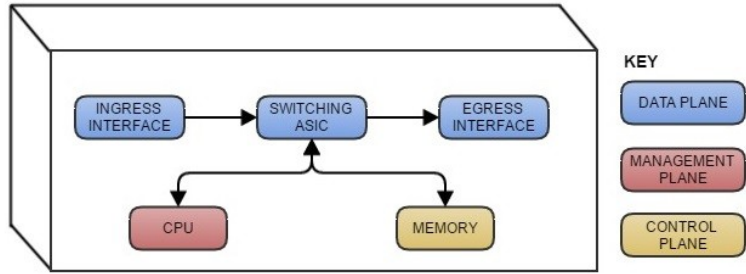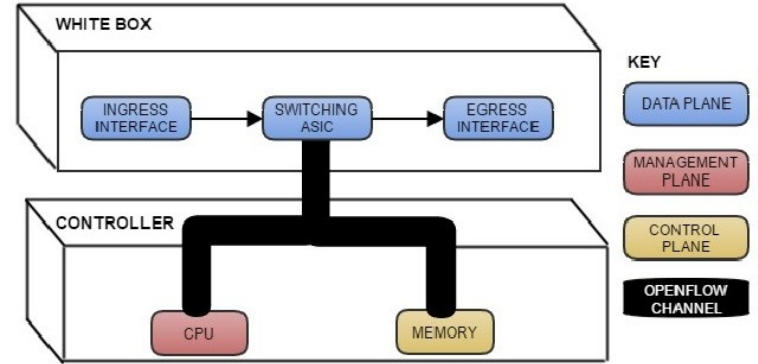# Software Defined Networking

OpenFlow

Traditional Switch
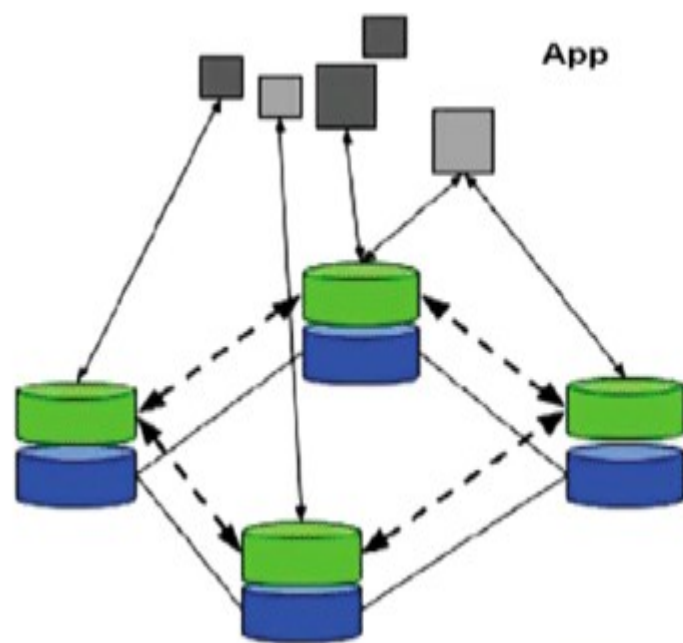

SDN Switch

Traditional Network Architecture	**SDN Architecture**
Distributed Control Plane	Centralized Control Plane

App

- Data Plane
- Control Plane
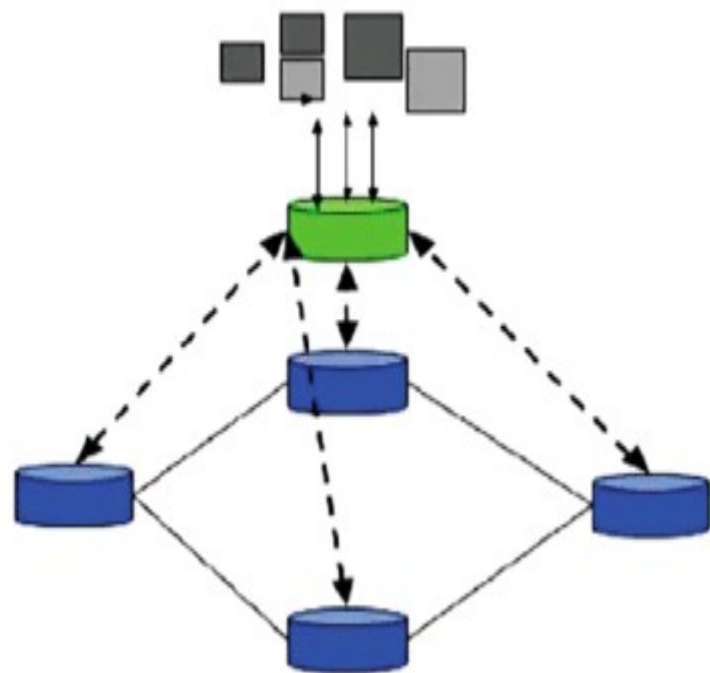
Use Cases

● Load Balancing

● Routing

● Packet-level Metrics

● Intrusion Detection
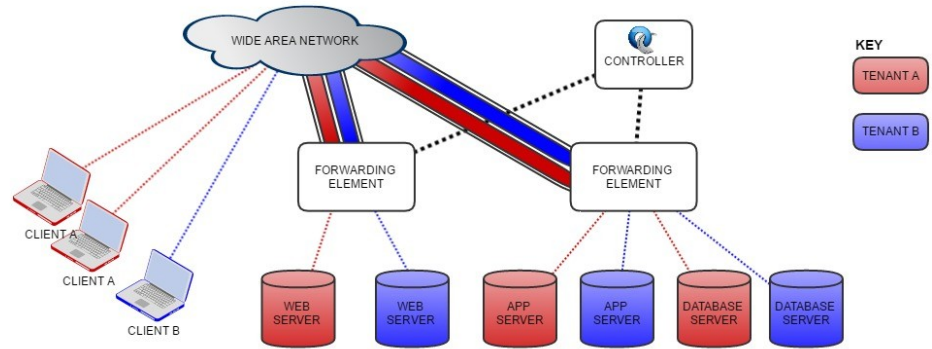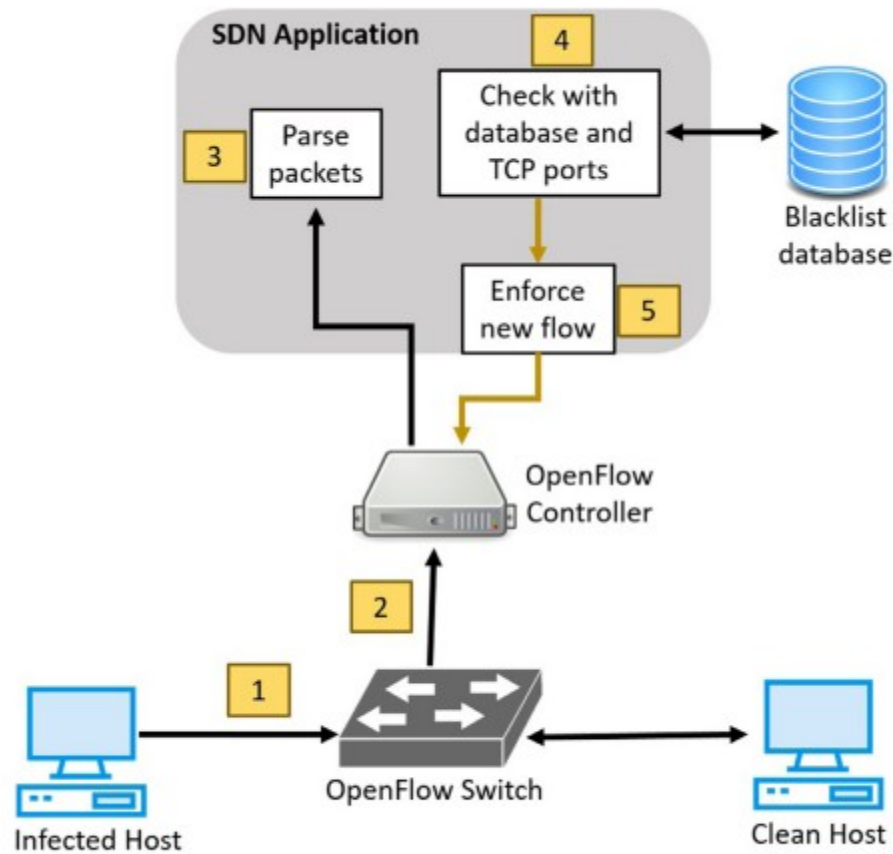
Fig. 7. Conceptual design of the proposed SDN-based mechanism.

OpenFlow

- Relies completely on the controller for forwarding
- Flow Table - Performs packet look-ups
  - Match Fields - Headers, ingress and metadata
  - Counters - collects statistics for a flow
  - Actions - Applies to a match
  - Priority - Priority of flow entries
  - Timeouts - How long a flow entry should last
  - Cookies - Used to filter flow entries
  - Flags - Alter the way flows get managed.

Header

Port	Src MAC	Dst MAC	Ether Type	VLAN ID	VLAN Priority	Src IP	Dst IP	IP Protocol	IP ToS bits	Src TCP/UDP port	Dst TCP/UDP port	Action	Counter	Priority	Timeouts	Cookies	Flags
*	*	C8:0A:	*	*	*	*	10.2.2.5	*	*	*	*	Port 1	234	10	10	*	*
*	*	*	*	*	*	*	10.4.1.6	*	*	*	*	Port 2	333	12	13	*	*
*	*	*	*	*	*	*	*	*	*	*	*	Drop	103	30	*	*	*
*	*	*	*	*	*	*	192.168.1.10	*	*	*	*	Local	231	4	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	Controller	18	1	*	*	*
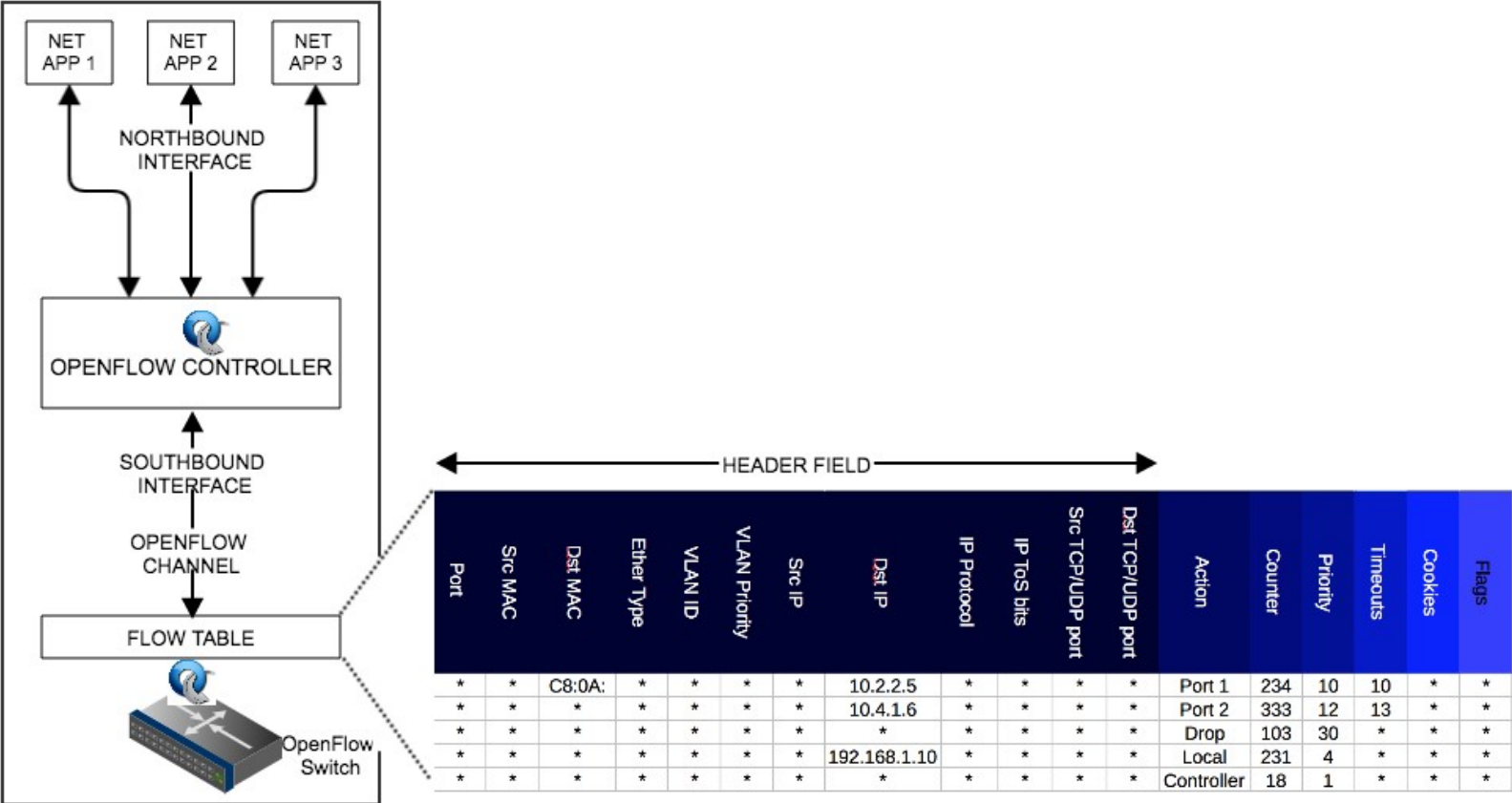
Actions

Required Actions

- **Forward**
  - ○ ALL
  - ○ CONTROLLER
  - ○ LOCAL
  - ○ TABLE
  - ○ IN_PORT
- **Drop**

Optional Actions

- **Forward**
  - ○ NORMAL
  - ○ FLOOD
  - ○ ENQUEUE
- **Modify Field**
  - ○ VLAN_ID
  - ○ ETH_SRC or ETH_DST
  - ○ TCP\UDP