How identity works: a day in a life
Across borders and virtual worlds

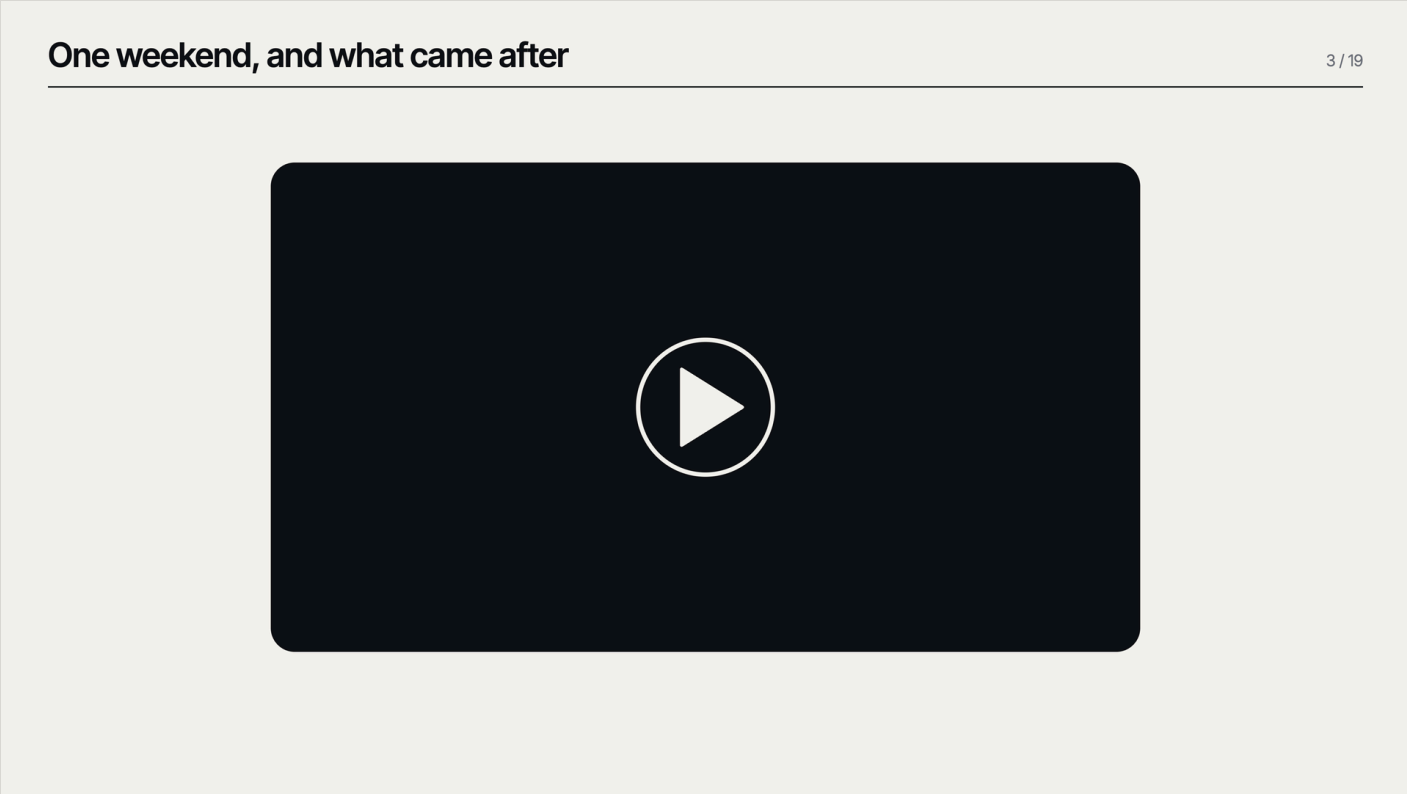
Thursday 24 September 2026


How identity works: a day in a life
Across borders and virtual worlds
Grig Bilham
MSF Ecosystem Working Group
24 September 2026



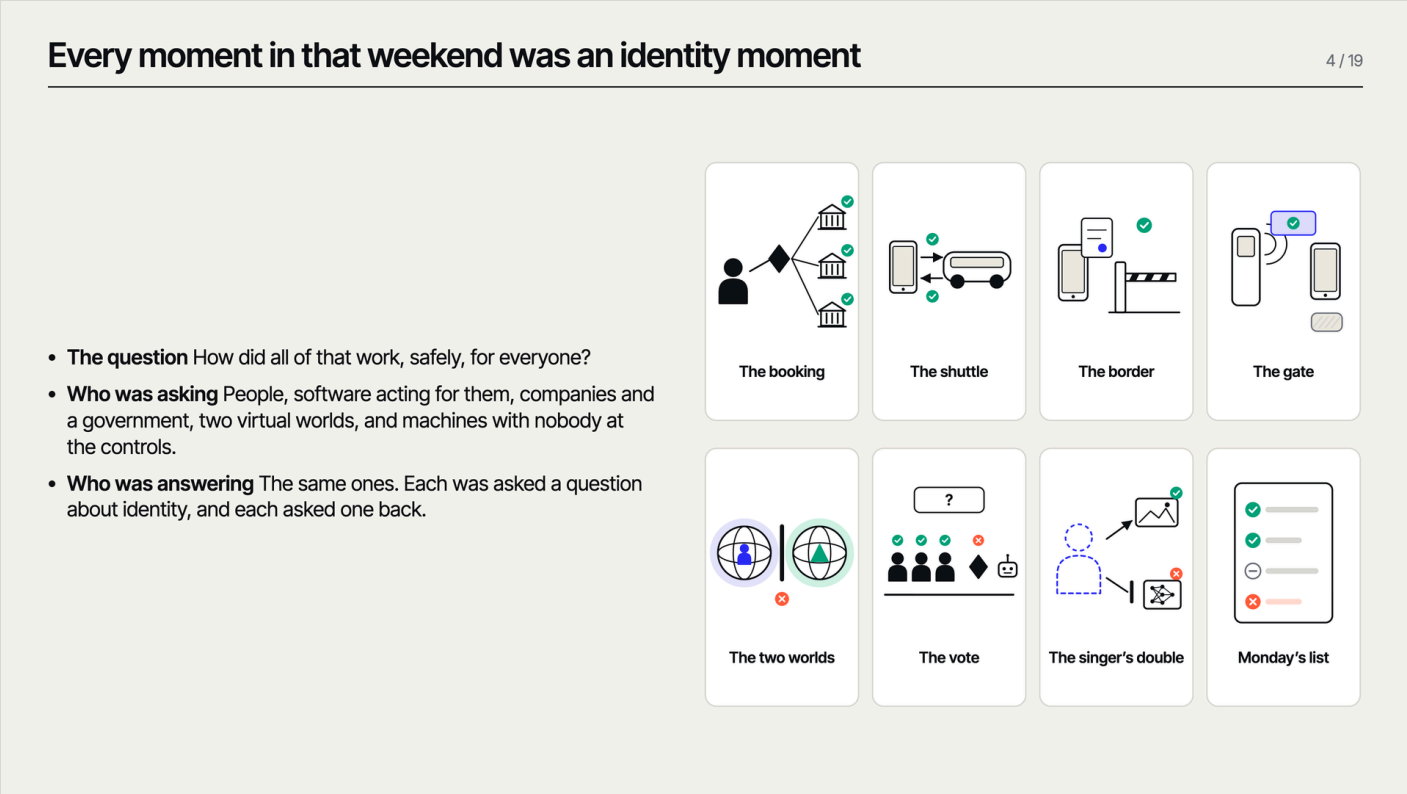
Good morning, and thank you for the time. I'll show you one weekend, and what came after it. A traveller crosses a border to a festival that also runs in two virtual worlds, and along the way people, their software, companies, worlds and machines all need to know a little about each other. Then I'll spend the rest of my time on how it worked.

3 One weekend, and what came after



Here it is.

4 Every moment in that weekend was an identity moment

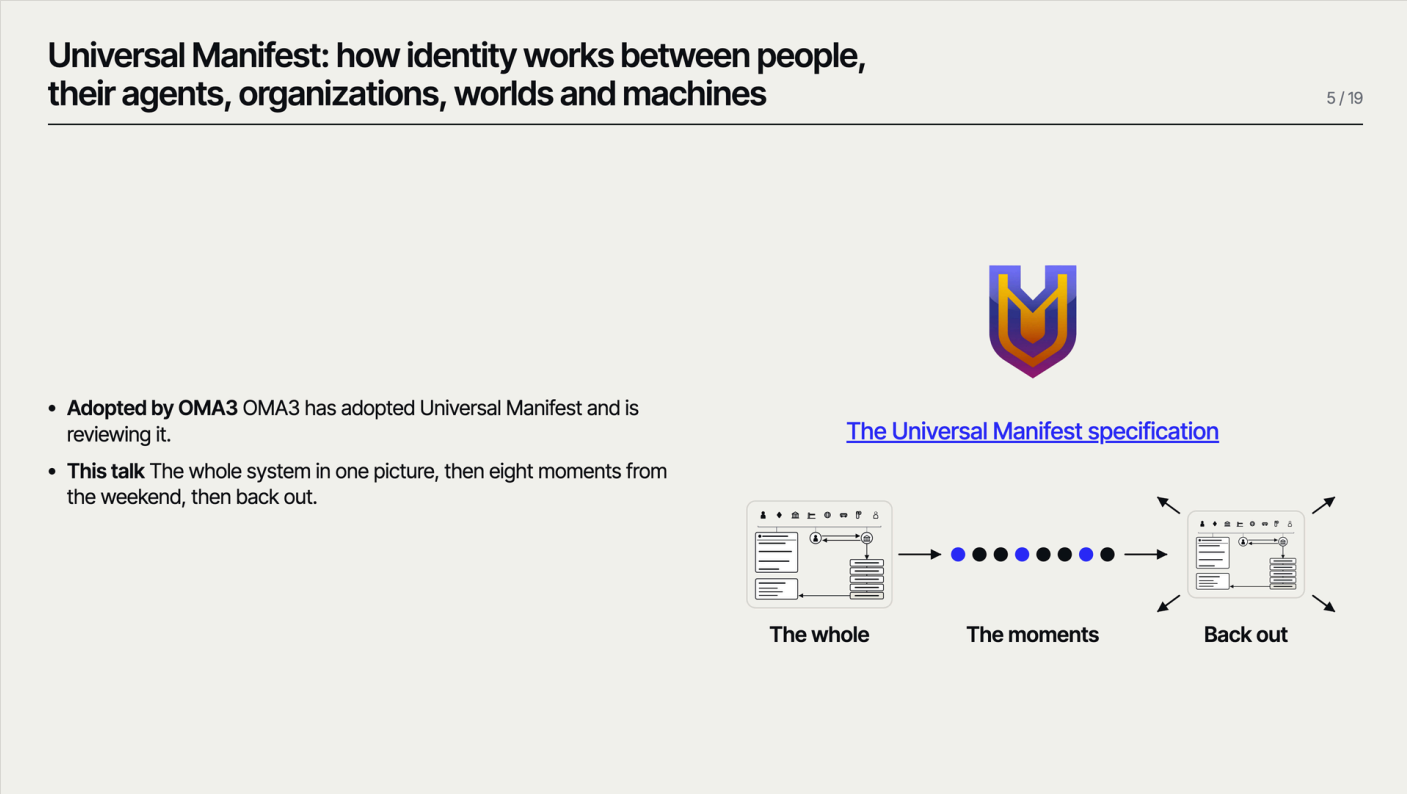


The video ends on the question I want to spend my time on. Every moment in that weekend was an identity moment. How did all of that work, safely, for everyone?

Some of those moments looked like identity, like the border and the gate. The booking on Friday evening was one too, though it didn't look like it. In every one of them, one side had to learn one thing about the other, be sure it was true, and learn nothing more.

Look at who was asking: people, software acting for people, companies, a government, two virtual worlds, a machine with nobody at the controls, and a scan of a singer that outlived the weekend. Every one of them was asked a question about identity, and asked one back.

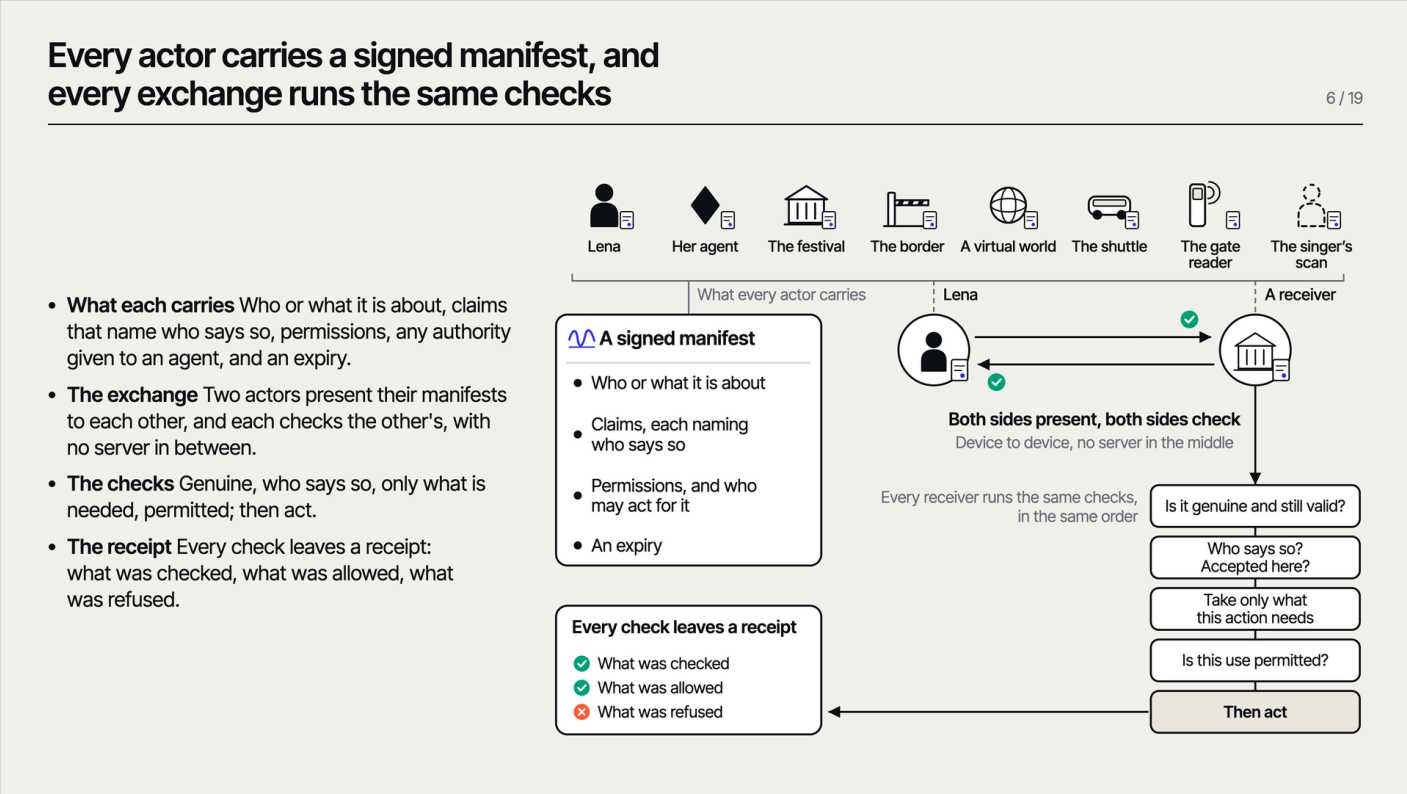
5 Universal Manifest: how identity works between people, their agents, organizations, worlds and machines



The answer I am going to give you is Universal Manifest. It is the specification I wrote for how all of those actors present themselves to one another and check what they are shown. This morning I'll use it to explain identity. OMA3 has adopted it and is reviewing it.

I'll do it in three parts: first the whole system in one picture, so you can hold it in your head; then eight moments from the weekend, each placed on that picture; then I'll pull back out to show how far it reaches. The full specification is public. The link is on this slide, and it will be up again at the end, so you can read the exact form of anything I say in plain words.

6 Every actor carries a signed manifest, and every exchange runs the same checks



Every actor carries one signed thing, every exchange checks both ways, every receiver runs the same checks, and every check leaves a receipt. I'll build the picture in those four steps, and everything else I say is a part of it.

The actors come first, around the edge: Lena, a person; her software agent; the festival and the border, organizations; a virtual world, a platform; the driverless shuttle, a machine; the gate reader, a device; and the singer's scan, a thing with a person inside it. Each of them carries one signed thing, which the specification calls a manifest, and that's the word I'll use from here on. A manifest says who or what it's about. It carries claims, which are statements about that actor, and every claim names who says so: a government, a festival, or the actor itself. It carries permissions, which the specification calls consents: what the holder allows to be done with each piece, for what purpose, and until when. If the holder has handed authority to an agent, the manifest carries that too. Every manifest has an expiry, after which nobody may rely on it.

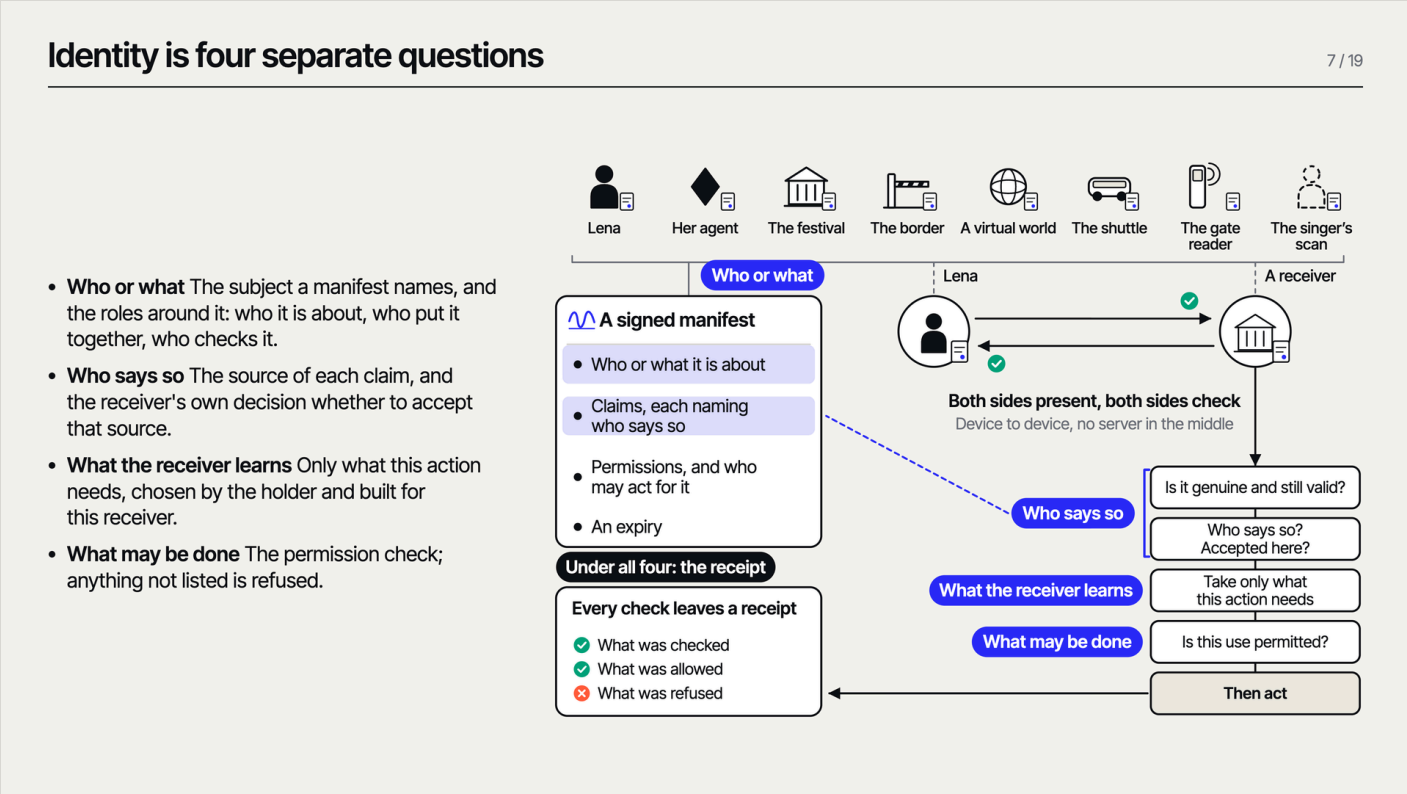
The exchange sits in the middle. Two actors face each other, each presents its manifest, and each checks the other's. Every moment you just watched has that shape. Two phones can do it standing next to each other, with no server in between.

The checks come next. I'll call whoever receives a manifest the receiver, whether it's a gate, a border or a world, and every receiver runs the same checks in the same order. Is this genuine, and still valid? Who says each thing in it, and does this receiver accept their word? It takes only what this action needs. Has the holder permitted this use? If all of that passes, it acts.

Every check leaves a receipt. Like a shop receipt, it lists what was checked, what was allowed, and what was refused. The receiver keeps it, and the holder can ask to see it. It's kept small and only for a while, so the record of a check never becomes a record of a person.

It's one picture instead of eight because every manifest has the same shape, whether it carries Lena's claims, her agent's authority, the shuttle's description or the record that travels with the singer's scan; even a receipt can be one. That's why a border, a robot, a virtual world and a game studio can all take part in the same weekend and read one another.

7 Identity is four separate questions



The questions this group has been raising about identity fit into four, and the four sit on four different parts of this picture. They're the lens for the rest of the talk.

Who or what is this? That's the subject of a manifest, and the roles around it: who it's about, who put it together, and who checks it.

Who says so? Each claim names its source, and the receiver decides for itself whether to accept it.

What does the receiver learn? Only what this action needs, chosen by the holder and built for this receiver.

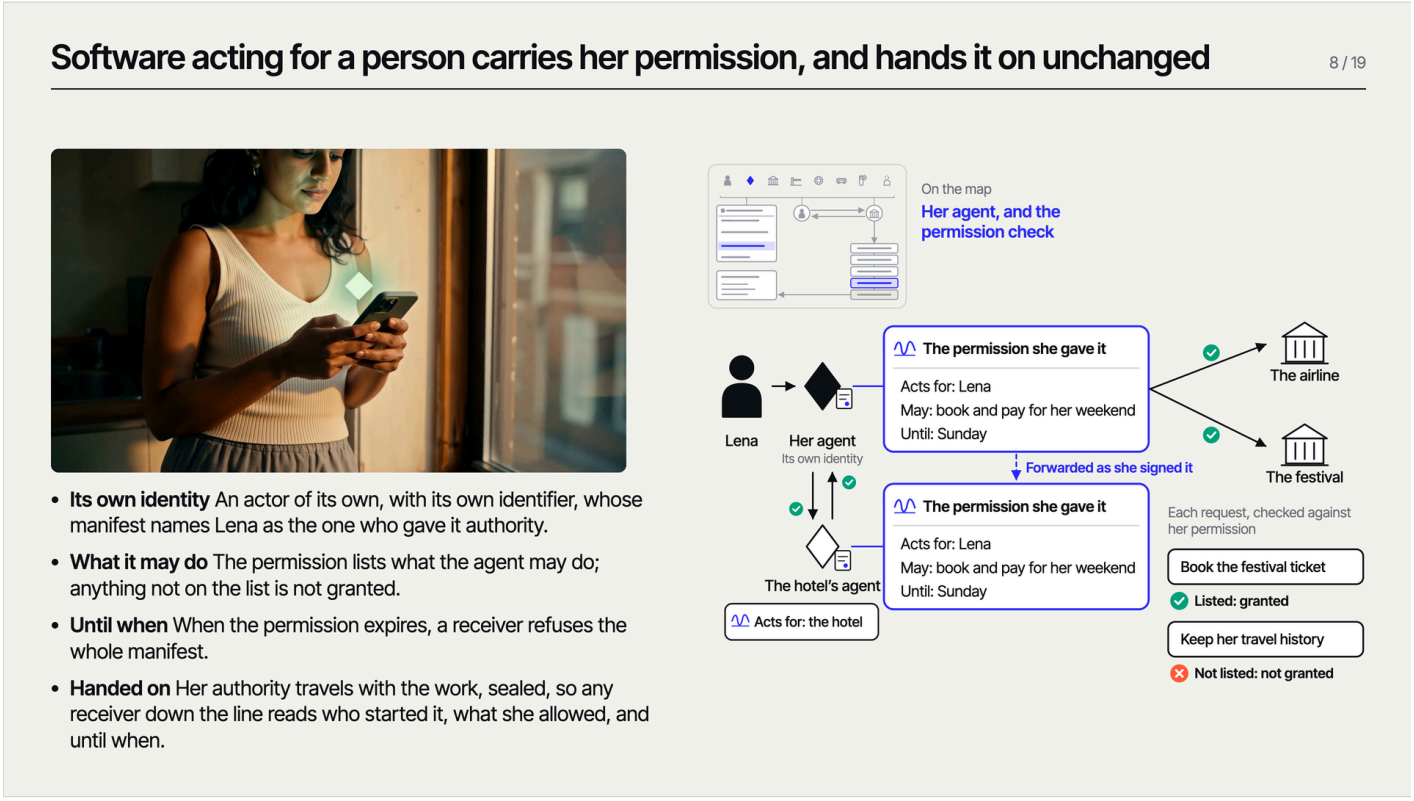
What may be done? The permission check answers that, and anything not listed is refused.

The receipt sits under all four, because it records how each question was answered.

The word identity hides several different ideas, which is why people can agree it matters while meaning different things. That calls for a grammar of questions rather than a list, and these four are that grammar. Laid on the picture, they pull the meanings apart by what a receiver can conclude. A login proves control of a key: that's who or what. A government credential proves what a

government says: who says so. An age check proves one fact: what the receiver learns. A permission to spend proves what she allowed: what may be done. Nobody has to settle on one meaning of the word, because no receiver ever needs all of them at once.

8 Software acting for a person carries her permission, and hands it on unchanged



The first moment was Friday evening. Lena was at home, and her software agent booked the weekend for her: the flight, the hotel, the festival ticket and the shuttle to the airport, all paid for, within what she asked for and only until Sunday.

On the picture, the agent is on one side of the exchange and each seller is a receiver on the other. Every seller asks the first question, who or what is this, and the answer is software acting for a person: an actor of its own, with its own identifier, separate from Lena's, so no receiver mistakes the agent for her.

Inside the agent's manifest is the authority she gave it, which the specification calls a delegation. It says four things: what kind of delegate this is, that Lena herself granted it, what it may do, and until when. The airline and the festival both check that before they sell her anything, and because it names her, every seller can see the person the agent answers to.

This group's example of a robot sent to buy a soda makes the point: permission to spend is not permission for everything. In a manifest the permission is literal: it lists what the agent may do, and anything not on the list is not granted. The agent may book a flight, but it may not keep her travel

history, because nothing granted that. The expiry is just as literal: when it runs out on Sunday, a receiver refuses the whole manifest, not just the expired part.

At the hotel it went one step further: her agent handed the booking to the hotel's own agent, so two pieces of software were dealing with each other, and each showed the other who it acts for. Her authority travelled with the work, sealed: her agent forwarded her manifest exactly as she signed it, with nothing added, and the hotel's agent checked it for itself instead of taking her agent's word. However many hands the work passes through, whoever receives it can read who started it, what they allowed, and until when. Authority never grows along the way: what Lena didn't grant isn't granted at the first stop or the fifth, and no agent can grant authority in her name. Its end travels too: on Sunday every receiver along the chain refuses it, and if she withdraws it sooner, a receiver that checks finds it gone.

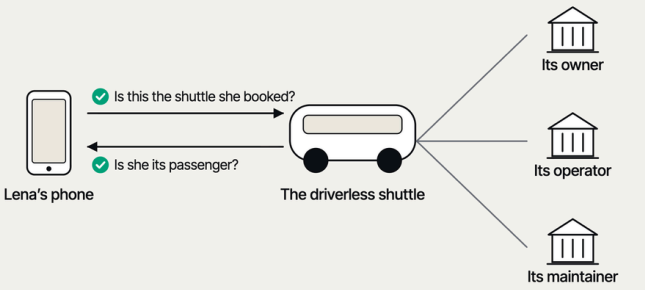
9 A machine is an actor in its own right, apart from whoever runs it

A machine is an actor in its own right, apart from whoever runs it

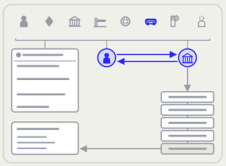
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- **Subject: the shuttle** Its manifest is about the shuttle; the company that runs it, whoever maintains it and whoever owns it are separate actors.
- **Both sides check** Her phone checks the shuttle, the shuttle checks its passenger, at the kerb, with nobody in the middle.
- **One rule for all** Person, machine, place or thing: whatever a manifest is about is its subject, with the same checks.



Three separate actors



On the map

The exchange, with a machine on one side

The shuttle pulled up with nobody driving. Before she got in, it showed her who runs it, and she showed it one thing: her booking.

This is the exchange in the middle of the picture, with a machine on one side. The question is still who or what, and this time the answer is a vehicle.

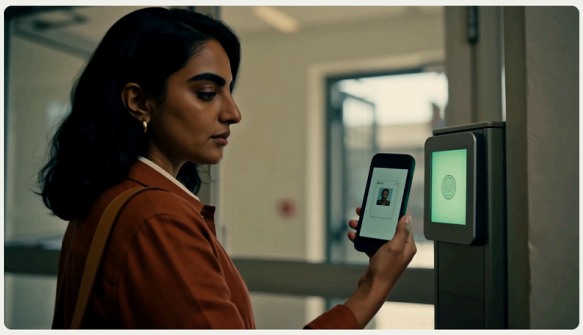
The shuttle carries a manifest like everyone else, and its subject is the shuttle itself. The company that runs it is a separate actor, named as the operator, and so are whoever maintains it and whoever owns it, and each answers for its own part. Her phone checks the shuttle's manifest: is this the vehicle I booked, and who runs it? The shuttle checks hers: is this my passenger? Both checks happen at the kerb, phone to shuttle, with nobody in the middle.

What can bear an identity? A person, a company, an object, a machine or a collective, and one rule covers all of them: whatever a manifest is about is its subject, with the same shape and the same checks. Keeping the shuttle as the subject and the company as the operator stops one particular mistake, which is answering "who is this?" with "who signed this?". The company signed the shuttle's manifest, and the shuttle is still the shuttle.

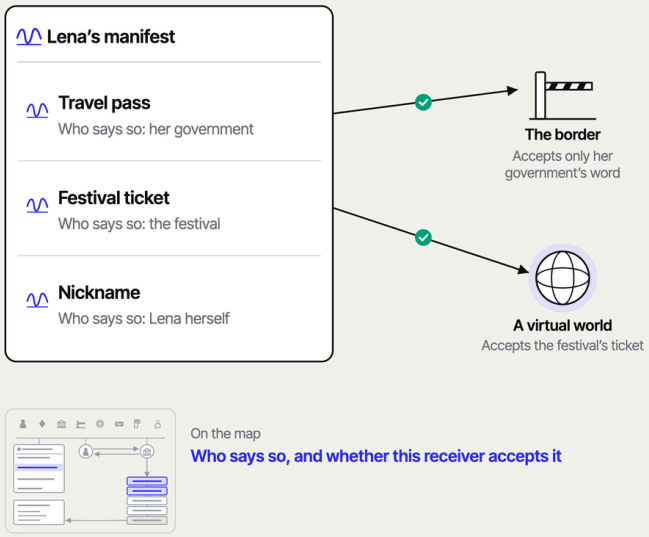
10 Every claim names who says so, and each receiver decides whose word it accepts

Every claim names who says so, and each receiver decides whose word it accepts

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- **Three claims, three sources** Her government's travel pass, the festival's ticket and her own nickname, side by side in one manifest.
- **The border accepts one** It takes the government's word and none of the others; a world that night takes the ticket.
- **A signature's limit** It proves who signed, not that the claim is true; that is a separate check against the source's own signature.
- **No central list** No single gatekeeper decides who is trusted; each receiver keeps its own.



On the map
Who says so, and whether this receiver accepts it

At the border her phone showed her government's travel pass, the border read all of it, and she went through. A border is one of the few places that needs all of that; most places need far less, and that thread runs through the rest of this talk.

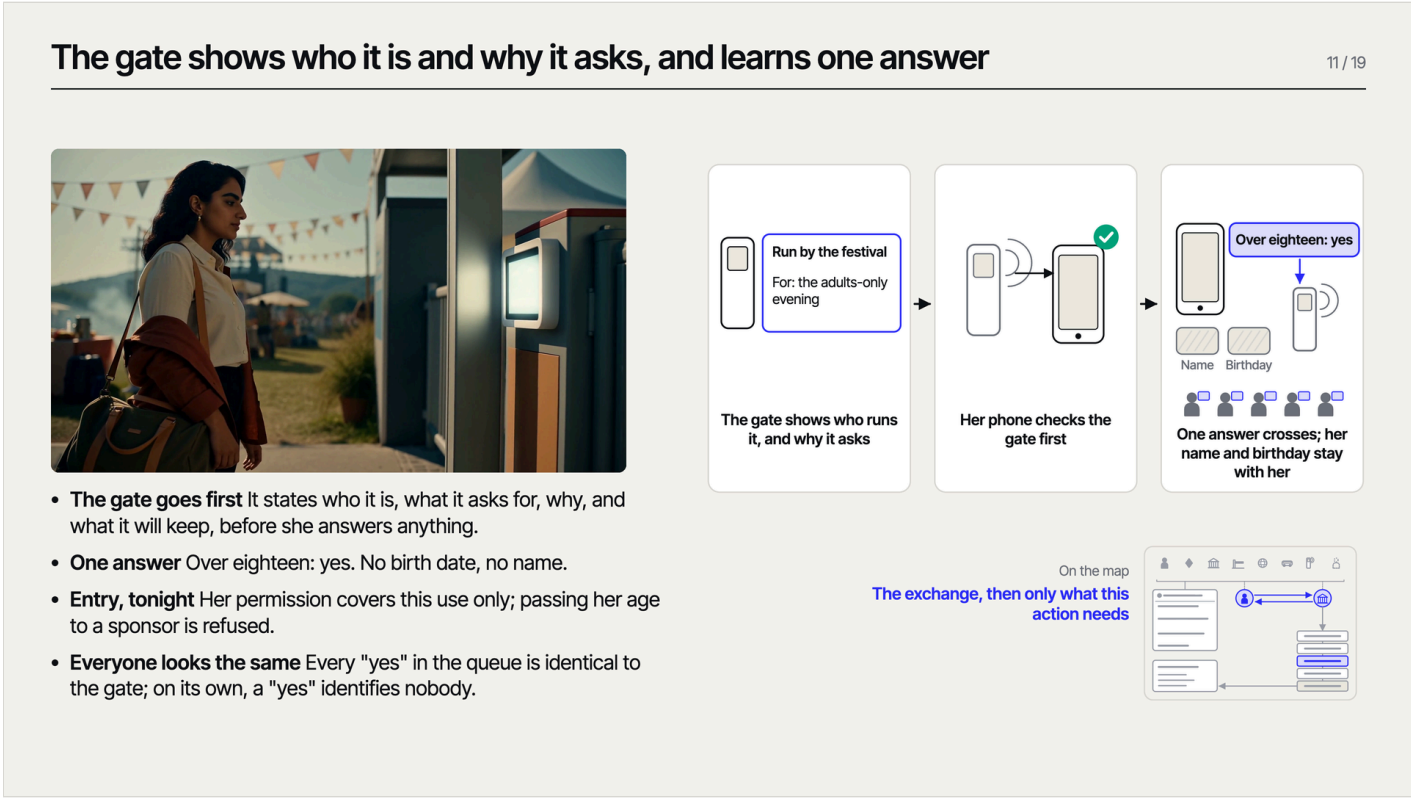
The border is the second check on the picture: who says so.

Lena's manifest holds three claims side by side, each with its source: her government's travel pass, signed by the government; the festival's ticket, signed by the festival; and her nickname, which is her own word for herself. The border accepts exactly one, the government's. That night a virtual world will accept the ticket and never ask for the pass. Each receiver decides for itself whose word it takes, and if it's asked for a check it can't run, it refuses; it never quietly lets her through on a weaker one.

A signature proves who signed, not that what they signed is true. The signature on Lena's manifest proves that she assembled it and nobody has changed it since. Whether the government really issued the pass is a separate check, against the government's own signature on the claim. The claim is also tied to the person presenting it, so her pass in anyone else's hands, borrowed, stolen

or copied, fails. The specification says this about itself: a manifest is a bag of claims, not a proof of truth, and every check exists to close that gap honestly and record how far it got. No single gatekeeper decides who is trusted; each receiver keeps its own list, and the specification forbids requiring a central one.

11 The gate shows who it is and why it asks, and learns one answer



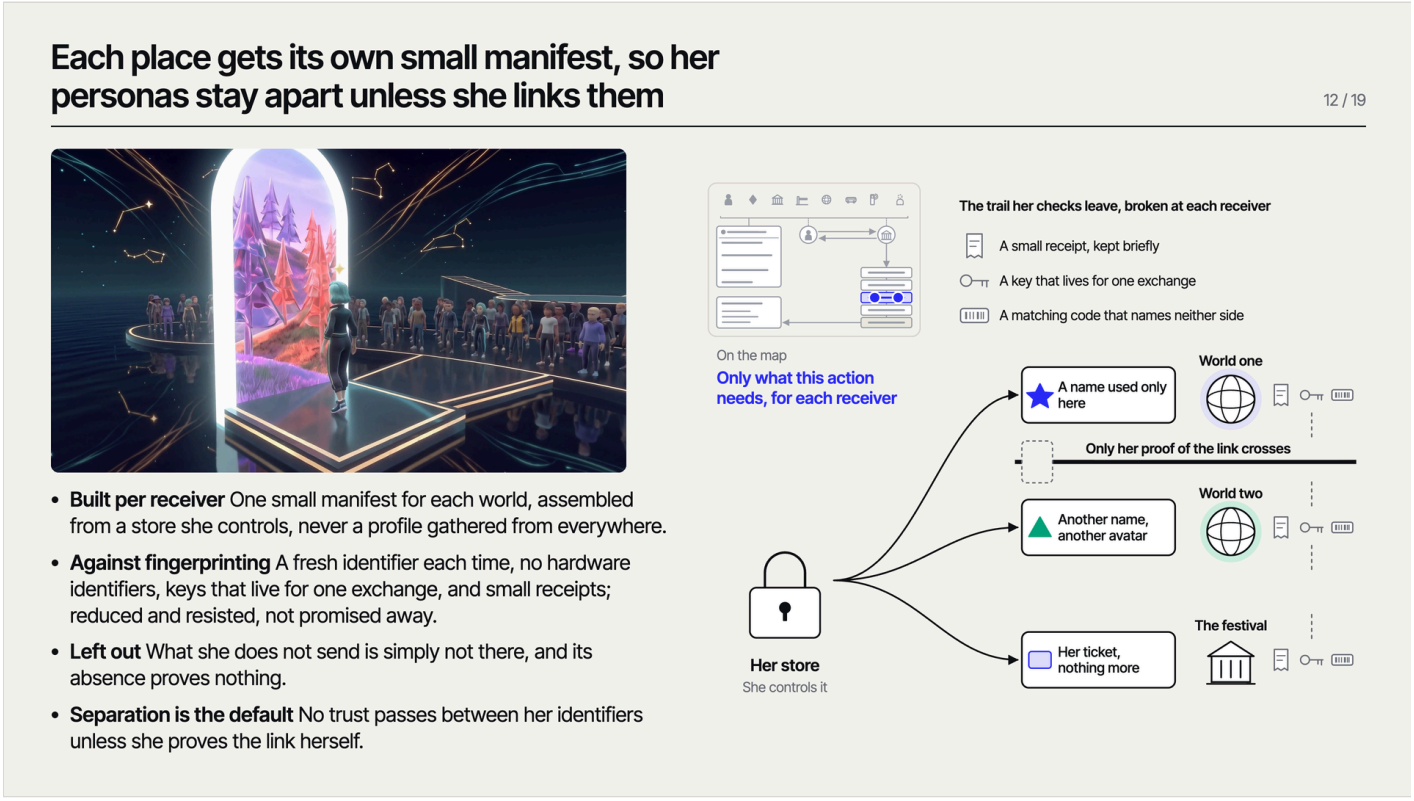
At the festival gate, before Lena's phone gave anything away, the gate showed who it was and why it was asking. Then her phone answered one thing: over eighteen, yes. It gave no birthday and no name.

Here the exchange comes first, and then the third check: take only what this action needs.

Both sides check, as at the shuttle, but here the order matters. The gate goes first: it states who it is, what it's asking for, why, and what it will keep. Her phone checks that it really is the festival asking, and only then answers, with the threshold and not the value. The gate asked "over eighteen?" and got "yes": no birth date and no name, because this action needs neither. Her permission for that answer is limited too: entry, tonight. That's why the festival's app was refused when it tried to pass her age to a sponsor.

The gate going first turns the usual idea of identity around: instead of the visitor proving things to the venue, the gate proves itself to her. Before she discloses anything, she knows who's asking, and her receipt says so, which is what stops a fake gate, or a fake payment terminal, from collecting answers. The other half is that every "yes" looks the same to the gate. Picture the queue behind her: a thousand identical answers, and on its own a "yes" identifies nobody.

12 Each place gets its own small manifest, so her personas stay apart unless she links them



That night Lena stepped into the festival's two virtual worlds, with a different name and a different avatar in each. Her ticket counted in both, and neither world could tell she was the same person.

This is the third check again, take only what this action needs, but this time it runs at two receivers, with two different answers.

Lena doesn't carry one big profile around. She builds a small manifest for each receiver, from a store she controls, holding only what that receiver needs: the first world gets her ticket and the name she chose for it, and the second gets the ticket and another name. Each carries a fresh identifier, so the two can't be matched up by their labels. What she left out simply isn't there, and its absence proves nothing: a world that doesn't see her real name may not conclude that she has none, or that she has something to hide.

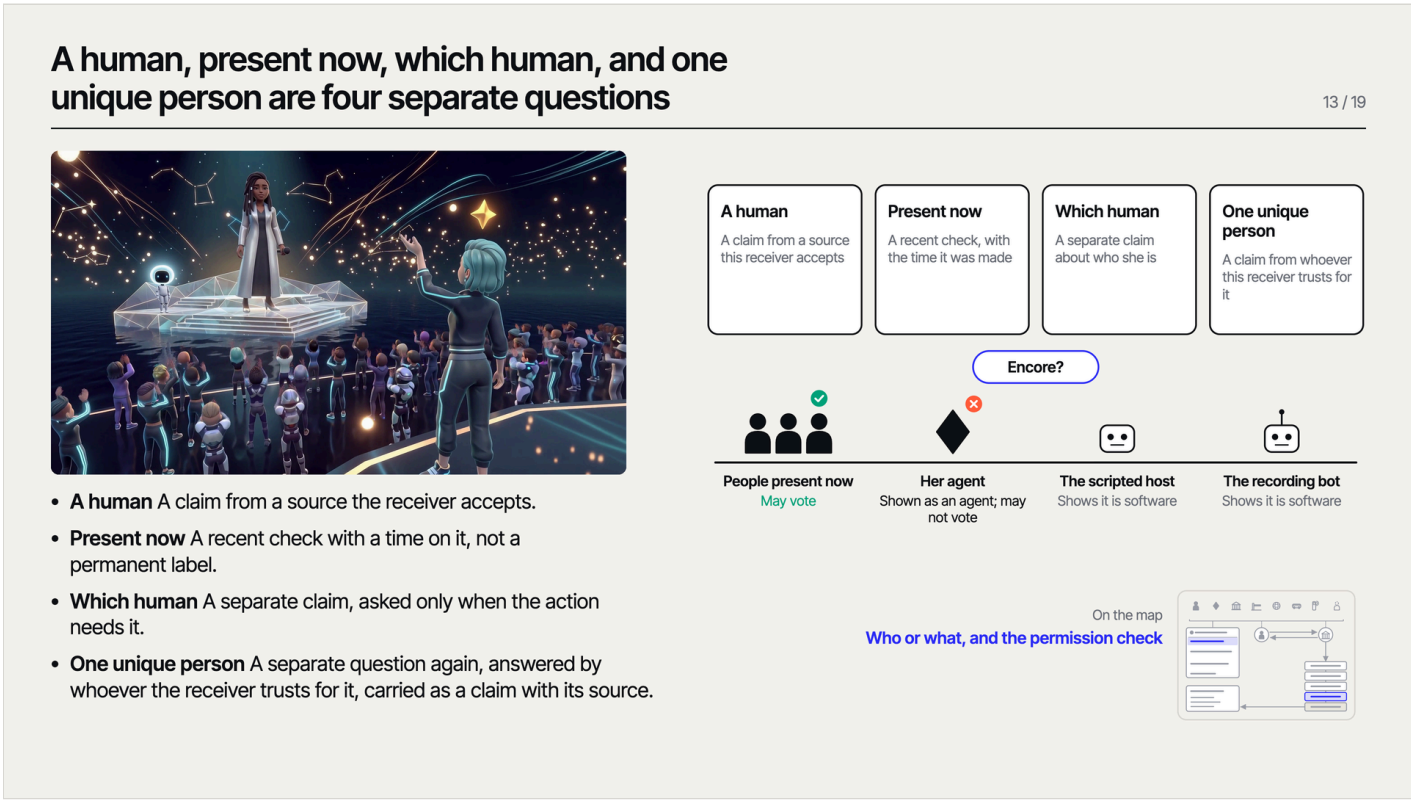
Two ideas come up whenever people talk about identity. Bundling your data means one signed manifest, assembled by you for one receiver from a store you control, never a profile gathered from everywhere you've been. Fingerprinting is being recognized by the shape of what you carry even when your name isn't on it, and avoiding it starts with the same habits: a small manifest per

receiver, a fresh identifier each time, a different name per place if you choose, and no hardware identifiers next to a name she uses only there.

She can also be recognized by the trail her checks leave behind, and the specification closes that trail where it can. Receipts are small and kept briefly. The keys that sign them last for one exchange, so no key follows her from place to place, and when the two sides match up their receipts, they use a code that names neither of them. A receiver can check whether her manifest is still valid without leaving a trail, and where more is needed, she can present a proof that two receivers can't match up even if they compare notes. The specification also states its limit: the shape and timing of what she sends can still carry information about her. These habits reduce recognition by pattern; they don't promise it away.

Separation is the default, not a setting. No trust passes from one of Lena's identifiers to another unless she proves the link herself, so two worlds that both hold a ticket from the same festival still may not treat her as the same person. The link between her personas, the separate selves she shows in separate places, is one she makes, never one the worlds work out.

13 A human, present now, which human, and one unique person are four separate questions



At the virtual stage, only the people who were present right then could vote for the encore. Lena's agent couldn't vote for her, and the scripted host and the festival's recording bot showed that they were software.

The vote is the first question again, who or what, but this time an action depends on the answer, so it runs straight into the fourth question, what may be done.

"Is this a human?" sounds like one question, but it's at least four. Is this a human at all? Is that human present right now? Which human is it? Is it one unique person, or one person with two accounts? Each has its own evidence, from a source the receiver chooses to accept. Presence is a recent check with a time on it, and it goes stale; it never becomes a permanent label that says "human". Which human she is stays a separate claim, and the vote never asked for it, because the encore doesn't need her name. One unique person is a separate question again, answered by whoever this receiver trusts for it, and carried as one more claim in her manifest, with its source on it.

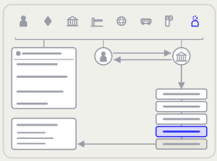
Her agent raises two different facts, and a manifest keeps them apart: she gave it permission to act for her on Friday, and right now, in this session, it is acting instead of her. Friday's permission is still valid on Saturday night, but the agent still may not vote, because the vote is for people who are present. A person acting through an assistant counts as an agent too, wherever the action is for humans only. The software on that stage showed what it was, so nobody in the audience had to guess whether they were talking to a person.

A likeness carries the permission of the person in it, one use at a time

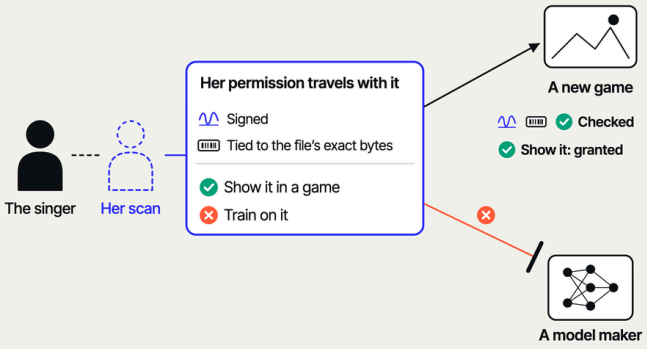
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- **Signed and bound** Her permission travels with the scan, signed and tied to its exact bytes; a receiver checks who signed and that nothing changed.
- **Use by use** Show it, move it, change it, train on it, use it to make money: each granted or not, and can be withdrawn.
- **Owning is not permission** The file's owner, the rights holder, the platform and the person depicted are separate actors.
- **Display is not training** A permission to show it never stretches into a permission to train on it.



On the map
The permission check, for an asset with a person in it



Years later, near the end of the film, the singer finds her digital double in a new game. She allowed that. She never allowed anyone to train an AI on it, and that doesn't happen.

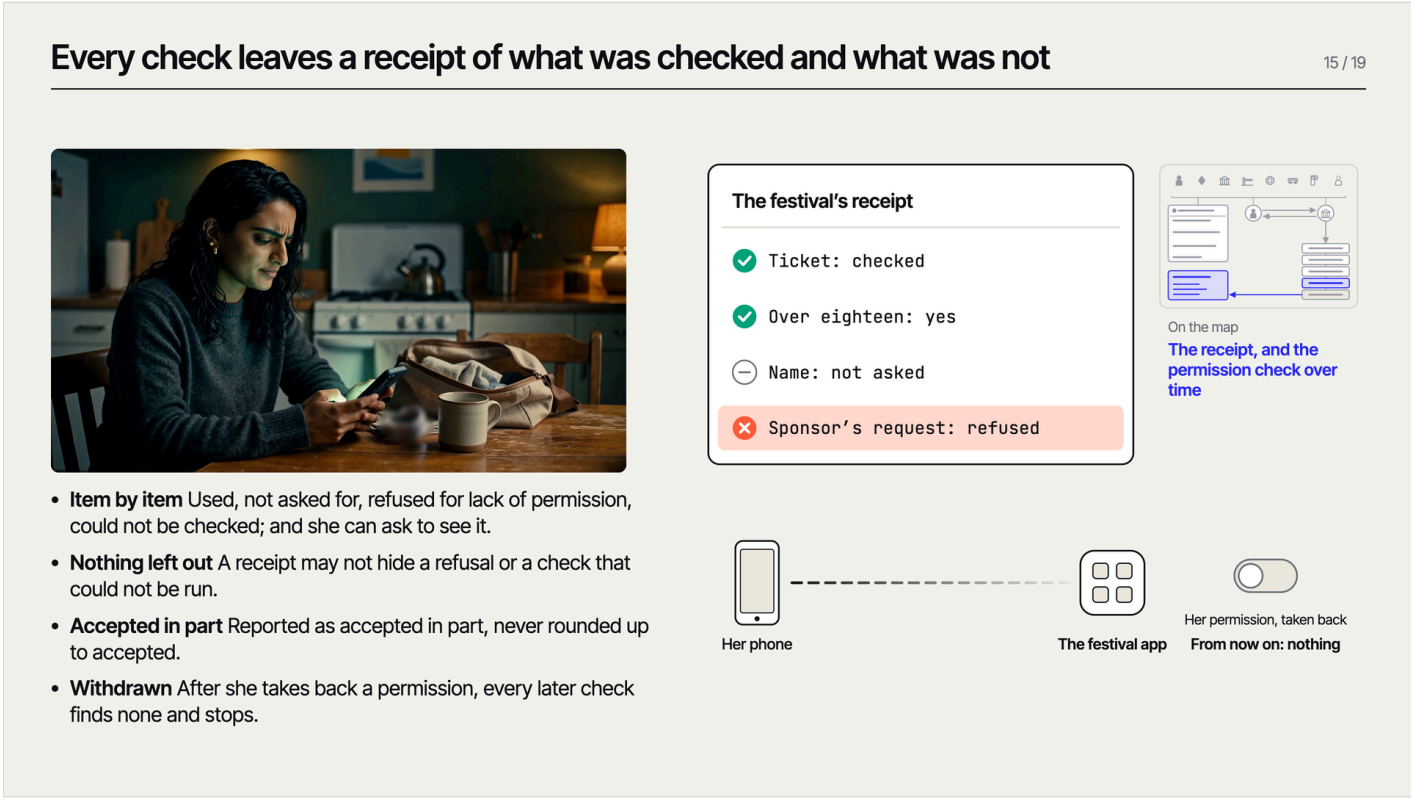
This moment is the permission check, applied to a thing with a person inside it: a scan. It's the same check as everywhere else; the difference is whose permission it is.

The scan is a file, and the file travels: to the festival's worlds on Saturday night, to a game years later, to whoever asks next. A signed record travels with it, tied to the file's exact bytes, so wherever it turns up a receiver can check who signed the record and that neither has changed. Anything a person or an organization creates gets its provenance the same way: a signed record of who made it, bound to exactly what they made. Here the record carries the singer's permission, one line for each use: showing it, moving it into another world, changing it, training on it, and making money from it. Each is granted or not on its own, for a purpose, until a date, and she can withdraw any of them. The game asked to show it, and that was granted. Training on it was never granted, so the receiver refuses, and its receipt says why.

The owner of the file, the holder of the rights, the platform running the game and the person depicted are four separate actors, and only one of them is her. For anyone who has ever been

scanned, that separation is what matters most. Ownership records answer who controls the asset, not whether the person inside it agreed, or to what. Owning the file isn't her permission, and neither is a token that points at it or a licence from the rights holder. Her permission is a record granted by her, or by anyone who verifiably acts for her, and nothing else counts. A permission to show is never a permission to train, whoever happens to hold the file.

15 Every check leaves a receipt of what was checked and what was not



On the Monday after the festival, Lena, back at home, asked the festival what it kept about her, and a short list came back: ticket, checked. Over eighteen, yes. Name, not asked. A sponsor's request, refused. Then she took back the permission she had given the festival's app, and from that moment it may use nothing.

This is the receipt at the bottom of the picture, and the permission check running on into the future.

Every receiver that checked Lena over the weekend produced a receipt, listing every item and what happened to it: used, not asked for, refused for lack of permission, or could not be checked. What makes a receipt worth having is that it may not leave out a failed check, so the festival's receipt says the sponsor's request was refused. Once she withdraws the app's permission, every later check finds none and stops. Asking a service whether a permission still stands tells it who's asking and when, so that live check is optional, and there are ways to make it without leaving a trail.

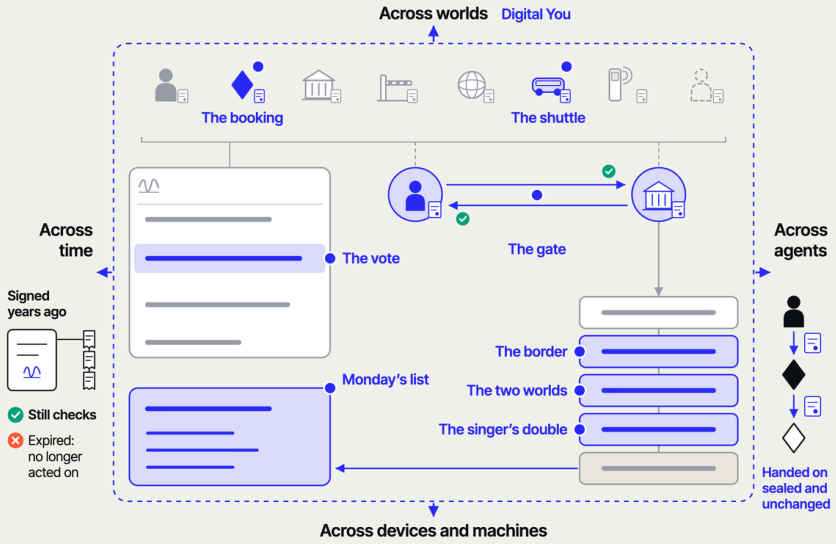
That rule lets a receipt do two more jobs. It's the visible mark that says "checked", but item by item, including what wasn't checked. It's also how a person finds out what is held about them: they can ask to see it. Two smaller rules follow. Accepted in part is reported as accepted in part, so nobody

gets a green tick on a half-checked manifest. Absence isn't evidence either, so an item Lena never sent shows up as not asked for, never as missing or suspicious.

The same checks reach across worlds, agents, devices and time

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- **Across worlds** What travels is evidence, and the destination decides what it accepts; portability never forces acceptance.
- **Across agents** Every agent answers to whoever delegated to it, and when work is handed on, that authority travels unchanged, traceable to whoever started it.
- **Across devices and machines** One rule for every actor, with or without a person inside it.
- **Across time** Manifests expire and permissions can be withdrawn, but what was signed years ago still checks: who signed it, and that nothing changed.



The eight moments are pinned on the picture where they happened, and every one of them ran the same checks.

The picture doesn't stop at the edge of a festival. It reaches in four directions.

Across worlds, what travels is evidence, and the destination decides: Lena carried her ticket into two worlds, and each decided for itself what to accept. Portability never forces anyone to accept anything. What a person carries between worlds has been called Digital You: your money, your clothes and your preferences moving with you, as they do in physical life. On this picture, Digital You is the manifest, built for each destination, with each destination judging for itself what to trust.

Across agents, every agent answers to whoever delegated to it, and its manifest names that person. When one agent hands work to another, the authority travels with it, sealed, so any receiver, however far down the line, can trace it back to whoever started it. Every agent on this picture acts for a person or an organization.

Across devices and machines, one rule covers every actor, with or without a person inside it: the shuttle, the gate reader, her headset, a robot, a drone.

Across time, every manifest expires, and every permission can be withdrawn. A likeness outlives the weekend, and the permission of the person inside it travels with it for as long as it exists. What was signed years ago can still be checked: the signature still says who signed, a document tied to a record still matches it or it doesn't, and a chain of receipts still shows whether any of it was quietly changed. Expired means it can no longer be acted on, not that it can no longer be checked.

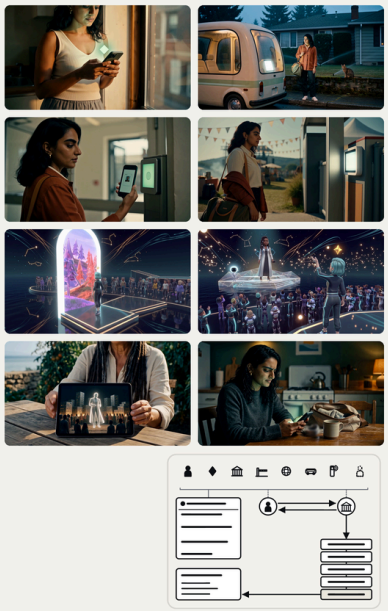
Everything identity touches rides in that one manifest: claims about who or what, permissions over each piece, authority handed to agents, descriptions of devices, the record that travels with a thing, and the receipt of every check. One shape carries all of it, and everyone reads it the same way; that's how identity connects to everything else Universal Manifest does. It also carries the standards this room already uses, as they are: a government credential, a content-provenance record, a location, each still checked by its own rules, so it replaces none of them.

Notice what this does to some of the questions this group has been collecting. Does identity shield or expose? Whichever the holder built the manifest to do, one receiver at a time. Walled gardens, and onboarding again at every door? A manifest is carried, never re-entered. The worry that interoperability puts you on services you never chose? Nothing here presents a manifest except its holder, for one exchange, so nothing puts Lena anywhere by itself.

17 Identity is four separate questions, and Universal Manifest keeps them apart for every kind of actor

Identity is four separate questions, and Universal Manifest keeps them apart for every kind of actor

- **Who or what** The gate never needs to know who.
- **Who says so** The border needs a government's word; a world needs the festival's.
- **What the receiver learns** Over eighteen, yes, and nothing else.
- **What may be done** Show the double; never train on it.

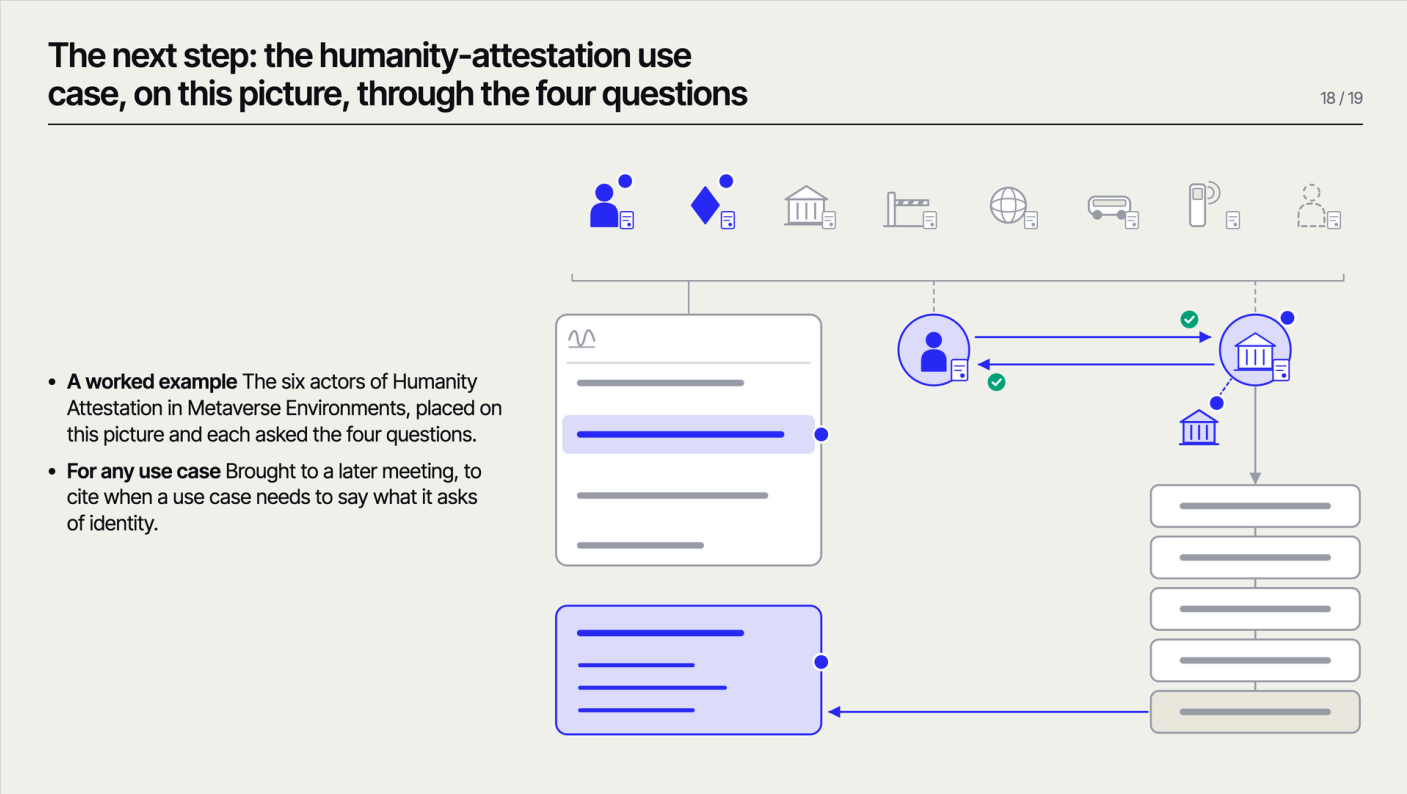


The whole talk fits in one sentence. Identity is four separate questions: who or what, who says so, what the receiver learns, and what may be done. Universal Manifest keeps them apart, for every kind of actor, in every exchange.

Keeping them apart is the point: it lets each question be answered only as far as the moment needs. The gate can learn "over eighteen" without learning who. The stage can learn "present now" without learning which human. The border can learn who she is without learning what she permits. The game can learn what the singer allowed without owning her. Fuse the four into one thing called an identity, and a receiver has no way to take less than all of it. Kept apart, each receiver takes only its own answer, and the receipt says which one it took.

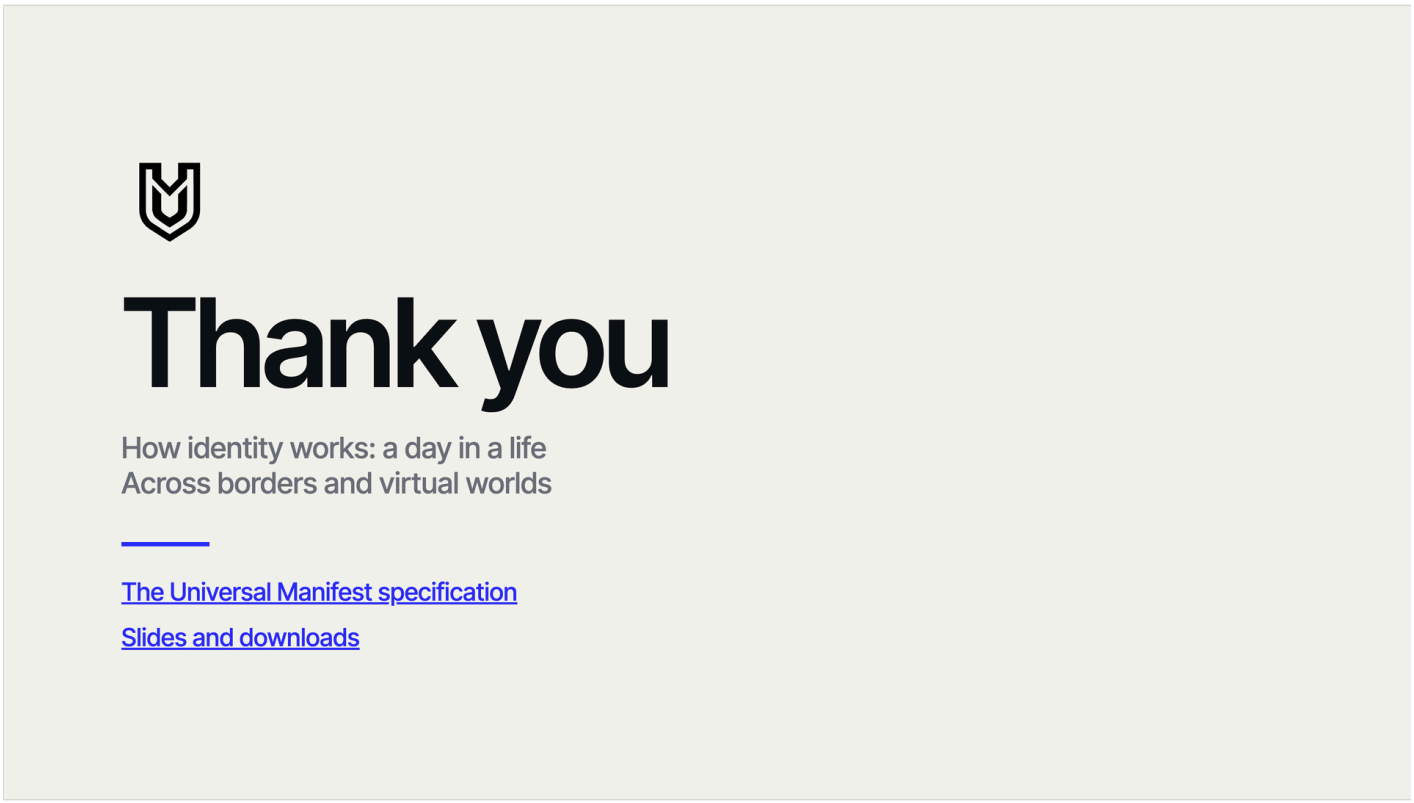
The answer to the several hundred concerns this group has raised about identity is a separation: four questions, kept apart, answered one exchange at a time by every kind of actor there is.

18 The next step: the humanity-attestation use case, on this picture, through the four questions



The picture and the four questions explain one weekend, and they also give this group a way to read any situation it writes down.

I would like to take one of this group's own use cases, Humanity Attestation in Metaverse Environments, put its six actors on this picture, and ask the four questions of each. I will bring the result to a later meeting as a worked example, one that any use case can cite when it needs to say what it asks of identity.



That is my part. The specification is on this slide again, for the exact form of everything I said in plain words.

Thank you.

The next speaker takes it from here with her examples, and every one of them lands on the same picture you saw earlier. Over to you.