When used with 3D Secure...

Improve reliability and solve Content Security Policy problems by avoiding the need to redirect to the issuing bank.

Gracefully degrade to vanilla 3D Secure for unenrolled users and on unsupported devices.

Background

Context
Focused on payment authentication, separate from credential entry (at least initially)

Compatible with existing payment authentication solutions, e.g. 3D Secure

Payment context established by the Payment Request API

Users verified with FIDO biometric authentication

Goals
Provide a reliable, low-friction authentication mechanism for users, merchants and banks

Increase user confidence with biometric confirmation of transaction details in browser-native UI

Protect user privacy by requiring explicit consent before confirming identity

Stop phishing + satisfy EU SCA requirements for dynamic linking by capturing transaction details in a tamper-proof cryptographic signature
About the Secure Payment Confirmation API

Background

API “Superpowers”

Browser binds payment details into cryptographic signature

Any merchant can request a signature from the issuer’s public key: cross-origin credential sharing
About the Secure Payment Confirmation API

Enrollment Flow Mocks
PH window
T-shirt (Blue / M)
€2.00

Verify your purchase
hooks.stripe.com

Speed up future checkouts
To pay faster next time, use TouchID to verify your Mastercard ****4444 card

ırken
Skip bank verification by enrolling your fingerprint

Protect yourself from fraud by adding your fingerprint

Verify with TouchID

No thanks
Thanks for your order!

We just sent your receipt to your email address, and your items will be on their way shortly!
About the Secure Payment Confirmation API

Authentication Flow Mocks
Pay with card

Email: janedoe@stripe.com

Card information:
- Card number: 5555 5555 5555 4444
- Expiration date: 01 / 25
- Security code: 123

Name on card: Jane Doe

Country or region: Ireland

Pay $20.00
T-shirt (Blue / M)
€2.00

Use Touch ID to verify purchase of €20.00 on merchant.com?
Verifying your purchase will charge your card

Mastercard ****4444

Cancel
Verify

Name on card
Jane Doe

Country or region
Ireland

Pay $20.00
Thanks for your order!

We just sent your receipt to your email address, and your items will be on their way shortly!
Enrollment

Pilot Flow

1. User visits issuing bank, either during a traditional authentication or separately

2. Issuing bank triggers enrollment, provides instrument name and icon

3. Browser returns a PaymentCredential (based on PublicKeyCredential, keys stored in FIDO UVPA internally)

4. Issuing bank, acting as Relying Party, registers public key and instrument ID in their backend

Pilot UI

Check out faster with Touch ID
btidar-authenticate-mydev.dev.stripe.me

Enroll your fingerprint to pay faster and protect yourself from fraud. You’ll be prompted to verify future payments with Touch ID on supported websites.

Stripe Test Card —- 5555

Enroll

No Thanks

Stripe is partnering with Google Chrome to offer stronger payment authentication on the web as part of a limited pilot program. Your data is stored securely by Stripe, a payment processor certified to PCI Service Provider Level 1. Biometric information is processed by macOS and never leaves your device. See stripe.com/privacy.
About the Secure Payment Confirmation API

**Authentication**

**Pilot Flow**

1. Merchant requests list of credential IDs from issuing bank via backend protocol (e.g. 3D Secure)

2. Merchant invokes Payment Request API **on their origin** with instrument IDs and transaction details

3. Browser displays transaction details to user, collects biometric confirmation

4. Browser **binds transaction details into Web Authentication challenge** and returns signed assertion (Web Payment Cryptogram) to merchant

5. Merchant submits Web Payment Cryptogram to issuer via backend protocol **and can verify the signature independently**

**Pilot UI**

Use Touch ID to verify and complete your purchase?

- **Store**: stripe-payments-demo.appspot.com
- **Payment**: Stripe Test Card ⋯5555
- **Total**: EUR €33.95

[Options: Cancel, Verify]
# Eligibility Requirements

## Customer
- Chrome 86+ on macOS
- Has FIDO user-verifying platform authenticator (Touch ID)
- Visa, Mastercard and American Express
- Card supports 3D Secure 2
- Excluded: cards that decline non-3D Secure transactions — India + 3 European countries with early SCA enforcement

## Merchant
- Cohort of global internet businesses, predominantly small and medium-sized

## Duration
- November 12 to January 25

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stripe
### About the experiment

## Experiment Arms

### 3DS2 Challenge
- Trigger 3D Secure 2
- Request a challenge from the issuing bank via requestorChallengeInd=03
- Run challenge in an iframe

*Benchmark for markets where two-factor authentication is required by law: India + Europe under SCA*

### Vanilla 3DS
- Trigger 3D Secure 1 or 2 based on internal optimization logic
- Request frictionless flow via requestorChallengeInd=02
- If challenged, run challenge in an iframe

*Benchmark for markets where frictionless authentication is prevalent*

### Secure Payment Confirmation
- Perform 3D Secure 2
- Request a challenge from the issuing bank via requestorChallengeInd=03
- Run challenge in a Secure Modal Window
- Upon successful completion, prompt user to enroll a credential
- Subsequent payments: authenticate with Secure Payment Confirmation + fall back to 3D Secure 2 challenge if unsuccessful
About the experiment

Hypotheses

Secure Payment Confirmation *increases* conversion (authentication rate) compared to other arms.

Secure Payment Confirmation *reduces* time spent (authentication duration) compared to other arms.
Results

All-inclusive Conversion

84.7%
3DS2 Challenge

91.4%
Vanilla 3DS

92.7%
Secure Payment Confirmation
Includes fallback to the 3D Secure 2 challenge flow

Limitation: excludes transactions where the issuing bank returned frictionless approval or error (> 50%) — not directly comparable with the Vanilla 3DS arm
## Results

### SPC Biometric Flow

<table>
<thead>
<tr>
<th>Est. Biometric Confirmation Rate</th>
<th>Enrollment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>86.3%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Driven by users canceling out of biometric flow, likely due to unfamiliarity as rate increases on subsequent payments.

Even if user cancels, can still recover the payment by completing a traditional 3D Secure challenge.

**Limitation:** some frontend events blocked by ad blockers, rate interpolated.

**Fraud Rate**

**Negligible**
Results

Median Duration

36s
3DS2 Challenge
Mean of 52 seconds
Mean is elevated due to long tail of slow authentications

7s
Vanilla 3DS
Mean of 22 seconds
Mean is elevated due to authentications where the frictionless flow is not granted

12s
Secure Payment Confirmation
Mean of 15 seconds
Mean remains low because fallback to 3D Secure challenge is rare
Results

Summary

Key Results

SPC pilot increases conversion by 8pp compared with 3DS2 challenge flow.

SPC pilot reduces authentication duration by over 3x compared with 3DS2 challenge flow.

Future Work

Experimenting with issuer branding and copy changes to improve authentication and enrollment rates.

More precise measurement of when and why users fall back from the biometric prompt.

Integration with 3D Secure and additional payments protocols.

Feedback from stakeholders, developing the design of the API.

Many thanks to the Google Chrome team for piloting this proposal with us.