SOHO

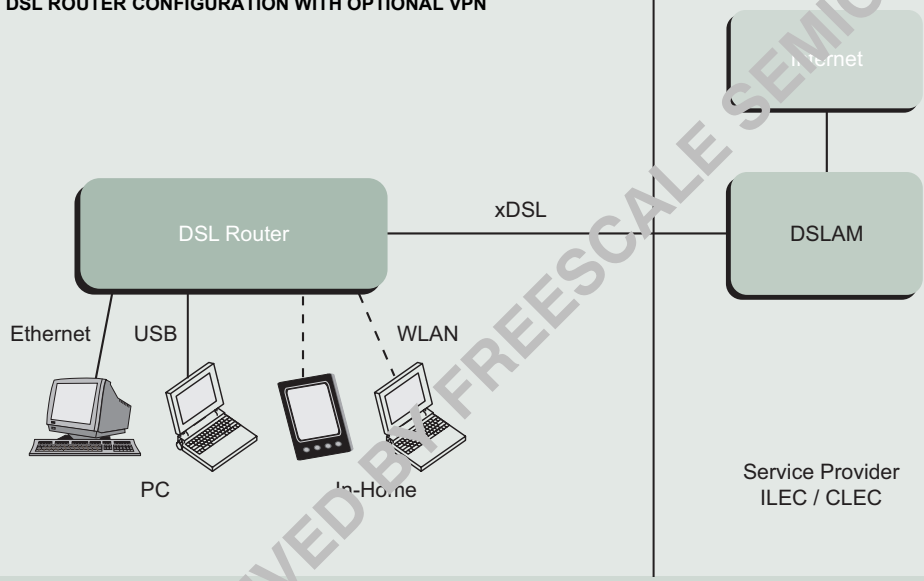
Smart Gateway DSL Router

Overview

Digital subscriber line (DSL) is the world's most prevalent broadband technology for residential and SOHO subscribers. According to the DSL Forum, approximately 36 million DSL lines are now installed worldwide. DSL will continue to gain momentum as subscribers demand higher bandwidth and multiservice access (voice/video/data).

Customer premises equipment (CPE) manufacturers have responded to the steady growth of the DSL market by developing new generations of routers that enable subscribers to connect a variety of computing and peripheral devices, such as desktop PCs, laptops, PDAs, printers and servers.

DSL ROUTER CONFIGURATION WITH OPTIONAL VPN



Key Benefits

> Allows the DSL connection to be shared among many home network devices, including PCs, laptops, and printers

> Single DSL router device functions like a DSL modem and an Internet sharing SOHO router

> Supports optional VPN functionality

> Enables subscribers to connect with their workplace from home

> Allows home office connection from the external world

> Allows pass through for VPN clients

> Supports three types of VPN: PPTP, L2TP, and IPsec

Freescale Ordering Information		
Part Number	**Product Highlights**	**Additional Information**
DSP56L307	Programmable DSP	www.freescale.com[Note]
MPC180	Security Processor	
MPC857DSL	PowerQUICC™ Integrated Communications Processor	
MPC859DSL	PowerQUICC Integrated Communications Processor	
Note: Search on the listed part number.		

Design Challenges

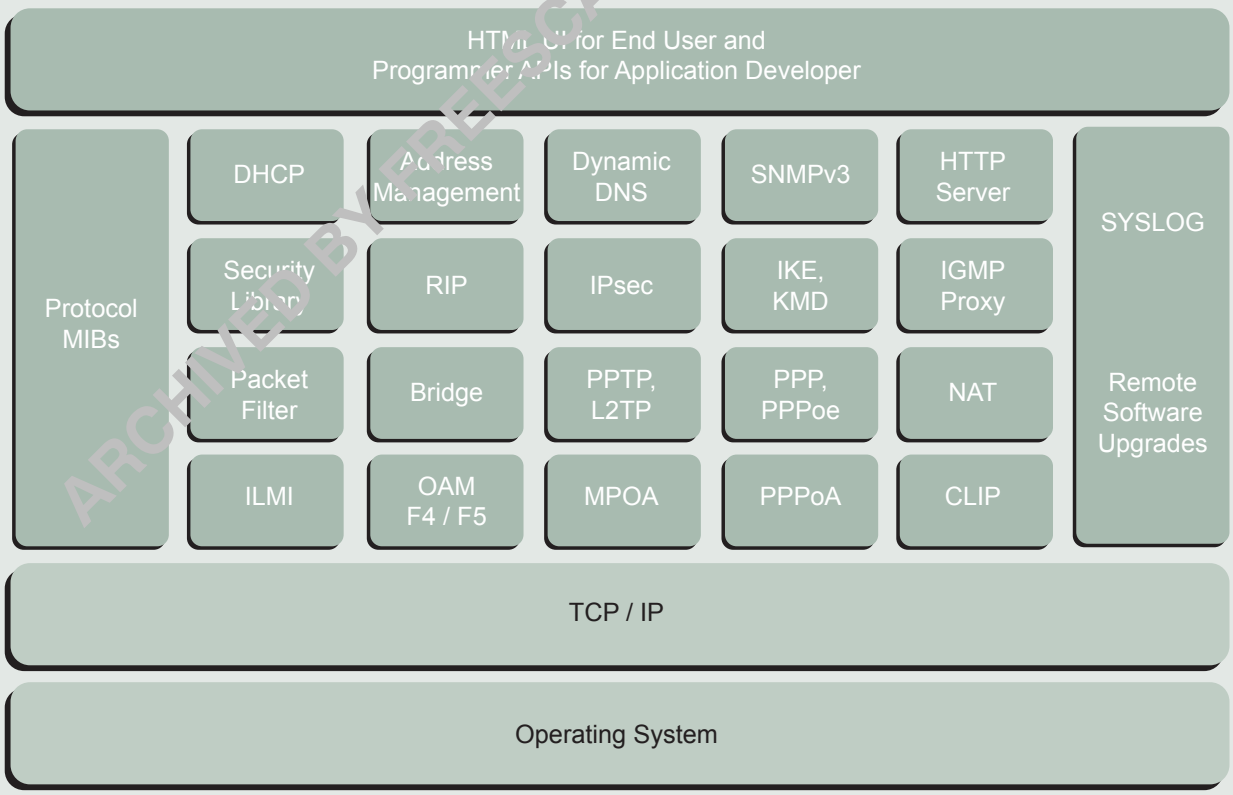
Time-to-market and system cost are key considerations in designing DSL router products. Design cycles for routers are relatively short, which is typical for consumer electronics products. System developers often must speed consumer premises equipment (CPE) products to market in a matter of months to achieve revenue goals. Developing complex designs from scratch and having to work with multiple hardware and software vendors not only impacts time-to-market, but it can also increase development costs. System integration involving operating systems, communication software stacks, and board support packages (BSPs) also contribute to the burgeoning cost of creating new router applications. Increasing competition requires the timely delivery of DSL products to the router marketplace.

Freescale Semiconductor Solution

The solution is DSL router software from Metrowerks, a Freescale Semiconductor company. When combined with a Freescale Semiconductor Smart Gateway reference platform, Metrowerks' DSL router software provides a complete Linux®OS-based solution that enables developers to speed their router products to market.

DSL Router software is a production-ready development environment for designers and manufacturers of DSL router equipment. It provides a complete set of protocol stacks for DSL CPE devices, including support for optional virtual private network (VPN) capability. Metrowerks' DSL router software leverages the scalability of Linux, is based on interoperable open standards, and includes an easy-to-use HTML interface for router configuration and administration.

PROTOCOL STACKS FOR DSL ROUTER WITH OPTIONAL VPN



Additional Benefits

> Provides IEEE 802.11b wireless LAN connectivity for multiple home network devices through wireless access point functionality
> Allows file/folder sharing in the home network LAN (Windows® OS file/print share)
> Enables Web server or application server hosting through DMZ configuration
> Stateful IP packet filter protects against malicious attacks
> Provides parental protection by blocking Web access for specified URLs
> Includes a Web-based UI for DSL router configuration and administration
> Supports SNMP-based remote management
> Includes convenient software upgrade procedure

Specifications

Data over DSL Software

> Multiprotocol encapsulation over ATM per RFC 1483
> Classic IP-over-ATM per RFC 2225
> ATM/DSL management features (OAM f4/F5 and ILMI)

Bridging and Routing

> Bridging based on IEEE 802.1d protocol, RIP version 2.0 routing per RFC 2453
> Support for multicast and unicast filters based on source and destination MAC
> Support for multicast traffic through IGMP proxy

Optional VPN Software

> Supports three types of VPN: L2TP (RFC 2661), PPTP (RFC 2637), IPSec (RFC 2401, 2406)
> Provides software encryption libraries for SHA-1, MD5, 3DES and AES, and APIs for easy integration with third-party encryption software libraries
> Provides well-defined interfaces for using a hardware encryption processor for improved VPN performance
> Supports both manual and dynamic configuration of IPSec policies (using IKE)
> Supports MSCHAPv2 (RFC 2759), MPPE (RFC 3078) with RC4/ARC4 encryption

Address Management

> Supports WAN interface IP address acquisition through either DHCP (RFC 2131, 2132) or PPPoE
> Facilitates static IP addressing of the DSL router WAN interface
> Supports dynamic and static addressing (mixed-mode addressing) of home network devices
> Supports host name based resolution in the home network through dynamic DNS (RFC 1034, 1035, 2136, 2535)
> Synchronized address management framework ensures address change notifications between various modules, which makes in-home device address configuration changes transparent to users
> PPP/PPPoE support (PPP: RFC 1661, PPPoE: RFC 2516, PAP: RFC 1334, CHAP: RFC 1994)

NAT and Firewall

> Robust NAT implementation per RFC 1631 and RFC 2993
> NAT supports both pass through and port forwarding
> Built-in NAT ALGs for PING, FTP, L2TP, PPTP, IPSec, SMTP, RTSP, RTP, H.323 applications, plus APIs to develop additional ALGs
> Robust implementation of stateful Layer 2 IP packet filter, provides protection against attacks: IP Spoof, SYN flood, IP Smurf, LAND, Ping of Death, UDP Echo Storm, Reassembly
> Packet filter rules are configurable through HTML UI, and all events related to packet filter policy violations or suspicious activities are appropriately logged

Remote Management

> SNMPv1/v2/v3 based management (RFC 1157, 2271-2274)t
> Supports the following protocol MIBs:
  - MIB2–RFC 1213
  - NAT MIB–working group draft
  - RIP MIB–RFC 1724
  - DHCP MIB–working group draft
> User-initiated software/firmware upgrades

Local Management

> Provides a small-footprint HTTP1.1 Web-server from Go-ahead.com
> Extensive HTML user interface for DSL router management and configuration by end user
> Parental protection URL filter through HTTP1.1 proxy
> RADIUS client-based user authentication (RFC 2865) for controlling access to DSL router administration UI
> Restoration of factory default settings in case of incorrect user configurations

Development Tools

Tool Type	Product Name	Vendor	Description
Reference Design	RDMPC857IAD	Freescale Semiconductor	Smart Gateway 857 IAD Reference Platform

Development Support

Vendor	Description	Contact Information
Metrowerks	DSL Router Software for Combined use with Freescale Semiconductor Smart Gateway Reference Platform	www.metrowerks.com

Learn More: Contact the Technical Information Center at +1-800-521-6247 or +1-480-768-2130.
For more information about Freescale products, please visit **www.freescale.com**.

SG2106
REV 1
12/2004

December2004

Launched by Motorola
freescale™
semiconductor