Department of Computer science and Engineering

PES UNIVERSITY

UE19CS202: Data Structures and its Applications (4-0-0-4-4)

APPLICATION

Abstract

Graph representation: Representation of Computer Network Topology, Different types of Topology

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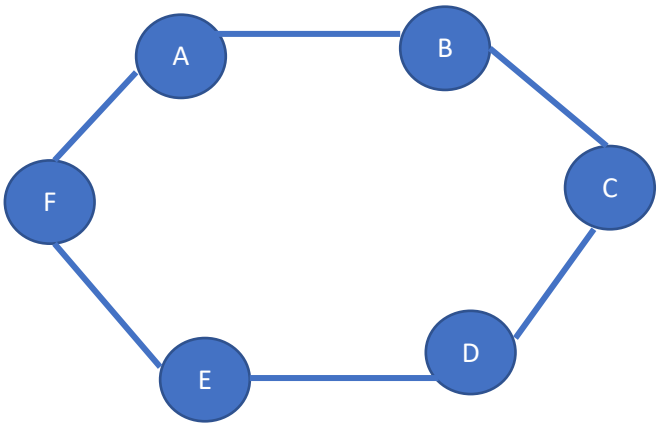
Graph representation: Representation of Network Topology:

Graph data structure is mainly in telecommunication and Computer Networks. Networking uses the Notation G(N,L) instead of G(V,E) for a graph were N is the set of nodes and L is the set of links.

Topology is the order in which nodes and edges are arranged in the network.

The different types of Network topology are

1. Ring topology (cycle): Ring topology is also called as cycle graph. A simple graph with two degrees of vertices is called cycle graph. In ring Topology each vertex is connected to other two vertices, So that they form a network which looks like a circle or ring.

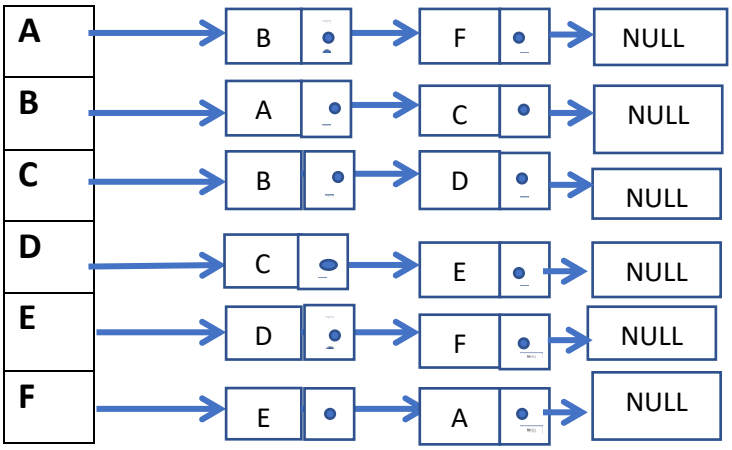


Ring topology

Adjacency matrix for the above graph

	A	**B**	**C**	**D**	**E**	**F**
A	0	1	0	0	0	1
B	1	0	1	0	0	0
C	0	1	0	1	0	0
D	0	0	1	0	1	0
E	0	0	0	1	0	1
F	1	0	0	0	1	0

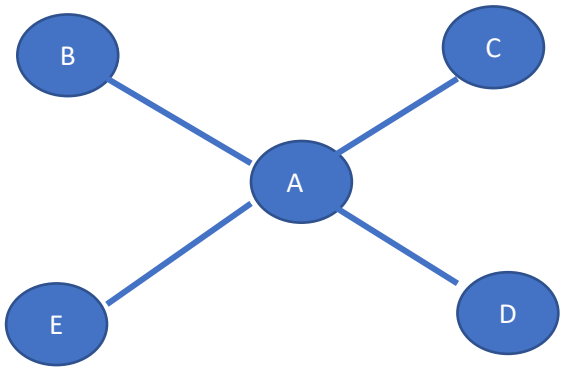
Adjacency list representation for ring topology



2. Star topology: Star topology is a network topology in the form of merging from the central vertex to each vertex.

A graph of V vertices represents a star topology if it satisfies the following three conditions:

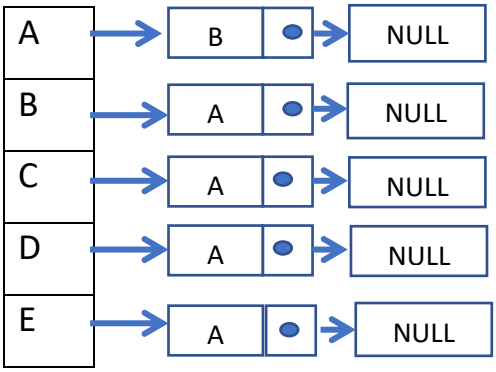
1. The centre node has degree n– 1.
2. All nodes except the central node have degree 1.
3. No of edges = No of Vertices – 1.



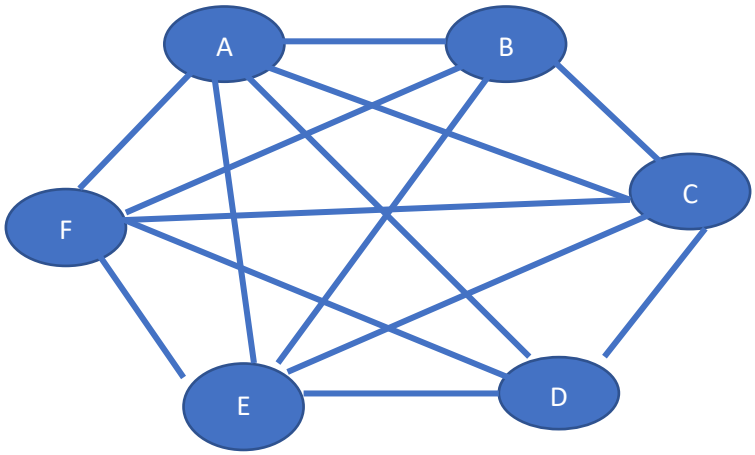
Star topology

Adjacency matrix representation for Star topology

	A	B	C	D	E
A	0	1	1	1	1
B	1	0	0	0	0
C	1	0	0	0	0
D	1	0	0	0	0
E	1	0	0	0	0



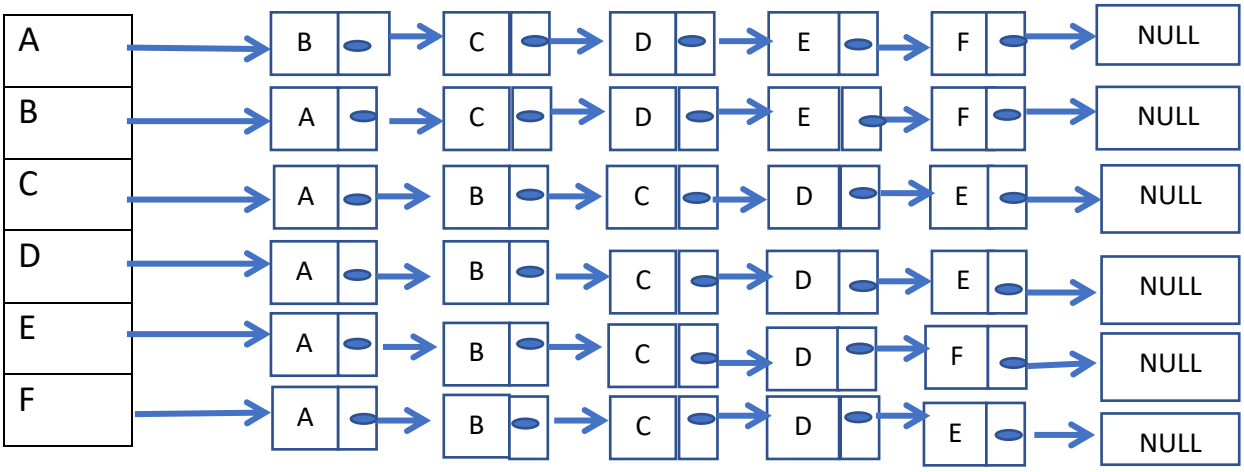
3. **Mesh topology**: Mesh topology uses a complete graph form. All the nodes in mesh topology are interconnected. Every node has degree n-1



Mesh Topology

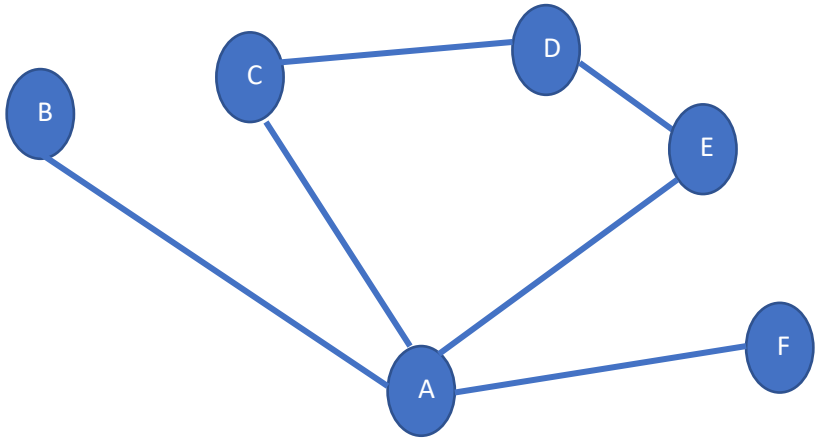
Adjacency matrix for the above graph

	A	B	C	D	E	F
A	0	1	1	1	1	1
B	1	0	1	1	1	1
C	1	1	0	1	1	1
D	1	1	1	0	1	1
E	1	1	1	1	0	1
F	1	1	1	1	1	0



4. Hybrid Topology

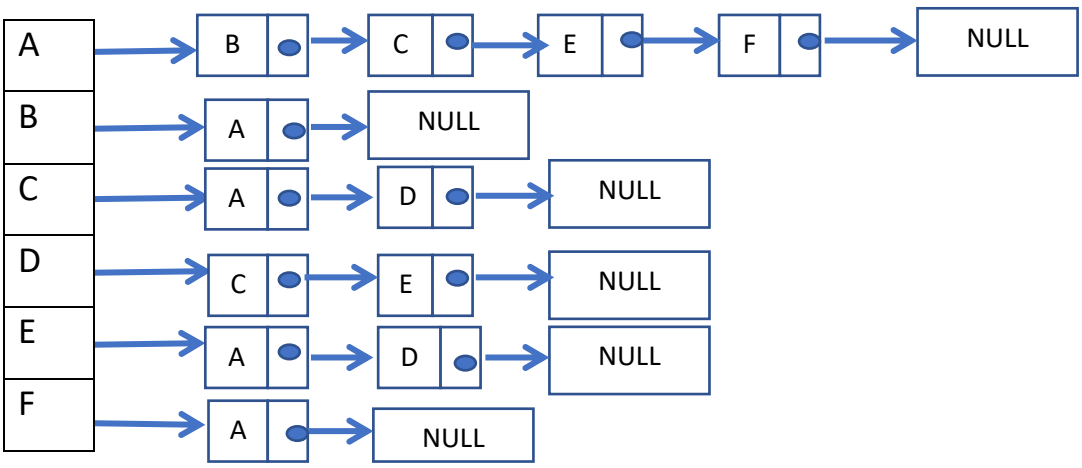
Hybrid topology is the combination of two or more topologies.



Hybrid Topology

Adjacency matrix for the above graph

	A	**B**	**C**	**D**	**E**	**F**
A	0	1	1	0	1	1
B	1	0	0	0	0	0
C	1	0	0	1	0	0
D	0	0	1	0	1	0
E	1	0	0	0	0	0
F	1	0	0	0	0	0


A
B
C
D
E
F
B
C
E
F
NULL
A
NULL
A
D
NULL
C
E
NULL
A
D
NULL
A
NULL