IIT MADRAS
Indian Institute of Technology Madras

Technology Transfer Office
TTO – IPM Cell

Industrial Consultancy & Sponsored Research (IC&SR)

DATA PACKET PROCESSING AND TRANSMISSION IN A NETWORK

IITM Technology Available for Licensing

PROBLEM STATEMENT

- A software-defined **networking architecture** allows a **computer network to transmit data packets** between **multiple computing devices** using various components like a **switching device and a controlling device.**
- The **communication is initiated by a source device,** which **transmits the data packet to a destination device**.
- The objective is to reduce the **number of interactions used to obtain the packet forwarding policy** between the controlling device and the plurality of switching devices.

TECHNOLOGY CATEGORY/ MARKET

Technology: Data packet processing and transmission in a network
Category: Computer Hardware, Software & Algorithm
Industry: Network Industry
Application: Simplification of controller interaction
Market: The global market size was **USD 13.2 billion in 2022 and is projected to grow to USD 46.6 billion by 2027, with a CAGR of 28.7%.**

INTELLECTUAL PROPERTY

IITM IDF Ref. 1942
Patent No: IN 511777

TRL (Technology Readiness Level)

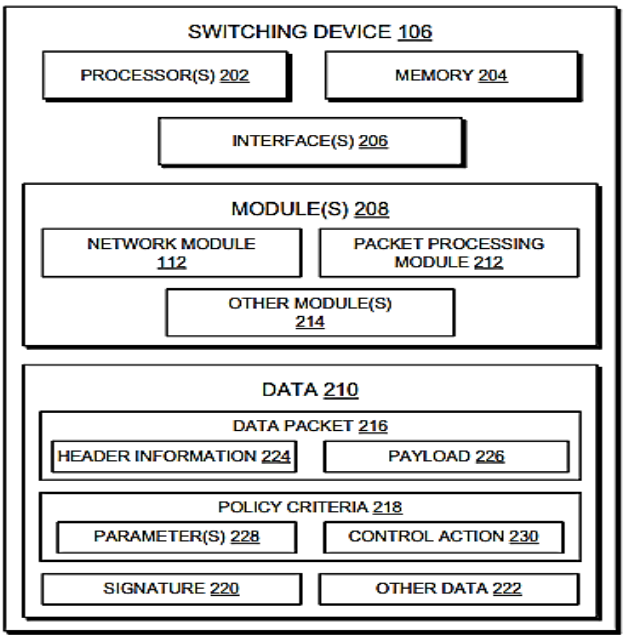
TRL- 2, Technology concept formulated

Research Lab

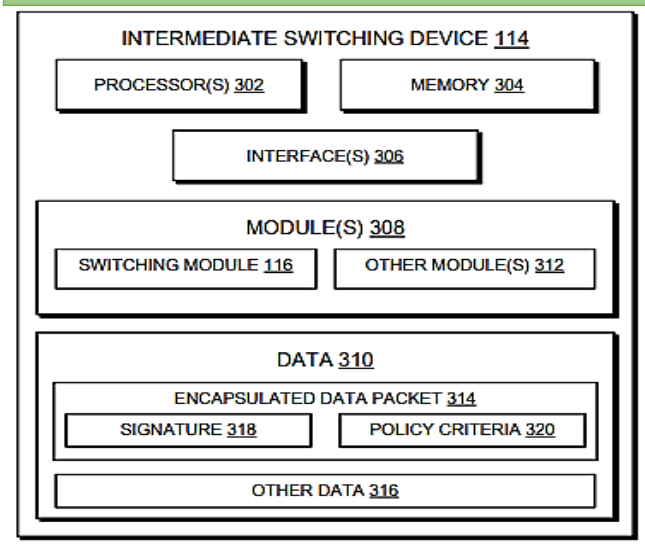
Prof. Krishna M Sivalingam,
Dept. of Computer Science and Engineering

TECHNOLOGY

Block diagram of an example switching device for processing and transmitting a data packet from a source computing device to a subsequent switching device in a network



Block diagram of an example intermediate switching device for processing and transmitting a data packet from a preceding switching device to a subsequent switching device in a network



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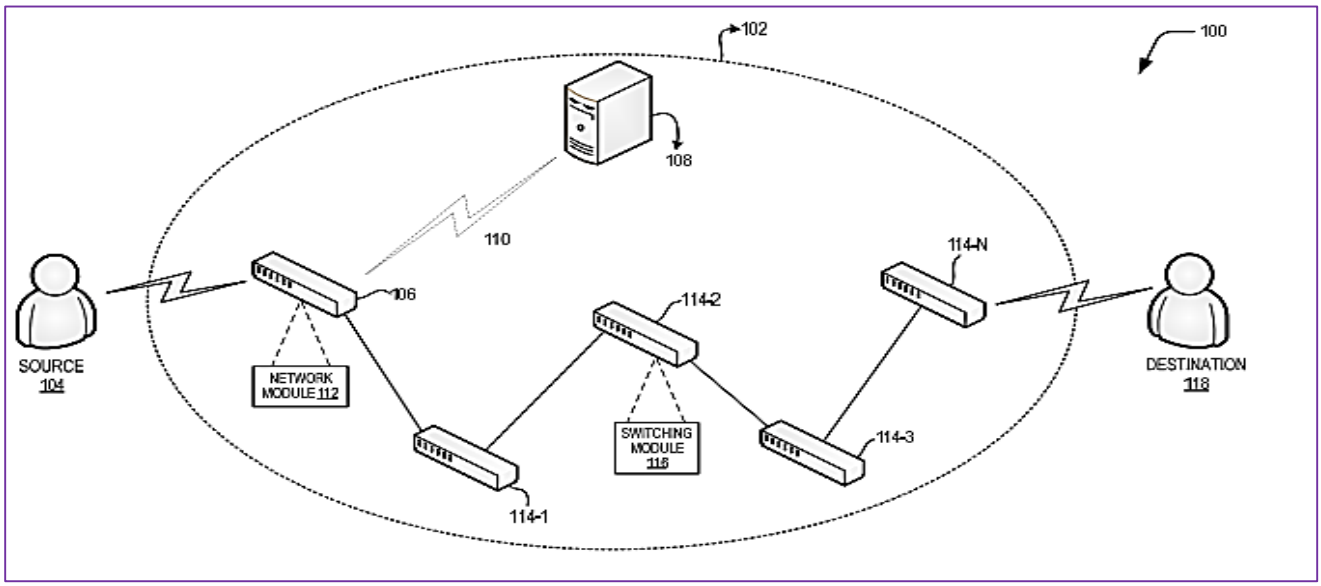
An exemplary networking environment for implementing a plurality of switching device(s) and other components in a network



Key Features / Value Proposition

- **Switching Device Advantages**
  - Processes and transmits data packets in software-defined networking environment.
- **Source address:**
  - MAC address of source computing device.
- **Destination address:**
  - MAC address of destination computing device.
  - Controlled by SDN controller.
- **Switching Device Policy**
  - Receives multiple policy criteria from controlling device.
  - Receives header information if no policy criteria present.
  - Provides policy criteria based on data packet header information.
  - Installs one of the received policy criteria from the controlling device.
  - Includes addresses of subsequent network switching devices for data packet flow.
  - Encapsulates data packet with a signature of the switching device
- **Intermediate Switching Device Implementation Method**
  - Hardware or software-based application.
- **Method for Receiving Policy Criteria**
  - Combines multiple policy criteria into flow entries.
- **Implementing Policy Criteria in Intermediate Switching Device**
  - Verification of preceding device's signature.
  - Implementing plural policy criteria**.**
- **Implementing Policy Criteria**
  - Add or modify flow entries in intermediate switching device flow table.

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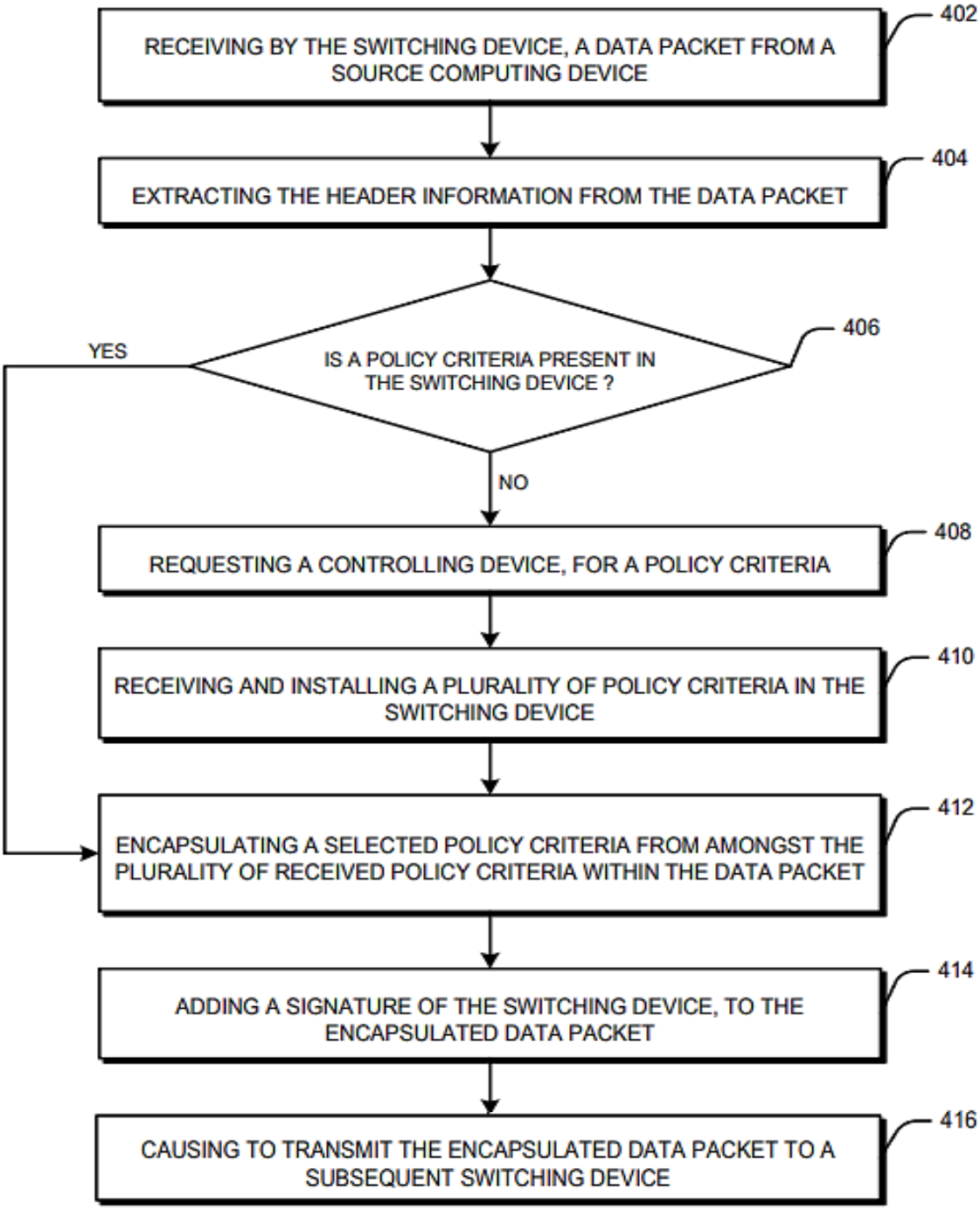
Flowchart depicting an example method for processing and transmitting a data packet from a source computing device to a subsequent switching device in a network



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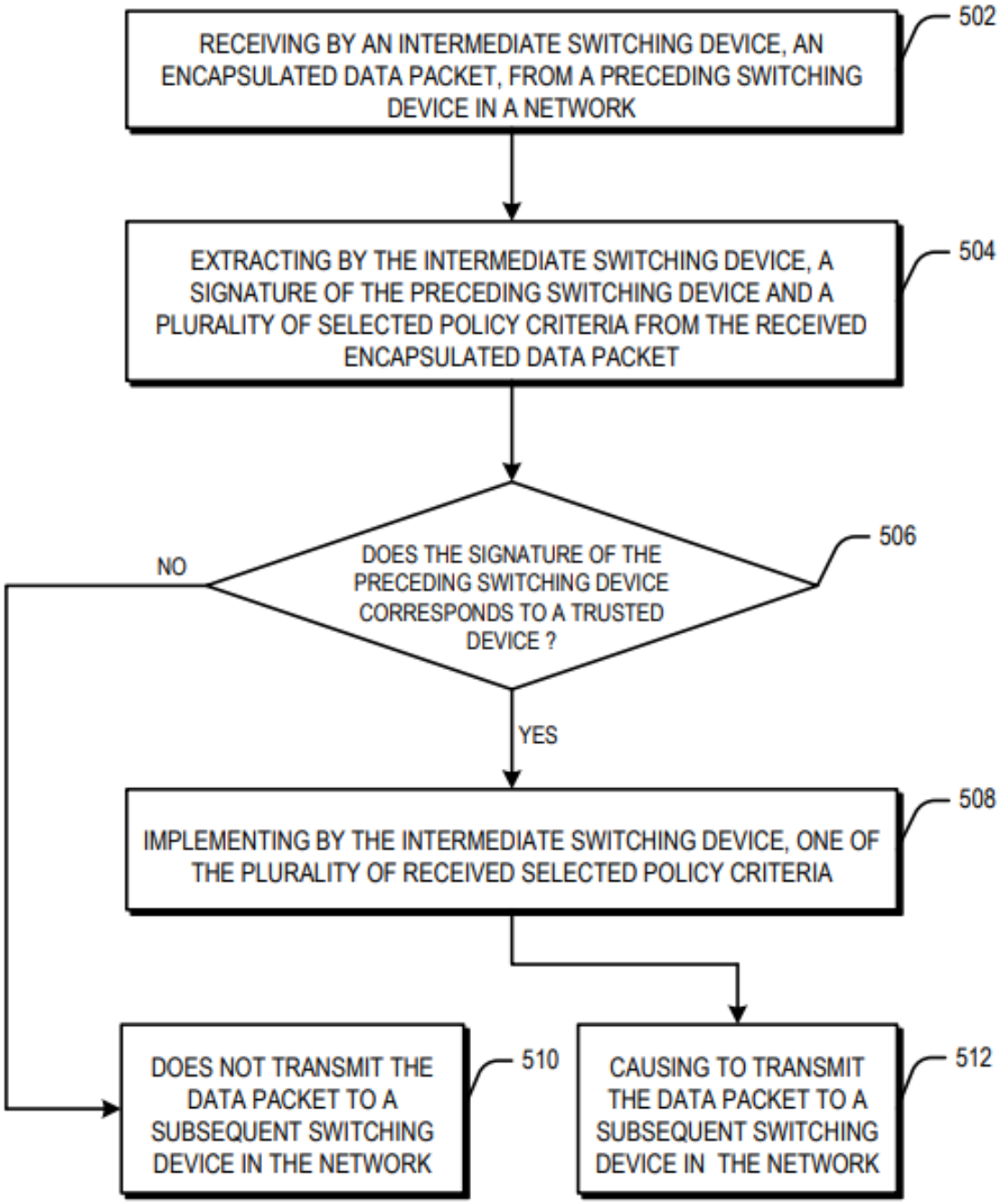
Flowchart depicting an example method for processing and transmitting a data packet from a preceding switching device to a subsequent switching device in a network



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