MRV

OA2000 - Optical Ethernet Service System

OA2000
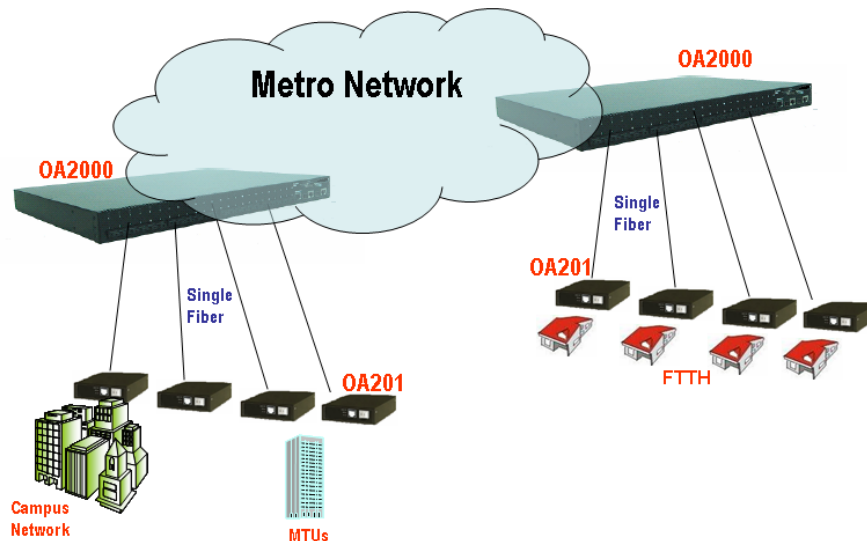
Optical Access Ethernet Aggregator

OA201

Optical Network Termination ONT

MRV Cost-performance FTTX Metro Ethernet Solution

MRV is a leading provider of optical transport solutions as well as carrier class Ethernet access solutions to carriers around the globe.
Now, MRV offers this unsurpassed level of quality and performance to operators and Network Service Providers (NSP) with its Optical Access OA2000 L2/4 Series Optical Ethernet Service System. MRV's Optical Access OA2000 approach to broadband access is unique. And its cost-performance solutions are among the best in the industry. MRV is looked upon as the quality leader in the telecom industry.

The OA2000 system is unique integration of OA2000 Layer2-4 single fiber aggregation unit with the OA201 remote managed single fiber Optical Termination Unit (ONT) to provide carrier class optical Ethernet access system. It enables NSPs to build their own low-cost FTTX access network solutions with advances operations, administration, and maintenance (OAM) support at optimal performance cost.

The MRV OA2000 Optical Access System solutions utilize advanced Ethernet access aggregator (OA2000) providing direct optical fiber connectivity to the OA201 Optical Network Termination (ONT). It offers high speed, single fiber access networks with unique cost-performance benefits for everyone from utilities, to service providers, to telecommunications carriers.

"Simplicity is the ultimate sophistication"

The Optical Access OA2000 system offers the most cost-effective range of features for the telecommunications industry

1. Fiber Cost Savings: Two-way traffic on a single-core fiber

- The Optical Access OA2000 L2/4 Series allows 2-way traffic on the same fiber path, allowing more cost-effective and efficient use of fiber resources.

2. Space Saving

- 1 RU aggregation system integrated both CO fiber conversion and L2/4 access functionality in minimal rack space.
- Maximum 192 subscribers per system (Optical Access OA2000).

3. Scalability and Easy Expansion

- Optical Access (OA2000/OA201) system offers high bandwidth over single fiber
  Down Stream: 100 Mbps per subscribers.
  Up Stream: 100 Mbps per subscribers.
- Plug and play new subscribers add-on, guaranteed easy network expansion.
- Optical Access OA2000 accommodates 8 stacking unit, each supporting 24 branches, allowing a maximum of 8 x24=192 subscribers.

4. Advanced Features

- Classifier and QoS (Layer 2-4): Optimizes Network Performance to Support any Digital Stream, from Internet Browsing to VoIP and Video
- 4 priority queues per port with WRR & Strict priority scheduling: Enables networks to support Voice, Video and Data application to be transmitted on the same time.
- IGMP snooping function allows for efficient transmission of Multicast data such as live video stream.
- VLAN function provides sufficient security between end users.
- Access control list, RADIUS/ TACACS+, SSH, HTTPS(SSL): Ensure secure network operation and traffic management by leverages access control. And well-known transport and encryption technologies (SSL) for secure communications.

5. Advanced Operations and Maintenance Management

The MRV Optical Access OA2000 Series offers advanced operations and maintenance capabilities:

- Loop Testing/Power Failure Alarms/Subscriber Port Monitoring of the remote customer unit with saving of IP Address (no IP address required in the ONT CPE)
- Advanced secure web based management
- SNMP-based Network Management using Mega Vision Pro Service Network Management System.

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Optical Access OA2000 L2/4 System – Advanced Optical Ethernet Service Solution

MRV's OA2000 L2/4 Series Optical Ethernet Service System combines the technological excellence of metro area Ethernet technology and an Optical Ethernet Service system that offers the most effective use of fiber optic resources. The OA2000 L2/4 Series provides L2/4 traffic aggregation for your broadband access network, linking the Customer Edge on one side and the Backbone Network on the other. The OA2000 L2/4 Series guarantees the most efficient use of fiber optic facilities and the most cost-effective use of space. All of this is supported by MRV's world-class network management technology.

Advanced Operation and Maintenance Capabilities

MRV's OA2000 L2/4 Series Optical Ethernet Service System features comprehensive Network Management and Maintenance capabilities. Real time data (power failure alarms and subscriber port status information) is gathered from the subscriber site and the customer interface and is forwarded to the monitoring equipment and the element management system using the Simple Network Management Protocol (SNMP). MRV's unique Mega Vision Pro Network Management System provides the most advanced and informative information management features to cost-effectively manage your network in today's competitive environment.

Remote Operations, Administration, and Maintenance (OAM) using IPLess™ Technology

MRV has developed an operations, administration, and maintenance (OAM) solution that provide remote management and maintenance without using IP Address (IPLess™) in the remote CPE. The purpose of the MRV remote OAM is to provide network operators with the mechanisms to monitor network health and to quickly determine the location of failing links or fault conditions. MRV OAM utilizes one packet exchange to provide service CO (OA2000)/CPE (Customer Premise Equipment – OA201) information, event notification, variable retrieval, and loopback controls.
The MRV OA solution (OA2000 integrated with OA201) enables providers to offer new/improved services with reduced capital and operational

Remote OAM - Loop Tests: The unique loop test capabilities of the OA2000 L2/4 Series provides testing functions for cable facilities and OA201 Customer Premise Equipment (CPE), making fault isolation and identification quick and easy. Loop test information is received from the subscriber-side branch unit (OA201) and collected at the access unit (OA2000) to be sent to the monitoring equipment or network management system.

Remote OAM - Subscriber Port-Link Status Monitoring: The subscriber port link status information is monitored by the element management system using TELNET or SNMP.

Remote OAM - Power Failure Alarm Monitoring: Power failure alarms make it easy to localize a fault and distinguish between cable faults and local power failures.

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Network Control through Advanced QOS and Rate Limiting

The OA2000 switch prioritizes each packet based on the required level of service using four priority queues with strict or Weighted Round Robin Queuing. It uses IEEE 802.1p and 802.1Q tags to prioritize incoming traffic based on input from the end-station application. These functions can be used to provide independent priorities for delay-sensitive data and best-effort data. The OA2000 switch also supports several common methods of prioritizing layer 3/4 traffic to meet application requirements. Traffic can be prioritized based on the priority bits in the IP frame's Type of Service (ToS) octet. When these services are enabled, the Priorities are mapped to a Class of Service value by the switch. After which, the traffic is sent to the corresponding output queue.

The Rate Limiting feature controls the maximum rate for traffic transmitted or received on an interface. Rate limiting is configured on interfaces at the edge of a network to limit traffic into or out of the network. Traffic that falls within the rate limit is transmitted, while packets that exceed the acceptable amount of traffic are dropped.

Fault-Tolerance

Spanning tree is a link management protocol that provides path redundancy while preventing undesirable loops in the network. The OA2000 switch performs the IEEE802.1D (Spanning Tree) protocol, the IEEE802.1s*(Multiple Spanning Tree), and the IEEE802.1w* (Rapid Spanning Tree) protocol for Fault-Tolerance. The OA2000 also provides redundant power supply hook-ups to enable simultaneous connections to two independent power sources to ensure the system reliability.

Enhanced Security Features

The Optical Access Series switches offer enhanced data security through a wide range of security features that protect network management and administrative traffic, secure the network from unauthorized users, provide granular levels of network access to users and track where users are located.

Secure Shell (SSH), Secure Telnet (v1.5/2.0) port based security, Simple Network Management Protocol version 3 (SNMPv3*) and network management information, thereby, protecting it from tampering or eavesdropping. Remote Access Dial-In User Service (RADIUS) authentication enables centralized access control of switches and restricts unauthorized users from altering the configurations. Alternatively, a local username and password database can be configured on the switch itself. Multi levels of authorization on the switch console and two levels on the web-based management interface provide the ability to give different levels of configuration capabilities to different administrators.

Port security and 802.1x provide the ability to keep unauthorized users from accessing the network. Port security limits access on an Ethernet port based on the MAC address of the device that is connected to it. It can also be used to limit the total number of devices plugged into a switch port, thereby, reducing the risks of rogue wireless access points or hubs. 802.1x can be used to authenticate users based on username and password (or other credentials) via a centralized RADIUS server. This is particularly useful for a mobile workforce because the authentication will be executed regardless of where the user connects to the network.

ACL's restrict access to sensitive portions of the network by denying packets based on source and destination MAC addresses, IP addresses, or TCP/UDP ports. ACL lookups are done in hardware, therefore, forwarding and routing performance are not compromised when implementing ACL-based security in the network. The Optical Access Series switches offer VLAN, router and port-based ACL's.

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Network Availability

The OA2000 provides efficient use of resources in bandwidth-hungry applications. It supports the Internet Group Management Protocol (IGMPv1/2) snooping to identify multicast traffic and it ensures an efficient utilization of the bandwidth. The OA2000 is ideal for server-to-server backups. Advanced Stacking features of the OA2000 include support for stack-wide VLAN's, trunking and packet priority. The loop-stacking configuration provides automatic traffic load balancing to optimize the utilization of network bandwidth.

Enhanced fiber uplinks connectivity

All the DaVinci systems offer optical interfaces in SFP format (Small Form-Factor Pluggables).
Sometimes, these interfaces are coupled in combos with an RJ45 copper port.
The flexibility of the SFP fiber interfaces enables Gigabit Ethernet links over multimode, single mode and single fiber fibers including WDM fiber connectivity. With the SX, LX, ELX, ZX or EZX interfaces, it is possible to a variety of distances from 500 meter up to 120 km.
MRV Communications also offers a unique multimode fiber solution based on the MRV MMX SFP that can provide connectivity for a range of up to 2 km over multimode fiber (general solution support up to 500 meter). As a result, the migration of a network core from Fast Ethernet towards Gigabit Ethernet, over Multimode type of fiber, is easily feasible without the need for laying out singlemode fibers.

Network Management

The OA2000switch supports the SNMP protocol and the Telnet interface delivers comprehensive in-band management. The system can be managed and monitored using the SNMP/RMON protocol through computers equipped with network management software or via an Internet web browser. LED indicators are located on the front panel to assist network administrators in troubleshooting. A Port Mirroring feature provides a non-intrusive mechanism for traffic inspection across the entire switch.

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L2 Features

- Stacking interface on the front panel
- Stacking up to 8 units via RJ-45 cables
- Up to 8K MAC address entries
- 4M-bit for packet buffer size
- Provides flow control mechanism: backpressure for half duplex; IEEE802.3x for full duplex operation
- Store-and-forward forwarding scheme
- HOL (Head of Line) blocking prevention
- Port mirroring
- Provides Link Aggregation
- Up to 8 ports in one trunk
- Up to 4 trunk groups
- Trunks across switches
- Supports 802.3ad (LACP) and Cisco Ether-channel (static truck)
- Load Balance for both Unicast and Multicast traffics
- Supports VLAN
- IEEE 802.1Q tagging VLAN
- Port-based VLAN
- Up to 255 active VLANs
- GVRP protocol for automatic VLAN registration and dynamic VLAN management
- 802.1v Protocol-Based VLAN*
- Private VLAN
- IGMP (v1/v2) Snooping and Query function
- Broadcast Storm control
- Spanning Tree protocol
- IEEE 802.1D Spanning Tree protocol
- IEEE 802.1w Rapid Spanning Tree

Security

- RADIUS/ TACACS+ (Authentication)
- SSL
- SSH (v1 5 / v2 0)
- Access Control List
- Supports IEEE 802.1x port based security Management

Quality of Service

- L2/L3/L4Traffic Classification/Priority Management
- CoS by IEEE 802.1p 4 priority queues control

- Traffic Classification/Priority Management based on IP Precedence/TOS & DSCP/TOS, and on TCP/UDP protocol number
- Supports WRR for priority queues
- Strict scheduling for priority queue
- Rate Limiting (Ingress & Egress based)
- Supports DiffServ priority forwarding
- Supports Random Early Detection (RED)
- Hot insertion and removal of stacking units
- Close Loop Stacking
- VLAN Membership across the stack
- Single IP address for management
- Trunking across the stack
- Packet Priority across the stack
- Port mirroring across stack

Management

- Supports SNMP v1/v2c/v3* management functions
- Supports RMON (groups 1,2,3 and 9)
- Supports Web-based management
- Supports TELNET console interface
- Supports BOOTP and DHCP for IP address assignment
- Supports firmware upgraded by TFTP file transfer protocol through the Ethernet network
- Supports Firmware image upgrade by TFTP protocol
- Supports dual Firmware images
- Supports Configuration file upload/download by TFTP protocol
- Supports two or more Configuration files
- SNMP access IP filtering configuration
- Provides 1 Male DB9 RS-232C console interface configured as DTE for operation, diagnostics, status, and configuration information
- Provides Command Line Interface from the console port using a VT-100 terminal
- Supports SNTP
- Event / Error Log
- MegaVision –Network Management system

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Physical Ports

- 24 Single Fiber WDM 100Base-FX ports
- 2 Combo G (RJ-45/SFP) ports

Remote Maintenance

The MRV OA2000switch Series sets the standard for Network Management and Maintenance capabilities:

- Loop testing is executed in-service, with no maintenance personnel. Loop test frames are sent remotely, providing port status reports directly to the maintenance console.
- Power failure alarms distinguish between cable faults and local power failures.

Optical Interface

- Connector : Single Fiber with SC Connector
- Cable : 9/125 m SM Fiber (ITU-T G.652)
- Standard : 100BASE – FX
- Wave Length : Up stream – 1,3 m Down stream - 1.5 m
- Transmitting Power Range : -8 ~ -14 dBm
- Receiving Power Range : -8 ~ -30 dBm

Mechanical

- Dimensions: 440mm x 324mm x 43mm (17.37" x 12.76" x 1.7")
- LED indicators: Port, Uplink, System, Diagnostic, Stack/Master

Performance

- Switch Fabric: 8.8 Gbps
- MAC address: 8K

Power Requirements

- Nominal AC Input Voltages: 110-240V
- DC Input Voltage: 12V
- Line Input Frequency: 47-63 Hz
- Maximum Power Consumption: 35W

Safety

- CSA/NRTL (UL1950, CSA 22.2.9.50)
- TUV/GS (EN60950)

Electromagnetic Compatibility

- CE Mark
- FCC Class A
- VCCI Class A
- CISPR Class A

Environmental

- Temperature:
  - IEC 68-2-14
  - 0 to 50 degrees C (Standard Operating)
  - -40 to 70 degree C (Non-operating)
- Humidity: 10% to 90% (Non-condensing)
- Vibration: IEC 68-2-36, IEC 68-2-6
- Shock: IEC 68-2-29

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OA2000 - Optical Access Ethernet Aggregator

OA2000 is a high-speed, high capacity access switch offering a SFP (SX, MMX, LX, ELX, ZE, EZX) interface with Optical trunks for a maximum of two ports and 24´100BASE-FX interface ports for end users.

OA201- Optical Network Termination (ONT) with Remote OAM

OA201 offers conversion between a 100BASE-FX optical trunk lines and a 10/100BASE-TX user access port. The unit comes with a unique built-in fiber and power connector lock mechanism to ensure network availability and uptime.

The MRV OA201 ONT sets the standard for Network Management and Maintenance capabilities without using additional IP address in the customer premises (IPLess™ technology):

- Loop testing is executed in-service, with no maintenance personnel. Loop test frames are sent remotely, providing port status reports directly to the maintenance console.

- Power failure alarms distinguish between cable faults and local power failures.

- The OA201 ONT uses the MRV Management solution, which can provide Fault, Performance, and Configuration Management, in one package.

- Power failure alarms (Last GASP) distinguish between cable faults and local power failures.

* Specifications are subject to change without notice.

Not sure which solution best fits your needs? Visit www.mrv.com or e-mail us at sales@mrv.com

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