**Evaluate monolithic, layered, and microkernel architectures according to:**

a. **Robustness**:

* Monolithic architectures may lack robustness because errors in one component can affect the entire system.
* Layered architectures can enhance robustness by isolating components, reducing the risk of system-wide failures.
* Microkernel architectures often exhibit robustness as critical services are kept separate, minimizing the impact of failures.

b. **Extensibility**:

* Monolithic architectures may need more extensibility, as adding or modifying new features can be complex and risky.
* Layered architectures offer moderate extensibility, as new layers can be added or existing ones modified with relative ease.
* Microkernel architectures excel in extensibility as additional services can be added or removed independently of the core kernel.

c. **Scalability**:

* Monolithic architectures may need help with scalability due to their all-in-one design, making it challenging to adapt to changing requirements.
* Layered architectures offer moderate scalability, as adding new layers can introduce overhead.
* Microkernel architectures typically exhibit good scalability. They allow for the modular addition of services, enabling better adaptation to vary workloads.

d. **Security**:

* Monolithic architectures pose security risks as a vulnerability in one component could compromise the entire system.
* Layered architectures can enhance security by enforcing strict boundaries between layers, limiting the impact of security breaches.
* Microkernel architectures often offer improved security as critical services are isolated, reducing the attack surface and minimizing the impact of security vulnerabilities.

**How has distributed computing affected operating system design?**

Distributed computing has significantly influenced operating system design by necessitating networked communication, resource sharing, and distributed coordination support. Operating systems must now facilitate seamless interaction between distributed components, manage network connections, ensure data integrity and security across distributed systems, and provide fault tolerance and load-balancing mechanisms. This has led to the development of networked and distributed operating system architectures, which enable collaborative computing and resource sharing across multiple nodes in a networked environment. Additionally, distributed computing has driven the adoption of distributed file systems, processing frameworks, and distributed database management systems, all requiring specialized support from modern operating systems.