Home Network Topology

Router:

- The central device that connects my home network to the internet.
- Manages incoming and outgoing traffic.
- Provides Wi-Fi access and assigns local IP addresses to devices.

Devices:

- Laptop: This device connects to the router via Wi-Fi.
- Smartphones: Access the network wirelessly.
- Smart TV and Streaming Devices: Connect to the network for entertainment and content streaming.

Wi-Fi Network:

- The wireless network created by router.
- Allows devices to communicate without physical cables.
- Secured with a Wi-Fi password.

Local Area Network (LAN):

- The internal network within my home.
- Devices communicate directly with each other.

Internet Service Provider (ISP):

- Provides internet connectivity to my home.
- Connects my router to the global internet.

Parallel Computing & Networked Systems

Parallel Computing

Application: Supercomputers in Astronomy

Explanation:

- **Supercomputers** equipped with parallel processing capabilities are used in astronomy to process vast amounts of data generated by telescopes and other observational instruments.
- These supercomputers can perform complex calculations in a fraction of the time it would take a single-processor computer.

Importance:

- Enables astronomers to create detailed simulations of celestial bodies.
- Analyzes light spectra from distant stars.
- Searches for patterns in vast quantities of data that may indicate the presence of exoplanets.

Networked Systems

Application: Social Networks

Explanation:

- Network theory ideas are widely used in social networks to model relationships between users.
- Social network analysis (SNA) helps understand communication, impact, and behaviour patterns.

Importance:

- Examines the structure of relationships between social entities (people, organizations, websites, etc.).
- Studies the spread of ideas, news, rumors, and diseases.
- Analyzes trust in exchange relationships and pricing dynamics in markets.
- Conceptualizes scientific disputes and academic standing.

Assignment 1: Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.

Assignment 2: Identify a real-world application for both parallel computing and networked systems. Explain how these technologies are used and why they are important in that context.