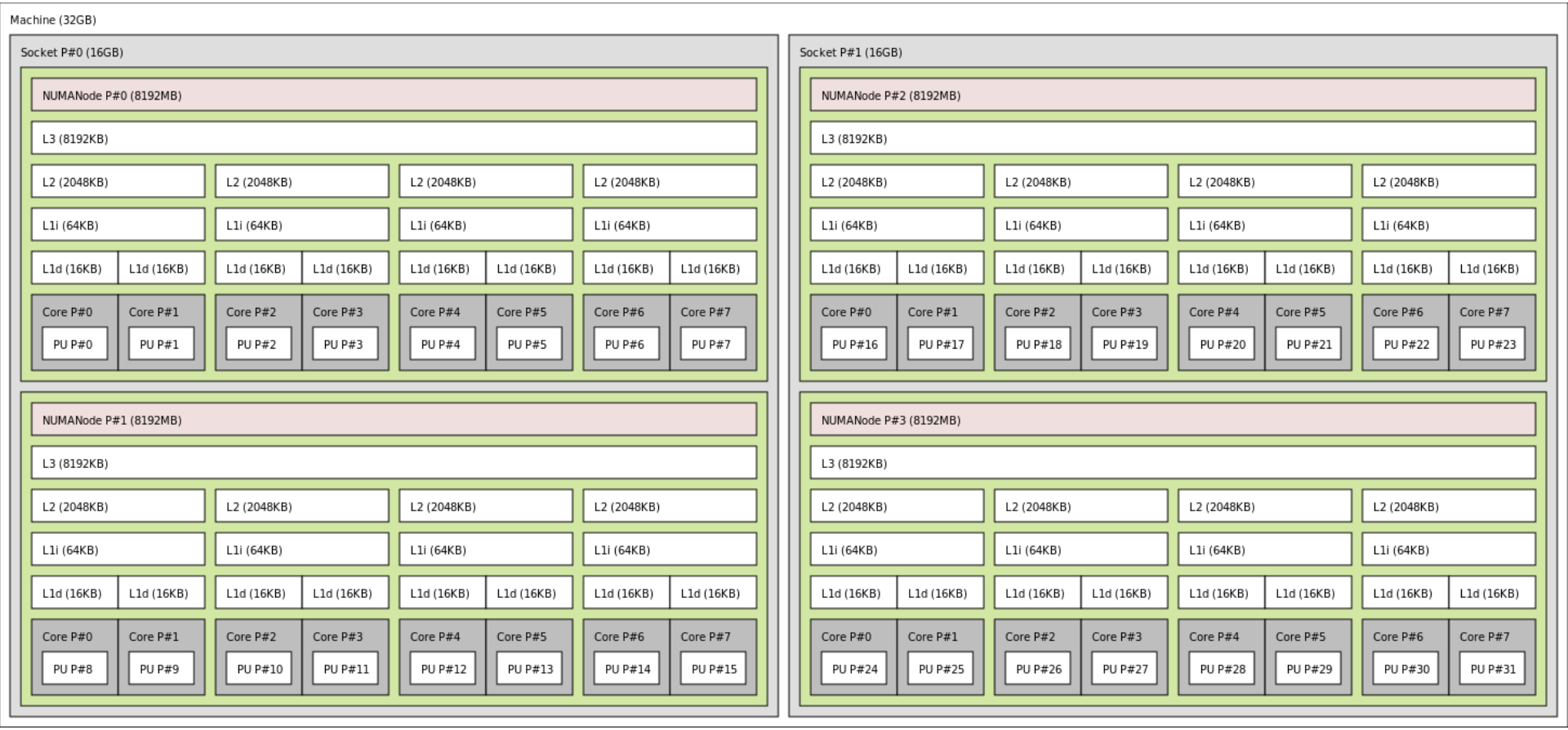
Chapter 13. Data Storage Structures

- Temporal locality:
  - If at one point a particular memory location is referenced, then it is likely that the same location will be referenced again in the near future.
- Spatial locality:
  - If a particular storage location is referenced at a particular time, then it is likely that nearby memory locations will be referenced in the near future.

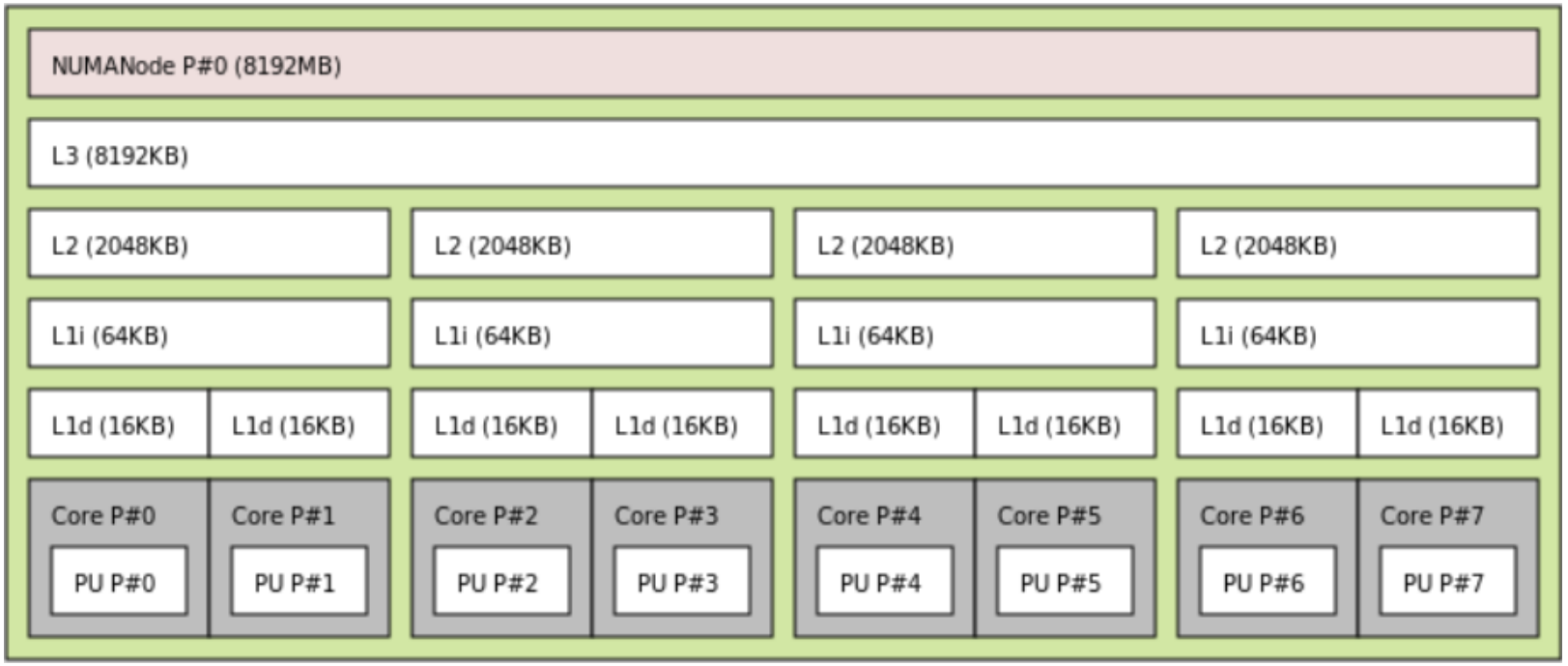
https://en.wikipedia.org/wiki/Locality_of_reference

Memory hierarchy of an AMD Bulldozer server

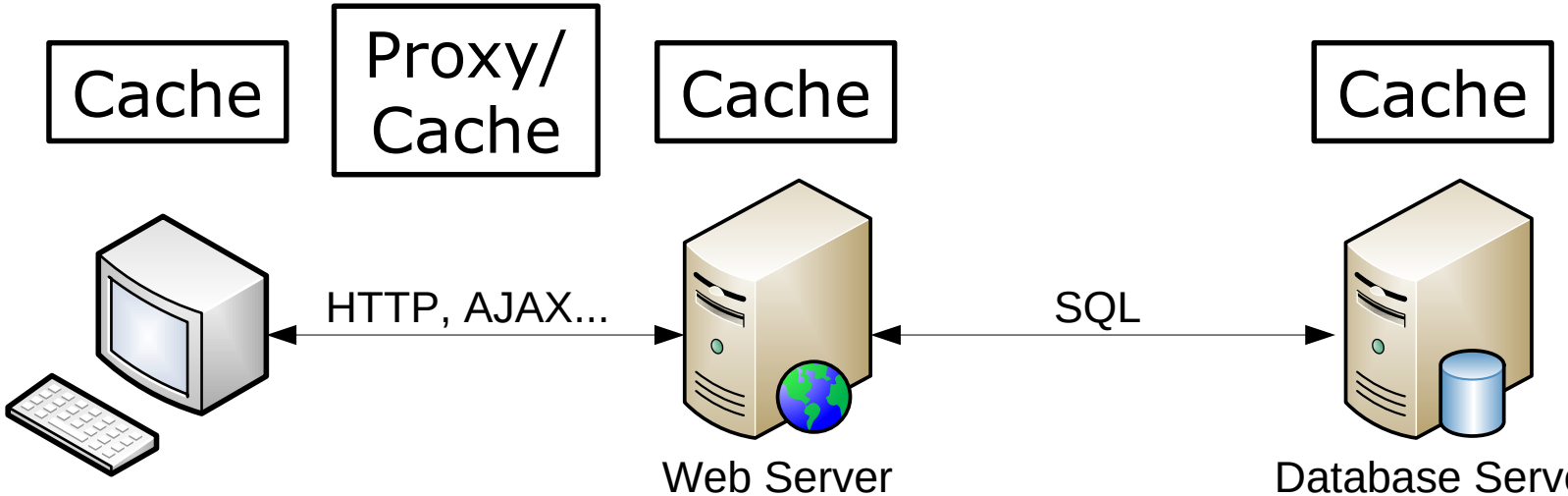


Cache in CPU

- L1i: Level 1 instruction cache
- L1d: Level 1 data cache



Cache in Web



Web Browser
HTML, Javascript, CSS⋯
XML, JSON⋯
JQuery, Bootstrap...

Web Server
PHP, Perl, Python, Ruby
Java, ASP.NET(C#, VB.NET)⋯
Various frameworks

Database Server
MySQL, PostgreSQL,
Microsoft SQL Server, Oracle...

LRU

- Suppose the size of cache is 2.
- Read A, cache miss

A	

- Read B, cache miss

A	B

- Read A, cache hit

A	B

- Read C, cache miss→cache replacement

A	C

https://en.wikipedia.org/wiki/Cache_replacement_policies

MRU

- Suppose the size of cache is 2.
- Read A, cache miss

A	

- Read B, cache miss

A	B

- Read A, cache hit

A	B

- Read C, cache miss→cache replacement

C	B