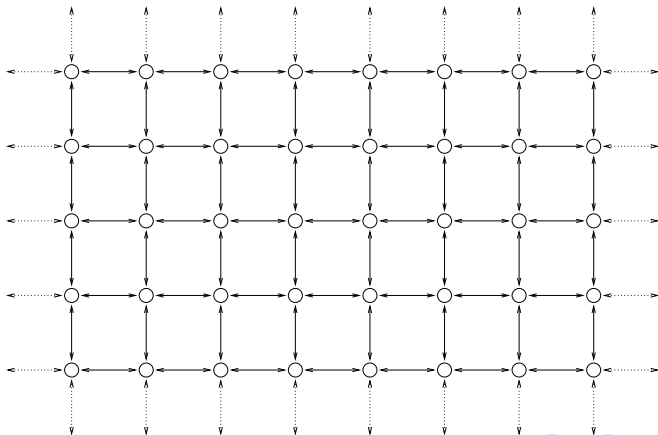


Gnutella

Let's take a Gnutella system (flooding). The system topology is a grid. Communications are symmetric, so if a node can see another node, this node can see it also.



- Question 1 : Really Naive algorithm

In this question, a request is transmitted until its *ttl* reaches 0.

- Which is the message number in function of the initial *ttl* ?

- Question 2 : Normally naive algorithm

The same, but we consider that if we just sent the message we wont forward it if it comes back from the same node we forwarded it.

- Question 3 : Algorithm with memory

In this questions, the *ttl* is still enforced, but we do not forward a query we already saw.

- Which is the number of new nodes B_n contacted during the phase n in function of B_{n-1} ? in function of n ?
- What is the number M_n of messages sent at the phase n in function of M_{n-1} ? in function of n ? What is M_{ttl} ?

- Question 4 : Adding a node : From here on, we suppose we have a gnutella-like system where nodes have at most 4 neighbors.

- Describe an algorithm to add a node.

- Question 5 : Attack scenario

- How to remove a data from the system ?
- Idem, while supposing one computer that owns the data is immune to direct attack ?