PERFORMANCE ENGINEERING TRAINING COURSE CONTENT

SECTION 1: 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

SECTION 2: 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 MONITORING

- 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 &amp; 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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