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Ultrablue

Remote attestation over Bluetooth

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French National Cyber Security Agency

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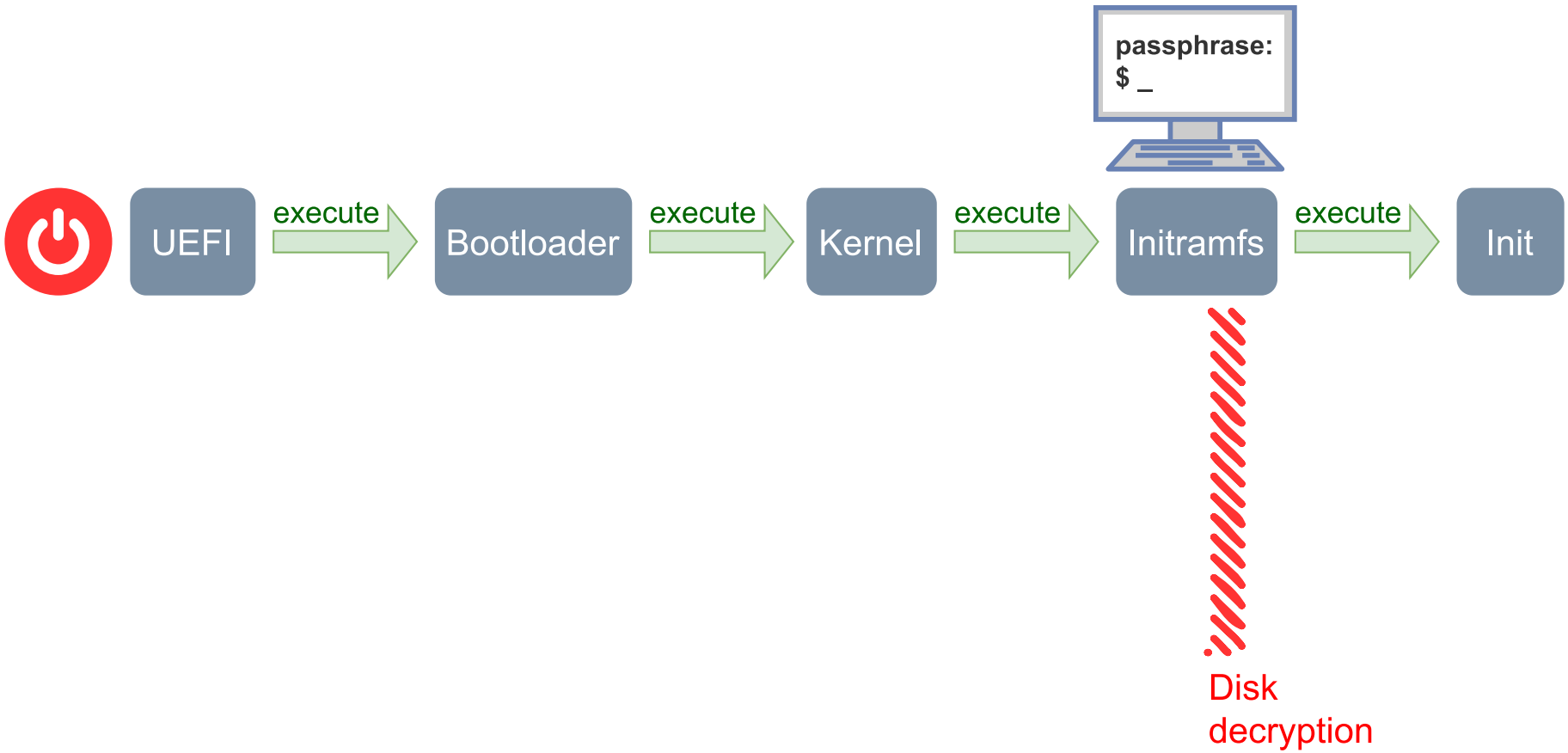
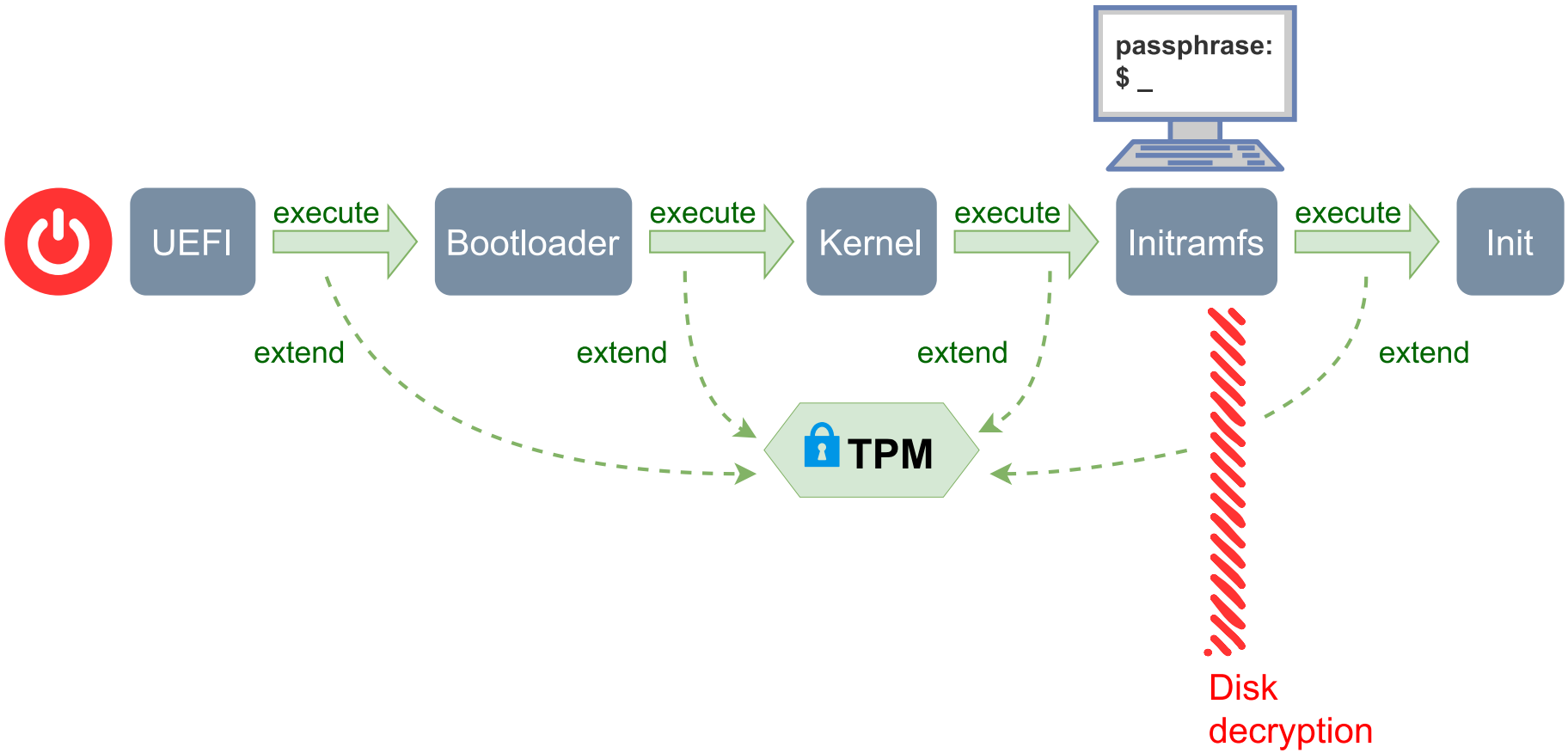
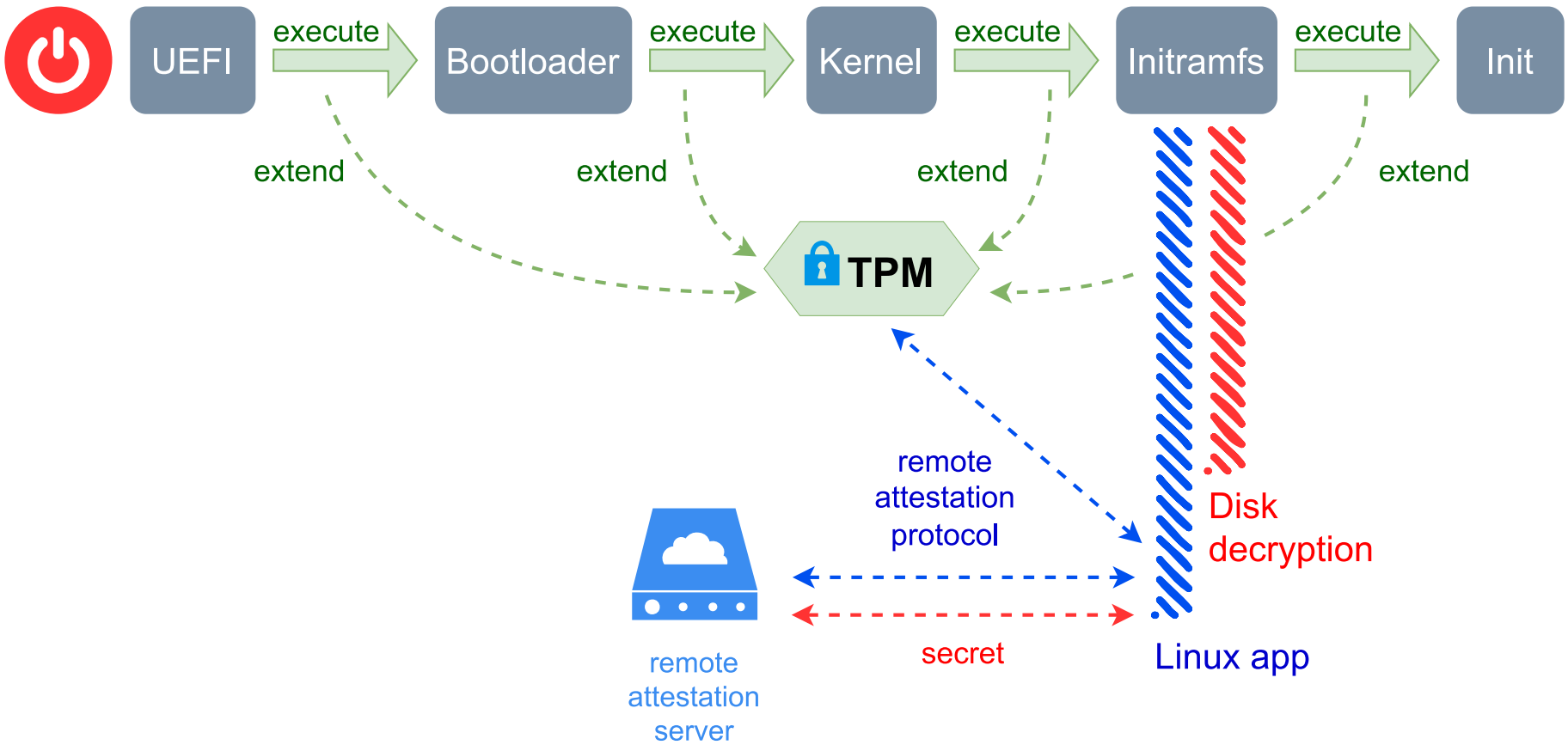
Bootchain


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

Ultrablue Stack



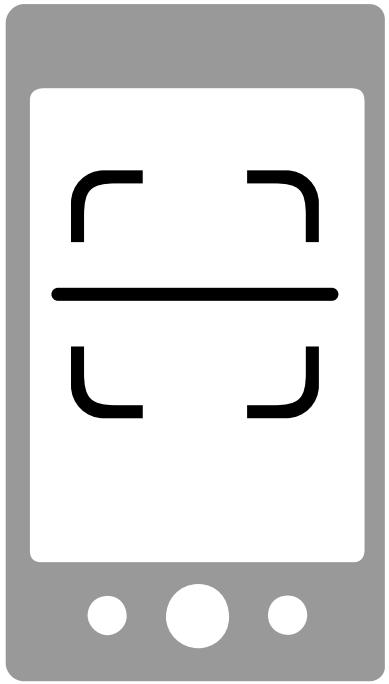





server
(laptop)

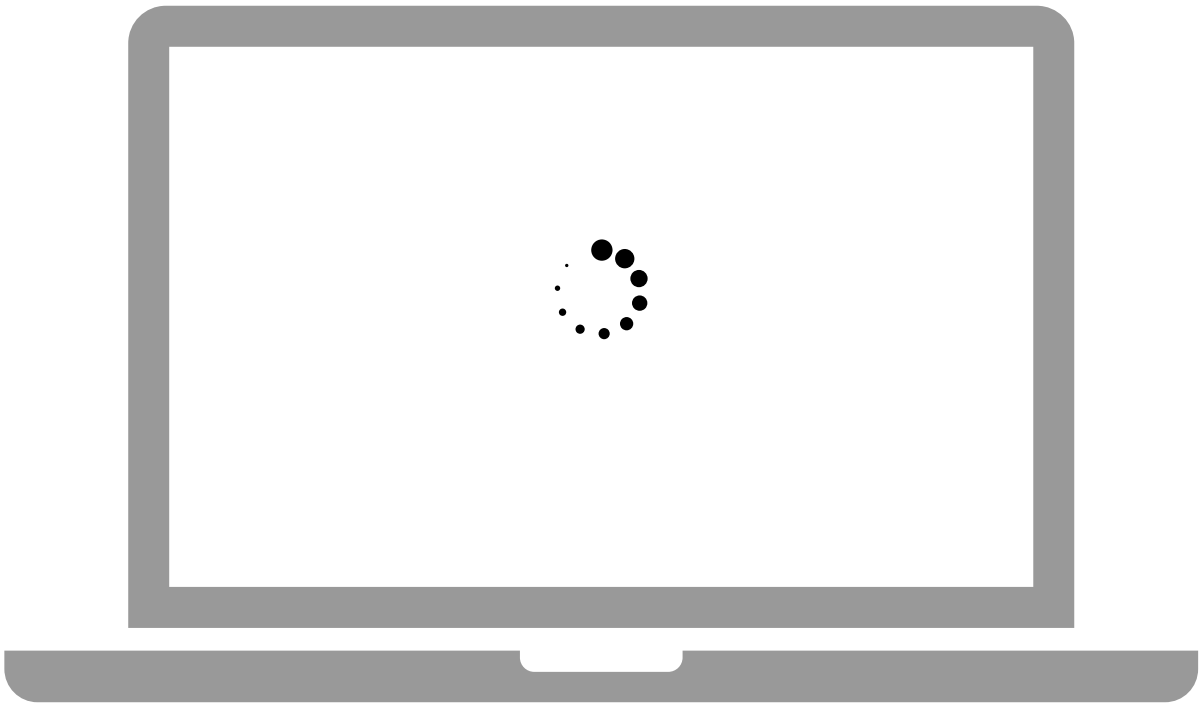
clients
(smartphone)

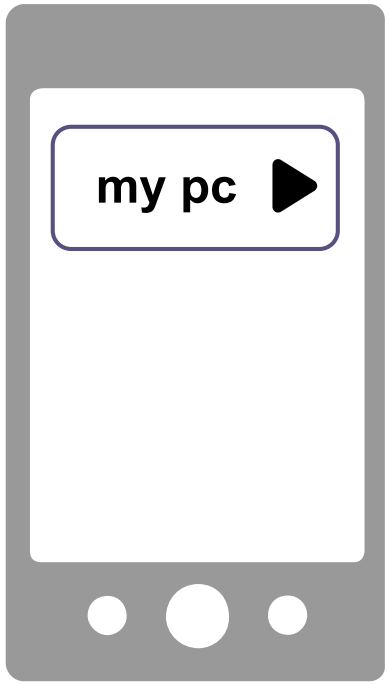
Ultrablue Workflow - Enrollment



- 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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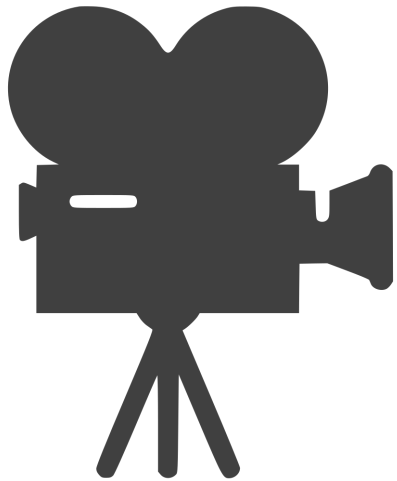
Ultrablue Demo



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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 `mkosi` scripts to build a test VM demonstrating those features
- We welcome use-cases, suggestions and contributions!

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Ultrablue protocol

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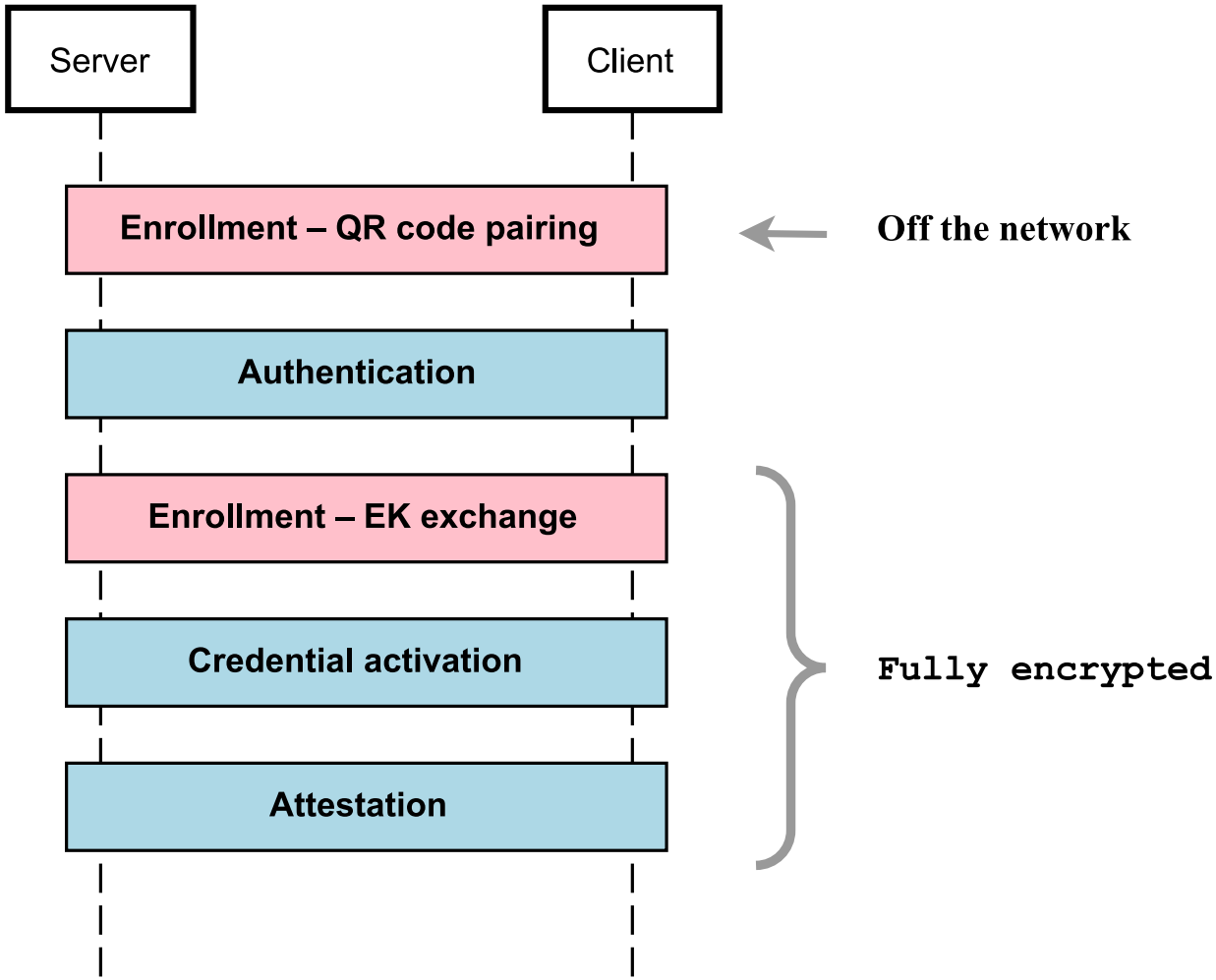
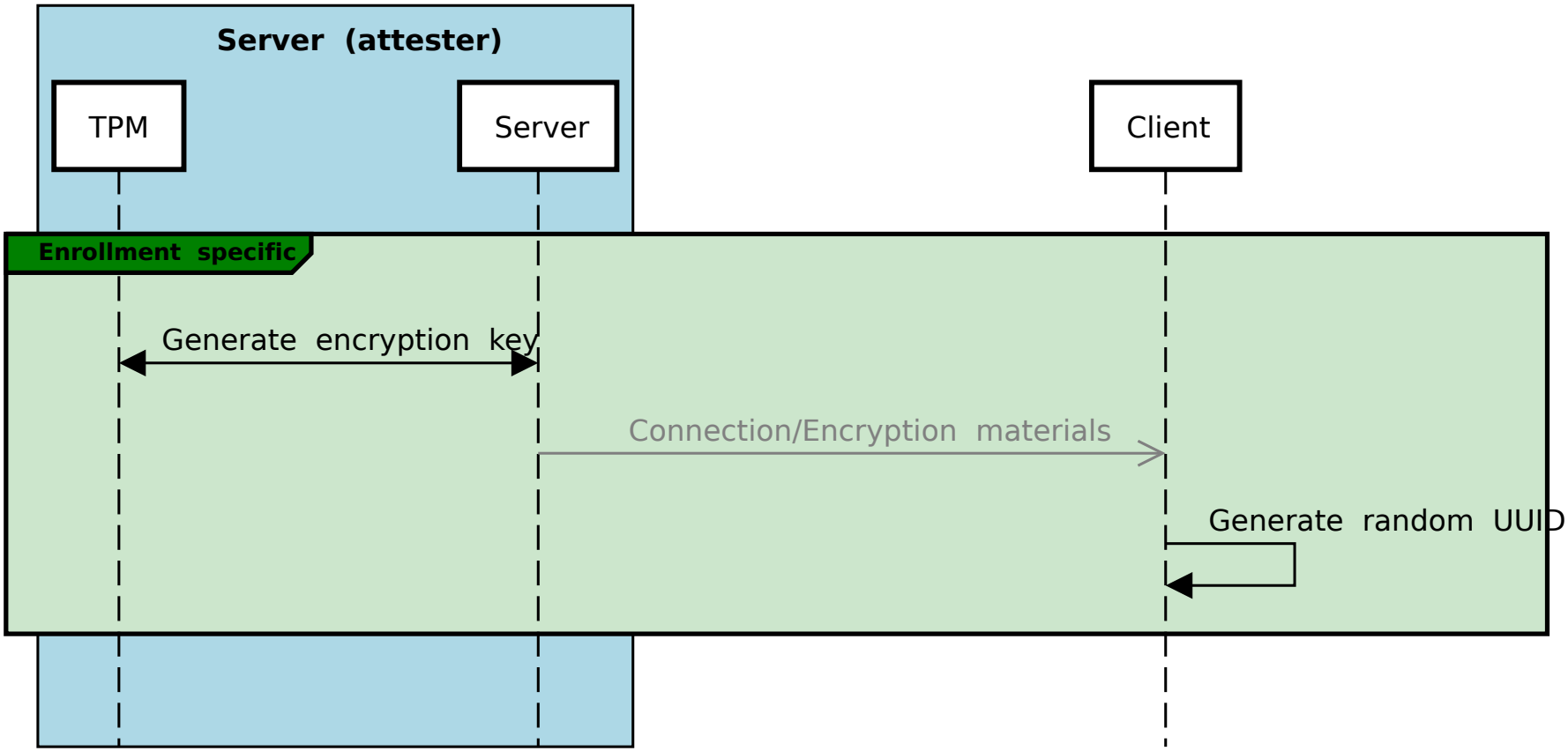
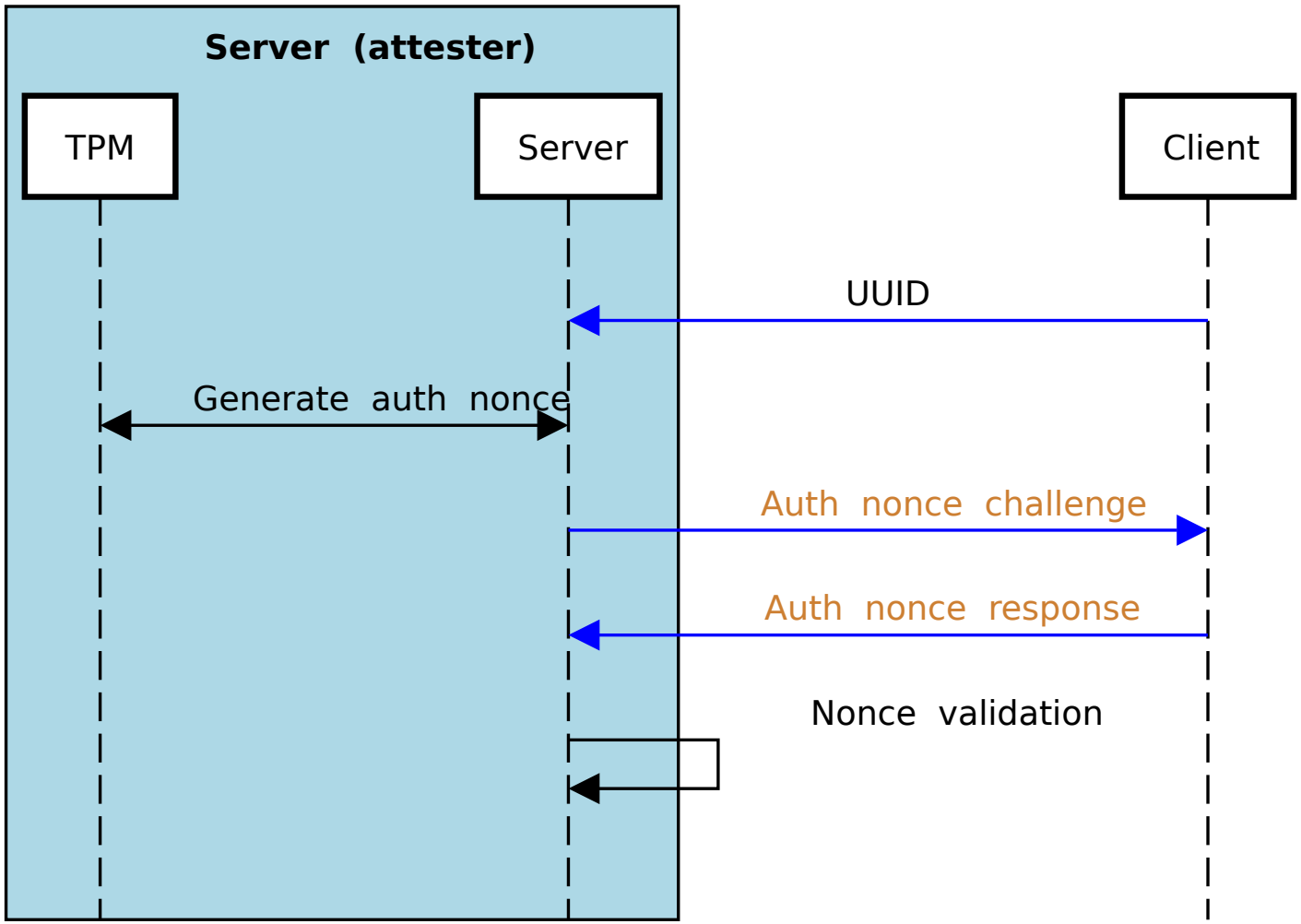
Protocol overview



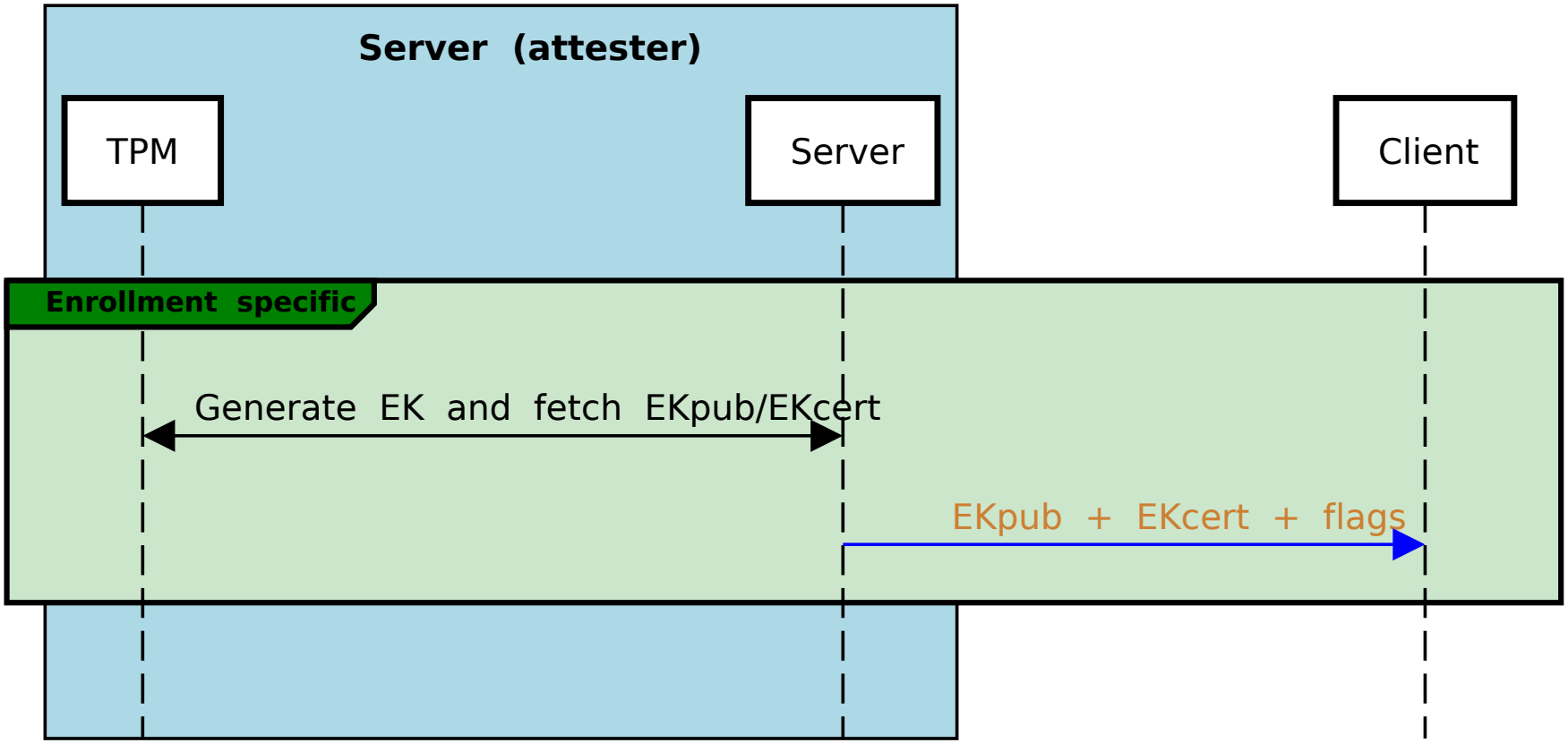
Enrollment – QR Code and UUID generation



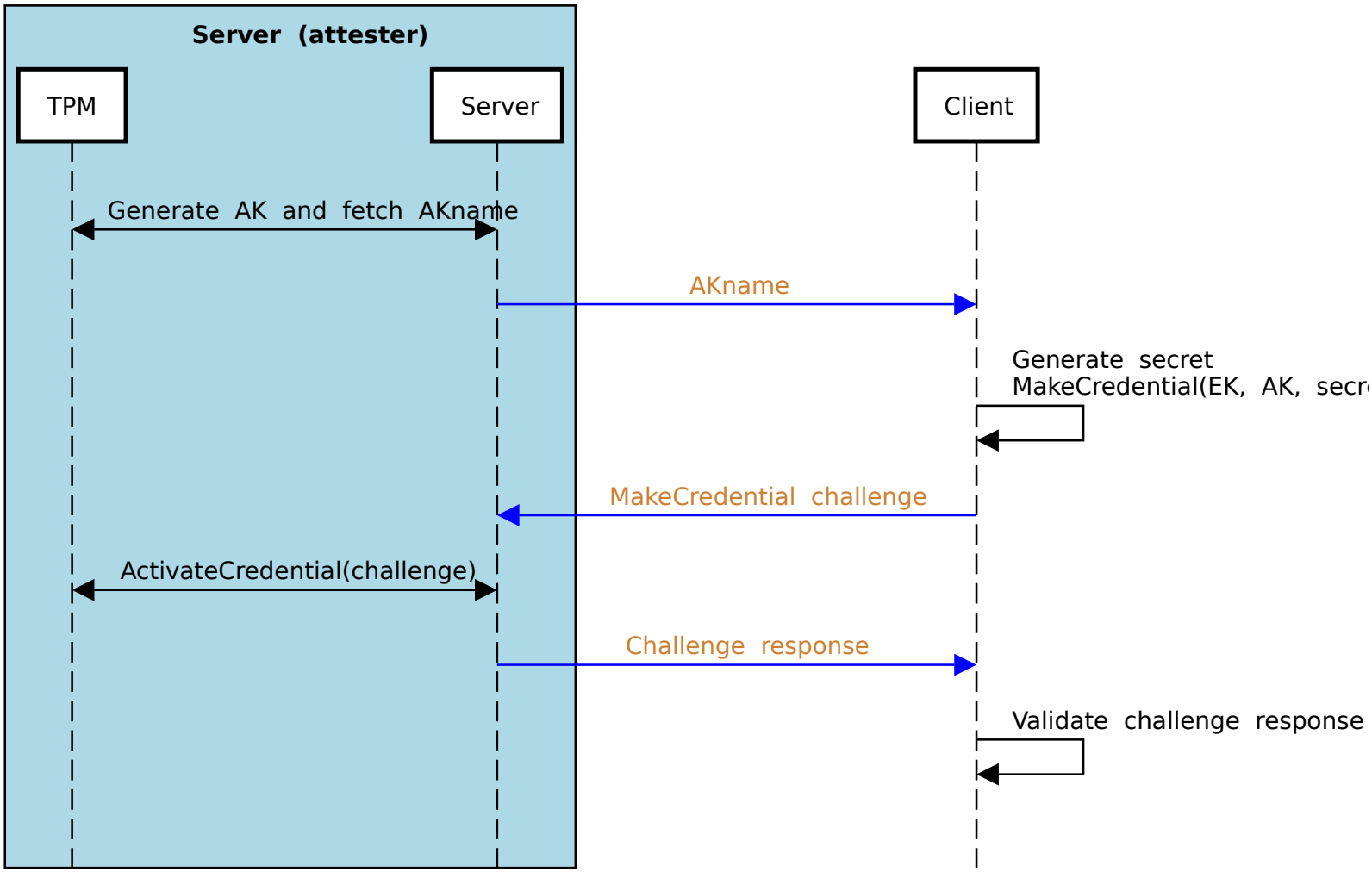
Authentication – Mitigate DoS attacks



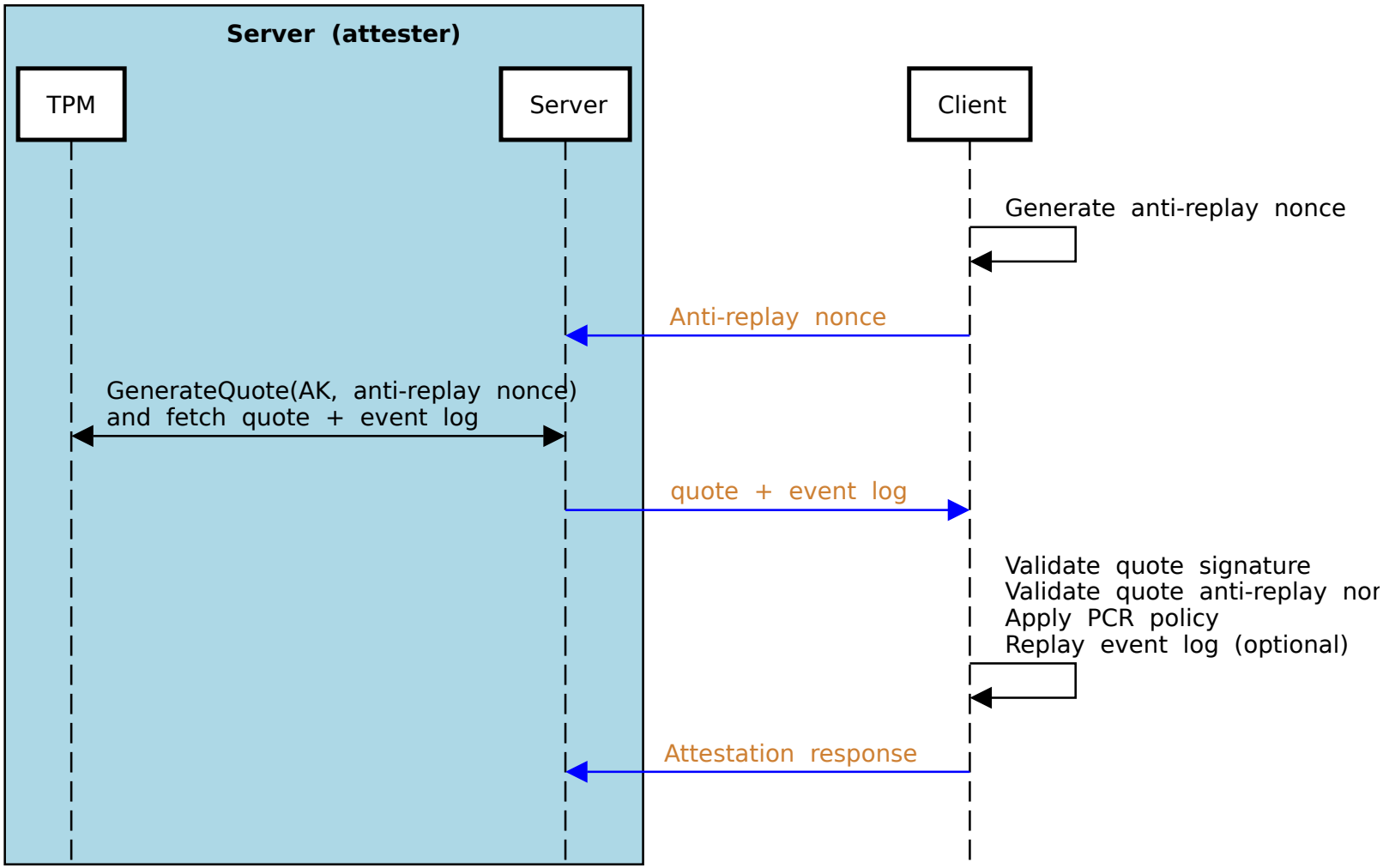
Enrollment – Endorsement key exchange



Credential activation – Generate an Attestation Key



Attestation – Validate boot state



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What's next?

- Integrate with external projects to ease setup
- Get more users and contributors
- Test our FOSDEM release!
  github.com/ANSSI-FR/ultrablue/releases

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