

SOCIO-TECHNICAL API PATTERNS

EINAR W. HØST

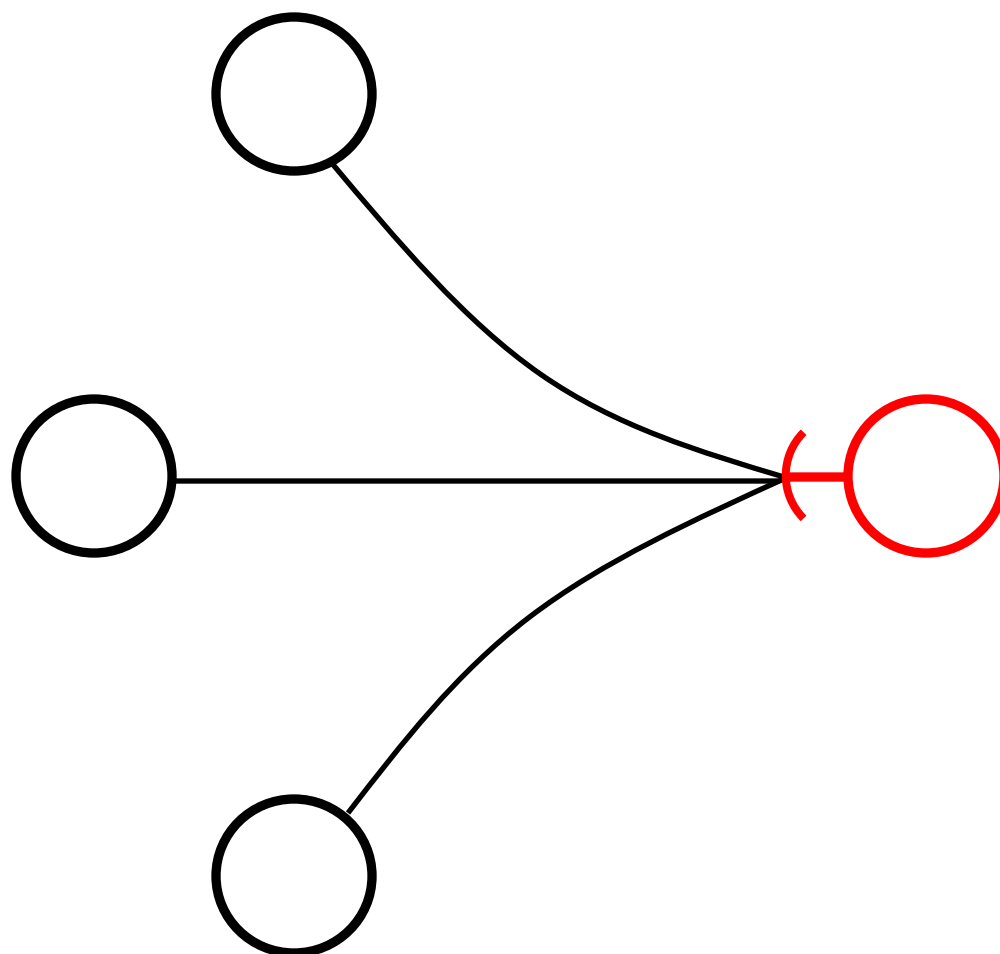
WHAT IS AN API?

A WAY TO CONNECT TWO OR MORE SYSTEMS

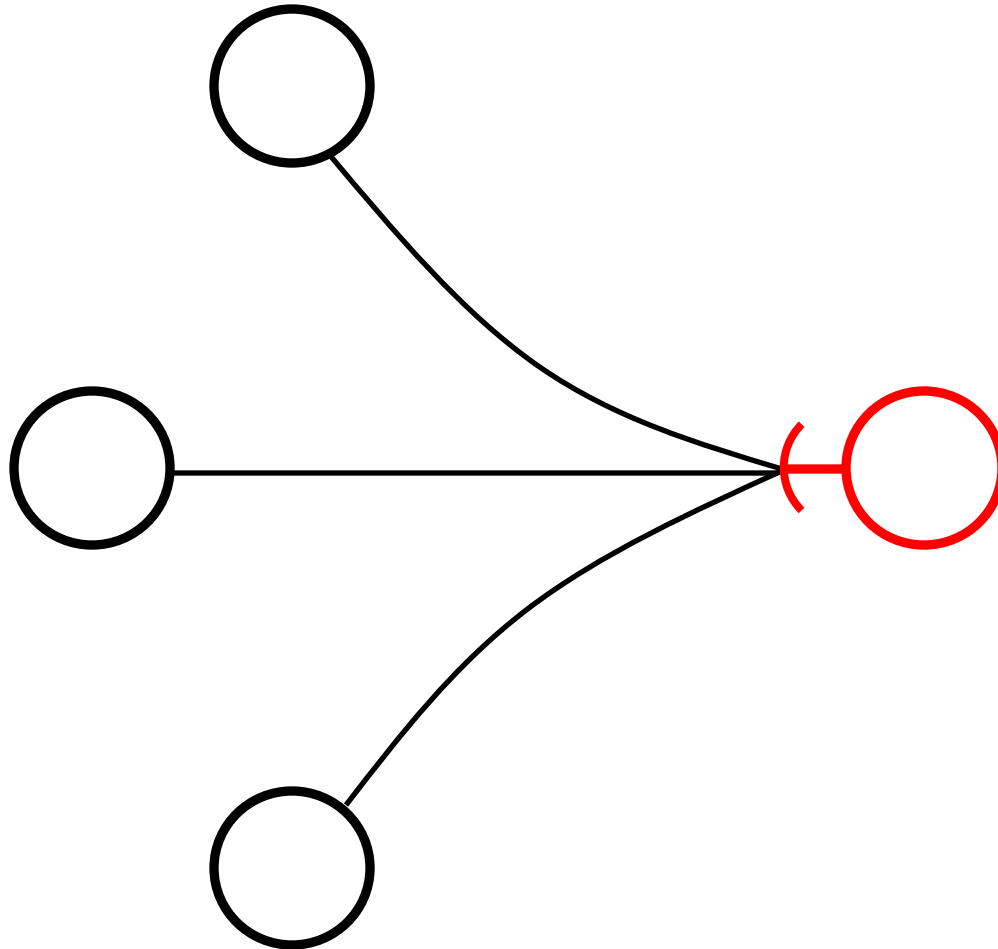
WHAT KINDS OF SYSTEMS?

CONNECTING **SOFTWARE SYSTEMS**

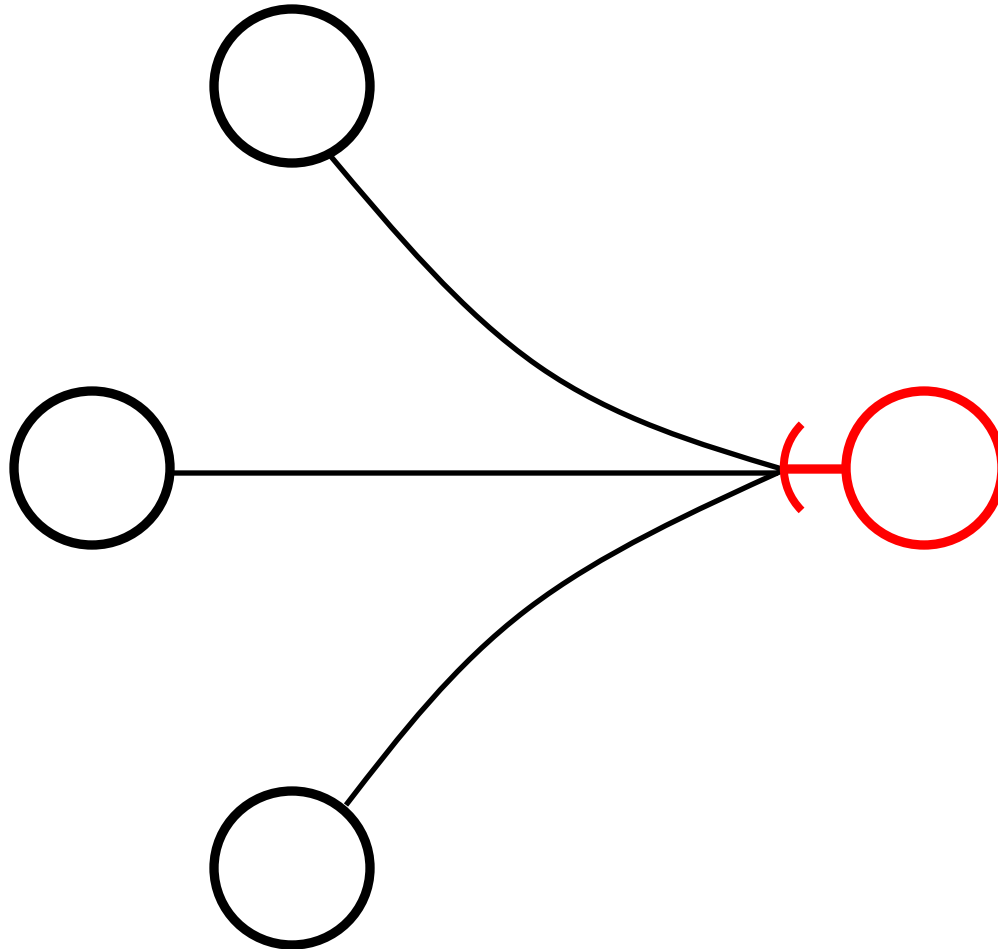
WEB API **AKA** JSON OVER HTTP



TOO ABSTRACT!



TOO ABSTRACT!

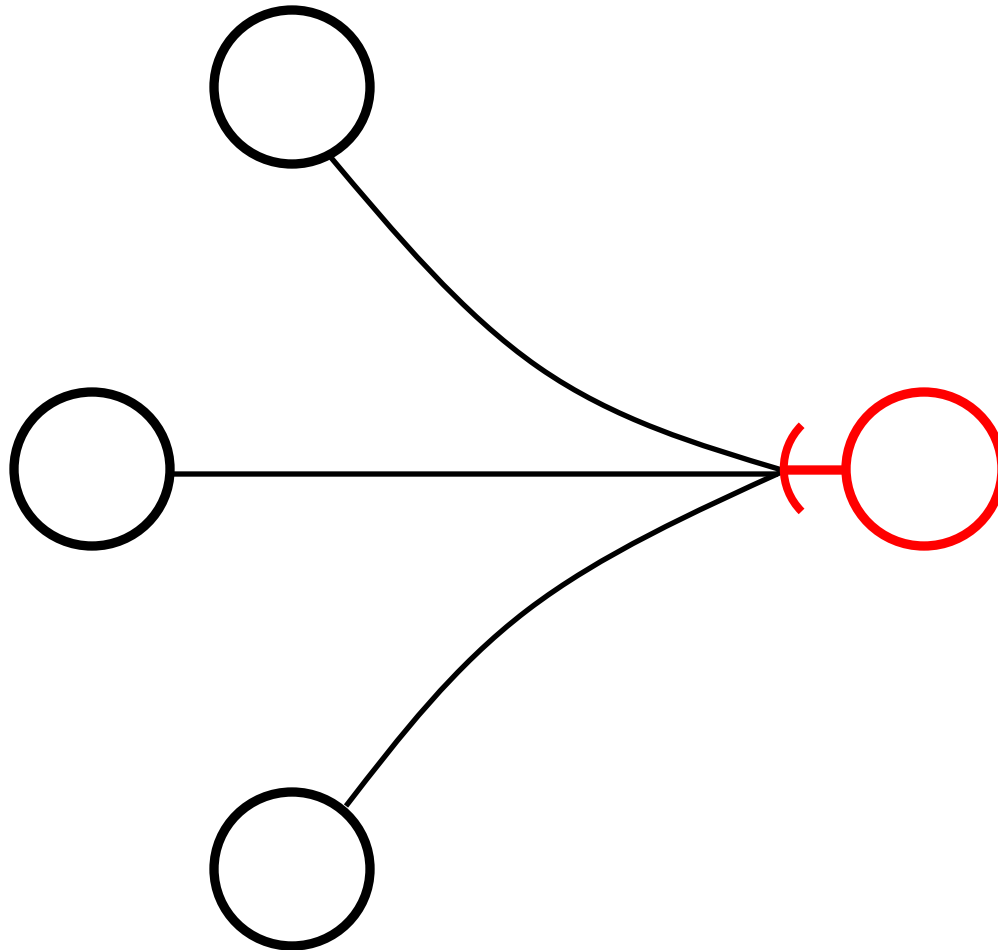


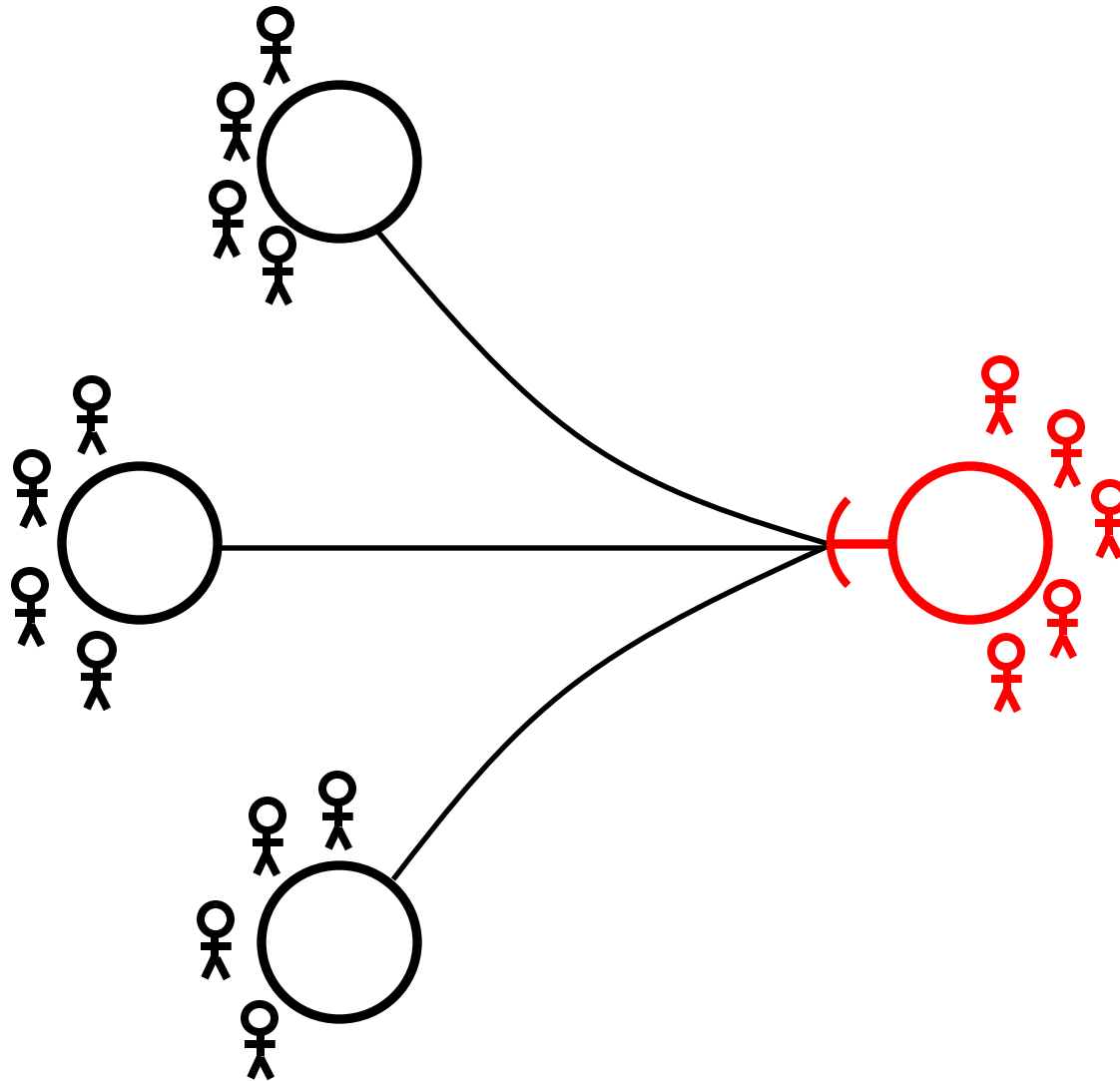
TOO SIMPLISTIC!

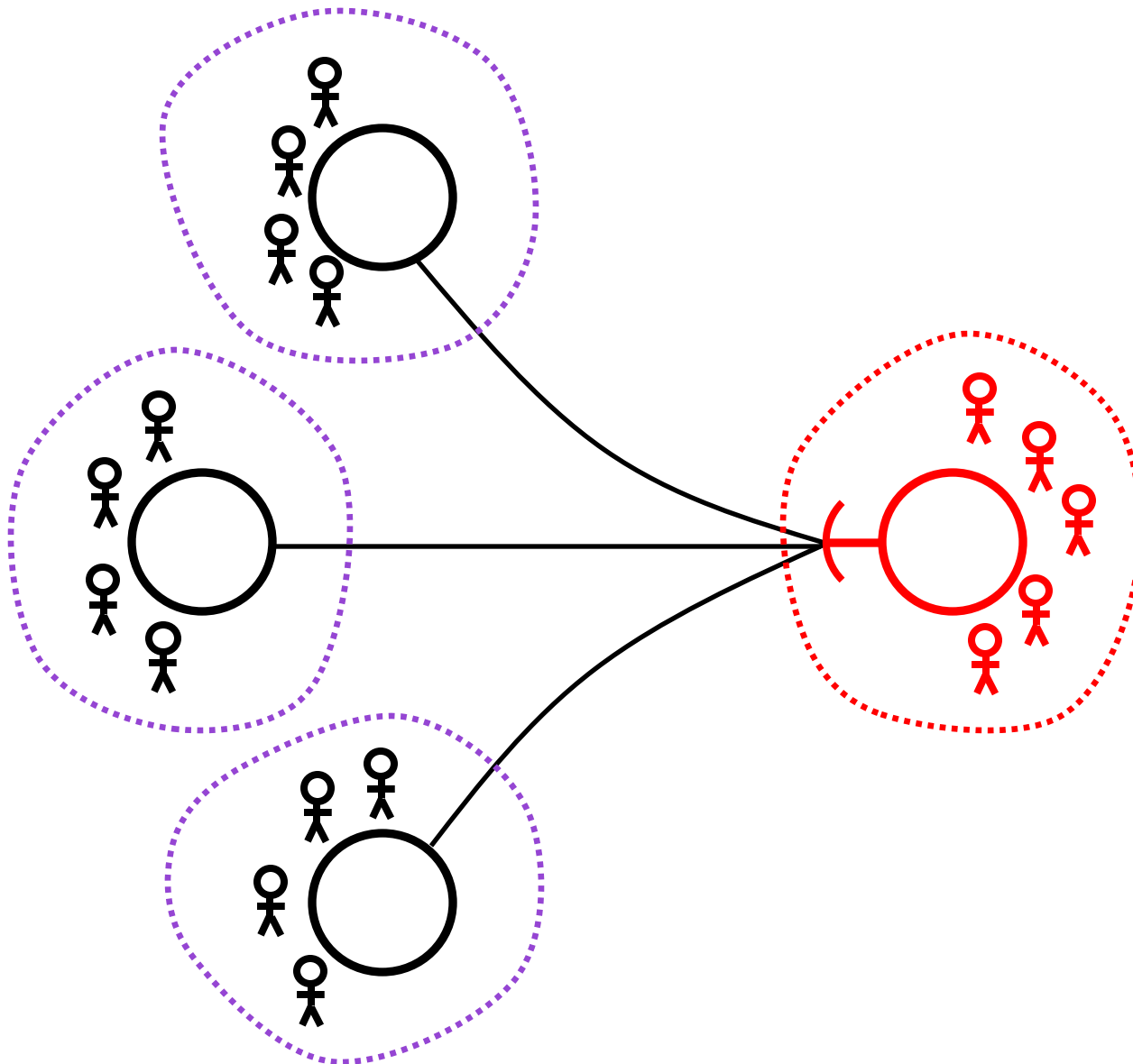
HOW DOES THE API COME ABOUT?

WHY DOES THE API COME ABOUT?

WHO MAKES THE API COME ABOUT?







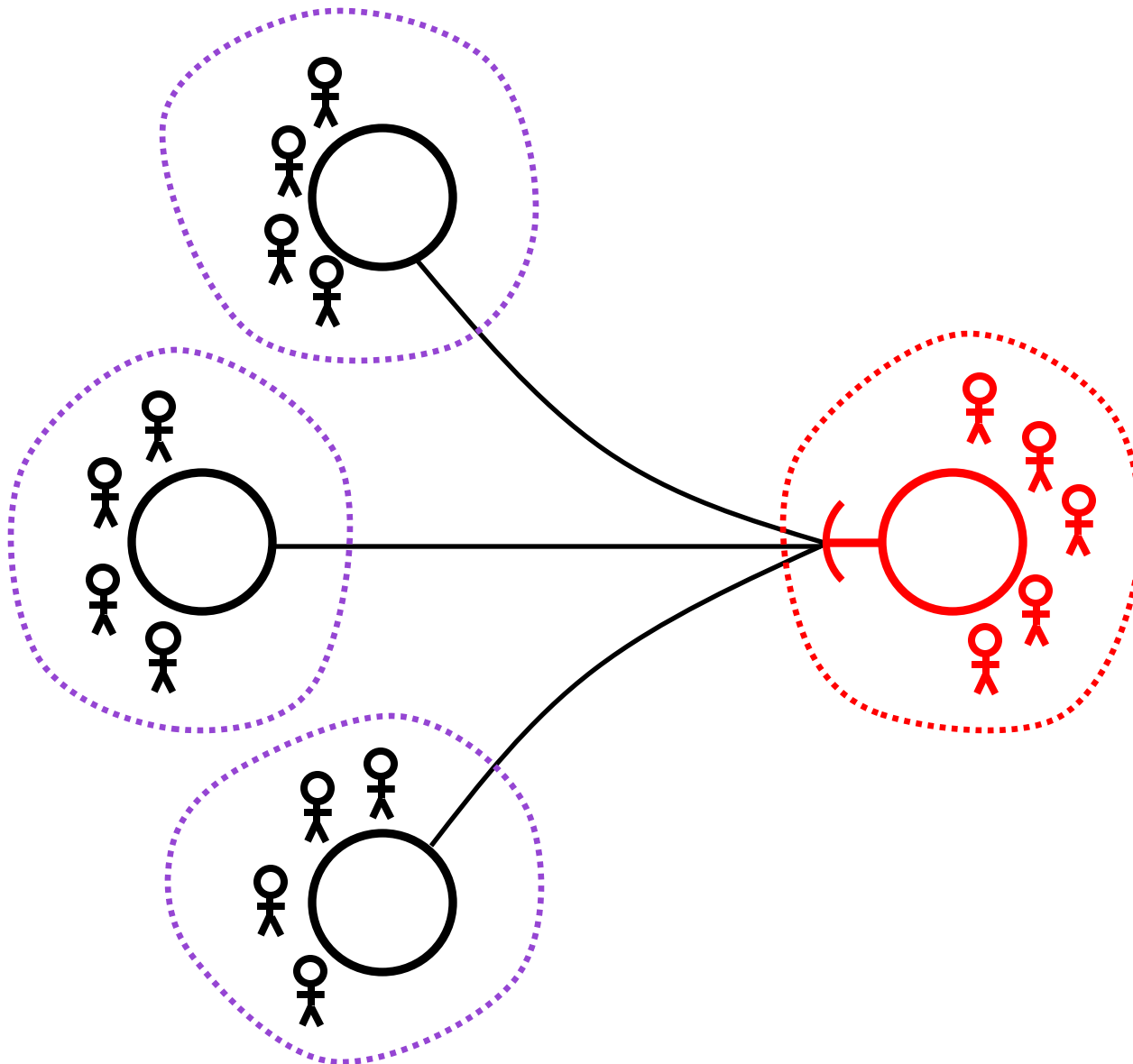
CONNECTING

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?

WHO IS THE CONSUMER?

WHAT ARE THEIR GOALS?

WHAT ARE THEIR RESPONSIBILITIES?

WHO IS THE **CONSUMER**?

WHAT ARE THEIR **GOALS**?

WHAT ARE THEIR **RESPONSIBILITIES**?

WHAT ARE THEIR **CONSTRAINTS**?

WHO IS THE PROVIDER?

WHO IS THE PROVIDER?

WHAT ARE THEIR GOALS?

WHO IS THE PROVIDER?

WHAT ARE THEIR GOALS?

WHAT ARE THEIR RESPONSIBILITIES?

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

PROVIDER/CONSUMER RELATIONSHIP

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

POINTS OF CONTENTION

FUNCTIONALITY

POINTS OF CONTENTION

FUNCTIONALITY
UP/DOWNTIME

POINTS OF CONTENTION

FUNCTIONALITY

UP/DOWNTIME

ERRORS

POINTS OF CONTENTION

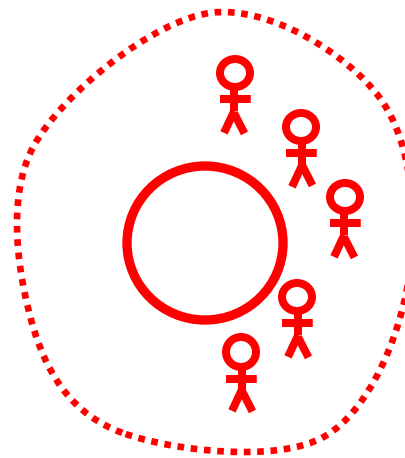
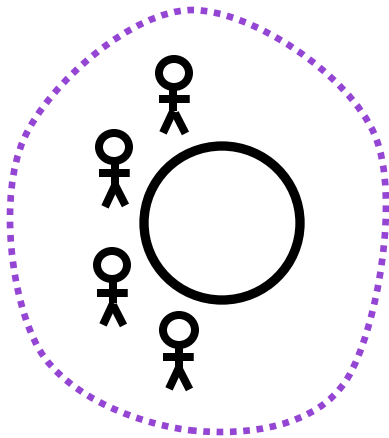
FUNCTIONALITY

UP/DOWNTIME

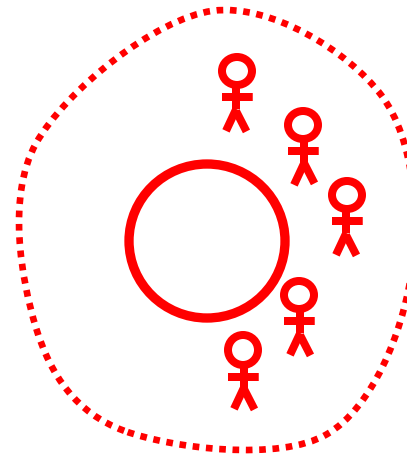
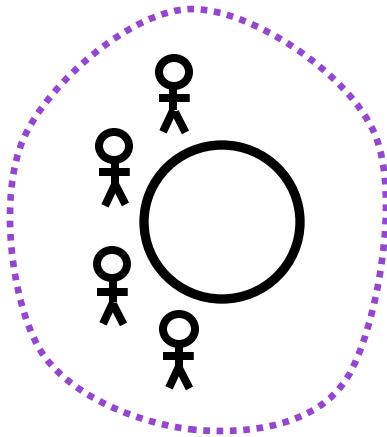
ERRORS

CHANGE/FLUX

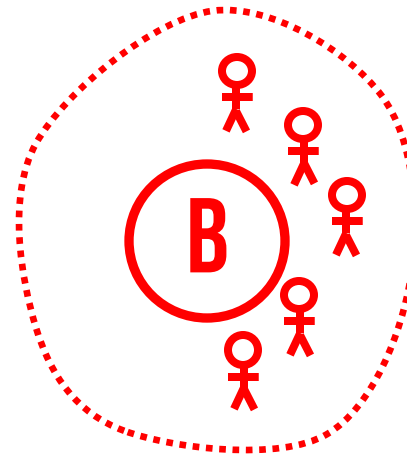
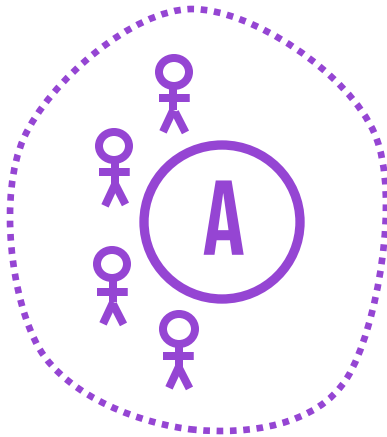
API DESIGN



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 DESIGNS 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

“GOOD ENOUGH”

PROVIDER

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

PROVIDER

“GOOD EFFORT”

“BEST EFFORT”

“NO GUARANTEES”

“IT IS WHAT IT IS”

LEFT TO POWER DYNAMICS

EMBRACE COLLABORATION

ARTICULATE THE UNARTICULATED

PATTERNS

A large, rough-hewn stone millstone is the central focus, resting within a circular stone basin. The millstone has a distinct circular hole in its center. The basin is made of rough-hewn stones and sits on a sandy, arid ground. In the background, there are sparse desert plants and some ruins of ancient stone 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

SOCIO-TECHNICAL FACTORS

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

SOCIO-TECHNICAL FACTORS

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

A grayscale cartoon illustration of Jerry the mouse from Tom and Jerry. Jerry is standing on Tom's head, holding a long, thin, white object (resembling a leech or a straw) in his mouth. Tom is lying down, looking up at Jerry with a weary expression. The background shows a simple room with a chair and a table.

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

A grayscale cartoon illustration of Jerry the mouse from Tom and Jerry. Jerry is perched on Tom's back, using his long, sharp front teeth to leech blood from Tom's neck. Tom is lying on his back, looking exhausted or unconscious, with his eyes closed. The background shows a simple room with a chair and a table.

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?