

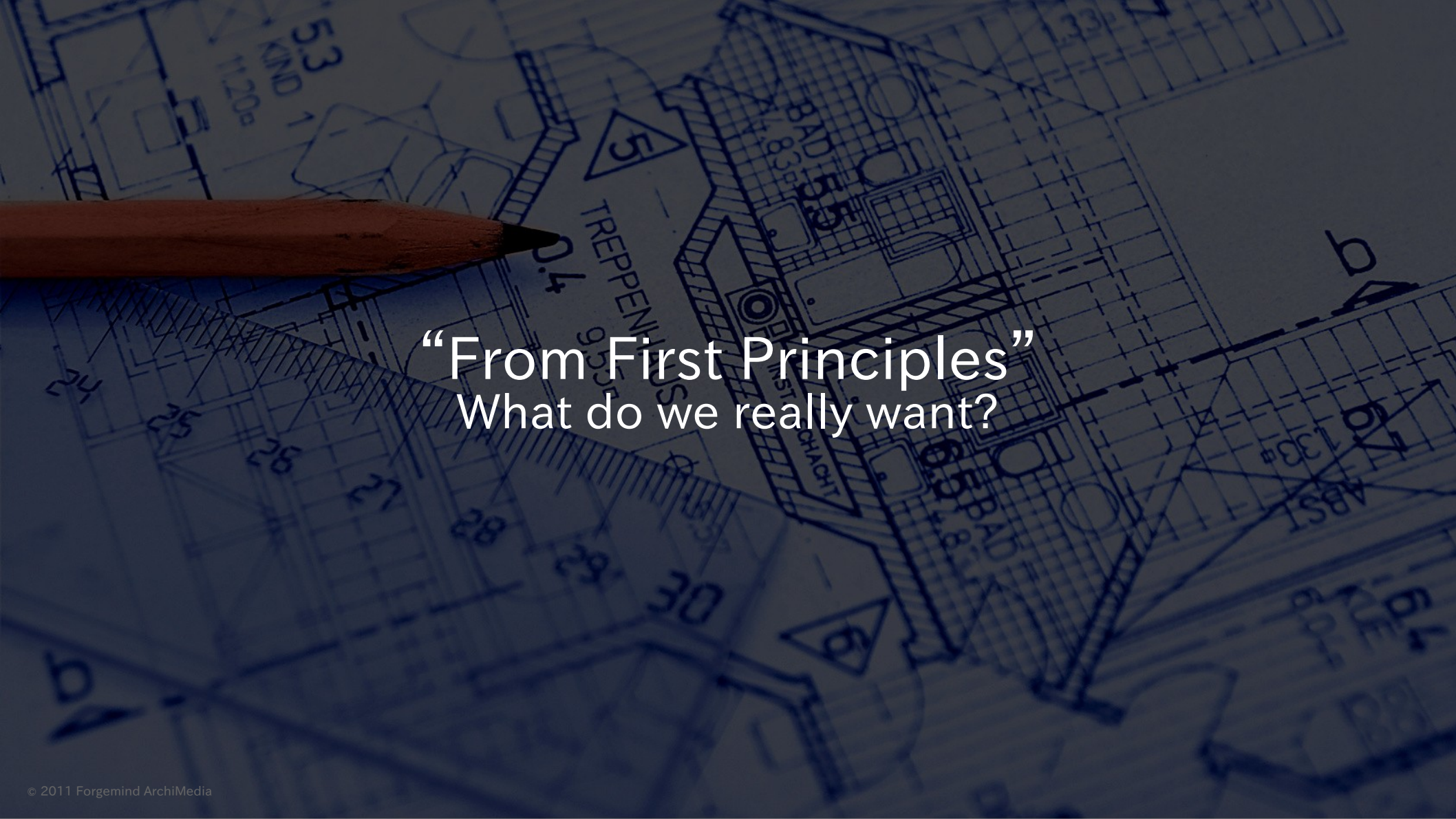


CONTAINER IMAGES CONSIDERED HARMFUL

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OPEN CONTAINER
INITIATIVE



“From First Principles”
What do we really want?

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(Aside from the obvious.)

Deduplicated (*transfer* and *storage*).

Parallelisable (*transfer* and *extraction*).

Reproducible (canonical representation).

Non-avalanching.

Transparent.

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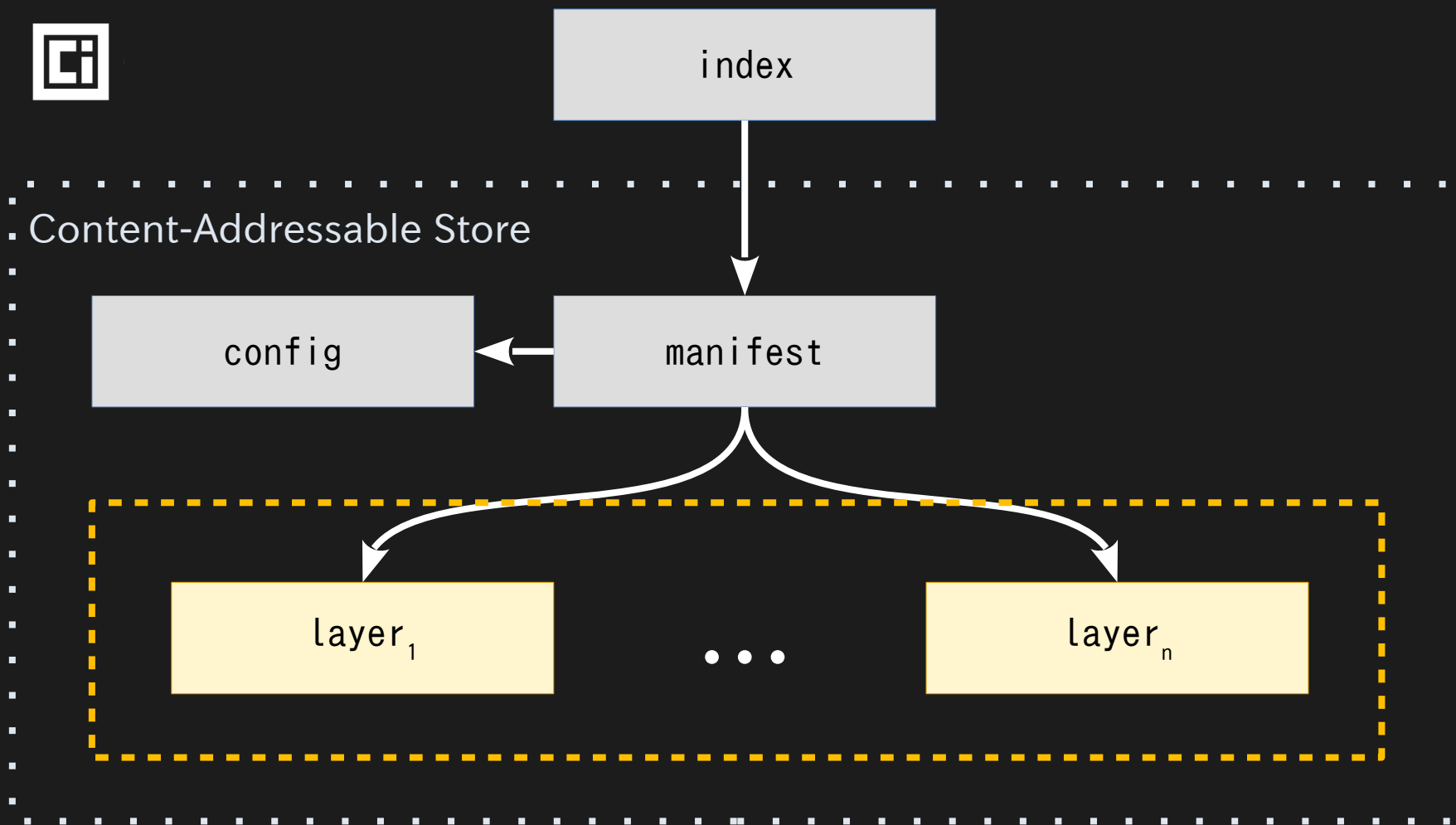
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(This slide intentionally left blank.)





Devil's Advocate

<https://xkcd.com/927/>



“It’s a POSIX standard!”



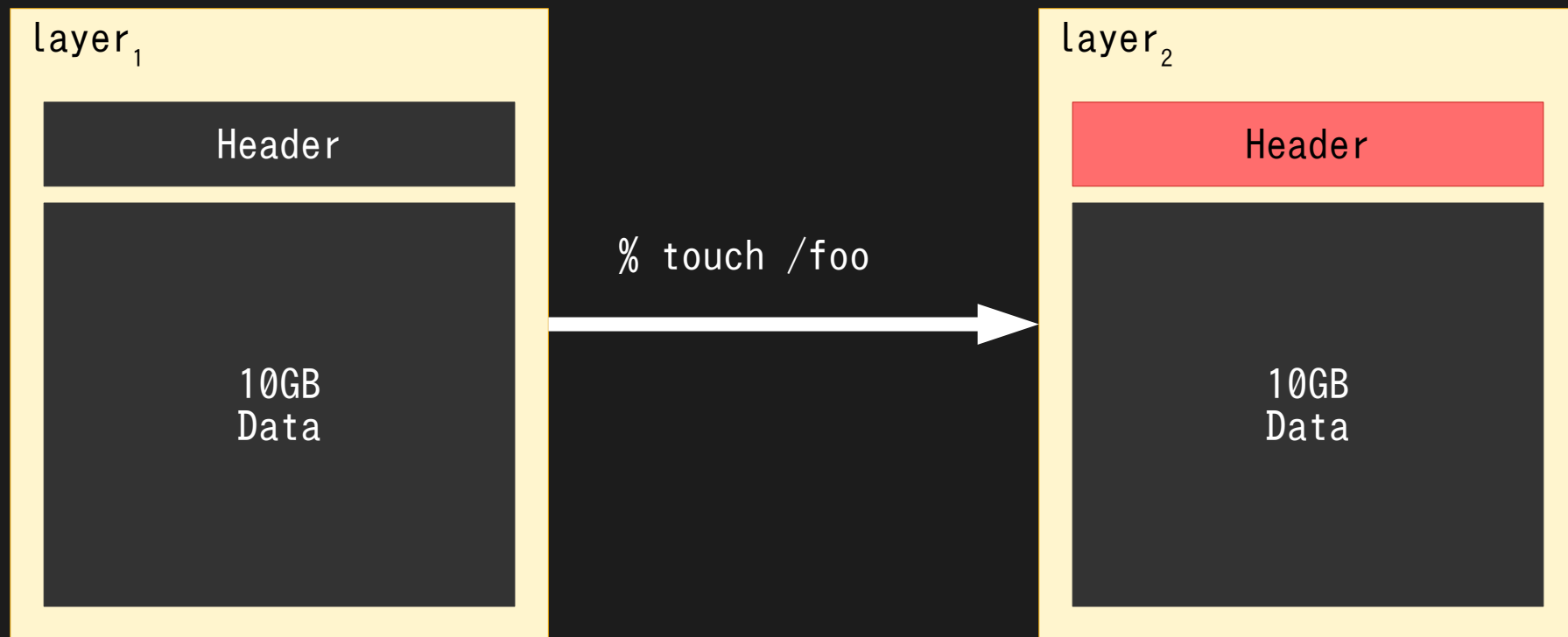
“It’s the obvious choice.”

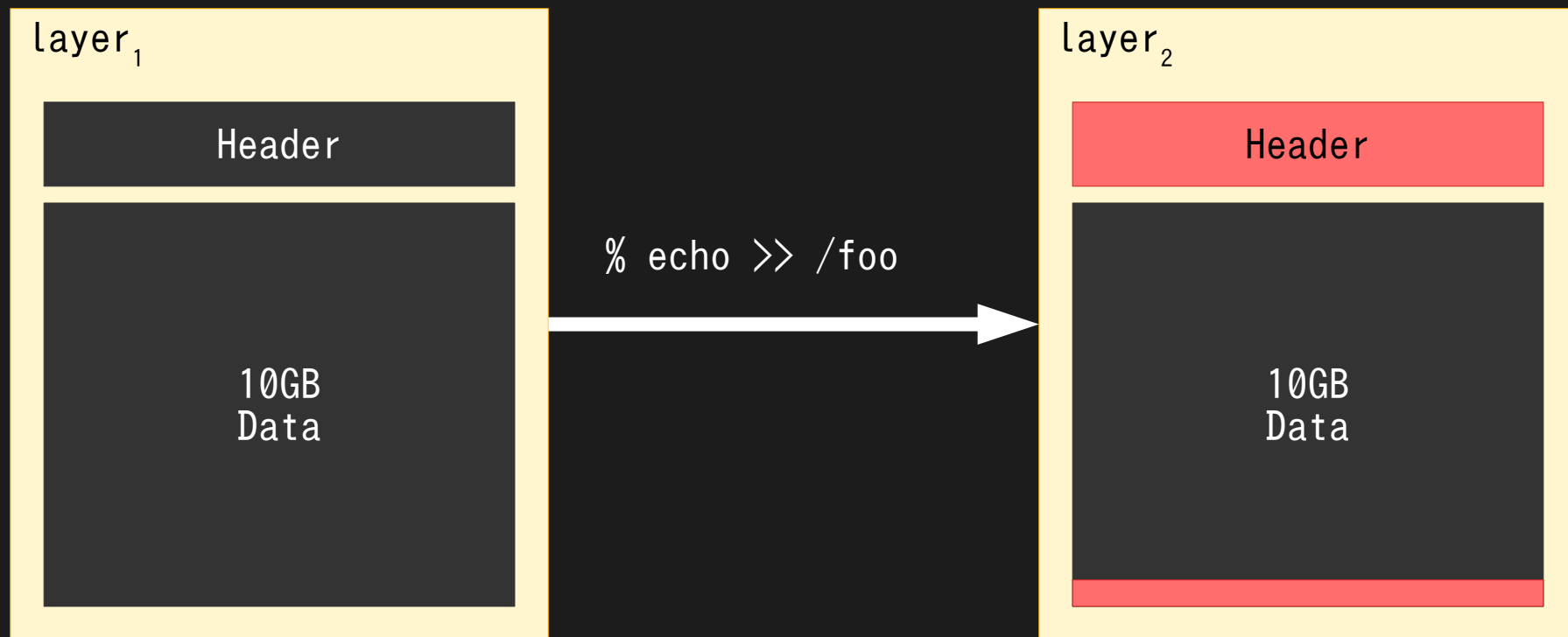


“Layer-level deduplication is Good Enough™.”

A scene from the movie 'The Firm' featuring Tom Cruise. He is in a high-rise office with a panoramic view of a city. He is wearing a white dress shirt and a patterned tie, sitting at a desk cluttered with papers and office equipment. He is holding a mobile phone to his ear with his right hand and shouting with his mouth wide open. The background shows a city skyline with various buildings and a clear sky.

“Show me the money examples!”





opensuse/tumbleweed₁

/bin/bash

/bin/zsh

/usr/bin/ping

/usr/bin/blah

/usr/share/man/**

/usr/lib/foo.so

% oci-pull image

opensuse/tumbleweed₂

/bin/bash

/bin/zsh

/usr/bin/ping

/usr/bin/blah

/usr/share/man/**

/usr/lib/foo.so

/usr/lib64/bar.so

```
% oci-pull ubuntu
```

```
ubuntu:18.04
```

```
/bin/bash
```

```
/bin/zsh
```

```
/usr/bin/apt
```

```
/usr/bin/ping
```

```
/usr/share/man/**
```

```
/usr/lib/libc.so
```

```
% oci-pull opensuse
```

```
opensuse/tumbleweed
```

```
/bin/bash
```

```
/bin/zsh
```

```
/usr/bin/ping
```

```
/usr/bin/zypper
```

```
/usr/share/man/**
```

```
/usr/lib/libc.so
```

% oci-build myimg

myimg₁

/foo/**

/opt/bar/**

/usr/share/man/**

/usr/lib/libc.so

≠

% oci-build myimg

myimg₂

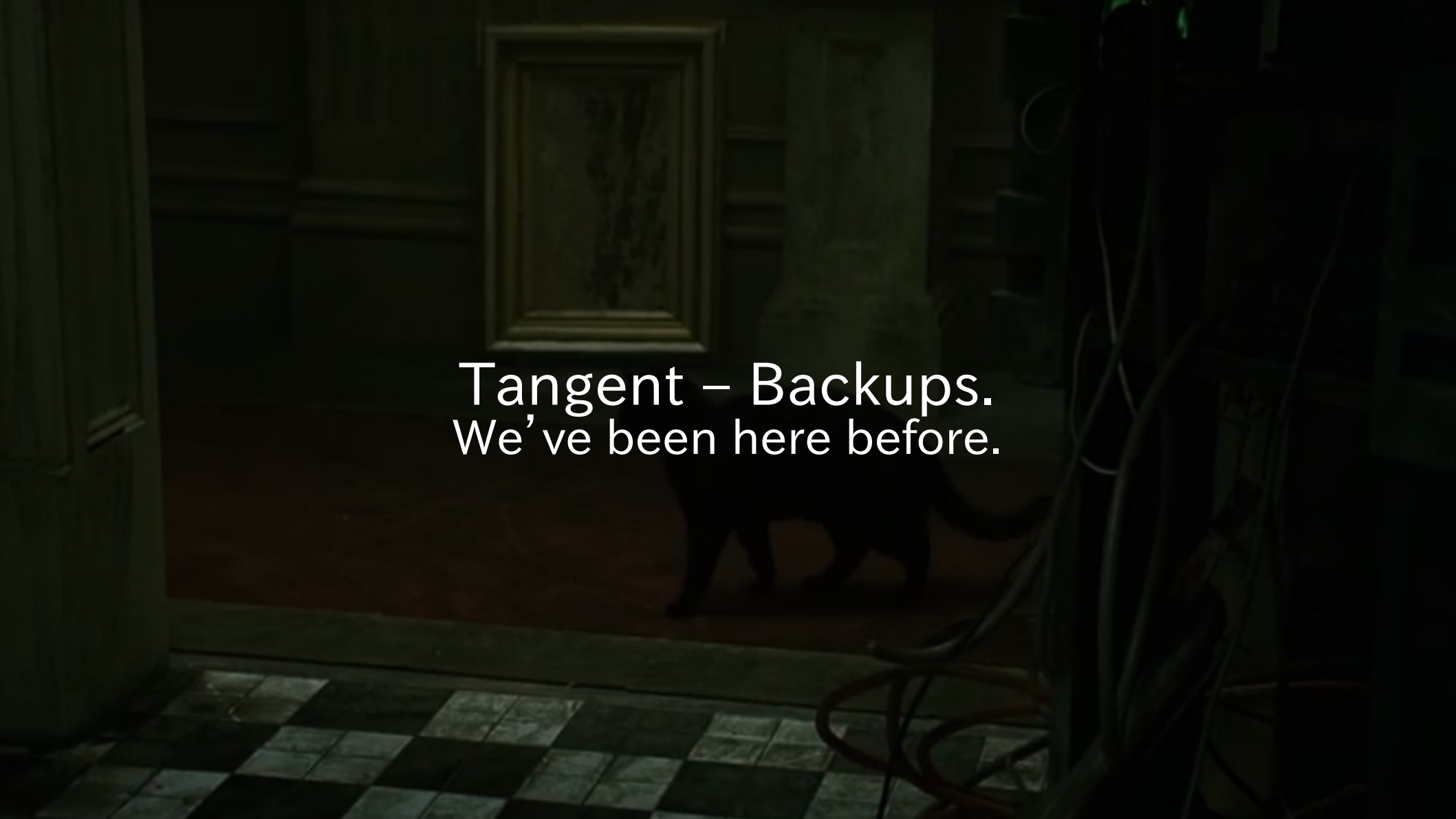
/foo/**

/usr/share/man/**

/usr/lib/libc.so

/opt/bar/**

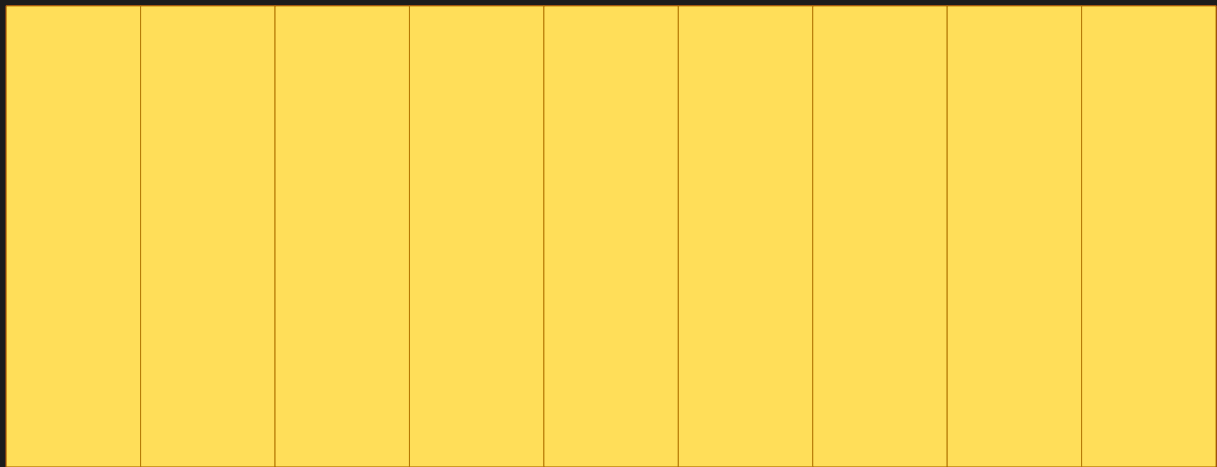
Ranting is all well and good.
But how can we do better?



Tangent – Backups.
We've been here before.

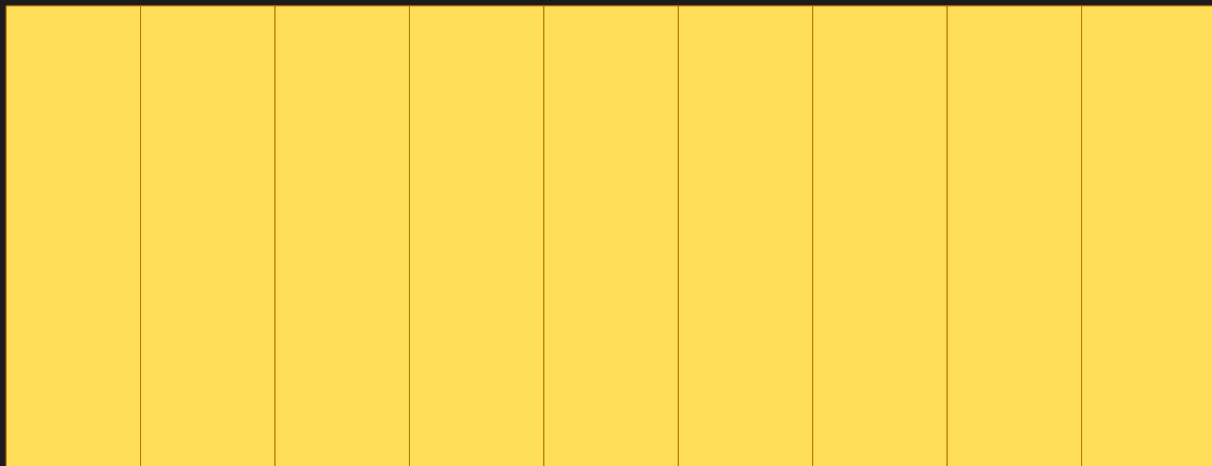


Pictured: A Humble File.



			foo					

			bar					



baz

			baz						

FINGERPRINTING BY RANDOM POLYNOMIALS

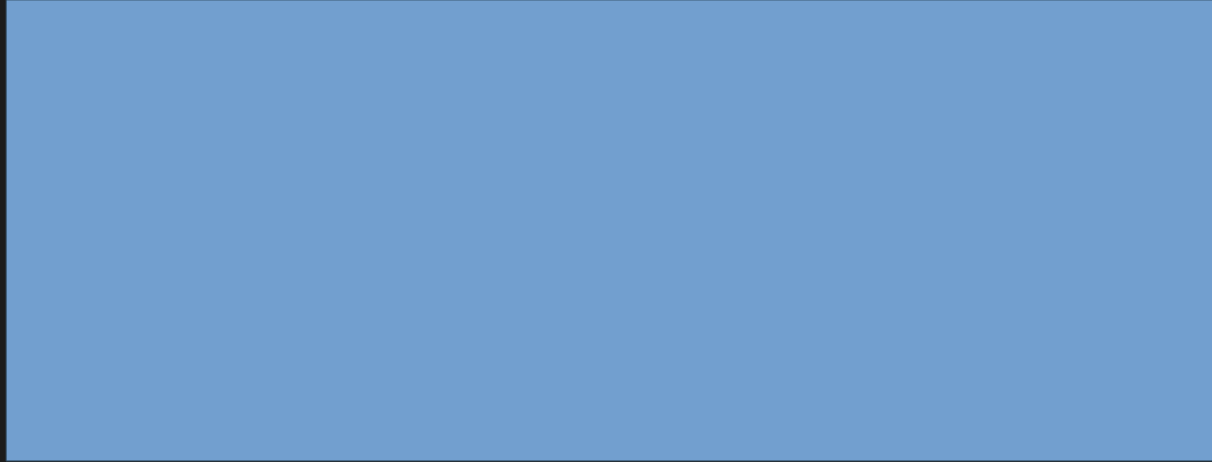
by

Michael O. Rabin
Department of Mathematics
The Hebrew University of Jerusalem

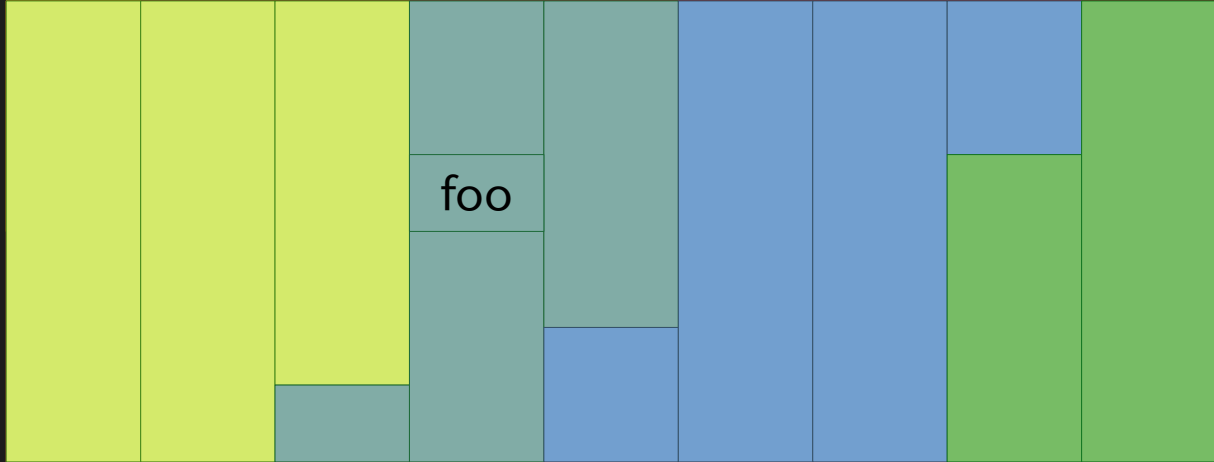
and

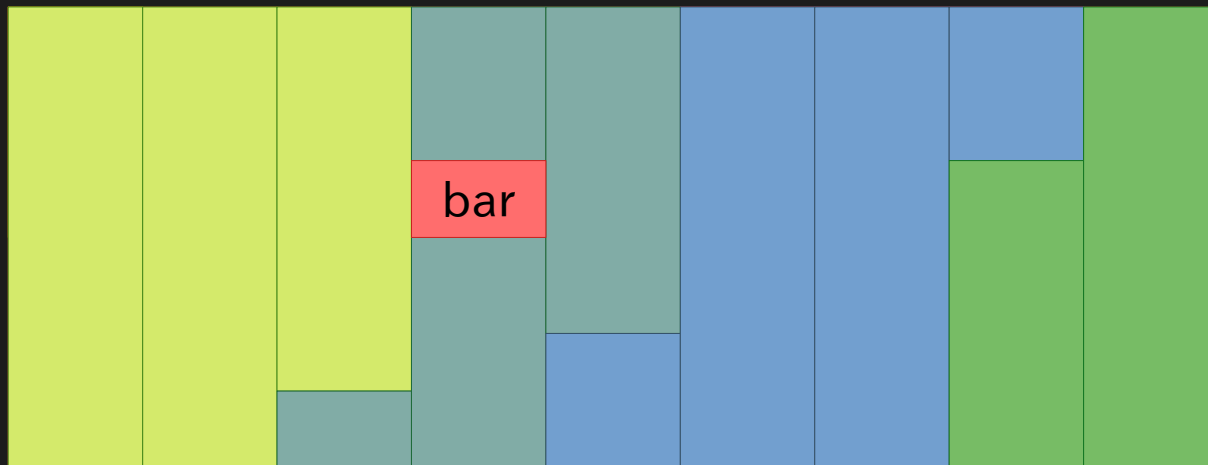
Department of Computer Science
Harvard University

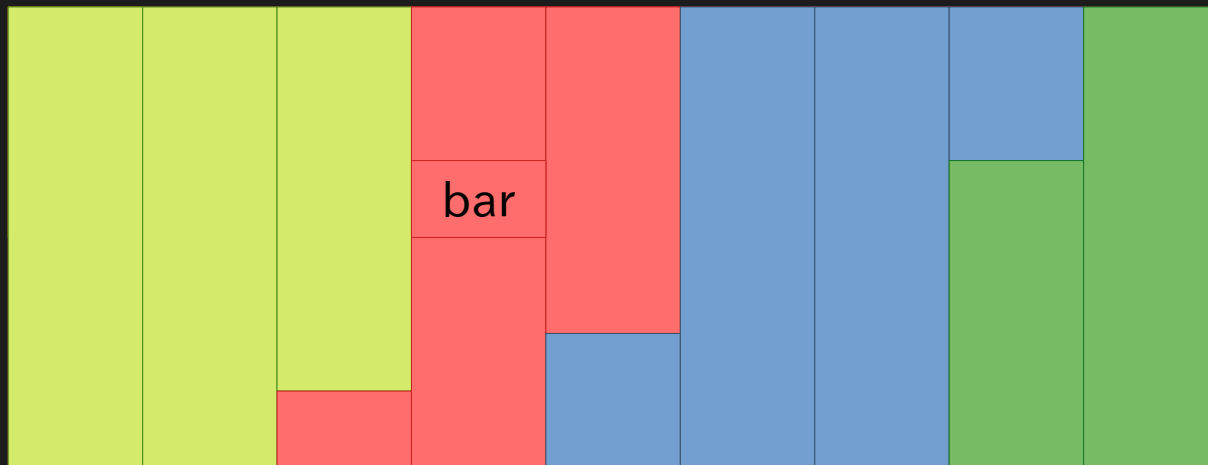
We have to go back (to 1981)!
Content-Defined Chunking

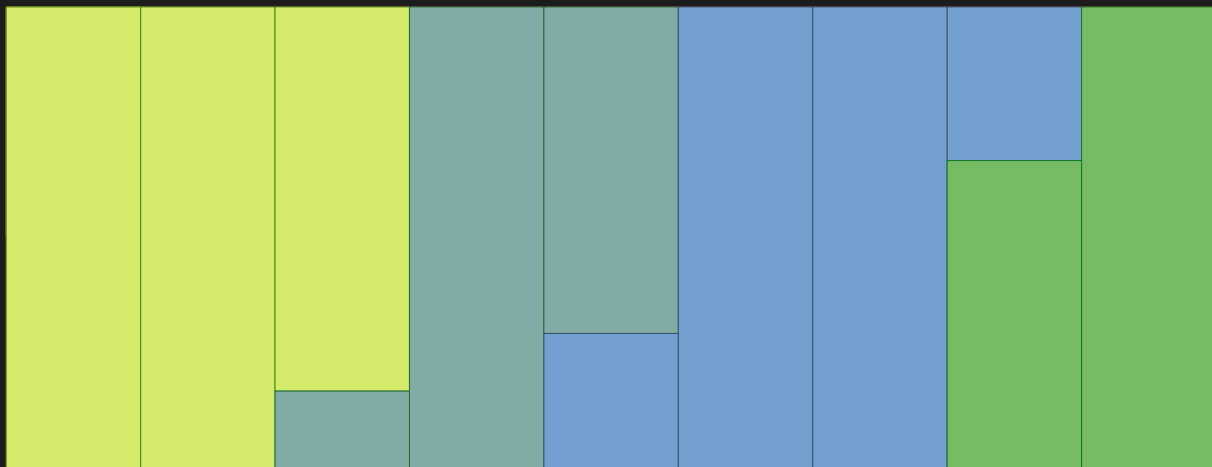


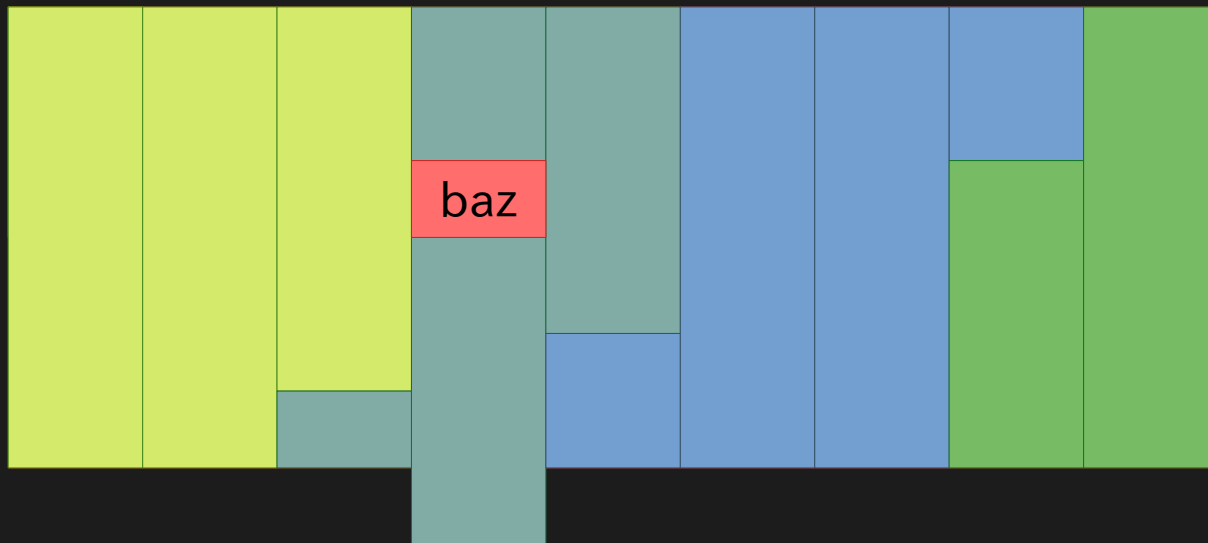
Pictured: A(nother) Humble File.

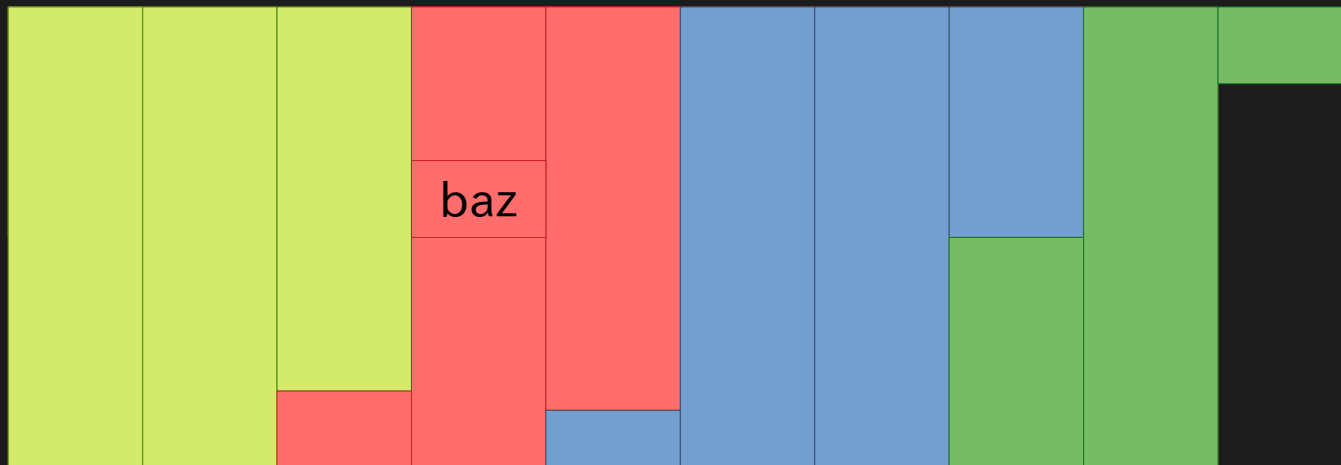






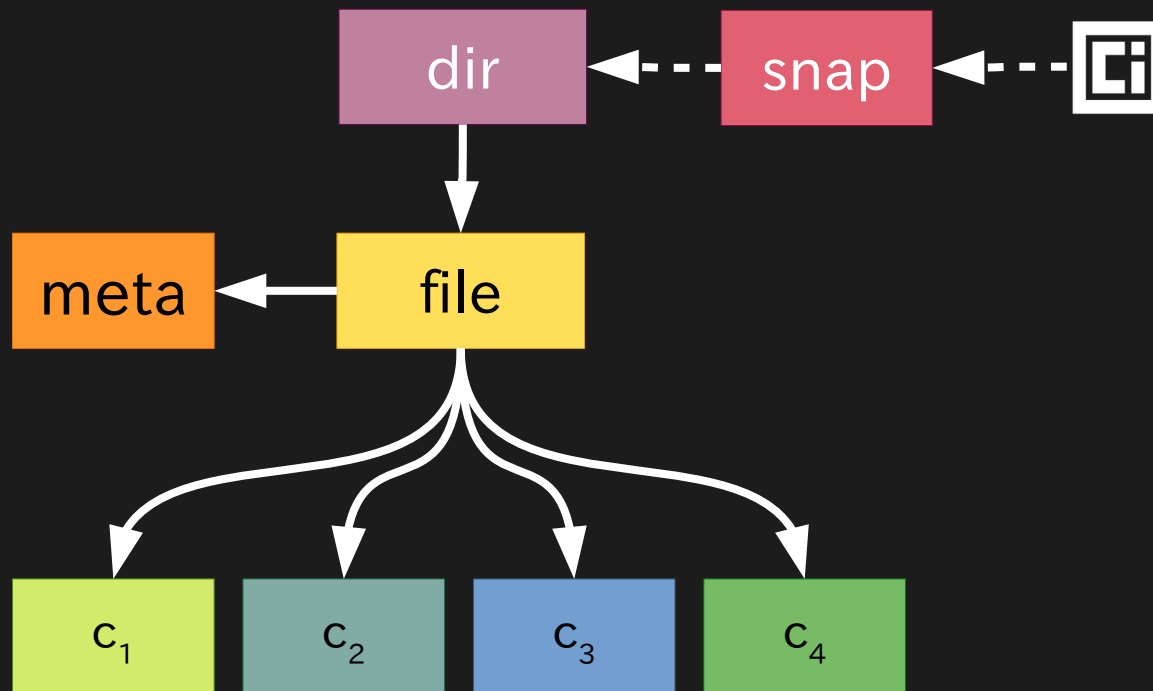


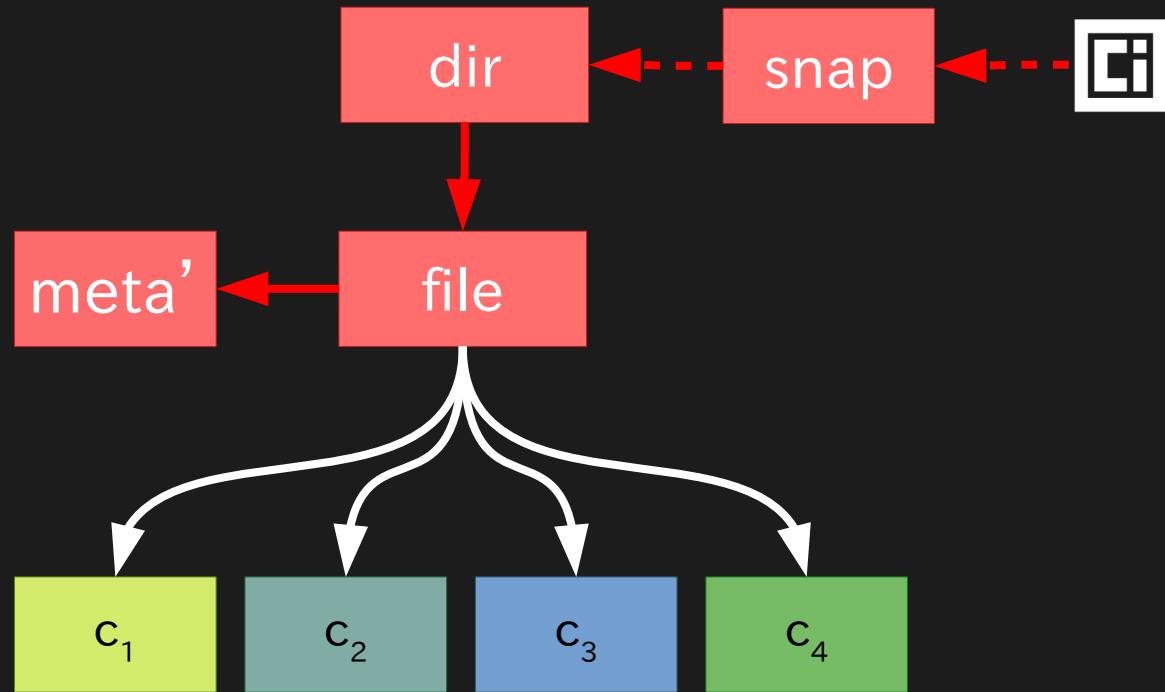




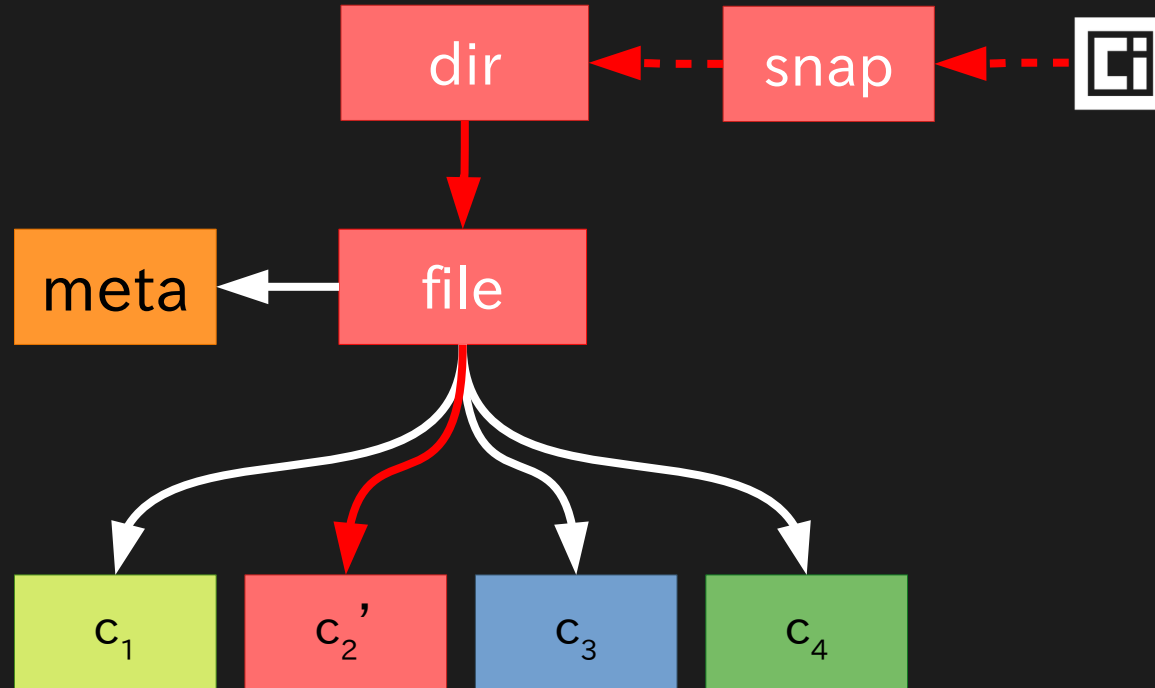
Per-Snapshot Merkle Tree (of Chunks)
Deduplicated, parallelisable **and** non-avalanching.

With a canonical
representation!





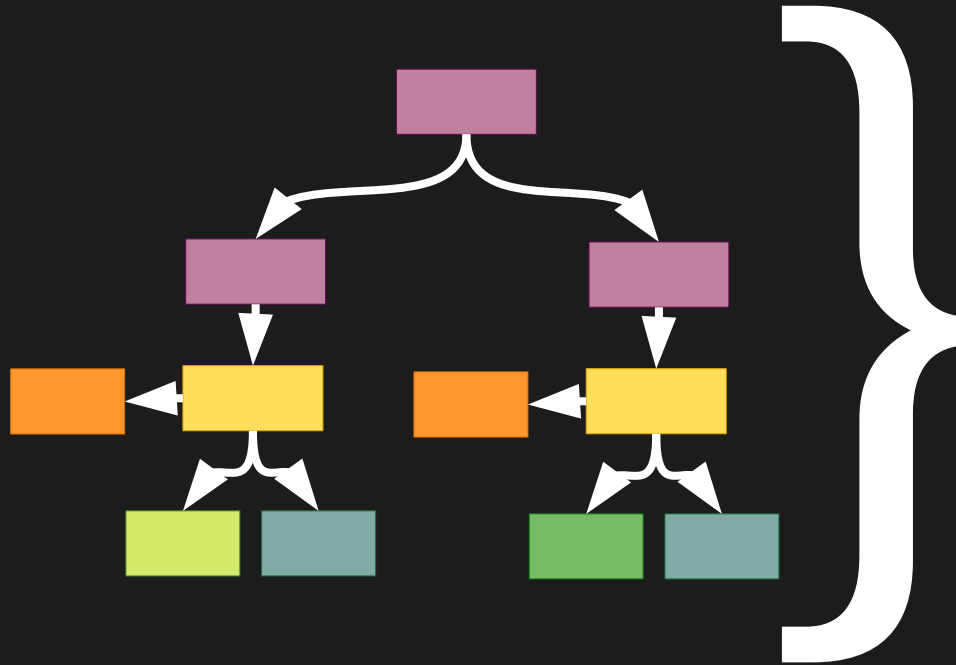
*Intra-layer, inter-layer, and even **inter-image** deduplication!*



A dark, grainy image of a cargo ship at sea. The ship is viewed from a side-on perspective, moving towards the left. It is heavily loaded with stacked cargo containers in various colors. A large plume of dark smoke or steam rises from the ship's funnel, drifting towards the right. The sea is visible in the foreground, and the sky is dark and overcast. The overall tone is somber and industrial.

Storage?

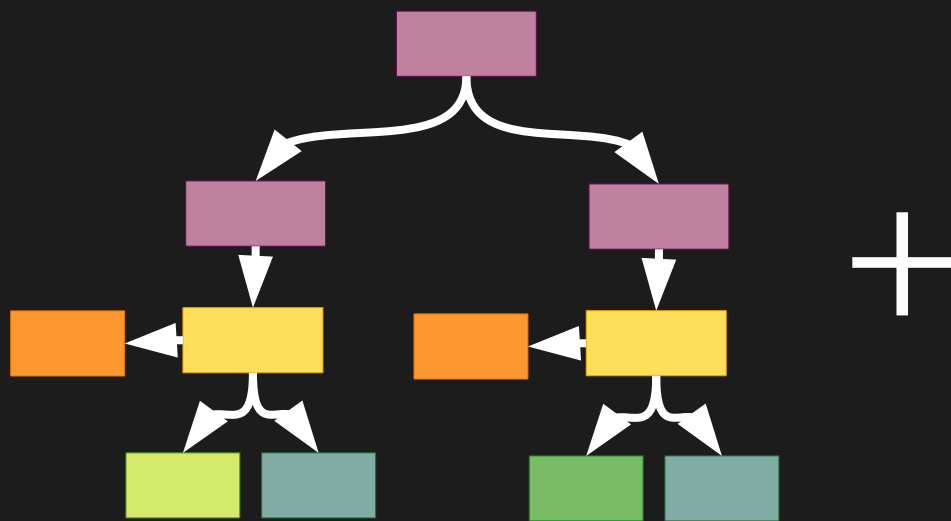
Incoherent rambling about `copy_file_range`.



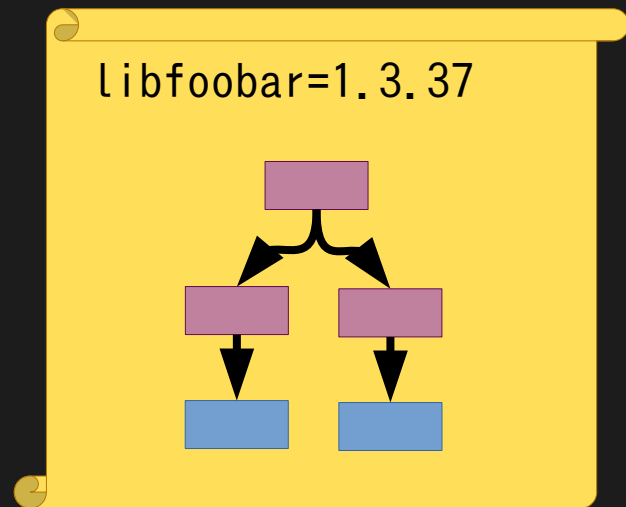
What is actually in this thing?



Transparency.
It's important.



+



Package
Manifest



We can do better, so *let's* do better.



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