* Link State Routing Algorithm:-

=> Link State Routing Algorithm is an algorithm used by dynamic routers in which each router shares the knowledge of its neighbourhood to every other router in the network.

=> This method has two phases:-

(1) Initial Phase:-

=> When each node knows the cost of only its neighbour

(2) Final Phase:-

=> When each node knows the entire graph.

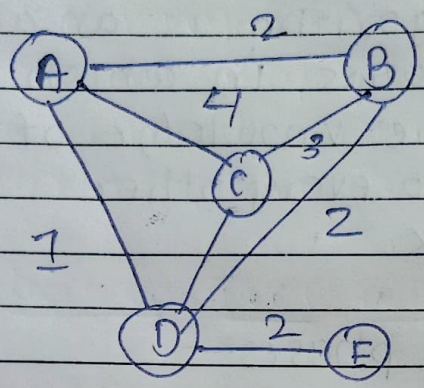
=> In this method, router sends information about the neighbours only.

=> They do not share routing table.

=> Routers uses FLOODING which is router sends info. to every other router except its neighbours.

=> Information is shared when some changes occurs.

* Consider the example :-



=) Step : 1 will be initialization step.

=) Least cost path from A to its neighbour are 2, 4, 1 for B, C, D.

=) So;

Step	Node	D(B), P(B)	D(D), P(D)	D(C), P(C)	D(E), P(E)
1	A	2, A	1, A	4, A	∞ ∞

=) Our observation is that vertex D contains least cost path in step : 1

=) So, it will be added to Node section.

=) Calculating Shortest path.

=) V = B; W = D

D(B) = min(1+2, 2) = (2, 3) = 2

=) For; A to E;

D(B) = min(∞, 1+1) = (∞, 2) = 2

=>

Step	N	D(B), P(B)	D(C) P(C)	P(D)	D(D)	D(E) P(E)
1	A	2, A	4, A		1, A	∞
2	AD	2, A	3, D			2, D

=> The, above steps will be continued, till the whole network routing info is ~~ab~~ obtained.

=> The only disadvantage is that, heavy traffic is created due to flooding

Static Routing	Dynamic Routing
=> Routes in the Routing Table are assigned by network admin.	=> Routes are updated in the routing table as per the changes happening in network
=> Static Routing provides higher security as paths are set by network admin.	=> Dynamic Routing provides less security compared to static Routing.
=> Static Routing is generally used in smaller networks.	=> Dynamic Routing is used in the larger networks.
=> No specific Routing protocols are used/ required.	=> certain Routing protocols like BGP, RIP, etc. are used.

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* Subnet mask on the network on the internet :-

255.255.240.0.

=> We need to calculate the maximum number of hosts it can handle.

=> Firstly, we will convert the given subnet in binary Representation.

=> 11111111.11111111.1111-0000.00000000

=> It is a clas B IP.

=> So, upper 16 bits will form network address.
=> lower 16 bits are subnet and host fields.

=> Most significant 4 bits = 1111.

=> Remaining 12 bits for host number.

=> $2^{12} = 4096$.

=> Total 4096 host address exists.

=> But, first address is used to identify network and last for broadcast;

So, total maximum number of hosts

$= 4096 - 2 = \boxed{4094}$

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* Following are the collision free protocols:-

=> (1) Binary Countdown
(2) Bit-map Protocol
(3) Limited Contention Protocols
(4) Adaptive Tree Walk Protocols

* Adaptive Tree Walk Protocol:-

=> We will partition the group of station and limit the contention of each slot

=> Under the light load, every ~~one~~ one can try for each slot.

=> Under heavy load, only a group can try for each slot.

=> Process:-

=> Treat every station as the leaf of Binary Tree

=> First slot and all the slots can try to get the slot.

=> If no conflict, then it is fine but, if a conflict arise then only nodes under the subtree get to try for next one.

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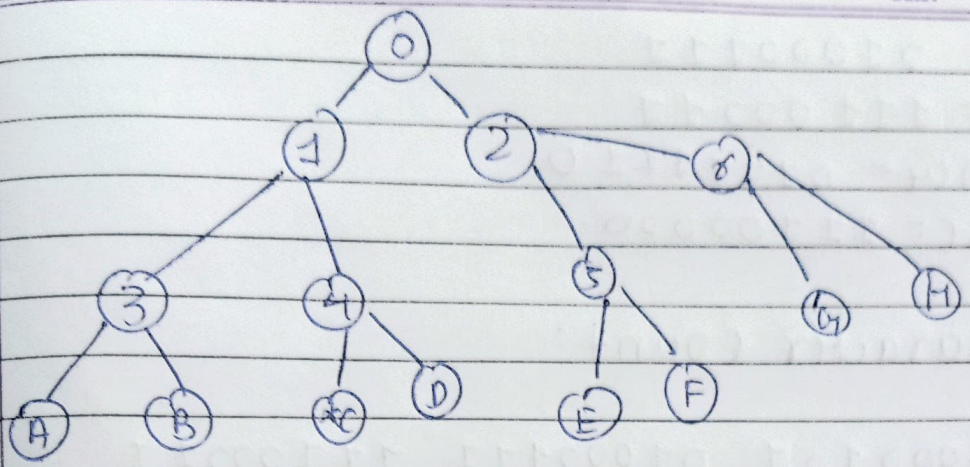

⇒ For slot 0 :→ C, E, F, H will conflict.

⇒ Slot: 1 → C sends

⇒ Slot: 2 → E, F, H conflict

⇒ Slot: 3 ⇒ E, F conflict

⇒ Slot: 4 ⇒ E sends

⇒ Slot: 5 ⇒ F sends.

⇒ Slot: 6 ⇒ H sends.