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**Algorithm 1** MAC Address Authentication

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**Require:** *Device\_MAC*: MAC address of the connecting device

**Require:** *Authorized\_List*: Set of authorized MAC addresses (whitelist)

**Ensure:** Access granted or Access denied

- 1: **Connection Detection:** When a device connects to a switch port
  - 2: **Read MAC Address:** The switch reads *Device\_MAC* from received Ethernet frames
  - 3: **Verification:**
  - 4: **if** *Device\_MAC*  $\in$  *Authorized\_List* **then**
  - 5:     Allow traffic on the port
  - 6:     *Port\_Status*  $\leftarrow$  *active*
  - 7:     **Output:** "Access granted"
  - 8: **else**
  - 9:     Block traffic on the port
  - 10:    Apply configured security policy:
  - 11:     • **protect:** ignore unauthorized frames
  - 12:     • **restrict:** ignore + log an alert
  - 13:     • **shutdown:** disable the port
  - 14:     **Output:** "Access denied"
  - 15: **end if**
  - 16: **End of verification**
  - 17: **Continuous Monitoring:**
  - 18: **if** a new frame arrives with a different MAC address on the same port **then**
  - 19:     Go back to Step 3 (Verification)
  - 20: **end if**
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