Grid Computing – Revision Notes

Grid Computing – Definitions (MCQ-Focused)

- **PCWebopedia**: A type of networking that uses **unused processing power** across a network to solve **intensive problems**.
- **IBM**: **Virtualizes distributed resources** (CPU, storage, bandwidth) into a **single system image**.
- **Sun Microsystems**: A **reliable and low-cost infrastructure** offering seamless access to computational capabilities.

Analogy: Electrical Power Grid vs Grid Computing

Electrical Grid	Grid Computing
Users get electricity from wall sockets, unaware of its source	Users get computing resources without knowing physical location/technology
Power plants are linked	Computers (PCs, servers, storage) are linked
Simple, seamless access to electricity	Transparent, seamless access to IT resources

Key Characteristics of Grid Computing

1. Shares **more than just data**: includes computing power, applications, and storage.
2. Operates across **multi-institutional virtual organizations**.
3. Enables **efficient utilization** of resources from multiple institutions.
4. Promotes **transparency** to users (they don't see the complexity).
5. Allows collaboration across **local and global communities**.

Why Grid Computing? (High MCQ Probability)

- Computational modeling is **cheaper** than experiments.
- Solves **complex, large-scale scientific problems**.
- Helps with **data analysis**, **visualization**, and **simulation**.
- **Utilizes underused resources** from different institutions.
- Reduces processing time while **increasing accuracy & precision**.

Types of Grid (Must-Memorize for MCQs)

Type	Description
Computational Grid	Access to massive shared **processing power**. Used for **compute-intensive tasks**.
Data Grid	Manages **large-scale data** storage, discovery, and manipulation across **heterogeneous systems**.
Collaboration Grid	Supports teamwork across locations; e.g., **virtual CAD projects** without revealing proprietary tech.
Network Grid	Ensures **high-performance and fault-tolerant communication**, acting like **data routers**.
Utility Grid	Offers **complete resource sharing** (software, special equipment). Users send data to a central machine, get processed results back.

☑ Exam Quick Points to Remember

- Grid computing = **Virtual supercomputer** formed by unused computing power.
- **Transparent & seamless** resource access.
- Supports **scientific research**, **data visualization**, **multi-party collaboration**.
- Types include **Computational**, **Data**, **Collaboration**, **Network**, and **Utility Grids**.
- **Virtual Organizations** collaborate using grid infrastructure.
- **IBM, Sun Microsystems, and PCWebopedia** offer differing but overlapping definitions.