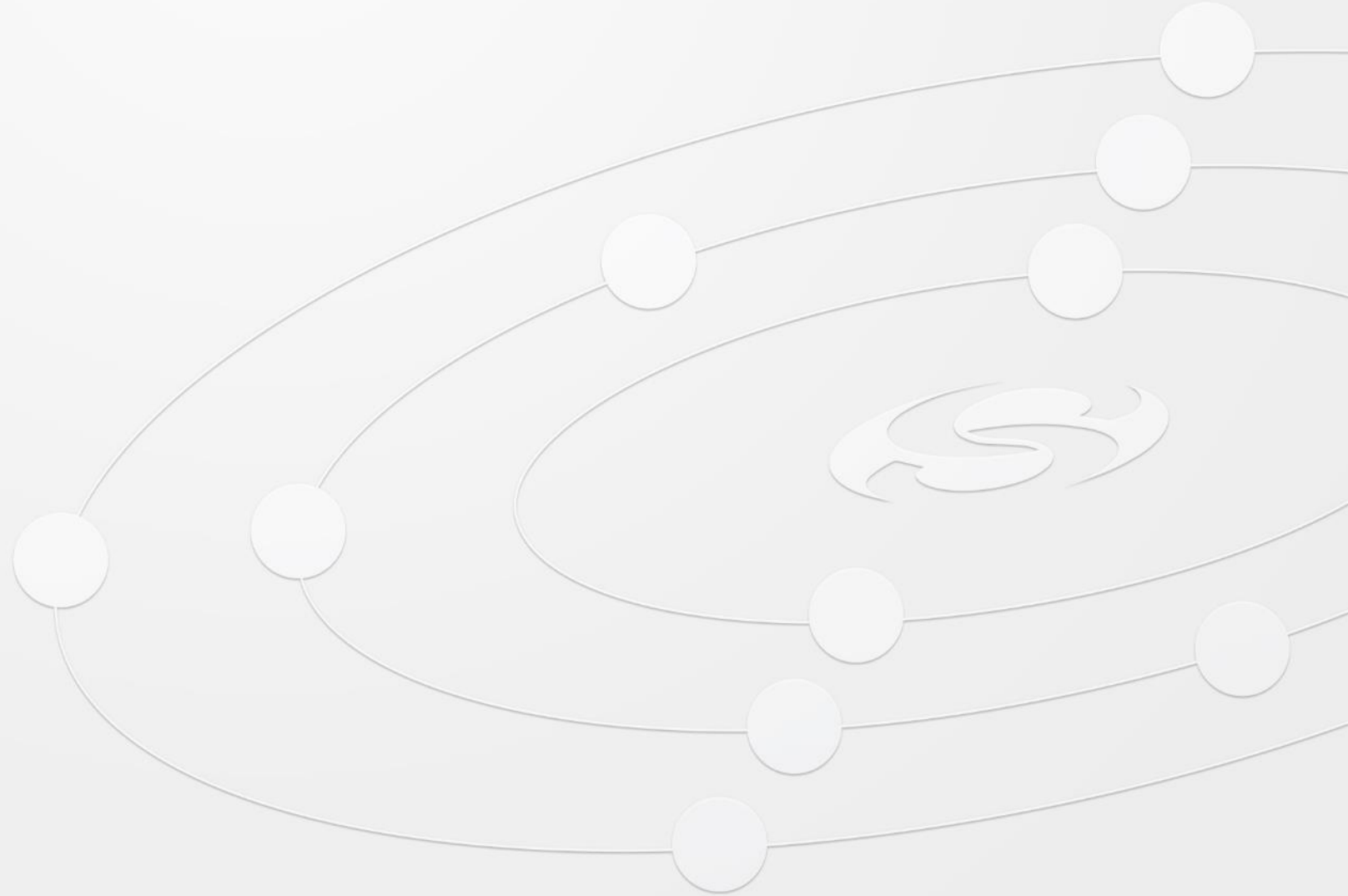




# Micrium OS Overview

MARK MULROONEY



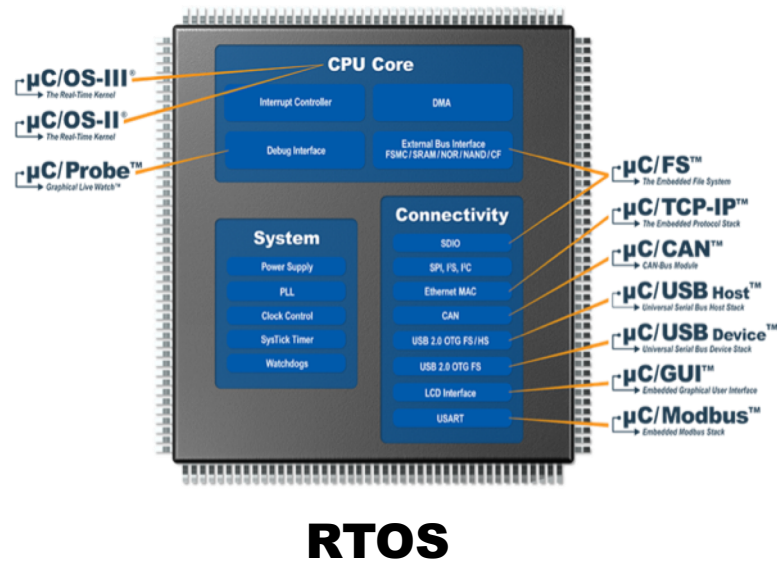
# Background

- Micrium was founded in 1999, acquired by Silicon Labs in 2016
- Main office in South Florida, with an additional facility in Montreal
- Provider of high-quality embedded software
  - Known for remarkably clean code, thorough documentation, and top-notch technical support
  - A full lineup of products, including real-time kernels, protocol stacks, a file system module, and GUI software



# Who Are We?

- An Embedded Software Company
  - Proven - Shipping uC/OS For Over 25 Years
  - Most Widely Deployed RTOS (UBM 2015 Survey)
  - Strong in Safety Critical Applications
  - High Quality and Robust Code



**Debug Tools**



**Education**

# Micrium Customers

- Micrium's customer base represents a broad range of market segments
  - Industrial (~39% of sales), aerospace (13%) and medical (11%) are among the most popular markets
- Customers are located worldwide, although the majority of business is still in the Americas
- Licensees include many segment leaders



# Micrium Offerings

**μC/OS<sup>TM</sup>**  
RTOS and Stacks

- Ported to over 50 architectures
- Deployed by top semiconductor providers, including Altera, Analog Devices, and Microchip
- Free 45 day trial for all Micrium modules

**Micrium OS**

- Silicon Labs only
  - EFR32 and EFM32
- Kernel is free for Silicon Labs customers
  - Additional charge for other modules
- Free 45 day trial for all Micrium modules

# Micrium Offerings



# Micrium OS

- **Kernel**

- µC/OS-II
- µC/OS-III

- **Communication**

- µC/TCP
- µC/USB-Device
- µC/USB-Host
- µC/CAN
- µC/Modbus

- **Storage and Display**

- µC/FS
- µC/GUI

- **Kernel**

- **Communication**

- Network
- USB Device
- USB Host

- **Storage and Display**

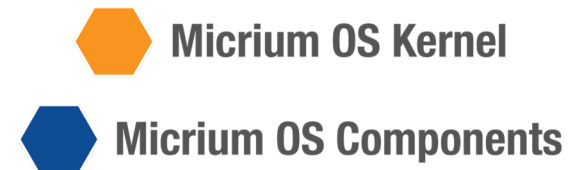
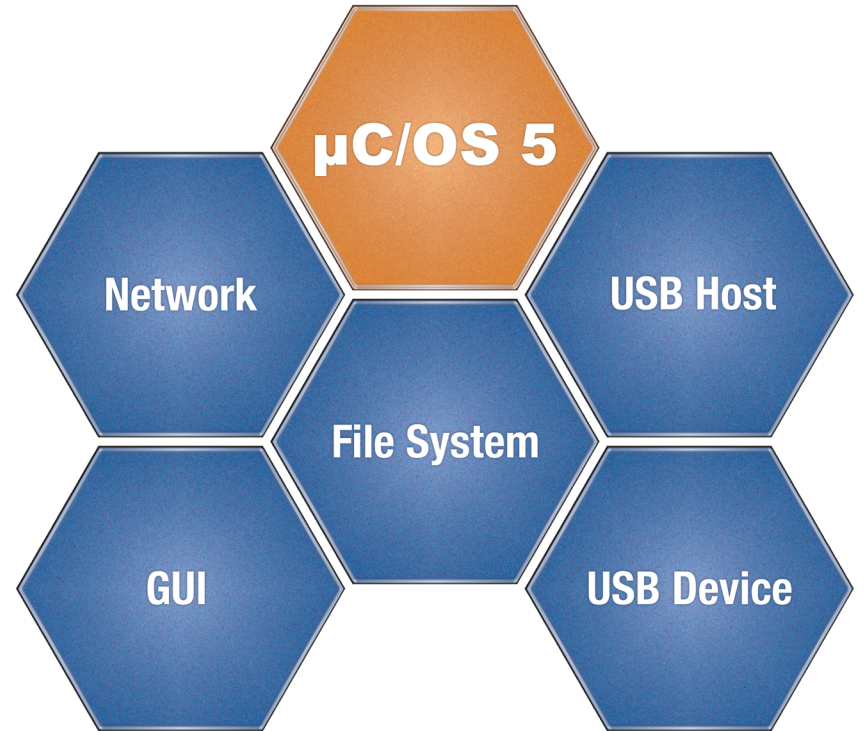
- File System
- GUI

Micrium OS



# Micrium OS

- A full-featured embedded operating system
  - Tightly integrates all components of the operating system together
- Released in 2017
  - Ready for devices running on Silicon Labs platforms.
  - EFR32 and EFM32
- Not a single package intended for use on all Silicon Labs devices
  - Few dependencies among the components allows developers select the software modules that make sense for their project



# Micrium OS Kernel

- Based off the **extremely** successful  $\mu$ C/OS-III kernel
  - Updated error handling
- A **reliable** kernel with an efficient, preemptive scheduler
  - Supports round-robin scheduling at each task priority level
- Supports an **unlimited** number of tasks and other kernel objects
- Highly configurable
  - Gives the ability to enable and disable most parts of the kernel to save space
  - ROM size ranges from **6-24 kBytes**
  - RAM size is typically **3-4 kBytes**
- Delivered in source-code form, and its thorough documentation helps to ensure a smooth user experience
- Built-in performance measurement capabilities

# Micrium OS: Communication Software

- **Network**

- Features dual IPv4 and IPv6 support, an SSL/TLS socket option
- Supports DHCP, DNS, HTTP, MQTT, SNTP, Telnet, SMTP, TFTP, FTP

- **USB Device**

- Support for Audio, CDCACM, CDCEEM, HID, MSC, and Vendor classes

- **USB Host**

- A USB host stack for embedded systems equipped with a USB host or OTG controller.
- Includes support for MSC, HID, CDC ACM, USB2Ser and AOAP classes

# Micrium OS: Storage and Display Software

- **File System**

- A FAT file system compatible with a wide range of storage devices. An optional journaling component provides fail-safe operation

- **Graphical User Interface**

- A graphical user interface solution capable of satisfying a variety of display needs, from simple monochrome text to rich, full-color images and touch-screen functionality