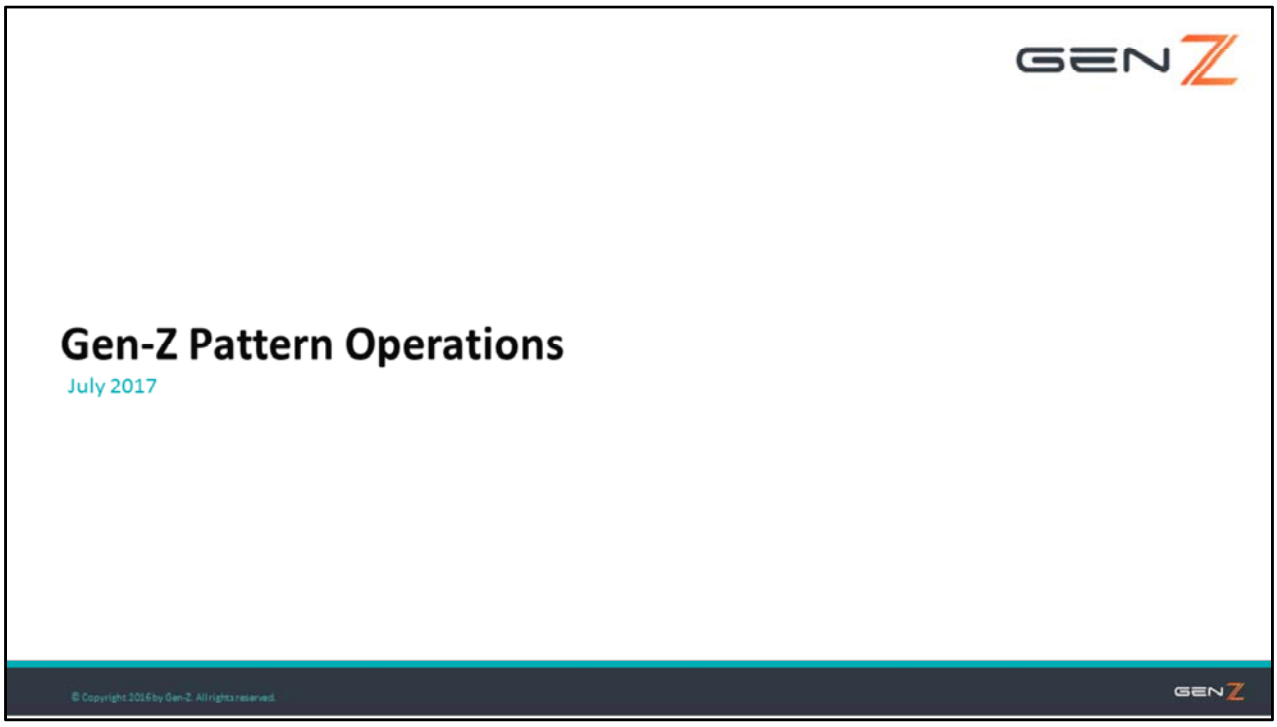

This presentation covers Gen-Z Pattern operations. Pattern operations can be used to simplify content management of large buffers, or to accelerate big data analytics operations.

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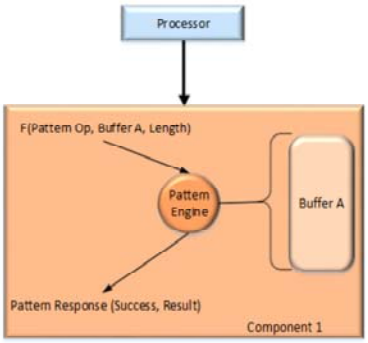
Pattern Operations

- Pattern requests enable a pattern to be applied to or against a resource range within a Responder
  - Pattern operations provide a standardized set of data-centric computation operations applicable to a variety of workloads
- The Pattern Engine is a processing element
  - General-purpose or specialized processor (discrete or integrated)
  - FPGA
  - Custom or augmented ASIC
  - Etc.
- The Pattern Engine is co-located or integrated within the memory or storage media controller
  - Provides direct access to the media
  - For example, a small embedded processor within the media controller. Upon receipt of pattern or other data-centric requests, the Pattern Engine directly accesses the media to execute the request



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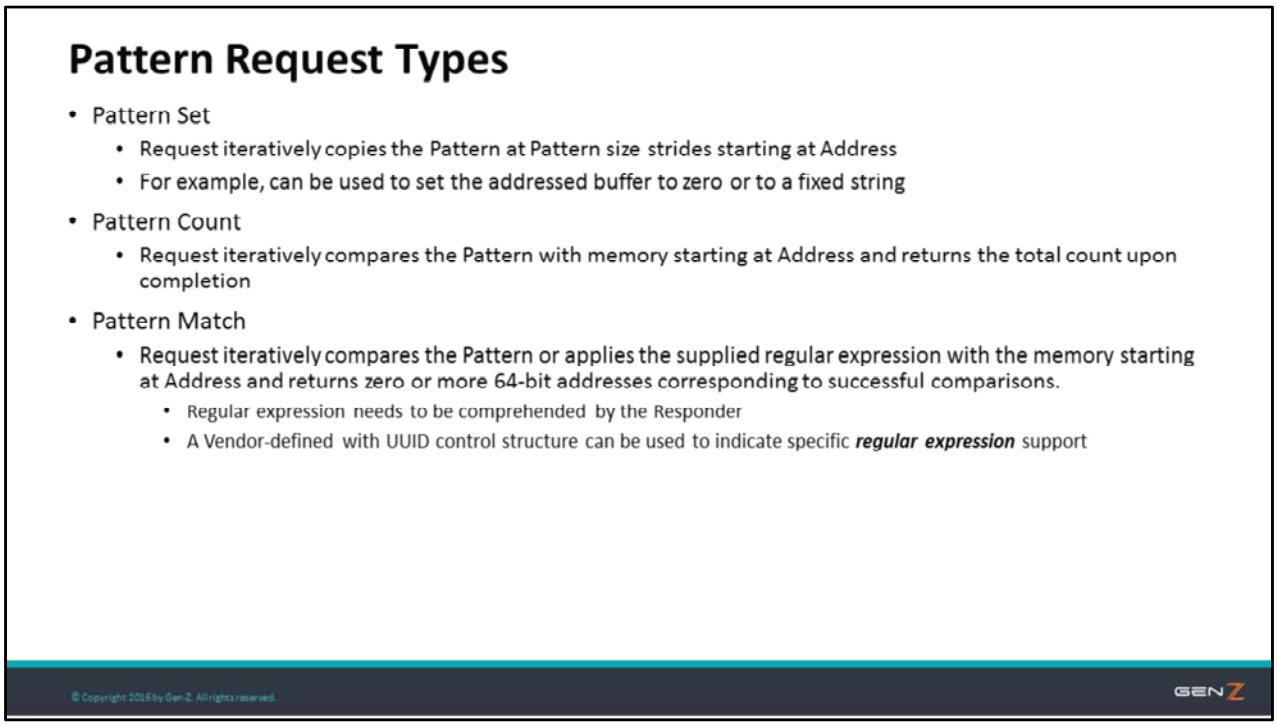
Pattern operations are executed by a pattern processing engine. The processing engine is co-located with memory or storage media, for example, it can be integrated into the memory or storage media controller, or it can be a discrete element that works through the media controller to access the underlying media. Multiple implementation options are possible.

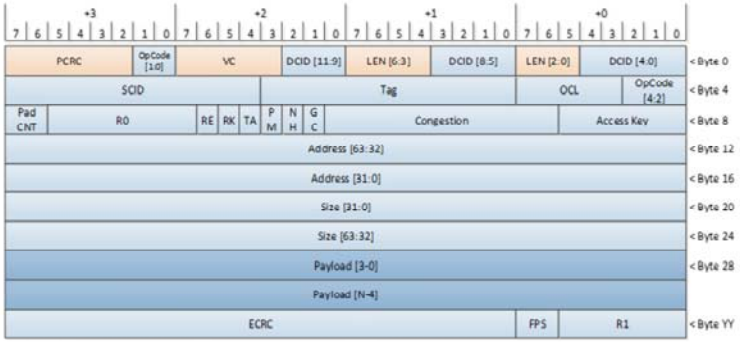


The following pattern requests are specified:

- Pattern Set operation repeatedly copies the pattern within the request packet's payload to targeted address range. For example, a Pattern Set operation can set the address range to 0x0 or to a fixed pattern, e.g., 0x12345678.

  Note: If a component supports the Component Media structure, then the primary or secondary media can be set to zero without using a Pattern Set operation.
- Pattern Count returns the number of times the pattern appears within the targeted address range. For example, count the number of times a keyword appears.
- Pattern Match returns one or more addresses that correspond to data locations that matched the supplied pattern or supplied regular expression. The regular expression needs to be comprehended by the Responder.

Pattern Request Packet Format



- Address—starting location of the data impacted by the pattern operation
- Size—length of the data buffer
- Payload—pattern to apply or a regular expression (if RE == 1b)

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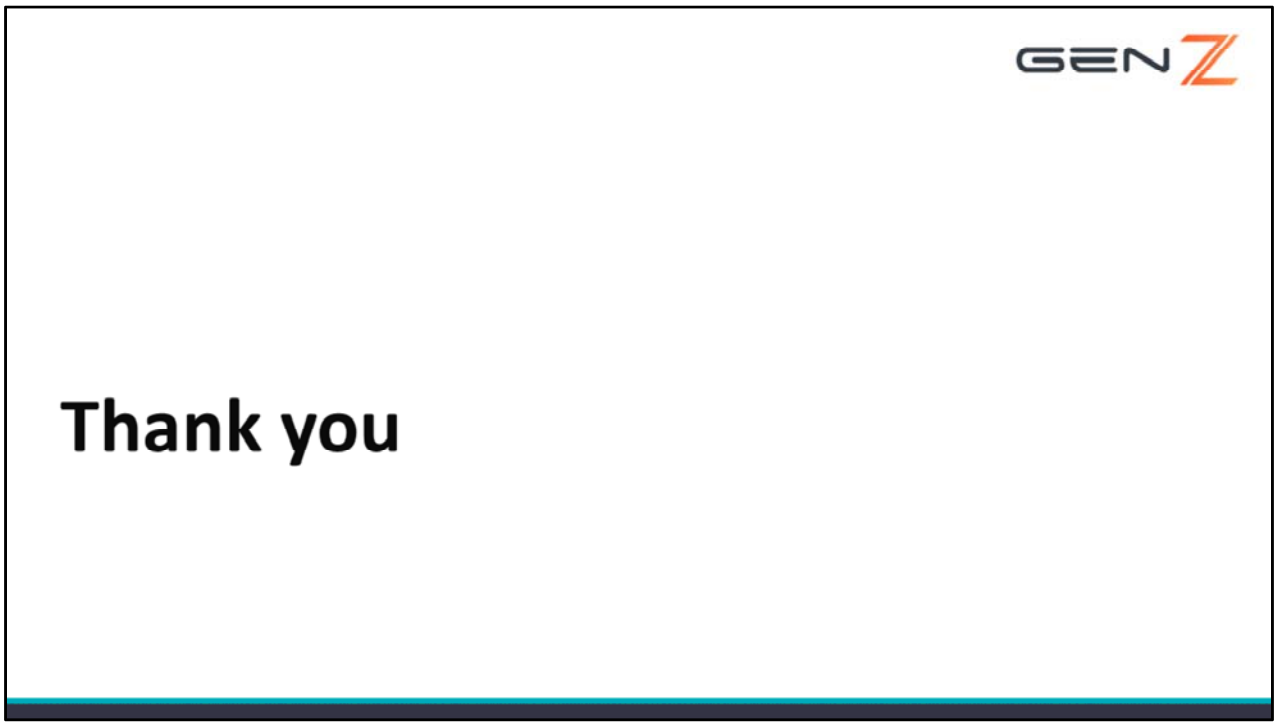
Pattern operations are included in the Advanced 1 OpClass. For the most part, the request packets contains the standard Explicit OpClass protocol fields.



This concludes this presentation. Thank you.