Gen-Z Identifiers

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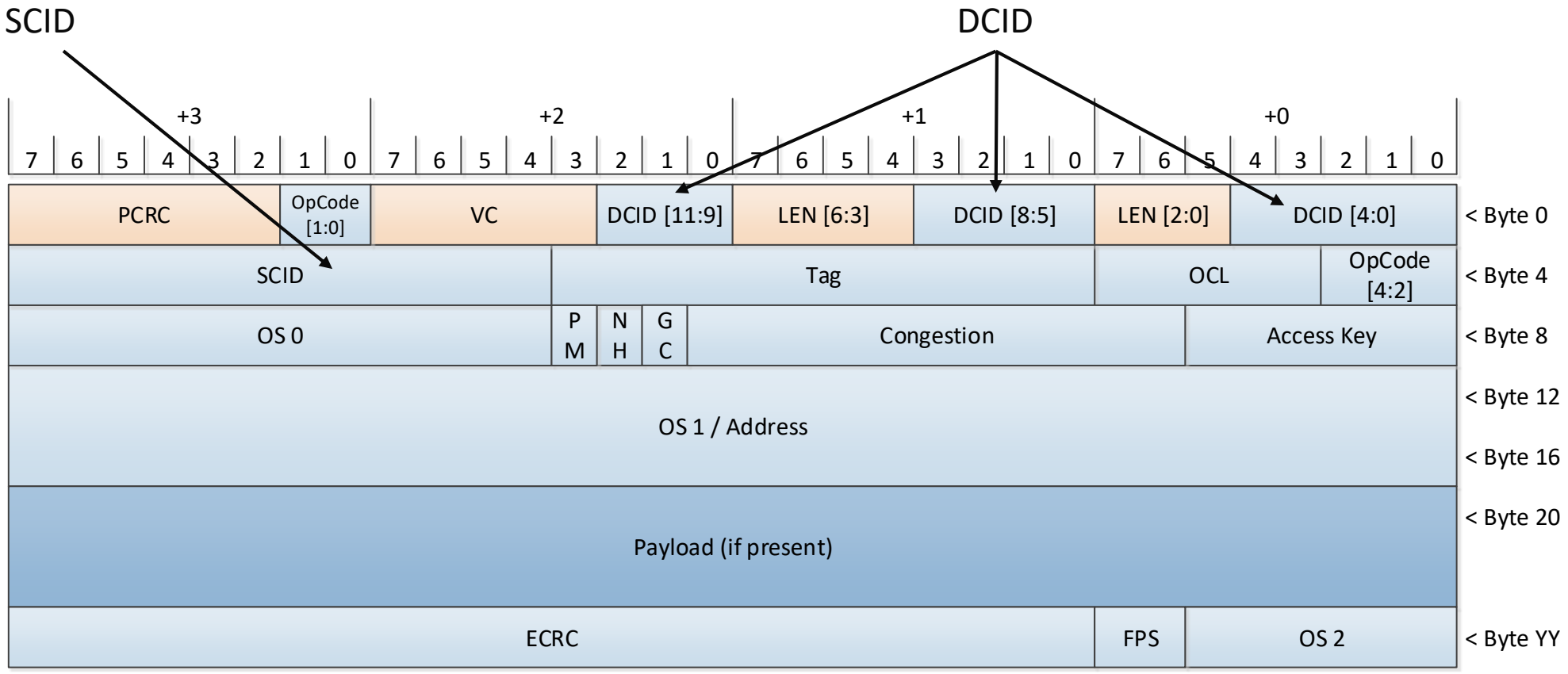
Component Identifiers (CID)

- A Component Identifier (CID) is assigned to uniquely identify a component within a subnet
  - 12-bit, subnet-local identifier
  - Each component is assigned one or more CIDs
  - Within an end-to-end packet,
    - A source CID (SCID) identifies the component that initially transmitted the packet
    - A destination CID (DCID) identifies the destination component
- CIDs are not used in P2P-Core, P2P-Coherency, or P2P-Vendor-defined OpClass packets

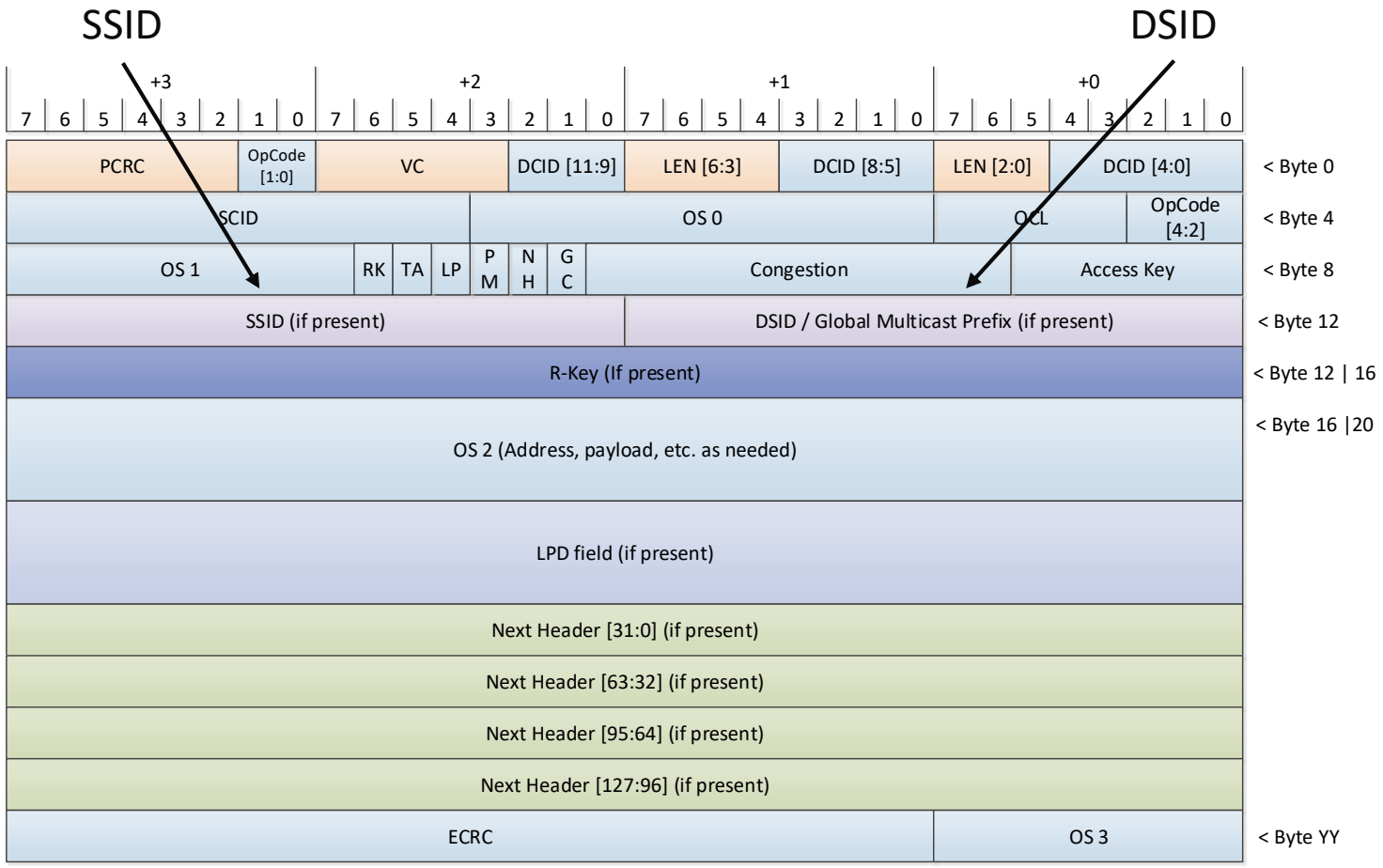
Example OpClass Packet with SCID / DCID



Global Component ID (GCID)

- Global CIDs created by concatenating a subnet identifier (SID) with a subnet-local CID
- Enables large-scale switch topologies
  - Only applicable to components that explicitly support this capability
  - Has no impact on subnet-local switch packet relay
- Within an end-to-end packet,
  - A source GCID (SGCID) identifies the component that initially transmitted the packet
  - A destination GCID (DGCID) identifies the destination component
  - A source SID (SSID) identifies the subnet where the packet was initially transmitted
  - A destination SID (DSID) identifies the subnet where the destination component is located

Example Explicit OpClass Packet with SSID / DSID



- SCID and DCID fields are not impacted by the inclusion of the SSID and DSID fields

UUID—Universally Unique Identifier

- UUID is a 128-bit identifier as specified in ITU-T X.667
- UUID is the preferred modern mechanism to identify attributes
  - Eliminates the need for company-specific allocation authority
  - Simplifies multi-vendor coordination (easy to allocate and share)
  - Simplifies standardization / de-facto standardization—allocate and publish UUID
- Gen-Z makes extensive use of UUIDs
  - Architecture specifies a single UUID to indicate a component supports Gen-Z
    - Used by management to unambiguously identify a Gen-Z component without maintaining “white lists”
  - Architecture uses UUIDs for multiple purposes, e.g.,:
    - Identify memory media types
    - Identify component types
    - Identify supported services (e.g., used by OS to bind software to hardware)
    - Identify vendor-defined operations and vendor-defined features
    - Identify various managers
    - Identify a FRU
    - Etc.

UUID and Vendor-Defined Operations

- OpCode Set structure contains a set of optional UUID
  - Single UUID is associated with vendor-defined P2P Vendor-defined and Multicast
  - Up to 8 UUIDs that are 1:1 associated with Vendor-defined OpClass OpCode Sets [1-8]
    - Management configures a OpClass Label (OCL) that is associated with each UUID
      - OCL enables Gen-Z to transport vendor-defined operations without deep packet inspection
        - Enables any number of vendor-defined OpClasses to simultaneously operate across the fabric
          - In theory, each pair of peer components can support a unique set of vendor-defined operations
    - Configuration indirection enables multiple components to support the same UUID without coordinating the UUID slot
- Large UUID space and extremely light-weight allocation enables:
  - Vendors to experiment and innovate without fear of running out of identifiers or standardization overheads
    - Increases hardware / software agility
  - Vendors to publish / share UUID among peers or the industry
    - For example, accelerators might use custom Gen-Z operations to improve performance, reduce communication overheads, reduce data movement, etc.

Thank you