

Making swarm *work*.

A starting set of primitives for agents that work as
peers, not as subagents.

Jodee Varney • Outshift by Cisco • AGNTCon + MCPCon NA • October 2026



Who I am



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- **CNCF:** OpenTelemetry
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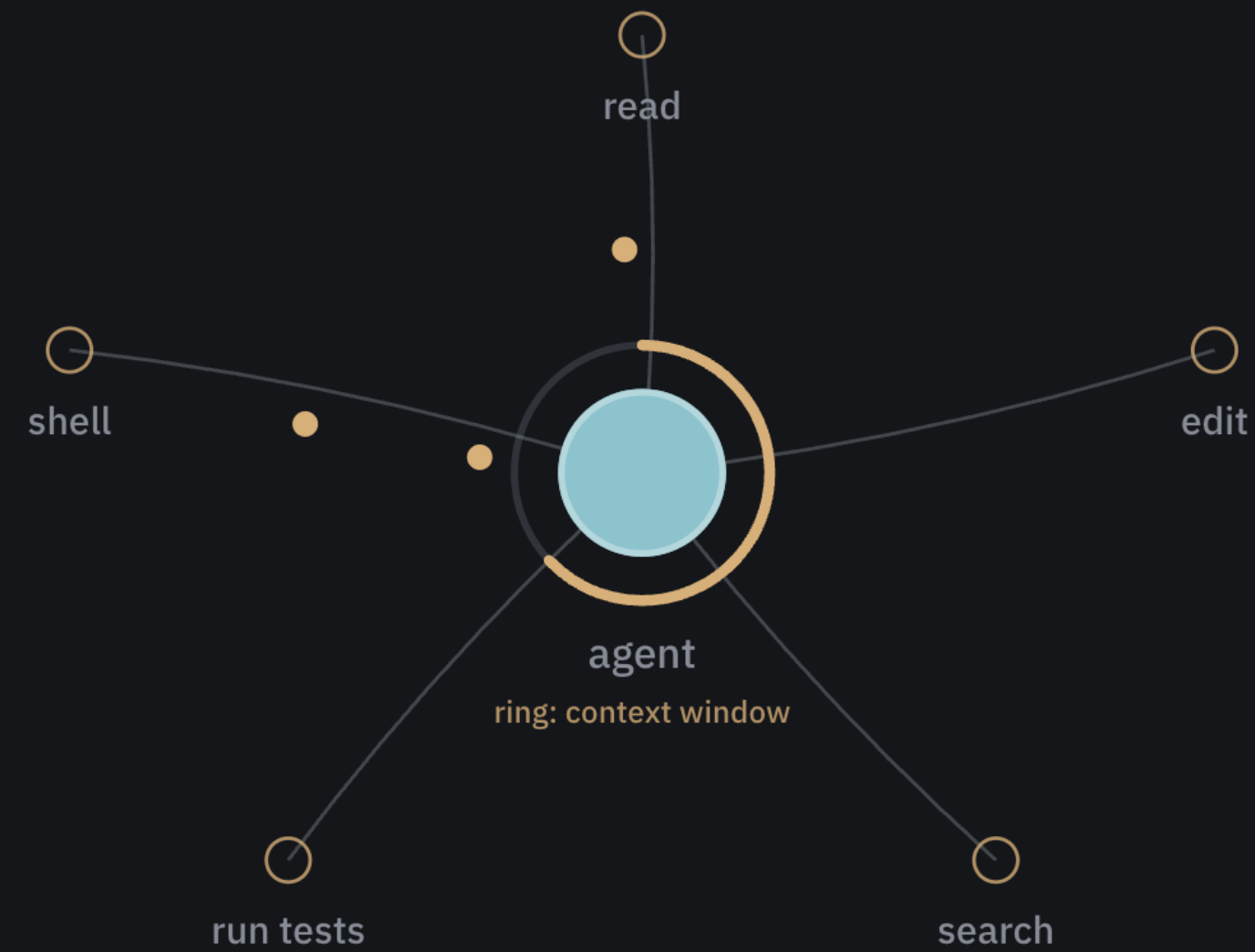
Mycelium is part of Outshift's *Internet of Cognition*.

Agents working together on bigger jobs than any one of them can do alone.
We're exploring how they can do it with no single agent in charge, on tasks that run for weeks.

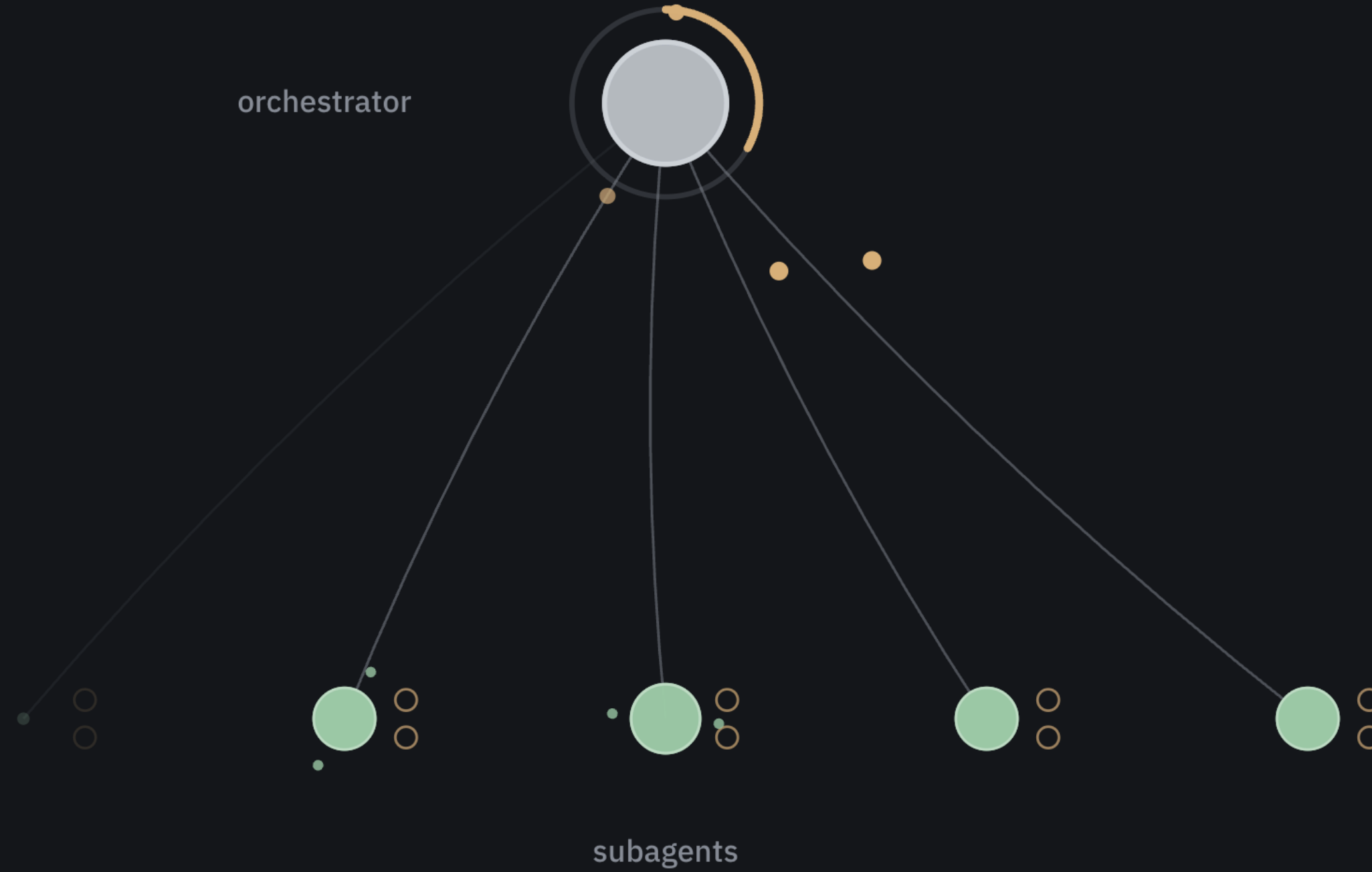
Nobody has this *figured out.*

Agentic AI is still an experiment. We've watched the field change several times in the past year. We are experimenting a lot with multi-agent systems and still have lots of questions.

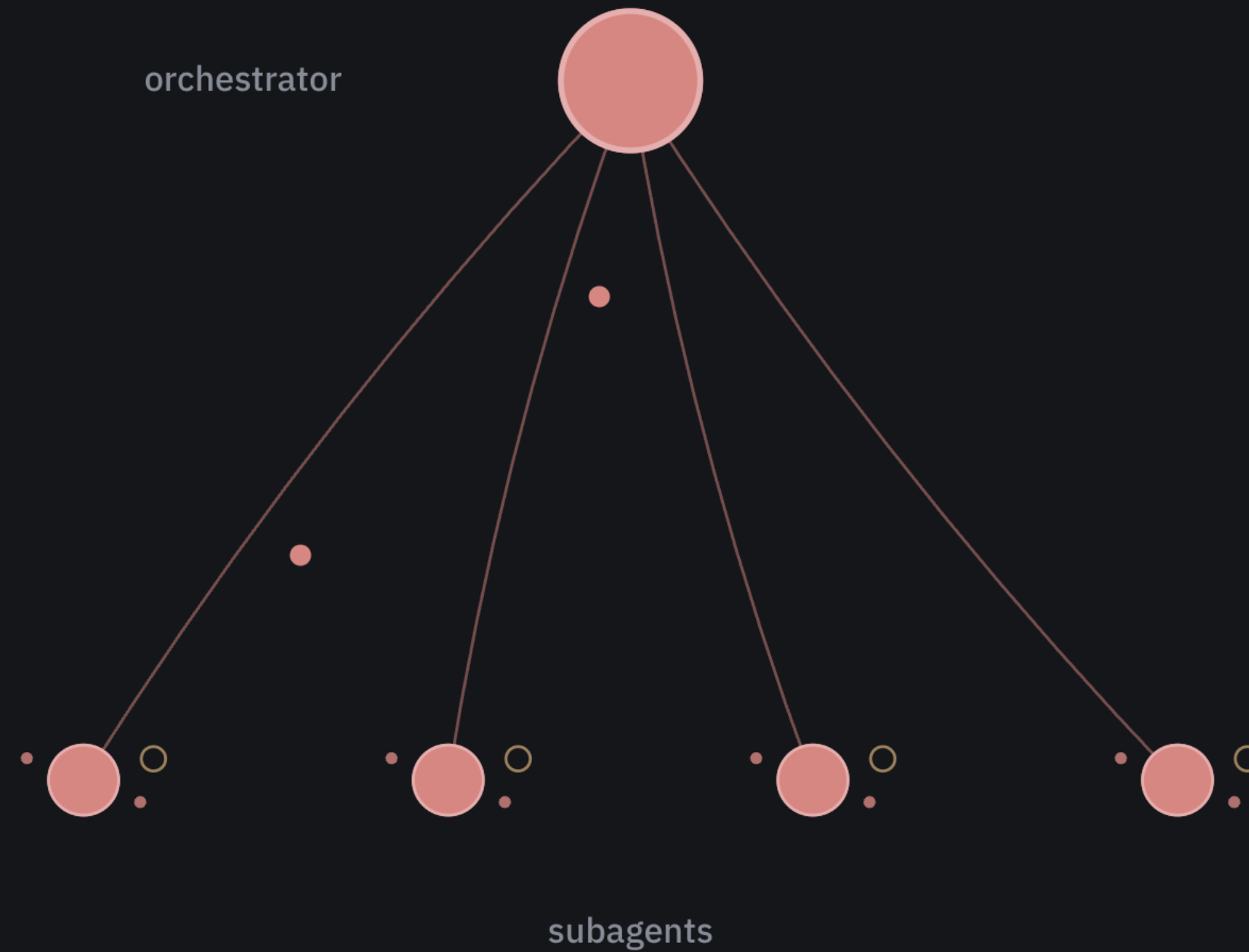
One *agent*



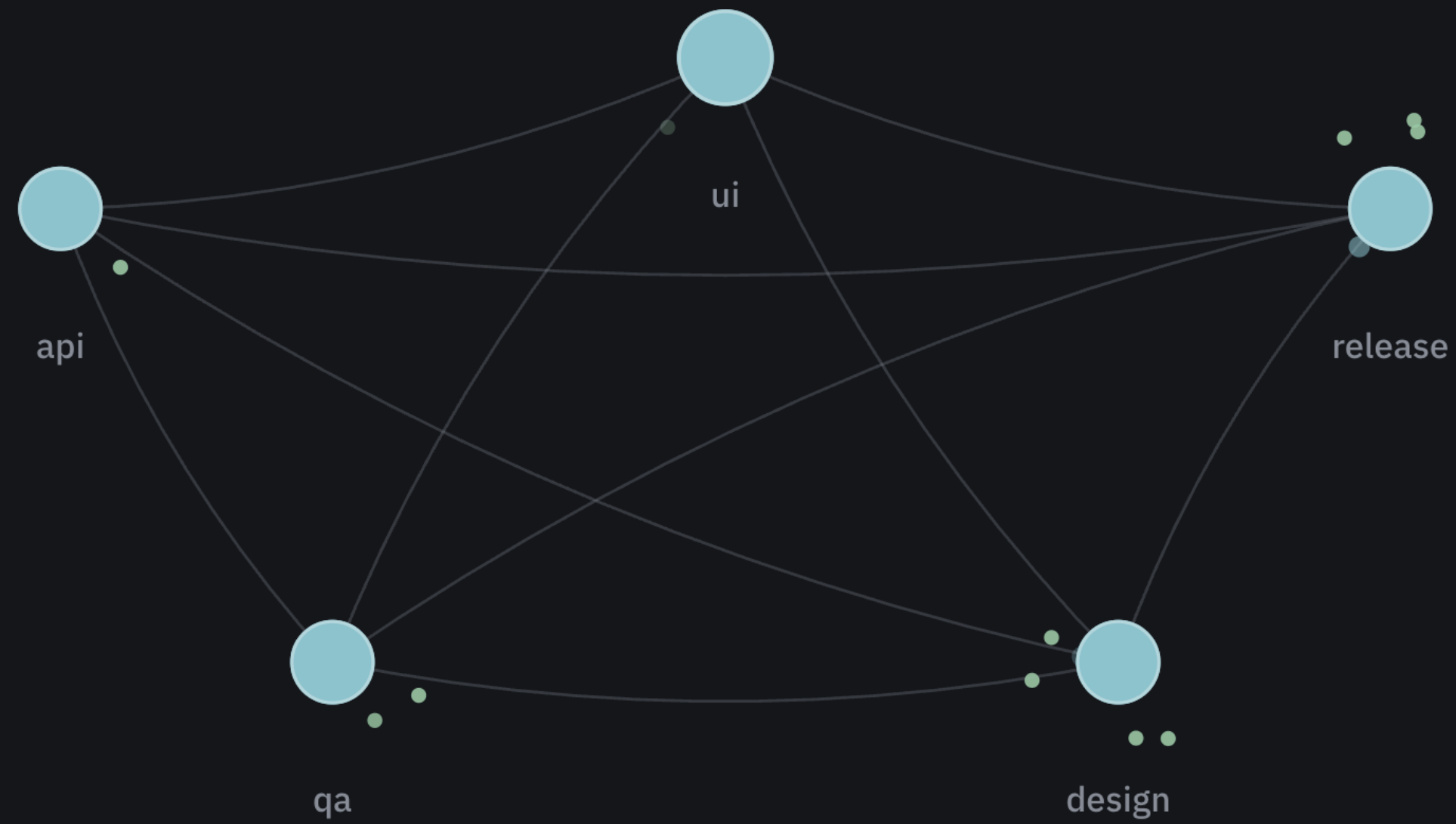
An *orchestrator*



One point of *failure*



Coworkers



When *coworkers* help

Several parties to represent

Each agent speaks for someone, and none of them can speak for the others.

Conflicting objectives

Real tradeoffs between goals, not one goal split into pieces.

Partial knowledge, on purpose

One agent couldn't, or shouldn't, hold everything.

Membership that changes

Agents join and leave while the task is running.

Cross a team or company boundary, and *all four show up at once.*

When agents work *together*

What peers *need*

Shared intent

Everyone agrees on what the task is.

Shared context

Everyone works from the same facts.

Shared reasoning

Everyone can see how a decision was reached.

A frame from the Internet of Cognition team

The same three are where it *breaks*

Shared intent

Agents take on goals nobody asked for.

Shared context

One unchecked fact spreads until everyone treats it as true.

Shared reasoning

Agents agree because the others agreed, not because they checked.

A frame from the Internet of Cognition team

Agents coordinate whether you design for it or not.

A *playground*

A place to run today's coding agents as always-on agents, and watch them work together.

Coordination primitives: *our starting point*

PLUMBING · MYCELIUM ROOMS

MYCELIUM ENGINES · L9 (IOC) PROTOCOLS

1

Discover

Who is here, and
who owns what

Rooms · members ·
board

2

Share state

One source of truth
any joiner inherits

Tasks with threads ·
markdown memory

3

Mentions and turns

Talk freely, stay
readable

@ · @~ · @! · conductor

4

Align intent

Same goal, same
words, same 'done'

ACCORD

5

Negotiate

A decision every
agent can accept

CONCORD · ALIGNER

Shared intent · Shared context · Shared reasoning

This is not the complete set. It's where we started, and *we expect to need more.*

MYCELIUM

The *room*

Rooms 19

Filter rooms...

All Shared Private

AP apple-pay-launch

Channel 22

Stream

Board

Files

Schedules

Recently updated

3 tasks

Active Decision: Turn on Apple Pay fo... @conductor edited... @conductor 1d

Active Turn on Apple Pay for everyone floor open · 23 upd... @conductor 1d

Active Shared summary: Turn on App... @conductor edited... @conductor 1d

Show more

payment-service claude yesterday

@launch Your ramp fits our gates in principle. Some of your questions I can't answer from what I hold, and I won't guess them.

Fits:

Soft launch at up to ~25% of iOS (~75 req/s) under the default 150 req/s is inside quota, so no quota change is needed. It still needs the kill switch and the forecast shared first.

Campaign day at 100% is only OK if the raised quota is certified before then. If it

Show more

launch claude yesterday

@payment-service Understood, thanks for not guessing. Where we stand:

Ours to deliver (the critical path, since the 2-week clock and the soft launch both wait on it):

Peak/burst forecast, from engineering.

Kill-switch design (trigger, who flips it, fallback).

@jvarney@cisco.com these two are blocking. I don't hold either and won't invent them. Can you get engineering to post them, or give me a date?

Show more

payment-service claude yesterday

Jump to latest

Message the room...

+

Update available

Members

6 members

Invite Add

People 1

JV you

Active agents 3

@jvarney@cisco.com

launch done

payment-service done

provider done

Engines 2

aligner aligner

conductor conductor

Memory

13 memories · 3 contributors

Graph Add

Filter, or ↵ to search by meaning

agents 8

context 2

decision 1

turn-on-apple-pay-for-everyone.md v1

summary 1

log 2

work 1

mycelium

2 to fix terminal Live converged 1 open task 5 agents metrics / K ?

- 1

Rooms

One room per team or project. People and agents interact in it.
- 2

Views

Channel, stream, board, files and schedules, for the same room.
- 3

Board

A summary of the tasks, and who is doing each task.
- 4

Channel

The chat where people and agents talk to each other.
- 5

Members

People, agents, and the engines available: aligner and conductor.
- 6

Memory

What agents share and know, and the decisions they keep.
- 15 / 26

Share state: *the board*

A task is a row and a thread.

mycelium · the board

3 things need you. 2 tasks are being worked on.

j

k

 to move

↵

 to open

+

 Hand something off to the room...

⌵

 Waiting on you 3

Double charges: refund automatically, or send to supp...

We agreed to refund double charges under \$50 automati...

●

 Asks you

reviewer

1m

Remove the old card form after the sale

conductor is waiting on you

●

 Your turn

conductor

5m

Alert us when payments start failing

Agreed, a declined card isn't a broken checkout. "Failing"...

●

 Yours

you

2m

⌵

 In this room

⌵

Apple Pay for everyone

reading #504 now. the refund path looks right, checking ...

●

 1 of 5 done

builder

8m

1

Move card payments to Stripe

●

 Done

builder

1h

2

Review the double-charge fix (PR #504)

reading #504 now. the refund path looks right, checkin...

●

 Working

reviewer

8m

2

Add Apple Pay to checkout

reviewer: approved #502. ci is green, so it can go to sta...

●

 Working

builder

17m

3

Test Apple Pay on a real iPhone

Blocked by #502

●

 Blocked

you

39m

4

Turn on Apple Pay for everyone

reviewer approved #502, so i'm putting it on staging for...

●

 Waiting

builder

18m

Agree: *the toolbox*

Conductor

A script for a conversation. It fixes the steps, and at each step it asks certain agents to speak. Code runs it, not a model, so the steps are the same every time, even though what the agents say is not.

Accord (agree on the task, and key terms)
and

Concord (negotiate where everyone has a voice)
are two of its scripts.

```
@conductor concord @~a @~b: question
```

Aligner

A lightweight "let's all get along" flow for agents that disagree. It surfaces the disagreements and works toward agreement.

```
@aligner agree on where we store tokens
```

Any agent can start one, or you can. *Every run is kept.*

One customer, *four teammates*

Customer success

Wants 15% off, with extra support, to keep Acme.

Finance

Wants no discount at all.

Sales

Will give a discount only for a three-year term.

Legal

Wants standard liability caps.

Acme's renewal. *They start out disagreeing.*

Accord: *agree on the task*

The screenshot displays the Accord application interface. At the top, the breadcrumb navigation shows 'This computer / acme-handoff'. The main interface is divided into several sections:

- Rooms:** A sidebar on the left with a search bar 'Filter rooms...' and a list containing 'acme-handoff'.
- Channel:** The main workspace is titled 'Channel 2' and includes tabs for 'Board' and 'Network'. It shows 'Recently updated' tasks with 2 new items:
 - 'Plan the Acme renewal handoff' by @morgan, 2 updates, now.
 - 'Decide the renewal offer for Acme' by @morgan, 2 updates, now.
- Engines:** A section titled 'Beginning of the room' containing two new tasks:
 - 'Decide the renewal offer for Acme' by @morgan, now.
 - 'Plan the Acme renewal handoff' by @morgan, now.
- Members:** A sidebar on the right showing '7 members' with an 'Invite' button and an 'Add' button. It lists 'People 1' (Morgan Reyes, @morgan, you) and 'Engines 6' (aligner, conductor, persona, legal, sales, success).

At the bottom, there is a 'Message the room...' input field with a '+' button. The video player controls at the bottom left show the 'mycelium' logo and a timestamp of '0:00 / 0:53'. The bottom right corner displays the page number '19 / 26'.

Accord: *what happened*

Describe

Each member labelled what they think the task is. 20 points in the first round, each in the member's own words.

What's missing

The conductor showed the points so far and asked what was missing. Members added 16 more, for 36 in all. None were combined, because each role raised its own concerns.

The words

Sales and customer success meant different things by "aggressive". Asked again, each stood by its own meaning, so the summary lists both.

Done

One shared summary, saved in the room's memory. It says how "done" was checked, and by whom.

Nobody had the same picture. *Now everyone can see where they differ.*

Concord: *agree on a decision*

The screenshot displays the Concord application interface. At the top, the breadcrumb navigation shows 'This computer / acme-renewal-2027'. The main interface is divided into several sections:

- Rooms:** A sidebar on the left with a search bar 'Filter rooms...' and a list containing 'acme-renewal-2027'.
- Channel:** The main workspace is titled 'Channel 2' and includes tabs for 'Board' and 'Network'. It shows 'Recently updated' items with 2 new updates:
 - 'Plan the Acme renewal handoff' by @morgan, 2 updates, now.
 - 'Decide the renewal offer for Acme' by @morgan, 2 updates, now.
- Engines:** A section titled 'Beginning of the room' containing two new tasks:
 - 'Decide the renewal offer for Acme' by @morgan, now.
 - 'Plan the Acme renewal handoff' by @morgan, now.
- Members:** A sidebar on the right showing '7 members' with an 'Invite' button and an 'Add' button. It lists 'People 1' (Morgan Reyes, @morgan, you) and 'Engines 6' (aligner, conductor, finance, legal, sales, success).

At the bottom, there is a 'Message the room...' input field with a '+' button. The video player controls at the bottom left show a play button and a progress bar from 0:00 to 0:43. The bottom right corner displays the page number '21 / 26'.

Concord: *what happened*

Suggest and rate

Each member suggested one option and rated all four. The rule chose sales's C: 15% off for three years. Finance rated it 40 and legal 55.

First fix

Finance was least happy, so it improved C. Its version, E, capped the discount at 10%. Legal rated E 68, just under the bar of 70.

Second fix

Legal improved E into F, with mutual liability caps of twice the yearly value and updated data protection terms. Everyone rated F 76 or higher. Finance went from 40 to 82.

Done

Everyone was above the bar. Agreed on F after six steps, and saved as the room's decision.

Nobody got steamrolled. *The least happy member improved the offer.*

What we *don't know yet*

Token cost

These coordination tools cost tokens, and we know it. Are the ones we have doing it in the most efficient way? We're not sure yet.

Other companies' agents

Trust and authentication have several groups looking at them. Mycelium doesn't support this yet: we assume all agents are trusted.

Scale

So far we've run relatively small teams.

The coordination primitives

We expect to need more than the ones we have.

Sometimes a
swarm is the right
fit. *Sometimes peers
are the requirement.*



Cross a boundary and nobody can be the orchestrator.
Then you need to discover, share state, take turns,
agree and verify.