



UCL Department of Computer Science  
CS M038/GZ06: Mobile and Cloud Computing  
Spring 2014  
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One-pager: Dynamo (DeCandia et al., 2007)

Due: Start of lecture, 14th February 2014

*Instructions: in your own words, answer the following question as succinctly as possible (in 200–500 words, but shorter answers within this range are encouraged). Quoting figures or text from the assigned reading or from any other source is specifically prohibited.*

In Section 4.2, the authors discuss the use of “virtual nodes” in Dynamo. The authors claim that one advantage of using virtual nodes is that, “If a node becomes unavailable . . . , the load handled by this node is evenly dispersed across the remaining available nodes.” Consider the Chord DHT (as presented in the previous assigned reading) *without* virtual nodes and Dynamo *with* virtual nodes, where Dynamo uses “Strategy 1” to partition key space and place keys, as defined in Section 6.2 of the Dynamo paper.

Draw an example of a Chord ring with several nodes. When one node fails, explain which remaining nodes become responsible for the keys the failed node was previously responsible for. Now draw an example of a Dynamo ring with virtual nodes (using Strategy 1), and explain why when a node on the ring fails, the use of virtual nodes disperses the load formerly served by a failed node evenly across the remaining available nodes.