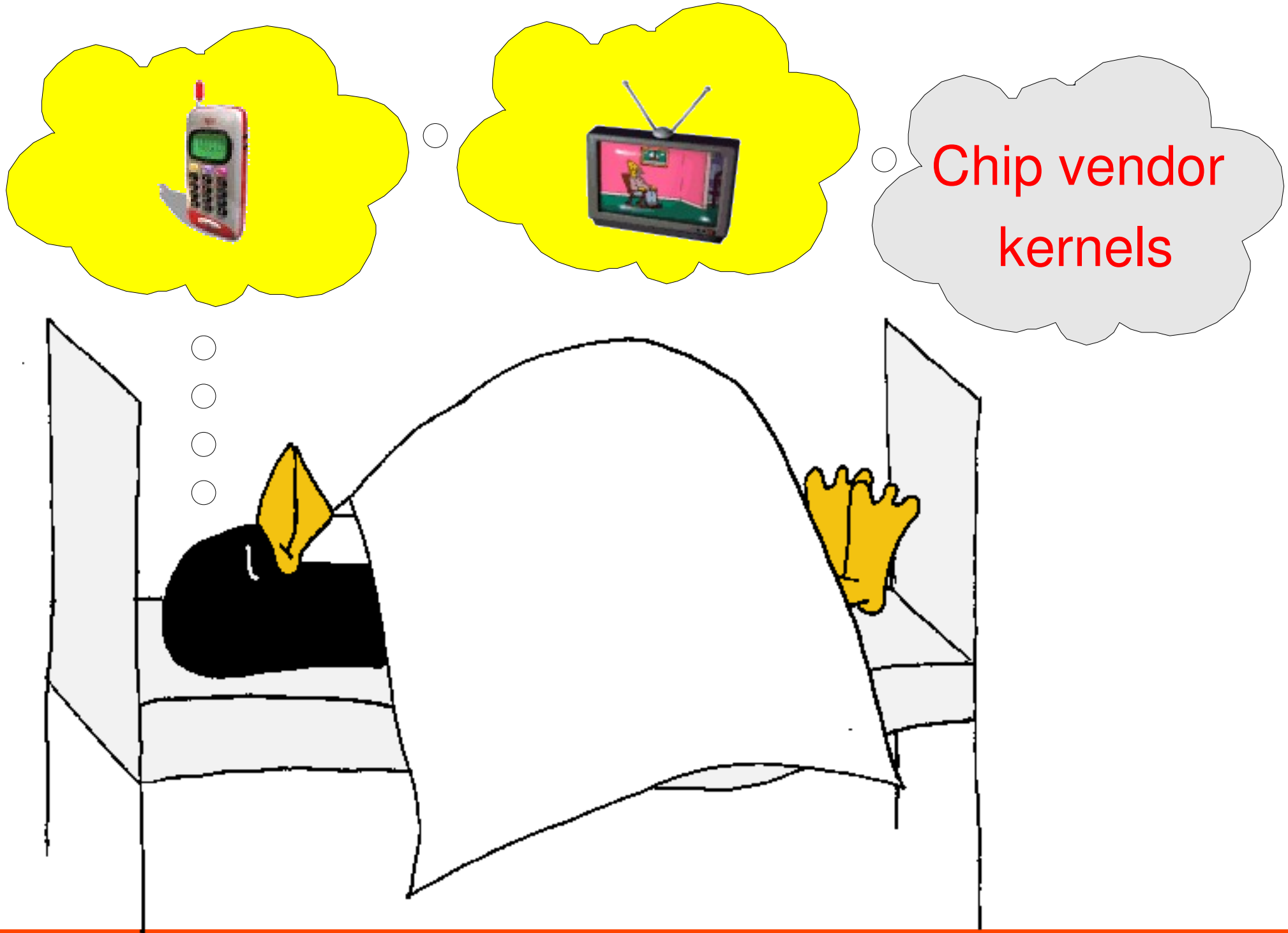

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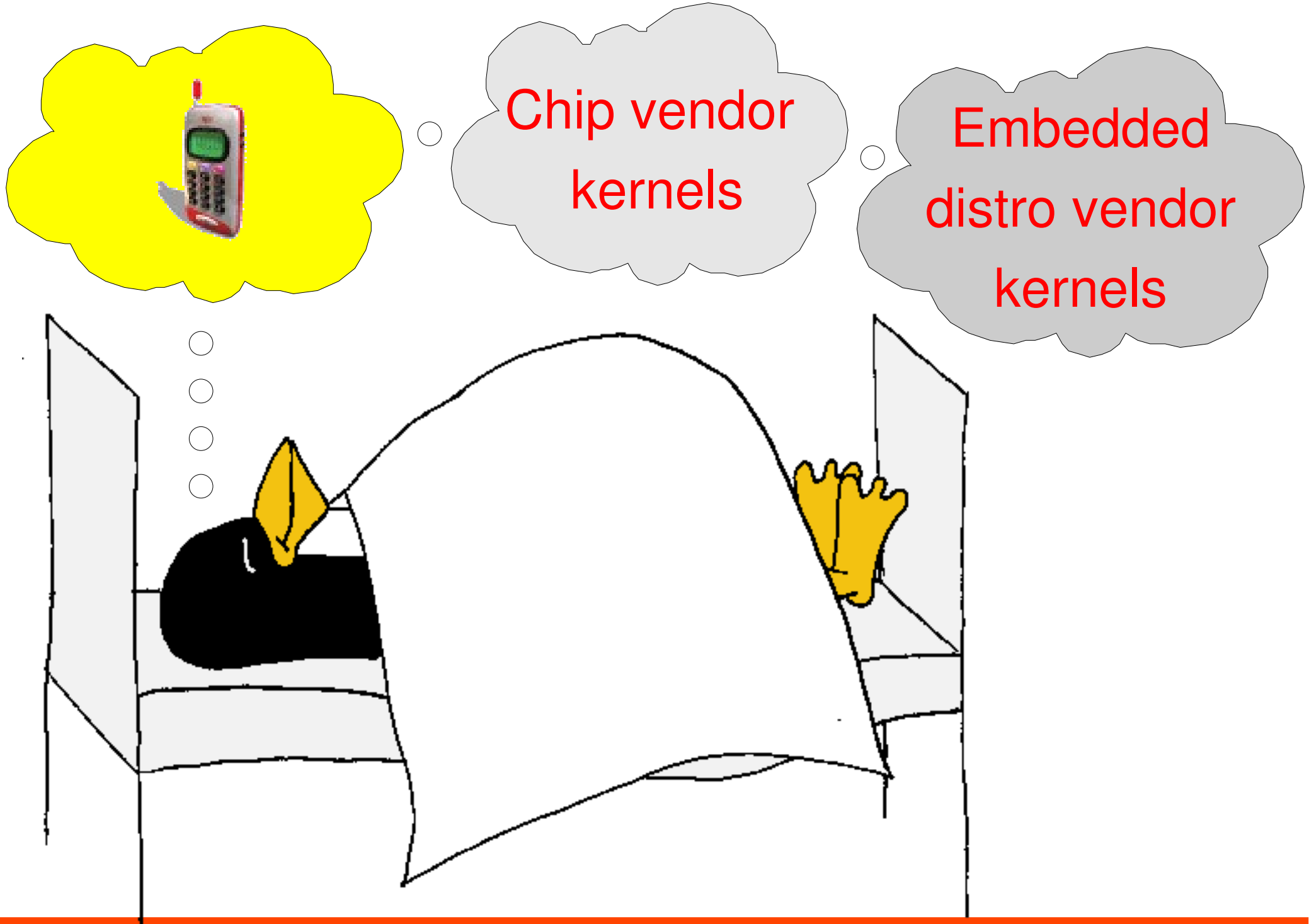

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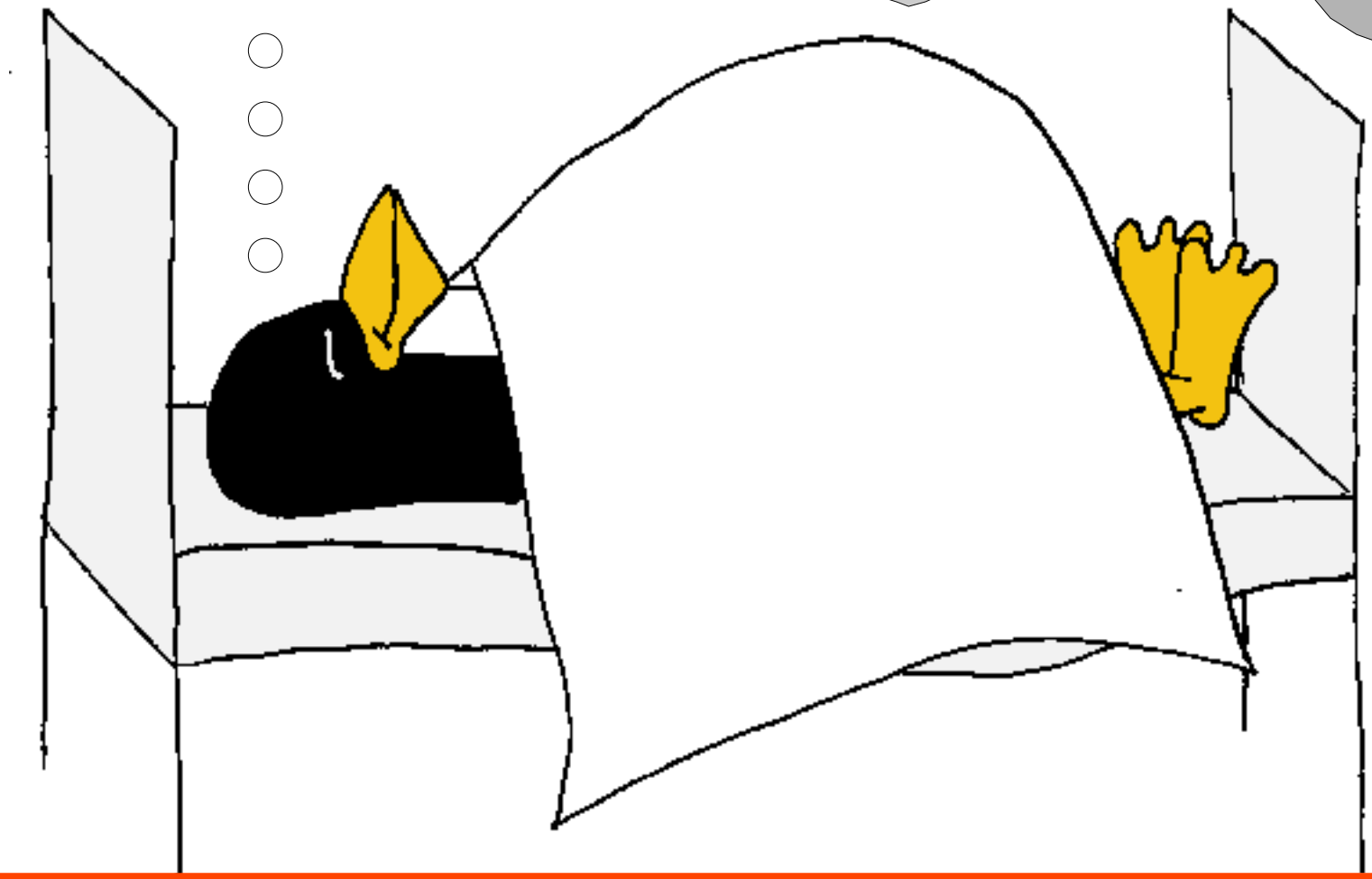
Chip vendor kernels

Embedded distro vendor kernels

Hardware vendor kernels



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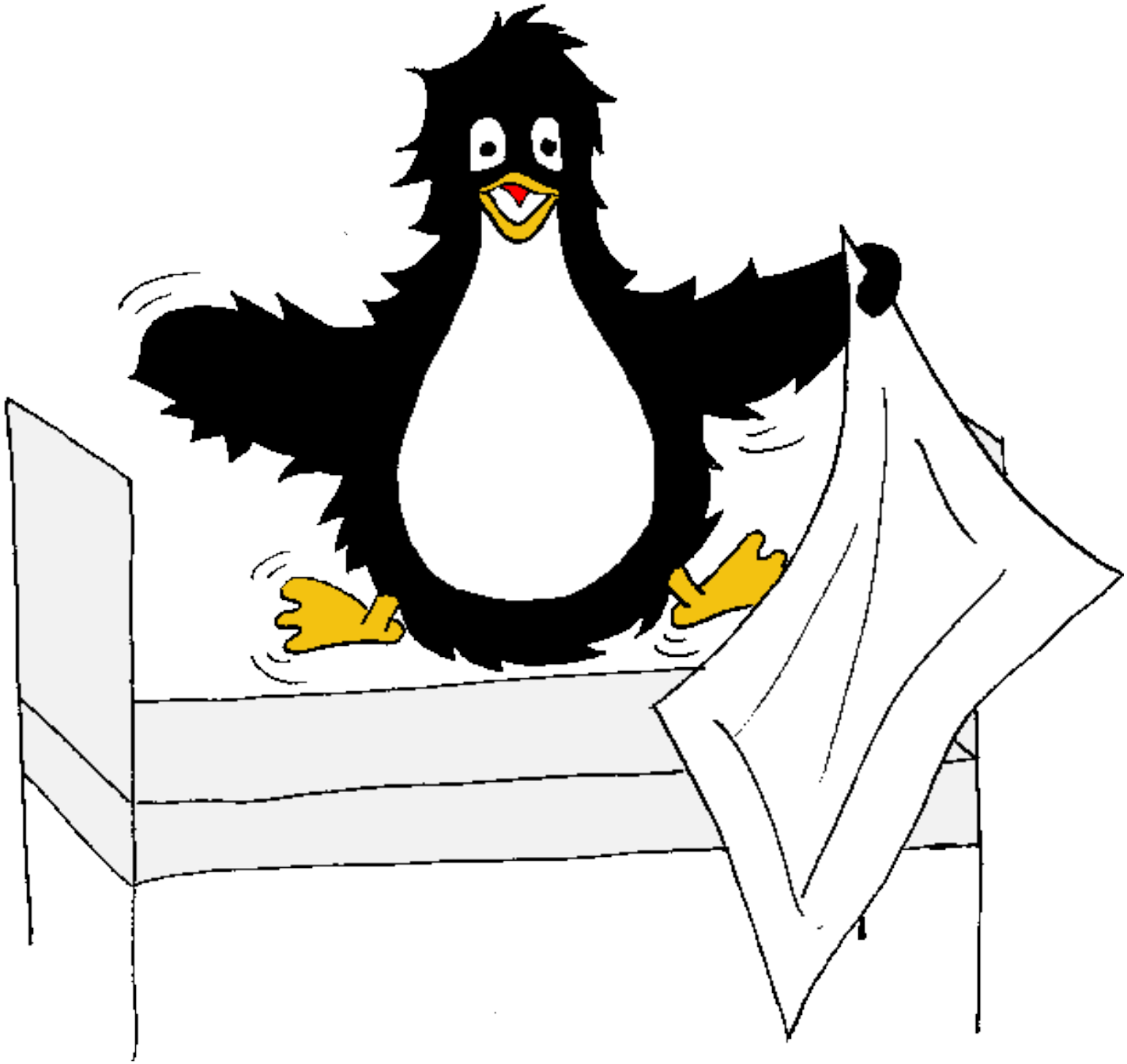

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The penguins are hysterical !

Vendor kernels

- are from the experts
- shorten Time to Market
- have professional support
- are preferred by users
- are a benefit for Linux

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Vendors are the experts !

linux-2.6.10: 16583 files - 227 MB source

Kernel patch	Files modified	Patch size
SoC vendor	10483	46 MB
Distro vendor	8344	33 MB
Board vendor	6588	24 MB

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2.6.10 – 2.6.11	5622	22 MB
2.6.20-rt8	725	1.8 MB
2.6.20-OLPC	105	0.8 MB

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Vendors are the experts !

For me, it's a red flag if a vendor ships a kernel with any patches at all.

Andrew Morton - 2004

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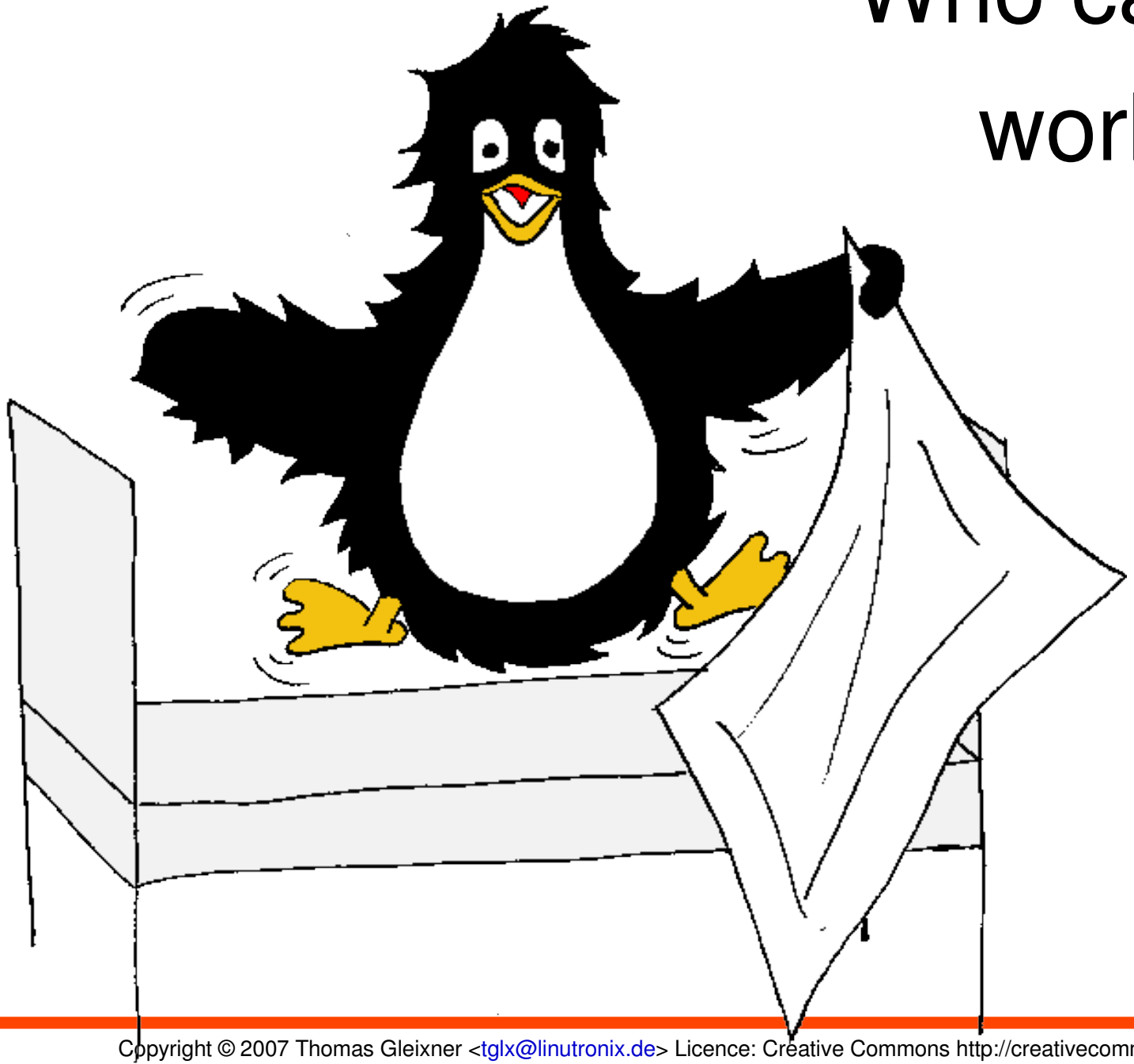
Who cares, it works !



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Vendor kernels shorten Time to Market

“... After spending four weeks to get the driver working we need your help. ...”

support inquiry

“Your hardware vendor screwed up the original syscall interface in an interesting way. No idea why they even touched that code.”

Thomas Gleixner

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Who needs more than the things we tested ?

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Vendor kernels have professinal support

"... Our kernel does not support these devices. You might ask for help on the MTD mailinglist. ...."

From a support mail.

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Vendor kernels have professional support

"... If you use a **vendor** supplied kernel, please get **support** from your kernel **vendor**. Do not ask on the mailinglist for help with such problems. You are either ignored or you get a pointer to this text. Please save the bandwidth and our time to sort out such questions."

http://www.linux-mtd.infradead.org/source.html#kernelversions

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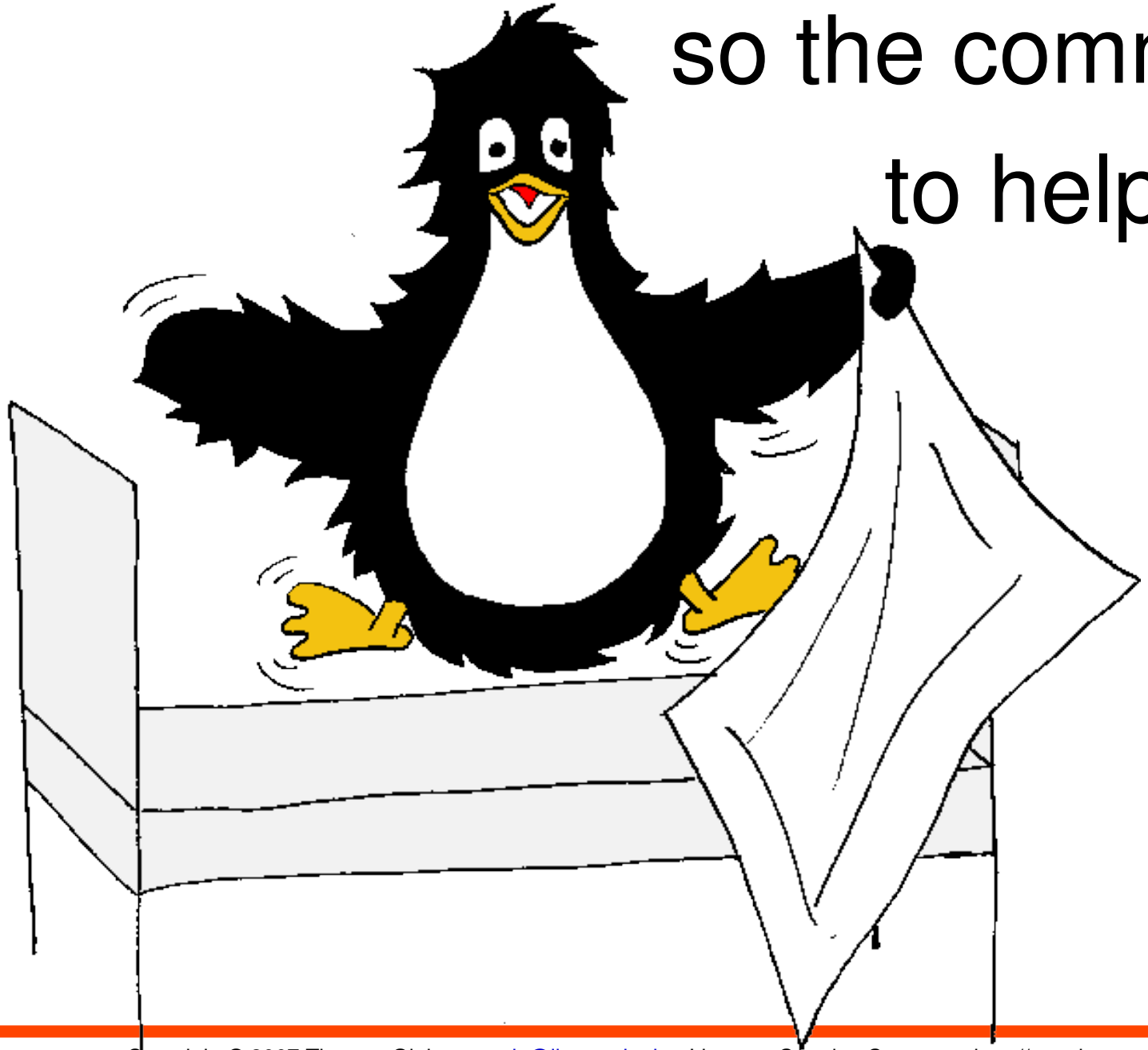
It's community code, so the community has to help you!



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Users prefer vendor kernels

Is there a preference when one is faced with Hobson's choice ?

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Unique features allow vendor lock in !

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Vendor kernels are a benefit for Linux

“I think we will just maintain our own port for the 93xx. I am not going to want to support **code not written by CirrusLogic**. So I give you kuddos for getting to the port first, but using GIT makes it easy to remove your work and add ours.”

http://www.freelists.org/archives/linux-cirrus/02-2007/msg00026.html

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Vendor kernels are a benefit for Linux

.... we could all help in bringing it about even faster. That's how open source development works.

Yea, that's how open source works.

we **use** open source, and that is how it works.

http://arm.cirrus.com/forum/viewtopic.php?t=2705

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We don't need the community, we just use their code

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The nightmare is reality !

A consequence of vendors behaviour:

- Community detachment
- Waste of resources

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Community detachment

http://www.linux-arm.org

This site is the definitive resource for the community of developers and users of the Linux Kernel on the ARM Family of processors.

Launched 2005

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Community detachment

Launched ten years after the community site
http://www.arm.linux.org.uk

without the decency of a link and a reference
to the community web site

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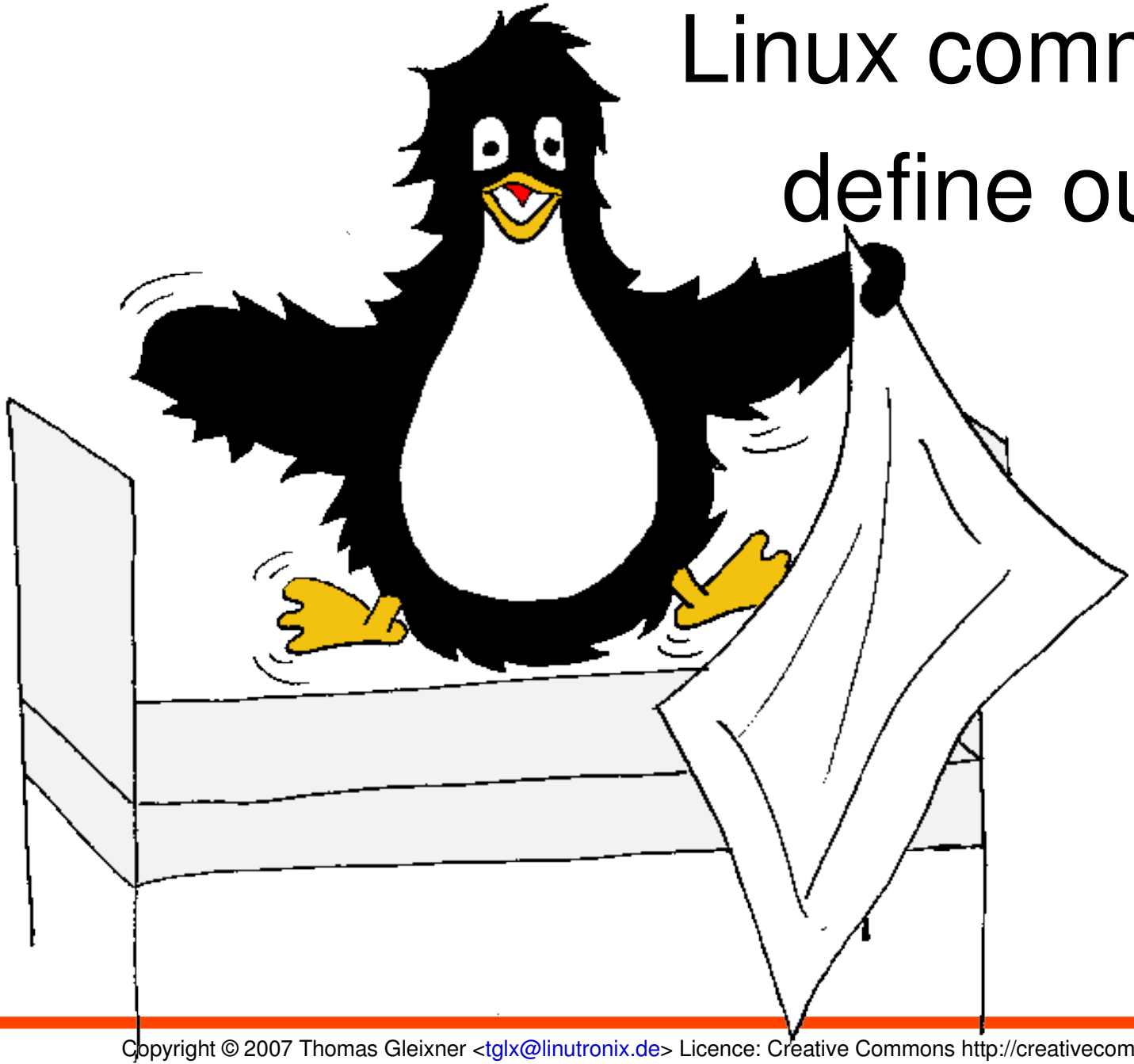
We don't need the Linux community, we define our own !



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Waste of resources

Example #1: Device driver for a SoC

- Vendor driver: 7184 SLOC
- Community driver: 1342 SLOC
- COCOMO estimated waste: $ 180,000
- Time waste: 1 man year

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Waste of resources

Example #2: SoC support for mainline

- Mainline implementation by volunteers partially paid by displeased customers
- COCOMO estimated waste: $ 500,000
- Time waste estimate: 3 man years

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Waste of resources

Example #3: Preempt-RT fork

- Not a single patch published
- Zero mail exchange with the developers
- Unportable and unmaintainable
- Waste estimate: beyond the pale
- Time waste: > 10 man years

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We can afford the waste !

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The nightmare is reality !

- Displeased customers
- Bad reputation for Open Source Software
- Fragmentation
- Community developers feel ripped off
- Waste of resources

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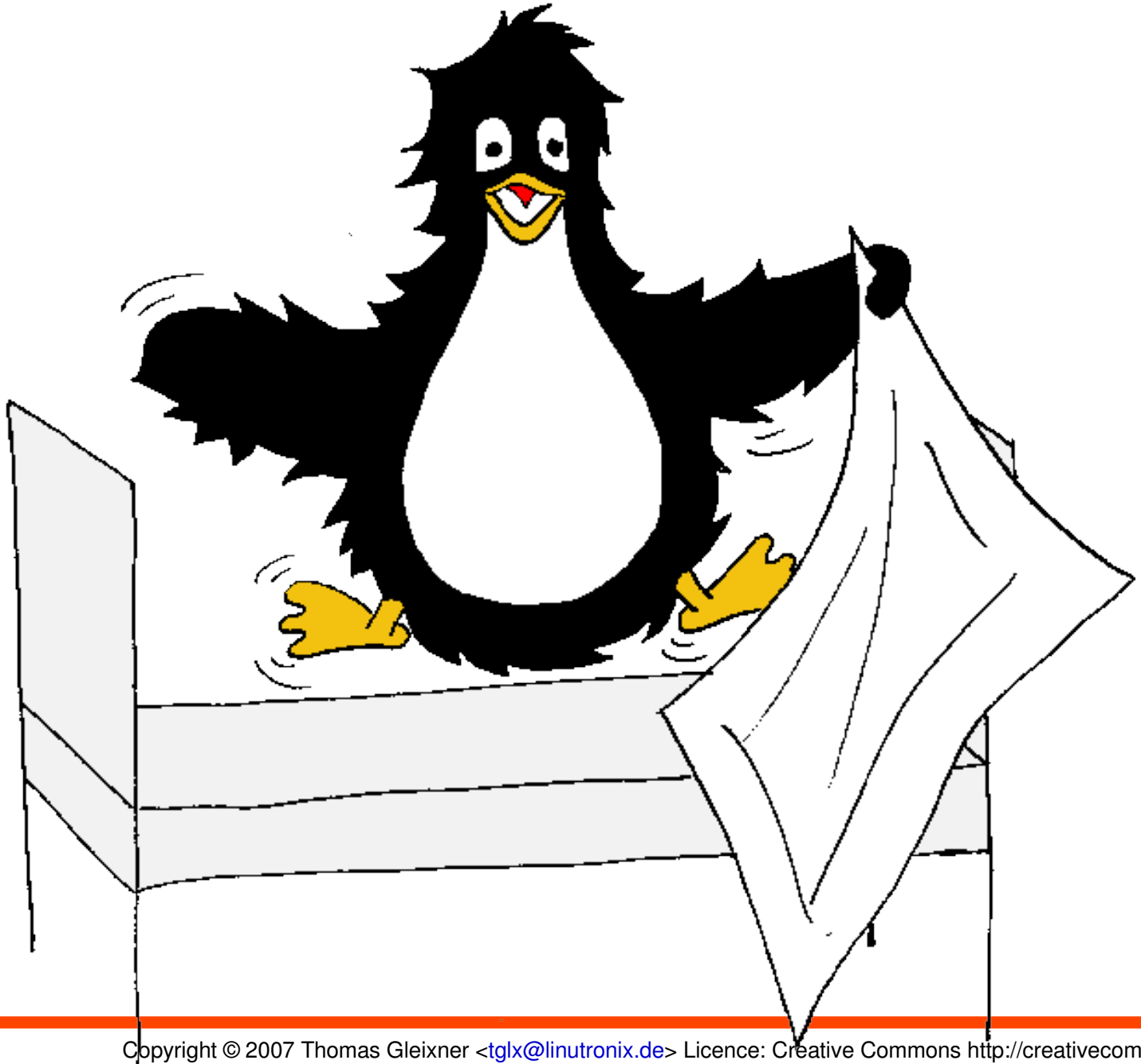
Please help stop the nightmare!



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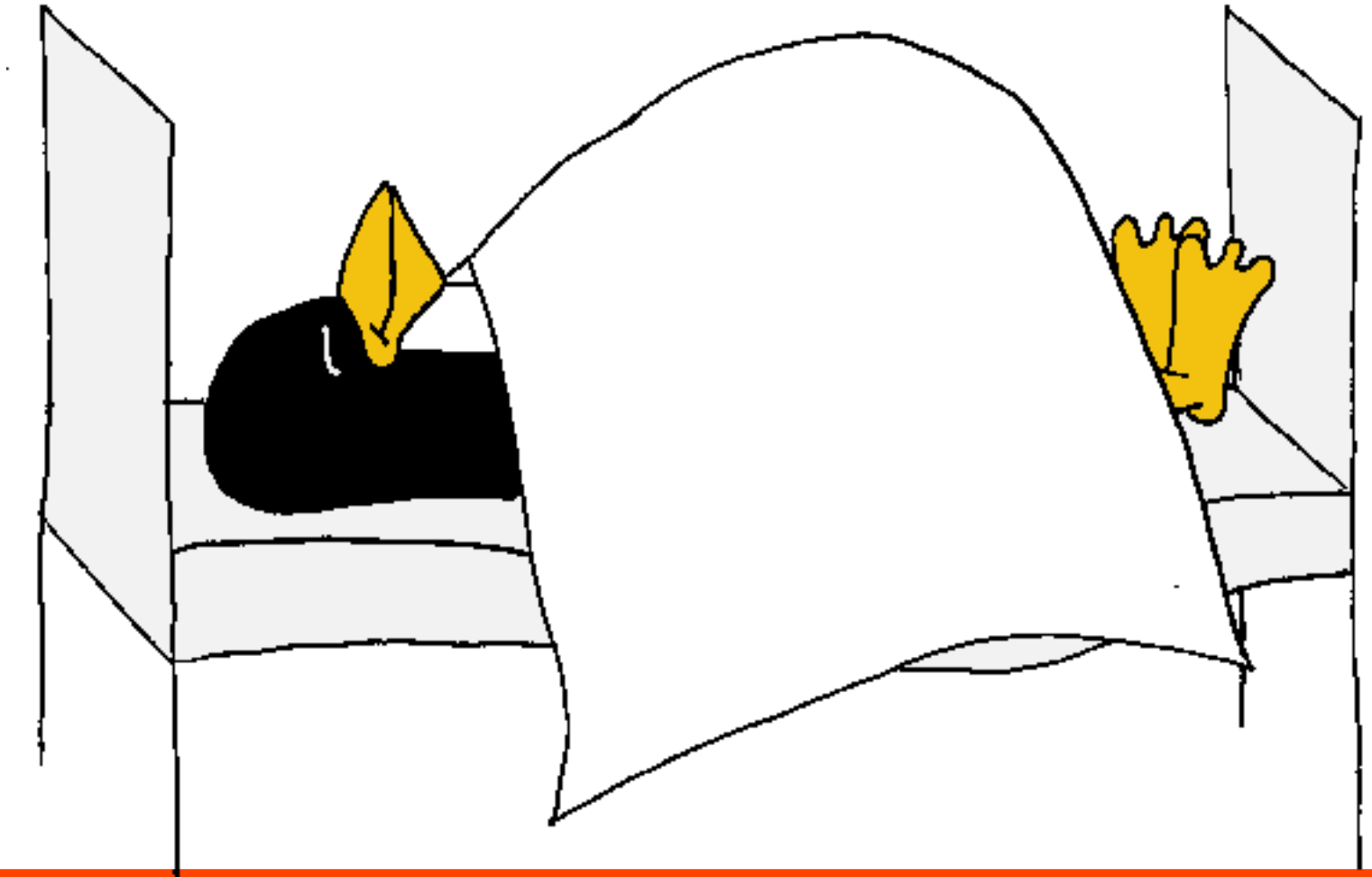
Remember, the Linux community is a mutual benefit society !



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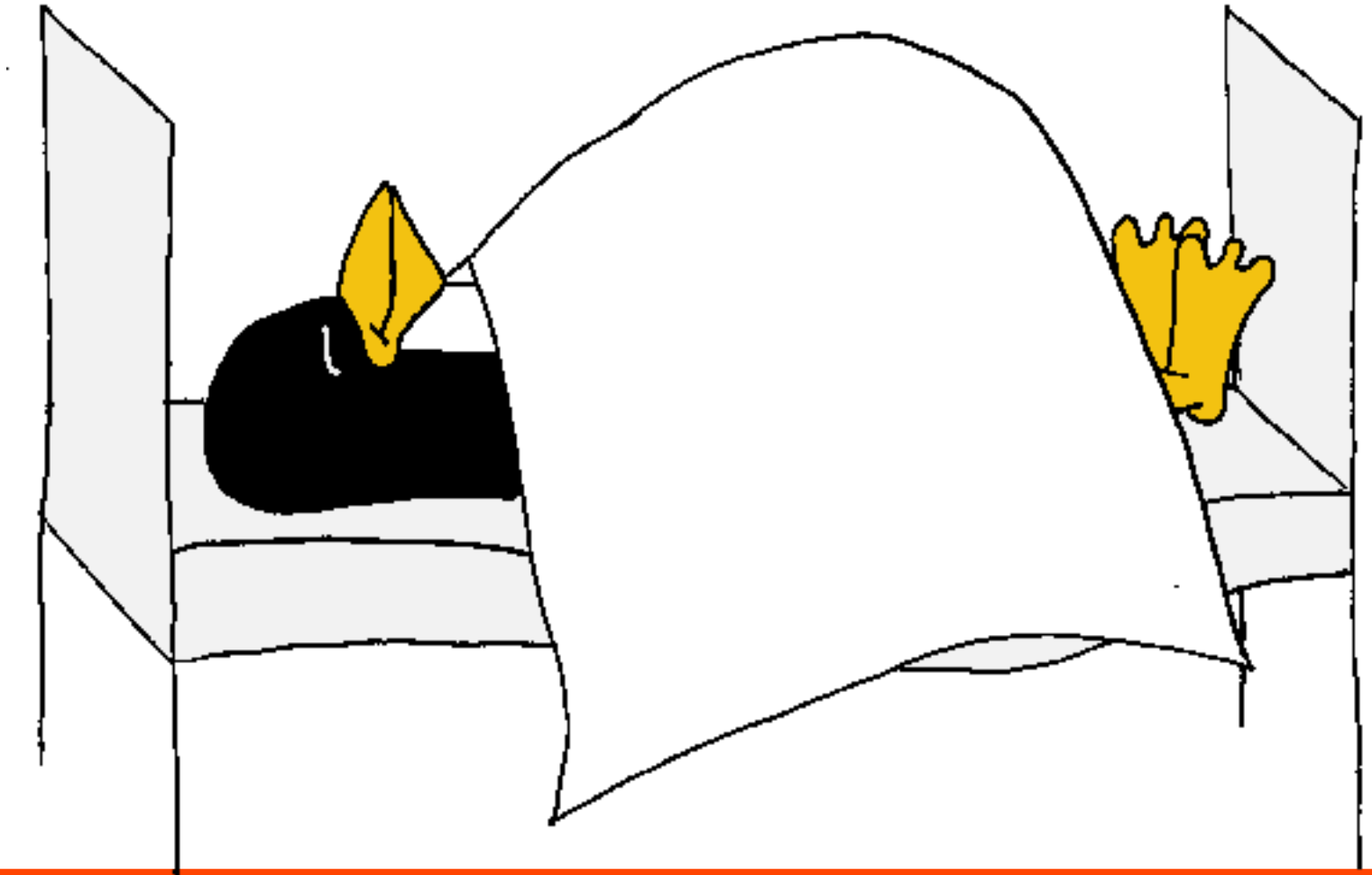
Please talk to us !



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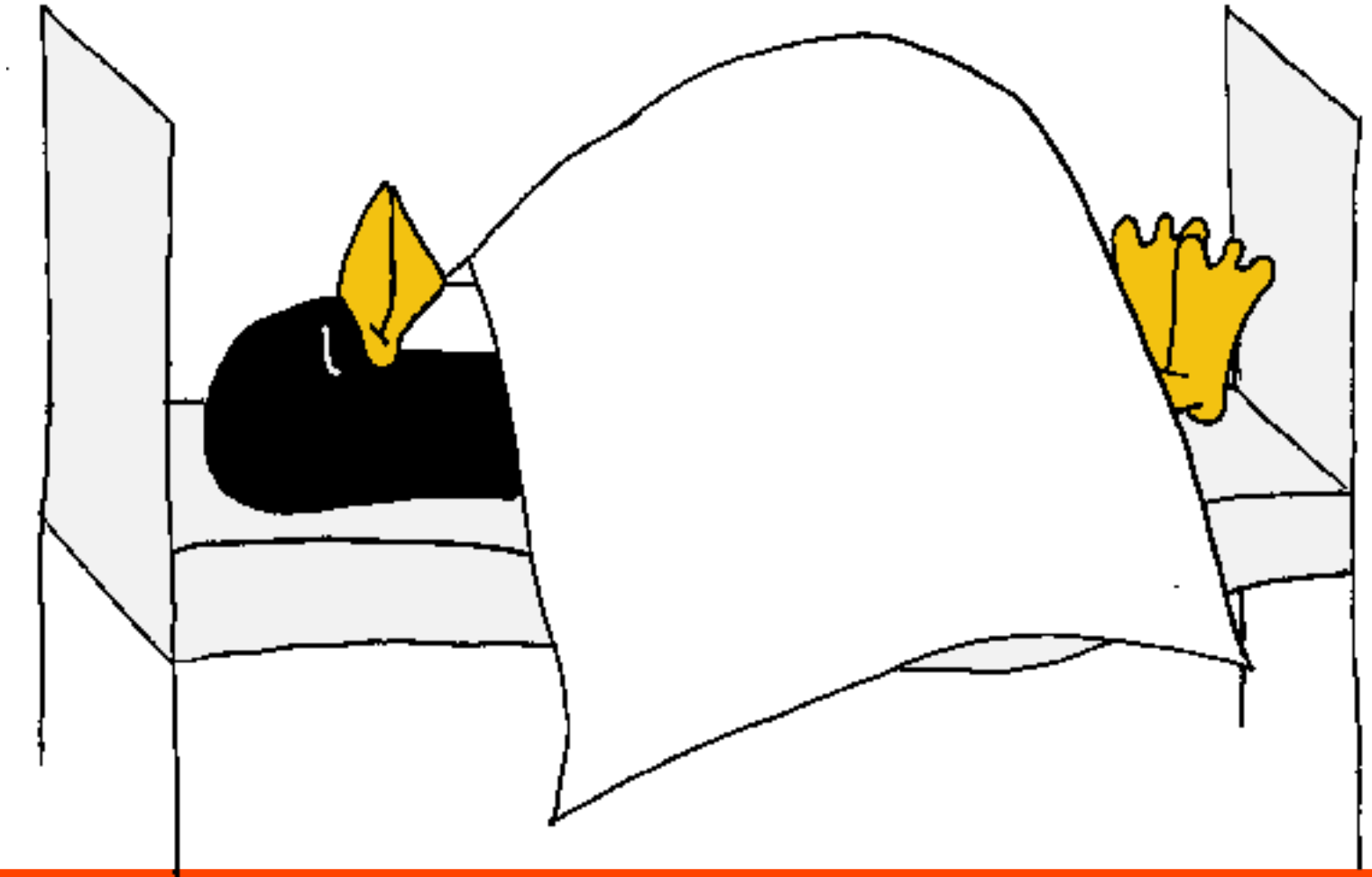
Please include your code into mainline !



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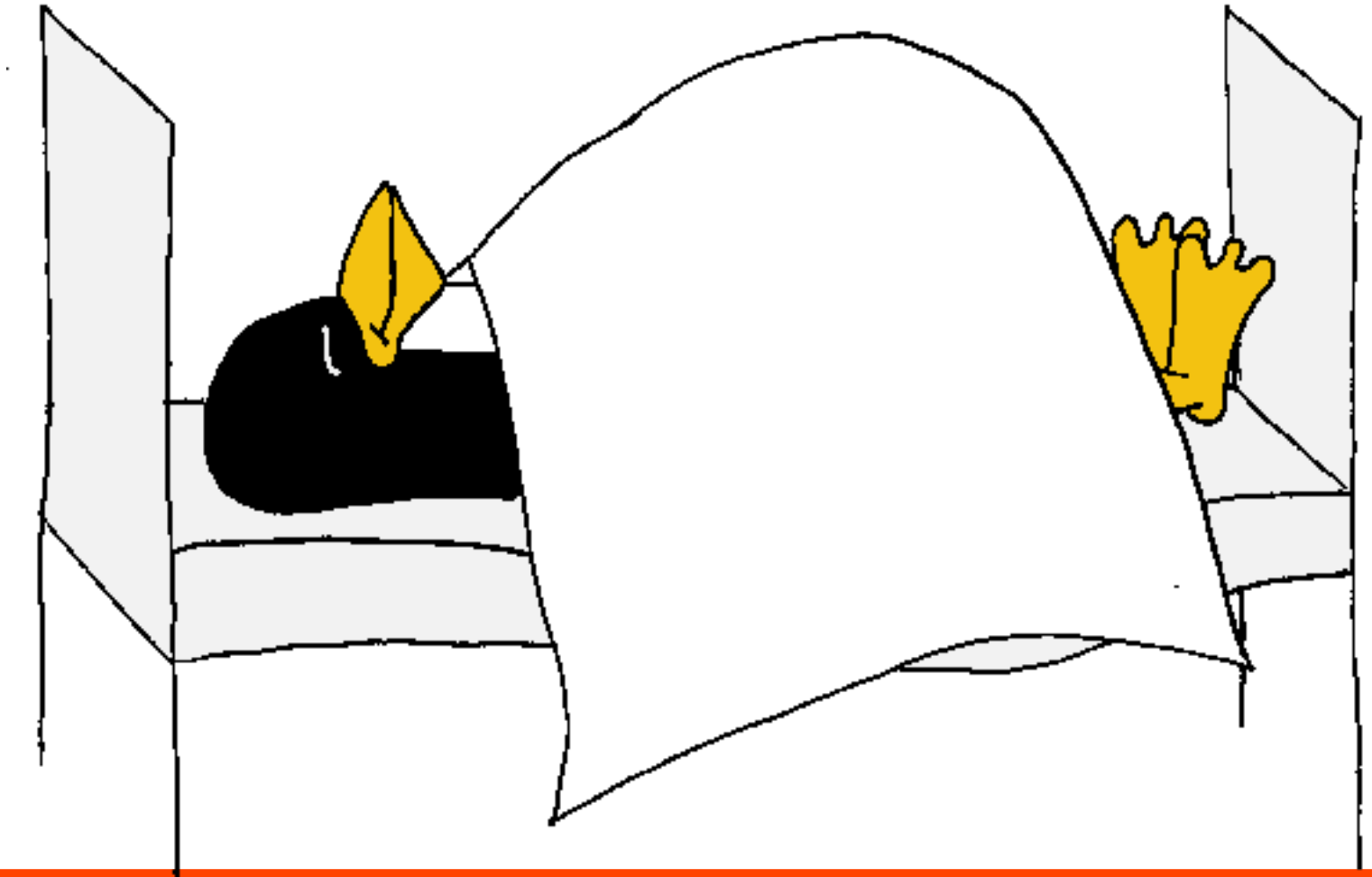
Please feed back bugfixes and improvements !



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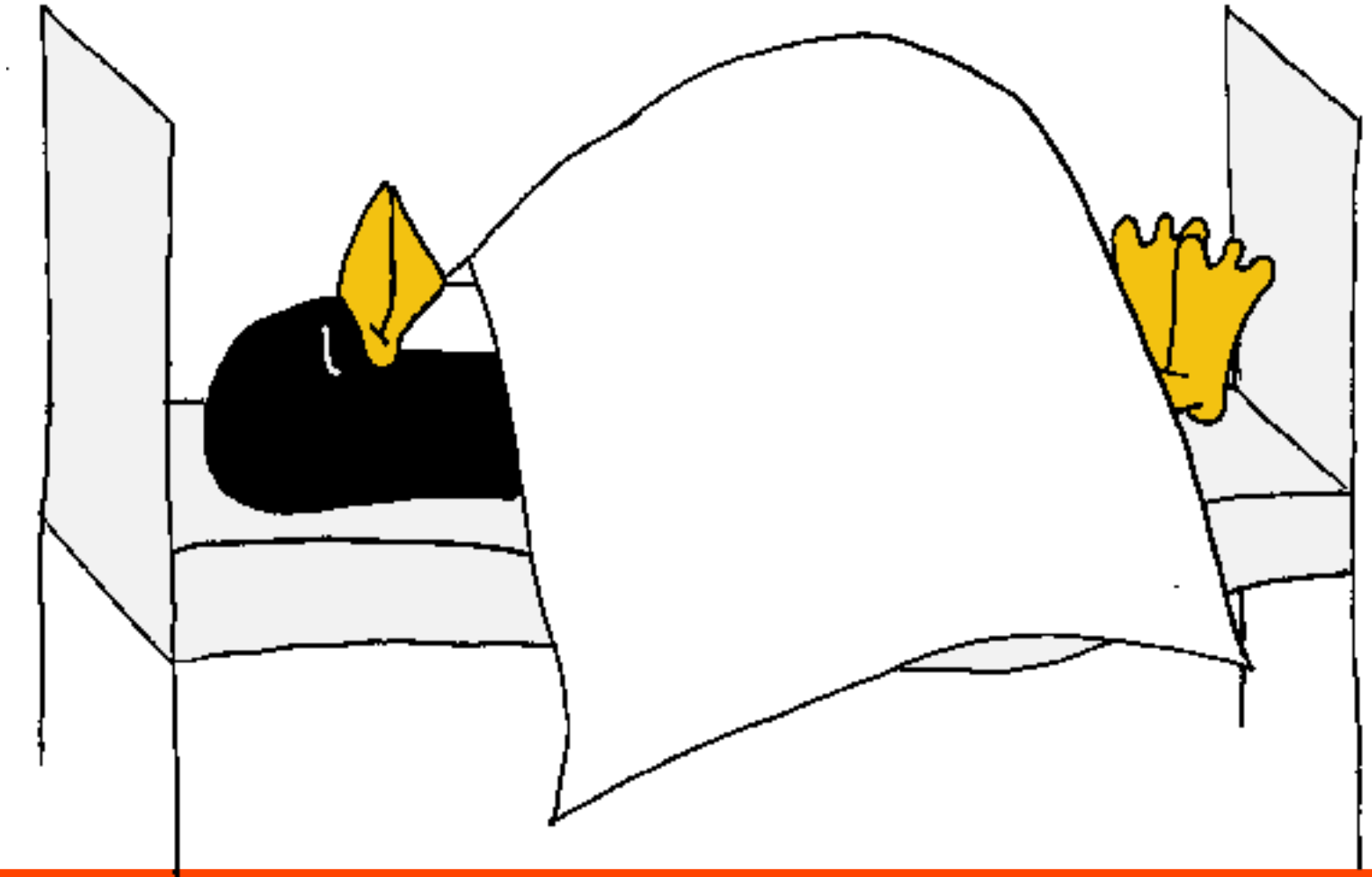
Become part of the mutual benefit society !



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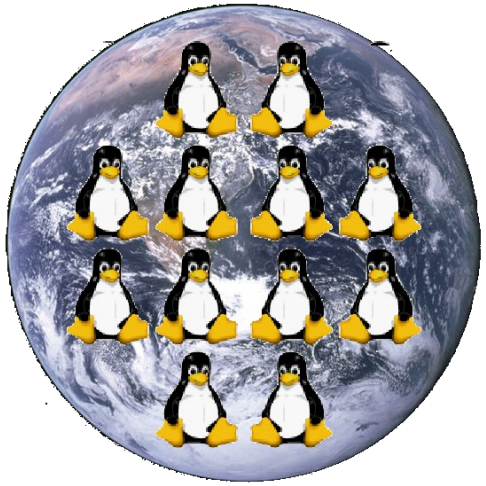
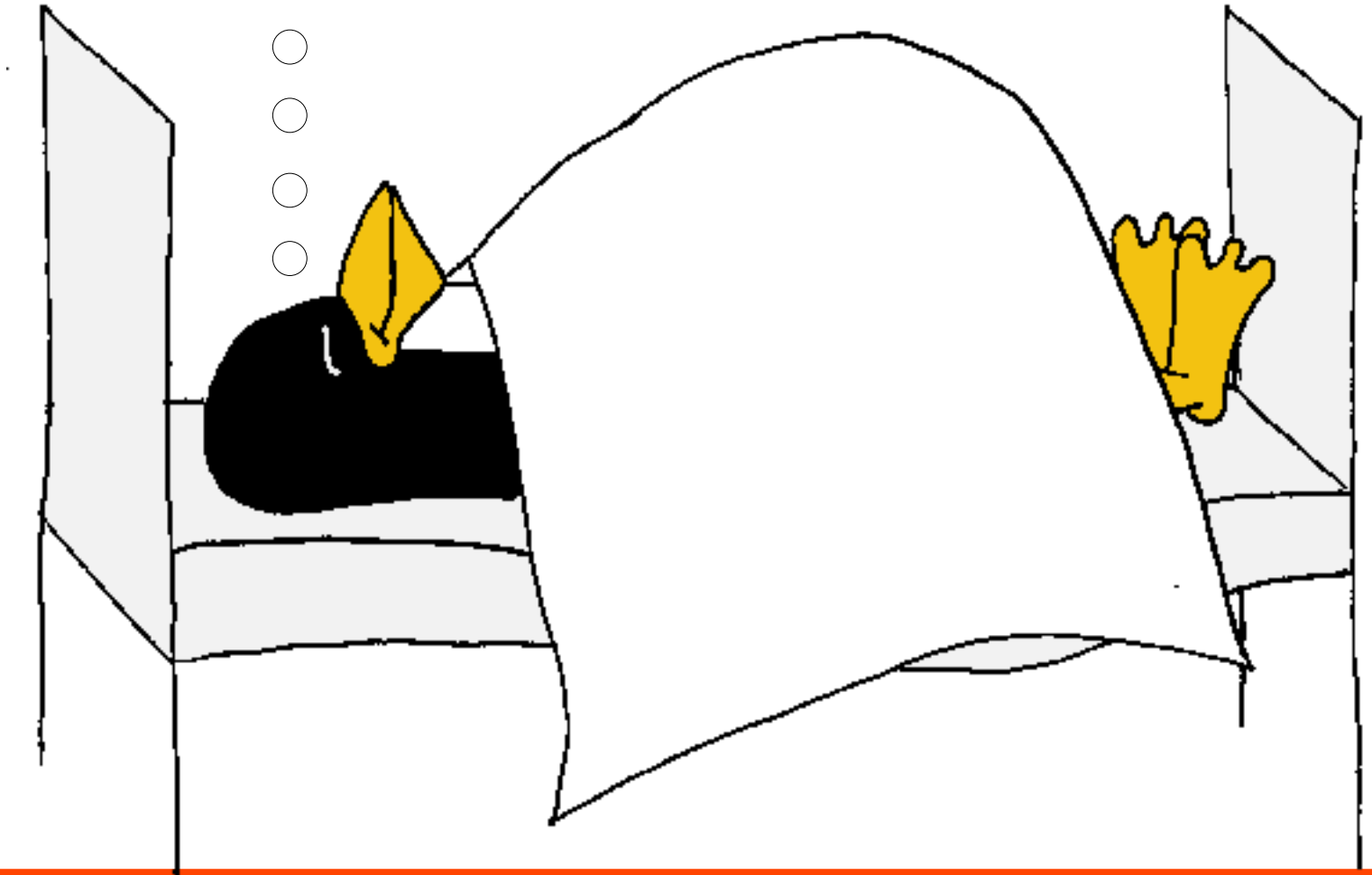


so world domination can proceed according to plan



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