

Row-based Index Concepts



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Module Overview



Basic structures

Index analogies

Scans vs. seeks

Bookmark lookups



Table Structures



Heap: table without clustered index

- Data completely unordered
- Nonclustered indexes contain physical link to table record

Clustered table: table with clustered index

- Data ordered by clustering key
- Nonclustered indexes contain clustering key of table record

Base table structure is NOT
affected by nonclustered
indexes but in turn it affects
THEIR structure!



When Are Heaps Appropriate?



Heaps can be great for high-performance data loading and staging tables

- Whitepaper at <http://bit.ly/2edDDE3>

Unordered data means costly scan required if no nonclustered indexes

Clustered index usually a better choice

- But have to choose wisely in your definition of the clustering key!!

All Indexes: Tree Analogy

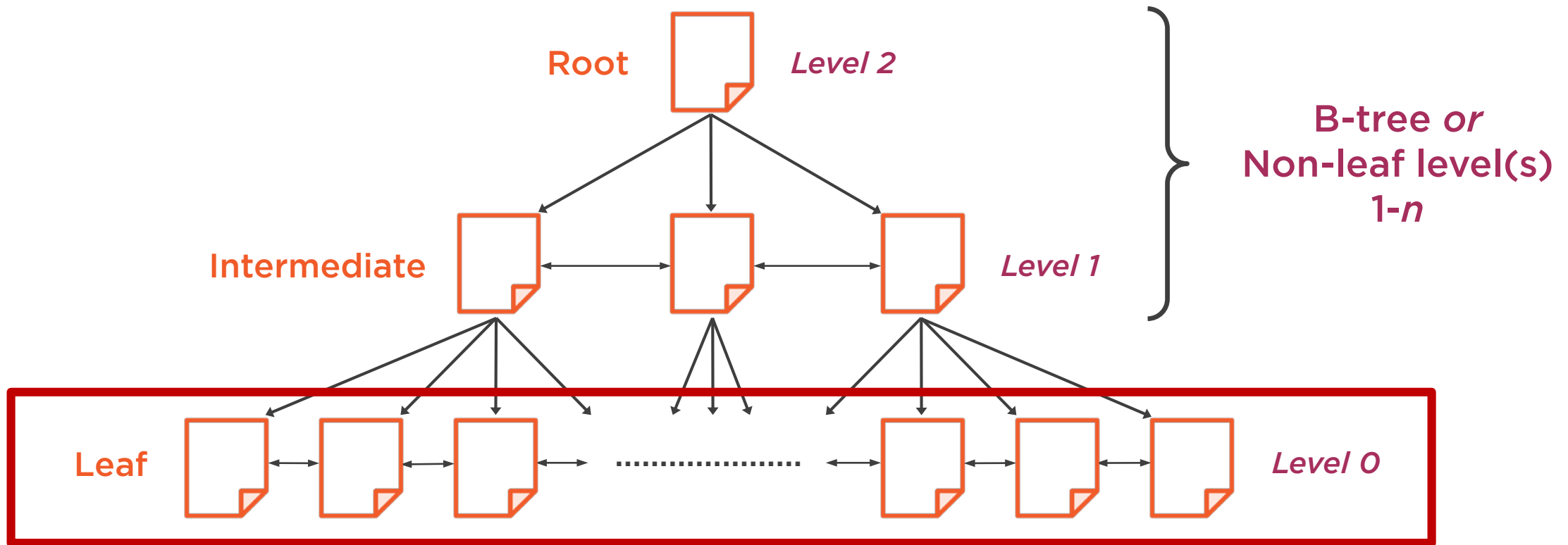


Imagine if a tree is data and you're looking for leaves with a certain property

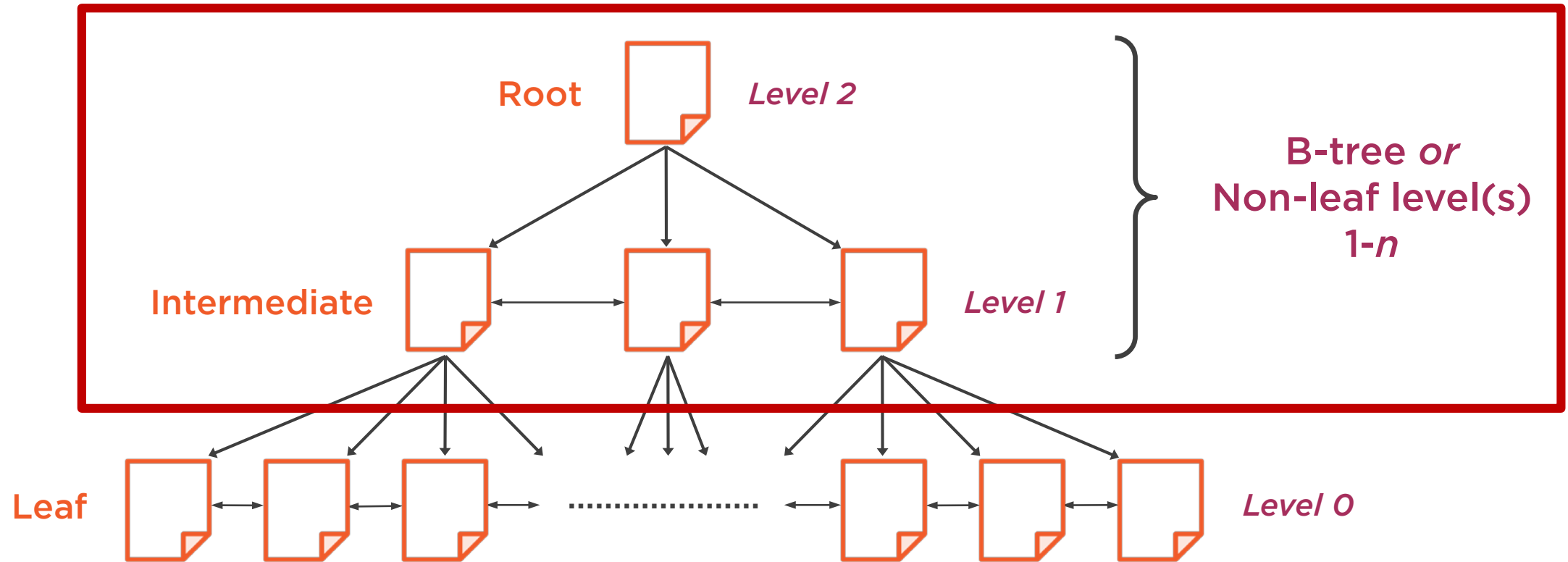
You have two options to find that data....

- Look at every leaf, checking each to determine if it has the desired property
- If you know that the property is caused by sun damage, such that those leaves are in an area of the tree that faces the sun, then you can start at the root, move to the branches on the sunny-side, and check only those leaves

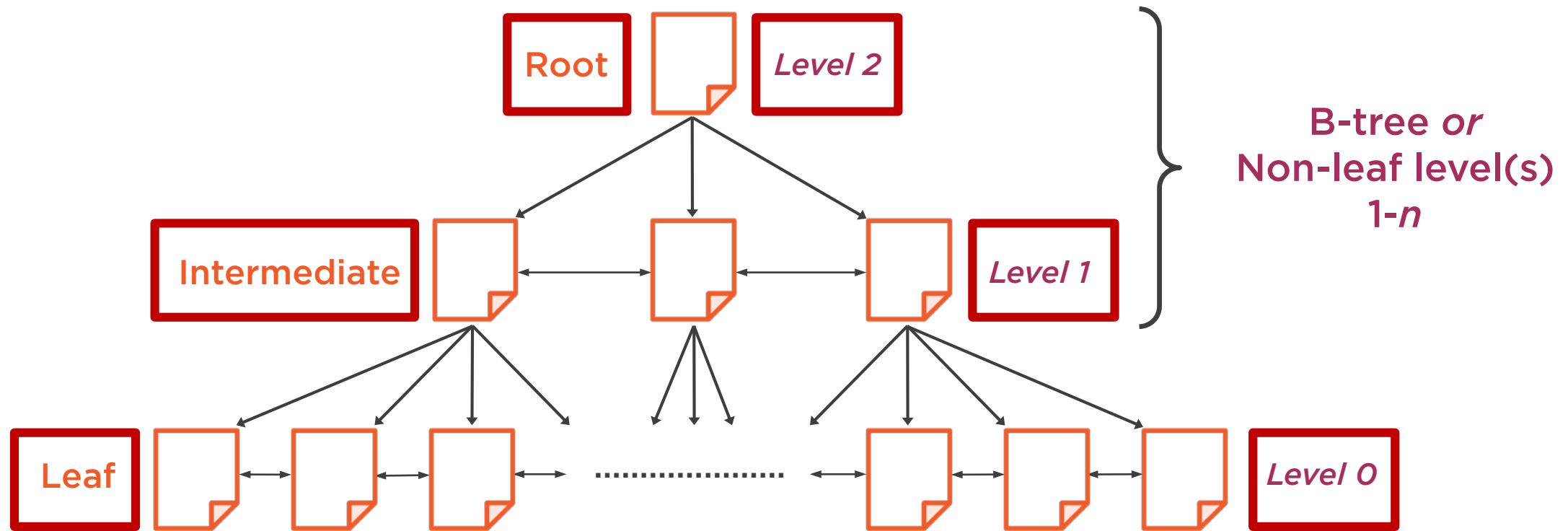
Basic Index Structure



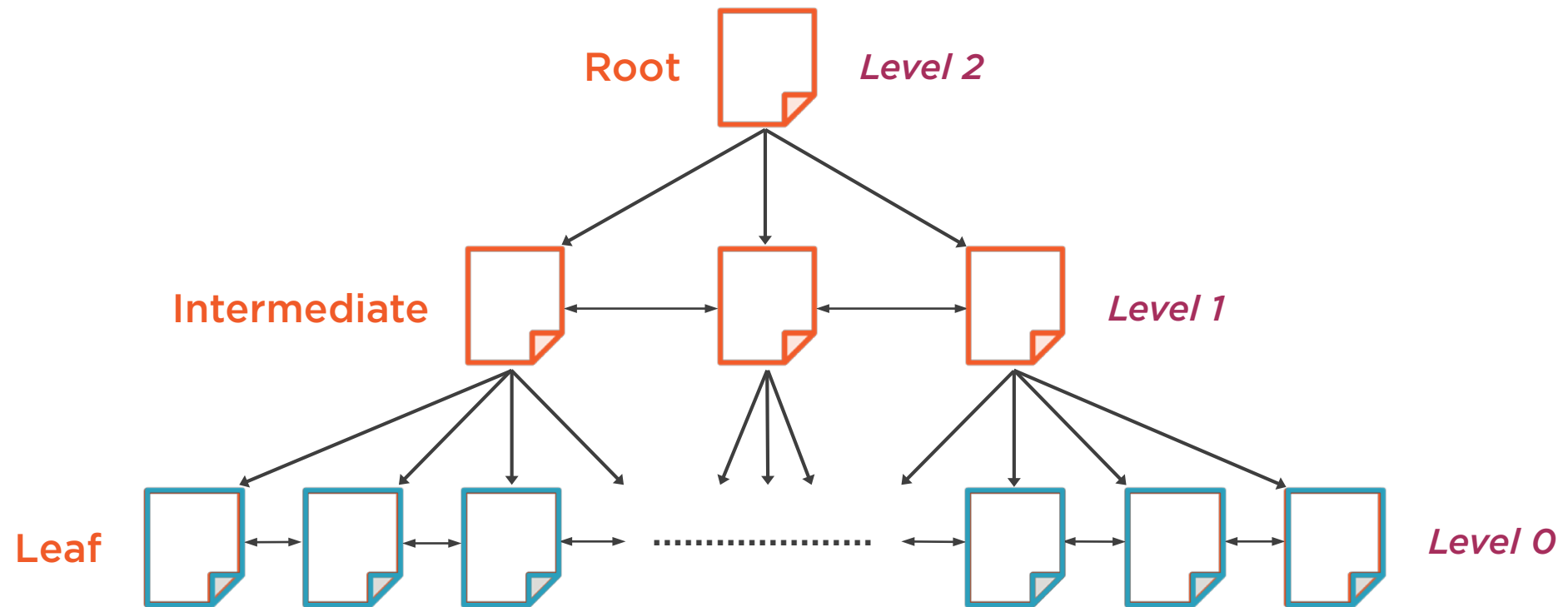
Basic Index Structure



Basic Index Structure



Scan



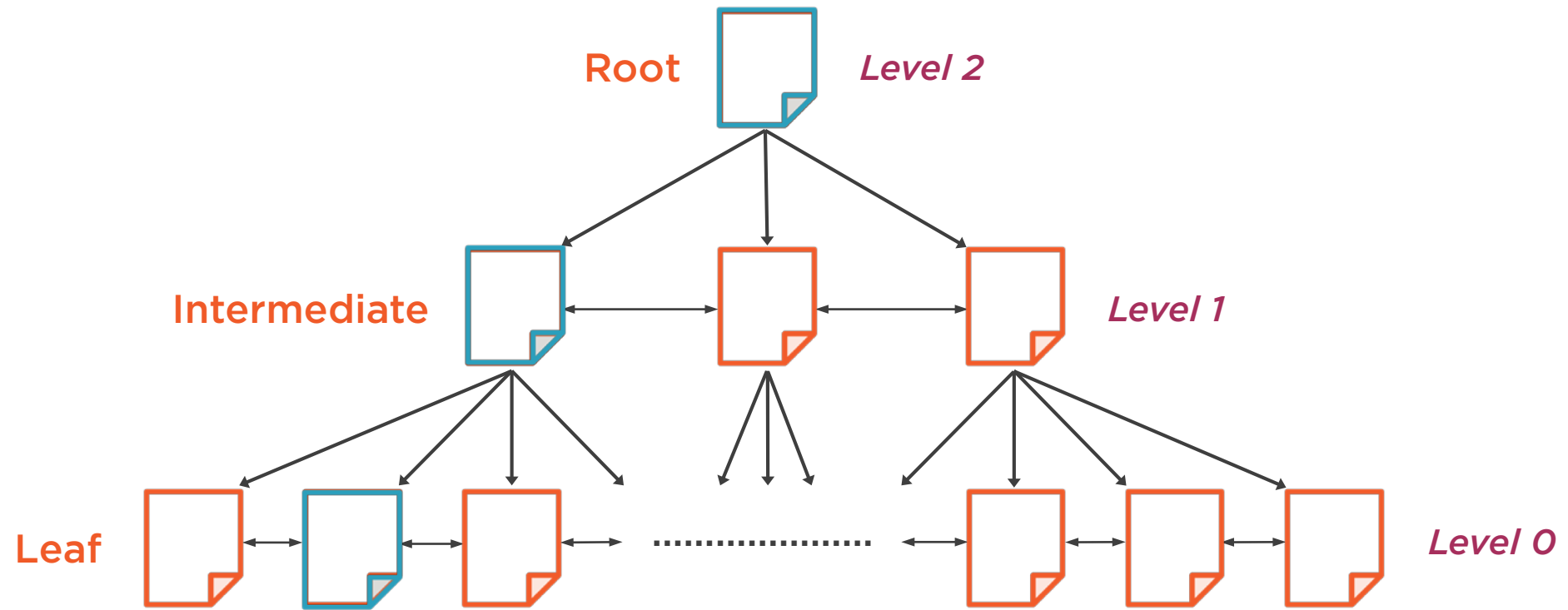
Demo



Using a scan to find data



Seek



Demo



Using a seek to find data



Nonclustered Indexes: Book Analogy



A book has one logical ordering

Various indexes exist to help look up data based on different orderings (keys)

Example: Indexes for a Book on Animals

By species common name



By species scientific name

By habitat and name

By type and name

By country and name



Demo



Using a bookmark lookup to find data



What We Covered



Basic structures

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