

And now for something completely different...

UCAN Control Your Stuff Local-First Authority Without Boundaries





Brooklyn Zelenka @expede



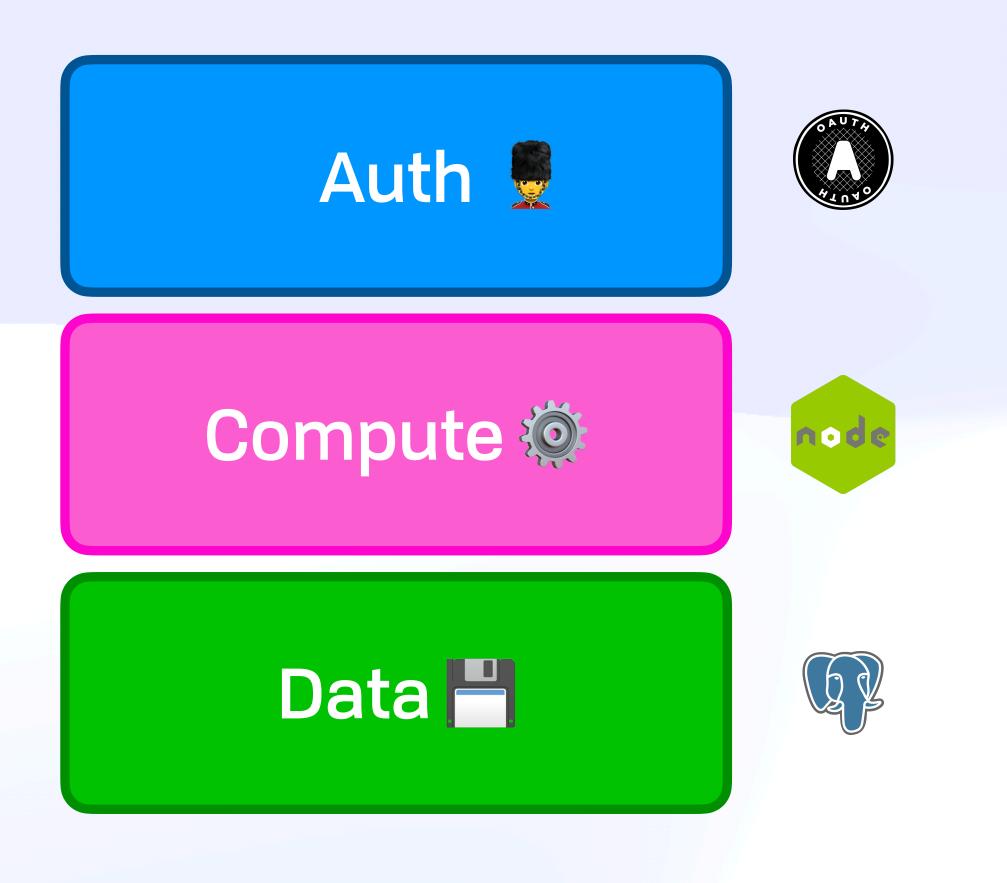
Brooklyn Zelenka @expede

- Open source, standards, PLT, DSys
- Knows a few things about UCAN
- Began UCAN for "the Rails of LoFi"
 - Now many use cases: CRDTs, storage, compute
- Runs an online distributed systems reading group
 - https://lu.ma/distributed-systems



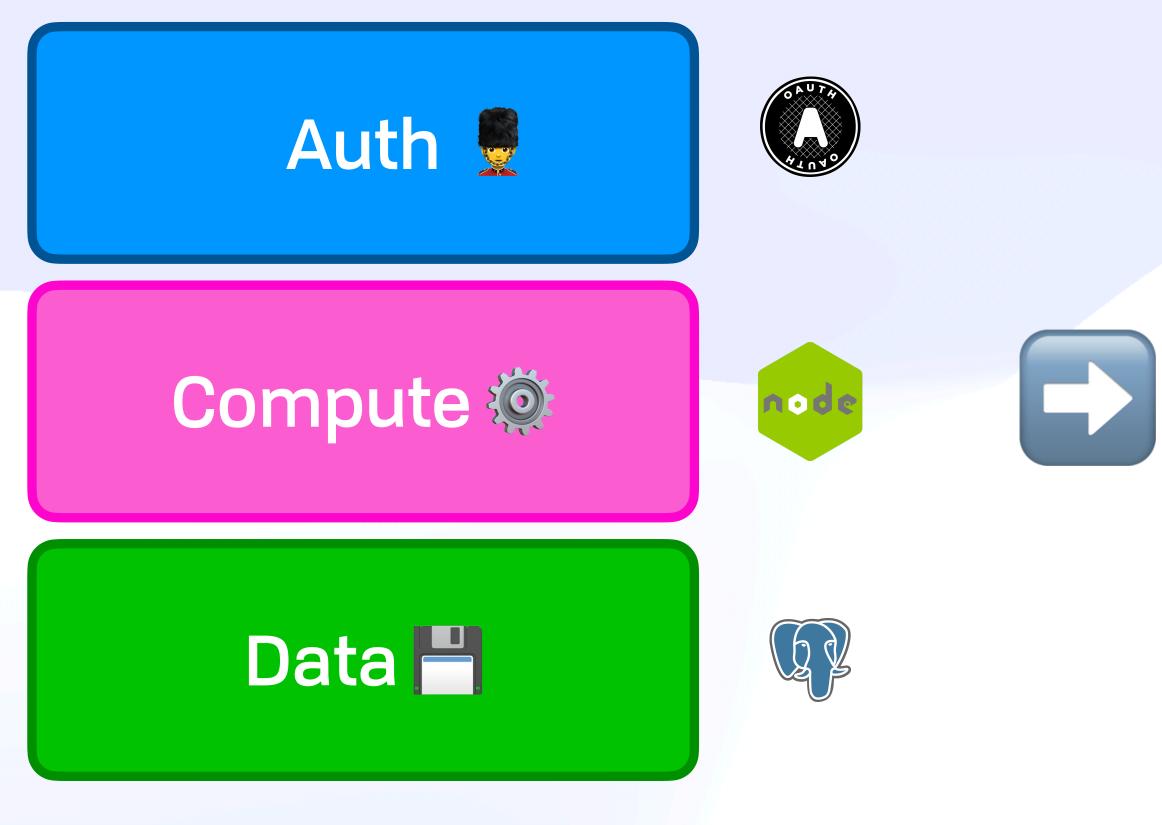


Client/Server



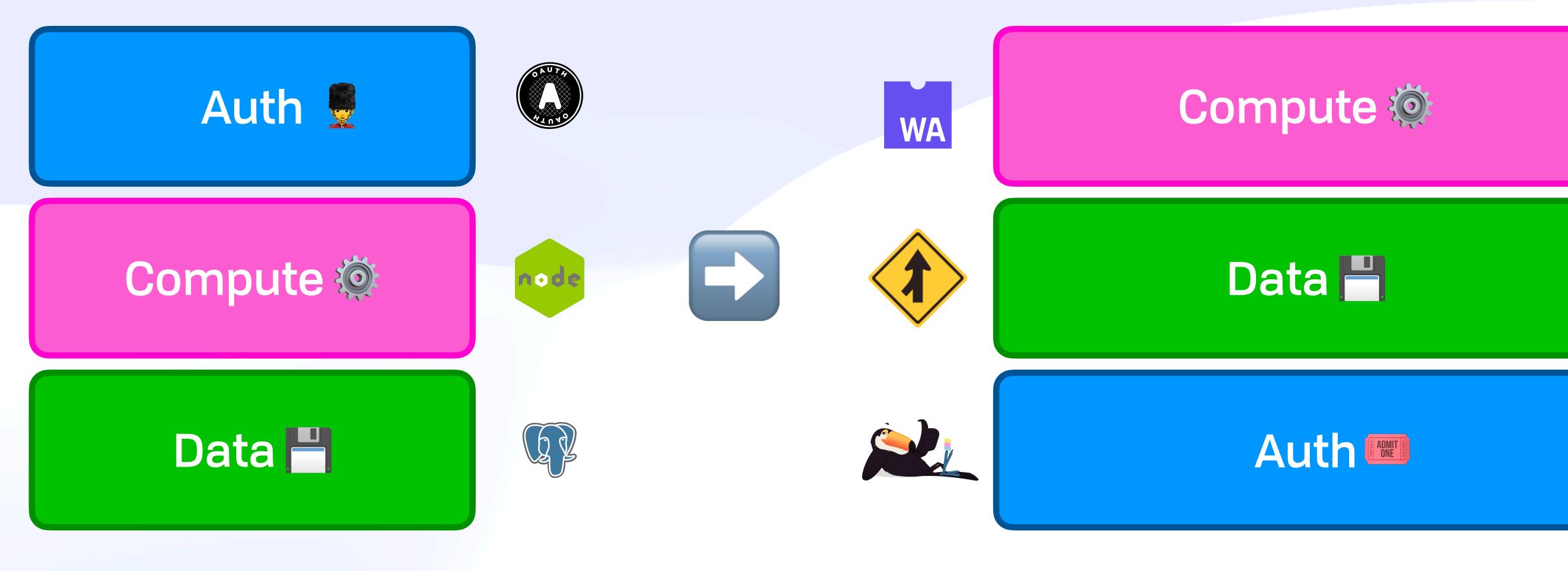


Client/Server





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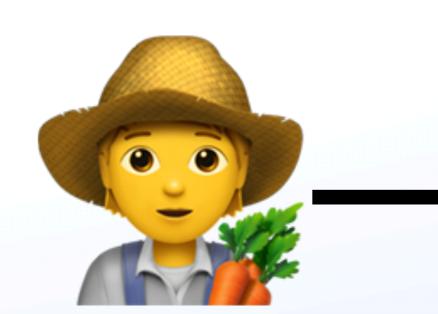


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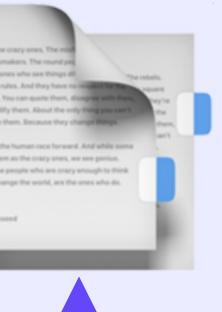
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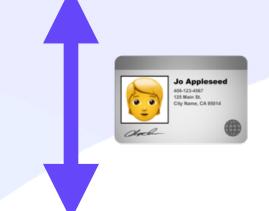






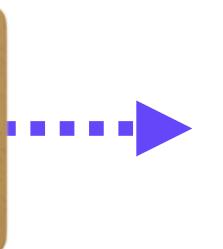














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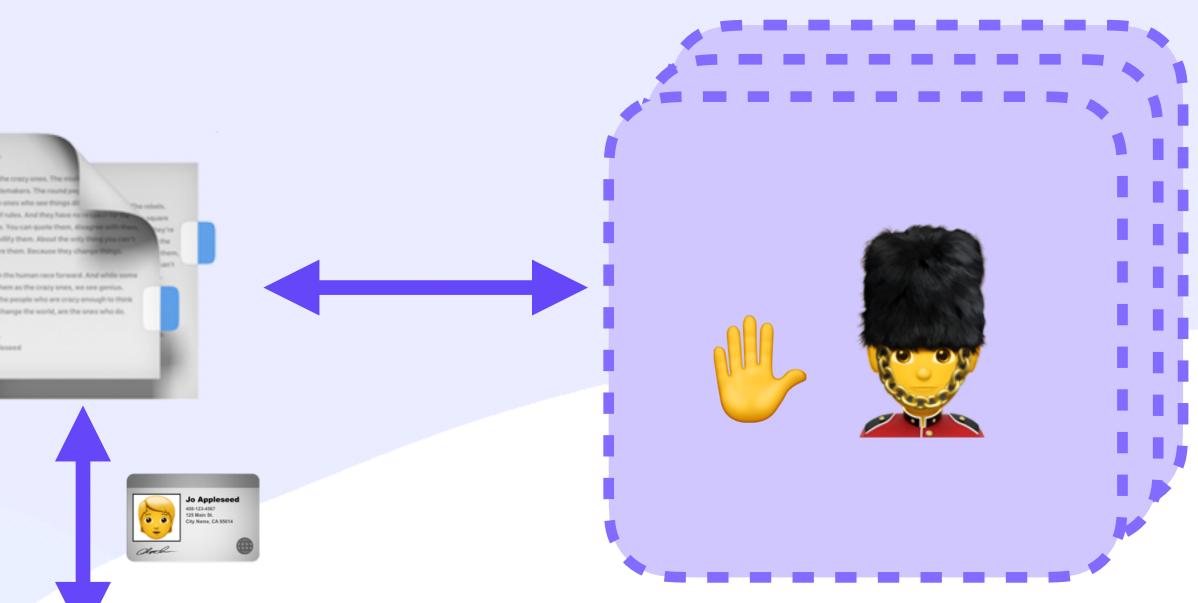
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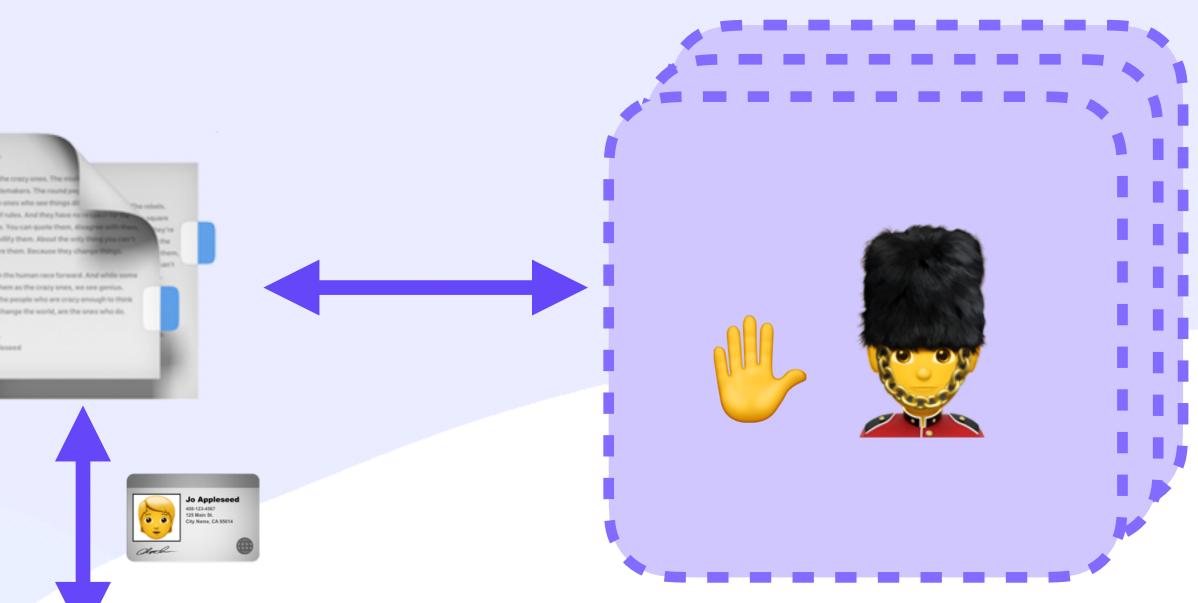
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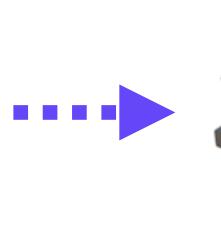














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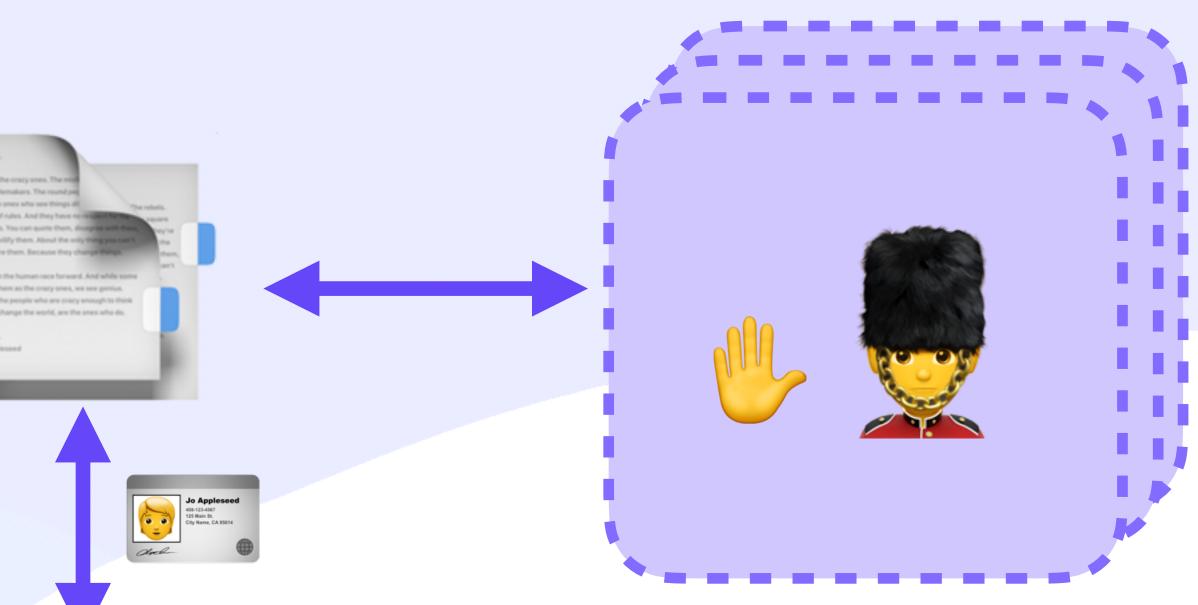
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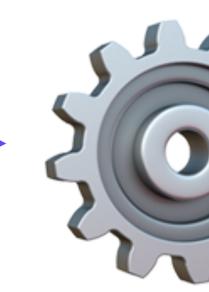




















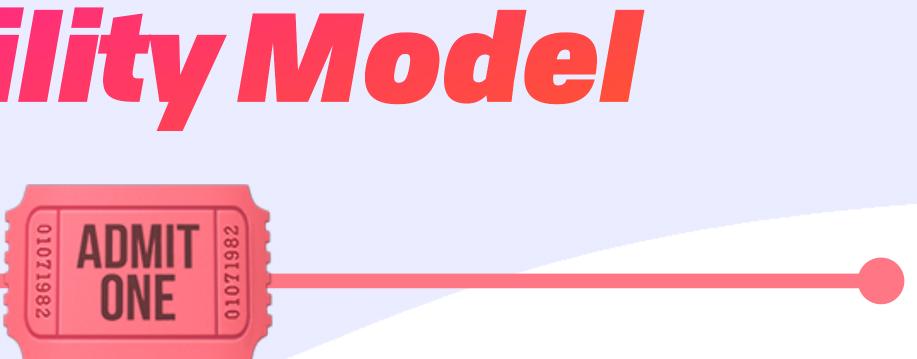






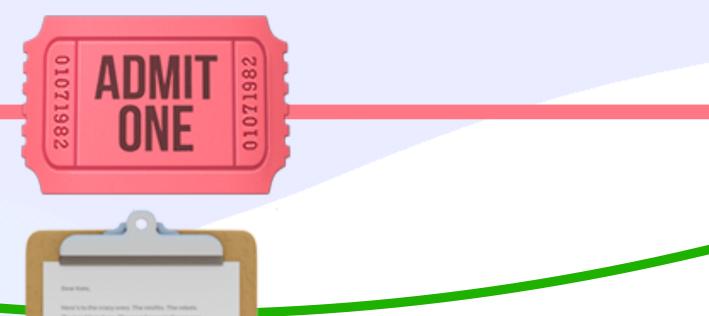
















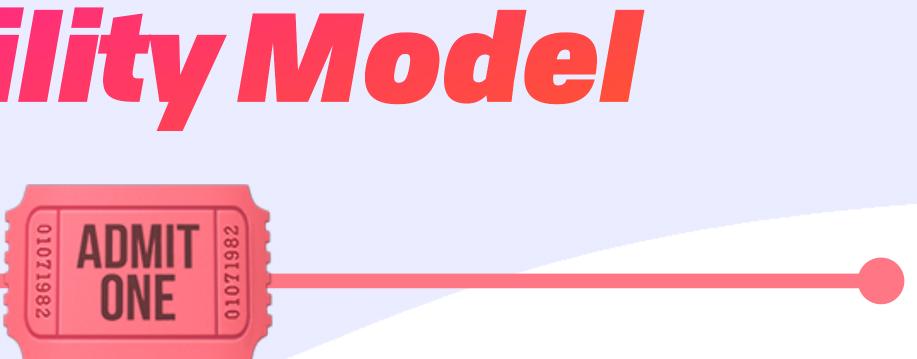




Self-contained: has <u>all</u> required info

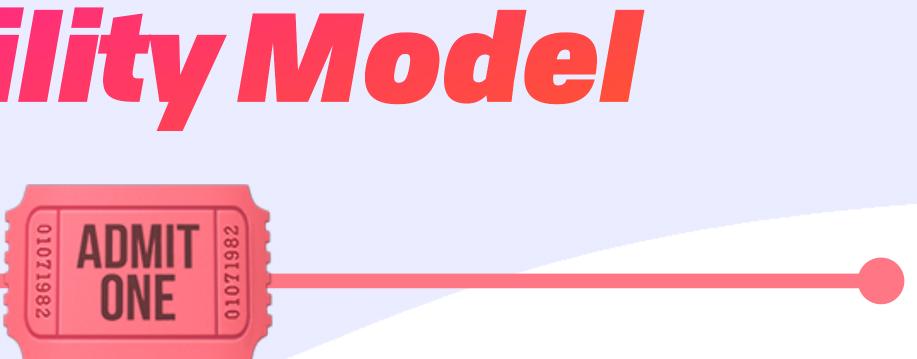






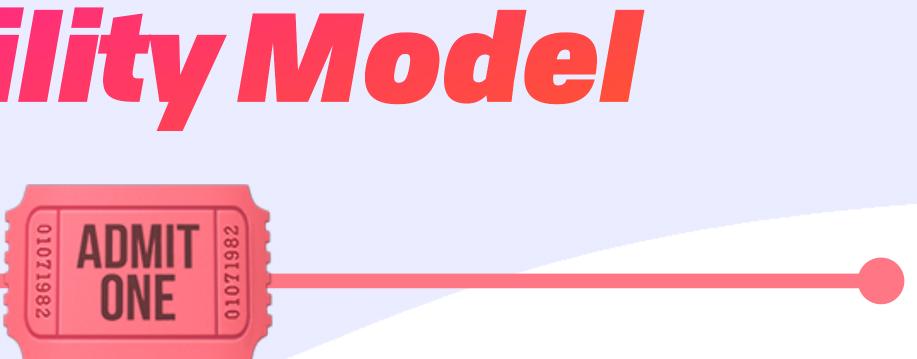






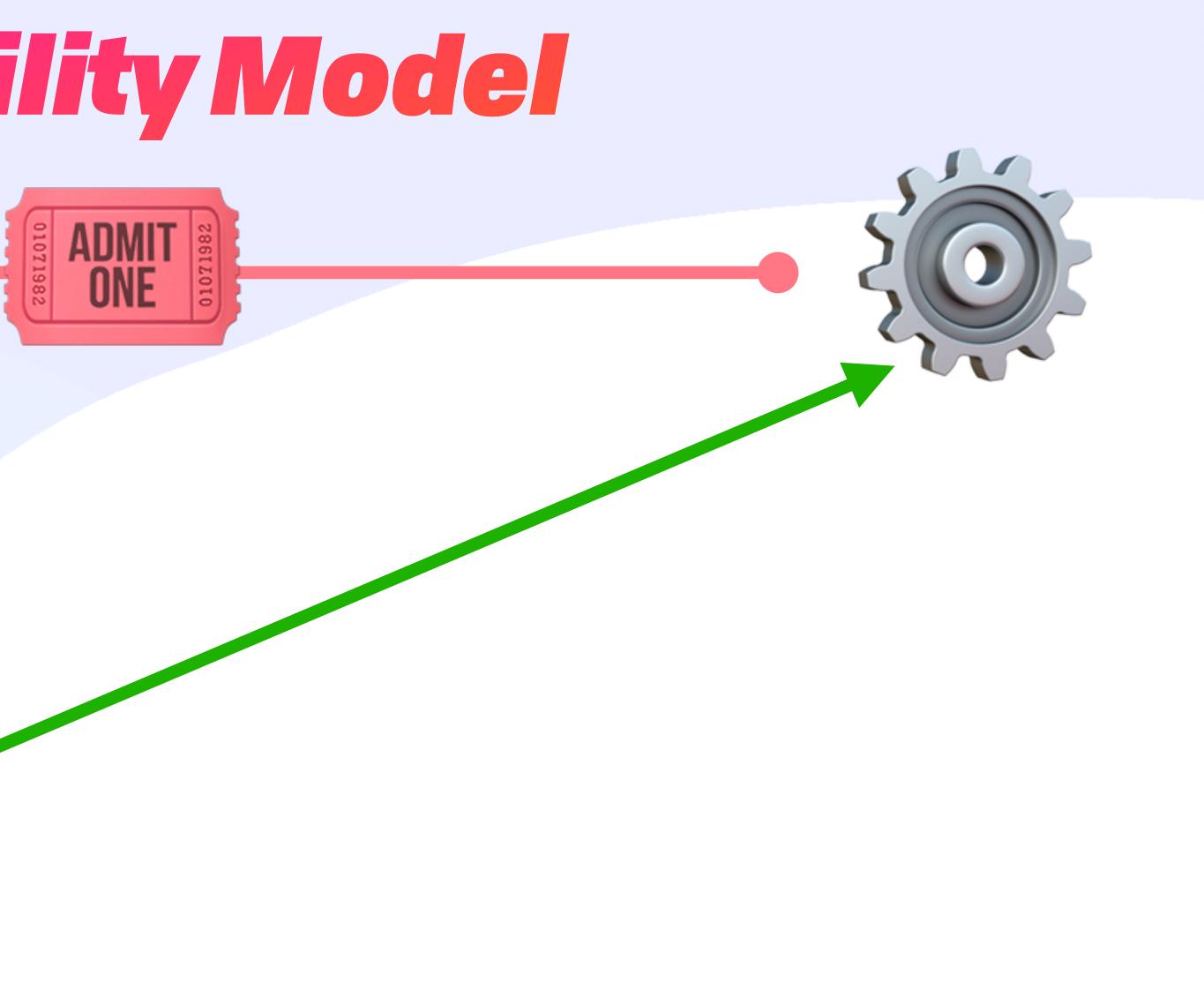




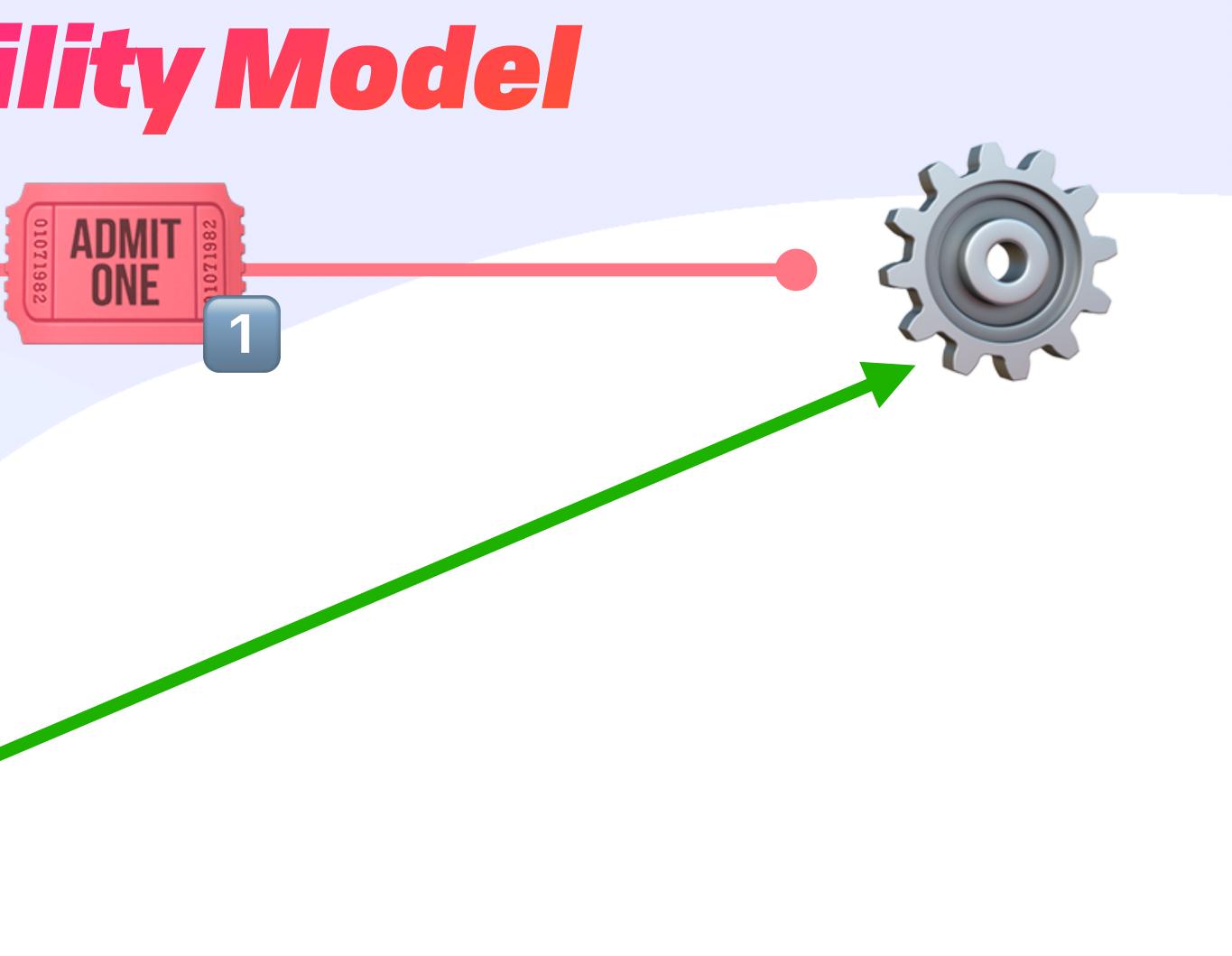




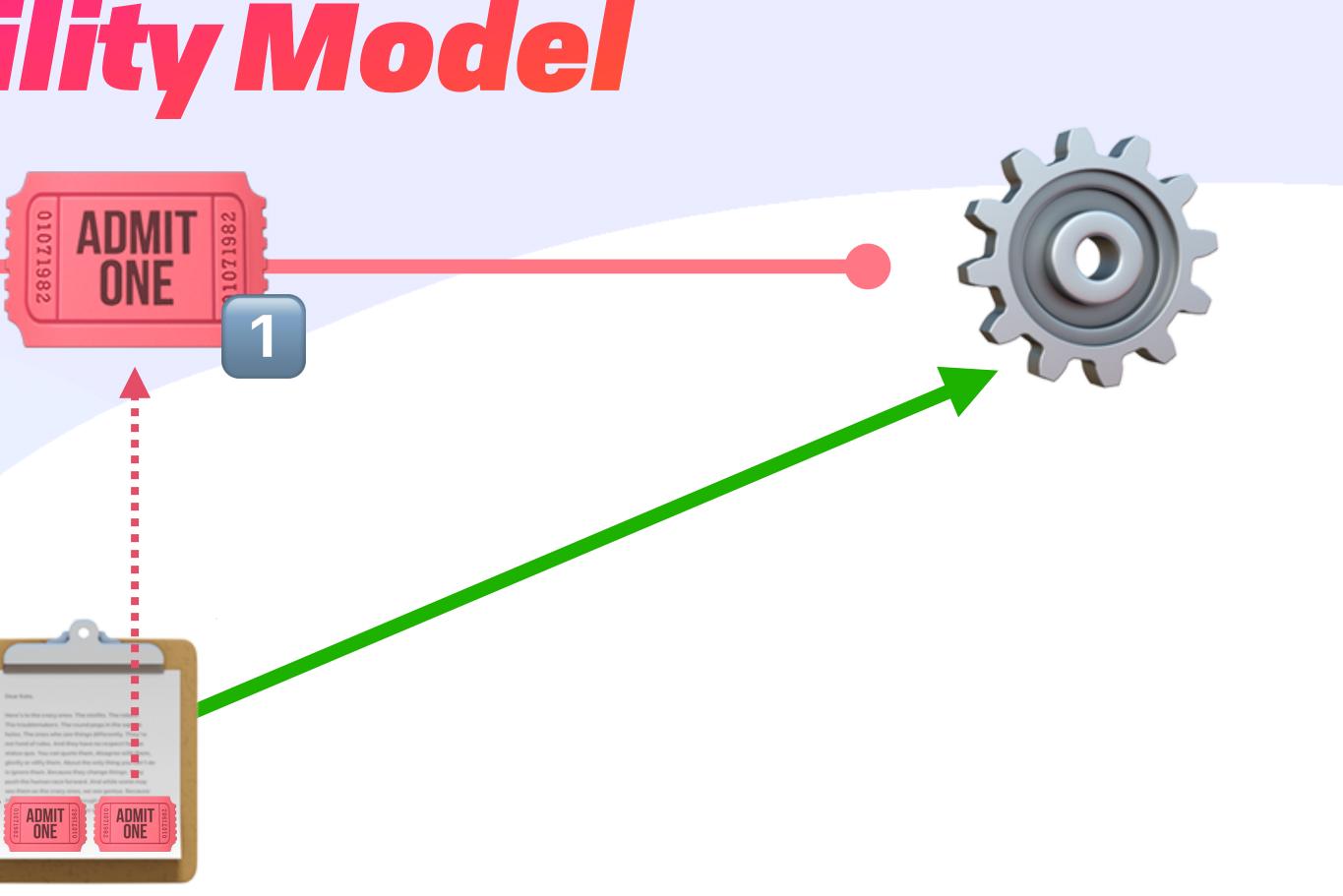
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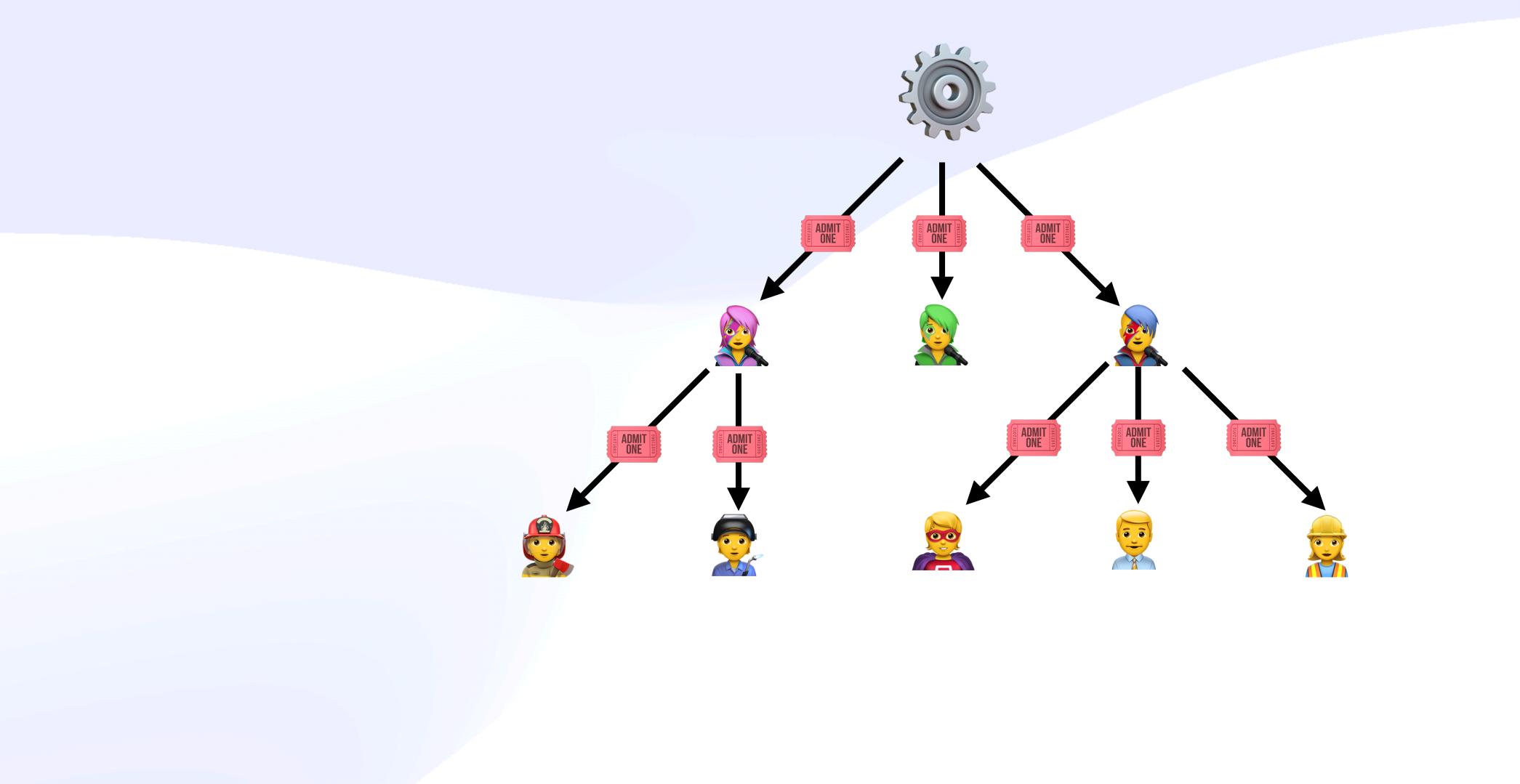




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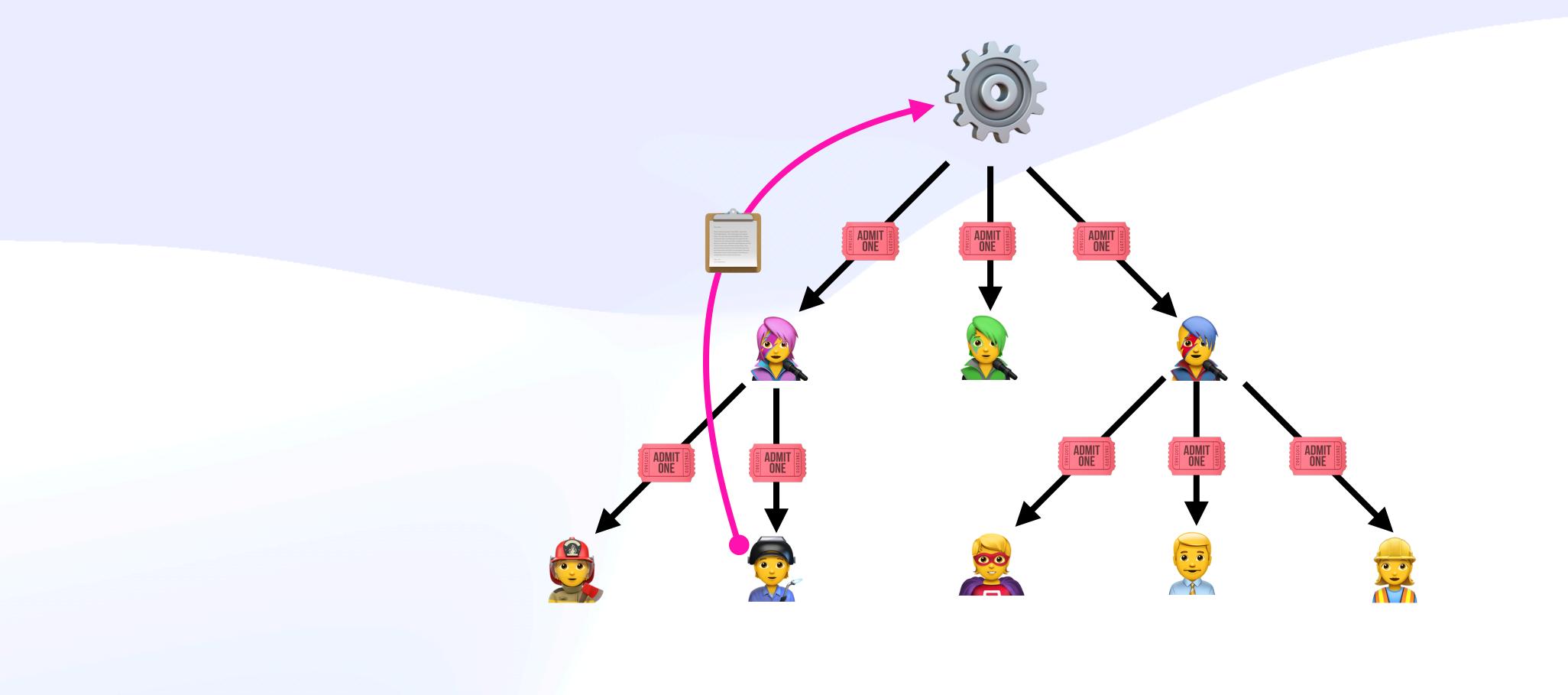


Schools of Thought **On a Need to Know Basis**





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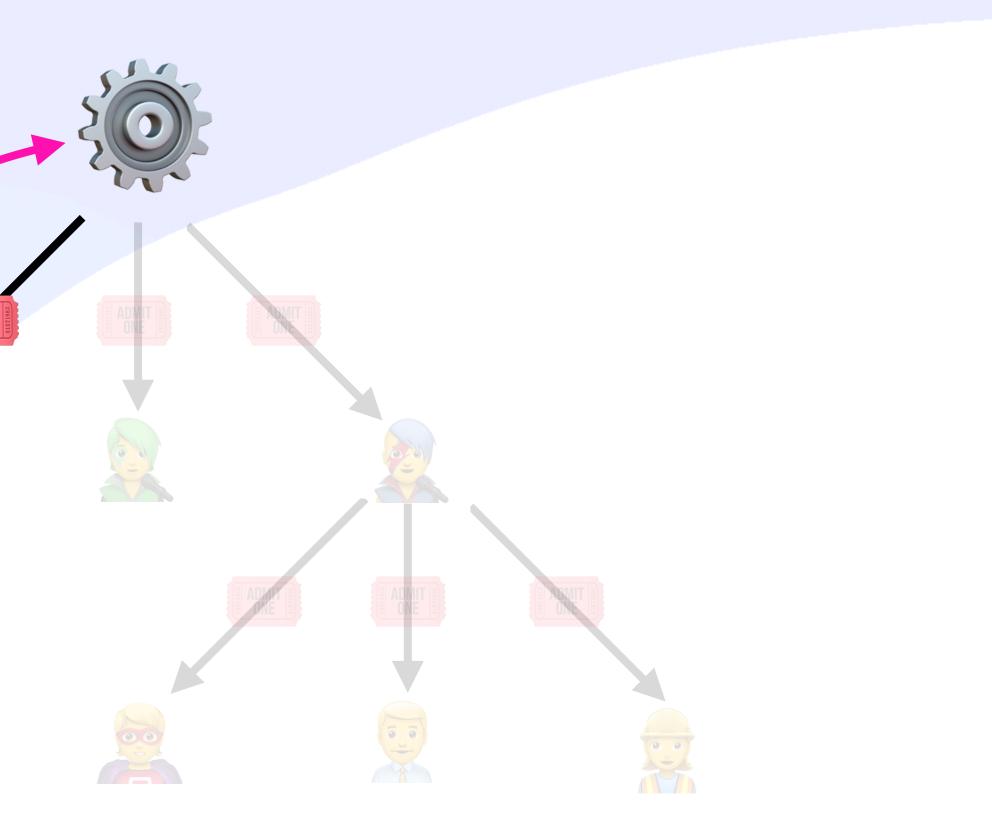


Schools of Thought **On a Need to Know Basis**



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ADMIT One



Schools of Thought AuthFlow

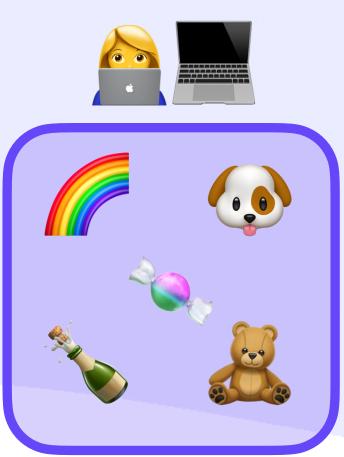


Schools of Thought AuthFlour Schools of Thought



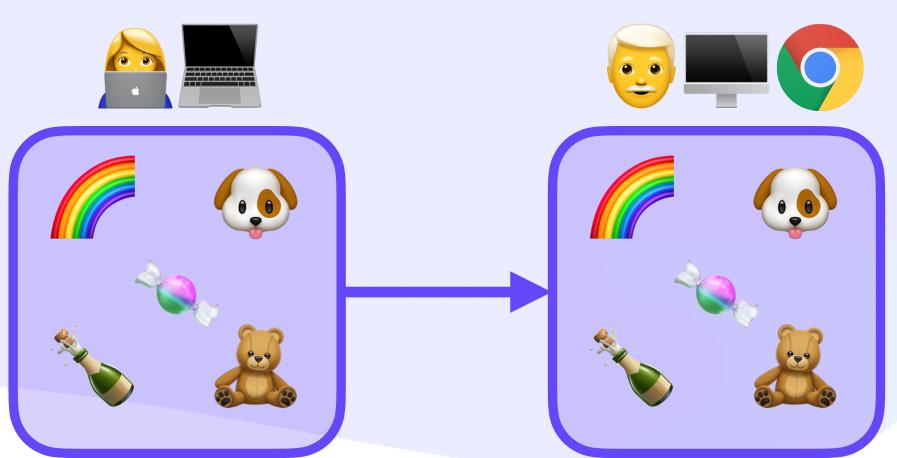




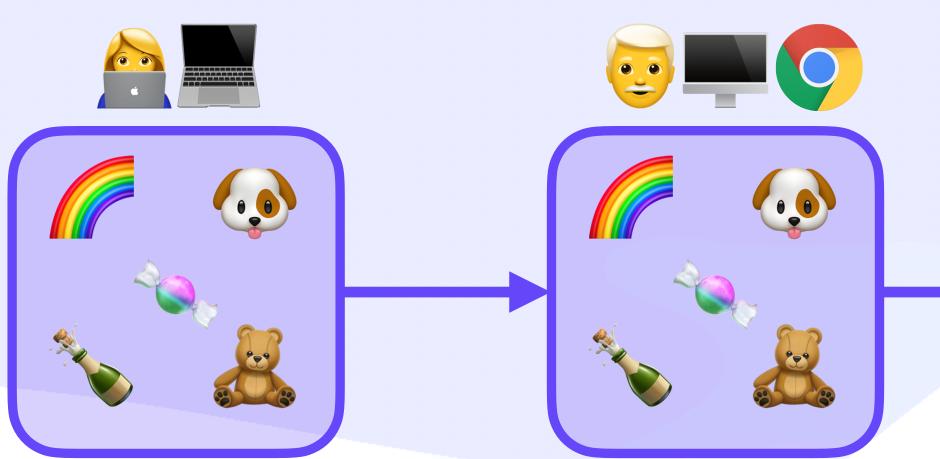


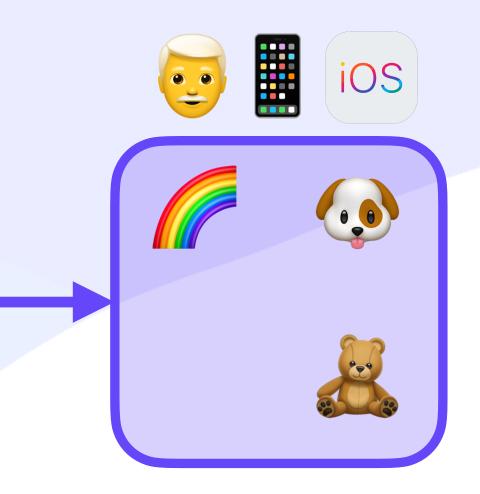


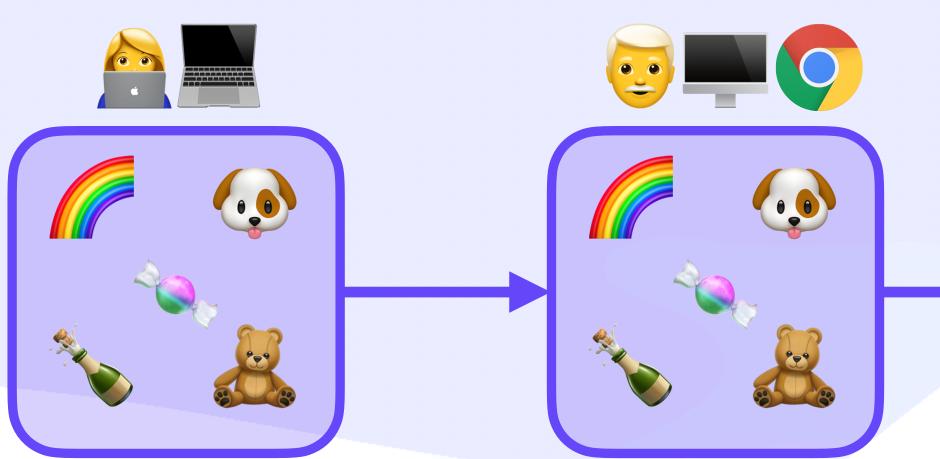


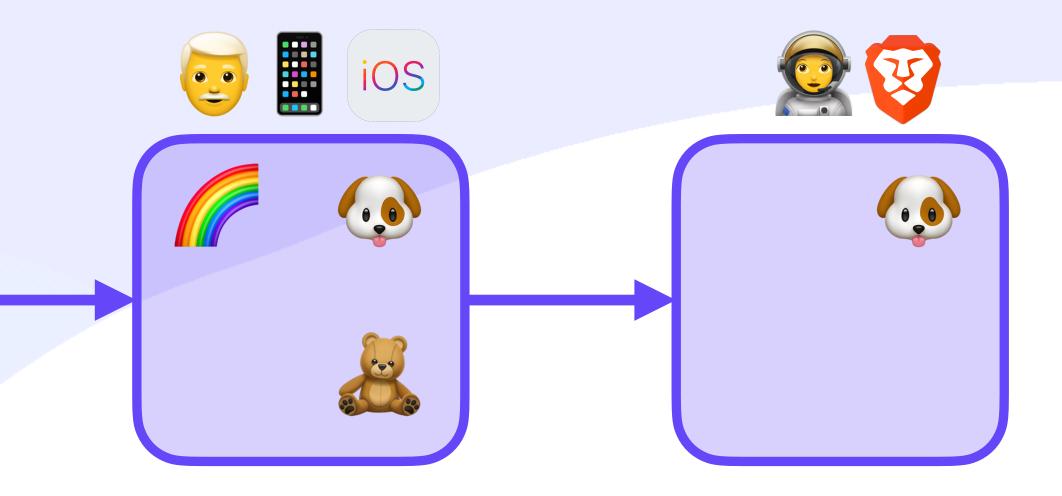




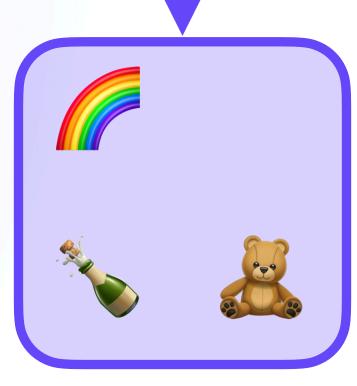




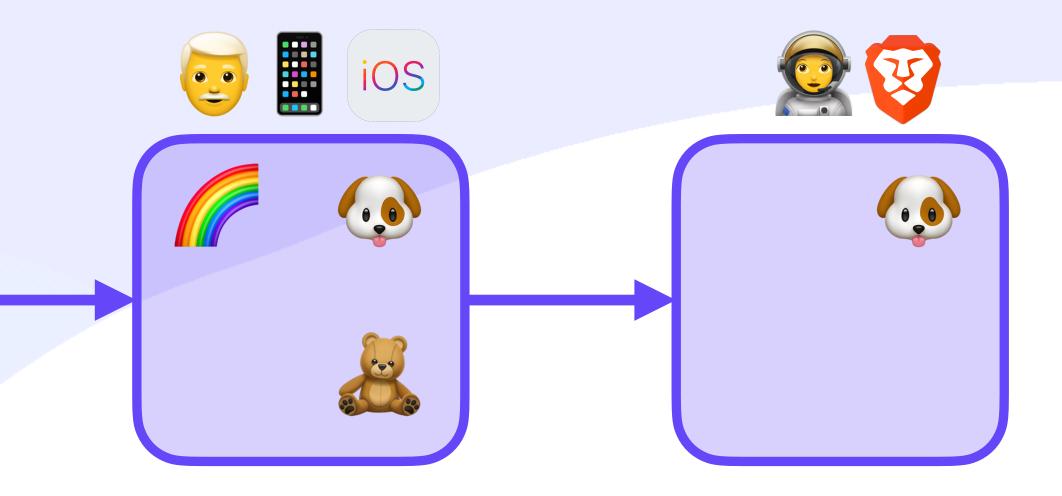




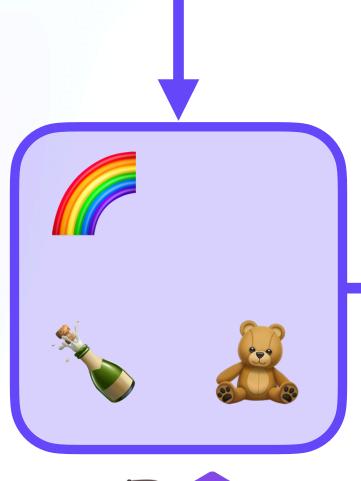




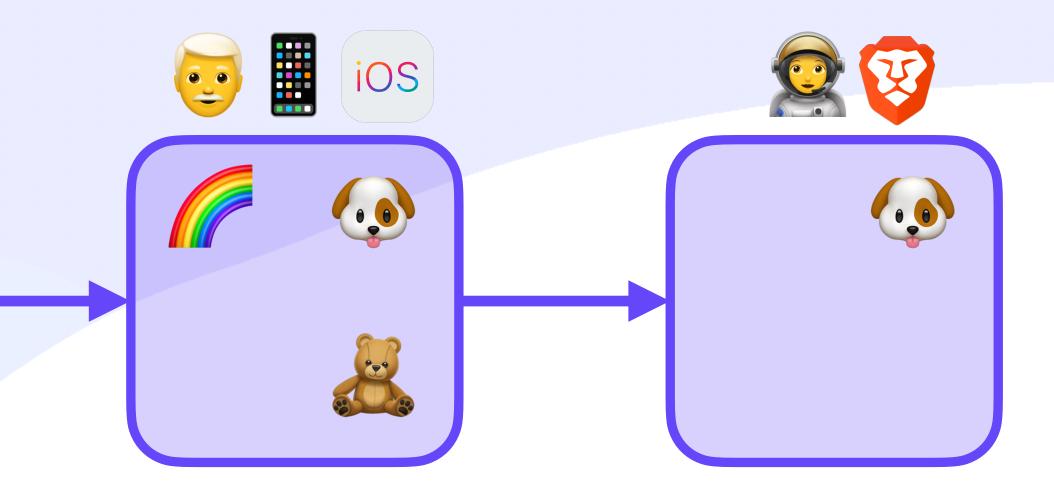


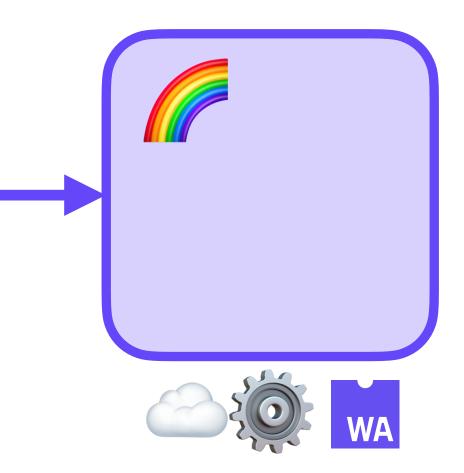




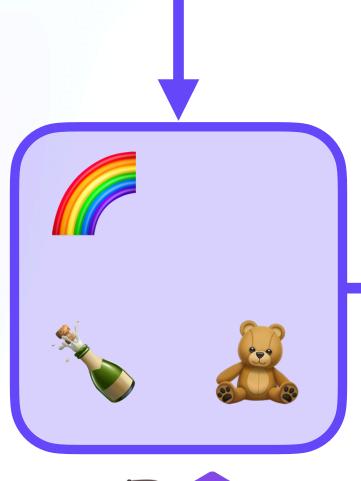




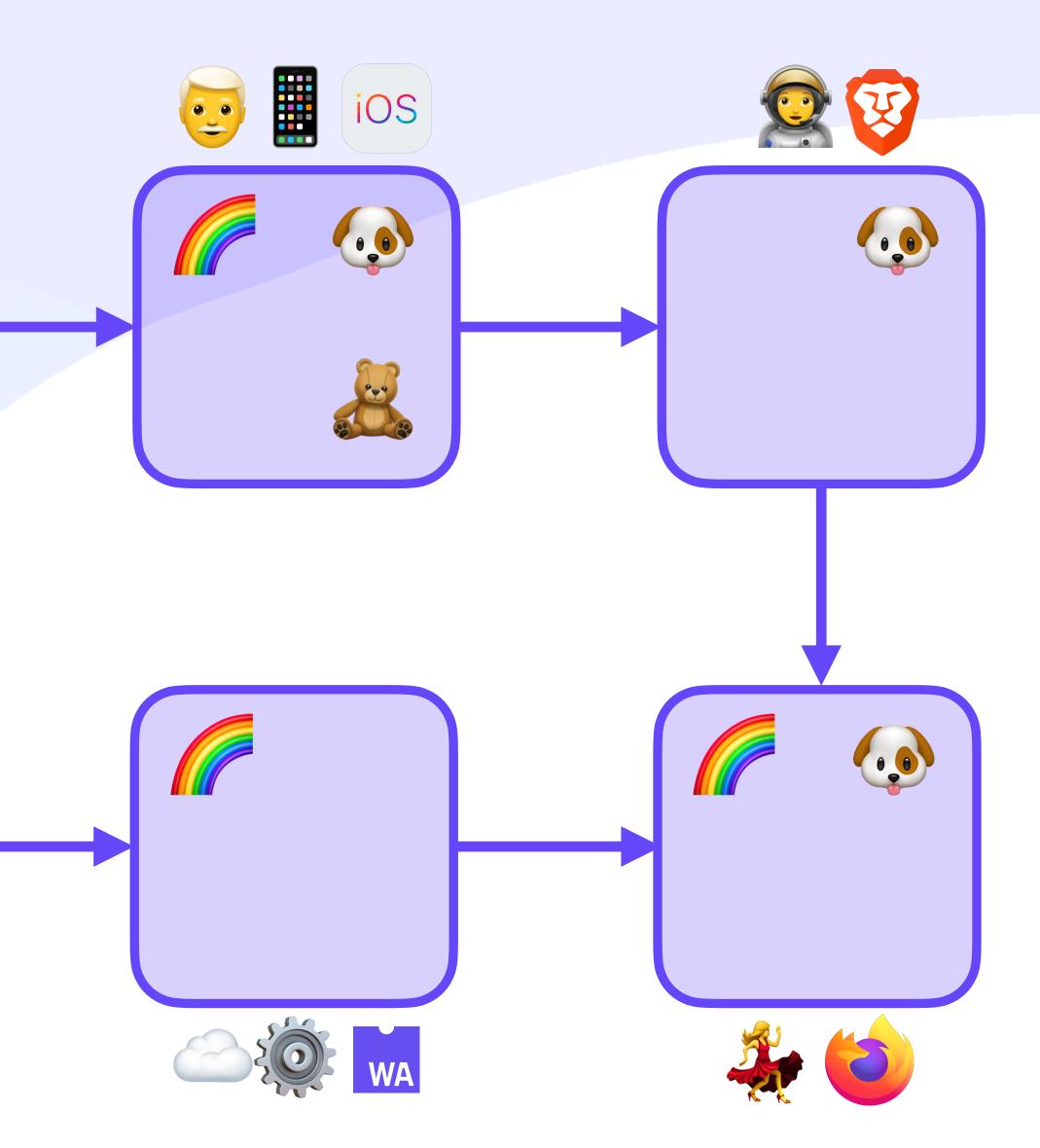




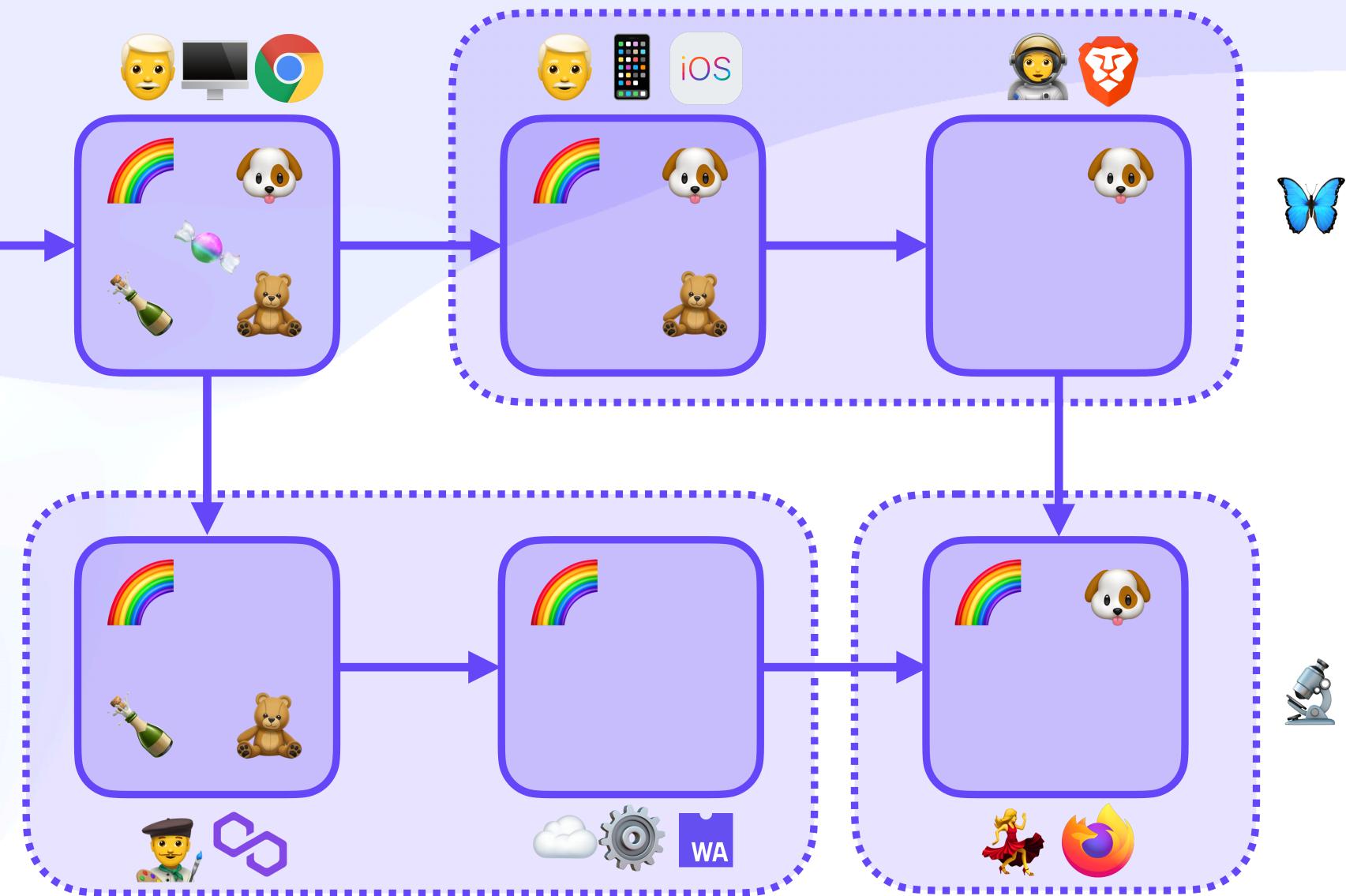






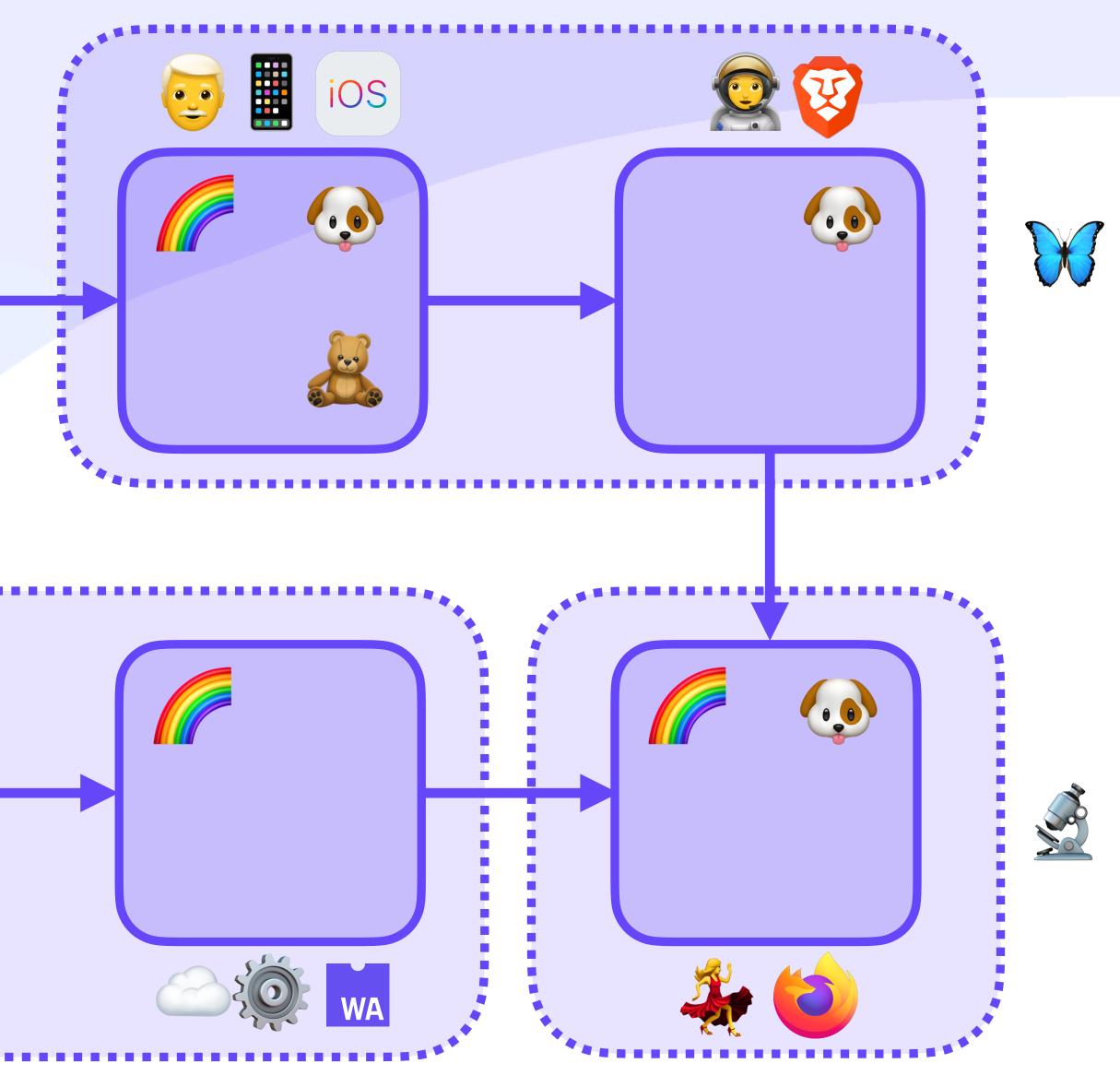
















Raw Mechanics Checking Chains About: About: From: 🧕 From: To: 😣 To: 🧕 **Can:** [00,] **Can:** [00,]

















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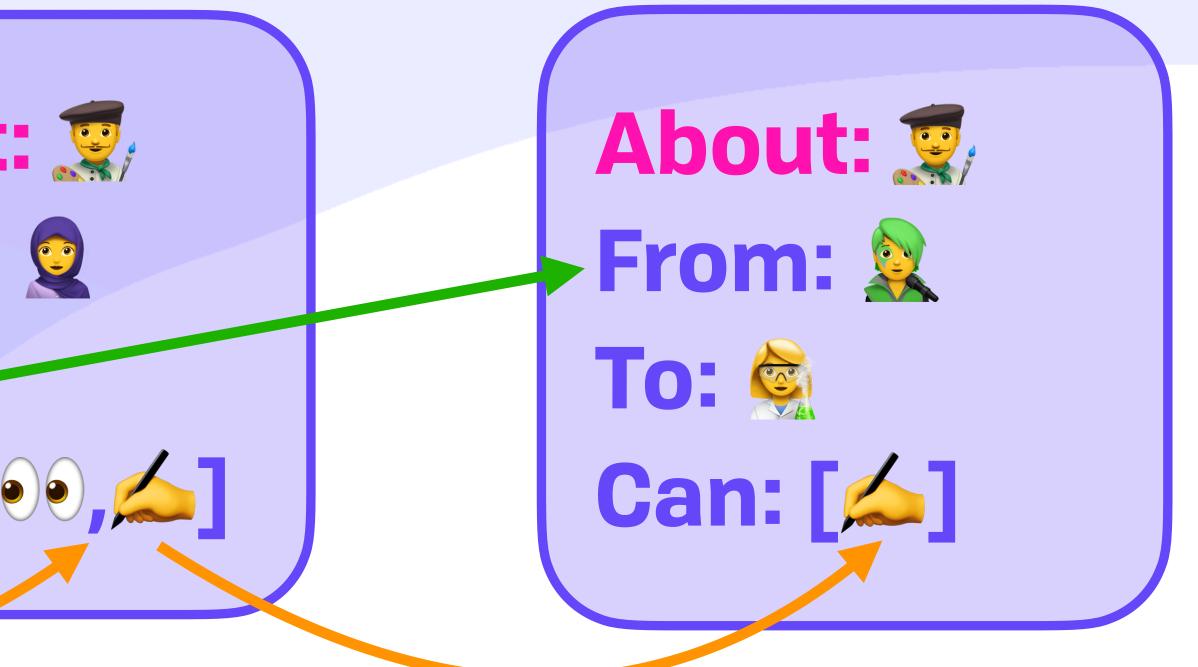


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Raw Mechanics Syntactically Driven

```
iss: "did:key:alice",
aud: "did:key:bob",
sub: "did:key:doc"
cmd: "/automerge/update",
pol: [
  ["gt", ".foo[1].bar", "42"],
  ["eq", ".prev", 0x98ea6e4f216f2fb4b69fff9b3a44842c38686ca685f3f55dc48c5d3fb1107be4]
                                    iss: "did:key:bob",
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                                    sub: "did:key:doc"
                                    prf: [hash(delegation), hash(more_chain)]
                                    cmd: "/automerge/update",
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                                      foo: [
                                        \{bar: 100\}, // > 42
                                        {quux: "unconstrained"}
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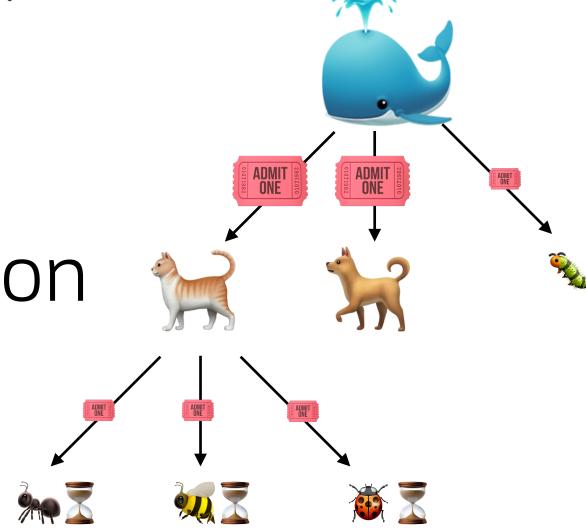
```
{quux: "unconstrained"}
```



The Freedom of Least Authority Ad Hoc Caveats

- Agents are abundant
 - Few human system administrators
 - Billions of throwaway single-purpose workers m
- Arbitrarily restrict authority
 - i.e. don't even allow an LLM to hallucinate intention









The Freedom of Least Authority Minimal Surface Area

- Avoid the confused deputy problem
- UCAN
 - Executor never runs under their own "ambient authority"
 - All info in request: run with exactly that level of auth
 - "Just run with the handle you were handed"



(Happens when an agent uses their authority to fulfil a request)



Capabilities Worldview Honest Model, Simple to Use

- "If you have it, you can use it & share it"
- Closely models auth ground truth
- Natural programming model "like passing handles"



Resources (Some) Existing Subprojects

- https://github.com/ucan-wg/
 - Specs & Improvement Proposals
 - v1.0 "any moment now"
- ts-ucan
- rs-ucan
- go-ucan
- hs-ucan
- AWAKE secure channels & login



https://ucan.xyz https://github.com/ucan-wg

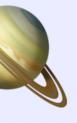


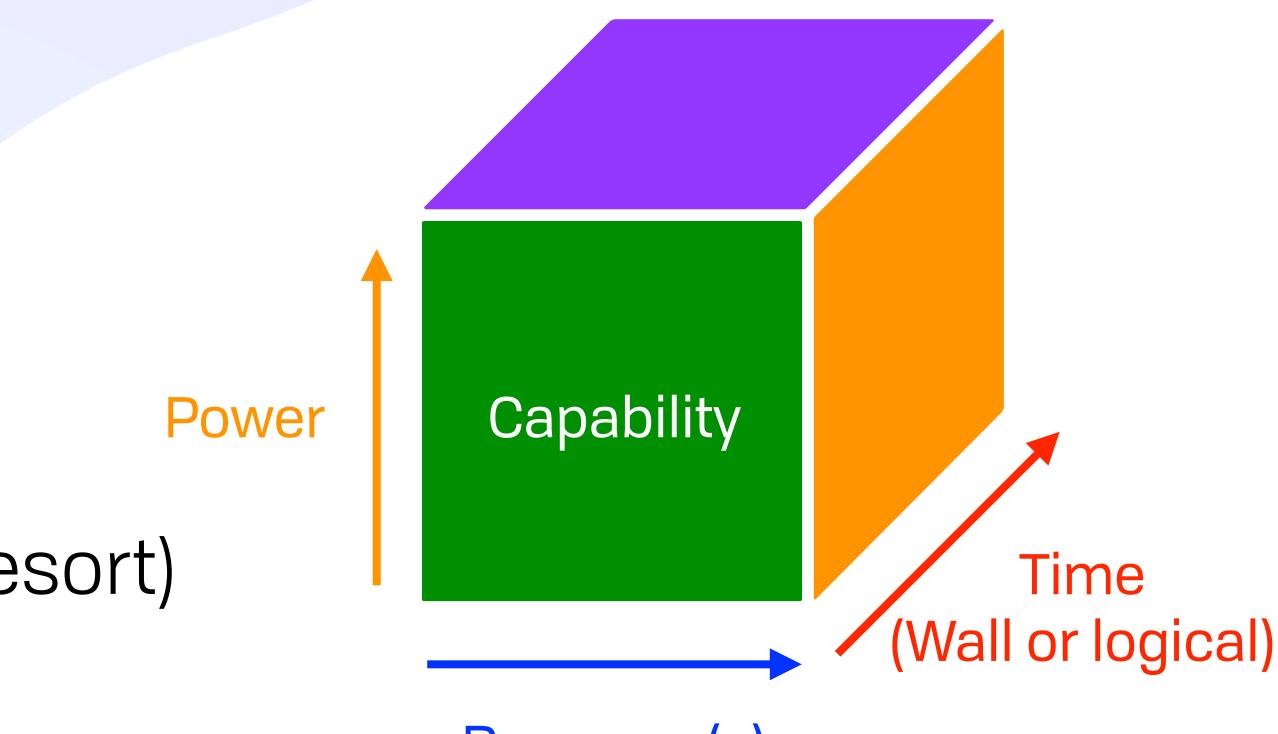
Thank You, Berlin

github.com/expede @expede

The Freedom of Least Authority Capability Space

- Fewest resources
- Lowest amount of power
- Least amount of time
- (Revocation considered a last resort)





Resource(s)

