

The Mainframe versus the Distributed System

Reliability	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none">• More easily supports automated disaster recovery• Is the superior platform for customers who have critical applications that require full disaster recovery capabilities• Is superior for running mission-critical and revenue-critical applications that cannot go down without severely impacting the business• Automatically activates extra components during busy times• Isolates failing components and seamlessly moves work to working components	<ul style="list-style-type: none">• Has minimal disaster recovery requirements designed into its architecture• Is often selected to run applications that do not interrupt the business if they go down
Availability	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none">• Supports rolling upgrades within the same hardware footprint with no application outage• Achieves high availability through the implementation of a Parallel Sysplex or GDPS, or both• Offers complete, built-in redundancy for hardware failover, usually without disruption• Focuses on both application availability and hardware availability• Inherently incorporates 99.999% application availability, 24 x 7	<ul style="list-style-type: none">• Requires bringing the server offline to perform system upgrades• Achieves availability by physically duplicating servers• Allows for easy installation of a new product or version in the development environment
Security	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none">• Provides multi-level security, at both hardware and software levels, for true workload isolation• When running z/OS, achieves Evaluation Assurance Level (EAL) 4+ security ratings as required by various country governments• Runs data on HiperSockets, which cannot be “sniffed” and does not have cables that can be kicked loose• Through memory protection, ensures that control information is not corrupted by raw data from insecure sources	<ul style="list-style-type: none">• Has average security requirements and uses cables to connect additional data and application servers as needed• Requires cable connections that can be kicked loose

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Total Cost of Ownership	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none"> Has a “small footprint,” which means that it requires less data center space while offering more computing power Supports more than 50,000 users per server Through use of rolling IPLs, enables operating system maintenance to be done without impacting end-user availability 	<ul style="list-style-type: none"> Requires application and database licenses on multiple servers Requires purchase of individual servers to perform specific tasks or functions, with limited scope of function per server
Efficiency	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none"> Handles 90+% central processing unit (CPU) workload with good performance Excels at driving very high input/output rates, which is part of its design Does not require additional staff to monitor applications to determine where software failure or overload occurs Automatically reassigns resources to accommodate workload based on priority Shortens the application path by collocating applications and data, which reduces traffic and improves performance Avoids wasted processing time to package and encrypt data for network use 	<ul style="list-style-type: none"> Statistically is designed to run at 5% to 25% utilization to allow for peak demand Is well suited for numerically intensive (scientific and engineering) computing due to its instruction-driven design, and its processing power is more important than its I/O throughput Is suited to single workload applications that work together well and run concurrently Requires constant re-partitioning, and segmenting data is a continuous task
Scalability	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none"> Requires an enterprise decision to acquire more capacity Scales up, out, and quickly to handle disparate workloads and large transaction volumes Allows for prioritizing work to match business requirements and for maintaining high utilization for long periods of time Automatically reassigns resources to accommodate workload based on priority Excels at managing large numbers of tasks with highly variable runtimes and operational profiles Hosts multiple concurrent applications within the same cluster 	<ul style="list-style-type: none"> Typically requires only a department decision to acquire server hardware or software

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Energy Efficiency	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none">• Uses less than one watt per MIPS• Is the platform of choice for customers who must avoid facility expansion and reduce power consumption	<ul style="list-style-type: none">• On average, consumes about 400 watts of power per square foot and can pose energy consumption challenges because local power companies cannot meet data center demands• Can cause challenges because local power companies cannot meet data center demands for energy consumption• Requires linear growth of support staff and floor space per each server installed• Often requires data center upgrades to handle server proliferation
Additional Attributes	
Mainframe Attributes	Distributed System Attributes
<ul style="list-style-type: none">• Concurrently runs disparate workloads that have unexpected input/output and processing requirements• Offers a tightly coupled networking environment, reducing latency because of the centralized design• Offers high input/output bandwidth capabilities to ensure that data does not slow down in the pipeline, which is important for database applications and transaction applications that require intensive data throughput	<ul style="list-style-type: none">• Fits a server to a specific task or function, with limited scope of function per server• Does not have to share data with other applications