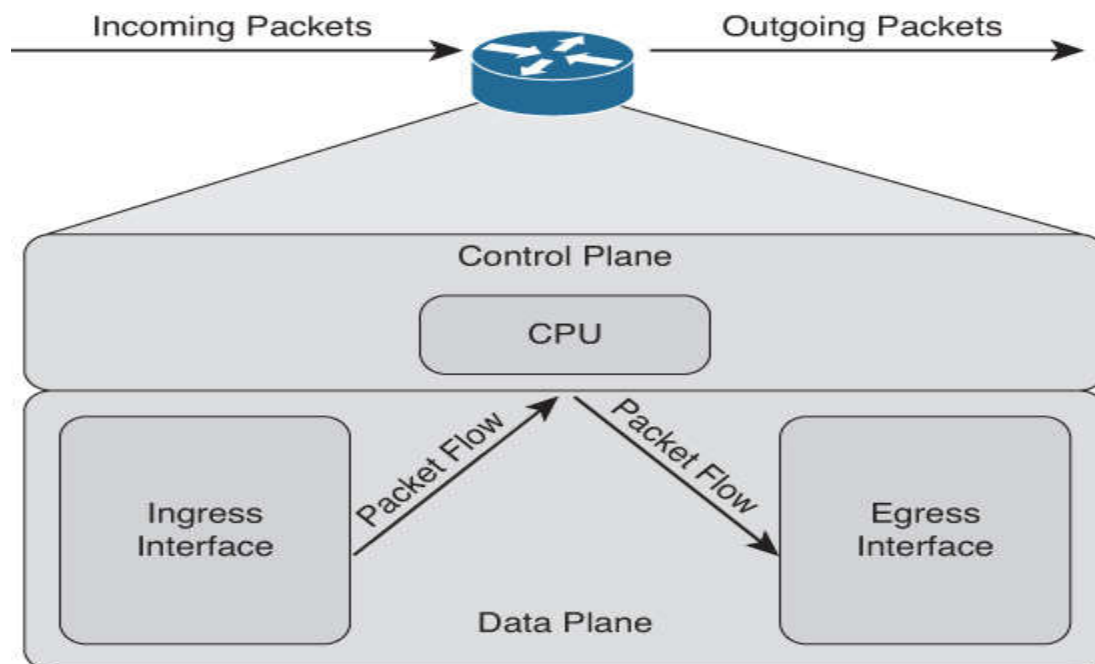
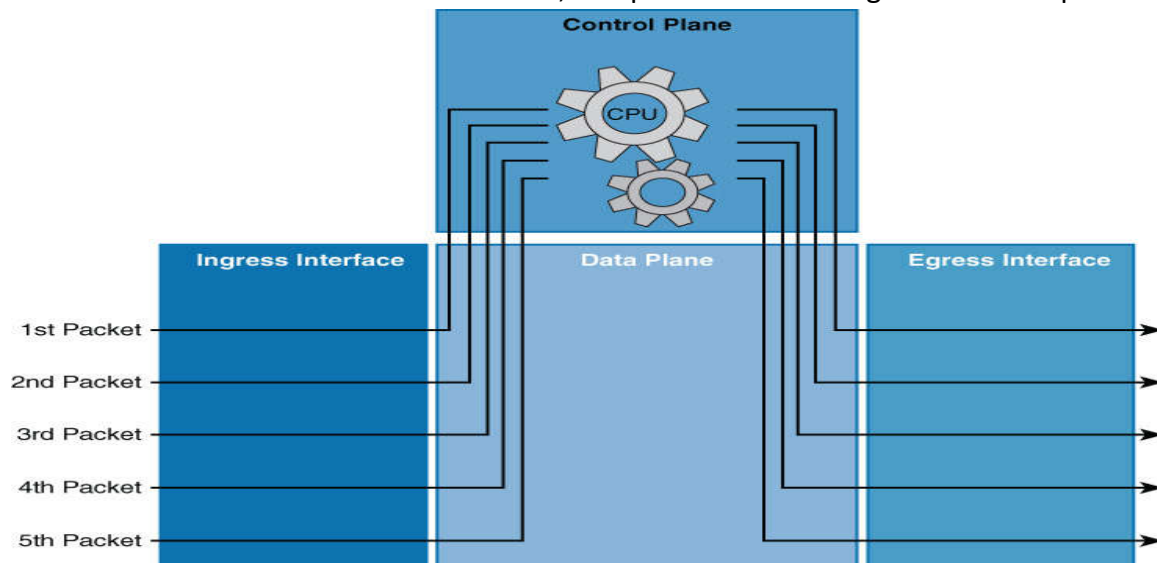


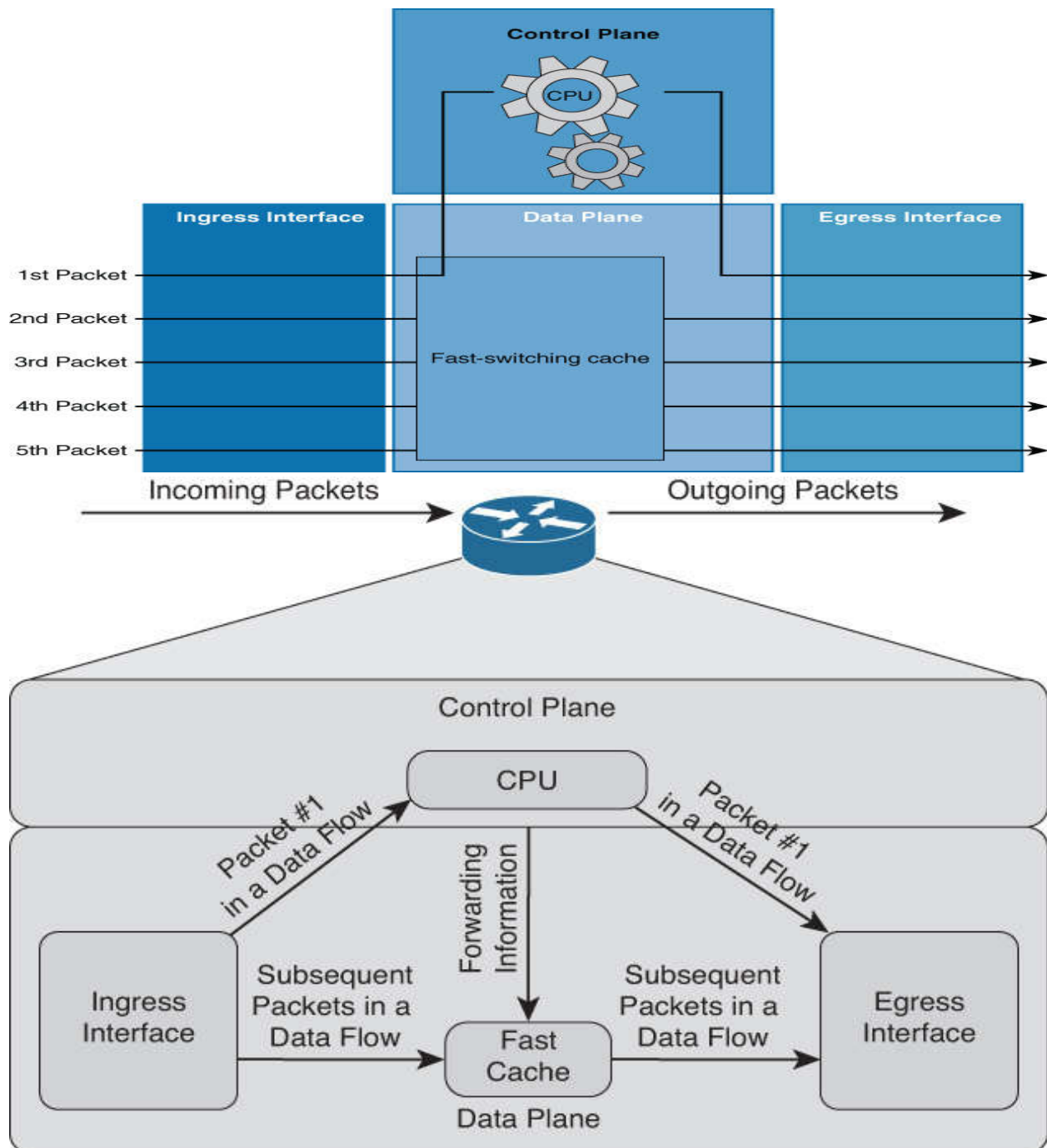
Process Switching:

- o Process Switching is primary function of forwarding the packets to the destination.
- o The Process switching, also referred to as **Software Switching** or called **Slow Path**.
- o Process Switching is responsible for inspecting every single packet by the processor.
- o Process switching requires CPU to be personally involved with every forwarding decision.
- o The **ip input** process runs on general-purpose CPU for processing incoming IP packets.
- o All packets examined by CPU & all forwarding decisions are made in software very slow.
- o Software Switching is significantly slower than the switching done in the hardware.
- o Process switching requires CPU to be personally involved with every forwarding decision.
- o Router looks on destination IP address, compare it with routing table next hop address.



Fast Switching (Route Caching):

- o Fast Switching improves on process switching by making use of a **cache** concept.
- o In Fast Switching, the first packet to a destination is Process Switched method.
- o But subsequent packets are forwarded using the information stored in fast cache.
- o First packet in flow is examined by CPU; the forwarding decision is cached in hardware.
- o When another packet going to same destination, next hop info can be reused from cache.
- o So, the processor does not have to look up and assemble all the information again.



CEF (Cisco Express Forwarding):

- o CEF is a Cisco term, which stands for Cisco Express Forwarding (CEF).
- o Router performs multiple steps before forwarding a packet: check routing table, lookup.
- o Router must perform multiple steps including ARP table lookup, ACLs checkup, etc.
- o If the Cisco Network Router does all of these in software, the process will be very slow.
- o Cisco Express Forwarding is a Packet-Switching technique used within Cisco Routers.
- o Purpose of CEF is to optimize forwarding of packets & increase packet switching speed.
- o Prior to CEF, there were 2 methods for packet-switching: Process and Fast-Switching.
- o The first method, Process-Switching, is the oldest and slowest method to process packets.
- o In short, in Process-Switching, the CPU is involved in every forwarding decision.
- o With fast-switching, the CPU is still used to determine the destination, but only for the initial packet.
- o The info is stored with fast-switching cache; subsequent packets are switched using the cache.
- o If a router receives a high volume of traffic to destinations not yet in cache, the CPU is still consumed.
- o To overcome the problems with Process-Switching and Fast-Switching, CEF was created.
- o CEF is built around 2 main components - Forwarding Information Base & Adjacency Table.
- o CEF puts all this info into a single hardware table which allows very fast packet forwarding.
- o CEF is a feature that allows a Router to very quickly and efficiently make a route lookup.
- o Cisco Express Forwarding is enabled by default & CEF is also called topology-based switching.
- o Only Cisco Multilayer switches or Layer 3 switches and Cisco routers use the CEF method.

