

# **SOCIO-TECHNICAL API PATTERNS**

**EINAR W. HØST**

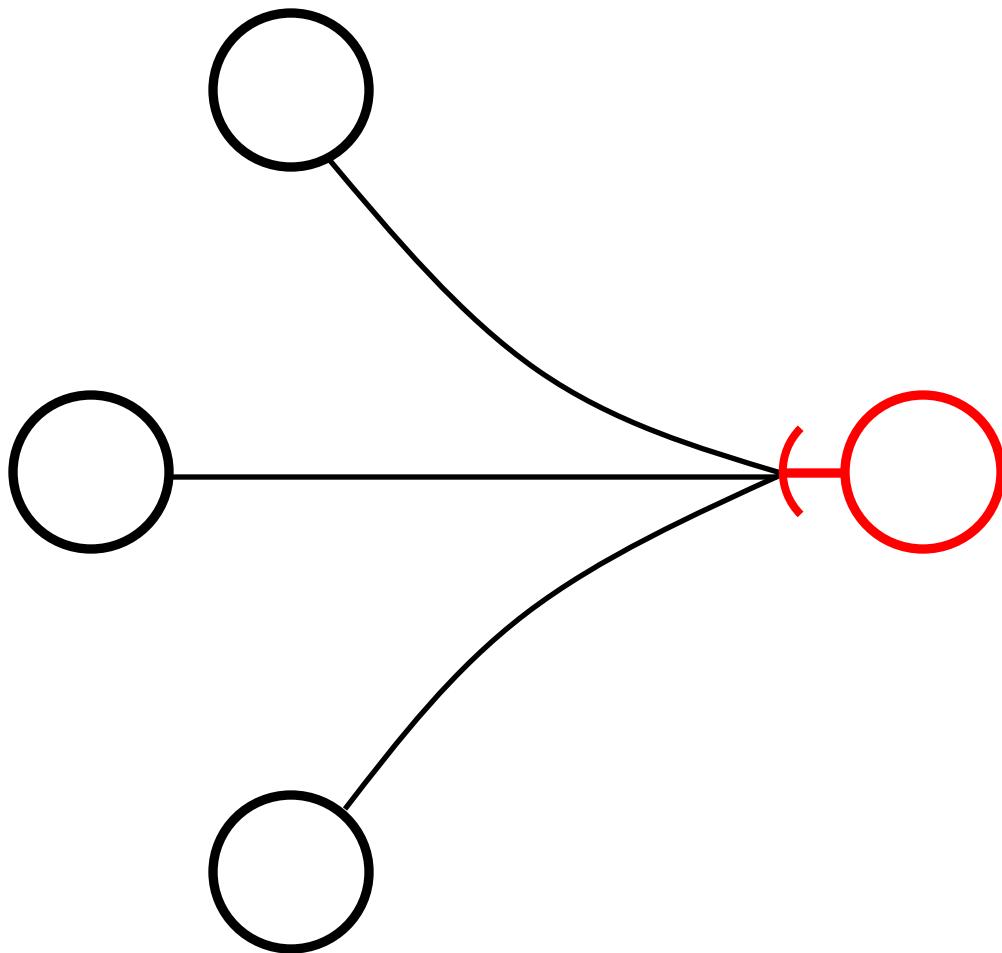
# **WHAT IS AN API?**

**A WAY TO CONNECT  
TWO OR MORE SYSTEMS**

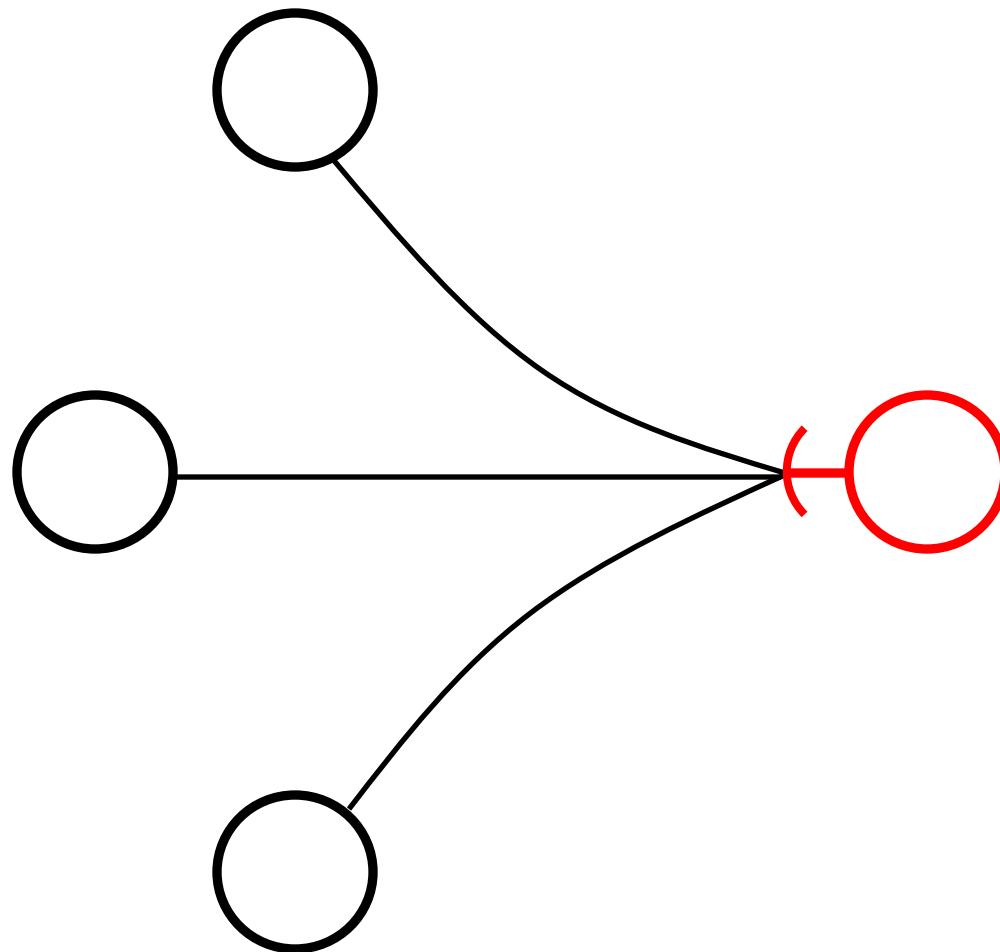
# **WHAT KINDS OF SYSTEMS?**

# **CONNECTING SOFTWARE SYSTEMS**

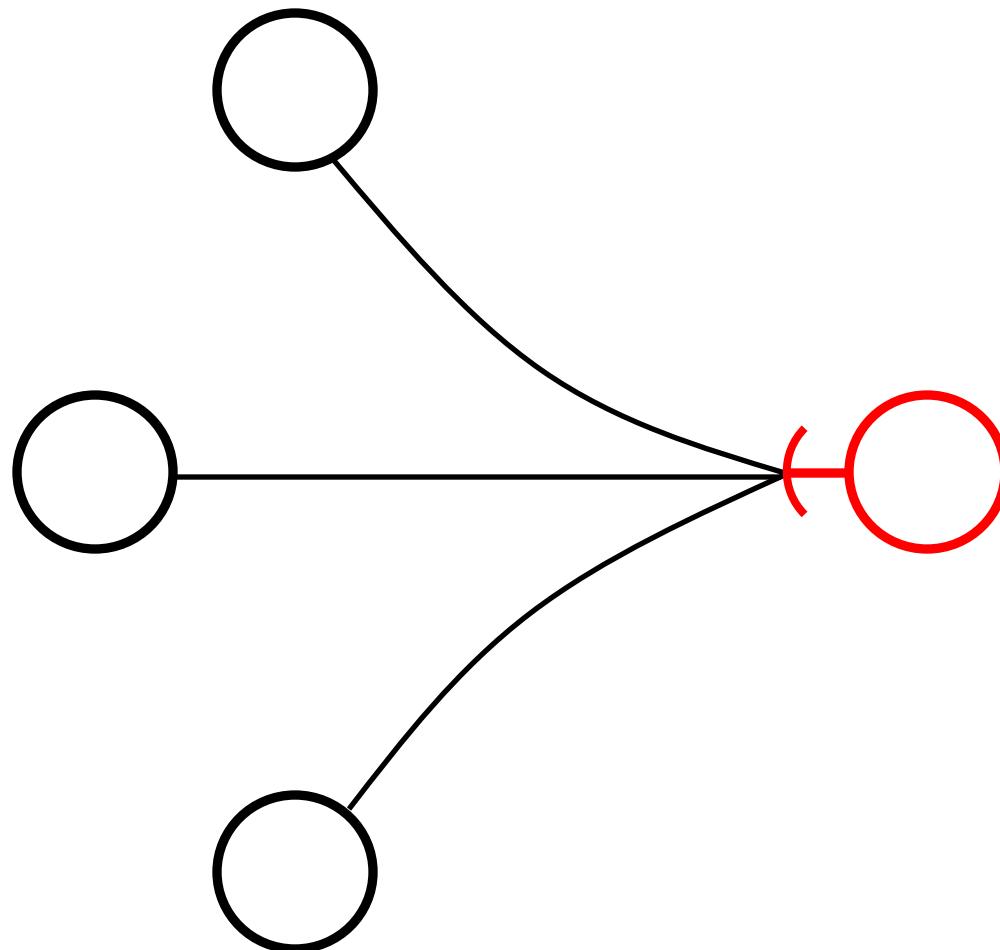
# **WEB API AKA JSON OVER HTTP**



# TOO ABSTRACT!



# TOO ABSTRACT!

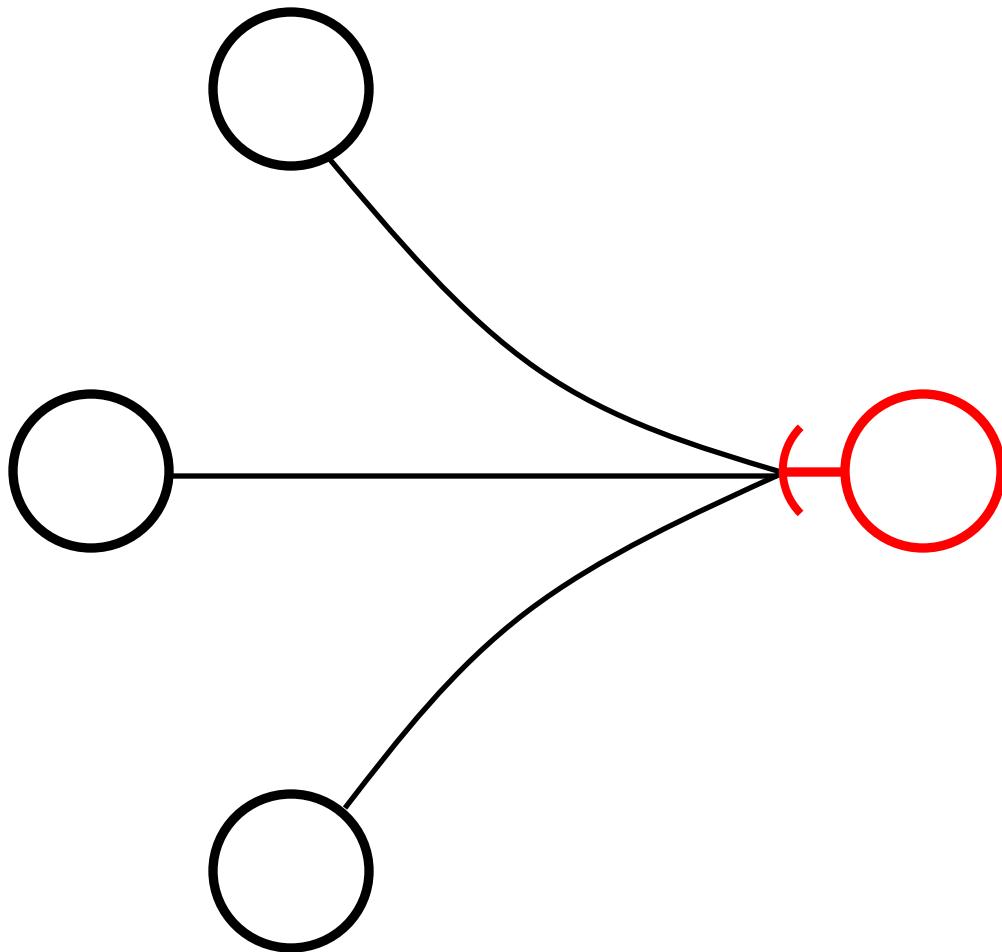


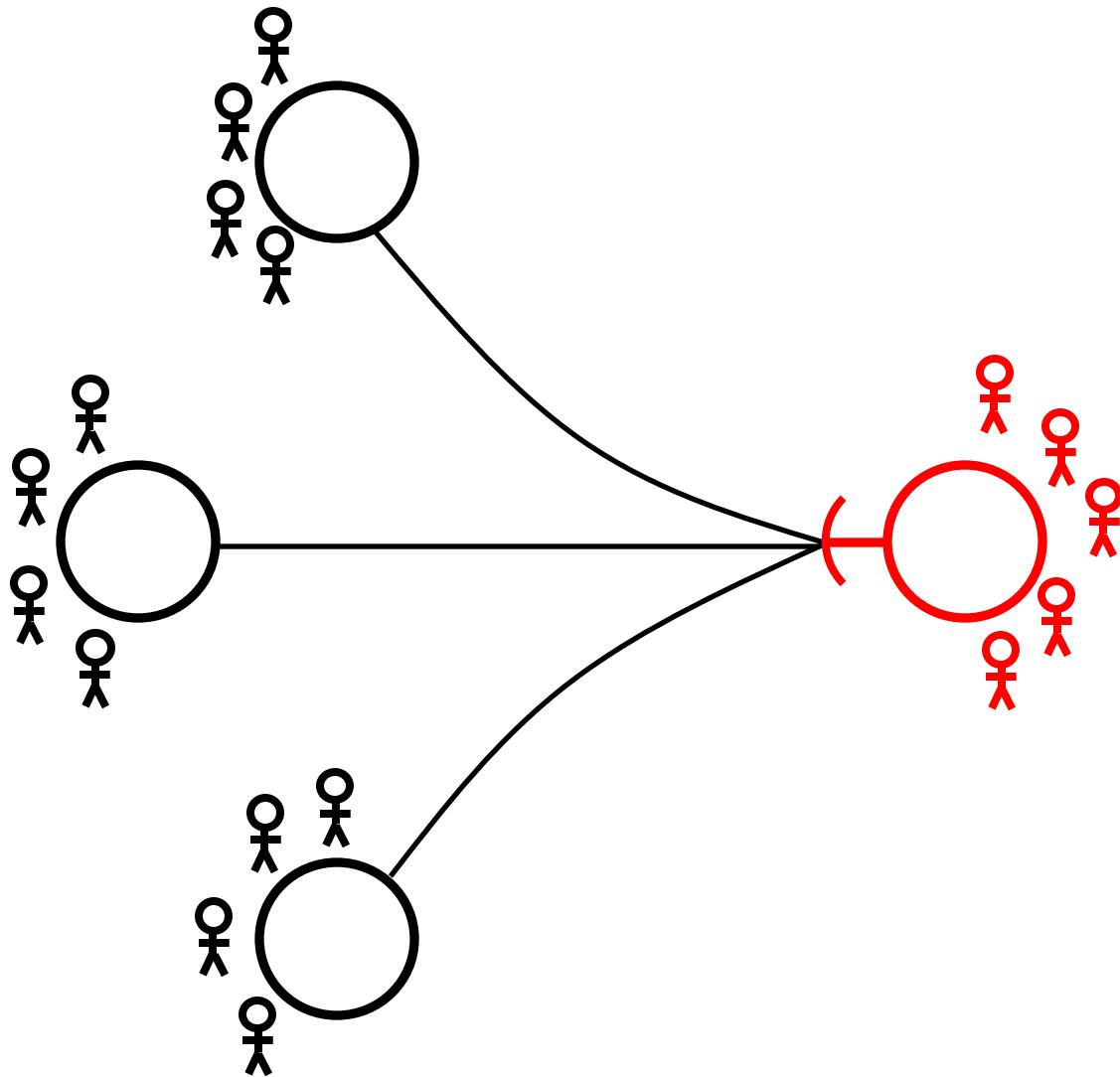
# TOO SIMPLISTIC!

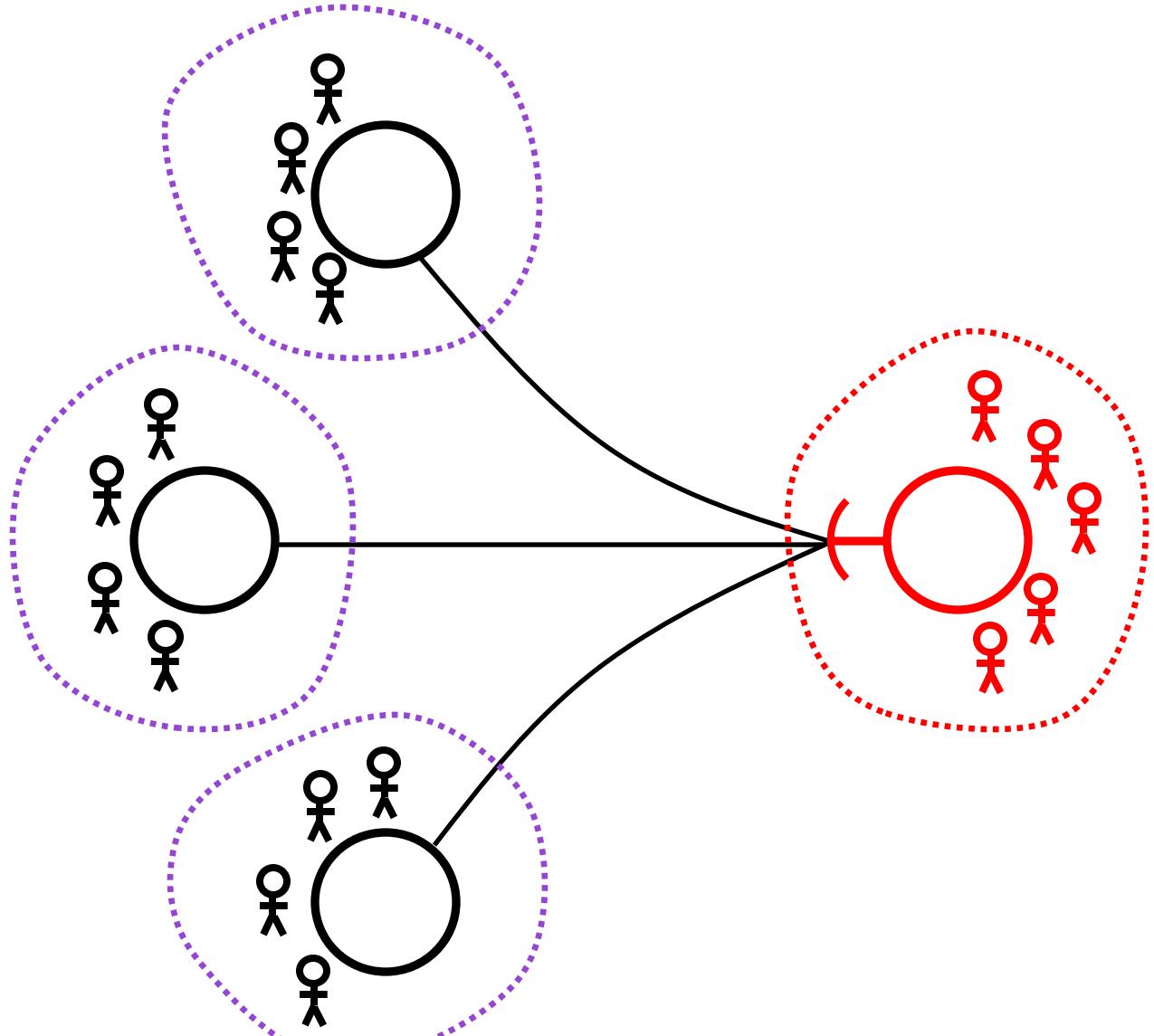
# **HOW DOES THE API COME ABOUT?**

# **WHY DOES THE API COME ABOUT?**

# **WHO MAKES THE API COME ABOUT?**





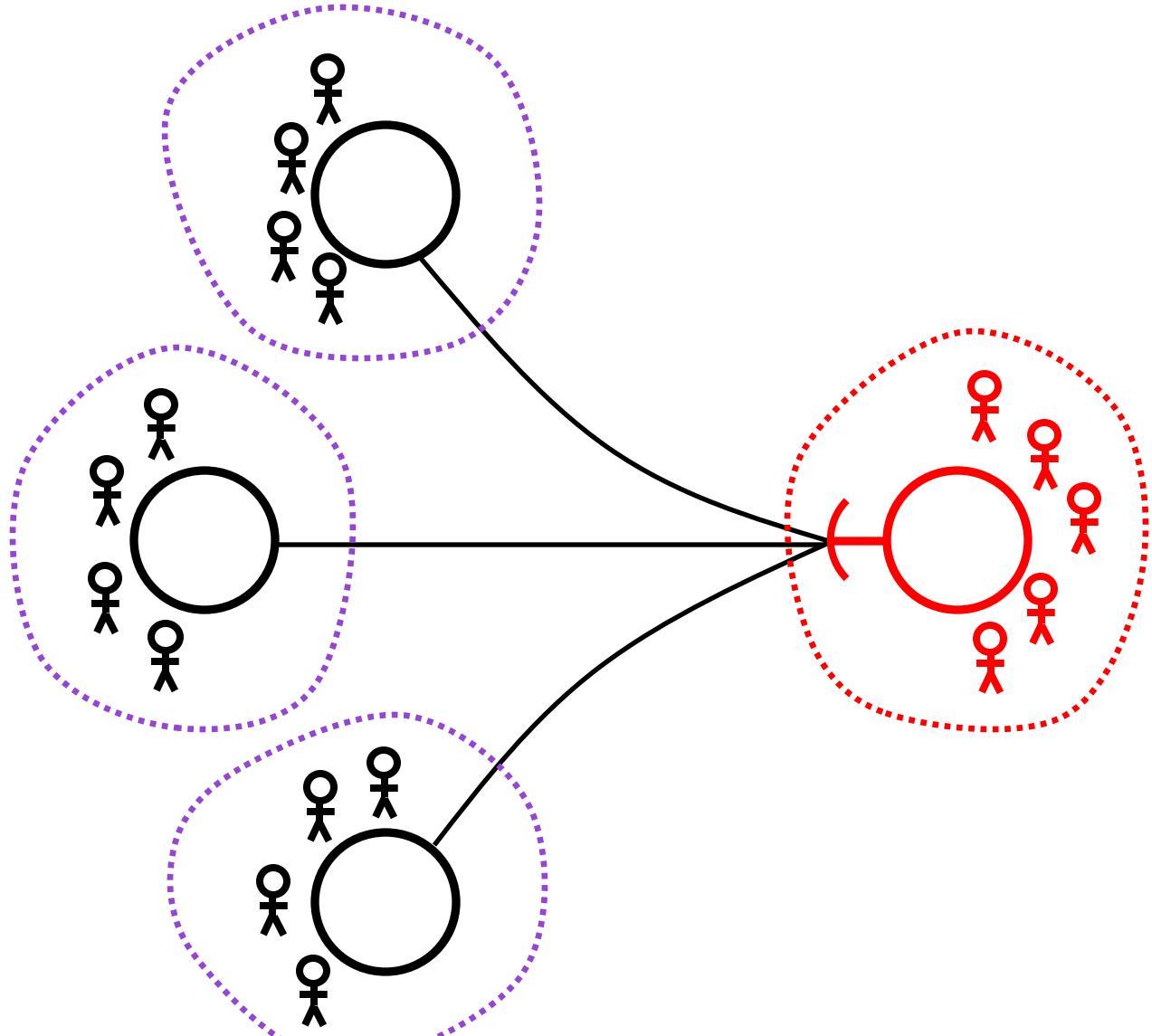


# **CONNECTING SOCIO-TECHNICAL SYSTEMS**

**SOCIO-TECHNICAL IS A BIG WORD**

# **NON-LINEAR & NON-TRIVIAL INTERACTIONS**

# **SOCIO-TECHNICAL PERSPECTIVE**



# **WHAT IS THE INTERFACE?**

# **WHAT IS THE AGREEMENT?**

**WHAT DO YOU MEAN  
THERE IS NO AGREEMENT?!?!**

# **WHAT SHOULD WE AGREE UPON?**

**AT LEAST WHAT REALITY LOOKS LIKE**

# **ASK A BUNCH OF QUESTIONS**

# **WHO IS THE CONSUMER?**

**WHO IS THE CONSUMER?**

**WHAT ARE THEIR GOALS?**

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**WHAT ARE THEIR GOALS?**

**WHAT ARE THEIR RESPONSIBILITIES?**

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**WHAT ARE THEIR RESPONSIBILITIES?**

**WHAT ARE THEIR CONSTRAINTS?**

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# **WHO IS THE PROVIDER?**

**WHAT ARE THEIR GOALS?**

**WHAT ARE THEIR RESPONSIBILITIES?**

**WHAT ARE THEIR CONSTRAINTS?**

# **HOW IMPORTANT IS THE API TO EACH PARTY?**

# **HOW IMPORTANT IS THE API TO THE PROVIDER?**

**MAIN FOCUS | SIDE HUSTLE | IMPOSED**

# **HOW IMPORTANT IS THE API TO THE CONSUMER?**

**ESSENTIAL | OPTIONAL**

# **PROVIDER/CONSUMER RELATIONSHIP**

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**IS THERE COMMUNICATION?**

# **PROVIDER/CONSUMER RELATIONSHIP**

**IS THERE COMMUNICATION?**  
**ARE THERE ANY CONFLICTS?**

# **PROVIDER/CONSUMER RELATIONSHIP**

**IS THERE COMMUNICATION?**

**ARE THERE ANY CONFLICTS?**

**WHAT ARE THE POWER DYNAMICS?**

# **POINTS OF CONTENTION**

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**FUNCTIONALITY**

# **POINTS OF CONTENTION**

**FUNCTIONALITY  
UP/DOWNTIME**

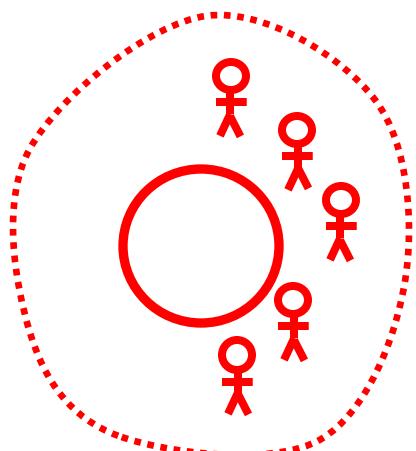
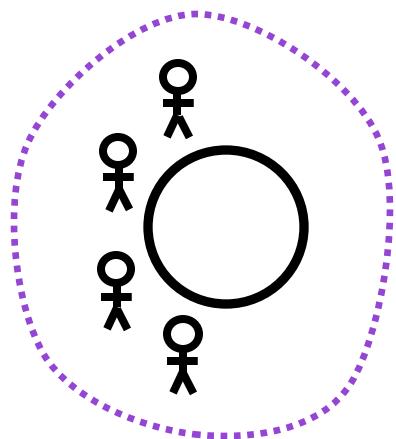
# **POINTS OF CONTENTION**

**FUNCTIONALITY  
UP/DOWNTIME  
ERRORS**

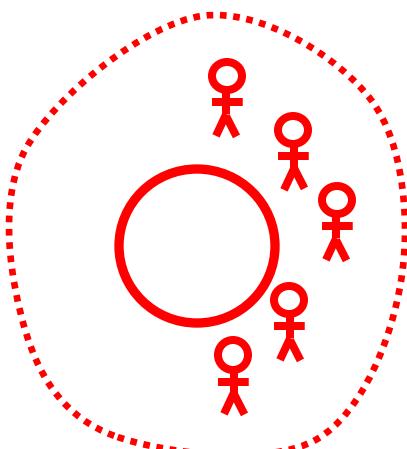
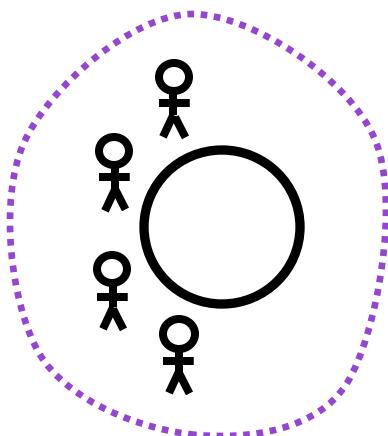
# **POINTS OF CONTENTION**

**FUNCTIONALITY  
UP/DOWNTIME  
ERRORS  
CHANGE/FLUX**

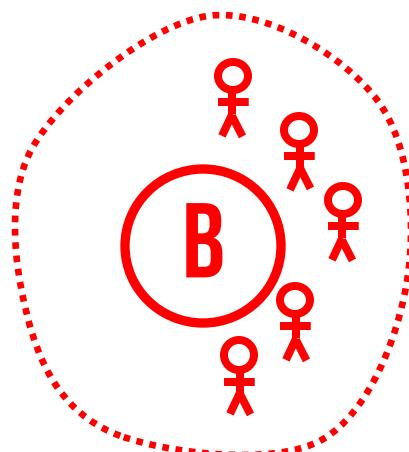
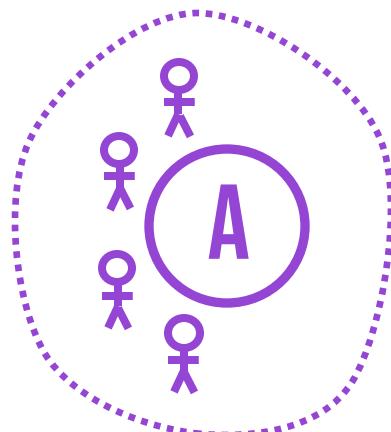
# **API DESIGN**



# AWKWARD!



# AWKWARD!



# WHAT SHOULD WE DO?

# **HOW CAN WE MINIMIZE THE SOCIAL AWKWARDNESS?**

**CAN WE KEEP THE INTERACTION  
TO AN ABSOLUTE MINIMUM?**

**INTERACTION IS FRAUGHT  
WITH SOCIAL RISK**

**WHO DESIGNES THE API?**

# **WHO DESIGNS THE API?**

**UNILATERAL | BILATERAL**

# **WHO DESIGNS THE API?**

**UNILATERAL | BILATERAL**

# **UNILATERAL API DESIGN**

# **BILATERAL API DESIGN**

# **PREREQUISITES FOR BILATERAL API DESIGN**

# **BILATERAL API DESIGN IN PRACTICE**

# **CONSEQUENCES OF BILATERAL API DESIGN**

# **DOCUMENTATION VS CONTRACT**

**WE WANT DIFFERENT THINGS FROM  
DOCUMENTATION AND CONTRACTS**

# **APIs SHOULD HAVE CONTRACTS**

# **DECOUPLING THE CONTRACT FROM THE IMPLEMENTATION**

# **SOCIAL BYPRODUCTS OF BILATERAL API DESIGN**

**ACKNOWLEDGE THAT  
WE ARE NEGOTIATING**

# **POINTS OF CONTENTION**

**FUNCTIONALITY  
UP/DOWNTIME  
ERRORS  
CHANGE/FLUX**

# **LEVEL OF SERVICE**

# **SERVICE LEVEL AGREEMENT**

# **CONSUMER**

# **PROVIDER**

**CONSUMER**

**PROVIDER**

**“GOOD ENOUGH”**

**CONSUMER**

**“GOOD ENOUGH”**

**PROVIDER**

**“BEST EFFORT”**

**CONSUMER**

**“GOOD ENOUGH”**

**PROVIDER**

**“BEST EFFORT”**  
**“NO GUARANTEES”**

**CONSUMER**

**“GOOD ENOUGH”**

**PROVIDER**

**“BEST EFFORT”**  
**“NO GUARANTEES”**  
**“IT IS WHAT IT IS”**

CONSUMER

“GOOD EFFORT”

LEFT TO POWER DYNAMICS

PROVIDER

“BEST EFFORT”  
“NO GUARANTEES”  
“IT IS WHAT IT IS”

# **EMBRACE COLLABORATION**

# **ARTICULATE THE UNARTICULATED**

# PATTERNS

A black and white photograph of a large, circular millstone. The millstone is made of a light-colored, textured rock and sits atop a smaller, irregularly shaped stone base. It is positioned in the foreground, slightly off-center. In the background, there is a vast, dry, and somewhat desolate landscape with sparse vegetation and distant structures under a clear sky.

# THE MILLSTONE

# THE MILLSTONE



**INTERNAL API  
RELUCTANT PROVIDER  
UNILATERAL DESIGN  
NO BUDGET FOR ANYTHING  
MINIMAL EFFORT  
EXPOSE DATA**

## SOCIO-TECHNICAL FACTORS

# THE MILLSTONE



**UNDERDESIGNED & UNDERSUPPORTED  
EVERYTHING IS A CHORE  
BROKEN ENCAPSULATION  
POURED CONCRETE OVER INTERNALS  
CONTENTION OVER EVOLUTION**

## **CONSEQUENCES**

# THE MILLSTONE



**CONSIDER LONG-TERM COST OF MILLSTONE  
WHAT'S MORE IMPORTANT?  
TREAT THE API AS A PRODUCT  
BILATERAL DESIGN  
ALLOCATE NECESSARY RESOURCES**

## PREVENTION



# **THE MOUNTAIN**

## **(VARIANT: THE VOLCANO)**

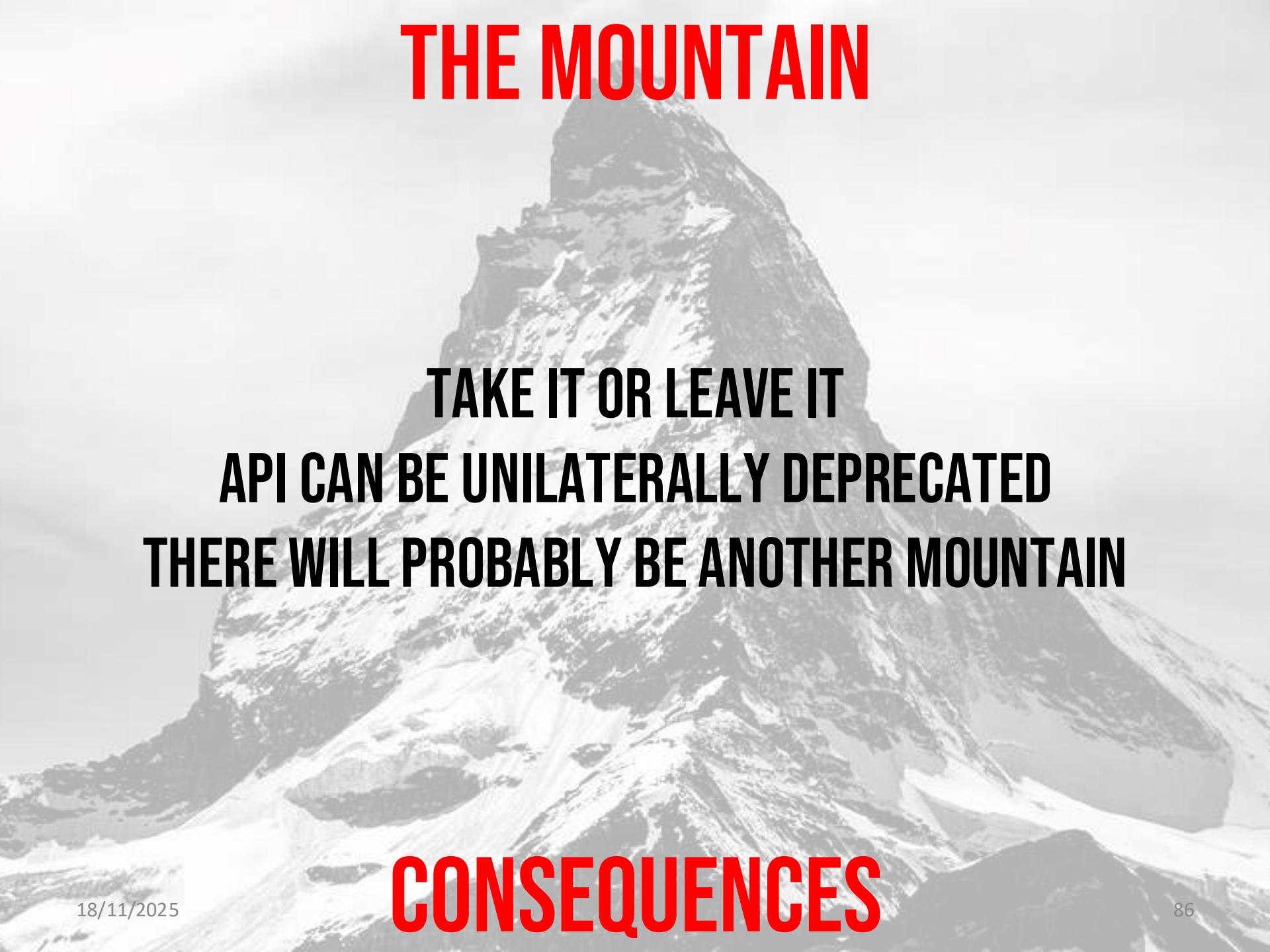
# THE MOUNTAIN



**API PROVIDER IS A BIG TECH COMPANY  
UNILATERAL DESIGN  
SERVICE LEVEL AGREEMENT  
COMMUNICATION IS CUSTOMER SUPPORT  
CONSUMERS HAVE LITTLE TO NO LEVERAGE  
API IS VERY STABLE**

## SOCIO-TECHNICAL FACTORS

# THE MOUNTAIN



TAKE IT OR LEAVE IT  
API CAN BE UNILATERALLY DEPRECATED  
THERE WILL PROBABLY BE ANOTHER MOUNTAIN

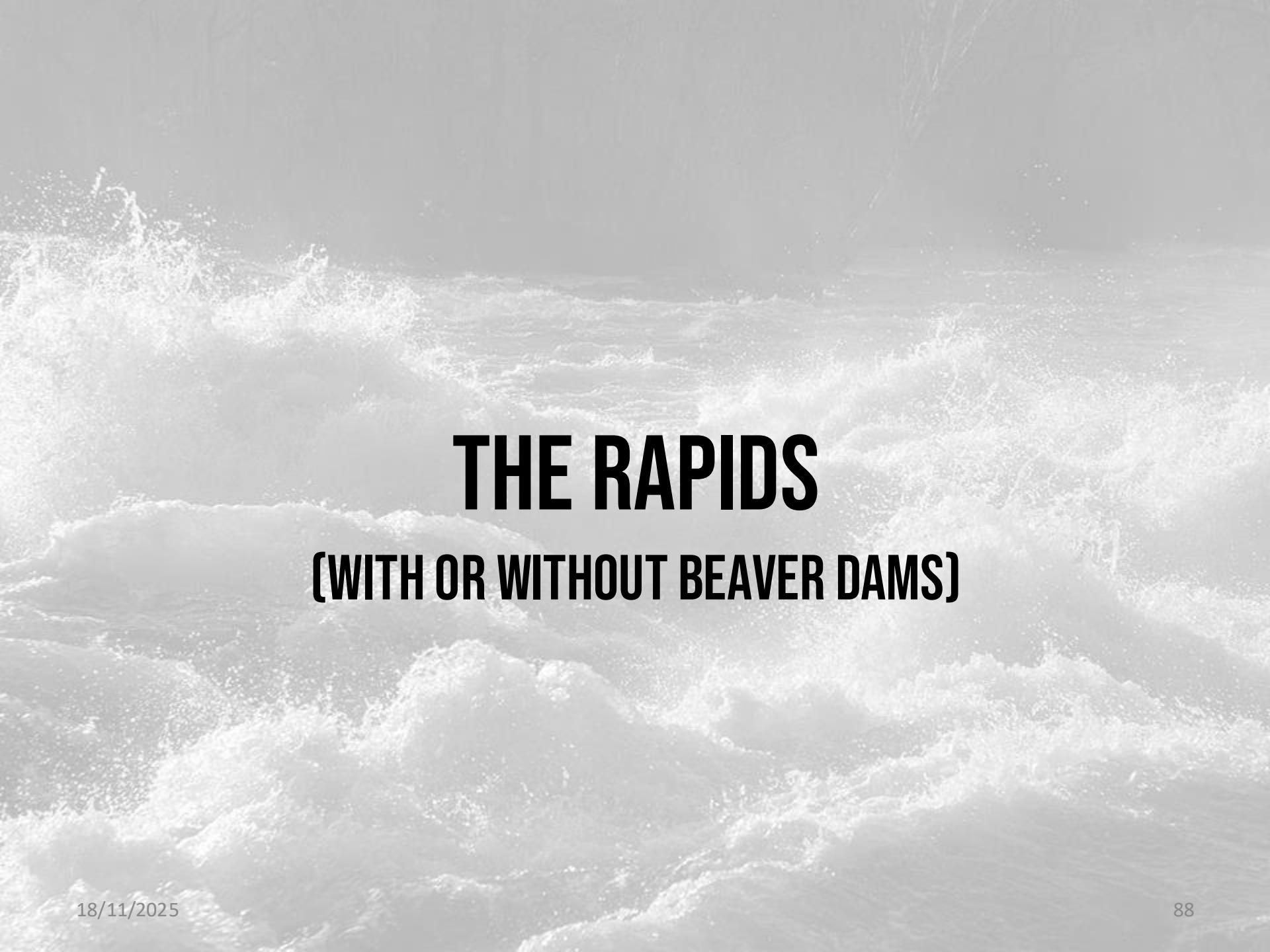
CONSEQUENCES

# THE MOUNTAIN



**ANTI-CORRUPTION LAYER  
BUILD IT YOURSELF**

**PREVENT**



# **THE RAPIDS**

## **(WITH OR WITHOUT BEAVER DAMS)**

# THE RAPIDS

**INTERNAL API IN THE MIDDLE OF A VALUE STREAM  
CONSTANT COLLABORATION REQUIRED  
STILL UNILATERAL DESIGN?!?  
TEAMS ARE INDEPENDENT  
CONSUMER/PROVIDER NOT ALWAYS ALIGNED/IN SYNC**

# THE RAPIDS

API IS CONSTANTLY EVOLVING  
SOMETIMES TEAMS BUILD BEAVER DAMS

CONSEQUENCES

# THE RAPIDS



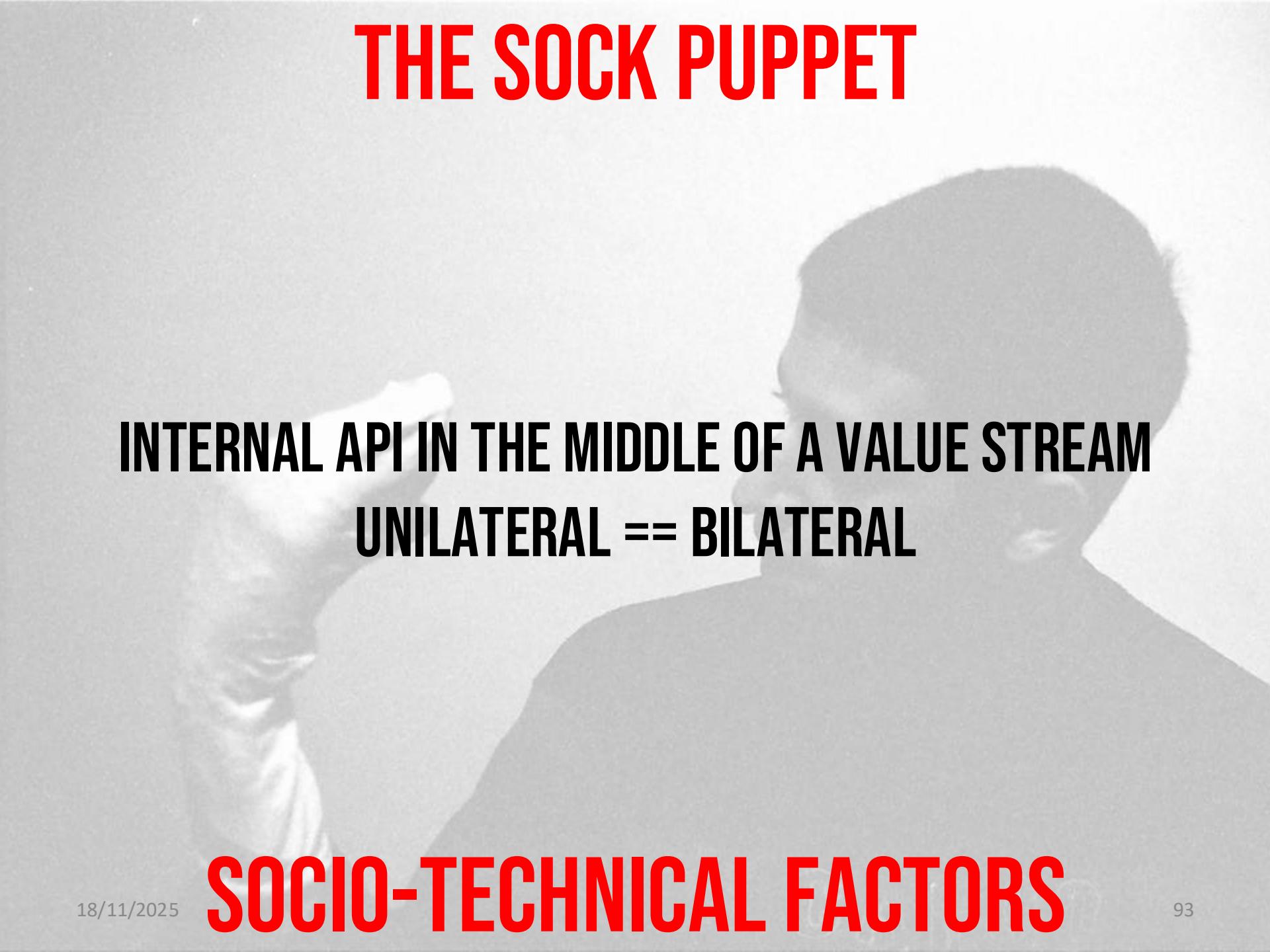
MERGE TEAMS

PREVENT



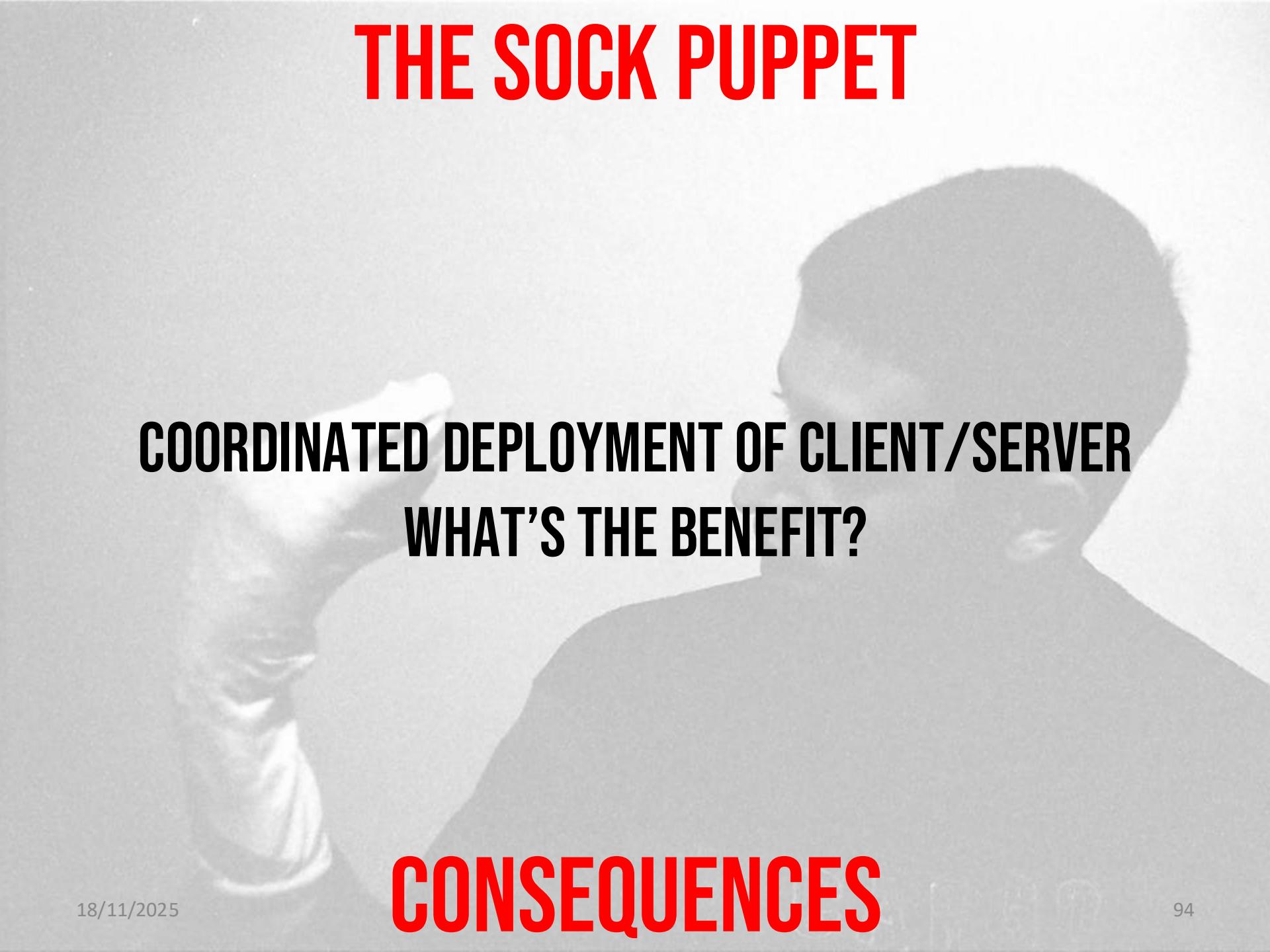
# THE SOCK PUPPET

# THE SOCK PUPPET



**INTERNAL API IN THE MIDDLE OF A VALUE STREAM  
UNILATERAL == BILATERAL**

# THE SOCK PUPPET



**COORDINATED DEPLOYMENT OF CLIENT/SERVER  
WHAT'S THE BENEFIT?**

## CONSEQUENCES

# THE SOCK PUPPET

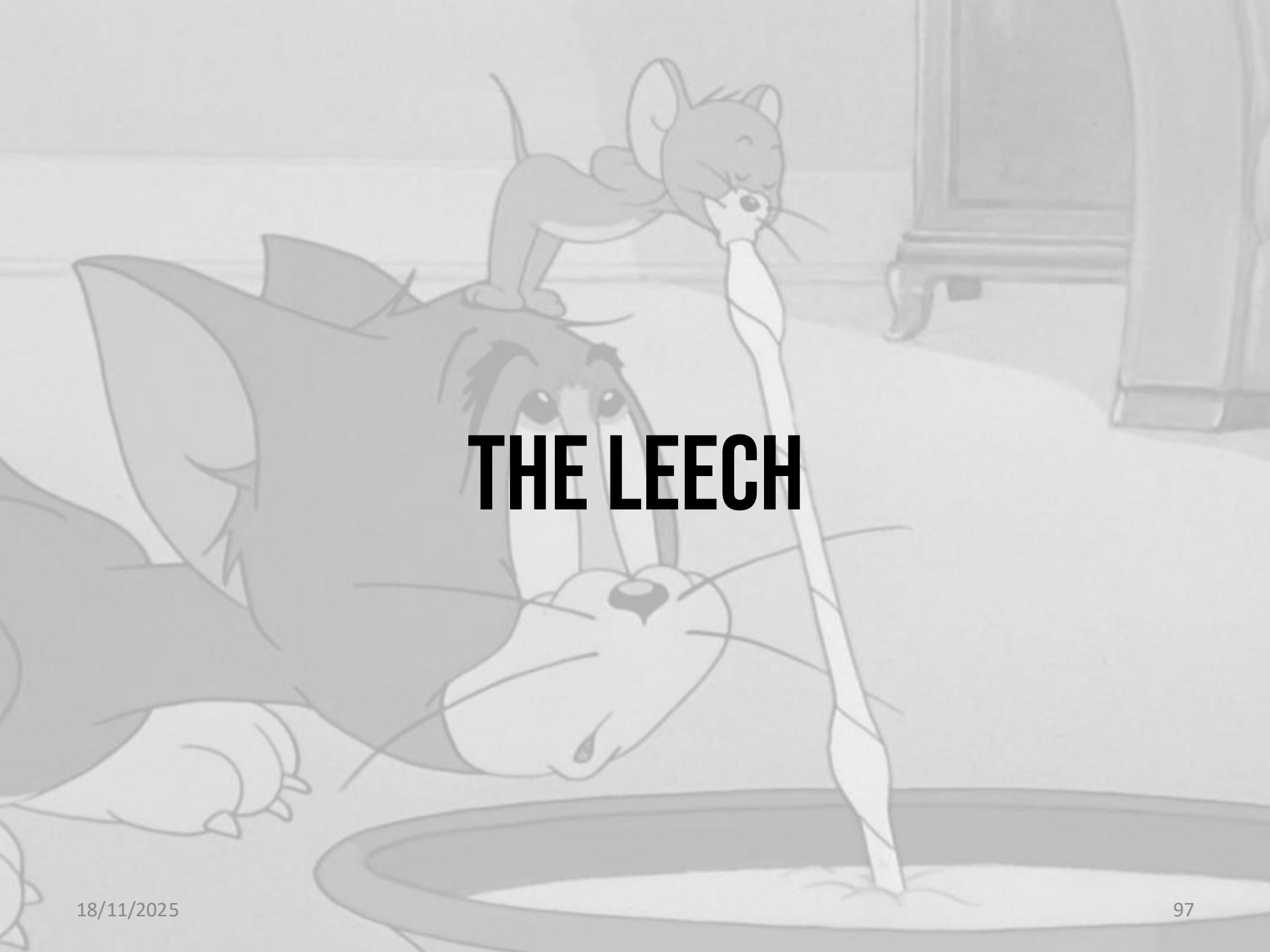


ELIMINATE API

PREVENT

# **BONUS PATTERNS**

## **BY SEBASTIAN HANS**



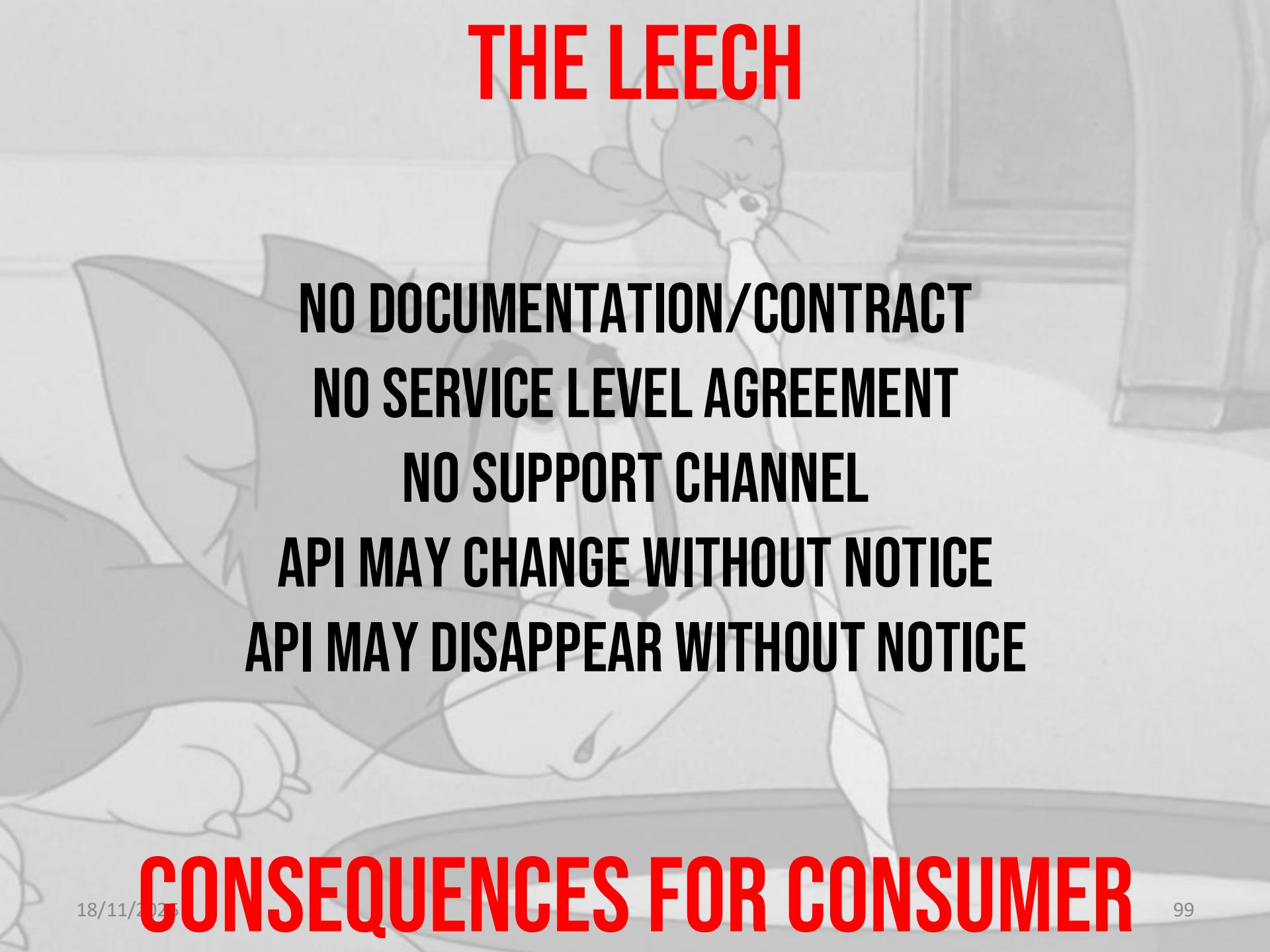
# THE LEECH

# THE LEECH

**COVERT CONSUMER!  
NO AGREEMENT IN PLACE**

**SOCIO-TECHNICAL FACTORS**

# THE LEECH



**NO DOCUMENTATION/CONTRACT**

**NO SERVICE LEVEL AGREEMENT**

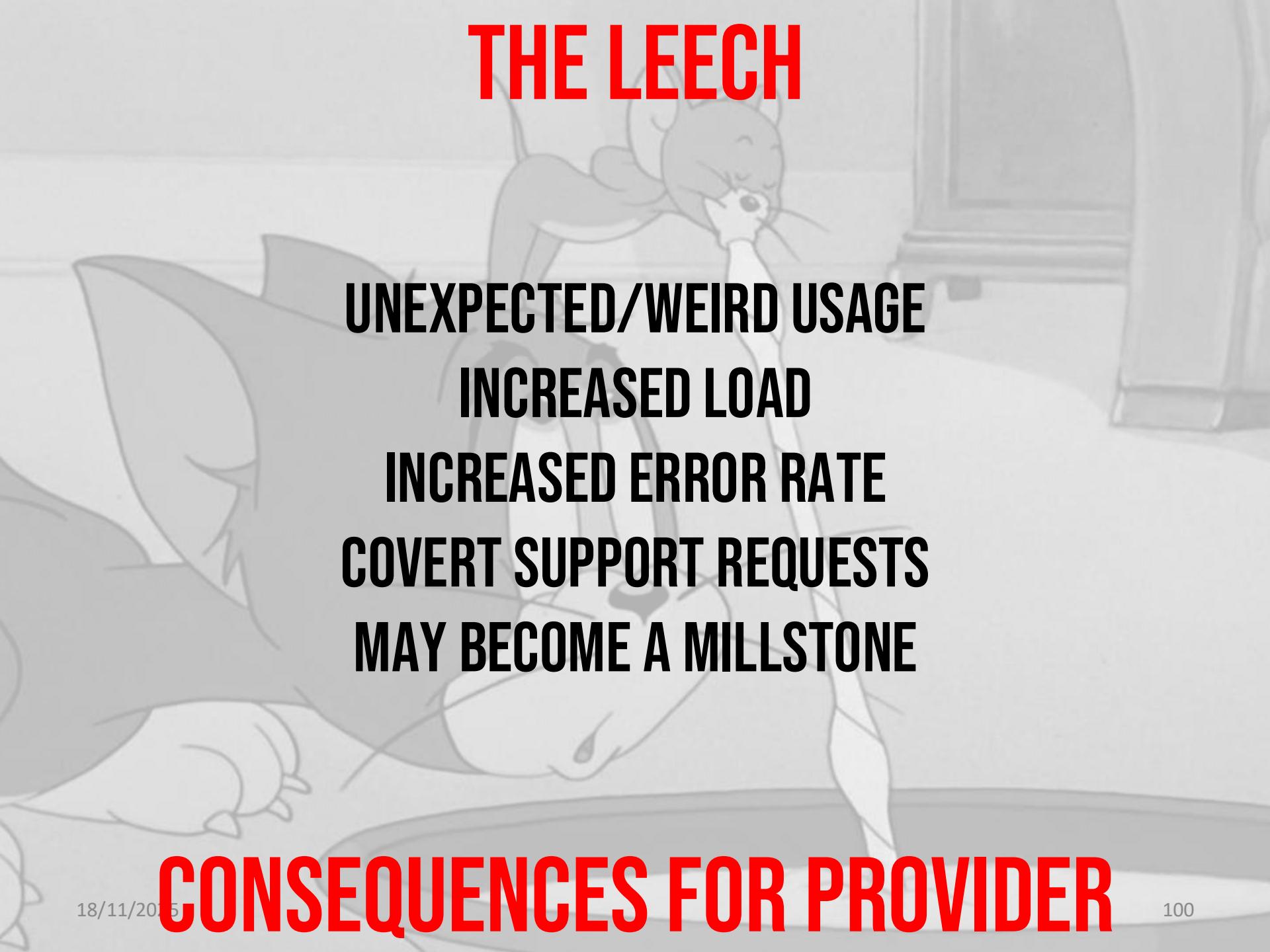
**NO SUPPORT CHANNEL**

**API MAY CHANGE WITHOUT NOTICE**

**API MAY DISAPPEAR WITHOUT NOTICE**

## **CONSEQUENCES FOR CONSUMER**

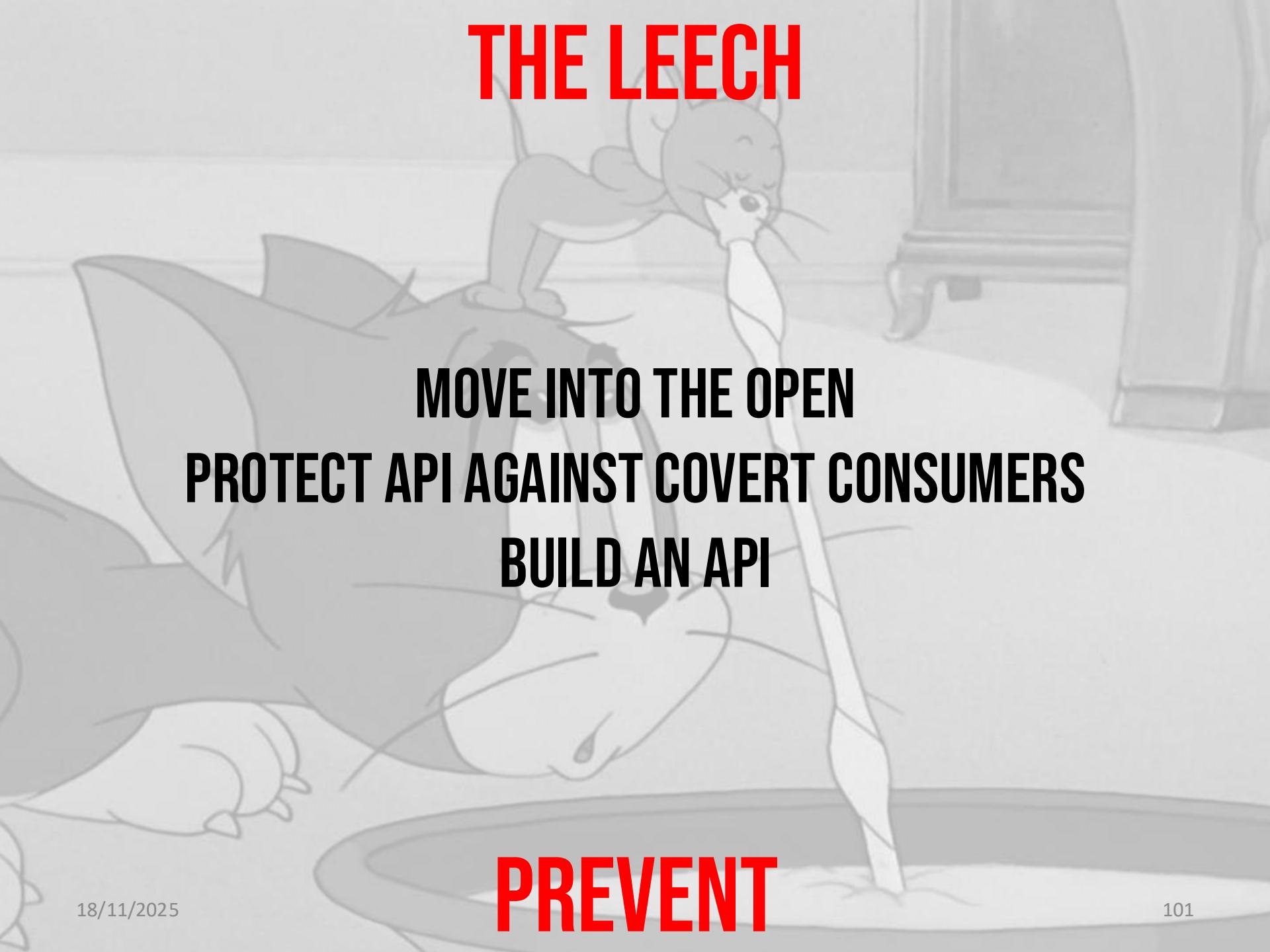
# THE LEECH



**UNEXPECTED/WEIRD USAGE  
INCREASED LOAD  
INCREASED ERROR RATE  
COVERT SUPPORT REQUESTS  
MAY BECOME A MILLSTONE**

## **CONSEQUENCES FOR PROVIDER**

# THE LEECH



MOVE INTO THE OPEN  
PROTECT API AGAINST COVERT CONSUMERS  
BUILD AN API

PREVENT



# **ENDLESS POSSIBILITIES**

# ENDLESS POSSIBILITIES

INITIAL API DESIGN IS HEALTHY  
NEW CONSUMERS ARE ONBOARDED OVER TIME  
NEW CONSUMERS HAVE NEW NEEDS  
KNOWLEDGE LOSS IN PROVIDER TEAM

# SOCIO-TECHNICAL FACTORS

# **ENDLESS POSSIBILITIES**

**FLAGS AND OPTIONS TO HANDLE VARIATION**

**COMBINATORY EXPLOSION**

**DESIGN INTEGRITY DECAYS**

**PROVIDER LOSES CONTROL**

**ERRORS PROLIFERATE**

**CONTRACT IS WEAKENED**

**DOCUMENTATION BECOMES INADEQUATE**

# **CONSEQUENCES**

# ENDLESS POSSIBILITIES

PROTECT DESIGN INTEGRITY  
DECISIONS OVER OPTIONS

SAY NO

# PREVENT

# EVEN MORE PATTERNS?

# CROWDSOURCE

# **IDENTIFY A DOMINANT SOCIO-TECHNICAL FACTOR**

# **COME UP WITH A NAME**

**WHO IS THE CONSUMER AND WHO IS THE PROVIDER?**

**WHAT CONSTRAINTS DO THEY OPERATE UNDER?**

**WHAT ARE THE POWER DYNAMICS?**

**WHAT IS THE COLLABORATION LIKE?**

**WHAT ARE THE COMMUNICATION CHANNELS?**

**HOW IMPORTANT IS THE API TO EACH PARTY?**

**WHAT IS THE EXPECTED CHANGE RATE?**

**HOW IS CHANGE HANDLED?**

**WHAT IS THE SERVICE LEVEL AGREEMENT?**

**ARE BOTH SIDES HAPPY?**