



Performax provides software load testing and performance engineering services to help our clients build, market, and deploy highly scalable applications.

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# Load Testing

*Load testing is an essential component of quality assurance. It can identify problems with an application's efficiency, stability, or scalability **before** it's released.*

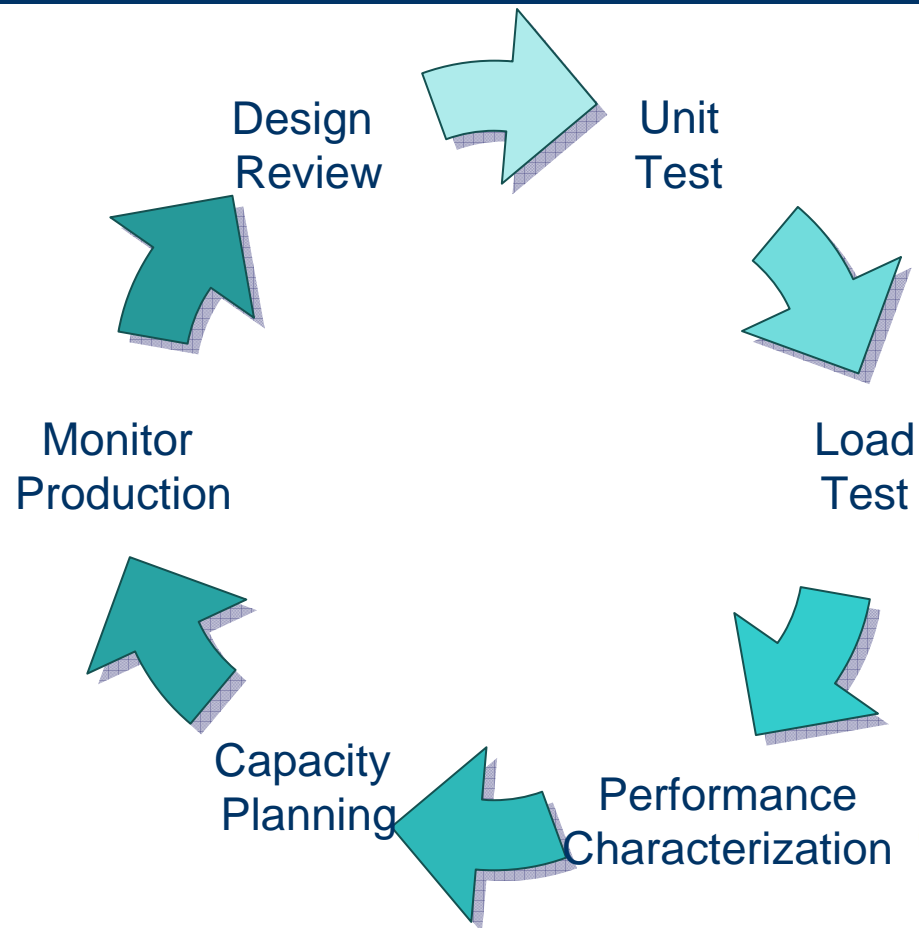
The cost of fixing performance problems after an application enters production is high. The cost of restoring reputations and confidence is higher yet.

# Performance Characterization

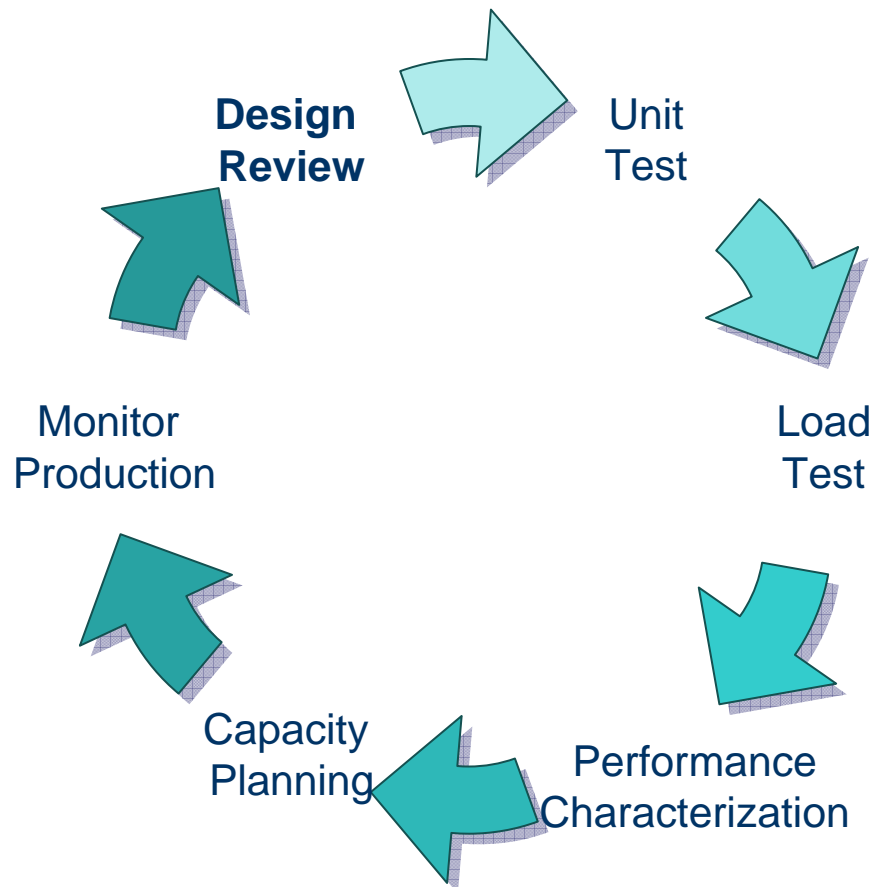
There is a tremendous value in understanding when a company is going to have to spend money on their IT infrastructure.

Performance characterization projects determine what spending is required on the infrastructure and when it will be needed to meet growing capacity demands.

# Performance Engineering Methodology



# Design review and rapid prototyping



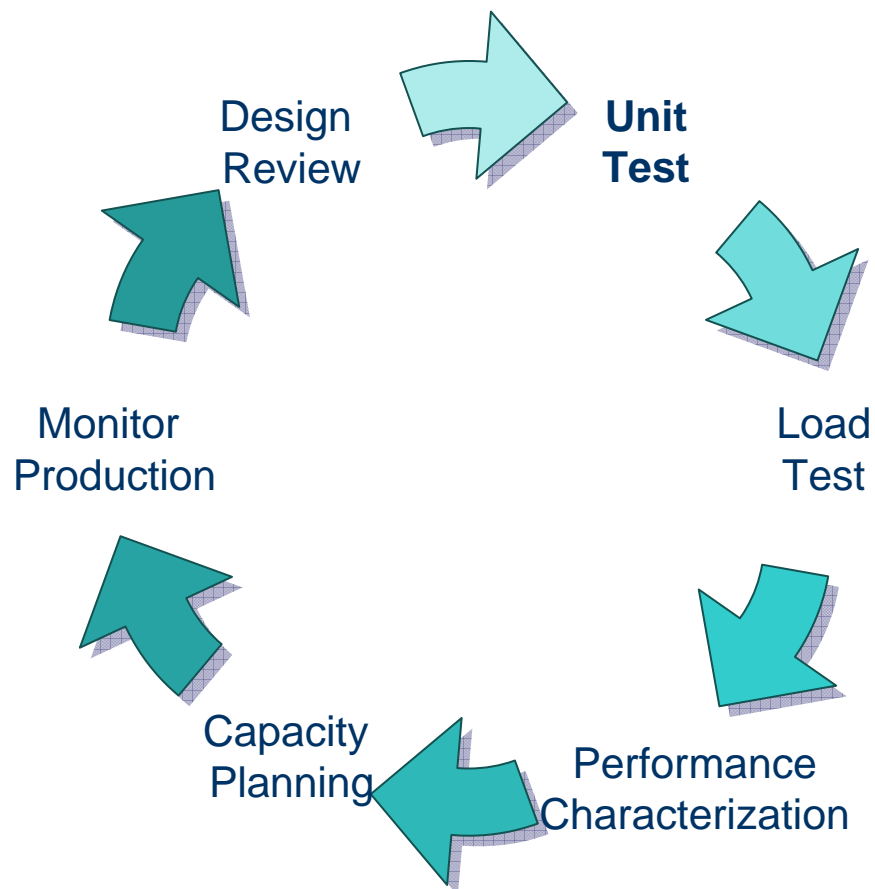
## Design Review

(pay \$ now or \$\$\$ later)

- Scalability and availability requirements
- Service level agreements
- Architecture review
- Response time budget by logical tier
- Agile prototyping & evaluation



# Unit test code during development

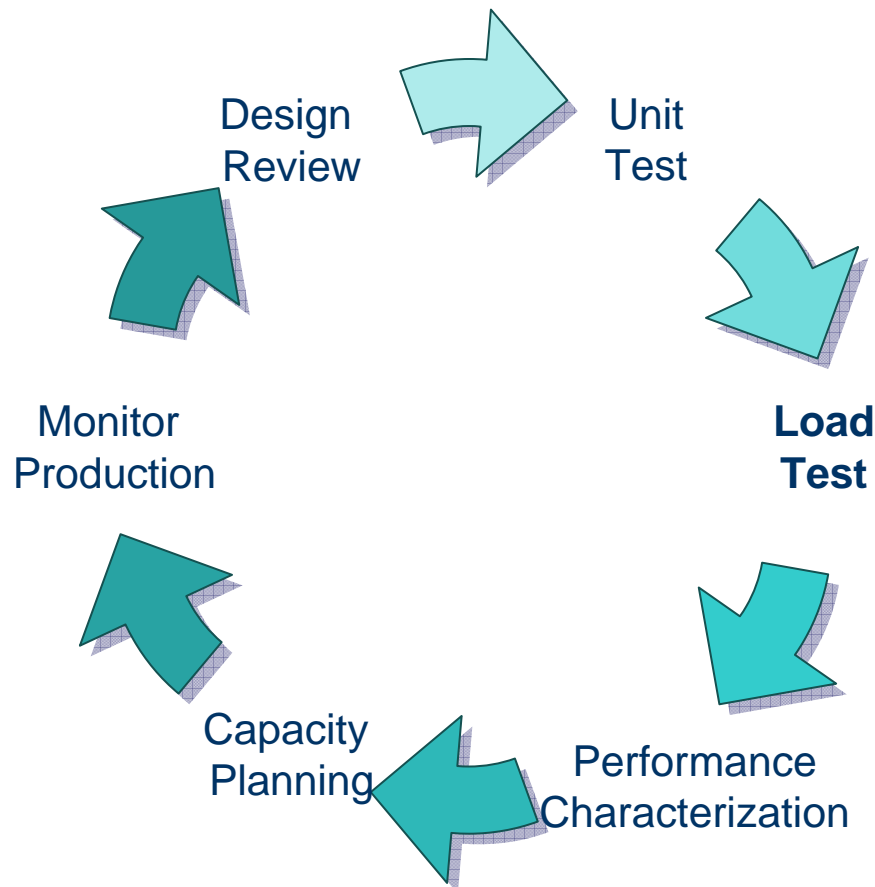


## Unit Test

- Profile long running, frequently executed, or critical transactions across distributed services
- Optimize to reduce hardware demand and increase concurrency
- Compare results against resource budget
- Regression analysis of single user performance



# Load test multiple users and a mix of transactions (system test)

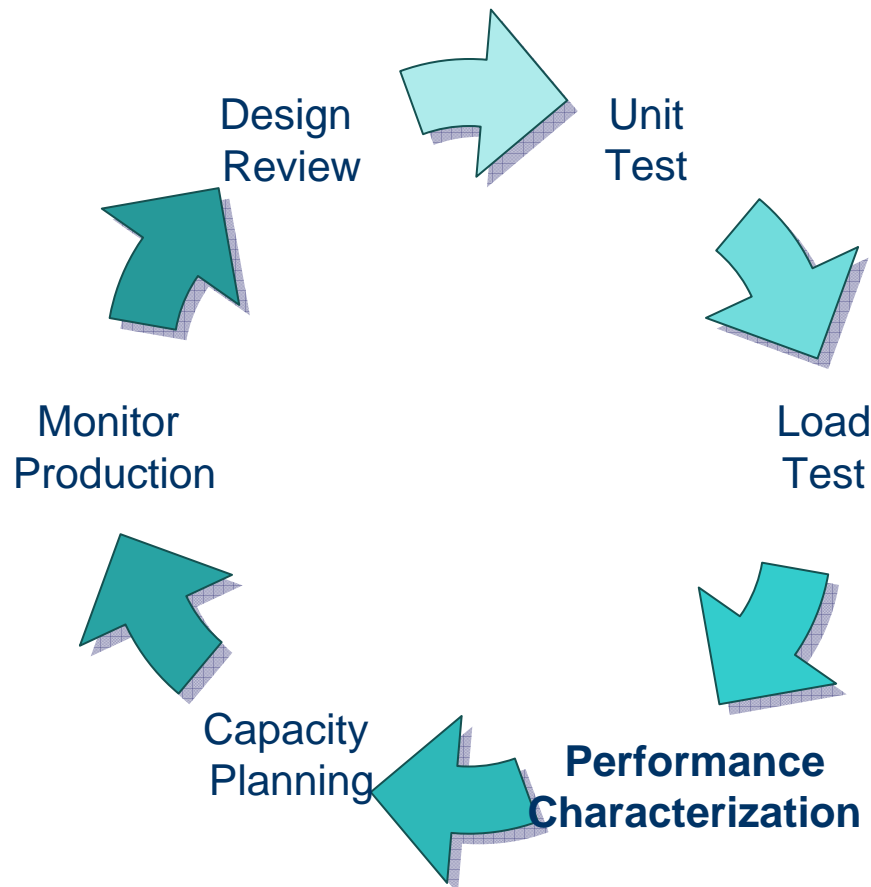


## Load Test

- Define usage scenarios (online/batch/maintenance)
- Measure response time and throughput versus load on reference hardware
- Monitor and tune System performance
- Multi-user performance regression analysis
- Stability under sustained load
- Failover characteristics under load



# Characterize performance versus load, hardware, data, and workload



## Performance Characterization

- Test different usage scenarios to determine impact on configuration
- Characterize capacity vs. the speed and number of CPUs by tier
- Heuristics for configuring network, memory, and disk bandwidth
- Spreadsheet model showing server capacity by physical tier
- Determine scalability limit of the architecture
- Document modeling methodology so that models can be extended





# Recap Goals of Performance Testing

## Unit testing

- Profile long running, frequently executed, or critical transactions across distributed services
- Optimize to reduce hardware demand and increase concurrency
- Compare results against resource budget
- Regression analysis of transaction performance

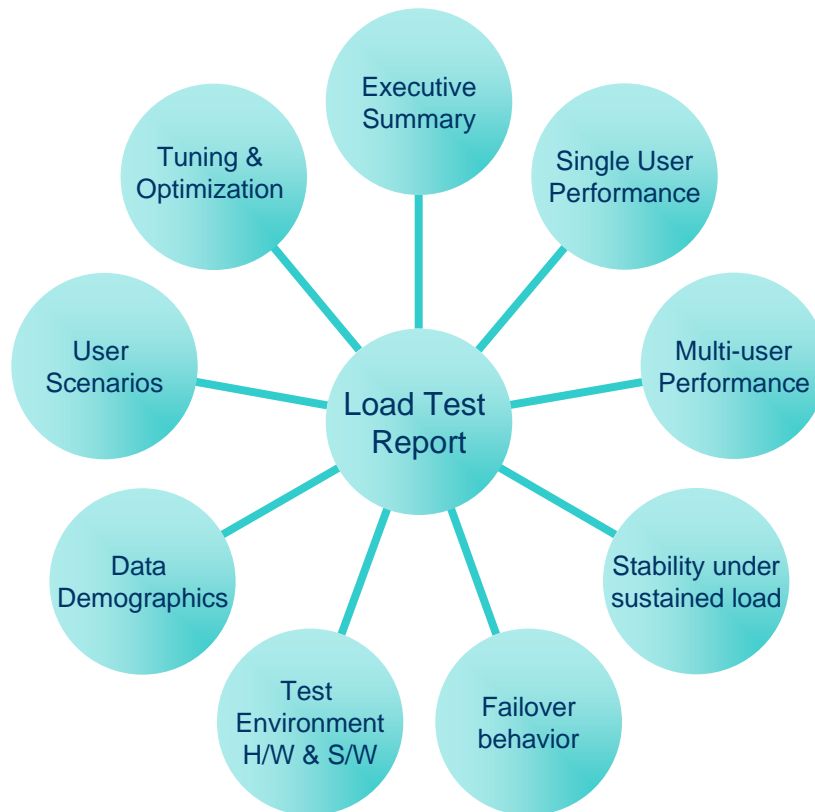
## Load testing

- Find and fix obvious system bottlenecks
- Regression analysis of system performance
- Measure application stability under sustained load.
- Determine capacity limits of a specific hardware configuration
- Determine failover characteristics

## Performance Characterization

- Determine hardware required to meet service objectives at various loads
- Decide when hardware needs to be added to stay ahead of demand
- Find the limits of the architecture's scalability
- Recommendations for enhancing scalability if necessary

# Deliverables



## Load Test

Load test report  
Multi-user scripts  
Test data repository

## Performance Characterization

Modeling methodology  
Capacity vs. server CPU configuration  
Network bandwidth requirements  
Disk and memory considerations  
Sensitivity to data demographics  
Sensitivity to workload



# Client Responsibilities

Identify and describe top user scenarios

Supply synthetic data to support load testing

Provide dedicated hardware for testing

Provide load test tool licenses  
(none required with OpenSTA)

# Optional Training

## Tools & methodology training

- OpenSTA basics (1 day)
- OpenSTA Advanced topics (1 day)
- Performance testing workshop (1 day)

# Contact Information



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