ELASTIC Project

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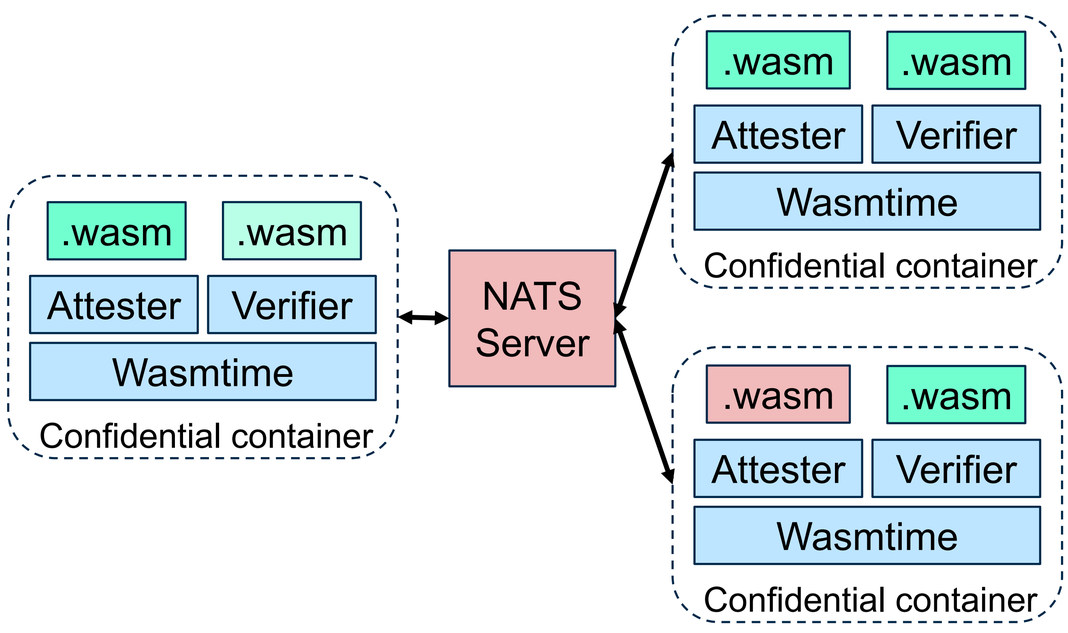
Secure, attested communication for serverless WebAssembly applications

Introduction

- The **WebAssembly (WASM)** component model defines interoperable software components using **Wasm Interface Type (WIT) interfaces**.
- **WIT interface** specifies exported and imported interface of a WASM component

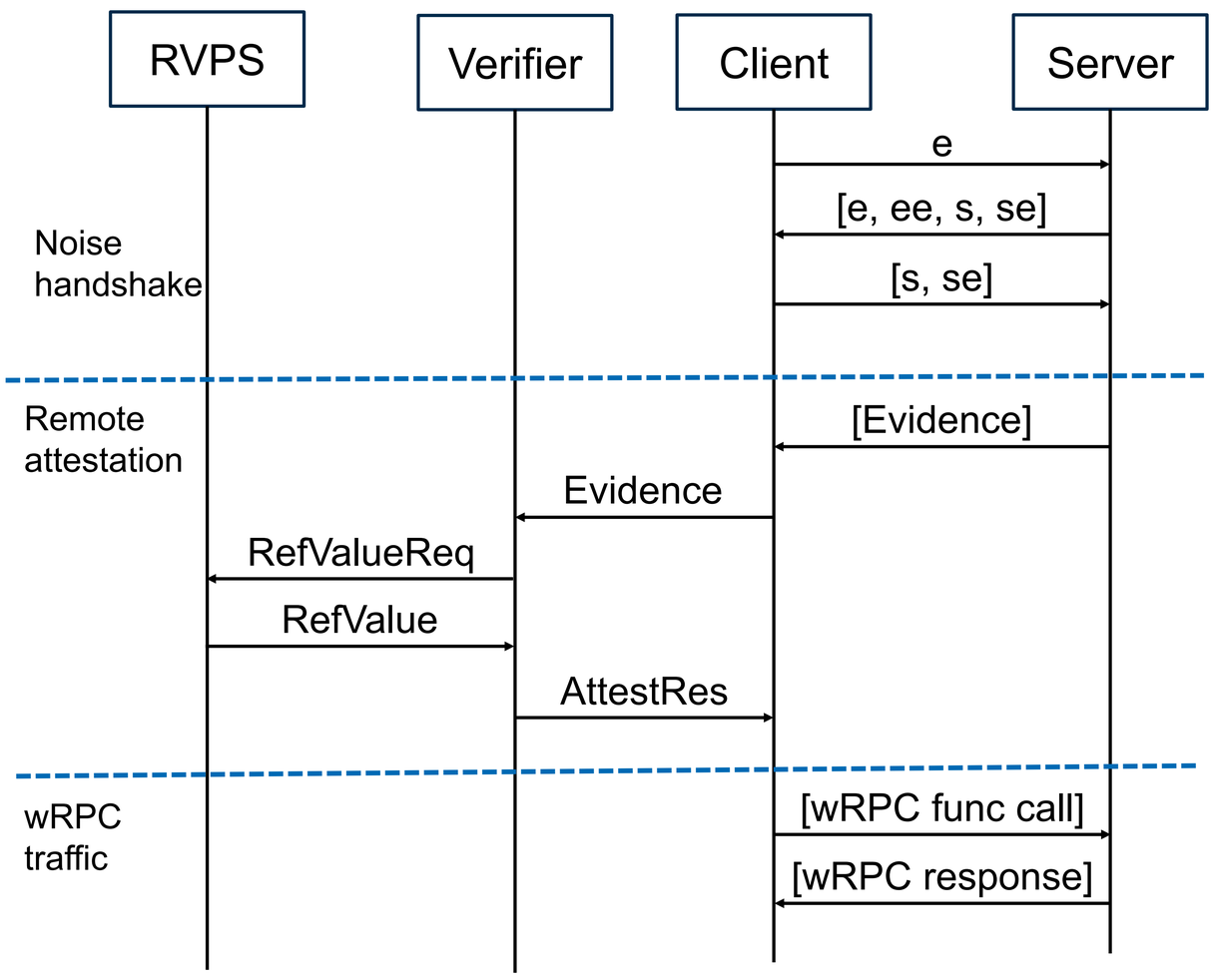
```
package demo:example;
world calculator-world {
    export calculator;
    interface calculator {
        add: func(a: u32, b: u32) → u32;
    }
}
```

- **wRPC** enables WASM components to connect over the network.



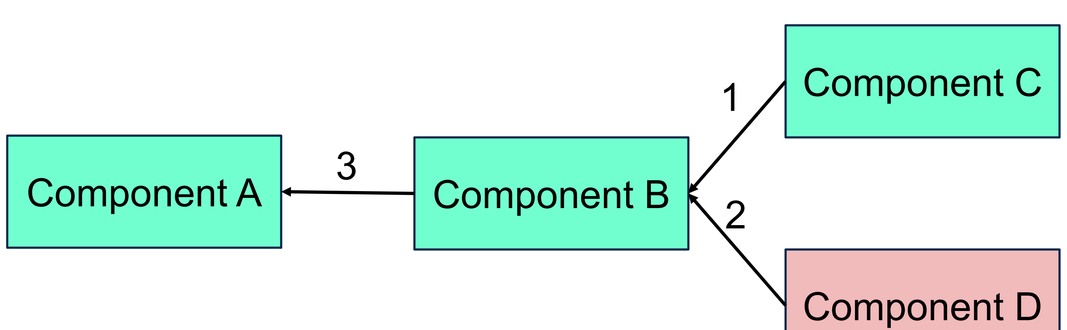
Solution

- Combine **remote attestation** with **Noise protocol**
- Bind the evidence with the active session with **transcript hash**
- A workload generates evidence if **all** dependencies are successfully attested



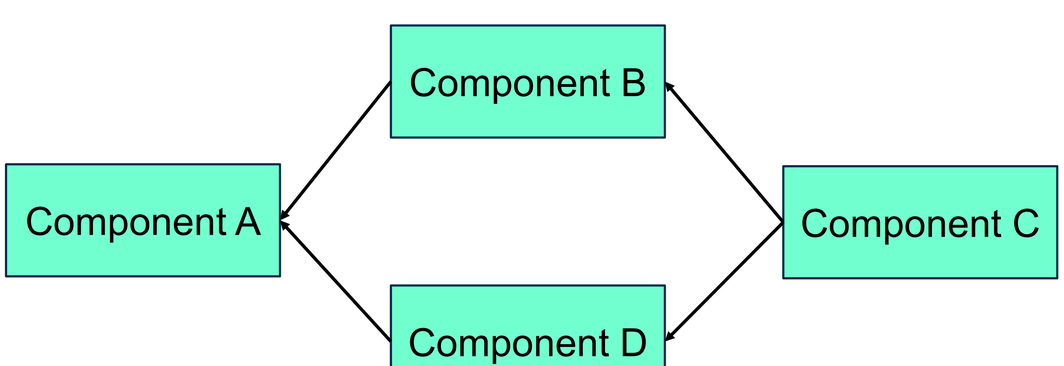
Problem

- How to verify which WASM component is at the other end of a wRPC connection before making wRPC call?
- How to ensure **end-to-end encryption** for wRPC traffic?
- How to extend remote attestation from individual workload to **dependency-aware trust establishment**?



Discussion

- How to handle **circular dependencies, diamond dependency**?
- **Component identity** related issue: component duplication?
- How to extend for **mutual attestation**?



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