

EMBD-MGRT-X861 (v1.0)

**Course Specification**

## Course Description

This course provides a structured approach to migrating from Intel® to AMD x86 architectures in embedded and high-performance computing environments. Participants will explore AMD Zen 5 microarchitecture innovations, compare Intel and AMD platforms across instruction sets, thermal design, memory subsystems, firmware, and platform security. The course emphasizes migration strategies, performance tuning, and tool transitions to ensure a smooth and optimized Intel-to-AMD migration path.

The emphasis of this course is on:

- Understanding AMD Zen 5 and comparing it with Intel processors in embedded markets
- Mapping Intel instruction sets, memory, and firmware to AMD equivalents
- Redesigning thermal systems for AMD migration
- Ensuring robust signal integrity and system reliability in migration scenarios
- Exploring AMD firmware and the boot flow as well as platform security technologies
- Migrating workloads from Intel MKL to AMD AOCL and profiling workflows from Intel VTune to AMD uProf

**Level** – X86 L0

### Course Details

- 2 days instructor led training (online or in person)
- 9 lectures
- 2 labs

**Price** – \$1,600 or 16 AMD Training Credits

**Course Part Number** – EMBD-MGRT-X861

**Who Should Attend?** – Embedded software developers and system architects as well as hardware designers and board engineers working on x86 platforms

### Prerequisites

- Basic knowledge of x86 architecture and Intel/AMD processor families
- Familiarity with thermal design, power delivery, and memory subsystem principles
- Experience with firmware development and profiling tools

### Software Tools

- AMD AOCL
- AMD uProf

### Hardware

- Architecture: Zen
- Demo board: Lilac board

After completing this comprehensive training, you will have the necessary skills to:

- Evaluate AMD Zen 5 performance enhancements and compare with Intel architectures
- Map and migrate Intel instruction sets to AMD equivalents for embedded deployments
- Redesign thermal systems for AMD platforms
- Ensure signal integrity during Intel-to-AMD migration scenarios
- Apply memory initialization and training flows with the AGESA™ firmware

- Replace Intel FSP with AMD AGESA firmware and debug configurations
- Implement platform security migration strategies with AMD SME, SEV, and SEV-SNP technologies
- Transition from Intel MKL to AOCL libraries and validate workloads
- Optimize performance profiling using AMD uProf instead of Intel VTune

## Course Outline

### Day 1

- **AMD Zen 5 Microarchitecture and Competitive Comparison**  
Discusses AMD Zen 5 enhancements for performance gains and compares AMD embedded portfolios to Intel. {Lecture}
- **Instruction Sets for x86 Embedded Architectures**  
Describes key x86 extensions, identifies tuning strategies and compatibility checks, and covers Intel-to-AMD migration plans. {Lecture}
- **Transitioning Thermal Designs**  
Reviews processor packaging and thermal parameters, outlines redesign strategies, and differentiates between AMD and Intel thermal tools. {Lecture}
- **Signal Integrity in Embedded x86**  
Describes signal integrity principles and applies them to Intel-to-AMD migration scenarios. {Lecture}
- **Memory Interface Transition**  
Explores AMD vs. Intel memory differences, outlines initialization/training with AGESA firmware, and discusses validation/debug methodologies. {Lecture}

### Day 2

- **AMD Firmware Stack Overview**  
Defines the concept of firmware and the boot process, maps Intel-to-AMD workflows, and describes UDK AGESA components. {Lecture}
- **Platform Security Migration**  
Explains platform security concepts, describes AMD SME, SEV, SEV-SNP technologies, and highlights migration strategies. {Lecture}
- **Optimizing x86 Embedded: Migrating from Intel MKL to AMD AOCL**  
Identifies AOCL equivalents to Intel libraries and describes how to validate performance and migrate/tune workloads for AMD platforms. {Lecture, Lab}
- **Optimizing Performance on AMD Platforms: Migrating from Intel VTune to AMD uProf**  
Compares AMD uProf vs. Intel VTune and discusses profiling on AMD CPUs/GPUs and how to optimize AOCL-based workloads as well as apply structured migration workflows. {Lecture, Lab}

## Register Today

Morgan Advanced Programmable Systems, Inc. (Morgan A.P.S.) delivers public and private courses in locations throughout the central US region; including Iowa, Illinois, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin.

Visit [morgan-aps.com/training](https://morgan-aps.com/training), for full course schedule and training information.



- You must have your tuition payment information available when you enroll. We accept credit cards (Visa, MasterCard, or American Express) as well as purchase orders and AMD training credits.

### **Student Cancellation Policy**

- Student cancellations received more than 7 days before the first day of class are entitled to a 100% refund. Refunds will be processed within 14 days.
- Student cancellations received less than 7 days before the first day of class are entitled to a 100% credit toward a future class.
- Student cancellations must be sent [here](#).

### **Morgan A.P.S. Course Cancellation Policy**

- We regret from time-to-time classes will need to be rescheduled or cancelled.
- In the event of cancellation, live on-line training may be offered as a substitute.
- Morgan A.P.S. may cancel a class up to 7 days before the scheduled start date of the class; all students will be entitled to a 100% refund.
- Under no circumstances is Morgan A.P.S. responsible or liable for travel, lodging or other incidental costs. Please be aware of this cancellation policy when making your arrangements.
- For additional information or to schedule a private class contact us [here](#).

### **Online or in person training with real hardware**

- Morgan Advanced Programmable Systems, Inc. has set up a training VPN where engineer participants can take classes online using the same computers and devCards used during in-person training.
- Even better, and upon request, you can use these computers after hours on training days to experiment with labs. This is not possible for in-person training.
- Additionally, just like in-person training, the laptops and devCards, tools, OS, and licensing are set up in advance.
- In some ways, live online-training is better than in-person...for example, you can grant the instructor permission to look at your Vivado, PetaLinux terminal, or Vitis for extended periods of time if your lab is not going exactly as planned to a missed step.
- This is often more comfortable than two engineers crowding around a laptop screen.
- Taking remote training also allows you to learn some tips and tricks for working remote. Whether your devCard is in the lab down the hall, or across the world via VPN, you can control your AMD based device quickly and efficiently.