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Ultrablue

Remote attestation over Bluetooth

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French National Cyber Security Agency

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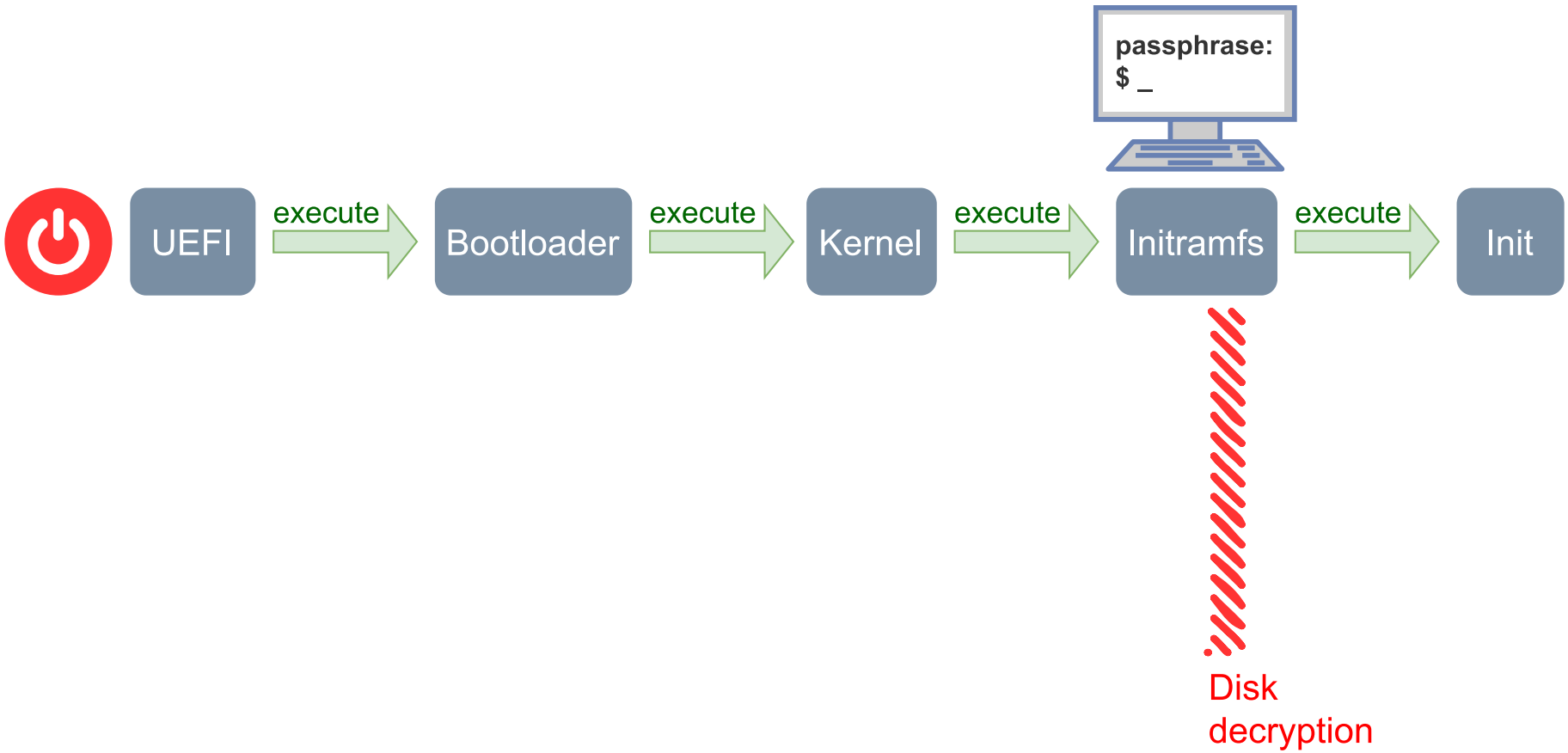
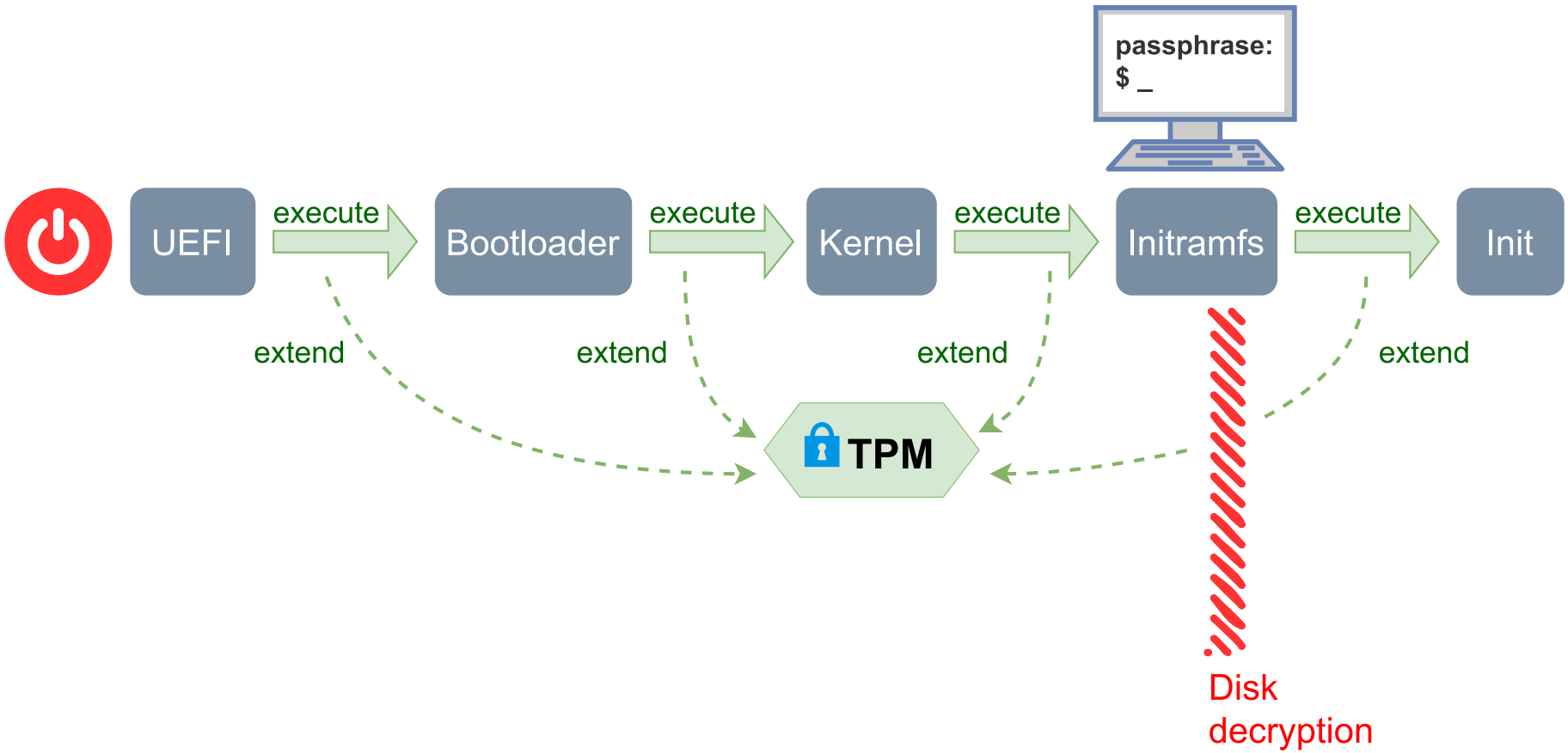
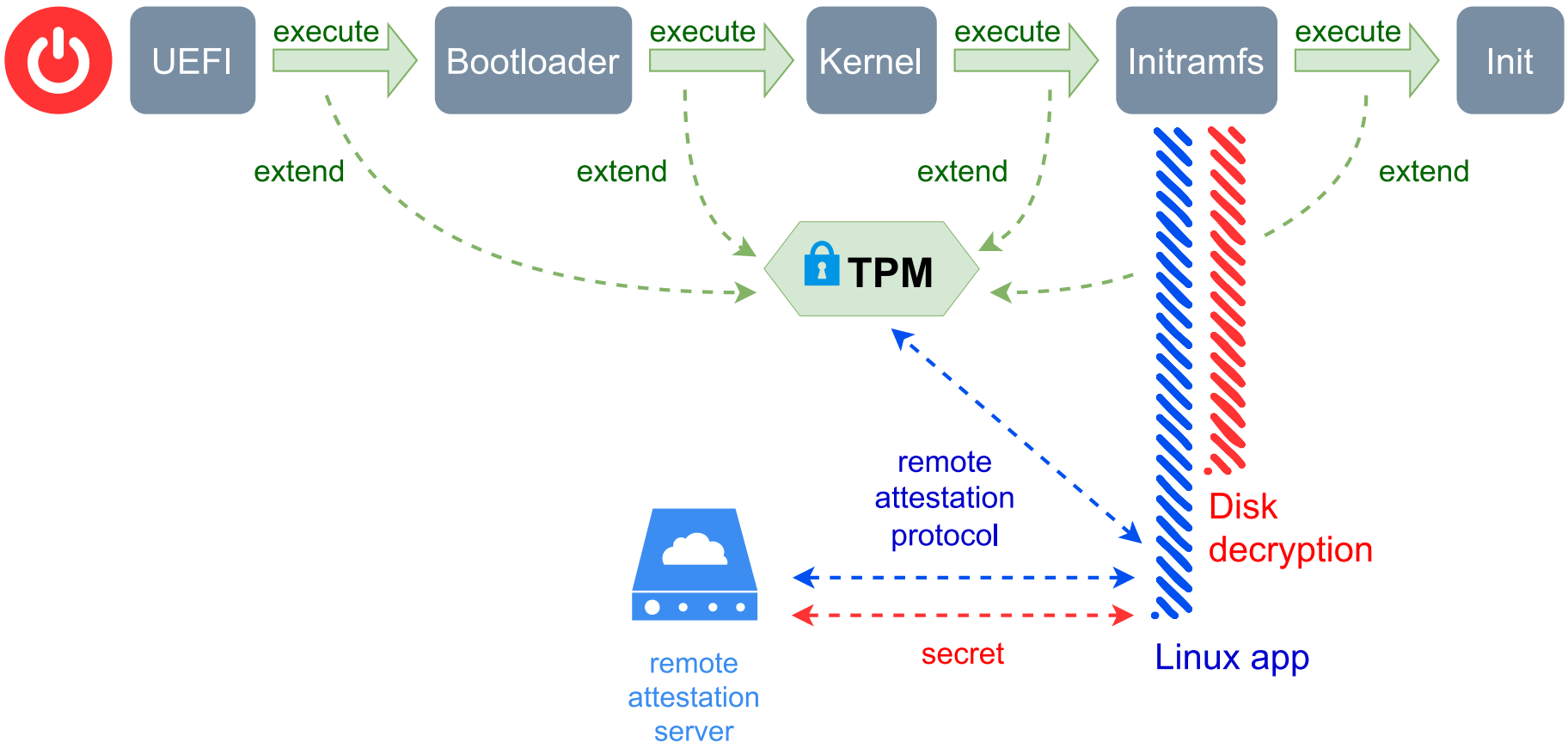
Bootchain


passphrase:
$ _
UEFI
execute
Bootloader
execute
Kernel
execute
Initramfs
execute
Init
Disk
decryption

Bootchain with TPM



Bootchain with TPM and remote attestation



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Ultrablue – User-friendly lightweight TPM remote attestation over Bluetooth

Your phone does remote attestation

Ultrablue Stack

GO

Bluetooth SMART

GO

Bluetooth SMART

Kotlin

GO

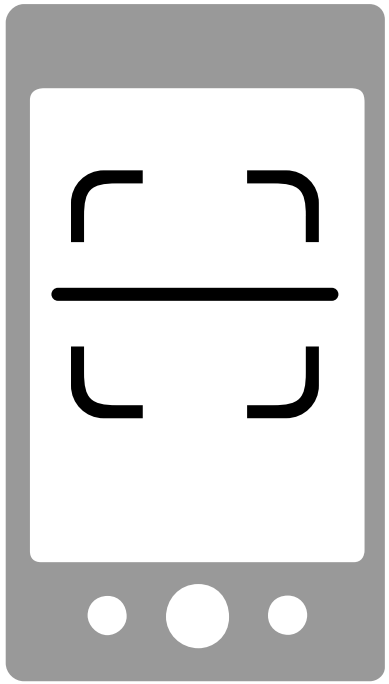
Bluetooth SMART

Swift

server
(laptop)

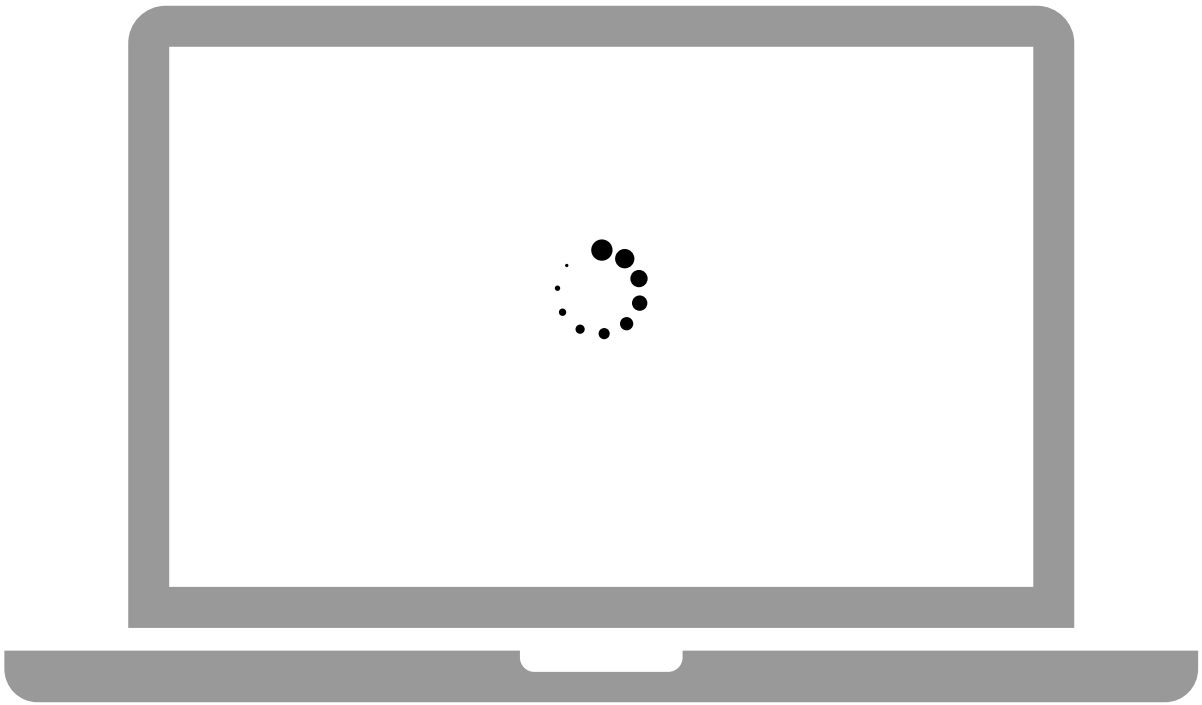
clients
(smartphone)

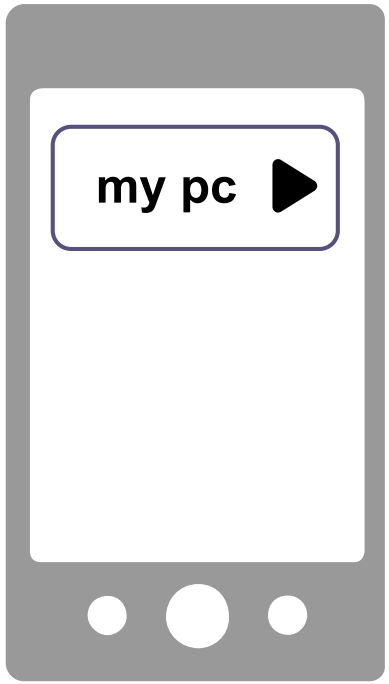
Ultrablue Workflow - Enrollment



- Use a QR code to share channel encryption key
- Get the reference state
- Boot state trusted on first use

Ultrablue Workflow - Attestation





- Get new boot state
- Inspect changes easily
- Control attestation result

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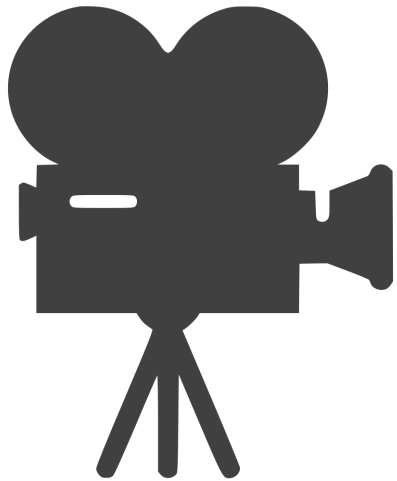
Ultrablue Demo



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Ultrablue is versatile

- Embeddable in initramfs, or runnable at a later stage
- Usable as a second factor for disk decryption
  (via PCR extension and LUKS TPM slot)
- Sample scripts to build a test VM demonstrating those features
- We welcome use-cases, suggestions and contributions!

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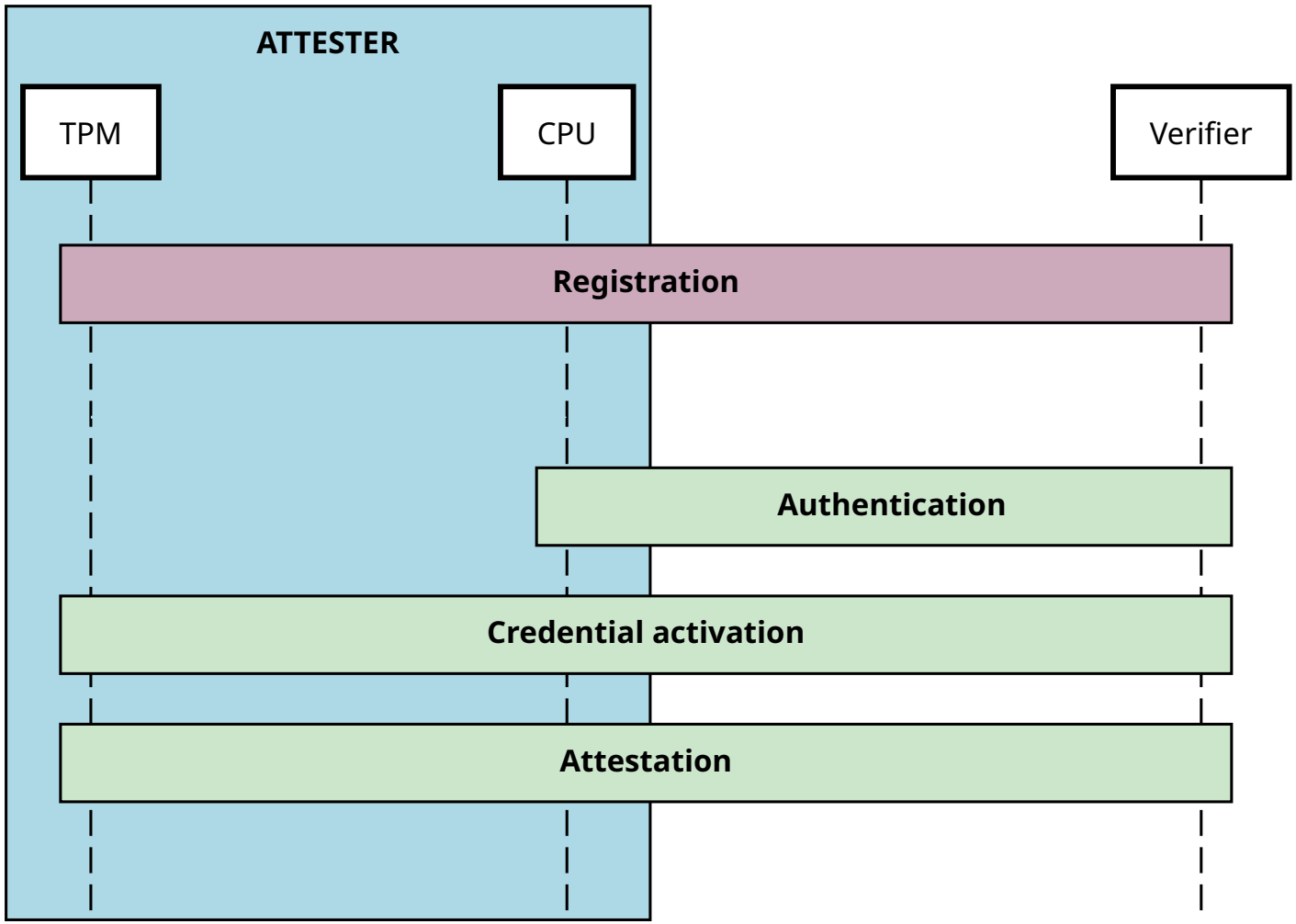
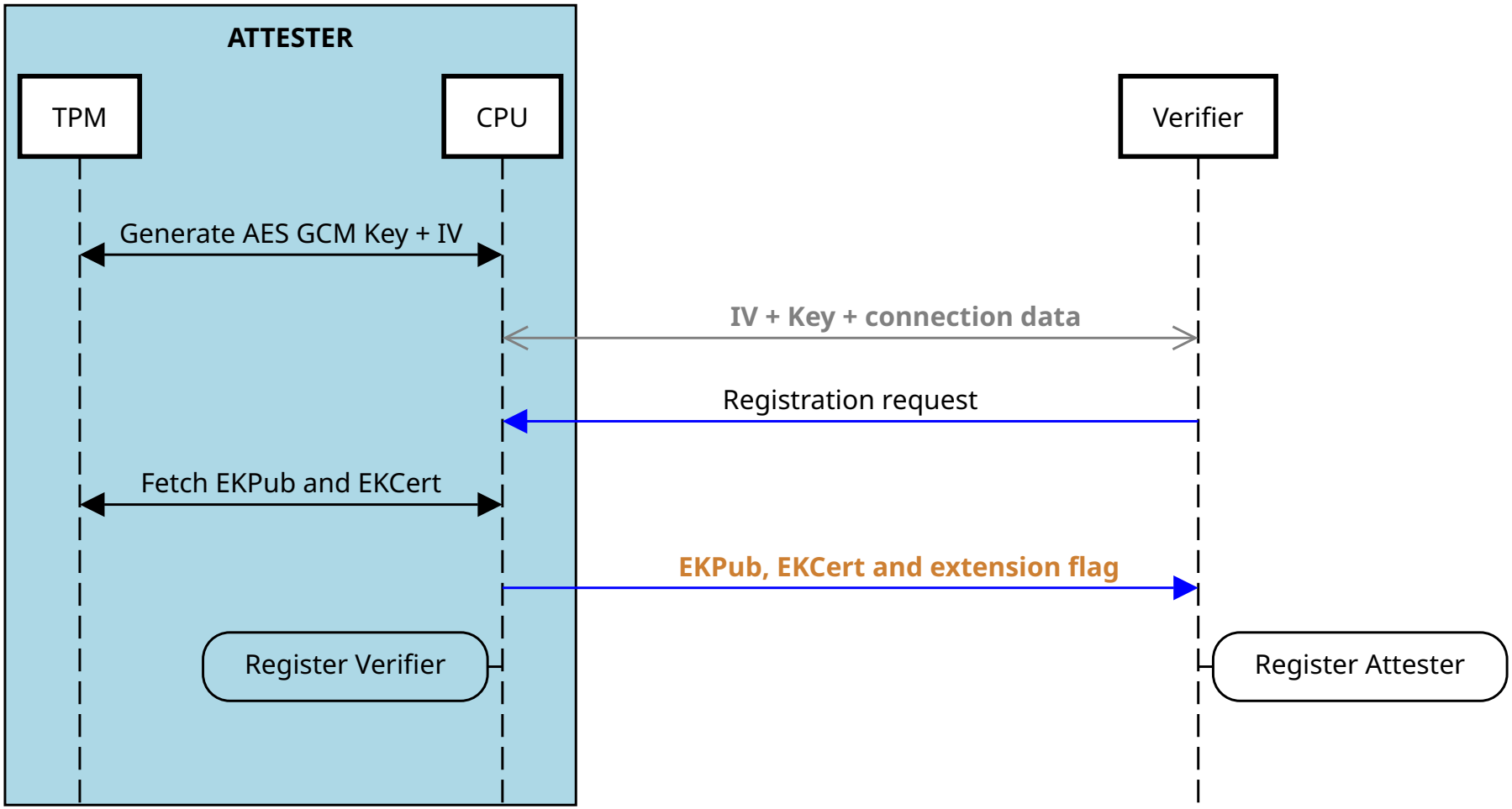
Ultrablue protocol

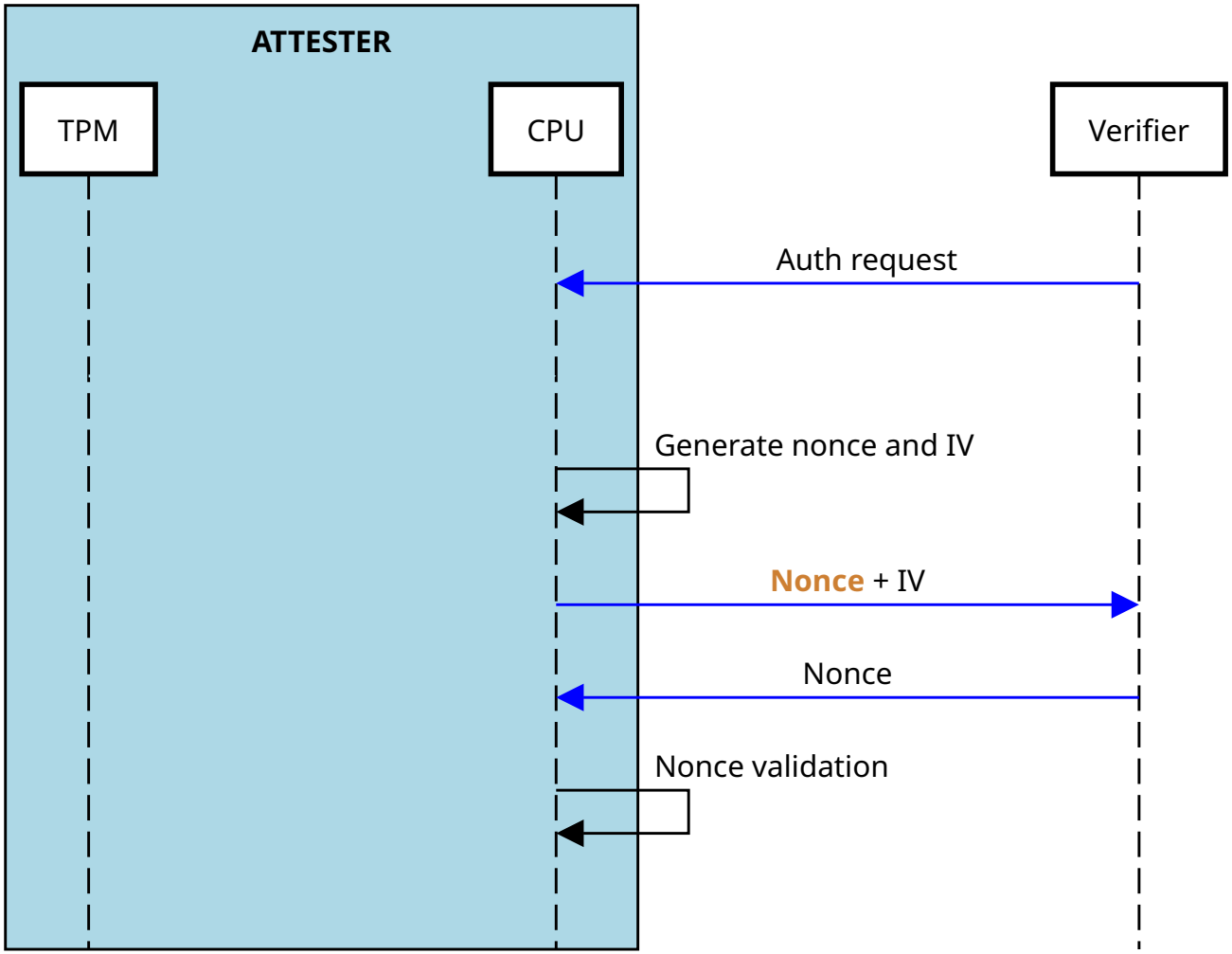
Protocol overview



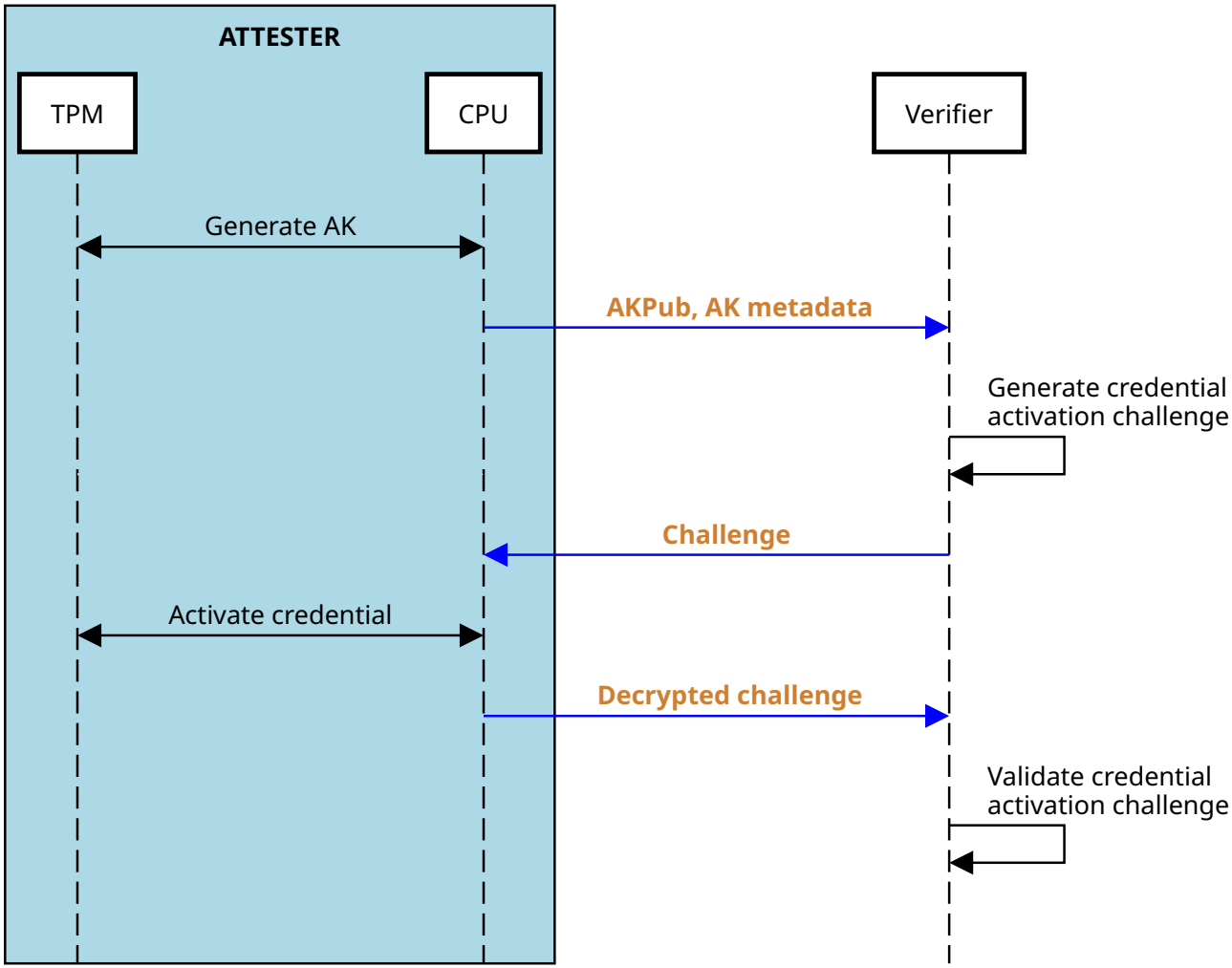
Registration – Store device and TPM identity



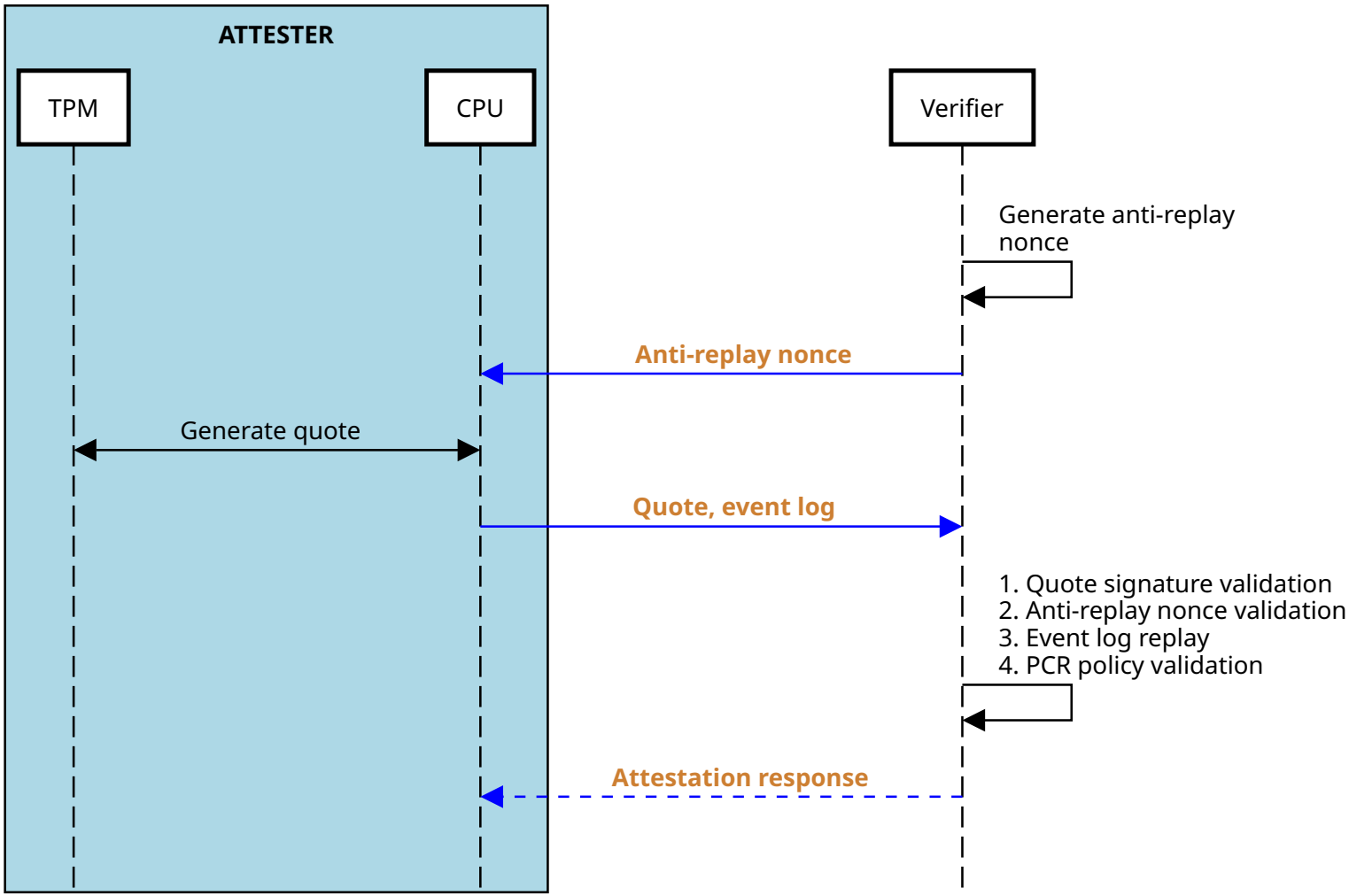
Authentication – Mitigate DoS attacks



Credential activation – Fetch Attestation Key



Attestation – Validate boot state



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What's next?

- Get more users and contributors
- UI improvements on Android
- Clean up and publish encryption code
- Integrate with external projects to ease setup

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https://github.com/ANSSI-FR/ultrablue