

## **GSAW 2019 Tutorial E:**

Understanding Multicore, Virtualization, and Containerization

**Length:** Half day

### **Overview:**

#### **Course Outline**

- Big Picture Up Front (BPUF)
- Multicore Processing (MCP): Definition, Current Trends, Pros and Cons, and Safety/Security Ramifications
- Virtualization (V): Definition, Current Trends, Pros and Cons, and Safety/Security Ramifications
- Containerization (C): Definition, Current Trends, Pros and Cons, and Safety/Security Ramifications
- Recommendations
  - When to Use
  - Architectural Patterns
  - How to Allocate (SW to containers to VMs to processors to cores)
  - Analysis (of interference and timing)
  - Testing
  - Documentation
  - Security
- Certification and Accreditation
- Conclusion.

**Instructor:** Donald Firesmith, Software Engineering Institute

### **Biography:**

ACM Distinguished Engineer, author of seven technical books, and over 200 publications and presentations, **Donald Firesmith** works at the Software Engineering Institute, where he supports DoD program offices acquire software reliant cyberphysical systems. With 40 years of experience in software and system engineering, his primary areas of technical expertise include requirements engineering, system and software architecture engineering, design methods, testing, and process engineering including Agile methods. Among other projects, he is currently supporting ground control systems for US Navy UAVs. In addition to his professional work, he is also the author of four science fiction, fantasy, and horror books.

### **Description of Intended Students and Prerequisites:**

Attendees include anyone interested in using multicore processors, virtual machines, and containers. Prerequisites include a very basic understanding of software environments.

### **What can Attendees Expect to Learn:**

The pros and cons of these three technologies, when they are applicable, their similarities and differences, their ramifications (especially with regard to safety and security), and recommendations for their use.