CycloneTCP is a dual IPv4/IPv6 stack dedicated to embedded applications. CycloneTCP conforms to RFC standards and offers seamless interoperability with existing TCP/IP systems. By supporting IPv6, CycloneTCP eases deployment of next-generation Internet. The stack is distributed as a full ANSI C and highly maintainable source code. CycloneTCP is available either as open source (GPLv2) or under a commercial license.

**Main Features**

- Dual stack (IPv4 and/or IPv6)
- Built-in support for multiple network interfaces
- BSD style socket API
- Blocking/non-blocking socket operation and event-driven functions (select and poll)
- Efficient data transfer through zero copy
- Well-crafted TCP module with selective acknowledgement (SACK) and congestion control
- Raw socket interface
- Multicast support (IGMPv2 and MLDv1)
- IP fragmentation and reassembly support
- Flexible memory footprint. Built-time configuration to embed only the necessary features
- High throughput
- Off-load checksum calculation (when supported by hardware) to accelerate IP/TCP/UDP/ICMP checksum generation and verification
- Configurable memory model: Static memory pool or heap memory allocation
- Dialog-based configuration wizard
- Portable architecture (no processor dependencies)
- Straightforward port to any RTOS
- Debugging and trace functionality to ease development and integration
- Highly maintainable source code
- Supports industry-standard microcontrollers with built-in MAC as well as standalone Ethernet controllers

**Add-On Modules**

- WebSocket client and server
- Auto-IP for dynamic configuration of IPv4 address
- DHCP client
- SLAAC for dynamic IPv6 address assignment and auto-configuration
- DHCPv6 client and relay agent
- Host name resolution (DNS, mDNS and NetBIOS Name Service)
- mDNS and NetBIOS responder
- DNS service discovery (DNS-SD)
- SMTP client for sending e-mails
- FTP client
- Secure FTPS client (both implicit and explicit security modes are supported)
- FTP server
- HTTP server with Server-Sides
  Includes and CGI scripting for dynamic contents
- Secure Web server (HTTPS)
- MQTT v3.1.1 client (TCP, SSL/TLS, WebSocket and secure WebSocket transport layers supported)
- CoAP client (UDP and DTLS transport layers supported)
- SNMPv1/v2c/v3 agent (MD5/SHA-1 authentication and DES/AES privacy protocols are supported)
- SNTP client (Network time synchronization)
- TFTP server
- PPP (Point-to-Point) protocol
- Icecast/SHOUTcast client for streaming audio over the Internet

**Related products**

- CycloneSSL (lightweight SSL/TLS library)
- CycloneCrypto (cryptographic toolkit)
## Supported Devices

### MCUs with 10/100 Ethernet MAC:

| Atmel® | AVR32 UC3A  
|        | SAM3X  
|        | SAM4E  
|        | SAM7X  
|        | SAM9263  
|        | SAME54  
|        | SAME70  
|        | SAMV71  
| Freescale® | Coldfire V2  
|           | Kinetis K6x / K7x  
|           | Kinetis KV5x  
|           | i.MX RT1052  
| Infineon® | XMC4500  
|           | XMC4700  
|           | XMC4800  
| Microchip® | PIC32MX  
|           | PIC32MZ EC/EF  
| Microsemi® | SmartFusion  
|           | SmartFusion2  
| Nuvoton® | NUC472  
| NXP® | LPC1700  
|       | LPC1800  
|       | LPC2300  
|       | LPC4300  
|       | LPC54608  
| Renesas® | RX62N  
|           | RX63N  
|           | RX64M  
|           | Synergy S7  
| Spansion® | FM4  
| ST® | STM32F107  
|       | STM32F207/217  
|       | STM32F407/417  
|       | STM32F427/437  
|       | STM32F429/439  
|       | STM32F746/756  
|       | STM32H743/753  
|       | STR912  

### MCUs with 10/100 Ethernet MAC+PHY:

| Texas Instruments® | Stellaris LM3S  
|                    | Tiva TM4C129X  

### MPUs with 10/100 Ethernet MAC:

| Atmel® | SAM5D2  
|        | SAM5D4  
| Renesas® | RZ/A1L / LU  
|          | RZ/A1M  
|          | RZ/A1H  

### MPUs with Gigabit Ethernet MAC:

| Atmel® | SAM5D3  
| Texas Instruments® | Sitara AM335x  

### DSPs with 10/100 Ethernet MAC:

| Texas Instruments® | Concerto F28M35x  
|                    | OMAP-L138  

### Processor IP cores with 10/100 Ethernet MAC:

| Cortus® | APS1/3/5  

### Standalone 10/100 Ethernet Controllers:

| Davicom® | DM9000A/B  
| Microchip® | KSZ8851  
| Microchip® | ENC28J60  
|            | ENC624J600  

### Wi-Fi modules (802.11b/g/n):

| Atmel® | WILC1000  
|        | WINC1500  
| Broadcom® | BCM43362  
| Espressif® | ESP32  
| ESP8266  
| Microchip® | MRF24WG0MA/B  
| Murata® | SN8000  
|          | SN8205  
| MXCHIP® | EWM3162  

### Ethernet PHY transceivers:

| Davicom® | DM9161  
| Micrel® | KSZ8031  
|          | KSZ8041  
|          | KSZ8051  
|          | KSZ8081  
|          | KSZ8721  
| Renesas® | uPD6061x  
| SMCS® | LAN8710  
|          | LAN8720  
|          | LAN8740  
|          | LAN8742  
| ST® | ST802RT1A  
| Texas Instruments® | DP83620  
|          | DP83848  

### Gigabit Ethernet PHY transceivers:

| Atheros® | AR8031  
| Micrel® | KSZ9031  

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Reference Standards

**Network Layer (IPv4)
- RFC 791: Internet Protocol Specification
- RFC 792: Internet Control Message Protocol Specification
- RFC 815: IP Datagram Reassembly Algorithms
- RFC 826: Ethernet Address Resolution Protocol
- RFC 1112: Host Extensions for IP Multicasting
- RFC 1122: Requirements for Internet Hosts - Communication Layers
- RFC 2113: IP Router Alert Option

**Network Layer (IPv6)
- RFC 2464: Transmission of IPv6 Packets over Ethernet Networks
- RFC 2710: Multicast Listener Discovery (MLD) for IPv6
- RFC 3484: Default Address Selection for Internet Protocol version 6 (IPv6)
- RFC 3493: Basic Socket Interface Extensions for IPv6
- RFC 4291: IP Version 6 Addressing Architecture
- RFC 4294: IPv6 Node Requirements
- RFC 4443: Internet Control Message Protocol Version 6 (ICMPv6) Specification
- RFC 4861: Neighbor Discovery for IP version 6 (IPv6)
- RFC 4862: IPv6 Stateless Address Autoconfiguration

**Transport Layer
- RFC 768: User Datagram Protocol
- RFC 793: Transmission Control Protocol
- RFC 2018: TCP Selective Acknowledgment Options
- RFC 5681: TCP Congestion Control
- RFC 6298: Computing TCP's Retransmission Timer

**Application Layer
- RFC 959: File Transfer Protocol (FTP)
- RFC 1035: Domain Names – Implementation and Specification
- RFC 2131: Dynamic Host Configuration Protocol
- RFC 2132: DHCP Options and BOOTP Vendor Extensions
- RFC 2616: Hypertext Transfer Protocol - HTTP/1.1
- RFC 2617: HTTP Authentication: Basic and Digest Access Authentication
- RFC 2818: HTTP Over TLS
- RFC 3207: SMTP Service Extension for Secure SMTP over Transport Layer Security
- RFC 3315: Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- RFC 3646: DNS Configuration options for DHCPv6
- RFC 4954: SMTP Service Extension for Authentication
- RFC 5321: Simple Mail Transfer Protocol
- RFC 6762: Multicast DNS
- RFC 7252: The Constrained Application Protocol (CoAP)