

Protocolos de Acesso ao Meio

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Protocolos de Acesso Ordenado

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⇒ **Retardo de transferência limitado**

⇒ **Justo (“fair”)**

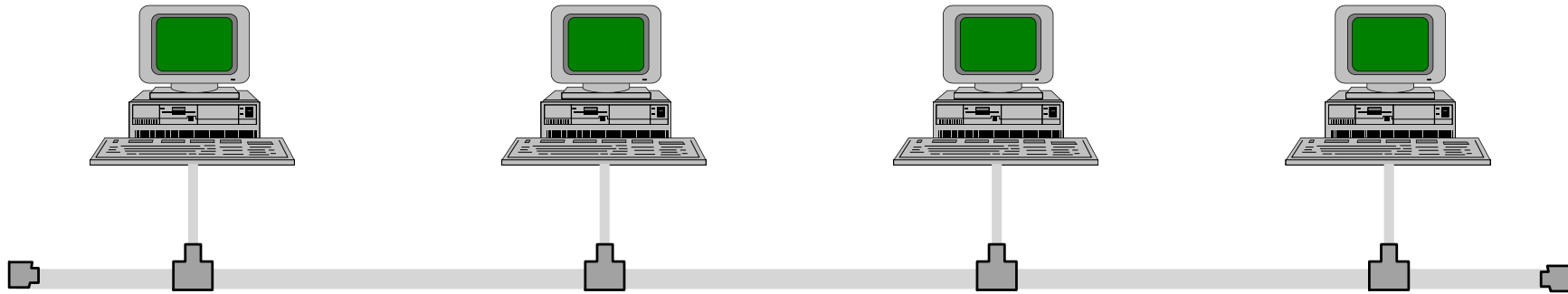
⇒ **Estável em sobrecarga**

Protocolos de Acesso Ordenado

⇒ **Polling**

⇒ **Token Passing - Passagem de Permissão**

Polling



- ⇒ **Topologia lógica: barra**
- ⇒ **Estação central: controladora**
- ⇒ **Estações só transmitem quando interrogadas pela controladora da rede**
- ⇒ **Se não tiver quadro a transmitir, envia um quadro de status avisando a controladora**

Polling

- ⇒ **Justo**
- ⇒ **Prioridade**
- ⇒ **Retardo de transferência limitado**
- ⇒ **Estável em sobrecarga**
- ⇒ **Interface simples de pequeno custo**
- ⇒ **Problema de confiabilidade devido a estrutura centralizada**
- ⇒ **Interessante quando características das estações são bem conhecidas, podendo ser usadas para determinar a disciplina de passagem de controle**

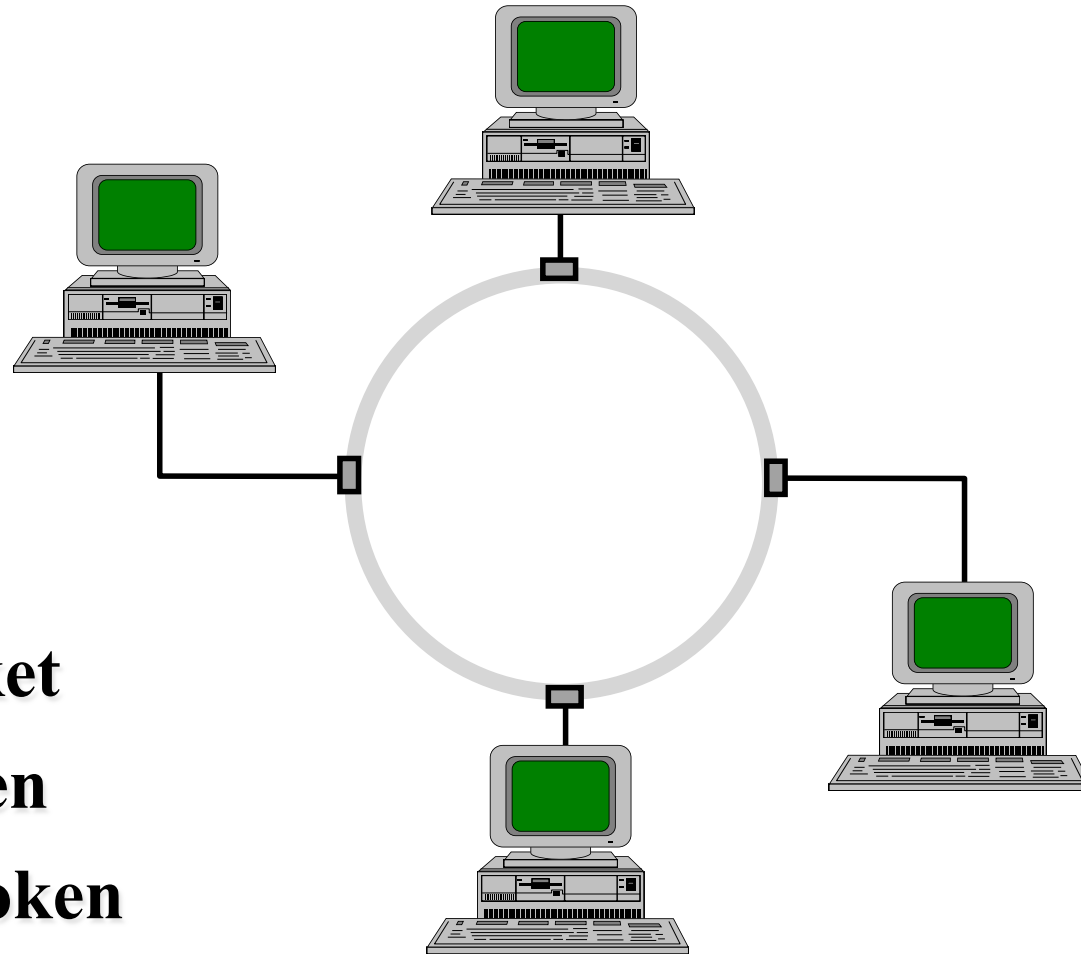
Passagem de Permissão - Token Passing

- ⇒ O token (permissão) é passado sequencialmente de uma estação para outra
- ⇒ Só quem tem o token pode transmitir
- ⇒ Topologia: anel (Token Ring) ou barra (Token Bus)
 - *na topologia em barra, a ordem lógica não é necessariamente a ordem física*
 - *na topologia em anel as ordens lógica e física coincidem.*

Token Ring

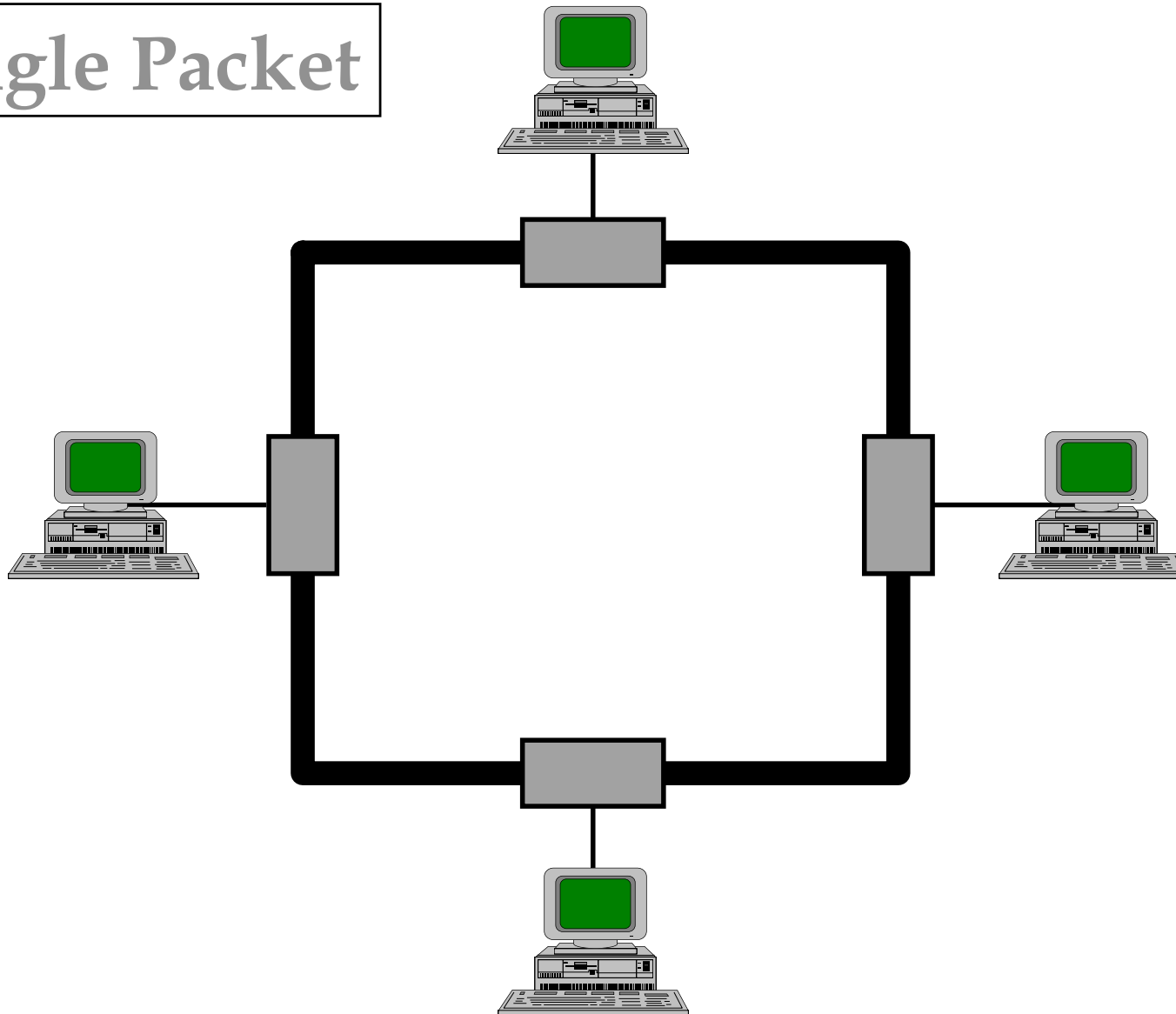
- ⇒ Técnica mais antiga para o anel, proposta em 1969 por Farmer e Newhall
- ⇒ Permissão circula no anel
- ⇒ Ao querer transmitir, a estação espera pela permissão livre, altera para ocupada e transmite seus dados em seguida
- ⇒ A transmissora é responsável pela retirada da mensagem do anel e pela inserção da nova permissão livre
- ⇒ O momento de inserção de uma nova permissão livre no anel varia conforme o tipo de operação

Token Ring

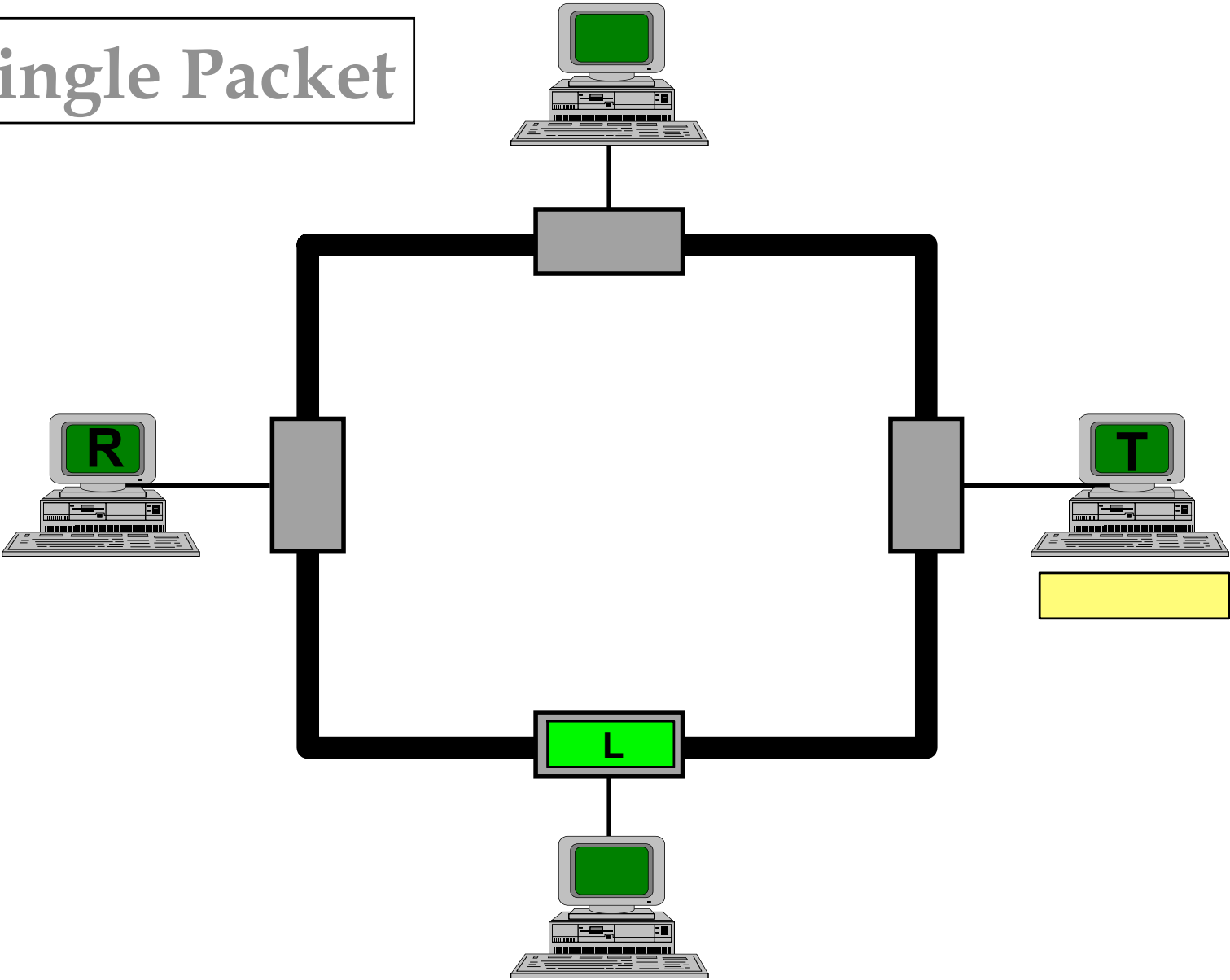


- ⇒ Single Packet
- ⇒ Single Token
- ⇒ Multiple Token

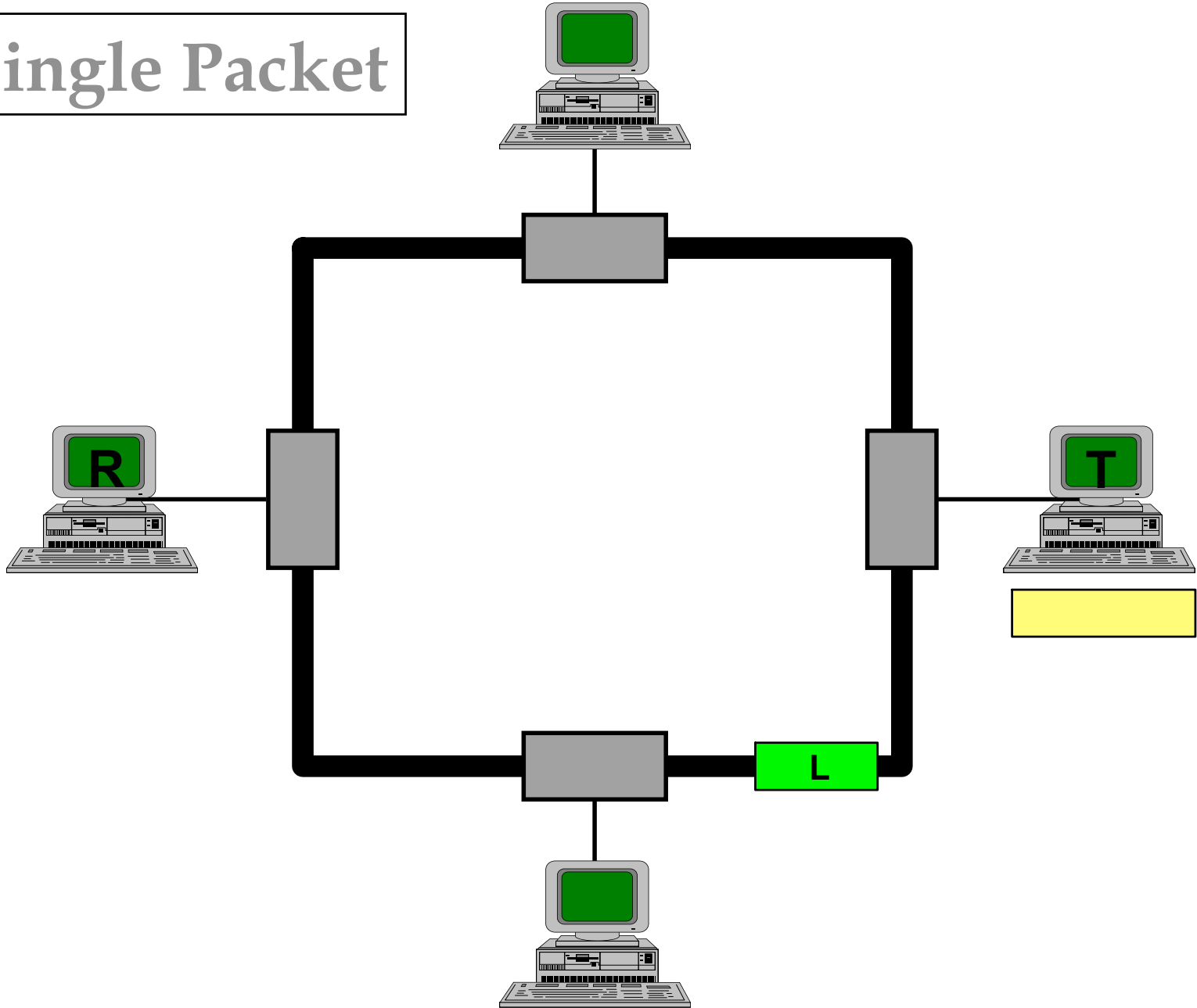
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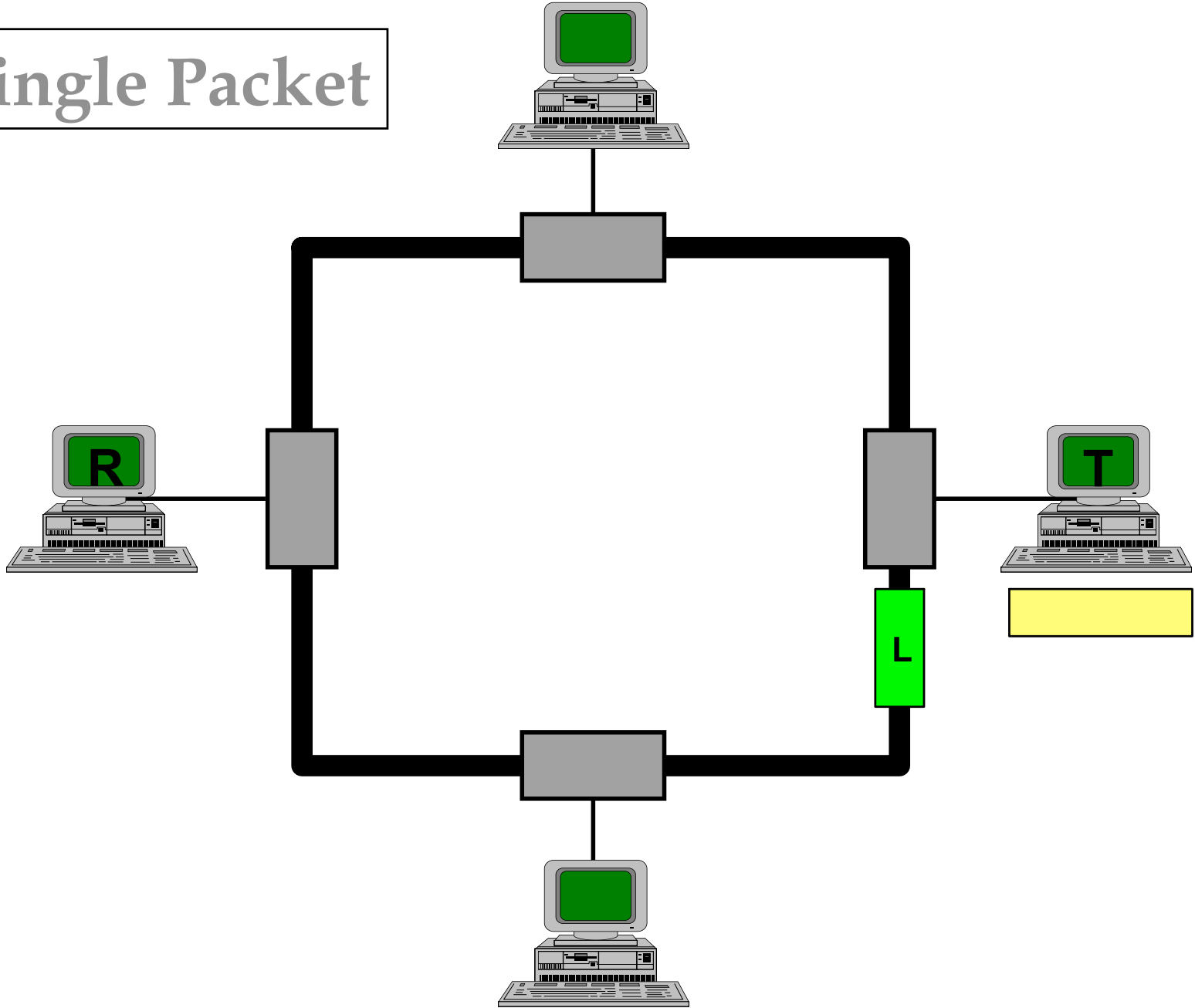
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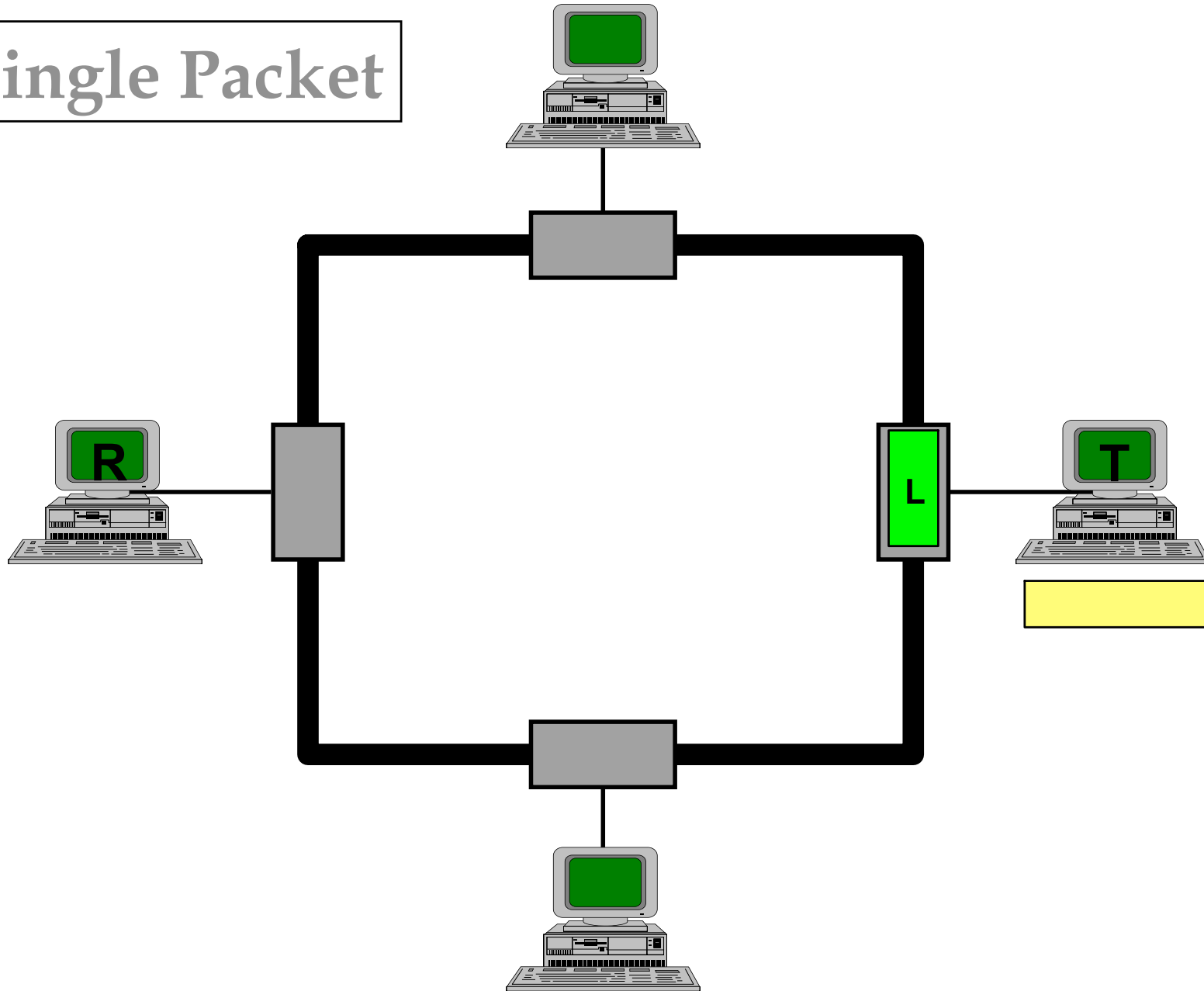
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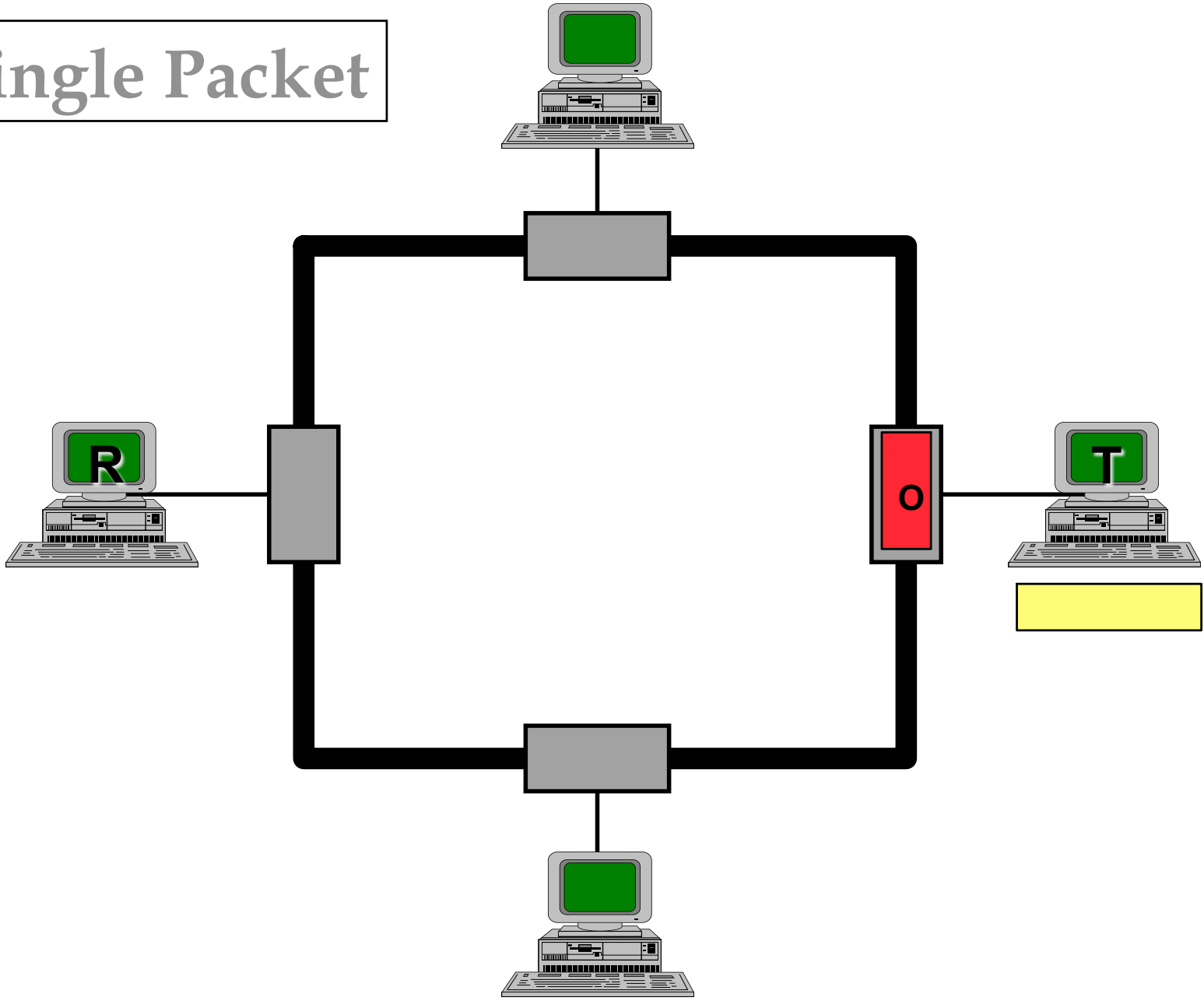
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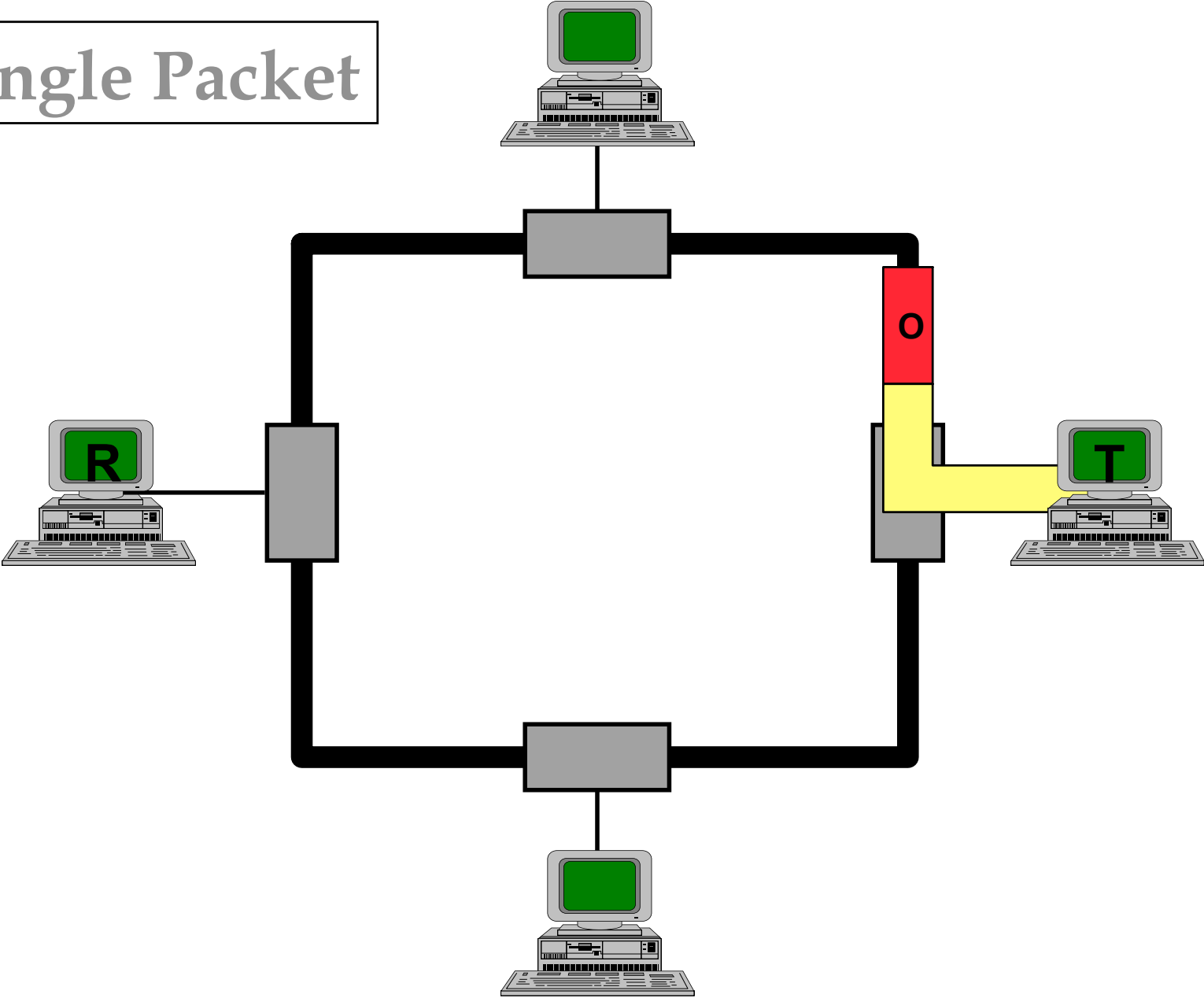
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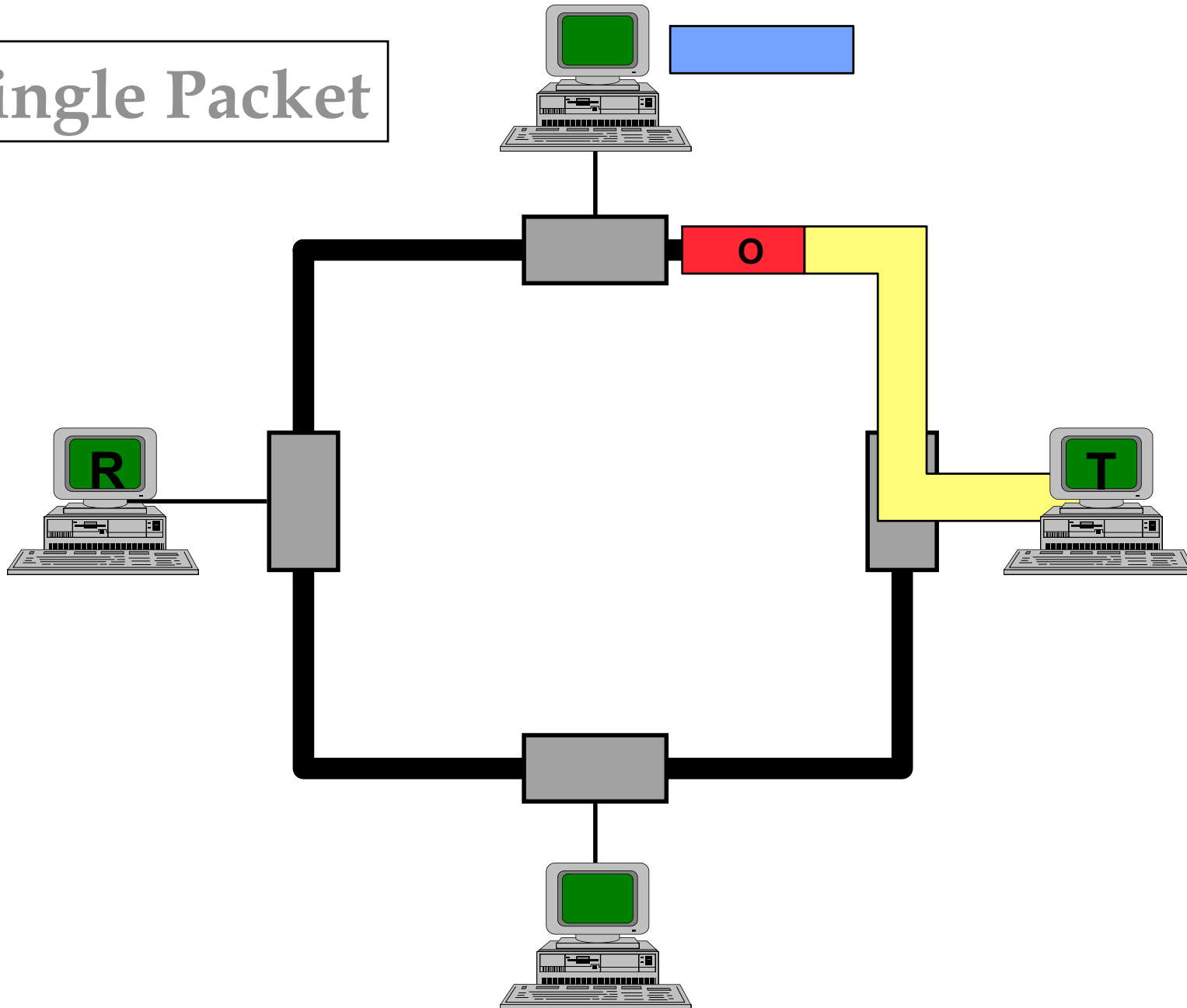
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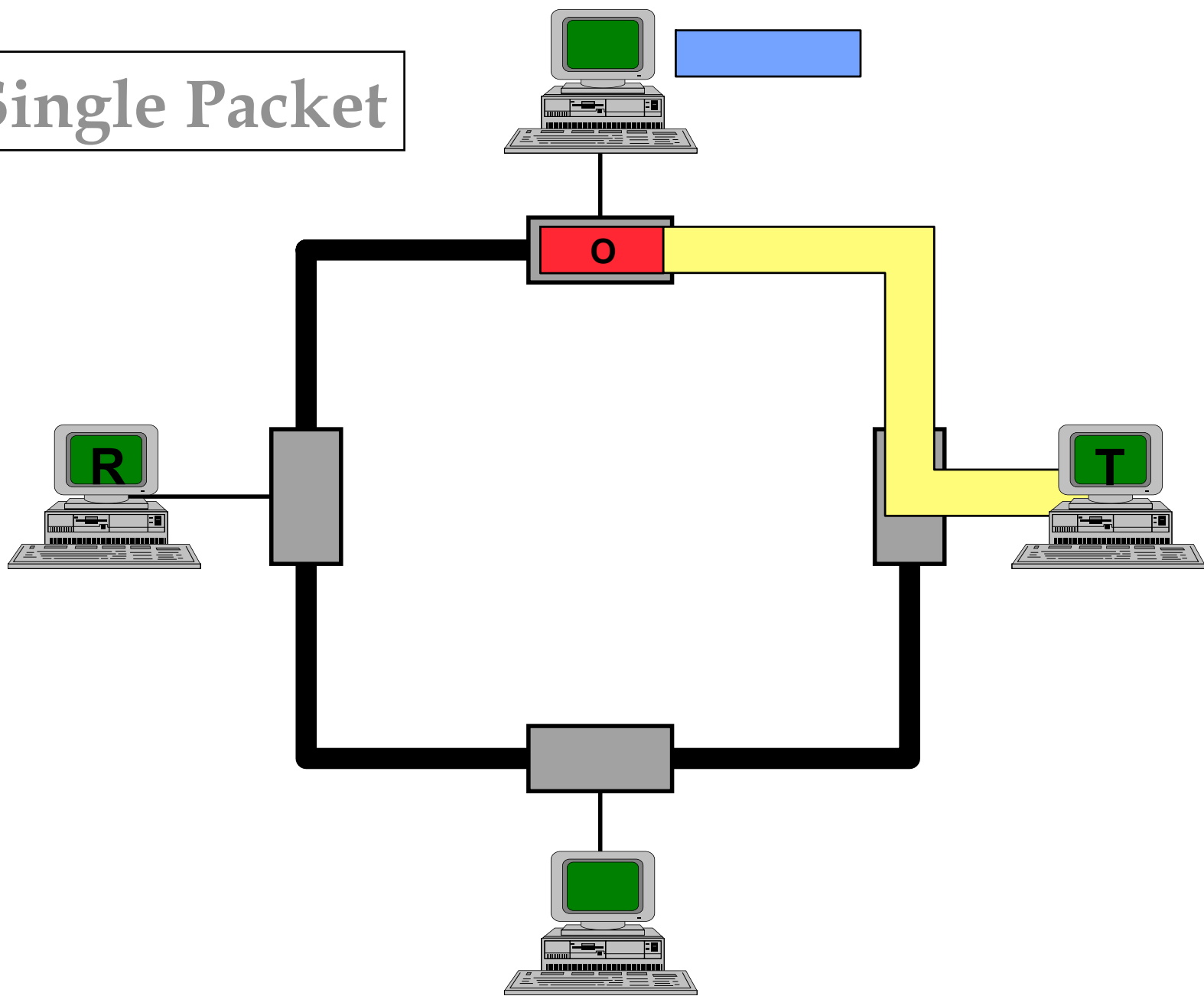
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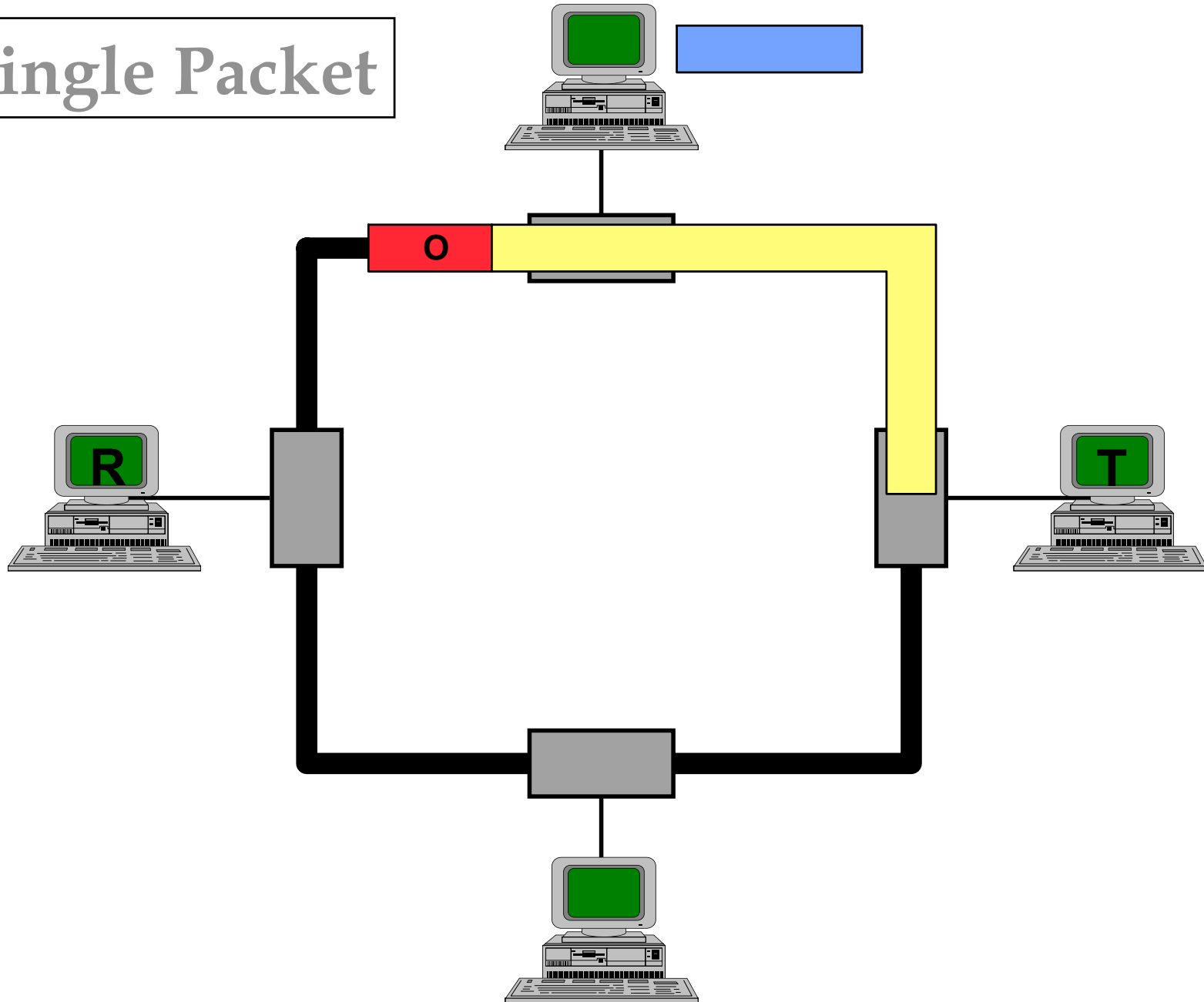
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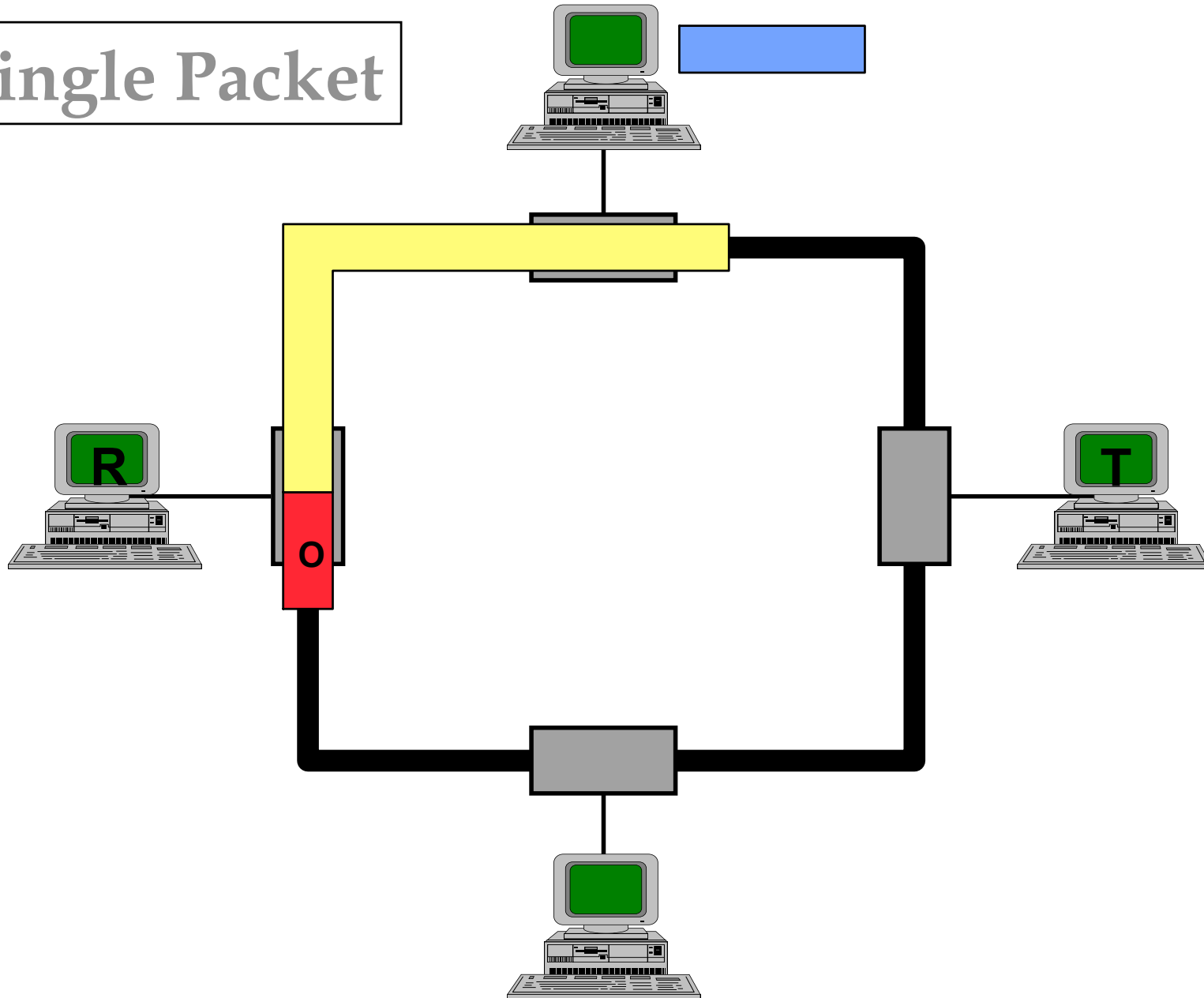
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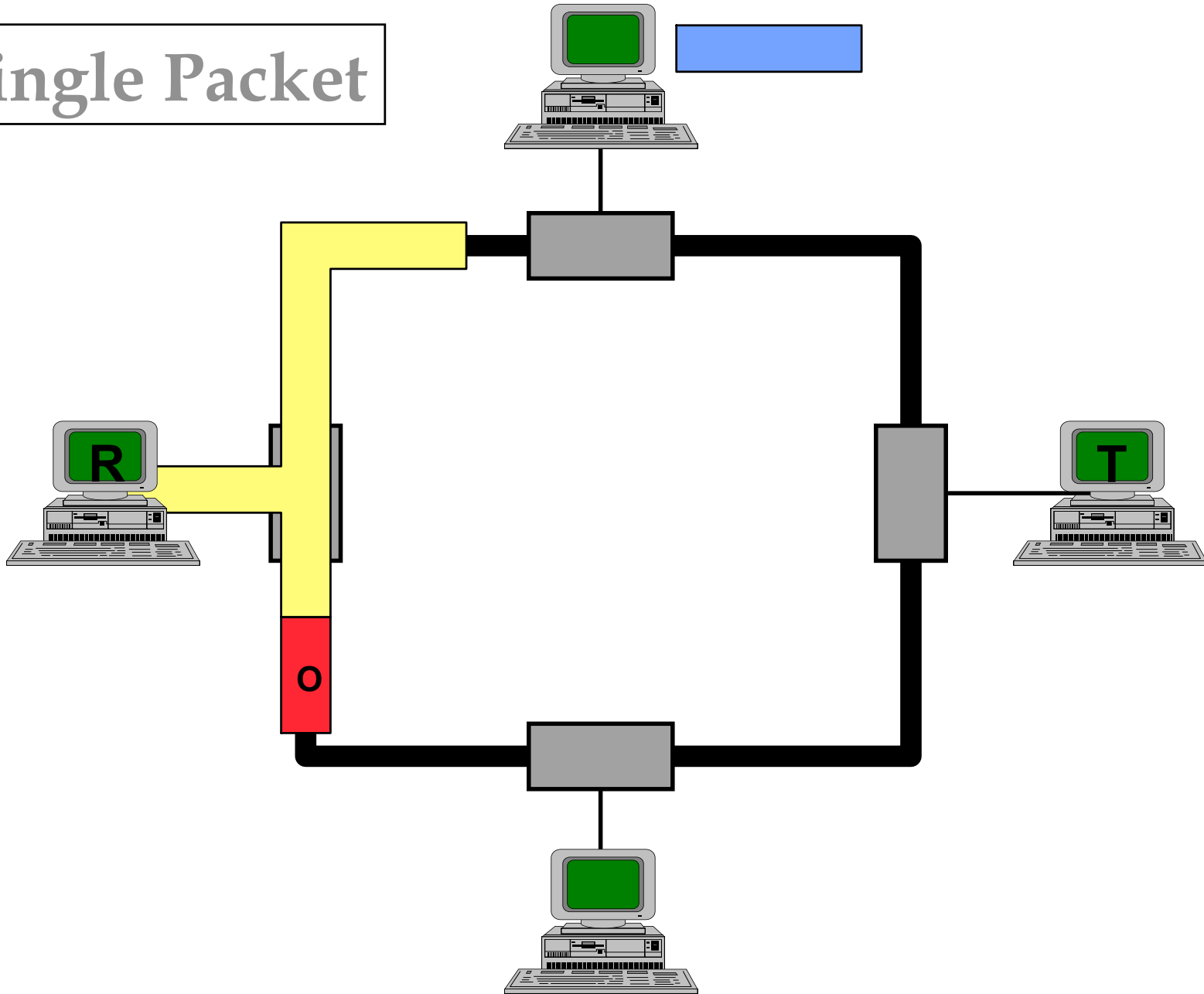
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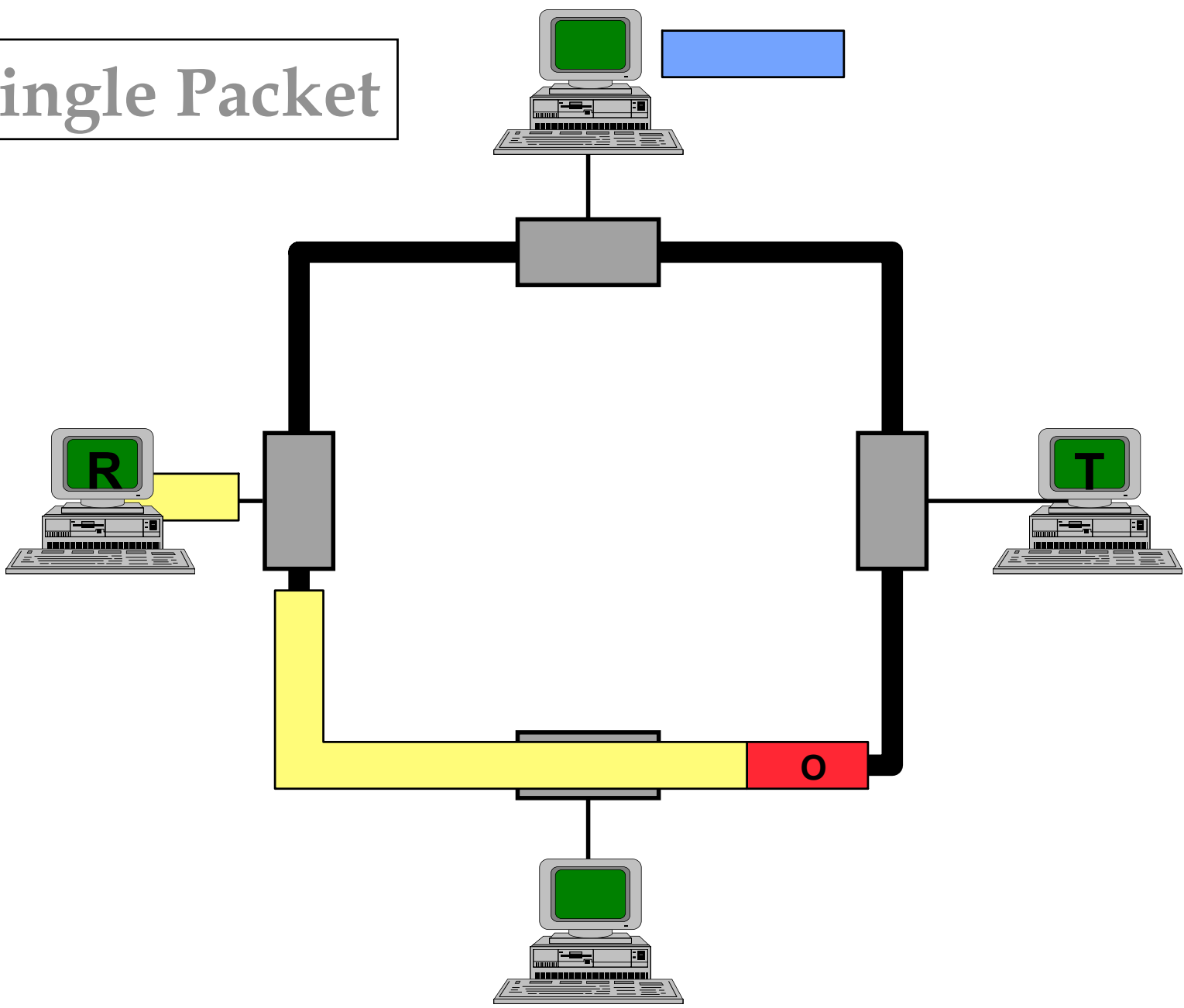
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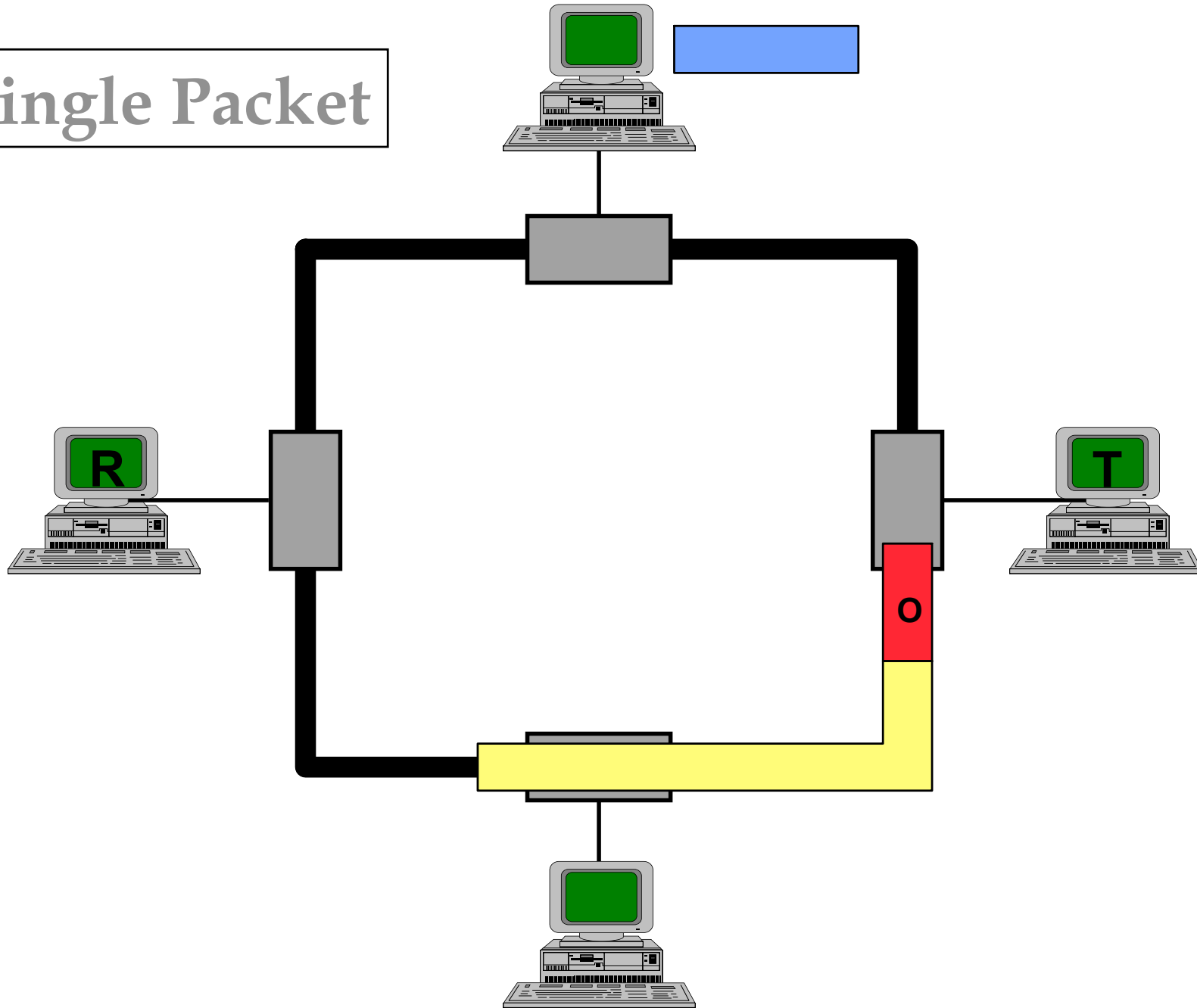
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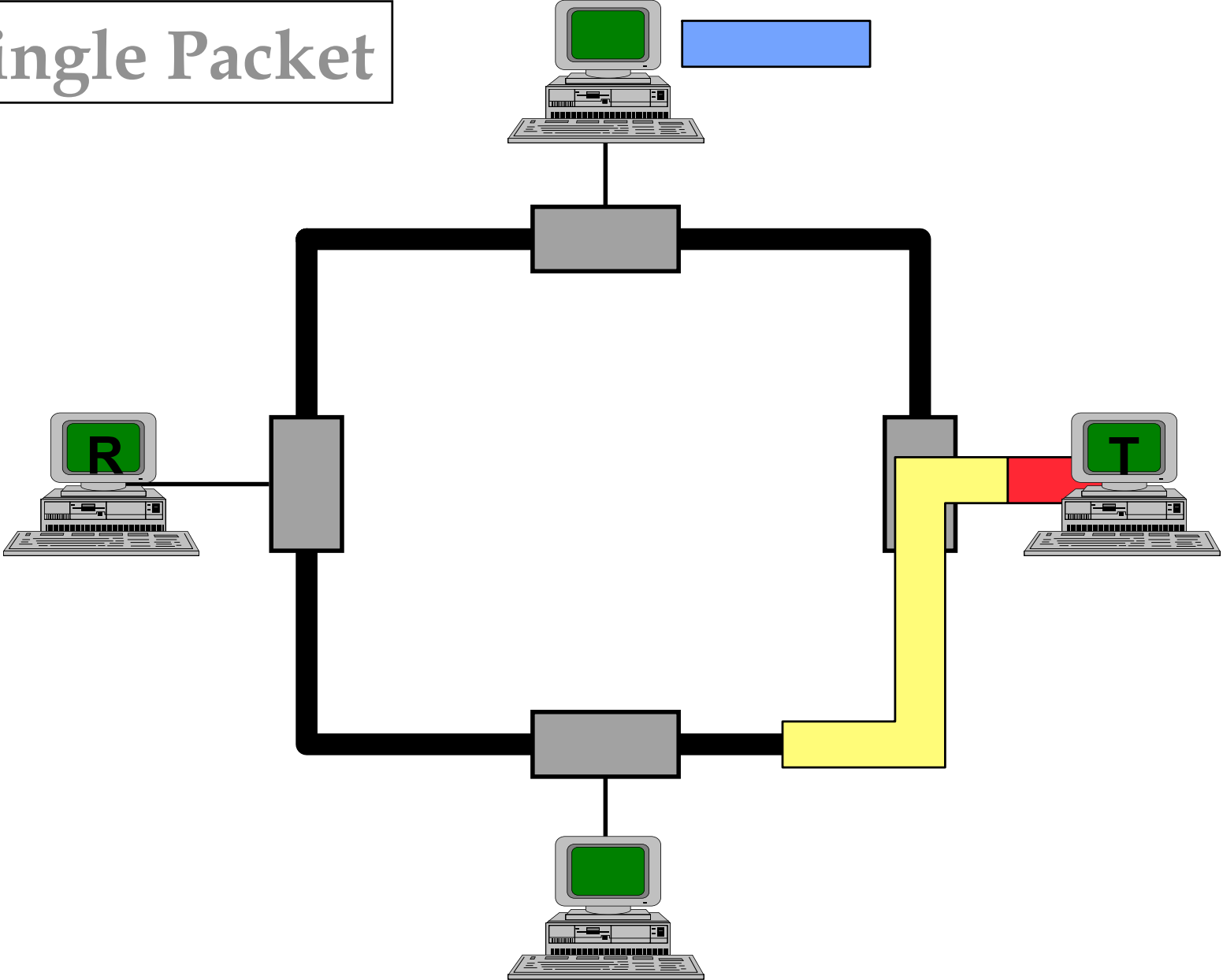
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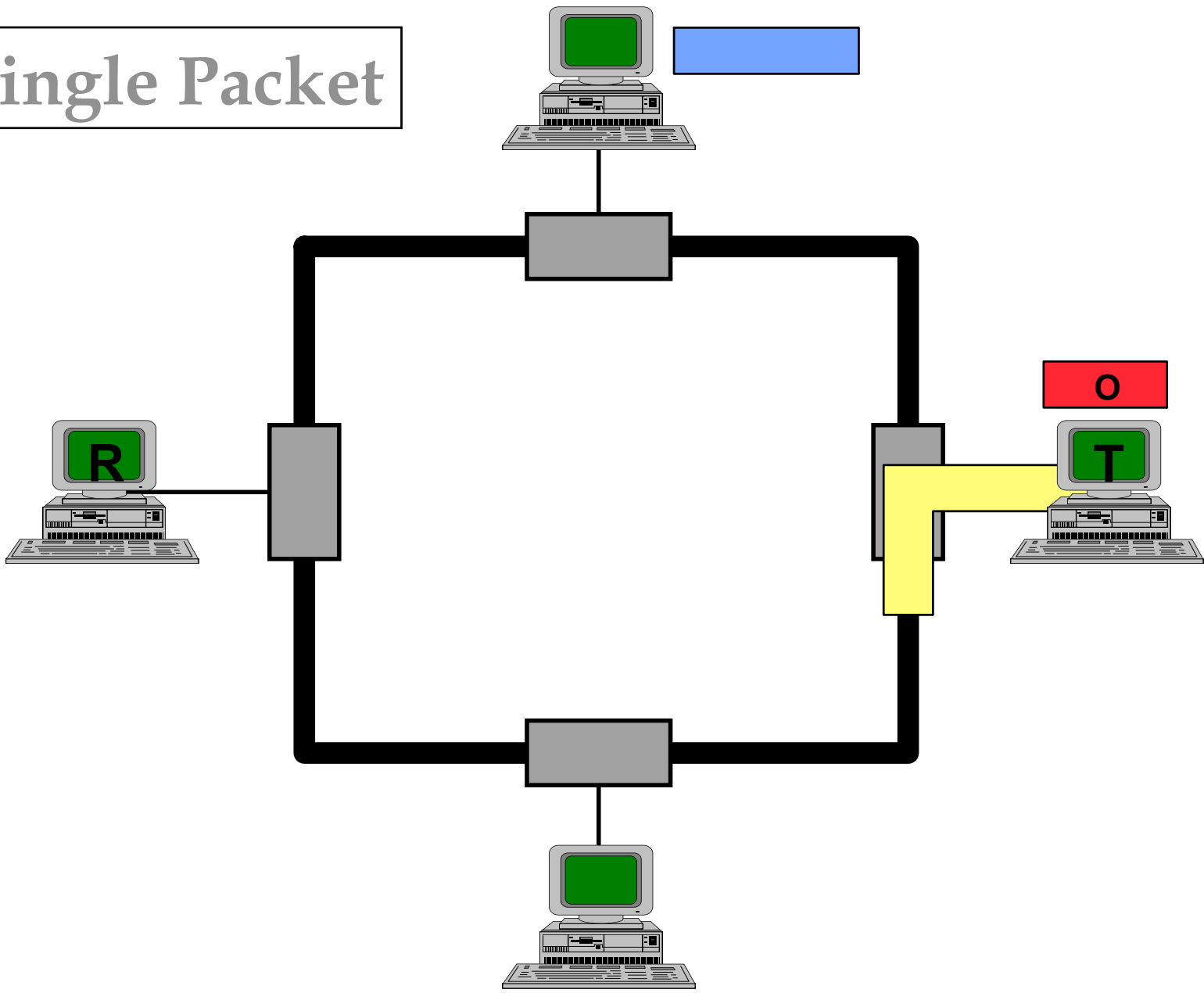
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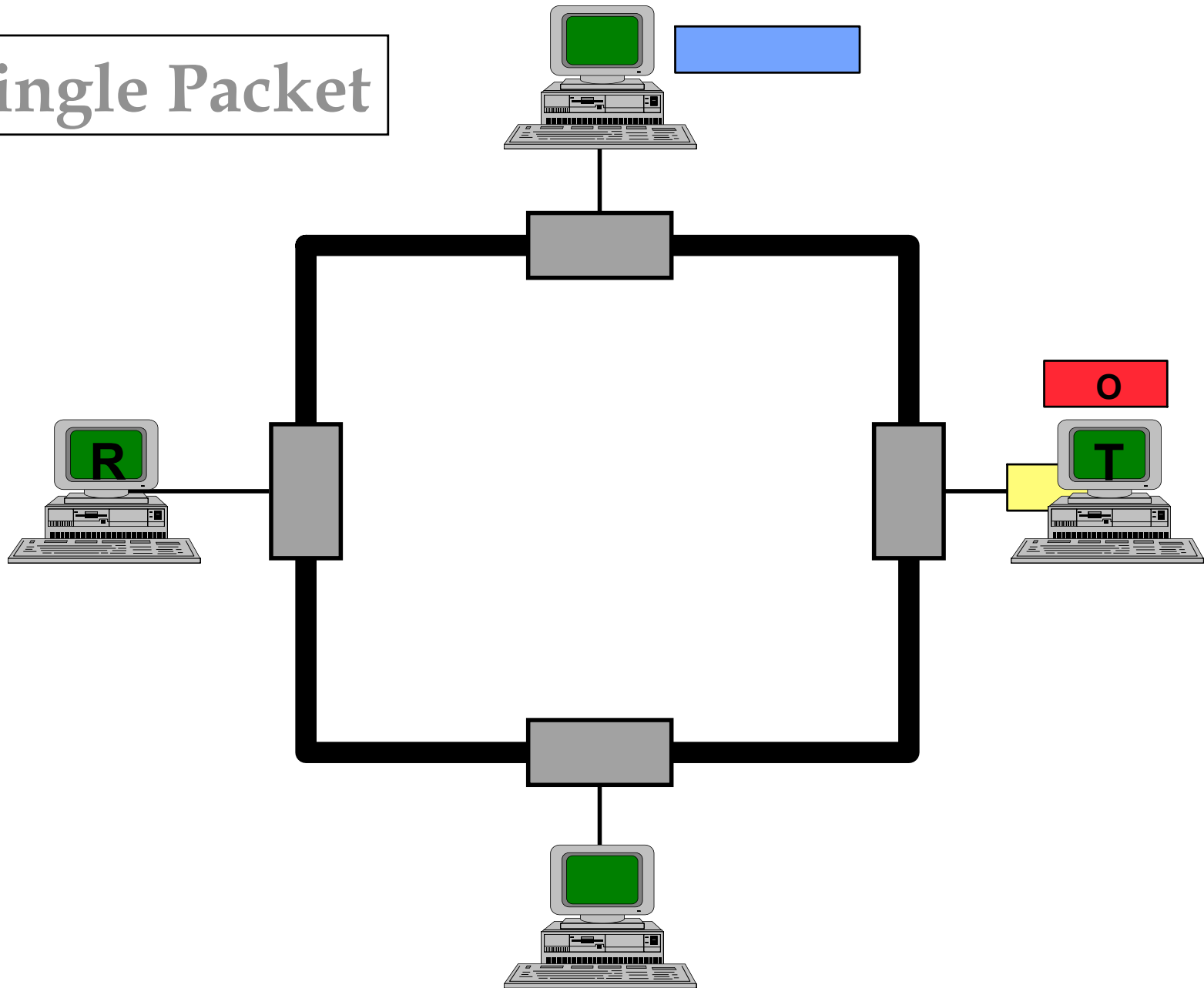
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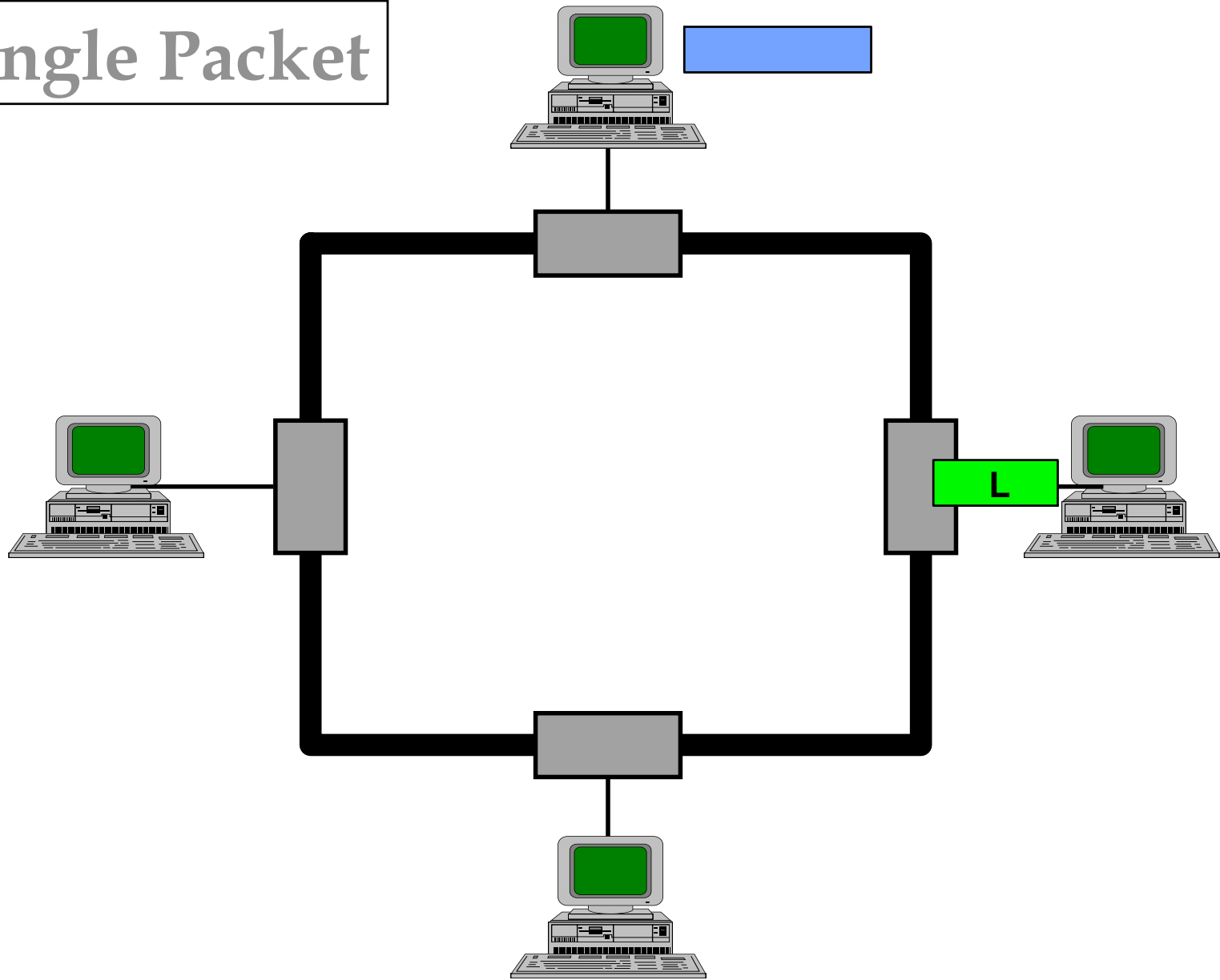
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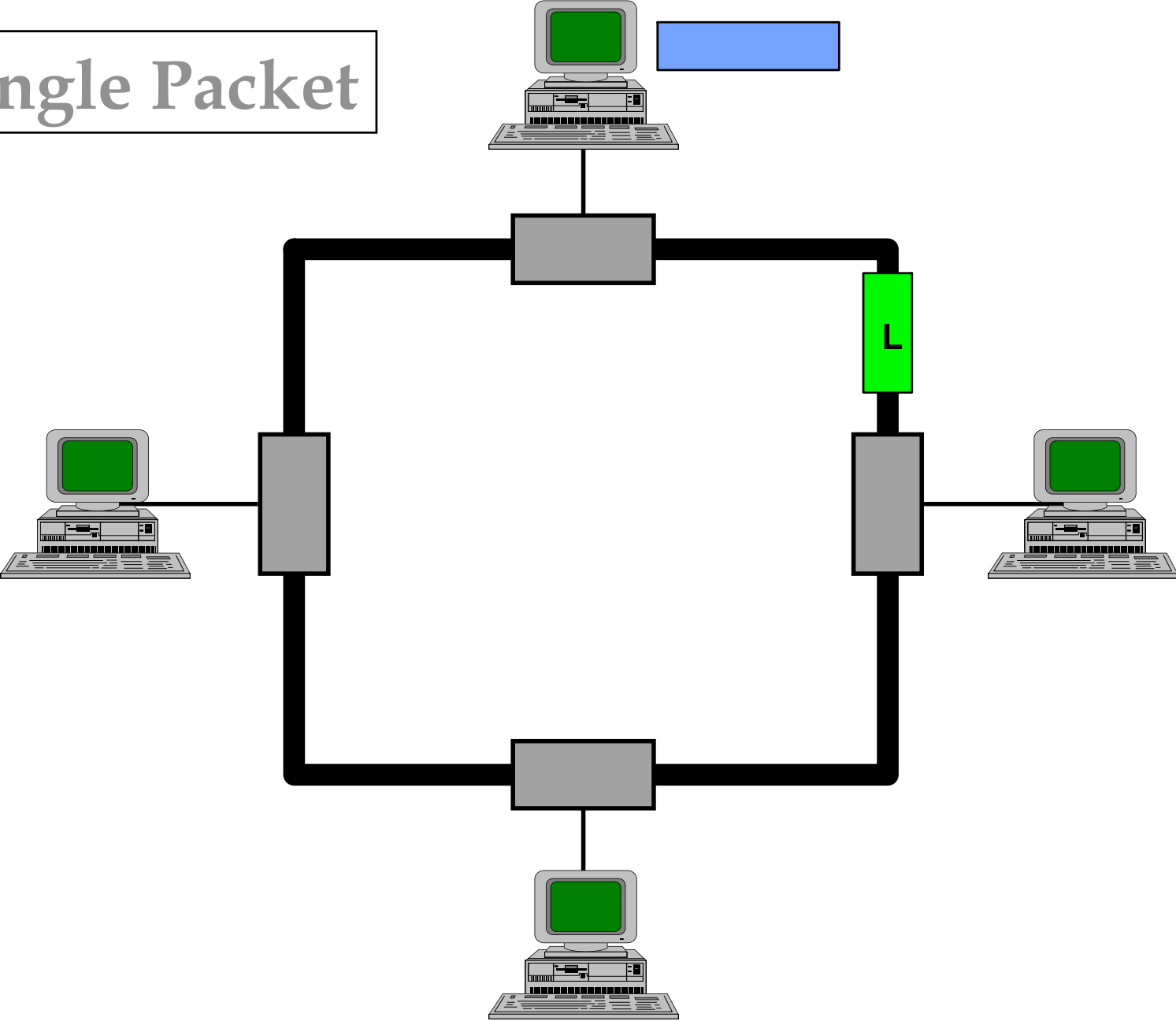
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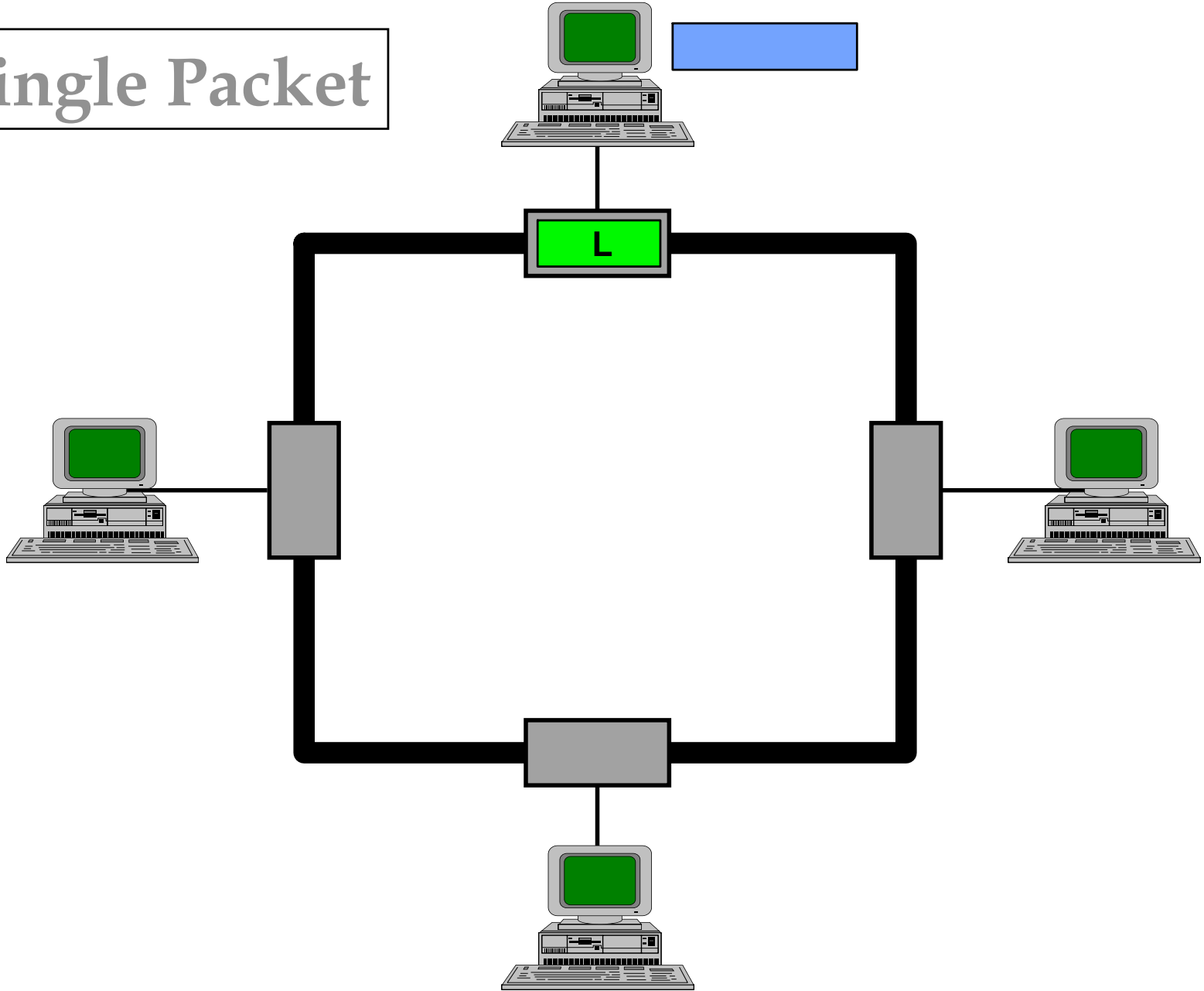
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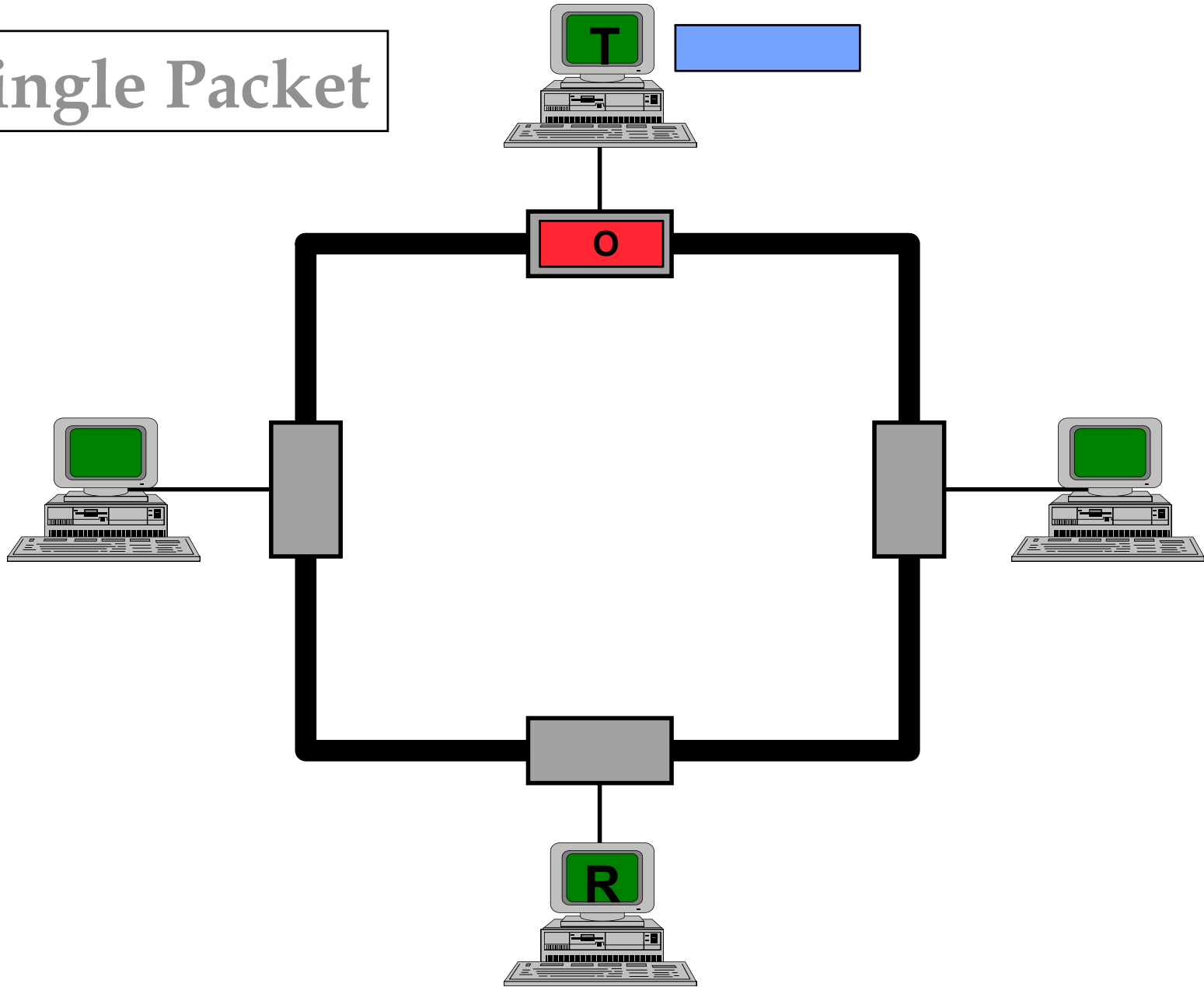
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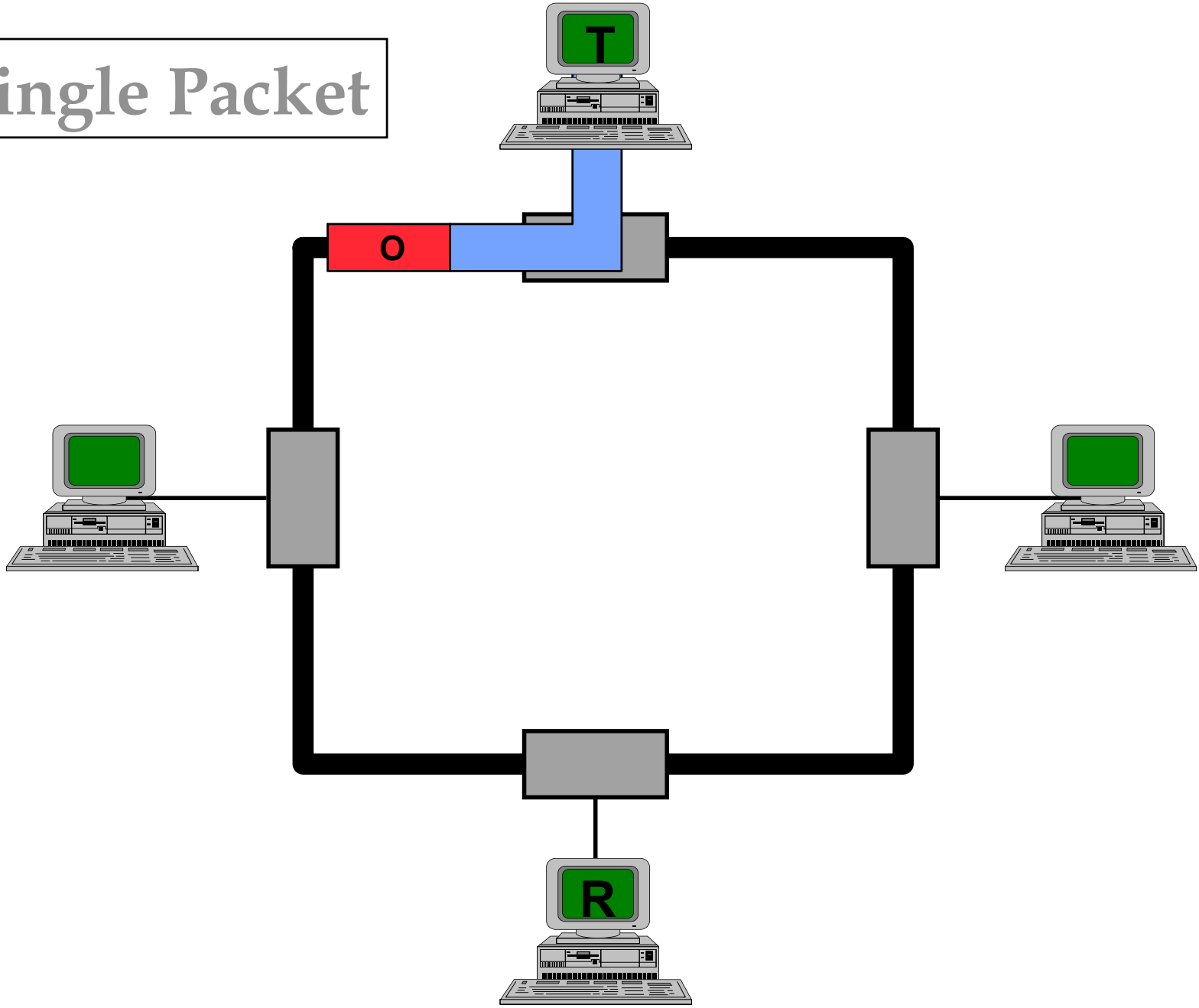
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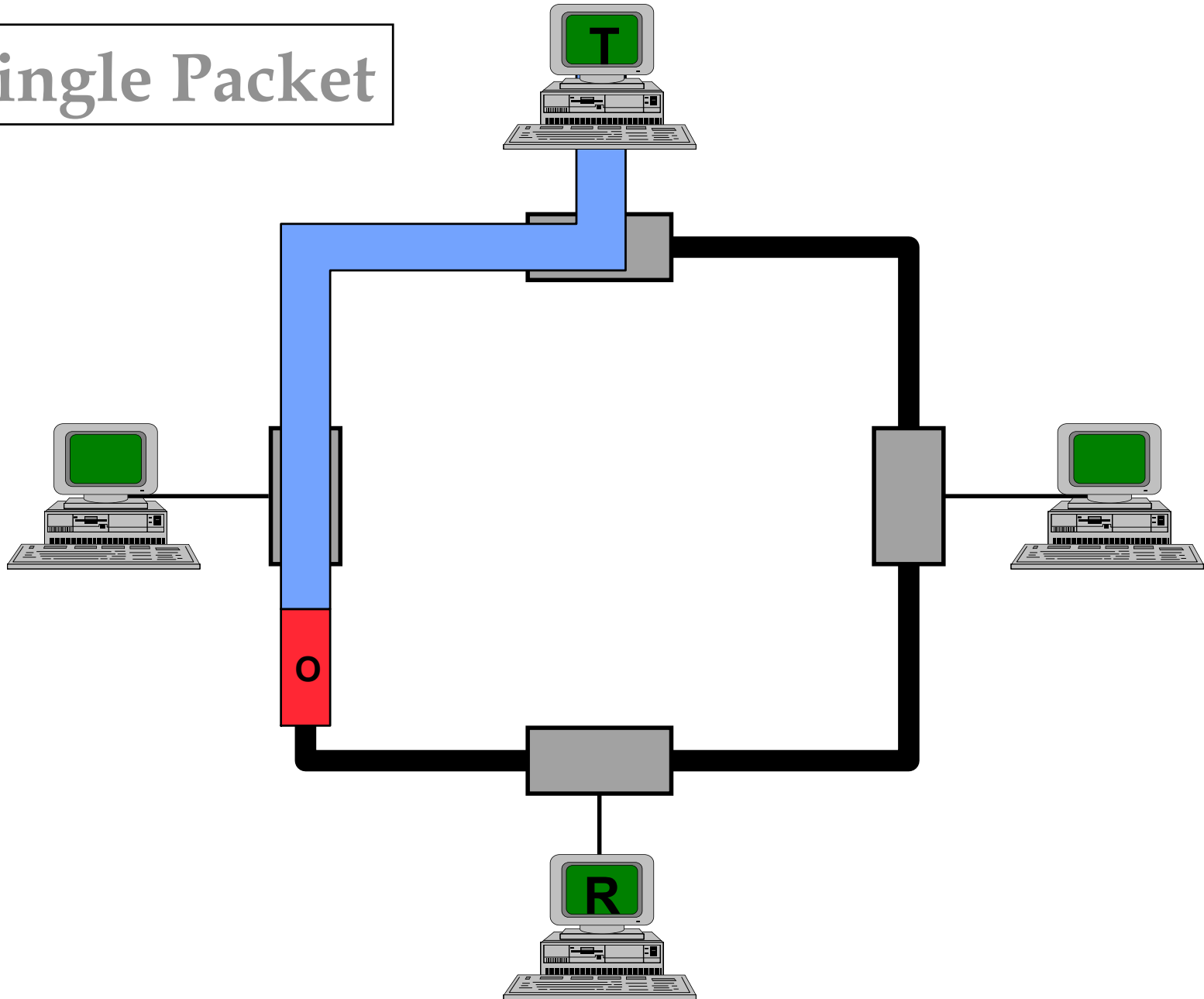
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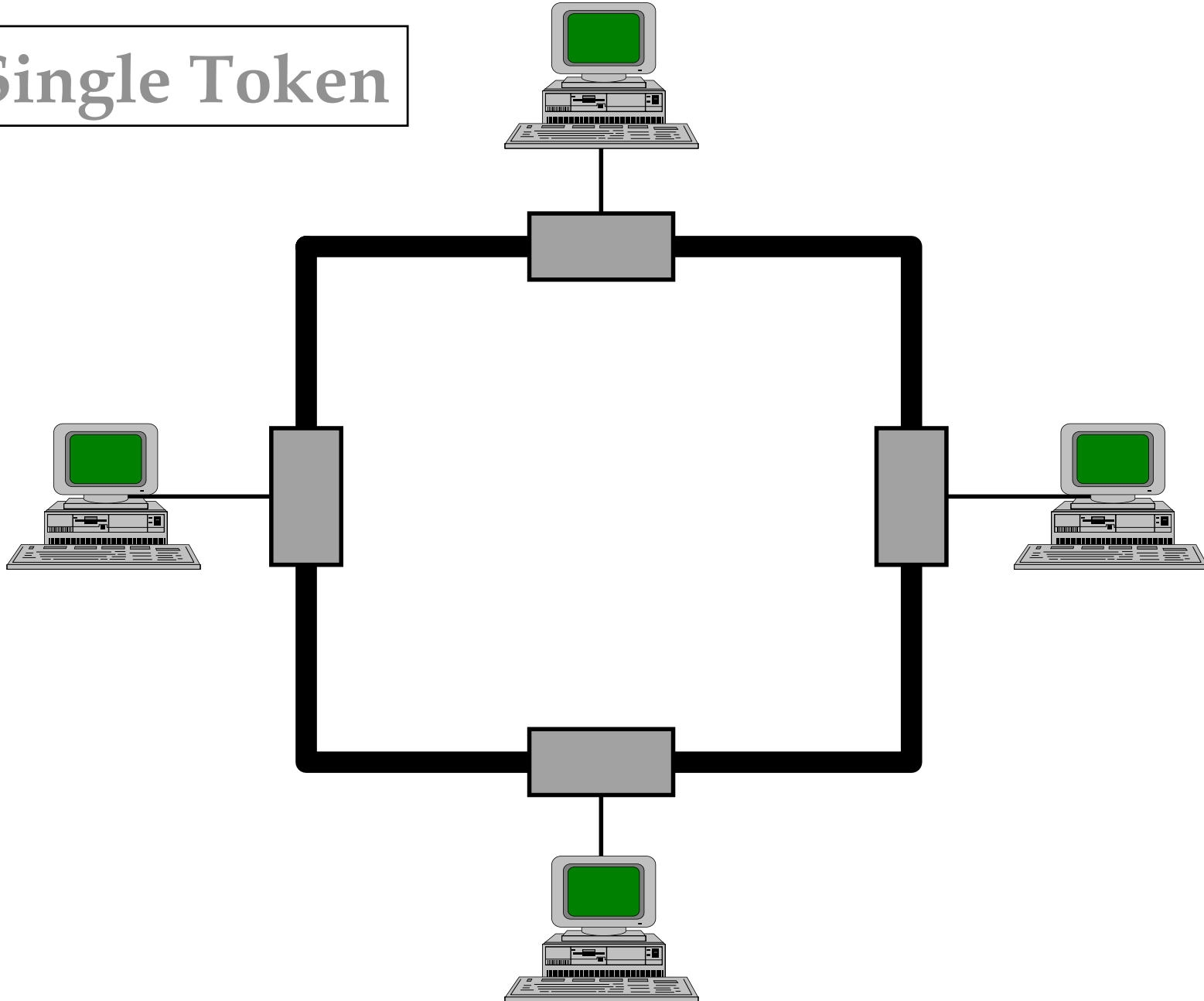
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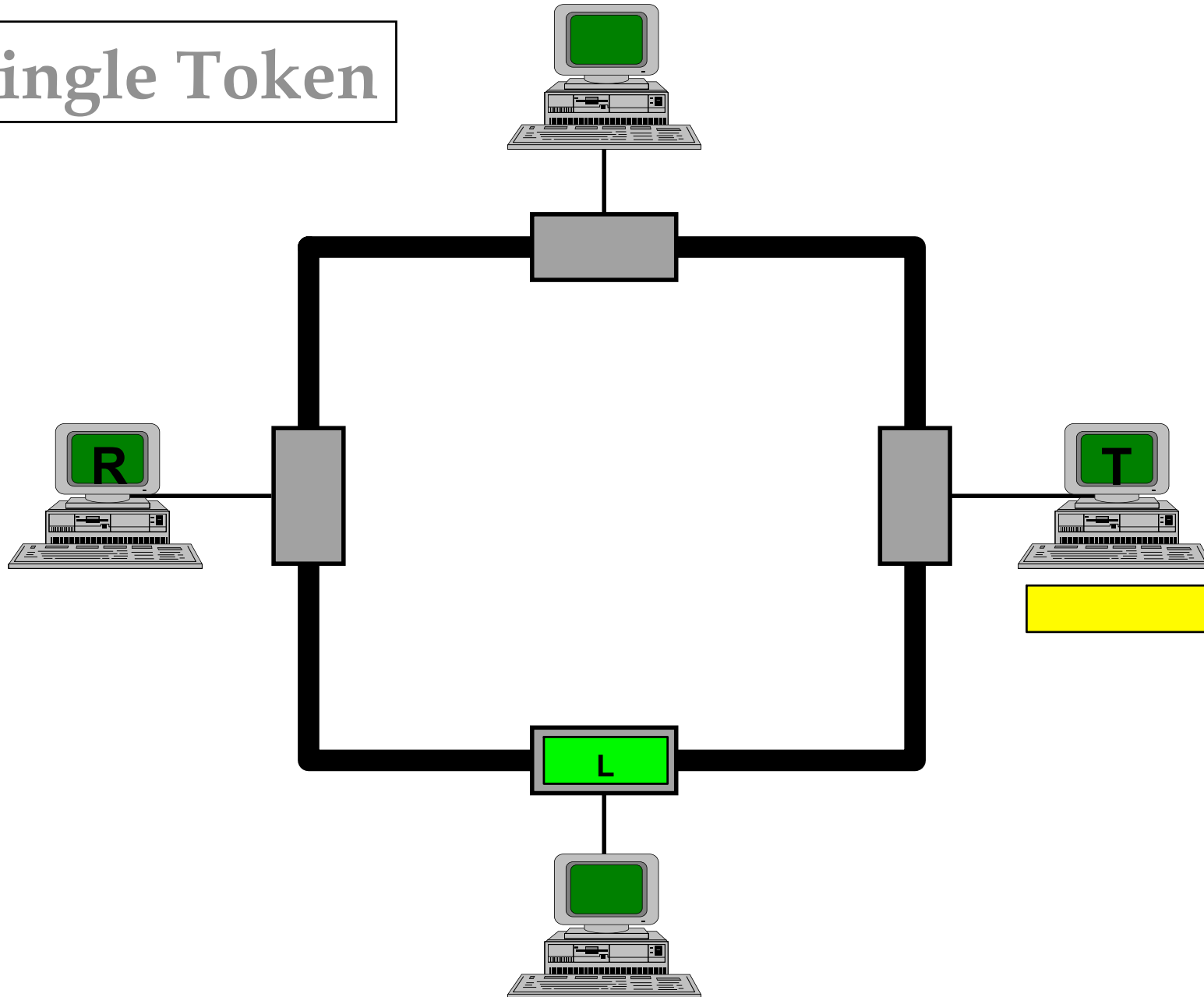
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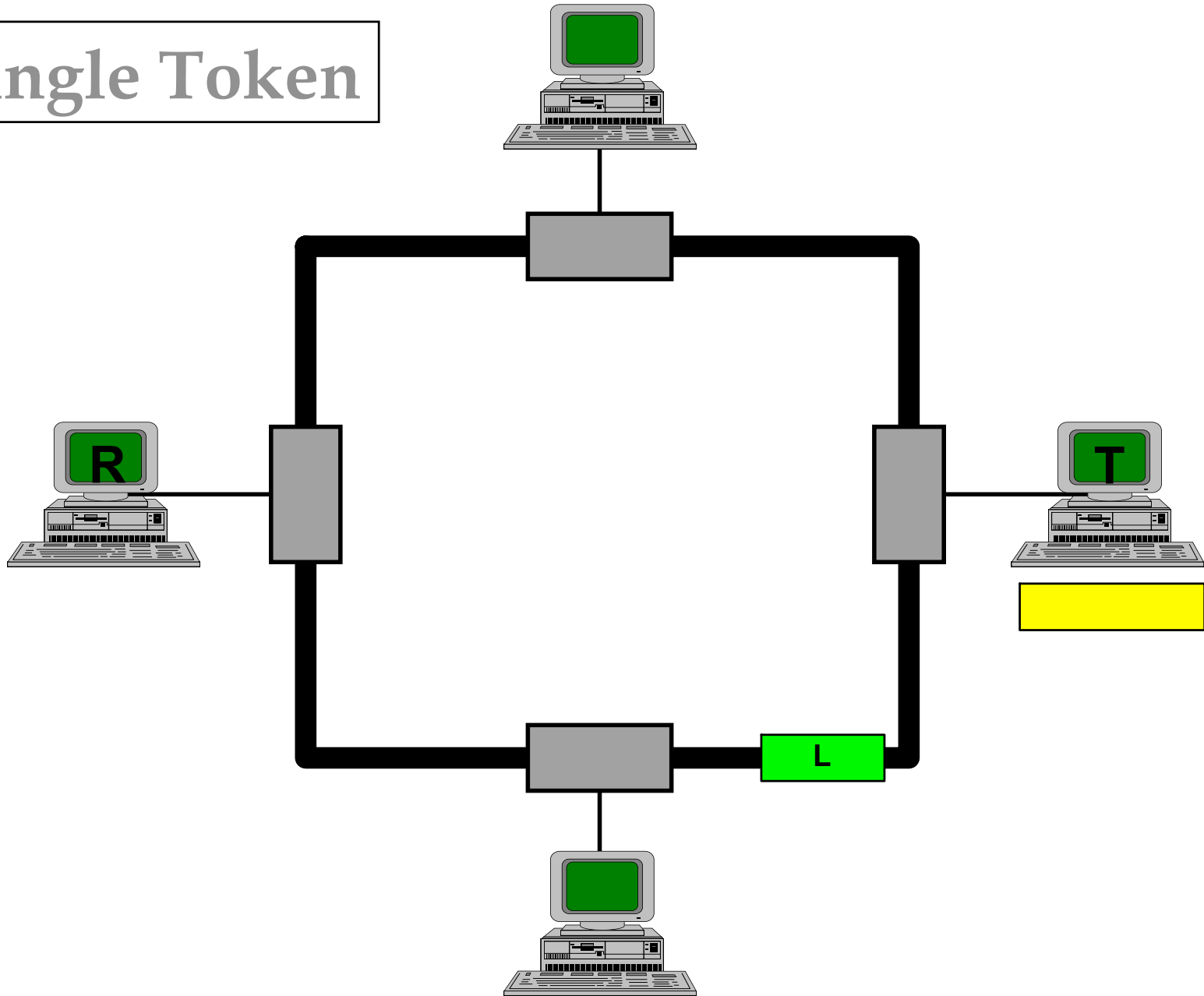
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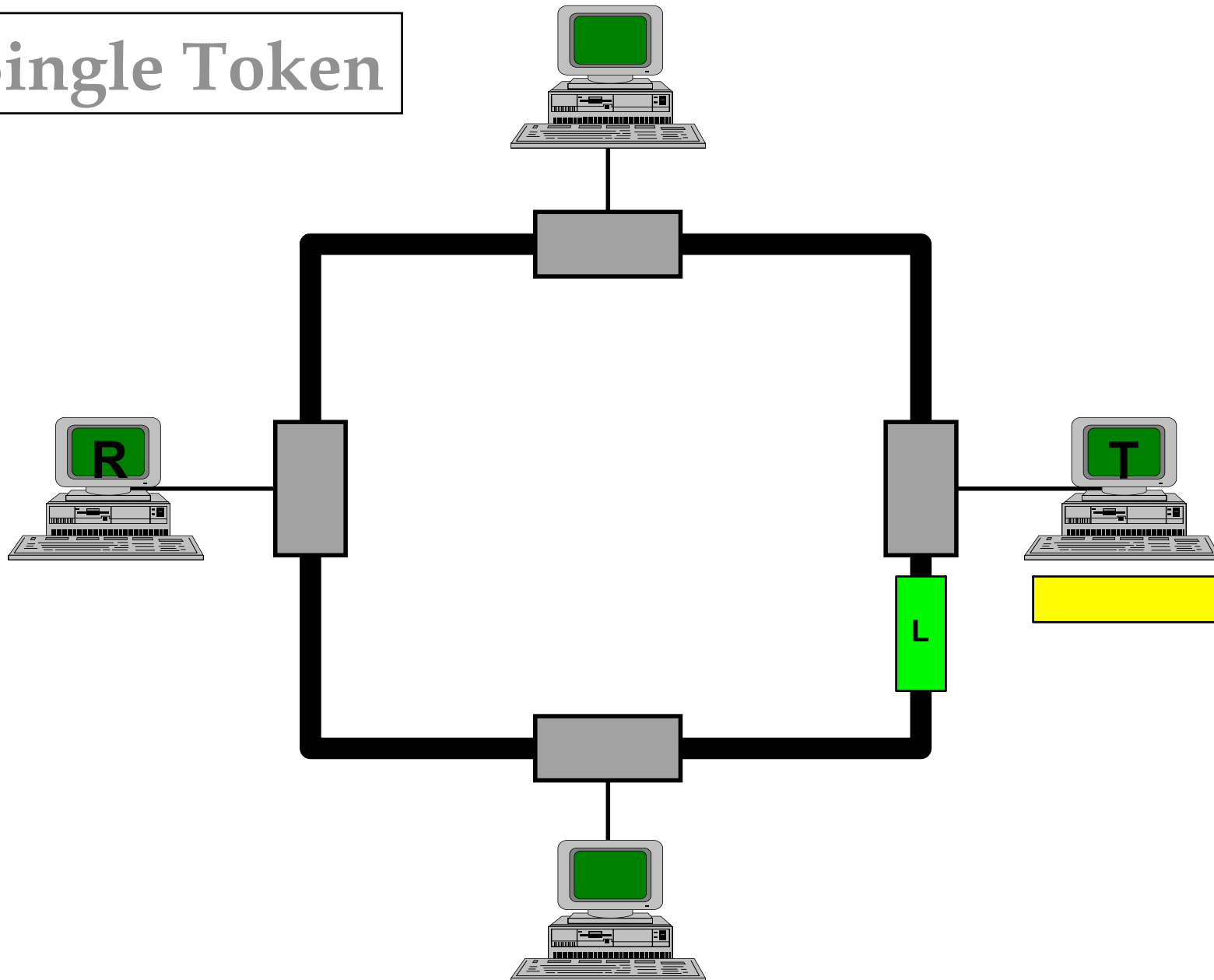
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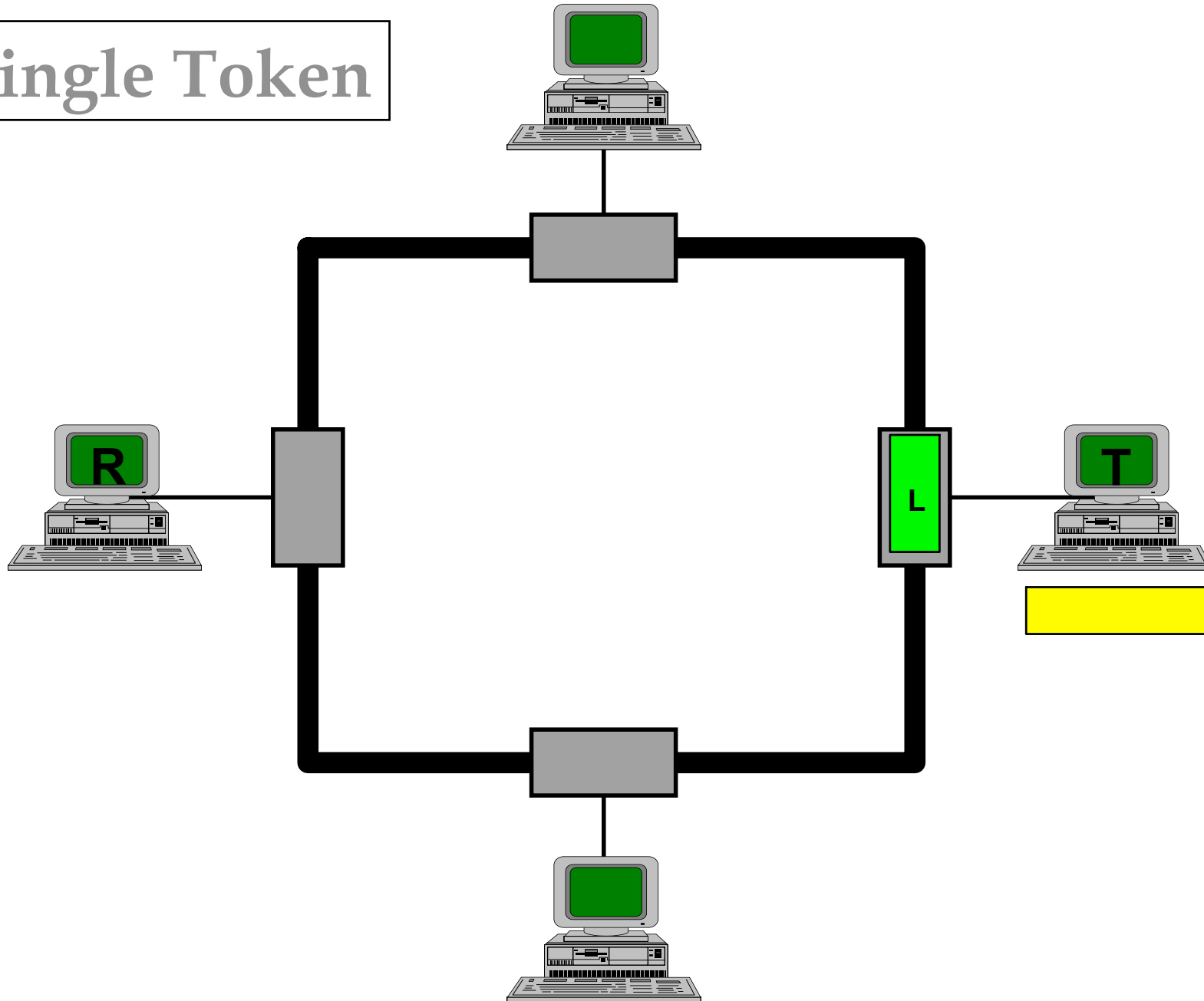
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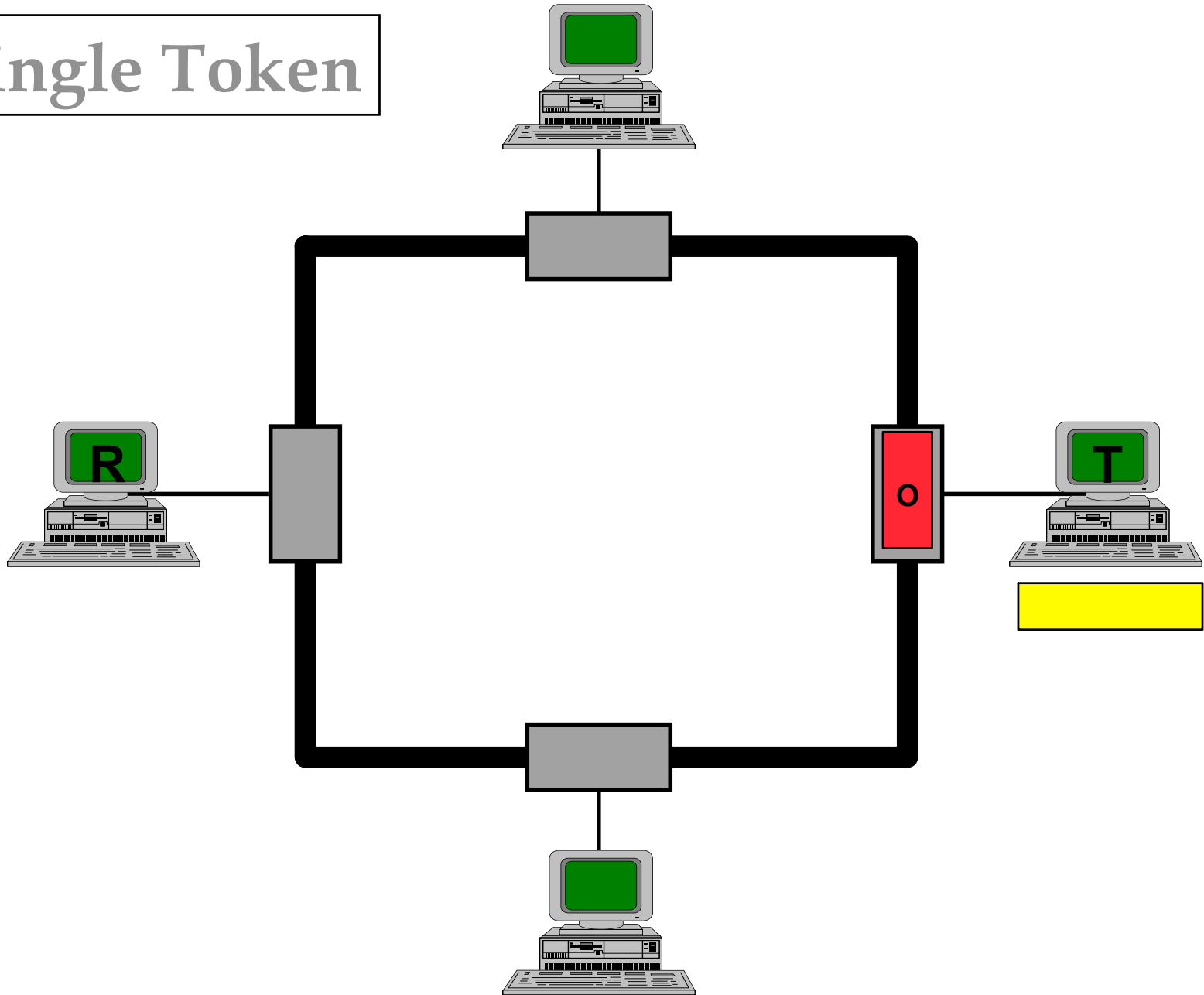
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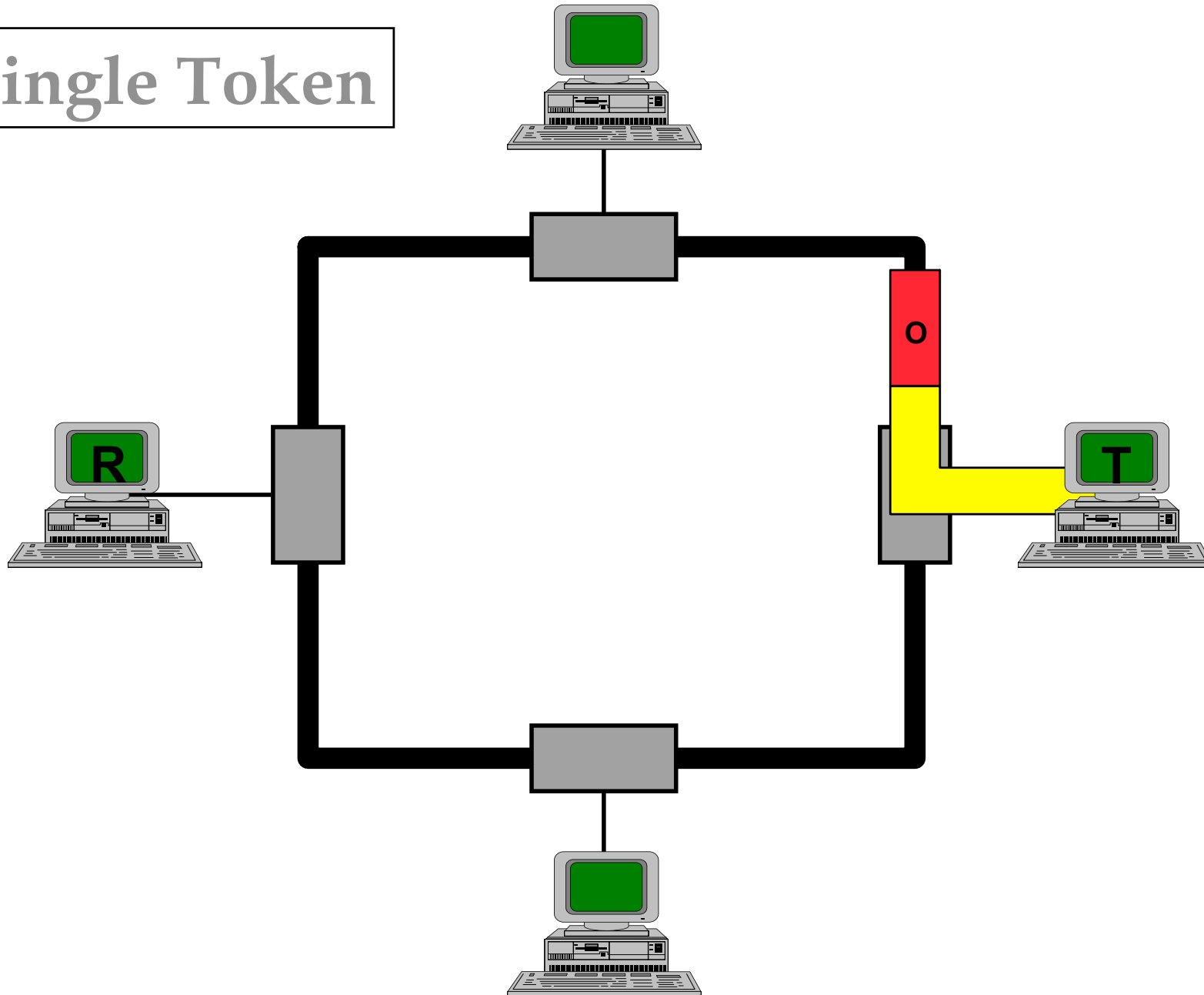
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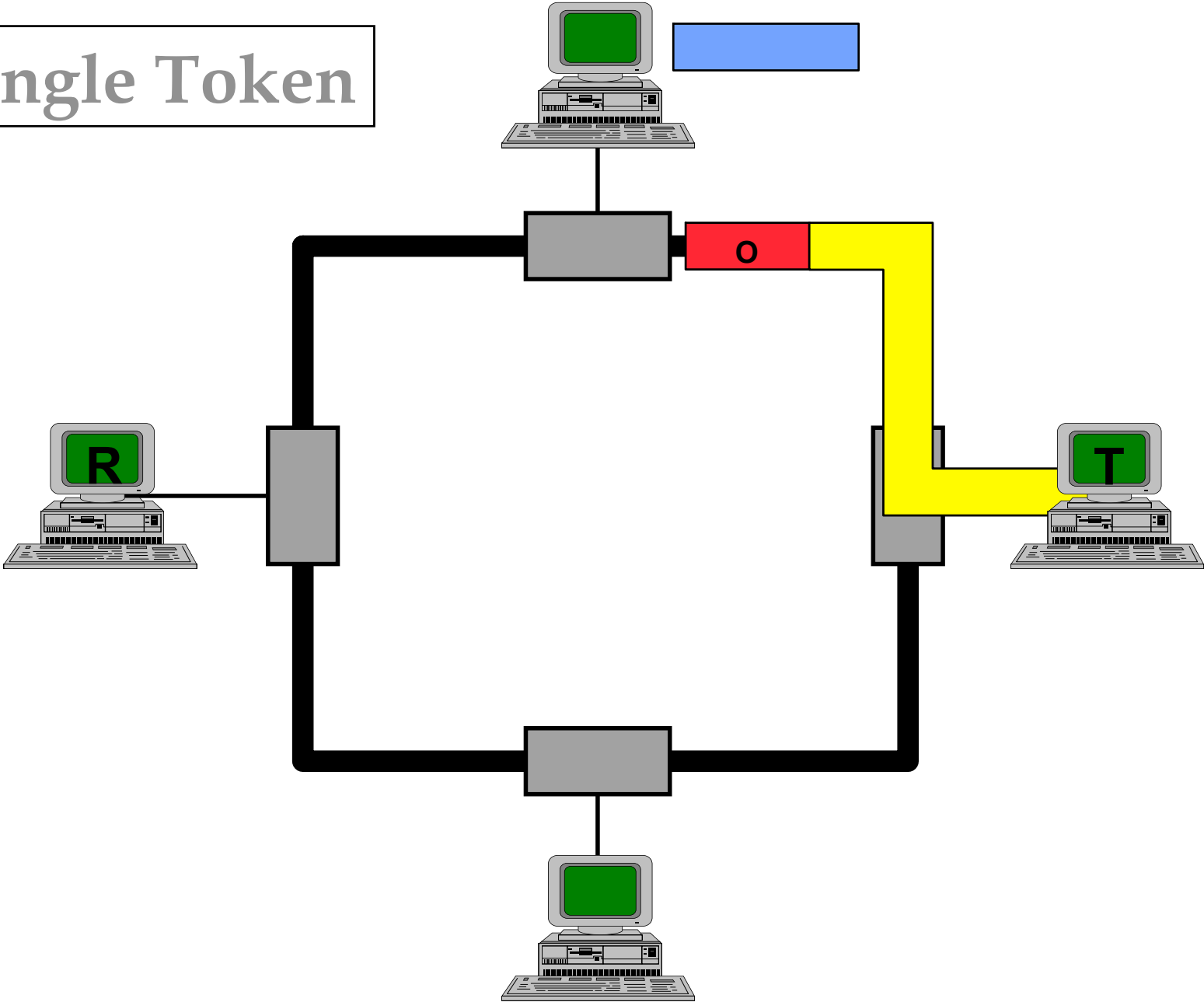
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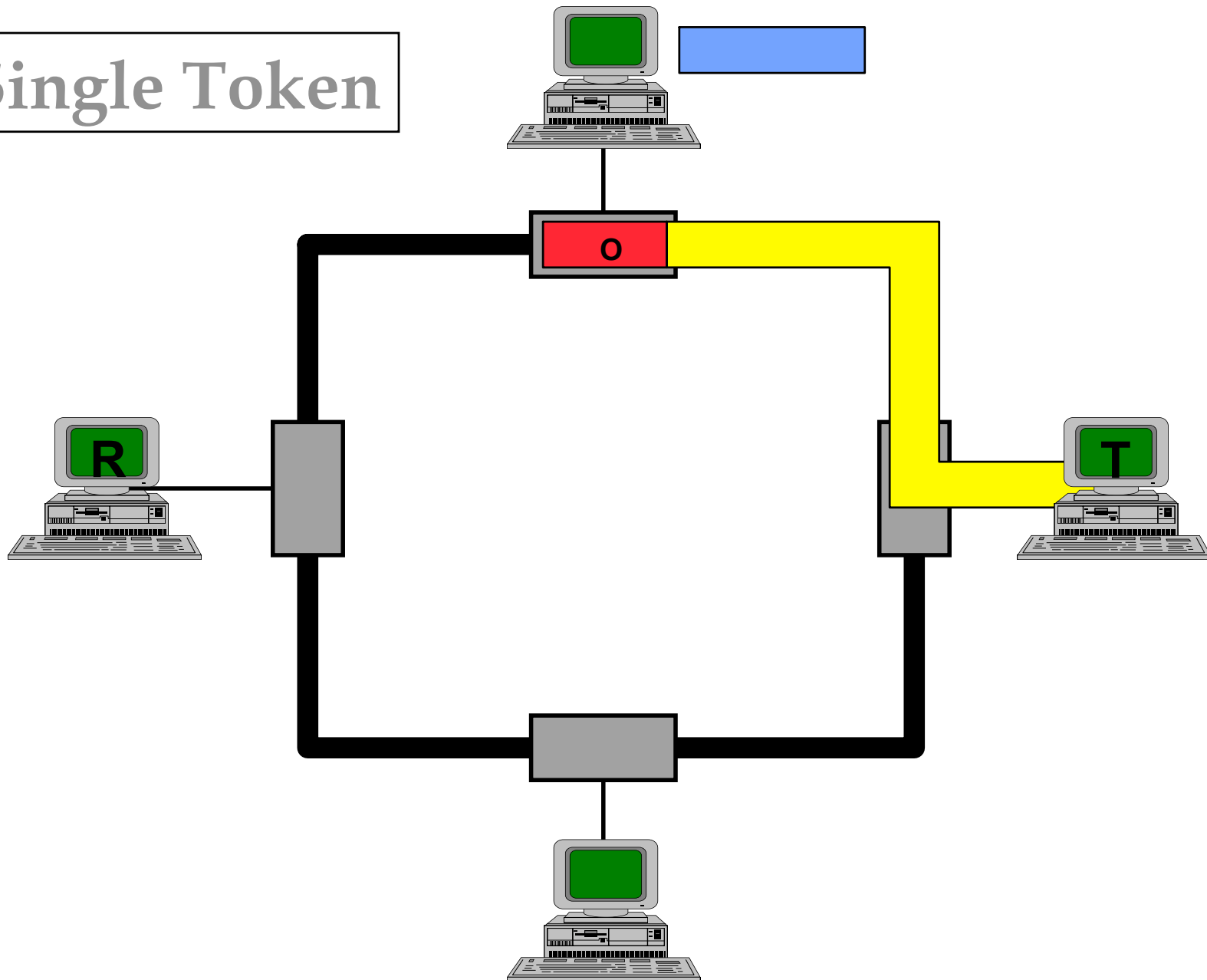
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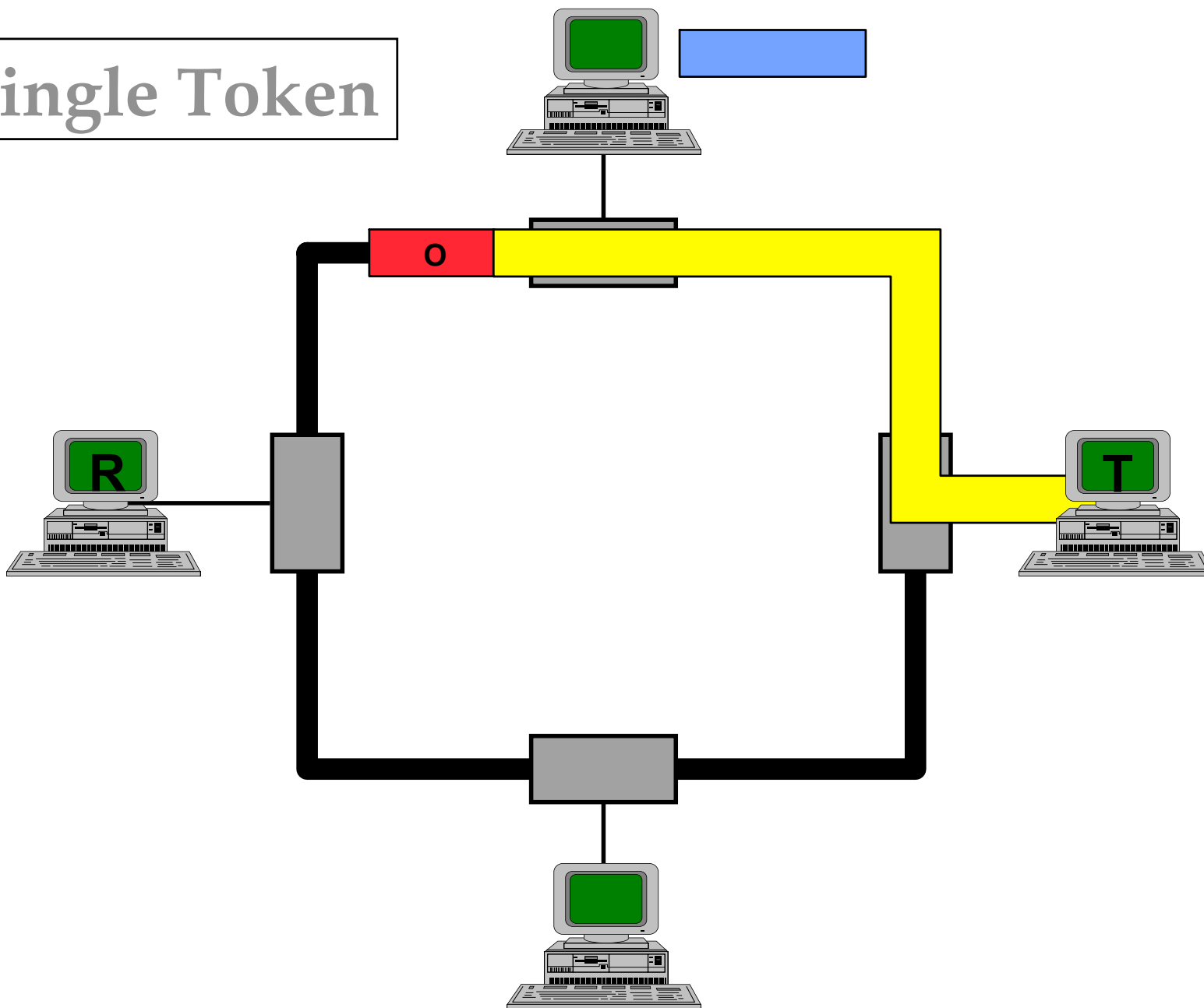
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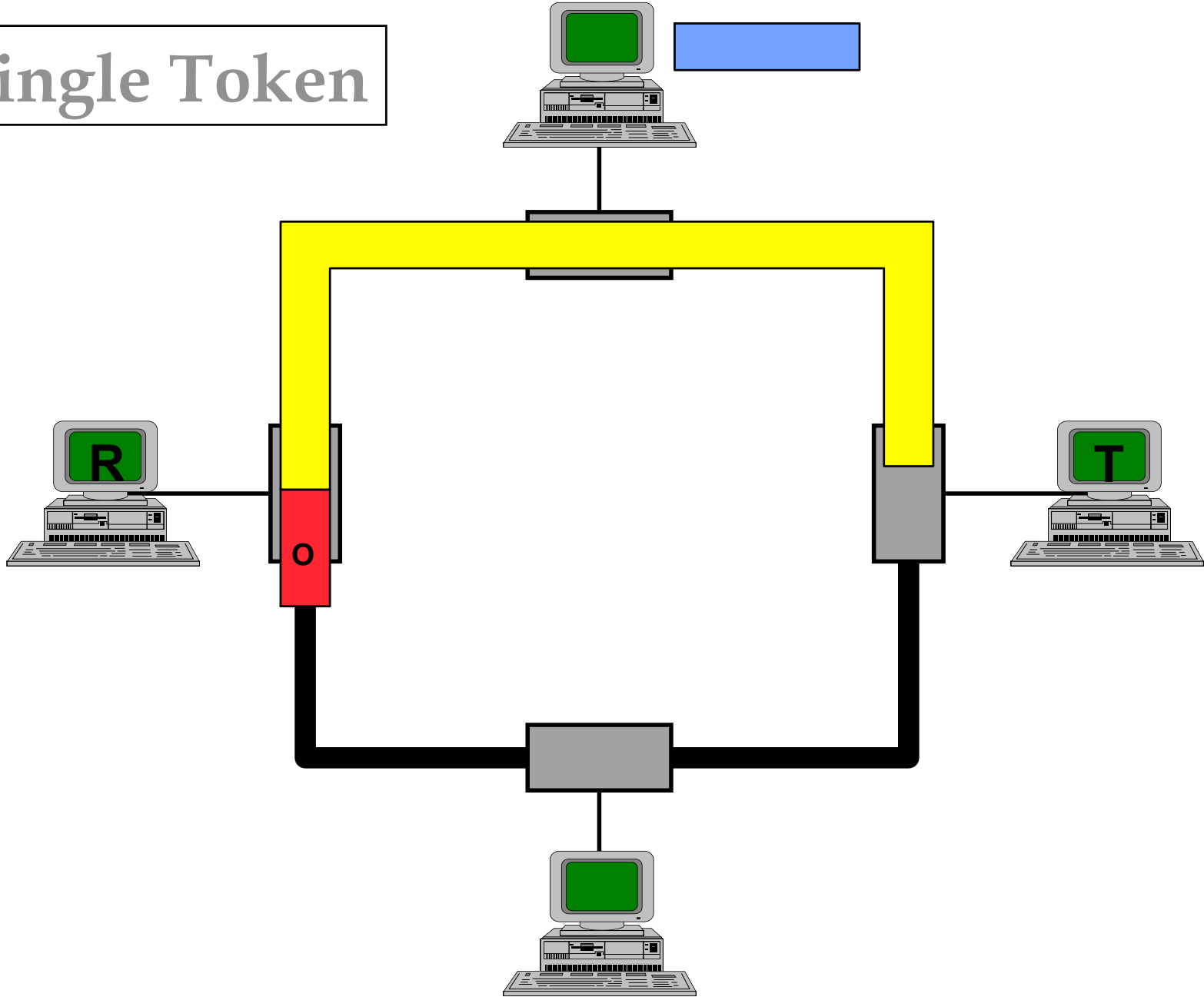
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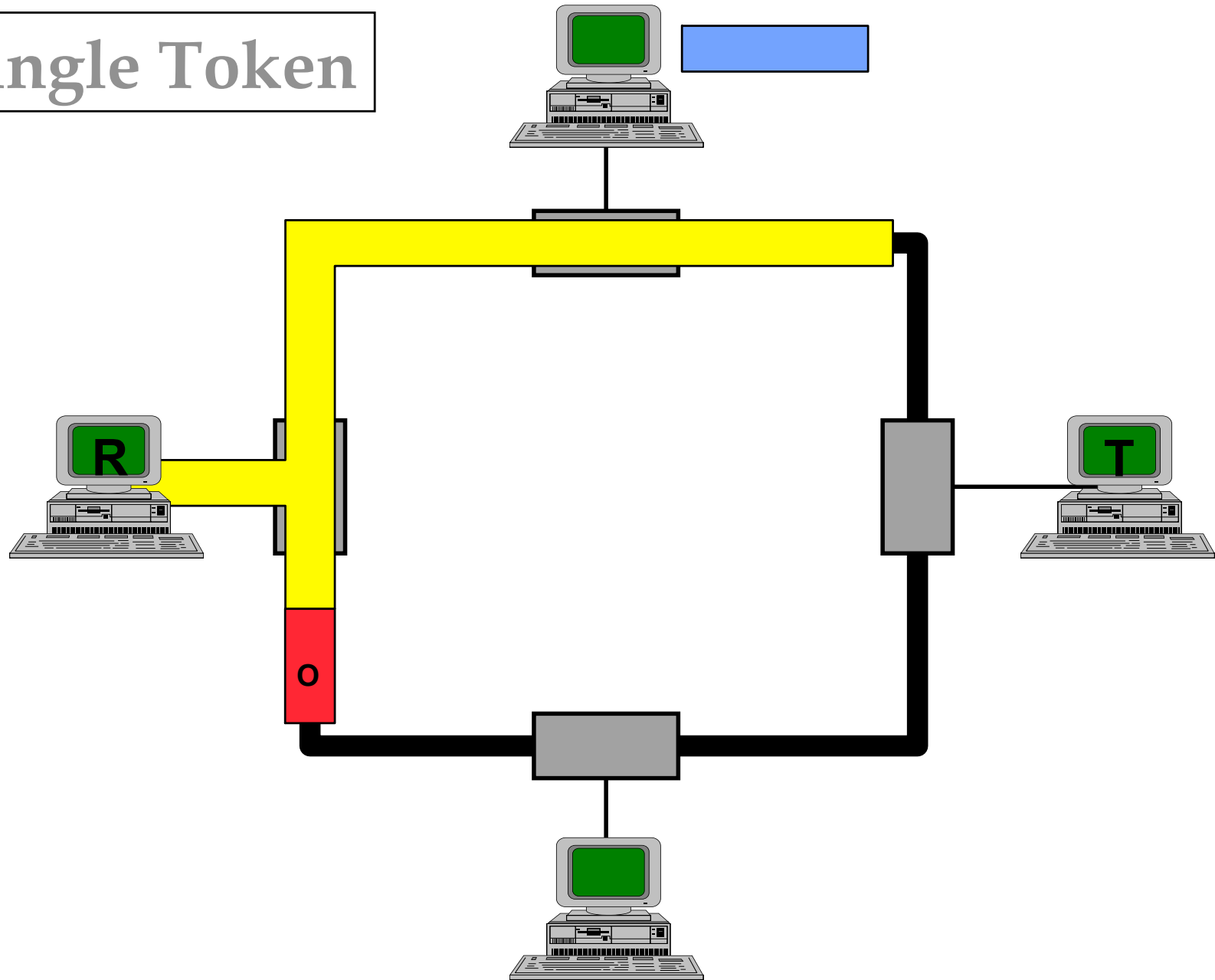
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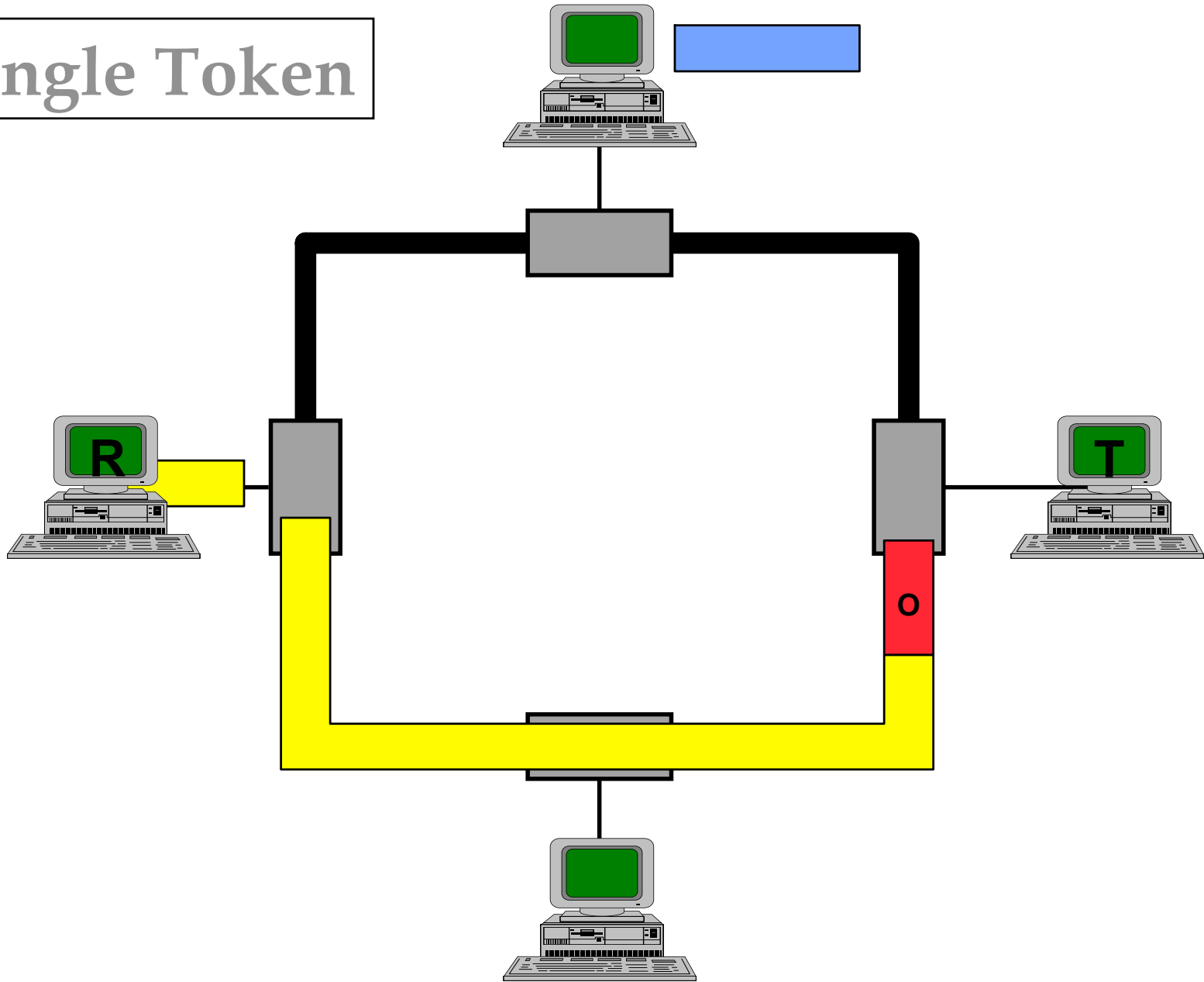
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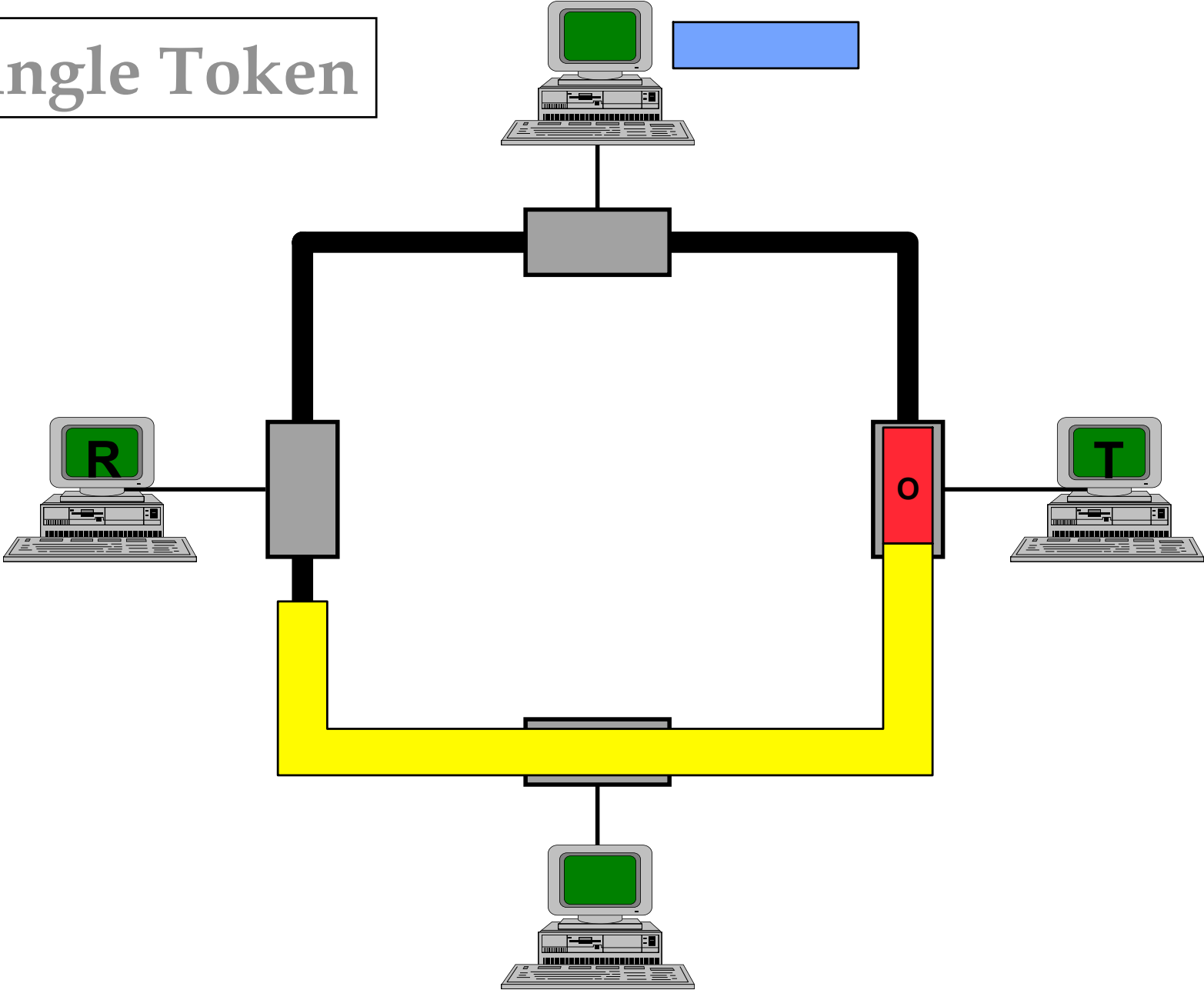
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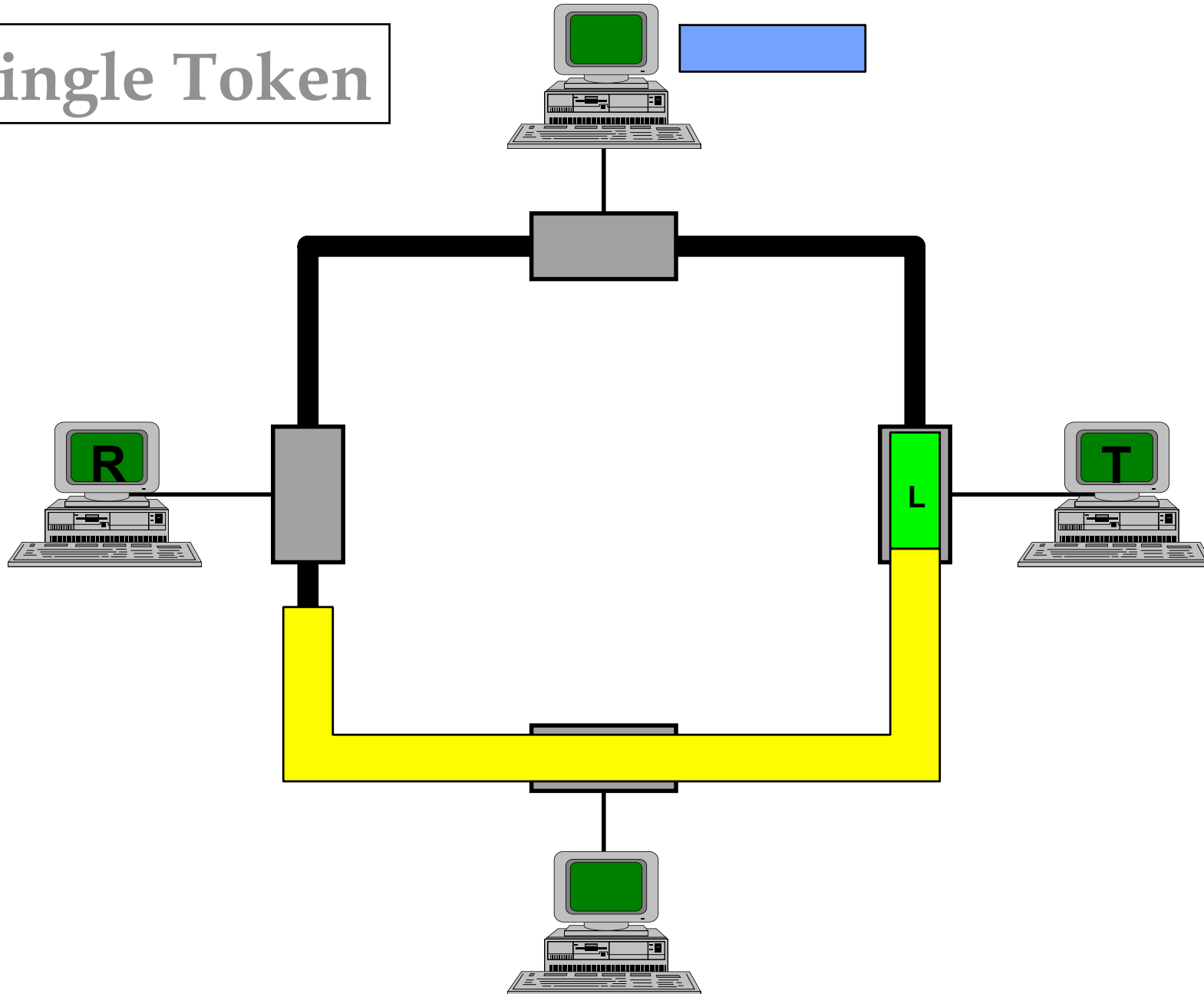
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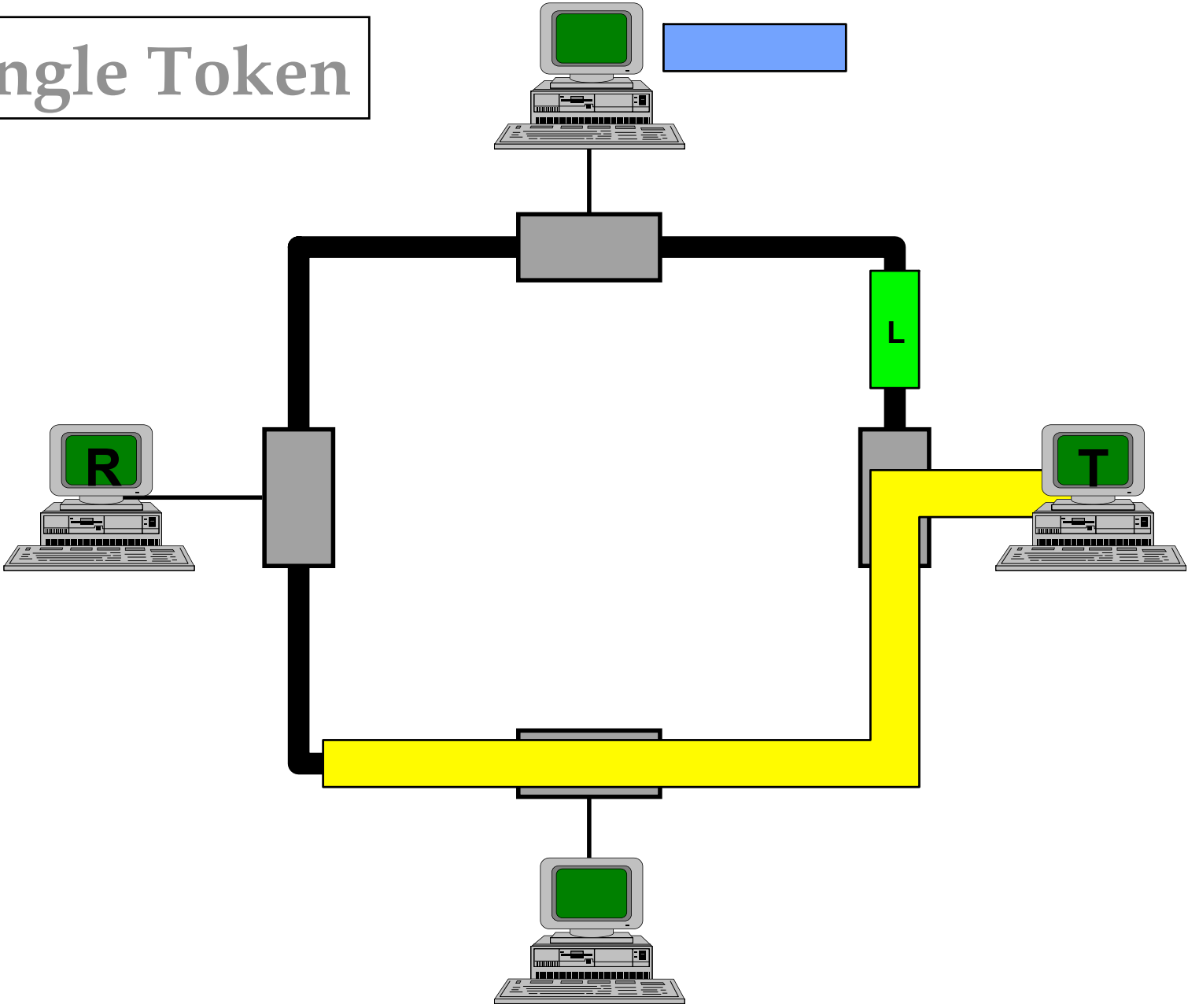
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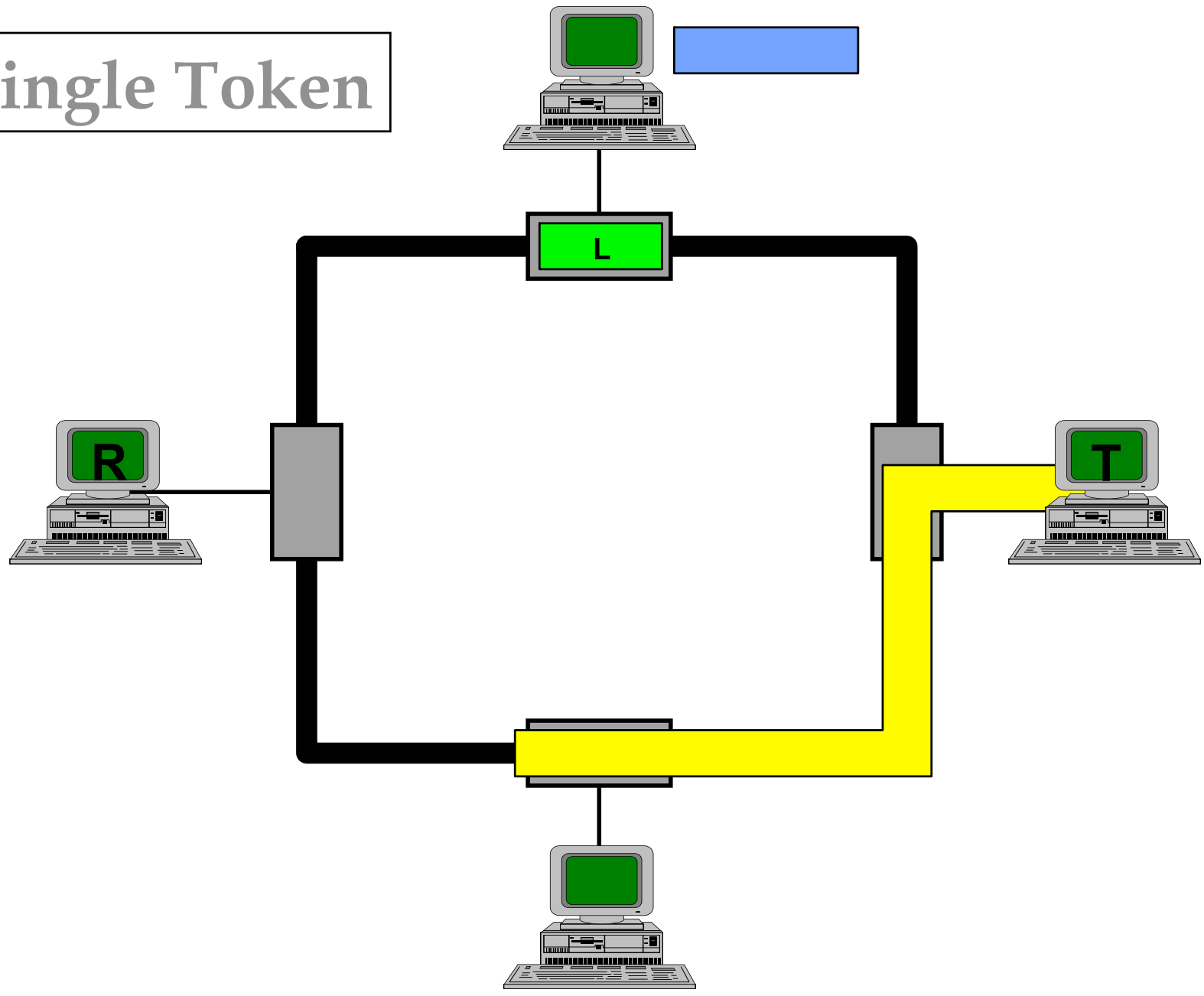
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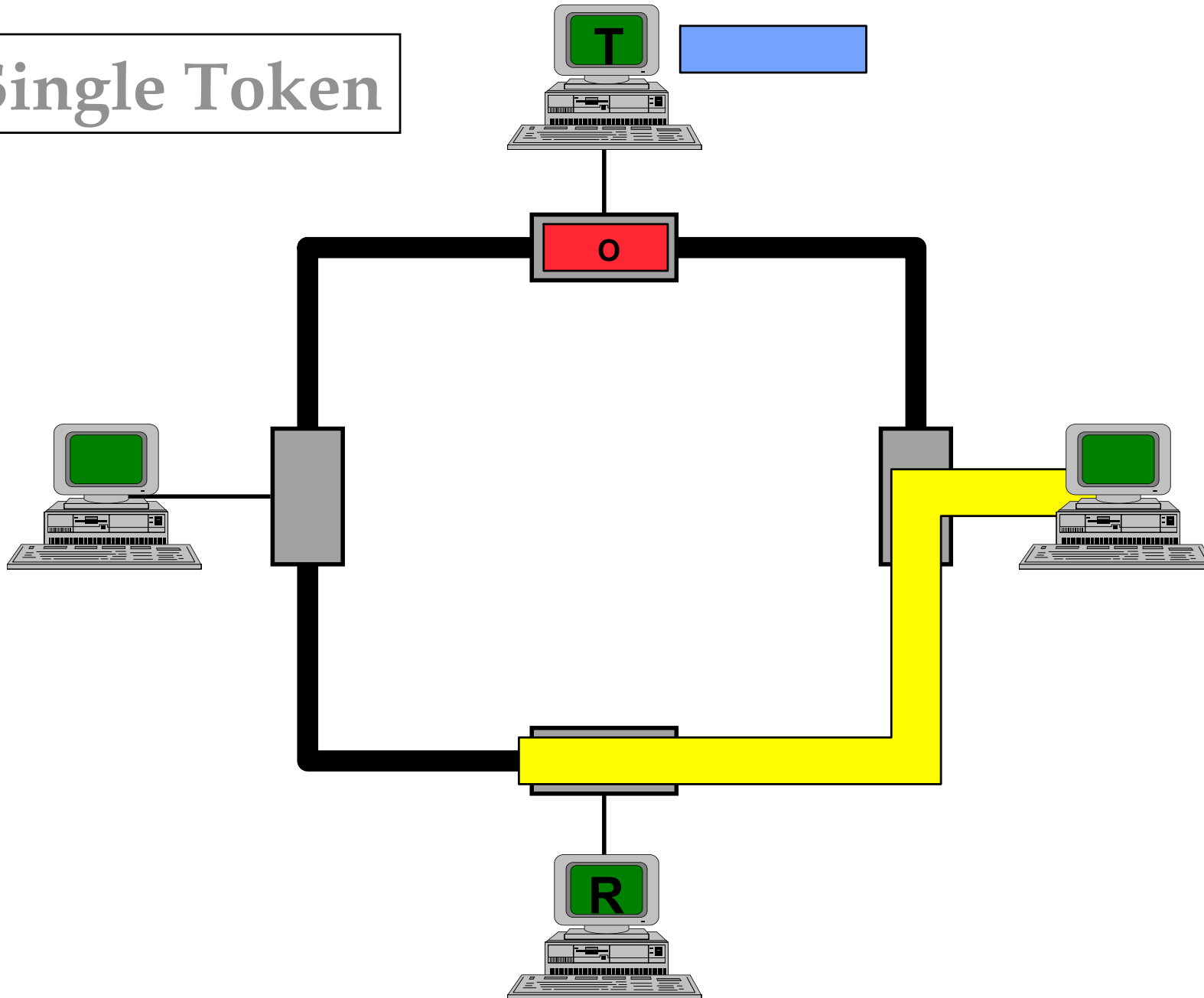
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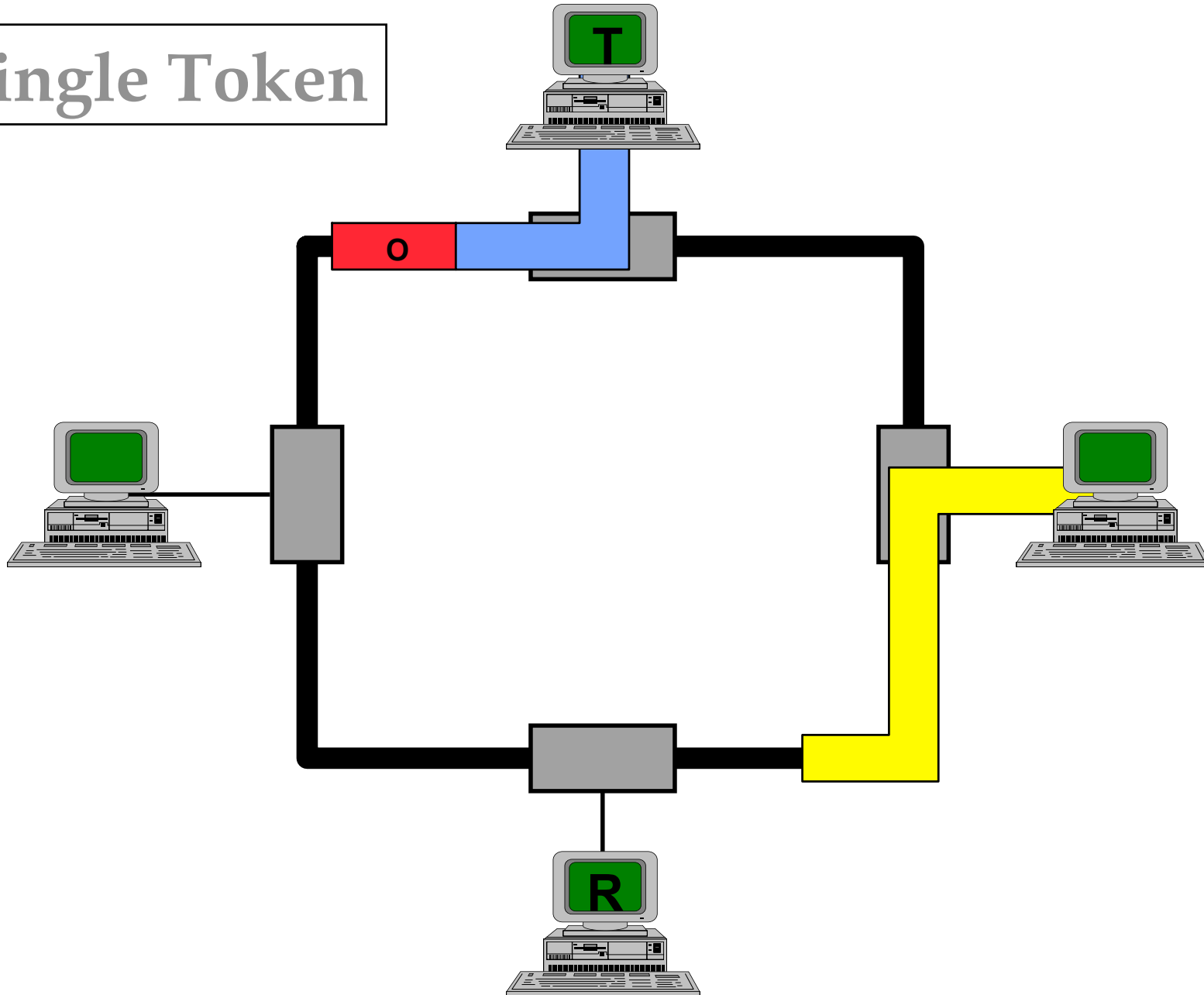
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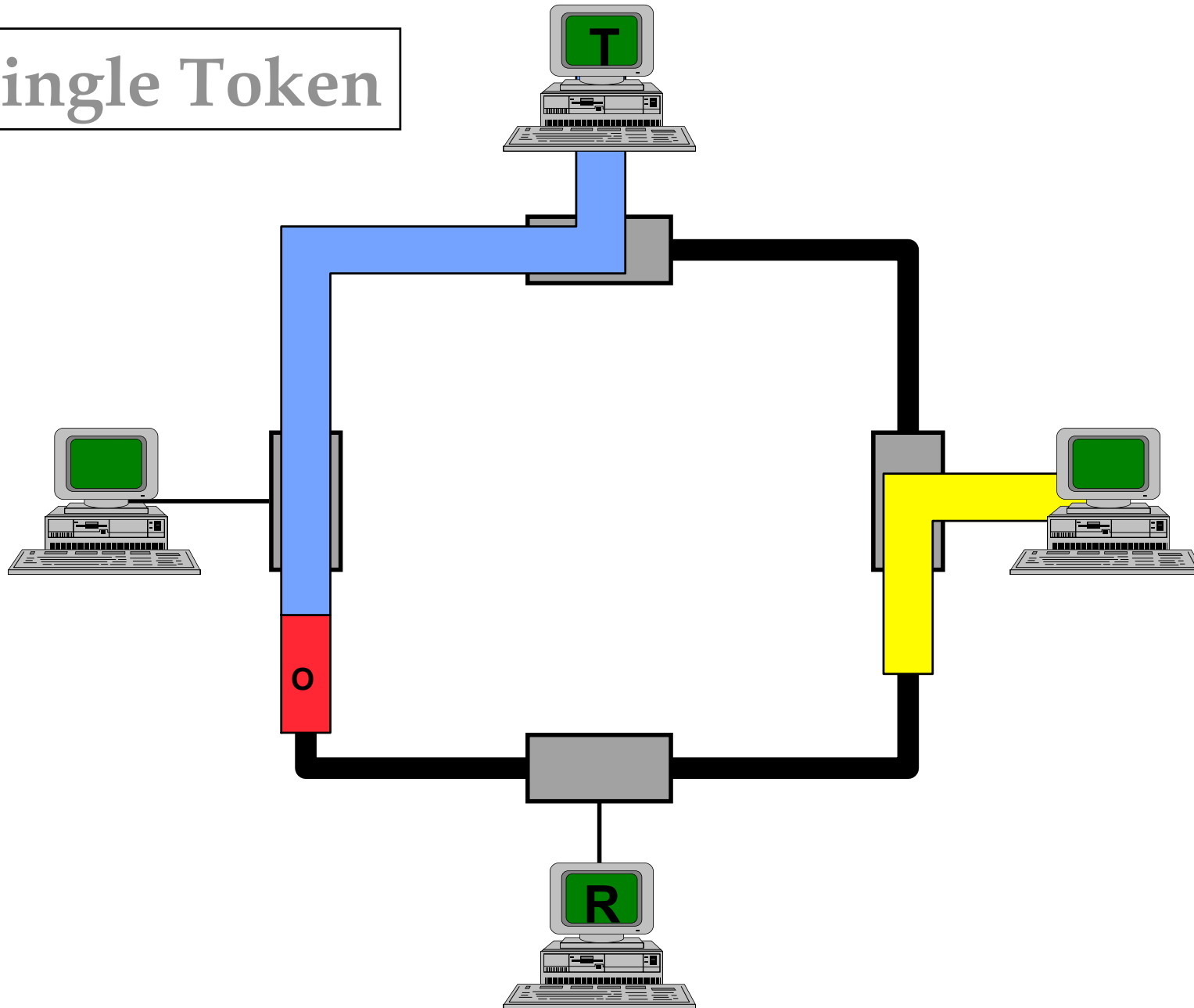
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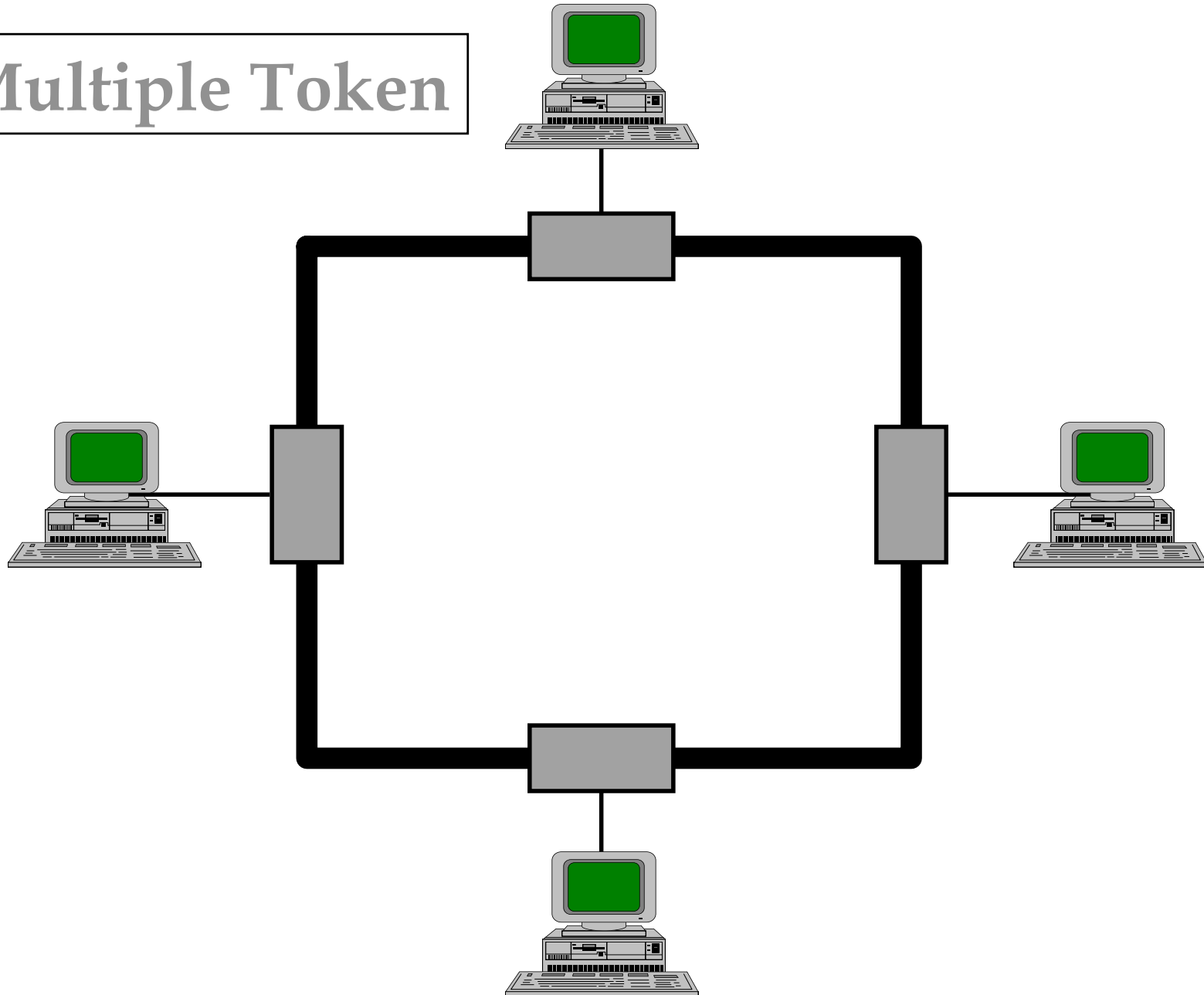
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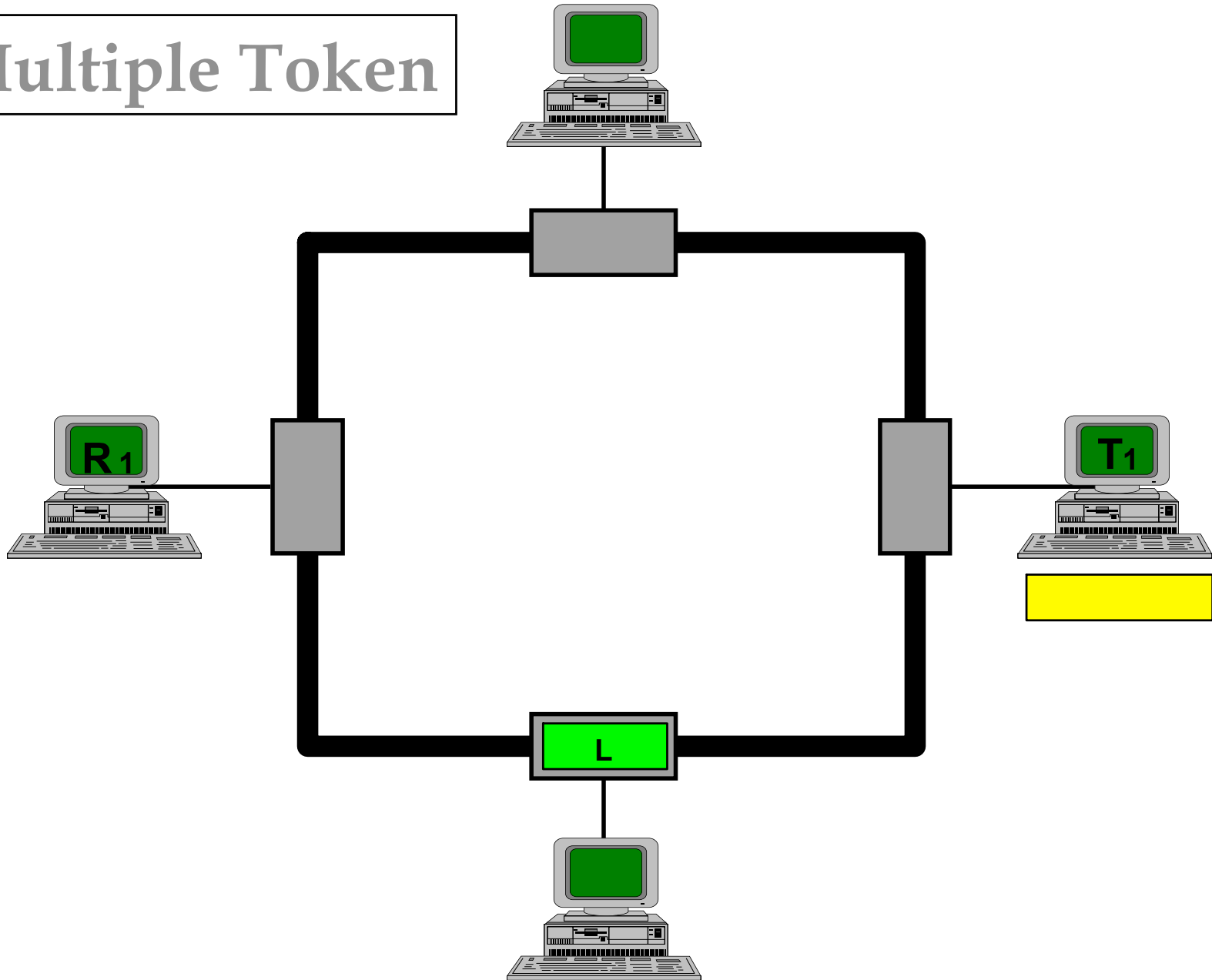
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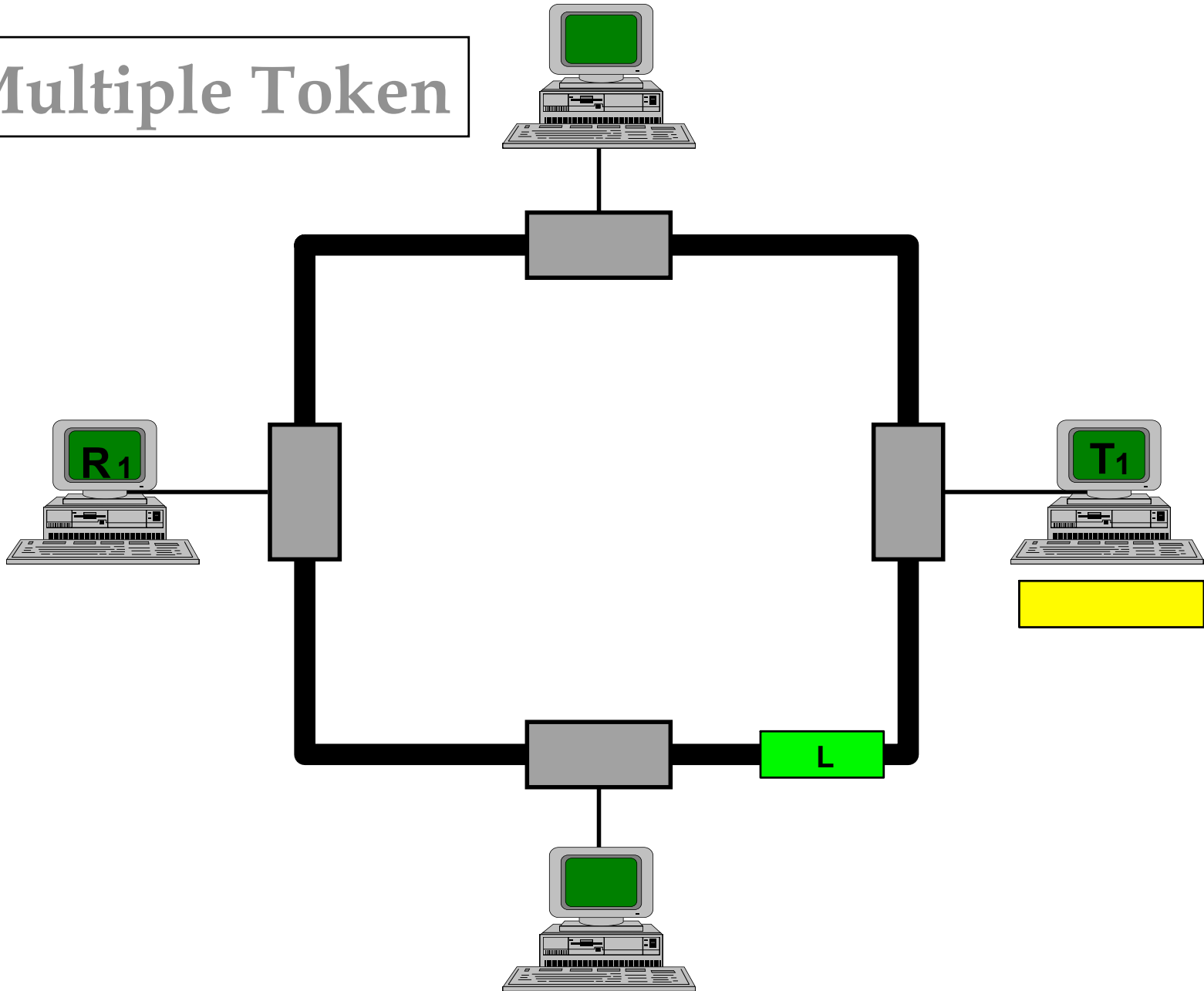
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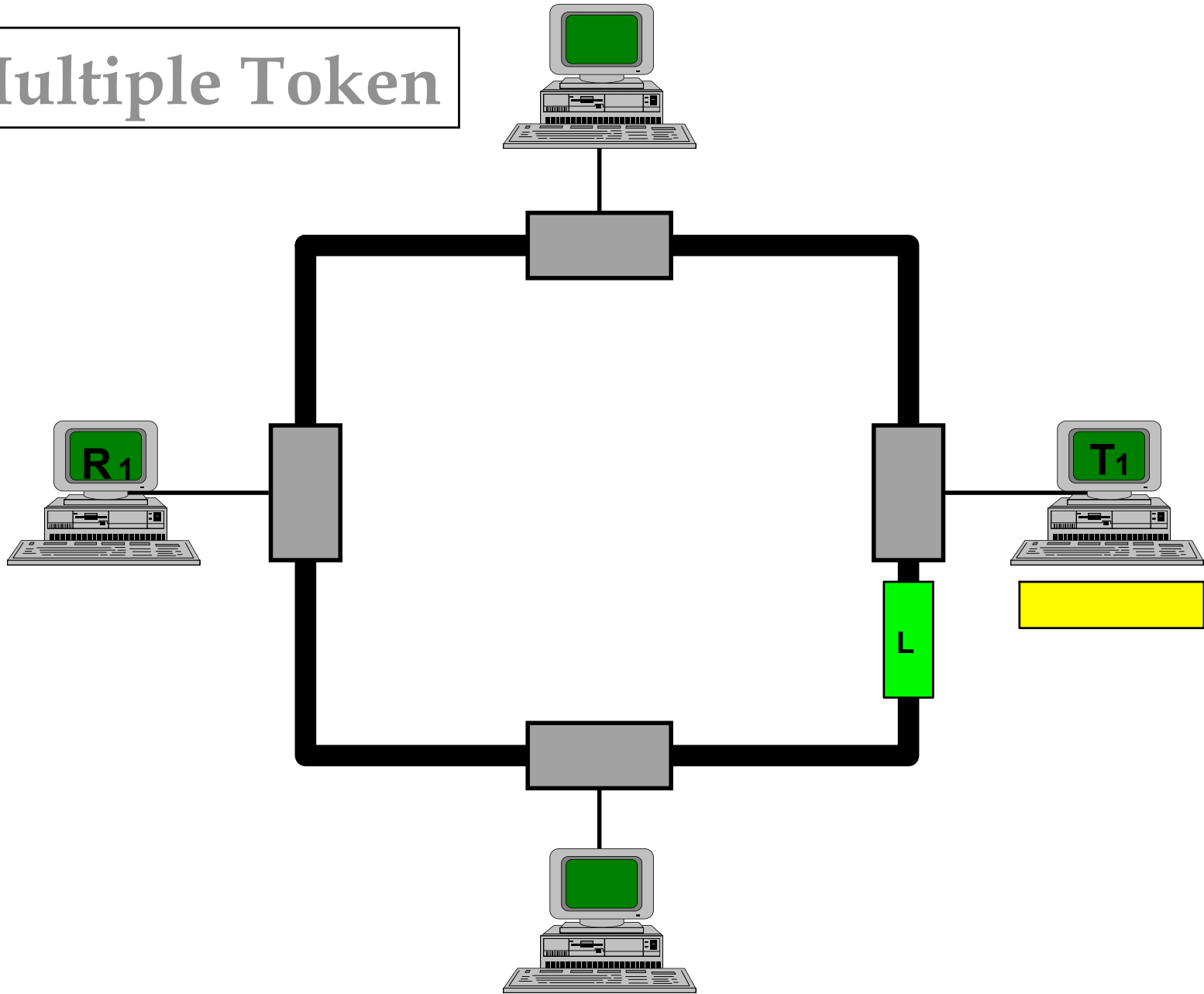
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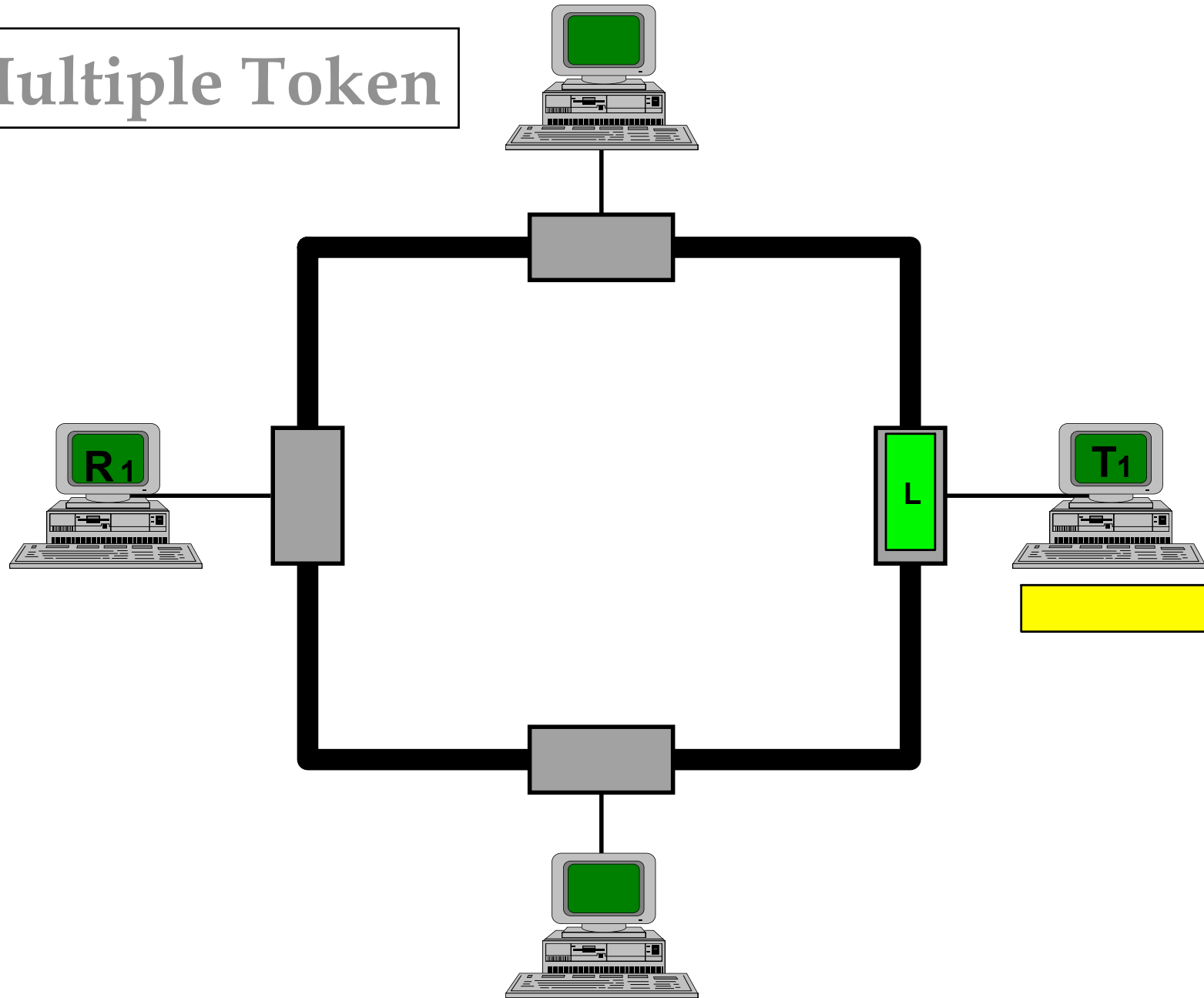
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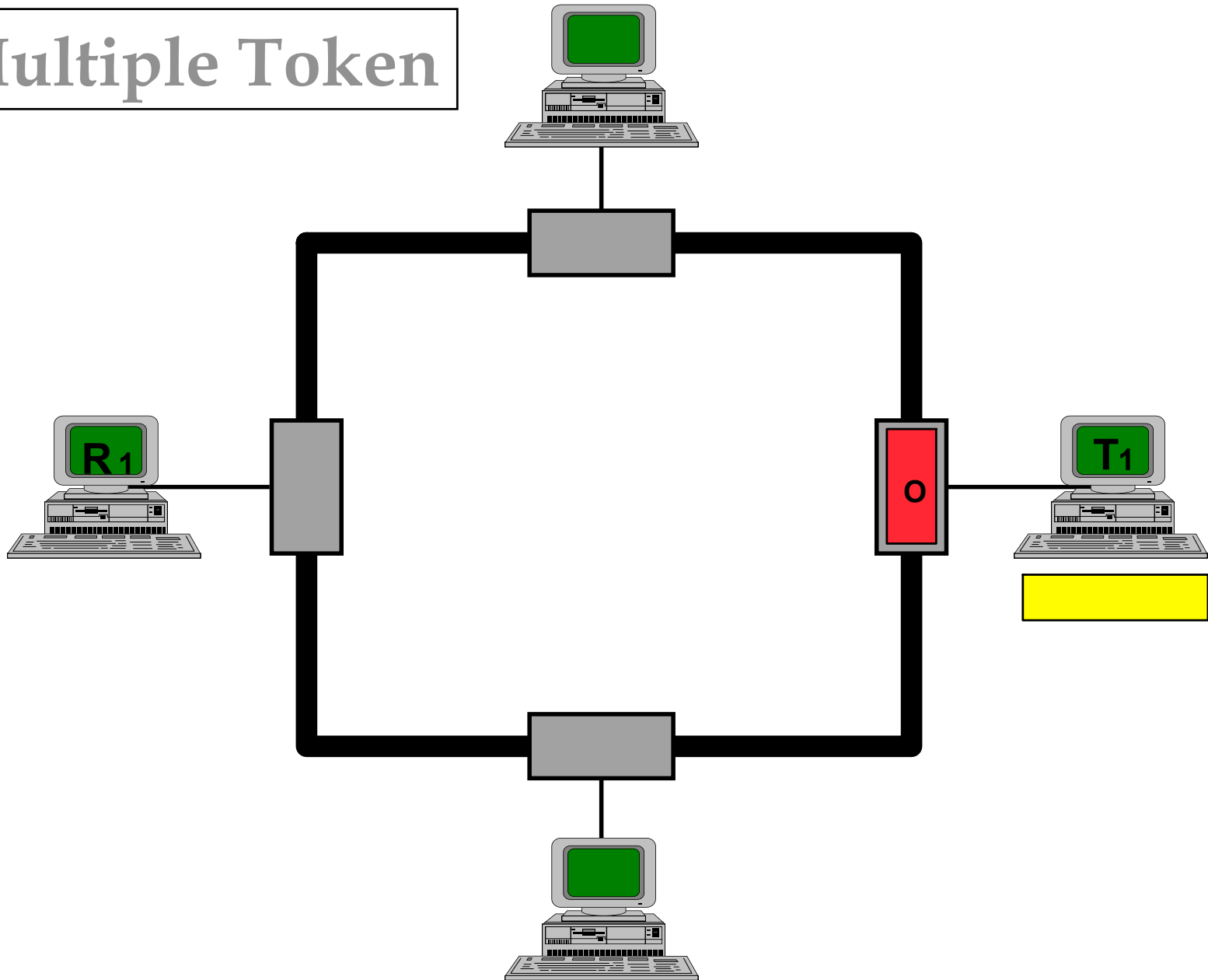
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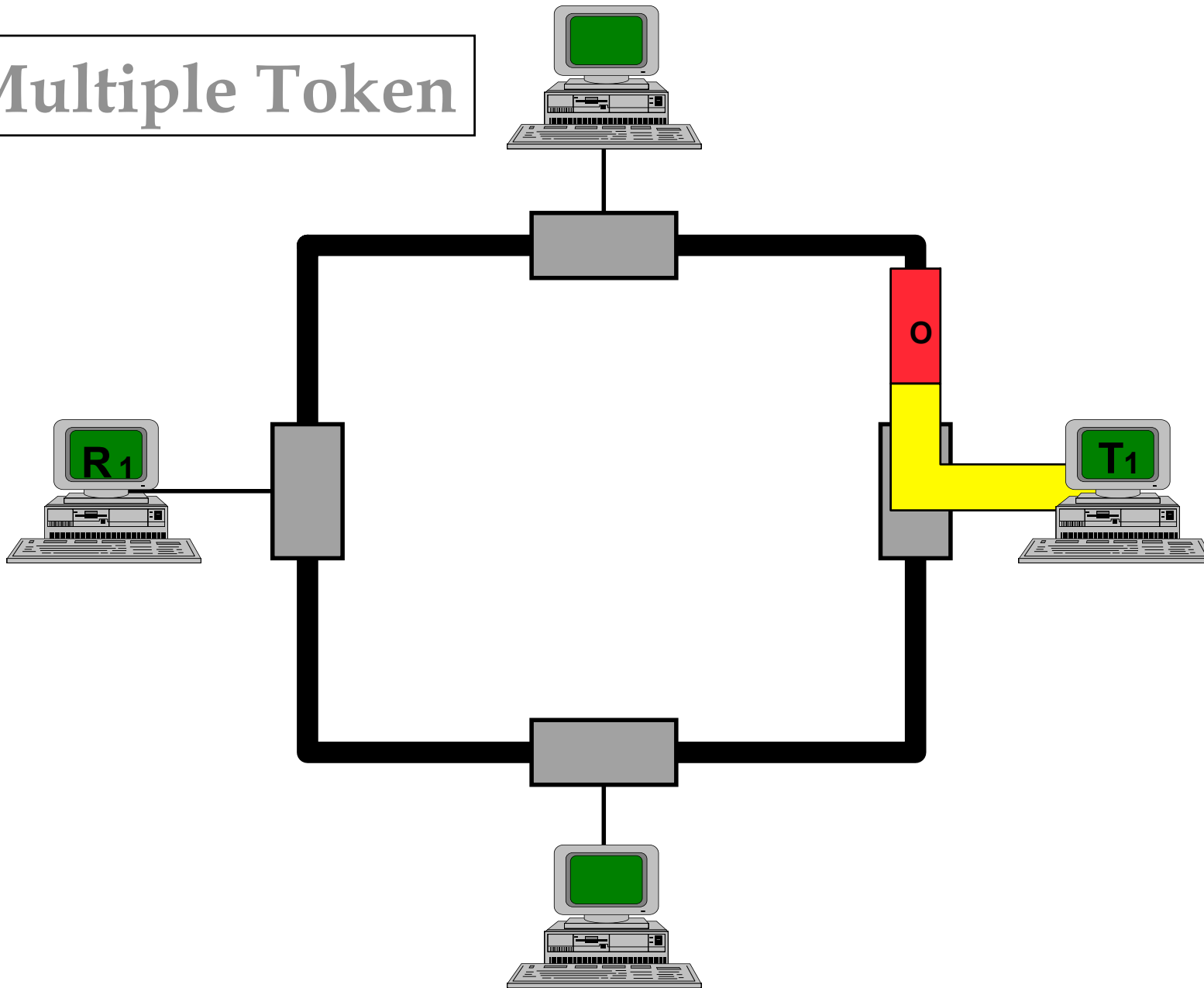
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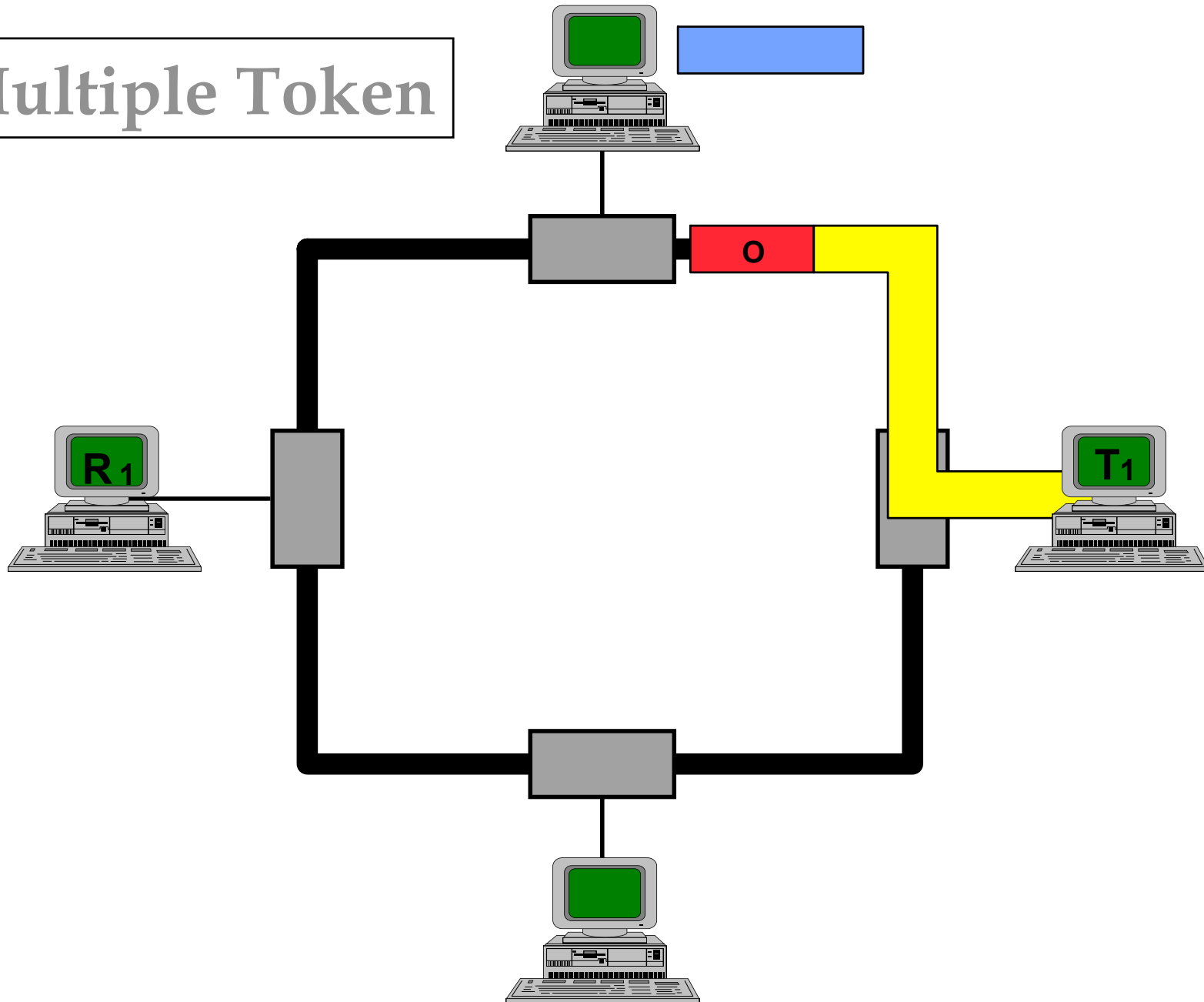
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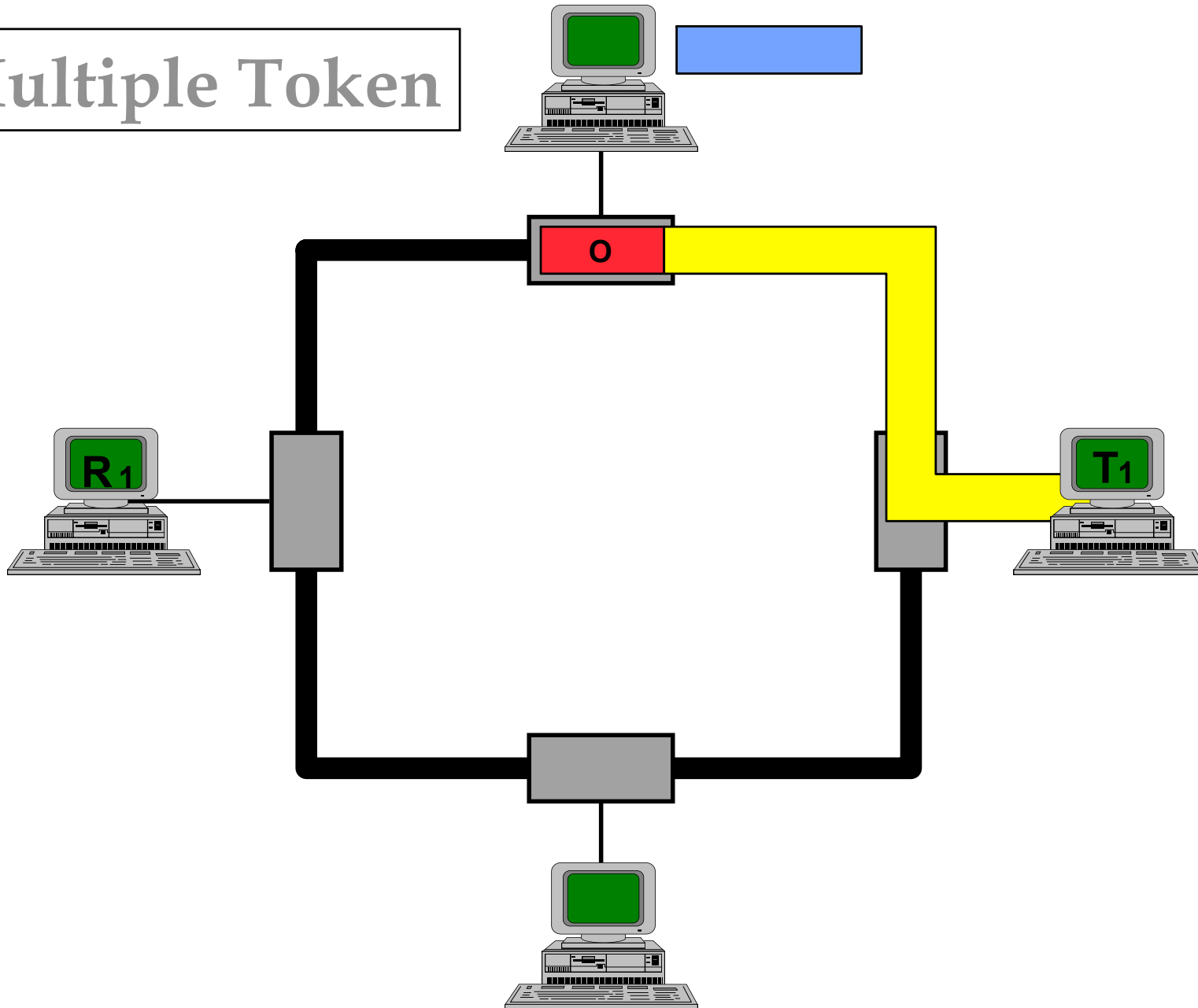
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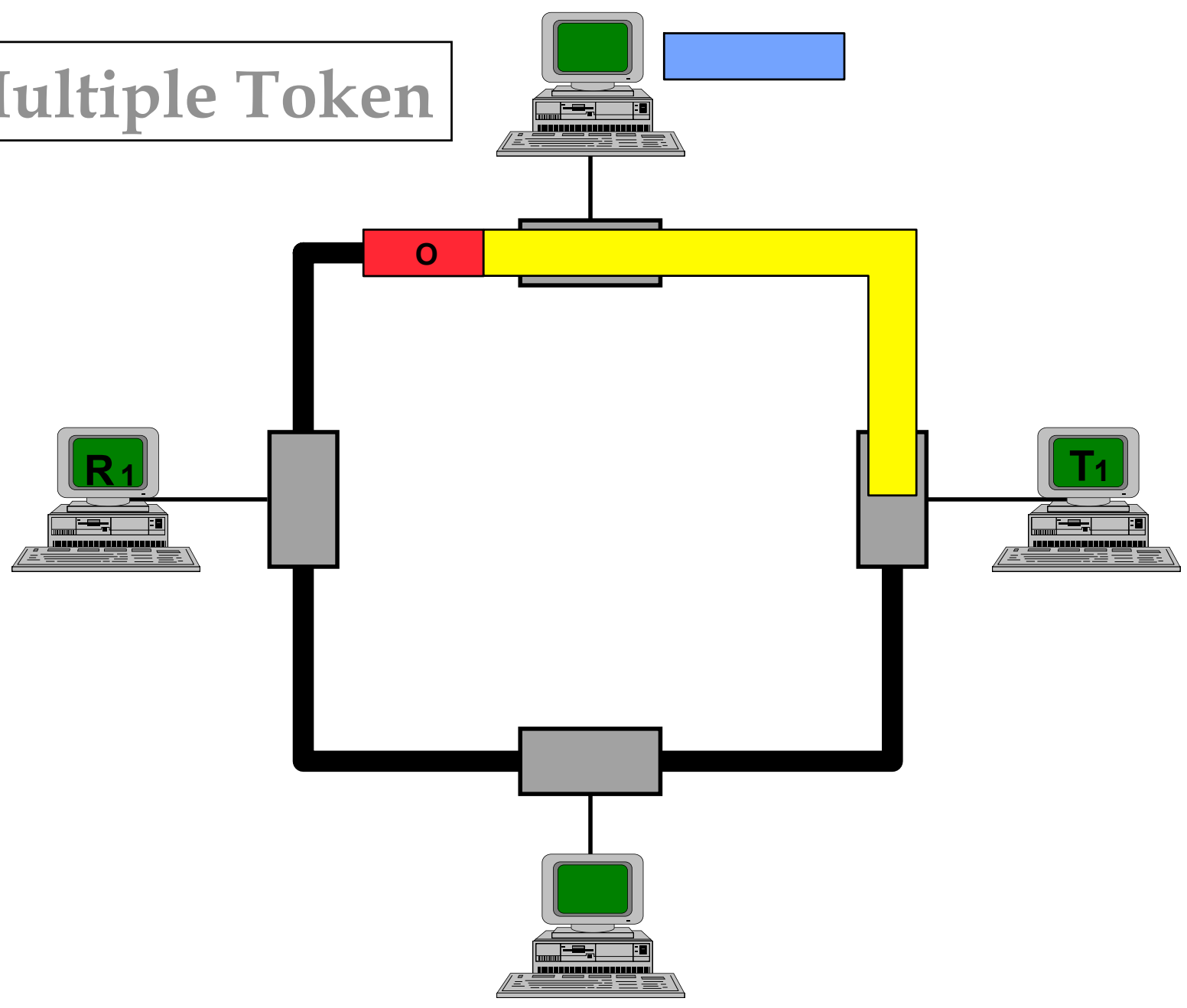
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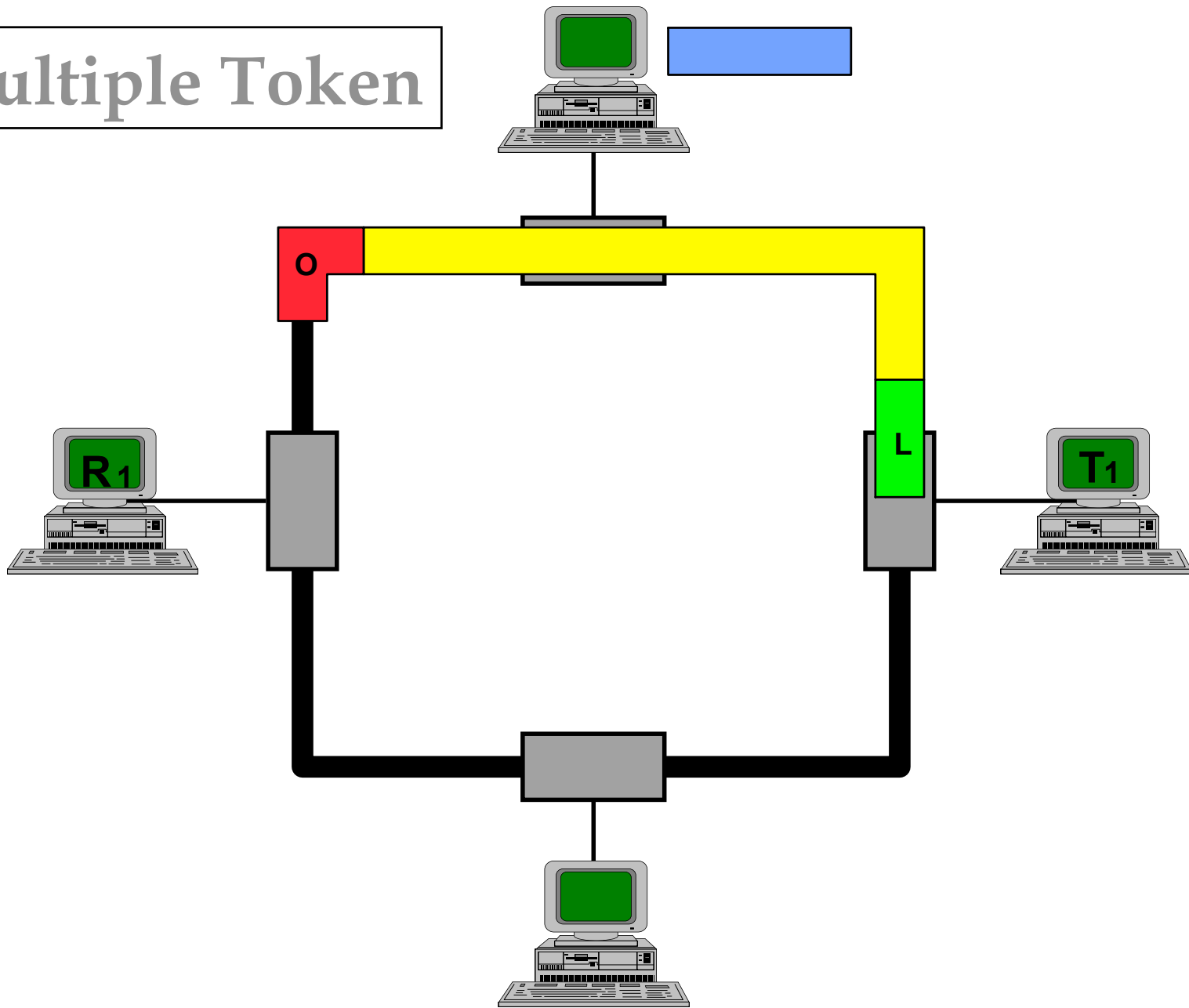
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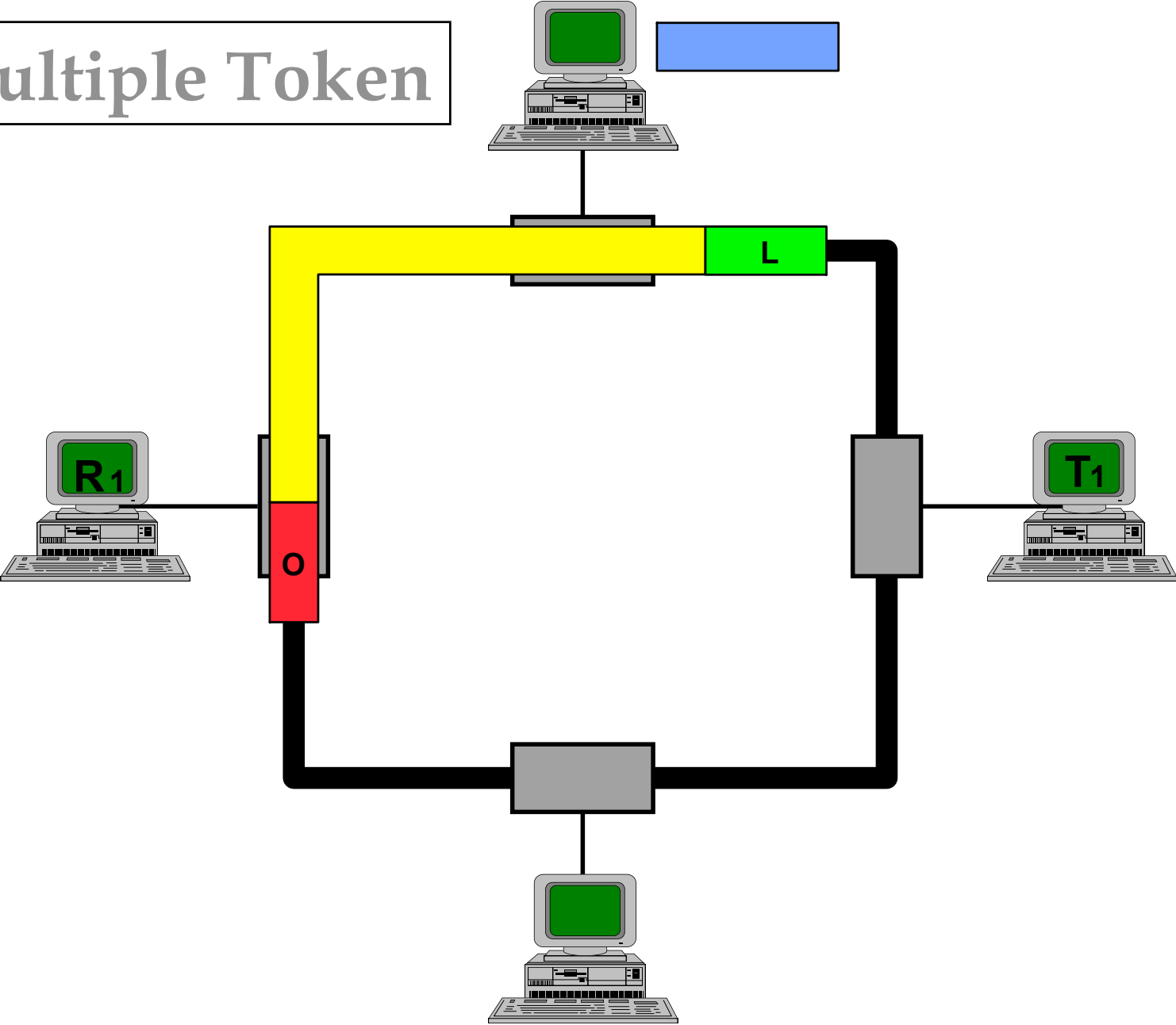
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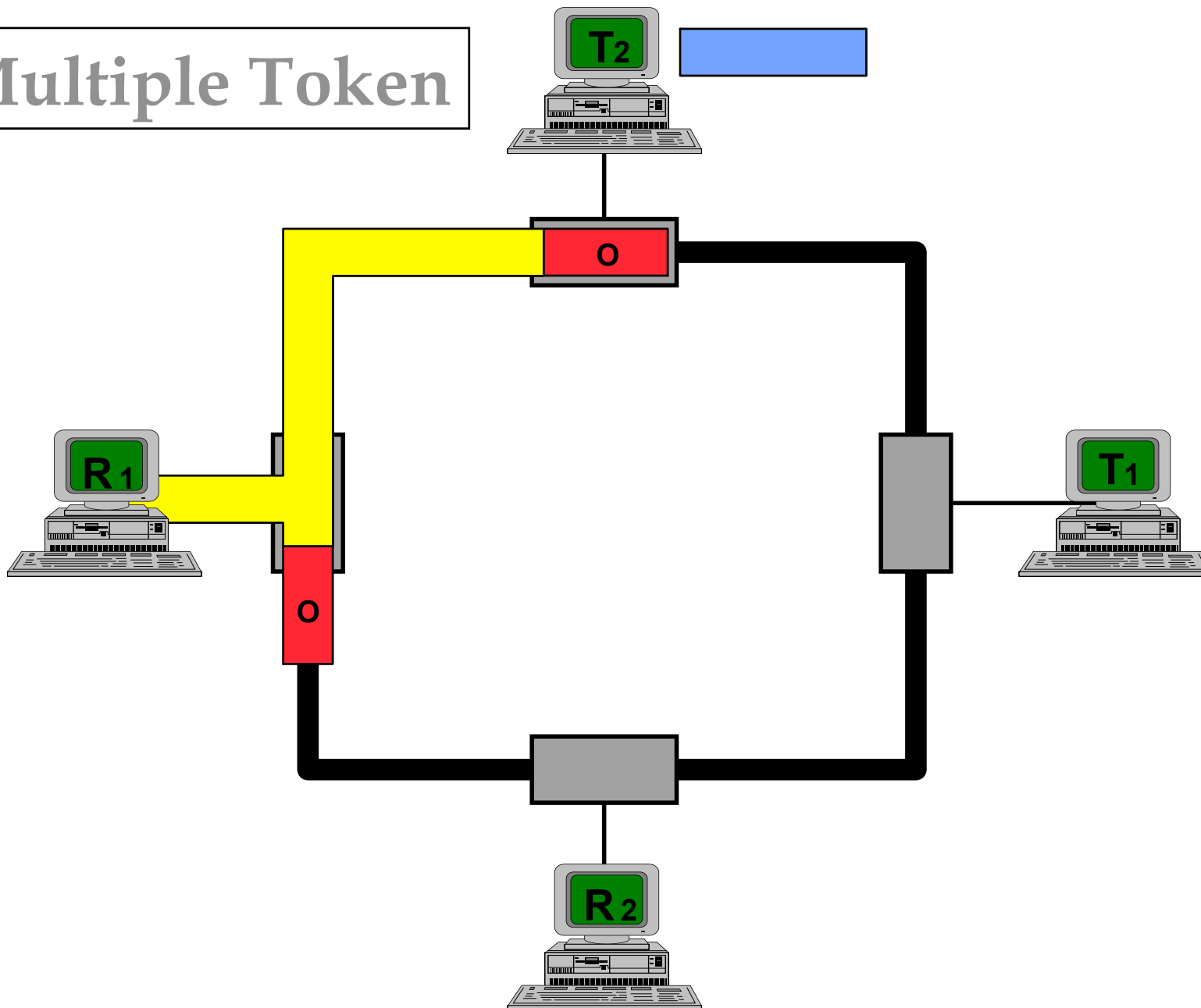
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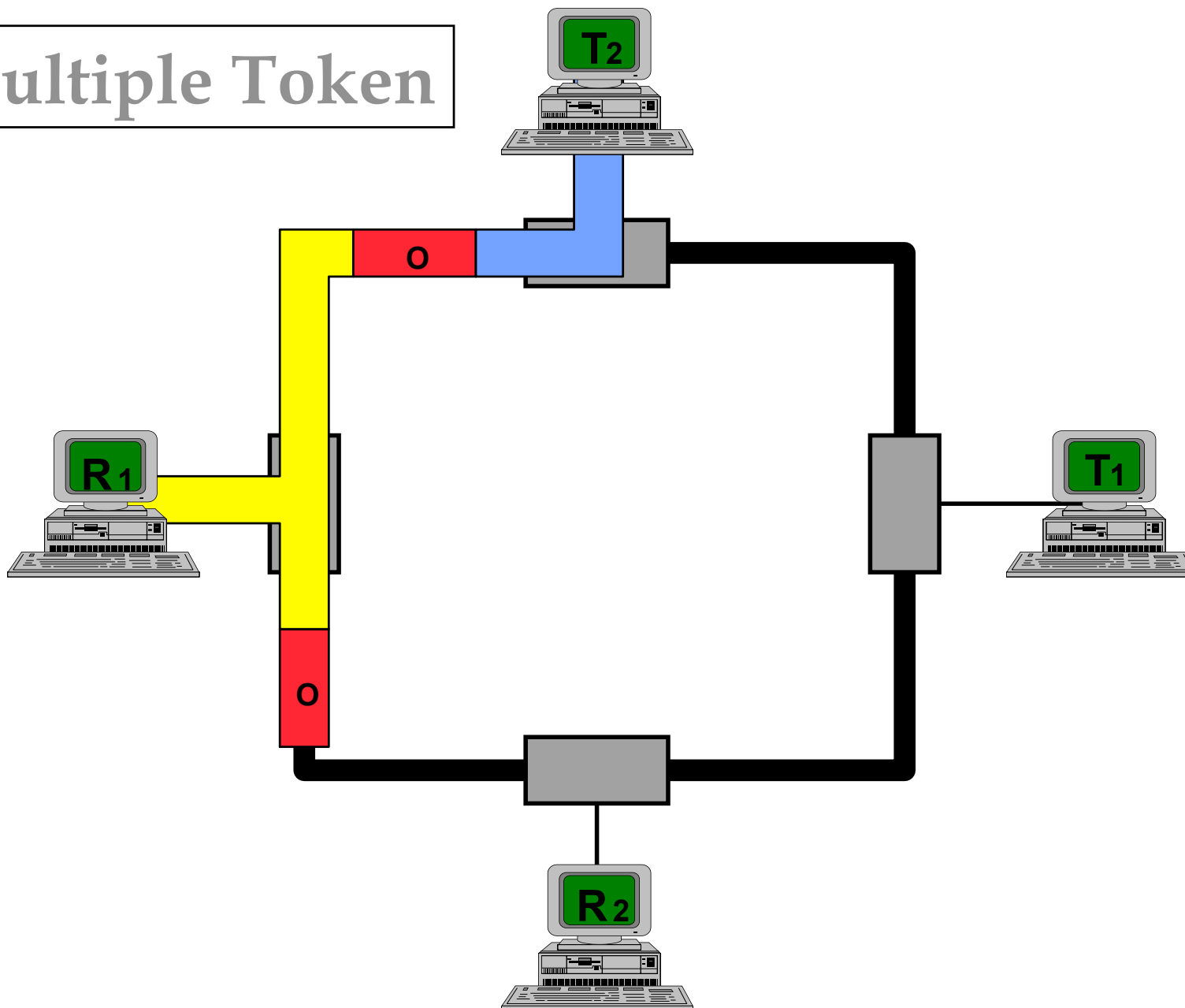
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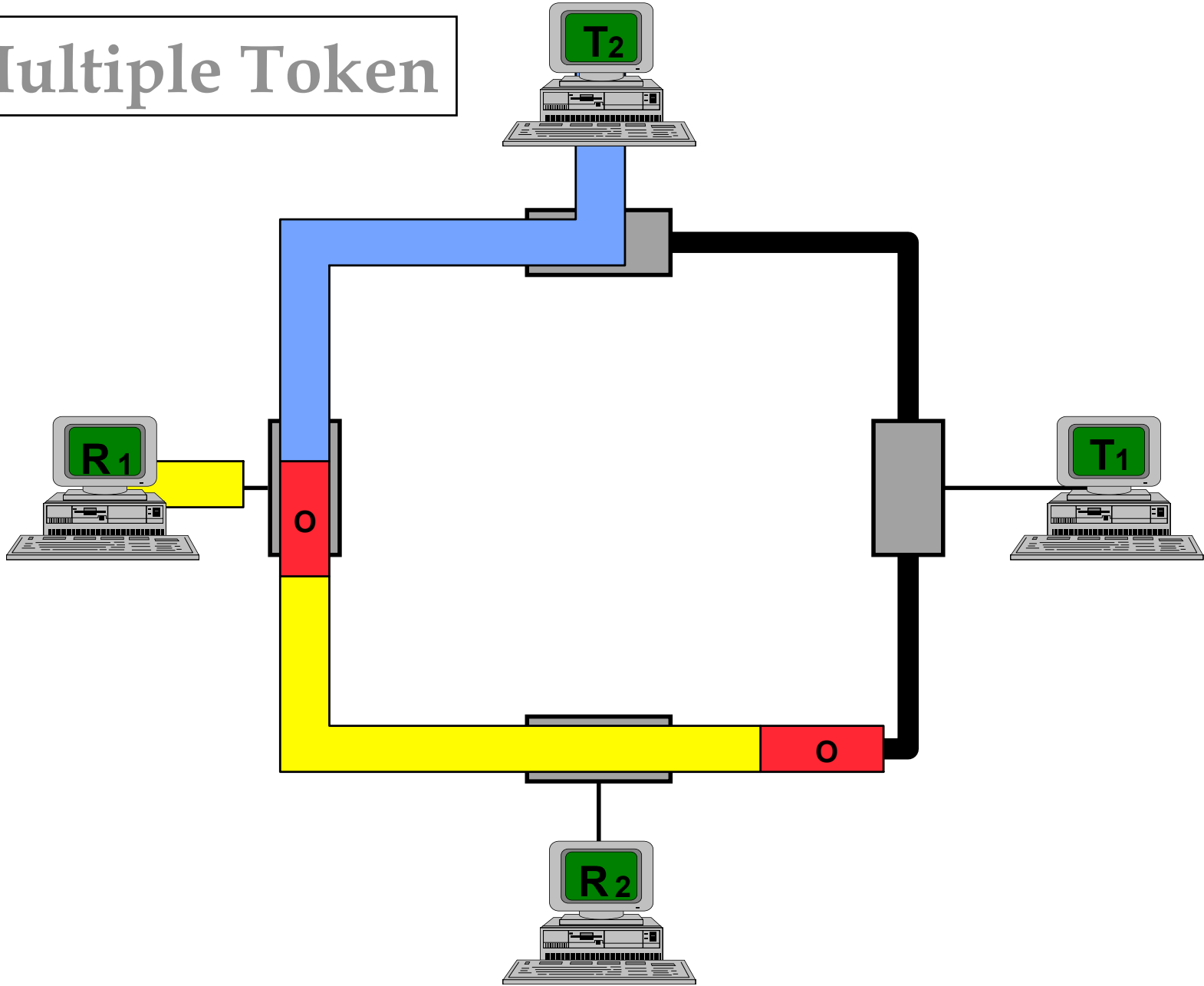
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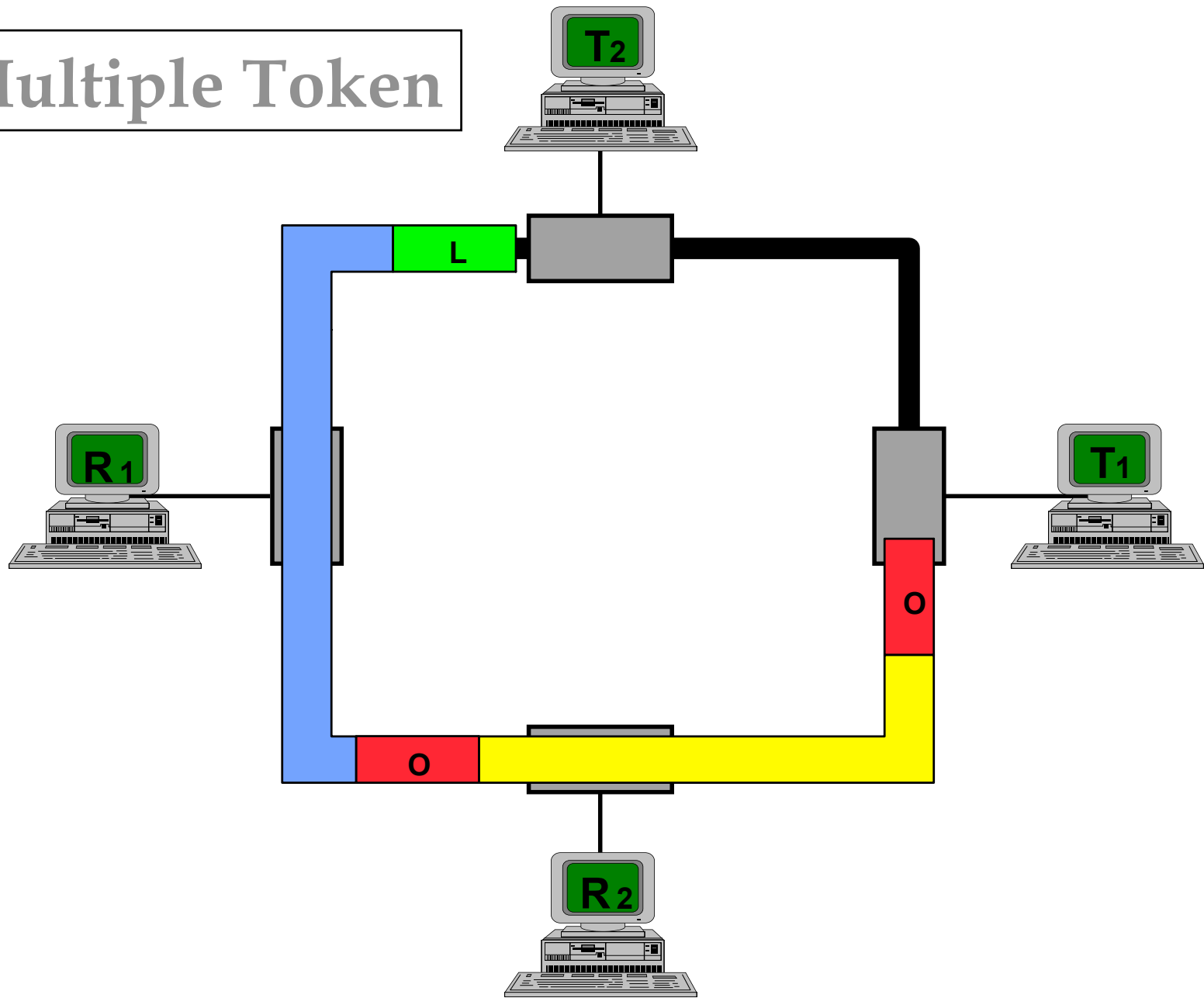
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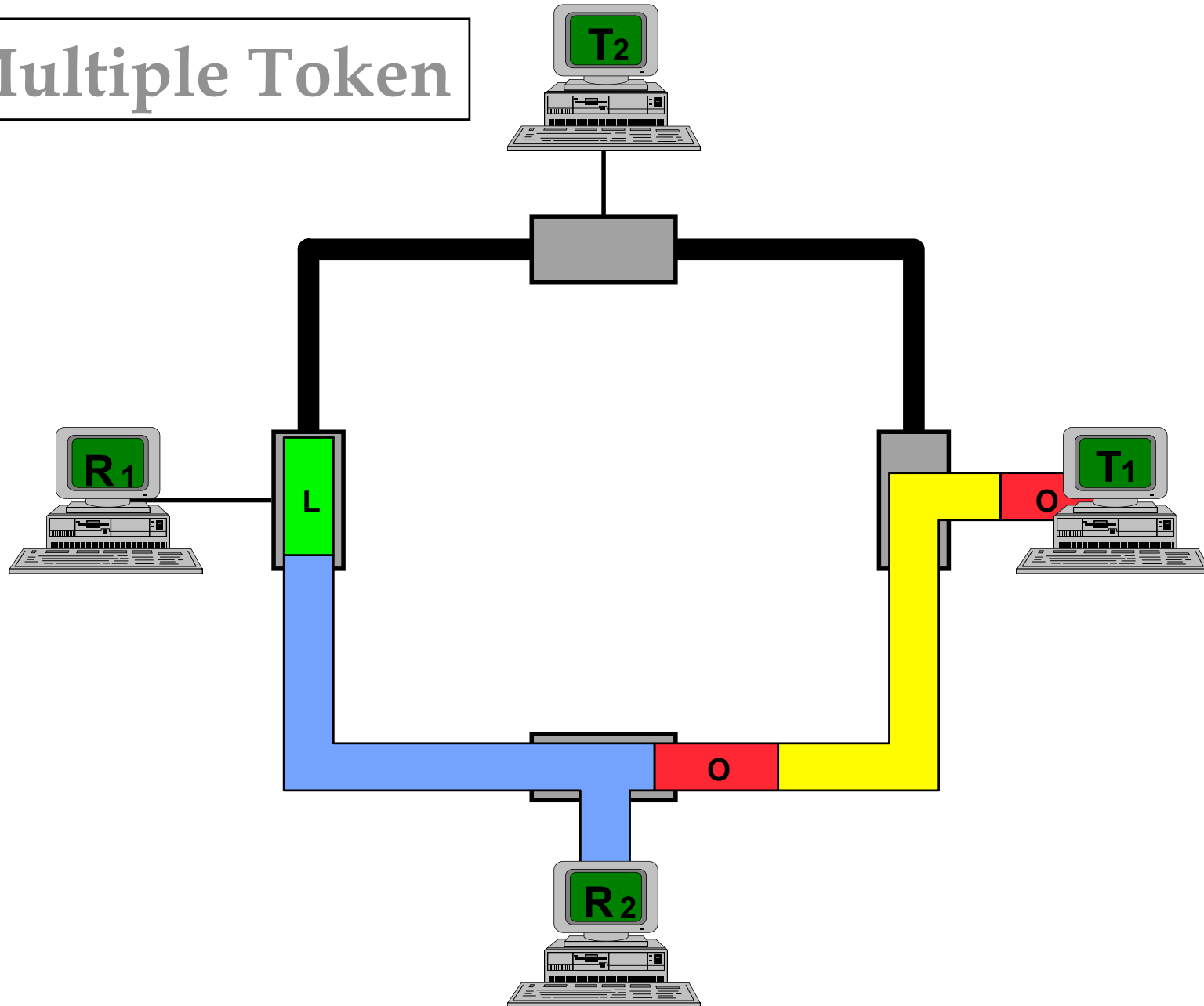
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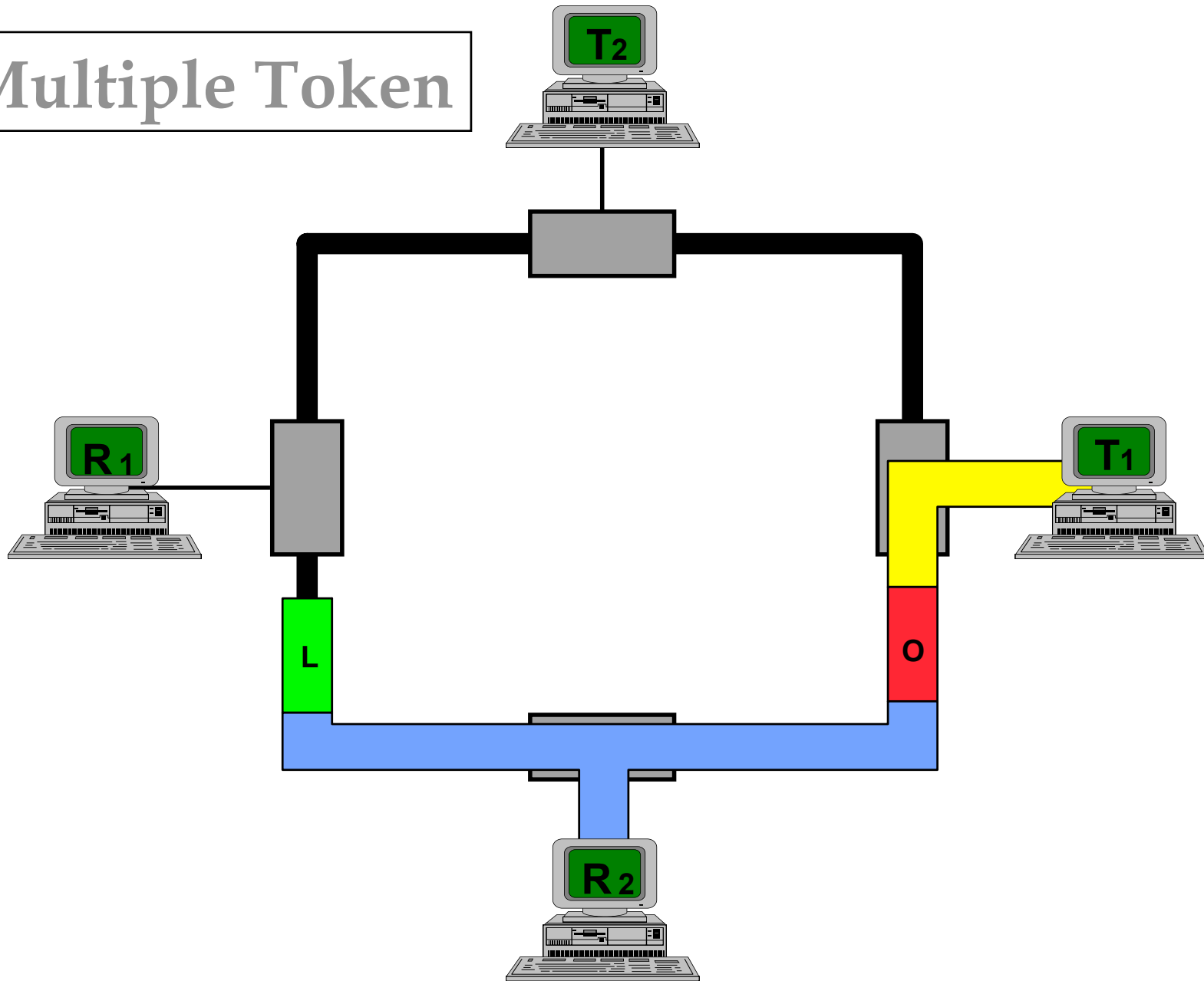
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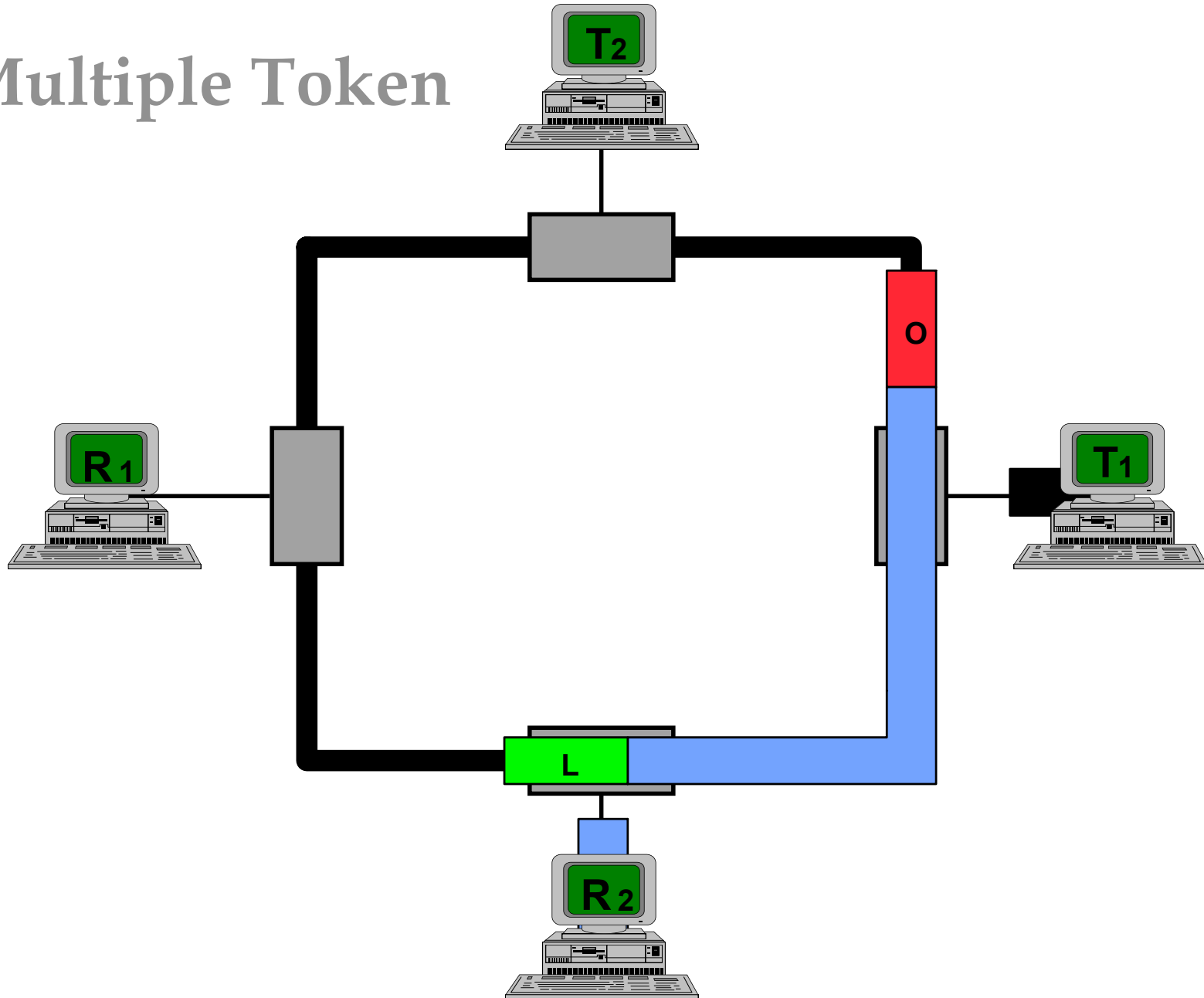
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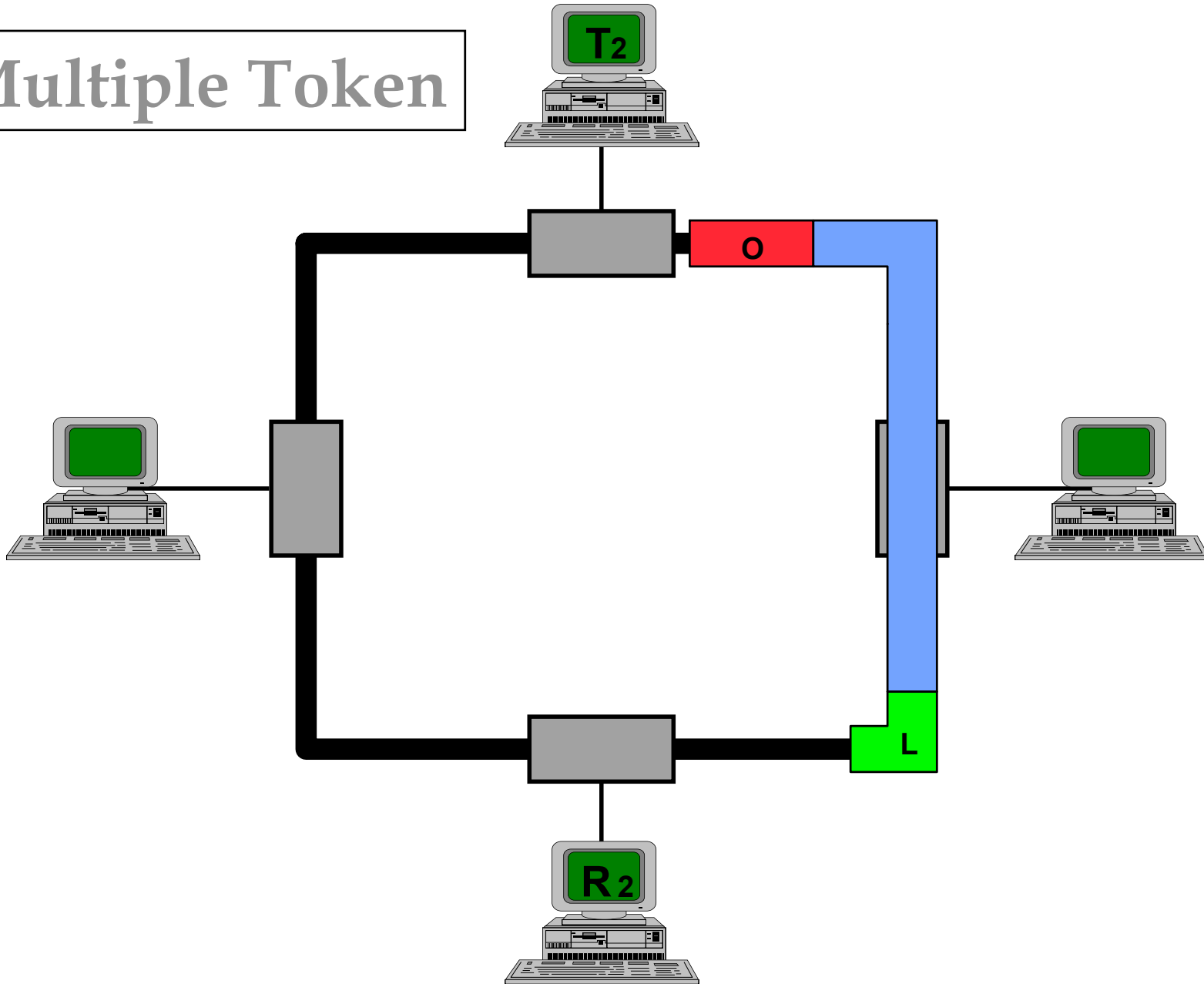
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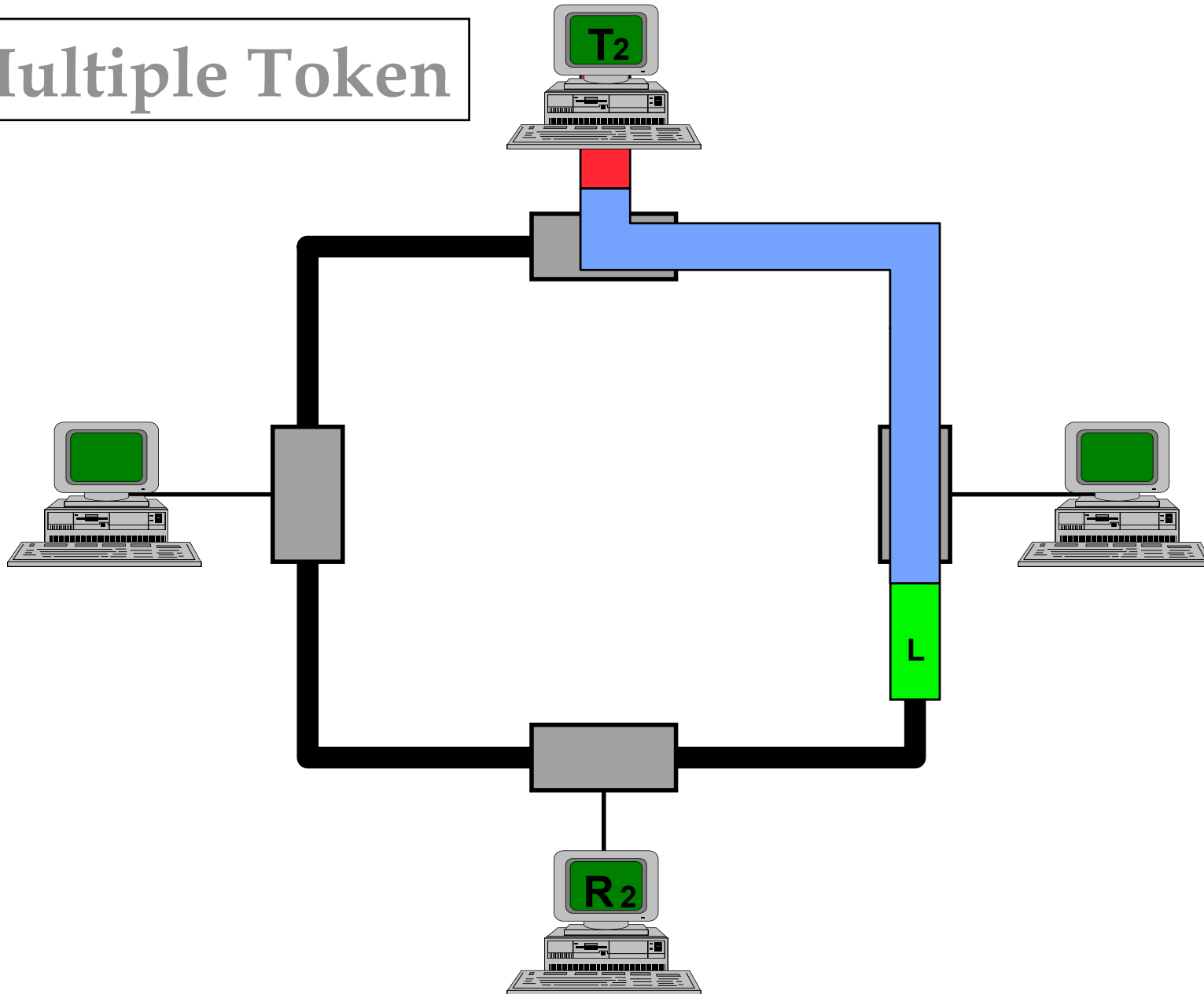
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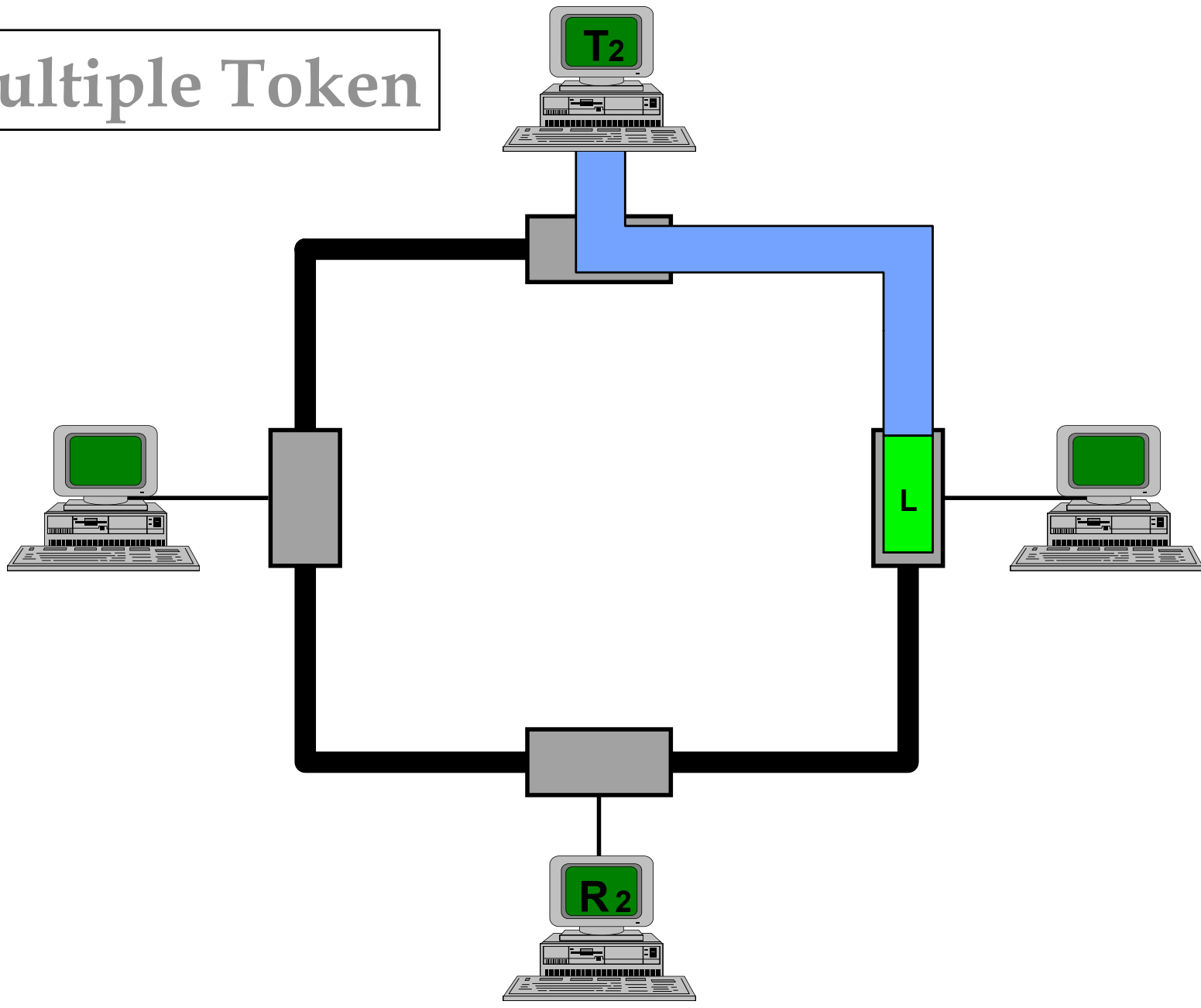
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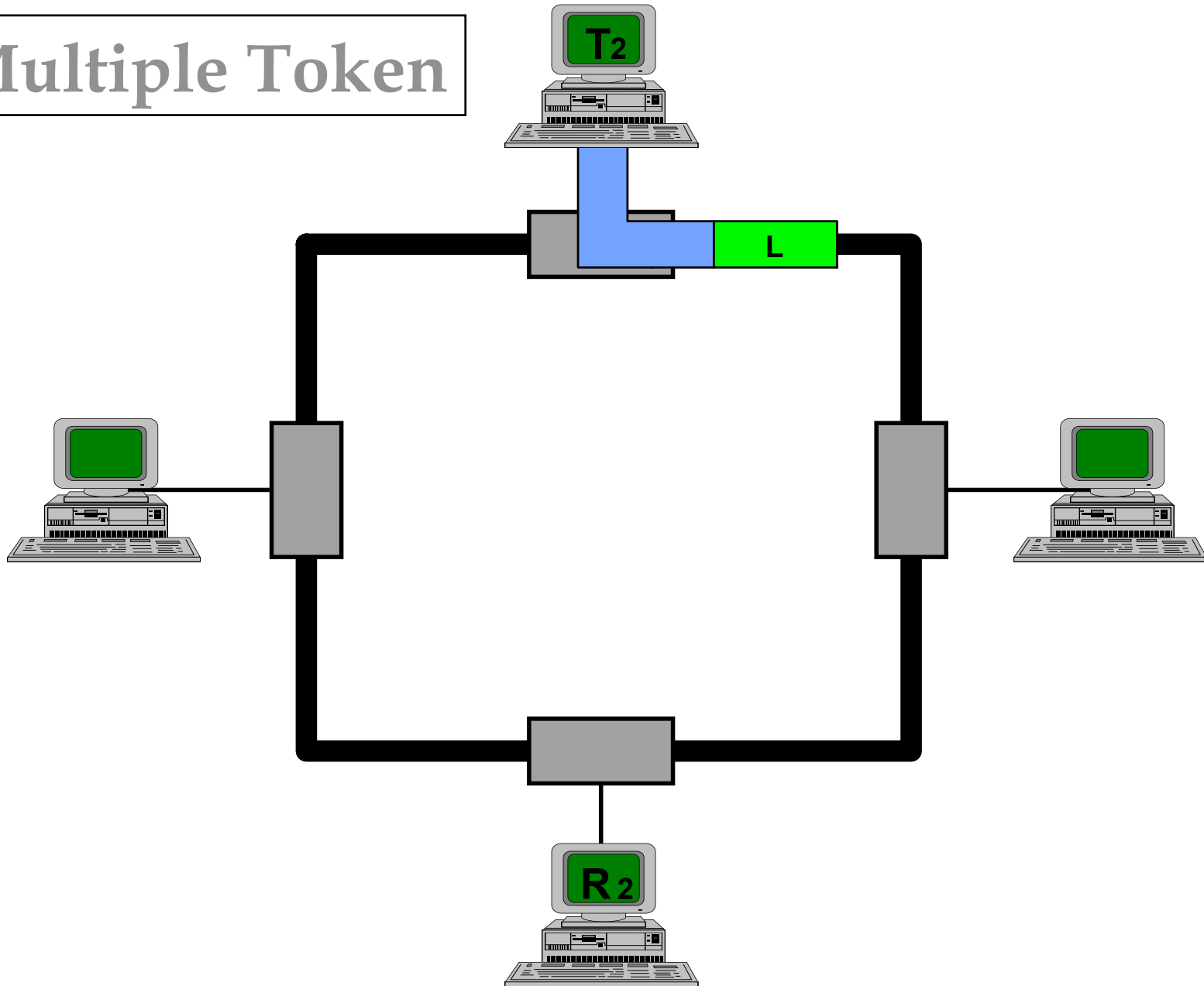
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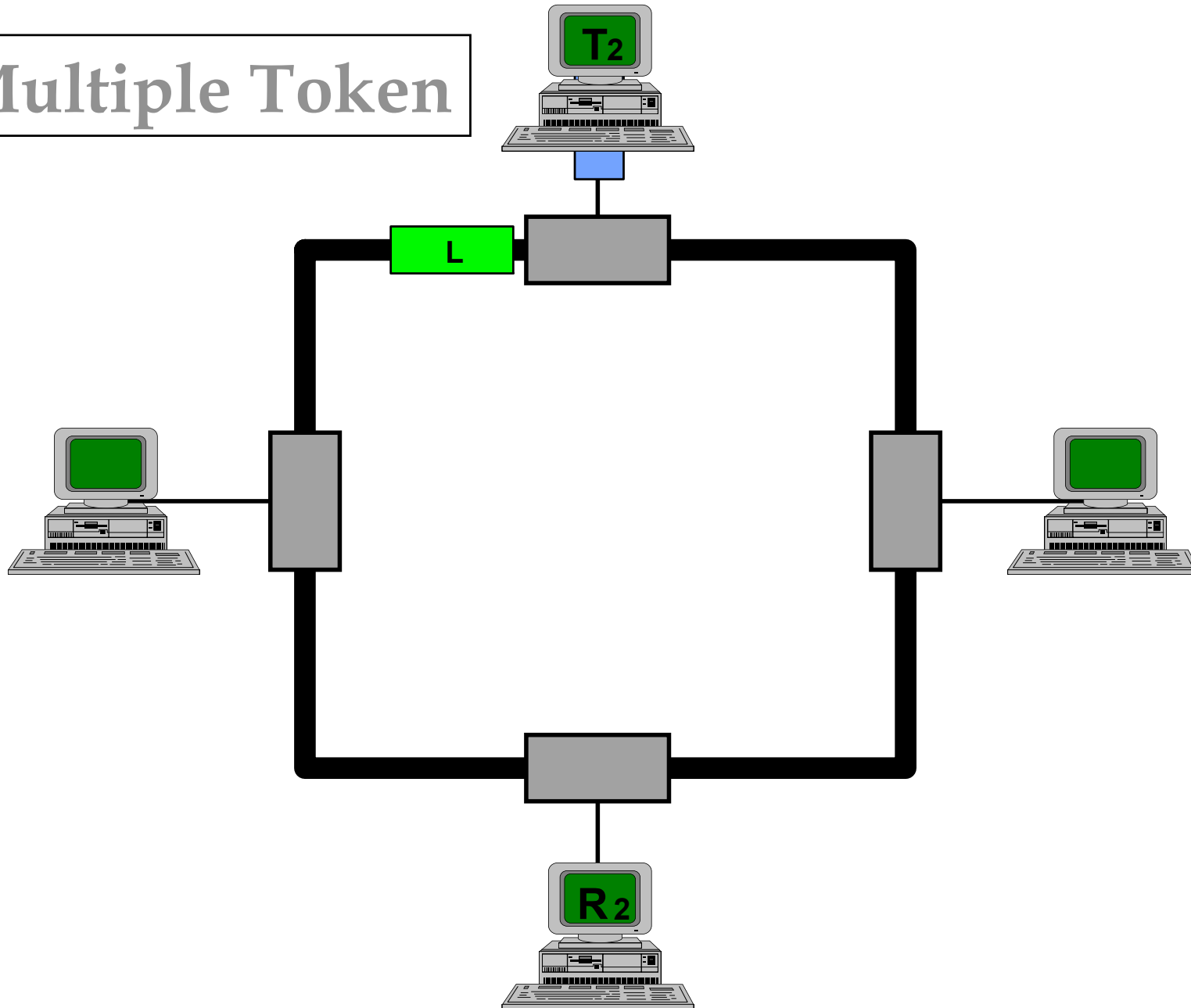
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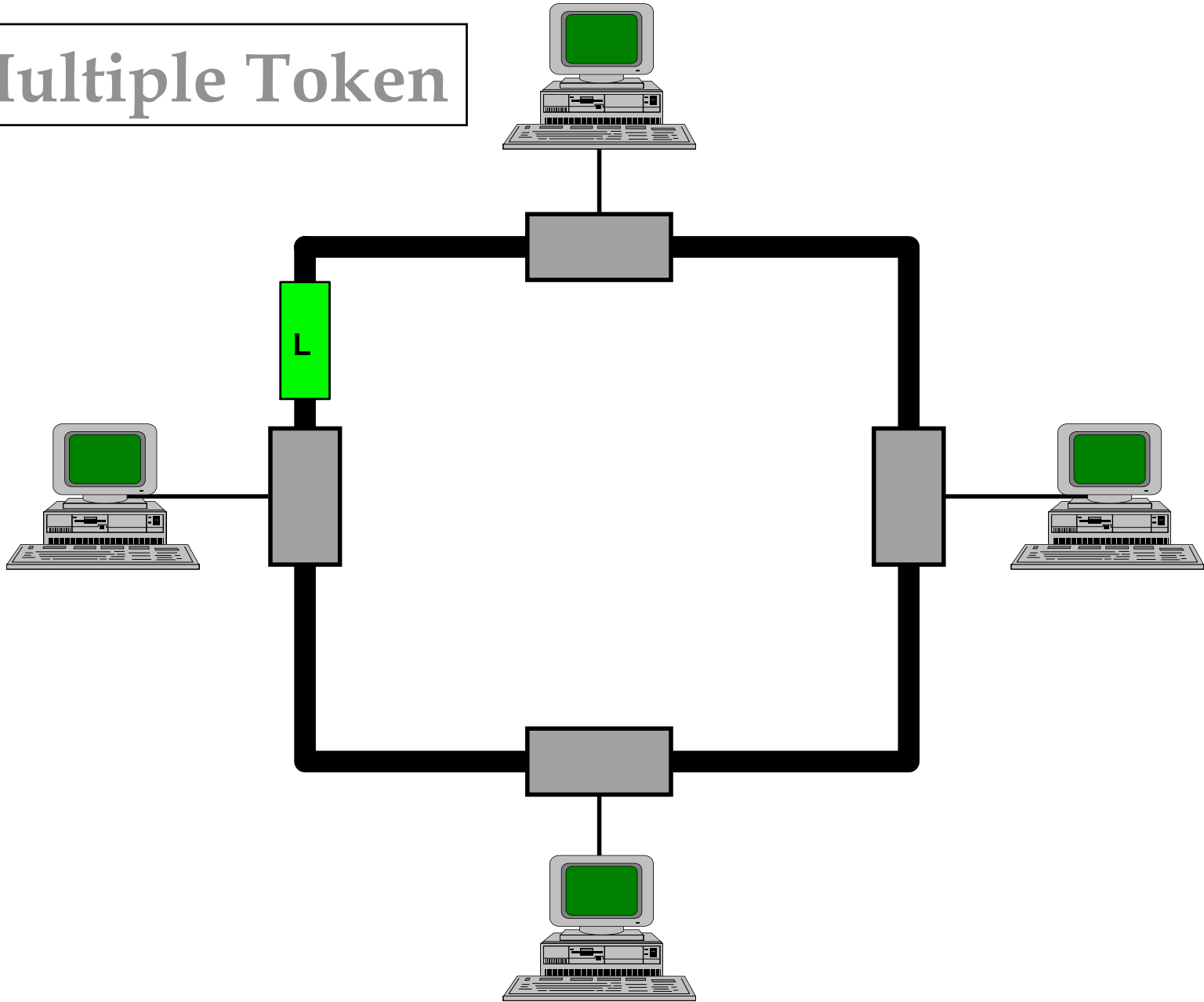
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Multiple Token

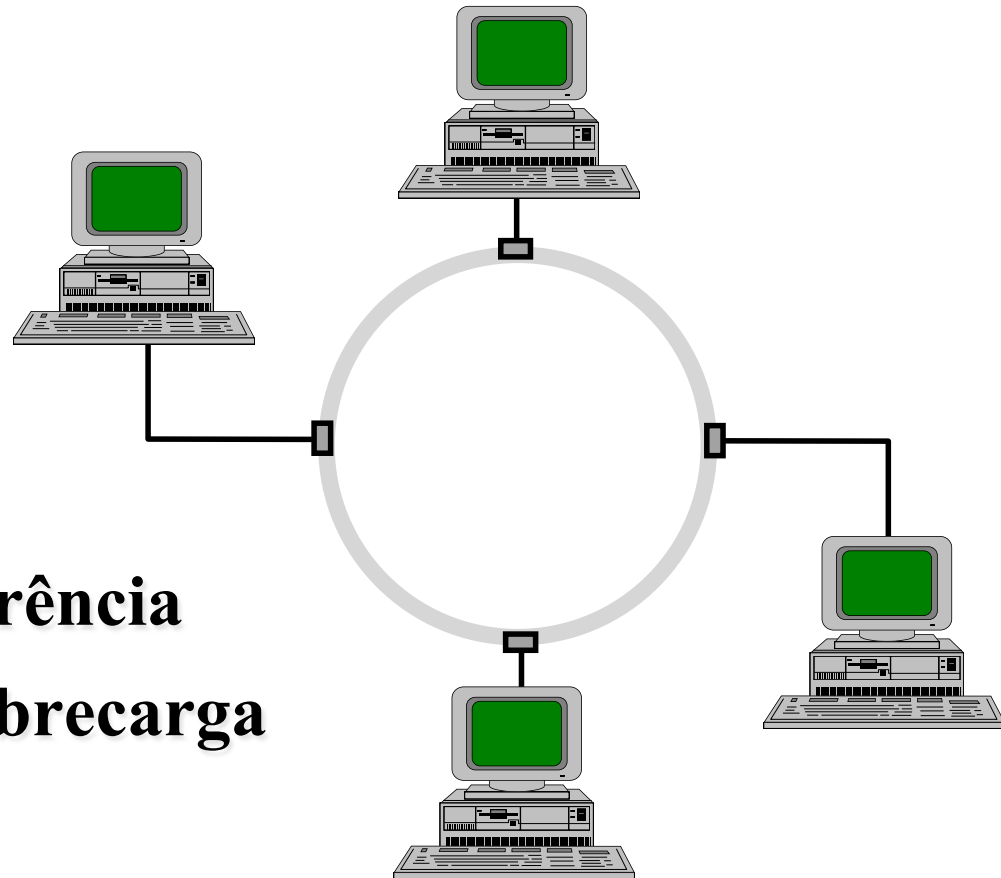


Multiple Token



Token Ring

- ⇒ **Eficiência**
- ⇒ **Equidade**
- ⇒ **Prioridade**
- ⇒ **Retardo de transferência**
- ⇒ **Estabilidade em sobrecarga**



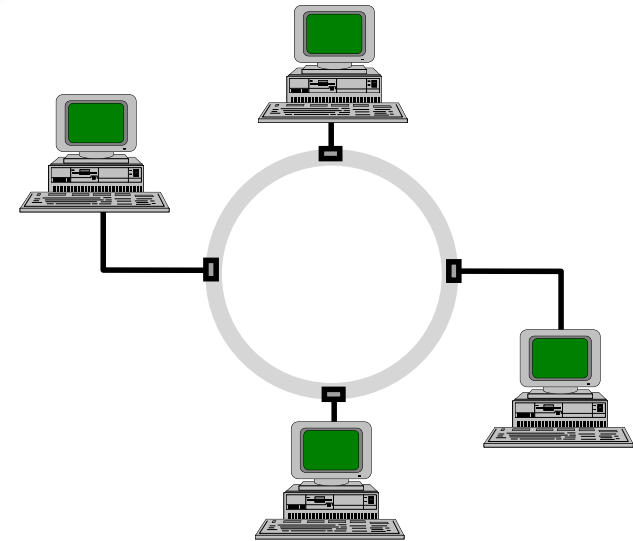
Latência do Anel

- ⇒ **Latência = soma do retardo dos repetidores e do tempo de propagação no anel**
- ⇒ **Podem existir tantos bits circulando quanto sua latência permitir**
- ⇒ **A latência pode ser aumentada introduzindo um buffer de retardo em qualquer estação**

Comparação entre os Tipos de Operação do Token Ring

Redes de Computadores

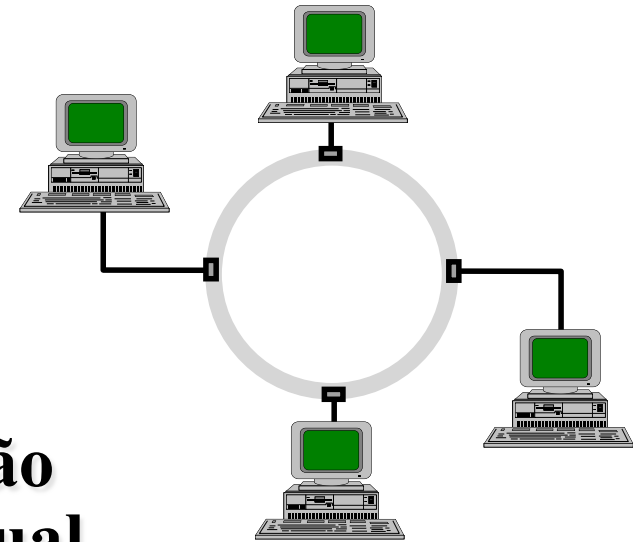
⇒ Se a latência for desprezível, os três tipos de operação têm o mesmo desempenho



⇒ O instante de tempo em que a estação termina de transmitir é igual ao instante em que chega o último bit transmitido de volta a origem

Comparação entre os Tipos de Operação do Token Ring

- ⇒ **L= latência; t = tempo de transmissão de 1 quadro**
- ⇒ **Se $L \leq t$, single token e multiple token são mais eficientes que single packet**
- ⇒ **O instante de tempo em que a estação termina de transmitir é maior ou igual ao instante em que chega o primeiro bit transmitido de volta a origem**



Comparação entre os Tipos de Operação do Token Ring

Redes de Computadores

- ⇒ **L= latência; t = tempo de transmissão de 1 quadro**
- ⇒ **Se $L > t$, multiple token é mais eficiente que single token que é mais eficiente que single packet**
- ⇒ **O instante de tempo em que a estação termina de transmitir é menor que o instante em que chega o primeiro bit transmitido de volta a origem**

