

# NET+OS<sup>®</sup> 7

## Integrated Real-Time OS Development Platform

### Overview

NET+OS is a complete and royalty-free software platform for networked-enabled embedded system development that allows you to take immediate advantage of Digi's leading and long-time expertise in embedded network technology.

A true turnkey solution specifically designed and optimized for Digi's own 32-bit NET+ARM processors and embedded modules, it offers a professional and fully integrated development environment with the integrated building blocks needed to build secure networking products.

### About NET+OS

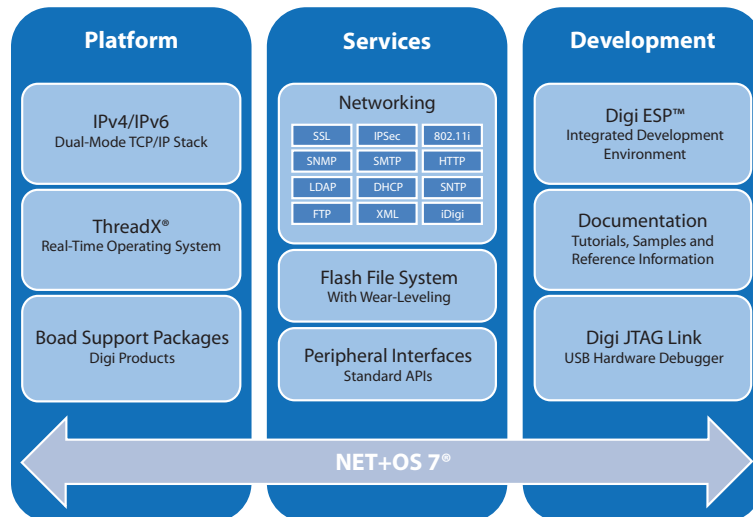
Using the right network technology is a key factor for market success, and NET+OS offers a complete and industry leading set of components that will ensure your products are equipped with the network technology required to be successful today and in the future.

At the heart of NET+OS is the field-proven ThreadX<sup>®</sup> Real-Time Operating System (RTOS). With over 600 million deployments in products worldwide, ThreadX is one of the most reliable and successful RTOS solutions available. NET+OS also provides a dual-mode IPv4/v6 capable TCP/IP stack, the Allegro advanced web server RomPager<sup>®</sup>, and integrated support for a wide variety of network services and protocols such as bridging, IPsec, SNMP, LDAP, SSL/TLS, POP3, SMTP, XML, Digi's RealPort<sup>®</sup> technology and the cloud-based iDigi<sup>®</sup> M2M network operating platform.

Leading wireless LAN software technology such as complete WPA2/802.11i security, Wi-Fi Protected Setup<sup>™</sup> for easy product setup and configuration, and built-in support for Ekahau's real-time location solution make NET+OS the ideal choice for true enterprise-grade applications and product designs.

The professional and innovative Digi ESP<sup>™</sup> development tools offer an IDE with editor, single-step debugging, seamless debugger hardware integration, managed make files, build environment, project wizard for ready-to-use application frameworks, and context-sensitive online help.

Digi also offers complete technical support for all hardware and software components, effectively eliminating the often inefficient and time-consuming interaction with multiple vendors. Working with a single, competent partner dramatically reduces your overall design risk and keeps your product development schedule on track.



### Features/Benefits

Complete and royalty-free turnkey development solution

Based on ThreadX Real-Time Operating System

Rich variety of networking and security services

Digi ESP integrated development environment

Common development platform for Digi modules and NET+ARM processors

Digi is the single source for complete hardware and software support

- Immediate development of powerful products without licensing cost
- Reliable operating system platform with small memory footprint
- Complete set of features and capabilities for network-connected devices
- Professional embedded development right out of the box
- Easy migration across all Digi product platforms provides unique design flexibility and protects your investment
- Eliminates time-consuming and inefficient interaction with multiple vendors



[www.digi.com](http://www.digi.com)



## Digi ESP

Professional and complete Windows-based Digi ESP development tools built on the open Eclipse™ framework and optimized GNU tools

- Visual source code debugger
- C/C++ source code editor
- Color-coded syntax highlighting
- Intelligent code assist
- Context-sensitive NET+OS API help
- Project builder for application templates
- Standard and managed make file support
- Integrated CVS version control system support
- Online software updates for NET+OS and Digi ESP via Digi Package Manager

See [Digi ESP feature spec](#) for more information.

## Hardware Debuggers

- Digi JTAG Link USB 2.0 debugger
- EPI MAJIC®
- Macraigor Raven™

## Board Support Package

Complete peripheral support\* for NET+ARM based module and chip designs (BSP source code provided).

- |                      |                                       |
|----------------------|---------------------------------------|
| • Ethernet           | • Serial UART                         |
| • SPI                | • I <sup>2</sup> C                    |
| • Flash              | • NVRAM                               |
| • Cache              | • LCD                                 |
| • PCI/CardBus        | • RTC                                 |
| • ADC                | • FIM                                 |
| • Quadrature Decoder | - SD/SDIO, 1-Wire®, I <sup>2</sup> S, |
| • AES HW             | UART, CAN®, J1708,                    |
| • PWM                | SPI, USB device (ls)                  |
| • USB device         | • USB host                            |
|                      | - Keyboard, mouse,                    |
|                      | printer, mass storage                 |

\*Interface availability depending on hardware capabilities.

## ThreadX RTOS Kernel

- |                      |              |
|----------------------|--------------|
| • Threads            | • Queues     |
| • Application timers | • Semaphores |
| • Event flags        |              |

## TCP/IP Stack

High-performance Treck™ dual-mode TCP/IP stack with IPv4 and IPv6 support.

- |           |        |
|-----------|--------|
| • TCP/UDP | • ICMP |
| • IGMP    | • ARP  |
| • RARP    |        |

## Stack Bypass Filtering

The stack bypass API allows special packet filtering to provide deterministic response times through application-specific exception handling.

## Higher Level Networking Protocols and Services

- BSD Sockets API
- Zero-Copy API
- SSL 3.0/TLS 1.0
- IPsec (Policy/VPN)
- LDAPv3 directory access services
- ADDP (Advanced Device Discovery Protocol)
- SNMPv1/2/3 agent
- SNTP (Simple Network Time Protocol)
- SLP (Service Location Protocol)
- DNS (Domain Name Service)
- DHCP
- Bridging
- BOOTP
- Basic/Advanced Web Server (HTTPv1.1)
- Email (POP3, SMTP and ESMTP)
- PPP (Point-to-Point Protocol)
- FTP server/client
- Telnet server
- Command Line Interface (CLI) API
- RealPort® (Server)
- Graphics Library (WxWidgets)
- Power Management
- iDigi API
  - Visit [www.idigi.com](http://www.idigi.com) for more information about the cloud-based iDigi M2M platform.

## Internet Address Manager (IAM)

- |                      |                        |
|----------------------|------------------------|
| • Dynamic (DHCPv4/6) | • Auto IP (IPv4/6)     |
| • Static IP (IPv4/6) | • User-defined methods |

## Integrated Security

- WPA/WPA2/802.11i WLAN security
- SSL 3.0/TLS 1.0
- SSHv2 Server (secure CLI)
- IPsec
- HTTPS
- Secure HTTP realms (basic/MD5)
- ESMTP (plain, login, MD5, CRAMMD5)
- Data encryption API (AES/DES/3DES)

## File System Support

- Native file system
  - Support for RAM and Flash data types, with Flash wear-leveling feature
  - Support for files of any length
  - Shared files among Flash sector boundary
  - Date and time stamp for files/directories
  - 32 levels of user-defined permissions
- FAT16/32 file system
  - Supported on USB mass storage devices

## Documentation

- Quick start guide
- NET+OS programmer's guide
- NET+OS API documentation
- Advanced Web Server
- Hardware reference manuals
- Development board schematics

## Utilities

- HTML-to-C compiler
- XML SAX parser (source code)
- NET+OS programmer tool

## Advanced Web Server

- Dynamic data content
- Web development tools
- 8 possible realms with controlled username/password access
- Optional connectivity to the local file system
- Common Gateway Interface (CGI) capability
- File upload capability
- Run-time-adjustable options
  - Number of simultaneous connections, timeouts, non-standard ports, error pages

## Wireless LAN

- Service Sets
  - Infrastructure (BSS)
  - Ad-Hoc (IBSS)
- Security
  - WEP (Wired Equivalent Privacy)
    - 64/128-bit encryption (RC4)
  - WPA/WPA2/802.11i
    - 128-bit TKIP/CCMP (AES) encryption
    - Enterprise mode (802.1X)
      - LEAP (WEP), PEAP, TTLS, TLS, EAP-FAST
      - GTC, MD5, OTP, PAP, CHAP, MSCHAP, MSCHAPv2, TTLS-MSCHAPv2
  - Pre-shared key mode (PSK)
- Configuration
  - Wi-Fi Protected Setup (WPS)
- Real-Time Location Services
  - Utilizing leading Ekahau RTLS technology
  - Locates down to floor/room/door level
  - Up to 1 meter (3.5 ft) average accuracy

Visit [www.ekahau.com](http://www.ekahau.com) for more information about the Ekahau RTLS solution.

## Supported Hardware

- Digi Connect ME®/Wi-ME
- Digi Connect EM®/Wi-EM
- Digi Connect ME® 9210
- ConnectCore™ 9P/Wi-9P 9215
- ConnectCore™ 7U
- ConnectCore™ 9C/Wi-9C
- ConnectCore™ 9P 9360
- Digi NET+ARM processors
  - NS9215, NS9210
  - NS7520, NS9360, NS9750

