

An aerial photograph of a multi-lane highway bridge that curves along a rugged coastline. The bridge is supported by several tall concrete pillars. The ocean is visible on the left, and a steep, rocky cliffside with some greenery is on the right. The sky is overcast. A dark car is visible on the bridge in the lower left. A large, semi-transparent dark triangle is overlaid on the left side of the image.

# WHY OPEN INFRASTRUCTURE MATTERS



# HELLO!

My name is Thierry Carrez

I work for the OpenStack Foundation

I am tcarrez on Twitter

And ttx on Freenode IRC



# 0. A PARADOX

Is free software really free



# DEVELOPMENT INFRASTRUCTURE

- Proprietary operating systems (OS/X)



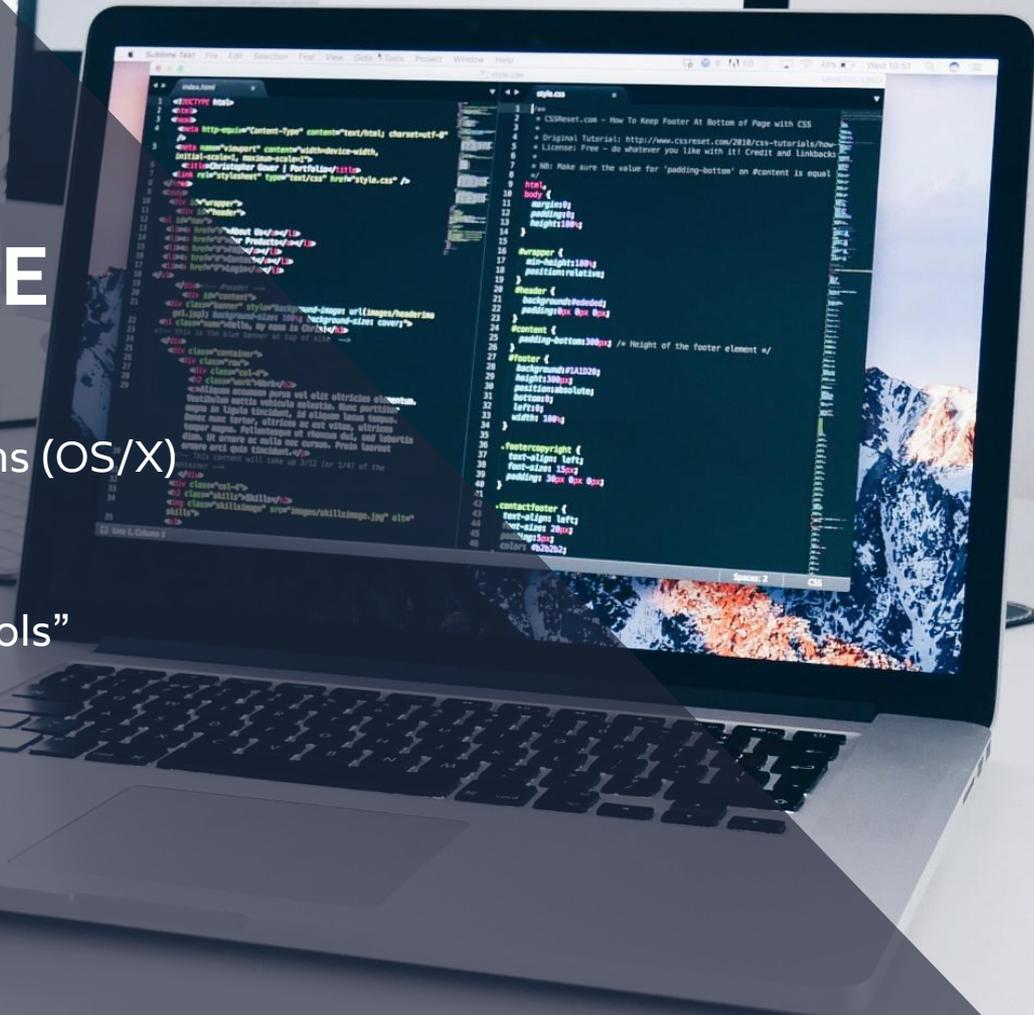
# DEVELOPMENT INFRASTRUCTURE

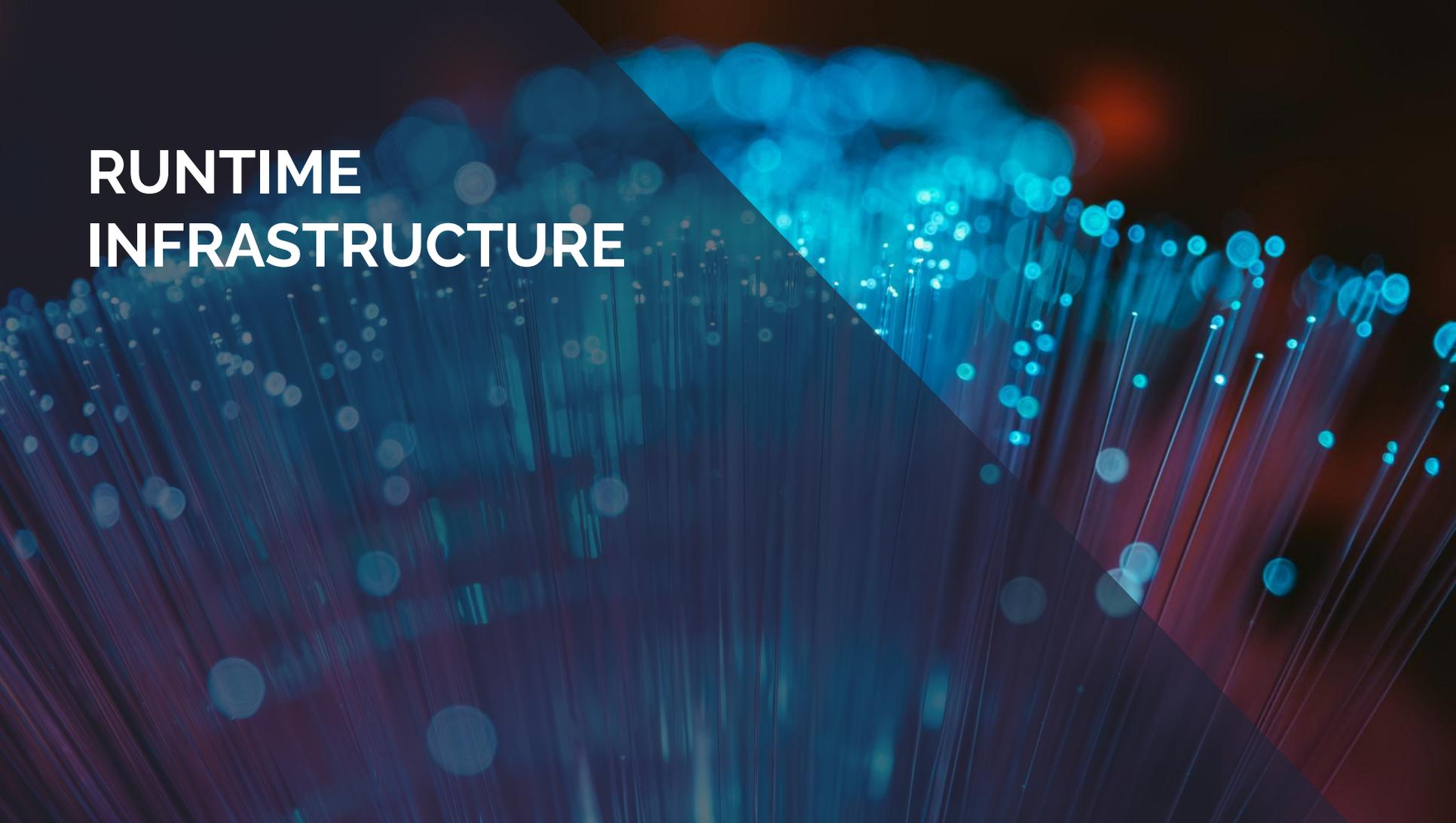
- Proprietary operating systems (OS/X)
- Proprietary services (GitHub)



# DEVELOPMENT INFRASTRUCTURE

- Proprietary operating systems (OS/X)
- Proprietary services (GitHub)
- “Free software needs free tools”  
(Benjamin Mako Hill)





# RUNTIME INFRASTRUCTURE

# RUNTIME INFRASTRUCTURE

- Proprietary services (Amazon Web Services)

# RUNTIME INFRASTRUCTURE

- Proprietary services (Amazon Web Services)
- Open infrastructure



# 1. INFRASTRUCTURE

Application deployers want programmable infrastructure

# PILING UP ABSTRACTIONS



# PILING UP ABSTRACTIONS



**Market pressure**

Commoditizing  
the lower layers

# PILING UP ABSTRACTIONS



## Market pressure

Commoditizing  
the lower layers

## Developers pressure

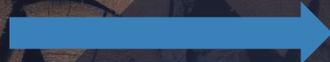
Abstracting differences  
between lower layers

Users



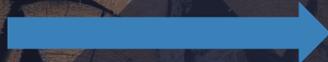
Applications

Users



Physical hardware

Users

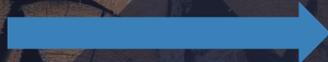


Application  
developers  
& deployers



Physical hardware

Users



Application  
developers  
& deployers

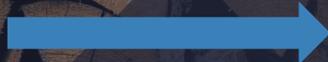


Hardware virtualization



Physical hardware

Users



Application  
developers  
& deployers



IaaS APIs

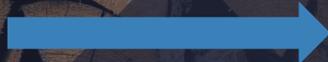


Hardware virtualization



Physical hardware

Users



Application  
developers  
& deployers



Application deployment APIs



IaaS APIs



Hardware virtualization



Physical hardware

# INFRASTRUCTURE EVOLUTION



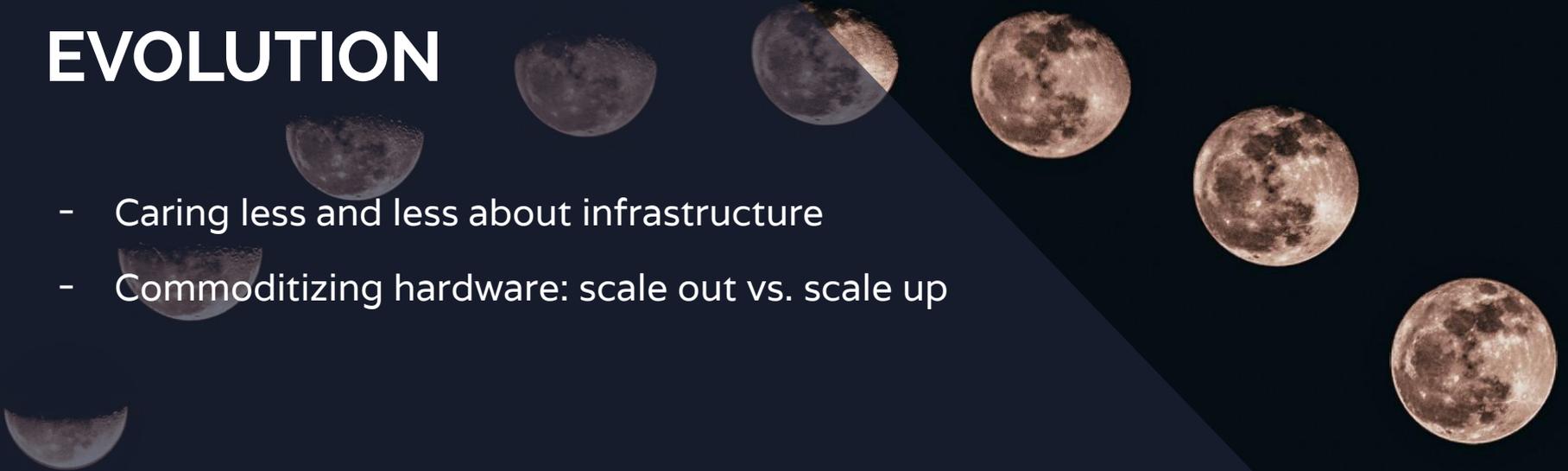
# INFRASTRUCTURE EVOLUTION

- Caring less and less about infrastructure



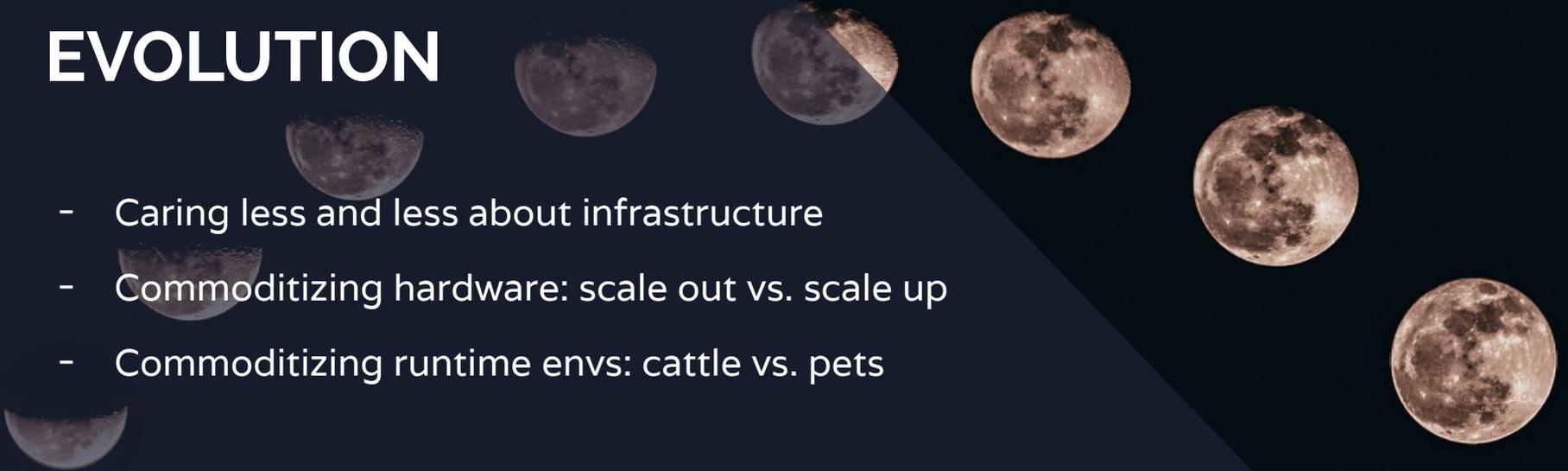
# INFRASTRUCTURE EVOLUTION

- Caring less and less about infrastructure
- Commoditizing hardware: scale out vs. scale up



# INFRASTRUCTURE EVOLUTION

- Caring less and less about infrastructure
- Commoditizing hardware: scale out vs. scale up
- Commoditizing runtime envs: cattle vs. pets



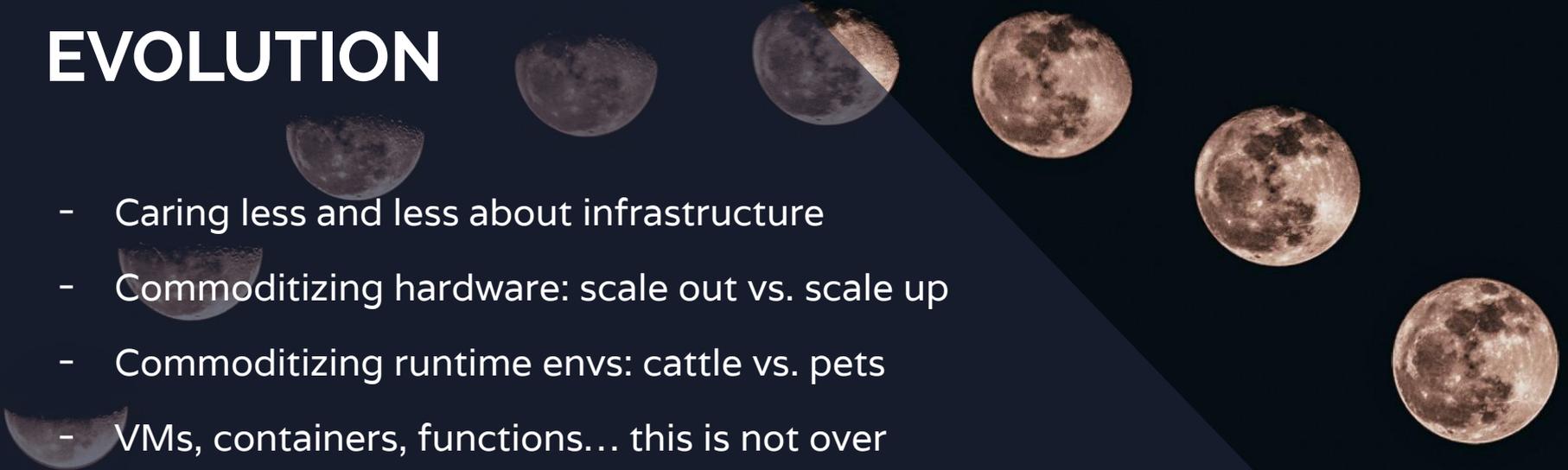
# INFRASTRUCTURE EVOLUTION

- Caring less and less about infrastructure
- Commoditizing hardware: scale out vs. scale up
- Commoditizing runtime envs: cattle vs. pets
- VMs, containers, functions... this is not over

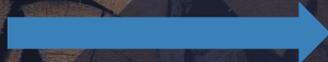


# INFRASTRUCTURE EVOLUTION

- Caring less and less about infrastructure
- Commoditizing hardware: scale out vs. scale up
- Commoditizing runtime envs: cattle vs. pets
- VMs, containers, functions... this is not over
- More software, less hardware



Users

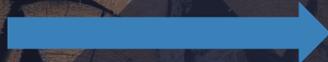


Application  
developers  
& deployers



Physical hardware

Users



Application  
developers  
& deployers

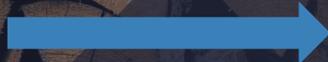


Hardware virtualization



Physical hardware

Users



Application  
developers  
& deployers



IaaS APIs

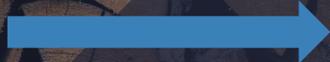


Hardware virtualization



Physical hardware

Users



Application  
developers  
& deployers



Application deployment APIs



IaaS APIs

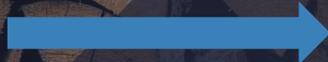


Hardware virtualization



Physical hardware

Users



Application  
developers  
& deployers



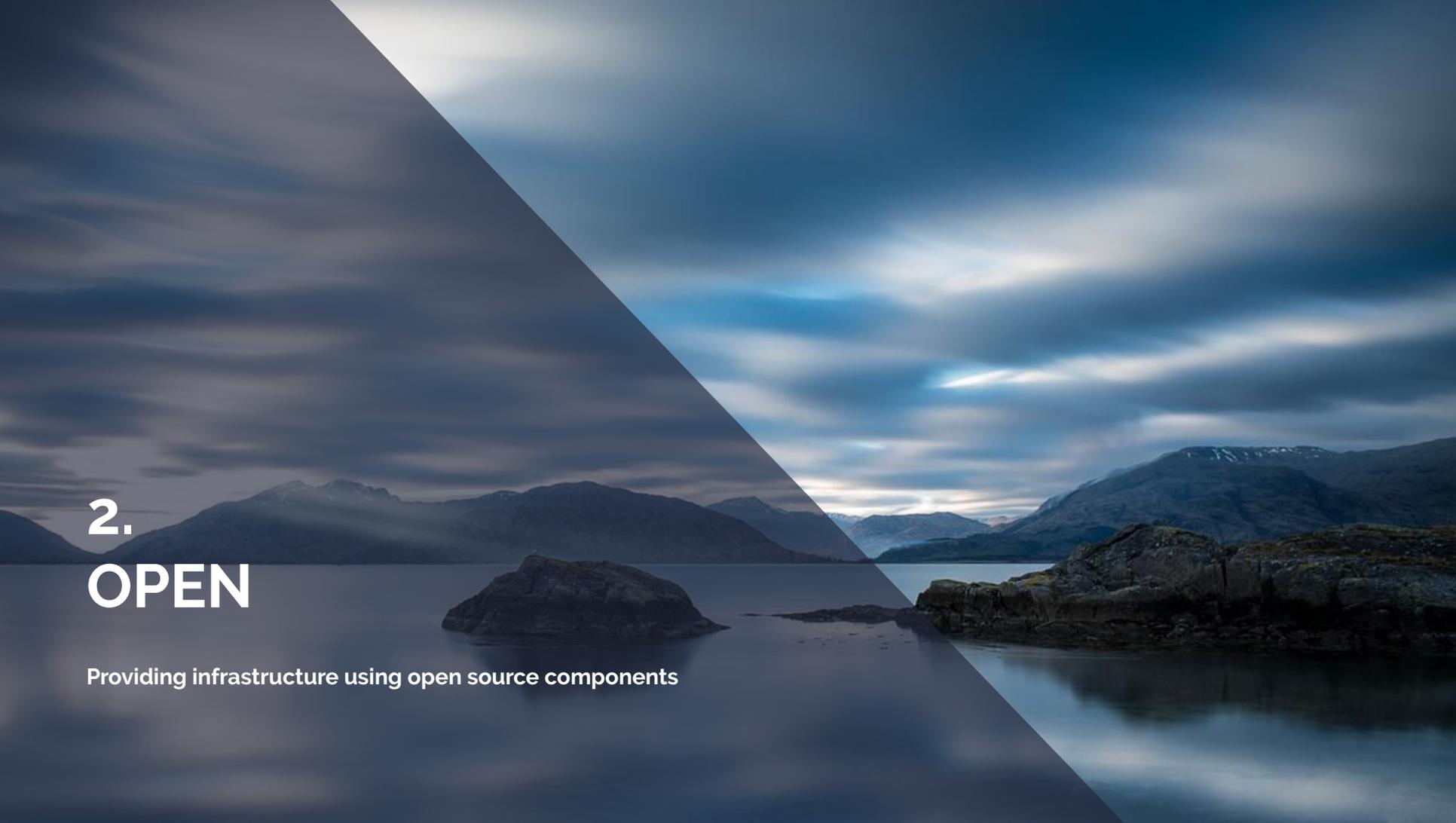
Infrastructure  
providers





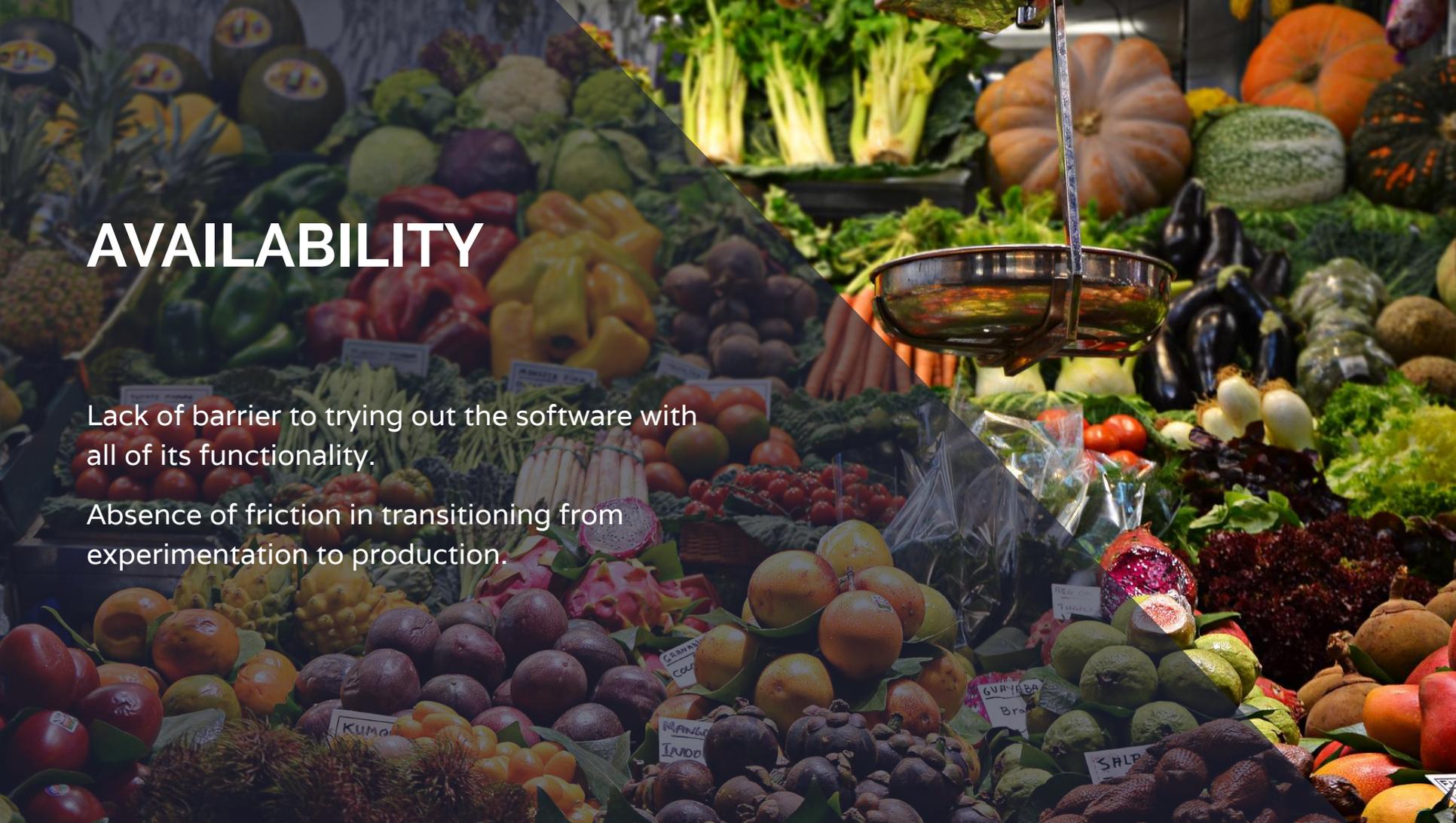
Infrastructure  
providers



A scenic landscape of a fjord with mountains and a lake, split by a diagonal line. The left side is dark and shadowed, while the right side is bright and shows a clear view of the water, rocks, and mountains under a blue sky with clouds.

## 2. OPEN

Providing infrastructure using open source components



# AVAILABILITY

Lack of barrier to trying out the software with all of its functionality.

Absence of friction in transitioning from experimentation to production.

A background image of a wind farm at sunset. The sky is a gradient of orange and yellow, transitioning to a deep blue. Several wind turbines are silhouetted against the sky. In the foreground, the dark silhouettes of palm trees are visible. A diagonal dark blue overlay covers the left side of the image, where the text is placed.

# SUSTAINABILITY

Existence of a multi-vendor market able to provide maintenance services over the software, making the choice of a given organization to use the software less dependent on the health of the software vendor, and limiting the risk of lock-in.



# FLUID JOB MARKET

Easy identification of potential recruits based on the open record of their contributions to the technology they are interested in.

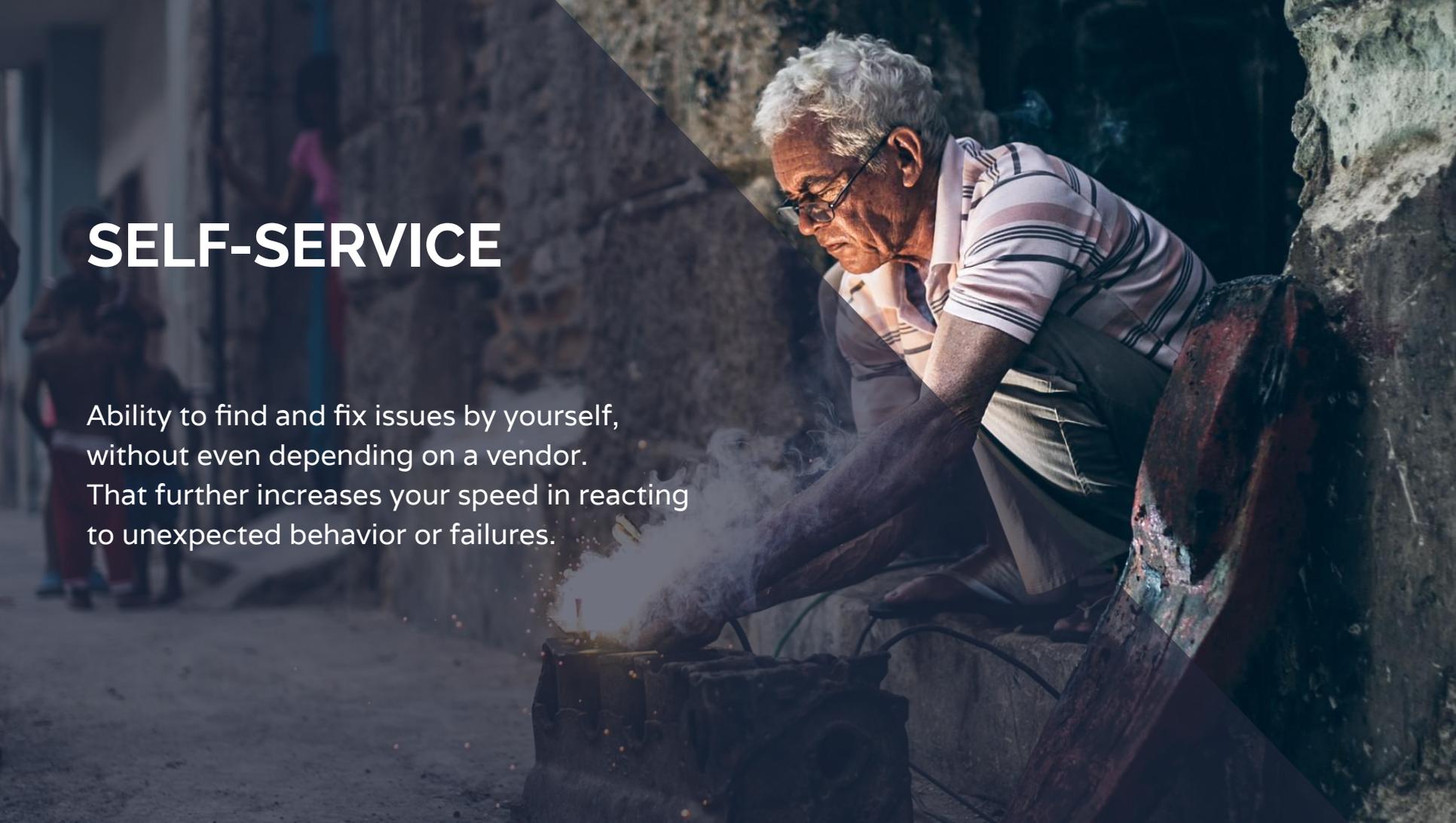
Easily evaluation of recruiting organizations based on the open source technologies they are using.



# TRANSPARENCY

Ability to look under the hood and understand how the software works, or why it behaves the way it does. Increases your speed in reacting to unexpected behavior or failures.

# SELF-SERVICE

A man with white hair and glasses, wearing a striped polo shirt, is focused on working on a large, dark metal component. He is using a tool that produces a bright spark and some smoke. The background is a workshop or industrial setting with a stone wall and some equipment. The lighting is dramatic, with strong highlights and deep shadows.

Ability to find and fix issues by yourself,  
without even depending on a vendor.  
That further increases your speed in reacting  
to unexpected behavior or failures.

# INFLUENCEABILITY

Possibility to engage in the community developing the software, and to influence its direction by contributing directly to it.

Organizations that engage in the open source communities can make sure the software adapts to future needs by growing the features they will need tomorrow.



# OPEN SOURCE BENEFITS

- Availability
- Sustainability
- Fluid job market
- Transparency
- Self-service
- Influenceability

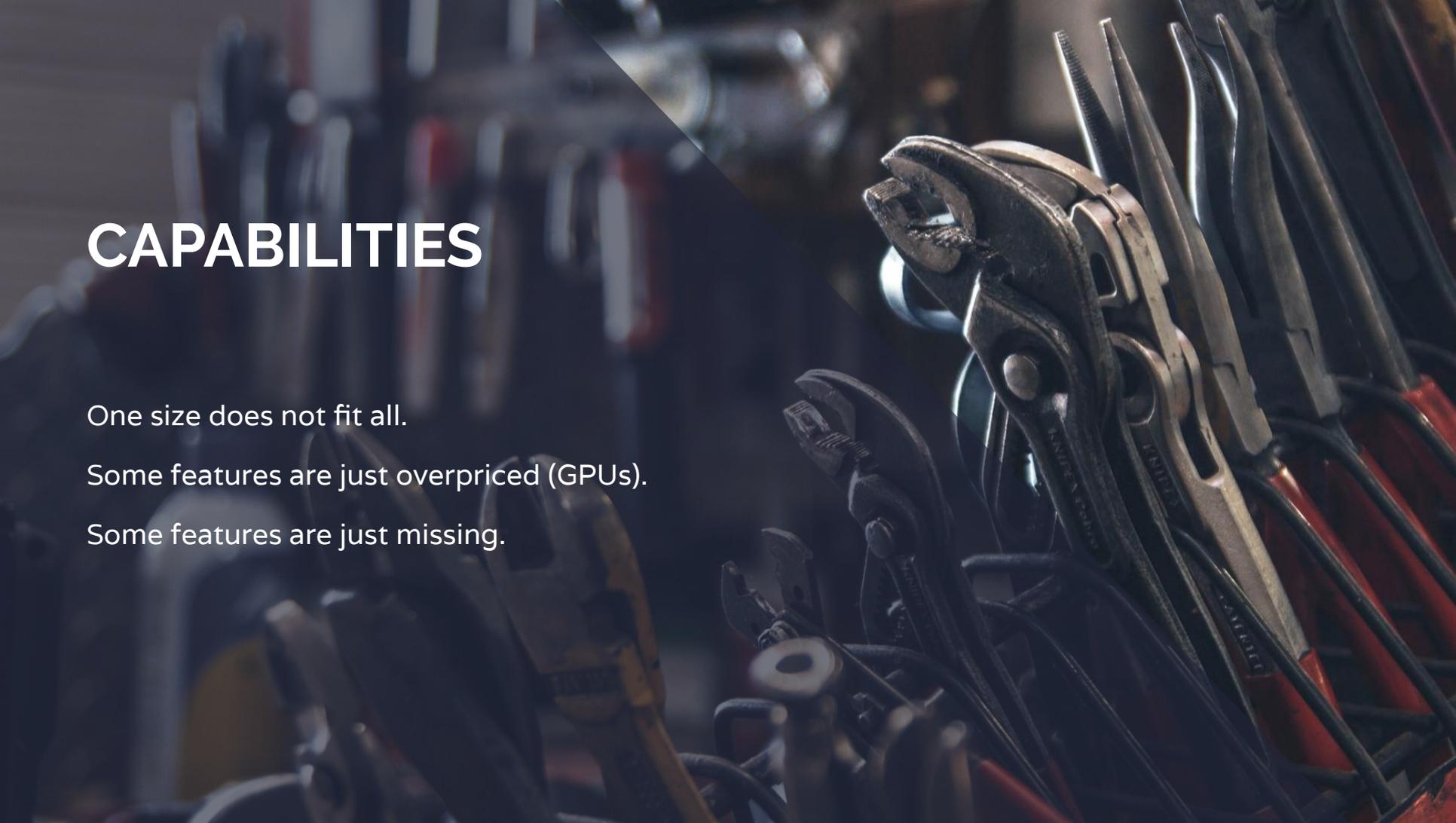


# 3. THE THREE Cs

Capabilities, Compliance and Cost



# CAPABILITIES



One size does not fit all.

Some features are just overpriced (GPUs).

Some features are just missing.

# COMPLIANCE

Legal requirements around data locality.

Confidentiality around strategic companies.





# COST

If you are interested by private infrastructure,  
open infrastructure will keep the price low.

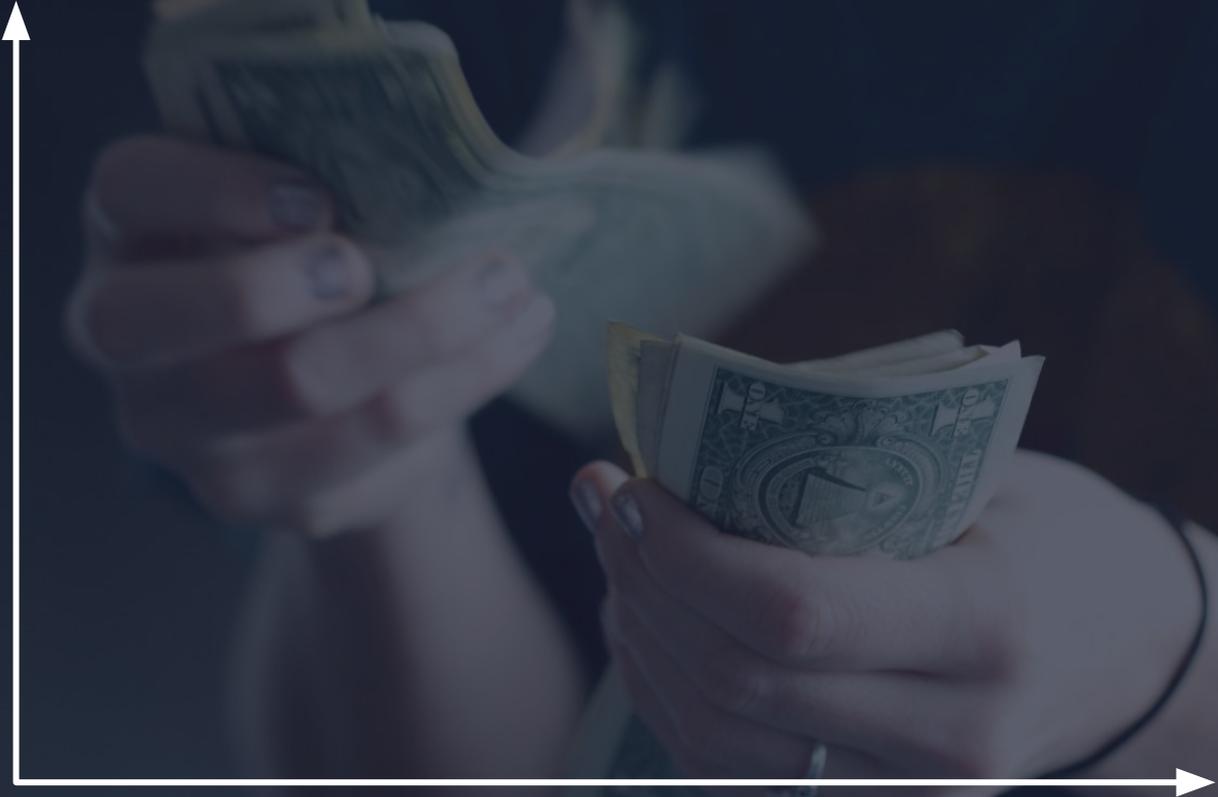
And if you want to provide public infrastructure,  
you should not start from scratch.

# 4. INTEROPERABILITY

Facilitating hybrid cloud scenarios

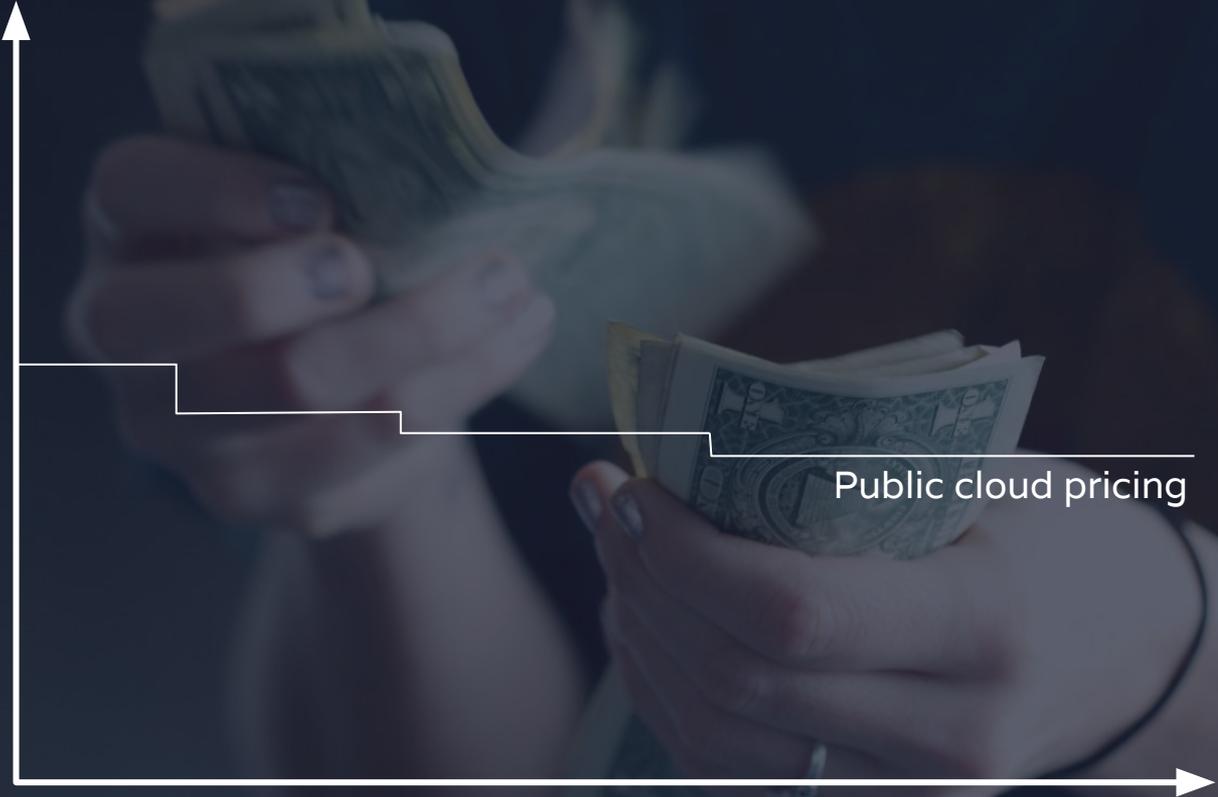


Cost per CPU core



Number of cores

Cost per CPU core



Public cloud pricing

Number of cores

Cost per CPU core



Private cloud

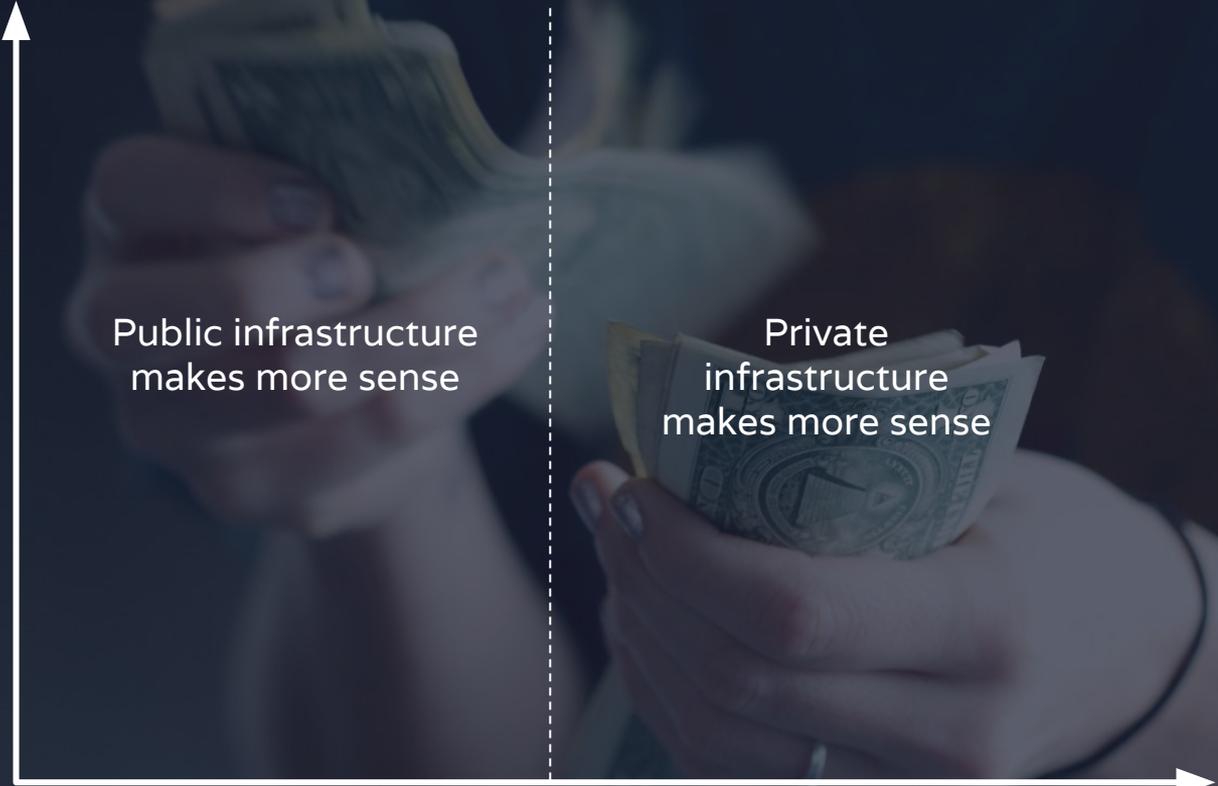
Number of cores

Cost per CPU core



Number of cores

Cost per CPU core



Public infrastructure  
makes more sense

Private  
infrastructure  
makes more sense

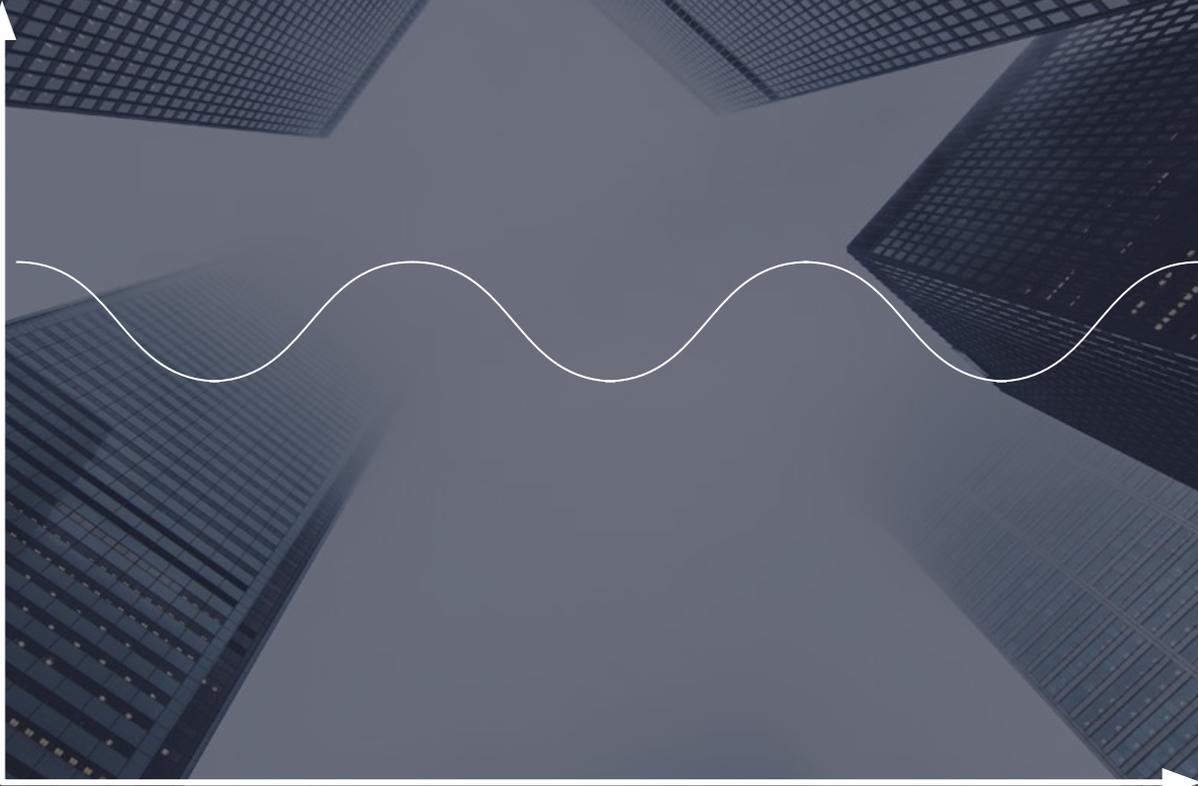
Number of cores

Number of cores



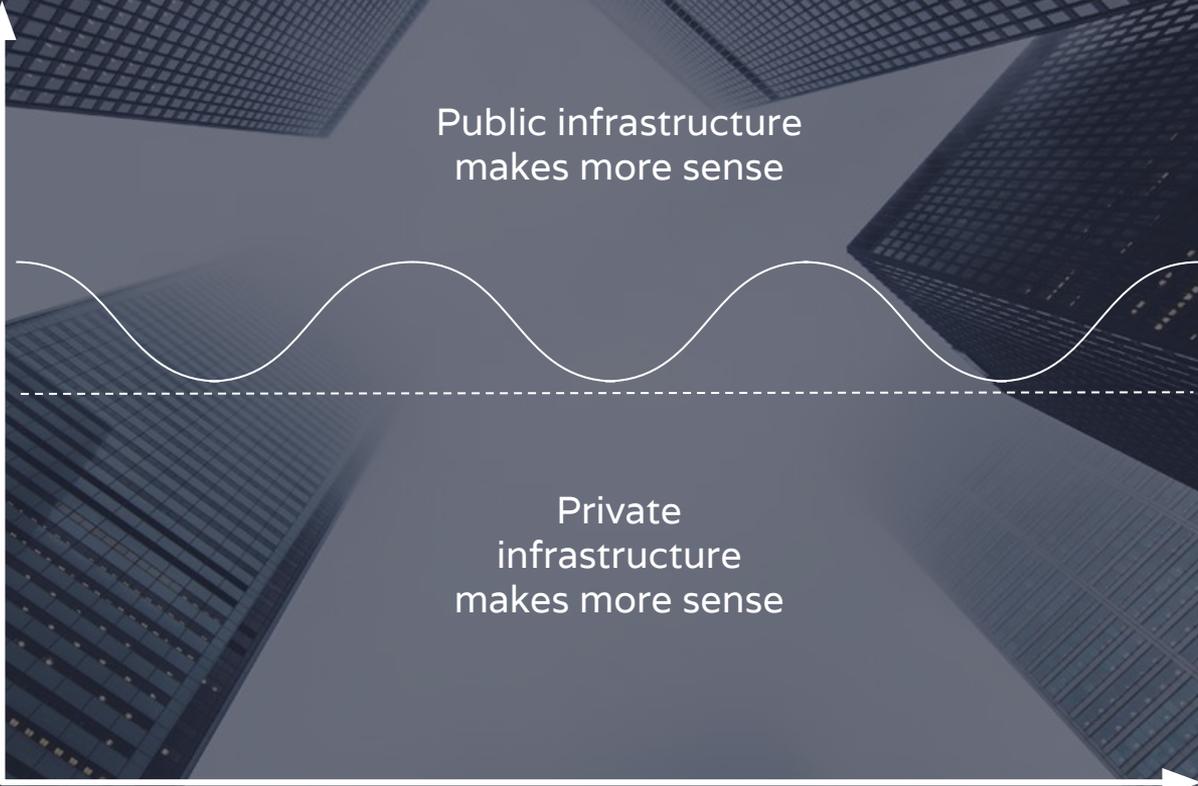
Time

Number of cores



Time

Number of cores



Public infrastructure  
makes more sense

Private  
infrastructure  
makes more sense

Time

**HYBRID,  
INTEROPERABLE  
INFRASTRUCTURE**



# HYBRID, INTEROPERABLE INFRASTRUCTURE

- Hybrid clouds allow to optimize cost



# HYBRID, INTEROPERABLE INFRASTRUCTURE

- Hybrid clouds allow to optimize cost
- Hybrid clouds enable capabilities & compliance



# HYBRID, INTEROPERABLE INFRASTRUCTURE

- Hybrid clouds allow to optimize cost
- Hybrid clouds enable capabilities & compliance
- Interoperable public & private clouds reduce applications cost



The background of the image consists of a dense stack of cut logs. The logs are arranged in a way that creates a textured, circular pattern. A diagonal line, starting from the top right and extending towards the bottom left, divides the image into two distinct color zones. The area to the left of this line is a dark, almost black, gradient, while the area to the right is a lighter, warm brown gradient. The text is positioned in the dark area on the left side.

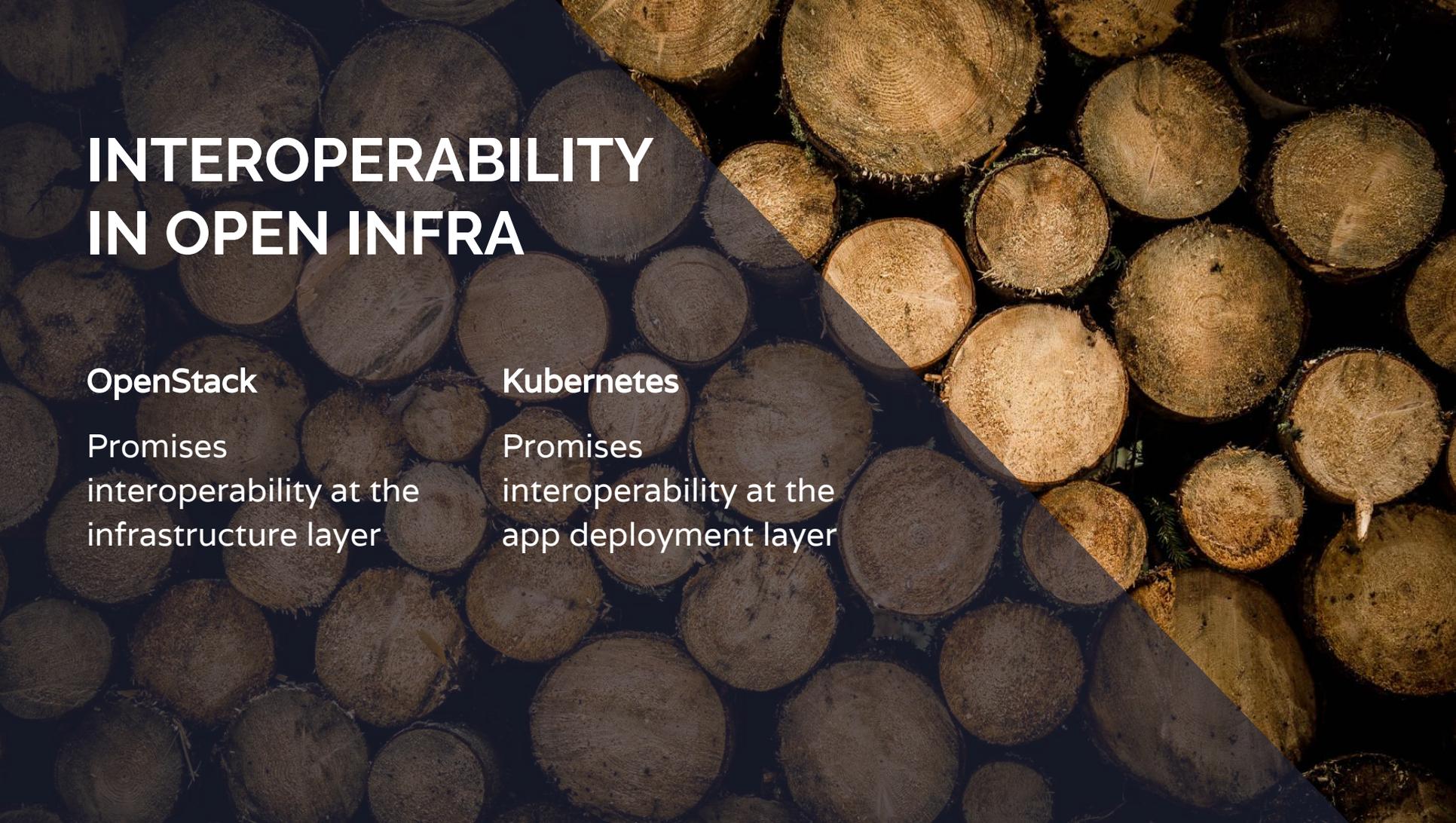
# INTEROPERABILITY IN OPEN INFRA

A background image showing a stack of cut logs. The logs are arranged in a dense, overlapping pattern. The lighting is dramatic, with a dark blue diagonal shadow running from the top-left towards the bottom-right, creating a sense of depth and highlighting the textures of the wood. The colors range from dark brown to light tan.

# INTEROPERABILITY IN OPEN INFRA

OpenStack

Promises  
interoperability at the  
infrastructure layer

The background of the slide is a close-up photograph of a stack of cut logs. The logs are arranged in a somewhat regular pattern, with their circular ends facing the viewer. The lighting is dramatic, with the top surfaces of the logs appearing bright and golden-brown, while the sides and the spaces between them are in deep shadow, appearing dark brown or black. The texture of the wood grain is clearly visible on the top surfaces.

# INTEROPERABILITY IN OPEN INFRA

## OpenStack

Promises  
interoperability at the  
infrastructure layer

## Kubernetes

Promises  
interoperability at the  
app deployment layer



# 5. FUTURE-PROOF

Investing in communities rather than in products



**THE FUTURE**

# THE FUTURE

- Abstractions will continue to be piled

# THE FUTURE

- Abstractions will continue to be piled
- There is no miracle technology that will end all technologies

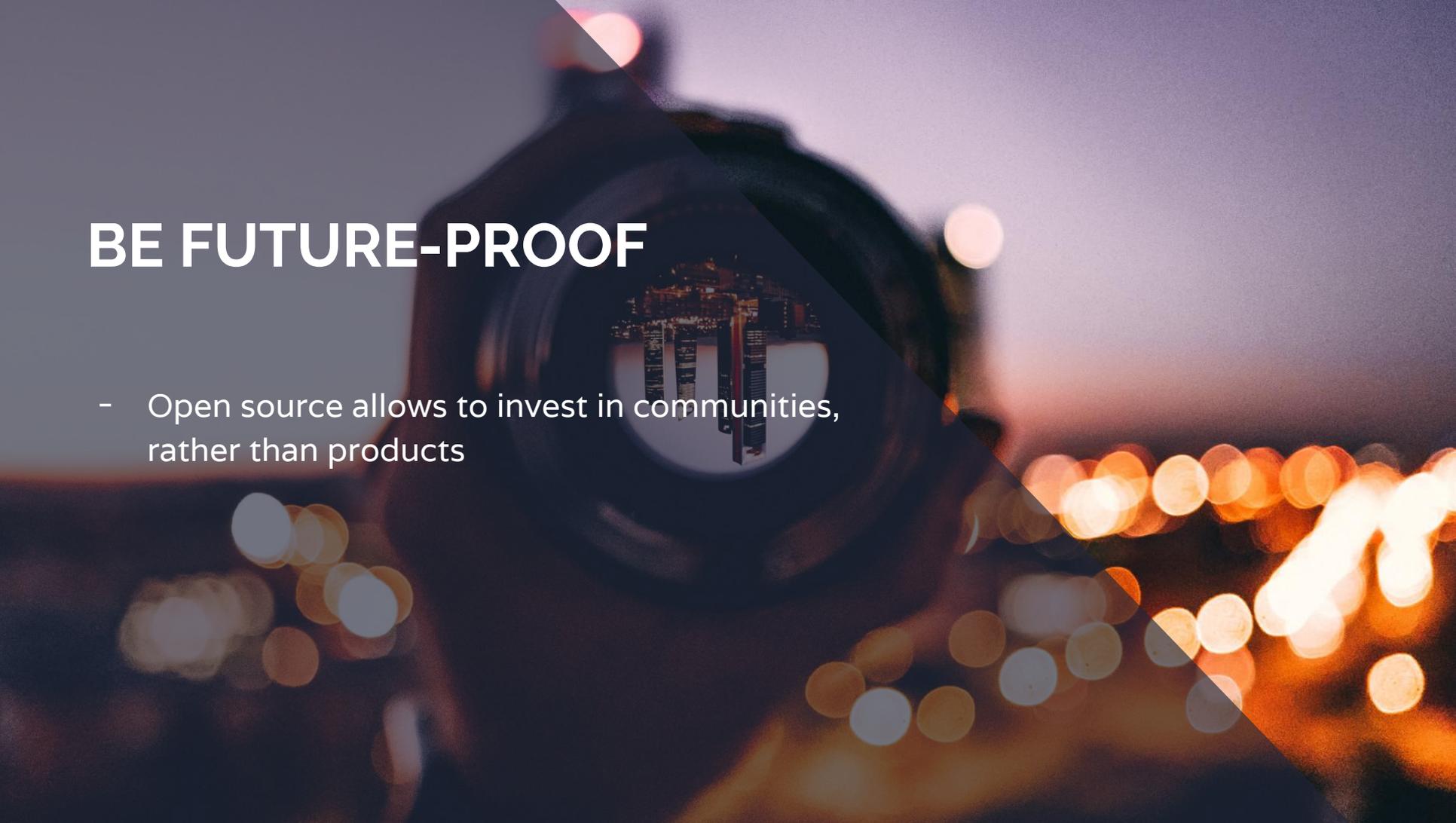
# THE FUTURE

- Abstractions will continue to be piled
- There is no miracle technology that will end all technologies
- There will always be applications and infrastructure

**BE FUTURE-PROOF**



# BE FUTURE-PROOF

A close-up photograph of a camera lens. The lens is dark and has a circular reflection of a city skyline at night. The background is filled with out-of-focus, warm-toned bokeh lights, suggesting a night city scene. A diagonal dark line runs across the image from the top-left to the bottom-right.

- Open source allows to invest in communities, rather than products

# BE FUTURE-PROOF

The background of the slide features a camera lens with a cityscape reflection in the center. The lens is dark, and the reflection shows a city at night with lights. The background is a bokeh of warm, orange and yellow lights, suggesting a night city scene. A dark diagonal line runs from the top left to the bottom right, partially obscuring the lens and the text.

- Open source allows to invest in communities, rather than products
- OpenStack community takes the angle of the infrastructure provider, and helps them build and operate open source solutions for infrastructure

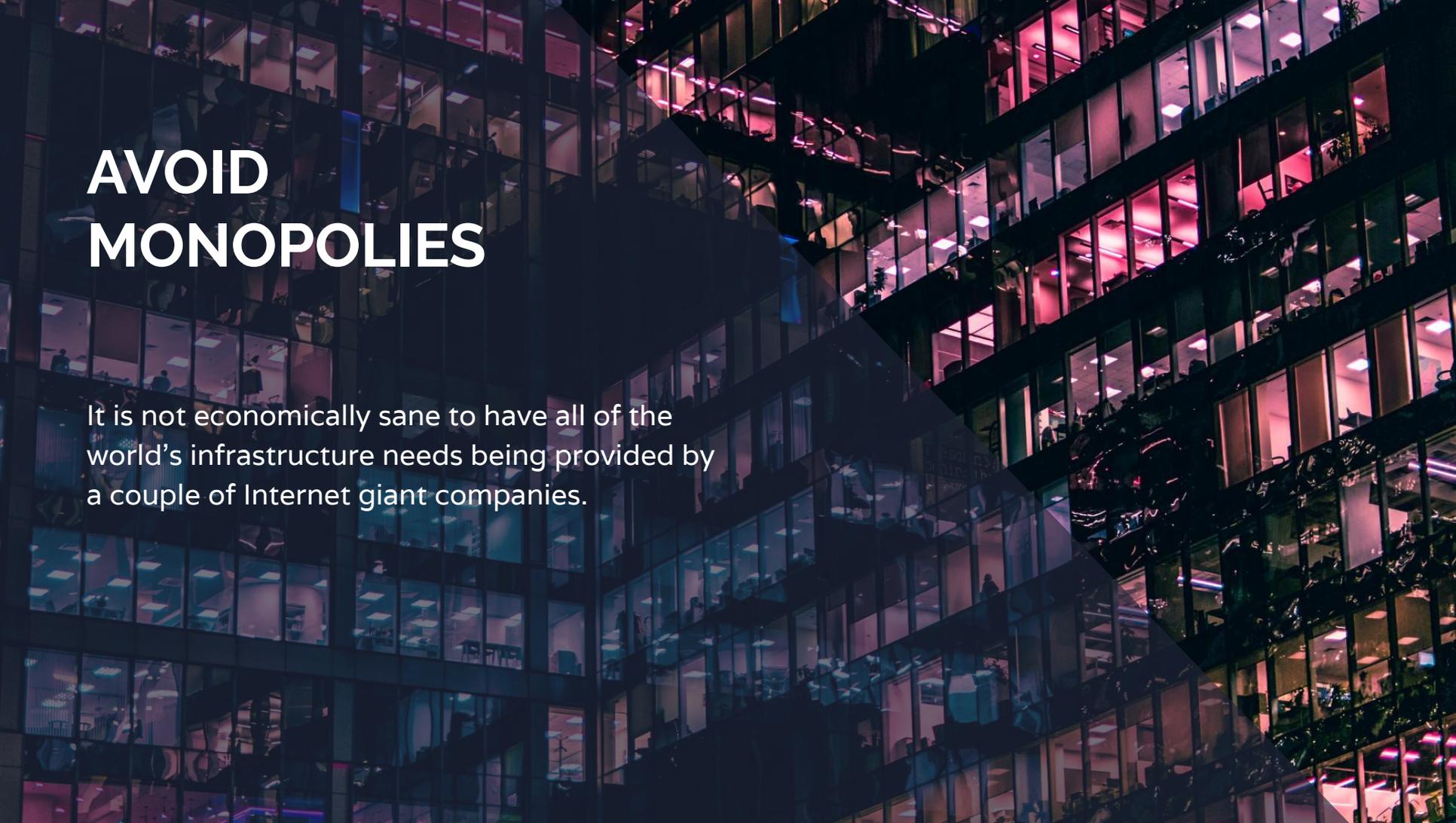
# SO... WHY CHOOSE OPEN INFRA ?

- Availability
- Sustainability
- Fluid job market
- Transparency
- Self-service
- Influenceability
- Compliance
- Capabilities
- Cost
- Interoperability
- Enabling hybrid usage
- Future-proof

A scenic landscape featuring a stone path that winds through a lush green field. In the background, there are rolling hills and mountains, some of which are shrouded in mist or low clouds. The sky is overcast. A small wooden bench is visible on the right side of the path. The overall atmosphere is serene and natural.

# 6. ENABLE INNOVATION

Creating ideal conditions for innovation everywhere



# AVOID MONOPOLIES

It is not economically sane to have all of the world's infrastructure needs being provided by a couple of Internet giant companies.

# AVOID MONOCULTURES

The background features a diagonal split between a dark brown color on the left and a vibrant orange color on the right. Numerous bubbles of various sizes are scattered across the entire background, with some appearing to overlap the diagonal line. The bubbles have a glossy, reflective surface, giving them a three-dimensional appearance.

It is not safe to have all of the worlds infrastructure needs being provided by a couple of Internet giants



# ENABLE EVERYONE

Giving everyone access to infrastructure providing technologies makes sure that we maximize innovation in the world.



# THANKS!

Any questions?

Shy?

You can reach me at @tcarrez on Twitter

Or email me at [thierry@openstack.org](mailto:thierry@openstack.org)

Credits

Presentation template by SlidesCarnival.com (licensed under CC-BY-4.0)

Photographs by Unsplash.com (licensed under Unsplash licence)