



## PERFORMANCE ENGINEERING TRAINING COURSE CONTENT

### SECTION1: PERFORMANCE TESTING CONCEPTS

- Performance Engineering -Introduction
- Common Performance issues
- Performance Mind map
- Production traffic Analysis
- Roles and Responsibilities of Performance Engineer
- Performance Engineering Life Cycle

### SECTION2: PERFORMANCE MONITORING – WINDOWS/UNIX SYSTEMS

- **2.1 On Windows Servers**
  - Detailed explanation about Windows system monitoring using Perfmon Counters
  - Perfmon – Configuring the counters with different aspects
  - Real time monitoring on Windows System
  - How to detect the CPU, Memory and Network performance issues from Perfmon
- **2.2 On Linux Servers**
  - Detailed explanation about Linux System monitoring tools
  - Detailed understanding about Linux monitoring tools like Vmstat, iostat, top, free, netstat, etc.
  - Real time performance monitoring
  - How to detect the CPU, Memory and Network performance issues from Vmstat,Top,iostat,netstat,etc..

### SECTION 3 : JAVA PERFORMANCE ENGINEERING – BASIC LEVEL

- Different types of JVM
- Detailed explanation about JVM Architecture Internals
- Detailed explanation about JVM Heap Structure
- Understanding the different types of Garbage collections techniques
- Understanding the JVM thread pooling concepts
- Detailed about JDBC connection pooling

### SECTION 4: JVM PERFORMANCE TUNING – ADVANCED LEVEL

- 4.1 JVM Performance Monitoring

- Detailed understanding about JVM performance monitoring
- How to Monitor Java Application using Open source tools(JConsole,JvisualVM)
- How to monitor the Java application using commercial tools (Yourkit)
- 4.2 JVM Thread Thump Analysis
  - Basics of Thread dumps
  - How to collect the Java Thread dumps
  - Techniques to analyze Thread dumps
  - How to identify Performance patterns using Thread dumps
  - Java Thread dump Tools
  - Hands- On Training
- 4.3 JVM Garbage collection Analysis
  - Collecting the GC logs
  - Real-time GC monitoring
  - How to analyze the GC logs
  - How to detect memory leak related issues using GC logs
- 4.4 JVM OutofMemory Error Analysis
  - Understanding the Application performance issues due to memory constraints
  - Basics of Memory Leak
  - Different between Memory leak and OutofMemory issues
  - Basics of OutofMemory issues
  - Different patterns of JVM OutofMemory issues
  - How to identify the Memory Leak and OutofMemory issues
  - How to Collect heap dumps from JVM
  - How to analyze the Heap dumps using Eclipse MAT& JvisualVM

## **SECTION 5 : REAL TIME APPLICATION PERFORMANCE ISSUES & PATTERNS**

- How to troubleshoot various Performance issues Patterns
- High CPU due to code spinning
- CPU Scalability due to blocked conditions
- High Response time related issues
- High Network retransmission latency
- Memory leak & OutofMemory issues

## **SECTION 6 : PERFORMANCE PROFILING TOOLS**

- JProfiler
- Yourkit
- JvisualVM

- Dynatrace APM & Ruxit

## **SECTION 7 : PERFORMANCE BEST PRACTICES**

- How to apply various techniques to fine-tune the Java applications
- Techniques to Optimize the JVM performance

## **SECTION 8: .NET PERFORMANCE ENGINEERING**

- Real Time .Net Performance problems
- .Net Performance Metrics
- .Net Performance Measurement
- .Net Memory Management
- Understanding the different Garbage Collection modes
- Analyzing Pause times in the .NET GC
- Locking and Synchronization
- Unnecessary logging
- Major database issues
- Techniques to Fine-tuning the IIS App-pool
- Optimizing Performance Asp.Net Web applications

## **SECTION 9 :DATABASE PERFORMANCE MOINTORING**

- Oracle Database monitoring
- Understanding the AWR,ASH,ADDM Reports and locating Database performance issues

## **SECTION 10 :CLIENT SIDE PERFORMANCE TUNING**

- Importance of Front end performance
- Common Performance problems at front end
- How Browser Rendering works
- Critical Performance metrics at front end
- Client side performance tools
  - Chrome Dev tools
  - Dynatrace Ajax
  - GTMetrix
- How to optimize the Critical Rendering path
  - Put Stylesheet on Top
  - Put Javascripts down.
  - Reduce DNS lookup
  - Inline the JS and CSS (if its small in size)
  - Remove Duplicate Scripts
  - Make CSS & JS external
  - Prioritize the visible content( consider DEFER )

- Served Scaled images
- Optimizing the Content Efficiency
  - Minify the CSS & JS
  - Gzip Compression
  - Image compression
  - Browser level caching
  - Avoid Redirects
  - Use a content Delivery

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Know more about [Performance Engineering](#)



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