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Explain in detail how information centric network works. Consider packet types, and routing mechanisms.

Information centric networks are networks where routing of packets are done based on the data contained in a packet. What this means is that lets say a computer A connected to router B opens a webpage H. In an ICN the computer sends to the router a Interest Packet to the router of data of webpage H. The router then stores the knowledge that A wants information of webpage H in an Pending interest table(PIT) then itself sends an Interest packet for data of H. When the router receives the data packets of webpage H it checks the PIT for who requested the data, so computer A, removes does from the interest and forwards the data towards A. The router will also store the data packets in case any other device should request the information. So if another device C sends an interest packet for webpage H it will load it from cache instead of forwarding the interest packet to fetch the data again.

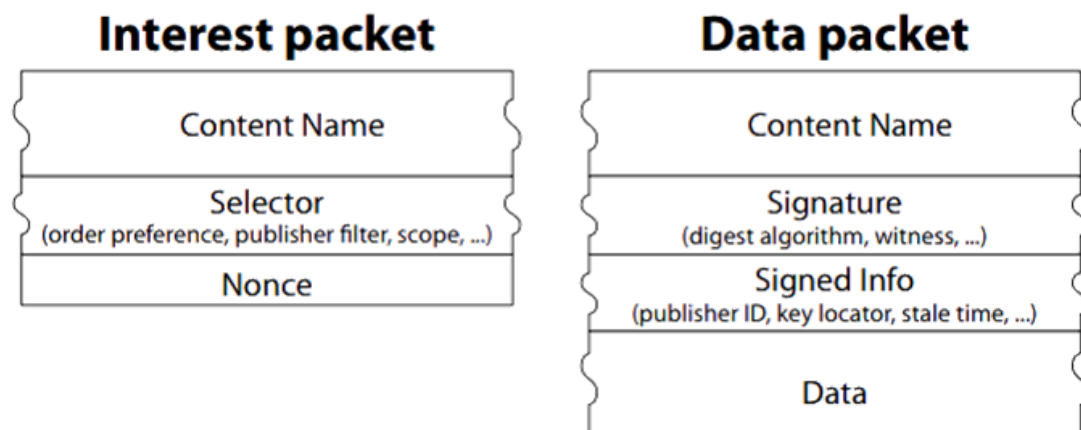


Figure 1: *Packet structure for Interest & Data packets*

Interest packet is the packet used to request particular data. Content name is a prefix used for routing towards data. Every interest packet additionally has a Nonce field which is a random number assigned by PIT to avoid forwarding loops. Data packet has a prefix with a content name used to identify carried data. Data packet also carries a signature of the producer to review for inconsistencies.

So in ICN there are just two types of packet; interest packets, and data packets. Interest packets that are sent when a host wants data about something specific. Data packets that are packets containing the information some host has requested.

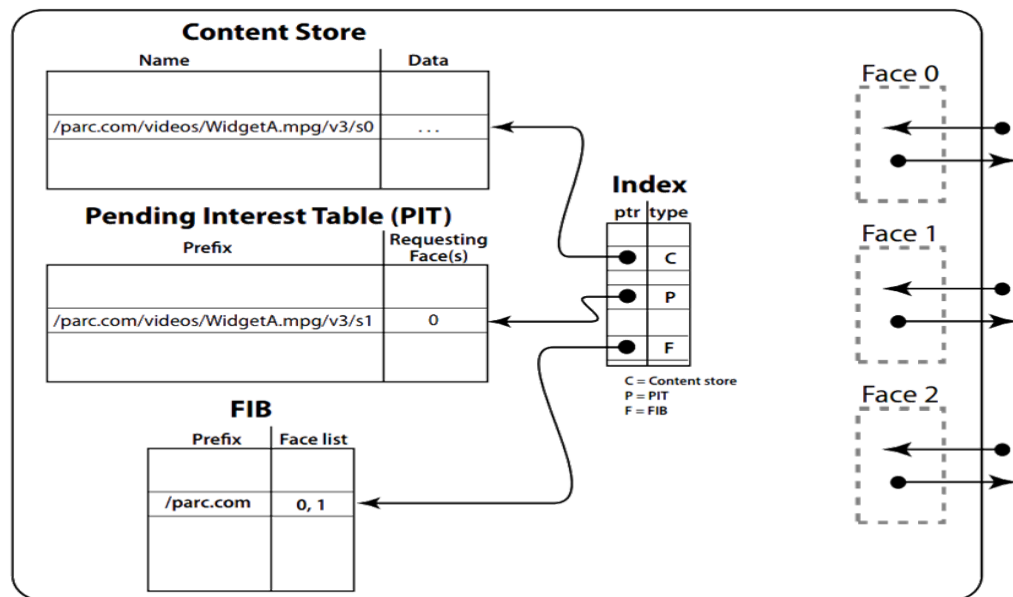


Figure 2: Content Store, Pending Interest Table, and Forwarding Information Base

A router in an ICN has CS, content store, is the local cache on the router where received data packets are stored in case any new interest packet requesting the same data is received. The PIT is the Pending Interest Table, it is used to store which interfaces are currently requesting any specific item from the content store. The FIB is the Forwarding Information Base functions to find the proper output network interface to which the input interface should forward a packet.

What are the major differences between software defined networks and network function virtualization?

SDN and NFV both have the same objective, however SDNs primary strategy is to split control and data forwarding planes while NFVs strategy is to replace network devices with software.

SDN abstracts the physical resources e.g. routers and switches, and NFV virtualizes the physical resources.

In a SDN network a device maintains singular functionality either as a supervisor or a forwarding element, instead NFV allows a physical device to have multiple virtual roles in the network.