🔄 Chainlink CCIP Transaction Lifecycle

Step 1: Message Initiation

A sender (EOA or smart contract) initiates a CCIP message on the source chain via the **Router**. The message may include tokens, data, or both.

Token Pool contracts handle burning or locking of tokens.

[User → Sender → Router → OnRamp → Token Pool]

Step 2: Source Chain Finality

CCIP waits for the transaction to reach finality—meaning it's irreversible. This varies by blockchain (e.g., block confirmations or deterministic finality).

[Finality Check → Confirmed Transaction]

Step 3: Committing DON Actions

The Committing DON observes finalized transactions, batches them, computes a **Merkle root**, and writes it to the **CommitStore** on the destination chain.

[Committing DON → Merkle Root → CommitStore]

Step 4: Risk Management Network Blessing

The RMN reviews the Merkle root for integrity and security. If verified, it "blesses" the batch, allowing execution to proceed.

[RMN → Blessing → Execution Approval]

Step 5: Execution on Destination Chain

The Executing DON delivers the message to the receiver. Token Pool contracts mint or unlock tokens as needed.

[Executing DON → Receiver → Token Pool (mint/unlock)]

Step 6: Smart Execution & Gas Management

CCIP uses Smart Execution to adjust gas dynamically. If execution fails within ~8 hours, manual execution may be required.

[Smart Execution → Gas Adjustment → Reliable Delivery]

Step 7: Token Pool Contracts

Each token has a dedicated Token Pool contract per chain. These manage mint/burn or lock/unlock logic depending on the bridge type.

[Token Pool = Vault + Mint/Burn or Lock/Unlock]