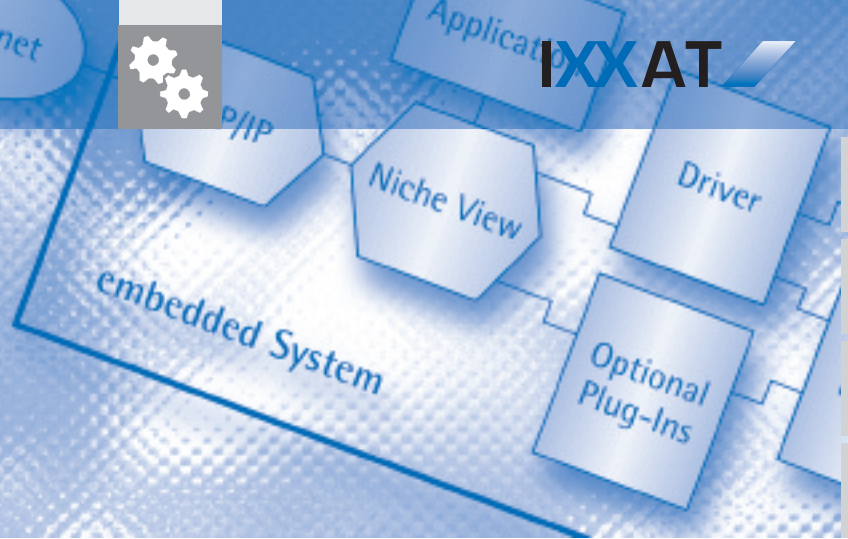


TCP/IP



NicheStack IPv4 & NicheLite TCP/IP

► Communication Protocols

NicheStack and NicheLite are both fully functional and easily portable TCP/IP stacks that contain all basic protocols for Internet-, Intranet- and LAN-connections. They are supplied as source code (ANSI-C) together with a socket API and comprehensive, detailed documentation.

Both stacks contain the following protocols and services:

- Address Resolution Protocol (ARP)
- Internet Protocol (IP)
- Internet Control Message Protocol (ICMP)
- Dynamic Host Configuration Protocol Client (DHCP-Client)
- Trivial File Transfer Protocol (TFTP)
- Transport Control Protocol (TCP)
- User Datagram Protocol (UDP)
- NicheTask (on request)

Additionally, the NicheStack also includes:

- File Transfer Protocol (FTP)
- TELNET
- IP Multicast

MEMORY REQUIREMENTS

The two stacks differ in some functional features which results in different codesize: NicheLite is extremely slim and requires only about 12 kByte of code. However, it supports only one interface (Ethernet-Controller, PPP, etc.), does not allow routing or multicasting, and has only a mini-socket with BSD-subset. While NicheStack does not have these limitations, it does require substantially more memory. A standard application on a 32-bit processor with ARP, IP, ICMP, UDP, DHCP and TCP results in a code size of about 42 kBytes. A socket-API increases the code requirement to approximately 52 kBytes.

OVERVIEW PROTOCOLS/SERVICES

	NicheLite Mini-IP	NicheStack
Code Size	4 kB	15 kB
UDP	x	x
IP	x	x
Routing	-	x
ICMP	x	x
ARP	x	x
Network	1 Interface	Unlimited
Multicast	-	x

	NicheLite Mini-TCP	NicheStack
Code Size	6 kB	31 kB
TCP	x	x
Sockets	Mini (BSD Subset)	Full BSD

SPECIFIC FEATURES

- **Easy integration:** NicheStack and NicheLite can be used in connection with RTOS as well as being integrated in super-loops. Special multitasking capabilities are not required.
- **Versatile, flexible memory management:** memory is used economically and available again immediately after use.
- Memory is allocated via macros and can thus be easily adapted to various compilers.
- **RTOS-independent:** both stacks provide an "Application Process Interface" for major operating systems, simplifying integration into these operating systems.
- **Network interfaces:** both stacks support Ethernet, Token Ring, SLIP and PPP.
- **Zero-Copy-Stack:** for the exchange of data between various protocol levels, a single memory buffer is used. The buffer is passed by reference, not copied, from one protocol level to the next, providing maximum performance with minimal memory requirement.



NicheStack IPv6 & NicheStack Dual IPv4v6

► Communication Protocols

The products NicheStack v6 and NicheStack Dual v4v6 are a logical further development of the NicheStack for the new Internet standard IPv6. NicheStack v6 supports the new Internet standard IPv6. NicheStack Dual v4v6 supports both IPv4 and IPv6. This is done at package level, where it is possible to use both protocols (IPv4 and IPv6) in parallel on one network.

Protocols contained in NicheStack v4 and NicheStack Dual v4v6: see NicheStack IPv4.

SPECIFIC FEATURES

- Specifically optimized for embedded applications (code size, memory requirement and performance)
- Easily portable via ANSI-C source code
- Prepared for real-time operating systems (upcalls) or Superloop (contained as a template in the source code)
- Stack works in blocking mode or non-blocking mode
- Supports MIB-II statistics (number of packages transmitted/-received, retransmits, collisions,...) for troubleshooting and optimization

Add-ons

► NicheStack IPsec/IKE

IPsec/IKE allows encryption of all data contents of IP packages. The keys can be replaced via the Internet (public/private key procedure). Available encryption mechanisms: DES, Triple DES, AES (128, 192, 256 Bit), MD5, SHA-1, SHA-2 (256, 384, 512 Bit).

► NicheStack SSL

SSL allows encryption of the complete TCP data traffic and is often considered to be the standard for encryption of Internet data (e.g. online banking). Available encryption mechanisms: RC4 (128 bit key), Triple DES, MD5, SHA-1 (160 bit).

► NicheStack TELNET-Server

The TELNET-Server is an additional package for the TCP/IP-protocol stacks (already included in NicheStack IPv4) and allows remote access or remote control of the device via a network. It is completely compatible with the standard TELNET-Clients contained, for example, in operating systems such as Windows.

► NicheStack PPP

The PPP protocol stack is an additional package for the TCP/IP protocol stacks. It includes the protocols LCP, IPCP, PAP and CHAP and allows the TCP/IP stack communication via the serial interface. Utilization of a telephone modem (analogue, ISDN, GSM) is supported by the NicheStack PPP.

► NicheStack FTP

The FTP-stack supplements the TCP/IP-protocol stacks by the client and server functions of the File Transfer Protocol FTP. FTP offers the user a standardized file exchange between two systems and checks the integrity of the data. The stack contains a FTP-Client as well as a FTP-Server.

► NicheStack POP3

The POP3 module allows the implementation of the e-mail protocol POP3 on an embedded system, allowing e-mails to be picked up from any POP3 e-mail server.

► NicheStack SMTP

NicheStack SMTP allows the implementation of e-mail notification functions on an embedded system. Therefore, pre-defined e-mails can be sent to any e-mail address; for example, to specifically draw attention to faults or in order to transmit production data automatically. It is also possible to send e-mails to several addresses.

► DHCP-Server

This software package allows the implementation of a DHCP server on an embedded system. This enables the system to allocate temporary or permanent IP-addresses to Clients. DHCP is the standard method to allocate a temporary IP-address to devices which do not have a permanent one.

► NicheStack HTTP-Server

NicheStack HTTP Server enables a full Webserver to be implemented on an embedded system, making it possible to access this system by means of common browsers such as Netscape Navigator or Internet Explorer in the same way as any other server in the network. All standard features of a web-server, like CGI, SSI, Server Push and authorization of selected webpages are supported by NicheStack HTTP Server. In addition, NicheStack HTTP Server includes a HTML compiler which can integrate standard HTML files, pictures (gif, jpg) or Java applets into the webserver project without needing to implement a file system.

► SNMP v1, v2c or v3 Agent

The Simple Network Management Protocol is the most commonly used protocol for the configuration and maintenance of network components. An SNMP-agent can be implemented with each of the three SNMP-modules.

► NicheView

NicheView is a physically accommodating yet extremely efficient WWW-browser for embedded systems. This product provides an interface for all user inputs such as keyboard inputs, mouse-clicks etc. and for outputs such as text or image displays etc. With a code size of only 35 kByte, NicheView implements HTML 3.2, multiple fonts, plug-ins and JavaScript in one device. It supports frames, animated GIFs, Color and JPEG, as well as tables and forms.