



CPPDbg - Version: 3  
01 May 2021

# C++ Debugging



# C++ Debugging

CPPDbg - Version: 3

---

 **3 days Course**

## Description:

In this three-day instructor-led course, you will learn how to debug C++ applications in development and production. Numerous extensive demonstrations and hands-on labs ensure that you will be able to apply the skills learned to your own applications and systems.

## Intended audience:

Experienced C++ developers with Win32 programming experience and understanding of fundamental OS concepts.

## Prerequisites:

At least one year of experience with C++ programming  
At least one year of experience programming Win32 applications  
Familiarity with operating systems concepts such as virtual memory and multithreading  
Familiarity with computer organization concepts such as CPU registers, cache, main memory

## Objectives:

Debug C++ applications in Visual Studio  
Debug C++ applications in the development and production environments with WinDbg and other tools  
Use debugging tools to diagnose problems without a debugger

## Topics:

Module 01 - Exceptions and Dumps

- Exception Handling
- Debugging Symbols
- Dump Files and Types
- Generating Dumps
- Automatic Dump Generation
- Opening Dump Files

## Module 02 - Introduction to WinDbg

- Basic WinDbg Commands
- Smart Breakpoints
- WinDbg Scripts
- WinDbg Extensions
- LAB: Getting Acquainted with WinDbg
- LAB: Capturing Crash Dumps (x3)

## Module 03 - C++ Debugging Scenarios

- Heap Corruptions
- Stack Corruptions
- Memory Leaks
- Resource Leaks
- Deadlocks
- LAB: Memory Leak
- LAB: Heap Corruption
- LAB: Stack Corruption
- LAB: Handle Leak
- LAB: Invalid Handles
- LAB: Deadlock (x2)

## Module 04 - Debugging Tools

- Performance Counters
- Process Explorer
- Process Monitor
- Application Compatibility Toolkit

- ETW and Xperf
- GFlags
- LAB: Profiling with Xperf
- LAB: Process Monitor
- LAB: Application Compatibility Toolkit

## Module 05 - Debugging in Visual Studio

- Visual Studio Windows
- Breakpoints and Tracepoints
- Data Breakpoints, Function Breakpoints
- Threads
- Parallel Stacks, Parallel Tasks
- Static Code Analysis
- LAB: Runtime Checks

° Module 06 - Assembly Language Fundamentals (Appendix)

° Module 07 - Windows Programming Concepts (Appendix)