Specifications Sheet

Document revision 2.8 (September 7, 2007, 8:36 GMT)
This document applies to V2.9

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General Information

Description

Major features

- **Firewall and NAT** - stateful packet filtering; Peer-to-Peer protocol filtering; source and destination NAT; classification by source MAC, IP addresses (networks or a list of networks) and address types, port range, IP protocols, protocol options (ICMP type, TCP flags and MSS), interfaces, internal packet and connection marks, ToS (DSCP) byte, content, matching sequence/frequency, packet size, time and more...
- **Routing** - Static routing; Equal cost multi-path routing; Policy based routing (classification done in firewall); RIP v1 / v2, OSPF v2, BGP v4
- **Data Rate Management** - Hierarchical HTB QoS system with bursts; per IP / protocol / subnet / port / firewall mark; PCQ, RED, SFQ, FIFO queue; CIR, MIR, contention ratios, dynamic client rate equalizing (PCQ), bursts, Peer-to-Peer protocol limitation
- **HotSpot** - HotSpot Gateway with RADIUS authentication and accounting; true Plug-and-Play access for network users; data rate limitation; differentiated firewall; traffic quota; real-time status information; walled-garden; customized HTML login pages; iPass support; SSL secure authentication; advertisement support
- **Point-to-Point tunneling protocols** - PPTP, PPPoE and L2TP Access Concentrators and clients; PAP, CHAP, MSCHAPv1 and MSCHAPv2 authentication protocols; RADIUS authentication and accounting; MPPE encryption; compression for PPPoE; data rate limitation; differentiated firewall; PPPoE dial on demand
- **Simple tunnels** - IPIP tunnels, EoIP (Ethernet over IP)
- **IPsec** - IP security AH and ESP protocols; MODP Diffie-Hellman groups 1,2,5; MD5 and SHA1 hashing algorithms; DES, 3DES, AES-128, AES-192, AES-256 encryption algorithms; Perfect Forwarding Secrecy (PFS) MODP groups 1,2,5
- **Proxy** - FTP and HTTP caching proxy server; HTTPS proxy; transparent DNS and HTTP proxying; SOCKS protocol support; DNS static entries; support for caching on a separate drive; access control lists; caching lists; parent proxy support
- **DHCP** - DHCP server per interface; DHCP relay; DHCP client; multiple DHCP networks; static and dynamic DHCP leases; RADIUS support
- **VRRP** - VRRP protocol for high availability
- **UPnP** - Universal Plug-and-Play support

- **NTP** - Network Time Protocol server and client; synchronization with GPS system
- **Monitoring/Accounting** - IP traffic accounting, firewall actions logging, statistics graphs accessible via HTTP
- **SNMP** - read-only access
- **M3P** - MikroTik Packet Packer Protocol for Wireless links and Ethernet
- **MNDP** - MikroTik Neighbor Discovery Protocol; also supports Cisco Discovery Protocol (CDP)
- **Tools** - ping; traceroute; bandwidth test; ping flood; telnet; SSH; packet sniffer; Dynamic DNS update tool

TCP/IP protocol suite:

- **Wireless** - IEEE802.11a/b/g wireless client and access point (AP) modes; Nstreme and Nstreme2 proprietary protocols; Wireless Distribution System (WDS) support; virtual AP; 40 and 104 bit WEP; WPA pre-shared key authentication; access control list; authentication with RADIUS server; roaming (for wireless client); AP bridging
- **Bridge** - spanning tree protocol; multiple bridge interfaces; bridge firewalling, MAC NATting
- **VLAN** - IEEE802.1q Virtual LAN support on Ethernet and wireless links; multiple VLANs; VLAN bridging
- **Synchronous** - V.35, V.24, E1/T1, X.21, DS3 (T3) media types; sync-PPP, Cisco HDLC, Frame Relay line protocols; ANSI-617d (ANDI or annex D) and Q933a (CCITT or annex A) Frame Relay LMI types
- **Asynchronous** - serial PPP dial-in / dial-out; PAP, CHAP, MSCHAPv1 and MSCHAPv2 authentication protocols; RADIUS authentication and accounting; onboard serial ports; modem pool with up to 128 ports; dial on demand
- **ISDN** - ISDN dial-in / dial-out; PAP, CHAP, MSCHAPv1 and MSCHAPv2 authentication protocols; RADIUS authentication and accounting; 128K bundle support; Cisco HDLC, x75i, x75ui, x75bui line protocols; dial on demand
- **SDSL** - Single-line DSL support; line termination and network termination modes

Layer 2 connectivity

IA32 Hardware requirements

- **CPU and motherboard** - advanced 4th generation (core frequency 100MHz or more), 5th generation (Intel Pentium, Cyrix 6X86, AMD K5 or comparable) or newer uniprocessor (multi-processor systems are not supported) Intel IA-32 (i386) compatible architecture with PCI local bus
- **RAM** - minimum 32 MiB, maximum 1 GiB; 64 MiB or more recommended
- **Non-volatile storage medium** - standard ATA/IDE interface controller and drive (SCSI and USB controllers and drives are not supported; RAID controllers that require additional drivers are not supported; SATA is only supported in legacy access mode) with minimum of 64 Mb space; Flash and Microdrive devices may be connected using an adapted with ATA interface

MIPS Hardware requirements

- **Supported systems** - RouterBOARD 500 series (532, 512 and 511)

- **RAM** - minimum 32 MiB
- **Non-volatile storage medium** - onboard NAND device, minimum 64Mb

Hardware needed for installation time only

- **Floppy-based installation** - standard AT floppy controller and 3.5" disk drive connected as the first floppy disk drive (A); AT, PS/2 or USB keyboard; VGA-compatible video controller card and monitor
- **CD-based installation** - standard ATA/ATAPI interface controller and CD drive supporting "El Torito" bootable CDs (you might need also to check if the router's BIOS supports booting from this type of media; if El Torito is not supported by the BIOS, you can still boot up from the CD using Smart Boot Manager Floppy); AT, PS/2 or USB keyboard; VGA-compatible video controller card and monitor
- **Floppy-based network installation** - standard AT floppy controller and 3.5" disk drive connected as the first floppy disk drive (A); PCI Ethernet network interface card supported by MikroTik RouterOS (see the Device Driver List for the list)
- **Full network-based installation** - PCI Ethernet network interface card supported by MikroTik RouterOS (see the Device Driver List for the list) with PXE or EtherBoot extension booting ROM (you might need also to check if the router's BIOS supports booting from network)

Depending on installation method chosen the router must have the following hardware:

Configuration possibilities

RouterOS provides powerful command-line configuration interface. You can also manage the router through WinBox - the easy-to-use remote configuration GUI for Windows -, which provides all the benefits of the command-line interface, without the actual "command-line", which may scare novice users. Web-based configuration is provided for some most popular functionality. Major features:

- Clean and consistent user interface
- Runtime configuration and monitoring
- Multiple connections
- User policies
- Action history, undo/redo actions
- safe mode operation
- Scripts can be scheduled for executing at certain times, periodically, or on events. All command-line commands are supported in scripts

- **Local teminal console** - AT, PS/2 or USB keyboard and VGA-compatible video controller card with monitor
- **Serial console** - any (you may choose any one; the first, also known as COM1, is used by default) RS232 asynchronous serial port, which is by default set to 9600bit/s, 8 data bits, 1 stop bit, no parity, hardware (RTS/CTS) flow control
- **Telnet** - telnet server is running on 23 TCP port by default
- **SSH** - SSH (secure shell) server is running on 22 TCP port by default (available only if security

package is installed)

- **MAC Telnet** - MikroTik MAC Telnet potocol server is by default enabled on all Ethernet-like interfaces
- **Winbox** - Winbox is a RouterOS remote administration GUI for Windows, that uses 8291 TCP port. It may also connect routers by their MAC addresses

Router may be managed through the following interfaces (note that until a valid IP configuration is enteres, telnet and SSH connections are not possible):