Atlas-i60/i61

Much more than just a Router

"The Atlas-i60/i61 is an innovative and revolutionary product bringing together both a communications infrastructure and business processes in the same dual core hardware platform as well as a high performance professional router with a standards based highly secure applications server thus providing unified management aimed at simplifying provision and maintenance tasks."

For operating offices and branches, connectivity to the NETWORK is essential given that the applications and data are 'in the air' making the router not only necessary but vital for day-to-day operations. Consequently resources for maintenance and management must be available to guarantee the smooth running of the delegation. So why not entrust the router to take care of other applications?

The Atlas-i60/i61 can simultaneously operate as a router and server thanks to its powerful internal double core architecture. Server for files/printers/scanners, IP telephony, domotic management, energy efficiency, LDAP backup server, document management are just a few generic example of what the Atlas-i60/i61 is capable of doing. Additionally as this is based on standards this means any application based on Linux can be easily and quickly migrated making the Atlas-i60/i61 an integrated solution that reduces dedicated server maintenance costs.

All of this without losing sight of the fact that the Atlas-i60/i61 is also a professional router with advanced features and switch capacity superior to 100Mbps, a full Operating System (CIT, the Teldat Internetworking Code) in addition to LAN and WAN connectivity capabilities

PRODUCT OVERVIEW

Hardware Architecture and Interfaces
800MHz double core processor
4GByte flash memory for user applications
2 x Gigabit Ethernet
8 x Fast Ethernet (PoE optional)
Expansion slot for up to 16 x Fast Ethernet
1 USB 2.0 port for additional connectivity (3G, 4G, Wimax, Zigbee,…)
Dedicated slot for xDSL connectivity cards
PMC slot for a wide range of Voice and Data cards
WiFi 802.11 a/b/g/n @ 2,4 GHz and double band 5GHz slot
Slot for WWAN modules (3G/4G)
Internal slot for hard disk (substituting the 4GB flash memory for user applications)

KEY CHARACTERISTICS

State of the art in hardware and software

The Atlas-i60/i61 is in fact two devices in one. One part is a powerful modular router and the other a versatile applications server. This is due to its advanced hardware architecture with a double core processor where two different Operating Systems run; the CIT (Teldat's Internetworking Code which runs in all the Teldat routers) Operating System and the Linux Debian Operating System. Both Systems run simultaneously and parallel in each core as if they were two processors in two different machines without compromising either performance or stability.

"Router" characteristics: The powerful processor allows the i60/i61 to exceed a 100Mbps switch throughput bidirectional sustained flow under normal operating conditions (IMIX with active services). The device additionally incorporates encryption hardware and surprising possibilities for LAN, WAN, WLAN and WWAN expansion.

"Server" characteristics: Both independently and simultaneously to the routing core, the other core supports a standard S.O. Linus (Debian) over which any application can be executed. Communications from the S.O. Linux are carried out through a virtual driver connected with the router so behavior for the applications is exactly the same as a typical server with an Ethernet card.

Modularity

Without a doubt this is one of the main attractions of the Atlas-i60/i61 providing the device with enormous almost unequalled versatility as a communications device and allowing it to expand from a minimum double connectivity Gigabit and an 8 port integrated switch to almost any configuration needed in a branch office, thanks to the 5 slot expansion possibilities (including voice support).

Routing software orientated towards enterprises

The Atlas-i60/i61 uses CIT (Teldat's Internetworking Code) which runs in all the Teldat routers, and is widely regarded as a point of reference for professional routing and borne out by the hundreds of thousands of devices operating for clients and in the most demanding environments. The following are just a few of the outstanding characteristics:

- Enormous emphasis is placed on security, incorporating firewall features (Stateful firewall) and IPSec with all its variants (RC4, DES, 3DES, RSA, SHA-1, MD5 algorithms, digital certificates, DMVPN, GETVPN, etc…)
- Supports IP Telephony with Media Gateway features (MGCP, SIP, H323) and IP Telephony integrated server capable of managing up to 300 telephones with SIP, H323, Alcatel NOE or SCCP (Skinny) protocols.
- Quality of Service, with CBWFQ, LLQ and WRED algorithms supporting hierarchical system with 32 different traffic classes per interface, traffic marking and profiling as well as traffic preclassification contained in VPNs and integrating QoS with MPPP and fragmentation.
- Necessary routing protocols adapted to corporate networks and MPLS in general (RIP-2, BGP-4 and OSPF in addition to Policy Routing, routing activating based on polls, HSRP, VRRP, VRF,…)
- Management adapted to needs of carriers and large enterprises through powerful command lines (CLI), access controlled through RADIUS/TACACS+, SNMPv3, ample level of debugs and statistics, integrated analyzer compatible with ethereal/wireshark, etc., in addition to Teldat's own management platform (Teldages) for proactive management for a large pool of devices.

APPLICATION SCENARIOS OVER EMBEDDED LINUX

As an applications server, the Atlas-i60/i61 can be integrated in numerous scenarios such as intrusion detection polls and service denegation, communications accelerator, cache proxy and contents control, video flow control for different applications such as digital signage, domotics, energy efficiency and many more. Some example scenarios can be seen below:

- Web proxy cache.
- File and printer server.
- Digital signage.
- Domotics and energy efficiency.

- Open platform for third party applications such as landline-mobile convergency, telesurvellence, etc.

- **Application example number 1: Web proxy cache.**

In scenarios where there is a heavy demand for web traffic, the local storing of pages and the rest of the web contents provide a much quicker response for the user, at the same time as downloading the redundant traffic communications line. This scenario is particularly useful in those environments where simultaneous and/or periodical access to the same contents occurs; such as colleagues or company training/seminar rooms, and generally in those environments where there is heavy use of web browsing and/or where communication lines are limited.

In addition to speeding up web browsing, the web proxy cache integrated in the Atlas-i60/i61 permits you to activate content filters at different layers (users, domains, URLs, expressions, etc.), and provide detailed information on the use of the connection in order to browse the web (sites visited, user statistics, etc.)

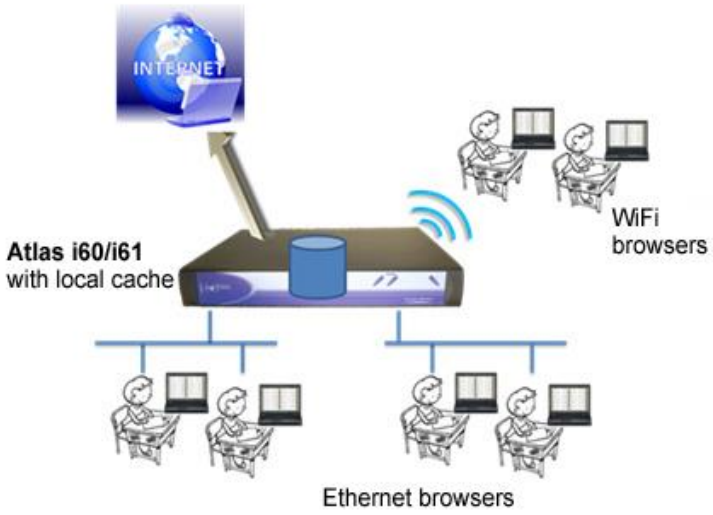

Illustration 1: Atlas-i60/i61 with integrated web proxy cache

- **Application example number 2: Files and printer server**

Maintaining dedicated servers to simply store contents or as a printer connection device (IP faxes, scanners, etc.,) isn't economically worthwhile, as the process capacity or the user interface, which traditional servers provide, aren't needed. In these scenarios the Atlas-i60/i61 provide a very simple solution and the integrated management that means you can dispense with the server as you are using in addition to providing a high performance environment where you can easily generate applications that provide added value in branches, e.g. automatic printing from a USB, document scanning, storage and transmission when the network has little traffic, etc.

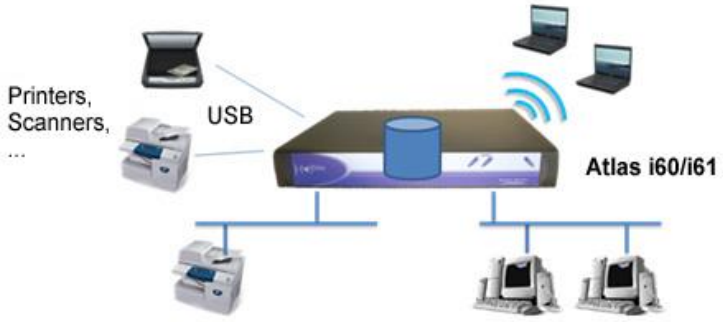

Illustration 2: Files and printer Server

Application example number 3: Digital Signage / Virtual billboard

If you have an Atlas-i60/i61 you do not need anything more than the TV screen in order to launch a Digital Signage / Virtual billboard solution in order to substitute your advertising posters for static information on TV screens. It's almost unnecessary to state the multiple advantages that Digital Signage gives such as the simplicity of managing mass media, adapting messages to the potential public, instant notifications, the saving in paper, etc.

Installation is as simple as connecting the TV screens (mass consummation as they already incorporate Ethernet/WiFi) to the branch office's local network. The Atlas-i60/i61 does the rest of the work and through the "Virtual Billboard" management, fully developed by Teldat, you only have to create the contents (using .jpg images which can be created from any information application such as Power Point) and program these in the selected screens.

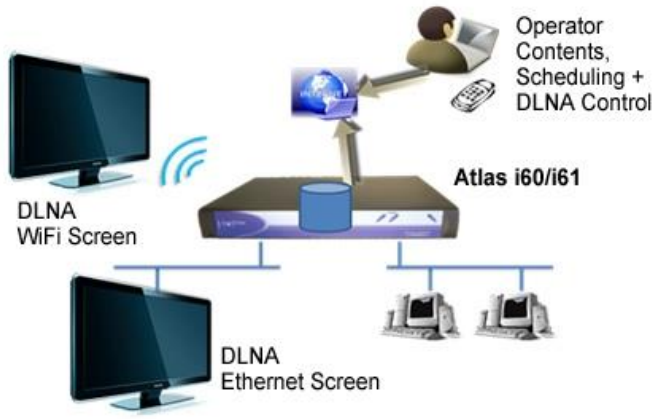

Illustration 3: Virtual board

Application example number 4: Domotic and energy efficiency

Seriously reduces the energy consumed in corporate offices which means the company benefits not only on an economic level but also environmentally, a goal that the vast majority of companies aim for, and that now thanks to the Atlas-i60/i61 this can be achieved in a simple and cost-effective way. With a simple consumption measure and power control devices enables the Atlas-i60/i61 to control lighting and/or temperature calculating consumption in real time thus achieving very efficient control.

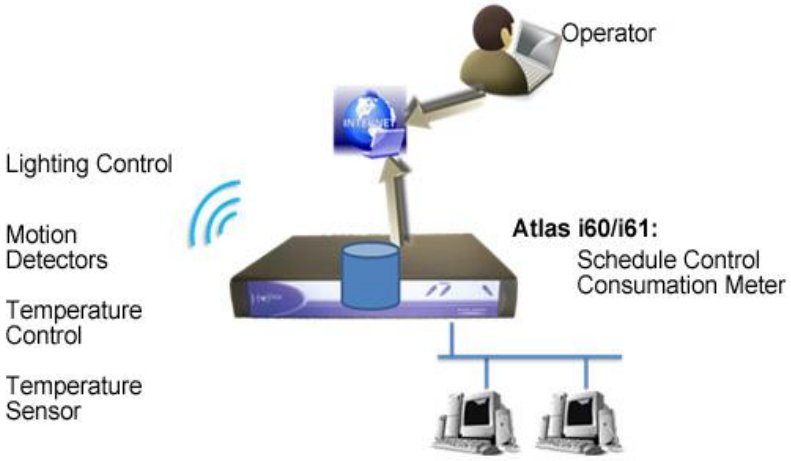

Illustration 4: Domotic and energy efficiency

- **Application example number 5: Open platform for third party applications.**

There are innumerable applications where the Atlas-i60/i61 provides added value such as facilitating a platform that integrates communications and services simplifying both management and implementation. The integration of a standard Unix Operating System and internal hard disk guarantee the success of any requirement.
These characteristics allow third parties to develop applications that can be executed in the device without interfering with other running programs or compromising routing processes. Consequently this converts into an open platform where the implementation and execution of lots of types of remotely administrated applications are carried out such as landline-mobile convergence, domotic, surveillance, etc. All of this is possible thanks to the powerful double core process which allows these applications to be organized and executed in parallel with other 'normal' tasks of routing and IP telephony without compromising speed etc.
The type and reach of the applications that can be developed is enormous; however figure 5 illustrates some of these uses.

Illustration 5: Open platform for third party applications

TECHNICAL SPECIFICATIONS

General

Description
2 x 10/100/1000 Ethernet, RJ-45
8 x 10/100 Ethernet, RJ-45, optional PoE and expandable to 16 x 10/100
1 x USB 2.0
1 x Expansion slot for xDSL cards
1 x Expansion slot (PMC)
1 x Expansion slot for Fast Ethernet ports (from 8 to 16 ports)
1 x Wireless-WAN expansion slot
1 x Wireless-LAN 802.11 a/b/g/n expansion slot
1 x Expansion slot for storage (SATA hard disk / solid state drive)
1 x Console, RJ-45

Gigabit Ethernet Interfaces
Electric interface complying with 10/100/1000BASE-T IEEE 802.3
IEEE 802.3 ah (Ethernet OAM)
Operational up to 180 meters with category 5 cable
Automatic crossed detection
MDI/MDIX for all operating modes
Auto-negotiation complying with IEEE 802.3u
IEEE 802.1Q (VLAN)
IEEE 802.1X
2 status LEDs per port

Switch Fast-Ethernet
10/100-BaseT detection
Automatic semiduplex/duplex negotiation
MDI /MDI-X detection ("crossover detection")
Ethernet V2 / IEEE 802.3
LLC (802.2), ARP
IEEE 802.1Q(VLAN) up to 4096 VLANs
Manageable Switch:
- EtherLike-MIB (RFC 2665)
- SNMP-REPEATER-MIB (RFC 2108)
- MAU-MIB (RFC 2668)

2 status LEDs and activity per port

Wireless LAN: specific features[1]
802.11 a/b/g/n modes
Manual or automatic channel selection
Selectable power transmission
Manual or automatic speed selection
Turbo mode (108 Mbps)
802.11i, WPA, WPA2
EAP, EAPOL
Authentication (open, shared, WPA)
Encryption (AES, TKIP, WEP)
ESSID
MAC filtering
Quality of Service (QoS) AIFS, CWmin, CWmax

Wireless WAN (3G) Interface[2]
Passive interface failure detection (analyzing received traffic)
Active interface failure detection (poll)
Advanced RF interface monitoring
Dual APN simultaneous context (dual PDP)
Remote firmware updating for the model over airwaves
Automatic handover
Internal and external SIM tray, with multiple selection criteria:
- Signal level
- Radio technology (GPRS, UMTS, HSPA, etc.)
- IP polls (availability, latency, jitter, etc.)
- Manual configuration

3G dual context

USB Interface[3]
USB 2.0 host interface
3G features:
Passive interface down detection (analysis of received traffic)
Active interface down detection (poll)
Automatic handover

Console
RS-232 at 9600 bps (max. 115200 bps)
8 bits without parity and one stop bit (8N1)

Power
Internal AC: 90v – 240v; 50/60Hz

Environmental Specifications
Temperature: 0ºC to 40 ºC
Relative Humidity: 5% to 85%
Barometric pressure: 860 mbar to 1060 mbar

Dimensions and weight
Length x Width x Height: 440 x348 x47 mm
Approximate weight: 4.5 Kg
Format: 19” rack and 1U

[1] The Wireless-LAN features are only available if the Wireless-LAN kit is included in the router.

[2] The Wireless-WAN features are only available if the Wireless-WAN kit is included in the router.

[3] Optional feature.

Protocols and functionalities

IPv4 Protocol
IP, ARP, Proxy ARP
Static IP Routing
RIP I, RIP II, OSPFv2 and BGP-4
"Bidirectional Forwarding Detection" protocol (BFD)
Compatible with HSRP
RFC 2281 VRRP – Virtual Router Protocol
Policy Routing
Multi-VRF
Quality of backup: Routing based on network quality measurements
Multi-path per IP packet (with static & dynamic routing)
Weighted balancing per TCP/IP session
Multicast: IGMP, IGMP-proxy, MOSPF
DHCP client, server & relay
NTP Client
DNS client & proxy. DNS cache.
DNS dynamic updating (RFC 2136)
DynDNS Client
NAT/PAT/Port Mapping/NAT exceptions
PAT fire-walling
Multiple addresses per interface
Loopback Interfaces

IPv6 Protocol
IPv6 Core/Routing
Dual Stack IPv4/IPv6 (DS-Lite)
Address autoconfiguration
Multicast MLD/MLDv2
IPv4->IPv6 transition mechanisms
RFC 4213
IPv6 over IPv4 / IPv4 over IPv6 tunnels
ACLs and Firewall
IPv6 Management (CLI, telnet, FTP, ping, traceroute, etc.)

PPP protocol
PPP (RFC 1661), PAP/CHAP, IPCP
Dynamic assignment of IP addresses (own or peer)
PPP Multilink
Multi-Class Extension to Multi-Link PPP (RFC 2686)

PPPoE protocol
PPPoE over Ethernet and over ATM
PPPoE Bridge + routing (PPPoE pass-through)
PPP Multilink over PPPoE
Re-negotiation based on PADT

ATM
SAR AAL5
PVCs: 31 y SVCs
VPIs and VCIs range: Complete
Dynamic creation and destruction of PVCs
Traffic Shaping: CBR, UBR, VBR-nrt, VBR-rt
OAM F4/F5

Encapsulation over ATM
Routed IP RFC 1483 LLC & VC based
PPPoA RFC 2364 LLC & VC based
PPPoE RFC 2516 LLC & VC based
RFC 2225, Classical IP over ATM
Ethernet Bridged RFC 1483 LLC & VC based
Frame Relay over ATM: FRF.5 & FRF.8

WDM PON Ecosystem certification LG-Ericsson (100Mbit/s and 1 Gbit/s)[4]
Bidirectional symmetric bandwidth
Optical technology with adaptable wavelength to reduce logistics, operation and maintenance
Nominal reach 20 km

Quality of service (QoS)
Packet labeling (DiffServ) depending on interface, subinterface, protocol, port, MAC and size
Congestion control: FIFO, queuing priority, BRS proprietary system, WFQ
Traffic limiting in queues, with overflow in lesser priority queues. Standard limitation over ATM and Frame Relay
Fragmentation in FR (FRF.12) PPP & MPPP

Security[5] and VPNs
IPSec client & server, compatible with third party IPSec peers
IPSec security services: ESP & AH
IPSec operation modes: tunnel & transport
Encryption: RC4, DES, 3DES & AES
Authentication: SHA-1 & MD5
IKE Protocol
ISAKMP Configuration Methods. Oakley groups 1, 2, 5 & 15
NAT-Traversal
Reverse Route Injection (RRI)
X.509v3, LDAP & PKIX digital certificates
SCEP Protocol
Tunnel End-point Discovery (TED) Protocol
IPSec PMTU Discovery
GRE & multi-GRE. GRE RC4 encryption

[4] Compatible WDM-PON and certified with LG-Ericsson network devices.
[5] IPSec features and those related to IPSec require software licenses.

Next Hop Resolution Protocol (NHRP)
Dynamic Multipoint IPSec VPNs (DMIVPN)
Gateway Encryption Transport VPN (RFC 3547)
Radius Access Control (RFC 2138)
L2TP client (LAC), L2TP initiation & L2TP Server (LNS)
L2TP/IPSec Server, compatible with Microsoft clients
Telnet, SSH & FTP console access user & password protected
User & permission levels
Advanced IP filters
Firewall functions
- Static and dynamic access controls (Stateful Packet Inspection)
- Intrusion detection and denial of service

Data compression
Compression in X.25 & PPP
IPHC Compression
Van Jacobson & STA LZS compression algorithms

IBM-SNA support [6]
SDLC-QLLC-LLC2 Conversions
SNA over IP:
- DLSw (RFC 1795) and remote IP Bridge (tunnel)

SNA over Frame Relay (RFC 1490):
- BAN and remote Bridge Frame Relay

SNA over X.25 (X.25-QLLCB)

Bridge
Bridge over PPP (BCP), HDLC, FR y GRE.
STP "Spanning Tree Protocol" (IEEE 802.1d)
RSTP "Rapid Convergence Spanning Tree Protocol"(IEEE 802.1w)
Multiple bridge domains
Simultaneous bridging & routing
IEEE 802.1p CoS ("Class of Service")
PVST ("Per VLAN Spanning Tree Protocol")
Source Routing, MAC filtering and NetBIOS

Telephony over IP (ToIP)[7]
Signaling:
- SIP: RFC 3261, RFC 3262, RFC 3264, RFC 3265
- SIP transport over UDP, TCP & TLS
- X509 authentication over TLS
- SIP SDP: RFC2327
- SIP SDES: RFC4568
- H.323, H.245, H.225
- RAS
- UA-NOE (Alcaltel) (server function)
- SCCP (skinny) (server function)
- SIP and H323 modified AASTRA (server function)

Simultaneous telephone survival for SIP/H323/SCCP/UA-NOE/SIP (AASTRA)/ H323 (ASTRA) terminals
Encryption
- G711 (A-law & mu law)
- G729 (a & b)
- G723.1 (5.3Kb & 6.4Kb)
- T.38

Emergency switchboard features
PBX features
- Attended and blind transfers
- Multiple terminal simultaneous ringing
- Hunt group
- Call groups
- Overflow
- Call forwarding if busy, no answer or unconditional
- Music on hold, streaming mode from file
- Configurable microphone, loud speakers, echo and tone levels

RTP, RTCP, SRTP
Data fragmentation FRF.12
Header compression CRTP
Silence suppression (VAD)
Various voice packets per data frame
Codec classes per destination
Direct dialing
Numerical expansion and compression

X.25 Switch
Programmable routing
X.25 call parameter modification
X.25 over TCP/IP: XOT (RFC 1613)

Management
Command line interface on console, telnet & ssh
Access/execution user levels (local authentication or RADIUS)
SNMPv3: MIB-2, Teldat Private MIB
Event Logging System
Network/link quality guarantee Agent (feature similar to SAA) [8]
Netflow V5 & V9
Syslog Client
NTP Protocol
DynDNS Client
FTP & TFTP software, BIOS & configuration updating

[6] SNA support requires SNA software licenses
[7] Telephony over IP (ToIP) features require ToIP software license
[8] SAA is Cisco's "Service Assurance Agent"

Integrated protocol analyzer compatible with Ethereal/Wireshark
Default configuration switch
Partial support of CDP (Cisco Discovery Protocol)
Radius Accounting (RFC 2139)

Integrated in Teldages (Teldat professional management platform)
Interoperability with third party management platforms such as Openview, Tivoli Netcool, InfoVista, etc.

Expansion Modules

Ethernet switch slot

- 8 TO 16 PORTS FAST ETHERNET EXPANSION CARD

xDSL Slot

- VDSL2 CARD Annex-A (compatible ADSL/ADSL2+)
- VDSL2 CARD Annex-B/J (compatible ADSL/ADSL2+)
- ADSL2+ CARD (ADSL compatible)
- G.SHDSL CARD (ATM/EFM, 4 pairs)

PMC Slot

- ADSL2+ CARD (ADSL compatible)
- 2 x GE SFP CARD
- 1 x E1/T1/PRIMARY CARD
- 4 x E1/T1/PRIMARY CARD
- 1 x SERIAL CARD
- 3 x SERIAL CARD
- 2 x BRI ISDN CARD
- 2/1 x ANALOG MODEM CARD
- VoIP 4/2 x FXS/FXO CARD
- VoIP 2 x E&M CARD
- VoIP 2 x BRI-ISDN CARD
- DATA + VOIP 1 X E1/T1-30C CARD
- WDM-PON CARD

Wifi Slot

- 802.11 a/b/g/n card

WWAN Slot

- 2/3G/3.5G/3.7G modules
- 2/3G/3.5G/3.7G/LTE modules

Storage Slot

- SATA 160 GB hard disk
- SATA 250 GB hard disk
- SATA 1 TB hard disk
- 4 GB solid state drive
- 16 GB solid state drive
- 64 GB solid state drive SSD

PRODUCT IMAGES

Illustration 6: Atlas-i60/i61 router front panel

Illustration 7: Atlas-i60/i61 rear panel

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