RoweBots Limited

Software Data Sheet

Unison RTOS version 5.3

Ultra tiny embedded Linux™ or POSIX™ compatible RTOS

Unison and

Internet Protocols

Features

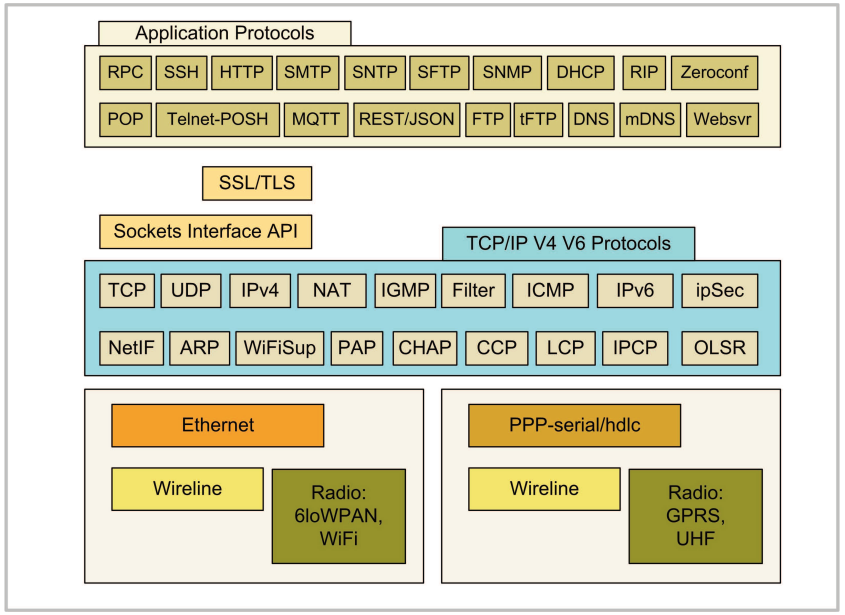

Figure 1: General Internet Protocols with TCP/UDP/IPv4/IPv6

The Unison Internet protocol stacks offer users a tiny footprint, size and feature selectable solution which can be optimized for a broad set of applications.

These stacks are completely POSIX compatible providing standard interfaces and algorithms consistent with industry mainstream offerings.

This maximizes software reuse while minimizing training and redevelopment.

A broad set of application protocols ensure that users have the functionality that they need off the shelf. This includes a tiny web server with dynamic page capabilities, file transfer options, network time and monitoring as well as email protocols.

The lower level Internet protocols are very complete as well. This includes complete router capabilities, IPv4, IPv6 or mixed IPv4 and v6, wireless protocol support and a POSIX sockets interface.

There is nothing to build or add for the vast majority of applications – it runs right out of the box in whatever size, performance level or configuration you need.

Security is an integral part of the Unison networking package and users benefit from out of the box security features which allow fast and simple construction of secure systems using POSIX standard calls.

Both VPN security options (IPSEC) and socket based security options (SSL/TLS 1.2) are offered with a wide range of additional protocols and applications to ensure out of the box operation for your applications.

Wireless integration is included allowing fast and easy implementation of mobile and detached applications. From 802.15.4 with 6loWPAN and IPv6 through GPRS, GPS and GSM connectivity, Unison offers it all – so you don't have to build it.

Wireless integration has also been expanded to WiFi mesh networks using advanced WiFi modules and Optimal State Link Routing (OLSR). Using this approach, large adhoc networks can be build which are dynamically adaptable and self configuring. This creates opportunities for reducing installation/wiring costs and eliminating costly system configuration costs at installation time.

Multiple network interfaces, zero copy implementation, high performance, adjustable buffer sizes, flexible buffers, DMA options, neighbour discovery protocol, stateless address auto-configuration and duplicate address detection are included in the overall internet protocol solutions. All are tested with industry standard test packges for both performance and compliance.

The Unison Internet Protocols implement the latest protocol variants, sometimes also providing backward compatible protocols. This is explicitly done so your application always gets implemented with the latest and greatest standards.

The Unison Internet Protocols provide a complete isolated package for various layers in the protocol. In this way, the entire section can be replaced with a custom or more desirable version without discarding the other components and the overall architecture is very easily understood.

Time to market is critical and we offer optimal savings through our extensive set of components and tools based on POSIX application programming interfaces which leads directly to minimum total cost of ownership.

Application Internet Protocols

AutoIP is fully supported. It offers the ability to bring up a network in isolation when a DHCP server is not available.

SNMP v1, 2c and v3 are all supported. It supports off the shelf standard MIBs for networking and user defined MIBs for variable tracking and event triggers.

Telnet/POSH offer the ability to login to the target system and perform a variety of commands including querying the file system, changing system parameters and examining objects.

DHCP Client and Server are both supported. They offer the ability to automatically get an IPv4 address on the network or automatically provide one to another node.

FTP and tFTP provide a small file transfer capability and a more elaborate file transfer capability.

SFTP is used for secure file transfer to/from target systems.

SSH is used for secure configuration of target systems

RPC/XDR provide the ability to communicate using a remote procedure call to a remote system across the Internet.

DNS – Http – Webserver are all provided to allow users to get an IP or other information about a website, query the site or get a file from the site and to provide an HTTP web interface.

Zeroconf / mDNS are supported. The multicast Domain Name System (mDNS) is a zero configuration host name resolution service. The mDNS protocol uses IP multicast UDP packets.

The latest components under version 5 of Unison are:

- MQTT
- REST/JSON/BSON

RoweBots is fully committed to delivering a comprehensive set of Internet of Things (IoT) protocols with examples working with various host environments. Thus far, MQTT and HTTP/RESTful versions are shipping and other protocols of interest to significant numbers are planned, in development or in test. Please consult the RoweBots Unison OS data sheet "Internet of Things Protocols" for more details.

Low Level Internet Protocols

PPP is a serial protocol for TCP/UDP communication between nodes. It supports both asynchronous as well as HDLC communication. PPP is generally used with wireless protocols today like GPRS.

WiFi provides the ability to join an existing network or act as a supplicant to create your own network. It uses standard 802.11 protocols with a variety of security and modulation options that are dependent on the radio module.

Wifi mesh protocols require special low level considerations. RoweBots has implemented specific support for a set of modules which are ideal for reliable WiFi mesh implementations.

6loWPAN with IPv6 is provided based on the latest standards in this area. It has complete edge router capabilities and offers IPv6 addressing to any node.

802.15.4 is a radio standard used for Zigbee, SimpliciTI and MiWi. It offers a simple low data rate radio with limited distance. Other protocols fit on top of the radio to provide either proprietary or commercial standards based solutions.

GPRS – GSM – GPS – SAT – UHF radio modules can be attached to systems.

Typically these systems communicate over a serial link and use an AT command set to setup the link. Radios of this type are routinely integrated into Unison Internet protocols.

Additional Information

Other seperately available RoweBots files for Unison OS:

- File Systems
- System Security
- Wireless
- USB
- IoT or M2M Communication
- Remedytools
- Unison for Specific Processor Families

Software Version

- Unison 5.3

Availability

- NOW
- Factory items
  -RIP, FTP, CoAP
  6 weeks ARO

UNISON

RTOS

version 5.3

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