



# Proxy Smart Contract

Solidity with Inline Assembly

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# PROBLEM

What is the problem that a proxy contract is solving?

Consider a software developer who creates a smart contract and deploys it to the Ethereum blockchain at time  $T_0$ .

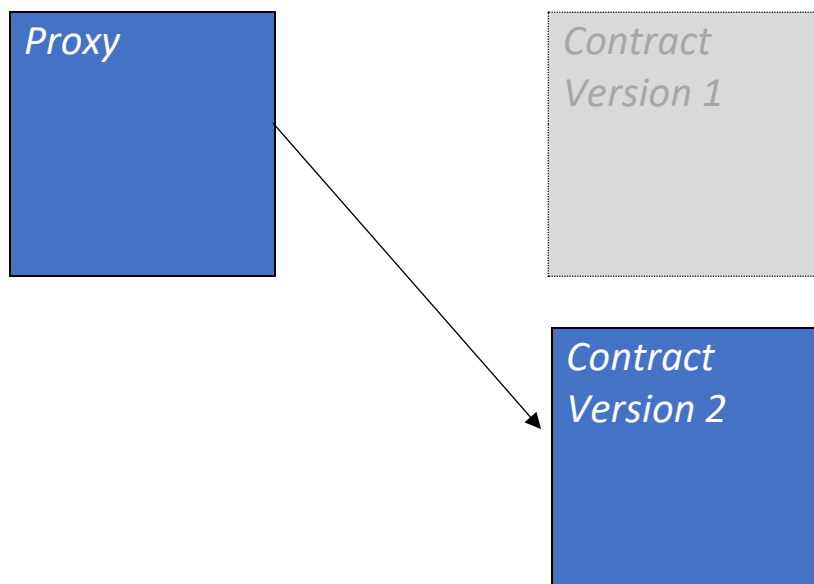
Later it is determined that there is a bug in the smart contract, or perhaps a new feature must be included and a change to the code needs to be made. A dilemma arises, due to the immutable nature of the blockchain. How can we change something that is unchangeable? How can we upgrade a smart contract?

Developer  $D \rightarrow$  Proxy Contract  $C_P \rightarrow$  Deployed Contract  $C_1$

Developer  $D \rightarrow$  function call  $\rightarrow$  Proxy  $C_P \rightarrow$  forwards call to  $\rightarrow$  Contract  $C_1$

Developer only needs to know the address of the Proxy Contract, not the contract

Developer deploys a new version of  $C_1 \rightarrow (C_2)$

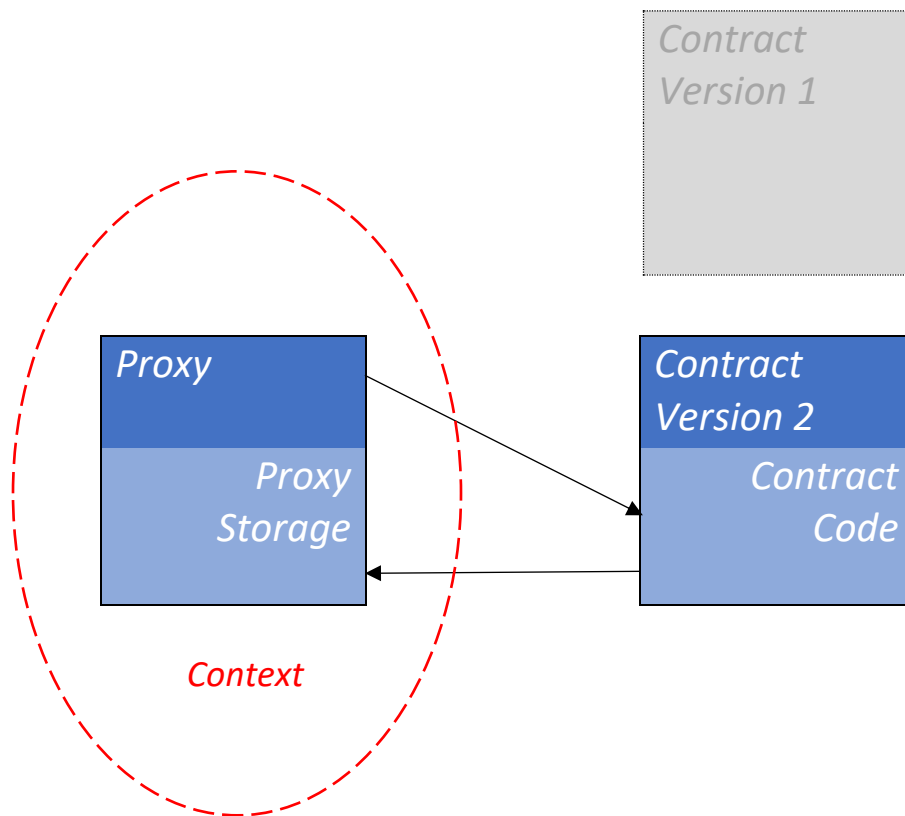


Developer  $D \rightarrow$  function call  $\rightarrow$  Proxy  $C_P \rightarrow$  forwards call to  $\rightarrow$  Contract  $C_2$

This process can be repeated, i.e. new versions of the deployed contract can be referenced, effectively allowing for a contract to be upgraded, bypassing the inherent immutability of the blockchain.

This is made possible by DelegateCall.

Execute the code of the latest deployed contract within the context of the proxy. Code in Contract Version 2 will modify storage of the proxy.



Steps:

1. Deploy the Proxy Contract.
2. Deploy the Smart Contract version 1.
3. Call a function in the Proxy Contract to update the address of the deployed Smart Contract.
4. In the future, if a new version of the smart contract is required because of a bug fix or new functionality, Contract version 2 is deployed.
5. Call the update function in the Proxy Contract to point to the newly deployed Smart Contract version 2.

# SOLUTION

Using Assembly to create a smart contract

# CODE

## Key Findings #1

Research and argument

[To replace a photo with your own, just delete it and then, on the Insert tab, click Picture.]

## Key Findings #2

Research and argument

## Key Findings #3

Research and argument

## Visual Data

Insert any data tables/charts/graphs/infographics etc.

# CONCLUSION

Time to wrap it up. What is your conclusion? How would you synthesize all the information into something even the busiest CEO wants to read? What are the key takeaways? How does your product/service/methodology uniquely address the issues raised by your study?

## Key Takeaways

- Takeaway #1
- Takeaway #2
- Takeaway #3