Age Protect

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Abstract

Age Protect is a specification that enables digital service providers to offer age-restricted content and services consistent with prevailing laws and regulations. It's implementation relies on a personal, on-device software agent that stores claims made by an Age Verification Service (AVS). Using this agent the person can present them to the service provider which filters the content and services it offers on its apps or websites. Age Protect specifies the interactions between three parties: service providers, agents, and age verification services. We conclude with progress on an initial implementation of this specification.

1 Design Goals

The state of the art has been described as follows:

> "Government agencies, private companies, and academic researchers have spent years seeking a way to solve the thorny question of how to check internet users' ages without the risk of revealing intimate information about their online lives. But after all that time, privacy and civil liberties advocates still aren't convinced the government is ready for the challenge.[2]"

Age Protect, by leveraging technology advances such as Verifiable Credentials(VC)[1] and personal agents has been designed to overcome these challenges and address the following design goals:

- **Opt-in**. Introduce no changes to how a person interacts with apps and websites unless they opt-in to Age Protect. Note that this goal is in opposition to age verification laws and mandates, which, as the EFF[2] has recently said, ""...don't just impact

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[1]w3.org/TR/vc-data-model/
[2]EFF.org

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young people. It's necessary to confirm the age of all website visitors, in order to keep out one select age group."[1]

- **Protect minors** by enabling an adult guardian to create policies that define what the minor can and cannot access.

- **Respect the privacy** and anonymity of all participants.

- **Reduce liability** for service providers, protect their brand, and help them comply with laws and regulations such as COPPA[3].

2   Overview

Age Protect can be used by both minors or adult. In this introduction we describe both usage scenarios.

2.1   Adult visits age-restricted website

The simplest scenario involving an adult, is one where they first acquire an *Age VC* from an Age Verification Service (AVS), store it in their agent, and then go to an age-restricted website of a Service Provider (SP) where they present it Age VC to prove their age. The agent acts as a kind of digital wallet into which the Age VC is stored and from which it is copied duing "presentation." An age VC is a digitally signed document which contains an attribute (technically called a "claim") whose value is the birth day and date of the minor as asserted by the AVS. On receipt the SP cryptographically verifies the Age VC.

This scenario is shown in Figure 1. We describe each numbered step in the flow:

1. The adult goes to an AVS and taps the *Connect-with-Mee* button.[45] They then begin identity verification using whatever methods are supported by the AVS.

2. After the adult has completed identity verification, the AVS issues them an Age (VC). This VC is transferred into the adult's agent using digital connection that was created when the adult tapped Connect-with-Mee.

3. The adult visits the service providers's website. In the HTTP header the agent includes a new field called "AgeProtect" with a value of "1" which is detected by the VC.

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[3]ftc.gov/legal-library/browse/rules/childrens-online-privacy-protection-rule-coppa

[4]If the adult doesn't have an agent installed on their device, tapping this button automatically redirects them to an app store where it can be downloaded. After that they can resume their flow.

[5]Tapping this button is similar to traditional sign-in/sign-up flows but has other benefits, including increased privacy and not requiring passwords.
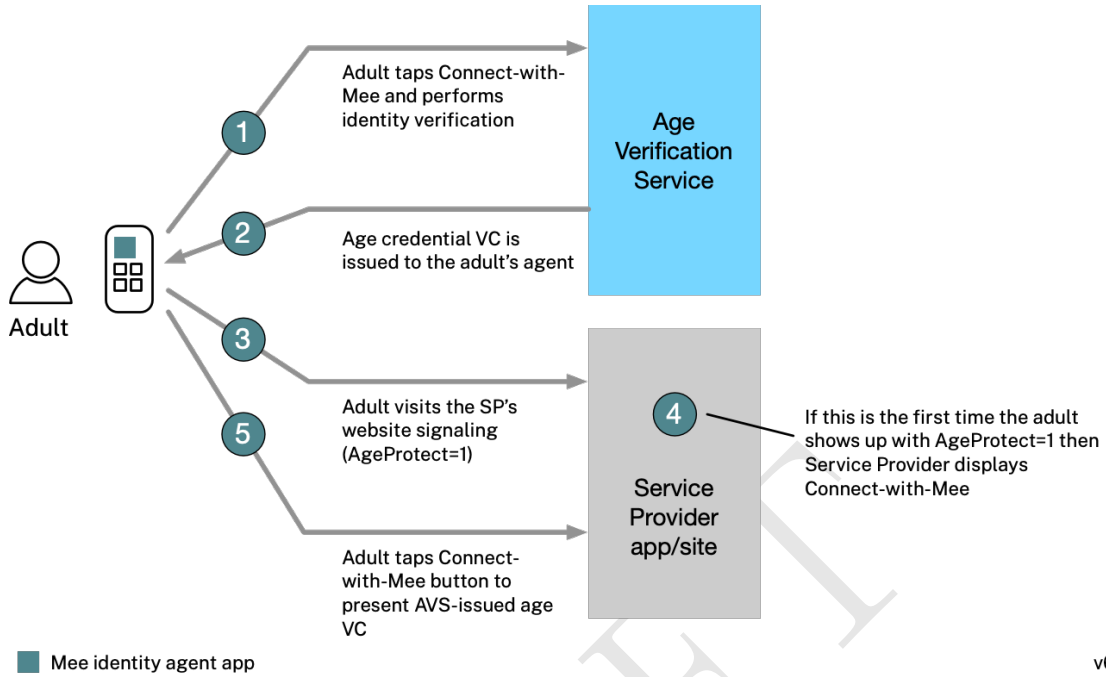
Figure 1: Adult gets age credential and visits an SP's website

4. If this is the first time the adult has shown up with AgeProtect=1 signal then the SP displays a page asking the adult to prove they are old enough to access the website and explains that they can do so by tapping the Connect-with-Mee button.

5. The adult taps the Connect-with-Mee button, which opens their agent, retreives the necessary VC and asks the adult to consent to share it with the website as proof of their age.

Additional details are provided in Figure 2.

2.2 Minor visits age-restricted website under control of a guardian

We consider the case where a guardian register a minor (e.g. child) at an AVS, shares a link with this minor, and the minor then visits a website that has implemented Age Protect. Thie flow, shown in Figure 3, is more complex than the adult's flow described in the previous section since it involved two people, the minor and their guardian. This flow involves a *Policy* VC which contains a set of guardian-defined claims, which taken together define what kinds of content and actions the minor can have access to when they interact with an SP's app or website.
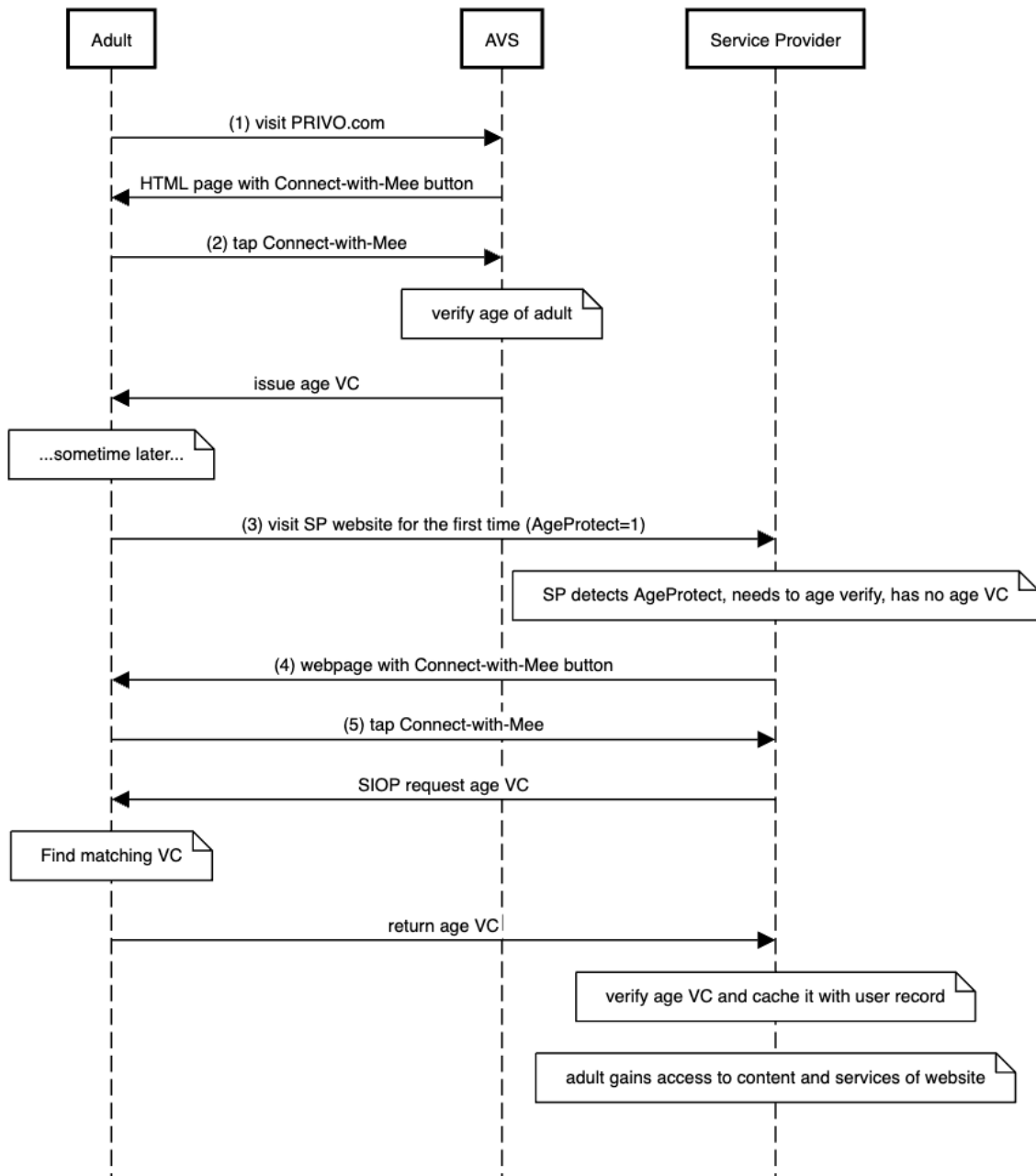
Figure 2: Adult gets age credential and visits an SP's website

A key insight is that the SP does need any information about the minor–not even their age. All they need to know is what capabilities the guardian has conferred on the minor to access various kinds of content and services.

1. The guardian goes to an Age Verfication Service (AVS) and taps the *Connect-with-Mee* button.[6][7] They then begin identity verification using whatever methods are supported by the AVS. After they have been identified, they register their child and enter the child's birthdate.

2. A URL (and QR code) is generated for the minor.[8]

3. The guardian shares this URL (and QR code) with the minor.

4. The minor scans the QR code (or taps the URL) which brings them to the AVS. A *Policy* VC is issued and stored in their agent

5. The minor goes to the service providers's app or website. In the HTTP header the agent includes field name of "AgeProtect" and a value of "1". The service provider detects this signal encoded in the header.

6. If this is the first time that the minor has shown up with AgeProtect=1 then Service Provider displays the Connect-with-Mee button asking the minor to press it to thereby create digital connection requests proof of age VC

7. The minor taps the Connect-with-Mee button to present the AVS-issued policy VC.

3 Technical specifications

3.1 Age Protect Signaling protocol

...describe the AppProtect=1 HTTP header field (which is identical in structure to the Global Privacy Control[9])

...describe custom URI scheme to check status on a mobile platform (age-protect://)

3.2 Connect-with-Mee button

...describe how Connect-with-Mee implements OpenID SIOPv2

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[6]If the guardian doesn't have an agent installed on their device, tapping this button automatically redirects them to an app store where it can be downloaded. After that they can resume their flow.

[7]Tapping this button is similar to traditional sign-in/sign-up flows but has other benefits, including enhanced privacy and not requiring passwords.

[8]For simplicity we only discuss the case here of the guardian having a single minor.

[9]globalprivacycontrol.org

Guardian taps Connect-with-Mee, performs identity verification and registers their minor child (1)

Download link to share with minor (2)

Age Verification Service (AVS)

Guardian

Guardian shares QR code/link with minor (3)

Minor taps link which brings them to the AVS. A *Policy* VC is issued and stored in their agent (4)

Minor notes to SP website with AgeProtect=1 signal (5)

Minor

Minor taps the Connect-with-Mee button to present the AVS-issued Policy VC. (7)

Service Provider website

(6) **If this is the first time the minor shows up with AgeProtect=1 then SP displays a page to request Policy VC (using Connect-with-Mee)**
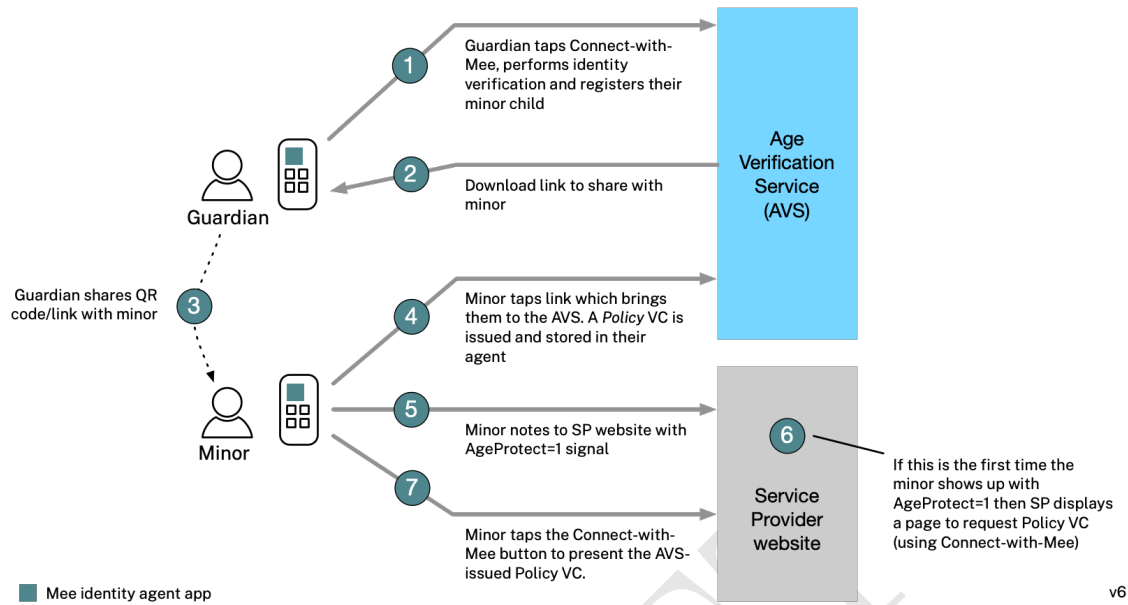
■ Mee identity agent app

v6

Figure 3: Minor with Guardian Flow

3.3 Age Protect Age Verification protocol

...define the invocation flow, age verification claims (perhaps only user age range and jurisdiction), and mechanism for presenting/prove age with the age verification VC

...define the schema of an age VC

...define the schema of a policy VC

4 Initial implementation

4.1 Age Protect signaling

...describe how the Age Protect HTTP header is implemented by the AppProtect Mee connector's browser extension.

...describe how the Age Protect signal is detected by service provider mobile apps and websites

4.2 Connect-with-Mee button

...describe how the AVS age verification service implements Connect-with-Mee

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4.3 Age Protect Verifiable credentials

...describe both the AVS import, and the AVS present Mee connectors and how they have been integrated into the Mee identity agent

4.4 Integration of AVS

...describe how our prototype service provider integrates the AVS service...data exchange, how service provider captures authorization policy, etc.

5 Conclusion

...to be written

References

[1] Jason Kelley and Adam Schwartz. Age verification mandates would undermine anonymity online — electronic frontier foundation. *EFF*, 2023. URL: https://www.eff.org/deeplinks/2023/03/age-verification-mandates-would-undermine-anonymity-online.

[2] Emma Roth. Online age verification is coming, and privacy is on the chopping block - the verge. *The Verge*, 2023. URL: https://www.theverge.com/23721306/online-age-verification-privacy-laws-child-safety.