Switching Operation

- Tables
  - Content Addressable Memory
    - STore source MAC, Port, VLAN, Timestamp
    - Source MAC is uniq
    - stale addressses
      - old
      - delteted
        - default 300s
        - //(mac address-table ageing-time #s
    - static entries
      - () mac addresss-table static #mac vlan
      - #id interface #int
    - clear mac address-table
    - verify
      - sh mac address-table [dynamic] [addres
      - #mac] | int #int | vlan #id
      - sh mac address-table count
        - statistics
        - available space
  - Ternary CAM
    - stores Access lists
    - Feature Manager
      - compiles ACL into TCAM
    - switching Database Manager
      - can partition TCAM
    - Tree Fields
      - Value
        - 134bit
        - Protocol information
      - Mask
        - 134bit
        - defines whitch bits matter
      - Result
        - numeric value
  - Logical Operation Unit
    - Opertins on tcp/udp-Port ranges
  - Forwarding Informatin Base
    - stores Routes
    - ordered by Prefix lenght
    - sh ip cef
      - [#int | vlan #nr] [detail]
      - [#prefix]
    - Adjency Table
      - L2 I£nfo for FIB
        - src + dst MAC
      - CEF glean
        - mac not in Table
        - to L3 Engine
        - ARP
      - NULL
        - for int Null0
      - Drop
        - sh cef drop
      - Discard
        - for access-lists
      - Punt
        - to L3 Engine
        - sh cef not-cef-switched
- Multilayer Switching
  - 1st Generation
    - forward based on Layer 3/4 information
    - Route Caching
    - reoute once, switch many
    - not supported by cisco
  - 2nd Generation
    - Cisco Express Forwarding (CEF)
      - 6500
        - SUP720
        - SUP2 + MSFC2
      - 4500
        - SUP 3,4,5,6e
      - 3750,3560,3550,2950
      - aCEF
        - FIB cache on Linecards
      - dCEF
        - Full FIB on Linecards
    - topologie Based
    - forwarding
      - routing table is stored in Hardware
        - FIB
      - rewrite Engine
        - update Package
          - src+dst MAC
          - TTL
          - Checlsums
      - exception
        - ARP
        - Packages Requiering REsponse
          - TTL expired
          - MTU exceded
        - Routing Protocols
        - CDP
        - NAT
    - sh ip cef
      - attached -> connected
      - receive -> Punt
  - Switched Virtual Interface
    - VLAN Interface
    - VLAN must exist
- Layer 2 Switching
  - frame forwarding
    - Security ACLS
      - TCAM
      - match
        - MAC
        - Protocol Type
        - IP
        - IP Protocol
        - TCP/UDP Port
    - QOS ACLs
      - TCAM
    - Fowrading Lookup
      - CAM
    - all tasks done simlutan
    - unknown unicast flooding
      - if MAC not in CAM